Chapter 24: Alternatives

A. INTRODUCTION

OVERVIEW

In accordance with the State Environmental Quality Review Act (SEQRA) and City Environmental Quality Review (CEQR) requirements, this chapter presents and analyzes alternatives to the proposed actions. Alternatives selected for consideration in an EIS are generally those which 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 substantively meet the goals and objectives of the proposed project.

As detailed in Chapter 1, "Project Description," the purpose of the proposed actions is to provide modern Class A commercial office space that would accommodate Manhattan's long-term growth in a central Manhattan location identified by the City as an area where increased density and redevelopment is appropriate. To attract a major corporate tenant or multiple commercial office tenants, both scenarios would be designed to accommodate trading uses (e.g., there would be large floorplates in the podium portion of the building). It is the applicant's belief that the availability of such space in a central Manhattan location well served by existing transit services would enhance significantly the likelihood of corporate office tenants remaining in or relocating to, and expanding in, New York City. In addition, the purpose of the project is to provide benefits to the public by increasing employment opportunities across all economic levels, increasing tax revenues for the City and State, and providing new mass transit improvements.

This chapter considers four alternatives to the proposed project:

- A No Action Alternative, which assumes that the proposed actions are not approved and that the site is developed under existing zoning;
- A Hotel-Residential Alternative, which considers a building that would contain hotel and residential uses above a commercial office component;
- A Cogeneration Energy Supply Alternative, which considers the addition of on-site energy infrastructure that would simultaneously produce electricity and usable thermal energy to provide heat and air conditioning on-site (cogeneration systems); and
- A No Unmitigated Significant Adverse Impacts Alternative, which considers a project program that would eliminate the proposed project's unmitigated significant adverse impacts.

PRINCIPAL CONCLUSIONS

The conclusion of the alternatives analysis is that all alternatives, aside from the No Unmitigated Significant Adverse Impacts Alternative, would have similar impacts to impacts of the proposed project.

The No Action Alternative would result in fewer severely congested locations with respect to traffic and transit compared with the proposed project. However, it is the applicant's belief that this alternative, because of its smaller size, would not accommodate trading uses and would therefore not accommodate Manhattan's long-term growth for commercial tenants requiring trading floor capacity as well as the proposed project. In addition, the No Action Alternative would not provide widened sidewalks or new mass transit improvements, which is one of the purposes of the proposed project.

With the Hotel-Residential Alternative, the mix of uses developed on the site would include hotel and residential use in addition to the retail and commercial uses proposed as part of the project, as well as new mass transit improvements and widened sidewalks. This alternative would result in the same or similar impacts as the proposed project.

The Cogeneration Energy Supply Alternative examines the potential effects if a cogeneration plant were to be constructed to provide a portion of the power, as well as heating and cooling for the proposed project. If this alternative were pursued, additional approvals from the New York State Department of Environmental Conservation (NYSDEC) and New York City Environmental Protection (NYCDEP) would be required. Compared with the proposed project, the Cogeneration Energy Supply Alternative would result in greater energy efficiency, less reliance on the utility power and steam infrastructure and, like the proposed project, would have no significant impact on energy. Although the Cogeneration Alternative would result in greater on-site air pollutant emissions, like the proposed project, no significant adverse air quality impacts are expected from the Cogeneration Energy Supply Alternative. Overall emissions of GHG from the building energy use would be lower with the Cogeneration Alternative than with the proposed project and would therefore further the goals of PlaNYC. The cogeneration system would be designed to meet all applicable noise regulations and, like the proposed project, would not result in any significant noise impacts.

The No Unmitigated Significant Adverse Impacts Alternative considers project programs that would eliminate the proposed project's unmitigated significant adverse impact on open space and pedestrian conditions. As discussed below, these potential programs would differ from the proposed project by eliminating approximately 809,000 sf of office uses from the Single-Tenant Office Scenario and approximately 120,000 sf of retail from the Multi-Tenant Office Scenario. While the potential programs to reduce these impacts would avoid significant adverse impacts on open space and pedestrian conditions, they would not meet the project's purpose and need as well as the proposed project (either scenario) would. The potential program to eliminate the open space impact would result in a considerably smaller building than either the Single- or Multi-Tenant Office Scenario. As such, it is the applicant's belief that this program, unlike the proposed project, would not enhance significantly the likelihood of corporate office tenants remaining in or relocating to, and expanding in, New York City. In addition, the program to eliminate the pedestrian impacts would result in substantially less retail space than the Multi-Tenant Office Scenario. Therefore, this program would be less supportive of the commercial character of the surrounding area and would be less accommodating of Manhattan's long-term growth than the proposed project. Furthermore, neither potential program would provide the new mass transit improvements that are one of the purposes of the proposed project.

B. NO ACTION ALTERNATIVE

DESCRIPTION

Consideration of the No Action Alternative is mandated by both SEQRA and CEQR, and is intended to provide an assessment of the consequences of not selecting the proposed project. The technical chapters of this EIS have described the future without the proposed project (the "No Action" condition), referred to in this chapter as the No Action Alternative, and have used it as the basis to assess the potential impacts and associated mitigation for the proposed project.

The No Action Alternative assumes that none of the proposed actions would be adopted. If this were to occur, the project sponsor will develop the 15 Penn Plaza development site with an as-of-right building (the "No Action building") under existing C6-6 and C6-4.5 zoning. As described in Chapter 2, "Procedural and Analytical Framework," this building will consist of approximately 1.6 million gross square feet (gsf) total space consisting of approximately 1.3 million gsf of office space, 40,600 gsf of retail space, 202,000 gsf of mechanical space, and 35,438 gsf of lobby area and amenity space. Accessory parking for up to 100 vehicles will be located below grade.

In the No Action building, the entrance to the office use will be located on Seventh Avenue. Ground-floor retail uses will be located on the West 32nd Street, Seventh Avenue, and West 33rd Street frontages. The building will have a full block base and three floors of office use above, rising to a height of 85 feet. The office tower will be setback above the podium base, rising to a total roof height of 581 feet, including mechanical space.

NO ACTION ALTERNATIVE COMPARED WITH THE PROPOSED PROJECT

The following sections compare conditions under the No Action Alternative with conditions with the proposed project.

LAND USE, ZONING, AND PUBLIC POLICY

Like the proposed project, the No Action Alternative would not result in any significant adverse impacts to land use, zoning, or public policy. The No Action Alternative would result in the same mixture of office and retail uses on the development site as the proposed project. However, the No Action Alternative would not include trading floor use, which would be included in the Single-Tenant Office Scenario. The No Action Alternative would result in a more intensive use on the development site, which would also occur as a result of the proposed project. Overall, the land uses associated with the No Action Alternative would be similar to the land uses found throughout the study area, which is defined by high-density commercial buildings with ground-floor retail. As such, the No Action Alternative would not result in any impacts to land use.

However, the No Action Alternative would not result in the new below-grade mass transit improvements that would result from the proposed project, and would therefore not provide the mass transit benefits associated with the proposed project.

SOCIOECONOMIC CONDITIONS

Direct Residential Displacement

The development site does not contain a residential population; therefore, neither the No Action Alternative nor the proposed project would directly displace any residents.

Indirect Residential Displacement

Neither the No Action Alternative nor the proposed project include a residential component, and as such would not have substantial effects on the residential real estate market. In addition, neither this alternative nor the proposed project would introduce non-residential uses that make the surrounding area substantially more attractive as a residential neighborhood complex. The study area already has well-established residential neighborhoods and high-density commercial uses, and the introduction of either the alternative or the proposed project would not substantively affect the area's residential desirability.

Direct Business and Institutional Displacement

The No Action Alternative would replace the existing hotel and additional commercial uses on the development site. Because this would occur in the No Action Alternative, the proposed project would not result in direct business or institutional displacement.

Indirect Business and Institutional Displacement

The study area already has a well-established commercial office presence such that the introduction of either this alternative or the proposed project would not significantly alter existing economic patterns and thereby lead to indirect business and institutional displacement.

Adverse Effects on Specific Industries

Both this alternative and the proposed project would reinforce existing business sectors, and provide new office space to retain and attract businesses. However, this alternative would not provide trading floor space.

COMMUNITY FACILITIES AND SERVICES

Like the proposed project, the No Action Alternative would not result in any significant adverse impacts to community facilities or services. Both the proposed project and the No Action Alternative would not result in a direct effect on any community facility, nor would either contain a residential component that would place additional demands on the service delivery of any community facility.

OPEN SPACE

The area surrounding the development site is currently underserved by passive open space resources. Both the No Action Alternative and the proposed project would increase the demand for these open space resources, and both would worsen existing deficiencies of open space. Although the proposed project would add a greater demand for open space resources compared to the No Action Alternative, it would also provide funding for open space improvements and/or maintenance to address project-generated open space demand. The No Action Alternative would not have to consider measures to address the deficiency of open space resources in the study area.

SHADOWS

For the most part, shadows cast by the No Action Alternative would be less than the shadow cast by the proposed project since the No Action building would be shorter than the proposed project (either scenario). However, there would be some small areas of additional shadow with the No

Action Alternative that would not occur with the proposed project. Neither this alternative nor the proposed project would result in shadows impacts.

HISTORIC AND CULTURAL RESOURCES

Since the development site has been determined not archaeologically sensitive, like the proposed project, no archaeological resources would be disturbed in the No Action Alternative.

Under the No Action Alternative, the project sponsor will demolish the existing Hotel Pennsylvania and redevelop the development site with a building that will conform to the existing C6-6 and C6-4.5 zoning. As described in Chapter 8, "Historic and Cultural Resources," the 22-story, brick- and stone-clad Hotel Pennsylvania is eligible for listing on the State and/or National Registers of Historic Places (S/NR)-eligible). Historic American Buildings Survey (HABS) Level II documentation will be undertaken by the project sponsor prior to the hotel's demolition to record the history and appearance of the Hotel Pennsylvania. The HABS documentation will be submitted to an appropriate public repository.

The No Action Alternative will also alter the context of some of the nearby architectural resources, particularly those closest to the development site; in addition, this alternative would change the context of the Empire State building in some eastward views from vantage points west of the development site. However, as described in Chapter 8, "Historic and Cultural Resources," these buildings, including the Empire State Building, are already located in the context of an area that has been extensively altered since these buildings were first built. Therefore, the No Action Alternative building will not block views to architectural resources that are not already obstructed by intervening buildings that limit the visual and contextual relationships among buildings in the study areas. Overall, neither the proposed project nor the No Action Alternative would result in significant adverse physical, visual, or contextual impacts to historic and cultural resources.

URBAN DESIGN AND VISUAL RESOURCES

Like either scenario of the proposed project, the No Action Alternative would alter the urban design of the development site. The No Action Alternative would result in the demolition of the Hotel Pennsylvania and the site's redevelopment with a No Action building.

Like either scenario of the proposed project, the No Action Alternative building will have retail street frontages on West 32nd and West 33rd Streets and Seventh Avenue, although the No Action Alternative would include more ground-floor retail space. Additionally, the No Action Alternative building's main entrance would be on Seventh Avenue. The building's approximately 85-foot-tall base would have four floors with large floorplates. The building would occupy the entire development site, except along Seventh Avenue, where it would set back from the lot line by approximately 15 feet, the same distance as the extant Hotel Pennsylvania and the proposed project (both scenarios). The No Action Alternative building would fully utilize the development site area, except for its setback along Seventh Avenue, and would be built to the lot lines of West 32nd and West 33rd Streets, thereby maintaining the existing streetwalls of those streets. The No Action Alternative building would also maintain the existing streetwall of Seventh Avenue. In comparison, both the Single-Tenant Office Scenario and the Multi-Tenant Office Scenario buildings would be set back 10 feet from the lot line on West 32nd and West 33rd Streets. The building would be clad with a glass and steel curtain wall, as would as the Single-Tenant Office Scenario and the Multi-Tenant Office Scenario. A slab-like tower would rise from the middle of the building's base and will be set back from all sides of the

base. The No Action Alternative building would be approximately 550 feet shorter than the Single-Tenant Office Scenario and approximately 576 feet shorter than the Multi-Tenant Office Scenario building.

The proposed project and the No Action Alternative building would include uses that would be consistent with uses that are currently present on the development site and prevalent in the surrounding area. Both the proposed project and the No Action Alternative building would be constructed on an existing block, and would not entail any changes to topography, street pattern and hierarchy, block shapes, or natural features on the development site or in the surrounding area.

As noted above, there are no visual resources located on the development site. Views in the study areas closest to the development site would be altered by the No Action building, as the building would become more of a focal point of these views; however, these views already include large-scale tower buildings. The No Action Alternative would not obstruct or substantially alter any views from the development site to surrounding visual resources.

NEIGHBORHOOD CHARACTER

Development of the No Action Alternative on the development site would transform this site from a site containing hotel uses to a site containing predominantly office use. This new use is in keeping with surrounding land uses. This alternative would result in the removal of the S/NR-eligible Hotel Pennsylvania. HABS Level II documentation will be undertaken by the project sponsor prior to the hotel's demolition to record the history and appearance of the Hotel Pennsylvania. The HABS documentation will be submitted to an appropriate public repository. Overall, like the proposed project, with this alternative, the character of the neighborhood would continue to be characterized by a level of intense activity that reflects the area's midtown location and its predominant uses as a transportation hub, a major city destination, and a vibrant business district.

NATURAL RESOURCES

The No Action Alternative would result in the demolition of the Hotel Pennsylvania building and the subsequent construction of a 1.6 million gsf No Action building. Therefore, the development site will continue to be fully developed. While the potential for an increased loss of migratory birds due to building collisions would be lower due to this alternative's lower height, no significant adverse impacts on migrating birds are expected with the proposed project.

HAZARDOUS MATERIALS

Under this alternative, the Hotel Pennsylvania will be demolished and a new building will be constructed requiring excavation and soil disturbance for construction of its new foundations. Demolition and excavation may disturb or involve certain environmental conditions (e.g., asbestos-containing materials, lead-based paint) that are governed by existing federal, state, and local regulations. Adherence to all applicable regulations would avoid significant adverse impacts. Therefore, like with the proposed project, this alternative would not result in significant adverse hazardous materials impacts.

INFRASTRUCTURE

The No Action Alternative would generate less demand for City water supply and sewer services than both the existing Hotel Pennsylvania and the proposed project. The North River WPCP would have available capacity to treat the sewage generated by both the No Action Alternative

and the proposed project. Overall, the No Action Alternative and the proposed project would not result in significant adverse infrastructure impacts.

SOLID WASTE AND SANITATION SERVICES

As described above, the No Action Alternative will contain approximately 1.3 million gsf of office space, 40,600 gsf of retail use as well as mechanical space, lobby area, and amenity space. These latter three uses do not generate solid waste. The No Action Alternative will generate approximately 79,305 pounds per week (approximately 40 tons) of solid waste. This amount of solid waste is approximately 54,058 pounds per week less than the amount of solid waste generated by the Single-Tenant Office Scenario and approximately 114,444 pounds per week less than amount of solid waste generated by the Multi-Tenant Office Scenario.

Compared with the approximately 115,000 tons of solid waste generated weekly in New York City, the amount of solid waste generated by the No Action Alternative (as well as by either scenario of the proposed project) would be considered a negligible increment. The No Action Alternative would comply with the City's recycling program and would be designed to accommodate source separation of recyclables in conformance with City recycling regulations. In addition, the proposed actions would not conflict with, or require any amendments to, the City's solid waste management objectives as stated in the SWMP. Therefore, no significant adverse solid waste impacts would result from either this alternative or the proposed project.

ENERGY

The No Action Alternative will create a demand for less energy than the proposed project—105,086 million British Thermal Units (BTU) per year, or approximately 59,722 million BTUs per year less than the Single-Tenant Office Scenario. The No Action Alternative would not include the energy intensive trading floor use (as in the proposed project), but is also not likely to include the proposed project's additional measures to reduce energy use. Neither this alternative nor the proposed project would result in significant adverse impacts on energy.

TRAFFIC AND PARKING

The No Action Alternative would result in the generation of new traffic and parking demand and would not generate the significant adverse traffic impacts identified with the proposed project. Overall, in the 2014 No Action alternative, of the 145 approach movements analyzed, 43 approach movements operate at mid-LOS D or worse in the AM peak hour, compared to 45 approach movements with the Single-Tenant Office Scenario and 43 approach movements with the Multi-Tenant Office Scenario. During the weekday midday peak hour, 24 approach movements operate at mid-LOS D or worse, compared to 24 approach movements with the Single-Tenant Office Scenario and 25 approach movements with the Multi-Tenant Office Scenario. During the PM peak hour, 35 approach movements operate at mid-LOS D or worse, compared to 35 approach movements with the Single-Tenant Office Scenario and 36 approach movements with the Multi-Tenant Office Scenario. During the Saturday midday peak hour, 29 approach movements operate at mid-LOS D or worse, compared to 29 approach movements with the Single-Tenant Office Scenario and 33 approach movements with the Multi-Tenant Office Scenario. These findings are presented in **Table 24-1**.

Table 24-1
No Action and Future with the Proposed Project
Number of Intersection Approach Movements at Mid-LOS D, LOS E, or LOS F

	Analysis Hour[1]			
Level of Service	**AM**	**Weekday Midday**	**PM**	**Saturday Midday**
Mid-LOS D	8 / 9 / 8	2 / 2 / 3	8 / 7 / 7	5 / 5 / 7
LOS E	11 / 11 / 11	9 / 9 / 7	7 / 6 / 7	12 / 12 / 12
LOS F	24 / 25 / 24	13 / 13 / 15	20 / 22 / 22	12 / 12 / 14
Note: [1]Results are reported as No Action / Single-Tenant / Multi-Tenant				

Due to background growth in parking demand and parking demand generated by developments assumed to be completed by 2014 in the No Action condition, off-street parking is anticipated to be more highly utilized. As shown in **Table 24-2**, anticipated 2014 off-street parking facilities have an occupancy rate of 93 percent, with approximately 475 available spaces during the weekday midday hour.

Table 24-2
No Action Off-Street Parking Utilization

Analysis Period	Total Capacity	Demand	Utilization Rate	Available Spaces
Weekday Midday	7,040	6,566	93%	474

TRANSIT AND PEDESTRIANS

Transit conditions for the No Action Alternative are described in Chapter 17, "Transit and Pedestrians."

As part of the proposed project, significant mass transit improvement are planned, including the re-opening and renovating of the pedestrian passageway under the south side of West 33rd Street. In addition, both scenarios would improve several subway stairways and control areas serving the Seventh Avenue, Sixth Avenue, and Broadway lines, and PATH. **Table 24-3** compares unmitigated significant adverse impacts for the 2014 No Action condition versus the proposed project.

Table 24-3
No Action and Future with the Proposed Project
Number of Unmitigated Significant Adverse Impacts

	Analysis Hour[1]			
Element	**AM**	**Weekday Midday**	**PM**	**Saturday Midday**
Pedestrian Impacts	2 / 0 / 0	0 / 0 / 2	2 / 0 / 0	0 / 0 / 2
Transit Impacts	1 / 0 / 0	0 / 0 / 0	1 / 0 / 0	0 / 0 / 0
Note: [1]Results are reported as No Action / Single-Tenant / Multi-Tenant				

AIR QUALITY

Like the proposed project, the No Action Alternative would not result in any significant adverse air quality impacts. The emissions from existing stationary sources (heating, ventilation, and air conditioning systems for existing buildings, and existing industrial uses) would be the same with the No Action Alternative and with the proposed project and would result in no significant impact to air quality at the project site. The No Action Alternative garage would have a lower

capacity and usage rate than the garage for the proposed project, and like the proposed project, it would not result in significant impacts on air quality near the garage vents. Like the proposed project, the No Action Alternative would most likely use utility steam in the building heating systems, and would therefore not result in local stationary source emissions. If oil or natural gas were used, the emissions would be greater than with the proposed project. The No Action Alternative would result in fewer vehicle trips than the proposed project, and like the proposed project it would not result in indirect mobile source impacts on air quality. Both scenarios would be consistent with the New York State Implementation Plan (SIP).

GREENHOUSE GAS EMISSIONS

The greenhouse gas (GHG) emissions from the No Action Alternative associated with electricity and steam consumption, project-generated vehicle trips, construction activity, and construction material use would be lower than with the proposed project. The No Action Alternative is not likely to include the energy efficiency and GHG reduction measures that would be incorporated as part of the proposed project. Therefore, the intensity of GHG emissions (emissions per floor area developed and number of employees accommodated) would likely be higher with the No Action Alternative. In addition, the No Action Alternative would not fully meet the need for office or trading floor space, which the proposed project would supply. The needed office or trading floor uses would likely be developed elsewhere, potentially at locations with less access to public transportation and with no commitment to voluntary energy efficiency and other sustainable measures. In contrast to the proposed project, the No Action Alternative would not incorporate commitments to advance the goals of PlaNYC.

NOISE

With both the No Action Alternative and the proposed project, noise levels would remain in the "marginally unacceptable" category (as per the CEQR Noise Exposure Guidelines), and no significant adverse impacts would occur.

CONSTRUCTION

Construction of the No Action Alternative would be expected to take a total of about 42 months to complete. Of this construction duration, approximately 18 months would be devoted to the site preparation, demolition, and foundations phases, with about 28 months of general construction activities for the No Action development. Construction of the No Action development would involve the same construction phases, with similar durations and worker intensities as the proposed project; however, the overall duration for this alternative would be shorter. Additionally, the No Action Alternative would not include any of the construction activities associated with the various subway improvements.

Construction of the No Action Alternative would result in the same or similar effects on land use, socioeconomic conditions, community facilities, open space, historic resources, traffic, parking, transit, pedestrians, air quality, noise, and vibration as the proposed project. The elevated noise levels exceeding CEQR impact criteria that would occur with the proposed project would also occur with the No Action Alternative, as would the significant adverse noise impact on the terraces of The Epic residential building. In addition, with the No Action Alternative, noise reduction measures beyond what is required by the New York City Noise Code could be implemented but would not be required; therefore, in the No Action condition, without the noise control measures that are being committed to by the project sponsor, noise

levels would be expected to be approximately 10 dBA higher than noise levels with the proposed project, and elevated noise levels are expected to also occur at the St. Francis Roman Catholic Church and possibly at other locations.

PUBLIC HEALTH

Like the proposed project, the No Action Alternative is not expected to result in significant adverse impacts on public health.

CONCLUSION

In the No Action Alternative, the proposed actions would not be implemented, and a No Action building of 1.6 million gsf would be constructed on the development site. No trading floor use would be provided. Impacts would be similar between this alternative and the proposed project.

As with the proposed project, the No Action Alternative would not result in any significant adverse impacts on land use, zoning, and public policy; socioeconomic conditions; community facilities; open space; shadows; historic resources; urban design and visual resources; neighborhood character; natural resources; hazardous materials; infrastructure; solid waste and sanitation services; energy; parking; air quality; operation-period noise; and public health.

The No Action Alternative would result in fewer severely congested locations with respect to traffic. Since the No Action alternative does not include the proposed mass transit improvement package, the No Action alternative results in more severely congested locations with respect to transit and pedestrians.

Elevated noise levels during construction would result in a significant adverse noise impact on The Epic's terraces under both the No Action Alternative and the proposed project. In addition, without the noise reduction measures that would be incorporated as part of the proposed project, the No Action Alternative would be expected to also result in impacts at the St. Francis Roman Catholic Church and possibly at other locations that would not occur with the proposed project.

While both this alternative and the proposed project would provide modern Class A commercial office space, the proposed project, because of its larger size and its large podium floorplates that could accommodate trading uses, would better accommodate Manhattan's long-term growth. The No Action Alternative would not result in the project's public transit benefits since it would not provide new mass transit improvements or widened sidewalks.

C. HOTEL-RESIDENTIAL ALTERNATIVE

DESCRIPTION OF THE ALTERNATIVE

The proposed C6-6 zoning on the project site would permit a range of uses, including hotel and residential uses. To provide flexibility for possible future program adjustments in response to changing market conditions, this section analyzes a Hotel-Residential Alternative in which the development site would be developed with hotel, residential, office, and retail uses. These uses would be located in a new, mixed-use building. The building profile for this alternative would fit entirely within the Single-Tenant Office Scenario building profile and would therefore result in widened sidewalks, like this scenario.

As conceptually laid out, the Hotel-Residential Alternative would produce approximately 2.5 million gsf of total space consisting of approximately 1.5 million gsf of office space;

approximately 308,373 gsf of hotel space (containing approximately 324 hotel rooms); approximately 201,736 gsf of residential space (containing approximately 237 market-rate residential units[1]); approximately 207,065 gsf of retail space; and mechanical space. It is expected that this alternative would provide up to 100 accessory parking spaces (like the proposed project).

In the Hotel-Residential building, the entrance to the office use would be located on Seventh Avenue. The residential units and hotel would each have separate entrances located on West 33rd Street and separate lobby space. Ground-floor retail uses would be located on the West 32nd Street, Seventh Avenue, and West 33rd Street frontages. In addition to their location on the ground floor, retail uses would occupy the entirety of the second and third floors and a portion of the below-grade space. The building's office uses would occupy the fourth through eighth floors as well as the 11th through 43rd floors. The hotel would be located above the office uses and would occupy the 46th through 64th floors. Finally, the residential component would be located between the 66th and 78th floors. Two floors of mechanical space would be located on the 79th and 80th floors, with additional mechanical space on the 9th and 10th floors, 44th floor (between the office and hotel space), and the 65th floor (between the hotel and residential space).

The building would have a full block podium base that would rise to eight stories and a height of 150 feet. Following this height, a tower would rise above the podium base to 80 stories and a total roof height of 1,190 feet, including mechanical space, the same height as Single-Tenant Office Scenario. The tower would setback from Seventh Avenue at 558 feet and at 733 feet.

The Hotel-Residential Alternative would also result in the new below-grade mass transit improvements that would result from the proposed project. These improvements include significantly upgrading the existing subway entrances on West 32nd and West 33rd Streets as well as re-opening and renovating of the passageway under the south side of West 33rd Street. The passageway would accommodate pedestrian flows and improve pedestrian circulation on the street-level sidewalks.

HOTEL-RESIDENTIAL ALTERNATIVE COMPARED WITH THE PROPOSED PROJECT

The following sections compare conditions under the Hotel-Residential Alternative with conditions with the proposed project.

LAND USE, ZONING, AND PUBLIC POLICY

Like the proposed project, the Hotel-Residential Alternative would not result in any significant adverse impacts to land use, zoning, or public policy. This alternative would result in office and retail uses on the development site, as would the proposed project, as well as hotel space and residential uses. The Hotel-Residential Alternative would not include trading floor use, which would be included in the Single-Tenant Office Scenario of the proposed project. Similar to the proposed project, the Hotel-Residential Alternative would result in a more intensive use on the development site, which would also occur as a result of the proposed project. Overall, the land uses associated with the Hotel-Residential Alternative would be similar to the land uses found throughout the study area, which is defined by high-density commercial buildings, ground-floor

[1] Based on approximately 850 gsf per unit.

retail, hotel, and scattered residential uses. As such, the Hotel-Residential Alternative would not result in any significant adverse impacts to land use.

SOCIOECONOMIC CONDITIONS

Direct Residential Displacement

Like the proposed project, the Hotel-Residential Alternative would result in the redevelopment of a site that does not contain any permanent residential dwelling units. Therefore, neither the proposed project nor the Hotel-Residential Alternative would result in direct residential displacement.

Indirect Residential Displacement

The Hotel-Residential Alternative would introduce approximately 237 market-rate residential units to the development site. However, as discussed in Chapter 4, "Socioeconomic Conditions," the study area already has well-established residential neighborhoods with high rents and high incomes. Furthermore, several thousand residential units are planned for completion within the study area by 2014. Therefore, the residential units introduced by the Hotel-Residential Alternative would not have the potential to add a substantial new population with different socioeconomic characteristics to the study area, nor would it be expected to have an effect on the residential desirability of the area. Like the proposed project, the Hotel-Residential Alternative would not result in any significant adverse impacts due to indirect residential displacement.

Direct Business and Institutional Displacement

Absent the proposed project, the development site will be developed with the No Action commercial office building, which would displace the existing hotel and commercial uses on the site. Therefore, like the proposed project, the Hotel-Residential Alternative would not result in direct business displacement.

Indirect Business and Institutional Displacement

The Hotel-Residential Alternative, like the proposed project, would expand the existing base of commercial office and retail offerings within the study area. Development under the Single-Tenant Office Scenario would add approximately 1.9 million gsf of commercial office, trading floor, and retail uses, while the Multi-Tenant Office Scenario would add approximately 2.3 million gsf of commercial office and retail uses. In comparison, this alternative would add approximately 2.1 million gsf of commercial office, hotel, and retail uses. The study area already has a well-established commercial office presence such that the introduction of the commercial office and retail uses of this alternative would not significantly alter existing economic patterns. Furthermore, the hotel use introduced by this alternative would not be a new use to the area, and would not result in a noticeable difference in the types of workers or other economic patterns in the study area. As with the proposed project, the Hotel-Residential Alternative would not result in any significant adverse impacts due to indirect business displacement.

Adverse Effects on Specific Industries

Because the Hotel-Residential Alternative, like the proposed project, would not directly or indirectly displace businesses, it would not adversely affect business conditions in any industry or any category of business within or outside of the study area. This alternative would also not indirectly reduce employment or impact the economic viability of an industry or category of

business. Therefore, like the proposed project, this alternative would not have significant adverse impacts on a specific industry.

COMMUNITY FACILITIES AND SERVICES

Unlike the proposed project, the Hotel-Residential Alternative would include a residential component. This alternative would introduce approximately 237 market-rate residential units, which would result in greater demand for community facilities and services than with the proposed project.

Overall, however, the demand for community facilities and services generated by the Hotel-Residential Alternative would be minimal. The new population introduced by this alternative would not exceed any of the preliminary screening analysis thresholds set forth in the *CEQR Technical Manual*. As such, neither this alternative nor the proposed project would result in significant adverse impacts on public schools, hospitals or health care facilities, libraries, day care facilities, or fire and police protection services.

OPEN SPACE

Both the Hotel-Residential Alternative and the proposed project would introduce new workers to the development site, and thereby generate additional demand for passive open spaces within ¼ mile of the development site. The area surrounding the development site is currently underserved by passive open spaces. The Hotel-Residential Alternative would introduce approximately 7,170 workers compared to 9,950 workers with the proposed project. Although the Hotel-Residential Alternative would introduce fewer workers, it would have similar effects on passive open space ratios. The Hotel-Residential Alternative would decrease passive open space ratios by approximately 1 percent, where the proposed project would decrease passive open space ratios by approximately 3 percent. The *CEQR Technical Manual* states that even a small change in the open space ratio in areas underserved by open space may result in a potential significant adverse impact. Therefore, both the Hotel-Residential Alternative and the proposed project would result in significant adverse open space impacts within a ¼-mile area around the development site.

Unlike the proposed project, the Hotel-Residential Alternative would introduce new residents to the development site. The new residents would create additional demand for active and passive open spaces within an approximately ½-mile area around the development site. This ½-mile area is currently underserved by active and passive open space for residents, and will continue to be underserved in the future without the proposed project. The Hotel-Residential Alternative would decrease active and passive open space ratios by less than 1 percent and, therefore, would not substantially worsen existing open space deficiencies. Therefore, the Hotel-Residential Alternative would not result in a significant adverse impact to open spaces within ½-mile of the development site.

SHADOWS

As discussed above, the Hotel-Residential Alternative would fit within the same building profile as the Single-Tenant Office Scenario. Therefore, the effects of shadows on nearby sun-sensitive resources would be the same for this alternative as with the Single-Tenant Office Scenario, and no significant adverse shadows impacts would result.

HISTORIC AND CULTURAL RESOURCES

Since the development site has been determined not archaeologically sensitive, like the proposed project, no archaeological resources would be disturbed in the Hotel-Residential Alternative.

Both the Hotel-Residential Alternative and the proposed project would result in the demolition of the S/NR-eligible Hotel Pennsylvania. As with the proposed project, the demolition of the S/NR-eligible Hotel Pennsylvania in the Hotel-Residential Alternative would not constitute a significant adverse impact on architectural resources because it will be demolished with the No Action condition. HABS Level II documentation would be undertaken by the project sponsor prior to the hotel's demolition to record the history and appearance of the Hotel Pennsylvania. This commitment would be set forth in a Restrictive Declaration. The HABS documentation would be submitted to an appropriate public repository.

Like both scenarios under the proposed project, the Hotel-Residential Alternative would alter the context of nearby historic and cultural resources (and the context of the more distant Empire State building in some eastward views from vantage points west of the development site) by redeveloping the development site with a new, tall building. The change in context under both the proposed project and the Hotel-Residential Alternative is not expected to result in any significant adverse impacts on architectural resources in the study areas. The study areas already contain a mix of buildings of varying heights and from different periods. Further, the context of architectural resources nearby would be altered with the construction of the No Action building on the development site. Overall, like the proposed project, this alternative would not obstruct significant views of any architectural resource, or adversely alter the visual setting of any resource in the study area.

The Hotel-Residential Alternative would require the same Construction Protection Plan (CPP) as required by the proposed project to avoid inadvertent construction-related impacts on the former Equitable Life Assurance Company Building.

Overall, neither the proposed project nor the Hotel-Residential Alternative would result in any adverse effects on archaeological or architectural resources.

URBAN DESIGN AND VISUAL RESOURCES

Like either scenario of the proposed project, the Hotel-Residential Alternative would alter the urban design of the development site. The Hotel-Residential Alternative would result in the demolition of the Hotel Pennsylvania and the site's redevelopment with a new, tall building with a contemporary steel and glass curtain wall design. The Hotel-Residential Alternative building would have the same lot line setbacks as the proposed project (both scenarios): 10 feet from the lot line on West 32nd and West 33rd Streets and 15 feet from Seventh Avenue. Therefore, this alternative would produce the same streetwalls along West 32nd and West 33rd Streets and Seventh Avenue as the proposed project (both scenarios).

The building in this alternative would be the same height as the Single-Tenant Office Scenario building. As with either scenario of the proposed project, the Hotel-Residential Alternative would become the tallest structure in the surrounding area. However, there are already a number of tower structures in the area, and like both buildings in the proposed project, the height and size of the Hotel-Residential Alternative would not be readily apparent, particularly for the pedestrian experience at street level. Likewise, this alternative would be built within a context of both older and newer buildings that vary greatly in height, form, and materials.

Although this alternative would include hotel and residential uses that would not occur under either scenario of the proposed project, these uses would be consistent with uses that currently exist in the study area. Both the Hotel-Residential Alternative and the proposed project would be constructed on an existing block, and would not entail any changes to topography, street pattern and hierarchy, block shapes, or natural features on the development site or in the surrounding area.

The Hotel-Residential Alternative, like both scenarios under the proposed project, would enhance the streetscape experience along the development site. As discussed above, this alternative would improve existing subway entrances on West 32nd and West 33rd Streets and would undertake significant mass transit improvements, including re-opening and renovating the pedestrian passageway below West 33rd Street. Like both scenarios of the proposed project, the Hotel-Residential Alternative would incorporate ground-floor retail and would have highly transparent cladding at the base level, thereby enlivening and enhancing the pedestrian experience. The wide sidewalk on Seventh Avenue also would be maintained in this alternative, allowing for a better pedestrian experience in this busy area.

Like both scenarios of the proposed project, the Hotel-Residential Alternative would not substantially alter views to visual resources that can be seen from the sidewalks adjacent to the development site. The Hotel-Residential Alternative would (like both scenarios of the proposed project) alter views in the study areas, as the height of the proposed building would be more notable in surrounding views. Most notably, the proposed building would become a prominent feature of views east along West 33rd Street and some views east along West 34th Street toward the Empire State Building. These views already include other large-scale tower buildings, however, and with either the proposed project or the Hotel-Residential Alternative the change in views would not be considerable. Views to the Empire State Building from vantage points north, east, or south of the project site would not be obstructed or obscured, and most views to the Empire State Building would remain available with either the proposed project or this alternative, where those views would exist in the No Action scenario. Thus, the Empire State Building would maintain its visual prominence as an important architectural and cultural resource in the Manhattan skyline, and the change in views would not be considered adverse. The Hotel-Residential Alternative, like the proposed project (both scenarios) would not obstruct any views to other visual resources in the study areas.

In summary, neither the Hotel-Residential Alternative nor the proposed project would result in any adverse effects to urban design or visual resources.

NEIGHBORHOOD CHARACTER

The effects of the Hotel-Residential Alternative on neighborhood character would be substantially similar to the effects on neighborhood character from the proposed project. The inclusion of hotel and residential uses on the development site would be consistent with land uses in the area.

NATURAL RESOURCES

Neither the proposed project (either scenario) nor this alternative would result in significant adverse impacts to migratory bird populations. The Hotel-Residential Alternative, like the proposed project, would abide by several "bird-safe" building principles and would also seek to minimize rooftop obstacles to birds' flight.

HAZARDOUS MATERIALS

The Hotel-Residential Alternative would not result in any greater disturbance of in-ground conditions than would occur with the proposed project and it would be subject to the same federal, state, and local requirements. Therefore, this alternative would result in similar effects as those with the proposed project, and both this alternative and the proposed project would result in no significant adverse hazardous materials impacts.

INFRASTRUCTURE

Development of the Hotel-Residential Alternative would generate a total water demand of approximately 473,183 gallons per day (gpd), of which approximately 248,473 gpd would be for consumptive purposes and would become sanitary sewage. This total water demand would be 8,359 gpd more than the Single-Tenant Office Scenario and 28,553 gpd less than the Multi-Tenant Office Scenario. In terms of sanitary sewage, this alternative would generate approximately 1,831 gpd less than the Single-Tenant Office Scenario and approximately 2,392 gpd less than the Multi-Tenant Office Scenario. Like the proposed project (both scenarios), the Hotel-Residential Alternative would generate less water demand and less sanitary sewage than the existing Hotel Pennsylvania on the site. Existing water pipes in the street would be able to accommodate the estimated water demand of this alternative and it would not adversely affect the treatment efficiencies of the North River WPCP or cause the plant to not properly treat wastewater prior to discharge to the Hudson River. Therefore, the Hotel-Residential Alternative would not result in any significant adverse impacts to water supply or sanitary sewage.

The development of the Hotel-Residential Alternative would not result in an increase in the development site's runoff coefficient compared to the proposed project (both scenarios). Stormwater would continue to enter the combined sewer system. However, this alternative would include similar stormwater management measures as both scenarios of the proposed project. This alternative would also be required to detain some portion of the stormwater on-site during precipitation events, as would the proposed project. Like the proposed project, the stormwater management measures and on-site detention of stormwater in this alternative would reduce peak flow into the sewer system during storm events. Therefore, neither the proposed project nor the Hotel-Residential Alternative would have a significant adverse impact on CSO events or water quality in the Hudson River.

SOLID WASTE AND SANITATION SERVICES

Like both scenarios of the proposed project, the Hotel-Residential Alternative would result in changes in solid waste generation and collection on the project sites. This alternative would generate approximately 151,564 pounds per week (approximately 76 tons) of solid waste. This amount of solid waste would be approximately 18,201 pounds per week (9 tons) more than the Single-Tenant Office Scenario and approximately 42,185 pounds per week (21 tons) less than the Multi-Tenant Office Scenario. Because this alternative would include residential units, approximately 6,443 pounds per week of the solid waste would be handled by the New York City Department of Sanitation (DSNY), whereas all of the solid waste generated by both scenarios of the proposed project would be handled by private carters. The amount of solid waste handled by DSNY in this alternative would not adversely affect solid waste collection services. Furthermore, as with both scenarios of the proposed project, the solid waste generated by the Hotel-Residential Alternative would be considered a negligible implement. Therefore, like, the proposed project, this alternative would not result in significant adverse impacts on solid waste disposal or sanitation services.

ENERGY

The Hotel-Residential Alternative would generate a demand of approximately 209,376 million British thermal units (BTUs) per year, 44,566 million BTUs more than the Single-Tenant Office Scenario of the proposed Project. While this would represent an increase over existing conditions, as with both scenarios of the proposed project, this would be a negligible increase and would not result in any significant adverse impacts to the distribution and generation of energy.

Like both scenarios of the proposed project, this alternative would comply with the New York State Energy Conservation Construction Code Act and would include additional measures to reduce energy demand beyond what is required by code.

TRAFFIC AND PARKING

The Hotel-Residential Alternative would generate lower vehicular traffic than the proposed project for the weekday AM, midday, and PM, and Saturday midday peak hours. A comparison of the traffic volumes generated by the proposed project and the Hotel-Residential Alternative is presented in **Table 24-4**.

Table 24-4
Vehicle Trip Generation Comparison
Hotel-Residential Alternative vs. the Proposed Project

Analysis Hour	Direction	Proposed Project[1]	Hotel-Residential Alternative
AM Peak Hour	In	216	58
	Out	24	40
	Total	240	98
Weekday Midday	In	176	130
	Out	160	119
	Total	336	249
PM Peak Hour	In	154	144
	Out	245	168
	Total	399	312
Saturday Midday	In	196	124
	Out	174	111
	Total	370	235

Note: [1] Single-Tenant Office Scenario generates the most vehicle trips during the AM peak hour. The Multi-Tenant Office Scenario generates the most vehicle trips for the weekday midday and PM, and Saturday midday peak hours.

Since no unmitigated adverse traffic impacts were caused by the proposed project and the Hotel-Residential Alternative generates fewer trips, a detailed traffic analysis was not undertaken.

Though the Hotel-Residential Alternative will generate a higher level of overnight parking demand, a significant amount of overnight parking capacity exists in the study area. Therefore, no adverse impacts to off-street parking will occur, as summarized in **Table 24-5**.

TRANSIT AND PEDESTRIANS

With fewer pedestrian trips, the Hotel-Residential Alternative would reduce the number of unmitigated significant adverse pedestrian impacts in comparison with the proposed project. **Table 24-6** compares the person trips generated by the Hotel-Residential Alternative with the proposed project.

Table 24-5
Off-Street Parking Utilization
Future with the Proposed Project vs. Hotel-Residential Alternative

Analysis Period	Total Capacity	Parking Demand			Utilization Rate	Available Spaces
		No Action	Build Increment	Total Demand		
Single-Tenant Office Scenario						
Weekday Midday	7,040	6,566	470	7,036	100%	4
Weekday Overnight	5,260	2,752	0	2,752	52%	2,508
Multi-Tenant Office Scenario						
Weekday Midday	7,040	6,566	435	7,001	99%	39
Weekday Overnight	5,260	2,752	0	2,752	52%	2,508
Hotel-Residential Alternative						
Weekday Midday	7,040	6,566	407	6,973	99%	67
Weekday Overnight	5,260	2,752	124	2,876	55%	2,384

Table 24-6
Person Trip Generation Comparison
Hotel-Residential Alternative vs. the Proposed Project

Analysis Hour	Direction	Proposed Project[1]	Hotel-Residential Alternative
AM Peak Hour	In	3,077	369
	Out	-33	205
	Total	3,044	574
Weekday Midday	In	2,382	1,184
	Out	2,068	951
	Total	4,450	2,135
PM Peak Hour	In	1,737	1,245
	Out	3,295	1,589
	Total	5,032	2,834
Saturday Midday	In	2,550	1,296
	Out	2,067	1,244
	Total	4,617	2,540

Note: [1]The Single-Tenant Office Scenario generates the most person trips during the AM peak hour. The Multi-Tenant Office Scenario generates the most person trips for the weekday midday and PM and Saturday midday peak hours.

Due to fewer person trips being generated by the Hotel-Residential Alternative compared to the proposed project, a detailed transit and pedestrian analysis was not undertaken.

AIR QUALITY

Like the proposed project, the Hotel-Residential Alternative would not result in any significant adverse air quality impacts. The emissions from existing stationary sources (heating, ventilation, and air conditioning systems for existing buildings, and existing industrial uses) would be the same with the Hotel-Residential Alternative and with the proposed project and would result in no significant impact to air quality at the project site. The Hotel-Residential Alternative garage would have a similar capacity and usage rate as the garage for the proposed project, and like the proposed project, it would not result in significant impacts on air quality near the garage vents. Like the proposed project, the Hotel-Residential Alternative would use utility steam in the building heating systems, and would therefore not result in local stationary source emissions. The Hotel-Residential Alternative would result in fewer vehicle trips than the proposed project,

and like the proposed project it would not result in indirect mobile source impacts on air quality. Both scenarios would be consistent with the New York State Implementation Plan (SIP).

GREENHOUSE GAS EMISSIONS

The greenhouse gas (GHG) emissions from the Hotel-Residential Alternative associated with electricity and steam consumption, project-generated vehicle trips, waste generation, construction activity, and construction material use would be comparable to the emissions from those activities with the proposed project. The Hotel-Residential Alternative would include the same commitment to energy efficiency and GHG reduction measures as the proposed project. Therefore, the overall GHG emissions with the Hotel-Residential Alternative would be comparable to the GHG emissions with the proposed project. Like the proposed project, the Hotel-Residential Alternative would incorporate commitments to advance the goals of PlaNYC.

NOISE

With both the Hotel-Residential Alternative and the proposed project, noise levels would be expected to remain in the "marginally unacceptable" category (as per the CEQR Noise Exposure Guidelines), and no significant adverse impacts would occur. In addition, the *CEQR Technical Manual* has set noise attenuation quantities for buildings based on exterior $L_{10(1)}$ noise levels in order to maintain interior noise levels of 45 dBA or lower for hotel and residential uses. Based on the results of the building attenuation analysis, 35 dBA of window/wall attenuation would be required to maintain an interior noise level of 45 dBA. The proposed design for the proposed buildings includes the use of well-sealed double-glazed windows and the use of air conditioning (i.e., alternate means of ventilation). The proposed building's façades, including these elements, would be designed to provide a composite Outdoor-Indoor Transmission Class (OITC) rating greater than or equal to the attenuation requirements (i.e., 35 dBA). By adhering to these design requirements, the proposed buildings will thus provide sufficient attenuation to achieve the CEQR interior noise level guideline of 45 dBA L_{10} for hotel and residential uses.

CONSTRUCTION

Construction of the Hotel-Residential Alternative would be similar to the construction effort required as part of the proposed project. The site preparation, demolition, and foundation phases would be the same, and the general construction activities would be similar. Construction of the Hotel-Residential Alternative would involve the same construction phases, with similar durations and worker intensities as the proposed project. Both this alternative and the proposed project would include the construction activities associated with the various subway improvements.

Construction of the Hotel-Residential Alternative would result in the same or similar effects on land use, socioeconomic conditions, community facilities, open space, historic resources, traffic, parking, transit, pedestrians, air quality, noise, and vibration as the proposed project. The elevated noise levels exceeding CEQR impact criteria that would occur with the proposed project are also likely to occur with the Hotel-Residential Alternative, and this alternative would also result in a significant adverse construction noise impact on the terraces of The Epic residential building.

PUBLIC HEALTH

Like the proposed project, the Hotel-Residential Alternative is not expected to result in significant adverse impacts on public health.

CONCLUSION

With the Hotel-Residential Alternative, the mix of uses developed on the site would include hotel and residential use in addition to the retail and commercial uses proposed as part of the project. This alternative would result in the same or similar impacts as the proposed project.

D. COGENERATION ENERGY SUPPLY ALTERNATIVE

INTRODUCTION

One of the PlaNYC energy initiatives is aimed at expanding clean distributed energy generation throughout New York City 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. Therefore, the construction of on-site systems to generate electricity, heat, and cooling as part of the proposed project was considered under the Cogeneration Energy Supply Alternative, described in this section. The proposed development for the Cogeneration Energy Supply Alternative would be identical as with the proposed project, and the only difference with the Cogeneration Alternative would be the additional on-site energy infrastructure. If the Cogeneration Energy Supply Alternative were pursued, additional approvals from NYSDEC and NYCDEP would be required.

Cogeneration systems simultaneously produce electricity and usable thermal energy that could provide heat and air conditioning on-site. With traditional electricity generation from fossil fuels, heat is generated as a byproduct, but is not captured for use. For the same amount of fuel, a cogeneration system therefore produces a greater amount of useable energy (in the form of electricity and steam for heating or chilled water for cooling) than a typical electric generating facility. Cogeneration is therefore energy efficient. A number of policies recognize the benefits of combined heat and power (CHP), including cogeneration. The American Recovery and Reinvestment Act of 2009 (the stimulus package) includes financial incentives for CHP and micro-turbines. The New York State Energy Research and Development Authority (NYSERDA) has also been providing financial incentives to eligible CHP projects.

FEASIBILITY ANALYSIS SUMMARY

As discussed above, 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 CHP systems in order to help building owners understand the benefits of CHP and help accelerate transformation of the CHP market. A feasibility study for the Cogeneration Energy Supply Alternative was conducted by Jaros Baum & Bolles, consistent with the goals of PlaNYC. The feasibility report is included in Appendix E.

The feasibility analysis of this alternative consisted of the evaluation of preliminary design and operational concepts, as well as financial projections for integrating cogeneration with the proposed project. Electrical and heating, ventilation, and air conditioning (HVAC) loads were estimated to develop building peak minimum and average load profiles for electric power,

steam, and chilled water. No energy efficiency measures, beyond those required by the current building code were assumed in the feasibility study.

OPTIONS CONSIDERED

The feasibility analysis considered two building profiles, corresponding to the Single-Tenant Office Scenario (with a trading floor), and the Multi-Tenant Office Scenario, as discussed in Chapter 2, "Procedural and Analytical Framework."

For the Multi-Tenant Office Scenario, cogeneration systems involving two, three, and four 2,000 kilowatt (kW) natural-gas-fired reciprocating engines were evaluated. During the cooling season, the heat from the exhaust stream of the generators would be captured through the use of heat recovery silencers and be converted to high-pressure steam for a turbine-driven chiller. During the heating season, the exhaust stream would be used to heat the building via steam to hot water heat exchangers, and would reduce the amount of steam for heating that would need to be purchased from Con Edison. These systems were analyzed assuming that they would only operate during peak electric load of the building (Monday through Friday, 8 AM to 10 PM). At other times, all electricity and steam for the building would be supplied by Con Edison.

For the Single-Tenant Office Scenario, the proposed cogeneration system would consist of a 4.5 MW natural-gas-fired turbine with heat recovery. The turbine capacity was selected to operate at full load and reduce the building's electricity needs during both peak and off-peak hours, since the electricity load throughout the day is more uniform, as compared with a generic office use, due to the need to operate and keep cool the extensive information systems required by the trading tenant. As with the Multi-Tenant Office Scenario, the heat generated by the turbine would be utilized for building heating and chilled water production.

The cogeneration option proposed for the Single-Tenant Office Scenario, which would have a payback of six to seven years, was identified as potentially viable. However, none of the options identified for the Multi-Tenant Office Scenario would be economically feasible. The payback period for the cogeneration options considered for the Multi-Tenant Office Scenario ranges from more than eight years to more than 15 years. In addition, for the Multi-Tenant Office Scenario cogeneration option that would result in the shortest payback period (more than eight years) the upfront costs would be prohibitively high (more than 22 percent higher than for the Single-Tenant Office Scenario cogeneration option). With the Multi-Tenant Office Scenario, the minimum energy load is much smaller than with the Single-Tenant Office Scenario with trading floor uses. As a result, the Multi-Tenant Office Scenario does not have the energy use profiles that would allow for a sizable cogeneration system that could operate continuously, and does not result in a favorable payback under any of the cogeneration system options considered.

COGENERATION ENERGY SUPPLY ALTERNATIVE COMPARED WITH THE PROPOSED PROJECT

Since cogeneration under the Single-Tenant Office Scenario was identified as a potentially viable option for the proposed project, a quantitative analysis of the potential impacts of the cogeneration system on energy and air quality is presented in this section. GHG emissions that would result from the Cogeneration Energy Supply Alternative are also discussed, as well as the potential impacts on noise levels. Comparative assessments for other types of environmental impacts are not required, as introduction of cogeneration would not affect the analyses conducted for the proposed project.

ENERGY

The Cogeneration Energy Supply Alternative would result in the same overall development as the proposed project and would therefore result in the same amount of energy demand on-site. The cogeneration system proposed for the Single-Tenant Office Scenario, which was identified as potentially viable, would generate approximately 36,000 MWh of electricity per year. The remaining electricity demand for the building would be supplied by Con Edison. The overall demand for electricity would be lower with the Cogeneration Energy Supply Alternative than for the proposed project, as the building's cooling needs would be partially met through cogeneration. Under the Single-Tenant Office Scenario with cogeneration, all of the heating demand for the proposed project could be met using steam generated on-site. Con Edison steam would be purchased on a standby basis.

Without cogeneration, the proposed project would purchase both electricity and steam from the utility, and would therefore not consume fuel on-site on a regular basis. With cogeneration, approximately 350,000 million BTU of natural gas would be consumed on-site on an annual basis.

With the Cogeneration Energy Supply Alternative, much of the energy demand would be met through the energy cogenerated on-site, and less electricity and steam would need to be supplied by the grid. Therefore, like the proposed project, the Cogeneration Energy Supply Alternative would not result in significant adverse impacts on energy.

AIR QUALITY

As discussed above, natural gas would be consumed on-site with the Cogeneration Energy Supply Alternative. Without cogeneration, on-site fossil fuel combustion would be limited to emergency generator use. Therefore, the local air emissions with the Cogeneration Energy Supply Alternative would be greater than with the proposed project.

The pollutants of concern for the Cogeneration Energy Supply Alternative are NO_x, SO_2, PM_{10}, and $PM_{2.5}$. The natural gas heat input rate at maximum load and continuous operation were conservatively assumed in the analysis. Emission factors from the U.S. Environmental Protection Agency (EPA)'s AP-42[1] and manufacturer's data were used to calculate emission rates. Stack parameters were based on manufacturer data and cogeneration facilities with comparable design. **Table 24-7** presents the stack parameters and emission rates used in the analysis.

Table 24-7
Boiler Stack Parameters and Emission Rates

Parameter		Development
Stack Exhaust Temp. (°F)		332
Stack Exhaust Height (feet)		130
Stack Exhaust Flow (ACFM)(1) (2)		51,048
Stack Exhaust Velocity (feet/second) (2)		81
Lb/hr(2)	NO_x	0.731
	SO_2	0.137
	$PM_{2.5}$	0.266
	PM_{10}	0.266

Notes: (1) ACFM = actual cubic feet per minute.
(2) Emission rates and stack parameters are based on continuous 100 percent load operation.
Source: Emission factors and stack parameters are based on AP-42, manufacturer's data, and conceptual design information.

[1] *Compilation of Air Pollutant Emission Factors, AP-42, Fifth Edition, Volume I: Stationary Point and Area Sources.*

Dispersion Modeling

Potential impacts from cogeneration system emissions were evaluated using the EPA/American Meteorological Society AERMOD dispersion model. The AERMOD model was designed as a replacement to the EPA Industrial Source Complex (ISC3) model and was recently approved for use by the EPA. AERMOD is a state-of-the-art dispersion model, applicable to rural and urban areas, flat and complex terrain, surface and elevated releases, and multiple sources (including point, area, and volume sources). AERMOD is a steady-state plume model that incorporates current concepts about flow and dispersion in complex terrain and includes updated treatments of the boundary layer theory, understanding of turbulence and dispersion, and handling of terrain interactions.

The AERMOD model calculates pollutant concentrations from one or more points (e.g., exhaust stacks) based on hourly meteorological data, and has the capability of calculating pollutant concentrations at locations when the plume from the exhaust stack is affected by the aerodynamic wakes and eddies (downwash) produced by nearby structures. The analyses of potential impacts from exhaust stacks were made assuming stack tip downwash, urban dispersion and surface roughness length (with and without building downwash), and elimination of calms.

The AERMOD Model also incorporates the algorithms from the PRIME model, which is designed to predict impacts in the "cavity region" (i.e., the area around a structure which, under certain conditions, may affect an exhaust plume, causing a portion of the plume to become entrained in a recirculation region). The Building Profile Input Program (BPIP) program for the PRIME model (BPIPRM) was used to determine the projected building dimensions modeling with the building downwash algorithm enabled. The modeling of downwash from sources accounts for all obstructions within a radius equal to five obstruction heights of the stack.

The analysis was performed both with and without downwash in order to assess the worst case at elevated receptors close to the height of the sources, which would occur without downwash, as well as the worst case at lower elevations and ground level, which would occur with downwash.

Meteorological Data

The meteorological data set consisted of five consecutive years of meteorological data: surface data collected at La Guardia Airport (2003–2007), and concurrent upper air data collected at Brookhaven, New York. The meteorological data provide hour-by-hour wind speeds and directions, stability states, and temperature inversion elevation over the five-year period. These data were processed using the EPA AERMET program to develop data in a format which can be readily processed by the AERMOD model. The land uses around the site where meteorological surface data were available were classified using categories defined in digital United States Geological Survey (USGS) maps to determine surface parameters used by the AERMET program.

Receptor Placement

Discrete receptors were analyzed and included elevated locations on an existing nearby hotel building, the closest potentially sensitive use that would be taller than the cogeneration facility exhaust stack (assumed to be at the podium level, at approximately 130 feet). The model also included ground-level receptor grids in order to assess the potential for neighborhood scale impacts of $PM_{2.5}$ emissions.

Background Concentrations

To estimate the maximum expected pollutant concentrations, the predicted levels were added to corresponding background concentrations, presented in Table 18a-3 of the air quality chapter. It was conservatively assumed that the maximum background concentrations occur on all days.

Probable Air Quality Impacts with the Cogeneration Alternative

Maximum concentrations of NO_2, SO_2, and PM_{10}, including predicted concentrations at sensitive receptors and background concentrations, are presented in **Table 24-8**. The predicted concentrations are an overestimate of the actual concentrations, as the presence of intervening buildings between the cogeneration system exhaust and the sensitive receptor are not fully accounted for by the model.

Table 24-8
Maximum Pollutant Concentrations
With The Cogeneration Energy Supply Alternative (μg/m^3)

Pollutant	Averaging Period	Maximum Predicted Increment	Background Concentration	Total Concentration	NAAQS
NO_2 [1]	Annual	0.64	64	65	100
SO_2	3-hour	2.14	133	135	1,300
	24-hour	0.73	76	77	365
	Annual	0.12	26	26	80
PM_{10}	24-hour[2]	1.42	53	54	150

Notes:
[1] NO_2 concentration was conservatively assumed to be equal to the predicted NO_x concentration.
[2] EPA revoked the annual NAAQS for PM_{10}, effective December 18, 2006.

As shown in the table, the conservatively predicted maximum concentrations resulting from the cogeneration facility are low, and when added to background concentrations, would be well below ambient air quality standards.

The air quality modeling analysis also determined the highest predicted increase in 24-hour and annual average $PM_{2.5}$ concentrations from the Cogeneration Alternative. As shown in **Table 24-9**, the maximum 24-hour incremental impacts at discrete sensitive receptor locations would be less than the applicable interim guidance criterion of 2 μg/m^3. On an annual basis, the projected $PM_{2.5}$ impacts would be less than the applicable interim guidance criterion of 0.3 μg/m^3 for local impacts, and the DEP interim guidance criterion of 0.1 μg/m^3 for neighborhood scale impacts. Therefore, no potential significant air quality impacts are expected to occur with the Cogeneration Alternative.

Table 24-9
Maximum Predicted $PM_{2.5}$ Concentration Increments

Pollutant	Averaging Period	Maximum Concentration	Threshold Concentration (μg/m^3)
$PM_{2.5}$	24-hour	1.42	2 μg/m^3 (5 μg/m^3 not to exceed value)
	Annual (discrete)	0.23	0.3
	Annual (neighborhood scale)	0.03	0.1

GREENHOUSE GAS EMISSIONS

Using the average GHG emission factor for electricity consumed in New York City (775 lbs CO_2e/MWh),[1] the GHG emissions resulting from building energy use with the Cogeneration Alternative would be over 5 to 9 percent lower than with the proposed project, depending on how the 10 percent commitment to energy efficiency would affect the energy estimates provided in the cogeneration feasibility study, which assumed no building energy efficiency measures beyond those required to meet code. Much of the electricity consumed in the City is produced from renewable or non-GHG-emitting sources outside of the City. Furthermore, much of the

[1] Inventory of New York City Greenhouse Gas Emissions: September 2009.

steam supplied by Con Edison is cogenerated. A comparison of on-site cogeneration using the average electricity and steam emission factors does not fully illustrate the potential benefits of on-site cogeneration associated with a decreased reliance on less efficient oil-fired plants that supply electricity to the grid. Considering the emission factor for in-city generated electricity only (excluding renewable imports and contracts), the benefit of cogeneration is estimated to be greater. Using the in-city generated emission factor (1,080 lbs CO_2e/MWh),[3] the Cogeneration Alternative would result in GHG emissions from building energy consumption that would be 17 to 21 percent lower than for the proposed project without cogeneration.

NOISE

In this alternative, the proposed cogeneration facility has the potential to increase noise levels at nearby sensitive receptor locations. While the specific cogeneration facility design details required to perform a detailed noise study are currently not available, the cogeneration facility would be designed to meet all applicable noise regulations (i.e., the New York City Noise Control Code and the New York City Department of Buildings Code) and to avoid producing levels that would result in any significant increase in ambient noise levels. If necessary, the design for the Cogeneration Alternative will include noise reduction measures so that this alternative, like the proposed project, would not result in any significant adverse noise impacts.

CONCLUSION

With the Cogeneration Energy Supply Alternative, a cogeneration plant would be constructed to provide a portion of the power, as well as heating and cooling for the proposed project. (If the Cogeneration Energy Supply Alternative were pursued, additional approvals from NYSDEC and NYCDEP would be required.) The evaluation of cogeneration as an alternative is consistent with the PlaNYC initiative to expand distributed generation. Compared with the proposed project, the Cogeneration Energy Supply Alternative would result in greater energy efficiency, less reliance on the utility power and steam infrastructure and, like the proposed project, would have no significant impact on energy. Although the Cogeneration Alternative would result in greater on-site air pollutant emissions, like the proposed project, no significant adverse air quality impacts are expected from the Cogeneration Energy Supply Alternative. Overall emissions of GHG from the building energy use would be lower with the Cogeneration Alternative than with the proposed project and would therefore further the goals of PlaNYC. The cogeneration system would be designed to meet all applicable noise regulations and, like the proposed project, would not result in any significant noise impacts.

E. NO UNMITIGATED SIGNIFICANT IMPACTS ALTERNATIVE

As discussed in Chapter 23, "Unavoidable Adverse Impacts," the proposed project could result in unmitigated significant adverse impacts on pedestrian conditions. Therefore, alternatives were developed to explore modifications to the proposed project that would allow for the mitigation of these impacts.

OPEN SPACE

The proposed project (either scenario) would result in a significant adverse impact on passive open space for the study area worker population and the combined population of residents and workers. Because the proposed project is in an area that is currently underserved by open space resources, to avoid an unmitigated significant adverse impact on open space, it would be necessary for the

decrease in open space ratios to be less than 1 percent. To achieve this, the project could introduce no more than approximately 6,700 workers, which would be 2,080 fewer than in the Multi-Tenant Office Scenario and 3,250 fewer than in the Single-Tenant Office Scenario. This reduced number of workers, which would avoid the unmitigated significant adverse impact on open space, could be accommodated within a building program containing the same amount of retail space and trading floor uses as the Single-Tenant Office Scenario (18,266 sf and 340,857 sf, respectively) and only 725,000 sf of office space. However, this would represent over a 50 percent reduction in the amount of office space provided at the site (i.e., a reduction of approximately 809,000 sf). Unlike the proposed project, it is the applicant's belief that a building of this size would not enhance significantly the likelihood of corporate office tenants remaining in or relocating to, and expanding in, New York City. Furthermore, this potential program would not provide the new mass transit improvements that are one of the purposes of the proposed project.

It should be noted that the feasibility of potential mitigation measures to reduce or eliminate the significant adverse open space impact of the proposed project (either scenario) was further explored and evaluated in consultation with the New York City Department of Parks and Recreation (NYCDPR) between publication of the Draft and Final EIS and measures to partially mitigate the project's open space impacts were identified. Specifically, the applicant has committed to provide funding for open space improvements and/or maintenance in the study area.

TRANSIT AND PEDESTRIANS

The Multi-Tenant Office Scenario would result in unmitigated significant adverse impacts at two crosswalk locations during the weekday midday peak period and two crosswalk locations during the Saturday midday peak period. These unmitigated significant adverse impacts would occur as a result of activity generated by this scenario's destination retail component. To avoid these unmitigated significant adverse impacts, the amount of destination retail would need to be reduced by 120,000 gsf to 241,711 gsf. This would represent a substantial reduction in the retail space. As such, this program would be less supportive of the commercial character of the surrounding area and would be less accommodating of Manhattan's long-term growth than the proposed project. Furthermore, this potential program would not provide the new mass transit improvements that are one of the purposes of the proposed project. ✷