Chapter 25: Alternatives

A. INTRODUCTION

In accordance with the State Environmental Quality Review Act (SEQRA) and the City Environmental Quality Review (CEQR), this chapter presents and analyzes alternatives to the Proposed Actions. Alternatives selected for consideration in an EIS are generally those which are feasible and have the potential to reduce, eliminate, or avoid adverse impacts of a proposed action while meeting some or all of the goals and objectives of the action. In addition to a comparative impact analysis, the alternatives in this chapter are assessed to determine to what extent they would meet the goals and objectives of the Proposed Actions.

HISTORICAL SUMMARY OF ALTERNATIVES CONSIDERED

The Proposed Actions reflect many years of planning and consideration of development alternatives for the Caemmerer Yard. Public planning for development over the Caemmerer Yard began with a proposal to relocate Madison Square Garden there. The *Master Plan—Caemmerer West Side Yard*, which was published by the Metropolitan Transportation Authority (MTA) in 1989, grew out of this proposal. Although Madison Square Garden's owners ultimately decided to renovate the existing structure rather than move it, the planning effort identified a broad range of public benefits that could result from the development of the area above the Caemmerer Yard, including new housing, parks and waterfront recreation, support uses to enhance the then relatively new Convention Center's marketability, and office space to accommodate employers which require large development sites. The MTA Master Plan anticipated a floor area ratio (FAR) of 10.0 in order to create a residential community of 3,600 units, a series of office buildings with retail along Eleventh Avenue, approximately 2,900 parking spaces, and a large amount of new public open space. The residential uses were to be developed on the west side of the Western Rail Yard facing the Hudson River, and the street grid would be extended halfway into the site, ending at turnarounds in front of the residential buildings. The Master Plan also called for a new pedestrian bridge over Twelfth Avenue, linking new open spaces on the Western Rail Yard site to open spaces along the waterfront.

Planning for the redevelopment of the Caemmerer Yard continued into recent years, with studies by the New York City Department of City Planning (DCP) and the Manhattan Borough President, both of which were released in December 2001. DCP's study, *Far West Midtown: A Framework for Development ("Framework")*, which was the basis for the subsequent Hudson Yards Rezoning effort described below, established a plan for the revitalization, over the next three decades, not only of the Caemmerer Yard but also of the larger Far West Midtown area, which was considered to be a critical but long-neglected neighborhood. The study contemplated comprehensive changes to zoning and development, and analyzed opportunities to meet the City's need for an expanded central business district within this area (referred to in the study as the "Hudson Yards area").

The *Framework* anticipated that a multi-use exhibition and sports/entertainment facility would be built on the Western Rail Yard, potentially including a stadium for the City's 2012 Olympic bid or for the New York Jets football team, or expansion space for the Convention Center. Cumulatively, up to 7.5 million sf were to be developed on the Western Rail Yard and Eastern Rail Yard. As an alternative, if no stadium were to be built, the *Framework* assumed that the Western Rail Yard and Eastern Rail Yard would accommodate up to 17 million sf of new large-scale commercial (office, hotel, and related uses) development. Portions of the site were intended to be part of a new regional open space providing connections to Hudson River Park. The extension of the No. 7 Subway Line was noted in the *Framework* as key to ensuring that the area's infrastructure would support the projected new development.

The Manhattan Borough President C. Virginia Field's study, *A Vision for the West Side Rail Yards*, primarily identified an alternative vision for the Caemmerer Yard that did not include a stadium. Instead, the plan would support and retain low- to medium-density mixed uses, creating up to 7.3 million sf of residential, commercial, and open space on the Caemmerer Yard as well as its surrounding area. The plan proposed to extend the existing street grid across the decked rail yard, to reduce block sizes and encourage pedestrian traffic. The new public open space to be provided on the Western Rail Yard, along with residential uses, would include a pedestrian bridge to the Hudson River Park.

Subsequent to the two studies described above, the *No. 7 Subway Extension—Hudson Yards Rezoning and Development Program* was proposed, with four components: rezoning of a large area that included the Eastern Rail Yard but not the Western Rail Yard, extension of the No. 7 Subway Line, expansion of the Convention Center, and development of a multi-use facility, including a new stadium for the New York Jets, on the Western Rail Yard. The New York City Council ("City Council") adopted the project's zoning and other land use actions in January 2005, after the completion of a comprehensive environmental review process, with a Final Generic Environmental Impact Statement (FGEIS) completed in November 2004. Subsequent to the City Council approval of the City's actions (which did not include the Western Rail Yard), the Public Authorities Control Board (PACB) failed to approve the construction of the multi-use facility on the Western Rail Yard in June 2005, after which that proposal was withdrawn.

During the public review process of the Hudson Yards effort, the Hell's Kitchen Neighborhood Association (HKNA) issued a *Plan for Rezoning Hell's Kitchen/Hudson Yards* in December 2004. This plan was also presented as Alternatives "J" and "T" in the FGEIS. The key feature of the HKNA plan was a southward expansion of the Convention Center over the Western Rail Yard with meeting rooms, exhibition space, and a ballroom. The HKNA plan also provided for approximately 6 million sf of commercial and residential development on the Western Rail Yard site, in the form of towers on the four corners of the site, with lower commercial structures between them. The commercial development would include one or two hotels for the Convention Center. The roof of the proposed Convention Center expansion was to become a 10-acre public park and community recreation area, with a direct link to Hudson River Park. This proposal projected an FAR of 10.0 on the Western Rail Yard site.

Similarly, the Regional Plan Association (RPA) issued a report in December 2004, *Urban Development Alternatives for the Hudson Rail Yards*, which also analyzed a series of alternative development plans for the Western Rail Yard. The RPA plan assumed all-residential development of the Western Rail Yard, with 20 percent of all units to be affordable, as well as on-site open space. Under this proposal, the Western Rail Yard would have been developed to an FAR of 9. The report concluded that residential and open space development on the Western

Rail Yard was viable for private developers and, compared with potential redevelopment as a stadium/convention center expansion, would better connect the waterfront to the district, promote urban development throughout the area, and provide a significantly larger rate of return on public infrastructure improvements.

In summary, public policy and community input over the past several decades have envisioned development above the Western Rail Yard, although the plans and proposals varied. One path sought options to locate major sports facilities (originally, Madison Square Garden; most recently, the multi-use facility). When the multi-use facility was not approved, MTA and the City determined that the best approach to developing the Western Rail Yard was to select a private developer to build over the Western Rail Yard with a mix of uses and open spaces similar to those set forth in other prior plans and proposals and comparable to the neighboring Special Hudson Yards District.

This chapter, therefore, considers in detail the following four alternatives to the Proposed Actions:

- A No Action Alternative, which assumes that the Proposed Actions are not approved and the project sites remain in their current uses;
- A No Unmitigated Significant Adverse Impact Alternative, which considers development that would not result in any identified significant, unmitigated adverse impacts; and
- A Reduced Density Alternative, which considers a smaller project on the Development Site that avoids some or all of the significant adverse impacts identified in the EIS analyses;
- A Tri-Generation Energy Supply Alternative to improve energy efficiency and reliability while reducing greenhouse gas emissions from the Development Site Project.

PRINCIPAL CONCLUSIONS

Neither the No Action Alternative nor the No Unmitigated Significant Adverse Impact Alternative would meet the goals and objectives of the Proposed Actions. Moreover, the latter alternative is not feasible in view of the substantial initial costs required to construct a platform over the operating LIRR rail yard on the Development Site. The Reduced Density Alternative, even if feasible, would result in significant adverse environmental impacts only slightly less than those of the Proposed Actions while (1) failing to realize principal project goals of maximizing revenue for MTA's capital plan and (2) reducing the number of affordable housing units constructed on the Development Site. The Tri-Generation Energy Supply Alternative, while requiring somewhat greater initial investment, would meet the goals and objectives of the Proposed Actions and offer the opportunity to achieve modest increases in energy efficiency and somewhat reduced GHG emissions.

For each alternative, the principal conclusions of the analysis in this chapter are as follows:

NO ACTION ALTERNATIVE

Consideration of the No Action Alternative is mandated by both SEQRA and CEQR, and is intended to provide the co-lead and involved agencies with an assessment of the consequences of not selecting the Proposed Actions. The No Action Alternative assumes that the Proposed Actions—including disposition of the Development Site by MTA and TBTA, disposition by the City of the Additional Housing Sites, zoning map and text amendments, and site selection for the public school—would not be implemented. Under the No Action Alternative, no material

changes would occur on the Development Site or at the Additional Housing Sites. Instead, it is assumed that the Development Site and the Additional Housing Sites would remain in their current states.

With no new buildings on the project sites and no new residents or workers, none of the significant adverse impacts anticipated for the Proposed Actions would occur in the No Action Alternative. At the same time, however, the No Action Alternative would not meet the goals and objectives of the Proposed Actions. Specifically, the No Action Alternative would not provide additional revenues for MTA's transportation improvements, nor would it encourage the development of new residential, commercial, public school, and open space uses within a largely underutilized area of Far West Midtown, nor would it enhance the vitality of the Hudson Yards area, build the City's tax base, or create a new 24-hour neighborhood that complements the adjacent areas of Midtown and Chelsea and the emerging development in West Chelsea and the Hudson Yards area. The No Action Alternative would not provide new publicly accessible open space, nor would it provide a substantial number of new permanently affordable housing units.

NO UNMITIGATED SIGNIFICANT ADVERSE IMPACT ALTERNATIVE

To eliminate all unmitigated significant adverse impacts, the Proposed Actions would have to be reduced in size or modified to a point where they would not be feasible and could not realize the principal goals of the Proposed Actions. This analysis finds that:

- To eliminate the Proposed Actions' significant adverse impact on child care capacity by reducing the number of children at the project sites who would be eligible for publicly funded child care, the Proposed Actions would have to be reduced to only 104 apartments (up to an approximately 85 percent reduction) affordable to low- to moderate-income households at the project sites. This potential alternative would not meet the Proposed Actions' goal of maximizing affordable housing opportunities.
- To eliminate the Proposed Actions' significant adverse impact on total and active open space ratios, the project would have to be reduced to a maximum of 2,552 residential units (a 56 percent reduction), or would have to include an additional 6.2 acres of open space—for a total of 11.65 acres on the 13-acre Development Site or in the surrounding area. The inability to locate such acreage on-site or to find suitable locations nearby makes this potential alternative infeasible.
- To eliminate the Proposed Actions' significant adverse shadow impact on the planned Eastern Rail Yard open space, the three residential buildings along the midblock of Eleventh Avenue and at the southeast corner of the Development Site (WR-1, WR-2, and WR-3) would have to be reduced in height by 58 to 75 percent, which would require a substantial reduction in bulk over the entire site. Such reduction in bulk would negatively affect the overall project viability and such a redistribution of bulk from this corner to other buildings on the site, which would not be consistent with the design intent for the Development Site. To eliminate the significant adverse shadow impact on the planned open space adjacent to the Tenth Avenue Site, the new building on the site could not exceed 40 feet in height, providing little or no realistic development opportunity and not meeting the goal of maximizing new permanently affordable housing at that site.
- Because of existing and congestion at a number of intersections and the anticipated congestion in the Future without the Proposed Actions, even a minimal increase in traffic would result in unmitigated impacts at some locations and, therefore, any substantial

development on the Development Site would result in unmitigated significant adverse traffic impacts.

REDUCED DENSITY ALTERNATIVE

The Reduced Density Alternative assumes the same mix of uses as the Proposed Actions, but with a lesser amount of total development (an 8.0 FAR, rather than 10.0 FAR under the Proposed Actions). On the Development Site, the Reduced Density Alternative would include the same overall site plan layout, including location of buildings, open space, and internal roadways, as those currently contemplated for the Proposed Actions. Like the Proposed Actions, the Reduced Density Alternative would provide residential, commercial (retail and office or hotel space), a public school, publicly accessible open space, and enclosed accessory parking on the Development Site. The Additional Housing Sites would have the same development program as with the Proposed Actions. Overall, the Reduced Density Alternative would provide approximately 20 percent less total development on the Development Site than with the Proposed Actions, with approximately 5.0 million to 5.1 million gsf of development compared to between 6.2 million and 6.4 million gsf of development for the Proposed Actions. Building heights would generally range from approximately 350 to 750 feet compared to building heights ranging from 350 to 950 feet under the Proposed Actions.

The Reduced Density Alternative would result in significant adverse environmental impacts similar to those of the Proposed Actions while failing to realize a principal project goal—to maximize revenue for MTA's capital plan—and reducing the number of affordable housing units constructed on the Development Site. The Reduced Density Alternative would still require the extraordinary cost of constructing a platform over the operating LIRR rail yard in order to erect any commercial and residential buildings and open space over the rail yard. The cost of the platform and other required infrastructure would have to be amortized by a smaller number of residential units and reduced commercial space, thereby reducing the monetary value of the Development Site Project and making it unlikely to realize all of the goals and objectives of the Proposed Actions as set forth in Chapter 1, "Project Description." Specifically, it is highly unlikely that the Reduced Density Alternative would be able to contribute as substantially as the Proposed Actions to MTA's capital budget for critical transportation improvements. The Reduced Density Alternative would also fail to provide the same number of residential units—particularly affordable units—as the Proposed Actions; nor would it provide the same level of economic development to the City. Given the fixed infrastructure costs at the Development Site, the viability of constructing a reduced density development with the features of the Proposed Actions is questionable.

In areas where the Proposed Actions are anticipated to result in significant adverse impacts, the Reduced Density Alternative would not eliminate those impacts. Like the Proposed Actions, the Reduced Density Alternative would result in significant adverse impacts related to publicly funded child care space, total and active open space utilization, and shadow impacts on the planned Eastern Rail Yard open space and the open space planned adjacent to the Tenth Avenue Site. The Reduced Density Alternative would, like the Proposed Actions, also result in significant adverse traffic, transit, and pedestrian impacts. The total number of intersections with significant adverse traffic impacts under the Reduced Density Alternative would be essentially the same as the Proposed Actions, although more intersection movements would be unmitigated with the Proposed Actions. The Reduced Density Alternative would reduce the number of unmitigated significant adverse pedestrian impacts in comparison with the Proposed Actions, but significant adverse impacts would remain that could not be mitigated. Like the Proposed

Actions, the Reduced Density Alternative would result in incidents of high winds at the pedestrian level for certain locations and prevailing winds.

TRI-GENERATION ENERGY SUPPLY ALTERNATIVE

Under the Tri-Generation Energy Supply Alternative, on-site facilities to generate electricity, heat, and cooling would be constructed as part of the Development Site Project. All other aspects of the Proposed Actions would remain the same for this Alternative. The Tri-Generation Energy Supply Alternative is under consideration by the Developer as part of an overall effort to create a sustainable community, conserve energy and minimize greenhouse gas (GHG) emissions. Tri-generation systems provide three key building requirements—electricity, heat, and cooling. With tri-generation, the thermal byproduct of electricity generation is captured and used to supply heat, hot water, and air conditioning needs on-site. The overall feasibility of the Tri-Generation Energy Supply Alternative was evaluated to further the goals of improved energy efficiency, energy reliability, and reducing the GHG emissions from the Development Site Project. With the same overall development program, the Tri-Generation Alternative would achieve the goals and objectives established for the project and offer the opportunity to achieve greater energy efficiency and reduced GHG emissions, although the energy efficiency benefits would not equal EPA benchmarks. The cost effectiveness and total financial feasibility of the alternative would also require further analysis by the Developer prior to implementation.

The differences between the Proposed Actions and the Tri-Generation Alternative include:

- Consideration of the Tri-Generation Alternative of on-site energy capacity is specifically responsive to public policies in PlaNYC.
- While the Tri-Generation Energy Supply Alternative would meet the same annual energy demand for the Development Site Project as the Proposed Actions, the alternative's on-site production of energy would be more efficient than the combined regional electricity distribution system (Con Edison) and on-site boilers for heat and hot water. The additional efficiency would lead to a reduction in GHG emissions associated with the production of energy necessary to serve the Development Site. Like the Proposed Actions, the alternative would still require improvements to the local electrical and natural gas distribution systems servicing the site and adjacent Hudson Yards area.
- Like the Proposed Actions, the Tri-Generation Alternative would not result in any significant adverse air quality impacts. In addition, while local emissions of some pollutants at the Development Site could be marginally higher than with the Proposed Actions, GHG emissions associated with the proposed development electricity, heat, hot water, and air conditioning use could be reduced by five to six percent, or greater with additional optimization.

B. NO ACTION ALTERNATIVE

DESCRIPTION

Consideration of the No Action Alternative is mandated by both SEQRA and CEQR and is intended to provide the co-lead and involved agencies with an assessment of the expected environmental impacts of no action on their part. The technical chapters of this EIS have described the No Action Alternative (referred to in preceding chapters as "the Future without the

Proposed Actions") and have used it as the basis to assess the potential impacts and associated mitigation for the Proposed Actions.

The No Action Alternative assumes that the Proposed Actions would not be implemented. No amendments would be made to change the zoning of the Development Site from M2-3 to C6-4 and no zoning text amendments would be made to create a new subdistrict of the Special Hudson Yards District. Other Proposed Actions would not occur, including site selection of a public school, special permits for off-street parking and public open space on the Development Site. Disposition and development of the Additional Housing Sites for affordable housing would not be authorized under the No Action Alternative.

Under the No Action Alternative, no material changes would occur on the Development Site or at the Additional Housing Sites. The Development Site would remain in use as an open, largely below-grade rail yard with no development above. Bus operations and New York City Department of Sanitation (DSNY) facilities would remain on the portion of the Development Site ("terra firma") not occupied by MTA-Long Island Rail Road (LIRR) operations (or until DSNY facilities are relocated as part of a proposed future consolidation). The Ninth Avenue Site would remain as a gravel parking lot for the adjoining MTA-New York City Transit (NYCT) building and the Tenth Avenue Site would not be developed and would continue as a below-grade rail cut. Therefore, the No Action Alternative would not bring any new residential, public school, open space, or commercial development to the Development Site. In addition, the No Action Alternative would not add up to approximately 390 affordable housing units to the Development Site or approximately 312 permanently affordable units to the Additional Housing Sites.

The effects of the No Action Alternative in comparison to those of the Proposed Actions are summarized below.

ABILITY TO MEET GOALS AND OBJECTIVES OF THE PROPOSED ACTIONS

The No Action Alternative would not meet the goals and objectives of the Proposed Actions. Specifically, the No Action Alternative would not encourage the development of new residential, commercial, public school, and open space uses within this area of the Hudson Yards, nor would it enhance the vitality of the Hudson Yards area, or create a new neighborhood that complements adjacent area and emerging development in the Hudson Yards area. The No Action Alternative would not provide new publicly accessible open space, nor would it provide a substantial number of new permanently affordable housing units. Compared to the Proposed Actions, the No Action Alternative does not generate any new revenues to MTA's capital budget for transportation improvements.

NO ACTION ALTERNATIVE COMPARED WITH THE PROPOSED ACTIONS

LAND USE, ZONING, AND PUBLIC POLICY

The No Action Alternative would not result in any changes to the land use or zoning on the Development Site. As described above, under the No Action Alternative the Development Site would remain as an open, largely below-grade rail yard surrounded by concrete walls. The bus operator and DSNY would continue to operate on a portion of the terra firma (although it is noted that the DSNY M-6 garage, including the facilities located on the Development Site, is expected to eventually be consolidated with other DSNY facilities at another location). The No Action Alternative would not result in the construction of a platform over the Western Rail Yard

to allow for new residential uses, commercial, community facilities, accessory parking, and publicly accessible open space. Finally, the No Action Alternative would not result in the development of permanently affordable housing at either the Tenth Avenue or the Ninth Avenue Sites.

Like the Proposed Actions, the No Action Alternative would not result in any significant adverse impacts to land use, zoning, or public policy. However, the No Action Alternative would not provide any of the benefits that would be realized under the Proposed Actions and would be inconsistent with land use trends and public policy for the Far West Side including its connections to the Hudson Yards area and Hudson River Park. As noted above, public planning for the Caemmerer Yard has long envisioned development at the Project Site. The No Action Alternative would not result in any type of development that would complement and support future development in the subareas surrounding the Development Site. As described in Chapter 3, "Land Use, Zoning, and Public Policy," the development within the adjacent Convention Corridor, the Large-Scale Plan, and Chelsea subareas will introduce commercial, residential, community facility, and open space land uses to the surrounding area, and a number of projects within the Farley Corridor, most notably the Expanded Moynihan Station/Penn Station Redevelopment Project, will link the area to the Midtown Central Business District to the east.

The No Action Alternative would not develop approximately 5.45 acres of publicly accessible open space on the Development Site, including the redevelopment of the portion of the High Line on the western and southern edges of the Western Rail Yard. This open space would provide the area's residents and workers with a much needed recreational resource (also see "Open Space," below). It would also serve as the western extension of the extensive open space network that will be developed in the Hudson Yards area. Without the proposed open space, Hudson River Park and the waterfront area would remain visually and physically separated from the adjoining neighborhoods.

The No Action Alternative would not help meet the City's goal of adding to the overall supply of affordable housing. The Proposed Actions would develop approximately 390 affordable rental units on the Development Site and approximately 312 permanently affordable units at the Ninth and Tenth Avenue Sites. Therefore, the Proposed Actions would provide tangible benefits for low-, moderate-, and middle-income residents. The No Action Alternative would not provide any affordable housing unit on the project sites and would forgo these benefits to low-, moderate-, and middle-income residents.

Finally, the No Action Alternative would not capture the full potential from the No. 7 subway line extension. PlaNYC specifically describes how the extension of the subway and the development on the Development Site would work together to capture the potential of infrastructure investments to create transit-oriented development. The No Action Alternative would forego this opportunity.

SOCIOECONOMIC CONDITIONS

Like the Proposed Actions, the No Action Alternative would not result in significant adverse impacts to socioeconomic conditions. The following compares the effects of the No Action Alternative to those of the Proposed Actions with respect to the five CEQR socioeconomic issues of concern.

Direct Residential Displacement

None of the project sites contain a residential population; therefore, neither the No Action Alternative nor the Proposed Actions would directly displace any residents.

Indirect Residential Displacement

Neither this alternative nor the Proposed Actions would result in significant adverse impacts due to indirect residential displacement. The No Action Alternative would not introduce any uses to the project sites, and, therefore, would not have any potential to alter or accelerate residential market conditions in a manner that could indirectly displace residents through increased rents.

Direct Business and Institutional Displacement

Neither the No Action Alternative nor the Proposed Actions would result in significant adverse impacts due to direct business and institutional displacement. However, the No Action Alternative would not directly displace any businesses or institutions from the project sites. This would differ from the Proposed Actions, which would result in direct displacement of the uses on the Development Site—which include Greyhound Bus parking, DSNY facilities, and NYCT storage uses. The displacement of these uses would not constitute a significant adverse impact.

Indirect Business and Institutional Displacement

Neither this alternative nor the Proposed Actions would result in significant adverse impacts due to indirect business and institutional displacement. The No Action Alternative would not introduce any uses to the project sites, and, therefore, would not have the potential to alter or accelerate market conditions (which in turn could result in the indirect displacement of businesses and institutions through increased rents). Unlike the No Action Alternative, the Proposed Actions would result in the development of substantial new uses. However, the uses introduced by the Proposed Actions would not be new types of economic activities to the study area, nor would they be expected to alter or accelerate an ongoing trend to alter existing economic patterns.

Unlike the No Action Alternative, the Proposed Actions would add up to 2.2 million gross square feet (gsf) of commercial office space to the Development Site study area, which would bring a substantial number of residents and daytime workers and visitors, thereby providing significant numbers of new customers for the existing and proposed business uses.

Adverse Effects on Specific Industries

Like the Proposed Actions, the No Action Alternative would not result in significant adverse impacts on any industry or any category of business within or outside the study areas. Neither this alternative nor the Proposed Actions would introduce any regulations or policies that would restrict any business or process from continuing to function within or outside the project sites' study areas. Similarly, neither this alternative nor the Proposed Actions would directly or indirectly displace a substantial amount of employment or impair the economic viability in any one industry sector or category of business.

COMMUNITY FACILITIES AND SERVICES

In the No Action Alternative, no new population would be introduced on the Development Site or the Additional Housing Sites, and, therefore, no new demand would be placed on the hospitals, libraries, and police precincts and firehouses serving those sites. The Development

Site would add no additional demand in the No Action Alternative and would not create any new demand for public schools and publicly funded child care services. Therefore, in the No Action Alternative, the Proposed Actions' temporary significant adverse impacts on public schools, and significant adverse impact on child care services would be avoided. However, the new public school (420 elementary seats and 330 intermediate seats) on the Development Site that is included as part of the Proposed Actions would not be constructed in the No Action Alternative.

Under the No Action Alternative, as with the Proposed Actions, elementary and intermediate schools within the study area would operate with a substantial deficit of seats in 2019 (see Table 25-1) because of the new population introduced by the other development projects occurring in the area around the project sites. With the Proposed Actions, if the new PS/IS school is not completed by 2017, the new students introduced by the Proposed Actions would result in a temporary significant adverse impact on elementary schools in the study area. This impact would not occur with the No Action Alternative.

Table 25-1
Comparison of Estimated Public Elementary/Middle School Utilization, 2019
No Action Alternative and Proposed Actions

Analysis Area	No Action Alternative				Future with the Proposed Actions			
	Enrollment	Capacity	Available Seats in Program	Program Utilization (Percent)	Enrollment	Capacity	Available Seats in Program	Program Utilization (Percent)
Elementary Schools								
Study Area	3,389	1,726	(1,663)	196	4,118	2,146	(1,972)	192
CSD 2	19,003	16,522	(2,481)	115	19,732	16,942	(2,790)	116
Intermediate Schools								
Study Area	1,970	1,752	(218)	112	2,213	2,082	(131)	106
CSD 2	7,390	8,140	750	91	7,633	8,470	837	90

Sources: DOE *Enrollment Projections*; DOE, *Utilization Profiles: Enrollment/ Capacity/ Utilization, 2007- 2008.*

In 2019, elementary schools in the study area would operate at basically the same utilization rate in the No Action Alternative as with the Proposed Actions. With the Proposed Actions, the new PS/IS school to be included on the Development Site would partially offset the introduction of new elementary-school age students as a result of the Proposed Actions, so that no significant adverse impact would occur under the *CEQR Technical Manual* standard, which provides that any increase in overcapacity of less than five percent is not significant.

For intermediate schools, conditions under the No Action Alternative would be worse in the study area and Community School District (CSD) than with the Proposed Actions. The reduction in overcrowding (from a shortage of 218 seats to 131 seats in the No Action and Proposed Actions, respectively) would not occur in the No Action Alternative.

As with the Proposed Actions, high schools would operate with a surplus of seats in the No Action Alternative.

As with the Proposed Actions, publicly funded child care under the No Action Alternative would operate with a substantial deficit in capacity in 2019. (In the No Action Alternative, child care facilities in the one-mile study area are projected to operate at 334 percent of capacity in 2019.) However, this alternative would not generate the additional child care-eligible children that would be added by the low- to moderate-income affordable housing units resulting from the Proposed Actions.

OPEN SPACE

The No Action Alternative would not introduce new residents and workers to the project sites who would use the surrounding area's open spaces. As a result, unlike the Proposed Actions, the No Action Alternative would not have significant adverse impacts under the *CEQR Technical Manual* standards on active open space and total open space ratios in the residential study area around the Development Site. Like the Proposed Actions, in the No Action Alternative, total open space ratios and active open space ratios in the residential study area would be well below the City's guideline open space ratios (see Table 25-2). Passive open space ratios in the non-residential and residential study areas would remain above the City's guidelines under either the No Action Alternative or with the Proposed Actions.

Table 25-2
Comparison of Adequacy of Open Space Resources
No Action Alternative and Proposed Actions, 2019

Ratio	City Guideline Open Space Ratios	No Action Alternative: Open Space Ratios	Proposed Actions: Open Space Ratios
2019 Non-Residential Study Area			
Passive/Workers	0.15	0.30	0.32
Passive/Total Population	0.22/0.24*	0.24	0.24
2019 Residential Study Area			
Total/Residents	2.50	1.15	1.03**
Active/Residents	2.00	0.44	0.39**
Passive/Residents	0.50	0.71	0.64
Passive/Total Population	0.23/0.24*	0.15	0.16

Notes: Ratios in acres per 1,000 people.
* Weighted Average: No Action/Proposed Actions
** Results in a significant adverse impact

In qualitative terms, the No Action Alternative would not create the 5.45 acres of publicly accessible open space on the Development Site that would be provided with the Proposed Actions. A considerable new open space amenity would not be provided for residents and workers in the area to provide attractive pedestrian connections between the Development Site, the High Line, the open space planned for the Eastern Rail Yard, surrounding neighborhoods, and Hudson River Park. These areas would continue to be separated by the largely below-grade rail yard, and the Hudson River Park would remain visually and physically distant from the surrounding open spaces and neighborhoods.

SHADOWS

The No Action Alternative would not result in the construction of new buildings on either the Development Site or the Additional Housing Sites and thus no new shadows would be created. The No Action Alternative would not result in significant adverse shadow impacts at either of the two locations identified with the Proposed Actions—on the Eastern Rail Yard open space or on the open space to be built adjacent to the Tenth Avenue Site. In contrast, with the Proposed Actions, significant adverse shadow impacts would occur on those open spaces.

HISTORIC RESOURCES

Like the Proposed Actions, the No Action Alternative would not result in significant adverse physical, visual, or contextual impacts to historic resources. Unlike the Proposed Actions, under

the No Action Alternative there would be no beneficial restoration and adaptive re-use of those portions of the High Line located on the Development Site. This portion of the High Line, which runs along the south and west frontages of the Development Site, would remain vacant and inaccessible to the public. Since there would be no new construction on the Development Site, there would be no need to implement a construction protection plan for the High Line to avoid inadvertent construction damage to that resource. Further, since no material changes would occur on the Development Site, the visual context of the High Line on the Development Site would not be altered under the No Action Alternative.

URBAN DESIGN AND VISUAL RESOURCES

Like the Proposed Actions, the No Action Alternative would not result in significant adverse impacts to the urban design and visual resources of the study area. The No Action Alternative would not have the beneficial effects of the Proposed Actions that would result from the Proposed Actions' development of up to eight mixed-use buildings and a varied five-acre open space network constructed on a platform over the Western Rail Yard, or the beneficial effect from the development of residential affordable housing buildings on the two Additional Housing Sites. Under the No Action Alternative, there would be no change to the Development Site and the two Additional Housing Sites and, therefore, the inactive streetscapes surrounding these sites would remain unchanged. In contrast to the Proposed Actions, the presence of transportation-oriented Development Site would not support or enhance the urban design or visual character of the surrounding area. In the No Action Alternative, unlike the Proposed Actions, the presence of the two underutilized Additional Housing Sites would not support or enhance the urban design or visual character of the surrounding, mostly residential areas. Unlike the Proposed Actions, the No Action Alternative would not generate high wind effects at the pedestrian level.

NEIGHBORHOOD CHARACTER

Like the Proposed Actions, the No Action Alternative would not result in significant adverse impacts to the character of the neighborhoods in the study area. Under the No Action Alternative, there would be no change to the Development Site or the two Additional Housing Sites. Therefore, in this alternative, unlike with the Proposed Actions, these sites would not support or enhance the neighborhood character of the surrounding areas, and would not be a part of the study area's shift toward a denser, more mixed-use area. The portion of the High Line that runs along the south and west frontages of the Development Site would remain vacant and inaccessible to the public. Unlike the Proposed Actions, the No Action Alternative would not generate high wind effects at the pedestrian level.

NATURAL RESOURCES

Like the Proposed Actions, the No Action Alternative would not result in significant adverse impacts to natural resources. Under the No Action Alternative, the groundwater conditions and floodplain, and terrestrial resources within the project sites would remain in their current conditions. The Development Site and Additional Housing Sites would continue to provide limited habitat for wildlife. However, this alternative would not have the potential beneficial effects to terrestrial wildlife and plant resources that would result from the Proposed Actions by the creation of more than five acres of open space. These open space areas resulting from the Proposed Actions would be planted with a variety of native and ornamental plants and would benefit wildlife resources by providing improved habitat for urban wildlife, migratory songbirds, and butterflies.

Neither the No Action Alternative nor the Proposed Actions would result in in-water construction activities or significant adverse impacts to aquatic resources. While the No Action Alternative would not result in increased discharges of sanitary sewage to the sanitary sewage system (as would occur as a result of the Proposed Actions), these increases would not result in significant adverse impacts with the Proposed Actions. In the No Action Alternative, stormwater runoff generated within the southern third of the Development Site would continue to discharge to the combined sewer system and have the potential to contribute to combined sewer overflows. The No Action Alternative would not include stormwater management measures that would be included in the Proposed Actions to control the rate and improve the quality of stormwater runoff generated from the Development Site to the Hudson River.

HAZARDOUS MATERIALS

Under the No Action Alternative, new development on the Development Site and the Additional Housing Sites would not occur. As a consequence, the overall potential for disturbance of hazardous materials (i.e., contaminated soil, soil vapor, groundwater, or building materials) would be significantly less than that under the Proposed Actions. However, the Proposed Actions are not anticipated to result in any significant adverse impacts with respect to hazardous materials because of the implementation of the measures described in Chapter 12, "Hazardous Materials."

WATERFRONT REVITALIZATION PROGRAM

The No Action Alternative, unlike the Proposed Actions, would not be consistent with most of the applicable New York City Waterfront Revitalization Program (WRP) policies, particularly those that aim to encourage public access to waterfront resources. Unlike the Proposed Actions, the No Action Alternative would not advance the goal of encouraging commercial and residential redevelopment in appropriate portions of the coastal zone where public facilities and infrastructure are or will be adequate. The No Action Alternative would not result in the development of approximately 5.45 acres of publicly accessible open space within the coastal zone with new views of the Hudson River waterfront. The significant adverse open space impact that would occur under the Proposed Actions would not occur under the No Action Alternative. In contrast to the No Action Alternative, the Proposed Actions would be consistent with citywide goals for providing public access in the coastal zone and protecting scenic resources.

INFRASTRUCTURE

In the No Action Alternative, there would be no new development and its associated demand for infrastructure at either the Development Site or the Additional Housing Sites, and these locations would remain with the same uses as described for existing conditions. As a result, no changes would occur in future demands on the New York City water supply and sanitary sewage systems, and there would be no changes with regard to the future quantity, quality, and rate of stormwater runoff discharges from the Development Site or the Additional Housing Sites. While the Proposed Actions would result in new development and new demand, they would not result in significant adverse impacts to infrastructure services specific to these locations.

In the No Action Alternative, as with the Proposed Actions, New York City would have implemented the Amended Drainage Plan sewer improvements and the Trunk Plan for water distribution system improvements within local streets in the vicinity of the Development Site in order to facilitate construction of portions of the adjacent Hudson Yards projected development.

SOLID WASTE AND SANITATION SERVICES

In the No Action Alternative, there would be no new development and no incremental increase in solid waste and sanitation services at either the Development Site or the Additional Housing Sites. It is assumed that the uses currently on the Development Site would remain. While the Proposed Actions would result in new development and new demand at these locations, they would not result in significant adverse impacts to solid waste and sanitation services. Unlike the Proposed Action, under the No Action Alternative there would be no need to find an interim location for the existing DSNY storage and other uses on the Development Site. However, the M-6 garage and its accessory facilities would still be relocated at a later date to a new Manhattan 6/8/8A Garage planned for East 73rd street near the FDR Drive.

ENERGY

In the No Action Alternative, no new development would occur on either the Development Site or the Additional Housing Sites and, as a result, no changes would be expected from the project sites with respect to energy demands. However, although the Proposed Actions would generate new energy demands, these are not expected to result in significant adverse impacts to the local or regional capacity or distribution of energy to the project sites. With either the No Action Alternative or the Proposed Actions, Con Edison may implement some improvements to the local electrical and natural gas distribution infrastructure to meet the energy demands for the Hudson Yards developments in adjacent areas and other Manhattan development projects, but these energy infrastructure improvements would not affect existing activities on the Development Site.

TRAFFIC AND PARKING

Traffic

The No Action Alternative would not result in the generation of new traffic and parking demand and would not generate the significant adverse traffic impacts identified with the Proposed Actions. However, independent of the Proposed Actions, traffic service levels at many locations in the study areas would experience congested conditions. Overall, in the No Action Alternative (i.e., the Future without the Proposed Actions) in 2019, 114 approach movements at 70 intersections are projected to operate at mid-LOS D, LOS E, or LOS F during the weekday AM peak hour compared with 124approach movements with the Proposed Actions (10 fewer approaches than with the Proposed Actions); and 108, 144, and 83 approach movements at 71, 83, and 63 intersections are projected to operate at these levels of service during the weekday midday peak hour, weekday PM peak hour and Saturday midday peak hour, respectively. This compares to 118, 153, and 89 approach movements with the Proposed Actions (or 6 to 10 fewer approaches than with the Proposed Actions for each time period). The approach movements and intersections projected to operate within mid-LOS D, LOS E, or LOS F during each analysis hour are provided in Table 25-3.

Of these, (assuming no measures had been implemented by the City to address traffic congestion in the No Action Alternative), only 10 intersections could not be mitigated with the Proposed Actions in the weekday AM peak period, 3 intersections could not be mitigated in the weekday midday peak period, 13 intersections could not be mitigated in the weekday PM peak period, and 5 intersections could not be mitigated in the Saturday midday peak period.

Table 25-3
2019 No Action Alternative and Proposed Actions
Number of Intersection Approach Movements at Mid-LOS D, LOS E or LOS F

Level of Service	Analysis Hour			
	AM	Weekday Midday	PM	Saturday Midday
Mid-LOS D	15/15(n/c)	22/25(+3)	11/11(n/c)	22/21(-1)
LOS E	23/28(+5)	15/12(-2)	27/29(+2)	9/13(+4)
LOS F	76/81(+5)	71/80(+9)	106/113(+7)	52/55(+3)

Notes:
XX/YY = No Action/Proposed Action
(+/-X) = Change from No Action to Proposed Action

Similarly the significant adverse traffic impacts identified in 2017 for the Proposed Actions would be avoided in 2017 under the No Action Alternative.

Parking

The No Action Alternative would not result in the generation of new parking demand from the Development Site. However, due to background growth in parking demand and parking demand generated by developments assumed to be completed by the 2019 analysis year in the Future without the Proposed Actions, off-street parking is anticipated to still be highly utilized. Table 25-4 presents the anticipated off-street parking capacity and utilization for the weekday midday and overnight analysis periods for the No Action Alternative (i.e., Future without the Proposed Actions) in 2019. As shown, midday parking demand is projected to exceed available study area off-street capacity by 2,057 spaces, including the anticipated increase in midday parking supply. Overnight parking is expected to be available in the study area in the No Action Alternative in 2019, with a projection of 1,150 overnight spaces available and a utilization rate of 76 percent. In comparison, the Proposed Actions would increase the maximum midday parking shortfall by 322 spaces to an estimated 2,379 spaces in 2019.

Table 25-4
2019 Off-Street Parking Utilization
No Action Alternative and Proposed Actions
(Maximum Residential Scenario-Hotel Option)

Analysis Period	No Action Available Spaces	Increment	Proposed Action Available Spaces
Weekday Midday	(2,057)	322	(2,379)
Weekday Overnight	1,150	586	564

Note: Increment is net demand beyond what is accommodated by on-site accessory parking

TRANSIT AND PEDESTRIANS

Transit

Transit conditions for the No Action Alternative are described in Chapter 18, "Transit and Pedestrians," as the 2019 Future without the Proposed Actions.

In terms of subway line-haul and subway station elements, the No Action Alternative generates no additional passengers from Development Site or the Additional Housing Sites and, like the Proposed Actions would not result in a significant adverse impact on subway line haul.

However, it is noted that the Proposed Actions would result in a significant adverse impact to one subway station stairway (M23/M24 at Control Area N67 in the 34th Street-Penn Eighth Avenue Station) if not relocated and widened as part of the Moynihan project, which would not occur under the No Action Alternative.

In the No Action Alternative, as with the Proposed Actions, existing levels of bus service would not be sufficient to meet the projected demand. Some bus routes would require additional capacity, which could be provided by either increasing the standard or articulated bus service, where feasible. Without the additional population introduced by the Proposed Actions, the No Action Alternative would not require the incremental additional bus service required as a result of the Proposed Actions (Table 25-5). Therefore, the total number of additional buses needed on the affected routes would be smaller than with the Proposed Actions.

Table 25-5
Additional Buses Needed for the Proposed Actions

Bus Route	Direction	The Proposed Actions	
		Regular	Articulated
AM Peak Hour			
M10/ M20	NB	1	1
	SB	2	2
M11	NB	2	1
	SB	3	2
M34/ M16	EB	4	3
	WB	13	10
PM Peak Hour			
M10/ M20	NB	2	2
	SB	1	1
M11	NB	4	3
	SB	2	1
M34/ M16	EB	15	11
	WB	5	4

In 2019, additional standard or articulated bus service would need to be utilized to accommodate future passenger demand on the M10/M20, M11, and M34/M16 routes under both the No Action Alternative and the Proposed Actions. While more bus service would be required for the Proposed Actions than the No Action Alternative, it is NYCT policy to increase bus service to accommodate rider demand, taking into account financial and operational constraints, and thus no significant adverse impact to bus service would occur under the No Action Alternative or with the Proposed Actions.

Similarly, the significant adverse traffic impacts identified in 2017 for the Proposed Actions would be avoided in 2017 under the No Action Alternative.

Pedestrian Conditions

Pedestrian conditions for the No Action Alternative are described in Chapter 18, "Transit and Pedestrians," as the 2019 Future without the Proposed Actions. In general, pedestrian operations would be better under the No Action Alternative than under the Proposed Actions. While congested conditions could occur at some locations under the No Action Alternative in 2019, the significant adverse impacts under the Proposed Actions in 2019, which are presented in Table 25-6, would not occur under the No Action Alternative.

Table 25-6
2019 Future with the Proposed Actions:
Number of Pedestrian Element Locations with Significant Adverse Impacts

Time Period	Mitigated Significant Adverse Impacts	Unmitigated Significant Adverse Impacts
Sidewalks		
AM	1	1
Midday	0	1
PM	1	4
Saturday	0	1
Crosswalks		
AM	10 (3*)	2
Midday	6 (2*)	6 (3*)
PM	7	3
Saturday	7	1
Corners		
AM	12	1
Midday	2	7 (2*)
PM	9	3
Saturday	7	0

Note: * Additional significant adverse impact is due to changes in traffic signal timing as part of traffic mitigation measures.

AIR QUALITY

Air quality levels in the area around the project sites under the No Action Alternative would generally remain the same as current levels. While pollutant emissions may increase due to increases in emissions caused by anticipated developments, these should be offset by increasingly stringent vehicular emission control requirements, increases in energy efficiencies, and the increasing use of alternative fuel sources. Based on the mobile source analysis results presented in Chapter 19, "Air Quality and Greenhouse Gas Emissions," for the 2019 Future without the Proposed Actions condition, no exceedance of the National Ambient Air Quality Standards (NAAQS) is expected in the No Action Alternative for CO, SO_2, or PM_{10}. In addition, while the study area currently exceeds the $PM_{2.5}$ NAAQS, DEC is preparing and will implement measures designed to reduce $PM_{2.5}$ levels in the region as part of its $PM_{2.5}$ State Implementation Plan (SIP). These measures are projected by DEC to reduce annual levels below the $PM_{2.5}$ standard by 2010. In addition, compliance with the revised 24-hour standard is required by 2014.

Under the No Action Alternative, no residential, commercial, school, or other buildings would be constructed at the Development Site or the Additional Housing Sites. The Greenhouse gas (GHG) emissions from activities associated with the uses that would be developed under the Proposed Actions would not occur at the Development Site or the Additional Housing Sites under the No Action Alternative. However, it is likely that similar uses would be developed elsewhere to meet the demand for residential, commercial, educational and other space, and that depending on proximity to mass transit, design, and operating conditions of such uses. GHG emissions could be higher. At the same time, the opportunity for transit-oriented development, efficient land use over the rail yard, and sustainable building design at the Development Site would be missed.

NOISE

Under the No Action Alternative, there would be no incremental increase in noise generated at project sites. However, because there would be no perceptible difference in noise levels between the No Action Alternative and the Proposed Actions, there are no significant adverse noise impacts generated by the Proposed Actions,.

CONSTRUCTION

In the No Action Alternative, no new development would occur on either the Development Site or the Additional Housing Sites and, as a result, no on-site construction activities would be generated. Therefore, no significant adverse impacts related to construction activities on the project sites would occur with the No Action Alternative. In contrast, vehicle traffic associated with construction of the Proposed Actions at the Development Site would result in significant adverse impacts at nearby intersections as construction activities accelerate and peak in late 2016. Of the 25 intersections analyzed, significant adverse impacts were predicted at 10 intersections in the weekday AM peak period, 8 intersections in the weekday midday peak period, and 11 intersections in the weekday PM peak period. During the multi-year construction schedule associated with the Proposed Actions, detailed construction analysis shows that with the strict adherence to construction management techniques, there would be no significant adverse air quality or noise impacts during construction.

PUBLIC HEALTH

The public health analysis considers potential health effects near the project sites related to changes in air quality, noise, and hazardous materials that may result from the Proposed Actions. In the No Action Alternative, no changes would occur on the project sites that might affect public health. Neither the No Action Alternative nor the Proposed Actions would result in significant adverse public health impacts.

C. NO UNMITIGATED SIGNIFICANT ADVERSE IMPACT ALTERNATIVE

DESCRIPTION

The impact analyses provided in the previous chapters of this FEIS identified a number of significant adverse impacts for which no practicable mitigation has been formulated. Such impacts were identified in the areas of community facilities and services, open space, shadows, operational and construction traffic, and pedestrians. The feasibility of measures that would reduce or eliminate these unmitigated significant impacts is examined below.

The assessment focuses only on those technical analyses for which unmitigated impacts have been identified. There are no summary comparative assessments for technical analyses where there were no significant adverse impacts or where such impacts were fully mitigated for the Proposed Actions.

NO UNMITIGATED SIGNIFICANT ADVERSE IMPACT ALTERNATIVE COMPARED WITH THE PROPOSED ACTIONS

COMMUNITY FACILITIES AND SERVICES

The Proposed Actions would generate an estimated 147 children eligible for publicly funded child care in 2019, which would result in a significant adverse impact on child care facilities if no new child care capacity is added in the Future without the Proposed Actions. These new children represent approximately 33 percent of the collective capacity of publicly funded child care and Head Start centers in the study area. Given that this exceeds the CEQR threshold of a 5 percent increase of the collective capacity, if no new public child care and Head Start facilities or private providers accepting vouchers are created to increase the study area's capacity, significant adverse impacts could occur as a result of the Proposed Actions. In order not to exceed the CEQR threshold of five percent of the study area's child care capacity, the Proposed Actions would have to introduce fewer than 22 child-care eligible children which would limit the affordable housing component to only 104 units, substantially less than as with the Proposed Actions (a reduction of up to approximately 85 percent).

As noted in Chapter 24, "Mitigation," one option for reducing the Proposed Actions' significant adverse impact on publicly funded child care would be the development of publicly funded child care space as part of the New York City Administration for Children's Services' (ACS) public-private partnership initiatives. ACS will monitor the demand and need for additional capacity and implement change to the extent practicable.

In the absence of such mitigation, the No Unmitigated Impact Alternative would reduce the Proposed Actions' significant adverse impact on publicly funded child care by reducing the number of children from the project who would be eligible for publicly funded child care. However, using the methodology described in Chapter 5, "Community Facilities and Services," a rate of 0.21 child care-eligible children up to age 6 per low- or low-moderate income unit are assumed. Therefore, to result in fewer than 22 child-care-eligible children, the Proposed Actions would have to include only 104 affordable units for low- to moderate-income households, rather than the 702 such units included under the Proposed Actions. This alternative is not considered a reasonable alternative, since the identified need of providing affordable housing in New York City in general far outweighs the specific and limited impact on publicly funded child care services.

OPEN SPACE

As noted below in "Reduced Density Alternative," the Reduced Density Alternative would reduce the new demand for open space resources, it would still result in significant adverse impacts on total open space and active open space ratios.

The overall density of the project would have to be reduced to approximately 2,552 residential units (2,162 market rate and 390 affordable units) in order to result in no change in the total open space ratio as an increment over the Future without the Proposed Actions (or the No Action Alternative). Conversely, the Proposed Actions would have to include an additional 6.2 acres of open space on or in the study area or on the Development Site (2.4 acres or more of active space and 3.8 acres or less of passive open space) in 2019 so that the total open space ratio and active open space ratio in the ½-mile residential study area would remain unchanged from the ratios in the Future without the Proposed Actions. The total open space created as part of the Proposed Actions—on the Development Site and/or off-site in the study area—would, therefore, need to

increase to 11.65 acres in 2019, which would almost equal the size of the 13-acre Development Site. The inability to locate such acreage on-site or to find suitable locations nearby makes this alternative infeasible.

SHADOWS

The Proposed Actions result in significant adverse shadow impacts at two locations, the Eastern Rail Yard open space as a result of new buildings on the Development Site, and an open space resource to be built adjacent to the Tenth Avenue Site. In order to fully avoid creating this shadow impact, alternative building heights would have to be considered that were short enough to not cast shadows on these sensitive resources.

No Shadow Impact on Eastern Rail Yard Open Space

For the Development Site, the buildings heights of the three residential buildings at the southeast corner of the site (WR-1, WR-2, and WR-3), along Eleventh Avenue and West 30th Street, would have to be substantially reduced to avoid a significant adverse shadow impact. Reductions would be as follows:

- WR-1: 250 feet, resulting in building heights of 450-610 feet compared to 700-800 feet with the Proposed Actions (a reduction in height of up to 68 percent).
- WR-2: 200 feet, resulting in building heights of 450-610 feet compared to 650-810 feet with the Proposed Actions (a reduction in height of up to 75 percent).
- WR-3: 300 feet, resulting in building heights of 250-410 feet compared to 550-710 feet with the Proposed Actions (a reduction in height of up to 58 percent).

However, changes in building heights of this magnitude would not be a reasonable alternative or be consistent with the project's goals and objectives. Reductions of this magnitude would mean either a significant reduction in the overall floor area of the project or a major redistribution of bulk on the Development Site. A substantial reduction in the overall floor area would diminish the economic value of the Proposed Actions and would negatively affect the overall project viability, given the costly infrastructure and amenities of the Proposed Actions. A redistribution of bulk from the southeast corner to other locations on the Development Site would not be consistent with the design intent for the Development Site. As described in Chapter 1, "Project Description," proposed building massing and heights are intended to reflect a gradual decrease in height and mass descending from Eleventh Avenue and West 33rd Street to Twelfth Avenue and West 30th Street. For this reason, it is anticipated that the tallest building on the site would be the commercial building in the northeast corner. Taller residential buildings are proposed generally in the eastern and northern portions of the Development Site, and shorter residential buildings in the southwest quadrant of the Development Site. This building arrangement is intended to step down toward the waterfront, resulting in a transition to Hudson River Park and the High Line.

No Shadow Impact Adjacent to Tenth Avenue Site

For the Tenth Avenue Site, the new building could not exceed 40 feet in height. A building this short would not be considered practical in that it would not provide sufficient density to make the site's development feasible and would not provide new affordable housing.

TRAFFIC AND PARKING

As described in Chapter 17, "Traffic and Parking," the Proposed Actions would result in significant adverse traffic impacts at intersections within the study area that cannot be fully alleviated with practical mitigation measures. Under projected 2019 No Action Alternative traffic conditions, 76 intersection approach movements would operate at LOS F in the weekday AM peak hour. During the weekday midday and PM peak hours, 71 and 106 intersection approach movements would operate at LOS F, respectively. Midday Saturday, 52 intersection approach movements would operate at LOS F. Under CEQR guidelines, a three second increase in delay at any intersection lane groups operating at LOS F with a delay of less than 120 seconds, or a one-second increase in delay at intersection lane groups operating at LOS F with a delay greater than 120 seconds, would constitute a significant adverse impact. Under these conditions, any substantial development on the Development Site would result in unmitigated traffic impacts, and no reasonable alternative could be developed to completely avoid such impacts without substantially compromising the project's stated goals.

TRANSIT AND PEDESTRIANS

As described in Chapter 18, "Transit and Pedestrians," the Proposed Actions would result in significant adverse pedestrian impacts at intersections within the study area that cannot be fully alleviated with practical mitigation measures. Because of the anticipated congestion under the No Action Alternative, any practicable development on the Development Site would result in unmitigated pedestrian impacts, and no reasonable alternative could be developed to completely avoid such impacts without substantially compromising the project's stated goals.

D. REDUCED DENSITY ALTERNATIVE

DESCRIPTION

DEVELOPMENT PROGRAM

The Reduced Density Alternative assumes redevelopment of the Development Site with the same mix of uses as with the Proposed Actions, but with a reduced amount of total development. At the Additional Housing Sites, the Reduced Density Alternative assumes that the same development would occur as with the Proposed Actions, as this would allow for the maximum number of permanently affordable residential units at these sites and within the community.

This alternative assumes an 8.0 FAR on the Development Site, compared to a 10.0 FAR under the Proposed Actions. Overall, the Reduced Density Alternative would provide approximately 20 percent less total development on the Development Site than with the Proposed Actions, with approximately 5.0 million to 5.1 million gsf of development compared to between 6.2 million and 6.4 million gsf of development for the Proposed Actions. Like the Proposed Actions, the Reduced Density Alternative would provide residential, commercial (retail and office or hotel) space, a public school, publicly accessible open space, and enclosed accessory parking. The Reduced Density Alternative, similar to the Proposed Actions, would encourage a mix of housing types on the Development Site, including market-rate, rental, and affordable housing, with a floor area bonus to facilitate permanent affordable housing.

Like the Proposed Actions, the Reduced Density Alternative assumes that 20 percent of all rental units on the Development Site would be affordable housing units under the terms of the

applicable 80/20 program, with the provision of affordable units subject to (1) the allocation of sufficient tax-exempt bond cap or other equivalent low-cost financing to Developer for each building of rental housing as and when required; and (2) the availability to Developer of such other incentives, programs, exemptions, credits, or abatements as are then generally available for the development of 80/20 housing in the City.

Similar to the Proposed Actions, a portion of the development for the Reduced Density Alternative would be constructed over the railroad tracks and LIRR facilities buildings, requiring the construction of a platform. The remainder of the development would be constructed on land (terra firma) that is not occupied by LIRR operations (and thus would not require platform construction). Like the Proposed Actions, some of the existing LIRR on-site facilities would be temporarily relocated to facilitate construction of the Reduced Density Alternative. Although there would be temporary or periodic track outages during construction of both the Reduced Density Alternative and the Proposed Actions (described in Chapter 21, "Construction Impacts"), there would be no disruption of LIRR passenger service.

Similar to the Proposed Actions, a range of new development could occur within the Development Site under the Reduced Density Alternative, and for analysis purposes, two reasonable worst-case development scenarios have been identified for the Reduced Density Alternative—a Maximum Residential Scenario and a Maximum Commercial Scenario. The Maximum Residential Scenario and Maximum Commercial Scenario under both the Reduced Density Alternative and the Proposed Actions would include approximately 5.45 acres of publicly accessible open space and an approximately 120,000-gsf public school. The Maximum Residential Scenario under the Reduced Density Alternative would include between 4,261 and 4,618 residential units and either (1) 1.2 million gsf of office space; or (2) a 960-room convention-style hotel. In comparison, the Maximum Residential Scenario under the Proposed Actions would include between 5,347 and 5,762 residential units and either (1) 1.5 million gsf of office space; or (2) a 1,200-room convention-style hotel (see Table 25-7). Under the Reduced Density Alternative, the Maximum Commercial Scenario would include 3,655 residential units and 1.75 million gsf of office space. In comparison, the Maximum Commercial Scenario under the Proposed Actions would include 4,624 residential units and 2.19 million gsf of office space (see Table 25-8). The Reduced Density Alternative would provide approximately 1,280 on-site accessory parking spaces, in comparison to approximately 1,600 on-site accessory parking spaces under the Proposed Actions.

These reasonable worst-case development scenarios for the Reduced Density Alternative represent the upper bounds of residential and commercial space for the purposes of the impact analysis of this alternative. This analysis will, therefore, examine the scenario with the greater potential environmental impact for each impact area, similar to what was done for the analyses of the Proposed Actions. As described above, the two different scenarios associated with the Development Site for the Reduced Density Alternative would assume the same development for the Additional Housing Sites.

It is assumed that the Reduced Density Alternative would include the same sustainable, green components as those analyzed in the Proposed Actions.

Table 25-7
Development Site Maximum Residential Scenario:
Comparison of the Reduced DensityAlternative and the Proposed Actions

Development Program	Reduced Density Alternative		Proposed Actions	
	Office Option[1]	Hotel Option[1]	Office Option[1]	Hotel Option[1]
Residential	3,575,000	3,875,000	4,469,063	4,836,563
Residential Units				
Rental Units	1,450 units	1,567 units	1,948 units	1,948 units
Condominium Units	2,811 units	3,051 units	3,399 units	3,814 units
Total Units	**4,261 units**	**4,618 units**	**5,347 units**	**5,762 units**
Affordable Units (rental)	290 units[2]	313 units[2]	390 units[2]	390 units[2]
Market Rate Units (rental and condo)	3,971 units	4,305 units	4,957 units	5,372 units
Commercial				
Office	1,196,000	0	1,495,000	0
Hotel	0	806,400 960 rooms	0	1,008,000 1,200 rooms
Retail	176,000	168,000	220,500	210,000
Community Facility				
Public School	**120,000**	**120,000**	**120,000**	**120,000**
TOTAL	**5,067,000**	**4,969,400**	**6,304,563**	**6,174,563**

Notes:
1. For analysis purposes, two options are considered for the commercial building in the Maximum Residential Scenario under the Reduced Density Alternative and under the Proposed Actions. One would be for an office building. The other would be for a convention-style hotel.
2. Twenty percent of all rental units on the Development Site would be affordable housing units under the terms of the applicable 80/20 program.

Table 25-8
Development Site Maximum Commercial Scenario:
Comparison of the Reduced DensityAlternative and the Proposed Actions

Development Program	Reduced Density Alternative	Proposed Actions
Residential	3,075,000	3,837,225
Residential Units		
Rental Units	1,183 units	1,896 units
Condominium Units	2,472 units	2,728 units
Total Units	**3,655 units**	**4,624 units**
Affordable Units (rental)*	237 units*	379 units*
Market Rate Units (rental and condo)	3,418 units	4,245 units
Commercial		
Office	1,748,000	2,185,000
Hotel	0	0
Retail	176,000	220,500
Community Facility		
Public School	120,000	120,000
TOTAL	**5,119,000**	**6,362,725**

Note:
* Twenty percent of all rental units on the Development Site would be affordable housing units under the terms of the applicable 80/20 program.

SITE PLANNING, BULK, AND MASSING

Like the Proposed Actions, there would be up to eight buildings organized around and within the approximately 5.45 acres of publicly accessible open space on the Development Site under the Reduced Density Alternative. It is assumed that the Reduced Density Alternative would include

the same overall site plan layout for the Development Site, including location of buildings, open space, and internal roadways, as those currently contemplated for the Proposed Actions. Like the Proposed Actions, it is anticipated that the tallest building on the site under the Reduced Density Alternative would be the commercial building in the northeast corner. For both the Reduced Density Alternative and the Proposed Actions, taller residential buildings are proposed generally in the eastern and northern portions of the Development Site and shorter residential buildings in the southwest quadrant of the Development Site. Under the Reduced Density Alternative, it is anticipated that building heights would generally range from approximately 350 to 750 feet compared to building heights that would generally range from 350 to 950 feet under the Proposed Actions (see Table 25-9).

Table 25-9
Development Site Approximate Building Heights: Comparison of the Reduced DensityAlternative and the Proposed Actions

Building	Height with Reduced Density Alternative (feet)	Height With Proposed Actions (feet)
WC-1	700-750	850-950
WR-1	580-660	700-800
WR-2	550-670	650-810
WR-3	450-570	550-710
WR-4	350-400	350-500
WR-5	450-560	500-700
WR-6	550-670	650-810
WR-7	450-570	550-710

Similar to the Proposed Actions, the tallest building on the Development Site under the Reduced Density Alternative would be an office building at the northeast corner (WC-1). Under the Reduced Density Alternative, the building would be between 700 and 750 feet in height compared to approximately 850 to 950 feet under the Proposed Actions. Under the Reduced Density Alternative, a residential building (WR-6) would be located directly west of the commercial building, and would be approximately 550 to 670 feet in height—compared to 650 to 810 feet in height under the Proposed Actions. The shortest building along West 33rd Street (WR-7) would be located at Twelfth Avenue under the Reduced Density Alternative, and would be between 450 and 570 feet in height—compared to 550 to 710 feet in height under the Proposed Actions.

South of the commercial building would be a residential building with ground floor retail (WR-1), that would be between 580 and 660 feet in height under the Reduced Density Alternative, compared to between 700 to 800 feet in height under the Proposed Actions. West of this building would be a residential building that may include ground floor retail (WR-5) that would be between 450 and 560 feet in height under the Reduced Density Alternative, compared to between 500 and 700 feet in height under the Proposed Actions.

Both the Reduced Density Alternative and the Proposed Actions would have a mixed-use building at the southeast corner of the Development Site (WR-2). This building would be between 550 and 670 feet in height under the Reduced Density Alternative, compared to between 650 to 810 feet in height under the Proposed Actions. To the west of this building would be a shorter mixed-use building (WR-3) that would be between 450 and 570 feet in height under the Reduced Density Alternative, compared to between 550 and 710 feet in height under

the Proposed Actions. Similar to the Proposed Actions, the shortest building on the Development Site under the Reduced Density Alternative would be the residential building at the southwest corner of the site (WR-4). This building would be approximately 350 to 400 feet in height under the Reduced Density Alternative—under the Proposed Actions, this building would be approximately 350 to 450 feet in height.

The Reduced Density Alternative would provide approximately 5.45 acres of publicly accessible open space—the same as the Proposed Actions. It is assumed that the Reduced Density Alternative would include the same open space layout, size of open space areas, and open space amenities as those currently contemplated for the Proposed Actions. Therefore, the Reduced Density Alternative would include an approximately 1.42-acre central open space in the eastern portion of the Development Site between the northern and southern vehicular roadways and an approximately 1.51-acre waterfront lawn in the western portion of the Development Site, between the residential buildings to the north and south. For analysis purposes, the Reduced Density Alternative and the Proposed Actions assume that the 1.42-acre central open space would include a playground.

The Proposed Actions and the Reduced Density Alternative are expected to provide two smaller open space areas along West 33rd Street. Both the Reduced Density Alternative and the Proposed Actions would include an approximately 2,600-square foot plaza at the northeast corner of the Development Site and an approximately 11,400-sf open space with a pedestrian plaza and a dog run between residential building WR-6 and commercial building WC-1. It is anticipated that under the Reduced Density Alternative, the portion of the High Line located within the Development Site would be adaptively reused as 1.05 acres of passive open space elevated above portions of the Development Site, like the Proposed Actions.

CIRCULATION AND PARKING

The Reduced Density Alternative would have the same proposed layout for the roadways on the Development Site as the Proposed Actions. Two parallel vehicular roadways would function as unmapped extensions of West 32nd and West 31st Streets into the site from Eleventh Avenue. Both roadways would also be two-way, providing access to the buildings in the western portion of the site in a cul-de-sac drop-off.

Under both the Reduced Density Alternative and the Proposed Actions, access to parking would be along both the new northern and southern roadways and access to loading areas would be on West 33rd Street. Both the Reduced Density Alternative and the Proposed Actions would have two access points for the LIRR, one on West 33rd Street and the other on Twelfth Avenue. In addition, to provide better service access to and from the platform level, West 33rd Street would be rebuilt to an appropriate profile and elevation between Eleventh and Twelfth Avenues. As described above, the Reduced Density Alternative would provide up to approximately 1,280 on-site accessory parking spaces, compared to up to approximately 1,600 on-site accessory parking spaces with the Proposed Actions.

ABILITY TO MEET GOALS AND OBJECTIVES OF THE PROPOSED ACTIONS

The Reduced Density Alternative would result in significant adverse environmental impacts similar to those of the Proposed Actions while failing to realize a principal project goal—to maximize revenue for MTA's capital plan—and reducing the number of affordable housing units constructed on the Development Site.

The Reduced Density Alternative would still require the extraordinary cost of constructing a platform over the operating LIRR rail yard in order to erect any commercial and residential

buildings and open space over the rail yard. The cost of the platform and other required infrastructure would have to be amortized by a smaller number of residential units and reduced commercial space, thereby reducing the monetary value of the Development Site Project and making it unlikely to realize all of the goals and objectives of the Proposed Actions as set forth in Chapter 1, "Project Description." Specifically, it is highly unlikely that the Reduced Density Alternative would be able to contribute as substantially as the Proposed Actions to MTA's capital budget for critical transportation improvements. The Reduced Density Alternative would also fail to provide the same number of residential units—particularly affordable units—as the Proposed Actions; nor would it provide the same level of economic development to the City. Given the fixed infrastructure costs, the viability of constructing a reduced density development with the features of the Proposed Actions is questionable.

As noted above and as set forth more fully below, the Reduced Density Alternative, even if feasible, would still result in most of the significant adverse environmental impacts of the Proposed Actions that are an inevitable consequence of any substantial development on the Development Site.

REDUCED DENSITY ALTERNATIVE COMPARED WITH THE PROPOSED ACTIONS

Since the Reduced Density Alternative and the Proposed Actions have the same development program for the Additional Housing Sites, the comparative analysis of the Reduced Density Alternative is specifically focused on the Development Site.

LAND USE, ZONING, AND PUBLIC POLICY

Neither the Reduced Density Alternative nor the Proposed Actions would result in any significant adverse impacts to land use, zoning, or public policy. Like the Proposed Actions, the Reduced Density Alternative would change the land use and zoning on the Development Site. Both the Proposed Actions and the Reduced Density Alternative would redevelop the open, below-grade rail yard with a mixture of residential, commercial, community facility, parking, and public open space uses that would support future development and link together the surrounding neighborhoods. Also like the Proposed Actions, the Reduced Density Alternative would not result in any significant adverse impacts on land use or zoning and would be consistent with public policy, such as PlaNYC. However, certain benefits of the Proposed Actions would not be realized in this alternative. Specifically, the Reduced Density Alternative would provide fewer affordable housing units on the Development Site (the Maximum Residential Scenario-Office Option would provide 100 fewer units and the Hotel Option would provide 77 fewer units; the Maximum Commercial Scenario would provide 142 fewer units). Thus, although this alternative would increase the supply of affordable housing available in New York City, which is consistent with City housing policy, the number of dwelling units would be less than under the Proposed Actions. Thus, the Proposed Actions would provide a greater benefit for low- and to moderate-income residents than the Reduced Density Alternative by providing for more affordable units on the Development Site.

SOCIOECONOMIC CONDITIONS

Like the Proposed Actions, the Reduced Density Alternative would not result in significant adverse impacts related to socioeconomic conditions. Neither this alternative nor the Proposed Actions would, either directly or indirectly, result in significant adverse impacts due to

residential or business displacement, and neither would adversely affect a specific industry. The following compares the effects of the Reduced Density Alternative to those of the Proposed Actions with respect to the five CEQR socioeconomic issues of concern.

Direct Residential Displacement

None of the project sites contain a residential population; therefore, neither the Reduced Density Alternative nor the Proposed Actions would directly displace any residents.

Indirect Residential Displacement

As detailed above, the Reduced Density Alternative assumes redevelopment of the Development Site with the same mix of uses as presented by the Proposed Actions, but with approximately 20 percent less overall development. Like the Proposed Actions, the Reduced Density Alternative would not result in indirect residential displacement pressures within the Development Site study area that are substantially different from those generated by the Proposed Actions. The Reduced Density Alternative would result in the development of fewer residential dwelling units on the Development Site (as few as 4,261 units, of which 290 would be affordable units) as compared to the Proposed Actions (up to 5,672 units, of which 390 would be affordable[1]). However, similar to the Proposed Actions, the new population would be substantial, with demographic characteristics that do not differ substantially from that of the study area population in the Future with the Proposed Actions.

By 2017 and 2019, housing prices, rents, and median incomes are expected to rise in the study area such that this alternative would not significantly alter or substantially accelerate the study area's long-term trend toward increasing residential development, affluence, and residential desirability. Like the Proposed Actions, the Reduced Density Alternative would not introduce any type of land use that would diminish the residential desirability of the area, offset positive trends in the study area, impede efforts to attract investment to the area, or create a climate for disinvestment. For these reasons, no significant adverse impacts from indirect residential displacement would be expected to result from either the Reduced Density Alternative or the Proposed Actions.

Direct Business and Institutional Displacement

Like the Proposed Actions, the Reduced Density Alternative would directly displace the project sites' uses—which include Greyhound Bus parking, DSNY facilities, and NYCT parking uses. As detailed in the socioeconomic assessment for the Proposed Actions, the potential displacement of these uses would not constitute a significant adverse impact as defined by CEQR. Therefore, neither the Reduced Density Alternative nor the Proposed Actions would result in significant adverse impacts due to direct business and institutional displacement.

Indirect Business Displacement

Like the Proposed Actions, the Reduced Density Alternative would not result in significant adverse impacts due to indirect business and institutional displacement. The Reduced Density Alternative would introduce the same mix of uses as the Proposed Actions; uses that are currently present and well-established in the study areas and that are projected to be in place in

[1] Twenty percent of all rental units on the Development Site would be affordable housing units under the terms of the applicable 80/20 program.

the Future without the Proposed Actions. Therefore, as with the Proposed Actions, this alternative would not be expected to alter or accelerate an ongoing to trend to alter existing economic patterns.

The Reduced Density Alternative, with its lesser amount of commercial office space as compared to the Proposed Actions, would bring fewer people to the area to form a customer base for local businesses. However, under both the Reduced Density Alternative and the Proposed Actions, the net effect would be a substantial increase in the number of residents and daytime workers and visitors, thereby providing significant numbers of new customers for the existing and proposed business uses.

Adverse Effects on Specific Industries

Like the Proposed Actions, the Reduced Density Alternative would not result in significant adverse impacts on any industry or any category of business within or outside the study areas. Neither this alternative nor the Proposed Actions would introduce any regulations or policies that would restrict any business or process from continuing to function within or outside the project sites' study areas. Similarly, neither this alternative nor the Proposed Actions would directly or indirectly displace a substantial amount of employment or impair the economic viability in any one industry sector or category of business.

COMMUNITY FACILITIES AND SERVICES

With a smaller population, the Reduced Density Alternative would place proportionately less demand on community services than the Proposed Actions. Neither the Reduced Density Alternative nor the Proposed Actions would have significant adverse impacts on police protection, fire protection, health care, or library services.

Both the Reduced Density Alternative and the Proposed Actions would result in the construction of the PS/IS school (420 elementary seats and 330 intermediate seats) on the Development Site. The Reduced Density Alternative would introduce fewer new school-age children at the elementary, middle, and high school student levels. As shown in Table 25-10, the Reduced Density Alternative would, therefore, result in slightly lower utilization rates for both elementary and intermediate schools within the study area than in the Future without the Proposed Actions (the No Action Alternative) or the Proposed Actions. The utilization rates for elementary and intermediate schools in the overall CSD would be the same as with the Proposed Actions. Neither the Reduced Density Alternative nor the Proposed Actions would result in significant adverse impacts in 2019 upon completion of the anticipated development, but in the Reduced Density Alternative, unlike the Proposed Actions, conditions in the study area would be improved over the Future without the Proposed Actions. Unlike the Proposed Actions, even if the planned PS/IS is not yet complete by 2017, the Reduced Density Alternative would not result in temporary significant adverse impact on elementary or intermediate schools in the study area.

Although fewer high school students would be generated under the Reduced Density Alternative, high schools would operate with a surplus of seats under either this alternative or the Proposed Actions.

For publicly funded child care, both the Reduced Density Alternative and the Proposed Actions would result in a significant adverse child care impact. The low- to moderate-income affordable residential units included in the Reduced Density Alternative would result in 66 children eligible for child care, compared with 147 child-care-eligible children with the Proposed Actions. The addition of 66 children would still exacerbate the predicted shortage in child care slots and would constitute

15 percent of the collective capacity of child care facilities in the study area. Like the Proposed Actions, this increase would result in a significant adverse impact on child care facilities in 2019.

Table 25-10
Comparison of Estimated Public Elementary/Middle School Utilization, 2019
Reduced Density Alternative and Proposed Actions

Analysis Area	2019 Future without the Proposed Actions		2019 Future with the Proposed Actions		2019 Future with the Reduced Density Alternative	
	Available Seats in Program	Program Utilization (Percent)	Available Seats in Program	Program Utilization (Percent)	Available Seats in Program	Program Utilization (Percent)
Elementary Schools						
Study Area	(1,663)	196	(1,972)	192	(1,835)	186
CSD 2	(2,481)	115	(2,790)	116	(2,653)	116
Intermediate Schools						
Study Area	(218)	112	(131)	106	(85)	104
CSD 2	750	91	837	90	883	90

Sources: DOE *Enrollment Projections*; DOE, *Utilization Profiles: Enrollment/ Capacity/ Utilization, 2007- 2008.*

OPEN SPACE

As noted above, it is assumed that the Reduced Density Alternative would include the same open space acreage, layout, size of open space areas, and open space amenities as those currently contemplated for the Proposed Actions. However, fewer residents and workers would be introduced to the Development Site and, therefore, the demands on those open spaces and other open spaces in the surrounding area would be smaller.

Neither the Reduced Density Alternative nor the Proposed Actions would result in significant adverse open space impacts in the non-residential study area, and neither would result in significant adverse impacts on passive open space in the residential study area (see Table 25-11).

As shown in the table, the Reduced Density Alternative, like the Proposed Actions, would result in significant adverse impacts on total open space ratios and active open space ratios in the residential study area. Although the total and active open space ratios in the future with both the Reduced Density Alternative and the Proposed Actions would continue to be below the levels recommended by the City, it is recognized that this goal is not feasible for many areas of the City, and these ratios are not considered impact thresholds. The Reduced Density Alternative would result in a decrease of approximately six percent and nearly seven percent, respectively, in the total and active open space ratios compared to the Future without the Proposed Actions condition. This would be a substantial change in areas that are not well-served by open space, according to the *CEQR Technical Manual*, and would, therefore, constitute a significant adverse impact on open space. However, like the Proposed Actions, the Reduced Density Alternative would also result in an important open space benefit, by adding 5.45 acres of new open space to the study area.

Table 25-11
Comparison of Adequacy of Open Space Resources
Reduced Density Alternative Compared with the Proposed Actions, 2019

Ratio	City Guideline Open Space Ratios	Future Without Proposed Actions Ratios	Proposed Actions Open Space Ratios	Reduced Density Alternative Open Space Ratios	Percent Change, Proposed Actions	Percent Change, Reduced Density Alternative
Non-Residential Study Area						
Passive/Workers	0.15	0.30	0.32	0.33	6.67	10.00
Passive/Total Population	0.22/0.24/0.23*	0.24	0.24	0.25	0.00	4.17
Residential Study Area						
Total/Residents	2.50	1.15	1.03	1.08	-10.43**	-6.09
Active/Residents	2.00	0.44	0.39	0.41	-11.36**	-6.82
Passive/Residents	0.50	0.71	0.64	0.68	-9.86	-4.23
Passive/Total Population	0.23/0.24/0.23*	0.15	0.16	0.16	6.67	6.67

Note: Ratios in acres per 1,000 people.
* Weighted Average: No Action/Proposed Actions/Reduced Density
** Results in a significant adverse impact.

SHADOWS

As described above, the site plan of the Reduced Density Alternative would be essentially the same, in terms of the location of buildings and open space, as that currently considered for the Proposed Actions. However, under the Reduced Density Alternative, it is anticipated that building heights would generally range from approximately 350 to 750 feet, compared to building heights that would generally range from 350 to 950 feet under the Proposed Actions. With the Reduced Density Alternative, buildings would be approximately 15 to 20 percent shorter than the buildings associated with the Proposed Actions analyzed in Chapter 7, "Shadows." Nearby shadow-sensitive resources that would experience incremental shadows from the top 100 to 150 feet of the buildings associated with the Proposed Actions would consequently experience a smaller extent and duration of new shadows with the Reduced Density Alternative.

However, as shown in Chapter 7, "Shadows," most of the incremental shadows generated by the Proposed Actions would come from the lower 80 to 85 percent of the buildings and, therefore, incremental shadows from the Reduced Density Alternative would be very similar in extent and duration. The Reduced Density Alternative would, similar to the Proposed Actions, cast a substantial area of incremental shadows on the Eastern Rail Yard open space, to be located east of the Development Site across Eleventh Avenue, in the late afternoons during the spring, summer, and fall, causing a significant adverse shadow impact to this planned open space. These incremental shadows would be a little smaller in extent than those cast by the Proposed Actions for much of the affected time, but would still be substantial enough to result in a significant adverse impact to this open space. As with the Proposed Actions, the incremental shadows would come primarily from proposed buildings WR-1, WR-2, and WR-3, and, due to the proximity of these sites to the Eastern Rail Yard open space, the lower overall heights of the Reduced Density Alternative as compared to the Proposed Actions would not have much of an effect because most of the incremental shadow would come from the lower and middle portions of proposed buildings WR-1, WR-2, and WR-3.

As with the Proposed Actions, no other significant adverse shadow impacts would result from the Reduced Density Alternative at the Development Site. Similar to the Proposed Actions, the Reduced Density Alternative would cast incremental shadows westward on to the Hudson River and Hudson River Park during the morning throughout the year. The extent and duration of incremental shadow cast on the Hudson River by the Reduced Density Alternative would be somewhat smaller than those cast by the Proposed Actions, particularly in the late spring and summer. The extent and duration of new shadows cast by the Reduced Density Alternative on portions of Hudson River Park would be very similar to those of the Proposed Actions. Neither the Reduced Density Alternative nor the Proposed Actions would result in significant adverse shadow impacts on the Hudson River or Hudson River Park.

The Reduced Density Alternative would result in a much smaller duration of incremental shadow on the River Place plaza than the 40 minutes of new shadow that would occur with the Proposed Actions.

Shadows cast by the Reduced Density Alternative on the planned Hudson Park and Boulevard open spaces would be very similar in extent and duration to those cast by the Proposed Actions.

HISTORIC RESOURCES

The New York City Landmarks Preservation Commission (LPC) and the New York State Office of Parks, Recreation and Historic Preservation (OPRHP) have determined that the Development Site is not sensitive for archaeological resources. Therefore, the Reduced Density Alternative, like the Proposed Actions, would not disturb any potential archaeological resources.

Like the Proposed Actions, the Reduced Density Alternative would not result in significant adverse physical, visual, or contextual impacts to architectural resources. The Reduced Density Alternative, like the Proposed Actions, would integrate the High Line into the overall site plan for the Development Site as a passive open space resource and pedestrian pathway that would also connect with the portion of the High Line on the Eastern Rail Yard to the east and the 1.5-mile High Line Park to the south. In order to fully integrate the High Line with the planned open space network on the Development Site, features, such as railings, of the High Line's Twelfth Avenue section would be removed. In addition, there would be two new entrances to the High Line's Twelfth Avenue section, as under the Proposed Actions. Since OPRHP has agreed that construction near the High Line is historically appropriate, the Reduced Density Alternative, like the Proposed Actions, would require continued coordination with OPRHP in compliance with Section 14.09 of the New York State Historic Preservation Act of 1980.

Since the Reduced Density Alternative would have the same site plan for the Development Site as the Proposed Actions, it would result in four, out of a total of eight, buildings located immediately adjacent to the High Line, including at least one building that would bridge over the High Line; therefore, a construction protection plan would be required for the High Line in order to protect this architectural resource from potential inadvertent construction damage. The Construction Environmental Protection Plan (CEPP) would meet the guidelines set forth in the DOB's *TPPN #10/88*, concerning procedures for the avoidance of damage to adjacent historic structures from nearby construction, the *Protection Programs for Landmarked Buildings* guidance document of the LPC, and the National Park Service's *Preservation Tech Notes, Temporary Protection #3: Protecting a Historic Structure during Adjacent Construction*. It would also follow the guidelines set forth in section 523 of the *CEQR Technical Manual*. The construction protection plan would provide continued maintenance and protection for this architectural resource throughout construction of the Development Site.

The Reduced Density Alternative, like the Proposed Actions, would not have adverse visual or contextual impacts on architectural resources. The Reduced Density Alternative, like the Proposed Actions, would result in the development of tall buildings of modern design on the Development Site, but it would not block any views to architectural resources in the study area. Further, the Reduced Density Alternative, like the Proposed Actions, would not result in the isolation of an architectural resource from its setting or its visual relationship with the streetscape, and it would not introduce an incompatible visual, audible, or atmospheric element that would diminish the qualities of an architectural resource that make it significant. Like the Proposed Actions, the Reduced Density Alternative would not result in any blocked views of the High Line. In addition, although the High Line would be bordered by tall buildings on the Development Site under the Reduced Density Alternative, as under the Proposed Actions, the structure already runs adjacent to and through tall buildings in areas south of West 30th Street.

URBAN DESIGN AND VISUAL RESOURCES

Like the Proposed Actions, the Reduced Density Alternative would not result in significant adverse impacts to the urban design and visual resources of the Development Site study area.

Urban Design

The Reduced Density Alternative, like the Proposed Actions, would positively affect the urban design of the Development Site study area with the construction of up to eight mixed-used buildings and a five-acre open space system on a platform on top of the Western Rail Yard and there would be no significant adverse impacts on urban design. Like the Proposed Actions, the Reduced Density Alternative would generate similar conditions resulting in high winds at the pedestrian level that would occur at the same locations and for the same prevailing wind patterns as identified for the Proposed Actions (see Chapter 9, "Urban Design and Visual Resources"). These conditions would be similar to those at comparable sites in Manhattan near the Hudson River, and, like the Proposed Actions, and, like the Proposed Actions, these conditions would not result in a significant adverse urban design impact.

The Reduced Density Alternative would differ from the Proposed Actions in the heights of the buildings on the Development Site but it would be the same in terms of building use; building arrangements, locations and footprints; streetscape elements; characteristics of the two new roadways; and open space plan. Therefore, the Reduced Density Alternative would have the same effects on the topography, street pattern, block shape, building arrangement, building use, and streetscape of the Development Site and study area as the Proposed Actions. Overall, the buildings of the Reduced Density Alternative would be up to approximately 200 feet shorter than the buildings that would be developed under the Proposed Actions on the Development Site. With the exception of building WR-4, each building in the Reduced Density Alternative would have a maximum height range and the building heights would, similar to the Proposed Actions, descend in height across the site with the tallest tower (WC-1) located on the northeast corner of the site and the shortest tower (WR-4) located on the southwest corner of the site in order to increase views west and southwest of the Hudson River and Hudson River Park through the site. While shorter in the Reduced Density Alternative, each building would have the same massing and design as in the Proposed Actions and would have the same podium heights. Like the Proposed Actions, the Reduced Density Alternative would be in keeping with the scale of many of the development projects planned for completion in the study area by the 2019 analysis year.

The Reduced Density Alternative, like the Proposed Actions, would be particularly similar in height to the planned development of the Eastern Rail Yard. The eight buildings in this

alternative, which would range in height from approximately 400 feet to 750 feet, would be similar in height to the five high-rise, mixed-use towers and one low-rise building planned for development on the Eastern Rail Yard, which would range in height from approximately 500 feet to 900 feet. Both the Reduced Density Alternative and Proposed Actions would be similar to the height of the planned 650 to 700-foot-tall Extell Development planned on the east side of Eleventh Avenue between West 33rd and West 34th Streets. The Reduced Density Alternative would be shorter than the 900 to 1,000-foot-tall Moinian Group development planned on the east side of Eleventh Avenue between West 34th and West 35th Streets.

Visual Resources

Like the Proposed Actions, it is not expected that construction of the Reduced Density Alternative would result in significant adverse impacts on visual resources. Except for the building heights that would be shorter by up to approximately 200 feet, the Reduced Density Alternative would have the same urban design as the Proposed Actions. Therefore, the Reduced Density Alternative, like the Proposed Actions, would not directly block views of any visual resources or view corridors in the study area. The High Line would be adaptively reused on the Development Site as a passive open space. Although the Reduced Density Alternative, like the Proposed Actions, would alter the visual context of the High Line through the construction of tall buildings on its West 30th Street and Twelfth Avenue frontages, the High Line currently runs adjacent to and through tall buildings south of Tenth Avenue. Views to other visual resources in the study area would be improved and enhanced with the Reduced Density Alternative, like with the Proposed Actions. The Development Site's publicly accessible open spaces, including the High Line, would create new east-west view corridors through the site that would provide views of the Hudson River, Hudson River Park, and New Jersey skyline.

Like with the Proposed Actions, the Reduced Density Alternative would result in partially obstructed views north of the Jacob K. Javits Convention Center and south of the Starrett-Lehigh building from Eleventh and Twelfth Avenues due to the height, density, and scale of the development. However, these resources would still be visible to the north and south of the Development Site along these view corridors with both this alternative and the Proposed Actions. Further, the visual prominence of these two visual resources will already be diminished along the Eleventh Avenue view corridor as a result of the many development projects planned along the east side of Eleventh Avenue between West 28th and West 36th Streets, which will add a considerable amount of bulk and density to Eleventh Avenue.

Similarly, views east on West 33rd Street of the Daily News Building and on West 30th Street of the Empire State Building will be obstructed by several development projects planned east of Eleventh Avenue between West 30th and West 33rd Streets. Therefore, the Reduced Density Alternative, like the Proposed Actions, would not result in any significant adverse impacts on these visual resources.

NEIGHBORHOOD CHARACTER

The Reduced Density Alternative, like the Proposed Actions, would not result in significant adverse impacts to neighborhood character. Similar to the Proposed Actions, in the Reduced Density Alternative the Development Site would support and enhance the neighborhood character of the surrounding areas, and would be a part of the study area's shift toward a denser, more mixed-use area. Both the Reduced Density Alternative and the Proposed Actions would complement the emerging developments in the Special Hudson Yards District and the West Chelsea Special District, as well as areas of Midtown, Clinton, and Chelsea more broadly. Since

the development in this alternative would be shorter than with the Proposed Actions, the Development Site would be somewhat more consistent with the bulk and uses of buildings within the Chelsea subarea to the south. Like the Proposed Actions, the Reduced Density Alternative would also result in the potential for high pedestrian-level winds when the prevailing winds are from the northwest and west and, as a result, a characteristic of the Development Site and surrounding neighborhood would include the likelihood of high wind conditions at certain times under these specific wind conditions. These conditions would be similar to those at comparable sites in Manhattan near the Hudson River, and, like the Proposed Actions, would not be considered a significant adverse impact on neighborhood character.

As with the Proposed Actions, the Reduced Density Alternative would add a substantial new population to the Development Site, but the demographic characteristics of the resulting residential population would not differ substantially from that of the study area population in the Future without the Proposed Actions. The site plan for this alternative would be similar to the Proposed Actions, using the same configuration of building footprints, open spaces, roadway layout and circulation. The approximately 5.45 acres of new publicly accessible open space to be created on the Development Site with the Proposed Actions also would be created in the Reduced Density Alternative, and the adaptive reuse of a portion of the High Line as passive open space would preserve this historic resource and open it up to public access.

As with the Proposed Actions, in the Reduced Density Alternative the noise levels within the new open spaces on the Development Site would be comparable to noise levels in other New York City public open spaces, and the users of the Development Site would not experience any noise-related impacts to neighborhood character. Increases in subway and bus usage, as well as pedestrian usage of sidewalks in the study area, would still occur with this alternative, but to a lesser degree than with the Proposed Actions. Similarly, the projected increases in congestion at various traffic intersections would be somewhat less in this alternative than with the Proposed Actions. However, these increases with the Proposed Actions would not have significant adverse impacts on neighborhood character. Both the Reduced Density Alternative and the Proposed Actions would change the context of the historic resources in the study area, but the context of these resources is already expected to be altered with the completion of the various development projects in the Future without the Proposed Actions. In general, in the Reduced Density Alternative as with the Proposed Actions, the proposed development on the Development Site would be consistent with the character of the surrounding areas as they would be developed by 2019.

NATURAL RESOURCES

The Reduced Density Alternative, like the Proposed Actions, would not result in significant adverse impacts to natural resources. The site development plans for this alternative would be similar to the Proposed Actions, using the same configuration of building footprints, open spaces, and pavements. Therefore, generally the environmental effects on natural resources would be the same as those of the Proposed Actions. Neither the Proposed Actions nor the Reduced Density Alternative would cause any significant adverse impacts on terrestrial plant communities or wildlife, or on floodplains, wetlands, water quality, or aquatic biota in the Hudson River. Like the Proposed Actions, the Reduced Density Alternative would have the potential to benefit terrestrial wildlife and plant resources through the creation of approximately 5.45 acres of open space. Because it is assumed that the same stormwater management measures would be implemented for the Reduced Density Alternative as for the Proposed Actions, this alternative would result in the same beneficial effects to aquatic resources of the Hudson River

due to control of the rate and improved quality of stormwater runoff generated within the Development Site and conveyed to the Hudson River.

HAZARDOUS MATERIALS

Like the Proposed Actions, the Reduced Density Alternative would not result in significant adverse impacts to the general public, construction workers or future occupants of the Development Site. With the implementation of the precautionary measures and environmental controls that are described in the Construction Health and Safety Plan, there would be only insignificant risk of exposure to hazardous materials (i.e., contaminated soil, soil vapor, groundwater, or building materials) during the construction and operational phases of the Proposed Actions.

WATERFRONT REVITALIZATION PROGRAM

Both the Reduced Density Alternative and the Proposed Actions would be consistent with the City's applicable WRP policies, particularly those that aim to encourage public access to the water's edge. Both would be consistent with Citywide goals for supporting and facilitating residential and commercial development in appropriate areas, protecting ecological systems; protecting and improving water quality; providing public access in the coastal zone; and protecting scenic resources. Like the Proposed Actions, the Reduced Density Alternative would result in the development of approximately 5.45 acres of publicly accessible open space within the coastal zone and would result in new views of the Hudson River waterfront that are accessible to the public.

INFRASTRUCTURE

Like the Proposed Actions, the Reduced Density Alternative would generate increased demands on New York City's water supply and sanitary sewage treatment systems. Overall, the demand generated by the Reduced Density Alternative would be approximately 20 percent less than under the Proposed Actions: water supply demand would be approximately 1.24 million gallons per day (mgd) under the Reduced Density Alternative, compared to 1.54 mgd with the Proposed Actions, and the sanitary sewage generation would be 1.00 mgd for the Reduced Density Alternative, compared to 1.24 mgd for the Proposed Actions. Overall, both the Proposed Actions and the Reduced Density Alternatives would not result in significant impacts on the regional capacity or ability to provide water and sewer service to the project sites.

The site development plans for the Reduced Density Alternative and Proposed Actions would be similar and would use the same configuration of building footprints, open spaces, and pavements. For this reason, the site runoff coefficients would be equivalent, and site stormwater runoff characteristics would be similar for both alternatives. It is assumed that the same best management practices for the management and control of stormwater would be implemented for either the Proposed Actions or the Reduced Density Alternative.

Like the Proposed Actions, the Reduced Density Alternative would result in an increase in the volume of sanitary sewage generated and discharged into the combined sewer system, which may exacerbate the combined sewer overflows (CSOs) at affected outfalls by displacing other wastewater volumes from other sources. Nevertheless, because of the available assimilative capacity of the Hudson River, those increases from either the Reduced Density Alterative or the Proposed Actions would not have a significant adverse impact on water quality. The improvements to water distribution mains as identified in the Trunk Plan for local streets near the Development Site, to ensure users in the Hudson Yards area have an adequate water supply

at stable pressure for all conditions, would also service the water demands for either the Reduced Density Alterative or the Proposed Actions.

SOLID WASTE AND SANITATION SERVICES

Like the Proposed Actions, the Reduced Density Alternative would generate increased demands on New York City's solid waste services. Overall, the demand generated by the Reduced Density Alternative would be approximately 20 percent less than with the Proposed Actions: the quantity of solid waste would decrease from a maximum of 84 tons per week under the Proposed Actions to 68 tons per week for the Reduced Density Alternative (for the Maximum Residential Scenario), respectively. Like the Proposed Actions, the Reduced Density Alternative would not result in significant adverse impacts based on the generation of solid waste or the provision of sanitation services. The Proposed Actions and the Reduced Density Alternative would be consistent with, and would not require amendments to, the City's Solid Waste Management Plan. Both the Proposed Actions and the Reduced Density Alternative would require the interim relocation of existing DSNY facilities from the Development Site and that relocation is anticipated to result in minimal disruption to DSNY operations.

ENERGY

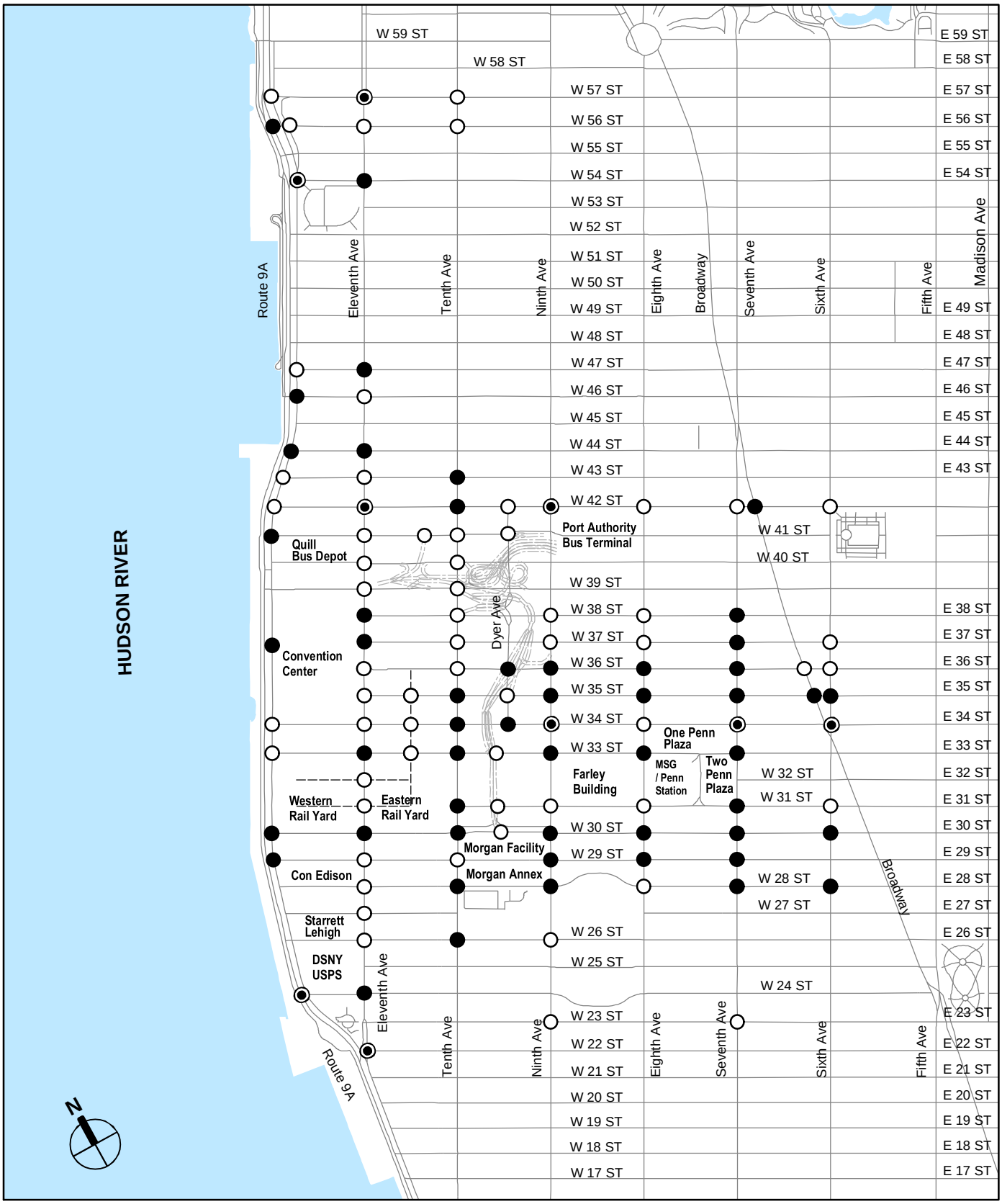
Like the Proposed Actions, the Reduced Density Alternative would generate increased demands on New York City's energy services. Overall, the demand generated by the Reduced Density Alternative would be approximately 17 percent less than the Proposed Actions. Neither the Reduced Density Alternative nor the Proposed Actions would result in significant adverse impacts related to energy demand.

Like the Proposed Actions and the No Action Alternative, improvements to local electrical and natural gas distribution systems would be necessary to service the sites and adjacent Hudson Yards development in the Reduced Density Alternative. It is assumed that improvements proposed by Con Edison to address service constraints caused by limitations in existing electrical network and gas distribution mains will be implemented within an appropriate timeframe and will be adequate to meet local demand requirements, and that regional sources and supply systems will be maintained and expanded as planned by the New York Independent System Operator (NYISO) and other responsible agencies.

TRAFFIC AND PARKING

With less floor area and a reduced population, the Reduced Density Alternative would generate correspondingly lower vehicular traffic than the Proposed Actions throughout the weekday and during the Saturday midday peak hour. A comparison of the volume of vehicular traffic that would be generated under the Proposed Actions and the Reduced Density Alternative is presented in Table 25-12.

Overall, the total number of intersections with unmitigated significant adverse impacts under the Reduced Density Alternative would be essentially the same as the Proposed Actions under weekday conditions and during the Saturday midday peak hour. However, more intersection movements would be unmitigated with the Proposed Actions. Figures 25-1 through 25-4 illustrate the location of significant adverse impacts and unmitigated significant adverse impacts for the Reduced Density Alternative, and Table 25-13 presents a comparison of the number of significant traffic impacts during each peak period for the Reduced Density Alternative and the Proposed Actions. (See Appendix I for detailed analysis tables for the Reduced Density Alternative including mitigation.)



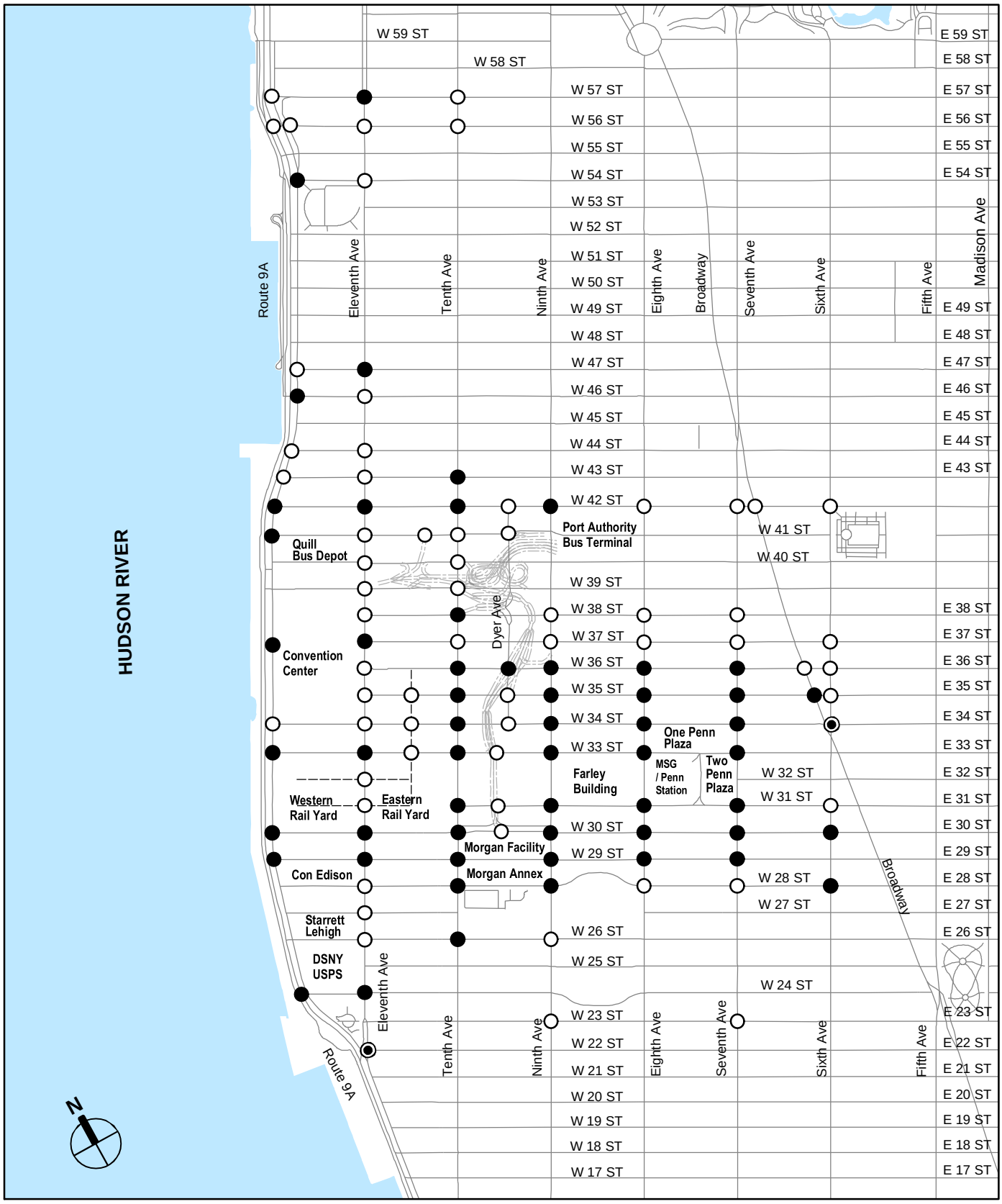
No Significant Impact *Significant Impact*

Mitigated Intersections *New Streets (Not to Scale)*

WESTERN **RAIL YARD**

Traffic Mitigation Overview: Reduced Density Development Alternative Primary Traffic Study Area AM Peak Hour

Figure 25-1



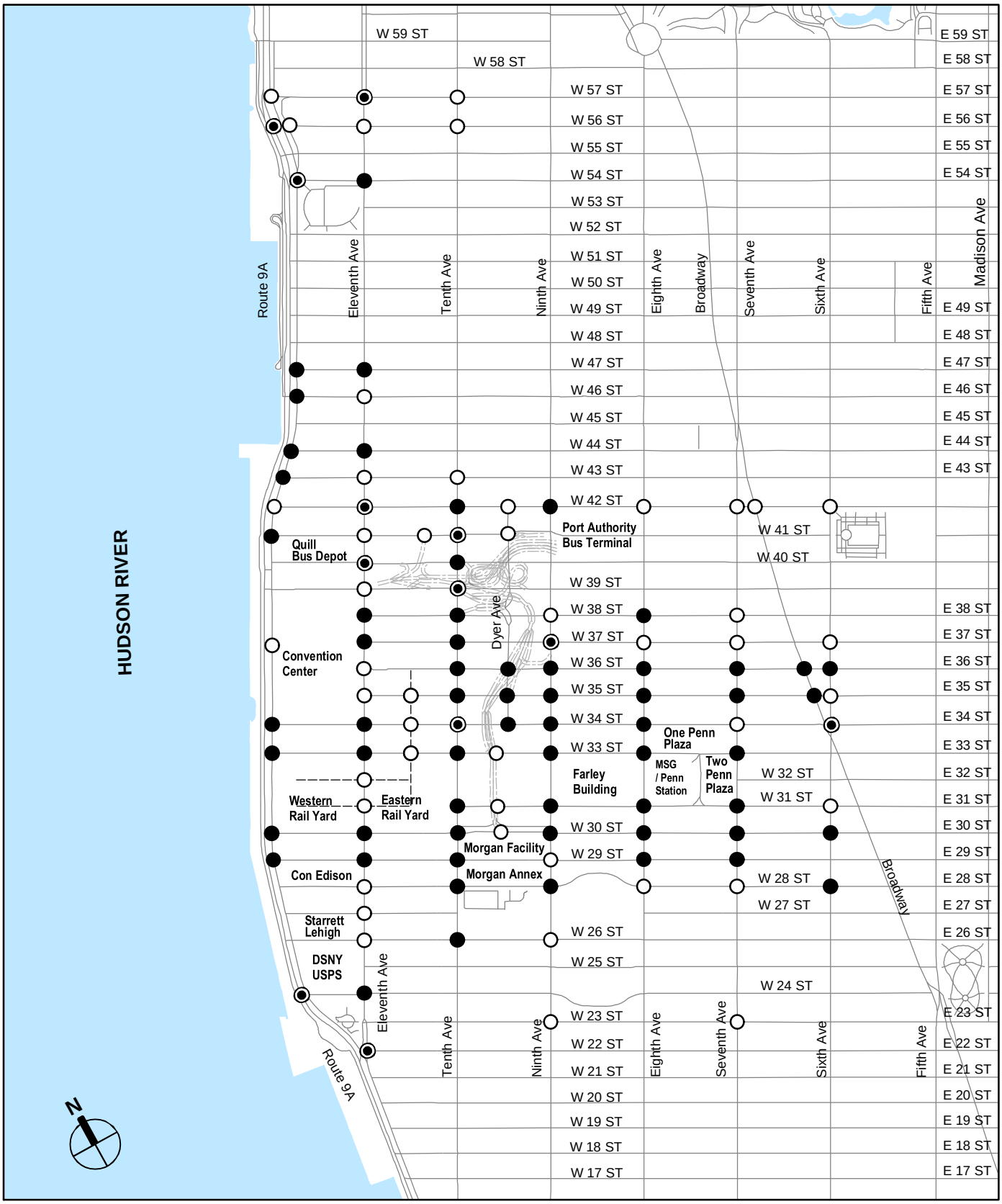
No Significant Impact *Significant Impact*

Mitigated Intersections *New Streets (Not to Scale)*

WESTERN **RAIL YARD**

Traffic Mitigation Overview:
Reduced Density Development Alternative
Primary Traffic Study Area
Midday Peak Hour

Figure 25-2



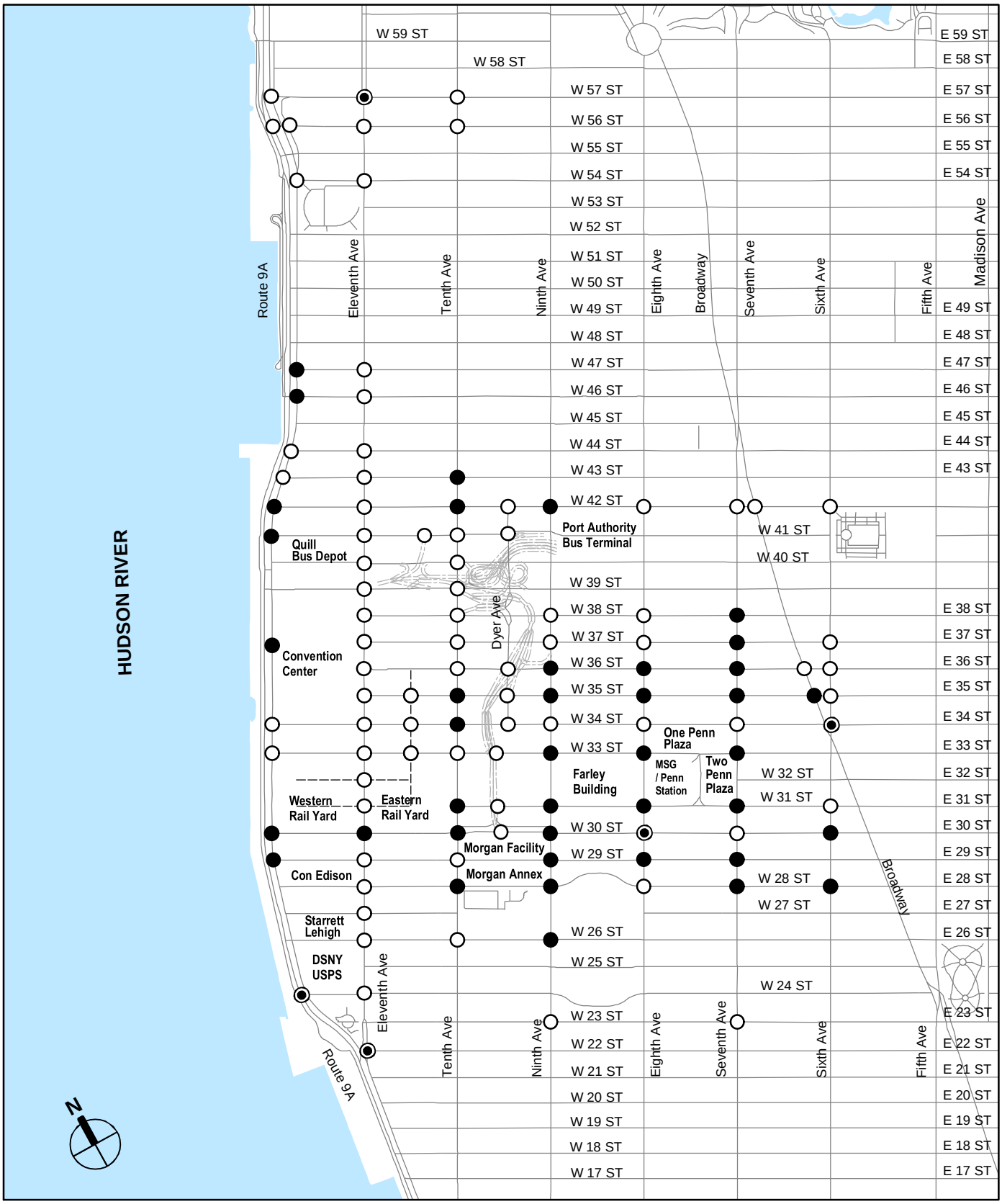
○ *No Significant Impact* ◉ *Significant Impact*

● *Mitigated Intersections* ---- *New Streets (Not to Scale)*

WESTERN **RAIL YARD**

Traffic Mitigation Overview: Reduced Density Development Alternative Primary Traffic Study Area PM Peak Hour

Figure 25-3



No Significant Impact *Significant Impact*

Mitigated Intersections *New Streets (Not to Scale)*

WESTERN **RAIL YARD**

Traffic Mitigation Overview: Reduced Density Development Alternative Primary Traffic Study Area Saturday Midday Peak Hour

Figure 25-4

Table 25-12
Vehicle Trip Generation Comparison—
Reduced Density Alternative vs. the Proposed Actions, 2019

Analysis Hour	Direction	Proposed Actions	Reduced Density Alternative
Weekday AM	In	536	433
	Out	375	302
	Total	911	735
Weekday Midday	In	381	307
	Out	382	308
	Total	763	615
Weekday PM	In	424	337
	Out	652	521
	Total	1,076	858
Saturday Midday	In	382	307
	Out	375	302
	Total	757	609

Table 25-13
Number of Intersections and Approaches with Significant Adverse Traffic Impacts
Comparison of Reduced Density Alternative and Proposed Actions, 2019

		Movements / Intersections Analyzed	Movements / Intersections With No Significant Impacts	Total Impacted Movements / Intersections	Mitigated Movements / Intersections	Unmitigated Movements / Intersections
Weekday AM	Proposed Actions	372/121	290/57	82/64	70/54	12/10
	Reduced Density	372/121	297/61	75/60	65/51	10/9
Weekday MD	Proposed Actions	371/121	294/61	77/60	74/57	3/3
	Reduced Density	371/121	300/63	71/58	69/56	2/2
Weekday PM	Proposed Actions	377/121	278/46	99/75	84/62	15/13
	Reduced Density	377/121	284/48	93/73	81/61	12/12
Saturday	Proposed Actions	369/121	317/73	52/48	47/43	5/5
	Reduced Density	369/121	322/76	47/45	42/20	5/5

Parking

The Reduced Density Alternative would require somewhat less off-street parking than the Proposed Actions. Table 25-14 compares the off-street parking supply and demand under the Proposed Actions and Reduced Density Alternative under weekday midday and overnight demands associated with different development scenarios. Like the Proposed Actions, the unsatisfied demand for parking spaces during the midday peak utilization period would result in vehicles parking outside of the parking study area and motorists walking greater distances to their destinations. As parking shortfalls do not constitute significant adverse impacts for CEQR purposes, mitigation is not required.

TRANSIT AND PEDESTRIANS

Transit

Neither the Reduced Density Alternative nor the Proposed Actions would have a significant adverse impact to subway line-haul. Like the Proposed Actions, because it is anticipated that the southernmost stairway serving the express (A train) platform at the 34th Street-Penn Eighth Avenue subway station (stairway M23/M24 at Control Area N67) will be relocated and widened as part of the proposed Moynihan Station Redevelopment Project. However, because the Moynihan project has

not yet been fully designed, it is possible that the relocation and widening of that stairway will not be included in that project's final design. If the Moynihan project does not relocate and widen that stairway, the Reduced Density Alternative would result in a significant adverse impact during the weekday PM peak hour in 2019 that could be mitigated by widening that stairway by a minimum of approximately six inches. If the stairway is not widened, this impact would remain unmitigated.

Table 25-14
Off-Street Parking Requirements, 2019
Reduced Density Alternative Compared to the Proposed Actions

Analysis Period	Total Capacity	Demand	Utilization Rate	Available Spaces
				Reduced Density Alternative
				Maximum Commercial Scenario
Weekday Midday	5,869	8,090	138%	(2,221)
Weekday Overnight	4,764	3,765	79%	999
				Maximum Residential Scenario (Office Option)
Weekday Midday	5,869	8,133	139%	(2,264)
Weekday Overnight	4,764	3,967	83%	797
				Maximum Residential Scenario (Hotel Option)
Weekday Midday	5,869	8,186	139%	(2,317)
Weekday Overnight	4,764	4,085	86%	679
				Proposed Actions
				Maximum Commercial Scenario
Weekday Midday	5,869	8,129	139%	(2,260)
Weekday Overnight	4,764	3,821	80%	943
				Maximum Residential Scenario (Office Option)
Weekday Midday	5,869	8,189	140%	(2,320)
Weekday Overnight	4,764	4,062	85%	702
				Maximum Residential Scenario (Hotel Option)
Weekday Midday	5,869	8,248	141%	(2,379)
Weekday Overnight	4,764	4,200	88%	564

As is the case for the Proposed Actions, existing levels of bus service would not be sufficient to meet the projected demand under the Reduced Density Alternative. Similar to the Proposed Actions, some bus routes would require additional capacity, which could be provided by either increasing the standard or articulated bus service. The projected bus passenger demand would be less under the Reduced Density Alternative than under the Proposed Actions, and, therefore, the additional bus service required to accommodate demand in the Reduced Density Alternative would be less than that required for the Proposed Actions. Table 25-15 compares the number of new buses needed for the Reduced Density Alternative and the Proposed Actions. Since it is NYCT policy to increase bus service to accommodate rider demand, taking into account financial and operational constraints, no significant adverse impact to bus service would occur under the Reduced Density Alternative or the Proposed Actions.

Pedestrian Conditions

With fewer pedestrian trips, the Reduced Density Alternative would reduce the number of unmitigated significant adverse pedestrian impacts in comparison with the Proposed Actions, but significant adverse impacts would remain that could not be mitigated. Table 25-16 compares the unmitigated significant adverse impacts on pedestrian conditions for the Reduced Density Alternative and the Proposed Actions.

Table 25-15
Additional Buses Needed to Meet Demands,
Reduced Density Alternative Compared to the Proposed Actions in 2019

Bus Route	Direction	Reduced Density Alternative		Proposed Actions	
		Regular	Articulated	Regular	Articulated
AM Peak Hour					
M10/ M20	NB	1	1	1	1
	SB	1	1	2	2
M11	NB	1	1	2	1
	SB	3	2	3	2
M34/M16	EB	3	3	4	3
	WB	11	8	13	10
PM Peak Hour					
M10/ M20	NB	1	1	2	2
	SB	1	1	1	1
M11	NB	4	3	4	3
	SB	2	1	2	1
M34/M16	EB	12	9	15	11
	WB	4	3	5	4

Table 25-16
Number of Locations with Unmitigated
Significant Adverse Pedestrian Impacts,
Reduced Density Alternative Compared to the Proposed Actions

Pedestrian Impact Type / Peak Hour	Reduced Density Alternative	Proposed Actions
Sidewalks		
AM Peak Hour	1	1
Midday Peak Hour	0	1
PM Peak Hour	3	4
Saturday Midday Peak Hour	0	1
Crosswalks		
AM Peak Hour	2	2
Midday Peak Hour	5	6
PM Peak Hour	2	3
Saturday Midday Peak Hour	0	1
Corners		
AM Peak Hour	0	1
Midday Peak Hour	1	7
PM Peak Hour	1	3
Saturday Midday Peak Hour	0	0

Note: Unmitigated significant adverse impacts include impacts due to Proposed Actions and impacts due to changes in traffic signal timing as part of traffic mitigation measures.

AIR QUALITY

The Reduced Density Alternative would generate less traffic than the Proposed Actions, and, therefore, would result in slightly lower mobile source emissions than the Proposed Actions. Neither the Reduced Density Alternative nor the Proposed Actions would result in significant adverse air quality impacts related to mobile source emissions.

With smaller buildings than those of the Proposed Actions, the Reduced Density Alternative would have reduced emissions related to its heating, ventilation, and air conditioning (HVAC) systems. However, the effects of the Reduced Density Alternative's HVAC emissions would be different than with the Proposed Actions, because the relative heights of the buildings compared to one another would change (i.e., the heights under the Reduced Density Alternative are not

uniformly lower than those evaluated under the Proposed Actions) and the potential impacts of the HVAC exhaust stack emissions under this alternative would occur at different heights and locations than those considered for the Proposed Actions.

The potential impacts of the HVAC emissions of the buildings associated with the Reduced Density Alternative were analyzed using the same methodologies and assumptions used for the analysis of the Proposed Actions provided in Chapter 19, "Air Quality and Greenhouse Gas Emissions." The combined impacts of the HVAC emissions of the proposed buildings on other proposed buildings (project-on-project impacts) and the impact of HVAC emissions of the proposed buildings on nearby existing or future No Build sensitive land uses, which would not change under this alternative, were estimated.

The impacts of existing "major" emission sources on the proposed buildings would be the same as those estimated for the Proposed Actions because the location of the project buildings would be the same under both alternatives, and receptors located at all heights of these buildings were previously considered. As with the Proposed Actions, no significant adverse air quality impacts would occur.

Building-On-Building Impacts

The same building massing scenarios as those evaluated for the Proposed Actions were analyzed—with building heights and sizes for the Reduced Density Alternative lower than those evaluated under the Proposed Action. The commercial building would range from 902,400 to 1,852,000 square feet (with a height of approximately 730 to 744 feet) and the residential buildings range from 300,000 to 720,000 square feet (with heights from 400 to 670 feet). Building sizes and heights, and stack heights assumed in the analyses under each scenario are provided in Table 25-17.

Table 25-17
Reduced Density Alternative: Buildings Heights and Sizes Assumed For Each Development Scenario

Building	Building Height (feet)	Gross Floor Area (gsf)
Scenario 1 - Maximum Commercial Scenario		
WR-1	580	544,000
WR-2	550	570,000
WR-3	450	457,500
WR-4	400	300,000
WR-5	450	470,500
WR-6	550	425,000
WR-7	450	537,500
WC-1	744	1,852,000
Scenario 2 - Maximum Residential-Office Option		
WR-1	650	631,500
WR-2	630	670,000
WR-3	530	557,500
WR-4	400	300,000
WR-5	510	533,000
WR-6	610	500,000
WR-7	510	612,500
WC-1	744	1,300,000
Scenario 3 - Maximum Residential-Hotel Option		
WR-1	660	644,000
WR-2	670	720,000
WR-3	570	595,000
WR-4	400	300,000
WR-5	560	595,500
WR-6	670	562,500
WR-7	570	687,500
WC-1	730	902,400

The estimated emission rates for the boilers burning fuel oil during the four winter months and natural gas for the rest of the year under each development scenario with the Reduced Density Alternative are provided in Table 25-18.

Table 25-18
Reduced Density Alternative:
Pollutant Emission Rates with Fuel Oil and Natural Gas

Building	Pollutant	Pollutant Emission Rates (grams/sec)					
		Max Commercial		Max Residential-Office		Max Residential-Hotel	
		Fuel Oil	Natural Gas	Fuel Oil	Natural Gas	Fuel Oil	Natural Gas
WR-1	NOx	0.217	0.041	0.252	0.048	0.257	0.049
	SO_2	0.308	0.0002	0.358	0.0003	0.365	0.0003
	$PM_{2.5}$	0.023	0.003	0.027	0.004	0.027	0.004
	PM_{10}	0.026	0.003	0.030	0.004	0.031	0.004
WR-2	NOx	0.227	0.043	0.267	0.051	0.287	0.055
	SO_2	0.323	0.0003	0.380	0.0003	0.408	0.0003
	$PM_{2.5}$	0.024	0.003	0.028	0.004	0.031	0.004
	PM_{10}	0.027	0.003	0.032	0.004	0.034	0.004
WR-3	NOx	0.183	0.035	0.222	0.042	0.237	0.045
	SO_2	0.259	0.0002	0.316	0.0003	0.337	0.0003
	$PM_{2.5}$	0.019	0.003	0.024	0.003	0.025	0.003
	PM_{10}	0.022	0.003	0.026	0.003	0.028	0.003
WR-4	NOx	0.120	0.023	0.120	0.023	0.120	0.023
	SO_2	0.170	0.0001	0.170	0.0001	0.170	0.0001
	$PM_{2.5}$	0.013	0.002	0.013	0.002	0.013	0.002
	PM_{10}	0.014	0.002	0.014	0.002	0.014	0.002
WR-5	NOx	0.188	0.036	0.213	0.040	0.238	0.045
	SO_2	0.267	0.0002	0.302	0.0002	0.337	0.0003
	$PM_{2.5}$	0.020	0.003	0.023	0.003	0.025	0.003
	PM_{10}	0.022	0.003	0.025	0.003	0.028	0.003
WR-6	NOx	0.170	0.032	0.199	0.038	0.224	0.043
	SO_2	0.241	0.0002	0.283	0.0002	0.319	0.0003
	$PM_{2.5}$	0.018	0.002	0.021	0.003	0.024	0.003
	PM_{10}	0.020	0.002	0.024	0.003	0.027	0.003
WR-7	NOx	0.214	0.041	0.244	0.047	0.274	0.052
	SO_2	0.305	0.0002	0.347	0.0003	0.390	0.0003
	$PM_{2.5}$	0.023	0.003	0.026	0.004	0.029	0.004
	PM_{10}	0.026	0.003	0.029	0.004	0.033	0.004
WC-1	NOx	0.739	0.141	0.519	0.099	0.360	0.069
	SO_2	1.049	0.0008	0.737	0.0006	0.511	0.0004
	$PM_{2.5}$	0.079	0.011	0.055	0.008	0.038	0.004
	PM_{10}	0.088	0.011	0.062	0.008	0.043	0.004

The number, location, and heights of the exhaust stacks above the buildings' roofs of the buildings under the Reduced Density Alternative were the same as with the Proposed Action. As with the Proposed Actions, 20-foot-tall stacks were assumed on all eight development buildings—with the exception on buildings WR-4 and WR-5, where 40-foot stacks were assumed.

A comprehensive receptor network was developed for the Reduced Density Alternative, which is similar to the network developed for the Proposed Actions, but for the shorter buildings. All analyses were conducted to estimate potential worst-case impacts at any of these receptors. For the proposed commercial building (with either office or hotel use), which would not have operable windows, locations of the air intake ducts were excluded on the upper stories of several facades so as not to be adversely impacted by exhaust plumes.

The results of the dispersion analyses are summarized in Tables 25-19 and 20. The maximum estimated $PM_{2.5}$ increments at any of the receptor locations are compared to the appropriate DEP/DEC Significant Threshold Values (STVs), and the maximum estimated total

concentrations of the other pollutants (background concentrations is included) are compared to the appropriate NAAQS. Complete results are provided in Appendix F, "Air Quality."

Table 25-19
Maximum Estimated Building-On-Building HVAC Increments and Concentrations (µg/m^3) For the Reduced Density Alternative

Pollutant	Averaging Time Period	Maximum Increments[1]			Background Conc.[2]	Maximum Concentrations			Applicable NAAQS[3]
		Scenario 1	Scenario 2	Scenario 3		Scenario 1	Scenario 2	Scenario 3	
SO_2	24-hr	47.8	74.4	47.1	123	170.8	197.4	170.1	365
	Annual	2.5	2.5	2.8	37	39.2	39.5	39.8	80
NO_2	Annual	2.3	2.6	2.7	71	73.3	73.6	73.7	100
PM_{10}	24-hr	4.0	6.2	4.0	60	64.0	66.2	64.0	150

Notes:
1. Results were estimated assuming the use of fuel oil for the four winter months and natural gas for the rest of the year.
2. Background concentrations are provided in Chapter 19, "Air Quality and Greenhouse Gas Emissions ," Table 19-3.
3. NAAQS = National Ambient Air Quality Standards.

Table 25-20
Maximum Estimated Building-On-Building HVAC Increments for $PM_{2.5}$ (µg/m^3) for the Reduced Density Alternative

Pollutant	Averaging Time Period	Background Conc.[1]	Maximum Increments			Significant Threshold Value[2] (STVs)
			Scenario 1	Scenario 2	Scenario3	
$PM_{2.5}$	24-hr	39.2	1.49	1.37	1.44	2–5
	Max Annual	15.8	0.23	0.22	0.23	0.3[2]

Notes:
1. Background concentrations are provided in Chapter 19, "Air Quality and Greenhouse Gas Emissions ," Table 19-3.
2. STVs established by DEP and DEC.
3. Maximum annual "neighborhood" increments were not considered because the maximum annual discrete increment did not exceed 0.3 µg/m^3.

The results of the detailed dispersion analyses are that with the proposed stack heights and locations, the combined impacts of the HVAC emissions from all of the buildings under the Reduced Density Alternative will not cause any exceedances of either the NAAQS or the STVs. Therefore, no significant adverse air quality impacts are projected.

As with the Proposed Actions, the Restrictive Declaration would specify the number, location, and heights of the HVAC stacks on the roof of each proposed building as well as the restrictions on the location of air intake ducts for the mechanical ventilation system of the proposed commercial building.

Impacts on Existing Land Uses

Similar to the Proposed Actions, air quality analyses were conducted to determine whether the HVAC emissions from the proposed buildings under Reduced Density Alternative would result in violations of ambient air quality standards or exceedances of STVs at nearby sensitive land uses.

As the HVAC emissions of the proposed buildings would all be released through rooftop stacks that are generally between 400 and 750 feet tall, the maximum impacts of these emissions would

occur at elevated receptors that are in this height range. Elevated receptors were, therefore, considered on all existing and future No Build tall (i.e., greater than 100 feet) buildings that are or will be located within a 400 feet radius of the Development Site (and are the same as those evaluated for the Proposed Actions).

The results of this analysis are that the impacts of the HVAC emissions from the project buildings under the Reduced Density Alternative on existing or future No Build land uses would not cause an exceedance of either the NAAQS, DEP de minimis values, or the STVs are expected to occur. Therefore, no significant adverse air quality impacts are projected.

Potential mobile sources impacts associated with the Reduced Density Alternative would be less than those predicted for the Proposed Actions and, therefore, no exceedances of the NAAQS, or the STVs are expected to occur. Therefore, like the Proposed Actions, no significant adverse air quality impacts are predicted for the Reduced Density Alternative.

Greenhouse Gases

The Reduced Density Alternative would result in fewer vehicle trips, less energy use for HVAC and electricity, and less project-generated waste from the Development Site. However, as with the Proposed Actions, the platform over the rail yard would need to be constructed under the Reduced Density Alternative. Ventilation for rail yard uses would also be required. The amount of concrete and other materials required to construct the platform, and the corresponding construction activity, as well as the energy required to ventilate the rail uses below the platform, would be the same for the Proposed Actions and the Reduced Density Alternative. Therefore, the GHG emissions associated with the platform would be identical for the Proposed Actions and the Reduced Density Alternative. As the Reduced Density Alternative would serve fewer people, the per capita GHG emissions associated with the Reduced Density Alternative would be comparable, if not higher than the per capita GHG emissions associated with the Proposed Action. Furthermore, since the Reduced Density Alternative would serve fewer residents and other uses, the GHG emissions associated with additional uses which could be served by the Proposed Actions would occur elsewhere, potentially without the benefit of transit oriented development in a mixed-use setting, resulting in higher per-capita GHG emissions.

NOISE

The Reduced Density Alternative, like the Proposed Actions, would not result in significant adverse exterior noise impacts from increased traffic, the proposed playground, or building mechanical equipment. Similar to the Proposed Actions, interior noise levels would be above CEQR acceptable limits at all of the proposed buildings in this alternative. Therefore, as part of the Reduced Density Alternative or under the Proposed Actions, buildings on the project sites would include noise attenuation measures as part of the building design to meet interior noise standards, and, therefore, avoid significant adverse noise impacts.

CONSTRUCTION

While the Reduced Density Alternative is somewhat smaller in the overall density and size of new buildings, it is essentially the same construction process and phasing as the Proposed Actions, most notably in the sequential requirements of building the platform (which would be the same as with the Proposed Actions) and new buildings. Since the buildings are smaller over the same construction schedule, there could be a modest reduction in the amount of materials and construction workers associated with building the Reduced Density Alternative. This could

slightly reduce the duration and total level activity. Like the Proposed Actions, the Reduced Density Alternative would not result in significant adverse air quality or noise impacts during construction. Like the Proposed Actions, it would likely result in significant adverse traffic impacts at certain intersections during peak construction periods.

PUBLIC HEALTH

Neither the Reduced Density Alternative nor the Proposed Actions would result in significant adverse impacts on public health associated with construction or operation of the new development on the project sites.

E. TRI-GENERATION ENERGY SUPPLY ALTERNATIVE

DESCRIPTION

This chapter considers an alternative to the Proposed Actions for providing energy at the Development Site. Under the Tri-Generation Energy Supply Alternative, on-site facilities to generate electricity, heat/hot water, and air conditioning would be constructed as part of the Development Site Project. All other aspects of the Proposed Actions would remain the same for the Tri-Generation Energy Supply Alternative.

Tri-generation systems provide three key building requirements—electricity, heat, and cooling. With tri-generation, the thermal byproduct of electricity generation, which is typically not used, is captured and used to supply heat, hot water, and air conditioning needs on-site. One of the PlaNYC energy initiatives is aimed at expanding clean distributed energy generation (which includes tri-generation, a type of combined heat and power generation) to 800 megawatts (MW). PlaNYC discusses the intent to require new large developments throughout New York City to complete an analysis of the technical and economic feasibility of installing Combined Heat and Power (CHP) systems, in order to help building owners understand the benefits of CHP and help accelerate transformation of the CHP market. The Tri-Generation Energy Supply Alternative is under consideration by the Developer, as part of an overall effort to create a sustainable community, conserve energy, minimize greenhouse gas (GHG) emissions and advance the goals of PlaNYC.

The efficiency and benefit of tri-generation is two-fold. First, on-site power reduces the electric load that is typically supplied by existing power plants, helping to manage the peak electricity usage, most notably during the summer months. This is an important consideration in that existing regional fossil fuel power plants serving New York City are 30 years old on average, and use 30 to 60 percent more fuel than newer plants to generate the same amount of electricity.[1] These older plants generally operate when electric loads are high, while renewable or non-fossil fuel facilities are used to meet energy demand during non-peak periods.

Second, transmission and distribution of electricity over long distances results in measurable losses. The GHG inventory for New York City approximates the losses to be more than 5 percent.[2] The transmission losses are reduced when power is produced on-site. As a result of the energy savings achieved, tri-generation systems can lower operating costs and reduce regional and global criteria pollutant and GHG emissions. A number of policies recognize the benefits of combined heat and power, including tri-generation. The American Recovery and Reinvestment

[1] The City of New York, *PlaNYC: A Greener, Greater New York*, 2007.
[2] The City of New York, Inventory of New York City Greenhouse Gas Emissions, September 17, 2008.

Act of 2009 (the stimulus package) includes financial incentives for combined heat and power, and micro-turbines. The New York State Energy Research Authority (ERDA) has also been providing financial incentives to eligible CHP projects.

The overall feasibility of the Tri-Generation Energy Supply Alternative was evaluated to further the goals of improved energy efficiency, energy reliability, and reducing the GHG emissions from the Development Site Project. The feasibility analysis of this alternative consisted of the evaluation of preliminary design and operational concepts as well as financial projections for integrating tri-generation at the proposed Development Site as prepared by Endurant Energy, LLC for the Developer and reviewed by the co-lead agencies.[1] The report is included in Appendix I4. Building energy usage was modeled to assess the year round electricity and heating and cooling demands for two prototype buildings—an office tower and a residential tower.

The tri-generation power plant analyzed for the prototype commercial building had a capacity of 5.8 MW and consisted of three engines or turbines with water and heat recovery to produce hot water, and a hot water fired absorption chiller to provide cooling to increase system efficiency in the summer months. For the prototype residential tower, the tri-generation power plant analyzed had a capacity of 520 kilowatts (kW) and consisted of three micro-turbines with heat and hot water recovery, and a hot-water fired absorption chiller capable of producing hot and chilled water. In the feasibility report, and for the purposes of the GHG emission analysis, the tri-generation systems were assumed to be fueled by natural gas. The use of natural gas would result in lower emissions of particulate matter, sulfur oxides, and greenhouse gases than fuel oil, and is considered to be a relatively clean energy source.

Using the operational characteristics of these prototype models, the feasibility study assumed a separate tri-generation system for each building on the Development Site to examine the energy supply that could be provided by a tri-generation system for the entire project. A large "district" tri-generation plant that would serve the entire Development Site was also considered, but found to be impractical due to cost, space, and structural concerns associated with the Development Site's location over a rail yard. It was estimated that a "district" plant would cost between 2 and 3.5 times more than a series of individual building systems, due in large part to the cost of distribution of the hot and chilled water above the platform covering the rail yards. The payback period for a "district" plant was also estimated to be significantly longer than for individual systems, due to the need to pay for and construct the plant before any of the buildings were completed and occupied. Space, site planning, and phasing considerations would also be less favorable for a "district" plant than for individual systems.

Although the feasibility study did not quantify the potential benefits and cost implications of linking nearby commercial and residential buildings with a shared tri-generation system, the study did qualitatively consider the complementary energy demand schedules for the two building types and identify the need to further study that option. The study noted that such a "Residential Tower Piggy Back" scenario could be feasible, provided the interconnection and distribution costs are reasonable. The upfront cost, energy cost savings, emissions, and space requirements of that option would be further explored in the future if the Tri-Generation Energy Supply Alternative is selected.

[1] Endurant Energy LLC, Tri-Generation Feasibility Assessment, Hudson Yards, Western Rail Yard, May 2009.

The tri-generation conceptual operation plan is based on peak load periods. Such an approach was developed with the goal of maximizing the efficiency and emissions benefits of on-site power generation. Endurant estimated that the greatest environmental benefit would be expected during peak electricity usage periods, defined as weekdays between 8 AM and 10 PM. During those hours, the GHG emissions from grid electricity were estimated to be greatest, based on an assumption that at those times, a greater number of older, less efficient fossil-fueled power plants would be operating.

Further study would be needed to assess whether operating the tri-generation systems during additional hours would provide an environmental benefit and be economically feasible. Full backup boiler systems, using natural gas, were assumed in Endurant's feasibility analysis. A full backup system was recommended by Endurant, to provide heat and hot water, when the tri-generation system is not operating. Under the assumed operating scenario, supplemental electricity would be purchased from Con Edison, or other available electricity providers during off-peak hours and during times when the electricity demand for the buildings exceeds the maximum load that the tri-generation system is designed to handle.

In summary, under the operational and design concepts identified in the feasibility study, the Tri-Generation Energy Supply Alternative has been determined to be a viable alternative. Tri-generation at the Development Site can be expected to lower annual energy costs, which would result in a return on investment within approximately 8 to 9 years from the start of system operation, based on the operating scenario analyzed for the feasibility study. By further optimizing the operating scenario, it may be possible to achieve a shorter payback period and further reduce the development's carbon footprint. As discussed, optimization could involve extending the tri-generation system operating hours beyond the peak periods, and connecting a tri-generation system in a commercial building to nearby Development Site residential uses. As discussed the Tri-Generation Energy Supply Alternative would improve energy efficiency, energy reliability, and reduce GHG emissions. Therefore, the alternative would be consistent with the Proposed Actions' goal of developing the site in accordance with sustainable design principles. The implementation of the alternative would also be consistent with PlaNYC initiatives. The following section considers the potential impacts from the Tri-Generation Energy Supply Alternative.

TRI-GENERATION ENERGY SUPPLY ALTERNATIVE COMPARED WITH THE PROPOSED ACTIONS

The Tri-Generation Energy Supply Alternative would add on-site energy infrastructure at the Development Site; otherwise, the alternative proposes the same development program as set forth in the Proposed Actions for both Development Site and the Additional Housing Sites. The comparative assessment of potential impacts resulting from the Tri-Generation Alternative with the Proposed Actions is, therefore, limited to only those technical analyses where introduction of Tri-Generation could have a different potential impact than as analyzed with the Proposed Actions.

LAND USE, ZONING, AND PUBLIC POLICY

The Tri-Generation Energy Supply Alternative would be the same overall development project as with the Proposed Actions, with the same mix of land uses and based on the same zoning. Therefore, like the Proposed Actions, the alternative does not result in significant adverse impacts to land use, zoning, or public policy. The consideration of a tri-generation facility as set forth in this alternative is directly in response to, and consistent with, public policies established in PlaNYC.

ENERGY

The Tri-Generation Energy Supply Alternative would be the same overall development project as with the Proposed Actions and would generate the same energy demand of approximately 985,000 million BTUs annually for the Development Site. With the Tri-Generation Energy Supply Alternative, it is anticipated that on-site produced energy will reduce the need to bring energy to the Development Site from the regional distribution system. This would result in additional efficiency primarily leading to a reduction in GHG emissions associated with the production of energy necessary to serve the project (see "Air Quality," below).

Therefore, like the Proposed Actions, the Tri-Generation Alternative would not result in significant adverse impacts based on the anticipated energy demand, although, like the Proposed Actions and the No Action Alternative, improvements to local electrical and natural gas distribution systems would be necessary to service the sites and adjacent Hudson Yards development even with the addition of on-site generating capacity. It is assumed that improvements proposed by Con Edison to address service constraints caused by limitations in existing electrical network and gas distribution mains will be implemented within an appropriate timeframe and will be adequate to meet local demand requirements, and that regional sources and supply systems will be maintained and expanded as planned by the New York Independent System Operator (NYISO) and other responsible agencies.

AIR QUALITY

Based on the Tri-Generation Feasibility Study (see Appendix I4), the air quality analyses for the Tri-Generation Energy Supply Alternative assumed the following:

- The commercial building would be served by a 5.8 MW natural gas-fired Tri-Generation system that would utilize three Caterpillar 3520 engines with exhaust heat recovery to produce hot water, and a hot water absorption chiller to increase thermal utilization of the engine plant during hottest months;
- Each residential building would be served by a natural gas-fired 520 KW system, which will utilize UTC Pure Comfort C600 micro-turbines. This system consists of three packaged Capstone C200 micro-turbines with integrated exhaust heat to produce hot water; and
- The boilers considered for the Proposed Actions would be used to provide heat and hot water to supplement the base load energy provided by the Tri-Generation units and for off-peak periods when the Tri-Generation units would not be operating.

While the Tri-Generation units in both the commercial and residential buildings would burn only natural gas, it is assumed for comparative purposes that, like the Proposed Actions, the supplemental boilers would burn both fuel oil and natural gas. This permits a direct comparison of the potential air quality impacts of criteria pollutant emissions from the Proposed Actions and the Tri-Generation Alternative. The same three scenarios that were considered for the Proposed Actions were evaluated for the Tri-Generation Energy Supply Alternative. These are the:

- Maximum Commercial Scenario;
- Maximum Residential Scenario-Office Option; and
- Maximum Residential Scenario-Hotel Option.

Stack heights, locations, and exhaust parameters, building heights, receptor heights and locations evaluated in each scenario under the Tri-Generation Alternative are the same as those considered for the Proposed Actions.

The pollutants of concern for the Tri-Generation Alternative are NO_x, SO_2, PM_{10}, and $PM_{2.5}$. Emission rates were estimated using the EPA AP-42 emission factors for gas-fired engines and turbines and fuel-fired supplemental boilers and the heat inputs for the engines and turbines for the commercial and residential buildings, respectively. Heat inputs for each type of Tri-Generation unit were estimated by the project's engineers. The analysis assumes that the Tri-Generation units (engines and turbines) would burn only natural gas and would operate continuously year-round to provide electricity. Therefore, annual and short-term emission rates from these units were assumed to be the same (i.e., constant throughout the year).

The supplemental boilers, which would be the same boilers proposed for the Proposed Actions, could burn both fuel oil (as a back-up fuel) and natural gas (as the primary fuel). Although the annual fuel oil usage in the boilers is expected to account for approximately one percent of the fuel use, for the purpose of the criteria pollutant analysis, it was conservatively assumed that these supplemental boilers would burn only fuel oil during the winter months (December, January, February, and March) and natural gas for the rest of the year. To estimate winter emission rates, it was assumed that all of the annual fuel oil required for each building would be consumed in a 100-day (2,400-hour) heating season; emission rates for the rest of the year were developed for natural gas.

Estimated SO_2, PM_{10}, and NOx emission rates for the winter heating season and the remainder of the year are provided in Table 25-21. These values were estimated for the largest residential and commercial buildings under any of the scenarios, and it was conservatively assumed that these emission rates would be same for each residential and commercial building, respectively. For $PM_{2.5}$, however, emission rates estimated based on size of each building under each scenario. Combined $PM_{2.5}$ emission rates from the Tri-Generation engines and turbines, and the supplemental boilers that were used in the analysis are provided in Table 25-22.

Table 25-21
Tri-Generation Alternative:
PM_{10}, SO_2, and NO_2 Emission Rates Under (grams/sec)

Pollutant	Winter		Rest of the Year	
	Commercial	Residential	Commercial	Residential
NOx	0.4533	0.0440	0.4526	0.0420
SO_2	0.1943	0.1796	0.0067	0.0043
PM_{10}	0.1247	0.0227	0.1117	0.0104

Notes:
Emission rates were estimated based on heat input for each Tri-Generation unit and the following AP-42 emission factors (in lb/mmbtu):

- For gas-fired turbines used in residential buildings: SO_2=0.0034; and PM_{10}=0.0066
- For gas-fired reciprocating engines used in commercial buildings: 0.0006; and PM_{10}=0.0098
- NOx emission rates for were provided by the project's engineers,
- For fuel oil-fired supplemental boilers: SO_2=0.2030; NO_x= 0.1429, and PM_{10} =0.0152, and PM_{10}=0.0170
- For natural gas supplemental boilers: SO_2=0.00059; NO_x= 0.098, and PM_{10} =0.0075, and PM_{10}=0.0075

Table 25-22
Tri-Generation Alternative:
$PM_{2.5}$ Emission Rates Estimated for Each Proposed Building (grams/sec)

Building	Total Floor Area (square feet)	Tri-Gen (All Year)	Supplemental Boilers Fuel Oil (Winter)	Supplemental Boilers Natural Gas (Other Months)	Emission Rates	
					Winter	Other Months
Scenario 1 - Max Commercial						
WR-1	730,000	0.008	0.0108	0.0020	0.019	0.010
WR-2	710,000	0.008	0.0105	0.0020	0.019	0.010
WR-3	585,000	0.008	0.0087	0.0016	0.017	0.010
WR-4	375,000	0.008	0.0056	0.0010	0.014	0.009
WR-5	535,000	0.008	0.0079	0.0015	0.016	0.009
WR-6	550,000	0.008	0.0082	0.0015	0.016	0.009
WR-7	675,000	0.008	0.0100	0.0019	0.018	0.010
WC-1	2,315,000	0.109	0.123	0.003	0.232	0.112
Scenario 2 - Max Residential/Office						
WR-1	805,000	0.008	0.0120	0.0022	0.020	0.010
WR-2	822,500	0.008	0.0122	0.0023	0.020	0.010
WR-3	697,500	0.008	0.0104	0.0019	0.018	0.010
WR-4	375,000	0.008	0.0056	0.0010	0.014	0.009
WR-5	660,000	0.008	0.0098	0.0018	0.018	0.010
WR-6	662,500	0.008	0.0098	0.0018	0.018	0.010
WR-7	775,000	0.008	0.0115	0.0021	0.019	0.010
WC-1	1,625,000	0.109	0.086	0.002	0.195	0.111
Scenario 3 – Max Residential/Hotel Scenario						
WR-1	792,500	0.008	0.0118	0.0020	0.020	0.010
WR-2	885,000	0.008	0.0131	0.0024	0.021	0.010
WR-3	772,500	0.008	0.0115	0.0020	0.019	0.010
WR-4	375,000	0.008	0.0056	0.0010	0.014	0.009
WR-5	747,500	0.008	0.0111	0.0019	0.019	0.010
WR-6	737,500	0.008	0.0110	0.0019	0.019	0.010
WR-7	850,000	0.008	0.0126	0.0022	0.021	0.010
WC-1	1,128,000	0.109	0.060	0.001	0.169	0.110

Note:
$PM_{2.5}$ emission rates were estimated based on heat input for each Tri-Generation unit and the AP-42 emission factor of 0.0066 lb/mmbtu.

Using the same air quality modeling approach and assumptions, stack locations, and receptor sites used for the Proposed Actions, the following analyses were conducted to estimate the potential impacts of the Tri-Generation Alternative:

- Building-on-building analysis; and
- Impacts on existing and future No Build land uses.

The impacts of existing "major" emission sources on the proposed buildings would be the same as those estimated for the Proposed Actions. This is because the sizes and locations of the project buildings (and, therefore, the affected receptors) are the same under both alternatives. No additional analyses are, therefore, required.

Building-on-Building Impacts

Results of the building-on-building analysis of the Tri-Generation Alternative are provided in Tabled 25-23 and 25-24. As shown, the incremental 24-hour and annual impacts of the $PM_{2.5}$ emissions under the Tri-Generation Alternative are less than STV of 2 ug/m3 and 0.3 $\mu g/m^3$, respectively. Predicted 24-hr PM_{10} and SO_2, as well as annual SO_2 and NO_2 total concentrations

are less than the applicable NAAQS. Therefore, like the Proposed Actions, the Tri-Generation Alternative does not result in a significant adverse air quality impact.

Table 25-23
Maximum Estimated Building-On-Building HVAC Increments and Concentrations (µg/m^3) For the Tri-Generation Alternative

Pollutant	Averaging Time Period	Maximum Increments[1]			Background Conc.[2]	Maximum Concentrations			Applicable NAAQS[3]
		Scenario 1	Scenario 2	Scenario 3		Scenario 1	Scenario 2	Scenario 3	
SO_2	24-hr	25.6	22.9	23.1	123	148.6	145.9	146.1	365
	Annual	1.7	2.1	2.0	37	38.7	39.1	39.0	80
NO_2	Annual	1.0	1.3	1.2	71	72.0	72.3	72.2	100
PM_{10}	24-hr	2.9	2.9	2.9	60	62.9	62.9	62.9	150

Notes:
1. Results were estimated assuming the use of fuel oil for the four winter months and natural gas for the rest of the year.
2. Background concentrations are provided in Chapter 19, "Air Quality and Greenhouse Gas Emissions ," Table 19-3.
3. NAAQS = National Ambient Air Quality Standards.

Table 25-24
Maximum Estimated Building-On-Building HVAC Increments for $PM_{2.5}$ (µg/m^3) for the Tri-Generation Alternative

Pollutant	Averaging Time Period	Background Conc.[1]	Maximum Increments			Significant Threshold Value[2] (STVs)
			Scenario 1	Scenario 2	Scenario3	
$PM_{2.5}$	24-hr	39.2	1.17	1.14	1.13	2–5
	Max Annual	15.8	0.26	0.25	0.27	0.3[2]

Notes:
1. Background concentrations are provided in Chapter 19, "Air Quality and Greenhouse Gas Emissions ," Table 19-3.
2. STVs established by DEP and DEC.
3. Maximum annual "neighborhood" increments were not considered because the maximum annual discrete increment did not exceed 0.3 µg/m^3.

Impacts on Existing and Future Without the Proposed Actions Land Uses

Results of this analysis are provided in Tables 25-25 and 25-26. As shown, the incremental 24-hr and annual impacts of the $PM_{2.5}$ emissions under Tri-Generation Alternative are less than STV of 2 ug/m3 and 0.3 µg/m^3, respectively. Predicted 24-hr PM_{10} and SO_2, as well as annual SO_2 and NO_2 total concentrations are less than the applicable NAAQS. Therefore, impacts of Tri-Generation Alternative emissions on the other proposed buildings are not considered to be significant.

Table 25-25
Maximum Estimated HVAC Increments (µg/m^3) on Existing and Future No Build Land Uses for the Tri-Generation Alternative

Pollutant	Averaging Time Period	Maximum Increments[1]			Background Conc.[2]	Maximum Concentrations			Applicable NAAQS[3]
		Scenario 1	Scenario 2	Scenario 3		Scenario 1	Scenario 2	Scenario 3	
SO_2	24-hr	9.8	15.0	10.9	123	132.8	138.0	133.9	365
	Annual	0.5	0.8	0.6	37	37.5	37.8	37.6	80
NO_2	Annual	0.8	0.9	0.9	71	71.8	71.9	71.9	100
PM_{10}	24-hr	1.6	1.9	1.7	60	61.6	61.9	61.7	150

Notes:
1. Results were estimated assuming the use of fuel oil for the four winter months and natural gas for the rest of the year.
2. Background concentrations are provided in Chapter 19, "Air Quality and Greenhouse Gas Emissions ," Table 19-3.
3. NAAQS = National Ambient Air Quality Standards.

Table 25-26
Maximum Estimated HVAC Increments for $PM_{2.5}$ (µg/m^3) on Existing and Future No Build Land Uses

Pollutant	Averaging Time Period	Background Conc.[1]	Maximum Increments			Significant Threshold Value[2] (STVs)
			Scenario 1	Scenario 2	Scenario 3	
$PM_{2.5}$	24-hr	39.2	1.97	1.71	1.55	2–5
	Max Annual	15.8	0.29	0.27	0.26	0.3[5]

Note:
1. Background concentrations are provided in Chapter 19, "Air Quality and Greenhouse Gas Emissions ," Table 19-3.
2. STVs established by DEP and DEC.
3. Maximum annual "neighborhood" increments were not considered because the maximum annual discrete impacts did not exceed 0.3 µg/m^3.

Greenhouse Gases

The Tri-Generation Energy Supply Alternative would result in reduced GHG emissions compared with the Proposed Actions. With tri-generation, the Proposed Development would have an energy supply that would be three to eight percent more energy efficient (less than the EPA benchmarks for cogeneration) and result in five to six percent lower GHG emissions than the scenario for the Proposed Actions, based on the feasibility analysis, as discussed in the feasibility report included in Appendix I4. Greater GHG benefits could be realized by further optimizing the tri-generation system and operating parameters.

As it is expected that the boilers under the Proposed Actions and the supplemental boilers under the Tri-Generation Alternative would primarily use natural gas, that scenario was presented in the feasibility study and assumed for the GHG estimates of the Proposed Actions. This provides a common basis for the comparison of GHG emissions of the Proposed Actions with the Tri-Generation Alternative.

NOISE

In this alternative, the proposed Tri-Generation facilities may increase noise levels at sensitive receptor locations within the Development Site. The Tri-Generation facilities would need to satisfy the outdoor and indoor noise level requirements of the New York City Noise Code as follows:

- **Outdoor Noise:** According to CEQR guidelines, noise levels from operation of mechanical equipment shall not increase the daytime existing noise level beyond 65 dBA and shall not increase existing night time noise level by 3 dBA or more. However, in New York City the daytime noise levels are often higher than 65 dBA and, therefore, it is practical and reasonable to specify that the daytime noise levels from mechanical equipment operations should not increase the existing daytime level by 3 dBA or more. Nighttime noise levels shall not exceed the future noise levels by 3 dBA or more. Noise generated at sensitive locations (e.g., pedestrian sidewalks and open areas) must also meet the requirements of the New York City Noise Code.
- **Indoor Noise:** New York City Noise Code specifies that noise levels from mechanical equipment shall not exceed 42 dBA inside a receiving property dwelling unit at a distance of three feet from an open window or terrace of the property.

Exterior noise levels from the tri-generation facilities in this alternative would be consistent with CEQR noise criteria, which limit mechanical systems noise levels to levels equal to or less than 3 dBA increase over the existing noise level during the daytime and less than a 3 dBA increase over the nighttime L_{eq} noise level. These facilities would be structurally designed to accommodate the mechanical equipment within the plants to minimize noise impacts to adjacent uses and public areas in order to achieve compliance with the New York City Noise Code. Therefore, like the Proposed Action, there are no significant adverse noise impacts resulting from the Tri-Generation Alternative. ✷