

**Technical Memorandum for the
Seward Park Mixed-Use Development Project FGEIS
CEQR Number 11DME012M
Technical Memorandum 003
March 9, 2015**

A. INTRODUCTION

The applicant proposes use changes to the previously approved development program (described in the Seward Park Mixed-Use Development Project Final Generic Environmental Impact Statement (FGEIS), Technical Memorandum 001, and Technical Memorandum 002) and design controls determined as part of a Large-Scale General Development (LSGD) applicable to Sites 1-6 of the proposed mixed-use development program (“Essex Crossing program”). The proposed 1.98 million-gross-square foot (gsf) mixed-use development would result in the following changes, as compared to the FGEIS and Technical Memoranda 001 and 002:

- Increase of overall development size by approximately 16.6 percent (281,405 gsf);
- Increase of public market by 13,876 gsf;
- Of the 1,000 residential units, 400 would be affordable units and 100 would be affordable senior units;
- Increase of school space by 9,000 gsf;
- Reduction of retail space by 177,222 gsf;
- Increase of “Other Commercial Space” by 344,427 gsf (including the following uses: commercial office, a gym, a bowling alley, and a movie theater);
- Elimination of 500 parking spaces;
- Increase of “Other Community Facility space” by 31,092 gsf; and
- Omission of previously proposed hotel use of 97,450 gsf.

As a result of these use changes and the advanced project design at this point in time, the proposed Essex Crossing program requires Minor Modification to the LSGD design controls for Sites 1 and 5, as well as a Board of Standards and Appeals (BSA) Special Permit pursuant to New York City Zoning Resolution (ZR) Section 73-36 to allow for a physical culture or health establishment (gym) on Site 1, which is located within a C6-1 commercial zoning district.

BACKGROUND

On August 10, 2012 the Office of the Deputy Mayor for Economic Development¹ (ODMED), as Lead Agency, issued a Notice of Completion for the Seward Park Mixed-Use Development Project Final Generic Environmental Impact Statement (FGEIS) that was prepared in coordination with the New

¹ The Office formerly known as the Deputy Mayor for Economic Development is now the Office of the Deputy Mayor for Housing and Economic Development (ODMHED).

York City Economic Development Corporation (NYCEDC) and New York City Department of Housing Preservation & Development (HPD). Following the issuance of the Notice of Completion, the New York City Council (City Council) proposed certain modifications to the Uniform Land Use Review Procedure (ULURP) applications (the “Applications” or the “proposed actions”) as a result of its review of the Applications. In addition, HPD submitted a revised Urban Development Action Area Project (UDAAP) project summary (the “UDAAP Revised Project Summary”) to the City Council to be reflected in the City Council’s resolution regarding the project, and the City stated certain intentions, as reflected in a letter dated September 27, 2012, from Robert K. Steel, Deputy Mayor for Economic Development, to Councilmember Margaret Chin. Those modifications were assessed in a Technical Memorandum (CEQR Number 11DME012M TM 001) dated October 1, 2012 (Technical Memorandum 001). The proposed modifications assessed in Technical Memorandum 001 increased the number of residential units in the reasonable worst-case development scenario (RWCDS) to 1,000 from the 900 units assessed in the FGEIS, included the potential for a school on Site 5 as part of the RWCDS, and revised the Large Scale General Development (LSGD) ground floor plans for Zoning Lots 2, 3, and 4 to eliminate the second waiver to the ground floor frontage requirements. Technical Memorandum 001 concluded that the proposed modifications to the proposed actions would not result in any significant adverse environmental impacts that were not previously identified in the FGEIS.

Further, the New York City Department of City Planning reviewed a minor modification to the Applications, which was proposed by NYCEDC and HPD, in Technical Memorandum 002 (CEQR Number 11DME012M TM 002). The proposed modification increased the size of the proposed open space on Site 5 to 15,000 square feet from the 10,000 square feet assessed in the FGEIS. Technical Memorandum 002 concluded that the proposed modification would not result in any significant adverse environmental impacts not already identified in the FGEIS.

Since the issuance of the 2012 FGEIS and subsequent Technical Memoranda 001 and 002, the City of New York issued a developer’s Request for Proposal for the sites and selected Delancey Street Associates (DSA) as the designated developer for the project sites. DSA has proposed a specific program for each site and specific buildings designs for the six sites located within the LSGD (Sites 1-6). As with the FGEIS RWCDS, Site 7, a public parking garage, would not be redeveloped under the Essex Crossing program, and therefore, is not included in the analysis and is not analyzed in this Technical Memorandum. This Technical Memorandum assumes the most up to date program information for Sites 8-10; however, development of Sites 8-10 are further out in the completion timeline and thus are not as developed as those for Sites 1-6. The proposed program (“Essex Crossing program”) is different from the program analyzed in the 2012 FGEIS (“FGEIS program”) and subsequent Technical Memoranda 001 and 002 (“approved program”). Primary differences in the Essex Crossing program for Sites 1-6 include: an increase in public market space; a reduction of retail space; the elimination of the hotel; the addition of sub-grade retail space, a gym (Physical Culture Establishment), movie theater, bowling alley, and museum space; an increase in the amount of professional office space; and the elimination of 500 parking spaces. With the Essex Crossing program, the same uses would be introduced on Sites 8, 9, and 10 as the approved program; however, there would be shifts in retail and residential space on these sites with the Essex Crossing program.

In addition to programming changes, the full completion of the entire Essex Crossing program is expected to extend beyond the 2022 Build year analyzed in the FGEIS and subsequent Technical Memoranda 001 and 002. Due to lease agreements with the current tenants of Site 10, the development of approximately 14 residential units and 5,311 gsf of retail space in that building could not begin until 2021 and which would last until 2024. The development of the other Sites is expected to be complete by 2022, as was analyzed in the 2012 FGEIS. Considering the

unfinished Site 10 development would represent only 1.4 percent of the total Essex Crossing program floor area, it would have little bearing on the impacts anticipated for the overall project, which would largely materialize by 2022 and for which mitigation measures would need to be implemented. Therefore, for analysis purposes, 2022 is still the appropriate analysis year for assessing potential impacts from the Essex Crossing program.

The purpose of this Technical Memorandum is to determine whether the proposed Essex Crossing program would result in any significant adverse environmental impacts not already identified in the 2012 FGEIS and subsequent Technical Memoranda 001 and 002. As set forth below, this Technical Memorandum (Technical Memorandum 003) concludes that the proposed Essex Crossing program would not result in such impacts.

NYCEDC and/or HPD will require that its developers will implement the mitigation and associated environmental measures identified in the FGEIS and this Technical Memorandum, by means of provisions in the contract of sale or long-term lease or other legally binding agreement between the developer(s) and NYCEDC, HPD, and/or the City.

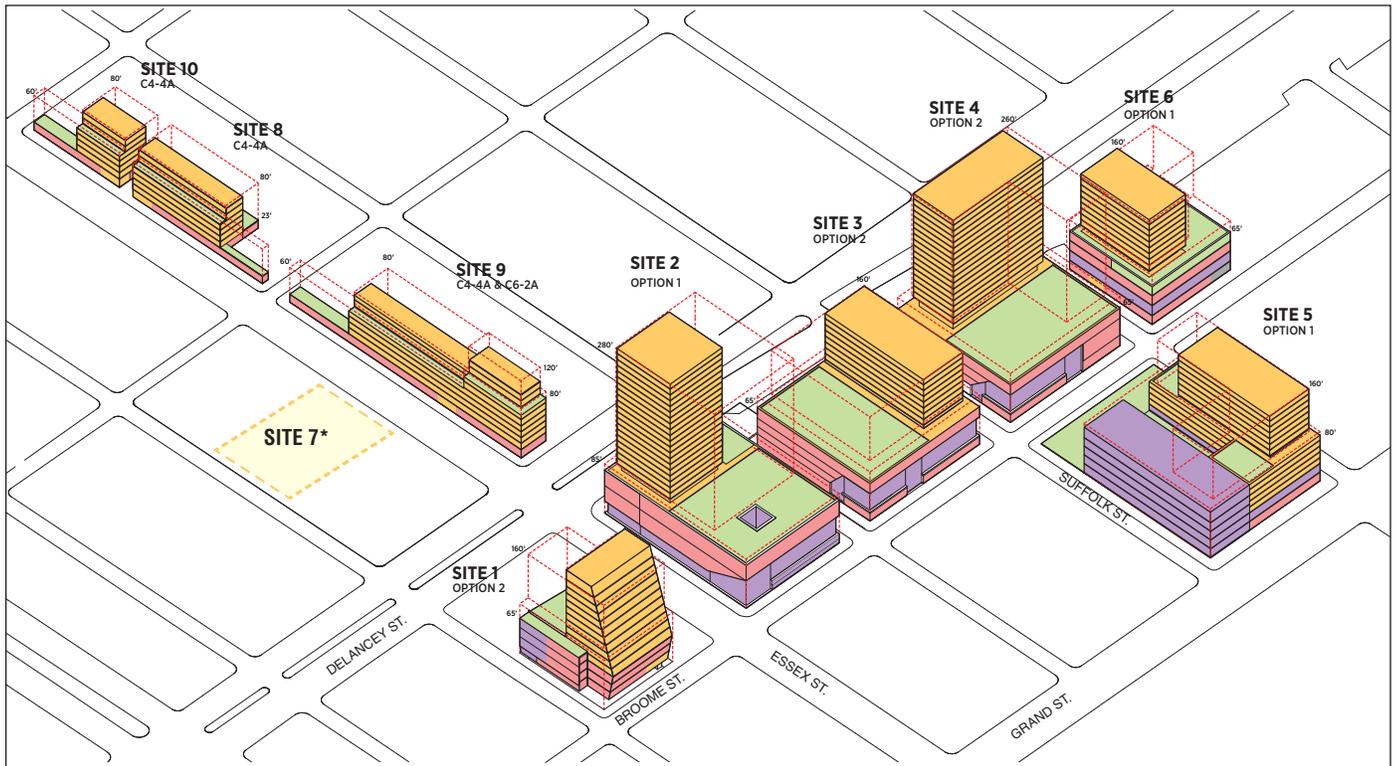
The development described below will require approval by the New York City Planning Commission (CPC) of an application for Minor Modification to a previously approved Seward Park LSGD Special Permit (C 120228 ZSM) to modify the design controls applicable to the LSGD for Site 1 and Site 5. Also, the addition of the gym to the program will require a Special Permit by BSA to allow a Physical Culture Establishment.

B. DESCRIPTION OF THE PROPOSED DEVELOPMENT

The proposed Essex Crossing program would introduce an approximately 1.98 million-gsf mixed-use development, which would be about 16.6 percent larger than the 1.70 million gsf approved program. As described below, the proposed buildings on Sites 1-6 would be within the limits of the maximum zoning envelopes established according to the LSGD rules and the future developments on Sites 8, 9, and 10 would be compliant with zoning (see **Figure 1**). **Table 1** compares the proposed Essex Crossing development with the approved program. Like the approved program, the proposed Essex Crossing program would provide 1,000 residential units. Of these residential units, there would be approximately 400 affordable units and 100 affordable senior housing units.

As shown in **Table 1**, the allowable zoning floor area for the proposed Essex Crossing program is 1.65 million zoning square feet (zsf), which is 5,128 zsf larger than the approved program. Tables 2, 3, 6, and 7 present proposed zsf estimates for Sites 1, 2, 5 and 6, respectively. The zsf estimates presented for the other sites (Sites 3, 4, 8, 9, and 10) are preliminary and may be further refined. While there may be nominal shifts in zsf for the other sites, the total zsf for the proposed Essex Crossing Program will not exceed the total amount presented in Table 1. Also, as the plans for each site are further refined, there may be shifts in the gsf estimates presented in Tables 1-10.

The proposed Essex Crossing program would introduce 715,886 gsf of commercial space, including retail (292,127 gsf), public market (43,028 gsf), and other commercial uses (380,731 gsf). "Other commercial uses" include commercial office, a gym, a bowling alley, and a movie theater. There would be 13 percent more commercial space than with the approved program, which would introduce 632,255 gsf of commercial space, including retail (469,349 gsf), hotel (97,450 gsf), public market (29,152 gsf), and other commercial space (36,304 gsf). The retail



FOR ILLUSTRATIVE PURPOSES ONLY

Proposed Essex Crossing Development



FOR ILLUSTRATIVE PURPOSES ONLY

FGEIS Illustrative Rendering with Maximum Building Envelopes and RWCDs Massing

*Site 7 would not be redeveloped under the approved program or the Essex Crossing Program

Proposed and Illustrative FGEIS Renderings
View Northwest
Figure 1

Table 1
Total Proposed Essex Crossing Program

	Allowable Zoning Floor Area (zsf)	Total Gross Floor Area (gsf)	Res. (gsf)	Retail (gsf)	Hotel (gsf)	Other Comm.* (gsf)	Public Market (gsf)	School (gsf)	Other CF* (gsf)	Other (gsf)
Proposed Essex Crossing Program	1,653,125	1,978,842	977,324 (1)	292,127	0	380,731 (2)	43,028	75,000	72,092 (3)	131,540 (4)
Tech Memo 001	1,647,997	1,697,437	951,182	469,349	97,450	36,304	29,152	66,000	48,000	0
Increment	5,128	281,405	26,142	-177,222	-97,450	344,427	13,876	9,000	31,092	131,540

Note:

- (1) 1,000 residential units (including 400 affordable units and 100 affordable senior units)
- (2) "Other Commercial Space" includes 237,708 gsf of office space, a 29,986 gsf gym (Physical Culture Establishment), 17,629 gsf bowling alley, and a 95,408 gsf movie theater.
- (3) Other Community Facility space includes 16,547 gsf of medical office space, 16,545 gsf museum, and 46,000 gsf of general community facility space.
- (4) Other includes 39,891 gsf of MEP, back of house, and support space; 79,364 gsf of mechanical space, 11,352 gsf Broome Street Gardens, and 933 gsf of subway space. Analyses including Transportation, Socioeconomic Conditions, Open Space, Water and Sewer Infrastructure, Solid Waste, and Energy allocate this other space to specific uses.
- (5) No parking spaces would be provided with the proposed Essex Crossing. In comparison, the FGEIS program and the approved program included the provision of up to 500 parking spaces on up to four sites (Sites 2 through 5).
- (6) A rooftop farm would be added on Site 2.

* Comm.= Commercial, CF= Community Facility

Source: Proposed program provided by the Applicant.

space that would be introduced with the proposed Essex Crossing program would include 43,028 gsf of public market space and 292,127 gsf of local and destination retail space, for a total of 335,155 gsf of retail space. The total amount of retail is lower than the approved plan's 498,501 gsf of retail that includes 469,349 gsf of local and destination retail and 29,152 gsf of public market space. The proposed Essex Crossing program would introduce 237,708 gsf of commercial office space. In comparison, the approved program assumed approximately 36,304 gsf of non-specific commercial uses, some of which could be office space. The proposed Essex Crossing program would also introduce 16,547 gsf of medical office space compared with the approved program, which assumed 43,000 gsf of medical office space. The proposed Essex Crossing program would not include a hotel, which was part of the FGEIS program and approved program. The proposed Essex Crossing program would introduce commercial and community facility uses that were not part of the FGEIS program or approved program. These include the following commercial uses: a 17,629-gsf bowling alley and 29,986-gsf gym (Physical Culture Establishment) on Site 1; a 95,408-gsf movie theater on Site 2; and 109,437 sf below-grade retail space (the Market Line) on Sites 2, 3, and 4 (the Market Line retail space at these sites would be connected underground), as well as the following community facility use: a 16,545-gsf museum on Site 1. Also, the Essex Crossing program would include the Broome Street Gardens on Sites 3 and 4, which would provide seating areas for visitors of the Market Line vendors. The proposed Essex Crossing program would also introduce a roof top farm on Site 2. These uses were not contemplated in the FGEIS.

Further, while the FGEIS and ULURP approval contemplated special permits that would accommodate the potential for up to 500 parking spaces on up to four sites (Sites 2 through 5), no parking spaces would be provided with the Essex Crossing program. As assessed in Technical Memorandum 001, the proposed development would reserve space on Site 5 for a

public school, and as assessed in Technical Memorandum 002, the proposed development would create an approximately 15,000-sf public open space on Site 5.

The specific development proposed for each site is described below.

SITE 1

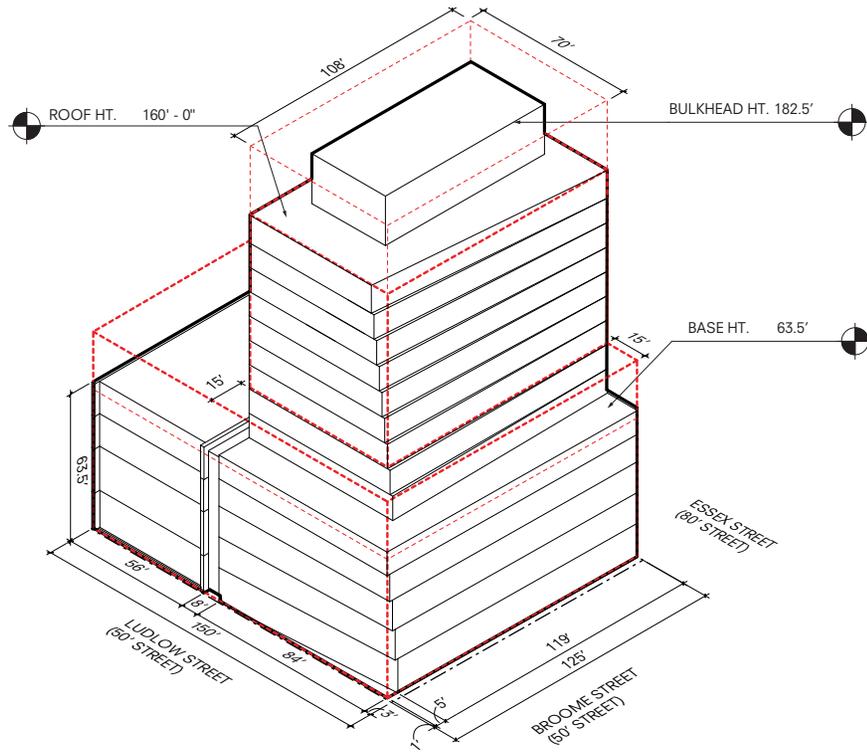
DSA proposes to construct a 185,676-gsf building on Site 1, which would be 44,994 gsf larger than the 140,682-gsf reasonable worst-case development scenario (RWCDS) building that was analyzed in the FGEIS and Technical Memorandum 001. The building on Site 1 would include 55 residential units, including 11 affordable units. In addition, the proposed building on Site 1 would include uses that were not previously analyzed, including a 29,986-gsf gym (Physical Culture Establishment) on floors 2 through 4, a 17,629-gsf bowling alley in the first below-grade level, and a 16,545-gsf museum on the ground and second floors. An operator for the gym has not been determined. As described above, a BSA Special Permit pursuant to ZR Section 73-36 would be required to allow a physical culture or health establishment in a C6-1 commercial district. These new uses would be consistent with the mix of commercial and community facility uses assessed for the development sites in the FGEIS and Technical Memorandum 001. **Table 2** shows a comparison between the proposed Essex Crossing program and the approved program.

**Table 2
Proposed Site 1 Program**

	Allowable Zoning Floor Area (zsf)	Total Gross Floor Area (gsf)	Residential (gsf)	Retail (gsf)	Hotel (gsf)	Other Comm.* (gsf)	Public Market (gsf)	School (gsf)	Other CF* (gsf)	Other (gsf)
Proposed Essex Crossing Program	137,542	185,676	74,692 (1)	6,933	0	47,615 (2)	0	0	16,545 (3)	39,891 (4)
FGEIS/ Tech Memo 001	142,708	140,682	74,951	60,731	0	0	0	0	5,000	0
Increment	-5,166	44,994	-259	-53,798	0	47,615	0	0	11,545	39,891

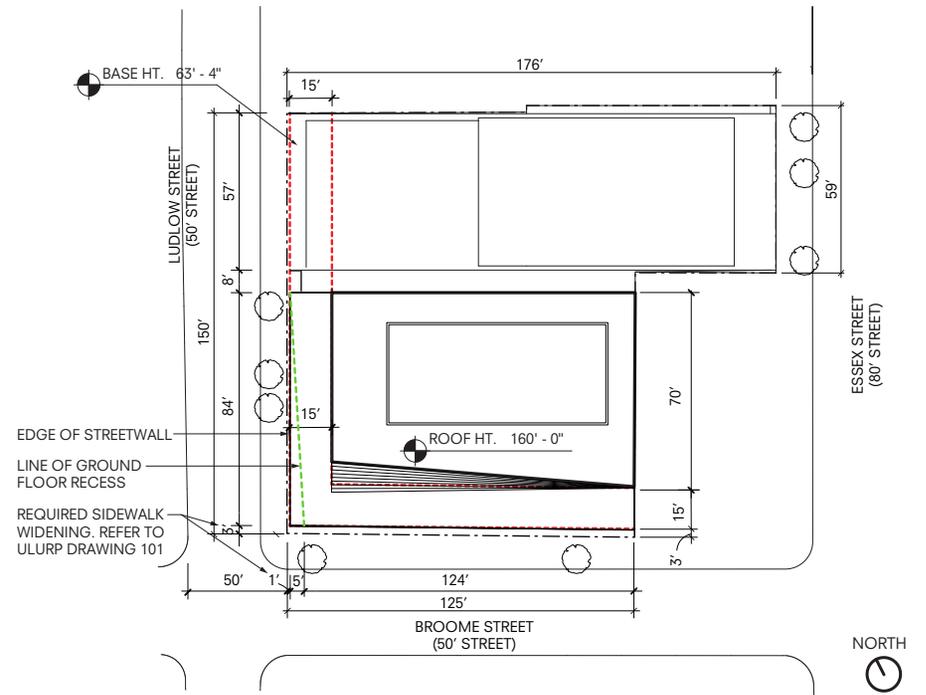
Notes:
 (1) 55 residential units (including 11 affordable units).
 (2) Other commercial space includes a bowling alley (17,629 gsf) and a gym (29,986 gsf).
 (3) The Community Facility Space is a proposed museum use.
 (4) Other space is MEP, back of house, and support space.
 * Comm.= Commercial, CF= Community Facility
Source: Proposed program provided by the Applicant.

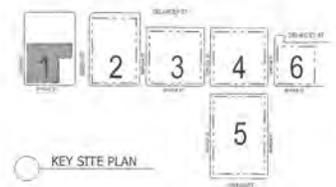
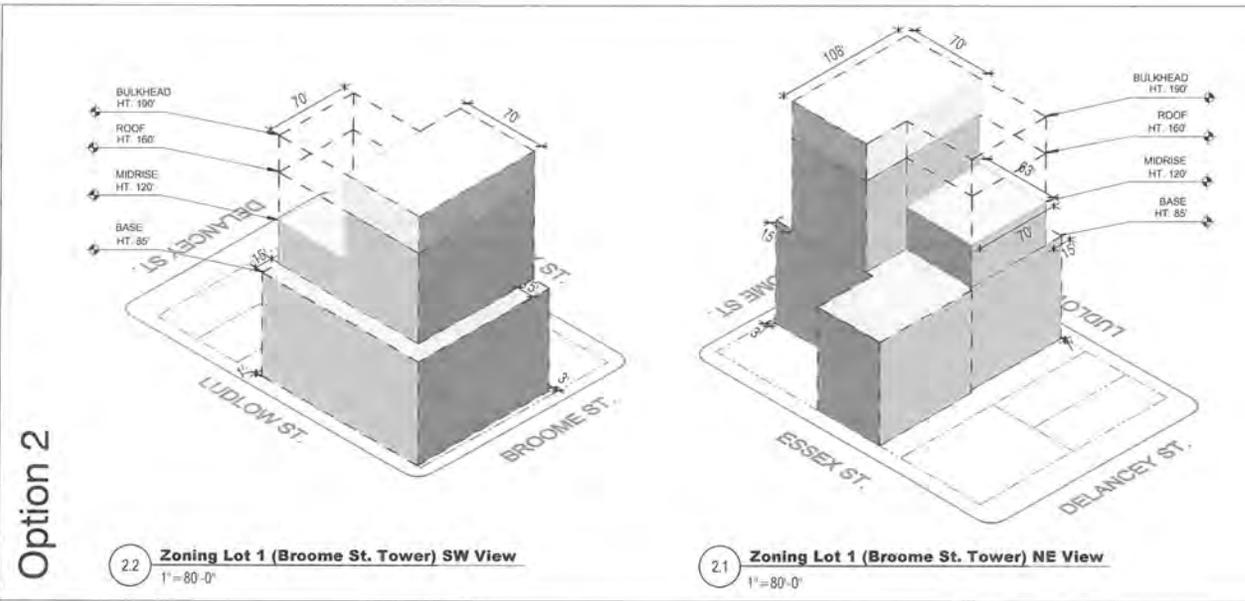
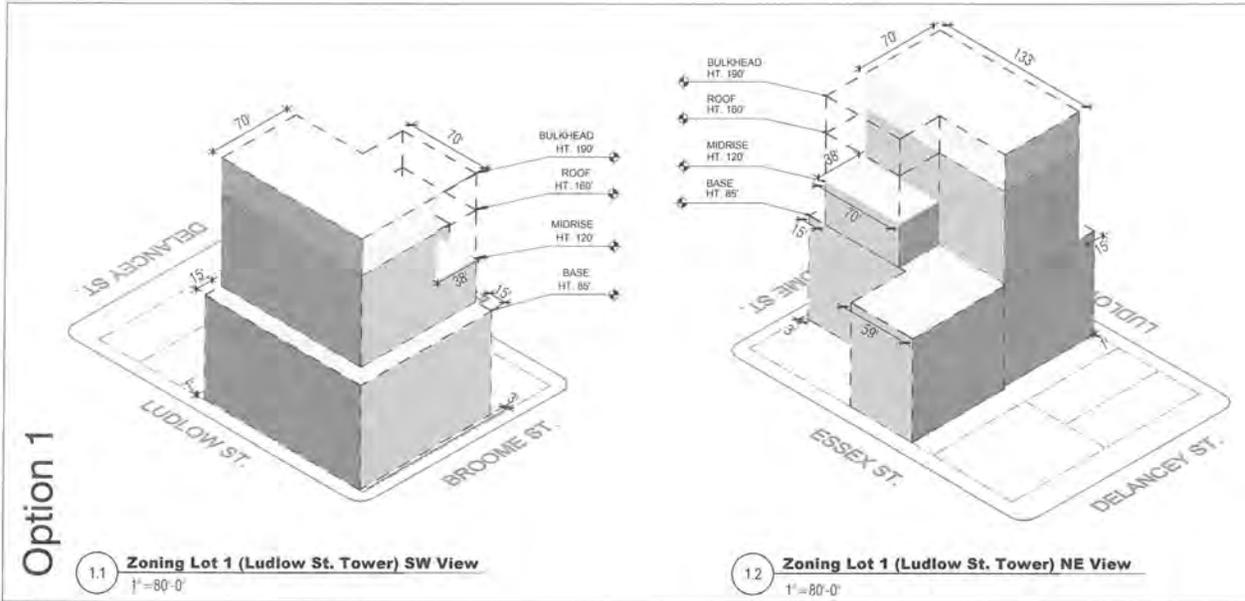
The proposed building would fit within the maximum zoning envelope assessed in the FGEIS. However, DSA is seeking a minor modification to the Large Scale General Development (LSGD) design controls for Site 1 to vary a portion of the streetwall (see **Figures 2a and 2b**). With the proposed modification, the base would be angled along Ludlow Street to create a wider sidewalk, and the streetwall along Ludlow Street would not be compliant with the LSGD design controls (see **Figure 2c**). The intent of the modification is to taper the building’s Ludlow Street frontage and widen the sidewalk at the corner of Broome and Ludlow Streets to provide pedestrian space at the building entry and corner, meet the setback of the Seward Park High School on the block south of the intersection, and provide more open views up Ludlow Street, thereby promoting the visitor’s appreciation of the existing low-rise buildings within the Lower East Side Historic District to the south and west. The allowance to taper the Ludlow Street streetwall would, therefore, serve to widen the public realm, promote pedestrian circulation,



NOTE:
DRAWING FOR ILLUSTRATIVE PURPOSES. HEIGHTS AND DIMENSIONS ARE APPROXIMATE AND MAY CHANGE.

- LEGEND**
- STREET CURB LINE
 - - - PROPERTY LINE
 - · - · - · MAX. PERMITTED BUILDING ENVELOPE PER ULURP
 - PROPOSED BUILDING MASSING

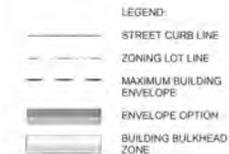




DESIGN CONTROLS

Bulk, Height and Setback

1. Envelope heights are relative to the Base Plane (Sheet 104M) or the Average Curb Level (Sheet 104N) elevations (as indicated).
2. The base or streetwall portion of Site 1 will have a minimum height of 60' and a maximum height of 85' on Broome and Ludlow Streets; the minimum base height on Essex Street may be below the minimum height of 60', but no lower than 25'.
3. The midrise portions of all buildings developed pursuant to the approved Large-Scale General Development will have a maximum height of 120'.
4. For Zoning Lot 1, Options 1 and 2, the envelope option volume indicates the maximum extent of the base and midrise portions of the building. The tower in Option 1 will be limited to a maximum length of 133' and a maximum width of 70'. The tower in Option 2 will be limited to a maximum length of 108' and a maximum width of 70'.
5. Elevator or stair bulkheads (including shafts; and vestibules not larger than 60 square feet in area providing access to a roof), roof water tanks and accessory mechanical equipment (including enclosures), other than solar or wind energy systems, shall be permitted to exceed the maximum building (roof) heights approved in the LSGD, up to a maximum bulkhead height of 30 feet, provided that:
 - i. such obstructions shall be located not less than 10 feet from the street wall of a building, except that such obstructions need not be set back more than 25 feet from a narrow street line or more than 20 feet from a wide street line. However, such restrictions on location shall not apply to elevator or stair bulkheads (including shafts or vestibules), provided the aggregate width of street walls of such bulkheads within 10 feet of a street wall, facing each street frontage, times their average height, in feet, does not exceed an area equal to four feet times the width, in feet, of the street wall of the building facing such frontage.
 - ii. all mechanical equipment shall be screened on all sides.
 - iii. such obstructions and screening are contained within a volume that complies with one of the following:
 - a. the product, in square feet, of the aggregate width of street walls of such obstructions facing each street frontage, times their average height, shall not exceed an area equal to eight feet times the width, in feet, of the street wall of the building facing such frontage; or
 - b. the lot coverage of all such obstructions does not exceed 20 percent of the lot coverage of the building.





bring more light and air onto the street, and align the Ludlow Street view corridor at this prominent intersection. The proposed modification would also serve to differentiate the entrance to the museum from the remaining portions of the mixed-use building. As described below, the proposed modification would not result in any significant adverse impacts.

With the exception of the variation in the streetwall the proposed building on Site 1 would be consistent with the LSGD design controls for Site 1. The proposed building would have an east-west oriented tower on Broome Street. The tower would be 160 feet to the roof and 182 feet to the top of the mechanical bulkhead in compliance with the maximum tower heights for the site. The proposed building would not have a mid-rise portion, and the base height would be 64 feet in compliance with the minimum and maximum base heights for the site. The proposed building would also be in compliance with tower dimension and setback controls.

SITE 2

DSA proposes to construct a 388,100-gsf building on Site 2, which would be approximately 32,900 gsf larger than the 355,200-gsf RWCDs building that was analyzed in the FGEIS and Technical Memorandum 001. As proposed by DSA, the building on Site 2 would include 187,195 gsf of residential space (195 units, of which 98 units would be affordable), whereas the FGEIS program and the approved program assumed that Site 2 would include a 200-room hotel. In addition, the relocated and expanded Essex Street Market would increase to approximately 43,028 gsf from the 29,152 gsf assessed in the FGEIS and Technical Memorandum 001. In addition to the Essex Street Market, Site 2 would have retail in a below-grade space called the Market Line that would run under Norfolk Street to the building on Site 3 and continue under Suffolk Street to the building on Site 4. DSA intends the Market Line’s smaller sized retailers to expand the breadth of goods and services available on the development sites and in the neighborhood. The 2nd and 3rd levels of the building on Site 2 would have a movie theater. The Market Line and movie theater are new program elements that were not evaluated in the FGEIS or Technical Memorandum 001. In addition, a roof top farm is envisioned on the roof of the third floor facing Broome Street. This 8,000- to 9,000-sf outdoor growing area would have an educational component and would be associated with the Market Line. This **Table 3** shows a comparison between the proposed Essex Crossing program and the approved program.

**Table 3
Proposed Site 2 Program**

	Allowable Zoning Floor Area (zsf)	Total Gross Floor Area (gsf)	Residential (gsf)	Retail (gsf)	Hotel (gsf)	Other Comm.* (gsf)	Public Market (gsf)	School (gsf)	Other CF* (gsf)	Other (gsf)
Proposed Essex Crossing Program	300,547	388,100	187,195 (1)	41,271	0	95,408 (2)	43,028	0	0	21,198 (3)
FGEIS/ Tech Memo 001	280,410	355,200	0	167,294	97,450	36,304	29,152	0	25,000	0
Increment	20,137	32,900	187,195	-126,023	-97,450	59,104	13,876	0	-25,000	21,198

Notes:
 (1) Building would include 195 residential units (including 98 affordable units).
 (2) Other commercial space includes a 95,408 sf movie theater.
 (3) Other space is mechanical space.
 * Comm.= Commercial, CF= Community Facility
Source: Proposed program provided by the Applicant.

The proposed building would fit within the maximum zoning envelope assessed in the FGEIS. Consistent with the LSGD design controls for Site 2, the proposed building would have a square tower on Delancey Street. The tower would be 285 feet to the roof and 315 to the top of the mechanical bulkhead in compliance with the maximum tower heights for the site. The proposed building would not have a mid-rise portion, and the base height would be 80 feet in compliance with the minimum and maximum base heights for the site. The proposed building would also be in compliance with tower dimension, streetwall, and setback controls.

SITE 3

The proposed building on Site 3 would be 296,593 gsf, which would be 57,335 gsf larger than the building analyzed in Technical Memorandum 001. The building on Site 3 would include 107,902 gsf of office space, 80,757 gsf of residential space, and 72,758 gsf of retail space. In addition, the building would include 97 residential units (including 48 affordable units). The retail space would include below-grade Market Line space that would connect with the Market Line space on Sites 2 and 4. In addition, the 2nd level would contain a seating area above the retail stores that overlooks Broome Street and the Market Line. This seating area would be called the Broome Street Gardens, and there would be a separate but similar seating area in the building on Site 4. On Site 3, the Broome Street Gardens space would be approximately 7,287 gsf (see **Figure 3**). This interior seating area, which would be open during the hours of operation of the retail space, would be accessed through the retail space. **Table 4** shows a comparison between the proposed Essex Crossing program and the approved program.

**Table 4
Proposed Site 3 Program**

	Allowable Zoning Floor Area (zsf)	Total Gross Floor Area (gsf)	Residential (gsf)	Retail (gsf)	Hotel (gsf)	Other Comm.* (gsf)	Public Market (gsf)	School (gsf)	Other CF* (gsf)	Other (gsf)
Proposed Essex Crossing Program	241,004	296,593	80,757 (1)	72,758	0	107,902 (2)	0	0	0	35,176 (3)
Tech Memo 001	265,038	239,258	168,239	71,019	0	0	0	0	0	0
Increment	-24,034	57,335	-87,482	1,739	0	107,902	0	0	0	35,176

Notes:
 (1) 97 residential units (including 48 affordable units).
 (2) Other commercial space includes 107,902 gsf of office space.
 (3) Other includes 27,889 gsf of mechanical space and the 7,287 gsf Broome Street Gardens.
 * Comm.= Commercial, CF= Community Facility
Source: Proposed program provided by the Applicant.

The proposed building would fit within the maximum zoning envelope assessed in the FGEIS. Consistent with the LSGD design controls for Site 3, the proposed building would have a tower on Suffolk Street. The tower would be 156 feet to the roof in compliance with the maximum tower heights for the site. The proposed building would not have a mid-rise portion, and the base height would be 76 feet in compliance with the minimum and maximum base heights for the site. The proposed building would also be in compliance with tower dimension, streetwall, and setback controls.



SITE 4

DSA proposes to construct a 433,777-gsf building on Site 4, which would be approximately 89,426 gsf larger than the building analyzed in Technical Memorandum 001. The proposed building on Site 4 would have a mix of uses, including 214,061 gsf of residential space (240 residential units, of which 118 units would be affordable), 129,806 gsf of office space, and 59,073 gsf of retail uses. This retail space would include below-grade Market Line retail space. Site 4 would also include approximately 4,065 gsf of Broome Street Gardens space. As described above, the Broome Street Gardens space would provide indoor seating areas on Sites 3 and 4 that would be accessible through the retail space. **Table 5** shows a comparison between the proposed Essex Crossing program and the approved program.

**Table 5
Proposed Site 4 Program**

	Allowable Zoning Floor Area (zsf)	Total Gross Floor Area (gsf)	Residential (gsf)	Retail (gsf)	Hotel (gsf)	Other Comm.* (gsf)	Public Market (gsf)	School (gsf)	Other CF* (gsf)	Other (gsf)
Proposed Essex Crossing Program	369,211	433,777	214,061 (1)	59,073 (2)	0	129,806 (3)	0	0	0	30,837 (4)
Tech Memo 001	264,063	344,351	256,663	69,688	0	0	0	0	18,000	0
Increment	105,148	89,426	-42,602	-10,615	0	129,806	0	0	-18,000	30,837
Notes:										
(1) 240 residential units (including 118 affordable units).										
(2) Retail includes: 12,764 gsf of sub-grade Market Line space.										
(3) Other Commercial Space is office space.										
(4) Other space includes 26,772 gsf of mechanical space and the 4,065 gsf Broome Street Gardens.										
* Comm.= Commercial, CF= Community Facility										
Source: Proposed program provided by the Applicant.										

The proposed building would fit within the maximum zoning envelope assessed in the FGEIS. Consistent with the LSGD design controls for Site 4, the proposed building would have a tower on Delancey Street. The tower would be 260 feet to the roof in compliance with the maximum tower heights for the site. The proposed building would not have a mid-rise portion, and the base height would be 76 feet in compliance with the minimum and maximum base heights for the site. The proposed building would also be in compliance with tower dimension, streetwall, and setback controls.

SITE 5

The proposed building on Site 5 would be 344,544 gsf, which would be approximately 1,086 gsf larger than the building analyzed in Technical Memorandum 001. The proposed building would contain 193,296 gsf of residential space (211 residential units, of which 104 units would be affordable) and 72,743 gsf of retail space. The FGEIS and ULURP approval contemplated special permits that would accommodate the potential for up to 500 parking spaces on up to four sites, including Site 5. With the Essex Crossing program, no parking would be provided on Site 5. The entrance to the building’s loading dock would be located on Clinton Street, whereas the parking and loading entrances to the RWCDs development on Site 5 were assumed in the FGEIS to be located on Suffolk Street. **Table 6** shows a comparison between the proposed Essex Crossing program and the approved program.

**Table 6
Proposed Site 5 Program**

	Allowable Zoning Floor Area (zsf)	Total Gross Floor Area (gsf)	Residential (gsf)	Retail (gsf)	Hotel (gsf)	Other Comm.* (gsf)	Public Market (gsf)	School (gsf)	Other CF* (gsf)	Other (gsf)
Proposed Essex Crossing Program	297,908	344,544	193,296 (1)	72,743	0	0	0	75,000	0	3,505 (2)
Tech Memo 001	394,602	343,458	229,603	47,855	0	0	0	66,000	0	0
Increment	-96,694	1,086	-36,307	24,888	0	0	0	9,000	0	3,505

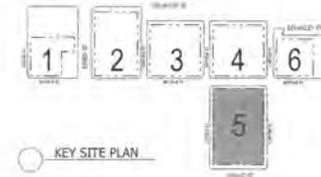
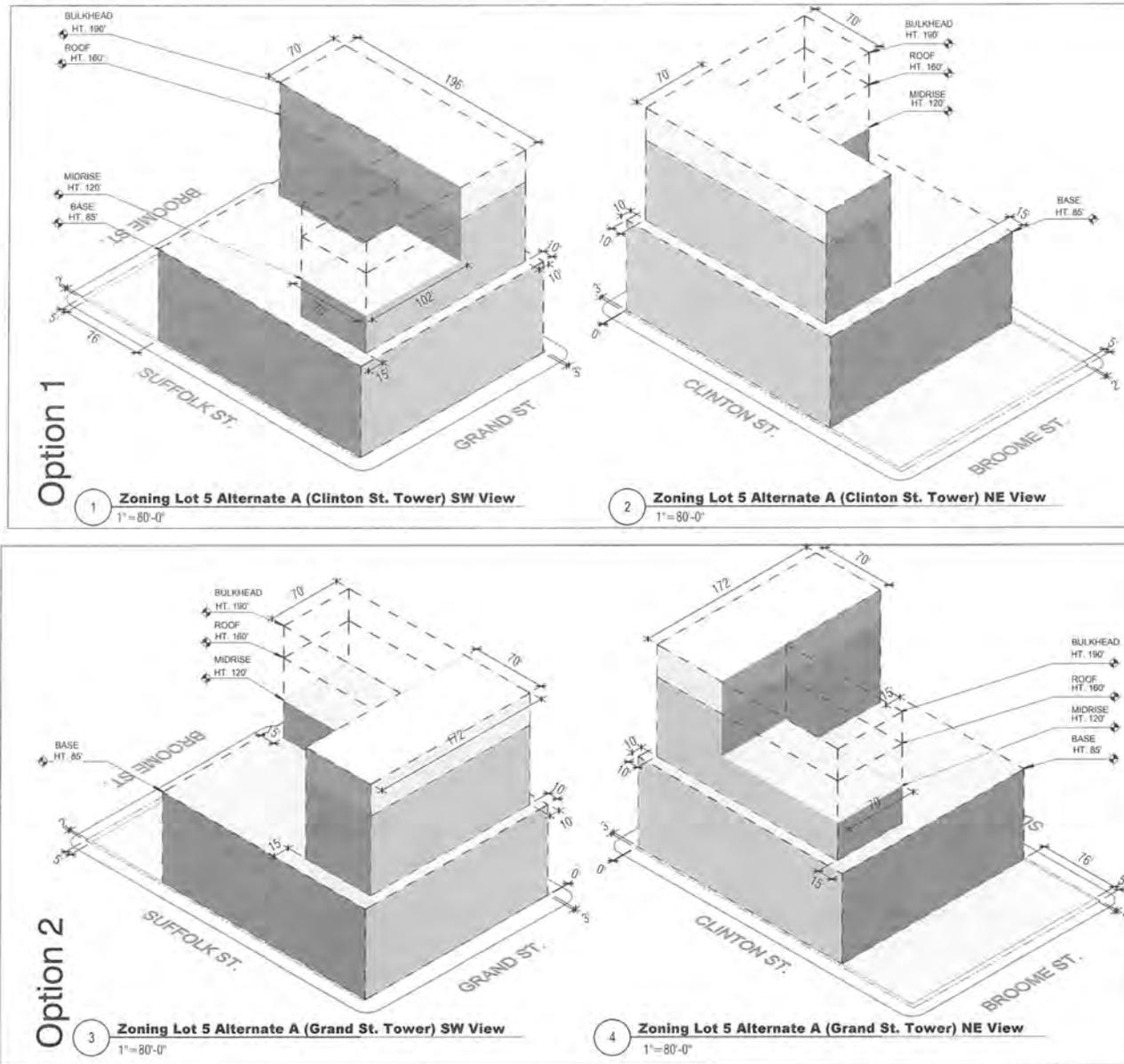
Note:
 (1) 211 residential units (including 104 affordable units)
 (2) Other space includes mechanical space.
 Site 5 would also include 15,000 gsf of publicly accessible open space.
 * Comm.= Commercial, CF= Community Facility
Source: Proposed program provided by the Applicant.

As assessed in Technical Memorandum 002, the proposed development on Site 5 would include a 15,000-sf public open space on the Broome Street portion of the site, and the proposed development on Site 5 is reserving an approximately 15,400-sf portion of the site fronting on Grand and Suffolk Streets for the potential future use of a school as assessed in Technical Memorandum 001. The Essex Crossing Program contemplates a 75,000-gsf school, while Technical Memorandum 001 analyzed a 66,000-gsf school. The proposed building would fit within the maximum zoning envelope assessed in the FGEIS. However, DSA is seeking a minor modification to the LSGD design controls for Site 5 to reduce the 60-foot minimum base height on the Clinton Street frontage of the site (see **Figures 4a, 4b, and 4c**). The proposed modification would permit the base height of the proposed building on Site 5 along Clinton Street 50 feet beyond the intersection with Grand Street and along the proposed open space to be set as low as 29 feet. Allowing for a lower streetwall in those locations is necessary to allow the building to set back at a lower level so that the residential tower can begin at the third floor. Without the proposed modification, residential tower floors three through six would be required to be built to the streetline of Clinton Street, conflicting with the otherwise efficient floor plans for the residential tower. With the proposed modification, the perimeter of floors three through six would align with the seventh floor in the above residential tower. As described below, the proposed modification would not result in any significant adverse impacts.

With the exception of the reduced base height, the proposed building would comply with all of the LSGD design controls. Consistent with the LSGD design controls for Site 5, the proposed building would have a tower on Clinton Street, which would be 160 feet to the roof and 180 feet to the top of the mechanical bulkhead in compliance with the maximum tower heights for the site, and it would comply with the tower dimension controls. The proposed building would not have a mid-rise portion, and the base height on Grand Street would be 78 feet in compliance with the minimum and maximum base heights for the site. The proposed building would also be in compliance with streetwall and setback controls.

SITE 6

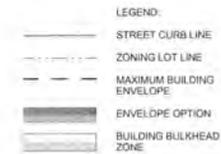
The proposed building that would be constructed on Site 6 would be 154,851 gsf, which would be 47,825 gsf larger than the building analyzed in Technical Memorandum 001, and it would include 100 affordable senior housing units. There would be 7,000 gsf of ground-floor retail



DESIGN CONTROLS

Bulk, Height and Setback

1. Envelope heights are relative to the Base Plane (see Sheet 504M).
2. The base or streetwall portions of Site 5 will have a minimum height of 60' and a maximum height of 85', except as indicated in Note 6.
3. The midrise portions of all buildings developed pursuant to the approved Large-Scale General Development will have a maximum height of 120'.
4. For Zoning Lot 5, Options 1 and 2, the envelope option volume indicates the maximum extent of the base and midrise portions of the building. The tower portion of the building may be located anywhere above the building base within the respective envelope options shown. In both options, the tower will be limited to a maximum length of 160' and a maximum width of 70'.
5. Elevator or stair bulkheads (including shafts; and vestibules not larger than 60 square feet in area providing access to a roof), roof water tanks and accessory mechanical equipment (including enclosures), other than solar or wind energy systems, shall be permitted to exceed the maximum building (roof) heights approved in the LSGD, up to a maximum bulkhead height of 30 feet, provided that:
 - i. such obstructions shall be located not less than 10 feet from the street wall of a building, except that such obstructions need not be set back more than 25 feet from a narrow street line or more than 20 feet from a wide street line. However, such restrictions on location shall not apply to elevator or stair bulkheads (including shafts or vestibules), provided the aggregate width of street walls of such bulkheads within 10 feet of a street wall, facing each street frontage, times their average height, in feet, does not exceed an area equal to four feet times the width, in feet, of the street wall of the building facing such frontage.
 - ii. all mechanical equipment shall be screened on all sides.
 - iii. such obstructions and screening are contained within a volume that complies with one of the following:
 - a. the product, in square feet, of the aggregate width of street walls of such obstructions facing each street frontage, times their average height, shall not exceed an area equal to eight feet times the width, in feet, of the street wall of the building facing such frontage; or
 - b. the lot coverage of all such obstructions does not exceed 20 percent of the lot coverage of the building.
6. The base height along the Publicly Accessible Open Space and on Clinton Street beyond 50 feet of its intersection with Broome Street shall have a minimum height of 29 feet.





space. The building would also include 16,547 gsf of medical office space and 46,000 gsf of other community facility space. **Table 7** shows a comparison between the proposed Essex Crossing program and the approved program.

**Table 7
Proposed Site 6 Program**

	Allowable Zoning Floor Area (zsf)	Total Gross Floor Area (gsf)	Res. (gsf)	Retail (gsf)	Hotel (gsf)	Other Comm.* (gsf)	Public Market (gsf)	School (gsf)	Other CF* (gsf)	Other (gsf)
Proposed Essex Crossing Program	138,708	154,851	85,304 (1)	7,000	0	0	0	0	62,547 (2)	0
Tech Memo 001	138,593	107,026	88,101	18,925	0	0	0	0	0	0
Increment	115	47,825	-2,797	-11,925	0	0	0	0	62,547	0

Notes:
 (1) 100 affordable senior residential units.
 (2) "Other Community Facility" space would include 16,547 gsf of medical office space and 46,000 gsf of community office space and general community facility space.
 * Comm.= Commercial, CF= Community Facility
Source: Proposed program provided by the Applicant.

The proposed building would fit within the maximum zoning envelope assessed in the FGEIS. Consistent with the LSGD design controls for Site 6, the proposed building would have a tower on Delancey Street. The tower would be 160 feet to the roof and 170 feet to the top of the mechanical bulkhead in compliance with the maximum tower heights for the site. The proposed building would not have a mid-rise portion, and the base height would be approximately 65 feet in compliance with the minimum and maximum base heights for the site. The proposed building would also be in compliance with tower dimension, streetwall, and setback controls.

SITE 8

The building on Site 8 has not been designed or programmed as fully as the buildings within the LSGD on Sites 1-6, but it is planned to be 46,215 gsf, which would be approximately 437 gsf smaller than the building analyzed in Technical Memorandum 001. The building would introduce 24 residential units, of which 20 percent would be affordable. The ground-floor retail space is envisioned to be neighborhood-oriented retailers. **Table 8** shows a comparison between the proposed Essex Crossing program and the approved program. The massing and height of the building on Site 8 would be compliant with existing zoning, as assessed in the FGEIS.

SITE 9

The building on Site 9 has not been designed or programmed as fully as the buildings within the LSGD on Sites 1-6, but it is planned to be 102,364 gsf, approximately 8,196 gsf larger than the building analyzed in Technical Memorandum 001. As currently programmed, the proposed building would include 83,609 gsf of residential space (64 units, of which 20 percent would be affordable) and 17,822 gsf of retail space. Like the retail space on Site 8, the retail space on Site 9 is envisioned to be occupied by neighborhood-oriented retailers. **Table 9** shows a comparison between the proposed Essex Crossing program and the approved program. The massing and height of the building on Site 9 would be compliant with existing zoning, as assessed in the FGEIS.

**Table 8
Proposed Site 8 Program**

	Allowable Zoning Floor Area (zsf)	Total Gross Floor Area (gsf)	Residential (gsf)	Retail (gsf)	Hotel (gsf)	Other Comm.* (gsf)	Public Market (gsf)	School (gsf)	Other CF* (gsf)	Other (gsf)
Proposed Essex Crossing Program	44,829	46,215	36,999 (1)	9,216	0	0	0	0	0	0
FGEIS/ Tech Memo 001	44,840	46,652	37,862	8,790	0	0	0	0	0	0
Increment	-11	-437	-863	426	0	0	0	0	0	0

Notes:
 (1) The building would include 24 condominiums (20 percent affordable).
 * Comm.= Commercial, CF= Community Facility
Source: Proposed program provided by the Applicant.

**Table 9
Proposed Site 9 Program**

	Allowable Zoning Floor Area (zsf)	Total Gross Floor Area (gsf)	Residential (gsf)	Retail (gsf)	Hotel (gsf)	Other Comm.* (gsf)	Public Market (gsf)	School (gsf)	Other CF* (gsf)	Other (gsf)
Proposed Essex Crossing Program	97,455	102,364	83,609 (1)	17,822 (2)	0	0	0	0	0	933 (3)
FGEIS/ Tech Memo 001	90,384	94,168	75,361	18,807	0	0	0	0	0	0
Increment	7,071	8,196	8,248	-985	0	0	0	0	0	933

Note:
 (1) 64 condominiums (20 percent affordable).
 (2) Retail space is envisioned as neighborhood oriented businesses and boutiques.
 (3) Other space is subway space.
 * Comm.= Commercial, CF= Community Facility
Source: Proposed program provided by the Applicant.

SITE 10

The building on Site 10 has not been designed or programmed as fully as the buildings within the LSGD on Sites 1-6, but it is planned to be 26,722 gsf, which would be 80 gsf larger than the building assessed in Technical Memorandum 001. The proposed building would introduce 14 residential units, of which 20 percent would be affordable, and there would be 5,311 gsf of ground-floor retail space. **Table 10** shows a comparison between the proposed Essex Crossing program and the approved program. The massing and height of the building on Site 10 would be compliant with existing zoning, as assessed in the FGEIS.

This Technical Memorandum is required to analyze whether the proposed Essex Crossing program, which includes uses not analyzed in the FGEIS and Technical Memoranda 001 and 002, would result in any significant adverse impacts not already identified in the FGEIS.

Table 10
Proposed Site 10 Program

	Allowable Zoning Floor Area (zsf)	Total Gross Floor Area (gsf)	Residential (gsf)	Retail (gsf)	Hotel (gsf)	Other Comm.* (gsf)	Public Market (gsf)	School (gsf)	Other CF* (gsf)	Other (gsf)
Proposed Essex Crossing Program	25,921	26,722	21,411 (1)	5,311	0	0	0	0	0	0
FGEIS/ Tech Memo 001	27,360	26,642	20,402	6,240	0	0	0	0	0	0
Increment	-1,439	80	1,009	-929	0	0	0	0	0	0
Note: (1) 14 condominiums (20 percent affordable). * Comm.= Commercial, CF= Community Facility										
Source: Proposed program provided by the Applicant.										

In addition, this Technical Memorandum analyzes the whether the proposed Minor Modification for Site 1 would result in any significant adverse impacts not already identified in the FGEIS. With the proposed modification on Site 1, the base would be angled along Ludlow Street to create a wider sidewalk, and the streetwall along Ludlow Street would not be compliant with the LSGD design controls. The allowance to taper the Ludlow Street streetwall would, therefore, serve to widen the public realm, promote pedestrian circulation, bring more light and air onto the street, and align the Ludlow Street view corridor at this prominent intersection.

This Technical Memorandum also analyzes whether the proposed Minor Modification on Site 5 would result in any significant adverse impacts not already identified in the FGEIS. As described above, the proposed modification on Site 5 would permit the base height of the proposed building on Site 5 along Clinton Street 50 feet beyond the intersection with Grand Street and along the proposed open space to be set as low as 29 feet. Allowing for a lower streetwall in those locations is necessary to allow the building to set back at a lower level so that the residential tower can begin at the third floor. With the proposed modification, the perimeter of floors three through six would align with the seventh floor in the above residential tower.

Finally, this Technical Memorandum analyzes whether the BSA Special Permit would result in any significant adverse impacts not already identified in the FGEIS. As described above, this BSA Special Permit is required to allow for a Physical Culture Establishment (gym) on Site 1, which is located within a C6-1 commercial zoning district.

INFRASTRUCTURE IMPROVEMENTS

As discussed above, the proposed Essex Crossing program includes the Market Line, which is sub-grade retail on Sites 2, 3, and 4. To facilitate the construction of the pedestrian tunnel connecting Sites 2 and 3, portions of an existing New York City Department of Environmental Protection (NYCDEP) owned 15-inch combined sewer and 12-inch water main within the bed of Norfolk Street would need to be relocated and reconstructed within Norfolk Street along the entire frontage of Sites 2 and 3. Design and permitting plans and details for the sewer and water main reconstruction would be filed with NYCDEP for review. Upon approval, NYCDEP would issue a permit to reconstruct their facilities within the Norfolk Street road bed. It is not anticipated that any additional utility relocations would be required as part of the tunnel construction between Sites 2 and 3; however, coordination with Consolidated Edison would be

incorporated into the construction planning in order to protect and maintain their facilities while the tunnel is under construction.

Relocation and reconstruction of portions of the existing NYCDEP owned 15-inch combined sewer bed 12-inch water main within the bed of Suffolk Street would likely be required to facilitate the construction of the pedestrian tunnel connecting the Market Line for Sites 3 and 4. Once the design is underway for Sites 3 and 4, the design team would initiate preliminary meetings with NYCDEP to determine the requirements for relocating water and sewer utilities within Suffolk Street to facilitate the proposed tunnel, and develop design and permitting plans for the proposed relocations. Relocation of existing Consolidated Edison electrical utilities may be required to facilitate tunnel construction and any required relocations will be coordinated with Consolidated Edison as the design for Sites 3 and 4 are advanced.

C. POTENTIAL IMPACTS OF THE PROPOSED DEVELOPMENT

The proposed Essex Crossing development would introduce a program that is different from the RWCDs program analyzed in the FGEIS and Technical Memoranda 001 and 002. Therefore, the potential for new significant adverse impacts in the analysis areas based on the program are considered below. In addition, each site within the LSGD (Sites 1-6) now has a specific building design; therefore, the potential for significant adverse impacts in the analysis areas based on height and massing are considered below. Following the approach of the 2014 *CEQR Technical Manual*, each of the relevant CEQR technical areas is discussed below.

LAND USE, ZONING AND PUBLIC POLICY

The FGEIS concluded that the proposed actions and RWCDs would have a positive effect on land use by creating an active new mixed-use development with publicly accessible open space on underutilized sites. Like the FGEIS program, the proposed Essex Crossing program would introduce new housing, retail, publicly accessible open space, and community facility uses that would bring activity to the development sites and would serve both residents of the surrounding area and the larger community. The proposed Essex Crossing program would not include a hotel or parking (which were part of the FGEIS program), but would introduce several uses that were not analyzed previously, including: a gym (Physical Culture Establishment), movie theater, bowling alley, roof top farm, and museum. With the proposed Essex Crossing program, there would be more commercial office space as compared to the FGEIS program and the approved program. Like the FGEIS program and the approved program, the uses introduced by the proposed Essex Crossing program would transform underutilized land into a vibrant, mixed use area and would complement the existing range of uses that surround the project sites.

Like the program analyzed in the FGEIS, Site 1 with the Essex Crossing program would include residential space; however, the Essex Crossing program would replace retail with the following uses not analyzed in the FGEIS: a bowling alley, gym, and museum. Like the program analyzed in the FGEIS, these uses would bring activity to the development sites and would serve both residents of the surrounding area and the larger community. As described above, the proposed Site 1 building would fit within the maximum zoning envelope assessed in the FGEIS. However, DSA is seeking a minor modification to the LSGD design controls for Site 1 to vary the streetwall along Ludlow Street. As proposed, the building on Site 1 would have an angled base along Ludlow Street to provide a wider sidewalk at the corner of Ludlow and Broome Streets. With the exception of this variation in the streetwall, the proposed building would comply with all of the LSGD design controls. Consistent with the LSGD design controls for Site 1, the

proposed building would have an east-west oriented tower on Broome Street. The tower would be 160 feet to the roof and 182 feet to the top of the mechanical bulkhead in compliance with the maximum tower heights for the site. The proposed building would not have a mid-rise portion, and the base height would be 64 feet in compliance with the minimum and maximum base heights for the site. The proposed building would also be in compliance with tower dimension and setback controls. Since the design varies from the LSGD design controls, a minor modification is required. The minor modification would not result in any significant adverse zoning impacts, since the proposed building design is compliant with the underlying zoning district regulations.

Similar to the approved program, Site 5 with the Essex Crossing program would include the following uses: residential, retail, school, and open space; however, while the approved program included parking on Site 5, no parking would be provided on Site 5 in the future with the Essex Crossing program. As described above, the proposed Site 5 building would fit within the maximum zoning envelope assessed in the FGEIS. However, DSA is seeking a minor modification to the LSGD design controls for Site 5 to reduce the 60-foot minimum base height on the Clinton Street frontage of the site. As proposed, the building on Site 5 would have a base height of approximately 29 feet on Clinton Street 65 feet from the intersection of Clinton and Grand Streets. With the exception of this reduced base height, the proposed building would comply with all of the LSGD design controls. Consistent with the LSGD design controls for Site 5, the proposed building would have a tower on Clinton Street, which would be 160 feet to the roof and 180 feet to the top of the mechanical bulkhead in compliance with the maximum tower heights for the site, and it would comply with the tower dimension controls. The proposed building would not have a mid-rise portion, and the base height on Grand Street would be 78 feet in compliance with the minimum and maximum base heights for the site. The proposed building would also be in compliance with streetwall and setback controls. Since the design varies from the LSGD design controls, a minor modification is required. The minor modification would not result in any significant adverse zoning impacts, since the proposed building design is compliant with the underlying zoning district regulations.

Like the proposed project analyzed in the FGEIS, the Essex Crossing program would introduce new affordable housing units and would contribute to achieving the City's goal of creating new affordable housing units, as expressed in *The New Housing Marketplace Plan*. The Essex Crossing program would also support the Lower East Side and Chinatown Business Improvement Districts (BIDs) by providing economic development within and adjacent to the BID's areas of operations. Also, like the approved program, the Essex Crossing program would be consistent with PlaNYC 2030. Therefore, like the approved program, the Essex Crossing program would support the objectives of applicable public policies.

Based on the assessment presented above, the proposed Essex Crossing program would not result in any new significant adverse land use, zoning, or public policy impacts.

SOCIOECONOMIC CONDITIONS

The FGEIS and Technical Memorandum 001 concluded that there would be no potential significant adverse impacts with respect to any of the six areas of socioeconomic concern—direct residential displacement; direct businesses displacement; indirect residential displacement; indirect businesses displacement due to increased rents; indirect business displacement due to retail market saturation; and adverse effects on specific industries. The proposed Essex Crossing program would have no changes to the FGEIS findings of direct residential displacement or

direct business displacement; therefore, the analysis below focuses on indirect residential displacement, indirect business displacement due to increased rents, indirect business displacement due to retail market saturation, and adverse effects on specific industries.

INDIRECT RESIDENTIAL DISPLACEMENT

Similar to Technical Memorandum 001, the proposed Essex Crossing program would not result in significant adverse impacts due to indirect residential displacement. According to the *CEQR Technical Manual*, a population increase of less than 5 percent of the total study area population would generally not be expected to change real estate market conditions. Technical Memorandum 001 analyzed the introduction of a total of 1,000 residential units, and found the population increase would be 4.94 percent, which is less than the 5 percent CEQR threshold. The proposed Essex Crossing program also would introduce 1,000 residential units, of which there would be 100 senior housing units on Site 6. Assuming that the 100 senior housing units would have an average household size of 1.5 people per household and that the other housing units would have an average household size of 2.21 people per household, the total population increase with the Essex Crossing program would be 2,139 residents, which is less than previously estimated (2,210 residents). Therefore, the findings with respect to indirect residential displacement would be unchanged, and the proposed Essex Crossing program would not result in any significant adverse indirect residential displacement impacts.

INDIRECT BUSINESS DISPLACEMENT DUE TO INCREASED RENTS

The FGEIS found that the proposed actions would not result in significant adverse indirect business displacement impacts due to increased rents. The socioeconomic conditions chapter in the FGEIS analyzed the introduction of 483,000 square feet of retail (469,000 sf plus the 14,000 sf expansion of the Essex Street Market). With the proposed Essex Crossing program, there would be 358,454 gsf of retail space (193,255 gsf of local and destination retail space, including the supermarket) plus 165,199 gsf of expanded Essex Street Market space and sub-grade Market Line space). This amount is higher than the retail amount presented in Table 1 as it conservatively includes the support space square footage associated with the retail use (that is listed as “Other” in Table 1. Table 15 shows the reallocation of support space to specific uses within each development site).² The proposed Essex Crossing program would introduce 124,546 gsf less overall retail space than previously analyzed, and therefore would not have the potential to result in a significant adverse indirect business displacement impacts due to increased rents.

While the proposed Essex Crossing program would result in an overall reduction of retail and the elimination of the 200-room hotel that was analyzed in the FGEIS, the proposed development would introduce 269,205 gsf of commercial office space,³ which is 232,901 gsf more office space than contemplated in the FGEIS. While the proposed Essex Crossing program would introduce significantly more office space than the FGEIS program, the ¼-mile study area includes an estimated 801,200 gsf of office space.⁴ Employment data also shows the presence of office space

² The 165,199 gsf of public market space also includes the Broome Street Garden as this space would include seating areas that could be used by visitors who purchased food from market vendors. This number subtracts the existing 15,000 sf Essex Street Market.

³ Based on the development program discussed under “Transportation,” which allocates support space to specific uses (See Table 15).

⁴ Based on New York City Department of City Planning’s 2013 MapPluto data.

in the area. Industries that typically require office space for their functions—such as information, finance, insurance, and real estate, as well as professional, scientific, and technical services, and management of companies and enterprises—represent a combined total of 16.1 percent of all employment in the ¼-mile socioeconomic study area.⁵ Thus, there is already economic activity generated in the study area by office uses and the introduction of additional office space would not have the potential to alter existing economic patterns.

The proposed Essex Crossing program would introduce new uses that were not specifically analyzed in the FGEIS, including a gym (Physical Culture Establishment), a 1,100-seat movie theater, a bowling alley, and a museum. The new uses would provide amenities to the residential and worker population in the study area. The new entertainment uses could result in increased foot traffic that may draw beyond local residents and workers. This increased foot traffic could benefit existing retail businesses in the ¼-mile study area. With the proposed Essex Crossing program, there would be an estimated 2,213 workers, as compared to 1,449 workers analyzed in the FGEIS and 1,428 workers analyzed in Technical Memoranda 001 and 002. Although existing businesses in the ¼-mile study area would benefit from the increased foot traffic, increases in pedestrian foot traffic could lead to increased rents in the immediate vicinity of the project site, which in turn could result in the indirect displacement of some existing retail establishments that are not able to capture sales from the increased foot traffic. However, as stated in the FGEIS, this potential displacement is expected to be limited and would not constitute a significant adverse impact under CEQR. As set forth in the *CEQR Technical Manual*, the consideration of a business or institution's economic value is based on the following criteria: (1) its products and services; (2) its location needs and whether those needs can be satisfied at other locations; and (3) the potential effects on businesses or on consumers of losing the displaced business or institution as a product or service. The retail stores that would be vulnerable to indirect displacement are not unique to the study area, and do not have locational needs that would preclude them from relocating elsewhere within the city. Also, since the ¼-mile study area already contains a large residential population, there would still be the local demand for neighborhood retail and services necessary to maintain the strong retail presence within the study area. The limited indirect retail displacement that could result from increased rents would not be expected to lead to adverse changes to neighborhood character and would not result in significant adverse socioeconomic impacts.

In addition, the industrial uses in the ¼-mile study area—including, but not limited to wholesalers, warehouses, and auto repair shops—could be considered potentially vulnerable to indirect displacement, as a property owner could decide to convert an existing industrial property to a retail use. However, as stated in the FGEIS, these pressures are already present within the study area and are expected to increase in the future irrespective of the proposed development. Similar to the findings presented in the FGEIS, the proposed Essex Crossing program could result in limited indirect displacement of existing industrial businesses; however, it would not alter or accelerate trends that would change existing economic patterns in a manner that would result in significant displacement.

Indirect Business Displacement Due to Retail Market Saturation

Similar to the proposed actions analyzed in the FGEIS, the proposed Essex Crossing program would not result in significant adverse impacts on neighborhood character due to retail market saturation or competition. As discussed above, the socioeconomic conditions chapter in the FGEIS

⁵ Based on ESRI Business Analyst 2013 Data.

analyzed the introduction of 469,000 sf of retail and the 14,000 sf expansion of the Essex Street Market. With the proposed Essex Crossing program, there would be 193,255 gsf of local and destination retail space and 165,199 gsf of net new Essex Street Market space and sub-grade Market Line space. While 275,745 gsf less local and destination retail space would be introduced with the proposed Essex Crossing program, the proposed development would introduce 151,199 gsf more retail space from the new sub-grade Market Line space under Sites 2, 3, and 4 and expanded Essex Street Market space, as compared to the program analyzed in the FGEIS.

The proposed Essex Crossing program would introduce 151,199 gsf more public market space from the larger Essex Street Market and the added sub-grade Market Line space. As discussed above, the Market Line would supplement the Essex Street Market with additional market space, food vendors, and retailers selling soft goods such as home goods, clothing and clothing accessories. The FGEIS analyzed the effect of the 65,000 sf grocery store and 14,000 sf of additional Essex Street Market space on local retail corridors, and found that smaller food stores would experience moderate competitive pressure, if any and neighborhood services stores and eating and drinking establishments would not be adversely impacted. While competitive pressure may increase due to the added Market Line space, it is not expected to lead to adverse changes to neighborhood character and would not result in significant adverse impacts. As stated in the FGEIS, local residents would continue to shop at existing smaller grocery stores for specialized goods and services for convenience, and for accessibility to public transit. Also, many local retail concentrations offer specialty goods and services familiar to a specific ethnic community. It is unlikely that the retail from the proposed development would offer goods and services that would directly compete with the specialty goods, services, and ethnic restaurants offered by local retailers focusing on a specific ethnic community. Further, as stated in the FGEIS, the character of retail in the area makes any substantial displacement due to new development and market saturation unlikely. Retail stores throughout the Lower East Side and adjacent neighborhoods all benefit from the high volumes of foot traffic spurred by the co-location of stores offering similar goods and services that draw shoppers from throughout the region. In effect, the concentration of stores in a location like the Lower East Side creates more positive synergy than negative competition among similar stores. Therefore, it is not expected that the added Market Line space and larger Essex Street Market would alter the findings with respect to indirect business displacement due to retail market competition.

The detailed analysis of indirect business displacement due to retail market saturation in the FGEIS analyzed grocery stores since they often serve as anchors for retail concentrations and since the FGEIS program included a 65,000 sf grocery store. The socioeconomic conditions chapter found that although one grocery store⁶ in the ½-Mile Local Trade Area could experience competitive pressure from a supermarket introduced by the proposed project, this potential closure would not negatively impact neighborhood character and would not result in a significant adverse impact due to indirect business displacement from market saturation. Since the grocery store that would be introduced by the proposed Essex Crossing program would be 27,805 gsf⁷, which is smaller than the 65,000 sf grocery store analyzed in the FGEIS, the proposed Essex Crossing program would not alter the findings with respect to grocery stores.

⁶ The Fine Fare at 357 Grand Street (at Clinton Street south of the development sites).

⁷ Based on the development program discussed below under "Transportation," which allocates mechanical and support space to specific uses.

The detailed analysis in the FGEIS also studied building materials and garden supply stores, large-scale department stores, and discount department stores since they often serve as anchors for retail concentrations and since the proposed actions could introduce these types of stores. Since less retail space is anticipated with the proposed development, the proposed development would not alter the findings with respect to building materials and garden supply stores, large-scale department stores, and discount department stores.

Based on the analysis presented above, and like the FGEIS, the proposed Essex Crossing program would not result in significant adverse impacts on neighborhood character due to retail market saturation or competition.

ADVERSE EFFECTS ON SPECIFIC INDUSTRIES

Similar to the proposed actions analyzed in the socioeconomic conditions chapter in the FGEIS, the proposed Essex Crossing program would not have a significant adverse impact on specific industries. The proposed development would displace the same businesses as the proposed actions analyzed in the FGEIS, but the displaced businesses are not critical to the viability of any City industries. Also, as discussed above, any indirect business displacement is expected to be limited and would not substantially affect a specific industry or category of business. Therefore, the proposed development would not have a significant adverse impact on specific industries.

COMMUNITY FACILITIES

Like the proposed project assessed in Technical Memorandum 001, the proposed Essex Crossing program would not result in any significant adverse impacts on community facilities. Similar to the approved program, the proposed Essex Crossing program would result in 1,000 residential units. In addition, under the proposed Essex Crossing program, all residential units that would be developed on Site 6 would be senior housing units. Therefore, the number of children that would be introduced with the proposed development would be similar or lower than the number of children analyzed in Technical Memorandum 001, which found that the project would increase the elementary and intermediate school utilization rates by less than five percentage points, the CEQR threshold for a potential significant adverse impact. Therefore, like Technical Memorandum 001 findings, the proposed Essex Crossing program would not alter the findings with respect to public and intermediate schools and there would be no significant adverse impacts on community facilities.

OPEN SPACE

The proposed Essex Crossing program would not alter the findings of the open space analyses presented in the FGEIS and Technical Memoranda 001 and 002. Like Technical Memorandum 002, 15,000 square feet of open space would be introduced on Site 5. The FGEIS found that there would be a decrease in the passive open space ratio from 0.78 acres per 1,000 workers in the No-Action Condition to 0.69 acres per 1,000 workers in the future with the proposed actions. Technical Memoranda 001 and 002 showed an increase to 0.70 acres per 1,000 workers. With the proposed Essex Crossing program, the open space ratio would decrease to 0.66 acres per 1,000 workers.⁸ Similar to the FGEIS and subsequent Technical Memoranda 001 and 002, there

⁸ Based on the development program discussed under "Transportation," below, the proposed development is estimated to result in the introduction of 2,213 workers, as compared to 1,449 workers analyzed in the FGEIS and 1,428 workers analyzed in Technical Memoranda 001 and 002.

would be a reduction in the open space ratio. However, the passive open space ratio in the commercial study area in the No-Action condition would be five times greater than the recommended City guideline of 0.15 acres of passive space per 1,000 workers, and this condition would continue in the future with the proposed Essex Crossing program. Therefore, the proposed development, like the FGEIS program and approved program, would not result in any significant adverse impacts on open space resources in the commercial study area.

As shown in **Table 11**, there would be no change in the total open space ratio for the residential study area compared to the With-Action total open space ratio presented in Technical Memorandum 002. Like Technical Memorandum 001 and 002, the Essex Crossing program would introduce 1,000 residential units. However, with the proposed Essex Crossing program, 100 residential units would be senior housing units, which would have a lower average household size than the 2.21 average household size assumed in the FGEIS and subsequent Technical Memoranda. Technical Memorandum 001 assumed that the project would generate 2,210 residents. Assuming an average household size of 1.5 for the senior housing units would result in 2,139 residents from the Essex Crossing program. The reduced residential population from the Essex Crossing program would result in substantially similar open space ratios in the residential study area as compared to Technical Memorandum 002. As with the proposed actions analyzed in Technical Memorandum 002, the open space ratios with the proposed Essex Crossing program would continue to fall short of the City’s recommended open space ratio guidelines. However, the decrease from the No-Action condition with the proposed Essex Crossing program would remain 1.43 percent or less and would not constitute a substantial change. Therefore, the proposed Essex Crossing program would not result in any significant adverse impacts on open space resources in the residential study area.

Table 11
2022 Open Space Ratios Summary
Future with the Proposed Essex Crossing Program

Ratio	DCP Guideline	Existing Ratio	No-Action Ratio	With-Action Ratio			Percent Change No-Action to With-Action (FGEIS/TM 001/TM 002/TM 003)	
				FGEIS	Proposed Mod. TM 001	Proposed Mod. TM 002		Proposed Mod. TM 003
Non-Residential Study Area								
Passive/non-residents	0.15	0.82	0.78	0.69	0.70	0.70	0.66	-11.45% / -11.29% / -10.61% / -16.42%
Residential Study Area								
Total/residents	2.5	0.79	0.83	0.82	0.81	0.82	0.82	-1.32% / -1.49% / -1.38% / -1.33%
Passive/residents	0.5	0.23	0.26	0.26	0.26	0.26	0.26	-1.18% / -1.35% / -1.17% / -1.11%
Active/residents	2.0	0.56	0.57	0.56	0.56	0.56	0.56	-1.38% / -1.55% / -1.48% / -1.43%
Note: Ratios in acres per 1,000 people.								

In addition to the 15,000 square feet of publicly accessible open space that would be added on Site 5, the Essex Crossing program would introduce the Broome Street Gardens on Sites 3 and 4 and the rooftop farm on Site 2. The Broome Street Gardens were not included in the quantitative assessment as this space would be seating area for visitors who purchased food from Market Line vendors. The rooftop farm was not included in open space calculations as it would have limited public accessibility.

SHADOWS

As the proposed buildings on Sites 1- 6 would be within the limits of the maximum zoning envelopes established according to the LSGD rules and the future developments on Sites 8, 9,

and 10 would be compliant with zoning, the proposed Essex Crossing program would not result in shadow impacts that were not identified in the FGEIS. The proposed buildings, in fact, could result in incremental shadows that have less extent and duration than what is described in the FGEIS as they would not be quite as large or bulky as the maximum zoning envelopes established for those sites.

As described in the FGEIS, the RWCDs assessed for the proposed actions would cast shadows on four of the block-long medians of Schiff Mall, which comprises medians in the center of Delancey Street that contain trees, rose bushes, and other vegetation. The medians that would experience project-generated shadow in one or more seasons are located between Orchard and Suffolk Streets. As the actual extent and duration of incremental shadow cast by the proposed buildings on Sites 1, 2, 3, and 4 could be less than what is described in the FGEIS, the roses on Schiff Mall may not actually be impacted by the proposed development. While the designs of the buildings on Sites 1 and 2 are advanced enough to conduct a refined shadows analysis, the designs of the buildings on Sites 3 and 4 are still in progress. Since the FGEIS determined that the shadows from all four buildings on Sites 1, 2, 3, and 4 could impact the roses, in accordance with the FGEIS commitments, prior to the application for a Certificate of Occupancy, DSA will either pay for the replacement measures identified in the FGEIS or provide a refined shadows analysis to the New York City Department of Parks and Recreation (DPR) demonstrating that the extent of the shadow impact would be less pronounced.

As noted above in the description of the proposed development, DSA is seeking a minor modification to the LSGD design controls for Site 5 to reduce the 60-foot minimum base height on the Clinton Street frontage of the site to a base height of approximately 29 feet. Similar to Technical Memorandum 002, the Essex Crossing program would introduce a 15,000-sf publicly accessible open space on the Broome Street portion of Site 5. With this decrease in the base height, there would be a corresponding small decrease in shadow on the proposed Broome Street public open space that would be introduced on Site 5 in all seasons, during a portion of the day in the morning and/or mid-day.

HISTORIC AND CULTURAL RESOURCES

As a result of the possibility that construction financing might be provided by New York State and/or the United States Department of Housing and Urban Development (HUD), the FGEIS and Technical Memoranda 001 and 002 were prepared in accordance with the New York State Historic Preservation Act of 1980 (Section 14.09 of the New York Parks, Recreation and Historic Preservation Law) and Section 106 of the National Historic Preservation Act of 1966.

Since the selection of DSA as the designated developer for the project sites, DSA and HPD have determined that the development of Sites 2-5 will receive construction financing through the New York City Housing Development Corporation (NYCHDC), a New York State agency for purposes of Section 14.09. Therefore, NYCHDC conducted a consultation with the New York State Office of Parks, Recreation and Historic Preservation (OPRHP), as required by Section 14.09.

No construction financing from NYCHDC or HUD is being sought for the development of Sites 1 and 6 or the development of Sites 8-10. Therefore, the development of Sites 1, 6, 8, 9, and 10 is not subject to consultation with OPRHP under Section 14.09 or further review under Section 106.

ARCHAEOLOGICAL RESOURCES

In accordance with the FGEIS commitments, a Phase 1B archaeological survey was undertaken on Sites 2-6 in August 2014 following the testing protocol that the New York City Landmarks Preservation Commission (LPC) and OPRHP approved in letters dated July 3, 2014 and July 16, 2014, respectively. No archaeological resources were encountered during the Phase 1B survey for Sites 2-6, and a final report summarizing the results of the Phase 1B survey was prepared and submitted to LPC and OPRHP for review and comment. As written in an Environmental Review letter dated November 26, 2015, LPC concurred with the findings of the Phase 1B report that there are no further archaeological concerns for Sites 2-6. OPRHP concurred with the Phase 1B report's recommendation that no further archaeological investigation is warranted for the project in a letter dated December 15, 2014.

ARCHITECTURAL RESOURCES

The proposed Essex Crossing program, which would be built within the maximum building envelopes established for each site by the LSGD and analyzed in the FGEIS, would not alter the conclusions in the FGEIS with respect to architectural resource impacts.

Potential Direct Impacts

As described in the FGEIS, the proposed development would result in significant adverse impacts on the four Essex Street Market buildings (on Sites 2, 8, 9, and 10) and the former fire station at 185 Broome Street (on Site 5); those architectural resources are eligible for listing on the State and National Registers of Historic Places (S/NR). As noted above, the developments of Sites 2 and 5 are subject to consultation under Section 14.09. Due to safety concerns at the former fire station, the City is expediting the building's demolition. Consultation with LPC and OPRHP is being conducted prior to demolition.

In connection with the Section 14.09 consultation, in a letter dated October 22, 2014 OPRHP requested a detailed analysis of alternatives specific to the historic resources on Sites 2 and 5. An analysis was prepared and submitted to OPRHP that assessed three alternatives: an alternative that retains and reuses the Essex Street Market building on Site 2 without new construction or alterations to the building; an alternative that retains the Essex Street Market building on Site 2 and builds above it to accommodate the Essex Crossing program components for Site 2; and an alternative that retains and reuses most of the former fire station on Site 5. The alternatives analysis, which is included in **Appendix A** to this Technical Memorandum 003, concluded that there are no prudent and feasible alternatives to avoiding significant adverse impacts to the Essex Street Market building on Site 2 and the former fire station on Site 5.⁹ These impacts were disclosed in the FGEIS.

In a letter dated December 22, 2014, OPRHP requested additional information to clarify the conclusions presented in the alternatives analysis. An executive summary that further described why the two historic buildings could not be retained and reused to meet the goals of the Essex Crossing program was prepared and submitted to OPRHP. The executive summary is included in **Appendix A**. In a letter dated January 26, 2015, OPRHP concluded that there are no feasible

⁹ Appendix A includes the alternatives analysis that was submitted to OPRHP on December 10, 2014. When the alternatives analysis was prepared and submitted to OPRHP, the Essex Crossing program included 98 parking spaces on Site 5. Subsequently, parking has been removed from the Essex Crossing program.

and prudent alternatives to demolition of the former Essex Street Market building on Site 2 and the former fire station on Site 5.

Therefore, in accordance with the FGEIS commitments and in consultation with LPC and OPRHP, DSA has proposed to undertake the following measures to partially mitigate the significant adverse impacts:

- Historic American Buildings Survey Document (HABS) documentation. DSA is preparing HABS Level II documentation of the Essex Street Market complex¹⁰ and the former fire station. A HABS work plan was submitted to LPC and OPRHP on August 14, 2014, and documentation packages will be submitted to LPC and OPRHP for review and comment. The completed documentation packages will be submitted to other repositories to be identified in consultation with LPC and OPRHP.
- Site commemoration plan. DSA proposes to prepare an interpretive exhibit on the Essex Street Market and is investigating installing the exhibit within the new market facility that will be constructed on Site 2. DSA will consult with NYCEDC, HPD, LPC, and OPRHP regarding the site commemoration plan.
- Architectural salvage. There is a neon sign in the former Essex Street Market building on Site 2 that appears to be original to the building; it advertises the former location of the meat department. Pursuant to their agreement with the City of New York, DSA will salvage this neon sign, store it on Site 8, and investigate the possibility of reinstalling the sign within the Essex Crossing project. No other significant exterior or interior architectural elements of the Essex Street Market buildings and fire station were identified.
- Market signage. The design of the new market facility on Site 2 is preliminary, but a currently contemplated design measure is signage for the new market that references the Moderne lettering of the façade signage of the original market buildings.

A Letter of Resolution (LOR) is being prepared that documents these mitigation measures that will be incorporated into the Essex Crossing program. The LOR is being prepared in consultation with OPRHP and will be executed by NYCHDC, DSA, and OPRHP.

In accordance with the FGEIS commitments, DSA will also prepare and implement, in consultation with LPC, construction protection plans for architectural resources located within 90 feet of Sites 1, 3, 6, 8, and 9. Implementation of construction protection plans will be required through the Land Disposition Agreement (LDA). As development on Site 3 will receive construction financing through NYCHDC, the construction protection plan for that site will also be submitted to OPRHP for review and approval. There are no architectural resources located within 90 feet of Sites 2, 4, 5, and 10. The architectural resources that will be included in the construction protection plans are:

- thirteen buildings surrounding Site 1 that are located within the S/NR-listed Lower East Side Historic District, including the Eastern Dispensary at 75 Essex Street, which is individually eligible for S/NR listing and is adjacent to Site 1;
- the Norfolk Street Baptist Church (Congregation Beth Hamedrash Hagodol) at 60-64 Norfolk Street, which is a designated New York City Landmark (NYCL) and S/NR-listed property and is located within 90 feet of Site 3;

¹⁰ Although only one of the four sites (Site 2) containing an Essex Street Market building is subject to Section 14.09 consultation, the entire Essex Street Market complex is one integrated historic resource. Accordingly, HABS documentation and other mitigative measures will be taken for the entire complex.

- the Williamsburg Bridge, which is eligible for S/NR listing and is located within 90 feet of Site 6; and
- ten buildings surrounding Sites 8 and 9 that are located within the potential Clinton, Rivington, Stanton Street Historic District, which is eligible for NYCL designation and S/NR listing.

Potential Visual and Contextual Impacts

In accordance with the FGEIS commitments, NYCEDC and DSA will continue to consult with LPC regarding the compatibility of the proposed building on Site 1 with the S/NR-listed Lower East Side Historic District, in which it is located, and with the S/NR-eligible Eastern Dispensary. NYCEDC will ensure that appropriate consultation occurs with LPC and that possible mitigation measures are fully explored. Such measures, to the maximum extent practicable and feasible, would be required through the provisions of a contract of sale or long-term lease or other legally-binding agreement between DSA and NYCEDC. Development of Site 1 is not receiving construction financing through NYCHDC and is, therefore, not subject to consultation under Section 14.09 of the New York Parks, Recreation and Historic Preservation Law.

The FGEIS concluded that—should there be any State or Federal permitting or funding for development on sites 8, 9, and 10—HPD and NYCEDC would consult with OPRHP regarding the compatibility of the proposed developments on those sites with the adjacent potential Clinton, Rivington, Stanton Street Historic District (NYCL-eligible, S/NR-eligible), even though the FGEIS concluded that the proposed developments on Sites 8, 9, and 10 would not have significant adverse visual and contextual impacts on the historic district. As described above, the developments on Sites 8, 9, and 10 are not receiving construction financing through NYCHDC and are, therefore, not subject to consultation under Section 14.09 of the New York Parks, Recreation and Historic Preservation Law.

The developments on Sites 2-5 will receive construction financing through NYCHDC but, as concluded in the FGEIS, the development of new buildings of various heights on Sites 2-5 would not have significant adverse visual and contextual impacts on architectural resources. As the buildings proposed for Sites 2-5 would be constructed within the maximum zoning envelopes established for each site and assessed in the FGEIS and Technical Memoranda 001 and 002, the proposed development would not alter the conclusions of the FGEIS, and there would be no significant adverse visual and contextual impacts on architectural resources from the buildings proposed for Sites 2-5. In accordance with the FGEIS commitments, NYCHDC and DSA undertook appropriate consultation with OPRHP under Section 14.09 regarding these sites and, in a letter dated October 22, 2014, ORPHP concluded that they have no additional concerns with Sites 3, 4, or 6.

NYCEDC and/or HPD will require that its developers will implement the mitigation and associated environmental measures identified in the FGEIS and this Technical Memorandum, by means of provisions in the contract of sale or long-term lease or other legally binding agreement between the developer(s) and NYCEDC, HPD, and/or the City.

URBAN DESIGN

As described above, the proposed buildings on Sites 1-6 would fit within the maximum building envelopes established for each site by the LSGD (see **Figure 1**). The proposed buildings on Sites 2-4 and Site 6 would largely comply with the LSGD design controls for maximum building heights, minimum and maximum base heights, setback requirements, and maximum tower

dimensions, and they would be massed according to one of the envelope options established for each site and presented in the FGEIS.

On Site 1, the proposed building would utilize envelope option 2 from the FGEIS (which orients the tower portion of the building east-west along Broome Street) for the site and would comply with all of the LSGD design controls, except that it would modify a portion of the streetwall at the intersection of Broome and Ludlow Streets. On Site 5, the proposed building would utilize envelope option 1 from the FGEIS (which orients the tower portion of the building north-south along Clinton Street) for the site and would comply with all of the LSGD design controls, except that it would not meet the minimum base height of 60 feet on Clinton Street. Sixty-five feet from the intersection of Clinton and Grand Streets, the proposed building would have a base height of approximately 29 feet on Clinton Street. Developments on Sites 8, 9, and 10 have not been designed, but they would be compliant with existing zoning.

Overall, because the proposed buildings on Sites 2-4 and 6 would be within the limits of the maximum zoning envelopes established according to the LSGD rules and the future developments on Sites 8, 9, and 10 would be compliant with zoning, the proposed buildings on those sites would not alter the conclusions of the urban design and visual resources analyses in the FGEIS, and there would be no significant adverse impacts on the urban design and visual resources of the developments sites and study area.

As described above, minor modifications are proposed to the LSGD design controls for Sites 1 and 5. The proposed building on Site 1 would have an angled base along Ludlow Street that varies from the LSGD streetwall design controls for the site (see **Figure 2c**). This modification would not result in significant adverse impacts to urban design and visual features, because the height of the base would be in compliance with the LSGD design controls and the angled base would provide a wider sidewalk at the corner and building entrance and more open views along Ludlow Street. This wider sidewalk would improve the pedestrian experience at the corner of Broome and Ludlow Streets and would have no effect on the pedestrian experience in other portions of the study area. While the proposed building on Site 5 is proposed to have a lower streetwall along a portion of its Clinton Street frontage, this variation to the design controls for Site 5 would not result in significant adverse impacts to urban design and visual resources (see **Figure 4c**). On Clinton Street, the building would have a base height of 78 feet for a portion of the streetwall in compliance with existing design controls for the site. Reducing the base height on the northern portion of the Clinton Street frontage to as low as 29 feet would not substantially alter the pedestrian experience along Clinton Street and would have no effect on the pedestrian experience in other portions of the study area. Along this small stretch of Clinton Street, the base of a tall building that has a 29-foot-tall streetwall would not be appreciably different to a pedestrian than the base of a tall building that has a 60-foot-tall streetwall, especially as the location of the streetwall would not be modified. Therefore, the proposed buildings—like the actions assessed in the FGEIS and Technical Memoranda 001 and 002—would enhance the pedestrian's experience of the development sites by replacing underutilized buildings and surface parking lots with new active, mixed-use development and would be consistent with the existing trends of new residential, hotel, and mixed-use development making the neighborhood more densely developed, and thus these proposed modifications would not result in any significant adverse impacts.

HAZARDOUS MATERIALS

In accordance with the FGEIS commitments, subsequent investigations including soil and groundwater testing (and potential remediation, as appropriate) would take place prior to

commencing construction of the proposed Essex Crossing program. Additional measures such as removal of petroleum bulk storage tanks and any associated contaminated soil, asbestos-containing materials (ACM) surveys and abatement, if necessary, prior to demolition activities, proper disposal of any chemicals or materials containing polychlorinated biphenyls (PCBs), and proper handling of lead-based paint during demolition would be undertaken. Additionally, appropriate health and safety/remedial measures would be developed under a Remedial Action Plan (RAP)/Construction Health and Safety Plan and implemented in consultation with NYCDEP that would precede or govern demolition, construction, and soil disturbance activities on the development sites. At the completion of construction activities, a New York State Professional Engineer-certified closure report would be submitted to NYCDEP for approval. With the implementation of these measures as identified in the FGEIS, no significant adverse impacts related to hazardous materials would be expected to result from the proposed development. Following construction, there would be no potential for significant adverse impacts as identified in the FGEIS.

A Phase I Environmental Site Assessment (ESA) for the original 10 Sites (Site 7 was subsequently eliminated from the proposed project) was completed by Holzmacher, McLendon, and Murrel, P.C. (H2M) in September 2008 and by Langan Engineering, Environmental, Surveying and Landscape Architecture, D.P.C. in February 2014. The Phase I ESAs identified the following: a fill port in the Norfolk Street sidewalk adjacent to Site 3; Historic Auto Station database listing for Site 3; a fill port, an out-of-service fuel oil underground storage tank (UST) and a vaulted 1,500-gallon fuel oil aboveground storage tank (AST) at Site 5; closed NYSDEC Spill #1100365 associated with Site 5; RCRA database listing as a non-hazardous waste generator and MANIFEST database listing for the disposal of lead waste in 1997 and chromium waste in 2003 at Site 5; two 500-gallon USTs on a 1922 Sanborn map of Site 6; and potential vapor intrusion at all 10 Sites due to possible historical releases from the many nearby USTs, ASTs and drycleaners and/or a historical manufactured gas plant (MGP) located on Hester Street (though no remediation of this plant is currently required by New York State). Based on the results of the Phase I ESA, a Phase II Work Plan was prepared and submitted to DEP for review and approval for Sites 1, 2, 5 and 6. As required, the Phase II Work Plan for Sites 3, 4, 8, 9, and 10 will be prepared at a later date.

The Phase II Environmental Site Investigation (ESI) for Sites 1, 2, 5 and 6 was completed in September 2014. The ESI included the advancement of 20 borings (5 at each site) with the collection of up to 2 soil samples from each boring; the installation of 8 temporary groundwater wells (2 at each site) in selected borings with collection of a groundwater sample from each; and, the installation of soil vapor probes for the collection of 12 soil vapor samples (3 at each site).

Several semivolatile organic compounds (SVOCs), pesticides, and metals exceeded their respective USCOs and/or RRSCOs in the soil samples collected from Sites 1, 2, 5, and 6 but these exceedances were likely attributable to historic fill materials (encountered in the borings) rather than a spill or release. The volatile organic compound (VOC) tetrachloroethene (PCE or perc) was detected in one groundwater sample collected from Site 1 at a concentration of 8 µg/L, slightly above its Class GA standard of 5 µg/L. Acetone was detected in one groundwater sample collected from Site 2 above its Class GA standard; however, acetone is a common laboratory artifact. Dieldrin was detected in the groundwater samples collected from Site 2 and Site 6 above its Class GA standard. As pesticides were also detected in the soil at both these sites, their presence may be attributable to the turbidity of the samples. Manganese and sodium were detected in the dissolved groundwater samples collected from Site 1 above their respective Class GA standards. Magnesium, manganese, selenium, and sodium were detected in the dissolved groundwater samples collected from Site 2 above their respective Class GA standards.

Iron, magnesium, manganese, and sodium were detected in the dissolved groundwater samples collected from Site 5 above their respective Class GA standards. Manganese and selenium were detected in the dissolved groundwater samples collected from Site 6 above their respective Class GA standards. The metals detected above their respective Class GA standard are naturally occurring and their presence in the groundwater does not represent an environmental concern.

Thirty VOCs were detected in the soil vapor samples from Sites 1, 2, 5 and 6. The VOCs detected included the chlorinated compounds PCE and carbon disulfide, and some petroleum-related compounds (2-hexanone, ethanol, hexane, benzene, toluene, xylenes, heptane, ethyl acetate, methyl ethyl ketone, and cyclohexane). The common laboratory contaminants acetone and methylene chloride were also detected. None of the VOCs with established NYSDOH Air Guideline Values (AGVs) were detected above their respective guidelines.

Based on the results of the ESI, a Remedial Action Plan (RAP) and Construction Health and Safety Plan (CHASP) were prepared for Sites 1, 2, 5 and 6 and submitted to DEP for review and approval. The RAP and CHASP for Sites 1, 2, 5 and 6 were approved on October 28, 2014. The RAP and CHASP specify the required procedures during construction: identification and management of any anticipated or unanticipated contaminated soil and/or underground storage tanks (including procedures for stockpiling and off-site transportation and disposal of soil, and reporting of petroleum spills); appropriate health and safety procedures, including dust control, installation of a minimum 10-mil vapor barrier underneath the foundation slab and outside of the sub-grade walls; and installation of a minimum two-foot-thick imported clean soil layer over any landscaped areas. Upon completion of these activities, a Site Closure Report will be provided to DEP documenting compliance with the RAP and CHASP requirements. In addition, closure of the existing New York State Department of Environmental Conservation (NYSDEC) Spill #1407415, associated with Site 3, will be coordinated with NYSDEC in accordance with all applicable regulations. NYSDEC Spill #1311663, associated with Site 2, was closed on September 16, 2014.

A Phase II Subsurface Investigation for Sites 3, 4, 8, 9, and 10 will be conducted prior to redevelopment. Based on the findings of the Subsurface Investigation, a RAP/CHASP would be developed and approved by DEP for implementation during soil and/or groundwater disturbing activities (prior to redevelopment). The RAP/CHASP would specify procedures for identifying and managing any anticipated or unanticipated contaminated soil and/or underground storage tanks (including procedures for stockpiling and off-site transportation and disposal), and appropriate health and safety procedures, including the need for dust control. The RAP would also include any necessary requirements for the new building's vapor controls and for any planned landscaped areas. With these procedures, the proposed Essex Crossing project, like the development assessed in the FGEIS, would have no significant adverse impacts on hazardous materials.

NYCEDC and/or HPD will require that its developers will implement the mitigation and associated environmental measures identified in the FGEIS and this Technical Memorandum, by means of provisions in the contract of sale or long-term lease or other legally binding agreement between the developer(s) and NYCEDC, HPD, and/or the City.

WATER AND SEWER INFRASTRUCTURE

WATER SUPPLY

As shown in **Table 12**, the proposed Essex Crossing program would result in a water demand of 727,011 gallons per day (gpd), which is 58,876 gpd more than the water demand generated by the proposed actions assessed in the FGEIS (670,135 gpd) and 36,816 gpd more than the

assessed in Technical Memorandum 001 (690,195 gpd). With this additional increment, the total incremental water demand over the No-Action condition (described in the FGEIS) generated by the proposed Essex Crossing program would continue to represent a small increase in demand on the New York City water supply system as compared to the 1.1 billion gallons per day (bgd) typically distributed within New York City and Westchester County. As a result, the proposed Essex Crossing program, like the FGEIS program and approved program, would have no significant adverse impacts on the City’s water supply.

Table 12
Future With the Proposed Essex Crossing Program: Water Consumption

Use	Unit	Size (sf)	Rate ¹	Consumption (gallons per day)
Residential				
Domestic	2,139 (people) ²	NA	100 gpd/person	213,900
Air Conditioning	NA	994,026	0.17 gpd/sf	168,984
Commercial/Office³				
Domestic	NA	331,753	0.10 gpd/sf	33,175
Air Conditioning	NA	331,753	0.17 gpd/sf	56,398
Retail⁴				
Domestic	NA	577,130	0.24 gpd/sf	138,511
Air Conditioning	NA	577,130	0.17 gpd/sf	98,112
Public School				
Domestic	518 (seats)	NA	10 gpd/seat	5,180
Air Conditioning	NA	75,000	0.17 gpd/sf	12,750
Total Water Supply Demand				727,011
Total Sewage Generation				390,766
Notes:				
1. Rates from Table 13-2 in the 2014 <i>CEQR Technical Manual</i> .				
2. The number of residents was calculated based on 1,000 units. A Community District 3 average household size of 2.21 was applied for 900 units. For the 100 senior housing units, an average household size of 1.5 was assumed.				
2. Commercial/Office uses include commercial office, medical office, community office, and community facility spaces (see development program discussed under "Transportation").				
3. Retail uses include local retail, destination retail, supermarket, public market and Market Line, gym, bowling alley, movie theater, and museum spaces.				

In accordance with the FGEIS commitments, the applicant is required to develop and implement stormwater best management practices (BMPs) in coordination with DEP and in accordance with recent stormwater rules promulgated by DEP. The new rules will require developments to achieve an overall release rate of 0.25 cfs or 10 percent of the allowable flow rate (whichever is greater) from the development sites. For City properties that may be managed by NYCEDC, this obligation will be required through the provisions of a contract of sale or long-term lease or other legally binding agreement between NYCEDC and the developer.

SANITARY SEWAGE

As with the FGEIS and Technical Memorandum 001, for purposes of this analysis the amount of sanitary sewage generated by the proposed development is conservatively estimated as all water demand except that used by air conditioning, which is typically not discharged to the sewer system. As shown in Table 12, the estimated amount of sanitary sewage that would be generated by the proposed Essex Crossing program is estimated to be 390,766 gpd, which is 9,196 gpd more than the sewage that would be generated by the FGEIS program (381,570 gpd) and 10,864 gpd less than the approved program (401,630 gpd). With this additional increment, the total increment of sanitary sewage generated by the proposed Essex Crossing program over the No-Action condition (described in the FGEIS) would represent a negligible increase in the average daily flow of 217 million gallons

per day at the Newtown Creek Wastewater Treatment Plant (WWTP)¹¹ and would not result in an exceedance of the Newtown Creek WWTP's capacity. Therefore, the proposed Essex Crossing program, like the FGEIS program and the approved program, would not create a significant adverse impact on the City's sanitary sewage treatment system.

STORMWATER

The proposed Essex Crossing program would be built with best management practices (BMPs) outlined in the BMP Concept Plan described in the FGEIS, as required as a part of the NYCDEP site connection approval process. These BMPs, as assessed in the FGEIS, would achieve an overall release rate of 0.25 cfs or 10 percent of the allowable flow rate (whichever is greater) from the proposed development sites. The BMP Concept Plan in the FGEIS summarizes the potential BMPs that would be suitable for implementation within the project site.

The proposed Essex Crossing program would include stormwater detention practices on each site, and with the incorporation of these BMPs, the overall volume of stormwater runoff and the peak stormwater runoff rate would remain the same as compared to the FGEIS program with BMPs incorporated. In addition, as described above, a roof top farm is anticipated on Site 2. This roof top farm is expected to have a cistern for a water recycling system. In conclusion, the proposed Essex Crossing program, like the FGEIS program, would not result in any significant adverse impacts on wastewater treatment or stormwater conveyance infrastructure.

SOLID WASTE AND SANITATION SERVICES

As shown in **Table 13**, the proposed Essex Crossing program would result in 239,250 pounds (119.6 tons) of solid waste per week, which is 18,012 pounds (or 9.0 tons) per week more than would be produced by the FGEIS program, and 13,402 pounds (or 6.7 tons) more than would be produced by the proposed actions assessed in Technical Memorandum 001.

An estimated 43,934 pounds (22.0 tons) of solid waste per week would be from the residential, school, and community facility uses. That 22.0 tons, which would be collected by the New York City Department of Sanitation (DSNY), would be 2.8 tons per week more than assessed in the FGEIS and 0.5 tons per week more than assessed in Technical Memorandum 001, but it would result in the same number of up to two added truckloads per week for solid collection services assessed in the FGEIS and Technical Memorandum 001, as the typical DSNY collection truck has a capacity of 12.5 tons. The remaining 195,315 pounds (97.7 tons) per week from commercial uses, which would be collected by commercial carters, would be 6.2 tons more than assessed in the FGEIS and Technical Memorandum 001. Conservatively assuming that the private carters carry 12 tons of solid waste, the proposed Essex Crossing program would require approximately nine truck trips per week, which is one truck more than was needed as determined by the FGEIS. Therefore, as with the FGEIS program and approved program, the proposed Essex Crossing program would not result in a significant adverse impact on solid waste services.

¹¹ 12-month average daily flow for the period ending April 2014.

Table 13

The Future with the Proposed Essex Crossing Program: Solid Waste Generation

Use	Program ¹	Households/ Employment/Students	Generation Rate (pounds per week) ²	Total (pounds per week)
Residential	1,000 units	1,000 households	41 per household	41,000
Office	269,206 sf	1,076 employees ³	13 per employee	13,988
Medical Office	16,547 sf	36 employees ⁴	13 per employee	468
General Retail—Local	83,872 sf	209 employees ⁵	79 per employee	16,511
General Retail—Destination	81,578 sf	102 employees ⁵	79 per employee	8,058
Food Stores—Grocery	27,805 sf	70 employees ⁵	284 per employee	19,880
Public Market and Market Line	180,199 sf	451 employees ⁵	284 per employee	128,084
Community Facility	46,000 sf	46 employees ⁷	13 per employee	598
Elementary School	518 seats	518 students	3 per pupil	1,554
Gym	47,258 sf	32 employees ⁸	79 per employee	2,489
Movie Theater	102,560 sf	60 employees ⁹	79 per employee	4,740
Bowling Alley	27,784 sf	14 employees ¹⁰	79 per employee	1,097
Museum	26,075 sf	26 employees ⁷	0.03 per sf	782
Total				239,250

Notes:

- Based on the development program discussed under "Transportation," which allocates the mechanical and support space to specific uses.
- Solid waste generation rates as per Table 14-1 in the 2014 *CEQR Technical Manual*.
- Office employment based on 250 sf per employee.
- Medical office employment based on 450 sf per employee.
- Local retail, public market, and Market Line employment based on 400 sf per employee. Destination retail employment based on 800 sf per employee.
- Market Line would include retail and food vendors. For a conservative assessment, the generation rate for food stores was used.
- Community facility and museum employment based on 1,000 sf per employee.
- Gym employment based on 1,500 sf per employee.
- Movie theater employment based on estimate of approximately 21 workers per shift (two 8-hour shifts per day, equivalent to 112 total work-hours per week).
- Bowling alley employment based on 2,000 sf per employee.

ENERGY

As shown in **Table 14**, the proposed Essex Crossing program would result in demand for 343,816 Thousand MBTUs per year.

The proposed Essex Crossing program would result in energy demand of 57,964 Thousand MBTUs per year more than assessed in the FGEIS and Technical Memorandum 001 (285,852 Thousand MBTUs per year). However, the energy demand of the proposed Essex Crossing program would remain a negligible increase compared with the approximately 353 Billion MBTUs of energy consumed annually within Con Edison's New York City and Westchester County service area and is not expected to overburden the energy generation, transmission, and distribution system. Therefore, the proposed Essex Crossing program would not change the findings of the FGEIS and Technical Memorandum 001, and the proposed development would not result in a significant adverse energy impact. In addition, the proposed Essex Crossing development would not alter the FGEIS assumptions about the inclusion of features aimed at reducing energy consumption and greenhouse gas emissions in the proposed development and the expectation that housing developments on all sites would be certified under the Enterprise Green Communities Program or would incorporate measures that would achieve equivalent energy efficiency levels.

Table 14

The Future with the Proposed Essex Crossing Program: Energy Consumption

Use	Program ¹	Rate (MBTU/sf/year) ²	Energy Consumption (Thousand MBTU/Year)
Residential	994,026 sf	126.7	125,943
Office	269,206 sf	216.3	58,229
Medical Office	16,547 sf	216.3	3,579
General Retail—Local	83,872sf	216.3	18,142
General Retail—Destination	81,578 sf	216.3	17,645
Food Stores—Grocery	27,805 sf	216.3	6,014
Public Market and Market Line	180,199 sf	216.3	38,977
Community Facility	46,000 sf	250.7	11,532
Elementary School	75,000 sf	250.7	18,803
Gym	47,258 sf	216.3	10,222
Movie Theater	102,560 sf	216.3	22,184
Bowling Alley	27,784 sf	216.3	6,010
Museum	26,075 sf	250.7	6,537
Total			343,816
Notes:			
1. Based on the development program discussed under "Transportation," which allocates the mechanical and support space to specific uses.			
2. Energy rates as per Table 15-1 in the 2014 <i>CEQR Technical Manual</i> .			

TRANSPORTATION

A detailed trip generation analysis was performed to estimate the volume of person and vehicle trips generated by the proposed Essex Crossing program. As described above, the proposed Essex Crossing program would introduce a program that is different from the RWCDs program analyzed in the FGEIS and subsequent Technical Memoranda 001 and 002. Primary differences include an increase in the public market space, the introduction of the Market Line use, an overall reduction of local and destination retail spaces, the removal of the hotel, the addition of a gym (Physical Culture Establishment), movie theater, bowling alley, and museum space, an increase in the amount of commercial office space, a reduction of medical office space, and the elimination of on-site parking spaces. The bowling alley, museum, and gym would be located on Site 1, the movie theater on Site 2, and sub-grade Market Line retail space on Sites 2, 3, and 4. **Table 15** provides a summary of the program assumptions used for the transportation analyses presented below.

Travel demand projections were prepared for each of the proposed development components under the proposed Essex Crossing program for the weekday AM, midday, PM, and Saturday peak hours. Although Technical Memoranda 001 and 002, which were prepared subsequent to the publication of the FGEIS, addressed potential impacts associated with modifications to the development program analyzed in the FGEIS, they did not include the same level of robust analyses presented in the FGEIS. Therefore, for purposes of the transportation assessments in this Technical Memorandum, all comparisons are made to the analyses described in the FGEIS. **Table 16** shows the transportation planning assumptions used in estimating the number of person and vehicle trips. Consistent with *CEQR* requirements and consistent with the travel demand assumptions used in the FGEIS, these assumptions are based on travel demand factors from established and published sources including the *CEQR Technical Manual*, *ITE Trip Generation Manual (9th Edition)*, U.S. Census data, various approved studies, and discussions with the New York City Department of Transportation (DOT). As further described below, trip estimates for the Market Line use were developed based on characteristics of the public market and destination retail uses.

Table 15
Program Assumptions for Transportation Analyses

Use		Site 1	Site 2	Site 3	Site 4	Site 5	Site 6	Site 8	Site 9	Site 10	Total
Residential	GSF	76,933	192,811	83,180	220,483	193,296	85,304	36,999	83,609	21,411	994,026
	Units	55	195	97	240	211	100	24	64	14	1,000
Office	GSF			125,363	143,842						269,205
Gym	GSF	47,258									47,258
Bowling Alley	GSF	27,784									27,784
	Lanes	13									13
Movie Theater	GSF		102,560								102,560
	Seats		1,100								1,100
Local Retail	GSF	7,626	3,584	14,870		18,443	7,000	9,216	17,822	5,311	83,872
Destination Retail	GSF			26,002	25,576	30,000					81,578
Public Market	GSF		43,028								43,028
Market Line	GSF		46,117	47,178	43,876						137,171
Supermarket	GSF					27,805					27,805
School	GSF					75,000					75,000
	Seats					518					518
Medical Office	GSF						16,547				16,547
Museum	GSF	26,075									26,075
Community Office	GSF						23,000				23,000
Community Facility	GSF						23,000				23,000
Total	GSF	185,676	388,100	296,593	433,777	344,544	154,851	46,215	101,431	26,722	1,977,909

Notes: Programming of Sites 1 to 5 has advanced to include the allocation of support space (i.e., for mechanical and back-of-house uses). Because the FGEIS and TM 001 analyses did not separate out this type of inactive space, the transportation analyses for this Tech Memo has conservatively reallocated the support space square footage to the individual uses within each of these development sites. For Sites 6 to 10, the design process has not been advanced to identify the required support space.

Approximately 933 gsf at Site 9 will be dedicated subway improvements and are not included in the above summary.

Since the Transportation analysis started, the allocation of residential units shifted on Sites 3, 4, and 5. However, the total number of residential units has remained at 1,000 units (see Tables 4, 5, and 6).

Table 16
Travel Demand Assumptions

Use	Residential				Office				Local Retail			
Daily Person Trip Generation Rate	(1) 8.075 Trips / Unit 9.6				(1) 18.0 Trips / KSF 3.9				(1) 205 Trips / KSF 240			
Trip Linkage	0%				0%				25%			
Temporal	AM	MD	PM	SAT	AM	MD	PM	SAT	AM	MD	PM	SAT
Directional	(1) 10% 5% 11% 8%				(1) 12% 15% 14% 17%				(1) 3% 19% 10% 10%			
In	(2) 15% 50% 70% 50%				(2) 96% 48% 5% 57%				(2) 50% 50% 50% 50%			
Out	85% 50% 30% 50%				4% 52% 95% 43%				50% 50% 50% 50%			
Total	100% 100% 100% 100%				100% 100% 100% 100%				100% 100% 100% 100%			
Modal Split	(3)				(4)				(2)			
Auto	9%	9%	9%	9%	17%	2%	17%	2%	2%	2%	2%	2%
Taxi	2%	2%	2%	2%	2%	3%	2%	3%	3%	3%	3%	3%
Subway	57%	57%	57%	57%	56%	6%	56%	6%	6%	6%	6%	6%
Bus	6%	6%	6%	6%	9%	6%	9%	6%	6%	6%	6%	6%
Walk	26%	26%	26%	26%	13%	83%	13%	83%	83%	83%	83%	83%
School Bus	-	-	-	-	-	-	-	-	-	-	-	-
Work at Home	0%	0%	0%	0%	3%	0%	3%	0%	0%	0%	0%	0%
Total	100% 100% 100% 100%				100% 100% 100% 100%				100% 100% 100% 100%			
Vehicle Occupancy	(2)(3)				(2)(4)				(2)			
Auto	1.46	1.46	1.46	1.46	1.21	1.21	1.21	1.21	1.65	1.65	1.65	1.65
Taxi	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40
School Bus	-	-	-	-	-	-	-	-	-	-	-	-
Daily Delivery Trip Generation Rate	(1) 0.06 Delivery Trips / Unit 0.02				(1) 0.32 Delivery Trips / KSF 0.01				(1) 0.35 Delivery Trips / KSF 0.04			
Delivery Temporal	AM	MD	PM	SAT	AM	MD	PM	SAT	AM	MD	PM	SAT
Delivery Directional	(1) 12% 9% 2% 9%				(1) 10% 11% 2% 11%				(1) 8% 11% 2% 11%			
In	(1) 50% 50% 50% 50%				(1) 50% 50% 50% 50%				(1) 50% 50% 50% 50%			
Out	50% 50% 50% 50%				50% 50% 50% 50%				50% 50% 50% 50%			
Total	100% 100% 100% 100%				100% 100% 100% 100%				100% 100% 100% 100%			
Use	Destination Retail				Public Market/ Supermarket				Medical Office (Staff)			
Daily Person Trip Generation Rate	(1) 78.2 Trips / KSF 92.5				(1) 175 Trips / KSF 231				(2) 10.0 Trips / KSF 4.3			
Trip Linkage	0%				25%				0%			
Temporal	AM	MD	PM	SAT	AM	MD	PM	SAT	AM	MD	PM	SAT
Directional	(1) 3% 9% 9% 11%				(1) 5% 6% 10% 9%				(2) 24% 17% 24% 17%			
In	(2) 61% 55% 47% 52%				(2) 59% 46% 47% 51%				(2) 94% 50% 12% 50%			
Out	39% 45% 53% 48%				41% 54% 53% 49%				6% 50% 88% 50%			
Total	100% 100% 100% 100%				100% 100% 100% 100%				100% 100% 100% 100%			
Modal Split	(2)				(2)				(4)(5)			
Auto	9%	9%	9%	9%	2%	2%	2%	2%	17%	17%	17%	17%
Taxi	4%	4%	4%	4%	3%	3%	3%	3%	2%	2%	2%	2%
Subway	28.5%	20%	28.5%	20%	6%	6%	6%	6%	58%	58%	58%	58%
Bus	8%	8%	8%	8%	6%	6%	6%	6%	10%	10%	10%	10%
Walk	50.5%	59%	50.5%	59%	83%	83%	83%	83%	13%	13%	13%	13%
School Bus	-	-	-	-	-	-	-	-	-	-	-	-
Work at Home	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100% 100% 100% 100%				100% 100% 100% 100%				100% 100% 100% 100%			
Vehicle Occupancy	(2)				(2)				(2)(4)			
Auto	2.00	2.00	2.00	2.00	1.65	1.65	1.65	1.65	1.21	1.21	1.21	1.21
Taxi	2.00	2.00	2.00	2.00	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40
School Bus	-	-	-	-	-	-	-	-	-	-	-	-
Daily Delivery Trip Generation Rate	(1) 0.35 Delivery Trips / KSF 0.04				(2) 0.35 Delivery Trips / KSF 0.04				(2) 0.29 Delivery Trips / KSF 0.0			
Delivery Temporal	AM	MD	PM	SAT	AM	MD	PM	SAT	AM	MD	PM	SAT
Delivery Directional	(1) 8% 11% 2% 11%				(2) 8% 11% 2% 11%				(2) 9.6% 11.0% 1.0% 0%			
In	(1) 50% 50% 50% 50%				(2) 50% 50% 50% 50%				(2) 50% 50% 50% 50%			
Out	50% 50% 50% 50%				50% 50% 50% 50%				50% 50% 50% 50%			
Total	100% 100% 100% 100%				100% 100% 100% 100%				100% 100% 100% 100%			

Table 16 (cont'd)
Travel Demand Assumptions

Use	Medical Office (Visitors)				School Students				School Staff			
Daily Person Trip Generation Rate	(2) 33.6 14.5 Trips / KSF				(2)(12) 2.0 0.0 Trips / Seat				(2) 2.0 0.0 Trips / Staff			
Trip Linkage	0%				0%				0%			
Temporal	AM	MD	PM	SAT	AM	MD	PM	SAT	AM	MD	PM	SAT
Directional	(2) 6% 9% 5% 9%				(2)(13) 50% 0% 10% 0%				(2) 50% 0% 2.5% 0%			
In	94%	50%	12%	50%	100%	50%	0%	50%	100%	50%	0%	50%
Out	6%	50%	88%	50%	0%	50%	100%	50%	0%	50%	100%	50%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Modal Split	(2)				(2)				(4)(5)			
Auto	25%	25%	25%	25%	10%	10%	10%	10%	17%	17%	17%	17%
Taxi	25%	25%	25%	25%	2%	2%	2%	2%	2%	2%	2%	2%
Subway	29%	29%	29%	29%	8%	8%	8%	8%	58%	58%	58%	58%
Bus	11%	11%	11%	11%	7%	7%	7%	7%	10%	10%	10%	10%
Walk	10%	10%	10%	10%	53%	53%	53%	53%	13%	13%	13%	13%
School Bus	-	-	-	-	20%	20%	20%	20%	-	-	-	-
Work at Home	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Vehicle Occupancy	(2)				(2)(14)				(2)(4)			
Auto	1.65	1.65	1.65	1.65	1.28	1.28	1.28	1.28	1.21	1.21	1.21	1.21
Taxi	1.20	1.20	1.20	1.20	1.22	1.22	1.22	1.22	1.40	1.40	1.40	1.40
School Bus	-	-	-	-	19.0	19.0	19.0	19.0	-	-	-	-
Daily Delivery Trip Generation Rate	(2) 0.29 0.0 Delivery Trips / KSF				(2) 0.07 0.0 Delivery Trips / KSF				(2) 0.07 0.0 Delivery Trips / KSF			
Delivery Temporal	AM	MD	PM	SAT	AM	MD	PM	SAT	AM	MD	PM	SAT
Delivery Directional	(2) 9.6% 11% 1.0% 0%				(2) 9.6% 11% 1% 0%				(2) 9.6% 11% 1% 0%			
In	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
Out	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Use	Community Office				Community Facility				Gym (Physical Culture Establishment)			
Daily Person Trip Generation Rate	(2) 18.0 3.9 Trips / KSF				(2) 48 19 Trips / KSF				(1) 44.7 26.1 Trips / KSF			
Trip Linkage	0%				0%				0%			
Temporal	AM	MD	PM	SAT	AM	MD	PM	SAT	AM	MD	PM	SAT
Directional	(2) 12% 15% 14% 17%				(2) 7% 10% 7% 14%				(1) 4% 9% 5% 9%			
In	96%	48%	5%	57%	61%	55%	29%	49%	41%	54%	75%	54%
Out	4%	52%	95%	43%	39%	45%	71%	51%	59%	46%	25%	46%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Modal Split	(4)	(2)	(4)	(2)	(2)				(6)			
Auto	17%	2%	17%	2%	5%	5%	5%	5%	2%	2%	2%	2%
Taxi	2%	3%	2%	3%	1%	1%	1%	1%	2%	2%	2%	2%
Subway	56%	6%	56%	6%	3%	3%	3%	3%	12%	12%	12%	12%
Bus	9%	6%	9%	6%	6%	6%	6%	6%	4%	4%	4%	4%
Walk	13%	83%	13%	83%	85%	85%	85%	85%	80%	80%	80%	80%
School Bus	-	-	-	-	-	-	-	-	-	-	-	-
Work at Home	3%	0%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Vehicle Occupancy	(2)(4)				(2)				(6)			
Auto	1.21	1.21	1.21	1.21	1.65	1.65	1.65	1.65	1.00	1.00	1.00	1.00
Taxi	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.00	1.00	1.00	1.00
School Bus	-	-	-	-	-	-	-	-	-	-	-	-
Daily Delivery Trip Generation Rate	(2) 0.32 0.01 Delivery Trips / KSF				(2) 0.29 0.04 Delivery Trips / KSF				(6) 0.19 0.01 Delivery Trips / KSF			
Delivery Temporal	AM	MD	PM	SAT	AM	MD	PM	SAT	AM	MD	PM	SAT
Delivery Directional	(2) 10% 11% 2% 11%				(2) 10% 11% 1% 0%				(6) 6% 11% 1% 7.6%			
In	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
Out	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

**Table 16 (cont'd)
Travel Demand Assumptions**

Use	Bowling Alley				Movie Theater				Museum			
Daily Person Trip Generation Rate	(7) 70.2 Trips / Lane				(1) 3.26 Trips / Seat				(1) 27.0 Trips / KSF			
Trip Linkage	0%				0%				0%			
Temporal	AM	MD	PM	SAT	AM	MD	PM	SAT	AM	MD	PM	SAT
	9.4%	11.5%	13.5%	13.5%	1%	3%	8%	5%	1%	16%	13%	17%
Directional	(8)				(10)				(11)			
In	60%	60%	83%	60%	95%	62%	54%	62%	50%	63%	52%	63%
Out	40%	40%	17%	40%	5%	38%	46%	38%	50%	37%	48%	37%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Modal Split	(9)				(9)				(11)			
Auto	9%	9%	9%	9%	9%	9%	9%	9%	12%	12%	12%	12%
Taxi	4%	4%	4%	4%	4%	4%	4%	4%	10%	10%	10%	10%
Subway	28.5%	28.5%	28.5%	28.5%	28.5%	28.5%	28.5%	28.5%	7%	7%	7%	7%
Bus	8%	8%	8%	8%	8%	8%	8%	8%	29%	29%	29%	29%
Walk	50.5%	50.5%	50.5%	50.5%	50.5%	50.5%	50.5%	50.5%	42%	42%	42%	42%
School Bus	-	-	-	-	-	-	-	-	-	-	-	-
Work at Home	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Vehicle Occupancy	(9)				(10)				(11)			
Auto	2.00	2.00	2.00	2.00	2.52	2.52	2.52	2.52	2.34	2.34	2.34	2.34
Taxi	2.00	2.00	2.00	2.00	2.30	2.30	2.30	2.30	1.90	1.90	1.90	1.90
School Bus	-	-	-	-	-	-	-	-	-	-	-	-
Daily Delivery Trip Generation Rate	(9) 0.35 Delivery Trips / KSF				(10) 0.02 Delivery Trips / Seat				(11) 0.05 Delivery Trips / KSF			
Delivery Temporal	AM	MD	PM	SAT	AM	MD	PM	SAT	AM	MD	PM	SAT
	8%	11%	2%	11.0%	12%	11%	1%	0.0%	9.6%	11%	1%	11%
Delivery Directional	(9)				(10)				(11)			
In	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
Out	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Sources	(1) 2014 CEQR Technical Manual (2) Seward Park Mixed-Use Development Project FGEIS and Technical Memoranda, 2012 (3) U.S. Census Bureau, ACS 2008-2012 Five-Year Estimates - Journey-to-Work (JTW) Data for Census Tracts 12, 14.01, 14.02, 16, 18, 22.01, and 30.01 (4) U.S. Census Bureau, ACS 2006-2010 Five-Year Estimates. Special Tabulation: Census Transportation Planning – Reverse-Journey-to-Work (RJTW) Data for Census Tracts 12, 14.01, 14.02, 16, 18, 22.01, and 30.01 (5) Work at home mode excluded from modal split estimations (6) Hudson Square Rezoning FEIS, 2013 (7) ITE Trip Generation 9th Edition, Land Use Code: 437, P821. Weekday daily person trip rate converted from ITE vehicle trip rate: (33.33 / 0.95) * 2 = 70.2. Saturday daily person trip rate based on the ratio of Golf Driving Range (Land Use Code:432) use weekday and Saturday trip rates and applied to the converted weekday daily person trip rate. (8) ITE Trip Generation 9th Edition, Land Use Code: 437, P821. Weekday midday temporal distribution based on the average of the weekday AM and PM temporal distributions. Weekday midday directional distribution assumed the same as weekday AM. Saturday peak hour directional and temporal distributions assumed the same as the weekday midday and PM peak hours, respectively. (9) Modal splits based on the destination retail use (10) Willets Point Development FSEIS, 2013 (11) West Harlem Rezoning FEIS, 2013 (12) Assumes 1 parent for every 1.28 students taking subway, bus, and walk modes to school. These trips were added to the student trips based on the factors presented above. (13) Weekday PM peak hour temporal distribution adjusted per DOT. (14) Based on DOT survey.											

TRIP GENERATION

Trip generation assumptions for the various previously analyzed uses are based on the assumptions utilized for the FGEIS and incorporate DOT-provided adjustments. For the destination retail use, the 25-percent linked trip credit previously assumed was eliminated in accordance with guidance from the latest edition of the CEQR Technical Manual. The proposed Market Line retail space would in part serve as an extension of the Essex Street Market with additional market space and food vendors and would provide vendors space for selling soft goods such as home goods, clothing, and clothing accessories. It also incorporates an underground circulation network connecting Sites

2, 3, and 4 with a new subway connection at the western end of Site 2. As discussed above under “Socioeconomic Conditions,” retail stores throughout the Lower East Side and adjacent neighborhoods all benefit from the high volumes of foot traffic spurred by the proximity of stores offering similar goods and services that draw shoppers from throughout the region. Therefore, the integration of this new Market Line use is expected to create positive relationships among similar stores. As this use can be expected to exhibit characteristics that resemble those of local retail, public market, and destination retail uses, its anticipated trip-making was estimated by assuming that the portion under Site 2 connecting to the future Essex Street Market would share the same travel demand characteristics as the public market/supermarket use, while the space under Site 3 and Site 4 would take on destination retail travel characteristics. For the detailed pedestrian analyses prepared for the FGEIS, it was described that those analyses accounted for a RWCDs assessment of future pedestrian levels absent a more defined development program. As such, the 25-percent linked-trip credit for the local retail and public market/supermarket uses was applied for all modes, except for the walk-only mode. Considering the recent retail trends in the Lower East Side, the relationship among the various retail and entertainment uses that define the current Essex Crossing program, and the increased opportunity for existing and future residents, workers, and visitors in this area to patronize multiple retail stores on the same trip, the 25-percent linked-trip credit was incorporated into the walk-only trip estimates for local retail and public market/supermarket uses in this Technical Memorandum’s transportation analyses.

For the elementary school, adjustments were made to the afternoon temporal distribution for students and to the travel characteristics of accompanying parents. In addition, modal splits and auto occupancies for the residential, office/community office, medical office staff, and elementary school staff were updated based on the latest 2008-2012 U.S. Census Bureau American Community Survey (ACS) Journey-to-Work (JTW) data and the 2006-2010 U.S. Census Bureau ACS (Special Tabulation: Census Transportation Planning) Reverse-Journey-to-Work (RJTW) data. Travel demand factors used to calculate trips generated by the new uses, including the gym, bowling alley, movie theater, and museum, are described in detail below.

Gym (Physical Culture Establishment)

For the gym use under the proposed Essex Crossing program, daily person trip generation rates of 44.7 person trips per 1,000 square feet for weekday and 26.1 person trips per 1,000 square feet for Saturday were obtained from the *CEQR Technical Manual*. Temporal distributions of 4 percent for the weekday AM peak hour, 9 percent for the midday peak hour, 5 percent for the PM peak hour, and 9 percent for the Saturday peak hour, as well as modal splits of 2 percent by auto, 2 percent by taxi, 12 percent by subway, 4 percent by bus, and 80 percent by walk, and vehicle occupancies of 1.00 per auto and 1.00 per taxi were obtained from the 2013 *Hudson Square Rezoning FEIS*.

For truck deliveries, daily trip generation rates of 0.19 trips per 1,000 square feet for weekday and 0.01 trips per 1,000 square feet for Saturday were obtained from the *Hudson Square Rezoning FEIS*. Temporal and directional distribution factors for truck deliveries were also obtained from the *Hudson Square Rezoning FEIS*.

Bowling Alley

For the bowling alley use under the proposed Essex Crossing program, the weekday daily person trip generation rate of 70.2 person trips per lane was derived based on trip rates presented in the *ITE Trip Generation Manual, 9th Edition* for the bowling alley land use. For the Saturday daily person trip generation rate, the relative weekday and Saturday trip rates for the driving range land use was taken to arrive at 90.9 person trips per lane for Saturday. Temporal distributions of

9.4 percent for the weekday AM peak hour and 13.5 percent for the PM peak hour were extrapolated from the relative daily vs. hourly trip rates shown in the *ITE Trip Generation Manual*. A temporal distribution of 11.5 percent for the weekday midday peak hour was derived based on the average of the weekday AM and PM peak hour temporal distributions. For the Saturday peak hour, the same temporal distribution of 13.5 percent as the weekday PM peak hour was assumed. Directional distributions for the weekday AM and PM peak hours are based on the *ITE Trip Generation Manual*. The weekday midday and Saturday directional distributions were assumed to be the same as the weekday AM peak hour. Modal splits of 9 percent by auto, 4 percent by taxi, 28.5 percent by subway, 8 percent by bus, and 50.5 percent by walk, and vehicle occupancies of 2.00 per auto and 2.00 per taxi are based on those assumed for the destination retail use.

For truck deliveries, daily trip generation rate of 0.35 trips per 1,000 square feet for weekday and 0.04 trips per 1,000 square feet for Saturday, as well as the temporal and directional distribution factors, are also based those assumed for the destination retail use.

Movie Theater

For the movie theater use under the proposed Essex Crossing program, daily person trip generation rates of 3.26 person trips per seat for weekday and 6.25 person trips per seat for Saturday were obtained from the *CEQR Technical Manual*. Temporal distributions of 1 percent for the weekday AM peak hour, 3 percent for the weekday midday peak hour, 8 percent for the PM peak hour, and 5 percent for the Saturday peak hour were also obtained from the *CEQR Technical Manual*. Directional distributions for the weekday AM, midday, PM, and Saturday peak hours were obtained from the 2013 *Willets Point Development FSEIS*. Modal splits of 9 percent by auto, 4 percent by taxi, 28.5 percent by subway, 8 percent by bus, and 50.5 percent by walk are based on those assumed for the destination retail use. Vehicle occupancies of 2.52 per auto and 2.30 per taxi were obtained from the *Willets Point Development FSEIS*.

For truck deliveries, daily trip generation rates of 0.02 trips per seat for weekday and 0.00 trips per seat for Saturday were obtained from the *Willets Point Development FSEIS*. Temporal and directional distribution factors for truck deliveries were also obtained from the *Willets Point Development FSEIS*.

Museum

For the museum use under the proposed Essex Crossing program, daily person trip generation rates of 27.0 person trips per 1,000 square feet for weekday and 20.6 person trips per 1,000 square feet for Saturday were obtained from the *CEQR Technical Manual*. Temporal distributions of 1 percent for the weekday AM peak hour, 16 percent for the weekday midday peak hour, 13 percent for the PM peak hour, and 17 percent for the Saturday peak hour were also obtained from the *CEQR Technical Manual*. Directional distributions for the weekday AM, midday, PM, and Saturday peak hours were obtained from the 2013 *West Harlem Rezoning FEIS*. Modal splits of 12 percent by auto, 10 percent by taxi, 7 percent by subway, 29 percent by bus, and 42 percent by walk, as well as vehicle occupancies of 2.34 per auto and 1.90 per taxi, were also obtained from the *West Harlem Rezoning FEIS*.

For truck deliveries, daily trip generation rates of 0.05 trips per 1,000 square feet for weekday and 0.01 trips per 1,000 square feet for Saturday were obtained from the *West Harlem Rezoning FEIS*. Temporal and directional distribution factors for truck deliveries were also obtained from the *West Harlem Rezoning FEIS*.

Summary

The total numbers of person and vehicle trips generated by the proposed Essex Crossing program are summarized in **Tables 17 and 18**, respectively. As presented in **Table 17**, the proposed Essex Crossing program would generate approximately 4,457, 6,488, 6,614, and 6,857 person trips during the weekday AM, midday, PM, and Saturday peak hours, respectively. In terms of vehicle trips, the proposed Essex Crossing program would generate approximately 412, 418, 514, and 416 vehicle trips during the weekday AM, midday, PM, and Saturday peak hours, respectively (see **Table 18**).

In comparison, the FGEIS program was expected to generate 3,245, 6,375, 6,355, and 7,403 person trips, and 371, 527, 540, and 496 vehicle trips, respectively, during the weekday AM, midday, PM, and Saturday peak hours. As shown in **Table 19**, a comparison of the person trips expected to be generated by the FGEIS program to the proposed Essex Crossing program indicates that the number of person trips would be greater for the proposed Essex Crossing program only during the Saturday peak hour, and as shown in **Table 20** for vehicle trips, the proposed Essex Crossing program would generate more vehicle trips only during the weekday AM peak hour (41 additional vehicle trips) in comparison to the trips projected to be generated by the FGEIS program.

TRAFFIC

A detailed trip distribution and assignment of projected vehicle trips was prepared for all four peak analysis hours. The assumptions were similar to those used for the FGEIS. Traffic assignments for the new uses that are part of the proposed Essex Crossing program, which includes gym, bowling alley, movie theater, and museum uses, are assumed to follow similar trip distributions and assignments as the destination retail use. The proposed school on Site 5, which was not a part of the FGEIS, assumes student trips to follow a similar trip distribution and assignment as local retail use, and for staff trips to be similar to the trip distribution and assignment of the office use. Parking demand generated by these uses would be destined to park at off-street parking facilities further away, but still within a ¼-mile radius of the project sites.

A qualitative assessment was performed to determine the potential for new significant impacts as a result of the proposed Essex Crossing program. This was achieved by comparing traffic volume increments expected as part of the FGEIS to those expected as a result of the proposed Essex Crossing program, and by reviewing the FGEIS traffic levels of service to assess whether significant impact and mitigation findings are likely to change. Subsequent to the publication of the FGEIS, DOT has made geometric and operational improvements in the study area to enhance traffic and pedestrian flow and safety. With the mayoral Vision Zero initiatives taking shape across the City, there are likely to be additional improvements made in the study area to further the goals and objectives of these transportation initiatives. Therefore, for purposes of the assessments presented below, conditions presented in the FGEIS were used as the baseline for comparing potential changes in traffic operations associated with the Essex Crossing development program. DOT can then consider the findings made from these assessments to make informed decisions on the implementation of future improvement plans.

Table 17
Trip Generation Summary
Person Trips - Proposed Essex Crossing Program

Use		Peak Hour		Person Trip						
				Auto	Taxi	Subway	Bus	School Bus	Walk	Total
Residential	1,000 Dwelling Units	AM	In	11	2	69	7	0	31	120
			Out	62	14	391	41	0	178	686
			Total	73	16	460	48	0	209	806
		MD	In	18	4	115	12	0	52	201
			Out	18	4	115	12	0	52	201
			Total	36	8	230	24	0	104	402
		PM	In	56	12	354	37	0	162	621
			Out	24	5	152	16	0	69	266
			Total	80	17	506	53	0	231	887
		SAT	In	35	8	219	23	0	100	385
			Out	35	8	219	23	0	100	385
			Total	70	16	438	46	0	200	770
Office	269.206 KSF	AM	In	95	11	313	50	0	73	542
			Out	4	0	13	2	0	3	22
			Total	99	11	326	52	0	76	564
		MD	In	7	10	21	21	0	290	349
			Out	8	11	23	23	0	314	379
			Total	15	21	44	44	0	604	728
		PM	In	6	1	19	3	0	4	33
			Out	110	13	361	58	0	84	626
			Total	116	14	380	61	0	88	659
		SAT	In	2	3	6	6	0	84	101
			Out	2	2	5	5	0	64	78
			Total	4	5	11	11	0	148	179
Gym	47.258 KSF	AM	In	1	1	4	1	0	28	35
			Out	1	1	6	2	0	40	50
			Total	2	2	10	3	0	68	85
		MD	In	2	2	12	4	0	82	102
			Out	2	2	10	3	0	70	87
			Total	4	4	22	7	0	152	189
		PM	In	2	2	10	3	0	63	80
			Out	1	1	3	1	0	21	27
			Total	3	3	13	4	0	84	107
		SAT	In	1	1	7	2	0	48	59
			Out	1	1	6	2	0	41	51
			Total	2	2	13	4	0	89	110
Bowling Alley	13 Lanes 27.784 KSF	AM	In	5	2	15	4	0	26	52
			Out	3	1	10	3	0	17	34
			Total	8	3	25	7	0	43	86
		MD	In	6	3	18	5	0	32	64
			Out	4	2	12	3	0	21	42
			Total	10	5	30	8	0	53	106
		PM	In	9	4	29	8	0	52	102
			Out	2	1	6	2	0	11	22
			Total	11	5	35	10	0	63	124
		SAT	In	9	4	27	8	0	48	96
			Out	6	3	18	5	0	32	64
			Total	15	7	45	13	0	80	160

Table 17 (cont'd)
Trip Generation Summary
Person Trips - Proposed Essex Crossing Program

Use		Peak Hour		Person Trip						
				Auto	Taxi	Subway	Bus	School Bus	Walk	Total
Movie Theater	1,100 Seats	AM	In	3	1	10	3	0	17	34
			Out	0	0	1	0	0	1	2
			Total	3	1	11	3	0	18	36
		MD	In	6	3	19	5	0	34	67
			Out	4	2	12	3	0	21	42
			Total	10	5	31	8	0	55	109
		PM	In	14	6	44	12	0	78	154
			Out	12	5	38	11	0	67	133
			Total	26	11	82	23	0	145	287
		SAT	In	19	9	61	17	0	108	214
			Out	12	5	37	10	0	66	130
			Total	31	14	98	27	0	174	344
Local Retail	83.872 KSF	AM	In	4	6	12	12	0	161	195
			Out	4	6	12	12	0	161	195
			Total	8	12	24	24	0	322	390
		MD	In	25	37	74	74	0	1,017	1,227
			Out	25	37	74	74	0	1,017	1,227
			Total	50	74	148	148	0	2,034	2,454
		PM	In	13	19	39	39	0	535	645
			Out	13	19	39	39	0	535	645
			Total	26	38	78	78	0	1,070	1,290
		SAT	In	15	23	45	45	0	627	755
			Out	15	23	45	45	0	627	755
			Total	30	46	90	90	0	1,254	1,510
Destination Retail	172.632 KSF (incl. Market Line Space of 47.178 ksf at Site 3 & 43.876 ksf at Site 4)	AM	In	22	10	70	20	0	125	247
			Out	14	6	45	13	0	80	158
			Total	36	16	115	33	0	205	405
		MD	In	60	27	134	53	0	394	668
			Out	49	22	109	44	0	323	547
			Total	109	49	243	97	0	717	1,215
		PM	In	51	23	163	46	0	288	571
			Out	58	26	184	52	0	325	645
			Total	109	49	347	98	0	613	1,216
		SAT	In	82	37	183	73	0	539	914
			Out	76	34	169	67	0	497	843
			Total	158	71	352	140	0	1,036	1,757
Public Market	89.145 KSF (incl. Market Line Space of 46.117 ksf at Site 2)	AM	In	7	10	21	21	0	286	345
			Out	5	7	14	14	0	199	239
			Total	12	17	35	35	0	485	584
		MD	In	6	10	19	19	0	268	322
			Out	8	11	23	23	0	315	380
			Total	14	21	42	42	0	583	702
		PM	In	11	16	33	33	0	456	549
			Out	12	19	37	37	0	515	620
			Total	23	35	70	70	0	971	1,169
		SAT	In	14	21	43	43	0	588	709
			Out	14	20	41	41	0	565	681
			Total	28	41	84	84	0	1,153	1,390

Table 17 (cont'd)
Trip Generation Summary
Person Trips - Proposed Essex Crossing Program

Use		Peak Hour		Person Trip						
				Auto	Taxi	Subway	Bus	School Bus	Walk	Total
Supermarket	27.805 KSF	AM	In	2	3	6	6	0	89	106
			Out	1	2	4	4	0	62	73
			Total	3	5	10	10	0	151	179
		MD	In	2	3	6	6	0	84	101
			Out	2	4	7	7	0	98	118
			Total	4	7	13	13	0	182	219
		PM	In	3	5	10	10	0	142	170
			Out	4	6	12	12	0	161	195
			Total	7	11	22	22	0	303	365
		SAT	In	4	7	13	13	0	184	221
			Out	4	6	13	13	0	176	212
			Total	8	13	26	26	0	360	433
Medical Office (Staff)	16.547 KSF	AM	In	6	1	22	4	0	5	38
			Out	0	0	1	0	0	0	1
			Total	6	1	23	4	0	5	39
		MD	In	2	0	8	1	0	2	13
			Out	2	0	8	1	0	2	13
			Total	4	0	16	2	0	4	26
		PM	In	1	0	3	0	0	1	5
			Out	6	1	20	3	0	5	35
			Total	7	1	23	3	0	6	40
		SAT	In	1	0	4	1	0	1	7
			Out	1	0	4	1	0	1	7
			Total	2	0	8	2	0	2	14
Medical Office (Visitors)	16.547 KSF	AM	In	8	8	9	3	0	3	31
			Out	1	1	1	0	0	0	3
			Total	9	9	10	3	0	3	34
		MD	In	6	6	7	3	0	3	25
			Out	6	6	7	3	0	3	25
			Total	12	12	14	6	0	6	50
		PM	In	1	1	1	0	0	0	3
			Out	6	6	7	3	0	2	24
			Total	7	7	8	3	0	2	27
		SAT	In	3	3	3	1	0	1	11
			Out	3	3	3	1	0	1	11
			Total	6	6	6	2	0	2	22
School (Students)	518 Seats	AM	In	52	10	41	36	104	275	518
			Out	0	0	0	0	0	0	0
			Total	52	10	41	36	104	275	518
		MD	In	0	0	0	0	0	0	0
			Out	0	0	0	0	0	0	0
			Total	0	0	0	0	0	0	0
		PM	In	0	0	0	0	0	0	0
			Out	10	2	8	7	21	55	103
			Total	10	2	8	7	21	55	103
		SAT	In	0	0	0	0	0	0	0
			Out	0	0	0	0	0	0	0
			Total	0	0	0	0	0	0	0

Table 17 (cont'd)
Trip Generation Summary
Person Trips - Proposed Essex Crossing Program

Use		Peak Hour		Person Trip							
				Auto	Taxi	Subway	Bus	School Bus	Walk	Total	
School (Parents) <i>[Subway, bus, and walk modes only]</i>	275 Parents	AM	In	0	0	33	28	0	214	275	
			Out	0	0	33	28	0	214	275	
			Total	0	0	66	56	0	428	550	
		MD	In	0	0	0	0	0	0	0	0
			Out	0	0	0	0	0	0	0	0
			Total	0	0	0	0	0	0	0	0
		PM	In	0	0	7	6	0	43	56	
			Out	0	0	7	6	0	43	56	
			Total	0	0	14	12	0	86	112	
		SAT	In	0	0	0	0	0	0	0	
			Out	0	0	0	0	0	0	0	
			Total	0	0	0	0	0	0	0	
School (Faculty)	52 Staff	AM	In	9	1	30	5	0	7	52	
			Out	0	0	0	0	0	0	0	
			Total	9	1	30	5	0	7	52	
		MD	In	0	0	0	0	0	0	0	
			Out	0	0	0	0	0	0	0	
			Total	0	0	0	0	0	0	0	
		PM	In	0	0	0	0	0	0	0	
			Out	0	0	2	0	0	0	2	
			Total	0	0	2	0	0	0	2	
		SAT	In	0	0	0	0	0	0	0	
			Out	0	0	0	0	0	0	0	
			Total	0	0	0	0	0	0	0	
Museum	26.075 KSF	AM	In	0	0	0	1	0	1	2	
			Out	0	0	0	1	0	1	2	
			Total	0	0	0	2	0	2	4	
		MD	In	9	7	5	21	0	30	72	
			Out	5	4	3	12	0	18	42	
			Total	14	11	8	33	0	48	114	
		PM	In	6	5	3	14	0	20	48	
			Out	5	4	3	13	0	18	43	
			Total	11	9	6	27	0	38	91	
		SAT	In	7	6	4	17	0	24	58	
			Out	4	3	2	10	0	14	33	
			Total	11	9	6	27	0	38	91	
Community Office	23 KSF	AM	In	8	1	27	4	0	6	46	
			Out	0	0	1	0	0	0	1	
			Total	8	1	28	4	0	6	47	
		MD	In	1	1	2	2	0	25	31	
			Out	1	1	2	2	0	27	33	
			Total	2	2	4	4	0	52	64	
		PM	In	0	0	2	0	0	0	2	
			Out	9	1	31	5	0	7	53	
			Total	9	1	33	5	0	7	55	
		SAT	In	0	0	1	1	0	7	9	
			Out	0	0	0	0	0	5	5	
			Total	0	0	1	1	0	12	14	

Table 17 (cont'd)
Trip Generation Summary
Person Trips - Proposed Essex Crossing Program

Use		Peak Hour		Person Trip						
				Auto	Taxi	Subway	Bus	School Bus	Walk	Total
Community Facility	23 KSF	AM	In	2	0	1	3	0	41	47
			Out	2	0	1	2	0	26	31
			Total	4	0	2	5	0	67	78
		MD	In	3	1	2	4	0	52	62
			Out	2	0	1	3	0	42	48
			Total	5	1	3	7	0	94	110
		PM	In	1	0	1	1	0	20	23
			Out	3	1	2	3	0	48	57
			Total	4	1	3	4	0	68	80
		SAT	In	2	0	1	2	0	26	31
			Out	2	0	1	2	0	27	32
			Total	4	0	2	4	0	53	63
Total		AM	In	235	67	683	208	104	1,388	2,685
			Out	97	38	533	122	0	982	1,772
			Total	332	105	1,216	330	104	2,370	4,457
		MD	In	153	114	442	230	0	2,365	3,304
			Out	136	106	406	213	0	2,323	3,184
			Total	289	220	848	443	0	4,688	6,488
		PM	In	174	94	718	212	0	1,864	3,062
			Out	275	110	912	268	21	1,966	3,552
			Total	449	204	1,630	480	21	3,830	6,614
		SAT	In	194	122	617	252	0	2,385	3,570
			Out	175	108	563	225	0	2,216	3,287
			Total	369	230	1,180	447	0	4,601	6,857

Table 18
Trip Generation Summary
Vehicle Trips – Proposed Essex Crossing Program

Use	Weekday Peak Hours									Saturday Peak Hour		
	AM			Midday			PM			In	Out	Total
	In	Out	Total	In	Out	Total	In	Out	Total			
Autos												
Residential	7	42	49	12	12	24	38	16	54	24	24	48
Office	78	3	81	6	6	12	5	91	96	2	1	3
Local Retail	2	2	4	15	15	30	8	8	16	9	9	18
Destination Retail	11	7	18	30	25	55	26	29	55	41	38	79
Medical Office (Staff)	5	0	5	2	2	4	1	5	6	1	1	2
Medical Office (Visitors)	5	0	5	4	4	8	1	4	5	2	2	4
School (Students)	40	40	80	0	0	0	8	8	16	0	0	0
School (Staff)	7	0	7	0	0	0	0	0	0	0	0	0
Community Facility	1	1	2	2	2	4	1	2	3	1	1	2
Public Market	4	3	7	4	5	9	7	8	15	9	8	17
Supermarket	1	1	2	1	1	2	2	2	4	3	3	6
Community Office	7	0	7	1	1	2	0	8	8	0	0	0

Table 18 (cont'd)
Trip Generation Summary
Vehicle Trips – Proposed Essex Crossing Program

Use	Weekday Peak Hours									Saturday Peak Hour		
	AM			Midday			PM			In	Out	Total
	In	Out	Total	In	Out	Total	In	Out	Total			
Gym	1	1	2	2	2	4	2	1	3	1	1	2
Bowling Alley	2	2	4	3	2	5	5	1	6	4	3	7
Movie Theater	1	0	1	2	1	3	6	5	11	8	5	13
Museum	0	0	0	4	2	6	2	2	4	3	2	5
Deliveries (all uses)	13	13	26	18	18	36	3	3	6	1	1	2
Taxis (all uses)	51	51	102	107	107	214	102	102	204	104	104	208
School Buses (all uses)	5	5	10	0	0	0	1	1	2	0	0	0
Total	241	171	412	213	205	418	218	296	514	213	203	416

Table 19
Person Trip Comparisons:
Proposed Essex Crossing Program vs. FGEIS Program

	Auto		Taxi		Subway		Bus		School Bus		Walk		Total		Total
	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In+Out
Weekday AM Peak Hour															
PM	235	97	67	38	683	533	208	122	104	0	1,388	982	2,685	1,772	4,457
FGEIS	191	114	91	54	376	425	117	103	0	0	960	814	1,735	1,510	3,245
Diff.	44	-17	-24	-16	307	108	91	19	104	0	428	168	950	262	1,212
Weekday Midday Peak Hour															
PM	153	136	114	106	442	406	230	213	0	0	2,365	2,323	3,304	3,184	6,488
FGEIS	205	188	137	129	454	419	196	184	0	0	2,278	2,185	3,270	3,105	6,375
Diff.	-52	-52	-23	-23	-12	-13	34	29	0	0	87	138	34	79	113
Weekday PM Peak Hour															
PM	174	275	94	110	718	912	212	268	0	21	1,864	1,966	3,062	3,552	6,614
FGEIS	190	265	109	129	638	641	189	208	0	0	1,932	2,054	3,058	3,297	6,355
Diff.	-16	10	-15	-19	80	271	23	60	0	21	-68	-88	4	255	259
Saturday Peak Hour															
PM	194	175	122	108	617	563	252	225	0	0	2,385	2,216	3,570	3,287	6,857
FGEIS	223	210	131	123	576	548	231	219	0	0	2,636	2,506	3,797	3,606	7,403
Diff.	-29	-35	-9	15	41	15	21	6	0	0	-251	-290	-227	-319	-546

Table 20
Vehicle Trip Comparisons:
Proposed Essex Crossing Program vs. FGEIS Program

	Auto		Taxi		Truck		School Bus		Total		Total Trips
	In	Out	In	Out	In	Out	In	Out	In	Out	In+Out
Weekday AM Peak Hour											
PM	172	102	51	51	13	13	5	5	241	171	412
FGEIS	131	84	67	67	11	11	0	0	209	162	371
Difference	41	18	-16	-16	2	2	5	5	32	9	41
Weekday Midday Peak Hour											
PM	88	80	107	107	18	18	0	0	213	205	418
FGEIS	124	117	129	129	14	14	0	0	267	260	527
Difference	-36	-37	-22	-22	4	4	0	0	-54	-55	-109
Weekday PM Peak Hour											
PM	112	190	102	102	3	3	1	1	218	296	514
FGEIS	124	176	120	120	0	0	0	0	244	296	540
Difference	-12	14	-18	-18	3	3	1	1	-26	0	-26
Saturday Peak Hour											
PM	108	98	104	104	1	1	0	0	213	203	416
FGEIS	134	130	116	116	0	0	0	0	250	246	496
Difference	-26	-32	-12	-12	1	1	0	0	-37	-43	-80

It is preliminarily expected that during the weekday AM peak hour, there could be three less significantly impacted intersections as part of the proposed Essex Crossing program in comparison to the FGEIS. Significant impact findings during the weekday PM peak hour are not anticipated to change due to the proposed Essex Crossing program. During the weekday midday peak hour, one intersection that was significantly impacted as part of the FGEIS, and two intersections for the Saturday peak hour, might not be impacted as part of the proposed Essex Crossing program. Descriptions of the preliminarily anticipated changes are provided below.

East Houston Street and Chrystie Street/Second Avenue

During the weekday AM peak hour, one movement that was identified as being significantly impacted in the FGEIS would likely not be impacted as part of the proposed Essex Crossing program, resulting in no significant impacts expected at this intersection. The findings are not expected to change when comparing the proposed Essex Crossing program with the other time periods analyzed in the FGEIS.

East Houston Street and Essex Street/Avenue A

Significantly impacted lane groups (i.e., westbound East Houston Street left turn and southbound Avenue A approach) are not expected to change at this intersection as a result of the proposed Essex Crossing program. However, in comparison with the FGEIS, impacts during the Saturday peak hour are expected to worsen. Additional measures similar to those considered in the FGEIS (such as signal timing and phasing modifications, lane restriping, and parking prohibitions) may be needed for the intersection to remain mitigated.

Rivington Street and Essex Street

Significantly impacted lane groups are not expected to change at this intersection as a result of the proposed Essex Crossing program. The same mitigation measures identified in the FGEIS (signal timing modifications, lane re-striping, and parking prohibitions) would similarly mitigate the traffic impacts anticipated for the Essex Crossing program. However, accompanying these traffic mitigation measures, a modest widening of the intersection's east crosswalk would be required. See specific discussions below in the "Pedestrians" section.

Delancey Street and Allen Street

In comparison with the FGEIS, one new movement may be impacted during the weekday AM peak hour with the proposed Essex Crossing program. This intersection was unmitigatable during the weekday AM peak hour in the FGEIS and would continue to remain unmitigatable with the proposed Essex Crossing program.

Delancey Street and Ludlow Street

In comparison with the FGEIS, one new movement may be impacted during the weekday PM peak hour with the proposed Essex Crossing program. This intersection was unmitigatable during the weekday PM peak hour in the FGEIS and would continue to remain unmitigatable with the proposed Essex Crossing program.

Delancey Street and Norfolk Street

Two movements that were identified as significantly impacted during the weekday midday, PM, and Saturday peak hours in the FGEIS (three movements during the weekday AM peak hour) would likely not be impacted with the proposed Essex Crossing program. This intersection, which was unmitigatable during all four peak analysis hours in the FGEIS, would not be expected to be impacted during the weekday AM, midday, and Saturday peak hours in the FGEIS with the proposed Essex Crossing program.

Delancey Street and Suffolk Street

One movement that was identified as being significantly impacted in the FGEIS during the Saturday peak hour is not expected to be impacted with the proposed Essex Crossing program. This previously impacted intersection would likely not be impacted as a result.

Delancey Street and Clinton Street

In comparison with the FGEIS, one new movement may be impacted during the weekday AM and Saturday peak hours with the proposed Essex Crossing program. This intersection was unmitigatable during the weekday AM, PM, and Saturday peak hours in the FGEIS, and would continue to remain unmitigatable with the proposed Essex Crossing program.

Grand Street and Allen Street

During the weekday AM, midday, and Saturday peak hours, one movement that was identified as significantly impacted in the FGEIS would likely not be impacted with the proposed Essex Crossing program. This intersection was previously impacted during the weekday AM peak hour in the FGEIS but would likely not be impacted during the weekday AM peak hour with the proposed Essex Crossing program. The findings for the proposed Essex Crossing program are not expected to change for the other peak analysis hours.

Grand Street and Clinton Street

In comparison with the FGEIS, significant impact findings at this intersection are not expected to change as a result of the proposed Essex Crossing program; however, impacts during the weekday midday and PM peak hours are expected to worsen. Additional mitigation measures similar to those considered as part of the FGEIS (such as signal timing and phasing modifications, lane restriping, and parking prohibitions) may be needed for the intersection to remain mitigated during all peak analysis hours.

NYCEDC and/or HPD will require that its developers will implement the mitigation and associated environmental measures identified in the FGEIS and this Technical Memorandum, by means of provisions in the contract of sale or long-term lease or other legally binding agreement between the developer(s) and NYCEDC, HPD, and/or the City.

PARKING

The proposed Essex Crossing program would not include any off-street parking, compared to 500 off-street parking spaces in the FGEIS. Parking demand as a result of the proposed Essex Crossing program would be expected to be accommodated by off-street parking facilities within a ¼-mile radius of the project sites, including: the municipal parking garage along Essex Street between Rivington Street and Delancey Street; the parking lot along Essex Street between Houston Street and Stanton Street; the parking garage along Allen Street between Grand Street and Hester Street; and the parking garage at the corner of Delancey Street and Columbia Street. Similar to the FGEIS, all existing trips to the surface parking lots at the development sites would continue to be retained in the street network.

TRANSIT AND PEDESTRIANS

As described above, the proposed Essex Crossing program would not only result in uses that are different from those previously assumed at each development site, it would also introduce different building/storefront access locations and alter the on-site parking accommodations. In addition, a new subway connection with direct access to Site 2, as well as, tunnel connections between Sites 2, 3, and 4 would be constructed below grade. These program elements are expected to alter pedestrian flow to and from the development sites both on-street and en route to/from the Delancey Street subway station.

Transit

As shown in **Table 19**, the proposed Essex Crossing program is expected to generate up to approximately 415 and 351 more subway trips during the weekday AM and PM peak hours, respectively, than the development program analyzed in the FGEIS. A detailed distribution of the projected subway trips onto the various station elements, including the new connections at Site 2, at the Delancey Street station showed that incremental trips at individual locations would not be materially different from those analyzed in the FGEIS. Since the previous FGEIS analyses had concluded that there would not be a potential for significant adverse impacts to station elements at and line-haul conditions of subway lines that serve the Delancey Street subway station, the proposed Essex Crossing program would likewise not be expected to result in any significant adverse subway impacts.

For City buses, the proposed Essex Crossing program would yield up to approximately 110 and 83 more riders during the weekday AM and PM peak hours, respectively, than the development program analyzed in the FGEIS. Similar to the findings presented in the FGEIS, the proposed

Essex Crossing program would result in significant adverse impacts on bus line-haul levels on the southbound M9 and westbound M14A during the weekday AM peak period and the northbound and southbound M9 during the weekday PM peak period. These impacts could be fully mitigated by increasing the frequency on the M09 and M14A bus routes. While NYCT routinely monitors changes in bus ridership and would make the necessary service adjustments where warranted, these service adjustments are subject to NYCT's fiscal and operational constraints and, if implemented, are expected to take place over time.

Pedestrians

A detailed trip distribution and assignment of projected person trips by mode and by use was prepared for all four peak analysis hours. Assumptions on the overall assignment patterns were similar to those used for the FGEIS. However, localized changes were made to account for more specific access locations for Sites 1 to 5, a direct subway connection at Site 2, and underground connections between Sites 2, 3, and 4. Because peak hour person trips projected for the Essex Crossing development program are up to 1,200 more than those projected for development program analyzed in the FGEIS and considering the changes in these trips' access and circulation, solely a qualitative assessment, as was discussed above for traffic and transit, would not be sufficient to identify potential new impacts, determine how previously identified impacts may change, and recommend new and/or modified mitigation measures.

A detailed analysis of the pedestrian elements analyzed in the FGEIS, using the projected pedestrian volumes for the proposed Essex Crossing program, was undertaken for the weekday AM, midday, PM, and Saturday analysis peak hours. Beyond the FGEIS pedestrian study area, incremental pedestrian trips would be expected to exceed the CEQR analysis threshold of 200 peak hour pedestrian trips at numerous additional sidewalk, corner, and crosswalk locations. A qualitative review of background pedestrian characteristics at these locations concluded that the relatively nominal increments projected for these locations would not be expected to result in the potential for significant adverse pedestrian impacts.

As described above, DOT has made geometric and operational improvements in the study area to enhance traffic and pedestrian flow and safety and is likely to make additional improvements in the future, in particular to further the goals and objectives of Vision Zero. Therefore, for purposes of the assessments presented below, conditions presented in the FGEIS were used as the baseline for comparing potential changes in pedestrian operations associated with the Essex Crossing development program. DOT can then consider the findings made from these assessments to make informed decisions on the implementation of future improvement plans. **Tables B-1 to B-3** (in **Appendix B**) summarize the With-Action condition for the proposed Essex Crossing program, with notations highlighting how service levels and findings on significant adverse pedestrian impacts would be different from those depicted in the FGEIS.

The FGEIS analyses concluded that significant adverse pedestrian impacts would result at five pedestrian analysis locations, including 1) the west crosswalk of Delancey Street and Essex Street during the midday peak period, 2) the east crosswalk of Delancey Street and Essex Street during the midday, PM, and Saturday peak periods, 3) the west sidewalk of Essex Street between Delancey Street and Broome Street during the AM and midday peak periods, 4) the east sidewalk of Essex Street between Delancey Street and Rivington Street during the midday and Saturday peak periods, and 5) the north crosswalk of Delancey Street and Clinton Street during the Saturday peak period. Crosswalk widenings were recommended and deemed feasible to mitigate the predicted impacts at the three crosswalk locations. For the two impacted sidewalk

locations, although modest widenings could mitigate the predicted impacts, such widenings were determined to be infeasible; hence these impacts were disclosed in the FGEIS as unmitigated.

As discussed above, with up to 1,200 more peak hour pedestrian trips projected to be generated by the proposed Essex Crossing program and changes in these trips' access and circulation, service levels at certain pedestrian study area locations are expected to be different from those presented in the FGEIS. At a few locations where local trip-making patterns are expected to alter due to changes in site access, connections between different uses and buildings, and circulation improvements associated with a new transit connection, service levels were projected to improve slightly over those summarized in the FGEIS. At the five pedestrian locations where significant adverse impacts were identified in the FGEIS, service levels would generally worsen with the proposed Essex Crossing program. At three other crosswalk locations, deteriorations in service levels with the proposed Essex Crossing program would exceed CEQR impact thresholds. However, crosswalk widenings in the form of project improvements would adequately alleviate these anticipated deteriorations. These improvements along with required changes to the potential mitigation measures recommended in the FGEIS are described below.

Sidewalks

- Essex Street between Rivington Street and Delancey Street – The southern portion of the east sidewalk was identified as an impacted location in the FGEIS during the midday and Saturday peak periods. With the proposed Essex Crossing program, it would no longer be impacted during the midday and Saturday peak periods but would incur deterioration exceeding the CEQR impact threshold during the PM peak period. Pedestrian LOS would deteriorate from LOS C (3.68 PMF), LOS C (4.43 PMF), and LOS C (5.22 PMF) under the No Action condition to LOS D (6.65 PMF—not impacted), LOS E (11.28 PMF), and LOS D (7.27 PMF—not impacted) during the midday, PM, and Saturday peak periods, respectively, in the future with the proposed Essex Crossing program. The impacts identified in the FGEIS for the midday and Saturday peak periods could be mitigated by widening the existing sidewalk by 8 inches. However, as concluded in the FGEIS, sidewalk widening at this location would not be feasible and practicable since there are constraints that would prohibit such widening. Specifically, the presence of subway stairways abutting Site 9 would preclude any widening eastward. Although widening the sidewalk by extending it into the roadbed is a potential mitigation measure, DOT does not typically undertake such widening except for extending corners by providing bulbouts. For the service level deterioration described above for the PM peak period with the proposed Essex Crossing program, the widening needed to alleviate the projected conditions to acceptable levels would be 1.5 feet. Therefore, as with the FGEIS, the significant adverse sidewalk impact attributed to the proposed Essex Crossing program for the PM peak period at this location would be unmitigated.
- Essex Street between Delancey Street and Broome Street – The west sidewalk was identified as an impacted location in the FGEIS during the AM and midday peak periods. With the proposed Essex Crossing program, it would also be impacted during the PM peak period (in addition to the AM and midday peak periods). Pedestrian LOS would deteriorate from LOS D (6.35 PMF), LOS C (4.57 PMF), and LOS C (3.47 PMF) under the No Action condition to LOS E (11.17 PMF), LOS D (8.93 PMF), and LOS D (8.91 PMF) during the AM, midday, and PM peak periods, respectively, in the future with the proposed Essex Crossing program. These impacts could be mitigated by widening the existing sidewalk by 10 inches (FGEIS identified a 7-inch required widening). However, the FGEIS concluded that this

mitigation would not be feasible and practicable due the presence of a subway stairway and DOT typically not undertaking sidewalk widenings into the roadbed except for extending corners by providing bulbouts. Therefore, as with the FGEIS, the significant adverse sidewalk impact attributed to the proposed Essex Crossing program would be unmitigated.

Crosswalks

- The east crosswalk of Delancey Street and Essex Street was identified as an impacted location in the FGEIS during the midday, PM, and Saturday peak periods. With the proposed Essex Crossing program, this crosswalk would be impacted only during the PM peak period but at a more deteriorated level. Pedestrian LOS would deteriorate from LOS C (39.6 SFP), LOS C (39.8 SFP), LOS C (34.5 SFP) under the No Action condition to LOS D (20.2 SFP—not impacted), LOS E (11.0 SFP), LOS D (20.3 SFP—not impacted) during the midday, PM, and Saturday peak periods, respectively, in the future with the proposed Essex Crossing program. In the FGEIS, a crosswalk widening of 6 feet (from 14 feet to 20 feet) was identified as a feasible improvement measure to mitigate the projected impacts. With the proposed Essex Crossing program, the projected impact would require a crosswalk widening of 11 feet (from 14 feet to 25 feet). With this change in previously recommended mitigation, in the form of a project improvement, pedestrian circulation during the PM peak period would improve to LOS D, 20.3 SFP.
- The west crosswalk of Delancey Street and Essex Street was identified as an impacted location in the FGEIS during the midday peak period. Pedestrian LOS would deteriorate from LOS D (21.7 SFP) under the No Action condition to LOS D (16.3 SFP) in the future with the proposed Essex Crossing program. In the FGEIS, a crosswalk widening of 3 feet (from 14 feet to 16 feet) was identified as a feasible improvement measure to mitigate the projected impact. With the proposed Essex Crossing program, the projected impact would require a crosswalk widening of 3 feet (from 14 feet to 17 feet). This crosswalk widening would mitigate the projected impact, with pedestrian circulation improving to LOS D, 20.1 SFP.
- The south crosswalk of Delancey Street and Norfolk Street, which was not identified as an impacted location in the FGEIS, would deteriorate during the PM peak period from LOS A (169.3 SFP) under the No Action condition to LOS E (10.5 SFP) in the future with the proposed Essex Crossing program. Widening this crosswalk by 7 feet (from 10 feet to 17 feet), in the form of a project improvement, would improve pedestrian circulation to LOS D, 20.3 SFP.
- The north crosswalk of Delancey Street and Clinton Street was identified as an impacted location in the FGEIS only during the Saturday peak period. Pedestrian LOS would deteriorate from LOS D (16.7 SFP) during the Saturday peak period under the No Action condition to LOS D (15.2 SFP) in the future with the proposed Essex Crossing program. This crosswalk impact can be mitigated by widening the crosswalk by 1 foot (from 16 feet to 17 feet), same as recommended in the FGEIS. With the widened crosswalk, pedestrian circulation would improve to LOS D, 16.2 SFP for the Saturday peak period.
- The north crosswalk of Broome Street and Norfolk Street, which was not identified as an impacted location in the FGEIS, would deteriorate during the PM peak period from LOS A (605.2 SFP) under the No Action condition to LOS D (18.0 SFP) in the future with the proposed Essex Crossing program. Widening this crosswalk by 2 feet (from 12 feet to 14 feet), in the form of a project improvement, would improve pedestrian circulation to LOS D, 21.6 SFP.

- The north crosswalk of Grand Street and Norfolk Street, which was not identified as an impacted location in the FGEIS, would deteriorate during the PM peak period from LOS B (48.3 SFP) under the No Action condition to LOS E (14.1 SFP) in the future with the proposed Essex Crossing program. Widening this crosswalk by 5 feet (from 14 feet to 19 feet), in the form of a project improvement, would improve pedestrian circulation to LOS D. 20.0 SFP.
- In addition to the above, as stated in the “Traffic” section, a modest widening of the east crosswalk of Rivington Street and Essex Street would be required in combination with the FGEIS identified traffic mitigation measures at that intersection. This crosswalk widening—1-foot from 11 feet to 12 feet—would be implemented as a project improvement associated with the Essex Crossing development program.

By implementing the mitigation measures identified in the FGEIS with the modifications described above in the form of project improvements, the Essex Crossing program would not result in any new significant adverse pedestrian impacts. For the two sidewalk locations identified in the FGEIS as unmitigated locations, they would incur similar unmitigatable impacts with the proposed Essex Crossing program.

NYCEDC and/or HPD will require that its developers will implement the mitigation and associated environmental measures identified in the FGEIS and this Technical Memorandum, by means of provisions in the contract of sale or long-term lease or other legally binding agreement between the developer(s) and NYCEDC, HPD, and/or the City.

VEHICULAR AND PEDESTRIAN SAFETY

As summarized in the FGEIS, the review of crash data from 2008 to 2011 identified ten high pedestrian accident locations within the transportation study area, including five intersections along Delancey Street—at Allen Street, Clinton Street, Essex Street, Norfolk Street, and Suffolk Street—and the intersections of Avenue A at Houston Street, Bowery at Houston Street, Allen Street at Grand Street, Clinton Street at Grand Street, and Essex Street at Grand Street. DOT has implemented a comprehensive safety plan along the Delancey Street corridor to improve pedestrian, bicycle, and vehicular safety. This plan included shortening Delancey Street crosswalks with new neckdowns and median tip extensions, instituting additional left-turn prohibitions, modifying signal timings, taking space from overly wide roadbed, clarifying travel lanes, enhancing bridge approach, and opening Clinton Street to the bridge. These measures are expected to calm traffic and improve safety at several Delancey Street intersections that serve the Seward Park development sites. At remaining high pedestrian accident locations, vehicular and pedestrian safety can be improved with standard safety improvement measures, such as installing crosswalk countdown timers, restriping faded crosswalks, and installation of warning signs to alert motorists about high intersection pedestrian crossing volumes. With regard to the potential school on Site 5, the SCA would undertake a comprehensive analysis of the traffic and pedestrian safety conditions resulting from the school as part of their environmental review, which may identify additional safety improvements measures, such as the provision of school crosswalks and signage at critical intersections.

AIR QUALITY

This section summarizes the conclusions of the air quality analyses completed as part of the FGEIS and Technical Memorandum 001 and describes the potential effect of the proposed Essex Crossing program on air quality, considering the proposed changes to the program and the

results of the prior assessment. The program modifications considered in Technical Memorandum 002 had no effect on air quality and were not analyzed.

MOBILE SOURCES

The FGEIS and Technical Memorandum 001 concluded that the maximum predicted pollutant concentrations and concentration increments from mobile sources would be well below the corresponding guidance thresholds and ambient air quality standards and would therefore not result in any significant adverse air quality impacts.

As shown in **Table 20**, with the proposed Essex Crossing program, there would be a decrease in project-generated vehicle trips as compared to what was analyzed in the FGEIS, during the weekday PM peak period. The PM peak period was analyzed in the FGEIS because the number of vehicle trips generated during that time is greatest. The PM peak period remains the worst-case period in terms of project generated trips, but there are fewer trips than with the program analyzed in the FGEIS. During other peak periods the number of trips generated with the proposed Essex Crossing program is comparable or less than the number of project generated trips analyzed in the FGEIS, and the overall reduction in vehicle trips with the proposed Essex Crossing program, as shown in **Table 20**. As the number of vehicle trips would be lower with the proposed Essex Crossing program the effect on air quality would also be lower than with the FGEIS program. Since it had been determined that there would be no significant adverse impacts from mobile sources with the FGEIS program, there would also be no potential for significant adverse impacts from mobile sources with the proposed Essex Crossing program.

PARKING FACILITIES

The proposed Essex Crossing program would not provide any parking spaces. The RWCDs assessed in the FGEIS and Technical Memorandum 001 assumed the provision of up to 500 parking spaces, located at four project sites (Sites 2, 3, 4, and 5). For the FGEIS, the parking facilities that were proposed on Site 2 and Site 3 were cumulatively considered to assess the reasonable worst-case effect on air quality from the parking facilities proposed at that time. Based on the results of the cumulative analysis of Site 2 and Site 3 that showed that there would be no potential for a significant adverse impact on air quality from the parking at those two sites, the FGEIS concluded that there would also be no potential for a significant adverse impact from the parking that was proposed on Site 4 and Site 5. As no parking facilities are proposed with the Essex Crossing program, an analysis of air quality impacts from parking facilities is not warranted, and there would be no potential for a significant adverse air quality impact from parking facilities.

STATIONARY SOURCES

Based on a refined stationary source modeling analysis, the FGEIS concluded that there would be no potential for a significant adverse impact on air quality from heating and hot water systems, provided that natural gas was the only fossil fuel used on all of the sites and that locations of the exhaust stacks for heating and hot water systems serving Site 5 and Site 9 were restricted as specified in the FGEIS. The FGEIS did not identify the need for stack placement restrictions on any other project sites. The FGEIS noted that the stack placement requirements could be modified or eliminated if additional air quality modeling shows that the requirements are not needed to meet national and local ambient air quality standards and thresholds. Technical Memorandum 001 considered an increase in floor area on Site 5 for a potential school that was

assumed to have its own heating and hot water systems that would exhaust at a height that is lower than the top of the residential and commercial development on Site 5. A screening analysis for the potential school was conducted and indicated that there would be no potential for significant adverse impacts on air quality assuming the school's heating and hot water system stack is located at least 57 feet away from any sensitive use of a similar or greater height. Technical Memorandum 001 noted that New York City School Construction Authority (SCA) would further examine the potential environmental effect of the school once a detailed program and a design for a school on Site 5 have been developed, as part of environmental review pursuant to the State Environmental Quality Review Act (SEQRA).

With the proposed Essex Crossing program, the gross floor area, and therefore emissions from the heating and hot water systems, would increase on every development site, except Site 8, where the gross floor area would slightly decrease. In addition, natural gas fueled microturbines would be installed on Sites 2, 3, and 4 to provide for some of the building's electricity and heat needs. The output capacity of the microturbines would be up to 130 kW on Site 2, up to 65 kW on Site 3, and up to 130 kW on Site 4. Other project sites would not include microturbines. The increase in fuel use (and consequently emissions) due to the increase in residential and commercial floor area and the addition of microturbines was considered, as shown in **Table 21**. Consistent with the *CEQR Technical Manual* and the analysis conducted for the FGEIS, nitrogen dioxide (NO₂) was considered as the pollutant of concern with the use of natural gas. Furthermore, based on the results of the FGEIS analysis, the 1-hour NO₂ averaging period was considered as the averaging period of greatest potential concern. The maximum 1-hour NO₂ emissions increase would occur on Site 4, and would be up to 39 percent greater than the emissions analyzed in the FGEIS. The projected increase in emissions would be proportional to the increases in fuel use shown in **Table 21**. Based on the increase in emissions, a proportional increase in predicted concentrations at the receptor locations analyzed (such as windows and air intakes of neighboring buildings) is shown in **Table 22**. When added to the 1-hour NO₂ background concentration of 129.8 micrograms per cubic meter (µg/m³), the concentration increases shown in **Table 22** would not exceed the 1-hour NO₂ National Ambient Air Quality Standard (NAAQS) of 188 µg/m³.

Table 21
Comparison of Fuel Use with the Proposed Essex
Crossing Program

Site No.	FGEIS Fuel Consumption MMcf / year	Fuel Consumption With Essex Crossing Program Floor Area and Microturbines MMcf / year	Percent Change in Short Term Fuel Use*
1	7.36	8.36	4
2	17.35	19.35	27
3	13.73	16.73	20
4	19.07	23.07	39
5	17.13	22.13	9
6	6.69	12.69	27
8	2.61	10.61	-1
9	5.26	14.26	8
10	1.48	11.48	0

Note: MMcf denotes million cubic feet of natural gas.
*Short term fuel use is based on the
Source: Seward Park Mixed-Use Development Project FGEIS.

As microturbines are a new sustainable feature introduced with the proposed Essex Crossing program, an additional analysis was performed to assess the effect of particulate matter (PM_{2.5}) emissions from the microturbines on air quality. Although the microturbines would use natural gas, PM_{2.5} emissions are a potential concern with this type of source. The analysis was performed using AP-42 emissions factors¹² and the worst-case assumptions on meteorological conditions built into the AERSCREEN model. The background concentration of 25 µg/m³ is based on the Division Street DEC monitoring station. The maximum predicted 24-hour average concentration is 1.02 µg/m³, and the maximum predicted annual average concentration is 0.17 µg/m³. As these levels do not exceed the *de minimis criteria* of 5 µg/m³ and 0.3 µg/m³, respectively, there would be no potential for a significant adverse impact on air quality with the proposed Essex Crossing program.

Table 22
Projected Concentration Increase

Site No.	FGEIS Projected 1-hour NO ₂ Increase (µg/m ³)	Percent Change in Short Term Fuel Use	Projected 1-hour NO ₂ Increase with New Program (µg/m ³)
Site 1	15.6	4	16.2
Site 2	2.0	27	2.5
Site 3	37.3	20	44.8
Site 4	6.3	39	8.8
Site 5	28.0	9	30.5
Site 6	30.2	27	38.4
Site 8	7.4	-1	7.3
Site 9	35.5	8	38.3
Site 10	3.6	0	3.6

Note: µg/m³ denotes microgram per cubic meter.
Source: Seward Park Mixed-Use Development Project FGEIS.

There would also be no potential for a significant adverse impact from the cumulative emission changes on all project sites. The fuel use and stack placement restrictions identified in the FGEIS would still be required with the proposed Essex Crossing program. Specifically,

- Natural gas shall be used for fossil-fuel fired heating and hot water equipment on all of the proposed development sites.
- To preclude the potential for air quality impacts from natural gas-fired heating and hot water systems of a new building on Site 5, the stack(s) shall be located at the highest rooftop of the building and at least 90 feet away from the lot line facing Broome Street.
- To preclude the potential for air quality impacts on existing and proposed buildings on the same block as Site 9, stack(s) associated with natural gas-fired heat and hot water systems for the building on Site 9 shall be located at the highest rooftop of the building and at least 70 feet away from any building of a similar or greater height.

As discussed in the FGEIS, for sites that may be under the jurisdiction of HPD, the implementation of fuel use and stack placement requirements will be required to be implemented by the developer through provisions in the LDA between HPD and the developer. For City properties that may be managed by NYCEDC, the implementation of fuel use and stack placement requirements will be required to be undertaken by the developer through provisions of

¹² EPA, Compilation of Air Pollutant Emission Factors AP-42, Fifth Edition, Volume I: Stationary Point and Area Sources, <http://www.epa.gov/ttn/chief/ap42>, Table 3.1-2a.

a contract of sale or long-term lease or other legally binding agreement between NYCEDC and the developer.

As shown in **Table 6**, the school currently considered for Site 5 would be larger than the school that was analyzed in Technical Memorandum 001. The minimum distance from the school's heating and hot water system exhaust stack and a sensitive used of a similar or greater height, needed to preclude the potential for a significant adverse impact on air quality would be 61 feet, based on an update to the screening level analysis performed for Technical Memorandum 001. SCA would further examine the potential environmental effect of the school pursuant to SEQRA, at a later time, when the program and design for the school are developed.

GREENHOUSE GAS EMISSIONS

Similar to the FGEIS program, the proposed Essex Crossing program would include features aimed at reducing energy consumption and greenhouse gas (GHG) emissions. It is expected that housing developments on all sites would be certified under the Enterprise Green Communities Program or would incorporate measures that would achieve equivalent energy efficiency levels. The FGEIS included estimates of GHG emissions. GHG emissions, which were estimated based on developed area (gsf), would not be substantially different based on the currently proposed program and the limitations of the 2014 *CEQR Technical Manual* methodology for calculating GHG emissions.

The proposed development would include sustainable design features, described in the FGEIS, that would, among other benefits, result in lower GHG emissions. In addition, in accordance with the FGEIS commitments, housing developments on City-owned sites that are managed by NYCEDC must be certified under the Enterprise Green Communities Program, which includes mandatory energy efficiency and sustainability measures. Also, all affordable housing projects developed through HPD programs must be certified under the Enterprise Green Communities Program. If a housing development cannot be certified under the Enterprise Green Communities Program because of its construction typology/methodology, the development would be designed and constructed to standards equivalent to those which would be necessary to achieve certification under the Enterprise Green Communities Program. All housing developments would be designed and constructed to reduce construction and demolition waste and to incorporate sustainable design features that reduce energy consumption and greenhouse gas emissions.

Overall, the proposed actions would result in mixed-use development with energy efficient buildings and would likely use low-carbon fuel (natural gas). The proposed development would also support the use of public transit and non-motorized commuting. The proposed development's design would include features aimed at reducing energy consumption and GHG emissions, and would, therefore, be consistent with the City's citywide GHG reduction goal.

NOISE

As was concluded in the FGEIS, the proposed Essex Crossing program would not generate sufficient traffic to have the potential to cause a significant noise impact (i.e., it would not result in a doubling of Noise Passenger Car Equivalents [Noise PCEs] that would be necessary to cause a 3 dBA increase in noise levels, and it is assumed that the building mechanical systems (i.e., HVAC systems) would be designed to meet all applicable noise regulations (i.e., Subchapter 5, §24-227 of the New York City Noise Control Code, the New York City

Department of Buildings Code) and to avoid producing levels that would result in any significant increase in ambient noise levels.

Further, the façade attenuation design requirements specified in the FGEIS and Technical Memorandum 001 that will be included in the proposed Essex Crossing program would be expected to result in acceptable interior noise levels according to CEQR and HUD interior noise level guidelines. Buildings will be required to construct facades providing Outdoor-Indoor Transmission Class (OITC) ratings equal or greater than the levels shown in **Table 23** as well as provide an alternate means of ventilation.

**Table 23
Building Attenuation Requirements (in dBA)**

Development Site	Block	Lot	Facade	Governing Noise Receptor	Attenuation Required for CEQR ¹	Attenuation Required for HUD ¹
2	352	1, 28	North	6	33	34
			East	7	31	28
			South	3 ³	N/A ²	23
			West	7	31	28
3	346	40	North	8	28	29
			East	4 ³	N/A ²	23
			South	3 ³	N/A ²	23
			West	7	31	28
4	346	40	North	8	28	29
			East	4 ³	N/A ²	21
			South	3 ³	N/A ²	23
			West	4 ³	N/A ²	23
5	346	40	North	3 ³	N/A ²	23
			North (adjacent to playground)	playground	33-39 ⁴	25-31 ⁴
			East	2 ³	N/A ²	20
			South	1 ³	28	27
			West	7	31	28
			West (adjacent to playground)	playground	33-35 ⁴	28-30 ⁴
			North	4	28	27
6	347	71	East	4 ³	N/A ²	23
			South	3 ³	N/A ²	23
			West	4 ³	N/A ²	23
			North	3 ³	N/A ²	23
8	354	1	East	3 ³	N/A ²	23
			South	3 ³	N/A ²	23
			West	7	31	28
			North	3 ³	N/A ²	23
9	353	44	East	3 ³	N/A ²	23
			South	6	33	34
			West	7	31	28
			North	3 ³	N/A ²	23
10	354	12	East	3 ³	N/A ²	23
			South	3 ³	N/A ²	23
			West	7	31	28
			North	3 ³	N/A ²	23

Notes:

¹The CEQR attenuation requirements shown are for residential uses; commercial uses would require 5 dBA less attenuation. HUD attenuation regulations would not apply to commercial uses.

²The maximum measured L₁₀ is below 70 dBA, and the *CEQR Technical Manual* does not specify minimum attenuation guidance for exterior L₁₀ values below this level.

³Attenuation requirements based on these locations are adjusted for future increases in traffic with the proposed project (see Appendix D of the FGEIS). At all other locations future increases in traffic would be insubstantial.

⁴A range of attenuation requirements is presented due to the upper floors being further away from the playground and needing less attenuation. Attenuation requirements by floor are included in Technical Memorandum 001.

In accordance with FGEIS commitments, for sites developed through HPD programs the LDA, and for sites that may be under the jurisdiction of NYCEDC the contract of sale or long-term lease or other legally binding agreement, would require that the selected developer provide window-wall attenuation in dwelling units and community facility space, which is equal to or greater than the attenuation requirements presented in the FGEIS (and shown in Table 25), while also providing an alternate means of ventilation to ensure a maximum interior noise environment of 45 dBA under closed-window conditions.

Window-wall attenuation requirements for commercial uses would be 5 dBA lower than the requirement for residential and community facility uses in order to ensure a maximum interior noise environment of 50 dBA. In the event federal funding is utilized, HPD would follow HUD guidance concerning window-wall attenuation for residential and community facility uses. The measures would be required through an LDA. To satisfy the LDA noise attenuation and alternate means of ventilation requirements, the developer would submit a letter from a Registered Architect describing the building façade design and certifying its OITC rating, as supported by ASTM E90 test data, and the alternate means of ventilation, as supported by mechanical drawings and equipment cut sheets.

Subsequent to the FGEIS, more detailed building design information was made available for Site 1, which allowed for a more refined building attenuation analysis to be conducted to more precisely determine the necessary window/wall attenuation at the proposed Site 1 building to ensure acceptable interior noise levels according to CEQR criteria. The refined building attenuation analysis used a detailed 3-dimensional model of the proposed building design along with an updated noise survey at the project site to calculate future predicted noise levels at specific locations along the building façade. The refined building attenuation analysis demonstrates that for the Site 1 building's tower, and the north facade of the Site 1 building's base, lower levels of window/wall attenuation than prescribed in the FGEIS would be sufficient to provide acceptable interior noise levels according to CEQR criteria. The resultant noise levels and window/wall attenuation requirements are shown in **Table 24**.

Table 24
Essex Crossing Site 1 Refined Façade Attenuation Requirements [in dB(A)]

Building Portion	Façade	Floor	FGEIS L ₁₀ ³	FGEIS L _{dn} ³	CadnaA Calculated Shielding/Distance Factor	Maximum Resultant L ₁₀	CEQR Required Attenuation ¹	Maximum Resultant L _{dn}	HUD Required Attenuation
Base	North	1 to 2	77.8	78.2	8.6 to 25.4	69.2	N/A ²	69.6	25
	North	3 to 5	77.8	78.2	7.2 to 22.0	70.6	28	71.0	26
	East	All	73.8	72.4	2.9 to 3.7	70.9	28	69.5	25
	West	All	73.8	72.4	1.5 to 3.2	72.3	28	70.9	26
Tower	North	All	77.8	78.2	8.2 to 18.0	69.6	N/A ²	70.0	25
	East	All	73.8	72.4	6.9 to 17.1	66.9	N/A ²	65.5	21
	South	All	65.4	65.5	1.7 to 5.5	63.7	N/A ²	63.8	19
	West	All	73.8	72.4	3.9 to 14.6	69.9	N/A ²	68.5	24
Notes:									
¹ The CEQR attenuation requirements shown are for residential uses; non-residential uses would require 5 dB(A) less attenuation. HUD attenuation regulations would not apply to non-residential uses.									
² The maximum measured L ₁₀ is below 70 dB(A), and the <i>CEQR Technical Manual</i> does not specify minimum attenuation guidance for exterior L ₁₀ values below this level.									
³ Attenuation requirements based on these locations are adjusted for future increases in traffic with the proposed project (see Appendix D of the FGEIS).									
⁴ Attenuation requirements different from those indicated in the 2012 Seward Park Mixed Use Development Project FGEIS are shown in bold.									

Based on the predicted noise levels, development at Site 1 with window/wall attenuation equal to or greater to the values shown in **Table 24**, as well as an alternate means of ventilation, would

provide sufficient attenuation to achieve the CEQR interior noise level guideline of 45 dBA L_{10} for residential uses and 50 dBA L_{10} for non-residential uses and the HUD interior noise level guideline of 45 dBA L_{dn} for residential and use. Depending on the operator of the gym (Physical Culture Establishment) that would be included in the Site 1 development, BSA may prescribe additional use-specific noise and vibration attenuation.

PUBLIC HEALTH

Since there would be no significant unmitigated adverse impacts found in other CEQR analysis areas, such as air quality, water quality, hazardous materials, or noise, the assessment of public health for the proposed Essex Crossing program, like that for the FGEIS program, examines the potential effects of construction-period noise impacts on public health. As described below in “Construction Noise Analysis Results,” the findings of the construction-related noise analyses presented in the FGEIS would be substantially similar with the proposed Essex Crossing program. Therefore, the proposed development would not change the FGEIS conclusion that there would be no significant adverse environmental impacts with respect to public health.

NEIGHBORHOOD CHARACTER

Since the proposed Essex Crossing program would not result in new significant adverse impacts on any of the contributing elements that define neighborhood character (land use, urban design, visual resources, historic resources, socioeconomic conditions, shadows, open space, traffic, and noise), the proposed development—like the proposed actions and RWCDs assessed in the FGEIS and Technical Memoranda 001 and 002—would not result in any significant adverse impacts on neighborhood character. Like the FGEIS program and the approved program, the proposed Essex Crossing program would improve the character of the neighborhood by replacing underutilized buildings and surface parking lots with new, active mixed-use development.

CONSTRUCTION

For the proposed Essex Crossing program, general construction practices, equipment, staging, and work hours would be similar to those described in the FGEIS. However, as described above in “Introduction,” the proposed Essex Crossing program and the project construction schedule are different from the assumptions analyzed in the FGEIS and subsequent Technical Memoranda 001 and 002. For example, the proposed development includes a below-grade retail space (the Market Line) on Sites 2, 3, and 4 and the overall construction duration for the proposed development is anticipated to be approximately nine years (FGEIS assumed five and a half year construction duration) with different construction phasing of buildings.

At the time of the FGEIS, there were no specific construction programs or designs for any of the buildings. The construction durations were conservatively chosen to serve as the basis of the analyses in the FGEIS and were representative of the reasonable worst-case for potential impacts. The conceptual schedule in the FGEIS represented a compressed and conservative potential timeline for construction, which showed overlapping construction activities and simultaneously operating construction equipment for development sites in proximity to one another. The conceptual construction schedule for the proposed buildings as analyzed in the FGEIS is shown in **Table 25**. In the FGEIS conceptual construction schedule, construction was assumed to begin in the third quarter of 2016 on Sites 2 and 5. Site 2 was expected to be completed in approximately two years while Site 5 was expected to take approximately 27 months to complete. Construction on Sites 3 and 4 was assumed to begin in the third quarter of

2017 in the FGEIS, and were expected to take approximately 27 months and 33 months to complete, respectively. Construction on Sites 1 and 6 was assumed to begin in the first quarter of 2019 in the FGEIS, and were expected to be completed by the third quarter of 2020. Construction on Sites 8, 9, and 10 was assumed to commence in the second quarter of 2020 in the FGEIS, and were expected to be completed by the third quarter of 2021, fourth quarter of 2021, and second quarter of 2021, respectively.

Table 25
FGEIS - Conceptual Construction Schedule

Reasonable Worst Case Development Scenario (RWCDs) Site	Start Quarter	Finish Quarter	Approximate duration (months)
Site 1	1st quarter 2019	3rd quarter 2020	21
Site 2	3rd quarter 2016	2nd quarter 2018	24
Site 3	3rd quarter 2017	3rd quarter 2019	27
Site 4	3rd quarter 2017	1st quarter 2020	33
Site 5	3rd quarter 2016	3rd quarter 2018	27
Site 6	1st quarter 2019	3rd quarter 2020	21
Site 7 ¹	--	--	--
Site 8	2nd quarter 2020	3rd quarter 2021	18
Site 9	2nd quarter 2020	4th quarter 2021	21
Site 10	2nd quarter 2020	2nd quarter 2021	15

Note:
¹ Site 7 would retain its current function as a municipal parking garage, which would continue to support the existing neighborhood uses, as well as the potential new development on the development sites. Therefore, Site 7 was not included in the FGEIS analysis.
Source: Hunter Roberts Construction Group

The scheduling of construction activities for a major project is an exceedingly complex endeavor, with conceptual schedules for construction made early on in project planning evolving over the course of the design and development process. **Table 26** presents the anticipated construction schedule for the proposed Essex Crossing program as currently envisioned. In this schedule, construction is assumed to begin in March 2015 on Sites 1, 2, and 5. Sites 1 and 5 are anticipated to take approximately 30 months to complete while Site 2 is anticipated to take approximately 36 months to complete. Construction on Site 6 would begin in September 2015 and would take approximately 27 months to complete. In September 2016, construction would commence on Site 8 with construction anticipated to be completed by November 2018. Construction on Sites 3 and 4 would begin in February 2018 and would each take approximately 36 months to complete. By April 2020, construction on Site 9 would begin and would take approximately 27 months to complete. Finally, construction on Site 10 is anticipated to begin by the end of 2021 and would be completed by March 2024. As discussed above, the full completion of the entire Essex Crossing program is expected to extend beyond the 2022 Build year analyzed in the FGEIS and subsequent Technical Memoranda 001 and 002. Due to lease agreements with the current tenants of Site 10, the development of approximately 14 residential units and 5,311 square feet of retail space in that building could not begin until 2021 and which would last until 2024. The development of all other buildings is expected to be complete by 2022. Considering the unfinished Site 10 development would represent only 1.4 percent of the total Essex Crossing program floor area, it would have little bearing on the impacts anticipated for the overall project, which would largely materialize by 2022 and for which mitigation measures would need to be implemented. Therefore, for analysis purposes, 2022 is still the appropriate analysis year for assessing potential impacts from the Essex Crossing program.

Table 26
Anticipated Essex Crossing Construction Schedule

Reasonable Worst Case Development Scenario (RWCDs) Site	Start Month	Finish Month	Approximate duration (months)
Site 1	March 2015	August 2017	30
Site 2	March 2015	March 2018	36
Site 3	March 2018	February 2021	36
Site 4	March 2018	February 2021	36
Site 5	March 2015	September 2017	30
Site 6	September 2015	December 2017	27
Site 7 ¹	--	--	--
Site 8	September 2016	November 2018	27
Site 9	April 2020	June 2022	27
Site 10	December 2021	March 2024	27

Note:
¹ Site 7 would retain its current function as a municipal parking garage, which would continue to support the existing neighborhood uses, as well as the potential new development on the development sites. Therefore, Site 7 is not included in this analysis.
Source: Turner Construction

This section assesses whether the updates in construction schedule and information regarding the design and construction of the proposed development would have the potential to result in new construction-related impacts in the relevant technical areas not previously identified in the FGEIS and subsequent Technical Memoranda 001 and 002. The construction impact analysis below focused on those technical areas (i.e., transportation, air quality, and noise) that could be affected by the design development and schedule change.

TRANSPORTATION

Construction of the project would generate construction worker and truck traffic. Because of these activities, an evaluation of construction sequencing and work/truck projections was completed in order to identify potential construction transportation impacts. As described below, the projected construction activities would yield an amount of total traffic similar to that disclosed in the FGEIS. Construction vehicle trips were assigned to the study area network, and a qualitative assessment was conducted to compare potential construction transportation impacts with the proposed project to those identified in the FGEIS.

Construction Traffic Projections

Average daily construction worker and truck activities by quarter were projected for the duration of the construction period and were refined with the same assumptions used in the FGEIS to account for worker modal splits, vehicle occupancy, and arrival and departure distribution.

Daily Workforce and Truck Deliveries

For a reasonable worst-case analysis of potential transportation-related impacts during construction, the daily workforce and truck trip projections in the peak quarter of the peak construction year were used as the basis for estimating peak hour construction trips. Based on a schedule of commencing construction in 2015, the combined construction worker and truck traffic peak would occur in the fourth quarter of 2016. The daily average number of construction worker and truck deliveries during

the peak quarters was estimated at 657 workers and 92 truck deliveries¹³ compared to 556 workers and 109 truck deliveries in the FGEIS peak quarter, which occurred in the third quarter of 2017.

Construction Worker Modal Splits

The travel characteristics for worker trips use the same assumptions as those found in the FGEIS. 71.1 percent of construction workers would travel to the site via public transportation, and the remaining 28.9 percent of construction workers would travel to the site via private auto (with an average auto occupancy rate of 2.04). The study area is well served by mass transit which includes the F, J, M, and Z subway lines, and the B39, M9, M14A, M15, M21, and M22 bus routes.

Peak Hour Construction Worker Vehicle and Truck Trips

Site activities would mostly take place during the typical construction shift of 7 AM to 3 PM or 3:30 PM. While construction truck trips would be made throughout the day (with more trips made during the early morning), and most trucks would remain in the area for short durations, construction worker travel would typically take place during the hours before and after the work shift. For analysis purposes, each worker vehicle was assumed to arrive in the morning and depart in the afternoon, whereas each truck delivery was assumed to result in two truck trips during the same hour (one “in” and one “out”).

The estimated daily vehicle trips were distributed throughout the workday based on projected work shift allocations and conventional arrival/departure patterns of construction workers and trucks. For construction workers, the majority (80 percent) of the arrival and departure trips would take place during the hour before and after each shift (6-7 AM for arrivals and 3-4 PM for departures). For construction trucks, deliveries would occur throughout the day when the construction site is active. Construction truck deliveries typically peak during the hour before the regular day shift (25 percent of the daily total), overlapping with construction worker arrival traffic. Based on these assumptions, peak hour construction traffic was estimated for the entire construction period. The peak construction hourly trip projections for the fourth quarter of 2016 are summarized in **Table 27**.

Table 27
Peak Construction Vehicle Trip Projections – Fourth Quarter of 2016

Hour	Auto Trips		Truck Trips		Total Vehicle Trips		
	In	Out	In	Out	In	Out	Total
6 AM - 7 AM	74	0	23	23	97	23	120
7 AM - 8 AM	19	0	9	9	28	9	37
8 AM - 9 AM	0	0	9	9	9	9	18
9 AM - 10 AM	0	0	9	9	9	9	18
10 AM - 11 AM	0	0	9	9	9	9	18
11- AM -12 PM	0	0	9	9	9	9	18
12 PM - 1 PM	0	0	9	9	9	9	18
1 PM - 2 PM	0	0	5	5	5	5	10
2 PM - 3 PM	0	5	5	5	5	10	15
3 PM - 4 PM	0	74	5	5	5	79	84
4 PM - 5 PM	0	14	0	0	0	14	14
5 PM - 6 PM	0	0	0	0	0	0	0
6 PM-7 PM	0	0	0	0	0	0	0

Note: Hourly construction worker and truck trips were derived from projected estimates of 657 workers and 92 trucks making two daily trips each (arrival and departure) in the fourth quarter of 2016. Numbers of construction worker vehicles were calculated using a 28.9-percent auto split with an auto-occupancy of 2.04.

¹³ The construction workforce and truck projections were estimated by a construction manager (Turner Construction) with experience on projects of comparable size and complexity in New York City and are based on the anticipated construction schedule presented in Table 26 and the activities that would be needed for the construction of the project buildings.

Traffic

As discussed above and shown in **Table 27**, construction activities would result in maximum combined auto and truck traffic of 120 and 84 vehicles trips during the 6-7 AM and 3-4 construction peak hours, respectively. In comparison, the peak construction quarter in the FGEIS would generate 118 and 74 vehicle trips during the same construction peak hours, as shown in **Table 28**.

Table 28
Comparison of Construction Vehicle Trips—FGEIS vs. Proposed Project

Weekday Peak Period	FGEIS Construction Vehicle Trips (Third Quarter 2017)			Proposed Project Construction Vehicle Trips (Fourth Quarter 2016)		
	In	Out	Total	In	Out	Total
6-7 AM Arrival Peak Hour	91	27	118	97	23	120
3-4 PM Departure Peak Hour	5	69	74	5	79	84

Vehicle trips generated by construction activities were assigned to the roadway network. Vehicles would be expected to utilize similar travel routes as in the FGEIS with the exception of the westbound Grand Street trips that would be diverted due to the Third Water Tunnel Water Main Shaft Installation Phase II project. This project would eliminate the westbound Grand Street approach between the Bowery and Essex Street during the peak construction quarter. Parking would not be provided on-site, and workers are assumed to utilize off-street parking facilities in the study area. Truck delivery trips would be destined to the project sites under construction.

Traffic volumes during the construction peak hours for the proposed project are generally expected to be similar to the construction peak hour volumes in the FGEIS. Hence, it is expected that the mitigation measures identified in the FGEIS would be sufficient to mitigate intersection impacts associated with construction trips.

Deliveries

Construction trucks would be required to use DOT-designated truck routes, including the Williamsburg Bridge, Delancey Street, Allen Street, and East Houston Street. Trucks would then use local streets to access the construction sites. Trucks would service the construction sites at designated loading zones.

Curb Lane Closures and Staging

Curb lane closures and staging for the proposed modification are comparable to those assumed in the FGEIS. During construction, long-term parking lane closures may be required. In the case where a travel lane closure is necessary, the closure would not be in effect for the entire block length. Lane closures would be delineated such that there would be enough space for a travel lane at the intersection approach to maintain the roadway capacity. It is anticipated that sidewalk closures may be required to the extent practicable. Short-term roadway closures and temporary sidewalk narrowings could occur along the sides of development sites during the construction period. Sidewalk and lane closures will be finalized as Maintenance and Protection of Traffic (MPT) plans are developed and reviewed with DOT.

All lane and sidewalk closures during construction would be coordinated with DOT's Office of Construction Mitigation and Coordination (OCMC). Traffic control agents may need to be deployed at times to facilitate traffic flow near the project site.

Parking

Construction workers would generate an estimated maximum daily parking demand for up to 93 spaces during the peak construction phase as compared to 80 spaces in the FGEIS. This parking demand could be accommodated by the off-street spaces available within a quarter-mile radius of the construction sites. Approximately half the worker auto trips (51 percent) would find parking within one to two blocks from the construction sites—in the municipal garage located on Essex Street north of Delancey Street and in the parking lot south of Delancey Street between Norfolk and Suffolk Streets. The remaining 49 percent would be expected to park within a quarter-mile radius in the parking lot along Essex Street between East Houston Street and Stanton Street (three percent), the parking garage along Allen Street south of Grand Street (13 percent), and the parking garage at the intersection of the Delancey Street service road and Columbia Street (32 percent). Therefore, the proposed modification would not result in any significant adverse parking impacts during construction, consistent with the conclusion in the FGEIS.

Transit

The study area is well served by public transit, including the F, J, M, and Z subway lines at the Essex Street-Delancey Street station. There are also several local bus routes, including the B39, M9, M14A, M15, M21, and M22.

With nearly 30 percent of the construction workers projected to travel via auto, the bulk of the remaining 70 percent would travel to and from the project area via transit. During peak construction (maximum of 657 average daily construction workers), this distribution would represent approximately 460 daily workers traveling by transit. With 80 percent of these workers arriving or departing during the construction peak hours, the total estimated number of peak hour transit trips would be approximately 368. Since these incremental construction transit trips would be distributed among the various available subway and bus services, no single transit element is expected to experience an increase of more than 200 peak hour transit riders, the recommended CEQR threshold for a detailed quantified analysis. Hence, consistent with the FGEIS, the proposed project would not result in significant adverse transit impacts attributable to the projected construction worker transit trips. Any temporary relocation of bus stops along bus routes that operate adjacent to the project area would be coordinated with and approved by DOT and NYCT to ensure proper access is maintained.

Pedestrians

For the same reasons provided on transit operations, a detailed pedestrian analysis would also not be warranted to address the projected demand from the travel of construction workers to and from the project area. With a maximum of 657 average daily construction workers, there would be up to approximately 525 workers arriving or departing during the construction peak hours via various modes of transportation. Considering that these pedestrian trips would primarily occur outside of the typical commuter peak hours (8 to 9 AM and 5 to 6 PM), spread over multiple development sites, several nearby transit services, and a number of area parking facilities, and therefore be distributed among numerous sidewalks and crosswalks in the area, consistent with the FGEIS, the proposed project would not result in significant adverse pedestrian impacts

attributable to the projected construction worker pedestrian trips. In addition, sidewalk protection or temporary sidewalks would be provided in accordance with DOT requirements to maintain pedestrian access if needed.

AIR QUALITY

The construction air quality analysis in the FGEIS was revisited to determine if the design development and construction schedule change would have the potential to cause significant adverse impacts not identified in the FGEIS. Overall, the construction means and methods, as presented in the FGEIS, are not expected to change. The FGEIS construction air quality analysis included a detailed quantified modeling study of the most intensive construction periods determined through a review of a site-wide PM_{2.5} emissions profile. PM_{2.5} was selected for determining the worst-case periods for all pollutants as analyzed, because the ratio of predicted PM_{2.5} incremental concentrations to impact criteria is higher than for other pollutants. To ensure that the construction would result in the lowest practicable diesel particulate matter (DPM) emissions, the FGEIS assumed that extensive measures would be incorporated into the construction program to the extent feasible and practicable, including:

1. *Diesel Equipment Reduction.* Construction of the proposed buildings would minimize the use of diesel engines and use electric engines, to the extent feasible and practicable. Equipment that would use electric power instead of diesel engines could include, but would not be limited to, small compressors, and material/personnel hoists.
2. *Clean Fuel.* ULSD would be used exclusively for all diesel engines throughout the construction sites. This would enable the use of tailpipe reduction technologies (see below) and would directly reduce DPM and SO_x emissions.
3. *Best Available Tailpipe Reduction Technologies.* Nonroad diesel engines with a power rating of 50 horsepower (hp) or greater and controlled truck fleets (i.e., truck fleets under long-term contract) including but not limited to concrete mixing and pumping trucks would utilize the best available tailpipe (BAT) technology for reducing DPM emissions, to the extent feasible and practicable. Diesel particulate filters (DPFs) have been identified as being the tailpipe technology currently proven to have the highest reduction capability. Diesel nonroad engines rated at 50 hp or greater would utilize DPFs, to the extent feasible and practicable, either installed on the engine by the original equipment manufacturer (OEM) or a retrofit DPF verified by EPA or the California Air Resources Board, and may include active DPFs,¹⁴ if necessary, or other technology proven to reduce DPM by at least 90 percent. This measure is expected to reduce site-wide tailpipe PM emissions by at least 90 percent.
4. *Utilization of Newer Equipment.* In addition to the tailpipe controls commitments, construction equipment rated Tier 2¹⁵ or higher for all nonroad diesel engines with a power

¹⁴ There are two types of DPFs currently in use: passive and active. Most DPFs currently in use are the “passive” type, which means that the heat from the exhaust is used to regenerate (burn off) the PM to eliminate the buildup of PM in the filter. Some engines do not maintain temperatures high enough for passive regeneration. In such cases, “active” DPFs can be used (i.e., DPFs that are heated either by an electrical connection from the engine, by plugging in during periods of inactivity, or by removal of the filter for external regeneration).

¹⁵ The first federal regulations for new nonroad diesel engines were adopted in 1994, and signed by EPA into regulation in a 1998 Final Rulemaking. The 1998 regulation introduces Tier 1 emissions standards

output of 50 hp or greater would be used to the extent feasible and practicable. The use of newer engine models with lower PM emissions is expected to reduce the likelihood of DPF plugging due to soot loading (i.e., clogging of DPF filters by accumulating particulate matter). In addition, while all engines undergo some deterioration over time, newer and better maintained engines will emit less PM than their older Tier or unregulated counterparts. Therefore, use of construction equipment rated Tier 2 or higher with lower tailpipe emission values would enhance this emissions reduction program and implementation of DPF systems as well as reduce maintenance frequency due to soot loading (i.e., less downtime for construction equipment to replace clogged DPF filters).

In addition, in order to reduce the resulting concentration increments at sensitive receptor locations (i.e., residences, parks), fugitive dust control plans will be implemented. For example, truck routes within the sites would be either watered as needed or, in cases where such routes may remain in the same place for an extended duration, the routes could be stabilized, covered with gravel, or temporarily paved to avoid the re-suspension of dust. Stabilized truck exit areas could be established for washing off the wheels of all trucks that exit the construction sites. In addition to regular cleaning by the City, streets adjacent to the sites could be cleaned frequently. All trucks hauling loose material would have their loads securely covered prior to leaving the sites. An on-site vehicular speed limit of 5 mph could be imposed. Water sprays would be used for all excavation, demolition, and transfer of spoils to ensure that materials are dampened as necessary to avoid the suspension of dust into the air. The fugitive dust emissions reduction program described above would provide at least a 50 percent reduction in particulate emissions from fugitive dust.

Additional measures would be taken to reduce pollutant emissions during construction of the proposed buildings in accordance with all applicable laws, regulations, and building codes. These include the restriction of on-site vehicle idle time to three minutes for all equipment and vehicles that are not using their engines to operate a loading, unloading, or processing device (e.g., concrete mixing trucks) or otherwise required for the proper operation of the engine.

For properties that may be under the jurisdiction of HPD, emissions reduction measures would be required to be undertaken by the developer through LDA provisions, to be entered into at the time of closing. The LDA would also require the use of a construction monitor, which would operate under the oversight of ODMHED, to ensure such measures are implemented during construction activities.

For properties that may be under the jurisdiction of NYCEDC, emissions reduction measures, to the extent practicable and feasible, would be required to be undertaken by the developer through provisions of a contract or other legally binding agreement between NYCEDC and the developer. The contract or other legally binding agreement would require the use of a construction monitor, which will operate under the oversight of ODMHED, to ensure that the emissions reduction measures, to the extent practicable and feasible, are implemented during construction activities.

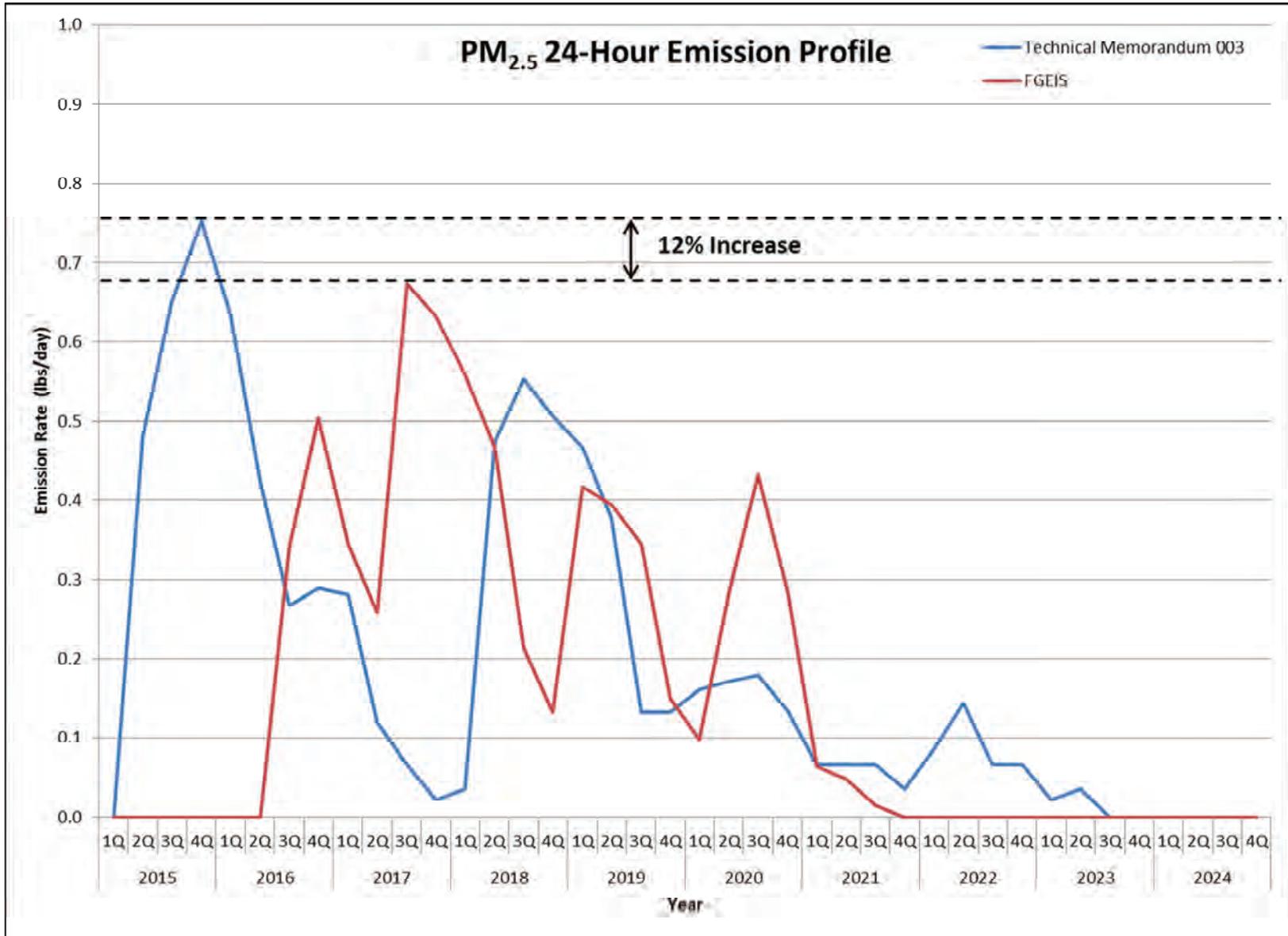
for all equipment 50 hp and greater and phases in the increasingly stringent Tier 2 and Tier 3 standards for equipment manufactured in 2000 through 2008. In 2004, the EPA introduced Tier 4 emissions standards with a phased-in period of 2008 to 2015. The Tier 1 through 4 standards regulate the EPA criteria pollutants, including particulate matter (PM), hydrocarbons (HC), oxides of nitrogen (NO_x) and carbon monoxide (CO). Prior to 1998, emissions from nonroad diesel engines were unregulated. These engines are typically referred to as Tier 0.

With the implementation of emissions control measures described above, the FGEIS showed that annual-average nitrogen dioxide (NO₂), carbon monoxide (CO), particulate matter with an aerodynamic diameter less than 10 microns (PM₁₀), and annual- average particulate matter with an aerodynamic diameter less than 2.5 microns (PM_{2.5}) concentrations would be well below their corresponding *de minimis* thresholds or National Ambient Air Quality Standards (NAAQS), respectively. Although PM_{2.5} concentrations (maximum predicted concentration of 3.2 µg/m³) were found to increase to levels exceeding the City's 24-hour interim guidance thresholds in areas immediately adjacent to construction activity, the PM_{2.5} threshold exceedances were predicted to be limited in extent, duration, and severity. Therefore, the FGEIS concluded that no significant adverse impacts on air quality would occur during the construction of the Project.

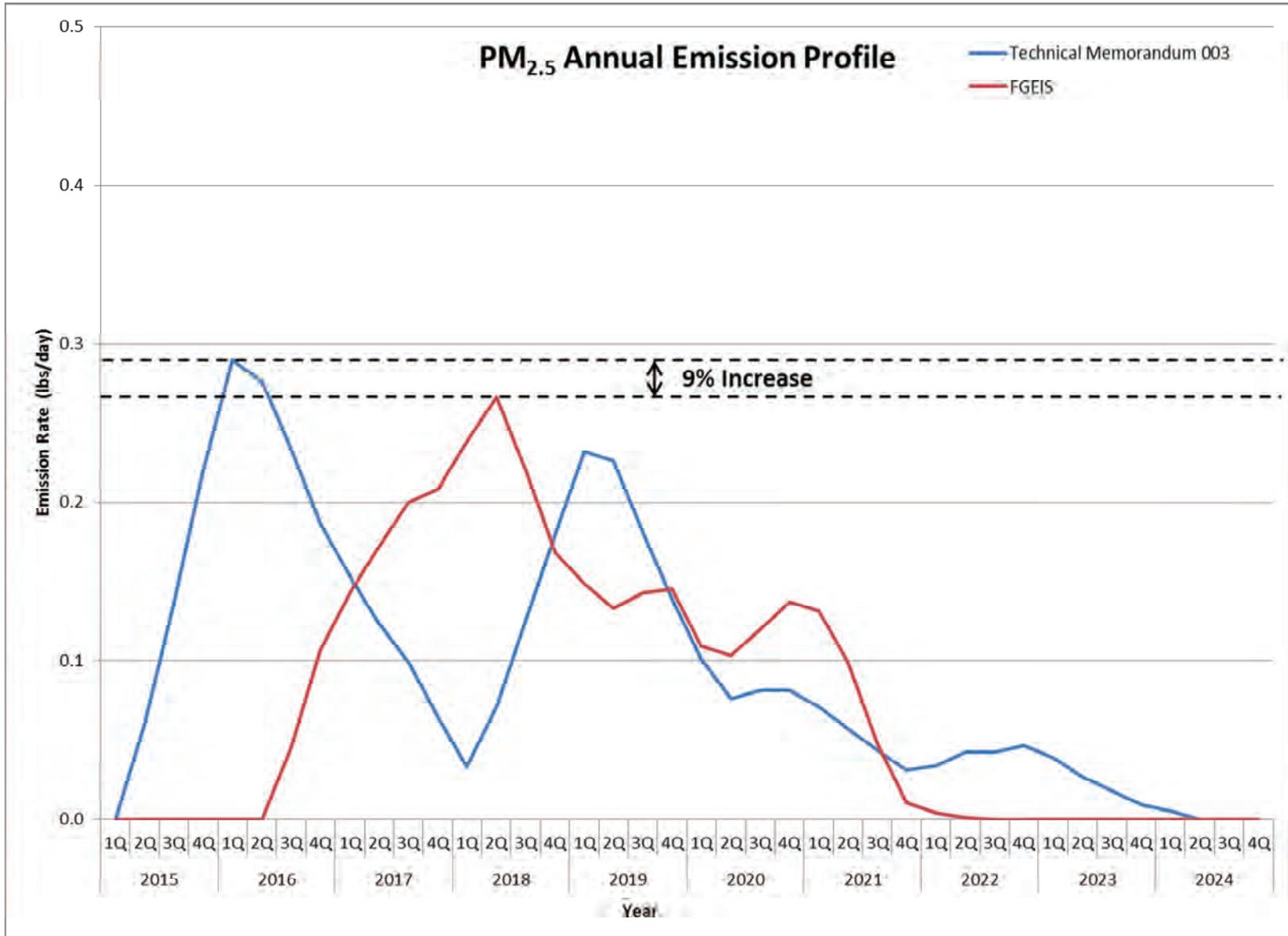
In order to assess the potential change in the impact on air pollutant concentrations with the design development and the construction schedule change, the emissions assumptions prepared for the FGEIS were applied to the updated construction information and schedule, resulting in new estimates ('emission profiles') of 24-hour and annual average PM_{2.5} emissions throughout the duration of construction. The new 24-hour and annual average emissions profiles for the proposed Essex Crossing program, together with the profiles presented in the FGEIS, are shown in **Figures 5 and 6**, respectively. As presented in the figures, the emission intensity levels during the peak construction periods with the updated construction information and schedule are comparable to those analyzed in the FGEIS. With updated construction information and schedule, there would be a 12 percent increase in peak short-term emission intensity and a 9 percent increase in peak annual emission intensity. While the peak emission intensities would increase for the proposed Essex Crossing program, the *de minimis* criteria employed for determination of potential significant adverse 24-hour PM_{2.5} impacts as set forth in the *CEQR Technical Manual* has been updated since the FGEIS was published. The current 24-hour PM_{2.5} *de minimis* threshold value is half the difference between the NAAQS of 35 µg/m³ and the ambient monitored background near the project site (27 µg/m³), or 4.0 µg/m³. This value is twice the 24 hour PM_{2.5} interim guidance threshold value (2 µg/m³)¹⁶ considered in the FGEIS. The maximum predicted annual average PM_{2.5} concentration was predicted to be 0.18 µg/m³ in the FGEIS, well below the applicable PM_{2.5} *de minimis* criterion of 0.3 µg/m³ for local impacts. A moderate increase (9 percent) in peak annual emission intensity for the current construction program would not result in new significant adverse construction-related air quality impacts not identified in the FGEIS.

Construction associated with the Third Water Tunnel Water Main Shaft Installation Phase II along Grand Street between Broadway and Essex Street is expected to occur between the present day and the spring of 2017 and, consequently, portions of that construction period may overlap with construction activities associated with the proposed project. However, the Water Main Shaft Installation project is located more than 350 feet away from the nearest project building and, therefore, such distance would provide for significant dispersion of pollutants from construction activities occurring at that distance. In addition, the intervening buildings would serve as a buffer between the construction sources for the Water Main Shaft Installation project and the construction sources for the proposed project, further dispersing emissions in the area. Therefore, the potential cumulative air quality effects from the construction of the Water Main

¹⁶ In the FGEIS analysis, 24-hour average PM_{2.5} concentration increments which are predicted to be greater than 2 µg/m³ but no greater than 5 µg/m³ would be considered to have the potential for a significant adverse impact on air quality based on the magnitude, frequency, duration, location, and size of the area of the predicted concentrations.



Comparison of FGEIS and Proposed Essex Crossing Program
PM_{2.5} 24-Hour Emission Profile



Comparison of FGEIS and Proposed Essex Crossing Program
PM_{2.5} Annual Emission Profile

Shaft Installation project and the proposed project would be negligible. Accordingly, the Water Main Shaft Installation project was not included in the detailed construction air quality analysis in this Technical Memorandum.

Therefore, based on the FGEIS construction air quality results, a moderate increase in peak period concentrations with the updated construction information and schedule, and a substantial increase in the 24-hour $PM_{2.5}$ *de minimis* criteria, the design development and construction schedule change would not result in new significant adverse construction-related air quality impacts warranting further study. Further, as discussed above, to ensure that construction would result in the lowest practicable diesel particulate matter emissions, an emission reduction program would be employed for the construction of the proposed Essex Crossing program to the extent feasible and practicable during construction.

NOISE

Introduction

Based on more specific building design, construction sequencing, and staging information for the proposed development at Sites 1 through 6, the quantified construction noise analysis in the FGEIS was revisited for these sites. Development of Sites 8 through 10 would occur further in the future, and more detailed construction information than what was examined in the FGEIS is not available at this time. It is assumed that development at these sites would occur according to the reasonable worst case scenario examined in the FGEIS, and the construction noise resulting from construction at these sites would be as described in the FGEIS. The FGEIS construction noise analysis identified the potential for significant adverse construction noise impacts at three (3) locations, including some façades and floors of 350 Grand Street (Seward Park High School) and certain outdoor balconies of two residential buildings (e.g., the residential building south of Grand Street between Essex and Clinton Streets and the residential building at the southeast corner of Clinton and Grand Streets). The purpose of this supplemental analysis was to more precisely determine the extent, magnitude, and duration of predicted significant adverse noise impacts that would occur during construction, and to examine the feasibility of implementing mitigation measures at such impacted locations.

Construction Noise Impact Criteria

The construction noise impact criteria for this supplemental analysis are the same as those used for the FGEIS construction noise analysis. The *CEQR Technical Manual* states that significant noise impacts due to construction would occur only at sensitive receptors that would be subjected to high construction noise levels for an extensive period of time. This has been interpreted to mean that such impacts would occur only at sensitive receptors where the activity with the potential to create high noise levels would occur continuously for approximately two years or longer. As recommended in the *CEQR Technical Manual*, this study uses the criteria to define a significant adverse noise impact as follows:

- If the No Action noise level is less than 60 dBA $L_{eq(1)}$, a 5 dBA $L_{eq(1)}$ or greater increase would be considered significant.
- If the No Action noise level is 61 dBA $L_{eq(1)}$, a 4 dBA $L_{eq(1)}$ or greater increase would be considered significant.
- If the No Action 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 CEQR criteria as being between 10:00 PM and 7:00 AM), the incremental significant impact threshold would be 3 dBA $L_{eq(1)}$.

Noise Analysis Methodology

The construction noise analysis methodology for this supplemental analysis is the same as that used for the FGEIS construction noise analysis. Construction activities associated with the proposed development would be expected to result in increased noise levels as a result of: (1) the operation of construction equipment on-site; and (2) the movement of construction-related vehicles (i.e., worker trips, and material and equipment trips) on the surrounding roadways. The effect of each of these noise sources was evaluated. The results presented below show the effects of construction activities (i.e., noise due to both on-site construction equipment and construction-related vehicle operation) and the total cumulative impacts due to operational effects (caused by project-generated vehicular trips) and construction effects (as construction proceeds on uncompleted components of the project).

Noise from the operation of construction equipment on-site at a specific receptor location near a construction site is calculated by computing the sum of the noise produced by all pieces of equipment operating at the construction site. For each piece of equipment, the noise level at a receptor site is a function of:

- The noise emission level of the equipment;
- A usage factor, which accounts for the percentage of time the equipment is operating at full power;
- The distance between the piece of equipment and the receptor;
- Topography and ground effects; and
- Shielding.

Similarly, noise levels due to construction-related traffic are a function of:

- The noise emission levels of the type of vehicle (e.g., auto, light-duty truck, heavy-duty truck, bus, etc.);
- Vehicular speed;
- The distance between the roadway and the receptor;
- Topography and ground effects; and
- Shielding.

Construction Noise Modeling

As was the case for the FGEIS construction noise analysis, noise effects from construction activities were evaluated using the CadnaA model, a computerized model developed by DataKustik for noise prediction and assessment. The model can be used for the analysis of a wide variety of noise sources, including stationary sources (e.g., construction equipment, industrial equipment, power generation equipment), transportation sources (e.g., roads, highways, railroad lines, busways, airports), and other specialized sources (e.g., sporting facilities). The model takes into account the reference sound pressure levels of the noise sources at 50 feet, attenuation with distance, ground contours, reflections from barriers and structures, attenuation due to shielding, etc. The CadnaA model is based on the acoustic propagation standards promulgated in International Standard ISO 9613-2. This standard is currently under review for adoption by the American National Standards Institute (ANSI) as an American Standard. The CadnaA model is a state-of-the-art tool for noise analysis and is approved for construction noise level prediction by the *CEQR Technical Manual*.

Geographic input data used with the CadnaA model included CAD drawings that defined site work areas, adjacent building footprints and heights, locations of streets, and locations of sensitive receptors. For each analysis period, the geographic location and operational characteristics—including equipment usage rates (percentage of time operating at full power) for each piece of construction equipment operating at the project site, as well as noise control measures—were input to the model. In addition, reflections and shielding by barriers erected on the construction site, and shielding from both adjacent buildings and project buildings as they are constructed, were accounted for in the model. In addition, construction-related vehicles were assigned to the adjacent roadways. The model produced A-weighted $L_{eq(1)}$ noise levels at each receptor location for each analysis period, as well as the contribution from each noise source.

Determination of No Action and Non-Construction Noise Levels

Noise generated by construction activities is added to noise generated by non-construction traffic on adjacent roadways in order to determine the total noise levels at each receptor location. No Action levels would be expected to be similar to existing noise levels in the study area, because no substantial increases in traffic are predicted to occur in the No-Action condition. Consequently, existing noise levels were conservatively used as the baseline noise levels for determining construction-generated noise level increases. Existing noise levels at the analysis receptors were determined by:

- Performing noise measurements at various at-grade locations;
- Calculating noise levels at the receptor sites and measurement locations using the CadnaA model with existing site geometry and existing traffic on adjacent roadways as inputs;
- Determining adjustment factors based on the difference between the measured and calculated existing noise levels at the measurement locations; and
- Applying the adjustment factors to the calculated existing noise levels at the construction noise receptors.

Analysis Periods

As described above, construction of Sites 1 through 6 is expected to take place over a period of about six years (i.e., from about 2015 to 2021). Except for unusual circumstances, construction activities would occur on weekdays only. Therefore, construction noise analyses were performed only for the weekday periods.

As described above, the anticipated construction schedule and durations for proposed development at Sites 1 through 6 have been developed with an experienced New York City construction manager to serve as the basis of the analyses. The schedule also allowed for reasonable projections to be developed regarding the number of workers, types and number of pieces of equipment, and number of construction vehicles anticipated to be operating during each quarter-year of the construction period. The schedule was developed to represent a reasonable worst-case scenario resulting in the highest potential construction noise levels at nearby receptor locations.

An analysis was performed based on this construction schedule to determine the quarter during each year of the construction period (i.e., 2015-2021) when the maximum potential for significant noise impacts would occur. For most years, in which the amount of on-site equipment would fluctuate widely during the year, this analysis examined both the worst-case quarter of the year, as well as an “off-peak” quarter. This off-peak quarter represents the quarter with the minimum potential for noise impacts based on the number and type of equipment expected to be in

use according to the conceptual construction schedule. Analysis of the peak quarter and the off-peak quarter provided a range of peak hourly construction noise levels during each year. For 2015 and 2021, which are not full years of construction according to the analyzed construction schedule, and for 2017, in which construction activities do not vary as widely, the analysis conservatively assumed that the worst-case quarter of each year would represent the entire year. Additionally, for each quarter being analyzed, including peak and off-peak quarters, the analysis considered the peak hour of construction during the quarter, and used the noise level resulting from that peak hour of construction to represent the entire quarter. This resulted in a conservative analysis, especially in determining the duration of predicted noise level increases.

Development of Sites 8 through 10 would occur further in the future, and more detailed construction information than what was examined in the FGEIS is not available at this time. It is assumed that development at these sites would occur according to the reasonable worst case scenario examined in the FGEIS, and the construction noise resulting from construction at these sites would be as described in the FGEIS.

Construction associated with the Third Water Tunnel Water Main Shaft Installation Phase II along Grand Street is expected to occur between the present day and the Spring of 2017, however it has not been included in the detailed construction noise analysis in this Technical Memorandum. The Water Main Shaft Installation project is part of the No Action scenario for the proposed development examined in this Technical Memorandum, and as such it is more conservative to not include noise associated with its construction work. This is because a lower No Action condition noise level would result in the greatest calculated noise level increases resulting from construction on Sites 1 through 6, and consequently the highest likelihood of finding significant noise impacts.

To be conservative, the noise analysis assumed that both peak on-site construction activities and peak construction-related traffic conditions would occur simultaneously.

Noise Reduction Measures

Construction of the projected development sites would be required to follow the requirements of the New York City Noise Control Code (NYC Noise Code) for construction noise control measures. Specific noise control measures will be described in a noise mitigation plan required under the NYC Noise Code. These measures could include a variety of source and path controls.

In terms of source controls (i.e., reducing noise levels at the source or during the most sensitive time periods), the following measures would be implemented in accordance with the NYC Noise Code:

- Equipment that meets the sound level standards specified in Subchapter 5 of the New York City Noise Control Code would be utilized from the start of construction. **Table 29** shows the noise levels for typical construction equipment and the mandated noise levels for the equipment that would be used for construction of the RWCDS.
- As early in the construction period as logistics will allow, diesel- or gas-powered equipment would be replaced with electrical-powered equipment such as welders, water pumps, bench saws, and table saws (i.e., early electrification) to the extent feasible and practical.
- Where feasible and practical, construction sites would be configured to minimize back-up alarm noise. In addition, all trucks would not be allowed to idle more than three minutes at the construction site based upon New York City Local Law.
- Contractors and subcontractors would be required to properly maintain their equipment and mufflers.

Table 29

Typical Construction Equipment Noise Emission Levels (dBA)

Equipment List	NYCDEP & FTA Typical Noise Level at 50 feet ¹	Noise Level with Path Controls at 50 feet ²
Backhoe/Loader	80	
Compressors	58	
Concrete Pump	82	
Concrete Trowel	85	75
Cranes	85	75
Concrete Trucks	85	
Cranes (Tower Cranes)	85	75
Delivery Trucks	84	
Drill Rigs	84	74
Dump Trucks	84	
Excavator	85	
Generators	82	72
Hand Tool	59	
Hoist	72 ³	62
Impact Wrenches	85	75
Pile Driving Rig (Impact)	85	
Rebar Bender	80	
Welding Machines	73	

Notes:

¹ Sources: Citywide Construction Noise Mitigation, Chapter 28, Department of Environmental Protection of New York City, 2007. Transit Noise and Vibration Impact Assessment, FTA, May 2006.

² Path controls include portable noise barriers, enclosures, acoustical panels, and curtains, whichever feasible and practical.

³ Source: Kessler, Frederick M., "Noise Control for Construction Equipment and Construction Sites," report for Hydro Quebec

In terms of path controls (e.g., placement of equipment, implementation of barriers or enclosures between equipment and sensitive receptors), the following measures for construction, which go beyond typical construction techniques, would be implemented to the extent feasible and practical:

- Where logistics allow, noisy equipment, such as cranes, concrete pumps, concrete trucks, and delivery trucks, would be located away from and shielded from sensitive receptor locations. Once building foundations are completed, delivery trucks would operate behind construction fence, where possible;
- Noise barriers constructed from plywood or other materials would be utilized to provide shielding (e.g., the construction sites would have a minimum 12-foot barrier and, where logistics allow, truck deliveries would take place behind these barriers once building foundations are completed); and
- Path noise control measures (i.e., portable noise barriers, panels, enclosures, and acoustical tents, where feasible) would be used for certain dominant noise equipment to the extent feasible and practical, i.e., asphalt pavers, drill rigs, excavators with ram hoe, hoists, impact wrenches, jackhammers, power trowels, powder actuated devices, rivet busters, rock drills, concrete saws, and sledge hammers. These barriers were conservatively assumed to offer only a 10 dBA reduction in noise levels for each piece of equipment to which they are applied, as shown in **Table 29**. The details to construct portable noise barriers, enclosures, tents, etc. are based upon the instructions of NYCDEP Citywide Construction Noise Mitigation.

Receptor Sites

The same receptor sites analyzed as part of the construction noise analysis in this Technical Memorandum are the same as those analyzed in the FGEIS construction noise analysis. Eight (8) noise measurement locations (i.e., sites M1 to M8) were selected to determine the baseline existing noise levels, and eighty-three (83) receptor locations (i.e., sites 1 to 83) close to the project area were selected as discrete noise receptor sites for the construction noise analysis. These receptors were either located directly adjacent to the project site or streets where construction trucks would pass. Each receptor site was the location of a residence or other noise-sensitive use. At some buildings, multiple building façades were analyzed. At high-rise buildings, noise receptors were selected at multiple elevations. At open space locations, receptors were selected at street level. **Figure 7** shows the locations of the 83 noise receptor sites, and **Table 30** lists the noise receptor sites and the associated land use at each site. The receptor sites selected for detailed analysis are representative of other noise receptors in the immediate project area and are the locations where maximum project impacts due to construction noise would be expected.

Construction Noise Analysis Results

Cumulative Analysis

Using the methodology described above, and considering the noise abatement measures from source and path controls specified above, cumulative noise analyses were performed to determine maximum one-hour equivalent ($L_{eq(1)}$) noise levels that would be expected to occur during one or two quarters from each year of the construction period.

For impact determination purposes, the significance of adverse noise impacts is determined based on whether predicted incremental noise levels at sensitive receptor locations resulting from construction of the proposed developments at Sites 1 through 6 would be greater than the impact criteria suggested in the *CEQR Technical Manual* for two consecutive years or more. While increases exceeding the CEQR impact criteria for less than two years may be noisy and intrusive, they are not considered to be significant adverse noise impacts.

The noise analysis results show that predicted noise levels would exceed the CEQR impact criteria during two or more consecutive years on one or more floors at 18 of the 83 receptor sites (i.e., 1-1C, 1E, 2, 2A, 2C, 2D, 3F, 3H, 4A, 5A, 5B, 8A, 8B, 10A-10C, 11B, 11C, 13A, 13C, 14A, 14F, 14G, 15, 16A-16C, 17, 17A, 18, 19, 20, 21-21A, and 22). **Figure 7** shows the locations and **Table 31** summarizes analysis results where predicted noise level increases exceed the CEQR impact criteria for two or more consecutive years (additional details of the construction analysis are presented in **Appendix C**).

As described above in the “Analysis Periods” section, the analysis, which included analyzing additional off-peak quarters during certain years of the construction period, made it possible to more precisely determine the duration of the predicted exceedances of the CEQR impact criteria. The analysis showed that at some analyzed receptor sites, exceedances of the CEQR impact criteria that may occur in two or more consecutive years would not occur *continuously* for two or more consecutive years. Furthermore, also as described above, the noise level calculations for each analysis quarter, including both peak and off-peak quarters, were based on the peak hour of the quarter and would not persist throughout the quarter. During hours or days when dominant noise sources (e.g., pile driving or cement mixing equipment) are not in use, noise levels would be lower at nearby noise receptors. At receptors that were predicted to experience construction noise levels exceeding the *CEQR Technical Manual* noise impact criteria (an increase of 3 – 5 dBA compared to No Action noise levels) not occurring continuously for at least 24 months, the noise level increases

Table 30
Noise Receptor Locations

Receptor	Location	Associated Land Use
M1	Grand Street between Suffolk and Clinton Streets	Future Residential
M2	Suffolk Street between Grand and Broome Streets	Future Residential
M3	Broome Street between Suffolk and Clinton Streets	Future Residential
M4	Delancey Street between Clinton and Ridge Streets	Future Residential
M5	Suffolk Street between Broome and Delancey Streets	Future Residential
M6	Delancey Street between Essex and Norfolk Streets	Future Commercial
M7	Essex Street between Rivington and Delancey Streets	Future Residential
M8	Delancey Street between Norfolk and Suffolk Streets	Future Residential
1-1L	South of Grand Street between Essex and Clinton Streets	Residential/Open Space
2-2D	Suffolk Street between Grand and Broome Streets	Residential
3-3I	South of Grand Street East of Clinton Street	Residential
4-7C	East of Clinton Street between Broome and Grand Streets	Residential/Church
8-8B	East of Clinton Street between Delancey and Broome Streets	Residential
9	Pitt Street between Delancey and Broome Streets	Residential
10-11C	Norfolk Street between Broome and Grand Streets	Residential/Church
12-12D	Grand Street between Essex and Norfolk Streets	Residential
13-13C	Broome Street between Essex and Norfolk Streets	Residential
14-14G	Block bounded by Ludlow, Broome, Essex, and Grand Streets	School
15	Essex Street between Delancey and Broome Streets	Residential
16-16C	Southwest corner of Delancey and Ludlow Streets	Residential/Commercial
17-17A	Ludlow Street between Delancey and Broome Streets	Residential/Commercial
20	North of Broome Street between Ludlow and Orchard Streets	Residential/Commercial
21-21A	Ludlow Street between Broome and Grand Streets	Residential/Commercial
22	South of Broome Street between Ludlow and Orchard Streets	Residential/Commercial
23-26	Ludlow Street between Rivington and Delancey Streets	Residential/Commercial
27-28B	South of Rivington Street between Ludlow and Essex Streets	Residential/Commercial/Hotel
29-31A	North of Rivington Street between Ludlow and Essex Streets	Residential/Commercial
32-42A	Essex Street between Stanton and Rivington Streets	Residential/Commercial
43-47A	West of Norfolk Street between Rivington and Delancey Streets	Residential/Commercial
48-51B	South of Rivington Street between Essex and Norfolk Streets	Residential/Commercial
52-53B	North of Rivington Street between Essex and Norfolk Streets	Residential/Commercial
54-61A	Norfolk Street between Stanton and Rivington Streets	Residential/Commercial
62-63A	Stanton Street between Essex and Norfolk Streets	Residential/Commercial
64-64B	Block bounded by Houston, Norfolk, Stanton, and Essex Streets	School/Open Space
65-66A	Stanton Street between Ludlow and Essex Streets	Residential/Commercial
67-67A	Essex Street between Houston and Stanton Streets	Residential
68-70B	East of Norfolk Street between Rivington and Delancey Streets	Residential/Commercial
71-73A	Rivington Street between Norfolk and Suffolk Streets	Residential/Commercial
74-74A	Suffolk Street between Rivington and Delancey Streets	Residential/Commercial
75-75B	Block bounded by Stanton, Suffolk, Rivington, and Norfolk Streets	School
76-76A	Northeast corner of Stanton and Norfolk Streets	Residential/Commercial
77-77A	Stanton Street between Norfolk and Suffolk Streets	Residential/Commercial
78-78A	Norfolk Street between Houston and Stanton Streets	Residential/Commercial
79	Broome Street between Allen and Orchard Streets	Residential/Commercial
80	Rivington Street between Orchard and Ludlow Streets	Residential/Commercial
81	Stanton Street between Orchard and Ludlow Streets	Residential/Commercial
82	Essex Street between Houston and Stanton Streets	Residential/Commercial
83	Clinton Street between Rivington and Delancey Streets	Residential/Commercial

Table 31

Locations Where Noise Increases Exceed CEQR Criteria for Two or More Consecutive Years

Building/Location	Associated Land Use	Total Stories	Façade	Associated Receptor(s)	Impacted Floor(s)	Maximum Increase in dBA*	Impact Duration (years)	Associated Development Site(s)
Open Space on Grand Street at Suffolk Street	Open Space	n/a	n/a	1	n/a	4.6	2	5
Residential Building south of Grand Street between Essex and Clinton Streets	Residential	18	North	1A, 1B, 1E	2nd to top	10.9	3	5
			East (northernmost section)	1C	3rd to top	11.4	3	5
384 Grand Street	Residential	6	East	2	all	12.1	3	2, 3, 4, 5
			North	2A, 2C	all	16.7	6	2, 3, 4, 5
			West	2D	5th to top	6.3	3	2, 3, 4, 5
Residential Building at the southeast corner of Clinton and Grand Streets	Residential	19	West (middle section)	3F	17th to top	10.0	3	5
410 Grand Street	Residential	24	West	4A	6th to top	15.2	3	4, 5, 6
157 Broome Street	Residential	7	West	5A	all	18.5	6	4, 5, 6
			South	5B	3rd to top	17.9	3	4, 5, 6
150 Broome Street	Residential	23	West	8A	11th to top	9.4	3	4, 5, 6
			South	8B	4, 5	13.2	2	4, 5, 6
50 Norfolk Street	Residential	13	North	10A	all	12.5	3	2, 3, 4, 5
			East (northernmost section)	10B	all	12.2	3	2, 3, 4, 5
			East (southernmost section)	10C	2nd to top	9.6	3	2, 3, 4, 5
60 Norfolk Street	Institutional	7	East	11B	2nd to top	12.5	3	2, 3, 4, 5
			South	11C	all	11.3	3	2, 3, 4, 5
65 Norfolk Street	Residential	20	East	13A	3rd to top	10.2	5	1, 2, 3
			West	13C	11	11.5	3	1, 2, 3
350 Grand Street	Institutional (Seward Park High School/Urban Assembly Academy of Government and Law)	10	East (northernmost section)	14A	8th to top	8.7	3	110
83 Essex Street	Residential/ Commercial	4	West (north section)	14F, 14G	2nd to top	15.1	3	2, 3
101 Delancey Street	Residential/ Commercial	6	East	15	all	12.3	3	2
			West	16A	all	11.0	3	2
			South	16B	4th to top	15.1	3	2
89 Ludlow Street	Future Residential/ Commercial	n/a	East	16C	4th to top	7.1	3	2
			East	17	all	18.6	3	1, 2
87 Ludlow Street	Residential/ Commercial	6	East	17	all	18.6	3	1, 2
85 Ludlow Street	Residential/ Commercial	6	North	17A	all	18.0	3	1, 2
246 Broome Street	Residential/ Commercial	7	East	18	all	20.3	3	1, 2
248 Broome Street	Residential/ Commercial	7	South	19	all	20.0	3	1, 2
243 Broome Street	Residential/ Commercial	6	South	20	all	16.1	3	1, 2
			North	21	all	20.5	3	1, 2
245 Broome Street	Residential/ Commercial	6	East	21A	2nd to top	19.1	3	1, 2
			North	22	4th to top	19.4	3	1, 2

Note: * Range of increases values were taken from predicted noise levels compared with existing noise levels.

may be readily noticeable and even intrusive, but these noise level increases would be temporary and the total exterior noise levels during construction would be comparable to those in the No Action condition at grade-level locations in the surrounding neighborhood or other locations near construction sites in New York City. Consequently, the predicted noise level increases at these receptors would not be considered a significant impact according to CEQR criteria.

As outlined above in the “Analysis Periods” section, the construction noise analysis was performed using the two quarters of each year that are anticipated to result in the respective maximum and minimum peak hourly construction noise levels of the year. The analysis conservatively assumed that the worst-case quarter would represent construction noise levels in the subsequent quarters, until the next analyzed quarter. During times of less intense construction activity, construction noise levels are anticipated to be less. For instance, pile driving at any particular development site would be expected to last only six to twelve months depending on the building, and even shorter durations for each pile location within the development site.

Consequently, an individual receptor location would experience pile driving noise for only a limited period of time out of the construction period. Similarly, excavators, impact wrenches, and other noise-intensive equipment would also not operate throughout the construction period, but would function in individual locations only for limited periods of time.

At locations predicted to experience an exceedance of the CEQR impact criteria, the exceedances would be due principally to noise generated by on-site construction activities (rather than construction-related traffic). As previously discussed, this noise analysis examined the reasonable worst-case peak hourly noise levels that would result from construction in an analyzed quarter, and consequently is conservative in predicting significant increase in noise levels. Typically, the loudest hourly noise level during each quarter of construction would not persist throughout the entire quarter.

The results of the construction noise analysis for this Technical Memorandum are comparable at most receptors to those included in the FGEIS. In the vicinity of Sites 1 and 2, maximum predicted construction noise levels are generally somewhat greater, because the conservative conceptual construction schedule used as the basis of this construction noise analysis includes simultaneous construction of those sites, whereas the FGEIS construction noise analysis did not assume simultaneous construction of Sites 1 and 2. However, while the simultaneous construction results in greater maximum predicted construction noise levels, the duration of these levels is substantially shorter, because the construction tasks that would have the greatest potential to result in elevated noise levels are carried out simultaneously, and thus completed as soon as possible. This also occurs in proximity to Sites 5 and 6, which are also assumed to be constructed simultaneously in the analysis for this Technical Memorandum, but were assumed to be constructed sequentially in the FGEIS. Throughout the study area, the overall magnitude of construction noise levels predicted in this analysis are comparable to those predicted in the FGEIS analysis.

As part of the FGEIS construction noise analysis, locations where the FGEIS analysis predicted noise level increases that exceed the CEQR impact criteria for two or more consecutive years, a visual survey was performed to identify which locations may not currently have double-glazed windows and/or a means of alternative ventilation, and which locations may have balconies, whose exterior space would have the potential to experience impact. For the visual survey, each façade of each building predicted to experience two or more consecutive years of significant noise level increase was inspected and photographed wherever possible from a publicly

accessible location. The window types were determined based on the condition, thickness, and material of the window frame, as well as the size of the individual glass panes and the general condition of the glass. The type of alternate means of ventilation was determined by the size, shape and number of visible air conditioners or louvers on the building façades, as well as any visible cooling towers, air-handlers, or other identifiable HVAC equipment on the building roof that was visible from publicly accessible locations or aerial photographs. At locations where a determination about windows or HVAC equipment was not possible based on features visible from publicly accessible locations or aerial photographs, the building was assumed not to have double glazed windows or an alternate means of ventilation. The results of the visual inspection of window type and alternate means of ventilation were used to determine the status of these items at the locations predicted to experience noise level increases exceeding the CEQR impact criteria for two or more consecutive years by the noise analysis in this Technical Memorandum.

Most buildings listed in **Table 31** have double-glazed windows and alternate ventilation (i.e., air conditioners, including and well-sealed through-the-wall/sleeve/PTAC air conditioners). The amount of façade attenuation provided by these buildings would depend on the specific façade construction measures of each building, but an attenuation of 25 dBA was used as a typical value to estimate interior noise levels.

Seward Park High School (350 Grand Street) does not currently have double-glazed windows, but, the school's windows are in the process of being replaced with double-glazed windows providing at least 28 dBA of attenuation, and all windows are expected to be replaced by January 2015. With these replacement windows and the existing window air-conditioning units, the school building's façade would be expected to provide at least 25 dBA of composite window/wall attenuation.

Based on these typical façade attenuation estimates, interior noise levels were estimated for each of the buildings listed in **Table 31** for each of the analysis periods during construction. **Table 32** shows the predicted maximum interior $L_{10(1)}$ noise levels during construction and the length of time during which peak-hour interior noise levels are predicted to exceed 45 dBA $L_{10(1)}$ (the CEQR acceptable interior noise level criteria). The duration of these exceedances at each receptor was determined by examining the one or two analyzed quarters of each year during the construction period and interpolating between the first and last consecutive quarters of predicted exceedance. At the buildings shown in **Table 32**, which are predicted to experience peak hour interior $L_{10(1)}$ noise levels greater than 45 dBA, interior noise levels are in the high 40s to high 50s dBA, which are comparable to interior noise levels at some buildings in this neighborhood that do not have double-glazed windows or air-conditioning. Additionally, none of the buildings shown in **Table 32** are predicted to experience peak hour interior $L_{10(1)}$ noise levels greater than 45 dBA over a period of two years or longer. Consequently, while construction noise at these buildings would be readily noticeable and potentially intrusive at times, the predicted magnitude and duration of the noise level increases would not constitute a significant adverse construction noise impact.

Table 32

Locations Where Interior Construction Noise Levels Exceed CEQR Recommended Threshold

Building/Location	Associated Land Use	Total Stories	Façade	Associated Receptor(s)	Floor(s) Experiencing L ₁₀₍₁₎ Greater Than 45 dBA	Maximum Interior L ₁₀₍₁₎ in dBA*	Maximum Duration of L ₁₀₍₁₎ Greater Than 45 dBA (years)	Associated Development Site(s)
Residential Building south of Grand Street between Essex and Clinton Streets	Residential	18	North	1A, 1E	4th to top	46.6	1	5
384 Grand Street	Residential	6	East	2	3rd to top	47.4	1.5	2, 3, 4, 5
			North	2A, 2C	2nd to top	51.8	1.75	2, 3, 4, 5
Residential Building at the southeast corner of Clinton and Grand Streets	Residential	19	West (middle section)	3F	7th to top	46.1	1	5
410 Grand Street	Residential	24	West	4A	5th to top	48.5	1	4, 5, 6
157 Broome Street	Residential	7	West	5A	all	51.2	0.5	4, 5, 6
			South	5B	3rd to top	51.0	1	4, 5, 6
150 Broome Street	Residential	23	West	8A	11th to top	46.1	1	4, 5, 6
			South	8B	4, 5	52.6	0.5	4, 5, 6
			North	10A	11th to top	49.8	1	2, 3, 4, 5
50 Norfolk Street	Residential	13	East (southernmost section)	10C	4th to top	46.1	1	2, 3, 4, 5
60 Norfolk Street	Institutional	7	South	11B	5th to top	47.3	1	2, 3, 4, 5
65 Norfolk Street	Residential	20	East	13A	3rd to top	48.6	1.75	1, 2, 3
			West	13C	11	51.2	1	1, 2, 3
350 Grand Street	Institutional (Seward Park High School/Urban Assembly Academy of Government and Law)	10	East (northernmost section)	14A	8th to top	47.3	1	110
			West (north section)	14G	3rd to top	48.9	1	2, 3
83 Essex Street	Residential/Commercial	4	East	15	all	56.5	1.75	2
101 Delancey Street	Residential/Commercial	6	West	16A	all	53.9	1.75	2
			South	16B	5th to top	48.9	1	2
			East	16C	4th to top	50.7	1.75	2
89 Ludlow Street	Future Residential/Commercial	n/a	East	17	all	57.5	1.75	1, 2
87 Ludlow Street	Residential/Commercial	6	East	17	all	57.5	1.75	1, 2
			North	17A	2nd to top	50.8	1.75	1, 2
85 Ludlow Street	Residential/Commercial	6	East	18	all	58.3	1.75	1, 2
246 Broome Street	Residential/Commercial	7	South	19	all	57.8	1.75	1, 2
248 Broome Street	Residential/Commercial	7	South	20	4th to top	48.8	1	1, 2
243 Broome Street	Residential/Commercial		North	21	all	53.6	1.75	1, 2
			East	21A	2nd to top	52.2	1	1, 2
245 Broome Street	Residential/Commercial	6	North	22	4th to top	52.1	1	1, 2

As an example, at 83 Essex Street, 85 Ludlow Street, 87 Ludlow Street, 89 Ludlow Street, and 246 Broome Street, all of which are immediately adjacent to Site 1, as shown in **Table 31**, construction is predicted to result in maximum noise level increases between 12.3 dBA and 20.6 dBA during peak construction activities at Site 1, which would be pile driving work. Each of these buildings has double-glazed windows and air conditioning, and are estimated along with the masonry façade area to provide 25 dBA composite building attenuation between exterior and interior noise levels. During the pile driving activity, maximum interior $L_{10(1)}$ noise levels are predicted to be up to the mid 50s dBA at these buildings. However, pile driving at Site 1 would occur only over a period of approximately a single year, and would occur only during 10 percent of work hours during that year. At other times during the excavation, foundation, superstructure, and exterior phases of construction at Site 1, maximum interior $L_{10(1)}$ noise levels are predicted to be up to the low 50s dBA at these buildings, at times exceeding 45 dBA $L_{10(1)}$ (the CEQR acceptable interior noise level criteria). Once Site 1 construction reaches the interior work phase, using mostly small hand tools with the building mostly enclosed, maximum interior $L_{10(1)}$ noise levels are predicted to be less than 45 dBA at these buildings. Since the occurrences of interior $L_{10(1)}$ noise levels greater than 45 dBA at these buildings would occur over a period of less than two years, and even peak interior noise levels would not be greater than the mid 50s dBA, which is comparable to interior noise levels at some other locations in the surrounding neighborhood, the predicted noise level increases at this location, while they would be readily noticeable and may be annoying or intrusive, would not constitute a significant adverse construction noise impact.

Table 33 identifies two outdoor locations that would experience substantially elevated noise levels for at least 24 continuous months. These are outdoor balconies of residential buildings. These two locations were identified in the FGEIS as having the potential for significant adverse construction noise impacts.

Table 33
Predicted Noise Impact Locations

Building/Location	Associated Land Use	Total Stories	Façade	Associated Receptor(s)	Impacted Floor(s)	Impact Duration (years)	Maximum Increase in dBA*	# of Impacted Single-Glazed Windows	Air-Conditioning
Balconies of Residential Building south of Grand Street between Essex and Clinton Streets	Residential	18	North	1A, 1B, 1E	2nd to top	3	10.9	n/a	
			East (northernmost section)	1C	3rd to top	3	11.4		
Balconies of Residential Building at the southeast corner of Clinton and Grand Streets	Residential	19	West (middle section)	3F	17th to top	3	10.0	n/a	

Note: * Range of increases values were taken from predicted noise levels compared to existing noise levels.

At the residential building south of Grand Street between Essex and Clinton Streets and the residential building at the southeast corner of Clinton and Grand Streets, balconies on various floors may experience significant noise impacts due to construction for limited portions of the construction period. However, it should be noted that even during the portions of the construction period that would generate the most noise at these balconies, the balconies could still be enjoyed without the effects of construction noise outside of the hours that construction

would occur, e.g. during night-time and on weekends. At these outdoor balconies, there would be no feasible or practicable mitigation to mitigate the construction noise impacts. Therefore these balconies, and only the balconies (i.e., not the residences' interior spaces) would be considered to experience unmitigated significant noise impacts as a result of construction.

Proposed buildings on Sites 1, 2, 5, and 6 that would be completed and occupied before construction is completed at Sites 3 and 4 would experience exterior noise levels due to construction activities in the mid-60-to-mid-70 dBA range. These predicted noise levels are based on modeling the worst-case hour of the worst-case quarter of each year of construction, based on a schedule of equipment and activity provided by the construction managers. The predicted noise levels would likely not persist at such a high level throughout the day or throughout the year. However, the design of all project buildings would include building façades providing not less than 18 – 34 dBA of attenuation, and alternate means of ventilation (i.e., air conditioners) that does not degrade the acoustical performance of the façade. During the time period when these proposed buildings would be occupied, and construction would still be underway at other proposed development sites (approximately two and a half years according to the construction schedule on which the construction noise analysis is based), interior noise levels would, during some times, exceed 45 dBA $L_{10(1)}$ (the CEQR acceptable interior noise level criteria for residential uses). Such exceedances may be intrusive, but would be only temporary and of limited duration. Consequently, they would not result in any significant impacts.

On-site, construction activities would produce $L_{10(1)}$ noise levels at open space areas in the low to mid 60s dBA, which would exceed the levels recommended by CEQR for passive open spaces (55 dBA L_{10}). (Noise levels in these areas exceed CEQR recommended values for existing and No Action conditions.) While this is not desirable, there is no effective practical mitigation¹⁷ that could be implemented to avoid these levels during construction. Noise levels in many parks and open space areas throughout the city, which are located near heavily trafficked roadways and/or near construction sites, experience comparable, and sometimes higher, noise levels.

NYCEDC and/or HPD will require that its developers will implement the mitigation and associated environmental measures identified in the FGEIS and this Technical Memorandum, by means of provisions in the contract of sale or long-term lease or other legally binding agreement between the developer(s) and NYCEDC, HPD, and/or the City. *

¹⁷ Noise barriers would not be practical because of security concerns.

Appendix A:
Historic and Cultural Resources

PROPOSED ESSEX CROSSING PROJECT
12PR00119 (11DME012M)
ALTERNATIVES ANALYSIS

A. INTRODUCTION

In September 2013, the City of New York selected Delancey Street Associates (DSA) as the designated developer for the Seward Park Mixed-Use Development project on the Lower East Side of Manhattan (see **Figure 1** for the project site). DSA is proposing use changes to the previously approved, reasonable worst-case development scenario (RWCDs) for Sites 1-6 and 8-10 that was described and assessed in the 2012 Seward Park Mixed-Use Development Project Final Generic Environmental Impact Statement (FGEIS), Technical Memorandum 001, and Technical Memorandum 002. DSA is also proposing changes to the design controls set forth as part of the Large-Scale General Development (LSGD) applicable to Sites 1-6. Now called Essex Crossing, the proposed 1.98 million-gross-square-foot (gsf) mixed-use development would result in the following changes, as compared to the programs assessed in the FGEIS and Technical Memoranda 001 and 002:

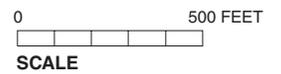
- Increase of overall development size by approximately 16.6 percent (281,405 gsf);
- Increase in public market by 13,876 gsf;
- Increase of residential space by 26,142 gsf;
- Increase of school space by 9,000 gsf;
- Reduction of retail space by 177,222 gsf;
- Increase of other commercial space by 360,974 gsf (including the following uses: commercial offices, medical offices, a gym, a bowling alley, and a movie theater);
- Reduction of the number of parking spaces by 402 (from 500) and placement of proposed 98 parking spaces on one site (Site 5); and
- Omission of previously proposed hotel use of 98,450 gsf.

As a result of these use changes and the advanced project design, the proposed Essex Crossing program requires minor modifications to the LSGD design controls for Sites 1 and 5, as well as a Board of Standards and Appeals (BSA) Special Permit pursuant to New York City Zoning Resolution (ZR) Section 73-36 to allow for a physical culture or health establishment (gym) on Site 1, which is located within a C6-1 commercial zoning district. These proposed changes are assessed in Technical Memorandum 003.

Since the selection of DSA as the designated developer for the project site, DSA and the New York City Department of Housing Preservation and Development (HPD) have determined that the development of Sites 2-6 will receive construction financing through the New York City Housing Development Corporation (NYCHDC). Therefore, the development of Sites 2-6 is subject to review in accordance with the New York State Historic Preservation Act of 1980 (Section 14.09 of the New York Parks, Recreation and Historic Preservation Law). No construction financing from NYCHDC or the United States Department of Housing and Urban Development is being sought for the development of Site 1 or the development of Sites 8-10.



-  Former Seward Park Urban Renewal Area (URA)
-  Former Seward Park Extension URA
-  Proposed Development Sites
- * Site 7 Would not be Redeveloped Under the Proposed Actions
-  2008 East Village/Lower East Side Rezoning Boundary



Therefore, the development of Sites 1, 8, 9, and 10 is not subject to review under Section 14.09 or Section 106 of the National Historic Preservation Act of 1966.

Of Sites 2-6, Sites 3, 4, and 6 are currently developed with parking lots. Site 2 (bounded by Essex, Delancey, Norfolk and Broome Streets) contains a parking lot and a former building of the Essex Street Market complex, which has been determined eligible for listing on the State/National Registers of Historic Places (S/NR-eligible). Site 5 (bounded by Suffolk, Broome, Clinton, and Grand Streets) contains a parking lot, two non-historic tenement buildings, and a S/NR-eligible former fire station.

Like the RWCDS assessed in the FGEIS, the Essex Crossing project would result in the demolition of the Essex Street Market building on Site 2 and the former fire station on Site 5, and the demolition of these buildings would constitute a significant adverse impact. The 2012 FGEIS identified these significant adverse impacts and proposed potential mitigation measures. In a letter dated October 22, 2014, the New York State Office of Parks, Recreation and Historic Preservation (OPRHP) requested—under Section 14.09—an analysis of alternatives specific to the historic resources on Sites 2 and 5. Presented below, this alternatives analysis assesses the potential for retaining and reusing the Essex Street Market building and the fire station in conjunction with the proposed Essex Crossing program. The following analysis concludes that it is not feasible to retain all or portions of those two architectural resources as part of the proposed Essex Crossing program.

B. PROPOSED ESSEX CROSSING PROJECT

PURPOSE AND NEED

The Essex Crossing program would fulfill the purpose and need of the Seward Park Mixed-Use Development project as described in the 2012 FGEIS and Technical Memoranda 001 and 002. The project site is the largest underdeveloped City-owned site south of 96th Street, and the purpose of adopting the proposed land use actions in October 2012 was to allow for the implementation of a mixed-use development on the project site, which has the following goals: (1) transform several underutilized City-owned properties into a thriving, financially viable, mixed-use development; (2) provide affordable and market-rate housing units, commercial and retail uses, community facilities and other neighborhood amenities (e.g., parking, a new and expanded facility for the public Essex Street Market, and publicly accessible open space); and (3) knit these sites back into the larger, vibrant Lower East Side neighborhood.

Community guidelines and urban design recommendations adopted by Manhattan Community Board 3 (CB3) in January 2011 served as a broad framework for defining key elements of the Seward Park Mixed-Use Development Project. Starting in 2008, CB3 embarked on a planning process for the sites with the goal of gaining broad community consensus on a development program for the project site and invited the City to be part of the discussions. The New York City Economic Development Corporation (NYCEDC), HPD, and the New York City Department of City Planning (DCP) participated in the process, providing technical support and resources to facilitate the community's discussion and analysis. Over the course of more than two years, CB3 worked to develop a set of project guidelines that CB3 unanimously adopted in January 2011. CB3 subsequently worked with the City to understand the urban design opportunities of the project and passed a set of urban design principles in June 2011. Together, these project guidelines and design principles express the community's desired mixed-use, mixed-income characteristics of the program for the project site and urban design preferences

with respect to the site's layout, height, and density. The guidelines call for a mixed-use and mixed-income development that is reflective of, and compatible with, adjacent communities. CB3 recommended that the design of the proposed development conform to the principles of contextual design, such that building orientation and access should support and enhance the existing pedestrian realm and integrate with the existing neighborhood.

PROPOSED SEWARD PARK MIXED-USE DEVELOPMENT PROJECT

In 2011, the Office of the Deputy Mayor for Economic Development (ODMED), in coordination with NYCEDC and HPD, sponsored an initiative to allow for the implementation of an approximately 1.7 million gsf mixed-use development on the 10 City-owned sites that compose the Seward Park Mixed-Use Development project site. These 10 sites are located in Manhattan Community District 3 generally along Delancey and Essex Streets on the Lower East Side. Five of the sites (Sites 2, 3, 4, 5, and 6) are located within the former Seward Park Extension Urban Renewal Area (SPEURA), which was established in 1965 and expired in 2005. Four sites (Sites 7¹, 8, 9, and 10) are located within the 2008 East Village/Lower East Side Rezoning area. The tenth site (Site 1) is in neither. The 10 City-owned sites and demapped sections of Broome and Suffolk Streets that are to be mapped as City streets and sections of Clinton and Delancey Streets that are to be demapped encompass the project site.

The program for the proposed development on Sites 1–6 and 8–10 was projected to include a variety of mixed-income residential, commercial (such as retail and office space), and community or cultural uses. The project also included provisions for parking and publicly accessible open space. To facilitate the redevelopment project, a number of discretionary actions were adopted. These actions included zoning map changes and zoning text amendments, zoning special permits, authorization, City map amendment, the disposition of City-owned property, approval of an Urban Development Action Area Project (UDAAP), and an acquisition.

In order to address the potential range of developer responses to Request for Proposals (RFPs) for the future development of the project site, the environmental review analyzed a RWCDs that conservatively considered for each impact category the reasonable worst-case potential for environmental effects. While the proposed discretionary actions were defined, the development program and design specifics under those actions were to be dependent on the RFP response(s). Thus, pursuant to City Environmental Quality Review (CEQR), an FGEIS was prepared that considered the environmental impacts based on the RWCDs.

A GEIS is a more general EIS that analyzes the impacts of a concept or overall plan rather than those of a specific project plan. The GEIS is useful when the details of a specific impact cannot be accurately identified, as no site-specific project has been proposed, but when a broad set of future projects that fit within the RWCDs is likely to result from the agency's action. The program analyzed in the RWCDs was used for illustrative and analysis purposes only; a site-specific breakdown is required for the environmental review. This was not meant to indicate an actual development program. The FGEIS was prepared pursuant to CEQR and the 2012 edition of the *CEQR Technical Manual*, and it analyzed the proposed actions' potential to generate significant adverse environmental impacts as the redevelopment took place. The FGEIS

¹ Site 7 has been considered part of the project site since the community planning process commenced in 2008 and all City-owned properties in the area were identified. However, in the proposed development project, Site 7 retained its current function as a municipal parking garage to support the existing neighborhood uses, as well as the potential new development on the project site.

considered alternatives that would reduce or eliminate impacts identified in the technical analyses and proposed mitigation for such impacts, to the extent practicable.

On August 10, 2012, ODMED, as Lead Agency, issued a Notice of Completion for the Seward Park Mixed-Use Development Project FGEIS that was prepared in coordination with NYCEDC and HPD. Following the issuance of the Notice of Completion, the New York City Council proposed certain modifications to the Uniform Land Use Review Procedure (ULURP) applications (the “Applications” or the “proposed actions”) as a result of its review of the Applications. In addition, HPD submitted a revised UDAAP project summary to the City Council to be reflected in the City Council’s resolution regarding the project, and the City stated certain intentions, as reflected in a letter dated September 27, 2012, from Robert K. Steel, Deputy Mayor for Economic Development, to Councilmember Margaret Chin. Those modifications were assessed in a Technical Memorandum dated October 1, 2012 (Technical Memorandum 001). The modifications assessed in Technical Memorandum 001 increased the number of residential units in the RWCDS to 1,000 from the 900 units assessed in the FGEIS, included the potential for a school on Site 5 as part of the RWCDS, and revised the LSGD ground floor plans for Sites 2, 3, and 4 to eliminate the second waiver to the ground floor frontage requirements. Technical Memorandum 001 concluded that the modifications to the proposed actions would not result in any significant adverse environmental impacts that were not previously identified in the FGEIS.

Further, DCP reviewed a minor modification to the Applications, which was proposed by NYCEDC and HPD, in Technical Memorandum 002 (October 22, 2012). The modification increased the size of the proposed open space on Site 5 to 15,000 square feet from the 10,000 square feet assessed in the FGEIS. Technical Memorandum 002 concluded that the modification would not result in any significant adverse environmental impacts not already identified in the FGEIS.

SITE PLAN AND URBAN DESIGN

As assessed in the FGEIS, the RWCDS program included up to approximately 1.7 million gsf (1.648 million zoning square feet) of mixed-use residential, commercial development, and community facility use (see **Figure 2** for an illustrative rendering). The proposed development included relocating the existing Essex Street Market on Site 9 to a new, larger facility on Site 2. The new public market was over 29,000 gsf and was expected to accommodate 35 to 65 vendors (depending on the size of each stall). The larger space was intended to create entrepreneurship opportunities for additional vendors and to allow for a variety of vendor price points. A new facility is an opportunity for capital investment in the market to address many of the physical limitations of the existing facility. The new market facility would have an improved internal layout, better connections with the street, and expanded common gathering areas for public seating and market events. In addition, the new facility would be energy efficient, be fully compliant with the Americans with Disabilities Act (ADA), and have improved storage capabilities, garbage handling, and climate control. The City would give existing vendors at the time of the move the first opportunity to relocate their business to the new market facility, when the new facility on Site 2 is complete and ready for occupancy.

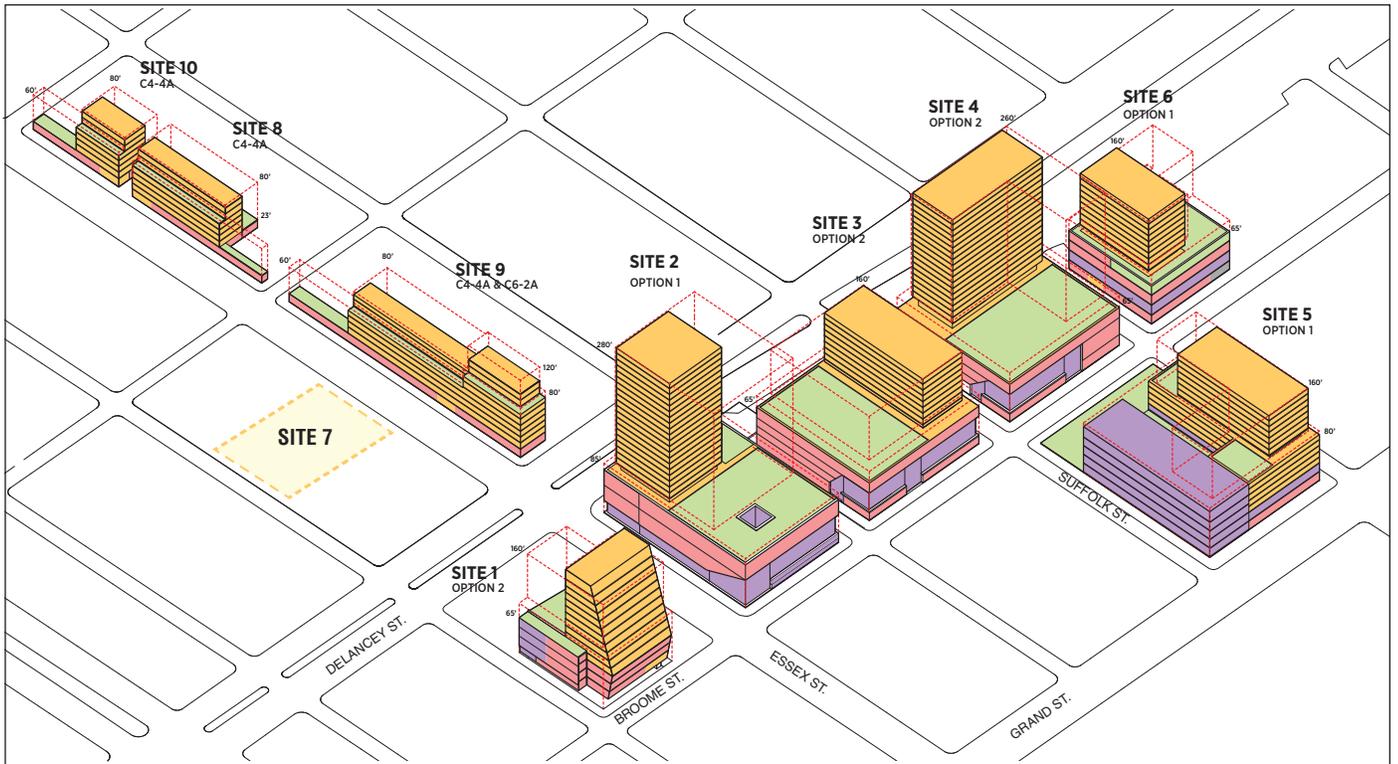
The urban design for the proposed Seward Park Mixed-Use Development project built on the framework laid out in the CB3 urban design principles. The general concept for the massing incorporated elements from the building forms of the surrounding neighborhood, which vary from low-rise walk-ups to large towers-in-the-park. The project incorporated a connected street



FOR ILLUSTRATIVE PURPOSES ONLY

FGEIS Illustrative Rendering with Maximum Building Envelopes and RWCDs Massing

*Site 7 would not be redeveloped under the approved program or the Essex Crossing Program



FOR ILLUSTRATIVE PURPOSES ONLY

Proposed Essex Crossing Development

Proposed Essex Crossing and Illustrative FGEIS Renderings
View Northwest
Figure 2

grid, and new buildings had retail and residential entrances on multiple sides to create ground-floor activity and provide necessary access. The buildings incorporated streetwall design characteristics that were intended to activate the pedestrian realm and setback towers to permit access to light and air. The development project maximized street-level uses such as retail that would support pedestrian activity throughout the development. A publicly accessible open space of approximately 10,000 square feet with a mix of active and/or passive recreation uses was incorporated into the development as well. (After completion of the FGEIS, the size of the proposed open space was enlarged to 15,000 square feet, as assessed in Technical Memorandum 002.) The proposed development was expected to include up to 500 parking spaces on up to four sites (Sites 2 through 5).

To allow for comprehensive planning for the project site and to allow flexibility in design and massing, including the ability to distribute floor area across lots and modify bulk distribution, height, and placement of buildings, the City approved LSGD special permits that apply to Sites 1 through 6 (see **Figure 3**). The LSGD establishes a maximum building envelope for each site, which is the three-dimensional space on the zoning lot within which a structure can be built, as permitted by applicable height, setback, and yard controls. Each of the maximum zoning envelopes on Sites 1 through 6 would be larger in terms of height, massing, tower locations, and floor area than what can ultimately be built on each development site to allow for flexibility of design. Buildings on Sites 1 through 6 would be massed with multiple setbacks, and the envelopes establish base heights of between 60 and 85 feet (6–8 stories), with varying heights above. The upper portions of all buildings would be set back at least 10 feet from Delancey, Essex, Clinton, and Grand Streets, and 15 feet from Ludlow, Broome, Norfolk, and Suffolk Streets. The maximum building envelopes allow potential towers on Sites 2 and 4 of up to 285 feet and 260 feet to the roof parapets, respectively (up to approximately 24 stories), and building heights of up to 160 feet to the roof parapets (up to approximately 14 stories) on Sites 1, 3, 5, and 6. Sites 8, 9, and 10 would be consistent with massing requirements and maximum heights allowable under existing zoning. **Figures 4a and 4b** show the massing controls and potential massings (in plan) for structures developed within the maximum building envelopes on Sites 1 through 6. **Figure 2** shows an illustrative rendering of the proposed development; Sites 1 through 6 are shown with illustrative massings rendered within the maximum building envelopes.

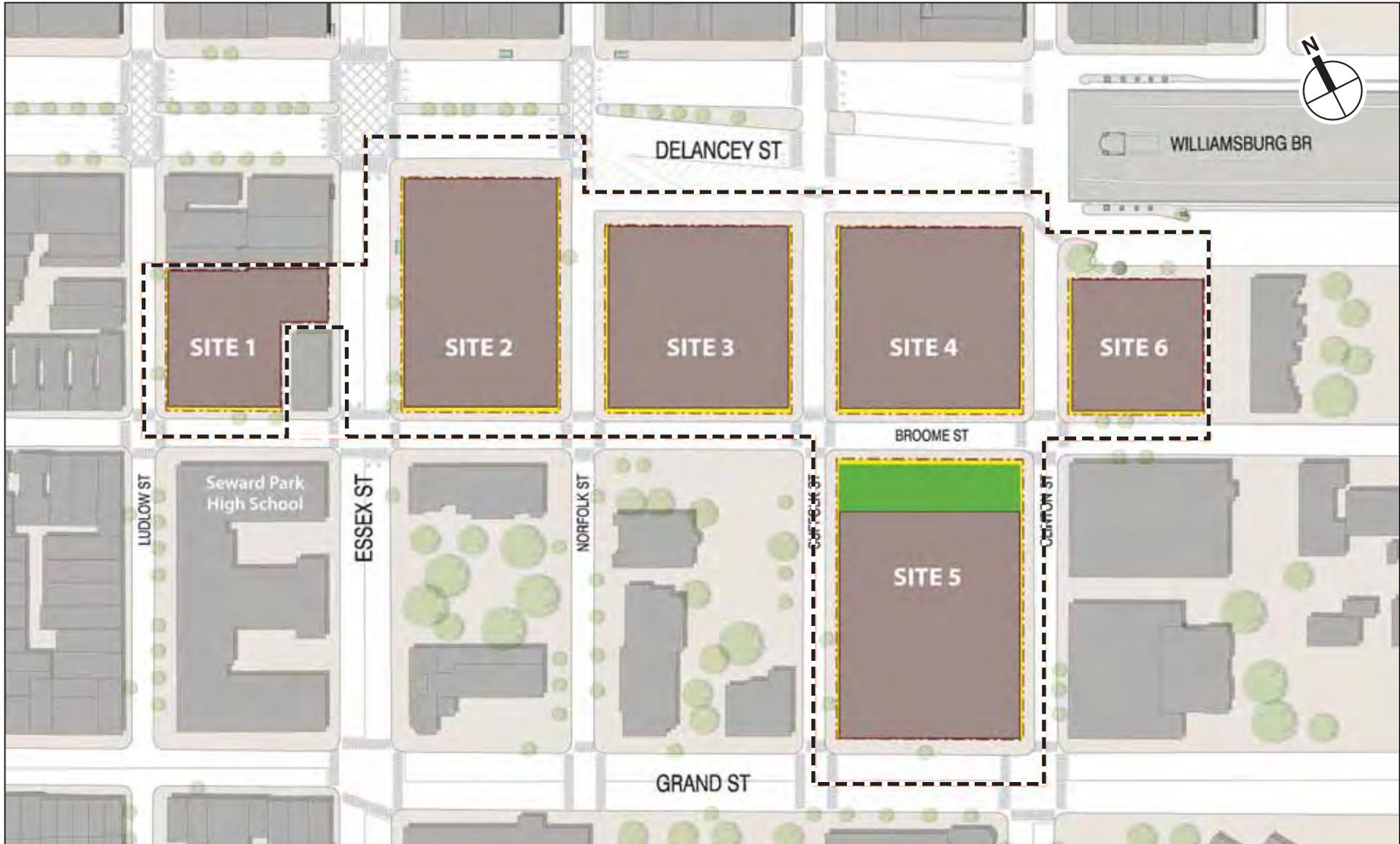
The proposed land uses and illustrative massings assessed in the FGEIS were intended to be illustrative of a possible configuration of the proposed uses and the possible interactions among those proposed uses across the project site.

REASONABLE WORST-CASE DEVELOPMENT SCENARIO

As described above, the City developed a maximum development envelope, or RWCDS, for CEQR analysis purposes, because the approved actions would allow for a range of new developments on the project site. The RWCDS was developed by establishing the maximum buildable floor area allowed under zoning (approximately 1.648 million zoning square feet) and assigning a 60 percent to 40 percent ratio of residential floor area to commercial floor area, in addition to community facilities use.

Site Program

Under the RWCDS, the FGEIS assumed that the proposed actions would result in approximately 951,000 gsf of residential development (comprising 900 dwelling units, in accordance with the UDAAP application, of which half would be affordable units); up to approximately 632,300 gsf

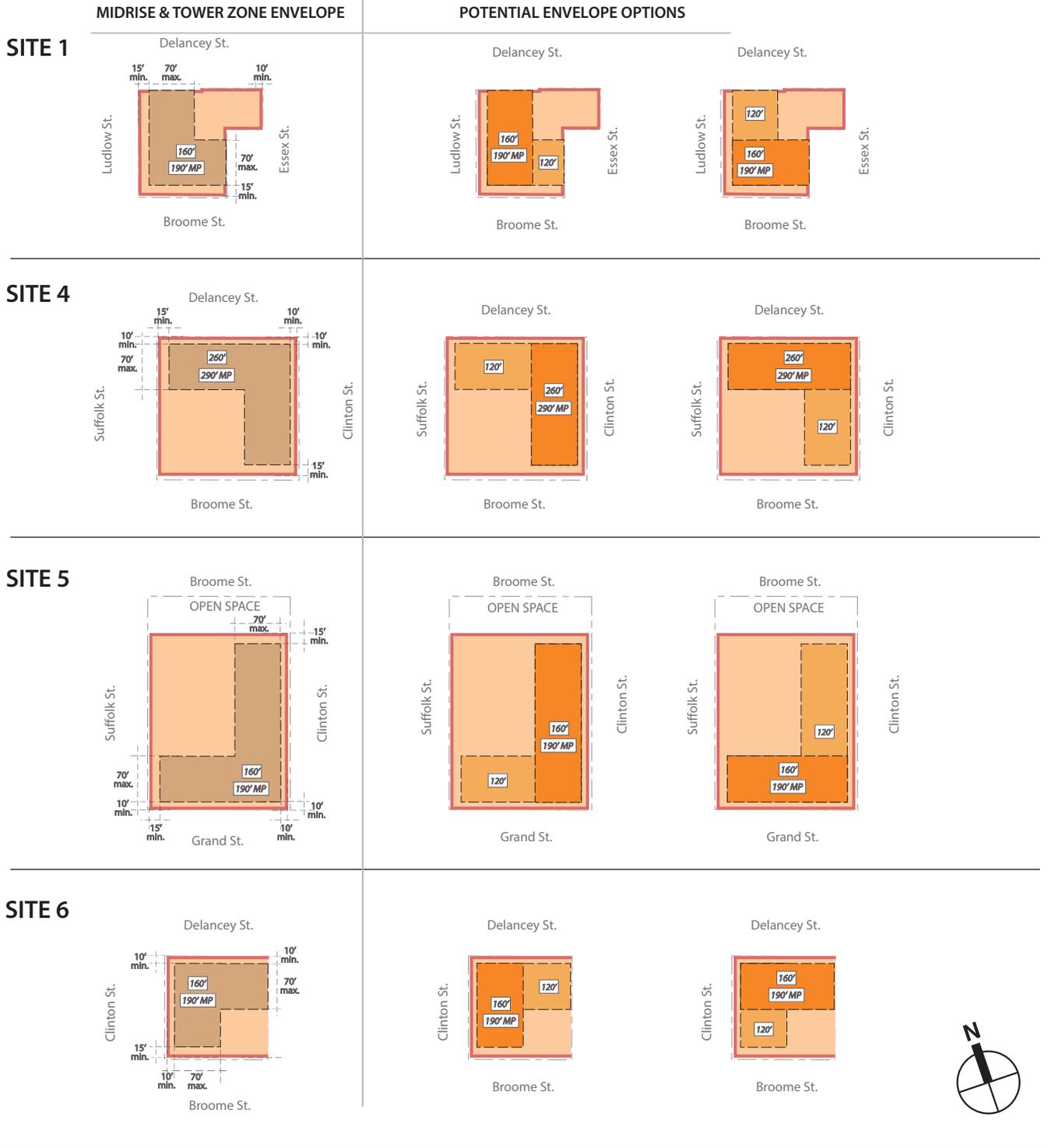


FOR ILLUSTRATIVE PURPOSES ONLY

- Building Footprint
- Large Scale General Development Boundary
- Publicly Accessible Open Space
- Sidewalk Widening

NOT TO SCALE

NOTE: This figure has been revised for the FGEIS.



LEGEND AND NOTES

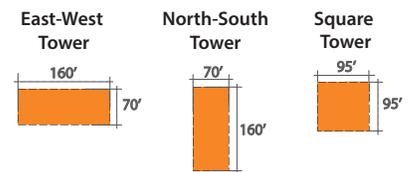
- Proposed Lot Lines
- Building Footprint
- Street Wall
- Midrise
- Tower
- Midrise only Zone
- Midrise and Tower Zone
- Maximum building height (excluding rooftop mechanical) shall not exceed number of stories as noted
- Maximum building height including rooftop mechanical

DESIGN CONTROLS

TOWER ORIENTATION:
Towers to be oriented to create variety.

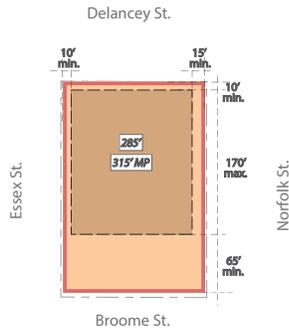
BUILDING SETBACKS:
Maximum base heights to be minimum 60' and maximum 85' high
Above the base, building to setback 10' (wide street) or 15' (narrow street) per zoning, except along Clinton Street where 10' setbacks are permissible.
Midrise levels to be maximum height of 120'

MAXIMUM TOWER DIMENSIONS (ABOVE 120')

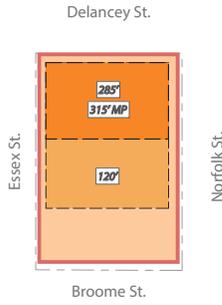


SITE 2

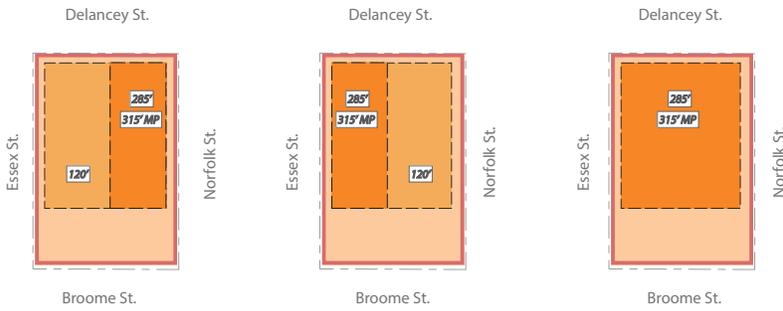
MIDRISE & TOWER ZONE ENVELOPE



POTENTIAL ENVELOPE OPTIONS



ADDITIONAL MASSING ALTERNATES



LEGEND AND NOTES

- Proposed Lot Lines
- Building Footprint
- Street Wall
- Midrise
- Tower
- Midrise only Zone
- Midrise and Tower Zone
- Maximum building height (excluding rooftop mechanical) shall not exceed number of stories as noted
- Maximum building height including rooftop mechanical

DESIGN CONTROLS

TOWER ORIENTATION:

Towers to be oriented to create variety.

BUILDING SETBACKS:

Maximum base heights to be minimum 60' and maximum 85' high

Above the base, building to setback 10' (wide street) or 15' (narrow street) per zoning, except along Clinton Street where 10' setbacks are permissible.

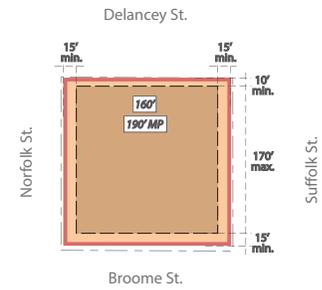
Midrise levels to be maximum height of 120'

MAXIMUM TOWER DIMENSIONS (ABOVE 120')

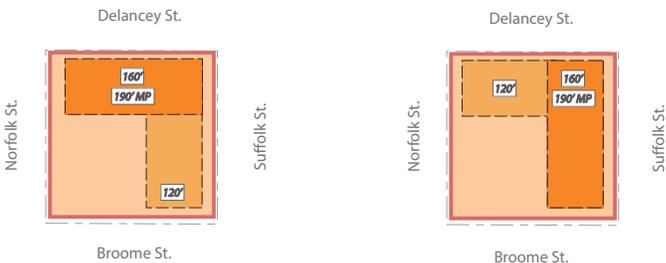


SITE 3

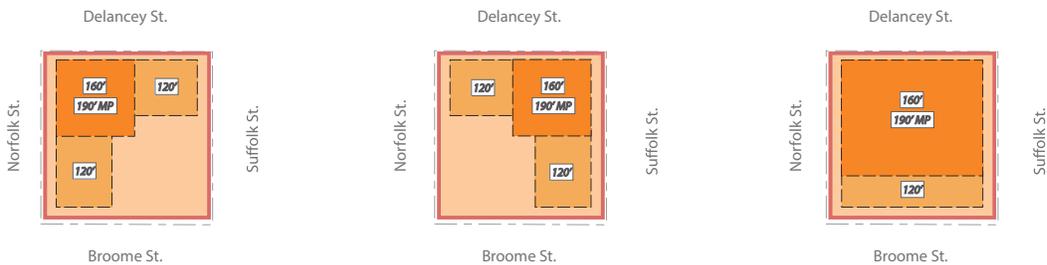
MIDRISE & TOWER ZONE ENVELOPE



POTENTIAL ENVELOPE OPTIONS



ADDITIONAL MASSING ALTERNATES



of commercial space; approximately 114,000 gsf of community facility or cultural uses; up to 500 parking spaces; and an approximately 10,000-square-foot publicly accessible open space on Site 5 (subsequently increased to 15,000 square feet). The commercial space included up to approximately 469,350 gsf of retail (including a grocery store), over 29,000 square feet of public market space, an approximately 97,500-square-foot hotel, and approximately 36,300 gsf of non-specific commercial uses. The site-specific program assessed in the FGEIS was illustrative only and for analysis purposes only, and it was not meant to indicate an actual development program. Pursuant to the proposed actions, the existing Essex Street Market, which is located on Site 9, would be relocated to a new, expanded public market facility on Site 2.

Residential

One of the goals of the proposed actions was to allow for the development of a mixed-income residential development. Under the RWCDS, approximately 951,000 gsf of residential development would be developed comprising 900 dwelling units (subsequently increased to 1,000 units). As contemplated in the RWCDS, these residential units would be developed on all the sites with the exception of Site 2. Half of these dwelling units would be dedicated for affordable housing and would include a mix of affordable housing options such as senior housing.

Commercial

In order to facilitate development flexibility, a wide range of commercial uses is allowed under the LSGD plan. These commercial uses, totaling approximately 632,300 gsf, were expected to include retail, such as local and neighborhood services and some retail stores with a larger draw; a public market, which represents the relocation and expansion of the existing Essex Street Market; and other commercial uses such as offices. The FGEIS also included the analysis of a 200-room hotel and a grocery store.

Community Facility

The RWCDS included a total of approximately 114,000 gsf of community facility or cultural space that would be distributed among Sites 1 through 6.

Parking and Circulation

As noted above, Site 7 would remain a municipal public parking garage with a capacity of 362 spaces. In addition, the project proposed the inclusion of up to 500 parking spaces on up to four of the development sites to meet the project's demand and to replace the number of public parking spaces that could be lost as a result of the proposed actions. The proposed development sought approval for four special permits to allow for these additional public parking facilities on Sites 2 through 5 within the LSGD. The RWCDS assumed that Sites 2 through 5 would provide the parking in approximately 314,500 gsf of below-grade space, which is a reasonable worst-case assumption for the maximum amount of below-grade space required to allow up to 500 parking spaces on up to four sites.

SIGNIFICANT ADVERSE IMPACTS TO HISTORIC AND CULTURAL RESOURCES

Under the Seward Park Mixed-Use Development project, the four S/NR-eligible buildings of the Essex Street Market (located on Sites 2, 8, 9, and 10) would be redeveloped. The market building at 78-90 Essex Street on Site 2 was expected to be replaced by an approximately 355,000-gsf, 285-foot-tall building that would contain a new market facility, the market building

at 96-124 Essex Street on Site 9 was expected to be replaced by an approximately 94,000-gsf, 80- to 120-foot-tall building, the market building at 130-144 Essex Street on Site 8 was expected to be replaced by an approximately 46,000-gsf, 80-foot-tall building, and the market building at 150 Essex Street on Site 10 was expected to be replaced by an approximately 26,000-gsf, 80-foot-tall building. Therefore, the FGEIS concluded that the proposed development would have a direct significant adverse impact on each Essex Street Market building and on the four-building market complex as a whole. Measures that could partially mitigate these significant adverse impacts were described in Chapter 21, “Mitigation Measures” of the FGEIS.

The development of an approximately 311,000-gsf, 160-foot-tall building and a 10,000-square-foot publicly accessible open space on Site 5 was expected to replace the S/NR-eligible former fire station at 185 Broome Street. Therefore, the FGEIS concluded that the proposed development would have a direct significant adverse impact on this architectural resource. Measures that could partially mitigate this significant adverse impact were described in Chapter 21, “Mitigation Measures” of the FGEIS.

PROPOSED ESSEX CROSSING PROJECT

Since the issuance of the 2012 FGEIS and subsequent Technical Memoranda 001 and 002, the City of New York issued a developer’s RFP for the sites and selected DSA as the designated developer for the project site. DSA has proposed a specific program for each site and specific buildings designs for the six sites located within the LSGD (Sites 1-6). Like the FGEIS, Site 7, a public parking garage, would not be redeveloped under the proposed program. Development of Sites 8-10 are further out in the completion timeline and thus are not as developed as those for Sites 1-6. The proposed Essex Crossing program is different from the program analyzed in the 2012 FGEIS and subsequent Technical Memoranda 001 and 002 (“approved program”). Primary differences in the Essex Crossing program for Sites 1-6 include: an increase in public market space; a reduction of retail space; removing the hotel; adding sub-grade retail space, a gym (Physical Culture Establishment), movie theater, bowling alley, and museum space; increasing the amount of professional office space; and reducing the number of parking spaces. With the Essex Crossing program, the same uses would be introduced on Sites 8, 9, and 10 as the approved program; however, there would be shifts in retail and residential space on these sites with the Essex Crossing program.

The proposed Essex Crossing program would introduce an approximately 1.98 million-gsf mixed-use development, which would be about 16.6 percent larger than the 1.70 million-gsf approved program. The proposed buildings on Sites 1-4 and 6 would be within the limits of the maximum zoning envelopes established according to the LSGD rules and the future developments on Sites 8, 9, and 10 would be compliant with zoning (see **Figure 2**). Like the approved program, the proposed Essex Crossing program would provide 1,000 residential units. Of these residential units, there would be approximately 400 affordable units and 100 affordable senior housing units.

The proposed Essex Crossing program would introduce 732,433 gsf of commercial space, including retail, public market, office, and other uses described below. The commercial program is 16 percent larger than the commercial space envisioned in the approved program (632,255 square feet). The commercial space would include approximately 335,155 gsf of retail space (including 43,028 gsf of public market space and 292,127 gsf of local and destination retail space). The total amount of retail is lower than the approved plan’s 498,501 square feet of retail that includes 469,349 square feet of local and destination retail and 29,152 square feet of public

market space. The proposed Essex Crossing program would introduce more office space (254,255 gsf) compared with the approved program. In comparison, the approved program assumed approximately 36,300 square feet of non-specific commercial uses, some of which could be office space. The proposed Essex Crossing program would not include a hotel, which was part of the approved program. The proposed Essex Crossing program would introduce commercial uses that were not part of the approved program, including: a bowling alley, museum, and gym (Physical Culture Establishment) on Site 1; a movie theater on Site 2; and below-grade retail space (the Market Line) on Sites 2, 3, and 4. The Market Line retail space at these sites would be connected underground. Further, while the FGEIS and ULURP approval contemplated special permits that would accommodate the potential for up to 500 parking spaces spread among three sites, the Essex Crossing program would provide only 98 public parking spaces on Site 5. As assessed in Technical Memorandum 001, the proposed development would reserve space on Site 5 for a public school, and as assessed in Technical Memorandum 002, the proposed development would create an approximately 15,000-square-foot public open space on Site 5.

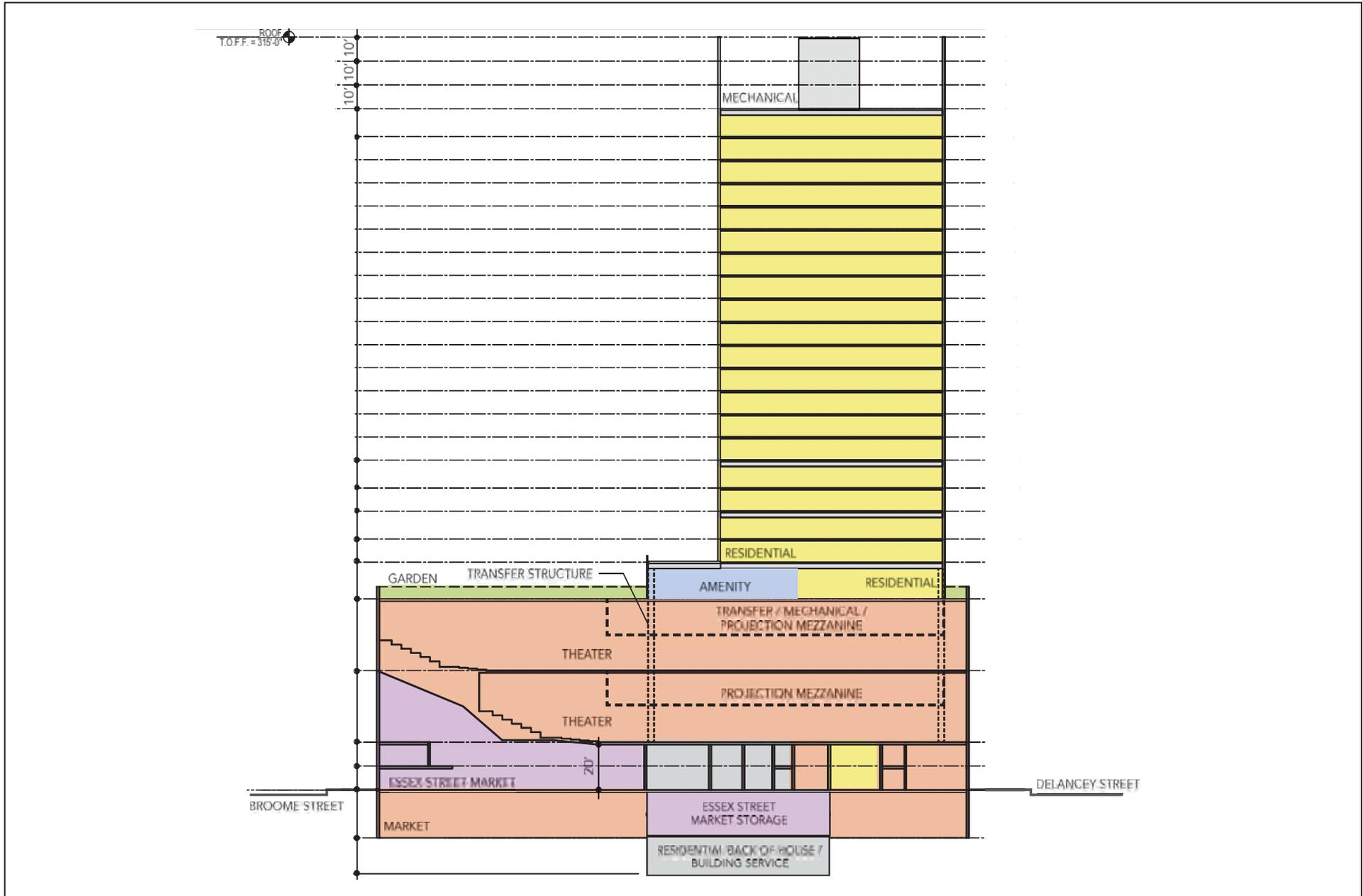
As OPRHP requested an analysis of alternatives specific to Sites 2 and 5, because those two sites would receive construction financing through NYCHDC and they contain architectural resources that would be demolished by the Essex Crossing program, the specific developments programs for Sites 2 and 5 are described below.

SITE 2

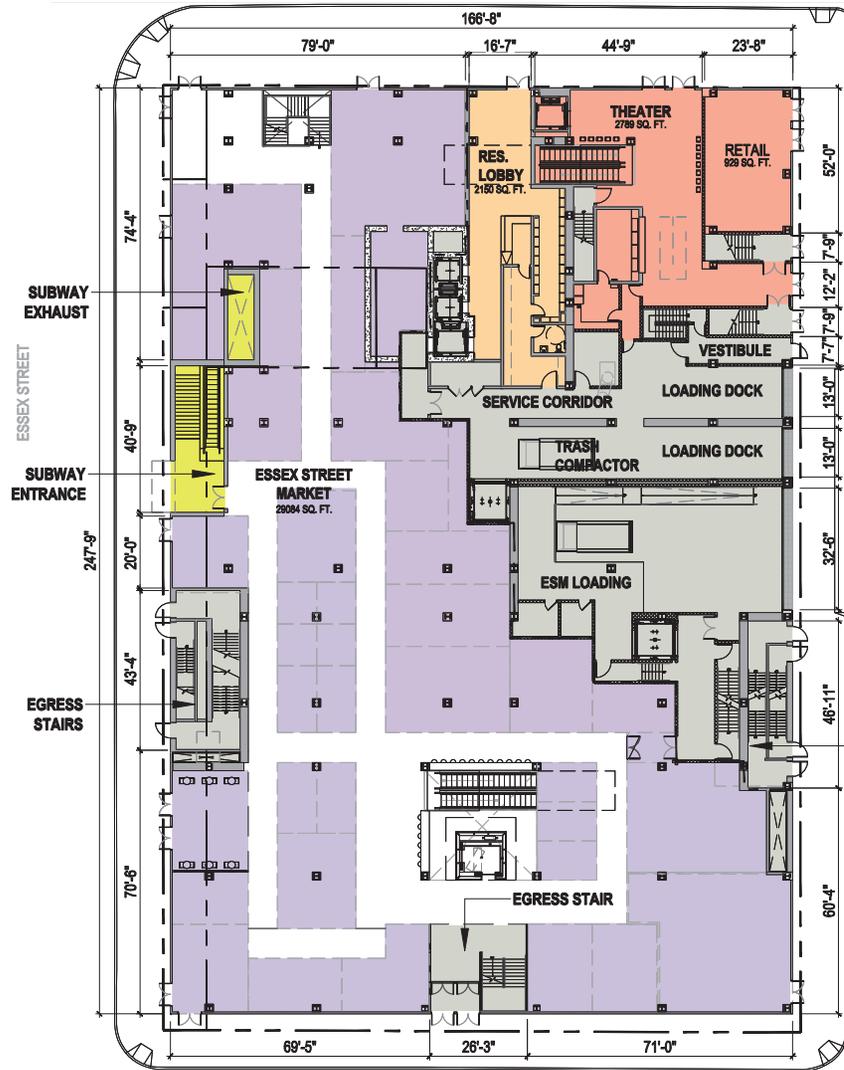
DSA proposes to construct a 388,100-gsf building on Site 2, which would be approximately 32,900 gsf larger than the 355,200-gsf RWCDs building that was analyzed in the FGEIS and Technical Memorandum 001. As proposed by DSA, the building on Site 2 would include 187,195 gsf of residential space (195 units, of which 98 units would be affordable), whereas the approved program assumed that Site 2 would include a 200-room hotel. In addition, the relocated and expanded Essex Street Market would increase to approximately 43,028 gsf from the 29,152 gsf assessed in the FGEIS and Technical Memorandum 001. In addition to the Essex Street Market, Site 2 would have retail in a below-grade space called the Market Line that would run under Norfolk Street to the building on Site 3 and continue under Suffolk Street to the building on Site 4. DSA intends the Market Line's smaller sized retailers to expand the breadth of goods and services available on the development sites and in the neighborhood. The 2nd and 3rd levels of the building on Site 2 would have a movie theater. The Market Line and movie theater are new program elements that were not evaluated in the FGEIS or Technical Memorandum 001. In addition, a roof top farm, which is envisioned on the roof of the third floor facing Broome Street, is currently envisioned to have an outdoor growing area. See **Figure 5** for a building section and **Figure 6** for the ground floor plan.

The proposed building would fit within the maximum zoning envelope assessed in the FGEIS. Consistent with the LSGD design controls for Site 2, the proposed building would have a square tower on Delancey Street. The tower would be 285 feet to the roof and 315 feet to the top of the mechanical bulkhead in compliance with the maximum tower heights for the site. The proposed building would not have a mid-rise portion, and the base height would be 80 feet in compliance with the minimum and maximum base heights for the site. The proposed building would also be in compliance with tower dimension, streetwall, and setback controls.

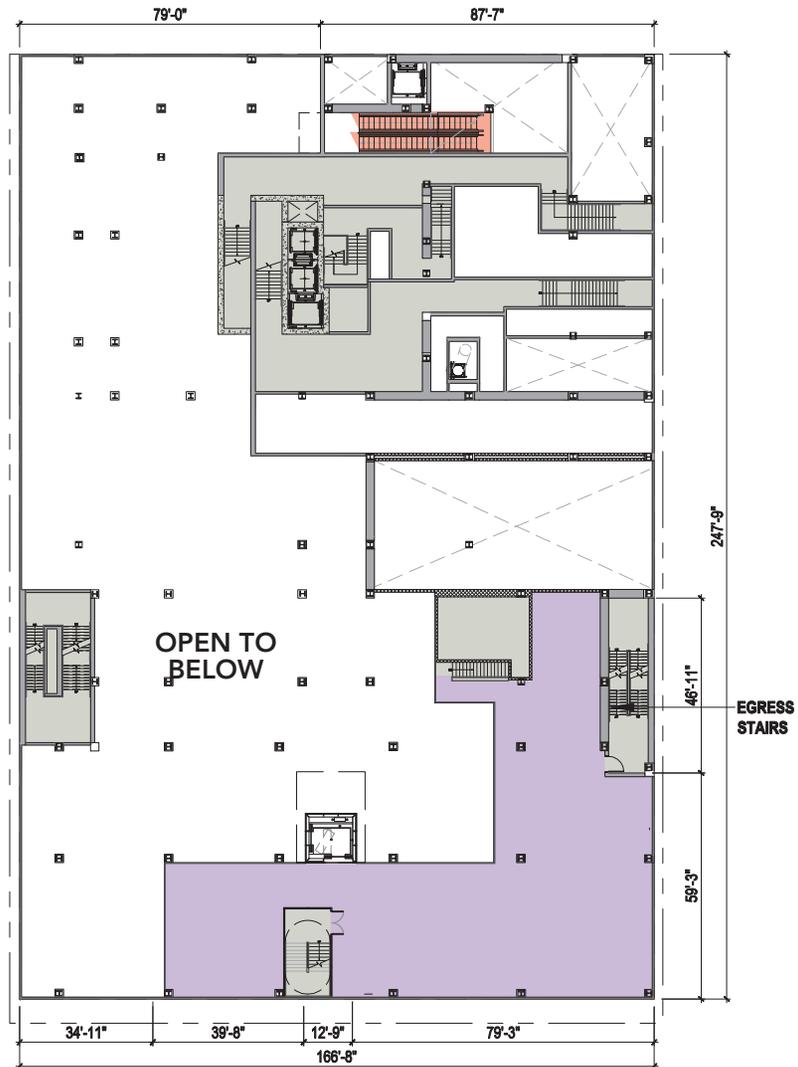
Like the RWCDs assessed in the FGEIS and Technical Memorandum 001, the Essex Crossing project would demolish the Essex Street Market Building on Site 2.



Site 2 Building North-South Section
Figure 5



LEVEL 1 - GROUND FLOOR
SCALE: 1/32" = 1'-0"



LEVEL 1M - ESSEX STREET MARKET MEZZANINE
SCALE: 1/32" = 1'-0"

SITE 5

The proposed building on Site 5 would be 344,544 gsf, which would be approximately 1,086 gsf larger than the building analyzed in Technical Memorandum 001. The proposed building would contain 193,296 gsf of residential space (211 residential units, of which 104 units would be affordable) and 72,743 gsf of retail space. While the FGEIS and ULURP approval contemplated special permits that would accommodate the potential for up to 500 parking spaces spread across three sites, the Essex Crossing program proposes only 98 public parking spaces on Site 5. The entrance to the parking garage and the building's loading dock would be located on Clinton Street, whereas the parking and loading entrances to the RWCDs development on Site 5 were assumed in the FGEIS to be located on Suffolk Street. See **Figure 7** for a building rendering.

As assessed in Technical Memorandum 002, the proposed development on Site 5 would include a 15,000-square-foot public open space on the Broome Street portion of the site, and the proposed development on Site 5 is reserving an approximately 15,400-square-foot portion of the site fronting on Grand and Suffolk Streets for the potential future use of a school as assessed in Technical Memorandum 001. The Essex Crossing program contemplates a 75,000-gsf school, while Technical Memorandum 001 analyzed a 66,000-gsf school. The proposed building would fit within the maximum zoning envelope assessed in the FGEIS. However, DSA is seeking a minor modification to the LSGD design controls for Site 5 to reduce the 60-foot minimum base height on the Clinton Street frontage of the site. The proposed modification would permit the base height of the proposed building on Site 5 along Clinton Street 50 feet beyond the intersection with Grand Street and along the proposed open space to be set as low as 29 feet. Allowing for a lower streetwall in those locations is necessary to allow the building to set back at a lower level so that the residential tower can begin at the third floor. Without the proposed modification, residential tower floors three through six would be required to be built to the streetline of Clinton Street, conflicting with the otherwise efficient floor plans for the residential tower. With the proposed modification, the perimeter of floors three through six would align with the seventh floor in the above residential tower. See **Figure 8a** for the LSGD building envelope diagrams for Site 5 and **Figure 8b** for the proposed massing with the minor modification.

With the exception of the reduced base height, the proposed building would comply with all of the LSGD design controls. Consistent with the LSGD design controls for Site 5, the proposed building would have a tower on Clinton Street, which would be 160 feet to the roof and 180 feet to the top of the mechanical bulkhead in compliance with the maximum tower heights for the site, and it would comply with the tower dimension controls. The proposed building would not have a mid-rise portion, and the base height on Grand Street would be 78 feet in compliance with the minimum and maximum base heights for the site. The proposed building would also be in compliance with streetwall and setback controls.

In November 2014, the Parks, Recreation, Cultural Affairs, Landmarks, & Waterfront committee of CB3 approved the proposed design of the open space on Site 5. The 15,000-square-foot publically accessible open space would be located on the northern, Broome Street portion of Site 5, occupying a parcel that measures approximately 200 feet by 77 feet. The proposed open space would contain landscaped areas spaced throughout the park, seating areas, and a play area for children. There would be no perimeter fencing.

Like the RWCDs assessed in the FGEIS and Technical Memoranda 001 and 002, the Essex Crossing project would demolish the former fire station on Site 5, which is located within the footprint of the proposed open space and extends into the footprint of the proposed building.

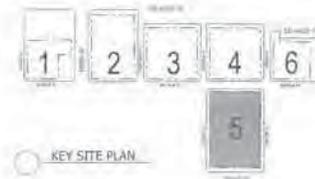
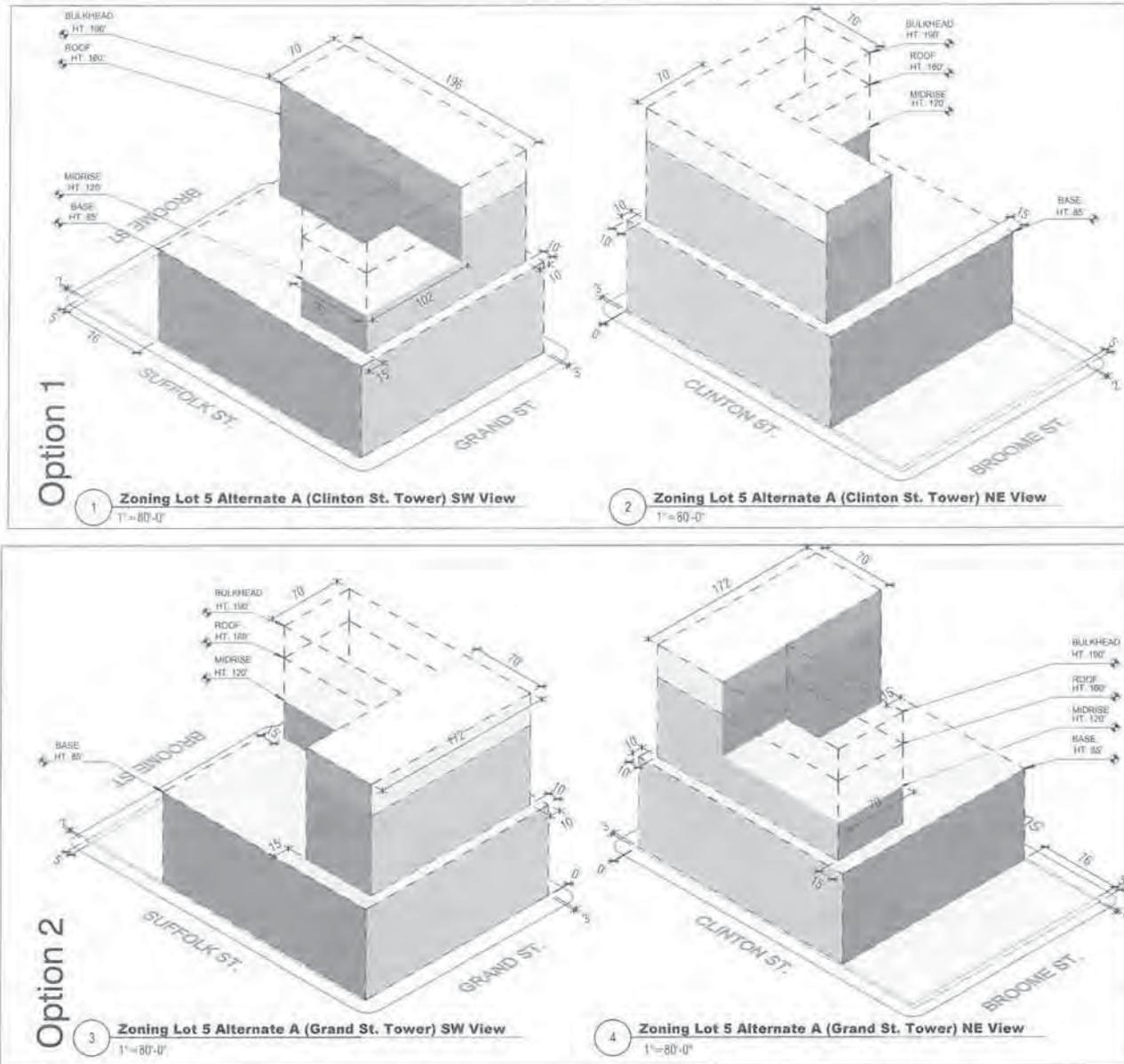


SITE FOR POTENTIAL SCHOOL

PROPOSED OPEN SPACE

FOR ILLUSTRATIVE PURPOSES ONLY

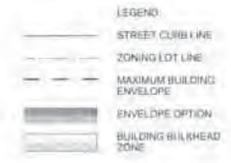
Site 5 Building Rendering
Aerial View North
Figure 7

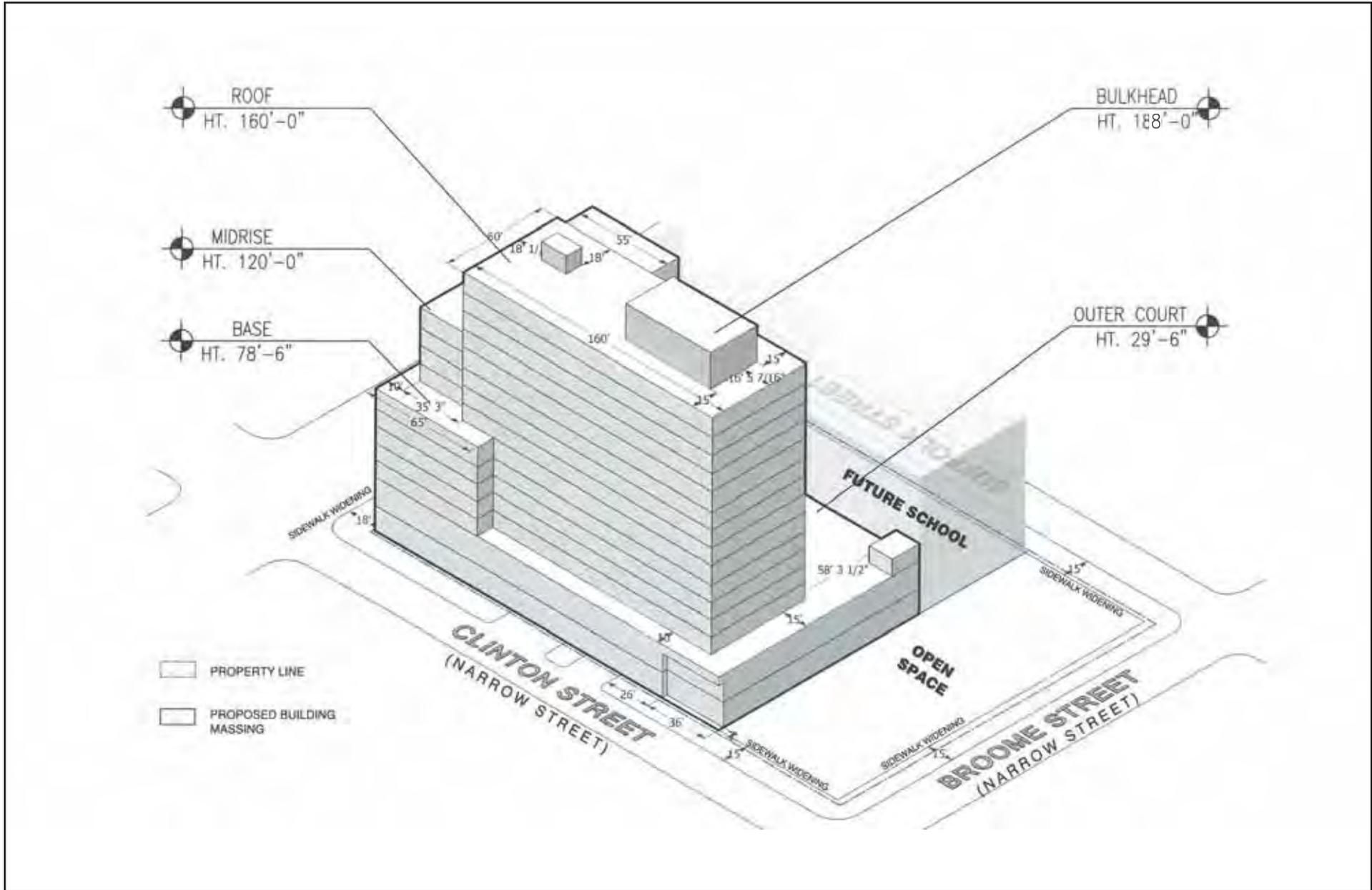


DESIGN CONTROLS

Bulk, Height and Setback

1. Envelope heights are relative to the Base Plane (see Sheet 504M)
2. The base or streetwall portions of Site 5 will have a minimum height of 60' and a maximum height of 85', except as indicated in Note 6
3. The midrise portions of all buildings developed pursuant to the approved Large-Scale General Development will have a maximum height of 120'
4. For Zoning Lot 5, Options 1 and 2, the envelope option volume indicates the maximum extent of the base and midrise portions of the building. The tower portion of the building may be located anywhere above the building base within the respective envelope options shown. In both options, the tower will be limited to a maximum length of 160' and a maximum width of 70'.
5. Elevator or stair bulkheads (including shafts, and vestibules not larger than 60 square feet in area providing access to a roof), roof water tanks and accessory mechanical equipment (including enclosures), other than solar or wind energy systems, shall be permitted to exceed the maximum building (roof) heights approved in the LSGD, up to a maximum bulkhead height of 30 feet, provided that:
 - i. such obstructions shall be located not less than 10 feet from the street wall of a building, except that such obstructions need not be set back more than 25 feet from a narrow street line or more than 20 feet from a wide street line. However, such restrictions on location shall not apply to elevator or stair bulkheads (including shafts or vestibules), provided the aggregate width of street walls of such bulkheads within 10 feet of a street wall, facing each street frontage, times their average height, in feet, does not exceed an area equal to four feet times the width, in feet, of the street wall of the building facing such frontage.
 - ii. all mechanical equipment shall be screened on all sides.
 - iii. such obstructions and screening are contained within a volume that complies with one of the following:
 - a. the product, in square feet, of the aggregate width of street walls of such obstructions facing each street frontage, times their average height, shall not exceed an area equal to eight feet times the width, in feet, of the street wall of the building facing such frontage; or
 - b. the lot coverage of all such obstructions does not exceed 20 percent of the lot coverage of the building.
6. The base height along the Publicly Accessible Open Space and on Clinton Street beyond 50 feet of its intersection with Broome Street shall have a minimum height of 29 feet.





C. EXISTING CONDITIONS OF SITES 2 AND 5

FORMER ESSEX STREET MARKET BUILDING (SITE 2)

Site 2 contains the former Essex Street Market building (S/NR-eligible) at 78-90 Essex Street (see **Figure 9**). The City of New York, under the administration of Fiorello LaGuardia, built the four Art Moderne buildings of the Essex Street Market in 1939 as part of a citywide program to address sanitation issues and relieve street congestion from pushcart vendors by providing indoor retail space. The Essex Street Market was the fourth of the City's enclosed retail markets, and when it opened it provided 475 spaces for vendors who had previously operated pushcarts in the open-air markets along Orchard, Hester, Grand, Rivington, Stanton, and East Houston Streets. Simply designed, the brick market buildings feature steel sash strip windows and concrete panels with incised lettering that reads "Essex Street Retail Market." In the early 1960s, the City sought to close the remaining six or seven enclosed retail markets, including the Essex Street Market. However, the City leased the Essex Street Market to the remaining 120 vendors in 1966. In the 1980s, the City considered redevelopment proposals for the Essex Street Market buildings and, with 59 tenants remaining, leased the market to a private developer in 1988. NYCEDC took over the management of the market in 1995 and consolidated the remaining vendors from two buildings into the one building at 96-124 Essex Street (located on Site 9). This is the only building that currently houses public market operations.

The Essex Street Market building at 78-90 Essex Street on Site 2 is the second largest of the four market buildings. It is vacant and most recently contained a diner and liquor store along the Delancey Street frontage. The incised lettering above the two entrances on Essex Street has been filled in but can be faintly discerned. A portion of the building overlaps the F and M subway platform below by 12 feet, and an escalator and stair exit to Essex Street through the building.

FORMER FIRE STATION (SITE 5)

The S/NR-eligible building at 185 Broome Street is the former fire station of Engine Company 17 and Hook & Ladder Company 18. It was built in 1937 by the Works Progress Administration and designed by James T. Treacy. Engine Company 17 was originally located at 91 Ludlow Street (built 1878), and Hook & Ladder Company 18 was originally located nearby on Attorney Street as early as 1897. In 1973, the two companies moved into a new station at Pitt and Delancey Streets that also contained the Seventh Police Precinct. That building still contains the police precinct and Hook & Ladder Company 18. Engine Company 17 was closed in 1991. The former fire station at 185 Broome Street is a two-story brick, stone, and concrete building designed in the Art Moderne style (see **Figure 10**). The Broome Street façade is articulated with multi-faceted brick piers with concrete capitals that provide a sense of verticality to the small, low-rise building. There are two large vehicular entrances. The building is currently vacant, and most recently housed a company that provided equipment and props for the motion picture industry.

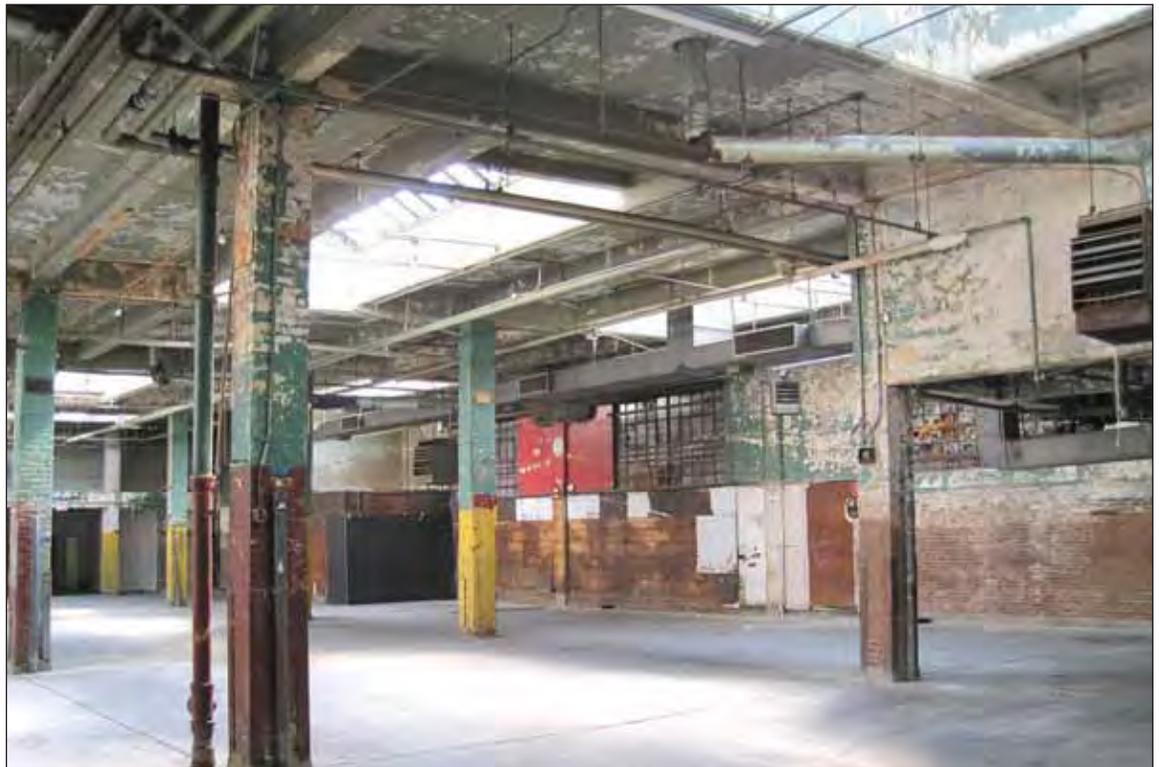
D. ALTERNATIVES

AVOIDANCE OF AN ADVERSE IMPACT—RETAIN AND REUSE THE ESSEX STREET MARKET BUILDING

To avoid an adverse impact on the Essex Street Market Building on Site 2, an alternative that retains and reuses the building without new construction or alterations to the building was



View southeast



Interior - View southwest

Essex Street Market Building D
Site 2
Figure 9



Interior - View south

Former Fire Station
Site 5
Figure 10

evaluated. Under this alternative, the Essex Street Market building would not be altered apart from basic restoration and regular maintenance. New development on Site 2 would be limited to the portion of the site occupied by the existing parking lot on the eastern side of the site. Therefore, leaving the market building in place would reduce the footprint of new development on Site 2, thereby providing less public market space and fewer residential units.

Under this alternative, the diner and liquor store spaces on the Delancey Street frontage of the market building could be re-tenanted with similar uses and a minimal amount of alteration as those retail spaces were occupied into 2014. The market hall, however, has been vacant since 1995. To renovate that space for new uses would likely require substantial upgrades to the building systems and roof. Assuming the long-vacant 15,265-square-foot market hall could be sufficiently renovated and upgraded to current building codes to accommodate new public market uses, it would provide substantially less public market space than would be provided by the Essex Crossing program, which would create a 43,028-square-foot public market on Site 2. Further, it would accommodate fewer vendors, and the renovated market hall would not include the expanded common gathering areas for public seating and market events. In addition, the renovated and reused space would be smaller than the proposed 29,152-square-foot market that was assessed for Site 2 in the FGEIS.

Constructed on a smaller footprint and limited to the envelope set by the LSGD, the new development on Site 2 under this alternative would be approximately 273,712 square feet; this alternative would, therefore, be approximately 114,388 square feet smaller than the 388,100-gsf building that would be built as part of the Essex Crossing program. With less overall floor area and smaller floorplates, the development would not be able to provide the total 195 residential units (of which 98 units would be affordable) that would be developed with the Essex Crossing program. This alternative would potentially have up to 40 fewer units. Further, a smaller development on Site 2 would result in less commercial space compared to the Essex Crossing program. The new development could potentially include public market space on the ground floor, but that new market use could not be connected to any potential market use in the retained Essex Street Market building as a large, uninterrupted market hall without compromising the integrity of the architectural resource.

Therefore, while this alternative would not result in a significant adverse impact to the Essex Street Market building, with a smaller public market, up to 40 fewer residential units, and less overall commercial space, this alternative would not be feasible as it would not meet the goals and objectives of the project as set forth above.

EXPANSION OF THE ESSEX STREET MARKET BUILDING

The potential for retaining the Essex Street Market building and building above it to accommodate the Essex Crossing program components for Site 2 was evaluated. As described below, this alternative would involve substantial alterations to the existing market building.

As described above, the proposed program for Site 2 includes a relocated and expanded Essex Street Market on the ground floor, cellar level retail to complement the Essex Street Market, a movie theater, and 195 residential units, of which 98 would be affordable to a range of incomes. The new market would provide ADA accessibility (unlike the existing Essex Street Market on Site 9), modern facilities and building systems, including garbage handling facilities (again, unlike the existing market on Site 9), and common gathering areas for public seating and market events. The new market would continue to serve the local community while attracting new customers. In its new location on Site 2, the social and cultural functions of the public market as

a local institution would continue without interruption and remain integral to the market's idiosyncratic identity.

Given the complexity of including diverse uses in a single building, including egress requirements for a structure with large assembly requirements (the movie theater), building above an active subway line, and maximizing the efficiency of the building in order to optimize the affordable housing, retaining the existing Essex Street Market building and building above it is not feasible. A new 285-foot-tall (to the roof) building would require a solid foundation, and the existing market building (which was constructed in 1939) lacks the structural capacity to support vertical expansion atop the building. Attempting to build over the existing building would require extensive new structural columns that would limit the usable programming of the ground floor, thereby compromising the size and goals of the new public market. Columns for the new development would need to be placed through the existing structure with new foundations constructed below the existing building for both above-grade and below-grade retail space. Further, the existing market building, which has largely been left vacant since 1995, would require significant rehabilitation and is not spatially feasible to house the newly expanded Essex Street Market and a movie theater above the roof. In addition, the street facades of the existing building, which are masonry with strip windows set near the roofline, do not accommodate the current requirements for transparency and accessibility for the new market set forth in the specifications issued by NYCEDC.

Additional interventions to the existing building would need to be made to accommodate other programmatic requirements of the new market. Construction of cellar storage for the new market (the existing building does not have a cellar) and the Market Line at a new cellar level that would complement the new Essex Street Market and would form a tunnel connection between sites 2, 3, and 4, would result in structural changes to the existing building. As part of the Essex Crossing program, DSA is required to relocate the existing fresh air intake for the subway station that currently runs underneath the existing market building and up the east façade to the roof. Demolishing the existing shaft and horizontal transition to construct a new intake system would result in the removal of much of the northern section of the building. Overall, this alternative would compromise the architectural integrity of the existing Essex Street Market building.

In conclusion, retaining the existing Essex Street Market building is not feasible. The existing building can not be incorporated into the new building while accommodating the structural and programmatic requirements of the Essex Crossing program. Much of the existing structure would be demolished in the course of constructing the new building. The existing building would impede foundation work required for the new building, and new construction would compromise the structural stability of the existing building and the goals for the new Essex Street Market.

AVOIDANCE OF AN ADVERSE IMPACT—RETAIN AND REUSE THE FORMER FIRE STATION

To avoid an adverse impact on the former fire station on Site 5, an alternative that retains and reuses most of the building was evaluated. As shown on **Figure 11**, the building is located within the site of the proposed open space, with the rear portion also extending within the footprint of the new building proposed for Site 5. Therefore, under this alternative, the rear portion of the fire station would be removed but no other alterations would be made apart from



 Site of Proposed Open Space

basic restoration and regular maintenance. This alternative would result in a reduction in the size of the proposed open space of approximately 4,000 square feet.

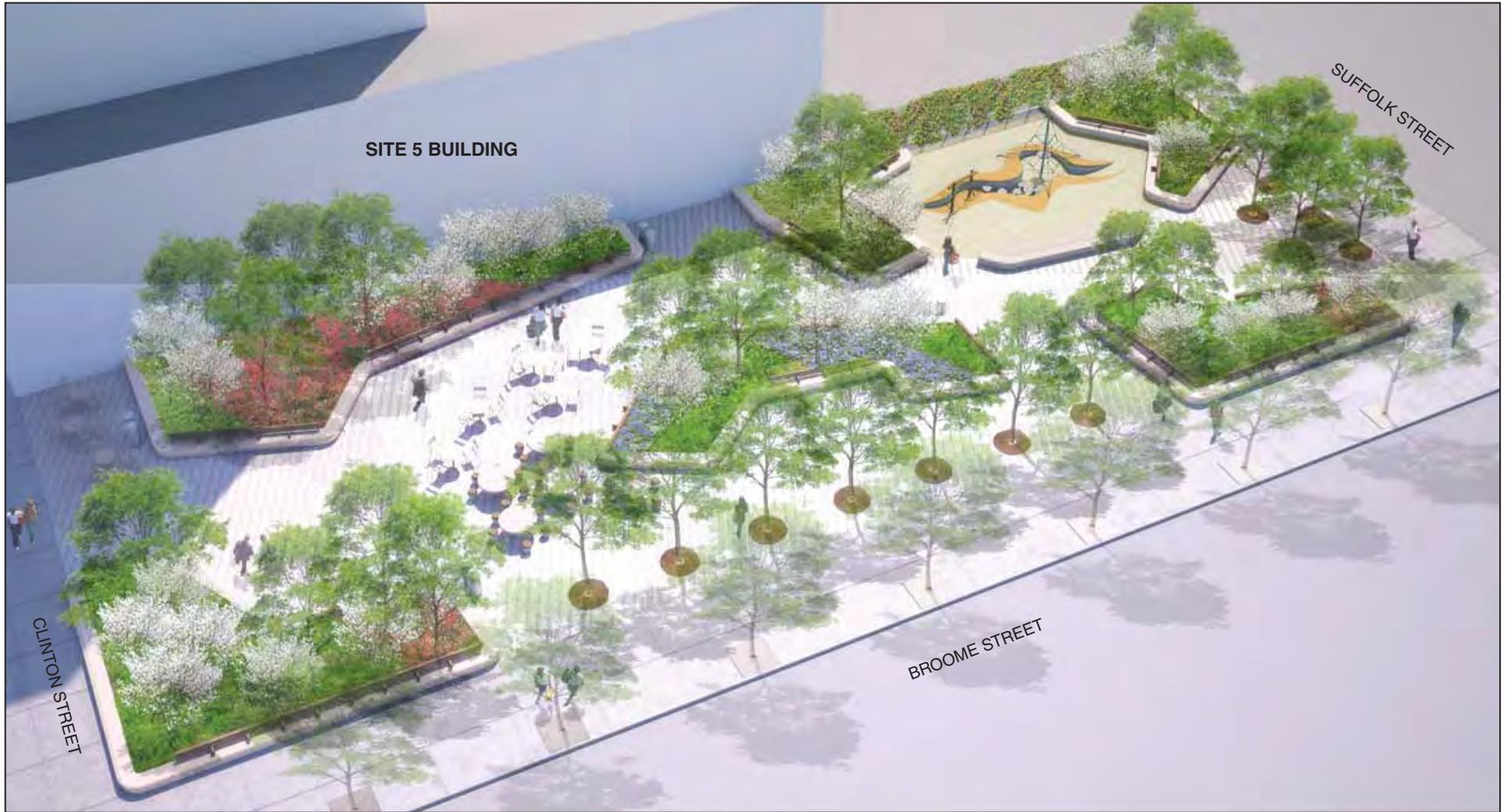
As described above, the fire station is located in the middle of the site of the 15,000-square-foot publicly-accessible open space. The building has an irregular footprint of approximately 4,000 square feet with a maximum width at the street of 54.64 feet, and retaining the front portion of the fire station would, therefore, result in a bifurcated open space with sections on the northwest and northeast corners of the site. The open space on the west side of the fire station would have a depth of 77 feet with a width that varies between approximately 84.43 feet and 102.54 feet for a total area of approximately 6,500 square feet; and the open space on the east side of the fire station would have dimensions of approximately 58.86 feet by 77 feet for a total area of approximately 4,500 square feet. The open space is conceived as a green oasis within a dense neighborhood, and it would serve passive and active uses, and it is designed so that users could move through the open space between distinct but connected elements (see **Figure 12**). Retaining the fire station in the middle of the site would compromise the usability and design of the open space, which has been approved by the CB3 Parks committee, and the total square footage of the two smaller open spaces would be approximately 4,000 square feet less than what would be provided with the Essex Crossing program. The open space is an important component of the overall project, and 15,000 square feet is a relatively small site to incorporate both active and passive uses. The LSGD includes a restrictive declaration binding the property and including specific requirements for the amount of planting, trees, seating, and play area to be included within the open space. Should the fire station be retained, the development on Site 5 would not be able to fulfill these requirements, which were designed to maximize diverse uses of the open space.

The public open space was a consistent element included in the four-year planning process conducted through monthly committee meetings with CB3 throughout 2008-2012, and Site 5 was selected for the location of the open space to be provided as part of the future development of the Seward Park Mixed-Use Development site, because Site 5 is the largest of the development sites and would, therefore, allow for a feasibly sized open space, which would also be adjacent to a public school on Site 5 if the City proceeds with building a school in the future. In addition, locating the open space in a central location within the overall development on the project site would allow it to serve all new residents and visitors to the project, as well as the surrounding neighborhood.

While this alternative would not result in a significant adverse impact to the former fire station, it would result in a smaller amount of total open space split between two sections and would, therefore, not be feasible, because it would not meet the open space goals and objectives of the project.

E. CONCLUSION

As described above, DSA has evaluated the potential for: 1) retaining and reusing the Essex Street Market building on Site 2; 2) retaining and building above the Essex Street Market building on Site 2; and 3) retaining and reusing the former fire station on Site 5. Of the two Essex Street Market alternatives, only the one that retains and reuses the building would avoid a significant adverse impact to that architectural resource. Building above the market building would necessitate alterations that would compromise its integrity. Retaining and reusing the Essex Street Market building, however, would not meet the project's programming needs—especially those for the Essex Street Market. Similarly, the alternative that retains and reuses the



Essex Crossing

former fire station, while avoiding a significant adverse impact to the architectural resource, would compromise the project's open space goals that, like the goals for the new public market, are central to the project's purpose and need.

In consideration of the City's purpose and need for the proposed project, there are no prudent and feasible alternatives to avoiding significant adverse impacts to the Essex Street Market building on Site 2 and the former fire station on Site 5. *

PROPOSED ESSEX CROSSING PROGRAM
12PR00119 (11DME012M)
EXECUTIVE SUMMARY FOR THE ALTERNATIVES ANALYSIS

This document provides additional information pertaining to the conclusions presented in the Alternatives Analysis (dated December 10, 2014) for the Essex Crossing program. In a letter dated December 22, 2014, the New York State Office of Parks, Recreation and Historic Preservation requested “a cover document that pulls together the information clearly supporting the stated conclusions” that there are no feasible and prudent alternatives to the demolition of the former Essex Street Market building on Site 2 and the former fire station on Site 5. To further clarify those conclusions, this document further describes why the two historic buildings cannot be retained and reused to meet the goals of the Essex Crossing program.

PURPOSE AND NEED

The goals of the Essex Crossing program are to: (1) transform several underutilized City-owned properties into a thriving, financially viable, mixed-use development; (2) provide affordable and market-rate housing units, commercial and retail uses, community facilities and other neighborhood amenities (e.g., parking, a new and expanded facility for the public Essex Street Market, and publicly accessible open space); and (3) knit these sites back into the larger, vibrant Lower East Side neighborhood. To achieve these goals, the Essex Crossing program would provide 1,000 residential units, of which 400 would be affordable units and 100 would be affordable senior units; it would also develop a new, approximately 43,000-square-foot Essex Street Market on Site 2 that is approximately 28,000 square feet larger than the existing Essex Street Market on Site 9 and would provide ADA accessibility (unlike the existing Essex Street Market on Site 9), modern facilities and building systems, including garbage handling facilities (unlike the existing market on Site 9), and common gathering areas for public seating and market events, and it would develop a 15,000-square-foot publicly accessible open space on Site 5.

SITE ANALYSIS

As described below, the former Essex Street Market building on Site 2 and the former fire station on Site 5 can not feasibly be retained and reused to meet the project’s goals.

SITE 2

As described more fully in the Alternatives Analysis, the former Essex Street Market building (State/National Register-eligible) at 78-90 Essex Street on Site 2 dates to 1939. At 15,265 square feet, the building is the second largest of the four market buildings. It is vacant and most recently contained a diner and liquor store along the Delancey Street frontage. The market hall has been vacant since 1995. A portion of the building overlaps the F and M subway platform below by 12 feet, and an escalator and stair exit to Essex Street through the building. Like the existing Essex Street Market on Site 9, the building on Site 2 is not ADA accessible, and it lacks modern facilities and building systems, including garbage handling facilities.

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On Site 2, the Essex Crossing program would construct a 388,100-gross-square-foot (gsf) building that would include 195 units, of which 98 units would be affordable, a relocated and expanded Essex Street Market, and retail in a below-grade space called the Market Line that would run under Norfolk Street to the building on Site 3 and continue under Suffolk Street to the building on Site 4.

To renovate the long-vacant market hall for new uses would likely require substantial rehabilitation and upgrades to the building systems and roof. Assuming the 15,265-square-foot market hall could be sufficiently renovated and upgraded to current building codes to accommodate new public market uses, it is not spatially feasible to house an expanded Essex Street Market there. The existing market hall would be of an insufficient size to meet the program goals; it would provide substantially less public market space than would be provided by the Essex Crossing program, which would create a 43,028-square-foot public market on Site 2. Further, a renovated market hall would accommodate fewer vendors than the proposed market, could not include garbage handling facilities without further reducing the space allocated to vendors (which could in turn result in less vendor space than currently exists in the market on Site 9), and would not include the expanded common gathering areas for public seating and market events that are intended to continue the existing market's public role in the community. Therefore, reusing the existing building for new market uses would not fulfill the project goal of developing an expanded, modern market facility.

It would also not be feasible to retain the existing building within a larger development without substantially compromising the building's historic integrity, given the complexity of including diverse uses in a single building, including egress requirements for a structure with large assembly requirements (a movie theater), building above an active subway line, and maximizing the efficiency of the building in order to optimize the affordable housing program. A new 285-foot-tall building would require a solid foundation, and the existing market building (which was constructed in 1939) lacks the structural capacity to support vertical expansion atop the building. Attempting to build over the existing building would require extensive new structural columns that would limit the usable programming of the ground floor, thereby compromising the size and goals of the new public market. Columns for the new development would need to be placed through the existing structure with new foundations constructed below the existing building for both above-grade and below-grade retail space. In addition, the City is requiring the relocation of the existing fresh air intake for the subway station that currently runs underneath the existing market building and up the east façade to the roof. Demolishing the existing shaft and horizontal transition to construct a new intake system would result in the removal of much of the northern section of the market building. Overall, much of the existing structure would need to be demolished in the course of constructing a new building on Site 2.

In conclusion, it is not feasible to retain and reuse the existing market building for new market uses and meet the program's goals, and the existing market building cannot feasibly be incorporated into a new development on Site 2 without substantially compromising its historical integrity.

SITE 5

Constructed in 1937, the State/National Register-eligible former fire station at 185 Broome Street has an irregular footprint of approximately 4,100 square feet. The widest portion of the two-story building (the northern part fronting on Broome Street) has a maximum width of 54.64 feet (with a footprint of approximately 2,664 square feet). The southern portion of the building

has two sections—the middle section is 37.48 feet wide and 19.20 feet deep (with a footprint of approximately 720 feet), and the southernmost section is 23.65 feet wide and 30.29 feet deep (with a footprint of 716 feet). This building configuration would not be conducive to residential conversion. Further, the 77-year-old building has not been used as a fire station since 1973, and it does not appear to contain modern building systems. In addition, the most recent tenant did not provide any substantial upgrades or renovations to the building, and renovation of the small, irregularly shaped building to house new uses as part of the Essex Crossing program would likely require substantial renovations. Therefore, it is not feasible to retain and reuse the former fire station for residential uses to meet the goals of the Essex Crossing program.

On Site 5, the Essex Crossing program would construct a 344,544-gsf building that would include 211 residential units, of which 104 units would be affordable, and 72,743 gsf of retail space. The proposed development on Site 5 also includes a 15,000-square-foot public open space on the Broome Street portion of the site, and the proposed development is reserving an approximately 15,400-square-foot portion of the site fronting on Grand and Suffolk Streets for the potential future use of a 75,000-gsf school.

The 15,000-square-foot publically accessible open space would be located on the northern, Broome Street portion of Site 5, occupying a parcel that measures approximately 200 feet by 77 feet. The proposed open space would contain landscaped areas spaced throughout the park, seating areas, and a play area for children. There would be no perimeter fencing. Site 5 was selected for the location of the open space, because it is the largest of the nine development sites and would, therefore, allow for a feasibly sized open space, which would also be adjacent to a public school on Site 5 if the City proceeds with building a school in the future. In addition, locating the open space on Broome Street (as opposed to Grand Street) would place it in a central location within the overall development where it would better serve all new residents and visitors to the project, as well as residents of the surrounding neighborhood.

As more fully described in the Alternatives Analysis, the fire station is located in the middle of the site of the 15,000-square-foot publicly-accessible open space proposed as part of the Essex Crossing program. Retaining the fire station would, therefore, result in a bifurcated open space with sections on the northwest and northeast corners of the site, which would compromise the usability and design of the open space. As described above, the proposed open space would be located on Site 5, because it is the largest of the nine development sites and may contain a public school in the future, and locating the open space on Broome Street would place it in a central location. Therefore, retaining the fire station would compromise the open space goals and objectives of the Essex Crossing program.

SUMMARY CONCLUSIONS

Delancey Street Associates (DSA), the developer of the Essex Crossing program, has evaluated the potential for: 1) retaining and reusing the Essex Street Market building on Site 2; 2) retaining and building above the Essex Street Market building on Site 2; and 3) retaining and reusing the former fire station on Site 5. As described above and in the Alternatives Analysis, in consideration of the City's purpose and need for the proposed program, retention and reuse of the former Essex Street Market building on Site 2 and the former fire station on Site 5 is not feasible, and there are no prudent and feasible alternatives to avoiding significant adverse impacts to the Essex Street Market building on Site 2 and the former fire station on Site 5. Of the two Essex Street Market alternatives, only the one that retains and reuses the building would avoid a significant adverse impact to that architectural resource. Building above the market

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building would necessitate alterations that would compromise its integrity. Retaining and reusing the Essex Street Market building, however, would not meet the project's programming needs—especially those for the Essex Street Market. Similarly, the former fire station could not feasibly be converted to residential use, and retaining it would compromise the project's open space goals that, like the goals for the new public market, are central to the project's purpose and need.

*

APPENDIX B
TRANSPORTATION

PEDESTRIAN ANALYSES LEVEL-OF-SERVICE TABLES

Table B-1
2022 With Action Condition Sidewalk Analysis

Intersection No.	Location	Sidewalk	Effective Width (ft)	15 Minute Two-Way Volume	Platoon Flow	
					PMF	LOS
AM Peak Period						
1	Essex Street between Stanton Street and Rivington Street	East	6.2	212	2.28	B
2	Essex Street between Rivington Street and Stanton Street	East	6.2	241	2.59	B
	Essex Street between Rivington Street and Delancey Street	East	5.0	555	7.40	D
3	Delancey Street between Allen Street and Orchard Street	South	13.0	122	0.63	B
4	Delancey Street between Orchard Street and Ludlow Street	South	15.0	135	0.60	B
5	Delancey Street between Ludlow Street and Essex Street	South	15.0	317	1.41	B
6	Delancey Street between Essex Street and Norfolk Street	North	11.0	425	2.58	B
		South	15.0	291	1.29	B
	Essex Street between Delancey Street and Rivington Street	East	4.0	300	5.00	C
	Essex Street between Delancey Street and Broome Street	East ¹	8.0	303	2.53	B(*)
West		2.5	419	11.17	E+	
7	Delancey Street between Norfolk Street and Essex Street	North	11.0	428	2.59	B
		South	13.8	249	1.20	B
	Delancey Street between Norfolk Street and Suffolk Street	North	10.0	718	4.79	C
		South	19.0	213	0.75	B
Norfolk Street between Delancey Street and Broome Street	West	7.0	54	0.51	B	
8	Delancey Street between Suffolk Street and Norfolk Street	South	18.0	177	0.66	B*
		North	10.0	536	3.57	C
	Delancey Street between Suffolk Street and Clinton Street	South	12.5	134	0.71	B
		Suffolk Street between Delancey Street and Broome Street	East	10.0	122	0.81
West	7.0	89	0.85	B		
9	Delancey Street between Clinton Street and Suffolk Street	South	13.5	103	0.51	B*
	Clinton Street between Delancey Street and Broome Street	East	7.0	46	0.44	A
		West	8.0	56	0.47	A
10	Broome Street between Allen Street and Orchard Street	North	4.0	74	1.23	B*
		South	5.0	60	0.80	B
11	Broome Street between Ludlow Street and Essex Street	North	6.0	93	1.03	B
		North	3.0	112	2.49	B
	Broome Street between Ludlow Street and Orchard Street	South	4.0	78	1.30	B
12	Broome Street between Essex Street and Ludlow Street	North	6.0	101	1.12	B
	Broome Street between Essex Street and Norfolk Street	North	5.0	168	2.24	B
		Essex Street between Broome Street and Delancey Street	East	8.5	294	2.31
	Essex Street between Broome Street and Grand Street	West	6.0	310	3.44	C
		East	10.0	193	1.29	B
West	7.0	238	2.27	B		

Note: PMF = pedestrians per minute per foot
¹ Sidewalk effective width was increased under With Action condition to reflect increased pedestrian space from the relocation of subway stairs from the sidewalk to within the adjacent building.
+ Denotes a significant adverse pedestrian impact.
* Denotes degrading level-of-service as compared to the FGEIS; (*) Denotes improved level-of-service as compared to the FGEIS.
 FGEIS and Tech Memo impacted pedestrian element; Tech Memo impacted pedestrian element only.

Table B-1 (Cont'd)
2022 With Action Condition Sidewalk Analysis

Intersection No.	Location	Sidewalk	Effective Width (ft)	15 Minute Two-Way Volume	Platoon Flow	
					PMF	LOS
13	Broome Street between Norfolk Street and Essex Street	North	6.0	227	2.52	B
	Broome Street between Norfolk Street and Suffolk Street	North	5.0	182	2.43	B
		South	5.0	115	1.53	B
	Norfolk Street between Broome Street and Delancey Street	West	10.0	54	0.36	A
14	Broome Street between Suffolk Street and Norfolk Street	North	6.0	167	1.86	B
	Broome Street between Suffolk Street and Clinton Street	North	8.0	116	0.97	B
	Suffolk Street between Broome Street and Delancey Street	East	6.0	92	1.02	B
		West	7.0	71	0.68	B*
	Suffolk Street between Broome Street and Grand Street	East	7.0	281	2.68	B
15	Broome Street between Clinton Street and Suffolk Street	North	7.0	107	1.02	B
	Broome Street between Clinton Street and Ridge Street	North	8.0	78	0.65	B(*)
	Clinton Street between Broome Street and Delancey Street	East	8.0	47	0.39	A
		West	8.0	56	0.47	A
	Clinton Street between Broome Street and Grand Street	West	8.0	117	0.98	B
16	Grand Street between Allen Street and Orchard Street	North	8.0	248	2.07	B
17	Grand Street between Ludlow Street and Orchard Street	North	7.8	269	2.30	B
	Grand Street between Ludlow Street and Essex Street	North	8.0	257	2.14	B
18	Grand Street between Essex Street and Norfolk Street	North	12.0	236	1.31	B
19	Grand Street between Norfolk Street and Suffolk Street	North	12.0	227	1.26	B
20	Grand Street between Suffolk Street and Clinton Street	North	10.0	194	1.29	B
	Suffolk Street between Grand Street and Broome Street	East	5.0	231	3.08	C*
21	Grand Street between Clinton Street and Suffolk Street	North	4.8	157	2.18	B
	Clinton Street between Grand Street and Broome Street	West	8.0	86	0.72	B
Midday Peak Period						
1	Essex Street between Stanton Street and Rivington Street	East	6.2	248	2.67	B(*)
2	Essex Street between Rivington Street and Stanton Street	East	6.2	235	2.53	B(*)
	Essex Street between Rivington Street and Delancey Street	East	5.0	393	5.24	C(*)
3	Delancey Street between Allen Street and Orchard Street	South	13.0	269	1.38	B
4	Delancey Street between Orchard Street and Ludlow Street	South	15.0	215	0.96	B
<p>Note: PMF = pedestrians per minute per foot ¹ Sidewalk effective width was increased under With Action condition to reflect increased pedestrian space from the relocation of subway stairs from the sidewalk to within the adjacent building. + Denotes a significant adverse pedestrian impact. * Denotes degrading level-of-service as compared to the FGEIS; (*) Denotes improved level-of-service as compared to the FGEIS. FGEIS and Tech Memo impacted pedestrian element; Tech Memo impacted pedestrian element only.</p>						

Table B-1 (Cont'd)
2022 With Action Condition Sidewalk Analysis

Intersection No.	Location	Sidewalk	Effective Width (ft)	15 Minute Two-Way Volume	Platoon Flow	
					PMF	LOS
5	Delancey Street between Ludlow Street and Essex Street	South	15.0	358	1.59	B
6	Delancey Street between Essex Street and Norfolk Street	North	11.0	508	3.08	C
		South	15.0	301	1.34	B
	Essex Street between Delancey Street and Rivington Street	East	4.0	399	6.65	D
	Essex Street between Delancey Street and Broome Street	East ¹	8.0	342	2.85	B(*)
West		2.5	335	8.93	D+	
7	Delancey Street between Norfolk Street and Essex Street	North	11.0	516	3.13	C
		South	13.8	251	1.21	B
	Delancey Street between Norfolk Street and Suffolk Street	North	10.0	486	3.24	C
		South	19.0	250	0.88	B
	Norfolk Street between Delancey Street and Broome Street	West	7.0	54	0.51	B
8	Delancey Street between Suffolk Street and Norfolk Street	South	18.0	207	0.77	B
	Delancey Street between Suffolk Street and Clinton Street	North	10.0	449	2.99	B
		South	12.5	192	1.02	B
	Suffolk Street between Delancey Street and Broome Street	East	10.0	93	0.62	B*
		West	7.0	73	0.70	B
9	Delancey Street between Clinton Street and Suffolk Street	South	13.5	132	0.65	B
	Clinton Street between Delancey Street and Broome Street	East	7.0	45	0.43	A(*)
		West	8.0	68	0.57	B
10	Broome Street between Allen Street and Orchard Street	North	4.0	144	2.40	B
		South	5.0	98	1.31	B
11	Broome Street between Ludlow Street and Essex Street	North	6.0	145	1.61	B
	Broome Street between Ludlow Street and Orchard Street	North	3.0	95	2.11	B
		South	4.0	124	2.07	B
12	Broome Street between Essex Street and Ludlow Street	North	6.0	157	1.74	B
	Broome Street between Essex Street and Norfolk Street	North	5.0	235	3.13	C
	Essex Street between Broome Street and Delancey Street	East	8.5	314	2.46	B(*)
		West	6.0	310	3.44	C
	Essex Street between Broome Street and Grand Street	East	10.0	312	2.08	B
West		7.0	295	2.81	B	
13	Broome Street between Norfolk Street and Essex Street	North	6.0	237	2.63	B
	Broome Street between Norfolk Street and Suffolk Street	North	5.0	215	2.87	B
		South	5.0	91	1.21	B
	Norfolk Street between Broome Street and Delancey Street	West	10.0	54	0.36	A
14	Broome Street between Suffolk Street and Norfolk Street	North	6.0	176	1.96	B
	Broome Street between Suffolk Street and Clinton Street	North	8.0	149	1.24	B
	Suffolk Street between Broome Street and Delancey Street	East	6.0	86	0.96	B
		West	7.0	55	0.52	B*
	Suffolk Street between Broome Street and Grand Street	East	7.0	177	1.69	B

Note: PMF = pedestrians per minute per foot

¹ Sidewalk effective width was increased under With Action condition to reflect increased pedestrian space from the relocation of subway stairs from the sidewalk to within the adjacent building.

+ Denotes a significant adverse pedestrian impact.

* Denotes degrading level-of-service as compared to the FGEIS; (*) Denotes improved level-of-service as compared to the FGEIS.

Yellow background: FGEIS and Tech Memo impacted pedestrian element; Orange background: Tech Memo impacted pedestrian element only.

Table B-1 (Cont'd)
2022 With Action Condition Sidewalk Analysis

Intersection No.	Location	Sidewalk	Effective Width (ft)	15 Minute Two-Way Volume	Platoon Flow	
					PMF	LOS
15	Broome Street between Clinton Street and Suffolk Street	North	7.0	146	1.39	B
	Broome Street between Clinton Street and Ridge Street	North	8.0	109	0.91	B
	Clinton Street between Broome Street and Delancey Street	East	8.0	45	0.38	A
		West	8.0	62	0.52	B*
	Clinton Street between Broome Street and Grand Street	West	8.0	141	1.18	B
16	Grand Street between Allen Street and Orchard Street	North	8.0	249	2.08	B
17	Grand Street between Ludlow Street and Orchard Street	North	7.8	220	1.88	B
	Grand Street between Ludlow Street and Essex Street	North	8.0	225	1.88	B
18	Grand Street between Essex Street and Norfolk Street	North	12.0	239	1.33	B
19	Grand Street between Norfolk Street and Suffolk Street	North	12.0	241	1.34	B
20	Grand Street between Suffolk Street and Clinton Street	North	10.0	318	2.12	B
	Suffolk Street between Grand Street and Broome Street	East	5.0	177	2.36	B
21	Grand Street between Clinton Street and Suffolk Street	North	4.8	200	2.78	B
	Clinton Street between Grand Street and Broome Street	West	8.0	121	1.01	B
PM Peak Period						
1	Essex Street between Stanton Street and Rivington Street	East	6.2	366	3.94	C
2	Essex Street between Rivington Street and Stanton Street	East	6.2	467	5.02	C
	Essex Street between Rivington Street and Delancey Street	East	5.0	630	8.40	D
3	Delancey Street between Allen Street and Orchard Street	South	13.0	424	2.17	B
4	Delancey Street between Orchard Street and Ludlow Street	South	15.0	472	2.10	B
5	Delancey Street between Ludlow Street and Essex Street	South	15.0	569	2.53	B
6	Delancey Street between Essex Street and Norfolk Street	North	11.0	652	3.95	C
		South	15.0	934	4.15	C*
	Essex Street between Delancey Street and Rivington Street	East	4.0	677	11.28	E+
	Essex Street between Delancey Street and Broome Street	East ¹	8.0	747	6.23	D
West		2.5	334	8.91	D+	
7	Delancey Street between Norfolk Street and Essex Street	North	11.0	659	3.99	C
		South	13.8	727	3.51	C*
	Delancey Street between Norfolk Street and Suffolk Street	North	10.0	828	5.52	C
		South	19.0	672	2.36	B
Norfolk Street between Delancey Street and Broome Street	West	7.0	85	0.81	B	
<p>Note: PMF = pedestrians per minute per foot ¹ Sidewalk effective width was increased under With Action condition to reflect increased pedestrian space from the relocation of subway stairs from the sidewalk to within the adjacent building. + Denotes a significant adverse pedestrian impact. * Denotes degrading level-of-service as compared to the FGEIS; (*) Denotes improved level-of-service as compared to the FGEIS. FGEIS and Tech Memo impacted pedestrian element; Tech Memo impacted pedestrian element only.</p>						

Table B-1 (Cont'd)
2022 With Action Condition Sidewalk Analysis

Intersection No.	Location	Sidewalk	Effective Width (ft)	15 Minute Two-Way Volume	Platoon Flow		
					PMF	LOS	
8	Delancey Street between Suffolk Street and Norfolk Street	South	18.0	523	1.94	B	
		North	10.0	547	3.65	C	
	Delancey Street between Suffolk Street and Clinton Street	South	12.5	474	2.53	B	
		Suffolk Street between Delancey Street and Broome Street	East	10.0	228	1.52	B*
			West	7.0	162	1.54	B
9	Delancey Street between Clinton Street and Suffolk Street	South	13.5	272	1.34	B	
		Clinton Street between Delancey Street and Broome Street	East	7.0	123	1.17	B
	West		8.0	147	1.23	B	
10	Broome Street between Allen Street and Orchard Street	North	4.0	175	2.92	B	
		South	5.0	165	2.20	B	
11	Broome Street between Ludlow Street and Essex Street	North	6.0	295	3.28	C*	
		Broome Street between Ludlow Street and Orchard Street	North	3.0	169	3.76	C*
	South		4.0	199	3.32	C*	
12	Broome Street between Essex Street and Ludlow Street	North	6.0	323	3.59	C	
		Broome Street between Essex Street and Norfolk Street	North	5.0	506	6.75	D*
	Essex Street between Broome Street and Delancey Street		East	8.5	563	4.42	C
		West	6.0	303	3.37	C*	
		Essex Street between Broome Street and Grand Street	East	10.0	374	2.49	B
West	7.0		237	2.26	B		
13	Broome Street between Norfolk Street and Essex Street	North	6.0	643	7.14	D*	
		Broome Street between Norfolk Street and Suffolk Street	North	5.0	498	6.64	D*
	South		5.0	206	2.75	B	
	Norfolk Street between Broome Street and Delancey Street	West	10.0	79	0.53	B*	
14	Broome Street between Suffolk Street and Norfolk Street	North	6.0	420	4.67	C*	
		Broome Street between Suffolk Street and Clinton Street	North	8.0	335	2.79	B
	Suffolk Street between Broome Street and Delancey Street		East	6.0	182	2.02	B
		West	7.0	128	1.22	B	
		East	7.0	381	3.63	C*	
15	Broome Street between Clinton Street and Suffolk Street	North	7.0	286	2.72	B	
		Broome Street between Clinton Street and Ridge Street	North	8.0	176	1.47	B
	Clinton Street between Broome Street and Delancey Street		East	8.0	105	0.88	B
		West	8.0	143	1.19	B	
		West	8.0	240	2.00	B	
16	Grand Street between Allen Street and Orchard Street	North	8.0	423	3.53	C*	
17	Grand Street between Ludlow Street and Orchard Street	North	7.8	387	3.31	C*	
		North	8.0	327	2.73	B	

Note: PMF = pedestrians per minute per foot
¹ Sidewalk effective width was increased under With Action condition to reflect increased pedestrian space from the relocation of subway stairs from the sidewalk to within the adjacent building.
 + Denotes a significant adverse pedestrian impact.
 * Denotes degrading level-of-service as compared to the FGEIS; (*) Denotes improved level-of-service as compared to the FGEIS.
 FGEIS and Tech Memo impacted pedestrian element; Tech Memo impacted pedestrian element only.

Table B-1 (Cont'd)
2022 With Action Condition Sidewalk Analysis

Intersection No.	Location	Sidewalk	Effective Width (ft)	15 Minute Two-Way Volume	Platoon Flow	
					PMF	LOS
18	Grand Street between Essex Street and Norfolk Street	North	12.0	318	1.77	B
19	Grand Street between Norfolk Street and Suffolk Street	North	12.0	385	2.14	B
20	Grand Street between Suffolk Street and Clinton Street	North	10.0	636	4.24	C*
	Suffolk Street between Grand Street and Broome Street	East	5.0	368	4.91	C*
21	Grand Street between Clinton Street and Suffolk Street	North	4.8	356	4.94	C*
	Clinton Street between Grand Street and Broome Street	West	8.0	7	1.48	B
Saturday Peak Period						
1	Essex Street between Stanton Street and Rivington Street	East	6.2	227	2.44	B(*)
2	Essex Street between Rivington Street and Stanton Street	East	6.2	301	3.24	C
	Essex Street between Rivington Street and Delancey Street	East	5.0	413	5.51	C(*)
3	Delancey Street between Allen Street and Orchard Street	South	13.0	331	1.70	B
4	Delancey Street between Orchard Street and Ludlow Street	South	15.0	252	1.12	B
5	Delancey Street between Ludlow Street and Essex Street	South	15.0	350	1.56	B
6	Delancey Street between Essex Street and Norfolk Street	North	11.0	512	3.10	C
		South	15.0	425	1.89	B
	Essex Street between Delancey Street and Rivington Street	East	4.0	436	7.27	D
	Essex Street between Delancey Street and Broome Street	East ¹	8.0	414	3.45	C
West		2.5	237	6.32	D	
7	Delancey Street between Norfolk Street and Essex Street	North	11.0	522	3.16	C
		South	13.8	315	1.52	B
	Delancey Street between Norfolk Street and Suffolk Street	North	10.0	601	4.01	C
		South	19.0	265	0.93	B
	Norfolk Street between Delancey Street and Broome Street	West	7.0	47	0.45	A(*)
8	Delancey Street between Suffolk Street and Norfolk Street	South	18.0	236	0.87	B
		North	10.0	512	3.41	C
	Delancey Street between Suffolk Street and Clinton Street	South	12.5	174	0.93	B
		East	10.0	127	0.85	B
9	Delancey Street between Clinton Street and Suffolk Street	South	13.5	137	0.68	B
		East	7.0	46	0.44	A(*)
	Clinton Street between Delancey Street and Broome Street	West	8.0	75	0.63	B
10	Broome Street between Allen Street and Orchard Street	North	4.0	181	3.02	C*
		South	5.0	142	1.89	B
11	Broome Street between Ludlow Street and Essex Street	North	6.0	160	1.78	B
		North	3.0	176	3.91	C
	Broome Street between Ludlow Street and Orchard Street	South	4.0	199	3.32	C

Note: PMF = pedestrians per minute per foot
¹ Sidewalk effective width was increased under With Action condition to reflect increased pedestrian space from the relocation of subway stairs from the sidewalk to within the adjacent building.
+ Denotes a significant adverse pedestrian impact.
* Denotes degrading level-of-service as compared to the FGEIS; (*) Denotes improved level-of-service as compared to the FGEIS.
 FGEIS and Tech Memo impacted pedestrian element; Tech Memo impacted pedestrian element only.

Table B-1 (Cont'd)
2022 With Action Condition Sidewalk Analysis

Intersection No.	Location	Sidewalk	Effective Width (ft)	15 Minute Two-Way Volume	Platoon Flow	
					PMF	LOS
12	Broome Street between Essex Street and Ludlow Street	North	6.0	170	1.89	B
	Broome Street between Essex Street and Norfolk Street	North	5.0	251	3.35	C
	Essex Street between Broome Street and Delancey Street	East	8.5	349	2.74	B(*)
		West	6.0	216	2.40	B
	Essex Street between Broome Street and Grand Street	East	10.0	246	1.64	B
West		7.0	176	1.68	B	
13	Broome Street between Norfolk Street and Essex Street	North	6.0	247	2.74	B
	Broome Street between Norfolk Street and Suffolk Street	North	5.0	218	2.91	B(*)
		South	5.0	101	1.35	B
	Norfolk Street between Broome Street and Delancey Street	West	10.0	47	0.31	A
14	Broome Street between Suffolk Street and Norfolk Street	North	6.0	182	2.02	B
	Broome Street between Suffolk Street and Clinton Street	North	8.0	128	1.07	B
	Suffolk Street between Broome Street and Delancey Street	East	6.0	101	1.12	B
		West	7.0	66	0.63	B
Suffolk Street between Broome Street and Grand Street	East	7.0	180	1.71	B	
15	Broome Street between Clinton Street and Suffolk Street	North	7.0	135	1.29	B
	Broome Street between Clinton Street and Ridge Street	North	8.0	82	0.68	B
	Clinton Street between Broome Street and Delancey Street	East	8.0	46	0.38	A
		West	8.0	68	0.57	B
Clinton Street between Broome Street and Grand Street	West	8.0	151	1.26	B	
16	Grand Street between Allen Street and Orchard Street	North	8.0	290	2.42	B
17	Grand Street between Ludlow Street and Orchard Street	North	7.8	258	2.21	B
	Grand Street between Ludlow Street and Essex Street	North	8.0	213	1.78	B
18	Grand Street between Essex Street and Norfolk Street	North	12.0	215	1.19	B
19	Grand Street between Norfolk Street and Suffolk Street	North	12.0	226	1.26	B
20	Grand Street between Suffolk Street and Clinton Street	North	10.0	341	2.27	B
	Suffolk Street between Grand Street and Broome Street	East	5.0	180	2.40	B
21	Grand Street between Clinton Street and Suffolk Street	North	4.8	210	2.92	B
	Clinton Street between Grand Street and Broome Street	West	8.0	120	1.00	B

Note: PMF = pedestrians per minute per foot
¹ Sidewalk effective width was increased under With Action condition to reflect increased pedestrian space from the relocation of subway stairs from the sidewalk to within the adjacent building.
 + Denotes a significant adverse pedestrian impact.
 * Denotes degrading level-of-service as compared to the FGEIS; (*) Denotes improved level-of-service as compared to the FGEIS.
 FGEIS and Tech Memo impacted pedestrian element; Tech Memo impacted pedestrian element only.

Table B-2
2022 With Action Condition Corner Analysis

Intersection No.	Location	Corner	AM Peak Period		Midday Peak Period		PM Peak Period		Saturday Peak Period	
			SFP	LOS	SFP	LOS	SFP	LOS	SFP	LOS
1	Stanton Street and Essex Street	Southwest	84.8	A	82.7	A	40.9	B	60.9	A(*)
		Southwest	107.1	A	93.4	A	71.0	A	52.8	B
2	Rivington Street and Essex Street	Northeast	66.7	A	73.5	A(*)	37.1	C*	44.2	B(*)
		Southeast	31.1	C	45.3	B(*)	20.6	D	35.1	C
		Southwest	87.4	A	59.9	B*	32.6	C	41.9	B
3	Delancey Street and Allen Street	Southeast	282.5	A	178.2	A	106.6	A	122.6	A
		Southwest	263.8	A	134.0	A	98.2	A	116.8	A
4	Delancey Street and Orchard Street	Southeast	342.2	A	133.1	A	112.6	A	94.5	A
		Southwest	352.7	A	130.4	A	94.4	A	107.8	A
5	Delancey Street and Ludlow Street	Northeast	216.6	A	143.2	A	109.2	A	127.4	A
		Southeast	185.1	A	106.3	A	87.2	A	123.5	A
		Southwest	269.2	A	104.8	A	93.6	A	116.9	A
		Northwest	254.5	A	140.9	A	114.4	A	118.4	A
6	Delancey Street and Essex Street	Northeast	81.2	A	58.3	B	41.8	B	54.5	B
		Southeast	104.4	A	73.2	A(*)	32.3	C*	58.5	B
		Southwest	102.5	A	66.7	A	50.0	B*	75.2	A
		Northwest	201.6	A	144.3	A	142.0	A	170.3	A
7	Delancey Street and Norfolk Street	Northeast	134.5	A	107.4	A	71.5	A	97.9	A
		Southeast	745.6	A	682.6	A	251.0	A	637.6	A
		Southwest	196.6	A	155.6	A	57.4	B*	137.1	A
		Northwest	122.6	A	91.6	A	54.5	B*	81.8	A
8	Delancey Street and Suffolk Street	Northeast	111.4	A	139.1	A	90.7	A	125.4	A
		Southeast	635.2	A	557.1	A	231.8	A	481.4	A
		Southwest	676.1	A	547.2	A	236.7	A	526.4	A
		Northwest	51.4	B	62.7	A	36.9	C*	60.3	A(*)
9	Delancey Street and Clinton Street	Southeast	388.3	A	305.4	A	166.7	A	307.6	A
		Northwest	155.6	A	235.9	A	139.8	A	206.5	A
12	Broome Street and Essex Street	Northeast	94.3	A	73.5	A(*)	37.9	C*	68.4	A(*)
		Southeast	241.9	A	181.0	A	115.4	A	173.3	A
		Southwest	49.6	B	43.7	B	37.5	C*	56.4	B
		Northwest	62.6	A	58.8	B*	38.2	C*	63.5	A
13	Broome Street and Norfolk Street	Northeast	195.1	A	157.0	A	60.3	A	167.7	A
		Southeast	137.8	A	118.6	A	52.3	B*	115.0	A
		Southwest	494.5	A	508.1	A	237.6	A	485.8	A
		Northwest	153.5	A	146.2	A	53.5	B*	139.4	A
16	Grand Street and Allen Street	Northeast	63.4	A	83.5	A	57.0	B*	60.9	A
		Southeast	61.8	A	65.9	A	43.1	B	44.0	B
17	Grand Street and Orchard Street	Northeast	74.7	A	101.5	A	53.6	B*	85.1	A
		Northwest	70.4	A	86.7	A	50.8	B*	72.1	A
18	Grand Street and Ludlow Street	Northeast	180.1	A	169.5	A	111.8	A	155.2	A
		Southeast	97.1	A	98.9	A	59.8	B*	75.3	A
		Northwest	90.1	A	120.6	A	70.4	A	85.8	A
19	Grand Street and Essex Street	Northeast	180.3	A	160.7	A	107.0	A	172.9	A
		Southeast	182.5	A	150.4	A	144.3	A	174.4	A
		Southwest	106.0	A	75.3	A	68.9	A	78.5	A
		Northwest	67.3	A	63.3	A	50.7	B*	81.2	A
20	Grand Street and Norfolk Street	Northeast	430.9	A	385.7	A	246.4	A	374.4	A
		Northwest	1047.2	A	947.8	A	632.9	A	907.4	A
21	Grand Street and Suffolk Street	Northeast	150.4	A	128.1	A	58.3	B*	117.4	A
		Northwest	159.7	A	151.5	A	74.5	A	146.8	A
22	Grand Street and Clinton Street	Southwest	516.2	A	361.8	A	293.8	A	392.4	A
		Northwest	185.4	A	142.2	A	95.9	A	136.4	A

Note: SFP = square feet per pedestrian
 + Denotes a significant adverse pedestrian impact.
 * Denotes degrading level-of-service as compared to the FGEIS; (*) Denotes improved level-of-service as compared to the FGEIS.

**Table B-3
2022 With Action Condition Crosswalk Analysis**

Intersectio n No.	Location	Crosswalk	Street Width (feet)	Crosswalk Width (feet)	Conditions with conflicting vehicles											
					AM			Midday			PM			Saturday		
					2-way Volume	SFP	LO S	2-way Volume	SFP	LOS	2-way Volume	SFP	LO S	2-way Volume	SFP	LO S
2	Rivington Street and Essex Street	East	24.0	11.0	323	29.4	C	249	42.0	B(*)	456	20.8	D*	288	36.0	C
3	Delancey Street and Allen Street	South ¹	44.0	20.0	113	66.3	A	194	61.5	A	306	39.8	C	263	47.8	B
4	Delancey Street and Orchard Street	South	25.0	22.0	118	201.8	A	276	85.5	A	397	56.7	B*	318	72.2	A
5	Delancey Street and Ludlow Street	North	25.0	20.0	220	85.6	A	348	52.3	B	441	40.7	B	378	47.3	B
6	Delancey Street and Essex Street	South	26.0	22.0	147	157.0	A	341	65.1	A	387	57.1	B*	289	77.1	A
		North	48.0	19.0	347	58.7	B*	446	45.1	B	462	41.8	B	415	46.6	B
		East	110.0	14.0	155	35.5	C	265	20.2	D(*)	431	11.0	E+	261	20.3	D(*)
		South	54.0	19.0	172	130.1	A	286	76.5	A	549	38.8	C*	357	60.9	A
7	Delancey Street and Norfolk Street	West	95.0	14.0	243	27.1	C	390	16.3	D+	311	21.1	D*	244	27.1	C
		North	26.0	20.0	233	72.1	A	351	46.0	B	488	31.8	C	372	46.9	B
		South	24.0	10.0	197	45.9	B*	238	36.7	C*	671	10.5	E+	247	35.5	C
8	Delancey Street and Suffolk Street	West	105.0	14.0	108	60.2	A	144	44.9	B	294	21.5	D*	177	36.2	C*
		North	26.0	20.0	578	34.4	C	446	44.9	B	608	31.5	C	453	44.8	B
		East ¹	56.0	20.0	90	140.5	A	96	130.9	A	202	60.9	A	137	90.5	A
		South	23.0	14.0	145	88.0	A	174	75.5	A	437	26.9	C*	171	77.8	A(*)
9	Delancey Street and Clinton Street	West ¹	51.0	18.0	113	95.4	A	154	70.7	A	306	33.4	C*	166	63.0	A
		North	24.0	16.0	377	8.0	F*	208	16.8	D	354	8.8	E	224	15.2	D+
		South	26.0	17.0	94	197.3	A	98	190.7	A	189	96.5	A	96	194.7	A
		West (North of Median)	36.0	23.0	168	87.5	A	186	78.7	A	276	51.3	B*	177	82.1	A
12	Broome Street and Essex Street	West (South of Median)	53.0	23.0	125	115.8	A	179	80.2	A	321	43.6	B*	188	76.4	A
		North	54.0	11.0	108	65.2	A	171	40.5	B	332	19.7	D*	209	32.6	C
		East	30.0	11.0	236	47.1	B(*)	297	36.0	C	451	22.6	D*	295	36.6	C
13	Broome Street and Norfolk Street	South	54.0	15.0	82	118.3	A	124	78.4	A	195	48.5	B*	118	82.0	A(*)
		North	25.0	12.0	196	56.1	B*	223	49.6	B	554	18.0	D+	218	50.0	B
17	Grand Street and Orchard Street	North	24.0	13.0	270	30.5	C	187	46.7	B	391	20.5	D*	237	35.1	C
18	Grand Street and Ludlow Street	North	24.0	15.0	207	50.6	B	197	54.2	B	316	32.3	C*	249	41.3	B(*)
19	Grand Street and Essex Street	North	54.0	15.0	190	55.3	B*	221	46.8	B	325	29.6	C*	183	58.5	B*
20	Grand Street and Norfolk Street	North	24.0	14.0	198	31.5	C*	223	28.9	C	350	14.1	E+	225	25.7	C(*)
21	Grand Street and Suffolk Street	North	25.0	13.0	207	59.9	B*	206	60.6	A*	423	26.8	C*	210	59.0	B

Notes: SFP = square feet per pedestrian

¹ Critical width (north/east or south/west of pedestrian refuge median) used for analysis street width.

+ Denotes a significant adverse pedestrian impact.

* Denotes degrading level-of-service as compared to the FGEIS; (*) Denotes improved level-of-service as compared to the FGEIS.

Yellow background: FGEIS and Tech Memo impacted pedestrian element; Orange background: Tech Memo impacted pedestrian element only.

Appendix C: Construction Noise

50A	5	57.2	60.9	2.5	0.0	63.1	62.2	63.2	53.5	65.0	53.1	59.5	1.1	0.0	61.7	59.7	59.1	0.7	0.0	61.3	0.0	58.5	0.0	0.0	60.6	55.4	60.2	1.8	0.0	62.4	53.9	59.7	1.3	0.0	61.0	48.6	58.8	0.4	0.0	61.0	48.6	58.8	0.4	0.0	61.0	38.4	58.4	0.0	0.0	60.6	48.1	58.8	0.4	0.0	61.0	61.0					
50A	6	59.8	62.7	3.2	0.0	60.7	64.0	65.3	58.0	65.0	60.7	60.7	1.2	0.0	62.9	53.4	60.5	1.0	0.0	62.7	0.0	58.0	0.0	0.0	61.7	55.7	61.3	1.8	0.0	63.5	53.9	60.9	1.4	0.0	61.1	49.7	59.9	0.4	0.0	62.1	49.7	59.9	0.4	0.0	62.1	49.7	59.9	0.4	0.0	62.1	58.5	59.0	0.0	0.0	61.7	48.1	58.8	0.4	0.0	61.0	62.1
51	1	51.5	61.0	0.5	0.0	64.0	52.0	61.1	0.6	0.0	64.1	51.0	61.0	0.5	0.0	64.0	50.9	61.0	0.5	0.0	64.0	0.0	60.5	0.0	0.0	63.5	51.2	61.0	0.5	0.0	64.0	51.3	61.0	0.5	0.0	63.9	50.8	60.9	0.4	0.0	63.9	50.5	60.9	0.4	0.0	63.9	50.6	60.9	0.4	0.0	63.9	63.9									
51	2	52.8	61.6	0.9	0.0	64.6	53.9	61.6	0.6	0.0	64.6	52.4	61.6	0.6	0.0	64.6	52.4	61.6	0.6	0.0	64.6	0.0	60.0	0.0	0.0	64.0	52.7	61.6	0.6	0.0	64.6	52.4	61.6	0.6	0.0	64.6	52.4	61.6	0.6	0.0	64.6	52.4	61.6	0.6	0.0	64.6	52.4	61.6	0.6	0.0	64.6	64.6									
51	3	53.2	61.6	2.0	0.0	64.6	53.9	61.6	2.1	0.0	64.6	53.2	61.6	2.1	0.0	64.6	53.2	61.6	2.1	0.0	64.6	0.0	60.5	0.0	0.0	64.0	53.1	61.6	2.1	0.0	64.6	53.2	61.6	2.1	0.0	64.6	53.2	61.6	2.1	0.0	64.6	53.2	61.6	2.1	0.0	64.6	53.2	61.6	2.1	0.0	64.6	64.6									
51	4	53.6	60.9	0.8	0.0	63.9	53.0	60.9	0.8	0.0	63.9	53.2	60.9	0.8	0.0	63.9	53.0	60.9	0.8	0.0	63.9	0.0	60.0	0.0	0.0	63.9	53.2	60.9	0.8	0.0	63.9	53.1	60.9	0.8	0.0	63.9	53.1	60.9	0.8	0.0	63.9	53.1	60.9	0.8	0.0	63.9	53.1	60.9	0.8	0.0	63.9	63.9									
51	5	53.6	60.7	0.9	0.0	63.7	53.9	60.7	0.9	0.0	63.7	53.4	60.7	0.9	0.0	63.7	53.4	60.7	0.9	0.0	63.7	0.0	59.8	0.0	0.0	63.7	53.5	60.7	0.9	0.0	63.7	53.5	60.7	0.9	0.0	63.7	53.5	60.7	0.9	0.0	63.7	53.5	60.7	0.9	0.0	63.7	53.5	60.7	0.9	0.0	63.7	63.7									
51	6	53.6	61.3	1.0	0.0	63.1	53.2	61.3	1.0	0.0	63.1	53.3	61.3	1.0	0.0	63.1	53.2	61.3	1.0	0.0	63.1	0.0	60.0	0.0	0.0	63.1	53.2	61.3	1.0	0.0	63.1	53.3	61.3	1.0	0.0	63.1	53.2	61.3	1.0	0.0	63.1	53.2	61.3	1.0	0.0	63.1	53.2	61.3	1.0	0.0	63.1	63.1									
51	7	54.5	60.2	1.3	0.0	63.6	53.6	60.2	1.1	0.0	63.6	53.6	60.2	1.1	0.0	63.6	53.6	60.2	1.1	0.0	63.6	0.0	58.9	0.0	0.0	63.6	53.7	60.2	1.1	0.0	63.6	53.7	60.2	1.1	0.0	63.6	53.7	60.2	1.1	0.0	63.6	53.7	60.2	1.1	0.0	63.6	53.7	60.2	1.1	0.0	63.6	63.6									
51A	1	44.6	55.1	0.4	0.0	58.1	46.7	55.3	0.6	0.0	58.3	43.6	54.9	0.2	0.0	57.9	41.3	54.9	0.2	0.0	57.9	0.0	54.7	0.0	0.0	57.7	43.2	55.0	0.3	0.0	58.0	43.5	55.0	0.3	0.0	58.0	43.5	55.0	0.3	0.0	58.0	43.5	55.0	0.3	0.0	58.0	43.5	55.0	0.3	0.0	58.0	58.0									
51A	2	45.8	55.0	0.5	0.0	58.3	47.0	55.3	0.7	0.0	58.5	44.3	55.3	0.7	0.0	58.3	44.3	55.3	0.7	0.0	58.3	0.0	54.7	0.0	0.0	57.7	44.8	55.0	0.4	0.0	58.1	45.7	55.1	0.4	0.0	58.1	45.7	55.1	0.4	0.0	58.1	45.7	55.1	0.4	0.0	58.1	45.7	55.1	0.4	0.0	58.1	58.1									
51A	3	47.6	55.5	0.8	0.0	58.5	48.5	55.6	0.9	0.0	58.6	45.7	55.6	0.9	0.0	58.2	45.6	55.6	0.9	0.0	58.2	0.0	54.7	0.0	0.0	57.7	46.5	55.3	0.6	0.0	58.3	49.0	55.7	1.0	0.0	58.3	49.0	55.7	1.0	0.0	58.3	49.0	55.7	1.0	0.0	58.3	49.0	55.7	1.0	0.0	58.3	58.3									
51A	4	53.2	57.1	2.3	0.0	60.1	54.1	57.5	2.7	0.0	60.5	52.7	56.7	1.9	0.0	59.9	52.4	56.8	2.0	0.0	59.8	0.0	54.8	0.0	0.0	59.8	52.5	56.8	2.0	0.0	60.4	53.9	57.4	2.6	0.0	60.4	53.9	57.4	2.6	0.0	60.4	53.9	57.4	2.6	0.0	60.4	53.9	57.4	2.6	0.0	60.4	60.4									
51A	5	55.2	59.4	2.0	0.0	62.4	58.4	59.9	2.5	0.0	62.9	54.8	59.9	1.9	0.0	62.3	54.8	59.9	1.9	0.0	62.3	0.0	57.4	0.0	0.0	62.4	54.1	59.1	1.7	0.0	62.1	54.1	59.1	1.7	0.0	62.1	54.1	59.1	1.7	0.0	62.1	54.1	59.1	1.7	0.0	62.1	54.1	59.1	1.7	0.0	62.1	62.1									
51A	6	58.2	62.0	2.3	0.0	64.6	58.5	62.1	2.5	0.0	64.6	58.5	62.1	2.5	0.0	64.6	58.5	62.1	2.5	0.0	64.6	0.0	59.6	0.0	0.0	64.6	58.5	62.1	2.5	0.0	64.6	58.5	62.1	2.5	0.0	64.6	58.5	62.1	2.5	0.0	64.6	58.5	62.1	2.5	0.0	64.6	58.5	62.1	2.5	0.0	64.6	64.6									
51B	1	46.9	55.3	0.7	0.0	58.3	49.0	55.7	1.0	0.0	58.0	42.4	55.0	0.3	0.0	58.0	42.4	55.0	0.3	0.0	57.9	0.0	54.7	0.0	0.0	57.9	43.5	55.0	0.3	0.0	58.0	43.9	55.0	0.3	0.0	58.0	43.9	55.0	0.3	0.0	58.0	43.9	55.0	0.3	0.0	58.0	43.9	55.0	0.3	0.0	58.0	58.0									
51B	2	49.6	55.7	1.0	0.0	60.3	54.0	56.2	1.1	0.0	60.3	54.0	56.2	1.1	0.0	60.3	54.0	56.2	1.1	0.0	60.3	0.0	54.7	0.0	0.0	60.3	54.1	56.2	1.1	0.0	60.3	54.1	56.2	1.1	0.0	60.3	54.1	56.2	1.1	0.0	60.3	54.1	56.2	1.1	0.0	60.3	54.1	56.2	1.1	0.0	60.3	60.3									
51B	3	55.3	58.0	3.3	0.0	61.0	60.5	61.5	6.8	0.0	61.5	49.9	55.9	1.2	0.0	58.9	47.6	55.9	1.2	0.0	58.5	0.0	54.7	0.0	0.0	58.7	48.8	55.0	1.0	0.0	58.6	51.0	56.2	1.6	0.0	59.2	51.0	56.2	1.6	0.0	59.2	51.0	56.2	1.6	0.0	59.2	51.0	56.2	1.6	0.0	59.2	59.2									
51B	4	58.2	59.8	1.1	0.0	62.8	62.0	62.7	8.1	0.0	62.8	62.0	62.7	8.1	0.0	62.8	62.0	62.7	8.1	0.0	62.8	0.0	54.7	0.0	0.0	62.8	62.0	62.7	8.1	0.0	62.8	62.0	62.7	8.1	0.0	62.8	62.0	62.7	8.1	0.0	62.8	62.0	62.7	8.1	0.0	62.8	62.0	62.7	8.1	0.0	62.8	62.8									
51B	5	58.6	60.4	0.7	0.0	63.1	62.8	63.4	8.7	0.0	63.1	62.8	63.4	8.7	0.0	63.1	62.8	63.4	8.7	0.0	63.1	0.0	54.7	0.0	0.0	63.1	62.8	63.4	8.7	0.0	63.1	62.8	63.4	8.7	0.0	63.1	62.8	63.4	8.7	0.0	63.1	62.8	63.4	8.7	0.0	63.1	62.8	63.4	8.7	0.0	63.1	63.1									
51B	6	60.5	62.1	1.1	0.0	65.0	65.2	65.8	8.7	0.0	65.0	65.2	65.8	8.7	0.0	65.0	65.2	65.8	8.7	0.0	65.0	0.0	54.7	0.0	0.0	65.0	65.2	65.8	8.7	0.0	65.0	65.2	65.8	8.7	0.0	65.0	65.2	65.8	8.7	0.0	65.0	65.2	65.8	8.7	0.0	65.0	65.2	65.8	8.7	0.0	65.0	65.0									
52	1	49.8	60.3	0.4	0.0	63.1	50.3	60.4	0.5	0.0	63.4	48.8	60.2	0.3	0.0	63.2	48.8	60.2	0.3	0.0	63.2	0.0	59.9	0.0	0.0	63.2	49.2	60.3	0.4	0.0	63.3	49.2	60.3	0.4	0.0	63.3	49.2	60.3	0.4	0.0	63.3	49.2	60.3	0.4	0.0	63.3	49.2	60.3	0.4	0.0	63.3	63.3									
52	2	52.6	60.7	0.5	0.0	63.7	50.7	60.6	0.4	0.0	63.7	50.7	60.6	0.4	0.0	63.7	50.7	60.6	0.4	0.0	63.7	0.0	59.9	0.0	0.0	63.7	50.7	60.6	0.4	0.0	63.7	50.7	60.6	0.4	0.0	63.7	50.7	60.6	0.4	0.0	63.7	50.7	60.6	0.4	0.0	63.7	50.7	60.6	0.4	0.0	63.7	63.7									
52	3	51.2	60.4	0.6	0.0	63.4	51.7	60.4	0.6	0.0	63.4	50.3	60.3	0.5	0.0	63.3	50.2	60.3	0.5	0.0	63.3	0.0	59.8	0.0	0.0	63.3	50.6	60.3	0.5	0.0	63.3	50.6	60.3	0.5	0.0	63.3	50.6	60.3	0.5	0.0	63.3	50.6	60.3	0.5	0.0	63.3	50.6	60.3	0.5	0.0	63.3	63.3									
52	4	51.6	60.0	0.7	0.0	63.0	52.5	60.1	0.8	0.0	63.0	52.5	60.1	0.8	0.0	63.0	52.5	60.1	0.8	0.0	63.0	0.0	59.8	0.0	0.0	63.0	52.5	60.1	0.8	0.0	63.0	52.5	60.1	0.8	0.0	63.0	52.5	60.1	0.8	0.0	63.0	52.5	60.1	0.8	0.0	63.0	52.5	60.1	0.8	0.0	63.0	63.0									
52	5	52.9	60.4	0.8	0.0	63.2	52.6	60.5	0.9	0.0	63.2	52.6	60.5	0.9	0.0	63.2	52.6	60.5	0.9	0.0	63.2	0.0	59.8	0.0	0.0	63.2	52.6	60.5	0.9	0.0	63.2	52.6	60.5	0.9	0.0	63.2	52.6	60.5	0.9	0.0	63.2	52.6	60.5	0.9	0.0	63.2	52.6	60.5	0.9	0.0	63.2	63.2									
52A	1	43.7	59.7	1.2	0.0	62.7	52.7	59.7	1.2	0.0	62.7	52.7	59.7	1.2	0.0	62.7	52.7	59.7	1.2	0.0	62.7	0.0	58.5	0.0	0.0	62.7	52.7	59.7	1.2	0.0	62.7	52.7	59.7	1.2	0.0	62.7	52.7	59.7	1.2	0.0	62.7	52.7	59.7	1.2	0.0																

