WORLD TRADE CENTER CAMPUS SECURITY PLAN

Draft Environmental Impact Statement (EIS)

CEQR No. 12NYP001M

Lead Agency:
New York City Police Department
Raymond W. Kelly, Police Commissioner

April 8, 2013

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Campus Security Plan

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CEQR No.: 12NYP001M
Project Location: New York, New York

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Raymond W. Kelly, Police Commissioner

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A public hearing on the Draft Environmental Impact Statement (DEIS) will be held at 4:00 PM on Tuesday, April 23, 2013 at 22 Reade Street, on the 1st Floor in Spector Hall, New York, New York. Written comments on the DEIS are requested and will be received and considered by the Lead Agency until 5 PM on May 8, 2013 (30 days after the Notice of Completion was issued).

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A. INTRODUCTION

The New York City Police Department (NYPD) proposes to implement a Campus Security Plan for the 16-acre World Trade Center (WTC) Campus in Manhattan Community District 1 (the "Proposed Project") in collaboration with other New York City agencies, the Port Authority of New York and New Jersey (PANYNJ) and other WTC stakeholders. Implementation of the Proposed Project is the "Proposed Action." **Figure ES-1** shows the site location in Lower Manhattan.

The Campus Security Plan, described in detail below in Section E, "Description of the Proposed Action," would create a comprehensive vehicle security perimeter for the WTC Campus (the "Campus Security Plan") to protect against vehicle-borne explosive devices while ensuring an open environment that is hospitable to remembrance, culture, and commerce. The Campus Security Plan bars unscreened vehicles from entering the WTC Campus and certain areas at the perimeter of the Site and creates increased stand-off distances to reduce the risk of catastrophic damage to persons and property (see **Figure ES-2** for a Conceptual Plan of the proposed Campus Security Plan). A vehicle seeking to enter restricted areas would be subject to credentialing to determine whether entry is authorized and screening to ensure the vehicle does not contain dangerous material. The creation of a Trusted Access Program[1] (TAP), in which WTC office tenants with parking privileges on site, residents and owners of businesses located in non-WTC buildings within the secure zone (Liberty Street between Greenwich Street and Trinity Place), for-hire vehicle operators, and delivery vehicle operators could enroll, is expected to facilitate entry for those vehicles with destinations within the WTC Campus. It is possible that yellow cabs would also be permitted to enroll in TAP; however, specific criteria have not yet been finalized.

The Vehicular Security Center (VSC) planned in conjunction with the WTC development irrespective of the Proposed Action controls access to the underground traffic network that serves the entire WTC Campus, including the loading docks for each building and parking areas. The parking garage will not allow general public parking; rather, the parking garage will be restricted to use by tenants. All vehicles entering the VSC, including tenants that park on site, tour buses and delivery vehicles will be processed and screened at the VSC. PANYNJ will operate and be responsible for screening vehicles entering the VSC and will be responsible for screening there. As it is anticipated that demand for on-site delivery, tour bus and private occupancy vehicle (POV) parking will be considerable, PANYNJ is developing a management strategy, including scheduling of tour buses and truck deliveries, to ensure orderly and efficient operations.

The NYPD and PANYNJ have coordinated to develop conceptual plans for the design and location of the proposed security infrastructure, which is discussed in more detail in Section E, below. The Project Area includes all streets, sidewalks and buildings that would be directly affected by the installation of the WTC site's security infrastructure. This area is generally bounded by Barclay, West, Albany and Church Streets. Four vehicular entry points are planned under the proposed Campus Security Plan at: Washington Street and Barclay Street; West Broadway and Barclay Street; Trinity Place/Church Street and Liberty Street; and Liberty Street and West Street/Route 9A. Exits from the secure zone are proposed at the following five locations: Church Street at Vesey Street; Vesey Street at West Street/Route 9A; Fulton Street at West Street/Route 9A; Liberty Street at West Street/Route 9A; and Greenwich Street at Cedar Street. The secure perimeter would consist of various types of vehicle interdiction devices, which would

[1] PANYNJ is currently developing the TAP program.

include static barriers (such as bollards) and operable barriers to allow vehicle access, all under NYPD control.

The Proposed Action also includes the reconfiguration of Trinity Place/Church Street from Cedar Street north to Vesey Street to create a northbound lane for screened vehicles within the security zone as well as an exit area north of Vesey Street. This secure lane would be created by constructing a four-foot-wide raised median on Church Street. An approximately 11-foot-wide inner secure lane would provide additional stand-off distance between the planned WTC buildings and the general traffic flow on Church Street. Three lanes of northbound Church Street traffic, having an approximate total width of 33 feet, would remain outside the secure zone.

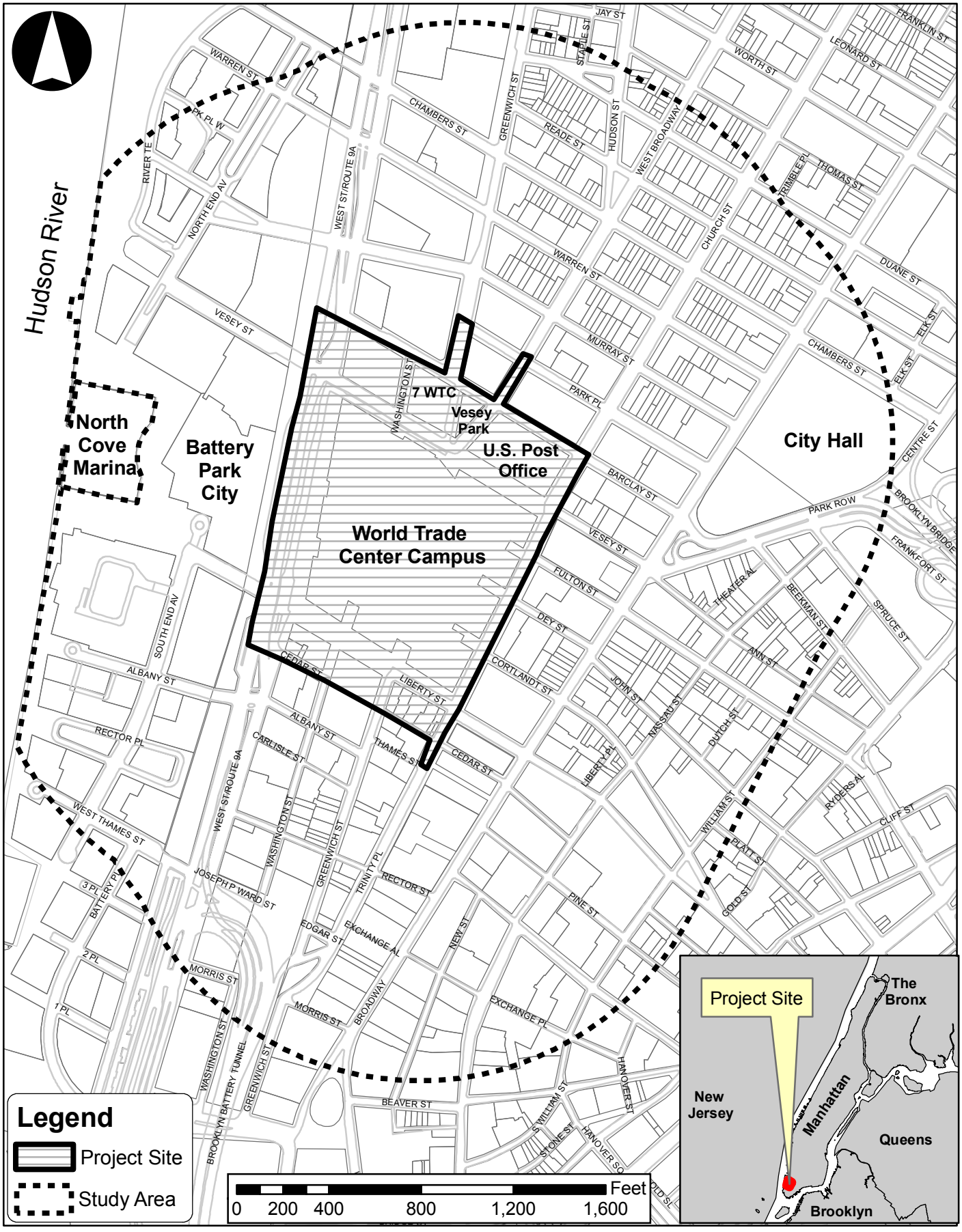
Construction of the Proposed Action is expected to commence in 2013. With or without the Proposed Action, it is unlikely that the planned street network within the WTC Campus would be completely constructed and accessible prior to 2019. As such, 2019 has been selected as the analysis year for the environmental analyses in this Environmental Impact Statement (EIS). It is anticipated that the security measures associated with the Proposed Action would be implemented as construction of the WTC buildings progresses through 2019. Construction sequencing would be scheduled based on the need to accommodate construction activities at the WTC site, the progress of development and the security needs of the tenants as new buildings are completed and occupied. Prior to the installation of the permanent security measures, it is likely that some interim measures would be installed adjacent to the occupied buildings to provide security while construction of adjacent WTC buildings and on-site streets and infrastructure is on-going. The specific sequencing of the proposed security measures would be determined once the future construction schedule for development at the WTC site becomes more defined.

As described in detail in Chapter 2, "Land Use, Zoning and Public Policy," a variety of new developments and conversions are anticipated to be completed within the quarter-mile study area by 2019. It should be noted that 5 WTC has not been included as within the Campus Security Plan or as a development that would occur by the time of the Proposed Action. At this time the only building program proposed for 5 WTC is the 57-story, approximately 1.6-million-square-foot office tower that was contemplated in the 2004 *World Trade Center Memorial and Redevelopment Plan FGEIS* with anticipated completion by 2015. Due to the current economic climate, however, it is unlikely that the PANYNJ will pursue development of the 5 WTC site in the near term. With the ongoing construction of 1 WTC and 4 WTC and the recent completion of 7 WTC, demand for new Class A office space is being met in Lower Manhattan in the near term. This EIS conservatively assumes that 2 WTC and 3 WTC would be fully constructed and occupied by 2019 even though the full build-out of 2 WTC and 3 WTC is predicated on the ability to viably market the office space. Therefore, it is unlikely that the demand exists in the current market for construction of the additional 1.6-million square feet of office space that would be made available if 5 WTC were developed as once contemplated.

Any other proposals for development of 5 WTC would be purely speculative at this juncture as no developer has been selected and no alternative plans have been developed for the site at this time. As such, it is projected that 5 WTC would not be developed by 2019. With so many details surrounding the 5 WTC site unresolved, extending the analysis year beyond 2019 would not be useful because there is no information available that would provide reasonable guidance on when construction of the site could be completed. Additionally, the 5 WTC site is located outside of the security zone as proposed. For the reasons outlined, therefore, 5 WTC is not included in the analysis.

As the City of New York would provide a portion of the funding for the Proposed Action and NYPD is the chief decision maker with regard to its design and implementation, NYPD is conducting an

Site Location Map



Conceptual Plan for the Proposed Project

Note: Image is schematic and for conceptual purposes only.

environmental review pursuant to the New York State Environmental Quality Review Act (SEQRA) and City Environmental Quality Review (CEQR), and their implementing regulations. The NYPD is acting as lead agency under SEQRA/CEQR. Other City agencies are involved or interested agencies; these include the New York City Departments of City Planning (DCP), Environmental Protection (NYCDEP) and Transportation (NYCDOT). The New York State Department of Transportation (SDOT) is also an involved agency. NYPD will continue to work with the City and State in connection with the Proposed Action.

The EIS for the Proposed Action would serve as the basis for NYPD's findings pursuant to SEQRA. Because the Proposed Action is entirely within New York City, the *CEQR Technical Manual* generally serves as a guide with respect to methodologies and impact criteria for evaluating the Proposed Action in this Draft EIS. Therefore, this EIS has been prepared in conformance with applicable laws and regulations, including Executive Order No. 91 of 1977 and the CEQR regulations, and follows the guidance of the 2012 *CEQR Technical Manual*.

While the NYPD would provide a portion of the funding for the Proposed Action, other potential funding sources include the Federal Emergency Management Agency/U.S. Department of Homeland Security (FEMA/DHS) and PANYNJ. Federal agencies are responsible for complying with the National Environmental Policy Act (NEPA), which has procedural requirements that are similar to, but jurisdictionally distinct from, SEQRA. The information provided in this SEQRA EIS is intended to provide a basis for a subsequent NEPA environmental review by FEMA/DHS if Federal funding is allocated for this project. Accordingly, this SEQRA EIS will be conducted in a manner to ensure consistency with Federal review requirements.

The EIS includes review and analysis of all relevant impact categories identified in the 2012 *CEQR Technical Manual*. The EIS contains a description and analysis of the Proposed Action and its environmental setting; the environmental impacts of the Proposed Action, including its short- and long-term effects, and typical associated environmental effects; identification of any significant adverse environmental effects that can be avoided through incorporation of corrective measures into the Proposed Action; a discussion of alternatives to the Proposed Action; the identification of any irreversible and irretrievable commitments of resources that would be involved in the Proposed Action should it be implemented; and a description of any necessary mitigation measures proposed to minimize significant adverse environmental impacts.

B. PURPOSE AND NEED FOR THE PROPOSED ACTION

As described above, the WTC Campus Security Plan was developed in response to the continued security concerns at the WTC site. The Proposed Action bars unscreened vehicles from entering the WTC Campus and certain areas at the perimeter of the WTC site and creates increased stand-off distances between unscreened vehicles and WTC buildings. A vehicle seeking to enter restricted areas would be subject to credentialing to determine whether entry is authorized and screening to ensure the vehicle does not contain dangerous material. As indicated above, the proposed security measures are intended to safeguard the WTC Campus while allowing access for screened vehicles.

Funding

The WTC Campus Security Plan is a direct undertaking by the NYPD and would be paid for, at least in part, with New York City funds. Therefore, the Proposed Action is subject to environmental review pursuant to SEQRA and CEQR.

C. DESCRIPTION OF THE PROPOSED ACTION

The Proposed Action would control vehicular access to and traffic movement within the WTC Campus. This would be accomplished through the creation of a secure perimeter around the WTC Campus that is intended to prevent unscreened vehicles from driving within close proximity to the National September 11th Memorial plaza and the museum building, commercial towers, and transportation facilities located within the WTC Campus. Therefore, selected portions of streets in and around the WTC Campus are proposed to be restricted access streets that would be closed to general vehicular traffic. No restrictions or controls would be implemented on pedestrians as a result of the Proposed Action. Implementation of the Proposed Action would involve installation and utilization of security infrastructure in the immediate vicinity of the WTC Campus. Vehicles destined for the WTC site seeking entry onto these streets would be subject to credentialing to determine whether entry to the WTC Campus should be permitted, and then screening to confirm that these vehicles pose no threat. The Proposed Action would not alter the building program that is currently planned for the site. Instead, the Proposed Action would manage vehicular traffic to and through the site.

Figure ES-2 shows a conceptual plan developed by the NYPD for the design and location of the security infrastructure that would be installed under the Proposed Action. The Project Area includes all streets and sidewalks that would be directly affected by the installation of this security infrastructure. As shown in **Figure ES-2**, the Project Area is generally bounded by Barclay Street and Park Place on the north, Albany Street on the south, Trinity Place/Church Street on the east and West Street/Route 9A on the west. The perimeter of the WTC Campus would be secured through the installation of various types of vehicle interdiction devices under the control of the NYPD. These could include static and operable barriers and traffic lane delineators. Screening of all vehicles entering the WTC Campus would utilize both mechanical and manual processes, and would be facilitated through the use of sally ports which, as described previously, would consist of a personnel booth controlling a set of two operable barriers with sufficient space between them to accommodate a motor vehicle undergoing screening. An additional booth would be installed at each credentialing location. It is anticipated that the sizes and locations of the booths and any ancillary structures will be refined as project design advances.

The Proposed Action would modify the vehicular access and traffic flow patterns considered in the 2004 WTC Memorial and Redevelopment Plan FGEIS. As shown in **Figure ES-2**, a secure zone is proposed to provide limited vehicular access on the following streets:

- Greenwich Street from Vesey Street to Cedar Street;
- West Broadway from Barclay Street to Vesey Street;
- Washington Street from Barclay Street to Vesey Street;
- Vesey Street from Church Street to West Street/Route 9A;
- Fulton Street from Church Street to West Street/Route 9A; and,
- Liberty Street from Trinity Place/Church Street to West Street/Route 9A.

Additionally, the Trinity Place/Church Street corridor[2] would be divided by a raised median with a static barrier, from Cedar Street to just north of Vesey Street. It is anticipated that to the east of the median the street would remain open to general traffic with three northbound moving lanes, while one additional moving lane to the west of the median would be located within the security perimeter and would be accessible only to screened vehicles.

As indicated above, PANYNJ Master Plan Version 10.0 intends to create a secure zone around 1 WTC by securing and restricting access to Vesey Street and Fulton Street between Greenwich Street and West Street/Route 9A. As such, these street segments would be managed streets irrespective of the Proposed

[2] Trinity Place becomes Church Street north of Liberty Street.

Action. Additionally, it is expected that Greenwich Street from Barclay Street to Vesey Street would continue to be limited for use only by 7 WTC tenants in the No-Action condition (as outlined in a December 5, 2007 reciprocal easement agreement among the City of New York, 7 WTC ownership, PANYNJ and LMDC); therefore, this section of Greenwich Street would be a controlled access street irrespective of the Proposed Action.

All vehicles seeking access to the WTC Campus would be subject to screening and vehicle operators would be required to provide credentials prior to being granted access to the interior of the WTC site. Credentialing zones are proposed at the following locations (refer to **Figure ES-2**):

- On West Broadway between Barclay Street and Park Place;
- On Barclay Street in the southern-most lane at the westbound approach to West Broadway;
- On Barclay Street in the southern-most lane at the westbound approach to Washington Street;
- On Trinity Place in the western-most lane at the northbound approach to Thames Street and Cedar Street;
- On West Street/Route 9A in the eastern-most lane at the northbound approach to Liberty Street; and,
- On West Street/Route 9A in the two southbound left turn lanes at the southbound approach to Liberty Street.

The proposed security sequence for entries consists of three zones: approach zones, credentialing and authorization zones, and screening zones. Approach areas would vary in size, detail and security elements installed depending on the anticipated vehicle volumes and the roadway geometry leading to the security station. It is expected that new signage would be installed to alert vehicles that they are approaching a secure zone and, where possible, to re-direct traffic that does not need to be credentialed.

TAP would allow for expedited vehicle entry into the secure zone. While specific operational details of the TAP program cannot be released for security purposes, a brief overview of the program is provided here. Enrollment in the TAP program would be open to:

- WTC office tenants with parking privileges on site;
- For-hire vehicle operators;
- Delivery vehicle operators; and,
- Residents and owners of businesses located in non-WTC buildings within the secure zone (on Liberty Street between Trinity Place and Greenwich Street).

Both drivers and vehicles would be enrolled in the TAP. TAP credentials would be checked as vehicles approach entry points to the WTC Campus, and authorized vehicles would then be admitted to a sally port for expedited security screening. Drivers and vehicles with business at the WTC site, but not enrolled in the TAP, would be permitted into the WTC Campus; however, these drivers and vehicles would be subject to more rigorous credentialing and screening. This arrangement would help to facilitate access for those who seek entry. Vehicles without the proper credentials would be denied entry per NYPD policy.

It is expected that when the security zone is first implemented, some vehicle operators without proper credentials may unknowingly attempt to enter the WTC Campus. However, after the program has been active for a short time there would likely be fewer attempts to enter the campus without proper credentials.

Screening would include the visual and physical inspection of vehicles. The physical design of screening areas would vary slightly, depending on the anticipated primary users of each specific screening zone. For example, screening areas that are expected to have high bus or delivery vehicle volumes would be sized to fit these vehicle types, with larger sally ports. Personnel booths at each sally port would house barrier

controls, data systems and other equipment. They will be designed to meet these operational requirements while having the smallest possible footprint to minimize potential pedestrian conflicts.

Screening procedures for individuals and vehicles enrolled in the TAP program would differ from screening procedures for non-TAP individuals and vehicles. Overall screening times for vehicles enrolled in TAP and for non-TAP vehicles are described in Chapter 8, "Transportation." As described in Chapter 8, screening time for non-TAP vehicles is longer than TAP screening as it is more extensive and requires additional manual and mechanical screening processes.

Exit-only security stations would manage all traffic exiting the WTC Campus. The dimensions of sally ports at exits would vary in size based on their location and the size of the primary vehicle type expected to use them.

The following describes the security infrastructure and traffic changes that would be implemented under the Proposed Action.

TRINITY PLACE/CHURCH STREET
The western-most lane at the Trinity Place approach to Liberty Street would be an entry-only sally port that would serve as the primary point of entry for tour buses en route to the National September 11th Memorial and Museum. Only buses with reservations to park on-site would be granted access. All others would be turned away in the credentialing zone. This policy would be strictly enforced.

The proposed credentialing and screening locations would be used as flexibly as possible to allow operational decisions to be made in the field so that inbound vehicle traffic could be distributed efficiently to all entry points. For example, during the morning peak period and after the PM peak period, POVs and for-hire vehicles would use this entrance to access the WTC Campus as tour bus activity during these time periods is expected to be very low.

Vehicles would approach the Trinity Place/Church Street entrance from the south. Credentialing zones associated with this entrance would be delineated in a single lane along the west curb south of Cedar and Thames Streets at the approach to Liberty Street. A personnel booth is proposed on the western sidewalk of Trinity Place/Church Street, just north of Thames Street near the front of the credentialing lane. As the proposed placement of the credentialing booth along the sidewalk at this location would narrow the pedestrian zone, the sidewalk in this area has been analyzed in the pedestrian section of Chapter 8, "Transportation."

Entry to the secure lane would be available from a screening zone located on Trinity Place at Cedar Street. The screening zone would consist of a single northbound lane that would be approximately 15 feet wide and approximately 55 feet long. Operable barriers would be located at the northern and southern ends of the sally port.

A personnel booth is proposed on the western sidewalk of Trinity Place adjacent to the sally port. Placement of the booth on the western side of Trinity Place would reduce the pedestrian space to just under 12 feet. Bollards are proposed between the curb and the building wall on the western sidewalk adjacent to the personnel booth. Bollards would be spaced four feet apart to allow adequate space for pedestrian flow, but also to serve as effective vehicle interdiction devices.

As shown in **Figure ES-2**, the Trinity Place/Church Street corridor would be divided by a raised median with fixed barriers (possibly bollards), from Cedar Street to just north of Vesey Street. A four-foot-wide north-south median would separate the two sections of Trinity Place/Church Street. It is anticipated that to the east of the median the street would remain open to general traffic with three northbound moving lanes,

while the one moving lane of approximately 11 feet to the west of the median would be located within the security perimeter and would be accessible only to screened vehicles as a circulating roadway. Additionally, this median would include an operable barrier across Liberty Street. This barrier would be used to provide emergency egress by fire trucks stationed at the Ten House within the WTC Campus.

A second sally port would be located on Church Street at the northern end of the WTC Campus, just north of Vesey Street. This sally port would serve as an egress point for all vehicle types exiting onto northbound Church Street from the secure lanes located within the WTC Campus. The exit would be comprised of a single 16-foot-wide lane with a 55-foot-long sally port. The western sidewalk at this location would be extended to the east by a width of approximately eight feet and would extend approximately 125 feet to the north to accommodate a personnel booth to be staffed by NYPD. The sidewalk extension would allow for the entire width of the existing sidewalk to be maintained at approximately 16 feet wide. Bollards are proposed between the curb and the U.S. Post Office building's streetwall on the western sidewalk adjacent to the screening booth. Bollards would be spaced four feet apart to allow adequate space for pedestrian flow, but also to serve as effective vehicle interdiction devices.

While pedestrian crosswalks in the vicinity of these security elements would be unimpeded by operable security elements, bollards would be spaced at four-foot intervals to allow pedestrian flow through at all crossings. All operable security devices would be set back from crosswalks to maintain the pedestrian zone. Within the Liberty Street intersection, operable barriers would replace the static barriers to allow emergency vehicle access when necessary.

WEST BROADWAY

Southbound West Broadway at Vesey Street would function as an entrance to the WTC Campus for for-hire vehicles and POVs arriving from the north for southbound access into the site. While all vehicles with business in the WTC Campus would be granted access, vehicles registered in the TAP would have expedited entry, while non-TAP vehicles would have to undergo more rigorous credentialing and screening. All other vehicles would be turned away if proper credentials are not provided in the credentialing zone. This policy would be strictly enforced.

Vehicles would approach the West Broadway entrance from the north and the east. The credentialing/authorization zones associated with this entrance would be delineated in two locations: the two eastern-most lanes on West Broadway north of Barclay Street and a single lane on the southern curb of Barclay Street at the approach to West Broadway. One personnel booth associated with credentialing/authorization would be located on the eastern sidewalk of West Broadway, just north of Barclay Street; the second personnel booth associated with credentialing/authorization would be located on the southern sidewalk of Barclay Street, just east of West Broadway. Street signs would be placed on the road leading up to the credentialing zones to inform drivers of the upcoming secure zone as they approach the credentialing zones. As the placement of the personnel booths at two sidewalk locations adjacent to the credentialing/authorization lanes would narrow the pedestrian zones, a pedestrian analysis is provided for these areas in Chapter 8, "Transportation." Due to the street geometry at these locations, sidewalk extensions would not be possible.

Entry to the secure zone would be available from a screening zone located on West Broadway at the approach to Vesey Street. The screening zone would consist of two side-by-side southbound lanes that would each be approximately 11 feet wide. Therefore, this entry point would facilitate access of multiple vehicles simultaneously entering the WTC Campus. The screening zone would consist of two 55-foot-long sally ports, separated by static barriers. Operable barriers would be located at the northern and southern ends of the sally ports to provide ingress and egress.

Bollards would be used to delineate a single travel lane along the east curb adjacent to the sally port but outside of the secure perimeter in order to maintain access to the adjacent loading and service area for the U.S. Post Office building (the width of this lane varies from approximately 11 feet closer to Barclay Street to approximately 15 feet wide). Postal vehicles would enter the building at the south end of the block and utilize an internal roadway to exit the facility onto West Broadway near Barclay Street.

The personnel booth associated with the West Broadway entrance would be located on the eastern sidewalk of West Broadway adjacent to and south of the U.S. Post Office exit. As a 10-foot-wide by approximately 65-foot-long sidewalk extension is planned at this location to accommodate the inspection booth, the sidewalk width would be maintained at over 16 feet. Bollards are proposed around Vesey Park and at the southern limit of the U.S. Post Office access to ensure that no vehicles are able to bypass the screening zone. Bollards proposed to cross the sidewalk from the edge of the curb to the building wall at the northeast corner of Vesey Street and West Broadway would be spaced four feet apart to allow adequate space for pedestrian flow, but to also effectively serve as vehicle interdiction devices.

Crosswalks on West Broadway, Barclay Street, and Vesey Street in the vicinity of these proposed credentialing and screening zones would be unimpeded by security elements. All operable security devices would be set back from crosswalks to maintain an unobstructed pedestrian zone.

GREENWICH STREET

It is anticipated that Greenwich Street from Barclay Street to Vesey Street would be limited for use only by 7 WTC tenants under future conditions (as outlined in a December 5, 2007 reciprocal easement agreement among the City of New York, 7 WTC ownership, PANYNJ and LMDC); therefore, this section of Greenwich Street would be a controlled-access street irrespective of the Proposed Action and would be closed to through traffic. The installation of operable vehicle barriers near the Vesey Street intersection would permit the use of this block for vehicle entry to the WTC campus in emergency situations when other entrances may be unusable. It is possible that operable barriers may also be installed on Greenwich Street near Barclay Street at the northern end of the block. Operable barriers at the north end of the block (default down) and the south end of the block (default up) would allow vehicular access to the adjacent 7 WTC building, but not into the secure zone. As noted above, the West Broadway entrance would provide the primary access to the segment of southbound Greenwich Street traversing the WTC site.

At the south end of the WTC Campus, a sally port would be located on Greenwich Street approaching Cedar Street to provide egress for fire trucks stationed at the adjacent "Ten House" fire station on the south side of Liberty Street between Greenwich Street and Trinity Place/Church Street as well as for POVs and for-hire vehicles seeking access to the Greenwich South neighborhood and other local destinations.

Vehicles exiting the WTC Campus would approach the one-lane sally port from the north. The lane would be approximately 22 feet wide and the overall length of the sally port would be approximately 35 feet. The personnel booth would be located on a western sidewalk extension that would run the length of the block from Liberty Street to Cedar Street (approximately 15 feet wide by 160 feet long). This extension would allow an approximately 23-foot-wide clear zone for pedestrian circulation.

Bollards would be installed on the sidewalks adjacent to the operable barriers proposed within the street; on the eastern sidewalk they would extend to the building streetwall and on the western sidewalk they would extend the width of the sidewalk extension and intersect with the bollard line that is planned in conjunction with the No-Action streetscape plan.

WASHINGTON STREET

The screening zone at Washington Street between Barclay and Vesey Streets would serve as an entrance and exit point for oversized trucks en route to and from the PAC at-grade loading dock on Vesey Street and as a secondary entrance for other vehicles seeking to enter the WTC Campus. Delivery and service vehicles would also continue to use Washington Street to access the 7 WTC loading dock. Access to the PAC at-grade loading dock would only be required infrequently as most PAC deliveries would use below grade loading docks via the VSC.

The credentialing zone proposed in conjunction with the Washington Street screening zone would be delineated in a single lane along the south curb of Barclay Street, east of Washington Street. A personnel booth would be located on the southern sidewalk of Barclay Street, just east of Washington Street, near the front of the credentialing lane. As placement of the personnel booth along the sidewalk would narrow the pedestrian zone to slightly more than seven feet, this location was analyzed in the pedestrian section of Chapter 8, "Transportation." Street signs would be placed on the road leading up to the credentialing zone to inform drivers of the upcoming secure zone as they approach the credentialing zone.

The Washington Street screening zone would consist of a southbound lane the full length of the roadway that would be approximately 163 feet long in order to accommodate the oversized vehicles that would deliver to the PAC. Operable barriers would be located at the northern and southern ends of the sally port.

A personnel booth would be located along the eastern side of Washington Street at the entrance to the sally port. The placement of the personnel booth on the eastern sidewalk would narrow the pedestrian zone to a width of approximately seven feet in the area immediately adjacent to the personnel booth. Based on field observations, this block is not heavily used by pedestrians.

Additional sidewalk elements would include fixed bollards, placed adjacent to the access and denial barriers (operable barriers at either end of the sally port) at four-foot intervals between the curb and the building wall on both the eastern and western sidewalks. Stop and signaling poles (includes lighting and stop and go signals for vehicles in the sally port) would be located at the northern end of the sally port, on both sidewalks as well. At the southern barrier, a light and equipment pole would be placed on both sides of the sally port.

While the With-Action Scenario would introduce new elements to the streetscape, it is important to note that the current site plan and vehicle circulation system for the WTC site incorporates security measures associated with the 2005 redesign of 1 WTC. Under these measures, both Vesey Street and Fulton Street would function as "managed streets" west of Greenwich Street. This would be achieved through the installation of operable barriers and sally ports on Vesey, Fulton and Washington Streets to restrict vehicular access. As such, there would only be a minor incremental change in the appearance of the intersection of Washington and Vesey Streets.

VESEY STREET

The portion of Vesey Street that would be located within the WTC Campus extends from Church Street on the east to West Street/Route 9A to the west. As shown in **Figure ES-2**, the block of Vesey Street from Church Street to West Broadway would be converted from eastbound to westbound operation under the Proposed Action. Vesey Street would operate two-way between Greenwich and Washington Streets and one-way westbound between Washington Street and West Street/Route 9A. Vesey Street would remain one-way eastbound east of Church Street and vehicles would not be able to travel from the managed corridor on the west side of Church Street onto eastbound Vesey Street due to the proposed configuration of Church Street which would include a raised median that would separate an inner secure lane from the rest of northbound Church Street.

Vesey Street at West Street/Route 9A would consist of a two-lane exit to West Street/Route 9A (northbound and southbound) for all vehicles exiting the WTC Campus. An approximately 35-foot-long sally port is proposed at this location. The sally port would be approximately 24 feet wide, accommodating two-lanes of westbound exiting vehicles. The sally port would be operated from a personnel booth located on an extended portion of the northern sidewalk in the area adjacent to the sally port. The proposed sidewalk extension would allow the sidewalk to be maintained for unobstructed pedestrian flow.

Fixed bollards would be installed across the sidewalk at both ends of the sally port. These bollards would be placed at four-foot intervals, from the southern edge of the sidewalk extension north across the sidewalk where they would end adjacent to the existing building.

The proposed sidewalk extension would be approximately eight feet wide and it would run the entire length of the proposed sally port. Placement of the personnel booth on the sidewalk extension would allow for the minimum impact on pedestrian use of the sidewalk in this area. As detailed in Chapter 8, "Transportation," the sidewalk extension would maintain the existing sidewalk width for pedestrian circulation on the northern sidewalk. Further, the security elements would be set back from West Street/Route 9A to ensure free-flow of pedestrians in the crosswalk.

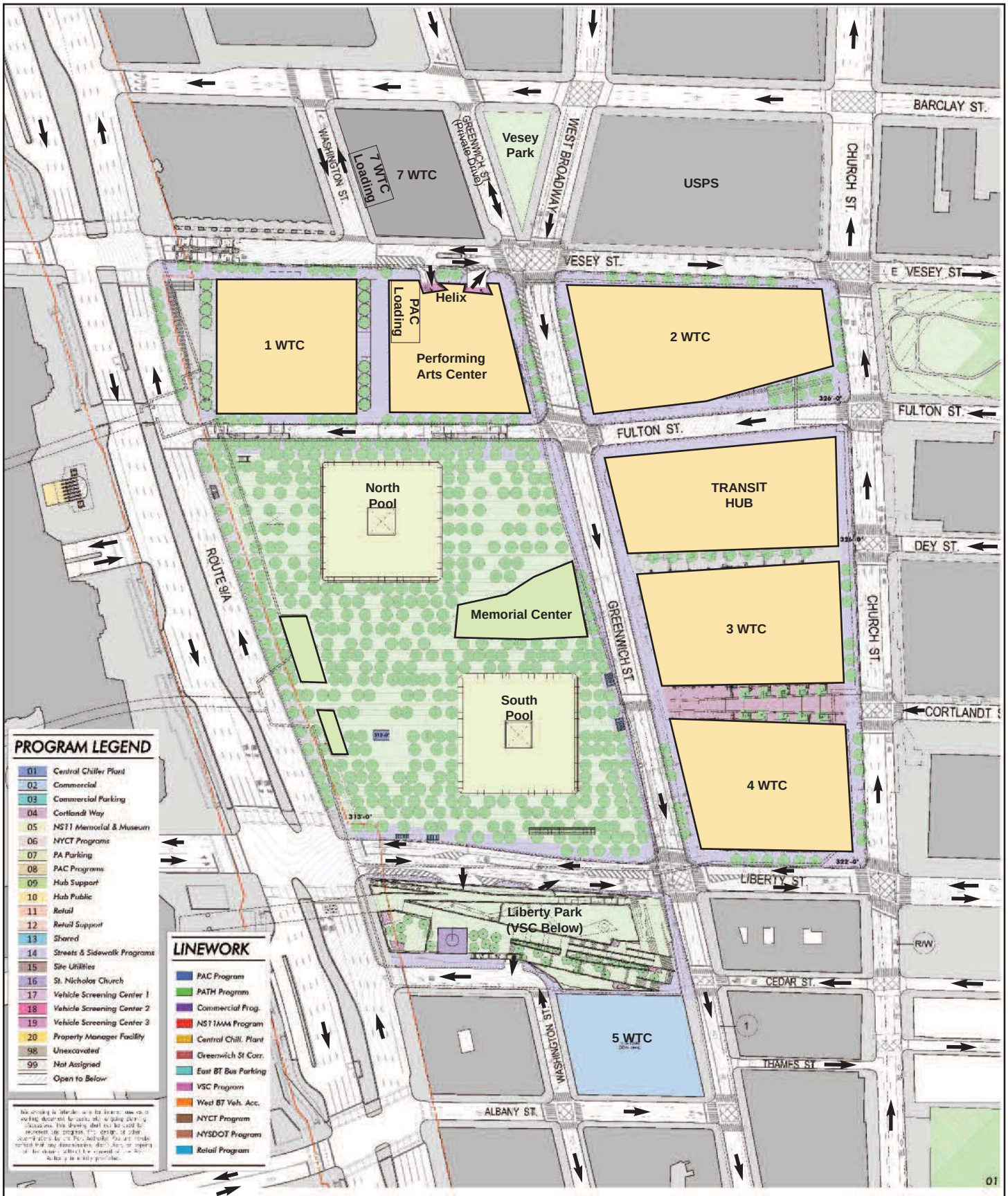
While the With-Action Scenario would introduce new elements to the streetscape, it is important to note that the current site plan and vehicle circulation system for the WTC site incorporates security measures associated with the 2005 redesign of 1 WTC. Under these measures, Vesey Street would function as a "managed street" west of Greenwich Street. This would be achieved through the installation of operable barriers and sally ports on Vesey and Washington Streets to restrict unscreened vehicular access adjacent to 1 WTC. As such, there would only be a minor incremental change in the appearance of Vesey Street as a result of the Proposed Action.

FULTON STREET

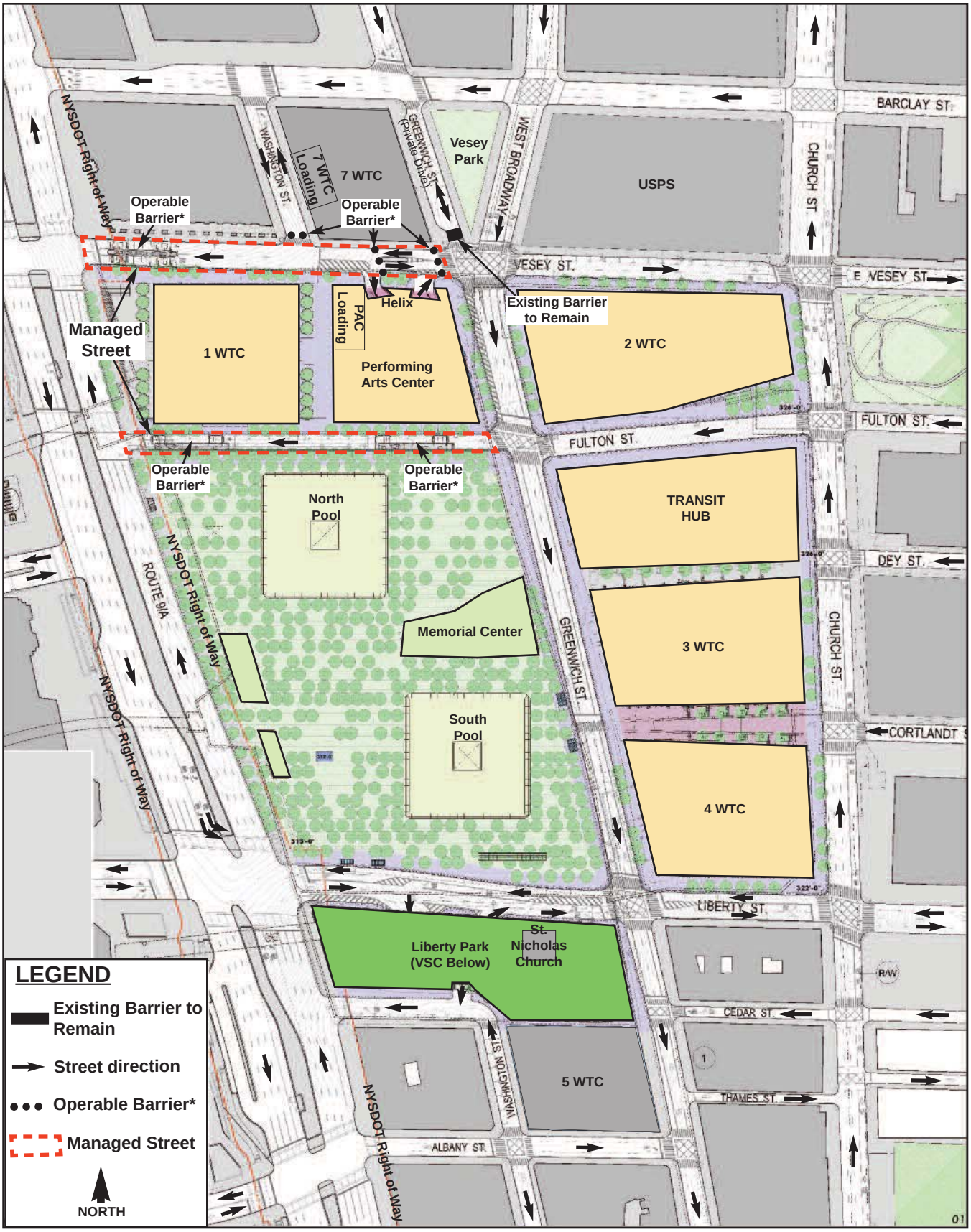
The portion of Fulton Street that would be located within the WTC Campus extends from Church Street on the east to West Street/Route 9A to the west. Under the Proposed Action, the block of Fulton Street between Greenwich and Church Streets would be converted from one-way westbound to one-way eastbound operation to facilitate drop-off and pick-up activity at the adjacent 2 WTC and the Transit Hub. The segment of Fulton Street west of Greenwich Street would remain one-way westbound as would Fulton Street east of Church Street (outside of the proposed secure zone). There would be no vehicular access on Fulton Street across the raised median and static barriers that would be installed along Church Street between Vesey Street and Cedar Street, although pedestrian access would be maintained.

A 35-foot-long, 15-foot-wide sally port is proposed on Fulton Street at the westbound approach to West Street/Route 9A. It would consist of a single exit lane for vehicles exiting the WTC Campus. A sidewalk extension would be installed along the north side of the roadway for the length of the sally port to accommodate the personnel booth at this location. The sidewalk extension would allow for an approximately 25-foot-clear pedestrian zone on the adjacent sidewalk. Fixed bollards would be placed at four-foot intervals between the curb and the northern end of the sidewalk extension where they would intersect with the bollards planned at the perimeter of each block on the WTC Campus as part of the No-Action condition. The north-south pedestrian crossing on the east side of West Street/Route 9A would be located within the sally port so that the required stand-off distance from the western-most barrier to 1 WTC can be provided.

While the With-Action Scenario would introduce new elements to the streetscape, it is important to note that the No-Action site plan and vehicle circulation system for the WTC site similarly incorporates security measures associated with the 2005 redesign of 1 WTC. Under these measures, Fulton Street


BARCLAY ST.
WASHINGTON ST.
7 WTC Loading
7 WTC
GREENWICH ST. (Private Drive)
Vesey Park
WEST BROADWAY
USPS
CHURCH ST.
VESEY ST.
E VESEY ST.
Helix
PAC Loading
1 WTC
Performing Arts Center
2 WTC
FULTON ST.
North Pool
TRANSIT HUB
DEY ST.
ROUTE 9A
Memorial Center
GREENWICH ST.
3 WTC
CHURCH ST.
South Pool
CORTLANDT S
4 WTC
LIBERTY ST.
Liberty Park (VSC Below)
R/W
CEDAR ST.
WASHINGTON ST.
5 WTC
THAMES ST.
ALBANY ST.
PROGRAM LEGEND
01 Central Chiller Plant
02 Commercial
03 Commercial Parking
04 Cortlandt Way
05 NST1 Memorial & Museum
06 NYCT Programs
07 PA Parking
08 PAC Programs
09 Hub Support
10 Hub Public
11 Retail
12 Retail Support
13 Shared
14 Streets & Sidewalk Programs
15 Site Utilities
16 St. Nicholas Church
17 Vehicle Screening Center 1
18 Vehicle Screening Center 2
19 Vehicle Screening Center 3
20 Property Manager Facility
98 Unexcavated
99 Not Assigned
Open to Below
LINEWORK
PAC Program
PATH Program
Commercial Prog.
NST1MM Program
Central Chill. Plant
Greenwich St Corr.
East BT Bus Parking
VSC Program
West BT Veh. Acc.
NYCT Program
NYSDOT Program
Retail Program
General Program Coordination Drawings - Version 10.0
THE PORT AUTHORITY OF NY & NJ
WTC Construction
Overall Ground Plan
October 1, 2010
0' 50' 100' 200'

No-Action WTC Site Plan



Note: Image is schematic and for illustrative purposes only.

*Likely location of operable barriers needed to secure 1 WTC.

would function as a "managed street" west of Greenwich Street. This would be achieved in the No-Action condition through the installation of operable barriers and sally ports on Fulton Street at West Street/Route 9A on the west and a point west of Greenwich Street on the east to restrict vehicular access (see **Figure ES-3 and Figure ES-4**). As such, there would only be a minor incremental change in the appearance of the Fulton Street when comparing the No-Action and With-Action conditions.

LIBERTY STREET

The portion of Liberty Street that would be located within the WTC Campus extends from Church Street on the east to West Street/Route 9A to the west. As shown in **Figure ES-2**, under the Proposed Action two-way operation would continue on Liberty Street, and it would function as the primary point of access and egress for the VSC.

Two sets of sally ports would be installed on Liberty Street to the west of the VSC entrance in the With-Action scenario to accommodate entering and exiting vehicles. The secure access that would be constructed to the west of the VSC would consist of two approximately 11-foot-wide exit lanes and two approximately 11-foot-wide entry lanes. The entry from West Street/Route 9A would primarily serve POVs and various delivery and service vehicles entering the WTC Campus's parking areas by way of the VSC. The overall length of the entry and exit sally ports is planned to be approximately 55 feet long. The personnel booth would be located in Liberty Street between the inbound and outbound lanes.

Credentialing zones for the entry sally port would be located on West Street/Route 9A, north of Liberty Street for the two southbound left-only designated turning lanes and also south of Liberty Street in the eastern-most lane for vehicles that make the northbound right turn into the site. Vehicle screening would occur inside of the VSC. The personnel booth associated with the southbound credentialing zone would be located along West Street/Route 9A's central median, and the personnel booth associated with the northbound credentialing zone would be located on the eastern sidewalk, allowing a clear pedestrian zone of nearly 18 feet wide.

Liberty Street east of the VSC entrance and exit would accommodate two-way traffic flow, with two lanes of westbound traffic and one lane of eastbound traffic. An operable barrier would be installed across the eastbound and westbound lanes. This barrier would be in the default up position to prevent unauthorized vehicles from bypassing the VSC screening. A personnel booth would be located in the Liberty Street median between the eastbound and westbound lanes to control access at this location.

Vehicles already within the secure perimeter (tour buses, for example) would be able to enter the VSC from the east on Liberty Street. As indicated above, access to the VSC from the east would be through an operable barrier located immediately to the east of the VSC entrance/exit. Most vehicles departing the VSC would exit onto westbound Liberty Street to reach West Street/Route 9A. (A secondary exit would be provided on Cedar Street west of Washington Street to be used primarily in the event that a vehicle was allowed to enter Liberty Street in error from the credentialing zone on West Street/Route 9A.)

Another operable barrier would be located on Liberty Street in-line with the Church Street median. This barrier would be used to provide emergency egress from the WTC site for fire trucks stationed at the Ten House within the WTC Campus.

Under future conditions with the Proposed Action, it is anticipated that tour bus access would be similar to future conditions without the Proposed Action. It is anticipated that tour buses with passengers en route to the National September 11th Memorial and Museum and Tower 1 viewing platform would unload passengers along the north curb of Liberty Street west of Greenwich Street or along the west curb of Greenwich Street adjacent to the Memorial Center before proceeding to the VSC. Buses departing the VSC onto eastbound Liberty Street were assumed to loop north on Church Street and west on Fulton

Street (under No-Action conditions) or west on Vesey Street (under With-Action conditions) to reach potential loading locations along the west curb of Greenwich Street, the north curb of Liberty Street and possibly the east curb of northbound West Street/Route 9A north of Liberty Street.

CEDAR STREET
Under both the No-Action and With-Action conditions, Cedar Street would be eliminated between Greenwich and Washington Streets, with the segment to the west operating one-way westbound as an outlet to West Street/Route 9A for northbound Washington Street. As noted above, a secondary exit from the VSC would be provided on Cedar Street west of Washington Street to be used primarily in the event that a vehicle was allowed to enter Liberty Street in error from the credentialing zone on West Street/Route 9A. The segment of Cedar Street between Greenwich Street and Trinity Place would operate one-way westbound under the Proposed Action.

BARCLAY STREET
As noted above, under the Proposed Action two credentialing zones would be established along the south curb of Barclay Street. One would be located immediately to the east of the screening zone on West Broadway, and the second would be located immediately to the east of the screening zone on Washington Street.

Bus and Delivery/Service Vehicle Scheduling

Delivery vehicles en route to the WTC site would need to be scheduled and would undergo a credentialing check as they approach the VSC. It is anticipated that in the No-Action condition, some delivery vehicles would arrive unscheduled, and would be diverted to an off-site reconciliation area where they would wait until WTC staff could confirm their status before being allowed to return to the VSC. For traffic assignment purposes, it was assumed that when the WTC site initially becomes operational 15 percent of delivery vehicles arriving at the VSC in the No-Action condition would be unscheduled. These vehicles would be diverted out of the VSC via the secondary exit on Cedar Street, and it is assumed that they would use West Street/Route 9A to travel to an off-site reconciliation area located to the north of the WTC site. As people who make deliveries to the WTC site become more accustomed to the WTC delivery policies, it is anticipated that attempts to make unscheduled deliveries would become negligible over time. A more extensive system of security measures would be implemented under the Proposed Action. As vendors and delivery companies become accustomed to the more stringent security procedures, it is anticipated that there would be relatively few unscheduled deliveries in the With-Action condition. Any vehicles making an unscheduled delivery would not be permitted access to the WTC Campus or the VSC.

Credentialed vehicles, including tour buses, black cars, and delivery vehicles, would be permitted access into the Site. All private vehicles with reserved parking spaces and prior authorization to park on-site would access the VSC from the east or west via Liberty Street. In the With-Action condition, all tour buses en route to the National September 11th Memorial and Museum and 1 WTC observation deck would enter the WTC Campus via the security station on Trinity Place at Cedar Street, and it is expected that most if not all would unload along the north curb of Liberty Street west of Greenwich Street before proceeding to the VSC. Buses departing the VSC are assumed to pick up passengers at one of two locations: the west curb of Greenwich Street adjacent to the Memorial Plaza or the east curb of northbound West Street/Route 9A north of Liberty Street, similar to the No-Action condition.

As indicated above, it is anticipated that all deliveries will need to be scheduled as a result of policies implemented under No-Action conditions. Incoming delivery vehicles would be directed to the dedicated loading area for the appropriate building – through the VSC and below-grade road network, following screening.

Construction of the Proposed Action may require the relocation of utilities in some areas. The appropriate agencies or utility companies would be contacted prior to construction. Areas of potential utility conflicts would be identified. Utilities in these areas would either be relocated or alternate designs would be proposed to avoid conflicts.

D. APPROVALS REQUIRED

The WTC Campus Security Plan is a direct undertaking by the NYPD and would be paid for, at least in part, with New York City funds. Therefore, the Proposed Action is subject to environmental review pursuant to SEQRA and CEQR.

E. THE FUTURE WITH THE PROPOSED ACTION

Land Use, Zoning and Public Policy

No significant adverse impacts on land use, zoning, or public policy, as defined by the guidelines for determining impact significance set forth in the 2012 *CEQR Technical Manual*, are anticipated in the future with the Proposed Action on the Project Site or within the quarter-mile Study Area. The Proposed Action would not generate land uses that would be incompatible with underlying zoning, nor would it cause a substantial number of existing structures to become non-conforming. Furthermore, the Proposed Action would not result in land uses that conflict with public policies applicable to the Project Site or Study Area.

The Proposed Action would implement a vehicle security overlay at the perimeter of the WTC Campus, but would not introduce any new buildings other than small personnel booths that would be installed at all vehicular entries and exits. When compared to future No-Action conditions, the Proposed Action is not expected to result in any significant land use changes on the Project Site or within the Study Area. Some local businesses and residents who live within the proposed secure zone may have to modify the way they receive deliveries. Additionally, persons and vehicles would have to pre-register to obtain access into the WTC Campus. While the Proposed Action would result in minor land use changes in the Project Site and Study Area, these changes would not be significant or adverse as detailed in Chapter 2 of the EIS.

Socioeconomic Conditions

The detailed analysis finds that the Proposed Action would not result in any significant adverse impacts as measured by the five socioeconomic areas of concern prescribed in the *CEQR Technical Manual*. The following summarizes the conclusions drawn from the analysis.

Direct Residential Displacement

Direct residential displacement (sometimes called primary displacement) is the involuntary physical displacement of residents from the site of (or a site directly affected by) a proposed project. The Proposed Action would not directly displace any residents, and therefore, would not result in significant adverse direct residential impacts. The Proposed Action is a comprehensive Campus Security Plan for the WTC site that involves the installation and utilization of security infrastructure to restrict the access of unauthorized vehicles from the roadways adjacent to and within the WTC site. Infrastructure related to the Proposed Action would be located within some streets and on select sidewalks at the periphery of the

WTC Campus, and would not entail any new development, or introduce new land uses to the Project Site.[3]

Direct Business and Institutional Displacement

Direct business and institutional displacement (sometimes called primary displacement) is the involuntary physical displacement of businesses or institutions from the site of (or a site directly affected by) a proposed project.

The Proposed Action would not result in significant adverse direct business or institutional impacts. As noted above, the Proposed Action is a security plan which involves the installation and utilization of security infrastructure to restrict vehicular access from roadways situated adjacent to the WTC site (i.e., Project Site). The Proposed Action, which would be located within some streets and sidewalks, does not entail any new development, and does not involve any involuntary displacement of business or institutions within the security zone. Although the Proposed Action would establish a credentialing zone on the east side of West Broadway between Barclay Street and Park Place zone where the Downtown PATH Greenmarket currently operates every Tuesday throughout the year, according to GrowNYC[4] this is a temporary location for the Greenmarket. It is anticipated that the Greenmarket will relocate to a more prominent permanent location when the WTC Site begins to reopen, which is expected to occur prior to the project build year of 2019. Formerly, the Greenmarket had operated at the World Trade Center prior to 9/11, and most recently the Greenmarket had been located at Zuccotti Park, which is located to the southeast of the WTC site, and bounded by Liberty Street, Broadway, Cedar Street, and Trinity Place. Therefore, the Proposed Action would not result in any direct business or institutional displacement and no further analysis is warranted.

Indirect Residential Displacement

Indirect residential displacement (sometimes called secondary displacement) is the involuntary displacement of residents that results from a change in socioeconomic conditions created by a proposed project. Pursuant to *CEQR Technical Manual* guidelines, the potential for indirect residential displacement is based on whether a project could result in rising property values, and thus rents, making it difficult for some residents to afford their homes.

A preliminary assessment found that the Proposed Action would not result in significant adverse impacts due to indirect residential displacement. As none of the residential units within the primary study area house populations at risk of involuntary displacement (i.e., residents that have incomes sufficiently low to be vulnerable to sharp rent increases), the Proposed Action would not result in significant adverse impacts due to indirect residential displacement in the primary study area. Furthermore, as the Proposed Action is a campus security plan that would not result in any new development or introduce any new land uses, it would not result in an indirect residential displacement in the secondary study area.

The proposed security plan would limit vehicular accessibility within the primary study area, and would result in some changes in vehicular accessibility for the residents of three multi-unit residential buildings (located at 110-112 Liberty Street, 114 Liberty Street, and 120-122 Liberty Street) containing a total of 47 dwelling units within the primary study area. Residents of these three residential buildings could

[3] The Project Site comprises the directly affected area or proposed security zone, which is generally bounded by Barclay, Church, Cedar and West Streets.

[4] GrowNYC is a hands-on non-profit organization which improves New York City's quality of life through environmental programs that transform communities block by block and empower all New Yorkers to secure a clean and healthy environment for future generations. The non-profit organizes the network of outdoor urban farmers markets in New York City.

encounter some inconveniences related to vehicular access to their homes and businesses as well as receiving deliveries and guests. However, these residents could choose to enroll in the planned TAP to make arrangements for vehicular access within the secure perimeter. The TAP program would allow the residents residing within the security zone to obtain expedited vehicle entry through the security stations and into the secure zone. Deliveries and guests of the residential buildings that need to enter the security zone in a vehicle would have to be pre-arranged and scheduled.

As the future traffic network with the Proposed Action would somewhat resemble the existing street network (in terms of free-flow traffic), the proposed security perimeter is not expected to significantly affect accessibility in the secondary study area, as compared to existing conditions. Most of the streets within and immediately adjacent to the WTC site either have not been built, are presently closed to through traffic or have reduced capacity due to construction activity or security concerns.

Lower Manhattan is a dense urban environment that contains a concentration of high profile corporations, financial headquarters, the City's civic center, as well as an increasingly vibrant residential community. It is also home to a number of museums, cultural venues and historic landmarks. In the aftermath of 9/11, the issue of security surrounding major corporate entities, civic operations, and prominent New York landmark locations has become of increased importance and various security measures have been implemented as well as further enhanced to protect these potential targets, especially in Lower Manhattan. There are three multi-block security zones that have been effectuated and maintained south of Canal Street in Lower Manhattan, and all three of these security zones are closed to unauthorized vehicle traffic. Two of the existing security zones, the NYSE Security Zone and One Police Plaza Security Zone, encompass buildings that include residential uses. The establishment and maintenance of these controlled security perimeters in Lower Manhattan do not seem to have resulted in the indirect displacement of residents from within these two security zones. For example, the NYSE Security Zone has experienced a large influx of market-rate residential units since the late 1990s subsequent to the establishment of the secure perimeter. As such, it does not appear that the NYSE Security Zone has hindered positive trends for the area, nor has it impeded efforts to attract residential investment in the area or created a climate for disinvestment. Furthermore, the sales prices of the residential cooperative units of Chatham Towers and Chatham Green, which are located immediately adjacent to and within the One Police Plaza Security Zone (established after 9/11) have generally increased since the establishment of the security perimeter. Although the average sale prices and average cost per square foot of these cooperative apartments are lower than average cost of apartments in Lower Manhattan, Chatham Towers and Chatham Green are older construction (built in the early 1960s) originally built for middle-income housing. The median sales prices of apartments in the Chatham Towers and Chatham Green are comparable to the median sales prices of apartments in the Civic Center area of Lower Manhattan, which includes both Chatham Towers and Chatham Green. Therefore, it is not anticipated that the Proposed Action would result in significant adverse impacts on indirect residential displacement in the study area.

Indirect Business and Institutional Displacement

Indirect business and institutional displacement (sometimes called secondary displacement) is the involuntary displacement of businesses, institutions, or employees that results from a change in socioeconomic conditions created by a proposed project.

A preliminary assessment found that the Proposed Action would not result in significant adverse impacts due to indirect business and institutional displacement. As the Proposed Action is a comprehensive security plan, it would not introduce any new economic activity or alter existing economic patterns, nor would it add to the concentration of a particular sector of the local economy. The Proposed Action also would not directly displace uses of any type that directly support businesses in the area or bring people to the area that form a customer base for local businesses. The study areas already have well-established

commercial and residential markets. The Proposed Action would not result in any direct residential displacement and limited business displacement, and the Proposed Action is also not expected to indirectly displace a substantial number of residents, business establishments/institutions, workers, or visitors who form the customer base of existing businesses in the study areas.

The Proposed Action would alter accessibility for vehicles picking up or dropping off people and making pickups from and deliveries to existing residents, businesses, and institutions within and immediately adjacent to the proposed secure zone, potentially disrupting established business routines and customer patterns. Moreover, the Proposed Action could affect conditions in the real estate market due to the increased security measures and changes in vehicular accessibility.

TAP would allow for expedited vehicle entry into the secure zone. While specific operational details of the TAP program cannot be released for security purposes, a brief overview of the program is provided here. Enrollment in the TAP program would be open to:

- WTC office tenants with parking privileges on site;
- For-hire vehicle operators with business on the site;
- Delivery vehicle operators; and
- Residents and owners of businesses located in non-WTC buildings within the secure zone (Liberty Street).

It is anticipated that the program would help to accommodate the needs of businesses and residents located within and immediately adjacent to the secure zone. Both drivers and vehicles would be enrolled in the TAP. TAP credentials would be checked as vehicles approach entry points to the WTC Campus, and authorized vehicles would then be admitted to a sally port for expedited security screening. Drivers and vehicles with business at the WTC site but not enrolled in the TAP would be permitted into the WTC Campus but would be subject to more rigorous credentialing and screening. This arrangement would help to facilitate access for those who seek entry. The NYPD policy for all vehicles without the proper credentials would be to deny entry.

The Proposed Action is not expected to significantly affect vehicular accessibility in the secondary study area as compared to current conditions. The future traffic network with the Proposed Action would somewhat resemble the existing street network (in terms of free-flow traffic).

Adverse Effects on Specific Industries

It may be possible that a given project may affect the operation and vitality of a specific industry not necessarily tied to a specific location. The Proposed Action would not result in significant adverse impacts on specific industries within the study areas, or in the City more broadly. The Proposed Action is not expected to significantly affect business conditions in any industry or any category of business within or outside of the study areas, and would not substantially reduce employment or impair economic viability in any industry or category of business.

Community Facilities and Services

The Proposed Action would not have a significant adverse impact on community facilities. This conclusion is drawn from the comparison of conditions in the future with the Proposed Action in 2019 (With-Action conditions) to the future without the Proposed Action in 2019 (No-Action conditions), when full development is expected, and therefore the potential for impacts is greatest. This analysis examines potential impact of the Proposed Action under current conditions, and takes into consideration development that is currently planned, proposed, or underway.

The Proposed Action is a result of extensive measures that have been taken on local, state, and national levels to reduce the likelihood of another terrorist attack and increase emergency preparedness. These measures include: the relocation of the city's Office of Emergency Management (OEM) from 7 WTC in Lower Manhattan to a new location; street closings and increased security in Lower Manhattan; increased training and coordination among emergency response providers including NYPD, FDNY, and Port Authority Police Department (PAPD); increased security in building design; and legislation such as the Homeland Security Act. However, even with these measures, the possibility exists for large-scale emergencies in the future. The Proposed Action would not interfere with the emergency service response to such an event and is intended to decrease the likelihood of future threats.

As no new population would be introduced to the area as a result of the Proposed Action, no new demands would be placed on the delivery of the existing community services. The Campus Security Plan would introduce security measures at the perimeter of the WTC Campus to eliminate unscreened vehicles from entering the site.

New York City Fire Department

The Proposed Action would not have an adverse impact on FDNY services or operations. FDNY does not anticipate that the Proposed Action would have any adverse impacts on its level of service in the area surrounding the Project Site. It is expected that the FDNY response within the WTC Campus from Engine Company 10, Ladder Company 10 ("Ten House") would be comparable to the No-Action condition. Response from the Ten House outside the WTC Campus may even improve over No-Action conditions due to the low traffic volumes anticipated within the WTC Campus that would allow for more expedited circulation through the proposed secure zone, even when taking into account the potential for increased traffic surrounding the WTC Campus under the Proposed Action. FDNY response units other than the Ten House would be facilitated through coordination at a centralized emergency response command center, checkpoints and responding units. The Proposed Action would not physically alter any station house. As described in Chapter 4, the Proposed Action includes measures to give priority to emergency vehicles so that the WTC Campus Security Plan would not alter operations of or access to or from any engine or ladder company.

New York City Police Department

The WTC Campus will be a heavily policed area with virtually instantaneous police response. NYPD response by non-WTC Command units would be facilitated through coordination at a centralized emergency response command center, checkpoints and responding units. Overall emergency service delivery to WTC campus would not be affected. As NYPD continually evaluates its level of service and makes changes as they are deemed necessary, no significant adverse impacts are expected as a result of the Proposed Action.

Port Authority Police Department

The Proposed Action would not result in any changes to PAPD staffing or allocation of resources as the NYPD would staff the proposed screening and credentialing locations. As described in Chapter 4, the perimeter security plan would not create any impediments to the PAPD services and would not be expected to result in slower response times. As such, the Proposed Action is not expected to adversely impact PAPD services or operations.

Health Care Facilities

The demand for health care facilities in the future with the Proposed Action would be no greater than the demand for health care facilities in the future without the Proposed Action. As described in Chapter 4, ambulances and other emergency vehicles would be granted expedited access into and through the site with the assistance of the central operations coordination center and the NYPD-controlled operable barriers. Private occupancy vehicles (POV's) headed to local health care facilities would likely avoid the credentialing and screening zones associated with the Proposed Action as the people utilizing these facilities would be familiar with the area and understand the traffic patterns. Instead, most health care facilities would likely be accessed by using the routes that are currently available. Further, patients may have to alter established routines to access the privately funded *Medhattan Immediate Medical Care* urgent care facility at 106 Liberty Street by vehicle; however, pedestrian access would remain largely unchanged from future No-Action conditions to future conditions with the Proposed Action.

Other Community Facilities

No changes to other area community facilities are expected as a direct result of the Proposed Action. As indicated in Chapter 4, no significant new population would be added to the WTC Campus as a result of the Proposed Action. As such, there would be no new demand on other community facilities associated with the Proposed Action.

These proposed security elements would not obstruct pedestrian crosswalks and would introduce limited obstructions on sidewalks, medians, or sidewalk extensions adjacent to select screening and credentialing zones. Pedestrian flow into, out of, and throughout the WTC Campus would generally be unimpeded. Further, all operable barriers that are proposed within the street right-of-way would be set back from pedestrian zones and would include safety features to prevent safety hazards. Vehicle access to the area's existing community facilities is expected to remain similar to the routes currently taken.

Historic and Cultural Resources

The Proposed Action would not be expected to result in significant adverse impacts to the WTC site as the proposed security components would be small in scale and located largely at the perimeter of the WTC site and would not obstruct views or significantly alter the context of the WTC site. The project components also would not obstruct views from the Project Area to nearby architectural resources. Therefore, the Proposed Action would not be expected to adversely affect any architectural resources within the Project Area.

The proposed security checkpoints would not be expected to adversely affect the context of the study areas' architectural resources. However, as described in Chapter 5, a Construction Protection Plan (CPP) would be developed and implemented prior to the commencement of any construction-related activities in the Project Area to protect the architectural resources that are located within 90 feet of proposed construction activities. The CPP would follow the New York City Department of Buildings (DOB) *Technical Policy and Procedure Notice (TPPN) #10/88*,[5] regarding procedures for the avoidance of damage to historic structures resulting from adjacent construction, and would be prepared in consultation with the New York State Historic Preservation Office (SHPO) and the New York City Landmarks Preservation Commission (LPC). *TPPN #10/88* requires a monitoring program to reduce the likelihood of

[5] *TPPN #10/88* was issued by DOB on June 6, 1988, to supplement Building Code regulations with regard to historic structures. *TPPN #10/88* outlines procedures for the avoidance of damage to historic structures resulting from adjacent construction, defined as construction within a lateral distance of 90 feet from the historic resource.

construction-related damage to adjacent architectural resources (within 90 feet) and to detect at an early stage the beginnings of damage so that construction procedures can be changed.

Overall, the Proposed Action is not expected to result in any significant adverse impacts to cultural resources on the project site or in the study areas.

Urban Design and Visual Resources

According to the 2012 *CEQR Technical Manual*, in terms of streetscape elements, a significant adverse impact would result if a project would add to, eliminate, or alter a critical feature of a streetscape. As described below and in Chapter 1, "Project Description," new security elements would be installed at the perimeter of the WTC Campus within some street beds and on the sidewalks that are immediately adjacent to the proposed credentialing and screening zones. The design of the proposed streetscape elements has been developed to ensure clear pedestrian zones by widening the sidewalk, where possible. According to the NYPD, the proposed security measures are necessary to protect the WTC Campus from a vehicle-borne explosive device as it is considered a potential terrorist target. Because there have been two previous attacks on the WTC site, the implementation of increased security precautions is necessary at the WTC Campus.

While security elements are not typically considered to be aesthetically pleasing, they have become more commonplace throughout the City since 2001. The proposed security plan would implement a uniform design approach with standardized security components such as static barriers and booths that resemble commonly used designs, intended to blend with streetscape elements widely-used around the City. However, the Proposed Action also includes some unique design elements that are intended to minimize the visual impact of the Proposed Action. Therefore, the proposed addition of security elements at the perimeter of the WTC Campus has the potential to alter the urban design characteristics of the area. While the changes to the urban design of the area resulting from the Proposed Action could be considered adverse negative impacts, they would not be significant because the plan would implement a cohesive design with elements that are intended to be consistent with other street furniture that is commonly seen around the City. A conscious effort has been made during the initial design phases to use the latest available technology for the security elements and to use materials and finishes that would blend with the surroundings for personnel booths and static and operable barriers. The Proposed Action would not result in any changes to street pattern, block form, or building arrangement. Therefore, the Proposed Action is not expected to result in any significant adverse impacts to urban design in the quarter-mile study area surrounding the WTC Campus.

As detailed in Chapter 6 of the EIS, the Proposed Action would not have a significant adverse impact on visual resources or view corridors on the WTC Campus (Project Site) or within the Study Area. Major visual resources in the Project Site and Study Area include historic buildings, such as the Woolworth Building, the Barclay-Vesey Building, and Trinity Church, modern buildings, such as the World Financial Center (WFC) and the WTC towers (many of which are under construction), and open space and natural features, such as the WTC memorial, Zuccotti Park, the Battery Park City (BPC) esplanade and Hudson River. Personnel booths located at screening and credentialing zones would have small footprints and would be located on sidewalk extensions where possible. All proposed security elements have a low-scale design. As such, the proposed security elements would not adversely affect public views to any visual resources.

Hazardous Materials

The Phase I ESA identified potential sources of contamination, including: historical fill materials of unknown origin; debris and releases (e.g., petroleum and dielectric oil) associated with the collapse of the

WTC, including the electrical substation at 7 WTC, a laboratory and petroleum storage; historical uses in the vicinity of the Property, such as manufacturing and filling stations; off-site regulatory listings (spills, petroleum storage, etc.). Previous studies conducted for the reconstruction of the WTC area indicated that debris associated with the collapse and historical petroleum storage tanks have been removed, significant remediation of soils and groundwater has occurred, and any residual contamination at the WTC campus would be encapsulated (e.g., beneath structures or pavement) to prevent potential exposure. Soil testing conducted in the 2000s in the eastern portion of the WTC Campus and on streets to the south (i.e., in or near the Project Area) indicated no evidence of petroleum impacts or elevated concentrations of asbestos or dioxins. Surface soils in this area contained slightly elevated concentrations of semi-volatile organic compounds (SVOCs) and metals, possibly associated with fill materials and/or the WTC collapse, and groundwater samples in this area contained slightly elevated concentrations of petroleum and solvent-related volatile organic compounds (VOCs). Soils in the vicinity of the former 7 WTC contained no elevated concentrations of polychlorinated biphenyls (PCBs), but soil and groundwater in this area showed evidence of petroleum and/or dielectric oil contamination; however, the testing was conducted prior to the construction of the new 7 WTC building and associated remediation.

Based on the above, soil and groundwater beneath the Project Area may have been affected by past and present, on- and off-site uses. However, significant remediation has occurred as part of WTC Campus redevelopment. Soil disturbance for the Proposed Action is expected to be limited to soils well above the water table – soils at or below the water table have a greater potential for being contaminated as moving groundwater can carry contaminants.

To reduce the potential for human or environmental exposure to contamination during and following construction of the Proposed Action, a Remedial Action Plan (RAP) and associated Construction Health and Safety Plan (CHASP) would be prepared and submitted to the New York City Department of Environmental Protection (NYCDEP) for review and approval. The RAP and CHASP would be implemented during project construction. The RAP would address requirements for items such as soil stockpiling, soil disposal and transportation; dust control; quality assurance; and contingency measures, should petroleum storage tanks or contamination be unexpectedly encountered. The CHASP would identify potential hazards that may be encountered during construction and specify appropriate health and safety measures to be undertaken to ensure that subsurface disturbance is performed in a manner protective of workers, the community, and the environment (such as personal protective equipment, air monitoring, and emergency response procedures).

Lead-based paint, asbestos-containing materials (ACM) and PCB-containing electrical equipment and fluorescent lighting fixtures may be present on the Project Area. During and following construction for the Proposed Action, regulatory requirements pertaining to ACM, lead-based paint and PCBs and chemical use and storage would be followed.

With these above-described measures, the Proposed Action would not result in any significant adverse impacts related to hazardous materials.

Transportation

Traffic

Weekday AM, midday and PM peak hour traffic conditions with the Campus Security Plan were evaluated at a total of 42 intersections generally located along the Broadway, Trinity Place/Church Street, West Broadway, Greenwich Street and West Street/Route 9A corridors from Chambers Street to Battery Place. A more limited study area was also analyzed for the Saturday midday focusing on a subset of 12

key intersections in the immediate vicinity of the WTC site that are most likely to be affected by diverted trips and weekend demand from visitors to the National September 11th Memorial and Memorial Center.

The traffic impact analysis indicates that there would be the potential for significant adverse impacts at 17 of the 42 analyzed intersections in the weekday AM peak hour, 10 in the midday and 13 in the PM peak hour, and three of the 12 analyzed intersections in the Saturday midday peak hour. The lane groups impacted in each peak hour are outlined below. Chapter 15, "Mitigation," discusses measures to mitigate these significant adverse traffic impacts.

Weekday AM Peak Hour

- Broadway and Chambers Street – eastbound approach;
- Broadway and Park Row/Barclay Street – southbound through movement;
- Broadway and Vesey Street/Park Row/Ann Street – southbound left-through lane group;
- Broadway and Fulton Street – westbound left turn;
- Church Street and Chambers Street – eastbound approach;
- Church Street and Fulton Street – westbound approach;
- Church Street and Cortlandt Street – westbound approach;
- Trinity Place and Rector Street – eastbound approach;
- Greenwich Street and Murray Street – eastbound approach;
- Greenwich Street and Battery Place – eastbound left turn;
- West Street/Route 9A and Chambers Street – eastbound approach and westbound left-through lane group;
- West Street/Route 9A and Warren Street – northbound left turn;
- West Street/Route 9A and Murray Street – eastbound left turn, westbound approach, and northbound through-right and left-turn lane groups;
- West Street/Route 9A and Liberty Street – northbound through-right and left-turn lane groups;
- West Street/Route 9A and Albany Street – eastbound approach;
- West Street/Route 9A and West Thames Street – southbound approach;
- West Street/Route 9A at the Brooklyn-Battery Tunnel – southbound approach; and
- West Street/Route 9A southbound service road at Battery Place – southbound left-turn and left-/right-turn lane groups.

Weekday Midday Peak Hour

- Broadway and Chambers Street – eastbound approach and southbound left-through lane group;
- Broadway and Park Row/Barclay Street – southbound through movement;
- Broadway and Vesey Street/Park Row/Ann Street – southbound left-through lane group;
- Church Street and Chambers Street – eastbound approach;
- Church Street and Barclay Street – westbound approach;
- Church Street and Fulton Street – westbound approach;
- Church Street and Cortlandt Street – westbound approach;
- West Street/Route 9A and Chambers Street – northbound approach;
- West Street/Route 9A and Warren Street – northbound left turn; and
- West Street/Route 9A and Murray Street – westbound approach and northbound and eastbound left turns.

Weekday PM Peak Hour

- Broadway and Chambers Street – eastbound approach and westbound left turn;
- Broadway and Warren Street – eastbound approach;
- Broadway and Park Row/Barclay Street – southbound through movement;

- Broadway and Vesey Street/Park Row/Ann Street – southbound left-turn and left-through lane groups;
- Broadway and Fulton Street – westbound approach;
- Church Street and Chambers Street – eastbound approach;
- Church Street and Fulton Street – westbound approach;
- Church Street and Cortlandt Street – westbound approach;
- Greenwich Street and Murray Street – eastbound approach;
- Greenwich Street and Battery Place – eastbound left turn;
- West Street/Route 9A and Murray Street – westbound left-turn and through-right lane groups and northbound and eastbound left turns;
- West Street/Route 9A and Liberty Street – eastbound right turn and northbound and southbound through-right lane groups; and
- West Street/Route 9A and Albany Street – eastbound approach.

Saturday Midday Peak Hour

- Broadway and Fulton Street – westbound approach;
- Church Street and Fulton Street – westbound approach; and
- Church Street and Cortlandt Street – westbound approach.

Transit

The proposed Campus Security Plan would not result in any significant adverse transit impacts with respect to subways and buses based on *CEQR Technical Manual* criteria. Much of the access between transit facilities and new and existing development in the vicinity of the WTC site will occur below-grade and would not be directly affected by physical changes to the surface street network associated with the Proposed Action. Increased traffic congestion along some corridors such as Broadway and Chambers Street and increased taxi pickup and drop-off activity in the along the west curb of Church Street as a result of the Proposed Action may, however, lengthen travel times for the local and express bus services operating along these corridors.

The would not result in the development of new land uses that would generate additional demand on the transit systems serving the WTC site, although it is possible that the restrictions on vehicular access resulting from the Proposed Action may potentially reduce vehicular travel for persons en route to and from the World Trade Center and its environs. However, any potential increase in transit trips is expected to be relatively small in the context of the overall demand on the PATH system and the numerous subway, bus and ferry routes serving the site, and the numbers of such trips would be unlikely to exceed *CEQR Technical Manual* analysis thresholds for either the rail or bus modes at any one rail transit station or bus route.

Pedestrians

The Proposed Action would not generate new pedestrian demand or change pedestrian access routes in the vicinity of the WTC site. However, the installation of security infrastructure (e.g., static barriers, personnel booths, etc.) would reduce the amount of space available for pedestrian circulation at some locations. In addition, the Proposed Action may also result in some relatively small changes in pedestrian flow due the relocation of some taxi pickup/drop-off activity. Conditions in the weekday AM, midday and PM peak periods in the future with the Proposed Action were therefore analyzed at a total of 12 sidewalks, three corner reservoir areas and 10 crosswalks in the vicinity of the WTC site. The results of the analysis indicate that the installation of security infrastructure associated with the Proposed Action

would result in significant adverse impacts in one or more peak hours at a total of two sidewalks. These include:

- Barclay Street (south) between West Broadway and Church Street in all periods; and
- Trinity Place (west) between Liberty and Cedar streets in the AM and PM.

The installation of static barriers such as bollards within crosswalks in conjunction with the proposed median along Trinity Place/Church Street is also expected to result in significant adverse impacts in one or more peak hours at a total of three analyzed crosswalks along this corridor. These include:

- The north crosswalk at Vesey Street in the AM;
- The north crosswalk at Fulton Street in the midday; and
- The north crosswalk at Cortlandt Street in the midday and PM.

Chapter 15, "Mitigation," discusses measures to mitigate these significant adverse pedestrian impacts.

Vehicular and Pedestrian Safety Evaluation

Four intersections in proximity to the WTC site experienced five or more pedestrian and/or bicyclist injury crashes in one or more years from 2008 through 2010 and are therefore considered high accident locations. These locations include three intersections along Chambers Street at Broadway, West Broadway and West Street/Route 9A, and the intersection of West Street/Route 9A with Murray Street. None of these intersections (nor any within the traffic and pedestrian study areas) are located within a designated Senior Pedestrian Focus Area (SPFA).

The Campus Security Plan is not expected to generate substantial new vehicular or pedestrian demand within the study area, nor alter pedestrian flow patterns at any of the four intersections identified as high accident locations. However, all four intersections would likely experience changes in traffic flow patterns due to street closures associated with the Proposed Action. Some approaches at these intersections would experience increases in the numbers of turning vehicles conflicting with pedestrians in crosswalks while others would experience decreases.

The Proposed Action would also result in a substantial decrease in vehicular traffic along streets within the WTC Campus, as only pre-authorized vehicles with business at the World Trade Center would be allowed access. The potential for conflicts between vehicular traffic and pedestrians at intersections within the WTC Campus, including the many tourists expected to be visiting the Memorial and Memorial Center, would therefore likely be reduced compared to the No-Action condition.

Parking

The proposed Campus Security Plan would not result in any significant adverse impacts with respect to off-street or on-street parking based on *CEQR Technical Manual* criteria. The Proposed Action would not result in the development of new land uses that would generate additional parking demand, nor displace any existing or future off-street public parking capacity. The installation of credentialing locations and security stations would, however, potentially displace an estimated 23 curbside spaces designated for authorized vehicle parking (Postal Inspector, Department of Labor and NYC Law Department), nine to 11 spaces for truck loading/unloading and four spaces for bus layover along Trinity Place/Church Street, Barclay Street and West Broadway. The displacement of this number of authorized vehicle parking spaces would not be considered a significant adverse impact under *CEQR Technical Manual* criteria, and it is anticipated that NYPD would coordinate with affected agencies and NYCDOT to identify alternative locations for this displaced authorized vehicle, truck and bus parking. The PATH Greenmarket that currently occupies curbside space along the east curb of West Broadway north of Barclay Street on

Tuesdays would likely need to be relocated from its current (temporary) location to accommodate the installation of a credentialing zone at this location.

Air Quality

The air quality analysis concluded that maximum predicted pollutant concentrations and concentration increments from mobile sources with the Proposed Action would be below the corresponding guidance thresholds and ambient air quality standards. The Proposed Action would have an insignificant impact on region-wide criteria pollutant and greenhouse gas emissions, and would not require an analysis of conformity with the New York State Implementation Plans (SIP). Thus, the Proposed Action would have no significant adverse impact on air quality.

Noise

The noise analysis determined that traffic diversions associated with the Proposed Action and stationary noise sources (i.e., operation of security barriers) would not result in any predicted exceedances of the suggested incremental thresholds in the city's *CEQR Technical Manual* at the selected receptors. Therefore, there would be no predicted significant adverse noise impacts from the Proposed Action.

Public Health

The 2012 *CEQR Technical Manual* states that a public health assessment is not necessary for most actions. Where no significant unmitigated adverse impact is found in other CEQR analysis areas, such as air quality, water quality, hazardous materials, or noise, no public health analysis is warranted. If, however, an unmitigated significant adverse impact is identified in any of these other CEQR analysis areas, the lead agency may determine that a public health assessment is warranted for that specific technical area. As described in the relevant chapters of this EIS, the Proposed Action would not result in unmitigated significant adverse impacts in technical areas such as hazardous materials (Chapter 7), air quality (Chapter 9), and noise (Chapter 10). Furthermore, as described in Chapter 13, "Construction," the Proposed Action would not result in any significant adverse impacts related to construction noise levels or construction air quality. Therefore, the Proposed Action would not result in significant adverse public health impacts.

Neighborhood Character

The Proposed Action is a physical and operational security infrastructure overlay that would be incorporated into the planned World Trade Center streetscapes. The proposed security elements would be installed on City streets and sidewalks in a well-developed area of Lower Manhattan. As described in earlier chapters in this EIS, the Proposed Action would not cause significant adverse impacts regarding land use, zoning, and public policy; socioeconomic conditions; open space; historic and cultural resources; urban design and visual resources; shadows; or noise. The redistribution of traffic due to the closure of street segments within the WTC site to unscreened vehicles under the Proposed Action would, however, result in a total of seven unmitigated significant adverse traffic impacts in the AM peak hour, four in the midday, two in the PM and one in the Saturday midday peak hour. These unmitigated impacts would occur primarily at intersections along Broadway, Church Street and West Street/Route 9A, all of which are known as heavily trafficked corridors. Additional traffic volumes on these streets would not significantly adversely affect the character of these major thoroughfares or the neighborhood's defining features.

The introduction of personnel booths and other security infrastructure elements along sidewalks and crosswalks in the vicinity of the WTC site is not expected result in unmitigated significant adverse

pedestrian impacts, nor alter pedestrian flow patterns or the ability of pedestrians to freely access the Campus compared to the No-Action condition. The Proposed Action would, however, result in a decrease in vehicular traffic along streets within the WTC Campus, as only pre-authorized vehicles with business at the World Trade Center would be allowed access. The potential for conflicts between vehicular traffic and pedestrians at intersections within the WTC Campus, including the many tourists expected to be visiting the Memorial and Memorial Center, would therefore likely be reduced compared to the No-Action condition. The Proposed Action is therefore not expected to significantly adversely affect the character of pedestrian travel in the vicinity of the WTC site.

Overall, the Proposed Action would help to provide a secure and safe environment for visitors and workers at the World Trade Center while also ensuring that the site is hospitable to remembrance, culture, and commerce. It is not expected to have significant adverse neighborhood character impacts, as discussed in further detail in Chapter 12.

Construction

Where possible, the Proposed Action would be constructed in sections of the roadways and sidewalks that would be closed for construction of the WTC towers and street system before those spaces are open to the public. Construction activities would be coordinated to ensure that the Proposed Action would be taken into consideration when streets and sidewalks are constructed within the WTC site so newly constructed streets and sidewalks would not have to be disturbed to accommodate the proposed security elements. Security elements proposed on streets and sidewalks outside of the WTC Campus which are accessible to the public would be constructed in halves so that no sidewalk or street would be completely closed to pedestrian or vehicular traffic as a result of the Proposed Action.

The inconvenience and disruption arising from the construction of WTC Campus Security Plan would likely result in some limited temporary diversions of pedestrians and vehicles, and would result in additional truck traffic in the area related to construction activities. Some of the construction would occur within the WTC site in locations that would still be construction zones that are off limits to the public (e.g., Vesey Street, Fulton Street, Liberty Street, and portions of Church Street), while construction would also occur in some areas that would remain publicly accessible (e.g., West Street/Route 9A, Washington Street, West Broadway, Trinity Place and Greenwich Street south of Liberty Street). Given the limited nature of the proposed security measures and the potential to complete some of the elements of the Campus Security Plan while the construction of the WTC buildings, streets and sidewalks is ongoing and the areas of disturbance would be part of the larger WTC construction site, the Proposed Action would not directly result in lengthy street closures or diversions. However, as the Proposed Action has the potential to affect elements of the City's transportation system at several locations, a preliminary assessment of potential construction impacts was prepared in accordance with the guidelines of the *CEQR Technical Manual*, and is presented in Chapter 13. As detailed in that chapter, construction for the Proposed Action has the potential to result in some short-term construction-period impacts related to traffic and pedestrian circulation.

Throughout the construction period, access to surrounding residences, businesses, institutions, and open spaces in the area would be maintained. In addition, throughout the construction period, measures would be implemented to control noise, vibration, and dust on the construction sites and minimize impacts on the surrounding areas in conformance with the City's building code. These measures would primarily include the erection of construction fencing and permitting to restrict work hours. Even with these measures in place, temporary impacts are predicted to occur. However, because none of these impacts would be continuous in any one location or permanent, they would not create significant impacts on land use patterns or neighborhood character in the area.

As discussed in Chapter 13, construction would likely begin in 2013 with various segments advancing through 2019 as the WTC street system is constructed and as the adjacent WTC buildings are completed. It is anticipated that much of the activities and traffic specifically related to the construction of the Campus Security Plan would occur in 2014 and 2015, with both years expected to have similar levels of construction activity. At peak construction, a maximum of 28 workers would be on-site to construct the proposed security measures (includes approximately ten workers per block, with up to ten additional trade workers required for some phases of construction and up to eight workers related to deliveries). With less than one third of the workers expected to drive to work on a typical work day, there would be less than ten new vehicle trips related to construction workers commuting to and from the area during the 6:00 to 7:00 AM and 3:00 to 4:00 PM peak hours. Further, the peak hours related to construction trips would not occur during the peak hour for general traffic in this area. As such, no new intersections are expected to experience significant adverse traffic impacts during the peak construction activities.

Due to the limited scope of the construction activities that would be required to install the security elements associated with the proposed Campus Security Plan on existing or planned streets and sidewalks, it is unlikely that any inadvertent damage would occur to local historic (architectural or archaeological) resources. However, the protective measures of the DOB's *TPPN #10/88* would apply and indirect significant adverse impacts resulting from construction would be avoided.[6]

It should be noted that, based on observations made at the Project Site, and on documentation provided in previous environmental impact statements which were conducted for the redevelopment of the WTC site, for the reconstruction of West Street/Route 9A, and for the permanent WTC Port Authority Trans-Hudson (PATH) Terminal, the Proposed Action would not affect any natural resources or endangered species. The proposed Campus Security Plan would be constructed in a dense urban environment on existing or planned streets and sidewalks in areas that have previously been disturbed. While the site is partially located within the City's coastal zone boundary, the Waterfront Revitalization Plan (WRP) assessment conducted for the Proposed Action concluded that the Campus Security Plan would not conflict with the goals of the WRP policies.

As also discussed in Chapter 13, construction-related activities resulting from the Proposed Action are not expected to have any long-term significant adverse impacts on transit or pedestrian conditions, air quality, noise, archaeological resources, or hazardous materials conditions, and a detailed analysis of construction impacts is not warranted. Moreover, the construction process in New York City is highly regulated to ensure that construction period impacts are reduced.

Environmental Justice

As there are no large minority or low-income communities located within the Study Area, the Proposed Action is not expected to result in any disproportionately high or adverse effects on minority or low-income populations. In addition, the Proposed Action would be in compliance with applicable NEPA regulations related to environmental justice protections. Therefore, there are no environmental justice concerns anticipated with the Proposed Action.

F. MITIGATION

The significant adverse impacts listed in earlier chapters of this DEIS and the number of impacts that could be mitigated through the implementation of practicable mitigation measures are described below. Impacts were identified in the area of transportation.

[6] TPPN #10/88 was issued by DOB on June 6, 1988, to supplement Building Code regulations with regard to historic structures. TPPN #10/88 outlines procedures for the avoidance of damage to historic structures resulting from adjacent construction, defined as construction within a lateral distance of 90 feet from the historic resource.

Transportation

Traffic

The traffic impact analysis in Chapter 8, "Transportation," indicates that there would be the potential for significant adverse impacts at 17 intersections in the weekday AM peak hour, 10 in the midday, 13 in the PM and three in the Saturday midday peak hour, as outlined below. All but seven of these significant impacts in the AM peak hour, four in the midday, two in the PM and one in the Saturday midday could be fully mitigated through a combination of traffic signal timing/phasing modifications, lane restriping, and changes to curbside parking regulations without any additional significant impacts to pedestrian or parking conditions. Based on *CEQR Technical Manual* criteria, the following significant adverse impacts would remain unmitigated:

AM Peak Hour

- Fulton Street at Church Street – westbound right turn;
- Chambers Street at Route 9A – Eastbound approach and westbound left-through lane group;
- Route 9A at Murray Street – eastbound left-turn, westbound approach and northbound through-right lane group; and
- Route 9A at Liberty Street – northbound through-right lane group.

Midday Peak Hour

- Chambers Street at Broadway – eastbound approach;
- Fulton Street at Church Street – westbound approach; and
- Murray Street at Route 9A – eastbound left turn and westbound approach.

PM Peak Hour

- Fulton Street at Church Street – westbound approach; and
- Route 9A at Liberty Street – southbound through-right lane group.

Saturday Midday Peak Hour

- Fulton Street at Church Street – westbound approach.

Pedestrians

The pedestrian impact analysis in Chapter 8, "Transportation," indicates that installation of security infrastructure associated with the Proposed Action would result in significant adverse impacts due to reductions in pedestrian space in the weekday AM, midday and/or PM peak hours at a total of two sidewalks and three crosswalks. Recommended mitigation measures, which are subject to review and approval by NYCDOT, generally consist of sidewalk and crosswalk widening and minor signal timing changes. All of the significant adverse sidewalk and crosswalk impacts would be fully mitigated with the recommended pedestrian mitigation measures.

G. ALTERNATIVES

No-Action Alternative

The No-Action Alternative examines future conditions within the Study Area, but assumes the absence of the Proposed Action. Under the No-Action Alternative, the proposed Campus Security Plan would not be implemented, but Vesey Street and Fulton Street between Greenwich Street and West Street/Route 9A

would operate as managed streets, as described in Chapter 1, "Project Description." It is anticipated that the WTC Campus would be developed (including 1 WTC through 4 WTC, the VSC, the PAC, the PATH terminal and the National September 11th Memorial and Museum) and Lower Manhattan would remain a vibrant mixed-use community with one of the largest central business districts in the U.S. In the future without the Proposed Action, the Study Area would continue to experience growth in commercial, office, retail, residential, hotel, and community facility uses by 2019, including almost forty new developments, conversions, and street improvement projects discussed in further detail in Chapter 2, "Land Use, Zoning, and Public Policy."

The technical chapters of the EIS have described the No-Action Alternative as the "Future Without the Proposed Action." The significant adverse impacts anticipated for the Proposed Action would not occur with the No-Action Alternative. However, the No-Action Alternative would not meet the needs and goals of the Proposed Action and the benefits expected from the proposed Campus Security Plan would not be realized. The WTC Campus has been the target of two terrorist attacks in the past, and these types of attacks remain a threat to the WTC site in the future. Therefore, implementation of the No-Action Alternative would not be feasible as it would fail to meet the objective of protecting the WTC site against vehicle-borne threats.

No Unmitigated Significant Adverse Impact Alternative

The No Unmitigated Significant Adverse Impact Alternative examines a scenario in which components of the Proposed Action are changed specifically to avoid the unmitigated significant adverse impacts associated with the Proposed Action.

The Proposed Action would result in unmitigated significant adverse traffic impacts at four intersections during the AM peak hour, three intersections during the midday peak hour, two intersections during the PM peak hour and one intersection during the Saturday midday peak hour. The specific lane groups with unmitigated significant impacts in each peak hour would include the following:

AM Peak Hour

- Fulton Street at Church Street – westbound right turn;
- Chambers Street at Route 9A – Eastbound approach and westbound left-through lane group;
- Route 9A at Murray Street – eastbound left-turn, westbound approach and northbound through-right lane group; and
- Route 9A at Liberty Street – northbound through-right lane group.

Midday Peak Hour

- Chambers Street at Broadway – eastbound approach;
- Fulton Street at Church Street – westbound approach; and
- Murray Street at Route 9A – eastbound left turn and westbound approach.

PM Peak Hour

- Fulton Street at Church Street – westbound approach; and
- Route 9A at Liberty Street – southbound through-right lane group.

Saturday Midday Peak Hour

- Fulton Street at Church Street – westbound approach.

The Proposed Action's significant traffic impacts are generally a consequence of the redistribution of traffic associated with the closures of various street segments within the WTC Campus to unscreened traffic, and the installation of a median along Church Street and curbside credentialing lanes on the

perimeter of the Campus. These features are integral to providing the level of security deemed necessary to safeguard the WTC Campus, and the need to maintain traffic flow capacity to the greatest extent possible was considered in their design. Modifying the scale or the design of the proposed security measures to eliminate all of the unmitigated significant adverse traffic impacts would therefore not be practicable, as such modifications would likely compromise the Proposed Action's ability to provide the needed level of security. Consequently, the No Unmitigated Significant Adverse Impacts Alternative is not a practicable alternative to the Proposed Action as it would fail to meet the objective of protecting the WTC site against vehicle-borne threats.

Unrestricted Liberty Street Alternative

Under this alternative, the vehicle restrictions proposed in conjunction with the Proposed Action would be modified to allow unscreened traffic to flow east-west on Liberty Street with no security controls. This would provide an additional east-west route in Lower Manhattan.

This proposed alternative was reviewed and evaluated by NYPD's Counter Terrorism Bureau and it was determined that this alternative would not allow sufficient protection for the WTC Campus. This proposed alternative would allow all types of vehicles onto Liberty Street and there would be no feasible way to mitigate against a possible threat with the stand-off distance that would be available under this alternative. As this stand-off distance would be reduced to an unsafe level, this alternative would not reach the objectives of the NYPD's Counter Terrorism Bureau to protect the WTC Campus, an area that is considered a potential terrorist target. This alternative would allow unrestricted vehicular access to the VSC entry point via Liberty Street, eliminating a layer of security for vulnerable areas of the WTC Campus. The Unrestricted Liberty Street Alternative, while potentially improving traffic flow, is not feasible as it would not meet the security goals and objectives of the Proposed Action.

H. UNAVOIDABLE SIGNIFICANT ADVERSE IMPACTS

Unavoidable significant adverse impacts occur when significant adverse impacts would be unavoidable if a project is implemented regardless of the mitigation employed (or if mitigation is impossible). As described in Chapter 15, "Mitigation" and as indicated in Chapter 17 "Unavoidable Significant Adverse Impacts," traffic impacts have been identified in each analyzed peak period. It is anticipated that some of the traffic impacts would be unmitigated at several study area intersections. No other unavoidable adverse impacts are anticipated in any other technical areas analyzed in this EIS.

As the Proposed Action is a security overlay, it would not be feasible to modify or scale down the project in a manner that would achieve the required level of security and also eliminate the unmitigated impacts, as described in Chapter 16, "Alternatives." The conclusion of the Alternatives chapter is that there are no alternatives which would eliminate or substantially reduce the traffic impacts while also meeting the security goals and objectives of the Proposed Action. Additional measures to further address all unmitigated significant adverse traffic impacts will be explored between the Draft and Final EIS. Absent the identification and implementation of such feasible and practicable measures, the Proposed Action could have unmitigated significant adverse traffic impacts at the locations identified in Chapters 15 and 17.

I. GROWTH-INDUCING ASPECTS OF THE PROPOSED ACTION

Growth-inducing aspects of a proposed action generally refer to "secondary" impacts of a proposed action that trigger further development. Proposals that add substantial new land use, new residents, or new

employment could induce additional development of a similar kind or of support uses (e.g., stores to serve new residential uses). Actions that introduce or greatly expand infrastructure capacity (e.g., sewers, central water supply) might also induce growth.

The environmental consequences of this growth are the subject of Chapters 2 through 17 of this EIS. No new residential or worker population would result from the Proposed Action as it is a security overlay that would be staffed by NYPD who would otherwise be working on the WTC Campus under No-Action conditions.

The Proposed Action would not result in more intensive land uses. However, it is expected that the enhanced safety measures would help to create a secure environment that would be supportive of existing and planned land uses on the WTC site. As stated in Chapter 3, "Socioeconomic Conditions," the Proposed Action would not introduce a new economic activity that would alter existing economic patterns within the study area. As the study area already has a well-established residential market under existing conditions and a critical mass of non-residential uses, including retail, office, hotel and community facility uses, the Proposed Action would not create the critical mass of uses or populations that would induce additional development. Moreover, the proposed WTC Campus Security Plan does not include the introduction of new infrastructure or an expansion of infrastructure capacity that would result in indirect residential or commercial development. Therefore, the Proposed Action would not induce significant new growth in the surrounding area.

J. IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

Resources, both natural and man-made, would be expended in the construction, renovation, reuse and operation of developments projected to occur as a result of the Proposed Action. These resources include the building materials used during construction or renovation; energy in the form of gas and electricity consumed during construction and operation of buildings by various mechanical and processing systems; and the human effort required to develop, construct, renovate, and operate various elements of projected and potential developments.

The building materials, energy, and human efforts used to construct and operate the proposed WTC Campus Security Plan are considered irretrievably committed because their reuse for some other purpose would be highly unlikely. The security elements that would be implemented in the Proposed Action are intended to safeguard the WTC Campus while allowing access for screened vehicles. While their use would be considered a short-term environmental loss, they would produce long-term benefits in enhancing public safety in and around the WTC Campus. The use of public roadway and sidewalk space to accommodate these proposed security elements could be considered a resource loss, though these areas would continue to be shared with vehicular and pedestrian traffic, respectively. Further, funds committed to the design, construction, and operation of the proposed security elements under the Proposed Action would not be available for other projects. However, the use of these irretrievable resources is necessary in order to maintain a secure and safe environment in the WTC Campus.

A. INTRODUCTION

The New York City Police Department (NYPD) proposes to implement a Campus Security Plan for the 16-acre World Trade Center (WTC) Campus in Manhattan Community District 1 (the "Proposed Project") in collaboration with other New York City agencies, the Port Authority of New York and New Jersey (PANYNJ) and other WTC stakeholders. Implementation of the Proposed Project is the "Proposed Action." **Figure 1-1** shows the site location in Lower Manhattan.

The Campus Security Plan, described in detail below in Section E, "Description of the Proposed Action," would create a comprehensive vehicle security perimeter for the WTC Campus (the "Campus Security Plan") to protect against vehicle-borne explosive devices while ensuring an open environment that is hospitable to remembrance, culture, and commerce. The Campus Security Plan bars unscreened vehicles from entering the WTC Campus and certain areas at the perimeter of the Site and creates increased stand-off distances to reduce the risk of catastrophic damage to persons and property (see **Figure 1-2** for a Conceptual Plan of the proposed Campus Security Plan). A vehicle seeking to enter restricted areas would be subject to credentialing to determine whether entry is authorized and screening to ensure the vehicle does not contain dangerous material. The creation of a Trusted Access Program[1] (TAP), in which WTC office tenants with parking privileges on site, residents and owners of businesses located in non-WTC buildings within the secure zone (Liberty Street between Greenwich Street and Trinity Place), for-hire vehicle operators, and delivery vehicle operators could enroll, is expected to facilitate entry for those vehicles with destinations within the WTC Campus. It is possible that yellow cabs would also be permitted to enroll in TAP; however, specific criteria have not yet been finalized.

The Vehicular Security Center (VSC) planned in conjunction with the WTC development irrespective of the Proposed Action controls access to the underground traffic network that serves the entire WTC Campus, including the loading docks for each building and parking areas. The parking garage will not allow general public parking; rather, the parking garage will be restricted to use by tenants. All vehicles entering the VSC, including tenants that park on site, tour buses and delivery vehicles will be processed and screened at the VSC. PANYNJ will operate and be responsible for screening vehicles entering the VSC and will be responsible for screening there. As it is anticipated that demand for on-site delivery, tour bus and private occupancy vehicle (POV) parking will be considerable, PANYNJ is developing a management strategy, including scheduling of tour buses and truck deliveries, to ensure orderly and efficient operations.

The NYPD and PANYNJ have coordinated to develop conceptual plans for the design and location of the proposed security infrastructure, which is discussed in more detail in Section E, below. The Project Area includes all streets, sidewalks and buildings that would be directly affected by the installation of the WTC site's security infrastructure. This area is generally bounded by Barclay, West, Albany and Church Streets. Four vehicular entry points are planned under the proposed Campus Security Plan at: Washington Street and Barclay Street; West Broadway and Barclay Street; Trinity Place/Church Street and Liberty Street; and Liberty Street and West Street/Route 9A. Exits from the secure zone are proposed at the following five locations: Church Street at Vesey Street; Vesey Street at West Street/Route 9A; Fulton Street at West Street/Route 9A; Liberty Street at West Street/Route 9A; and Greenwich Street at Cedar Street. The secure perimeter would consist of various types of vehicle interdiction devices, which would

[1] PANYNJ is currently developing the TAP program.

include static barriers (such as bollards) and operable barriers to allow vehicle access, all under NYPD control.

The Proposed Action also includes the reconfiguration of Trinity Place/Church Street from Cedar Street north to Vesey Street to create a northbound lane for screened vehicles within the security zone as well as an exit area north of Vesey Street. This secure lane would be created by constructing a four-foot-wide raised median on Church Street. An approximately 11-foot-wide inner secure lane would provide additional stand-off distance between the planned WTC buildings and the general traffic flow on Church Street. Three lanes of northbound Church Street traffic, having an approximate total width of 33 feet, would remain outside the secure zone.

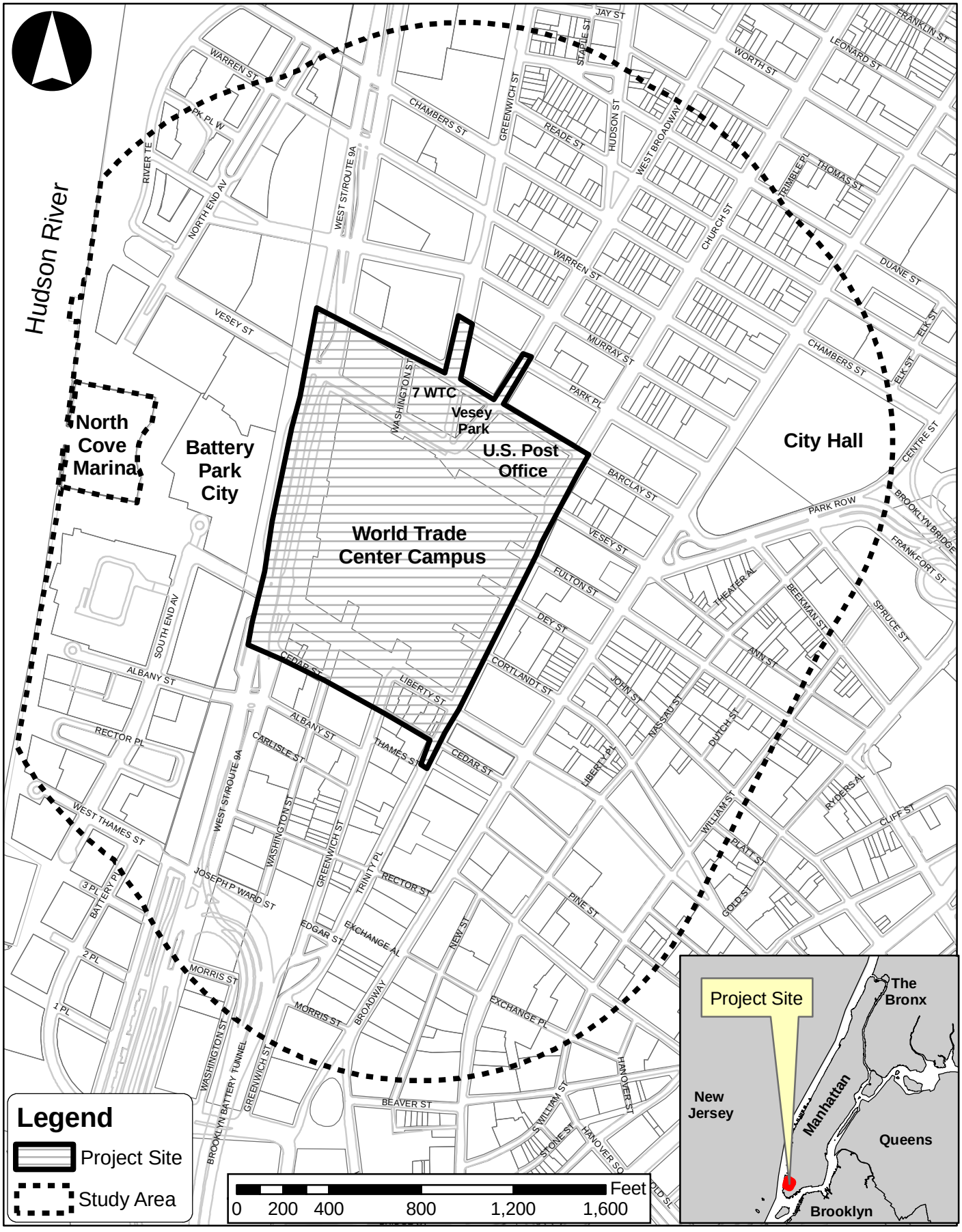
Construction of the Proposed Action is expected to commence in 2013. With or without the Proposed Action, it is unlikely that the planned street network within the WTC Campus would be completely constructed and accessible prior to 2019. As such, 2019 has been selected as the analysis year for the environmental analyses in this Environmental Impact Statement (EIS). It is anticipated that the security measures associated with the Proposed Action would be implemented as construction of the WTC buildings progresses through 2019. Construction sequencing would be scheduled based on the need to accommodate construction activities at the WTC site, the progress of development and the security needs of the tenants as new buildings are completed and occupied. Prior to the installation of the permanent security measures, it is likely that some interim measures would be installed adjacent to the occupied buildings to provide security while construction of adjacent WTC buildings and on-site streets and infrastructure is on-going. The specific sequencing of the proposed security measures would be determined once the future construction schedule for development at the WTC site becomes more defined.

As described in detail in Chapter 2, "Land Use, Zoning and Public Policy," a variety of new developments and conversions are anticipated to be completed within the quarter-mile study area by 2019. It should be noted that 5 WTC has not been included as within the Campus Security Plan or as a development that would occur by the time of the Proposed Action. At this time the only building program proposed for 5 WTC is the 57-story, approximately 1.6-million-square-foot office tower that was contemplated in the 2004 *World Trade Center Memorial and Redevelopment Plan FGEIS* with anticipated completion by 2015. Due to the current economic climate, however, it is unlikely that the PANYNJ will pursue development of the 5 WTC site in the near term. With the ongoing construction of 1 WTC and 4 WTC and the recent completion of 7 WTC, demand for new Class A office space is being met in Lower Manhattan in the near term. This EIS conservatively assumes that 2 WTC and 3 WTC would be fully constructed and occupied by 2019 even though the full build-out of 2 WTC and 3 WTC is predicated on the ability to viably market the office space. Therefore, it is unlikely that the demand exists in the current market for construction of the additional 1.6-million square feet of office space that would be made available if 5 WTC were developed as once contemplated.

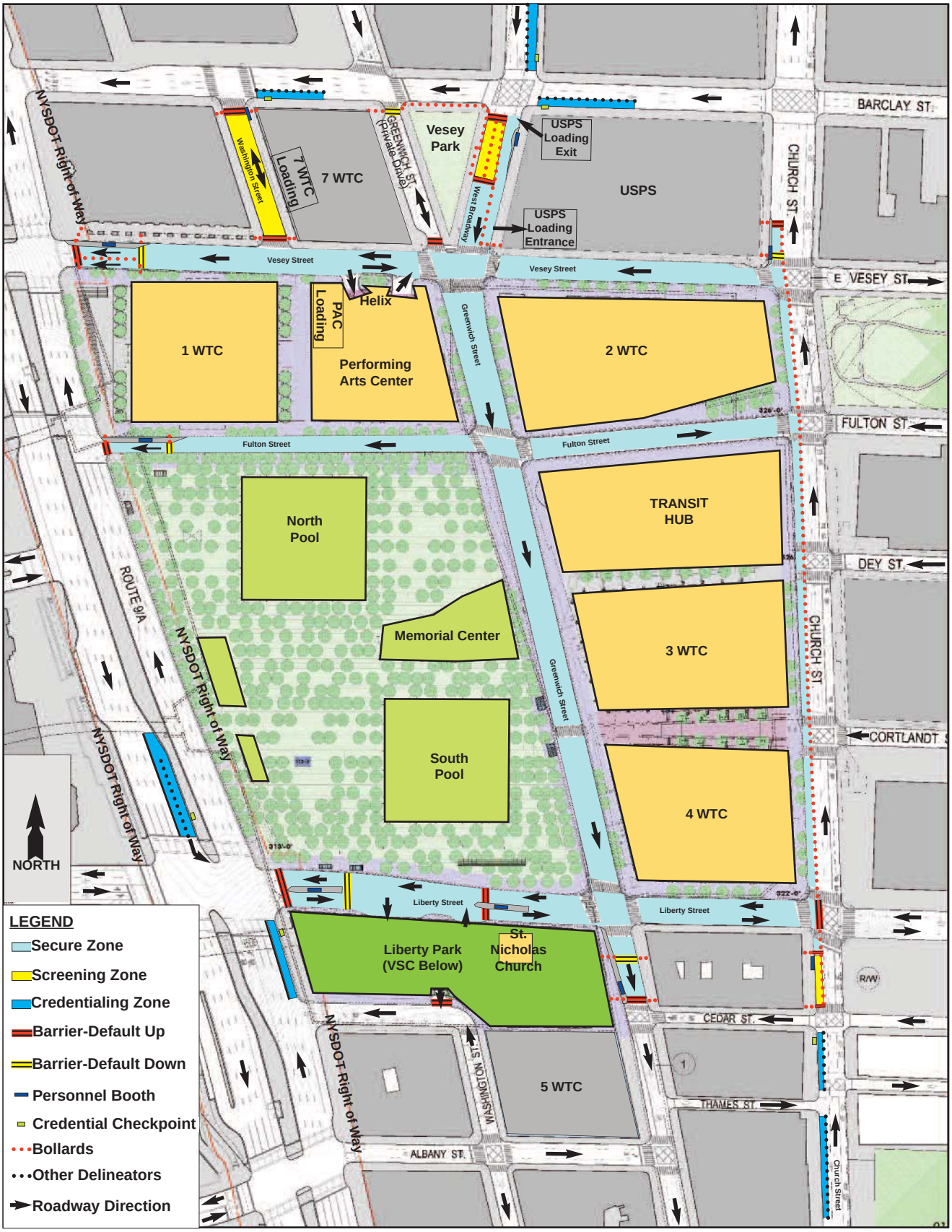
Any other proposals for development of 5 WTC would be purely speculative at this juncture as no developer has been selected and no alternative plans have been developed for the site at this time. As such, it is projected that 5 WTC would not be developed by 2019. With so many details surrounding the 5 WTC site unresolved, extending the analysis year beyond 2019 would not be useful because there is no information available that would provide reasonable guidance on when construction of the site could be completed. Additionally, the 5 WTC site is located outside of the security zone as proposed. For the reasons outlined, therefore, 5 WTC is not included in the analysis.

As the City of New York would provide a portion of the funding for the Proposed Action and NYPD is the chief decision maker with regard to its design and implementation, NYPD is conducting an environmental review pursuant to the New York State Environmental Quality Review Act (SEQRA) and

Site Location Map



Conceptual Plan for the Proposed Project



Note: Image is schematic and for conceptual purposes only.

City Environmental Quality Review (CEQR), and their implementing regulations. The NYPD is acting as lead agency under SEQRA/CEQR. Other City agencies are involved or interested agencies; these include the New York City Departments of City Planning (DCP), Environmental Protection (NYCDEP) and Transportation (NYCDOT). The New York State Department of Transportation (SDOT) is also an involved agency. NYPD will continue to work with the City and State in connection with the Proposed Action.

The EIS for the Proposed Action would serve as the basis for NYPD's findings pursuant to SEQRA. Because the Proposed Action is entirely within New York City, the *CEQR Technical Manual* generally serves as a guide with respect to methodologies and impact criteria for evaluating the Proposed Action in this Draft EIS. Therefore, this EIS has been prepared in conformance with applicable laws and regulations, including Executive Order No. 91 of 1977 and the CEQR regulations, and follows the guidance of the 2012 *CEQR Technical Manual.*

While the NYPD would provide a portion of the funding for the Proposed Action, other potential funding sources include the Federal Emergency Management Agency/U.S. Department of Homeland Security (FEMA/DHS) and PANYNJ. Federal agencies are responsible for complying with the National Environmental Policy Act (NEPA), which has procedural requirements that are similar to, but jurisdictionally distinct from, SEQRA. The information provided in this SEQRA EIS is intended to provide a basis for a subsequent NEPA environmental review by FEMA/DHS if Federal funding is allocated for this project. Accordingly, this SEQRA EIS will be conducted in a manner to ensure consistency with Federal review requirements.

The EIS includes review and analysis of all relevant impact categories identified in the 2012 *CEQR Technical Manual.* The EIS contains a description and analysis of the Proposed Action and its environmental setting; the environmental impacts of the Proposed Action, including its short- and long-term effects, and typical associated environmental effects; identification of any significant adverse environmental effects that can be avoided through incorporation of corrective measures into the Proposed Action; a discussion of alternatives to the Proposed Action; the identification of any irreversible and irretrievable commitments of resources that would be involved in the Proposed Action should it be implemented; and a description of any necessary mitigation measures proposed to minimize significant adverse environmental impacts.

B. BACKGROUND AND EXISTING CONDITIONS

On February 26, 1993 an explosive device was detonated in the underground public parking garage beneath the WTC towers. The attack resulted in several deaths and more than 1,000 injuries, along with hundreds of millions of dollars of damage. PANYNJ subsequently implemented an extensive upgrade plan, with a focus on life safety and security. Less than a decade later, on September 11, 2001, the WTC was again attacked, resulting in the loss of nearly 2,800 lives and the destruction of the entire WTC complex.

Since September 2001, redevelopment efforts have been underway. The National September 11th Memorial opened to the public in September 2011. Construction continues across the balance of the site for the approximately 8.4 million square feet of office space, approximately up to 500,000 square feet of retail, new cultural uses, the VSC, and the new WTC Port Authority Trans-Hudson (PATH) HUB. While 1 WTC and 4 WTC have been constructed to their full heights, construction of sub-grade structure for 2 WTC and the 3 WTC podium are well underway. **Figure 1-3** shows four views of the progress that has been made as of June 2012.

The Campus Security Plan is intended to protect against vehicle-borne explosive devices while ensuring an open environment that is hospitable to remembrance, culture, and commerce. The Campus Security Plan bars unscreened vehicles from entering the WTC site and certain areas at the perimeter of the WTC Campus and creates increased stand-off distances to reduce the risk of catastrophic damage to persons and property. A vehicle seeking to enter restricted areas would be subject to credentialing to determine whether entry is authorized and screening to ensure the vehicle does not contain dangerous material. The creation of TAP, in which WTC office tenants with parking privileges on site, residents and owners of businesses located in non-WTC buildings within the secure zone (Liberty Street between Greenwich Street and Trinity Place), for-hire vehicle operators, and delivery vehicle operators could enroll, is being developed by PANYNJ to expedite vehicle entry. While it is anticipated that yellow cabs would be permitted into the WTC Campus, the possibility of yellow cabs enrolling into TAP has not been decided at this time.

The Proposed Action was developed after careful consideration of the Lower Manhattan Development Corporation (LMDC) Master Plan (from the 2004 *World Trade Center Memorial and Redevelopment Plan FGEIS*) and the subsequent design of the commercial towers planned for the WTC Campus. The LMDC Master Plan included the National September 11th Memorial, the PATH HUB, the Performing Arts Center (PAC), and commercial office towers (WTC Towers 1 through 5).

C. PURPOSE AND NEED FOR THE PROPOSED ACTION

As described above, the WTC Campus Security Plan was developed in response to the continued security concerns at the WTC site. The Proposed Action bars unscreened vehicles from entering the WTC Campus and certain areas at the perimeter of the WTC site and creates increased stand-off distances between unscreened vehicles and WTC buildings. A vehicle seeking to enter restricted areas would be subject to credentialing to determine whether entry is authorized and screening to ensure the vehicle does not contain dangerous material. As indicated above, the proposed security measures are intended to safeguard the WTC Campus while allowing access for screened vehicles.

Funding

The WTC Campus Security Plan is a direct undertaking by the NYPD and would be paid for, at least in part, with New York City funds. Therefore, the Proposed Action is subject to environmental review pursuant to SEQRA and CEQR.

Agency Coordination

Additionally, the Proposed Action may require or involve, among others, the following agency notifications, actions, permits and/or approvals or expertise:

Federal

- Department of Homeland Security/Federal Emergency Management Agency – possible funding for all or a portion of the proposed Campus Security Plan
- Advisory Council on Historic Preservation (ACHP)
- Federal Highway Administration (FHWA)
- Federal Transit Administration (FTA)

1. View of 1 World Trade Center from the east.

2. View of 4 World Trade Center from the north.

3. View of the National September 11th Museum and Memorial from the east.

4. View of the WTC Campus from the south. The crane is located atop 3 World Trade Center.

Bi-State
- Port Authority of New York and New Jersey – possible plan funding and implementation

State
- New York State Department of State (NYSDOS)
- New York State Historic Preservation Office (SHPO)
- New York State Department of Transportation (SDOT)
- New York State Metropolitan Transportation Authority (MTA)

New York City
- New York City Mayor's Office of Environmental Coordination
- New York City Department of Transportation (NYCDOT) – review of proposed geometric changes, street direction changes, and security elements, as well as construction permits
- New York City Planning Commission acting as the New York City Coastal Commission – Coastal Zone Consistency review
- New York City Department of Environmental Protection

D. PROJECT SITE AND ITS CONTEXT

Project Site

As shown above in **Figure 1-2**, the WTC Campus Security Plan encompasses the approximately 16-acre parcel bounded by Vesey Street on the north, Liberty Street on the south, Church Street on the east and West Street/Route 9A on the west. As previous studies have been conducted for the site, the following sections provide a description of the earlier versions of the plans for the WTC site.

2004 World Trade Center Memorial and Redevelopment Plan FGEIS

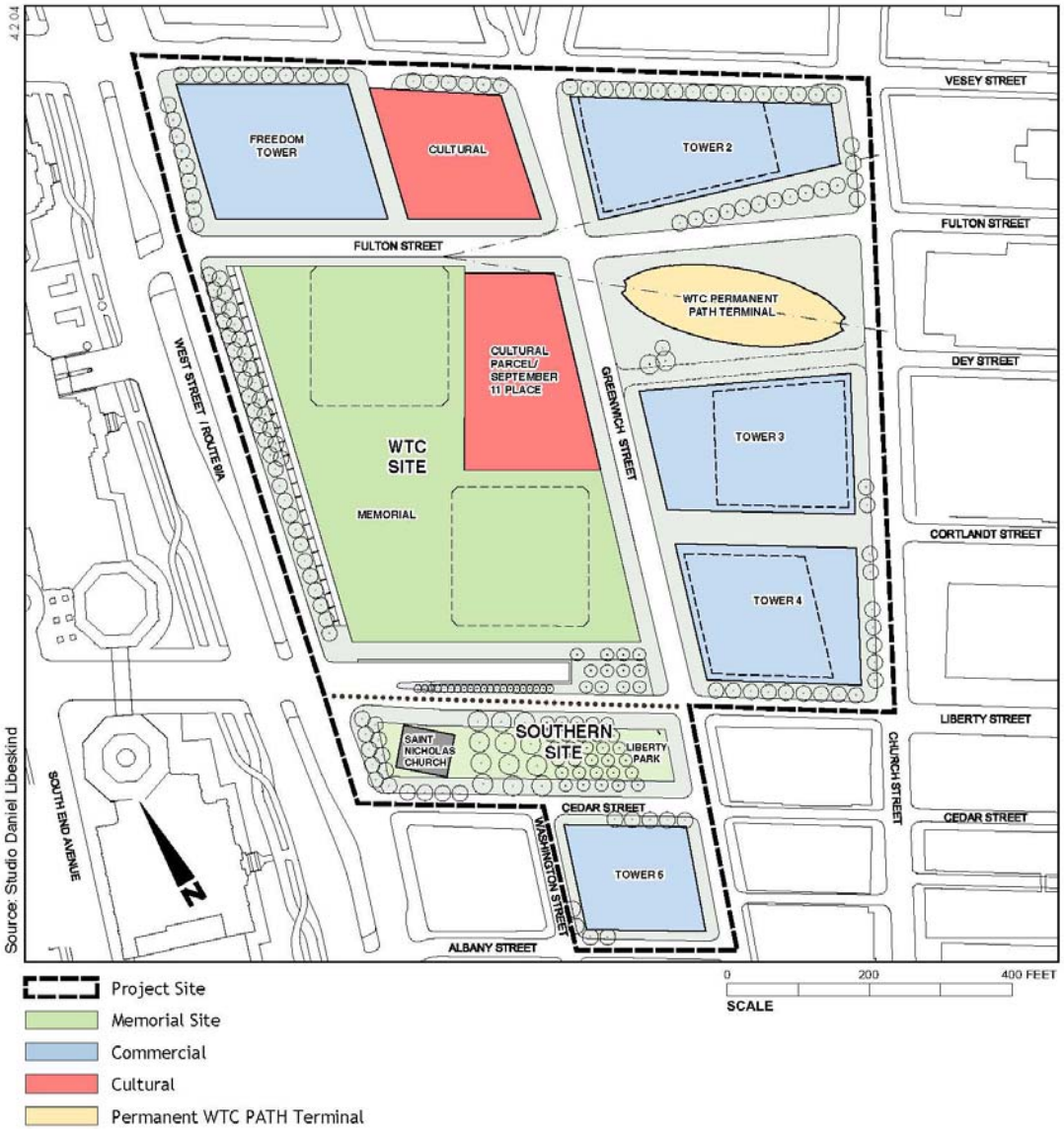
The LMDC-sponsored *World Trade Center Memorial and Redevelopment Plan FGEIS* was issued in 2004. The building program analyzed in the FGEIS, referred to as the Master Plan, included construction that was anticipated to occur across the entire 16-acre site, including: the National September 11th Memorial and Museum, cultural facilities, up to 10 million gross square feet (gsf) of Class A office space, plus associated non-office space such as storage, mechanical, loading, and subgrade parking, up to 1 million gsf of retail space, a hotel with up to 800 rooms and up to 15,000 gsf of conference space, open space areas, and infrastructure improvements (see **Figure 1-4** for the 2004 WTC Site Plan). This FGEIS evaluated a site plan and street configuration that proposed to restore vehicular access through the WTC site both from north to south and from east to west.

The overall site plan considered in the 2004 FGEIS also accounted for infrastructure and utilities to support the proposed building program. Traffic circulation was proposed to flow south on Greenwich Street and West Broadway from Tribeca to the area south of Liberty Street. Vehicular traffic was proposed to flow west on Fulton Street. Whereas the 2004 FGEIS indicated that all traffic would typically flow through the site in an unrestricted manner, the report also acknowledged that these streets might be restricted or closed from time to time, but did not specify the circumstances for such closures or restrictions (Section 1.5.4). Additionally, the FGEIS mentioned that public safety and law enforcement agencies such as the NYPD and Fire Department would be consulted to develop detailed security plans and systems for all areas of the WTC Campus. However, no specific measures that were considered for implementation are specified in the 2004 FGEIS for security reasons.

Traffic flow along Cedar Street was proposed to flow west. Washington Street was proposed to be eliminated north of Cedar Street, which would have required vehicles traveling north on Washington Street to turn left on Cedar Street to access West Street/Route 9A.

Access to the on-site parking facility for buses, trucks, and automobiles was proposed along the north side of Liberty Street, with access only available from the west via West Street/Route 9A. Alternatively, automobiles could access and exit the on-site parking garage via a ramp on the south side of Vesey Street at Washington Street. Under the original plan, all vehicles would have exited the site via the Liberty Street or Vesey Street ramps, or via an exit ramp onto the northbound West Street/Route 9A median.

Figure 1-4
2004 WTC Site Plan



Source: LMDC.
Available online: *http://www.renewnyc.com/content/pdfs/eis/04-12-2004/vol1/01%20Project%20Description.pdf*

2005 Environmental Assessment for Proposed Refinements to the Approved Plan

As LMDC worked with stakeholders and lessees to implement the Approved Plan for the WTC site, certain adjustments and refinements were made based on aesthetics, commercial viability, cost, and technical, security, and practical considerations. During December 2004, LMDC issued Generic Project Plan (GPP) Amendments to the Approved Plan for public review, with a public hearing in January 2005. LMDC then prepared an Environmental Assessment to evaluate whether previously approved mitigation measures would be adequate to support the proposed Amendments.

The Amendments relocated the entrance ramp for the underground parking and service network from the north side of Liberty Street to the south side of Liberty Street. Operation of Liberty Street was also modified from the originally proposed one-way eastbound flow to two-way operation between West Street/Route 9A and Church Street. Reconfiguration of below-grade space resulted in the reduction of bus parking capacity from 100 to approximately 67 parking spaces and enlargement of the WTC bathtub area to accommodate turning movements.

Under the updated 2005 plan, all vehicles would access the on-site garage via Liberty Street. All vehicles would exit the parking garage via eastbound Liberty Street as no vehicles would be permitted to turn left out of the VSC toward West Street/Route 9A. Automobiles would also be permitted to exit onto Cedar Street under this amended plan.

Liberty Park was redesigned to provide additional clearance by raising certain areas by 20 to 30 feet. The Amendments would result in a larger Liberty Park as well as the relocation of St. Nicholas Church from the western to the eastern portion of the park.

Other modifications were proposed as a result of the amended plan, including: the possible creation of a cul-de-sac aligned with Cedar Street immediately to the north of Tower 5; shifting up to 300,000 gsf of office space from Tower 5 to other towers on the WTC site; relocation of vehicular elevators for the subgrade parking area from Vesey Street opposite Washington Street to a location east of Washington Street within the PAC building; and increased open spaces as a result of plan refinements.

Subsequent Plan Refinements

In 2005, former Governor George Pataki established a taskforce to develop a security plan for the WTC Campus. The taskforce, which included experts on the federal, state, and local level, was convened to recommend strategies to protect the WTC Campus from future threats.

Following the 2005 plan amendments, stakeholders continued to coordinate to develop the master plan for the WTC site. One major development was the redesign of 1 WTC (the Freedom Tower) to increase building security. A second major development was that PANYNJ would be responsible for development of the VSC. The primary design change to the VSC during this time was the use of a single ramp structure to accommodate all vehicle types.

In September 2006, LMDC issued a Negative Declaration and Finding of No Significant Impact for the World Trade Center Memorial and Redevelopment Plan Environmental Assessment for Further Refinements to the Approved Plan (2006 EA). The 2006 EA evaluated various changes to the WTC Memorial and changes in the construction phasing for the planned on-site office towers. The VSC was included as part of the baseline condition for the 2006 EA.

In November 2006, a comprehensive set of agreements were established that outlined the City's rights and obligations to, and real property interests in, the WTC Site. This document detailed agreements on the

following types of issues: real property rights, land swaps, insurance deals, ownership of streets and sidewalks, construction methodology and sequencing, site operations and maintenance, dispute resolution, disposition of tie-back easements, permanent subsurface easements at buildings around the site, design guidelines for the commercial towers, vertical gores, liberty bond financing, etc.

This current EIS provides a description of the proposed security measures and evaluates the potential for the Proposed Action to result in significant adverse environmental impacts.

WTC Campus Development Program

Construction of the various components of the WTC development is expected to occur irrespective of the Campus Security Plan. However, as the current WTC development program differs from the program assumed in the 2004 FGEIS, descriptions of both plans are provided herein. As shown in **Table 1-1**, the development program contemplated under the 2004 Master Plan provided for the construction of a Memorial and Museum Pavilion, up to 10 million square feet of office space, up to 1 million square feet of retail space, a hotel with up to 800 rooms and up to 150,000 square feet of conference space, a 2,200-seat performance space, up to 240,000 square feet of cultural facilities; up to 290,000 square feet dedicated to the Memorial Center, up to 30,000 square feet of restaurant/café uses, and a 1,200 to 1,400-car underground parking garage. Also present on the project site was the permanent WTC terminal for PATH trains to New Jersey. Additionally, a VSC accessed from Liberty Street was included as part of the program for screening of all vehicles that sought access into the below grade parking garage loading areas.

Table 1-1
Comparison of Current WTC Development Program with 2004 FGEIS

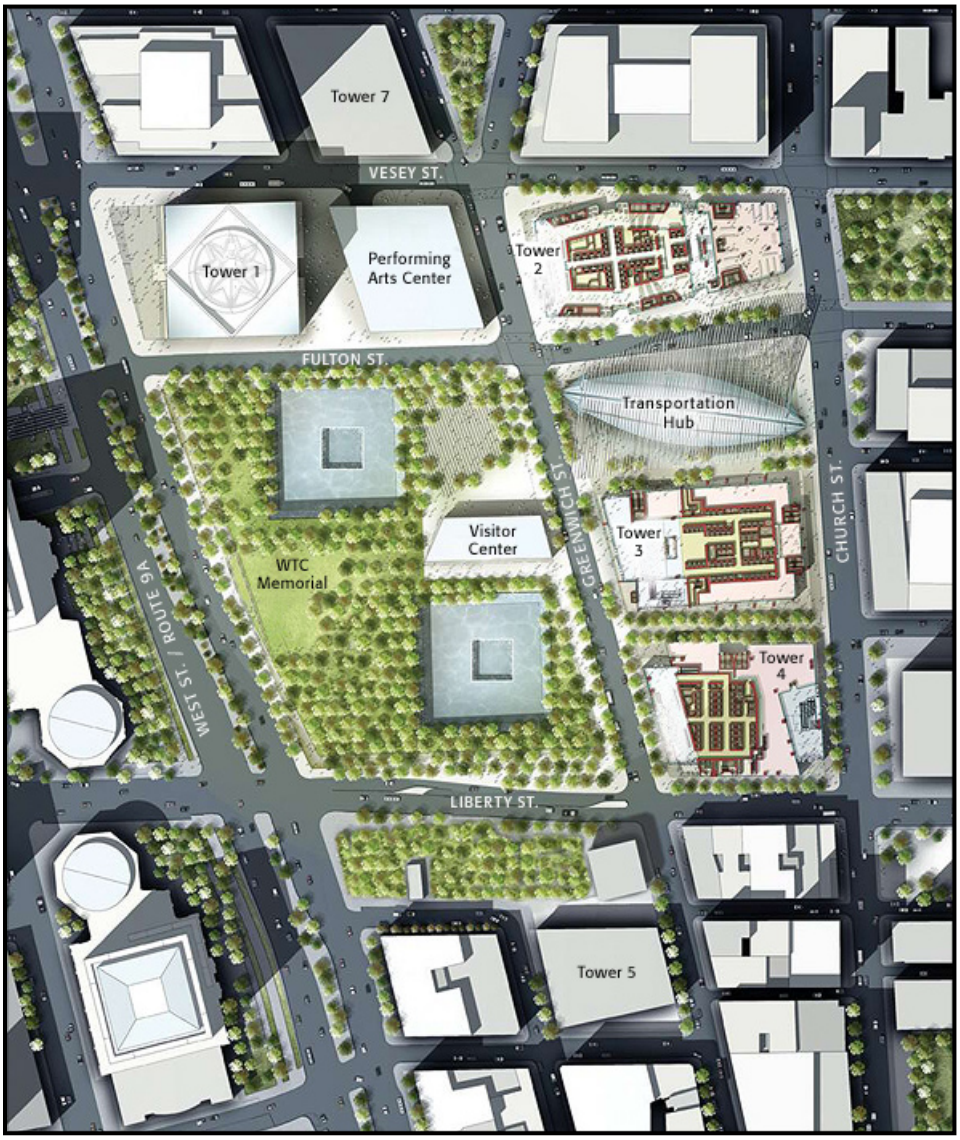
Project Component	2004 FGEIS Program (2015 Build Year)	Current Estimated Program	Net Change
Office	10 million sf	8.5 million sf	-1.5 million sf
Retail	1 million sf	441,000 sf	-559,000 sf
Hotel/Conference Space	800 rooms/150,000 sf	0 rooms/0 sf	-800 rooms/150,000 sf
Performing Arts Center	2,200 seats	1,000 seats	-1,200 seats
Memorial Center	290,000 sf	290,000 sf	0
Cultural Facilities	240,000 sf	0 sf	-240,000 sf
Restaurant/Café Uses	30,000 sf	14,000 sf	-16,000 sf
Garage	1,200-1,400 spaces	+/-500 spaces	Approx. 700-900 spaces
Notes: Memorial included in both programs.			

The current program for the WTC Campus includes the National September 11th Memorial and Museum, approximately 8.5 million square feet of office space, approximately 441,000 square feet of retail space, no hotel rooms or conference space, a 1,000-seat performance space, an approximately 290,000 square-foot Memorial Center, approximately 14,000 square feet of restaurant/café uses, and an underground parking garage consisting of up to approximately 500 parking spaces for autos and 67 bus parking spaces. The WTC terminal for PATH trains to New Jersey is present in both versions of the plan. Additionally, the VSC would remain as part of the program for screening of all vehicles that seek access into the below grade parking garage loading areas.

Site Plan and Vehicular Circulation

The proposed street configuration under the 2004 Master Plan included extending Fulton Street east-west through the site and Greenwich Street north-south through the site. Fulton Street would operate one-way westbound and Greenwich Street would operate one-way southbound, and it was understood that both streets might be restricted or closed to traffic from time to time. The area to the south of the WTC site would be reconfigured to open Cedar Street between Greenwich and Washington Streets and close Washington Street between Liberty and Cedar Streets (see **Figure 1-5**). Cedar Street would operate one-way westbound, with all traffic northbound on Washington Street turning left onto Cedar Street to West Street/Route 9A.

Figure 1-5
2004 WTC Master Plan



Source:
Silverstein Properties. Available online: *http://www.panynj.gov/wtcprogress/wtc-site-plan.html*

As shown in **Figure 1-5**, the extensions of Fulton and Greenwich Streets would divide the project site into four quadrants. It was planned that the Memorial, Museum Pavilion and cultural buildings would

occupy the southwest quadrant, while the tallest of five proposed towers (1 WTC) and cultural space would occupy the northwest quadrant. Three additional towers and the PATH Terminal would occupy the two eastern quadrants while the fifth tower would be located at the south end of the site between Albany, Washington, Cedar and Greenwich Streets.

Under the 2004 Master Plan, it was assumed that tour buses would stop to discharge and pick up passengers along the west side of Greenwich Street, and that these buses would be parked in a below-grade parking area, which would be accessed at the VSC via a ramp on Liberty Street east of West Street/Route 9A. Trucks en route to below-grade service levels on the WTC site were also assumed to enter at the VSC via this ramp, while autos belonging to building tenants would be allowed to enter and exit the 1,200-to-1,400-space below-grade parking areas via a ramp on the south side of Vesey Street at Washington Street. All vehicle types could exit the on-site service and parking areas via the Liberty Street or Vesey Street ramps, or via an exit ramp onto the northbound West Street/Route 9A median. Subsequent plans for the WTC Campus have resulted in Liberty Street as the primary access to and from the VSC with the West Street/Route 9A exit eliminated.

Current World Trade Center Site Development Program

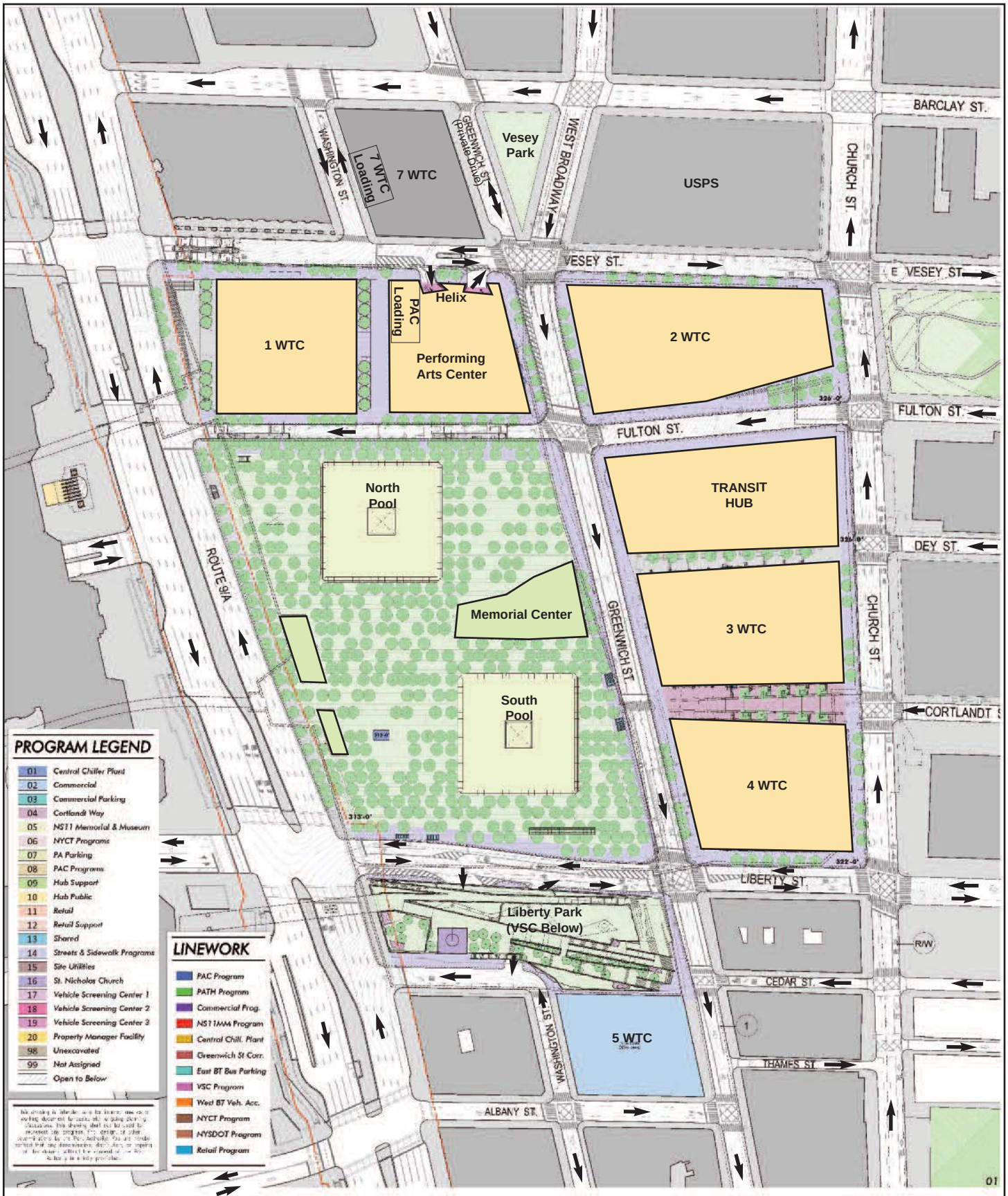
As described above, the development program for the WTC site has evolved since the 2004 FGEIS was released. Numerous factors, including the financing of the entire building program as described in the 2004 FGEIS, the current conditions of the financial market, and the process of finding tenants for the proposed office and retail space, have resulted in modifications to the building program that was originally considered. As shown in **Table 1-1**, the incremental difference between the 2004 FGEIS program and the building program that is currently being considered is a reduction of over 2 million square feet. As indicated in the table above, the hotel that was originally considered for the site has been eliminated from the building program. Additionally, the capacity of the PAC has been reduced from 2,200 seats under the plan analyzed in the 2004 FGEIS to approximately 1,000 seats. Other than the PAC and the memorial, no additional square footage is currently being planned for cultural uses.

Operational controls such as bus reservations and the scheduling of deliveries are expected to be implemented by PANYNJ in conjunction with the VSC under the No-Action condition. Bus loading could take place adjacent to the National September 11th Memorial and Museum along the east side of West Street/Route 9A, along the north side of Liberty Street, or along the west side of Greenwich Street.

Additionally, subsequent to the 2005 redesign of 1 WTC it was determined that no unscreened vehicles could be permitted to access Fulton and Vesey Streets immediately adjacent to 1 WTC as a measure to enhance security at-grade. As shown in **Figure 1-6**, PANYNJ Master Plan Version 10.0 incorporates sally ports along Fulton and Vesey Streets which would result in the management of traffic flow adjacent to 1 WTC. Therefore, this EIS considers Fulton and Vesey Streets managed streets under No-Action conditions as these streets would be controlled-access streets irrespective of the Proposed Action. As described above, this is one of the many changes to the WTC site redevelopment plan that have occurred since the 2004 FGEIS was published and which are reflected in this EIS.

E. DESCRIPTION OF PROPOSED ACTION

The Proposed Action would control vehicular access to and traffic movement within the WTC Campus. This would be accomplished through the creation of a secure perimeter around the WTC Campus that is intended to prevent unscreened vehicles from driving within close proximity to the National September 11th Memorial plaza and the museum building, commercial towers, and transportation facilities located within the WTC Campus. Therefore, selected portions of streets in and around the WTC Campus are


BARCLAY ST.
WASHINGTON ST.
7 WTC Loading
7 WTC
GREENWICH ST. (Private Drive)
Vesey Park
WEST BROADWAY
USPS
CHURCH ST.
VESEY ST.
E VESEY ST.
Helix
PAC Loading
1 WTC
Performing Arts Center
2 WTC
FULTON ST.
North Pool
TRANSIT HUB
DEY ST.
ROUTE 9A
Memorial Center
GREENWICH ST.
3 WTC
CHURCH ST.
South Pool
CORTLANDT S
4 WTC
LIBERTY ST.
Liberty Park (VSC Below)
R/W
CEDAR ST.
5 WTC
WASHINGTON ST.
THAMES ST.
ALBANY ST.
PROGRAM LEGEND
01 Central Chiller Plant
02 Commercial
03 Commercial Parking
04 Cortlandt Way
05 NST1 Memorial & Museum
06 NYCT Programs
07 PA Parking
08 PAC Programs
09 Hub Support
10 Hub Public
11 Retail
12 Retail Support
13 Shared
14 Streets & Sidewalk Programs
15 Site Utilities
16 St. Nicholas Church
17 Vehicle Screening Center 1
18 Vehicle Screening Center 2
19 Vehicle Screening Center 3
20 Property Manager Facility
98 Unexcavated
99 Not Assigned
Open to Below
LINEWORK
PAC Program
PATH Program
Commercial Prog.
NST1MM Program
Central Chill. Plant
Greenwich St Corr.
East BT Bus Parking
VSC Program
West BT Veh. Acc.
NYCT Program
NYSDOT Program
Retail Program
General Program Coordination Drawings - Version 10.0
THE PORT AUTHORITY OF NY & NJ
WTC Construction
Overall Ground Plan
October 1, 2010
0' 50' 100' 200'

proposed to be restricted access streets that would be closed to general vehicular traffic. No restrictions or controls would be implemented on pedestrians as a result of the Proposed Action. Implementation of the Proposed Action would involve installation and utilization of security infrastructure in the immediate vicinity of the WTC Campus. Vehicles destined for the WTC site seeking entry onto these streets would be subject to credentialing to determine whether entry to the WTC Campus should be permitted, and then screening to confirm that these vehicles pose no threat. The Proposed Action would not alter the building program that is currently planned for the site. Instead, the Proposed Action would manage vehicular traffic to and through the site.

Figure 1-2 shows a conceptual plan developed by the NYPD for the design and location of the security infrastructure that would be installed under the Proposed Action. The Project Area includes all streets and sidewalks that would be directly affected by the installation of this security infrastructure. As shown in **Figure 1-2**, the Project Area is generally bounded by Barclay Street and Park Place on the north, Albany Street on the south, Trinity Place/Church Street on the east and West Street/Route 9A on the west. The perimeter of the WTC Campus would be secured through the installation of various types of vehicle interdiction devices under the control of the NYPD. These could include static and operable barriers and traffic lane delineators. Screening of all vehicles entering the WTC Campus would utilize both mechanical and manual processes, and would be facilitated through the use of sally ports which, as described previously, would consist of a personnel booth controlling a set of two operable barriers with sufficient space between them to accommodate a motor vehicle undergoing screening. An additional booth would be installed at each credentialing location. It is anticipated that the sizes and locations of the booths and any ancillary structures will be refined as project design advances.

The Proposed Action would modify the vehicular access and traffic flow patterns considered in the 2004 WTC Memorial and Redevelopment Plan FGEIS. As shown in **Figure 1-2**, a secure zone is proposed to provide limited vehicular access on the following streets:

- Greenwich Street from Vesey Street to Cedar Street;
- West Broadway from Barclay Street to Vesey Street;
- Washington Street from Barclay Street to Vesey Street;
- Vesey Street from Church Street to West Street/Route 9A;
- Fulton Street from Church Street to West Street/Route 9A; and,
- Liberty Street from Trinity Place/Church Street to West Street/Route 9A.

Additionally, the Trinity Place/Church Street corridor[2] would be divided by a raised median with a static barrier, from Cedar Street to just north of Vesey Street. It is anticipated that to the east of the median the street would remain open to general traffic with three northbound moving lanes, while one additional moving lane to the west of the median would be located within the security perimeter and would be accessible only to screened vehicles.

As indicated above, PANYNJ Master Plan Version 10.0 intends to create a secure zone around 1 WTC by securing and restricting access to Vesey Street and Fulton Street between Greenwich Street and West Street/Route 9A. As such, these street segments would be managed streets irrespective of the Proposed Action. Additionally, it is expected that Greenwich Street from Barclay Street to Vesey Street would continue to be limited for use only by 7 WTC tenants in the No-Action condition (as outlined in a December 5, 2007 reciprocal easement agreement among the City of New York, 7 WTC ownership,

[2] Trinity Place becomes Church Street north of Liberty Street.

PANYNJ and LMDC); therefore, this section of Greenwich Street would be a controlled access street irrespective of the Proposed Action.

All vehicles seeking access to the WTC Campus would be subject to screening and vehicle operators would be required to provide credentials prior to being granted access to the interior of the WTC site. Credentialing zones are proposed at the following locations (refer to **Figure 1-2**):

- On West Broadway between Barclay Street and Park Place;
- On Barclay Street in the southern-most lane at the westbound approach to West Broadway;
- On Barclay Street in the southern-most lane at the westbound approach to Washington Street;
- On Trinity Place in the western-most lane at the northbound approach to Thames Street and Cedar Street;
- On West Street/Route 9A in the eastern-most lane at the northbound approach to Liberty Street; and,
- On West Street/Route 9A in the two southbound left turn lanes at the southbound approach to Liberty Street.

The proposed security sequence for entries consists of three zones: approach zones, credentialing and authorization zones, and screening zones. Approach areas would vary in size, detail and security elements installed depending on the anticipated vehicle volumes and the roadway geometry leading to the security station. It is expected that new signage would be installed to alert vehicles that they are approaching a secure zone and, where possible, to re-direct traffic that does not need to be credentialed.

TAP would allow for expedited vehicle entry into the secure zone. While specific operational details of the TAP program cannot be released for security purposes, a brief overview of the program is provided here. Enrollment in the TAP program would be open to:

- WTC office tenants with parking privileges on site;
- For-hire vehicle operators;
- Delivery vehicle operators; and,
- Residents and owners of businesses located in non-WTC buildings within the secure zone (on Liberty Street between Trinity Place and Greenwich Street).

Both drivers and vehicles would be enrolled in the TAP. TAP credentials would be checked as vehicles approach entry points to the WTC Campus, and authorized vehicles would then be admitted to a sally port for expedited security screening. Drivers and vehicles with business at the WTC site, but not enrolled in the TAP, would be permitted into the WTC Campus; however, these drivers and vehicles would be subject to more rigorous credentialing and screening. This arrangement would help to facilitate access for those who seek entry. Vehicles without the proper credentials would be denied entry per NYPD policy.

It is expected that when the security zone is first implemented, some vehicle operators without proper credentials may unknowingly attempt to enter the WTC Campus. However, after the program has been active for a short time there would likely be fewer attempts to enter the campus without proper credentials.

Screening would include the visual and physical inspection of vehicles. The physical design of screening areas would vary slightly, depending on the anticipated primary users of each specific screening zone. For example, screening areas that are expected to have high bus or delivery vehicle volumes would be sized to

fit these vehicle types, with larger sally ports. Personnel booths at each sally port would house barrier controls, data systems and other equipment. They will be designed to meet these operational requirements while having the smallest possible footprint to minimize potential pedestrian conflicts.

Screening procedures for individuals and vehicles enrolled in the TAP program would differ from screening procedures for non-TAP individuals and vehicles. Overall screening times for vehicles enrolled in TAP and for non-TAP vehicles are described in Chapter 8, "Transportation." As described in Chapter 8, screening time for non-TAP vehicles is longer than TAP screening as it is more extensive and requires additional manual and mechanical screening processes.

Exit-only security stations would manage all traffic exiting the WTC Campus. The dimensions of sally ports at exits would vary in size based on their location and the size of the primary vehicle type expected to use them.

The following describes the security infrastructure and traffic changes that would be implemented under the Proposed Action.

TRINITY PLACE/CHURCH STREET
The western-most lane at the Trinity Place approach to Liberty Street would be an entry-only sally port that would serve as the primary point of entry for tour buses en route to the National September 11th Memorial and Museum. Only buses with reservations to park on-site would be granted access. All others would be turned away in the credentialing zone. This policy would be strictly enforced.

The proposed credentialing and screening locations would be used as flexibly as possible to allow operational decisions to be made in the field so that inbound vehicle traffic could be distributed efficiently to all entry points. For example, during the morning peak period and after the PM peak period, POVs and for-hire vehicles would use this entrance to access the WTC Campus as tour bus activity during these time periods is expected to be very low.

Vehicles would approach the Trinity Place/Church Street entrance from the south. Credentialing zones associated with this entrance would be delineated in a single lane along the west curb south of Cedar and Thames Streets at the approach to Liberty Street. A personnel booth is proposed on the western sidewalk of Trinity Place/Church Street, just north of Thames Street near the front of the credentialing lane. As the proposed placement of the credentialing booth along the sidewalk at this location would narrow the pedestrian zone, the sidewalk in this area has been analyzed in the pedestrian section of Chapter 8, "Transportation."

Entry to the secure lane would be available from a screening zone located on Trinity Place at Cedar Street. The screening zone would consist of a single northbound lane that would be approximately 15 feet wide and approximately 55 feet long. Operable barriers would be located at the northern and southern ends of the sally port.

A personnel booth is proposed on the western sidewalk of Trinity Place adjacent to the sally port. Placement of the booth on the western side of Trinity Place would reduce the pedestrian space to just under 12 feet. Bollards are proposed between the curb and the building wall on the western sidewalk adjacent to the personnel booth. Bollards would be spaced four feet apart to allow adequate space for pedestrian flow, but also to serve as effective vehicle interdiction devices.

As shown in **Figure 1-2**, the Trinity Place/Church Street corridor would be divided by a raised median with fixed barriers (possibly bollards), from Cedar Street to just north of Vesey Street. A four-foot-wide north-south median would separate the two sections of Trinity Place/Church Street. It is anticipated that to

the east of the median the street would remain open to general traffic with three northbound moving lanes, while the one moving lane of approximately 11 feet to the west of the median would be located within the security perimeter and would be accessible only to screened vehicles as a circulating roadway. Additionally, this median would include an operable barrier across Liberty Street. This barrier would be used to provide emergency egress by fire trucks stationed at the Ten House within the WTC Campus.

A second sally port would be located on Church Street at the northern end of the WTC Campus, just north of Vesey Street. This sally port would serve as an egress point for all vehicle types exiting onto northbound Church Street from the secure lanes located within the WTC Campus. The exit would be comprised of a single 16-foot-wide lane with a 55-foot-long sally port. The western sidewalk at this location would be extended to the east by a width of approximately eight feet and would extend approximately 125 feet to the north to accommodate a personnel booth to be staffed by NYPD. The sidewalk extension would allow for the entire width of the existing sidewalk to be maintained at approximately 16 feet wide. Bollards are proposed between the curb and the U.S. Post Office building's streetwall on the western sidewalk adjacent to the screening booth. Bollards would be spaced four feet apart to allow adequate space for pedestrian flow, but also to serve as effective vehicle interdiction devices.

While pedestrian crosswalks in the vicinity of these security elements would be unimpeded by operable security elements, bollards would be spaced at four-foot intervals to allow pedestrian flow through at all crossings. All operable security devices would be set back from crosswalks to maintain the pedestrian zone. Within the Liberty Street intersection, operable barriers would replace the static barriers to allow emergency vehicle access when necessary.

WEST BROADWAY

Southbound West Broadway at Vesey Street would function as an entrance to the WTC Campus for for-hire vehicles and POVs arriving from the north for southbound access into the site. While all vehicles with business in the WTC Campus would be granted access, vehicles registered in the TAP would have expedited entry, while non-TAP vehicles would have to undergo more rigorous credentialing and screening. All other vehicles would be turned away if proper credentials are not provided in the credentialing zone. This policy would be strictly enforced.

Vehicles would approach the West Broadway entrance from the north and the east. The credentialing/authorization zones associated with this entrance would be delineated in two locations: the two eastern-most lanes on West Broadway north of Barclay Street and a single lane on the southern curb of Barclay Street at the approach to West Broadway. One personnel booth associated with credentialing/authorization would be located on the eastern sidewalk of West Broadway, just north of Barclay Street; the second personnel booth associated with credentialing/authorization would be located on the southern sidewalk of Barclay Street, just east of West Broadway. Street signs would be placed on the road leading up to the credentialing zones to inform drivers of the upcoming secure zone as they approach the credentialing zones. As the placement of the personnel booths at two sidewalk locations adjacent to the credentialing/authorization lanes would narrow the pedestrian zones, a pedestrian analysis is provided for these areas in Chapter 8, "Transportation." Due to the street geometry at these locations, sidewalk extensions would not be possible.

Entry to the secure zone would be available from a screening zone located on West Broadway at the approach to Vesey Street. The screening zone would consist of two side-by-side southbound lanes that would each be approximately 11 feet wide. Therefore, this entry point would facilitate access of multiple vehicles simultaneously entering the WTC Campus. The screening zone would consist of two 55-foot-long sally ports, separated by static barriers. Operable barriers would be located at the northern and southern ends of the sally ports to provide ingress and egress.

Bollards would be used to delineate a single travel lane along the east curb adjacent to the sally port but outside of the secure perimeter in order to maintain access to the adjacent loading and service area for the U.S. Post Office building (the width of this lane varies from approximately 11 feet closer to Barclay Street to approximately 15 feet wide). Postal vehicles would enter the building at the south end of the block and utilize an internal roadway to exit the facility onto West Broadway near Barclay Street.

The personnel booth associated with the West Broadway entrance would be located on the eastern sidewalk of West Broadway adjacent to and south of the U.S. Post Office exit. As a 10-foot-wide by approximately 65-foot-long sidewalk extension is planned at this location to accommodate the inspection booth, the sidewalk width would be maintained at over 16 feet. Bollards are proposed around Vesey Park and at the southern limit of the U.S. Post Office access to ensure that no vehicles are able to bypass the screening zone. Bollards proposed to cross the sidewalk from the edge of the curb to the building wall at the northeast corner of Vesey Street and West Broadway would be spaced four feet apart to allow adequate space for pedestrian flow, but to also effectively serve as vehicle interdiction devices.

Crosswalks on West Broadway, Barclay Street, and Vesey Street in the vicinity of these proposed credentialing and screening zones would be unimpeded by security elements. All operable security devices would be set back from crosswalks to maintain an unobstructed pedestrian zone.

GREENWICH STREET

It is anticipated that Greenwich Street from Barclay Street to Vesey Street would be limited for use only by 7 WTC tenants under future conditions (as outlined in a December 5, 2007 reciprocal easement agreement among the City of New York, 7 WTC ownership, PANYNJ and LMDC); therefore, this section of Greenwich Street would be a controlled-access street irrespective of the Proposed Action and would be closed to through traffic. The installation of operable vehicle barriers near the Vesey Street intersection would permit the use of this block for vehicle entry to the WTC campus in emergency situations when other entrances may be unusable. It is possible that operable barriers may also be installed on Greenwich Street near Barclay Street at the northern end of the block. Operable barriers at the north end of the block (default down) and the south end of the block (default up) would allow vehicular access to the adjacent 7 WTC building, but not into the secure zone. As noted above, the West Broadway entrance would provide the primary access to the segment of southbound Greenwich Street traversing the WTC site.

At the south end of the WTC Campus, a sally port would be located on Greenwich Street approaching Cedar Street to provide egress for fire trucks stationed at the adjacent "Ten House" fire station on the south side of Liberty Street between Greenwich Street and Trinity Place/Church Street as well as for POVs and for-hire vehicles seeking access to the Greenwich South neighborhood and other local destinations.

Vehicles exiting the WTC Campus would approach the one-lane sally port from the north. The lane would be approximately 22 feet wide and the overall length of the sally port would be approximately 35 feet. The personnel booth would be located on a western sidewalk extension that would run the length of the block from Liberty Street to Cedar Street (approximately 15 feet wide by 160 feet long). This extension would allow an approximately 23-foot-wide clear zone for pedestrian circulation.

Bollards would be installed on the sidewalks adjacent to the operable barriers proposed within the street; on the eastern sidewalk they would extend to the building streetwall and on the western sidewalk they would extend the width of the sidewalk extension and intersect with the bollard line that is planned in conjunction with the No-Action streetscape plan.

WASHINGTON STREET

The screening zone at Washington Street between Barclay and Vesey Streets would serve as an entrance and exit point for oversized trucks en route to and from the PAC at-grade loading dock on Vesey Street and as a secondary entrance for other vehicles seeking to enter the WTC Campus. Delivery and service vehicles would also continue to use Washington Street to access the 7 WTC loading dock. Access to the PAC at-grade loading dock would only be required infrequently as most PAC deliveries would use below grade loading docks via the VSC.

The credentialing zone proposed in conjunction with the Washington Street screening zone would be delineated in a single lane along the south curb of Barclay Street, east of Washington Street. A personnel booth would be located on the southern sidewalk of Barclay Street, just east of Washington Street, near the front of the credentialing lane. As placement of the personnel booth along the sidewalk would narrow the pedestrian zone to slightly more than seven feet, this location was analyzed in the pedestrian section of Chapter 8, "Transportation." Street signs would be placed on the road leading up to the credentialing zone to inform drivers of the upcoming secure zone as they approach the credentialing zone.

The Washington Street screening zone would consist of a southbound lane the full length of the roadway that would be approximately 163 feet long in order to accommodate the oversized vehicles that would deliver to the PAC. Operable barriers would be located at the northern and southern ends of the sally port.

A personnel booth would be located along the eastern side of Washington Street at the entrance to the sally port. The placement of the personnel booth on the eastern sidewalk would narrow the pedestrian zone to a width of approximately seven feet in the area immediately adjacent to the personnel booth. Based on field observations, this block is not heavily used by pedestrians.

Additional sidewalk elements would include fixed bollards, placed adjacent to the access and denial barriers (operable barriers at either end of the sally port) at four-foot intervals between the curb and the building wall on both the eastern and western sidewalks. Stop and signaling poles (includes lighting and stop and go signals for vehicles in the sally port) would be located at the northern end of the sally port, on both sidewalks as well. At the southern barrier, a light and equipment pole would be placed on both sides of the sally port.

While the With-Action Scenario would introduce new elements to the streetscape, it is important to note that the current site plan and vehicle circulation system for the WTC site incorporates security measures associated with the 2005 redesign of 1 WTC. Under these measures, both Vesey Street and Fulton Street would function as "managed streets" west of Greenwich Street. This would be achieved through the installation of operable barriers and sally ports on Vesey, Fulton and Washington Streets to restrict vehicular access. As such, there would only be a minor incremental change in the appearance of the intersection of Washington and Vesey Streets.

VESEY STREET

The portion of Vesey Street that would be located within the WTC Campus extends from Church Street on the east to West Street/Route 9A to the west. As shown in **Figure 1-2**, the block of Vesey Street from Church Street to West Broadway would be converted from eastbound to westbound operation under the Proposed Action. Vesey Street would operate two-way between Greenwich and Washington Streets and one-way westbound between Washington Street and West Street/Route 9A. Vesey Street would remain one-way eastbound east of Church Street and vehicles would not be able to travel from the managed corridor on the west side of Church Street onto eastbound Vesey Street due to the proposed configuration of Church Street which would include a raised median that would separate an inner secure lane from the rest of northbound Church Street.

Vesey Street at West Street/Route 9A would consist of a two-lane exit to West Street/Route 9A (northbound and southbound) for all vehicles exiting the WTC Campus. An approximately 35-foot-long sally port is proposed at this location. The sally port would be approximately 24 feet wide, accommodating two-lanes of westbound exiting vehicles. The sally port would be operated from a personnel booth located on an extended portion of the northern sidewalk in the area adjacent to the sally port. The proposed sidewalk extension would allow the sidewalk to be maintained for unobstructed pedestrian flow.

Fixed bollards would be installed across the sidewalk at both ends of the sally port. These bollards would be placed at four-foot intervals, from the southern edge of the sidewalk extension north across the sidewalk where they would end adjacent to the existing building.

The proposed sidewalk extension would be approximately eight feet wide and it would run the entire length of the proposed sally port. Placement of the personnel booth on the sidewalk extension would allow for the minimum impact on pedestrian use of the sidewalk in this area. As detailed in Chapter 8, "Transportation," the sidewalk extension would maintain the existing sidewalk width for pedestrian circulation on the northern sidewalk. Further, the security elements would be set back from West Street/Route 9A to ensure free-flow of pedestrians in the crosswalk.

While the With-Action Scenario would introduce new elements to the streetscape, it is important to note that the current site plan and vehicle circulation system for the WTC site incorporates security measures associated with the 2005 redesign of 1 WTC. Under these measures, Vesey Street would function as a "managed street" west of Greenwich Street. This would be achieved through the installation of operable barriers and sally ports on Vesey and Washington Streets to restrict unscreened vehicular access adjacent to 1 WTC. As such, there would only be a minor incremental change in the appearance of Vesey Street as a result of the Proposed Action.

FULTON STREET

The portion of Fulton Street that would be located within the WTC Campus extends from Church Street on the east to West Street/Route 9A to the west. Under the Proposed Action, the block of Fulton Street between Greenwich and Church Streets would be converted from one-way westbound to one-way eastbound operation to facilitate drop-off and pick-up activity at the adjacent 2 WTC and the Transit Hub. The segment of Fulton Street west of Greenwich Street would remain one-way westbound as would Fulton Street east of Church Street (outside of the proposed secure zone). There would be no vehicular access on Fulton Street across the raised median and static barriers that would be installed along Church Street between Vesey Street and Cedar Street, although pedestrian access would be maintained.

A 35-foot-long, 15-foot-wide sally port is proposed on Fulton Street at the westbound approach to West Street/Route 9A. It would consist of a single exit lane for vehicles exiting the WTC Campus. A sidewalk extension would be installed along the north side of the roadway for the length of the sally port to accommodate the personnel booth at this location. The sidewalk extension would allow for an approximately 25-foot-clear pedestrian zone on the adjacent sidewalk. Fixed bollards would be placed at four-foot intervals between the curb and the northern end of the sidewalk extension where they would intersect with the bollards planned at the perimeter of each block on the WTC Campus as part of the No-Action condition. The north-south pedestrian crossing on the east side of West Street/Route 9A would be located within the sally port so that the required stand-off distance from the western-most barrier to 1 WTC can be provided.

While the With-Action Scenario would introduce new elements to the streetscape, it is important to note that the No-Action site plan and vehicle circulation system for the WTC site similarly incorporates security measures associated with the 2005 redesign of 1 WTC. Under these measures, Fulton Street

would function as a "managed street" west of Greenwich Street. This would be achieved in the No-Action condition through the installation of operable barriers and sally ports on Fulton Street at West Street/Route 9A on the west and a point west of Greenwich Street on the east to restrict vehicular access (see **Figure 1-6**). As such, there would only be a minor incremental change in the appearance of the Fulton Street when comparing the No-Action and With-Action conditions.

LIBERTY STREET

The portion of Liberty Street that would be located within the WTC Campus extends from Church Street on the east to West Street/Route 9A to the west. As shown in **Figure 1-2**, under the Proposed Action two-way operation would continue on Liberty Street, and it would function as the primary point of access and egress for the VSC.

Two sets of sally ports would be installed on Liberty Street to the west of the VSC entrance in the With-Action scenario to accommodate entering and exiting vehicles. The secure access that would be constructed to the west of the VSC would consist of two approximately 11-foot-wide exit lanes and two approximately 11-foot-wide entry lanes. The entry from West Street/Route 9A would primarily serve POVs and various delivery and service vehicles entering the WTC Campus's parking areas by way of the VSC. The overall length of the entry and exit sally ports is planned to be approximately 55 feet long. The personnel booth would be located in Liberty Street between the inbound and outbound lanes.

Credentialing zones for the entry sally port would be located on West Street/Route 9A, north of Liberty Street for the two southbound left-only designated turning lanes and also south of Liberty Street in the eastern-most lane for vehicles that make the northbound right turn into the site. Vehicle screening would occur inside of the VSC. The personnel booth associated with the southbound credentialing zone would be located along West Street/Route 9A's central median, and the personnel booth associated with the northbound credentialing zone would be located on the eastern sidewalk, allowing a clear pedestrian zone of nearly 18 feet wide.

Liberty Street east of the VSC entrance and exit would accommodate two-way traffic flow, with two lanes of westbound traffic and one lane of eastbound traffic. An operable barrier would be installed across the eastbound and westbound lanes. This barrier would be in the default up position to prevent unauthorized vehicles from bypassing the VSC screening. A personnel booth would be located in the Liberty Street median between the eastbound and westbound lanes to control access at this location.

Vehicles already within the secure perimeter (tour buses, for example) would be able to enter the VSC from the east on Liberty Street. As indicated above, access to the VSC from the east would be through an operable barrier located immediately to the east of the VSC entrance/exit. Most vehicles departing the VSC would exit onto westbound Liberty Street to reach West Street/Route 9A. (A secondary exit would be provided on Cedar Street west of Washington Street to be used primarily in the event that a vehicle was allowed to enter Liberty Street in error from the credentialing zone on West Street/Route 9A.)

Another operable barrier would be located on Liberty Street in-line with the Church Street median. This barrier would be used to provide emergency egress from the WTC site for fire trucks stationed at the Ten House within the WTC Campus.

Under future conditions with the Proposed Action, it is anticipated that tour bus access would be similar to future conditions without the Proposed Action. It is anticipated that tour buses with passengers en route to the National September 11th Memorial and Museum and Tower 1 viewing platform would unload passengers along the north curb of Liberty Street west of Greenwich Street or along the west curb of Greenwich Street adjacent to the Memorial Center before proceeding to the VSC. Buses departing the VSC onto eastbound Liberty Street were assumed to loop north on Church Street and west on Fulton

Street (under No-Action conditions) or west on Vesey Street (under With-Action conditions) to reach potential loading locations along the west curb of Greenwich Street, the north curb of Liberty Street and possibly the east curb of northbound West Street/Route 9A north of Liberty Street.

CEDAR STREET
Under both the No-Action and With-Action conditions, Cedar Street would be eliminated between Greenwich and Washington Streets, with the segment to the west operating one-way westbound as an outlet to West Street/Route 9A for northbound Washington Street. As noted above, a secondary exit from the VSC would be provided on Cedar Street west of Washington Street to be used primarily in the event that a vehicle was allowed to enter Liberty Street in error from the credentialing zone on West Street/Route 9A. The segment of Cedar Street between Greenwich Street and Trinity Place would operate one-way westbound under the Proposed Action.

BARCLAY STREET
As noted above, under the Proposed Action two credentialing zones would be established along the south curb of Barclay Street. One would be located immediately to the east of the screening zone on West Broadway, and the second would be located immediately to the east of the screening zone on Washington Street.

Bus and Delivery/Service Vehicle Scheduling

Delivery vehicles en route to the WTC site would need to be scheduled and would undergo a credentialing check as they approach the VSC. It is anticipated that in the No-Action condition, some delivery vehicles would arrive unscheduled, and would be diverted to an off-site reconciliation area where they would wait until WTC staff could confirm their status before being allowed to return to the VSC. For traffic assignment purposes, it was assumed that when the WTC site initially becomes operational 15 percent of delivery vehicles arriving at the VSC in the No-Action condition would be unscheduled. These vehicles would be diverted out of the VSC via the secondary exit on Cedar Street, and it is assumed that they would use West Street/Route 9A to travel to an off-site reconciliation area located to the north of the WTC site. As people who make deliveries to the WTC site become more accustomed to the WTC delivery policies, it is anticipated that attempts to make unscheduled deliveries would become negligible over time. A more extensive system of security measures would be implemented under the Proposed Action. As vendors and delivery companies become accustomed to the more stringent security procedures, it is anticipated that there would be relatively few unscheduled deliveries in the With-Action condition. Any vehicles making an unscheduled delivery would not be permitted access to the WTC Campus or the VSC.

Credentialed vehicles, including tour buses, black cars, and delivery vehicles, would be permitted access into the Site. All private vehicles with reserved parking spaces and prior authorization to park on-site would access the VSC from the east or west via Liberty Street. In the With-Action condition, all tour buses en route to the National September 11th Memorial and Museum and 1 WTC observation deck would enter the WTC Campus via the security station on Trinity Place at Cedar Street, and it is expected that most if not all would unload along the north curb of Liberty Street west of Greenwich Street before proceeding to the VSC. Buses departing the VSC are assumed to pick up passengers at one of two locations: the west curb of Greenwich Street adjacent to the Memorial Plaza or the east curb of northbound West Street/Route 9A north of Liberty Street, similar to the No-Action condition.

As indicated above, it is anticipated that all deliveries will need to be scheduled as a result of policies implemented under No-Action conditions. Incoming delivery vehicles would be directed to the dedicated loading area for the appropriate building – through the VSC and below-grade road network, following screening.

Construction of the Proposed Action may require the relocation of utilities in some areas. The appropriate agencies or utility companies would be contacted prior to construction. Areas of potential utility conflicts would be identified. Utilities in these areas would either be relocated or alternate designs would be proposed to avoid conflicts.

F. FRAMEWORK FOR ANALYSIS

This EIS follows the customary approach to presenting an impact analysis under NEPA, SEQRA, and CEQR starting with a baseline of existing conditions in the relevant study areas and then forecasting those conditions forward to a time in the future that is appropriate for assessing project impacts. Future year conditions with and without the Proposed Action are then compared as a basis for presenting incremental change and identifying impacts. The reference point of conditions without the project is established by adjusting existing conditions to account for other known developments, policy initiatives, and trends that are expected to influence future conditions in the study area. This future condition without the project is then modified by overlaying the development and activity expected from the proposal under review to form a depiction of future conditions with the project in place. This comparison of future conditions with and without the project identifies the project impacts and the need, if any, for mitigation.

As stated above, the 2012 *CEQR Technical Manual* generally serves as a guide with respect to methodologies and impact criteria for evaluating the Proposed Action in this EIS. The analysis in each substantive area of impact assessment is consistent with federal, State and City requirements and guidelines, which are identified in each chapter as applicable.

The full range of environmental areas identified in the 2012 *CEQR Technical Manual* was considered. However, based on the guidelines in that document, it was determined that detailed analysis of the following environmental areas would not be necessary because the Proposed Action does not meet the criteria to warrant such analysis: open space, shadows, natural resources, water and sewer infrastructure, solid waste and sanitation services, and energy. This was documented in the Environmental Assessment Statement prepared for this project.

Although the National September 11th Memorial and Museum is located within the WTC Campus and Liberty Park will be constructed on the south side of Liberty Street east of West Street/Route 9A, the proposed security overlay would not prevent public access to these areas. Further, no significant new sources of noise, air pollutant emissions, odors, or shadows are anticipated immediately adjacent to open space areas as a direct result of the Proposed Action that would not be present under No-Action conditions, as described in detail in Chapter 9, “Air Quality” and Chapter 10, “Noise.” Finally, there would be no significant new residential or worker population that would potentially create new indirect effects on open spaces. Therefore, an open space analysis was not required.

As the proposed security plan would consist of a variety of low-scale elements, it would not cast new shadows on local open spaces or historic resources. As such, a shadows analysis is not required for either public open space or historic resources.

The Proposed Action is a physical and operations security infrastructure overlay that would be incorporated into the planned WTC streetscapes. The proposed security elements would be installed on City streets and sidewalks in a well-developed area of Lower Manhattan. No natural resources exist in the areas that would be used for the security elements. Therefore, no assessment of natural resources is warranted.

It was also determined that an analysis of water and sewer infrastructure, solid waste and sanitation services, and energy would not be necessary, as the Proposed Action would not introduce substantial new demands on these services. However, while the Proposed Action would not place new demands on local water and sewer infrastructure, the construction chapter provides an assessment of the Proposed Action's potential to affect existing water and sewer infrastructure as a result of construction activities.

Analysis Year

An EIS analyzes the effects of a Proposed Action on its environmental setting. Since typically a Proposed Action, if approved, would take place in the future, the action's environmental setting is not the current environment but the environment as it would exist at the proposed development's completion and occupancy, in the future. Therefore, future conditions must be projected. This projection is made for a particular year, generally known as the "analysis year" or "build year," which is the year when the action would be substantially operational. As previously described, the proposed WTC Campus Security Plan is expected to be completed and fully operational by 2019.

In the 2019 future without the Proposed Action, it is anticipated that the planned WTC street network would be completely constructed and accessible. It is expected that construction activities for various planned WTC developments will continue through 2019. As such, 2019 has been selected as the analysis year for the environmental analyses in the EIS. It is anticipated that the security measures associated with the Proposed Action would be implemented in phases through 2019, based on the need to accommodate construction activities at the WTC site, the progress of development and the security needs of the tenants as new buildings are completed and occupied. Prior to the installation of the permanent security measures, it is likely that some interim measures would be installed to provide security while construction of adjacent WTC buildings and on-site streets and infrastructure is on-going. The anticipated sequencing of the proposed security measures is described in Chapter 13, "Construction."

While some level of interim implementation of the security plan may occur, an interim analysis is not provided as the interim condition would not represent the reasonable worst case development scenario for the WTC Campus. Later phases of construction, including the completion of the PAC, 2 WTC tower and 3 WTC tower are expected to require lane closures to accommodate construction staging and related construction activities. It is expected that traffic circulation within the WTC Campus and along Church Street may be limited or restricted altogether at times. The construction of streets within the WTC Campus and the availability of interior and exterior streets due to construction activities will determine specific access routes during each phase of construction. Access routes may change during a particular phase as construction activity allows. Finally, as the WTC buildings would not be fully occupied, the interim condition does not represent the worst case in terms of travel demand. Therefore, the 2019 year of completion is assessed as the only analysis year; no additional interim conditions are evaluated.

Definition of Study Areas

For each technical area in which impacts may occur, a study area is defined for analysis. This is the geographic area likely to be affected by the proposed development for a given technical area, or the area in which impacts of that type could occur. Appropriate study areas differ depending on the type of impact being analyzed. It is anticipated that the direct principal effects of the proposed development would occur within close proximity to the boundaries of the proposed secure zone. The methods and study areas for addressing impacts are discussed in the individual technical analysis sections.

Defining Baseline Conditions

Existing Conditions

For each technical area being assessed in the EIS, the current conditions must first be described. The assessment of existing conditions establishes a baseline, not against which the Proposed Action is measured, but from which future conditions can be projected. The prediction of future conditions begins with an assessment of existing conditions because these can be measured and observed. Studies of existing conditions are generally selected for the reasonable worst-case conditions. For example, the times when the greatest number of new vehicular, pedestrian and transit trips to and from a project site would occur are measured for the traffic analysis. The project impacts are then assessed for those same traffic peak periods.

Definition of 2019 Future Without the Proposed Action (No-Action Condition)

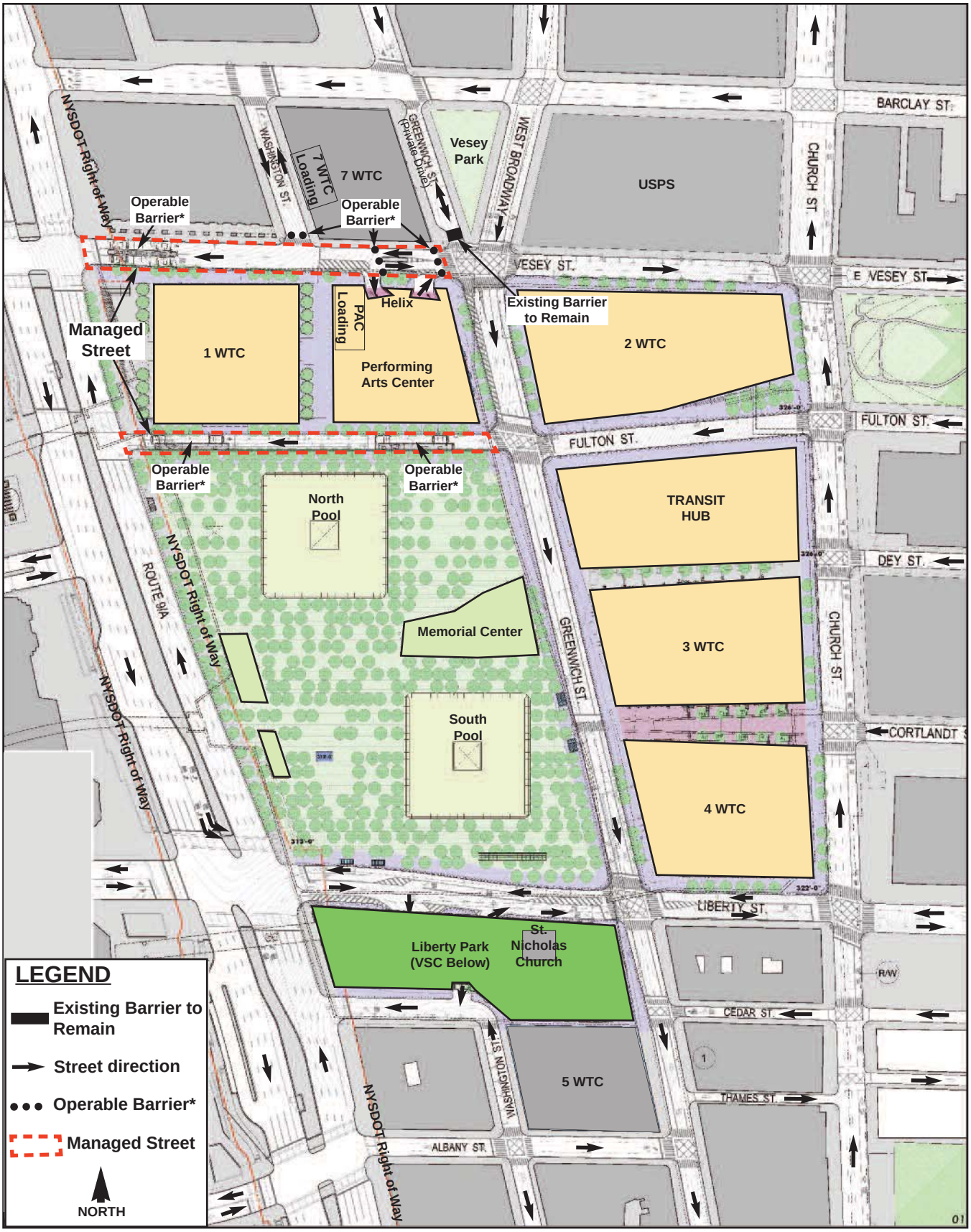
In the 2019 scenario without the Proposed Action (No-Action), it is anticipated that the WTC Campus would be fully redeveloped. As described above, the 5 WTC site, which is not located within the proposed WTC Campus security perimeter, is not expected to be developed during this timeframe. At present, the only building program available for 5 WTC is the approximately 1.6-million-square-foot office tower that was contemplated in the 2004 *World Trade Center Memorial and Redevelopment Plan FGEIS* with an anticipated completion in 2015. Due to the current economic climate, however, it is unlikely that the PANYNJ will pursue development of the 5 WTC site in the near term. With the ongoing construction of 1 WTC and 4 WTC and the recent completion of 7 WTC, there is expected to be a substantial amount of new Class A office space available in Lower Manhattan in coming years. To be conservative, the analyses in this EIS assume that 2 WTC and 3 WTC would also be fully constructed and occupied by 2019, even though full build-out of 2 WTC and 3 WTC is predicated on the ability to viably market their office space. Given the current market for office space and amount of new development planned, it is considered unlikely that there would be sufficient demand to justify the development of an additional 1.6-million square feet of office space on the 5 WTC site by 2019.

Any other scenarios for development of 5 WTC would be purely speculative at this juncture as no developer has been selected and no alternative plans have been advanced for the site at this time. As such, it is expected that 5 WTC would not be developed by 2019. With numerous details surrounding the 5 WTC site remaining unresolved, extending the analysis year beyond 2019 to incorporate 5 WTC would not be practicable as there is currently no information available that would provide reasonable guidance on when construction of the site could be completed. Additionally, the 5 WTC site is located outside of the security zone as proposed. As such, 5 WTC is not included in the analysis.

As shown in **Figure 1-7**, the current No-Action site plan for the WTC site includes the development of a VSC on the south side of Liberty Street east of West Street/Route 9A. All autos and tour buses en route to below-grade parking at the WTC site would undergo screening at this facility, as would delivery vehicles en route to below-grade loading areas for Towers 1 through 4. Operational controls such as bus reservations and the scheduling of deliveries at the VSC are expected to be implemented under the No-Action condition.

The entrance to the VSC would be located on the south side of Liberty Street. In the No-Action condition, all vehicles departing the VSC would exit onto eastbound Liberty Street. While there would continue to be an entrance/exit ramp to/from the underground road network on Vesey Street (referred to as the "Helix"), current plans call for it to be used primarily for emergency access. There are expected to be a total of up to approximately 500 parking spaces for autos and approximately 67 spaces for tour buses located in below-grade facilities on the WTC site.

No-Action WTC Site Plan



Note: Image is schematic and for illustrative purposes only.

*Likely location of operable barriers needed to secure 1 WTC.

As shown in **Figure 1-7**, with redevelopment of the World Trade Center, both Greenwich Street and Fulton Street would be extended through WTC site and Vesey and Liberty Streets would be reopened to traffic. In the No-Action condition, Greenwich Street is expected to operate one-way southbound with three moving lanes from Vesey Street to Fulton Street, and with two moving lanes and two curbside lanes south of Fulton Street. West Broadway between Barclay and Vesey Streets would remain open to southbound through-traffic, providing access to Greenwich Street through the WTC site. However, it is anticipated that the segment of Greenwich Street between Barclay and Vesey Streets, which is a privately-controlled street pursuant to a December 5, 2007 reciprocal easement agreement between the City of New York, 7 WTC ownership, PANYNJ, and LMDC, would primarily serve as an access point to the adjacent 7 WTC as at present. The parallel segment of Washington Street would operate two-way. It is expected that the intersections of Greenwich Street with Vesey, Fulton and Liberty Streets would be signalized, as would a midblock pedestrian crossing of Greenwich Street at Cortlandt Street.

Fulton Street would operate one-way westbound through the WTC site from Church Street to West Street/Route 9A in the No-Action condition. Vesey Street would operate one-way eastbound to the east of Greenwich Street, two-way between Greenwich and Washington Streets, and one-way westbound to the west of Washington Street.

At the south end of the WTC site, Liberty Street would be reopened to traffic between Church Street and West Street/Route 9A, and would operate two-way with one to two moving lanes in each direction. The exit from the VSC onto this block of Liberty Street would be stop-controlled, and left-turns from the VSC onto westbound Liberty Street would be prohibited in the No-Action condition. It is expected that the segment of Washington Street between Albany and Cedar Streets would be reopened to northbound traffic, and that the segment of Cedar Street from Washington Street to West Street/Route 9A would be reopened to westbound traffic. It is also expected that the segment of Cedar Street between Church and Greenwich Streets would be returned to one-way westbound operation.

With the completion of towers 2, 3 and 4 and the Transit Hub at the WTC site, lane closures associated with construction activity would no longer be needed along Church Street, and it is anticipated that the street would be restored to four lanes from Liberty Street to Vesey Street. The eastern-most lane would again function as an exclusive bus lane from 7 AM to 10 AM and from 4 PM to 7 PM on weekdays.

It is also expected that the reconstruction of West Street/Route 9A in the vicinity of the WTC site would be completed in the No-Action condition. This would include the installation of a traffic signal at a new intersection with Fulton Street. All traffic westbound on Fulton Street would turn onto northbound West Street/Route 9A as there would be no access across the median to the southbound lanes. Two crosswalks would be installed at this location, one on West Street/Route 9A on the north side of the intersection, and the second on the Fulton Street approach. To the south at Liberty Street, both northbound and southbound double left-turn lanes would be provided. The existing northbound left-turn at Albany Street would be eliminated. Lastly, it is anticipated that a new traffic signal would be installed at the intersection of Barclay Street with northbound West Street/Route 9A to accommodate new traffic generated by development at the WTC site.

It should be noted that the 2004 *World Trade Center Memorial and Redevelopment Plan FGEIS* acknowledged a need for security measures such as vehicular screening to secure buildings at the WTC site. The potential need to periodically close street segments within the WTC site was also recognized in the 2004 *FGEIS*, which includes an assessment of the potential traffic effects of closing both Fulton Street and Greenwich Street through the site. The No-Action site plan and vehicle circulation system assumed for the analyses in this EIS reflect the PANYNJ's master plan for the WTC (Version 10) and security measures associated with the 2005 redesign of 1 WTC. Under these measures, both Vesey Street and

Fulton Street would function as "managed streets" west of Greenwich Street, reflecting security engineering for 1 WTC that require that unscreened vehicles be prohibited from accessing the portions of these streets adjacent to the building. Implementation of managed street segments adjacent to 1 WTC is therefore reflected in the No-Action condition as restrictions on unscreened vehicles would still be needed to secure 1 WTC in the absence of the proposed Campus Security Plan. (A qualitative discussion of the effects on traffic flow from the managed operation of Vesey Street and Fulton Street in the No-Action condition is provided in Chapter 8, "Transportation.")

As the specific means to manage these street segments were not identified by the PANYNJ, it was assumed that in the No-Action condition they would be managed through the installation of sally ports and operable barriers, a common method for controlling access in similar situations (and one that would be employed more extensively at the WTC site under the Proposed Action). Each sally port would consist of a personnel booth and equipment house controlling a set of two operable barriers with sufficient space between them to accommodate one or more motor vehicles. In operation, the first barrier would be lowered to permit authorized vehicles to enter, and then raised to prevent entry by other vehicles. After completing a screening process, the second barrier would be lowered to allow vehicles within the sally port to exit. As shown in **Figure 1-7,** two sally ports would be located on Fulton Street, one at West Street/Route 9A and the second west of Greenwich Street. As it is anticipated that the west barrier on Fulton Street at West Street/Route 9A would be installed immediately adjacent to the West Street/Route 9A travel lanes, the crosswalk on Fulton Street would likely be located within the sally port.

Two sally ports would also be located on Vesey Street, one to the east of West Street/Route 9A (set back from the north-south crosswalk on the east side of West Street/Route 9A) and a second sally port would be required west of Greenwich Street in front of the helix access to prevent unauthorized vehicles from approaching 1 WTC. Additionally, an additional operable barrier would be installed on the Washington Street approach to Vesey Street that would remain raised as a default condition, and lowered only as needed to permit entry by authorized vehicles.

Under the No-Action plan as described, there would be unrestricted vehicular access along Greenwich Street between Vesey Street and Liberty Street through the WTC site. Autos and trucks destined for the below-grade parking or loading docks at the WTC would have unrestricted access to the VSC via Liberty Street, while trucks en route to the loading docks at the PAC would likely have to pass through the barriers on Washington Street and/or Vesey Street. Tour buses are expected to drop off passengers destined for the National September 11th Memorial and Museum on the west side of Greenwich Street or on Liberty Street west of Greenwich Street before proceeding to the VSC via Liberty Street. It is possible that tour buses may also drop off curbside on West Street/Route 9A. Buses that park in the VSC would exit the VSC onto eastbound Liberty Street, northbound Church Street and westbound Fulton Street to return to Greenwich Street to retrieve their passengers. Taxi and black (livery) car pick-up/drop-off activity would likely occur along both curbs of Greenwich Street as well as along both sides of Church Street as conditions permit, although there are many bus stops along east side of Church Street in this area. While black cars would also be expected to traverse the sally ports along Fulton and Vesey Streets to access 1 WTC, taxis would be unlikely to do so, and would be expected to pick-up/drop-off along nearby unrestricted streets such as Greenwich Street and West Street/Route 9A (if permitted by the prevailing curbside regulations).

As noted above, there are now expected to be up to approximately 500 underground parking spaces for office-tenant autos and approximately 67 for tour buses at the WTC site compared to 1,200 to 1,400 parking spaces under the original program analyzed in the LMDC FGEIS. It is therefore anticipated that under the current development program, some of the parking demand generated by WTC office tenants as well as all of the parking demand generated by other uses at the WTC site would be distributed among off-street public parking facilities on the periphery. Many of these vehicles would therefore not actually

enter the WTC site nor traverse intersections within its boundaries. All on-site parking spaces are expected to be reserved for tenants under an agreement with PANYNJ. No public parking would be permitted.

In addition to reflecting Version 10.0 of the PANYNJ's master plan for the site and the security measures associated with the 2005 redesign of 1 WTC, the No-Action condition assumed for this EIS also reflects other changes made to the WTC redevelopment plan subsequent to the publication of the 2004 *World Trade Center Memorial and Redevelopment Plan FGEIS*. These include changes to the building program now envisioned for the WTC site, including a reduction in the overall size of the program and changes in the uses proposed for the site.

Lastly, in addition to the planned WTC build-out, Lower Manhattan is expected to experience moderate growth in commercial office, retail, residential, hotel and community facility uses by 2019. The developments that are anticipated within the area by 2019 are described in Chapter 2, "Land Use, Zoning and Public Policy."

2019 Future With the Proposed Action (With-Action Condition)

The Proposed Action would result in the implementation of the WTC Campus Security Plan which includes a secure perimeter with limited vehicle access, vehicle credentialing and screening areas, and some proposed changes to street direction. The details of the Proposed Action are provided in more detail above.

The security elements, street configurations, and access restrictions being considered as part of the Proposed Action would be overlaid on the full build condition of the WTC development. The incremental differences between the two conditions that would result from the Proposed Action would be documented and evaluated for their potential to result in significant adverse environmental impacts pursuant to the impact criteria described in the CEQR Technical Manual.

It should be noted that the design of the proposed WTC Campus Security Plan has not yet been finalized, and may be refined as the project design process advances. Consequently, the analyses in some technical areas in this EIS (transportation, air quality and noise, for example) will be updated as needed between the DEIS and FEIS to reflect any substantial changes in the project design.

Identifying Significant Adverse Environmental Impacts

Identification of significant adverse environmental impacts is based on the comparison of future conditions without and with the Proposed Action. In certain technical areas (e.g., transportation, air quality, and noise) this comparison can be quantified and the severity of impact rated in accordance with the *CEQR Technical Manual*. In other technical areas, (e.g., urban design) the analysis is more qualitative. The methodology for each technical analysis is presented at the start of each technical chapter.

Mitigation

Mitigation measures for all significant adverse impacts identified in this EIS are described in Chapter 15, "Mitigation." CEQR requires that any significant adverse impacts identified in the EIS be minimized or avoided to the fullest extent practicable, given costs and other factors. In the EIS, options for mitigation can be presented for public review and discussion, without the lead agency having selected one for implementation. Where no mitigation is available, the EIS must disclose the potential for unmitigated significant adverse impacts.

Alternatives

Chapter 16, "Alternatives," assesses a range of alternatives to the Proposed Action. CEQR requires that a description and evaluation of the range of reasonable alternatives to the action be included in an EIS at a level of detail sufficient to allow a comparative assessment of the alternatives to a Proposed Action. Alternatives and the rationale behind their selection are important in the disclosure of environmental effects of a Proposed Action. Alternatives provide options to the Proposed Action and a framework for comparison of potential impacts and project objectives. If the environmental assessment and consideration of alternatives identify a feasible alternative that eliminates or minimizes significant adverse impacts, the lead agency may want to consider adopting that alternative as the Proposed Action. CEQR also requires consideration of a "No-Action alternative" that evaluates environmental conditions that are likely to occur in the future without the Proposed Action.

G. REVIEW PROCEDURES

The SEQRA/CEQR process provides a mechanism for decision-makers to understand the environmental consequences, the alternatives, and the need for mitigating significant impacts. SEQRA/CEQR rules guide environmental review through the following steps:

- Establish a Lead Agency. Under SEQRA/CEQR, the "lead agency" is the public entity responsible for conducting environmental review. The lead agency is typically the agency with primary responsibility for the Proposed Action. The NYPD is the lead agency for the Proposed Action.
- Determine Significance. The lead agency's first decision is to determine whether the Proposed Action may have a significant impact on the environment. After review of the Environmental Assessment Statement (EAS), it was determined that this proposal could have a significant adverse effect on the environment, requiring that an EIS be prepared. NYPD issued a Positive Declaration on February 8, 2012.
- Scoping. The lead agency issued a Positive Declaration on February 8, 2012 and issued a draft scope of analysis for the EIS. "Scoping" is the process of establishing the type and extent of the environmental impact analyses to be studied in the EIS. CEQR requires a public scoping meeting. A public scoping meeting was held for the Proposed Action on March 14, 2012, and a final scope of work, reflecting comments made during scoping, was issued on April 1, 2013.
- DEIS. This Draft Environmental Impact Statement (DEIS) has been prepared in accordance with the final scoping document. It is a comprehensive document used to systematically consider the expected environmental effects of the Proposed Action, evaluate reasonable alternatives, and identify mitigation measures that, to the maximum extent practicable, can address any potentially significant adverse environmental impacts of the Proposed Action. The lead agency reviews all aspects of the document to determine its adequacy and adherence to the work effort outlined in the Final Scoping Document. Once the lead agency is satisfied that the DEIS is complete for purposes of its public review, it issues a Notice of Completion and circulates the DEIS for public review.

- Public Review. Publication of the Notice of Completion of the DEIS commences the public review period. During this time, which must extend for a minimum of 30 days, the public may review and comment on the DEIS, either in writing or at a public hearing convened for the purpose of receiving such comments. The lead agency must publish a notice of the hearing at least 14 days before it takes place and must accept written comments for at least 10 days following the close of the hearing. All substantive comments become part of the CEQR record and are summarized and responded to in the Final EIS (FEIS).
- FEIS. After the close of the public comment period, the lead agency prepares the FEIS. The FEIS must include a summary of the substantive comments received and the lead agency's responses to the comments. When the lead agency has reviewed the FEIS and determines that it is a complete and adequate document, a Notice of Completion on the FEIS is issued. The completed FEIS is available for review and comment for a minimum of 10 days before the lead agency and the involved agencies can make their respective findings as to the expected environmental impacts of the proposed action, at which time such agencies are in a position to make their respective decisions on the proposed action.

  Based on the overall project schedule, it is anticipated that the FEIS for the Proposed Action will be completed in the spring of 2013.
- Statement of Findings. The lead agency and each involved agency must adopt a formal set of written findings based on the FEIS and reflecting its conclusions about the potential for significant adverse environmental impacts of the Proposed Action, potential alternatives, and potential mitigation measures. The Statement of Findings may not be adopted until 10 days after the Notice of Completion has been issued for the FEIS. Once findings are adopted, the lead and involved agencies may take their actions.

A. INTRODUCTION

Context

Under 2012 *CEQR Technical Manual* guidelines, a land use analysis evaluates the uses and development trends in the area that may be affected by a proposed project, and determines whether that proposed project is compatible with those conditions or may affect them. Similarly, the analysis considers the action's compliance with, and effect on, the area's zoning and other applicable public policies.

The goal of the Proposed Action is to establish a security overlay at the perimeter of the World Trade Center (WTC) Campus in Manhattan Community District 1. Primary features of the Proposed Action include entry/exit security checkpoints and a secure travel lane on Trinity Place/Church Street between Cedar and Vesey Streets. The Proposed Action would not alter the building program for the planned development, change the Site's existing land uses or change the Site's zoning. However, under CEQR guidelines, a preliminary assessment, which includes a basic description of existing and future land uses and zoning, should be provided for all projects that would affect land use or would change the zoning on a site, regardless of the project's anticipated effects. CEQR also requires a detailed assessment of land use conditions if a detailed assessment has been deemed appropriate for other technical areas, or in generic or area-wide zoning map amendments. Therefore, this chapter includes a detailed analysis that involves a thorough description of existing land uses and zoning within the 16-acre WTC site and the adjacent study area. Following the guidelines of the *CEQR Technical Manual*, the detailed analysis describes existing and anticipated future conditions to a level necessary to understand the relationship of the Proposed Action to such conditions, assesses the nature of any changes to these conditions that would be created by the Proposed Action, and identifies those changes, if any, that could be significant or adverse. The detailed assessment discusses existing and future conditions with and without the Proposed Action in the 2019 analysis year for a primary study area (Project Site), generally coterminous with the WTC site, and a secondary study area (Study Area), the quarter-mile area surrounding the WTC Campus.

B. PRINCIPAL CONCLUSIONS

No significant adverse impacts on land use, zoning, or public policy, as defined by the guidelines for determining impact significance set forth in the 2012 *CEQR Technical Manual*, are anticipated in the future with the Proposed Action on the Project Site or within the quarter-mile Study Area. The Proposed Action would not generate land uses that would be incompatible with underlying zoning, nor would it cause a substantial number of existing structures to become non-conforming. Furthermore, the Proposed Action would not result in land uses that conflict with public policies applicable to the Project Site or Study Area.

The Proposed Action would implement a vehicle security overlay at the perimeter of the WTC Campus, but would not introduce any new buildings other than small personnel booths that would be installed at all vehicular entries and exits. When compared to future No-Action conditions, the Proposed Action is not expected to result in any significant land use changes on the Project Site or within the Study Area. Some local businesses and residents who live within the proposed secure zone may have to modify the way they receive deliveries. Additionally, persons and vehicles would have to pre-register to obtain access into the

WTC Campus. While the Proposed Action would result in minor land use changes in the Project Site and Study Area, these changes would not be significant or adverse as detailed in the following sections.

C. METHODOLOGY

The purpose of this chapter is to examine the effects of the Proposed Action and determine whether or not it would result in any significant adverse impacts on land use, zoning, or public policy. The land use, zoning and public policy analysis has been conducted in accordance with the methodology presented in the 2012 *CEQR Technical Manual*. This chapter examines the Proposed Action's consistency with and effect on land use patterns and development trends, zoning regulations, and other applicable public policies.

Existing land uses were identified through review of a combination of sources including field surveys and secondary sources such as reports from the Alliance for Downtown New York (Downtown Alliance), LowerManhattan.info, articles from newspapers, as well as the City's Primary Land Use Tax Lot Output (PLUTO™) data files for 2010, and websites such as NYC Open Accessible Space Information System (www.oasisnyc.net) and NYCityMap (http://gis.nyc.gov/doitt/nycitymap/), and other publications and approved environmental review documents which have been completed for projects in the area. New York City Zoning Maps and the Zoning Resolution of the City of New York were consulted to describe existing zoning districts in the study area, and provided the basis for the zoning evaluation of the future No-Action and With-Action conditions. Relevant public policy documents, recognized by the New York City Department of City Planning (DCP) and other City agencies, were utilized to describe existing public policies pertaining to the Study Area.

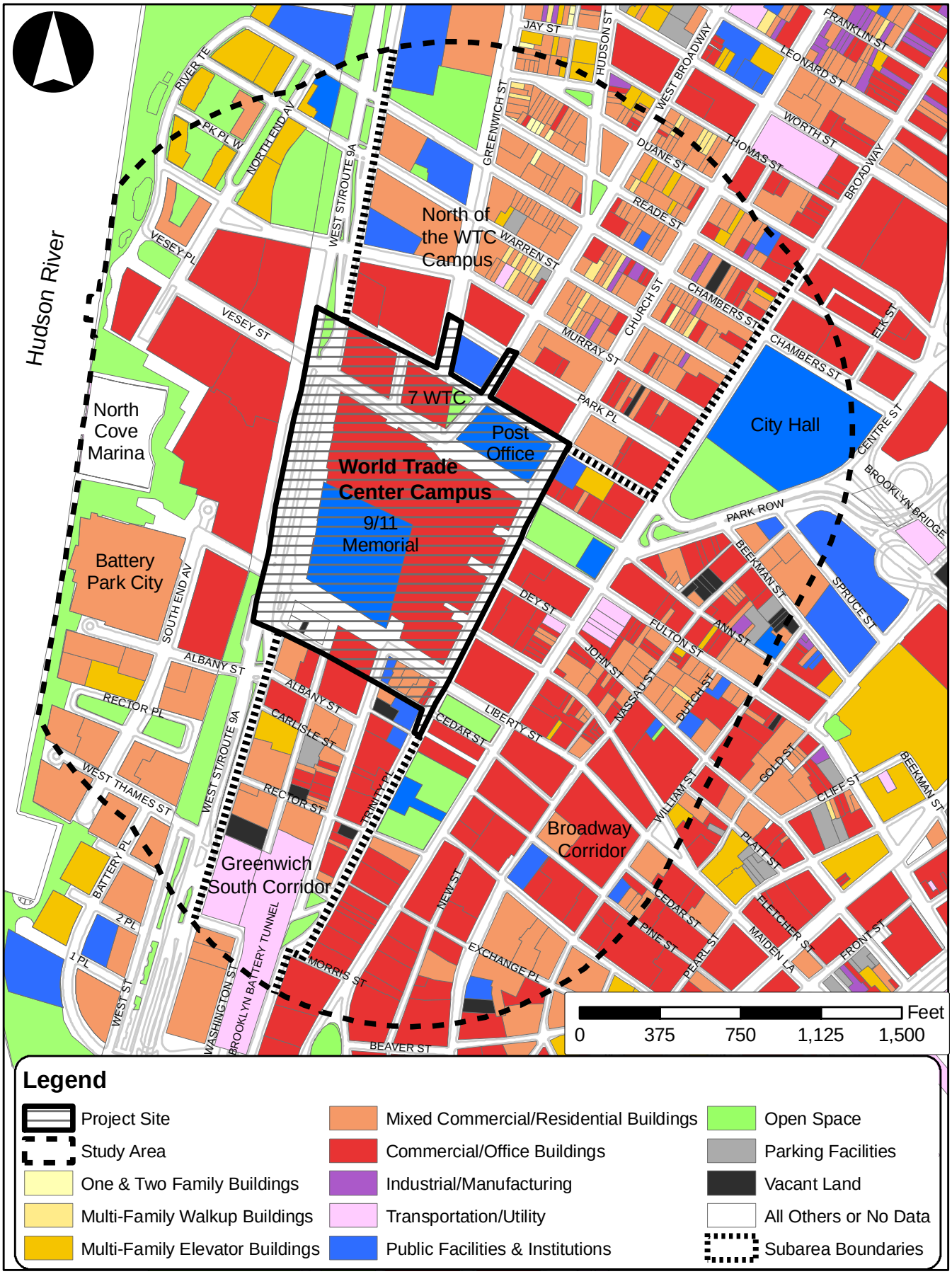
Analysis Year

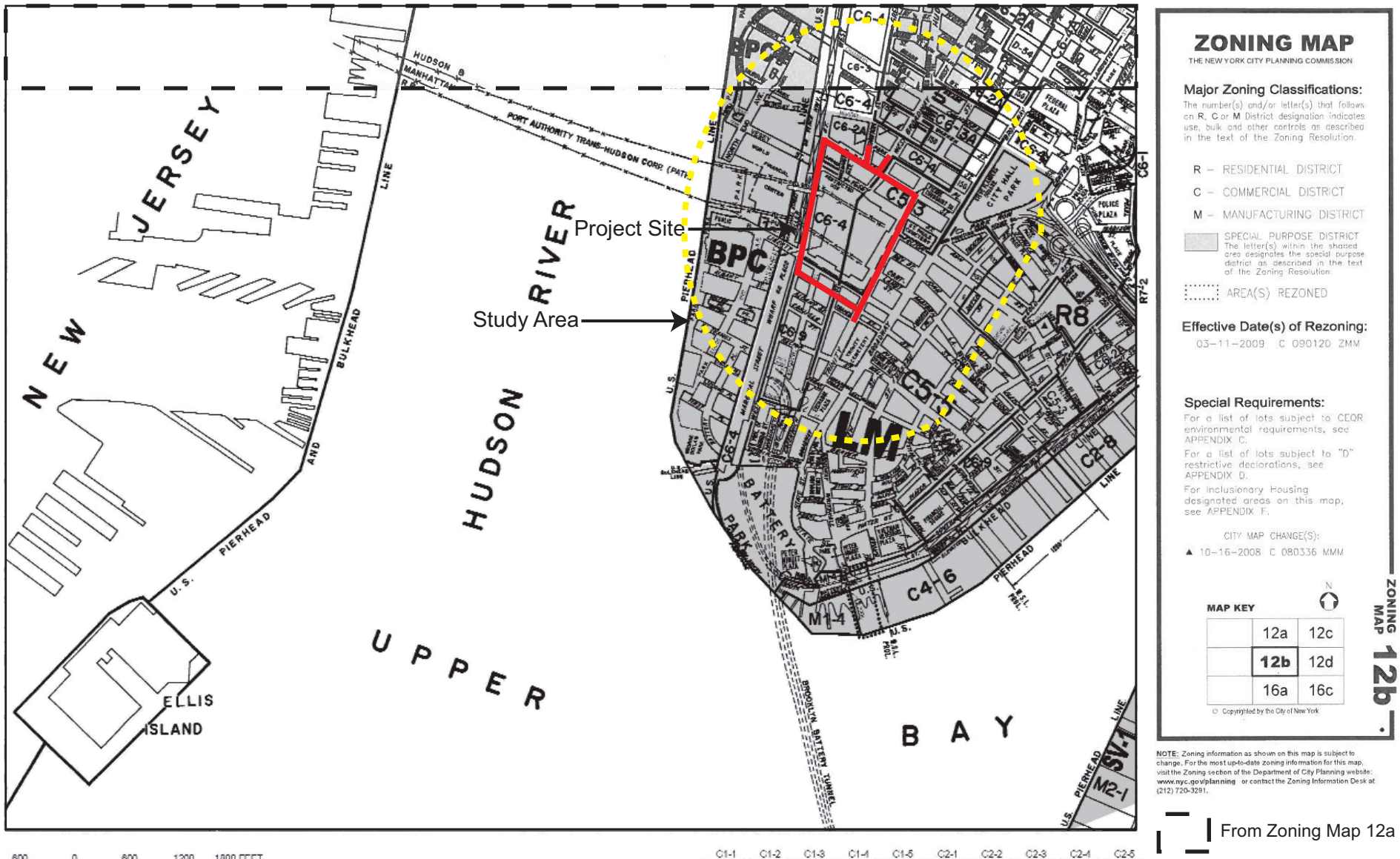
The analysis year is the Proposed Action's anticipated completion date of 2019. Therefore the future No-Action and With-Action conditions account for land use and development projects, zoning proposals, and public policy initiatives expected to be implemented by 2019.

Study Area

According to the *CEQR Technical Manual*, the appropriate study area for land use, zoning, and public policy is related to the type and size of the Proposed Action, as well as the location and context of the area that could be affected by the project. Study area radii vary according to these factors, with suggested study areas ranging from 400-feet for a small project to 0.5 miles for a very large project. In accordance with CEQR guidelines, land use, zoning, and public policy are addressed and analyzed for two geographical areas: (1) the primary study area, and (2) a secondary study area. As discussed above, for the purpose of this assessment, the primary study area (Project Site) is generally coterminous with the WTC Campus, and includes all streets, sidewalks and buildings that would be directly affected by the installation of the Site's proposed security infrastructure. This area is generally bounded by Barclay Street, West Street/Route 9A, Albany Street and Trinity Place/Church Street. The secondary study area (Study Area) extends an approximate quarter-mile from the boundary of the Project Site and encompasses areas that have the potential to experience indirect impacts as a result of the Proposed Action. The Study Area covers an area generally bounded by Duane Street to the north, William Street to the east, Morris Street to the south, and the Hudson River to the west. Both the primary and secondary study areas have been established in accordance with *CEQR Technical Manual* guidelines and can be seen in **Figure 2-1**.

The Study Area has been divided into four subareas based on geographic boundaries and commonly accepted neighborhood boundaries in order to more easily facilitate the discussion and analysis of the


Hudson River
North of the WTC Campus
7 WTC
Post Office
World Trade Center Campus
9/11 Memorial
City Hall
North Cove Marina
Battery Park City
Broadway Corridor
Greenwich South Corridor
JAY ST
HUDSON ST
WEST BROADWAY
FRANKLIN ST
LEONARD ST
GREENWICH ST
WORTH ST
THOMAS ST
BROADWAY
DUANE ST
READE ST
WARREN ST
CHURCH ST
CHAMBERS ST
ELK ST
MURRAY ST
PARK PL
CENTRE ST
BROOKLYN BRIDGE
PARK ROW
BEEKMAN ST
SPRUCE ST
DEY ST
FULTON ST
ANN ST
JOHN ST
NASSAU ST
DUTCH ST
LIBERTY ST
CEDAR ST
GOLD ST
CLIFF ST
WILLIAM ST
PLATT ST
NEW ST
EXCHANGE PL
PINE ST
PEARL ST
FLETCHER ST
MAIDEN LA
FRONT ST
RIVER TE
PK PL W
NORTH END AV
WEST ST/ROUTE 9A
VESEY PL
VESEY ST
SOUTH END AV
ALBANY ST
RECTOR PL
CARLISLE ST
RECTOR ST
TRINITY PL
WEST THAMES ST
BATTERY PL
1 PL
2 PL
WEST ST
WASHINGTON ST
BROOKLYN BATTERY TUNNEL
MORRIS ST
BEAVER ST
Feet
0
375
750
1,125
1,500
Legend
Project Site
Study Area
One & Two Family Buildings
Multi-Family Walkup Buildings
Multi-Family Elevator Buildings
Mixed Commercial/Residential Buildings
Commercial/Office Buildings
Industrial/Manufacturing
Transportation/Utility
Public Facilities & Institutions
Open Space
Parking Facilities
Vacant Land
All Others or No Data
Subarea Boundaries


Project Site
Study Area
NEW JERSEY
HUDSON RIVER
UPPER BAY
ELLIS ISLAND
HUDSON & MANHATTAN R.R.
PORT AUTHORITY TRANS-HUDSON CORP. (PATH)
U.S. PIERHEAD AND BULKHEAD LINE
BROOKLYN BATTERY TUNNEL
BATTERY PARK
BPC
LM
C6-4
C5-3
C5-5
C6-2A
C6-3A
C6-1A
C6-2
C5-2
C5-2.5
C6-1
C6-3
C6-4A
C6-5
C6-6
C6-7
C6-9
C5-1
C5-2.5
C6-8
R8
R7-2
C4-6
M1-4
M2-1
SV-1
600 0 600 1200 1800 FEET
C1-1 C1-2 C1-3 C1-4 C1-5 C2-1 C2-2 C2-3 C2-4 C2-5
NOTE: Where no dimensions for zoning district boundaries appear on the zoning maps, such dimensions are determined in Article VII, Chapter 6 (Location of District Boundaries) of the Zoning Resolution.
ZONING MAP
THE NEW YORK CITY PLANNING COMMISSION
Major Zoning Classifications:
The number(s) and/or letter(s) that follows an R, C or M District designation indicates use, bulk and other controls as described in the text of the Zoning Resolution.
R – RESIDENTIAL DISTRICT
C – COMMERCIAL DISTRICT
M – MANUFACTURING DISTRICT
SPECIAL PURPOSE DISTRICT
The letter(s) within the shaded area designates the special purpose district as described in the text of the Zoning Resolution.
AREA(S) REZONED
Effective Date(s) of Rezoning:
03-11-2009 C 090120 ZMM
Special Requirements:
For a list of lots subject to CEQR environmental requirements, see APPENDIX C.
For a list of lots subject to "D" restrictive declarations, see APPENDIX D.
For Inclusionary Housing designated areas on this map, see APPENDIX F.
CITY MAP CHANGE(S):
▲ 10-16-2008 C 080336 MMM
MAP KEY
12a 12c
12b 12d
16a 16c
ZONING MAP 12b
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NOTE: Zoning information as shown on this map is subject to change. For the most up-to-date zoning information for this map, visit the Zoning section of the Department of City Planning website: www.nyc.gov/planning or contact the Zoning Information Desk at (212) 720-3291.
From Zoning Map 12a

Proposed Action's potential impacts. The four subareas are: (1) the area north of the WTC site; (2) the Broadway Corridor; (3) the Greenwich South Corridor; and (4) Battery Park City (BPC). For the purposes of this analysis, the area to the north of the WTC site is roughly bounded by West Street/Route 9A to the west, Duane Street to the north, Broadway to the east, and Barclay Street to the south. The Broadway Corridor extends from Trinity Place/Church Street on the east to William Street on the west and from Barclay Street and Park Row to the north to Morris Street on the south. The Greenwich South Corridor is roughly bounded by West Street/Route 9A to the west, Cedar Street to the north, Trinity Place/Church Street to the east, and Morris Street to the south. BPC extends from the Hudson River on the west to West Street/Route 9A on the east and Chambers Street on the north to West Thames Street on the south.

D. PRELIMINARY ASSESSMENT

Land Use

A preliminary assessment, which includes a basic description of existing and future land uses, should be provided for all projects that would affect land use. However, under CEQR guidelines, if a detailed assessment is required in the technical analyses of socioeconomic conditions, neighborhood character, transportation, air quality, noise, infrastructure, or hazardous materials, a detailed land use assessment is appropriate. Furthermore, for some projects a more detailed land use assessment is necessary to sufficiently inform other technical reviews and determine whether changes in land use could affect conditions analyzed in those technical areas. As a detailed assessment is warranted for the Proposed Action, the information that would typically be included in a preliminary assessment (e.g., physical setting, present land use, etc.) has been incorporated into the detailed assessment in Section E below. As discussed in the detailed assessment, the Proposed Action is not expected to have significant adverse effects on land uses in the Project Site or Study Area.

Zoning

According to the *CEQR Technical Manual*, the preliminary assessment of zoning should provide information on existing zoning regardless of a project's anticipated effects. A preliminary assessment of zoning should identify and describe zoning regulations that pertain to the Project Site and Study Area. If the Proposed Action could potentially alter or conflict with established zoning, a detailed assessment should be conducted; otherwise, no further analysis of zoning is necessary.

Project Site

The 1962 bi-state legislation authorizing the development of the WTC site provides that no agency, commission, or municipality shall have jurisdiction over the WTC site so long as it is owned by the Port Authority of New York and New Jersey (PANYNJ). Since the PANYNJ still owns the WTC site, neither the New York City Zoning Resolution nor the City's building and fire codes apply. Nevertheless, the PANYNJ voluntarily conforms to these local regulations as much as possible, demonstrated by several Memoranda of Understanding executed by the PANYNJ and the New York City Department of Buildings (NYCDOB) and the New York City Fire Department (FDNY). Further, the 2006 Redevelopment Agreement gave the City certain rights at the WTC site. For example, the streets that run through the WTC Campus belong to the New York City Department of Transportation (NYCDOT).

As shown in **Figure 2-2**, the Project Site is in C6-4, C5-3, C5-5, and C6-9 medium- and high-density zoning districts and is also entirely within the Special Lower Manhattan (LM) District. Block 84 and the western half of Block 58 are in a C6-4 district while Block 86 and the eastern half of Block 58 are zoned

C5-3. Block 52 in the southeastern section of the Project Site is zoned C5-5 and the adjacent northern sections of Blocks 54 and 56 are in a C6-9 district.

C-5 zoning districts are for central commercial areas, which typically include department stores, office buildings, and mixed-use residential and commercial buildings with ground-level retail. Both C5-3 and C5-5 districts allow use groups 5-6 and 9-11, and have maximum floor area ratios (FAR) of 15.0 for commercial, 10.0 for residential, and 15.0 for community facilities. C6 zoning districts are central locations well served by mass transit but typically outside of central business cores. They permit a wide range of high-bulk commercial uses. Both C6-4 and C6-9 districts allow use groups 1-12. C6-4 districts have maximum FARs of 10.0 for commercial, residential, and community facilities while C6-9 districts have maximum FARs of 10.0 for residential and 15.0 for commercial and community facilities.

Special Lower Manhattan District

The Special LM District encompasses all of Lower Manhattan roughly bordered by Murray Street and the Brooklyn Bridge to the north. The Special LM District was created in 1988 to simplify and consolidate the complex and overlapping regulations of Lower Manhattan and curb strict use controls that prevented retail, entertainment, and service establishments in order to facilitate the development of a 24-hour, mixed-use community. The Special LM District regulations permit conversions from commercial to residential and require retail continuity while regulating building heights and setbacks to protect the unique skyline. The Special LM District includes two sub-districts: the Historic and Commercial Core Sub-district and the South Street Seaport Sub-district, neither of which include the Project Site.

Study Area

Similar to the Project Site, the Study Area is primarily zoned for medium- and high-density commercial development. Areas north and south of the Project Site are zoned C6-2A, C6-3A, C6-4, and C6-9. The C6-2A and C6-3A are contextual districts with maximum building heights. Areas north and east of the Project Site are zoned C5-3 and C5-5.

Table 2-1
Existing Zoning Districts in Project Site and Study Area

Zoning District	Type	Use Groups	Maximum FAR	Location
C5-3	Non-contextual central commercial district	5-6, 9-11	15.0 commercial; 10.0 residential; 15.0 community facility	Project Site & Study Area
C5-5	Central commercial district	5-6, 9-11	15.0 commercial; 10.0 residential; 15.0 community facility	Project Site & Study Area
C6-2A	Contextual central commercial district	1-12	6.0 commercial; 6.02 residential; 6.5 community facility	Study Area
C6-3	Central commercial district	1- 12	6.0 commercial; 0.99-7.52 residential; 10.0 community facility	Study Area
C6-3A	Contextual central commercial district	1-12	6.0 commercial; 7.52 residential; 7.5 community facility	Study Area
C6-4	Central commercial district	1- 12	10.0 commercial; 10.0 residential; 10.0 community facility	Project Site & Study Area
C6-9	Central commercial district	1-12	15.0 commercial; 10.0 residential; 15.0 community facility	Project Site & Study Area
LM	Special district	--	--	Project Site & Study Area
BPC	Special district	--	--	Study Area
TMU	Special district	--	--	Study Area

Source: New York City Zoning Resolution

Several special purpose zoning districts are located within the quarter-mile Study Area. As shown in **Figure 2-2**, the Special LM District discussed above encompasses most of the Study Area. To the west of West Street/Route 9A, the Special BPC District governs development. In the area north of the WTC Campus, the Special Tribeca Mixed-Use (TMU) District regulates development. Both special districts are discussed in more detail below.

The Special Battery Park City District

The Special BPC District was created in conjunction with a master plan for BPC to regulate the extensive residential and commercial development of the area and establish the continuous open spaces along the Hudson River. The Special BPC District regulates use, bulk, heights, streetwalls, parking, and waterfront design, and is divided into three sections: Zone A, Zone B, and Zone C. Zone A permits residential development with ancillary retail, service uses, and hotels. Zone B allows commercial and mixed-use development with ancillary retail and service uses. This zone includes the World Financial Center. Zone C permits commercial and mixed-use development with parking, ancillary retail, and service uses.

The Special Tribeca Mixed-Use District

Located within a commercially zoned area, the Special TMU District limits the size of ground-floor retail uses and hotels. Special rules encourage a mix of uses by allowing light industry and new contextual mixed-use buildings house a growing residential community.

Conclusion

There are no proposed or pending zoning actions anticipated for the Project Site or Study Area by 2019. Moreover, the Proposed Action would result in the construction of a security overlay and does not introduce new buildings to the Project Site; as such it would not modify or affect established zoning. The Proposed Action would not result in any significant adverse zoning impacts. As such, no further analysis of zoning is necessary.

Public Policy

According to the *CEQR Technical Manual*, a project that would be located within areas governed by public policies controlling land use, or that has the potential to substantially affect land use regulation or policy controlling land use, requires an analysis of public policy. A preliminary assessment of public policy should identify and describe any public policies, including formal plans or published reports, which pertain to the Study Area. If the Proposed Action could potentially alter or conflict with identified policies, a detailed assessment should be conducted; otherwise, no further analysis of public policy is necessary.

There are a number of adopted public policies applicable to portions of the primary Study Area, including: Downtown-Lower Manhattan Business Improvement District (BID); the Lower Manhattan Development Corporation (LMDC); *City Vision for a 21st Century Lower Manhattan* (Vision); the Commercial Revitalization Program (CRP); and the Local Waterfront Revitalization Program (WRP) as the Project Site is located within New York City's coastal zone boundary. The City's *PlaNYC 2030: A Greener, Greater New York* (PlaNYC) policies also apply. Released in 2007, PlaNYC was undertaken by Mayor Bloomberg to prepare the City for one million more residents, strengthen its economy, combat climate change, and enhance the quality of life for all New Yorkers. The Plan brought together over 25 City agencies to work toward the vision of a greener, greater New York.

Public Policies that apply to sections of the quarter-mile Study Area also include the 421-g Tax Incentive Program; Hudson River Park Trust (HRPT); Battery Park City Authority; Fulton Nassau Crossroads

Program; several historic districts that are designated by the New York City Landmarks Preservation Commission (LPC) and/or listed on the State and National Registers of Historic Places (S/NR); and *Vision 2020 – New York City Comprehensive Waterfront Plan* (Vision 2020). Each of these public policies is discussed briefly below. As described below, the Proposed Action would not alter or conflict with most of these identified policies, and thus does not warrant a detailed assessment of these public policies; however, as the WTC Campus is located within the coastal zone boundary, a detailed discussion of the applicable WRP policies is provided.

Project Site

Lower Manhattan Development Corporation

In the aftermath of September 11, 2001, Governor Pataki and Mayor Giuliani formed the LMDC to help plan and coordinate the rebuilding and revitalization of Lower Manhattan defined as the area south of Houston Street, which includes the Project Site.

The LMDC, a subsidiary of the Empire State Development Corporation, is a joint State-City corporation governed by a sixteen-member Board of Directors, half appointed by the Governor of New York and half by the Mayor of New York. It is charged with assisting New York City in recovering from terrorist attacks on the WTC and ensuring the emergence of Lower Manhattan as a strong and vibrant 21st century business district.

LMDC works in cooperation with its partners in the public and private sectors to coordinate long-term planning for the WTC site and surrounding communities, while pursuing short-term initiatives to improve the quality of life in Lower Manhattan during the revitalization effort. The plan for Lower Manhattan calls for the public and private sectors to partner in support of Lower Manhattan's growth and revitalization beyond the borders of the WTC Campus, and to strike the appropriate balance between the commercial uses planned for the WTC Campus and the need to develop Lower Manhattan as a viable, full-service New York community.

The Proposed Action, which is a security overlay that would control access into the WTC Campus, would not change the building program planned for the WTC site. The Proposed Action would help to foster a safe environment at the WTC Campus.

As described in Chapter 1, the Trusted Access Program (TAP) would allow for expedited vehicle entry into the secure zone. Enrollment in the TAP would be open to:

- WTC office tenants with parking privileges on site;
- For-hire vehicle operators;
- Delivery vehicle operators; and,
- Residents and owners of businesses located in non-WTC buildings within the secure zone (Liberty Street).

Both drivers and vehicles would be enrolled in the TAP. TAP credentials would be checked as vehicles approach entry points to the WTC Campus, and authorized vehicles would then be admitted to a sally port for expedited security screening. Drivers and vehicles with business at the WTC site but not enrolled in the TAP would be permitted into the WTC Campus but would be subject to more rigorous credentialing and screening. This arrangement would help to facilitate access for those who seek entry.

Pedestrian access in and around the WTC Campus would be unrestricted by the Proposed Action. As described in Chapter 3, "Socioeconomic Conditions," no direct or indirect displacement of local businesses or residents is anticipated as a result of the Proposed Action.

Downtown-Lower Manhattan Business Improvement District

The Downtown Alliance manages the City's largest BID. Established in 1995, the Downtown-Lower Manhattan BID encompasses approximately 450 block fronts, and is generally bounded by South Street to the southeast, Murray and Fulton Streets to the north, and West Street/Route 9A to the west. It includes approximately 1,062 retail businesses and more than 100 million square feet of office space. The Downtown-Lower Manhattan BID encompasses the WTC Campus.

As a BID, the Downtown Alliance provides supplementary security and sanitation services, free transportation, streetscape and design services, economic development advocacy, comprehensive neighborhood research, marketing and communication, and special event planning for Lower Manhattan, among other services and resources. The mission of the Downtown Alliance is to provide service, advocacy, research and information to advance Lower Manhattan as a global model of a 21st century central business district (CBD) for businesses, residents, and visitors. The Downtown Alliance strives to promote Lower Manhattan as a world-class destination to live, work, and play by creating a vibrant, multi-use neighborhood where businesses can prosper and the residential community can flourish.

As described above, the proposed security elements would not change the building program planned for the WTC site. Therefore, the Campus Security Plan would not impede development of the WTC Campus as one of New York City's world-class destinations. Pedestrian access would be unrestricted by the Proposed Action. As described in detail in Chapter 8, "Transportation," vehicular routes in the vicinity of the WTC Campus would be similar to existing conditions. (In many respects, the future traffic network with the Proposed Action would resemble the existing traffic network in that most of these street segments either have not yet been built or are presently closed to through traffic due to construction activity or security concerns, requiring diversions.) Screening and credentialing zones may change the way some businesses adjacent to credentialing and screening zones get deliveries, but the proposed security elements would not hamper foot traffic. Finally, businesses within the secure zone would get all deliveries through the Vehicular Security Center (VSC) irrespective of the Proposed Action.

Since details of the Proposed Action were made public, several projects have been completed in the area, construction of other developments has been initiated or has continued to progress, and plans for other new construction or conversion projects have been announced. Significant property in the area has also changed hands during this time. The continued interest in this area for development projects is an indication that the Proposed Action would not change the appeal of the area in the future.

City Vision for a 21st Century Lower Manhattan

On December 12, 2002, Mayor Michael Bloomberg released *Vision* with the stated purpose to connect Lower Manhattan to the world around it, build new neighborhoods, and create public places that make Lower Manhattan one of the most appealing places in the world. It was released in conjunction with LMDC's announcement of seven design proposals for the WTC site. The plan describes various recommendations to help revitalize and improve Lower Manhattan as a global center of business by creating new regional transportation links and to strengthen and further develop the area's residential neighborhoods. To attract new investment in the neighborhoods south and east of the WTC site, *Vision* calls for improvements to streetscapes, the expansion and creation of public plazas and parks, and the continued revitalization of the waterfront with new recreational amenities and public open space. *Vision* aims to spark private market reactions from these public investments to increase the number of businesses and residents in Lower Manhattan.

The Proposed Action would protect against vehicle-borne explosive devices while ensuring an open pedestrian environment that is hospitable to remembrance, culture and commerce. The security infrastructure proposed for the WTC Campus would not conflict with the ongoing efforts to redevelop the WTC site, nor would it hamper the revitalization efforts in the areas immediately adjacent to the proposed screening and credentialing zones. It is expected that the retail, office, and cultural uses associated with the redevelopment of the WTC Campus would continue to draw new businesses and residents to the area regardless of the Proposed Action.

Commercial Revitalization Program

The CRP, administered by the New York City Department of Finance, aims to increase tenant occupancy in Lower Manhattan's office and retail spaces and encourage investment in older commercial structures. The CRP encourages physical improvements through tax abatements and special commercial rent tax reductions for non-residential or mixed-use properties built before 1975 and located south of Murray and Frankfurt Streets, west of South Street, north of Battery Place, and east of West Street/Route 9A, which includes the Project Site.

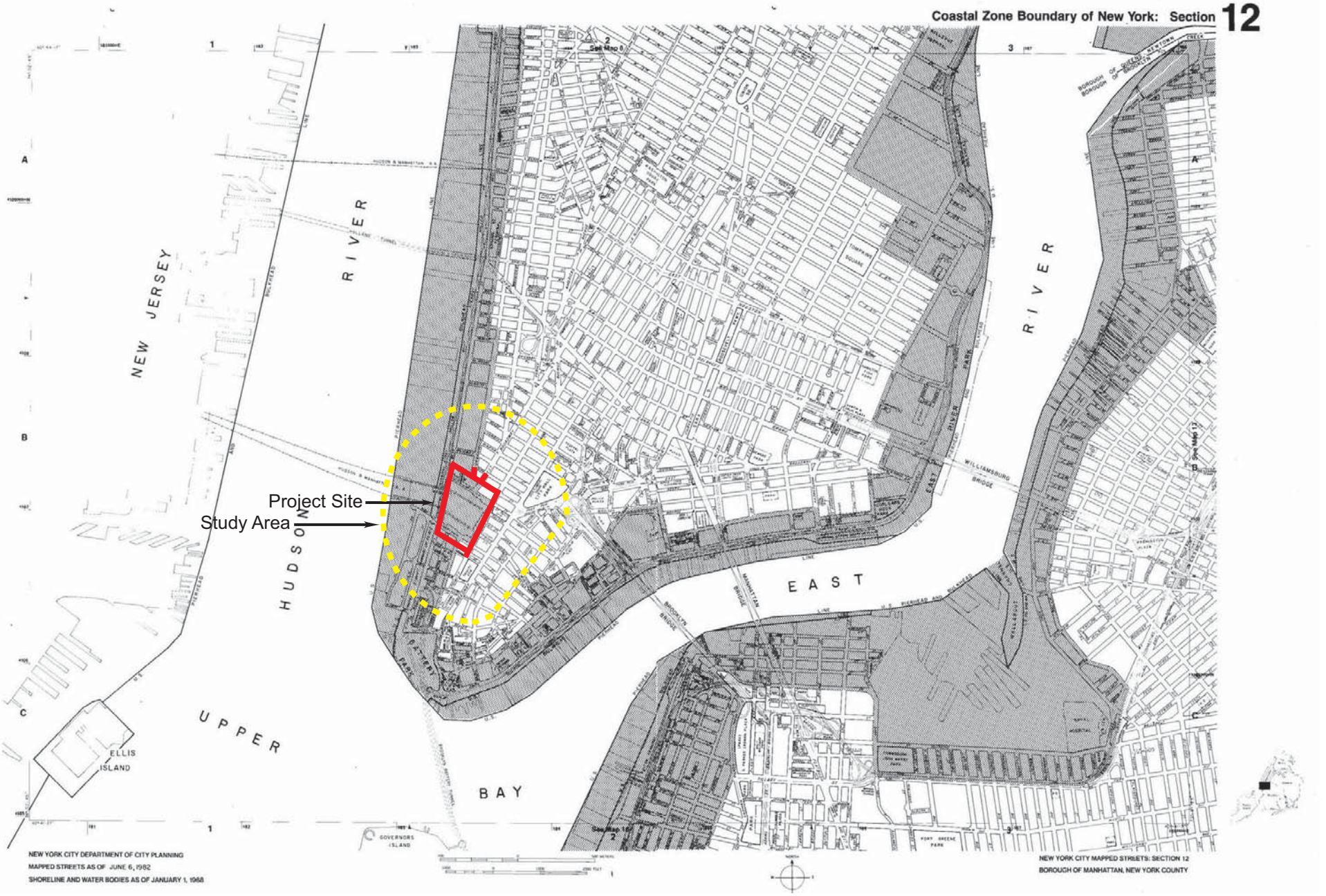
As the WTC Campus is being redeveloped with new buildings, CRP is not applicable to the WTC site itself. As indicated above, with the redevelopment of the WTC Campus, it is expected that interest in the area's existing commercial and retail spaces will continue to grow through 2019 and beyond. It is expected that the CRP would continue to bring new investment to the area regardless of the Proposed Action.

Local Waterfront Revitalization Program

Projects proposed for areas that are located within the designated boundaries of New York City's Coastal Zone must be assessed for their consistency with the City's WRP. The federal Coastal Zone Management Act (CZMA) of 1972 was enacted to support and protect the distinctive character of the waterfront and to set forth standard policies for reviewing proposed development projects along coastlines. The program responded to City, State, and federal concerns about the deterioration and inappropriate use of the waterfront. In accordance with the CZMA, New York State adopted its own Coastal Management Program (CMP), which provides for local implementation when a municipality adopts a local waterfront revitalization program, as is the case in New York City.

The WRP is the City's principal coastal zone management tool which was originally adopted in 1982 and approved by the New York State Department of State (NYSDOS) for inclusion in the New York State CMP. The WRP encourages coordination among all levels of government to promote sound waterfront planning and requires consideration of the program's goals in making land use decisions. NYSDOS administers the program at the State level, and DCP administers it in the City. The WRP was revised and approved by the City Council in October 1999. In August 2002, NYSDOS and federal authorities (i.e., the U.S. Army Corps of Engineers [USACE] and the U.S. Fish and Wildlife Service [USFWS]) adopted the City's 10 WRP policies for most of the properties located within its boundaries. The 10 WRP policies deal with residential and commercial redevelopment; water-dependent and industrial uses; commercial and recreational boating; coastal ecological systems; water quality; flooding and erosion; solid waste and hazardous substances; public access; scenic resources; and historical and cultural resources.

As illustrated in **Figure 2-3**, the WTC Campus falls within New York City's coastal zone boundary as delineated in the Coastal Zone Boundary maps published by DCP. In accordance with the guidelines of the *CEQR Technical Manual*, a Consistency Assessment Form (CAF) was prepared for the Proposed Action as part of the Environmental Assessment Statement dated February 2, 2012 (see **Appendix A**). As indicated in the form, the Proposed Action was deemed to require further assessment of three WRP policies. Each of the policies that were identified in the CAF as requiring further assessment are presented



World Trade Center Campus Security Plan EIS

Figure 2-3
Coastal Zone Boundary Map

below, followed by a discussion of the Proposed Action's consistency with the policy. As noted below, the Proposed Action does not conflict with the WRP policies.

Policy 1: Support and facilitate commercial and residential redevelopment in areas well-suited to such development.

1.1 Encourage commercial and residential redevelopment in appropriate coastal zone areas.

Compliance Statement:
The Project Site is not located directly on the waterfront. As indicated above, the Proposed Action is a security overlay that would primarily consist of street furniture (various security elements) and would not introduce any new buildings other than personnel booths. The Proposed Action would be constructed at the perimeter of the WTC Campus, a site that is currently being redeveloped by the PANYNJ, with a mix of land uses including office, retail, institutional, open space, and parking. The Project Site is not located in a designated Special Natural Waterfront Area or a Significant Maritime and Industrial Area. As such, the Project Site is appropriate and well-suited for redevelopment. All proposed security elements would be constructed within existing or planned streets or along existing or planned sidewalks. The Project Site and the area immediately adjacent to the Project Site is already a well-developed urban environment with no unique or significant natural features. As such, the Proposed Action is consistent with this policy.

1.2 Encourage non-industrial development that enlivens the waterfront and attracts the public.

Compliance Statement:
The Project Site is not located directly on the waterfront. The Proposed Action is a security overlay that would be constructed on streets and sidewalks at the perimeter of the WTC Campus. It would not introduce new buildings other than small personnel booths that would be installed at all vehicular entries and exits or hinder the development of non-industrial uses. Therefore, the Proposed Action would not conflict with this WRP policy.

Policy 8: Provide public access to and along New York City's coastal waters.

Compliance Statement:
As the Project Site is not located on a waterfront site, the Proposed Action would not hinder existing public access to New York City's coastal waters. Pedestrians would be able to move freely through the proposed security elements toward the BPC waterfront. The east-west streets in the Project Site would all be fully accessible to pedestrians, including Vesey and Liberty Streets, which provide direct access to BPC from east of the WTC site. As such, the Proposed Action would not conflict with this WRP policy.

Policy 10: Protect, preserve and enhance resources significant to the historical, archaeological, and cultural legacy of the New York City coastal area.

Compliance Statement:
As indicated above, the Proposed Action is a security overlay that would be constructed on streets and sidewalks at the perimeter of the WTC Campus in areas that have been previously disturbed by construction activities. Chapter 5, "Historic and Cultural Resources," describes the precautions that would be implemented to protect nearby historic resources that have the potential to be affected by construction activities. As a result, the Proposed Action would be consistent with this policy.

As discussed, the Proposed Action would be consistent with the applicable WRP policies and therefore would not substantially hinder the achievement of any of the coastal policies.

Sustainability and PlaNYC 2030: A Greener, Greater New York

In April 2007, the Mayor's Office of Long Term Planning and Sustainability released PlaNYC. An update to PlaNYC in April 2011 built upon the objectives set forth in 2007 and provided new goals and strategies. PlaNYC represents a comprehensive and integrated approach to planning for New York City's future. It includes policies to address three key challenges that the City faces over the next twenty years: population growth; aging infrastructure; and global climate change. In the 2011 update, elements of the plan were organized into 10 categories—housing and neighborhoods, parks and public space, brownfields, waterways, water supply, transportation, energy, air quality, solid waste, and climate change—with corresponding goals and initiatives for each category.

Per the *CEQR Technical Manual*, PlaNYC initiatives need to be considered for large publicly sponsored projects to ensure that the projects align with the broader sustainability priorities and goals the City has set. These initiatives involve air quality, energy, water quality, land use, open space, natural resources, solid waste, and transportation. As the Proposed Action is a City-sponsored security overlay at the perimeter of the WTC Campus, it is not considered a "large publicly-sponsored project" that would warrant an assessment of sustainability. As such, an evaluation of sustainability is not warranted and no assessment of PlaNYC initiatives is provided below. However, many of the PlaNYC initiatives, including an assessment of transportation, air quality, greenhouse gas (GHG) emissions, and construction, are provided in this Environmental Impact Statement (EIS).

Study Area

Hudson River Park Trust

In 1998, the Hudson River Park Act created the HRPT and established the boundaries for the Hudson River Park. The HRPT is a public benefit corporation under the jurisdiction of both the City and State of New York, which is responsible for developing and operating the 500-acre Hudson River Park. Located along Manhattan's West Side on the shore of the Hudson River, the expansive Hudson River Park extends five miles from Battery Park in Lower Manhattan, through the western portion of the Study Area, to West 59th Street in the north, where it connects to Riverside Park. Hudson River Park is the largest open space project to undergo construction in Manhattan since the completion of Central Park. The western boundary of Hudson River Park is the U.S. Pierhead Line and the eastern boundary is generally the westernmost point of West Street/Route 9A. In its entirety, the park includes approximately 150-acres of upland and pier areas and 400-water acres, all of which are further designated as part of the Hudson River Park Estuarine Sanctuary, which was also created by the Hudson River Park Act.

Since 1999, HRPT has used over $350 million in public funding to rebuild the piers, bulkheads, and land areas that comprise the Hudson River Park, such that at the close of 2011, the park was 70 percent complete. Hudson River Park incorporates many renovated piers on the Hudson River and provides an array of active and passive recreational amenities. When fully complete, the park will consist of thirteen park piers, a continuous waterfront esplanade, active and passive recreation space, boating, and three commercial development nodes.

Security elements associated with the Proposed Action would not prevent the use and enjoyment of Hudson River Park, nor would the security plan hamper the efforts of the HRPT to complete the park.

Battery Park City Authority

The Hugh L. Carey Battery Park City Authority is a New York State public benefit corporation created by the New York State Legislature in 1968, whose mission is to plan, create, coordinate and maintain a balanced community of commercial, residential, retail, and park space within its designated 92-acre BPC Site on the lower west side of Manhattan. The BPC Site is located at the southwest tip of Manhattan along the Hudson River, extending from Chambers Street to the Battery and west of West Street/Route 9A in

the BPC subarea of the Study Area. The BPC Site is a planned mixed-use commercial and residential community that includes 9.3 million square feet of commercial space, 7.2 million square feet of housing, 9,000 residents, 52 shops and services, 35-acres of parks, 22 restaurants, 20 works of public art, three public schools, two hotels, a multi-screen movie theatre, a marina, a 1.2-mile esplanade, the Irish Hunger Memorial, Museum of Jewish Heritage, New York Police Memorial and Skyscraper Museum. Parcels of land are leased to developers who build in accordance with the Battery Park City Authority's guidelines, which also incorporate green provisions mandating state of the art environmental specifications to maximize energy efficiency and minimize water usage.

The proposed security measures at the perimeter of the WTC Campus would not conflict with the mission of the Battery Park City Authority.

Fulton Nassau Crossroads Program

The Fulton Nassau Crossroads Program is a voluntary storefront and façade improvement program aiming to improve pedestrian and retail conditions and restore the historic architecture along Lower Manhattan's primary retail corridor. To be eligible for the program, a property must be located on Nassau Street between Spruce Street and Maiden Lane or Fulton Street between Broadway and Water Streets in the eastern section of the Broadway Corridor subarea of the Study Area. A key component of the City's effort to revitalize Lower Manhattan, the Fulton Nassau Crossroads Program is funded through an U.S. Department of Housing and Urban Development (HUD) Community Development Block Grant and the LMDC. The program provides free design and engineering services, basic storefront improvements worth up to $15,000, and funding for two-thirds of storefront improvement and façade restoration construction costs to eligible properties.

The Proposed Action would not interfere with the Fulton Nassau Crossroads Program, including its three primary goals: (1) Basic Storefront Improvements (Level 1); (2) Comprehensive Storefront Improvements (Level 2); and (3) Façade Restoration (Level 3). As such, no further analysis of this public policy is required.

Historic Districts

Parts of the Study Area fall within three LPC-designated historic districts, namely: the Wall Street Historic District; the African Burial Ground and the Commons Historic District; and the Tribeca Historic Districts (the Tribeca South and Extension Historic District and the Tribeca East Historic District). The intent of the historic districts is to protect the neighborhood character and unique architectural value of these areas. Landmark status prohibits any demolition or major upgrade/alteration to the buildings within the LPC-designated districts without the consent of the LPC.

The Proposed Action is a security overlay. It would not introduce new buildings (other than personnel booths at proposed entry/exit locations) or modify zoning within the mapped historic districts. All properties within the LPC-designated historic districts would require LPC permits and approvals prior to any new construction, addition, enlargement, or demolition. Therefore, the Proposed Action would be consistent with New York City Landmarks Law, and would not have a significant adverse impact on this aspect of public policy.

Furthermore, there are two mechanisms to protect buildings in New York City from potential indirect damage caused by construction activities. All buildings are provided some protection from accidental damage through the NYCDOB controls that govern the protection of any adjacent properties from construction activities. For all construction work, the Building Code serves to protect buildings by requiring that all lots, buildings, and service facilities adjacent to foundation and earthwork areas be protected and supported in accordance with the requirements of Building Construction Subchapter 7 and Building Code Subchapters 11 and 19. In addition, designated LPC and S/NR-listed historic buildings

located within 90 linear feet of a proposed construction site are further protected by the NYCDOB's Technical Policy and Procedure Notice (TPPN) #10/88. TPPN 10/88 supplements the standard building protections afforded by the Building Code by requiring, among other things, a monitoring program to reduce the likelihood of construction damage to adjacent LPC designated or S/NR-listed resources (within 90 feet) and to detect at an early stage the beginnings of damage so that construction procedures can be changed. By following these measures, which are required for any designated historic resources within 90 feet of a development site, the proposed work would not cause any significant adverse construction-related impacts.

Vision 2020: New York City Comprehensive Waterfront Plan

DCP's Comprehensive Waterfront Plan, adopted in 1992, identified goals and objectives for the City's waterfront, focusing on four principal waterfront functional areas: natural, public, working, and redeveloping. The 1992 Comprehensive Waterfront Plan recommended a number of regulatory changes that have been largely implemented through two means: the WRP and Waterfront Zoning Amendments. Revised in 2011, *Vision 2020* builds on these policies and sets the stage for expanded use of the waterfront.

A 10-year plan for the future of the City's 520 miles of shoreline, *Vision 2020* provides a sustainable framework for more water transport, increased public access to the waterfront and economic opportunities in order to help make the water part of New Yorkers' everyday lives. *Vision 2020* encourages use of the City's waterfront for parks, housing and economic development, and its waterways for transportation, recreation and natural habitats with new city-wide policies and site-specific recommendations.

Vision 2020's strategies for improving the waterfront are organized into eight overarching city-wide strategies, which are presented as eight goals: (1) Expand public access; (2) Enliven the waterfront; (3) Support the working waterfront; (4) Improve water quality; (5) Restore the natural waterfront; (6) Enhance the blue network (i.e., the waterways surrounding New York City); (7) Improve government oversight; and (8) Increase climate resilience. In addition to these city-wide goals, each segment of the City's incredibly diverse shoreline requires a local strategy as well. For the purposes of the *Vision 2020* plan, the City is divided into 22 segments, or reaches. The quarter-mile Study Area includes the western portion of Manhattan Reach 2 (i.e., the area along the Hudson River). As the Proposed Action is site-specific and not located directly on a waterfront site, it would not conflict with the goals of the reach-wide neighborhood strategies.

Vision 2020 is accompanied by the *New York City Waterfront Action Agenda (Action Agenda)*, the three-year implementation component of *Vision 2020*, which provides an outline of key projects to be initiated within three years to catalyze waterfront investment, improve water quality, and expand public access. The *Action Agenda* includes 130 specific, high-priority projects that demonstrate the City's commitment to investing in the transformation of the waterfront. The *Action Agenda* organizes each project under one of the eight goals of *Vision 2020*, identifies the City agency leading its implementation, and lists the date by which the project will be undertaken. The *Action Agenda* includes a number of initiatives for Lower Manhattan, including: complete renovation and restoration at historic Pier A for public use; develop hotel, restaurant, catering, and community use at Battery Maritime Building; complete construction of 8.5 acres of East River Esplanade South between Battery Maritime Building and Pier 35, including Pier 15, to feature water uses, educational uses, and café; and commence parkland and open space development, including restoration of historic open spaces and improvements to all gateway dock facilities on Governors Island.

As the New York City Comprehensive Waterfront Plan applies to the area directly along the waterfront, it would not be directly affected by the Proposed Action. As the Proposed Action would not alter or conflict with these policies, no further analysis is warranted.

Conclusion

In conclusion, the Proposed Action would not result in any significant adverse public policy impacts. As the Proposed Action is a site-specific security overlay, it would not affect the public policies that govern the project site. Therefore, a detailed analysis is not warranted. Nonetheless, as described below, a detailed land use assessment follows because it informs other technical areas.

E. DETAILED ASSESSMENT

Under CEQR guidelines, a detailed land use assessment is appropriate if a detailed assessment is required in the technical analyses of socioeconomic conditions, neighborhood character, transportation, air quality, noise, infrastructure, or hazardous materials. In addition, for some projects a more detailed land use assessment is necessary to sufficiently inform other technical reviews and determine whether changes in land use could affect conditions analyzed in those technical areas. Thus, a detailed assessment is warranted for the Proposed Action. Information that would typically be included in a preliminary assessment (e.g., physical setting, present land use, etc.) has been incorporated into the detailed assessment below.

Existing Conditions

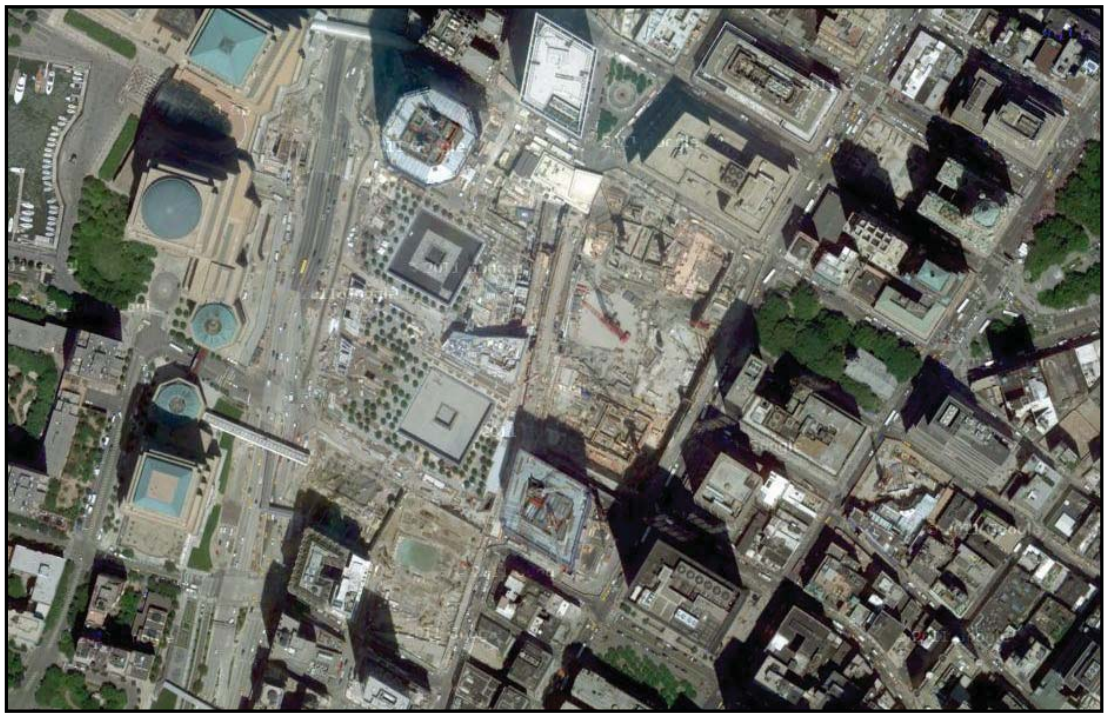
Land Use

Project Site

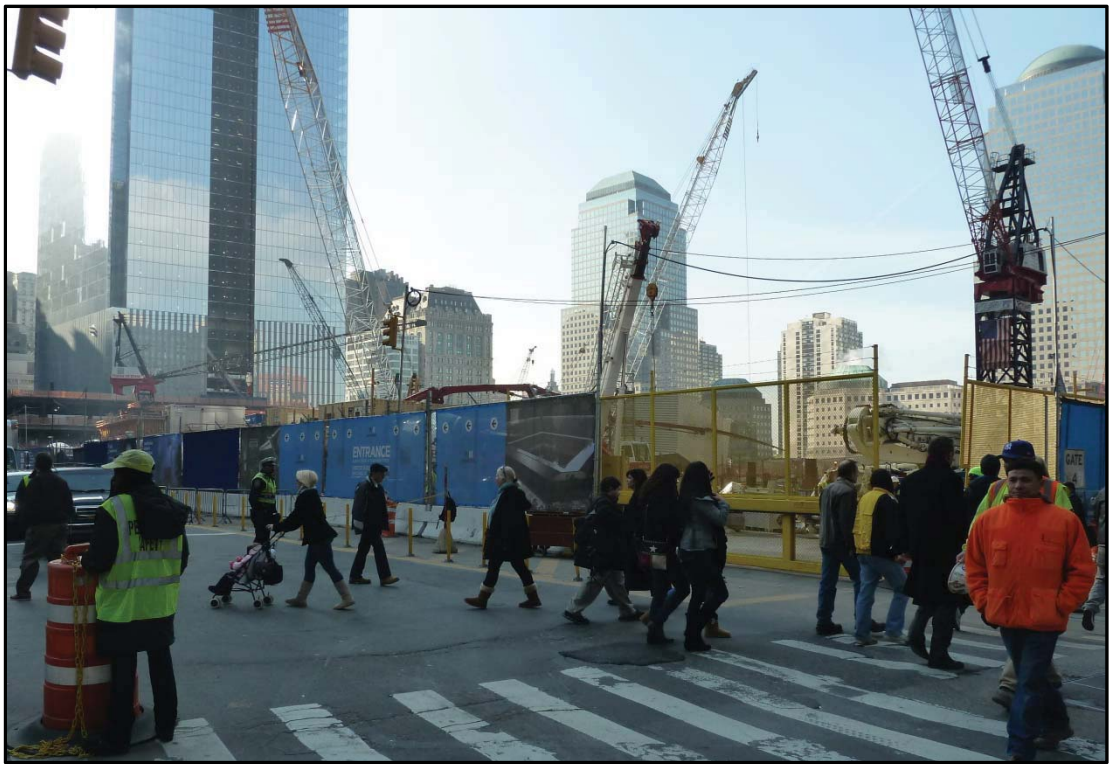
The WTC Campus is largely under construction, as can be seen in **Figure 2-4**. The core and shells of four planned towers at the WTC Campus are currently being erected and are at various stages of completion. As described in Chapter 1, "Project Description," the WTC Campus is anticipated to be redeveloped with approximately 8.5 million square feet of office space, 441,000 square feet of retail space, approximately 14,000 square feet of restaurant/café uses, a 1,000-seat performing arts center, a 290,000 square-foot Memorial Center, as well as up to approximately 500 underground parking spaces by 2019. In addition, the WTC Campus will include a new WTC Port Authority Trans-Hudson (PATH) Hub, which will be a multi-story central transit hall with upper and lower concourse levels. It will provide an integrated network of underground pedestrian connections to adjoining New York City subway stations and the Metropolitan Transit Authority's (MTA) Fulton Street Transit Center, as well as to locations on and around the WTC Campus, including the four WTC office towers, the National September 11th Memorial and Museum, Hudson River ferry terminals, the World Financial Center, PATH trains, and New York City Transit subway lines.

The National September 11th Memorial Plaza opened to the public in September 2011. The Memorial comprises the western and central portions of the WTC Campus. It consists of an approximately 1.5 acre plaza that is filled with oak trees. At the plaza's center are two cascading pools set within the footprints of the former Twin Towers, which include the names of nearly 3,000 individuals who died as a result of the September 11th attacks and the February 1993 World Trade Center bombing. The WTC Campus also includes a temporary WTC PATH station, which restored transit service in 2003. Its entrance is currently located on Vesey Street near West Broadway.

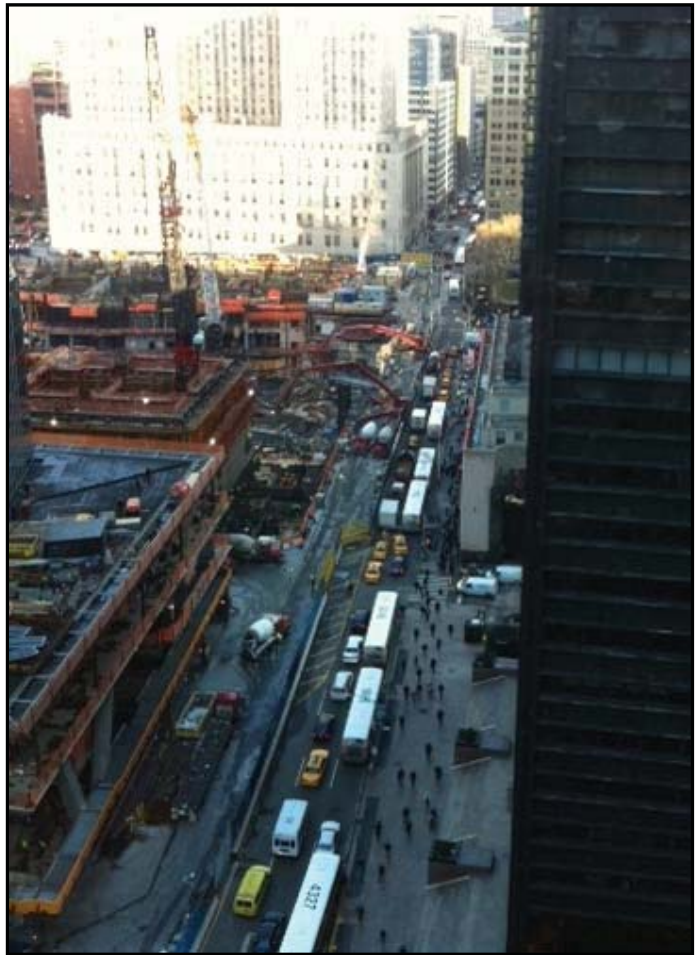
As a result of the ongoing construction of the WTC Campus, multiple streets are closed to vehicular and pedestrian traffic. To the south, Cedar Street is closed between West Street/Route 9A and Washington Street. Between Greenwich Street and Trinity Place/Church Street, Liberty Street is limited one-way vehicular traffic due to ongoing construction activities. To the north of the WTC Campus, Washington



1. Aerial view of the World Trade Center Campus.



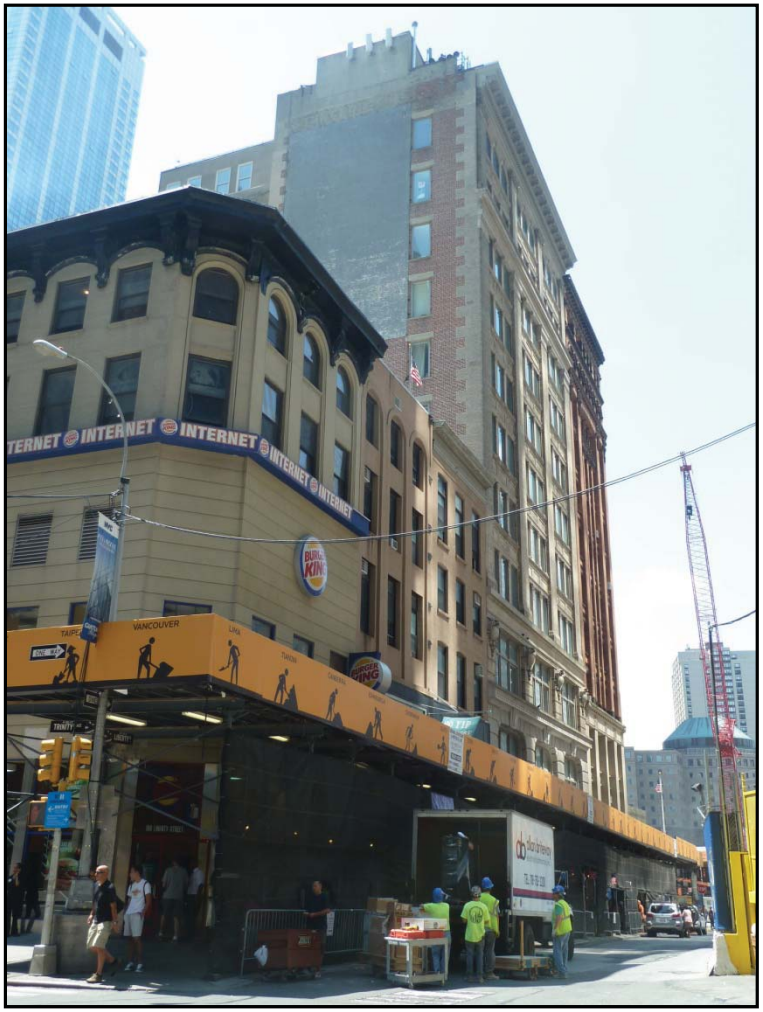
2. View of the WTC Campus from the intersection of Church Street and Vesey Street.



3. View north along Church Street with the World Trade Center Campus construction activities to the left.

4. View west across Church Street to 1 World Trade Center.

5. View of 4 World Trade Center from the northwest.



6. South side of Liberty Street between Greenwich Street and Trinity Place/Church Street.

7. Facing north on West Broadway from Vesey Street; Federal Office Building/U.S. Post Office on right.

8. Facing south on Washington Street from Barclay Street; Barclay-Vesey Building on right and 7 WTC on left.

Street is limited to local deliveries and construction access between Barclay and Vesey Streets while neighboring Vesey Street between West Street/Route 9A and Church Street is only open to pedestrian traffic. Fulton Street between Church Street and West Street/Route 9A does not currently exist and will be reconstructed in conjunction with the WTC Campus redevelopment.

The three blocks located immediately north of the WTC Campus are occupied by high-rise commercial office and institutional buildings that encompass entire blocks. The 32-story Barclay-Vesey building, which includes approximately 1.3 million square feet of office space, occupies the block bounded by Barclay, Washington, Vesey, and West Streets. 7 WTC, which was completed in 2006, occupies the block directly east bounded by Barclay, Greenwich, Vesey, and Washington Streets. It is 52-stories tall, and includes approximately 1.7 million square feet of office space and a Con Edison substation that supplies electrical service to downtown Manhattan. Adjacent to and east of 7 WTC is Vesey Park, a triangular-shaped public open space bounded by Greenwich Street, West Broadway and Vesey Street, which features a central open plaza with a fountain and landscaping. The Federal Office Building/U.S. Post Office, located at 90 Church Street, consists of 1.15 million square feet and occupies the block bounded by Barclay Street, Church Street, Vesey Street and West Broadway.

To the southeast of the WTC Campus, the block bounded by Liberty Street, Trinity Place, Cedar Street and Greenwich Street is occupied by a mix of residential, commercial, and institutional uses. Three mid-rise residential buildings with ground-floor retail uses occupy the mid-block, and FDNY Engine Company 10 and Ladder Company 10 (the "Ten House") is housed within a three-story institutional building located at 124 Liberty Street, comprising the western portion of the block. A five-story office building with a ground-floor Burger King and a two-story commercial building with two restaurants occupy the eastern edge of the block. The WTC Tribute Center is also located on this block.

Study Area

Land uses within the Study Area include a mixture of densely built city blocks containing a variety of uses, including high-rise commercial office buildings, mid-to-high-rise residential buildings, institutional facilities, converted industrial and commercial spaces, street-front retail corridors, and a variety of public open spaces, as can be seen in **Figure 2-1**. There are few vacant lots, and most of those currently vacant are slated to be redeveloped, as discussed in the No-Action section below.

North of the WTC Campus

The area immediately north of the WTC Campus is predominately mixed-use with residential, commercial, and institutional buildings interspersed throughout. Blocks north of Murray Street between Greenwich Street and Broadway are characterized by smaller, mixed-use buildings on narrow lots, typically with lower level retail spaces and upper-level residences. The identical buildings at 275 and 295 Greenwich Street are unusual examples of larger buildings in this area; each has 11 floors with 261 apartments. In contrast, the blocks west of Greenwich Street and south of Murray Street typically have larger buildings encompassing half or full blocks. These are commercial and institutional buildings as well as high-rise residential buildings with ground-floor retail. The larger residential buildings include 200 Chambers Street, a 29-story apartment building encompassing half of a city block, and neighboring 101 Warren Street, a 32-story apartment building with 227 apartments. In addition, a 12-story residential building is located at 53 Park Place and a 21-story building is located at 50 Murray Street.

Large office buildings are located south of Murray Street and along Broadway, including 75 Park Place, 123 Barclay Street, and 100 Church Street directly to the north of the Project Site. Several educational institutions are also located in the area north of the WTC Campus. Institutions of higher education include the New York University (NYU) School of Continuing and Professional Studies at 223 Broadway, Saint John's University School of Risk Management at 101 Murray Street, and The College of New Rochelle School of New Resources has space within the DC 37 building (New York City's largest public employee

union) at 125 Barclay Street. In addition, the Borough of Manhattan Community College's (BMCC) main campus is at 199 Chambers Street, and BMCC has recently completed the construction of Fiterman Hall at 30 Park Place, immediately to the north of the Project Site. P.S. 234, an elementary school with an enrollment of over 800 students, is located at 292 Greenwich Street. The landmarked St. Peter's Church is located at 22 Barclay Street. There are also several open spaces in the area north of the WTC Campus, including Vesey Park, which is a privately owned, public space, and the large Washington Market Park, a publically landscaped park with playgrounds located between West, Chambers, and Greenwich Streets.

Broadway Corridor

The Broadway Corridor is predominately commercial, with clusters of mixed-use buildings northeast of Broadway and Cortlandt Street and south of Broad and Wall Streets. The area south of Cortlandt Street is dominated by large office buildings, often encompassing half or full blocks with ground-level retail. Several notable buildings are the New York Stock Exchange, 140 Broadway, 1 Liberty Plaza, the Trinity Buildings, and the Bank of New York. In contrast, the area of mixed-use buildings in the northeast is characterized by narrow lots and shorter buildings.

There are numerous institutions throughout the Broadway Corridor subarea. City Hall is located in the northeastern section of this subarea on the irregularly shaped block bounded by Broadway on the west, Park Row to the south, Centre Street on the east and Chambers Street to the north. Trinity Church and Cemetery are located on the southern portion of a large block bounded by Trinity Place, Rector Street, and Broadway. Saint Paul's Chapel and Cemetery encompass the entirety of the block bounded by Church Street to the west, Fulton Street to the south, Broadway to the east and Vesey Street to the north. Pace University buildings are scattered located on several blocks in the northeast section of the Study Area, with a new Pace University building currently under construction on Broadway. There are also several other churches scattered throughout the Broadway Corridor.

In addition to the green spaces surrounding Trinity Church and Saint Paul's Chapel, Zuccotti Park is a privately-owned public plaza bounded by Liberty Street, Broadway, Cedar Street, and Trinity Place and City Hall Park encompasses the southern section of the block bounded by Broadway on the west, Park Row to the south, Centre Street on the east and Chambers Street to the north.

Greenwich South Corridor

The Greenwich South Corridor is characterized by a mix of residential, commercial, mixed-use, institutional, and transportation uses. Large office buildings dominate the area west of Greenwich Street, including the American Stock Exchange and 40 Rector Street. There are several hotels directly south of the WTC Campus, including Club Quarters and the World Center Hotel at 140-144 Washington Street, the Marriott Hotel at 80 West Street/Route 9A, and the W Hotel and Residences at 123 Washington Street. The latter is also an example of the large residential buildings in the area, and shares an entire city block with 120 Greenwich Street, a 13-story residential building. Other residential buildings in the Greenwich South Corridor include the 18-story building at 71 West Street, which encompasses half a city block, as well as 90 West Street immediately to the south of the Project Site, which has 410 apartments on 24 floors. Further south are the 27-story residential building at 90 Washington Street and the 38-story building at 88 Greenwich Street. There are also several hotels and residences currently under construction in the Greenwich South Corridor, detailed below in the No-Action scenario. Institutional buildings in the area include the High School for Leadership and Public Service at 88 Trinity Place with approximately 815 students and the High School of Economics and Finance at 96 Trinity Place with approximately 650 students. The Brooklyn Battery Tunnel entrance and exit ramps are located at the southern edge of the Study Area, and are accompanied by the large Battery Parking Garage, which can accommodate over 2,000 vehicles.

Battery Park City

Immediately to the west of the WTC Campus is West Street/Route 9A, which is an eight-lane highway with a planted median. To the west is BPC, a mixed-use community dominated by large buildings typically occupying half or whole blocks and substantial open space. Large residential towers surrounded by landscaped gardens and ballfields are located north of Murray Street. There is also a school, PS/IS 89 at 450 North End Avenue, and a branch of the New York Public Library at 175 North End Avenue. Large office buildings, including the World Financial Center, are located between Murray and Albany Streets. The World Financial Center includes four large office towers connected by a lower level retail mall. It surrounds the North Cove Marina and a glass-enclosed atrium called the Winter Garden. The Conrad Hotel is located at 102 North End Avenue. South of the World Financial Center are residential buildings with ground-level retail, surrounded by landscaped open space. Along the Hudson River are continuous open spaces with both active and passive recreation.

Future Without the Proposed Action (No-Action)

Land Use

Project Site

In 2019 without the proposed Campus Security Plan, it is anticipated that the WTC site would be fully developed. As described above, the WTC site will contain approximately 8.5 million square feet of office space, 441,000 square feet of retail space, approximately 14,000 square feet of restaurant/café uses, a 1,000-seat performing arts center, an approximately 290,000 square-foot Memorial Center, as well as up to approximately 500 underground parking spaces by 2019. In addition, the WTC site will include a new WTC PATH Hub, which will be a multi-story central transit hall with upper and lower concourse levels. It will provide an integrated network of underground pedestrian connections to adjoining New York City Transit subway stations and the proposed MTA Fulton Street Transit Center, as well as to locations on and around the WTC site, including the WTC office towers, the National September 11th Memorial and Museum, Hudson River ferry terminals, the World Financial Center, PATH trains, and New York City Transit subway lines.

Figure 1-7 in Chapter 1, "Project Description," provides the future No-Action WTC site plan with street configuration and traffic circulation patterns in the Project Site. As shown in **Figure 1-7**, the existing street configuration would be modified to extend Fulton Street east-west through the site and Greenwich Street north-south through the site. Within the Project Site, Fulton Street would operate one-way westbound and Greenwich Street would operate one-way southbound. However, the section of Fulton Street between West Street/Route 9A and Greenwich Street would be a managed street with sally ports and barriers irrespective of the Proposed Action based on version 10.0 of PANYNJ's master plan. Additionally, subsequent to the 2005 redesign of 1 WTC it was determined that unscreened vehicles would be prohibited from accessing the portions of Fulton and Vesey Streets immediately adjacent to 1 WTC as a measure to enhance security at-grade.

The new sections of Fulton and Greenwich Streets would divide the WTC site into four quadrants. The Memorial, Museum, and visitor center would occupy the southwest quadrant, while the tallest of five proposed towers, 1 WTC, and the Performing Arts Center would occupy the northwest quadrant. The three additional towers and transportation hub would occupy the two eastern quadrants, while the VSC would be located at the south end of the site.

Towers 1 through 4 will contain Class A office space. Tower 1 will be located at the southeast corner of Vesey Street and West Street/Route 9A to the north of the Memorial. It will contain approximately 2.6 million square feet, including office space, an observation deck, restaurants, and broadcast and antennae

facilities. Tower 2 will be located at the southwest corner of Vesey Street and Trinity Place/Church Street to the east of the Performing Arts Center and north of the WTC PATH Hub. It will include 88-stories and be the second tallest skyscraper in New York City. Tower 3 will be the third-tallest building on the WTC site and located to the south of the WTC transportation hub between Dey and Cortlandt Streets on Trinity Place/Church Street. Tower 4 will be located directly south of Tower 3 and rise 72 stories.

Retail space will be interspersed throughout the WTC Campus. Shops and services will be located on six levels, including two levels of a below-grade concourse extending from the World Financial Center to both the new Fulton Street Transit Center and the corner of Liberty Street and Trinity Place/Church Street. Retail will be provided at the street level on Trinity Place/Church Street, Cortlandt Street, and Dey Street, and on three above-grade levels within Towers 2, 3, and 4, as well as below-grade in the new transportation hub.

The National September 11th Museum will be located in the center of the WTC Campus at the southwest corner of Fulton and Greenwich Street adjacent to the Memorial. The entrance to the Museum Pavilion will be located on the Memorial Plaza on Greenwich Street. The opening date for the National September 11th Museum is currently unknown.

The PATH Terminal will be located at the southwest corner of Fulton and Church Streets between Towers 2 and 3. It will significantly improve mass-transit connections in Lower Manhattan and provide pedestrian concourses to existing and future transportation services, including PATH services, New York City Transit subway stations and the proposed MTA Fulton Street Transit Center through the Dey Street Corridor.

Vesey Street will be opened to traffic from Greenwich Street to Trinity Place/Church Street; however, the section of Vesey Street adjacent to Tower 1 between West Street/Route 9A and Greenwich Street will be a managed street with sally ports and barriers. Vesey Street will operate one-way eastbound to the east of Greenwich Street, two-way between Greenwich and Washington Streets, and one-way westbound to the west of Washington Street. West Broadway between Barclay and Vesey Streets will remain open to southbound through-traffic, providing access to Greenwich Street through the Project Site. Additionally, it is expected that Greenwich Street from Barclay Street to Vesey Street would be limited for use only by 7 WTC tenants in the No-Action condition (as outlined in a December 5, 2007 reciprocal easement agreement among the City of New York, 7 WTC ownership, PANYNJ and LMDC); therefore, this section of Greenwich Street would be a controlled access street irrespective of the Proposed Action. The parallel segment of Washington Street would operate two-way with an operable barrier at the intersection with Vesey Street to ensure that only screened vehicles would be permitted to drive next to 1 WTC.

At the south end of the WTC site, Liberty Street will be opened to traffic between Trinity Place/Church Street and West Street/Route 9A, and will operate with two-way traffic flow. Cedar Street will remain closed between Greenwich and Washington Streets, and Washington Street will remain closed between Cedar and Liberty Streets. All northbound traffic on Washington Street will turn westbound onto Cedar Street to reach West Street/Route 9A.

In the No-Action condition, the site plan and vehicle circulation system incorporates limited security measures that establish sections of both Vesey Street and Fulton Street as "managed streets," As described in Chapter 1, "Project Description." This will be achieved through the installation of operable barriers and sally ports on Vesey, Fulton and Washington Streets to restrict vehicular access near Tower 1. Each sally port will consist of a personnel booth controlling a set of two operable barriers with sufficient space between them to accommodate a motor vehicle. In operation, the first barrier will be lowered to permit a single vehicle to enter, and then raised to prevent entry by following vehicles. After completing a screening process, the second barrier will be lowered to allow the vehicle to exit. As shown

in **Figure 1-7**, two sally ports will be located on Fulton Street, one immediately east of West Street/Route 9A and the second west of Greenwich Street. Two sally ports will also be located on Vesey Street, one immediately to the east of West Street/Route 9A and a second west of Greenwich Street in front of the helix. An additional operable barrier will be installed on the Washington Street approach to Vesey Street that will be raised in the default condition, and lowered only as needed to permit entry by authorized vehicles.

Up to approximately 500 parking spaces for autos and 67 spaces for tour buses will be located below-grade at the WTC Campus, and accessed via the VSC. The entrance to the VSC will be located on the south side of Liberty Street east of West Street/Route 9A. All autos and tour buses en route to below-grade parking at the WTC Campus would undergo screening at this facility, as will trucks en route to below-grade loading areas for WTC Towers 1 through 4. All vehicles will exit onto Liberty Street, primarily westbound to West Street/Route 9A.

Although an entrance/exit ramp will be provided on Vesey Street (referred to as the "Helix"), current plans call for it to be used primarily for emergency access with all vehicles entering and exiting through the VSC under typical operating conditions.

Existing land use trends at the periphery of the Project Site will likely remain the same in the future without the Proposed Action. As such, it is anticipated that the existing mixed-use, commercial, and institutional buildings located on the block at the southeastern corner of the site (bounded by Liberty Street, Church Street, Cedar Street, and Greenwich Street) would not experience significant changes in land uses through 2019.

Study Area

In the No-Action condition, the WTC Campus will be fully developed. Lower Manhattan will remain a vibrant mixed-use community with one of the largest central business districts in the U.S. and is expected to experience moderate growth in commercial, office, retail, residential, hotel, and community facility uses by 2019. Anticipated private and public development projects currently under construction or planned to be constructed in the Study Area by 2019 are detailed below, and can be seen in **Figure 2-5** and **Table 2-2**.

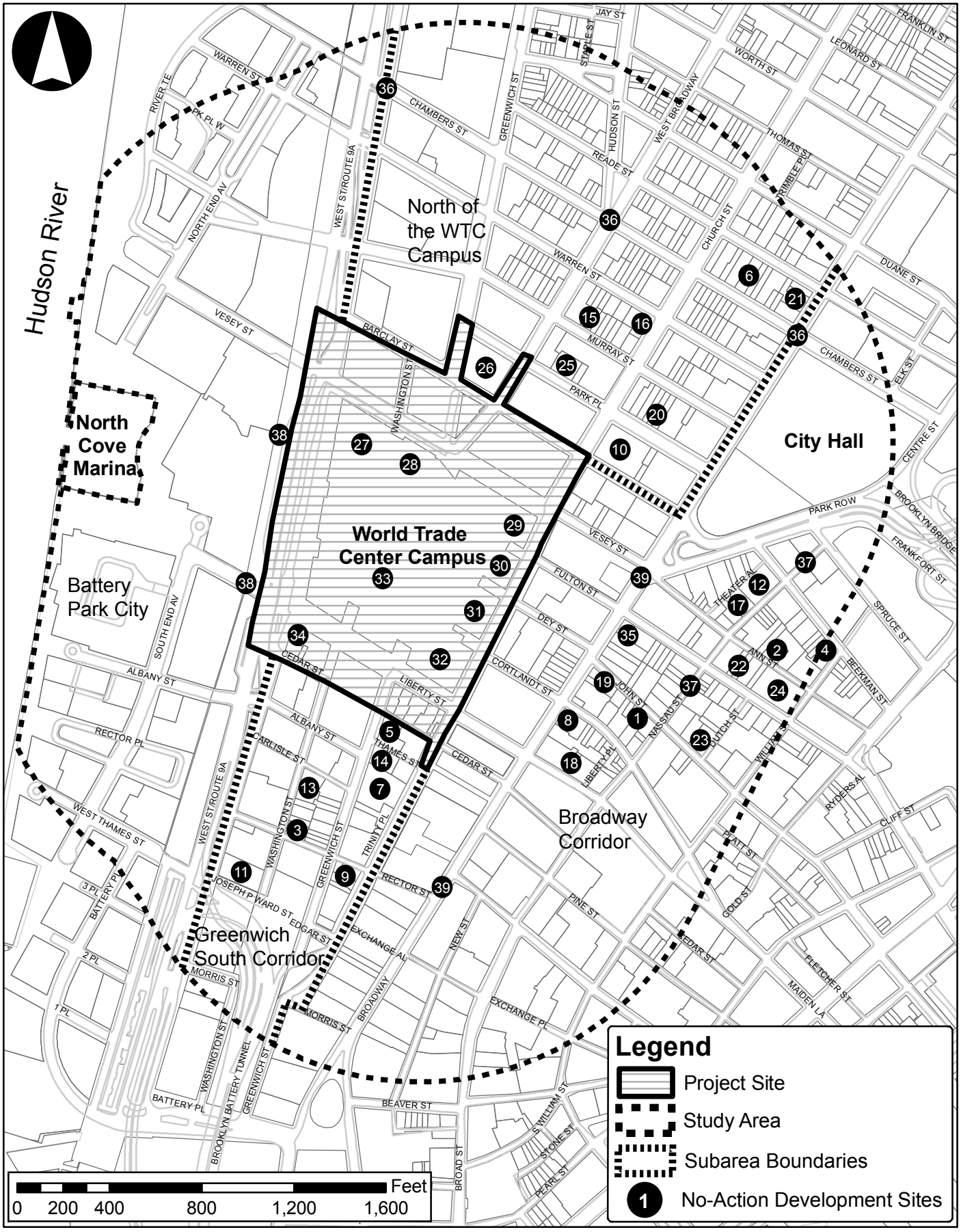
North of the WTC Campus

A variety of projects are currently under construction in the predominately mixed-use area north of the WTC Campus, including: a four-unit condo conversion at 55 Murray Street/55 Warren Street, a 24-unit condominium conversion with 5,500 square feet of retail space at 37 Warren Street/136 Church Street, and a new 84-unit residential building with 11,372 square feet of retail space at 57 Reade Street. A new 25-story condominium building will be finished in 2013 at 19 Park Place/16 Murray Street. BMCC's new Fiterman Hall at 30 West Broadway was recently completed, with 54 classrooms, 44 labs, and 160 offices for the institution.

Multiple projects north of the WTC Campus are in the pre-development stages. A 90-room hotel is planned for 87 Chambers Street/69 Reade Street, and a new 190-room Four Seasons Hotel is planned for 99 Church Street/30 Park Place. A 100,000 square-foot cultural center with a 500-seat auditorium is also planned for 45-51 Park Place. These projects illustrate the continuing trend of development and conversion to mixed-use in the area north of the WTC Campus.

Street improvement projects are under construction north of the WTC Campus along Chambers Street from West Street/Route 9A to Broadway. To be completed in 2014, these street improvements include utility upgrades, new signals, tree planting, and roadway reconstruction.

No-Action Developments Within Quarter-Mile Radius



No-Action Developments Within Quarter-Mile Radius

Map No.	Project Name / Address	Development Proposal Program	Build Year
1	24-26 John Street (expansion & conversion)	Hotel: 95 rooms; Retail: Restaurant & Bar	2013
2	Aloft Hotel / 49-53 Ann Street	Hotel: 113 rooms	2014
3	Holiday Inn / 99 Washington Street	Hotel: 350 rooms	2013
4	Homewood Suites Hotel / 33 Beekman Street	Hotel: 270 rooms	2014
5	133 Greenwich Street	Hotel: 320 rooms; Retail: 5,000 sf	2015
6	87 Chambers Street / 69 Reade Street	Hotel: 90 rooms	2019
7	78-86 Trinity Place	Hotel: 174 rooms; Retail: 100,000 sf	2019
8	170 Broadway (conversion)	Hotel: 165,000 sf	2019
9	50 Trinity Place	Hotel: 244 rooms	2019
10	Four Seasons Hotel / 99 Church Street/30 Park Place	Hotel : 190 rooms	2019
11	50 West Street/50 Little West Street	Hotel: 155 rooms; Residential: 280 DU; Retail: 15,000 sf	2019
12	Commune Hotel / 5 Beekman Street (conversion)	Hotel / Residential: 297 rooms	2019
13	111 Washington Street	Residential: 500 DU; Retail: 30,000 sf	2019
14	18-22 Thames Street / 123 Greenwich Street	Residential: 353 DU	2019
15	55 Murray Street/55 Warren Street (conversion)	Residential: 4 DU	2012
16	37 Warren Street/136 Church Street (conversion)	Residential: 24 DU; Retail: 5,500 sf	2012
17	113 Nassau Street/21 Ann Street	Residential: 167 DU	2013
18	67 Liberty Street (conversion)	Residential: 12 DU	2012
19	Pace University Dorm / 2 John Street/180 Broadway	Residential: 196 DU; Retail on lower three floors	2013
20	19 Park Place/16 Murray Street	Residential: 25 DU	2013
21	57 Reade Street (Reade57)	Residential: 84 DU; Retail: 11,372 sf	2012
22	127 Fulton Street / 42 Ann Street (Compass Lofts)	Residential: 7 DU	2012
23	45 John Street	Residential: 84 DU	2012
24	111 Fulton Street (The District)	Residential: 163 DU; Retail: 18,000 sf	2012
25	45-51 Park Place	Community Facility: 100,000 sf auditorium	2019
26	BMCC Fiterman Hall / 30 West Broadway	Community Facility: 390,000 sf of classrooms, labs, offices	2013
27	Freedom Tower / 1 World Trade Center	Commercial: 2.6 million sf; Retail: 55,000	2013
28	WTC Performing Arts Center	Community Facility: 1,000 seats	2019
29	WTC Transportation Hub	Transportation	2019
30	2 World Trade Center / 200 Greenwich Street	Commercial: 2.4 million sf; Retail: 143,000 sf	To-Grade 2013
31	3 World Trade Center / 175 Greenwich Street	Commercial: 2.1 million sf; Retail: 133,000 sf	Podium 2015
32	4 World Trade Center / 150 Greenwich Street	Commercial: 1.8 million sf; Retail: 146,000 sf	2013
33	National September 11th Memorial Museum	Community Facility: 200,000 sf	2012
34	Vehicular Screening Center	Transportation	2013
35	Fulton Center	Retail & Commercial: 70,000 sf	2014
36	Chambers Street Reconstruction: Chambers Street from West Street to Broadway	Utility upgrade, new signals, tree planting, and roadway reconstruction	2014
37	Fulton Street Corridor Reconstruction, Phases 2 and 3: Nassau Street from Beekman to Spruce Streets [2012]; Nassau Street from Fulton to John Streets; Fulton Street from Cliff to Water Streets; Fulton Street from South to Water Streets	Utility upgrade, streetscape improvements, and roadway reconstruction	2013
38	West Street Promenade Reconstruction, Segment 2: Left turn into BPC via Liberty Street from West Street and the bikeway between Albany and Vesey Streets	Updating utilities, restoring West Street to eight lanes, rebuilding sidewalks, roadways and crossings south of West Thames Street	2013
39	Broadway 1 Reconstruction: Broadway from Ann to Rector Streets	Utility replacements, streetscape improvements, and roadway reconstruction	2017

Sources:

Alliance for Downtown New York Reports:
Residential Development and Population Growth, March 2012
Lower Manhattan Hotel Inventory, March 2012
Lower Manhattan Construction Command Center Online (http://www.lowermanhattan.info)
Various newspaper and online articles

Broadway Corridor

Several projects are also planned within the predominately commercial Broadway Corridor, particularly hotels and residential buildings, which will be completed by 2019. The new residential buildings within the Broadway Corridor will continue the trend of redeveloping Lower Manhattan as a 24-hour community rather than just a financial center.

A 113-room Aloft Hotel at 49-53 Ann Street and a 270-room Homewood Suites Hotel at 33 Beekman Street are currently under construction with anticipated completion dates of 2014. A 95-room hotel conversion and expansion project with a restaurant and bar will be finished in 2013 at 24-26 John Street. A 165,000 square-foot hotel is being planned at 170 Broadway and a 297-room hotel and condominium conversion is also planned for 5 Beekman Street.

Six residential buildings are under construction in the Broadway Corridor, including: a 12-unit condominium conversion at 67 Liberty Street, a seven-unit residential building at 127 Fulton Street/42 Ann Street, an 84-unit residential building at 45 John Street, and a 163-unit residential building with 18,000 square feet of retail space at 111 Fulton Street. A new 167-unit rental building will be completed in 2013 at 113 Nassau Street/21 Ann Street while a new 196-room dorm is being developed by Pace University at 2 John Street/180 Broadway. This 23-story dorm will include three floors of high-end retail, and is expected to be completed in 2013.

There are street improvement projects under construction in the Broadway Corridor as well as along Fulton Street, with anticipated completion dates in 2013. Utility upgrades, streetscape improvements, and roadway reconstruction are underway on Nassau Street between Beekman and Spruce Streets and Fulton and John Streets, as well as on Fulton Street between Cliff and Water Streets and South and Water Streets. Utility replacements, roadway reconstruction, and streetscape improvements on Broadway between Ann and Rector Streets are expected to be finished in 2017. The Fulton Street Transit Center is also currently under construction, with 70,000 square feet of retail and commercial space planned and an anticipated completion date in 2014.

Greenwich South Corridor

Several hotel projects are also planned or currently under construction within the Greenwich South Corridor. A 350-room Holiday Inn is under construction at 99 Washington Street, and will be completed in 2014, and a hotel with up to 320 rooms and approximately 5,000 square feet of retail is planned at 133 Greenwich Street by the end of 2015. In addition, a 174-room hotel conversion with 100,000 square feet of retail is planned for 78-86 Trinity Place, the former American Stock Exchange, and a 244-room hotel is planned at 50 Trinity Place. A 500-unit residential building with 30,000 square feet of retail is planned for 111 Washington Street, a new 300,000 square-foot residential building is planned for 18-22 Thames Street, and a new 500,000 square-foot boutique hotel and condominium building with restaurant, café, retail, and meeting space is planned for 50 West Street/50 Little West Street. These projects continue the area's trend of redevelopment with hotel and residential uses.

Street improvement projects are also under construction along West Street/Route 9A, the western boundary of the Greenwich South Corridor and eastern boundary of BPC. These improvements are focused on West Street/Route 9A and Liberty Streets as well as the bikeway between Albany and Vesey Streets, and include utility upgrades, sidewalk, roadway, and crossing reconstruction south of Thames Street, and reinstitution of eight lanes on West Street/Route 9A.

Battery Park City

Except for the West Street/Route 9A street improvement projects discussed above, there are no development projects under construction or currently being planned for BPC.

These projects illustrate the ongoing trends of new residential, mixed-use, commercial, and hotel development in Lower Manhattan, mirroring the intensions of recent zoning changes and public policies attempting to turn Lower Manhattan into a 24-hour, mixed-use community. In the future without the Proposed Action these trends are expected to continue.

Future with the Proposed Action (With-Action)

Land Use

Project Site

By 2019, it is assumed that the redevelopment of the WTC site would be complete, as described above. The Proposed Action would be implemented as WTC construction progresses through 2019 to control vehicular access into the WTC Campus through the creation of a secure perimeter around the WTC site. The secure perimeter would include restricted vehicular access in and around the WTC site as well as the installation and utilization of security infrastructure in the immediate vicinity of the WTC site. Vehicles destined for the WTC site seeking entry onto these streets would be subject to credentialing to determine whether entry to the WTC Campus should be permitted, and then screening to confirm that these vehicles pose no threat. Under the Campus Security Plan, all pedestrian flows, including Liberty Street, would essentially remain unchanged from the No-Action condition. Since the Proposed Action is a security overlay and would not introduce new buildings, it would not result in the direct displacement of any current land uses or the construction of structures inconsistent with existing uses in the Project Site.

The Proposed Action would install security infrastructure with various types of interdiction devices under the control of the New York City Police Department (NYPD), including operable and static vehicle barriers and traffic lane delineators (see **Figure 1-2**). Screening of all vehicles entering the WTC Campus would utilize both mechanical and manual processes, and would be facilitated through the use of sally ports, which would consist of a personnel booth controlling a set of two operable barriers with sufficient space between them to accommodate a motor vehicle undergoing screening. An additional personnel booth would be installed at each credentialing location. Pedestrian access into the site would be unrestricted.

The Trinity Place/Church Street corridor would be divided by a raised median with static barriers from Cedar Street to just north of Vesey Street. East of the median would remain open to general traffic with three northbound lanes, while the one moving lane to the west of the median would be accessible only to screened vehicles. West Broadway would function as an entrance to the WTC Campus for for-hire vehicles and private occupancy vehicles (POVs) arriving from the north. Additionally, it is expected that Greenwich Street from Barclay Street to Vesey Street would continue to be limited for use only by 7 WTC tenants in the No-Action condition (as outlined in a December 5, 2007 reciprocal easement agreement among the City of New York, 7 WTC ownership, PANYNJ and LMDC); therefore, this section of Greenwich Street would be a controlled access street irrespective of the Proposed Action. A secure entry consisting of operable barriers controlled by an adjacent personnel booth at Washington Street between Barclay and Vesey Streets would serve as the primary point of access point for the loading docks for the Performing Arts Center (on Vesey Street) and 7 WTC (on Washington Street). This block may also serve as an entry point for for-hire vehicles and POVs and other vehicles destined to 1 WTC, as necessary. Vesey Street between Church Street and West Broadway would be converted from eastbound to westbound while Fulton Street between Greenwich and Church Streets would be converted from westbound to eastbound as a result of the Proposed Action. Consistent with No-Action conditions, Liberty Street would function as the primary point of access for the VSC. Additionally, the elimination of Cedar Street between Greenwich and Washington Streets planned in conjunction with the No-Action condition would remain, with the segment to the west to operate one-way westbound as an outlet to West Street/Route 9A for northbound Washington Street.

The Proposed Action is a security overlay that would not introduce any new buildings and would therefore not directly change any existing land uses. However, the limited vehicular access in the WTC Campus may indirectly affect existing land uses in the Project Site. The Proposed Action would be fully implemented by 2019 to coincide with the completion of the WTC redevelopment. As such, businesses that choose to operate within the WTC Campus would be familiar with the security infrastructure before moving in. All deliveries for WTC businesses would have to enter the site via the VSC. Deliveries would have to be pre-arranged with the business and would have to be on the daily manifest at the VSC. This is true for the No-Action condition as well as the With-Action condition.

The TAP would allow for expedited vehicle entry into the secure zone. Enrollment in the TAP would be open to:

- WTC office tenants with parking privileges on site;
- For-hire vehicle operators;
- Delivery vehicle operators; and,
- Residents and owners of businesses located in non-WTC buildings within the secure zone (Liberty Street).

Both drivers and vehicles would be enrolled in the TAP. TAP credentials would be checked as vehicles approach entry points to the WTC Campus, and authorized vehicles would then be admitted to a sally port for expedited security screening. Drivers and vehicles with business at the WTC site, but not enrolled in the TAP, would be permitted into the WTC Campus; however, these drivers and vehicles would be subject to more rigorous credentialing and screening. This arrangement would help to facilitate access for those who seek entry. Vehicles without the proper credentials would be denied entry per NYPD policy.

The Proposed Action would result in some changes in accessibility for residents and businesses that are located immediately adjacent to the Project Site or adjacent to proposed credentialing and screening zones. For example, the existing uses located on the northern half of the block bounded by Liberty Street to the north, Trinity Place to the east, Cedar Street to the south, and Greenwich Street to the west would be located within the boundaries of the secure perimeter. As such, vehicular access to these buildings would be subject to credentialing and screening. However, these businesses and residents could choose to enroll in the planned TAP program to make arrangements for vehicular access. Furthermore, pedestrian access within the secure zone would be unrestricted under the Proposed Action. It is expected that businesses would benefit from the high volume of pedestrian traffic that is anticipated in the vicinity of the WTC Campus.

It is expected that the TAP program would readily accommodate the needs of businesses and residents that are located within the Project Site or immediately adjacent to the proposed credentialing and screening zones. Therefore, the Proposed Action is not expected to have adverse impacts on land uses or result in the alteration or acceleration of existing development patterns in the Project Site.

Study Area

Since the Proposed Action is a security overlay that would not introduce new buildings, it would not result in the direct or indirect displacement of existing land uses (see Chapter 3, "Socioeconomic Conditions") or create buildings with inconsistent uses. As a result of the proposed Campus Security Plan, the future street system would be similar to the present system, particularly within the Study Area. Pedestrians would have unrestricted access into and throughout the WTC Campus, while vehicles would be subject to credentialing to determine whether entry should be permitted, and then screening to confirm that these vehicles pose no threat. This controlled vehicular access could indirectly affect land uses in the Study Area, specifically buildings immediately adjacent to the WTC Campus and the Greenwich South

neighborhood. Residents and workers in buildings immediately adjacent to the Project Site could encounter some inconveniences related to vehicular access to their homes and businesses and receiving deliveries.

Additionally, the limited through access for vehicles on Greenwich Street resulting from the Proposed Action would limit vehicular access into the Greenwich South neighborhood from north of the WTC Campus. However, vehicular access to the Greenwich Street neighborhood would be available via northbound West Street/Route 9A to eastbound Albany Street from the west; via Trinity Place/Church Street to westbound Cedar Street from the south; and via Broadway to Cedar Street from the north, as described in Chapter 8, "Transportation." While the Proposed Action would alter vehicular access to the Greenwich South area as compared to No-Action conditions, it is expected that no significant adverse land use impacts would occur as a result of the Campus Security Plan.

As discussed in Chapter 8, "Transportation," the secure zone and the related credentialing and screening zones have the potential to result in traffic diversions in the area. New traffic patterns resulting from the Proposed Action could cause traffic to select other routes to reach their destinations. It is expected that the traffic diversions would likely resemble current traffic patterns (absent the streets extending through the WTC site) due to ongoing street closures related to construction activity. These changes to traffic flow in the area are not likely to have significant adverse effects on land use in the Study Area.

As described above and shown in **Figure 2-5**, nearly 40 new developments are planned within a quarter mile of the Project Site by 2019. These developments are expected to be constructed regardless of the implementation of the Proposed Action. As such, it is anticipated that the Proposed Action would not affect the planning or construction of any No-Action developments discussed above.

According to the 2012 *CEQR Technical Manual*, land use changes can be significant, but not adverse. While changes in land use conditions could create impacts in other technical areas, it is rare that a proposed project would have land use impacts in the absence of impacts in other technical areas. The potential to create significant impacts in other technical areas should not necessarily be confused with a land use impact. The analysis of the effect of land use changes, then, is often used to determine whether the land use changes could lead to impacts in other technical areas. In making this determination, the following should be considered:

- If the proposed project would directly displace a land use and such a loss would adversely affect surrounding land uses;
- In general, if a project would generate a land use that would be incompatible with surrounding land uses, such a change should be considered in other technical areas if:
    - The new land use or new site occupants would interfere with the proper functioning of the affected use, or of land use patterns in the area. The relevant technical area may vary depending on the type of incompatible use identified. One example could be a new heavy manufacturing use near a residential area that might diminish the quality of residential use because of noise or air pollution. If so, the information provided in the land use analysis may be relevant for the noise or air quality analysis.
    - The incompatible use could alter neighborhood character and should be considered the neighborhood character analysis (see Chapter 12, "Neighborhood Character").
    - The project would create land uses or structures that substantially do not conform to or comply with underlying zoning. An example would be rezoning of several blocks from manufacturing to commercial use. Such a change might permit development of desired residential uses on vacant or underutilized sites in the area, but it could turn existing manufacturing uses into non-conforming

uses and might render their structures nonconforming as well. Such a project could affect operating conditions in a specific industry and, as such, it is assessed in Chapter 3, "Socioeconomic Conditions."

- If a project would alter or accelerate development patterns, it could affect real estate market conditions in the area. An assessment of real estate market conditions is provided in Chapter 3, "Socioeconomic Conditions."

The Proposed Action is not anticipated to directly displace a land use, generate a land use that would be incompatible with surrounding uses, or alter or accelerate existing development patterns in the Study Area. Therefore, based on the CEQR guidance for determining impact significance, the Proposed Action would be a significant change, but would not be adverse.

A. INTRODUCTION

This chapter assesses whether the Proposed Action would result in significant adverse impacts to the socioeconomic character of the area within and surrounding the proposed World Trade Center (WTC) Campus Security Plan. As described in the 2012 *CEQR Technical Manual*, the socioeconomic character of an area includes its population, housing, and economic activities. Socioeconomic changes may occur when a project directly or indirectly changes any of these elements. Although some socioeconomic changes may not result in environmental impacts under CEQR, they are disclosed if they would affect land use patterns, low-income populations, the availability of goods and services, or economic investment in a way that changes the socioeconomic character of the area.

As detailed in Chapter 1, "Project Description," the Proposed Action is a Campus Security Plan that would create a comprehensive vehicle security perimeter for the WTC Campus to protect against vehicle-borne explosive devices while ensuring an open environment that is hospitable to remembrance, culture, and commerce. Selected portions of streets in and around the WTC Campus would be restricted access streets that would be closed to unscreened vehicular traffic. No restrictions or controls would be implemented on pedestrians as a result of the Proposed Action. Implementation of the Proposed Action would involve installation and utilization of security infrastructure and changes to the traffic network within and immediately adjacent to the WTC site. Vehicles destined for the WTC seeking entry onto these streets would be subject to credentialing to determine whether entry to the campus should be permitted, and then screening to confirm that these vehicles pose no threat. The Proposed Action would not alter the building program that is currently planned for the WTC site. Instead, the Proposed Action would manage vehicular traffic to and through the WTC site.

In accordance with *CEQR Technical Manual* guidelines, this socioeconomic analysis considers five specific elements that can result in significant adverse socioeconomic impacts: (1) direct displacement of residential population on a project site; (2) direct displacement of existing businesses or institutions on a project site; (3) indirect displacement of residential population in a study area; (4) indirect displacement of businesses or institutions in a study area; and (5) adverse effects on specific industries.

B. PRINCIPAL CONCLUSIONS

The following analysis finds that the Proposed Action would not result in any significant adverse impacts as measured by the five socioeconomic areas of concern prescribed in the *CEQR Technical Manual*. The following summarizes the conclusions drawn from the analysis.

Direct Residential Displacement

Direct residential displacement (sometimes called primary displacement) is the involuntary physical displacement of residents from the site of (or a site directly affected by) a proposed project. The Proposed Action would not directly displace any residents, and therefore, would not result in significant adverse direct residential impacts. The Proposed Action is a comprehensive Campus Security Plan for the WTC site that involves the installation and utilization of security infrastructure to restrict the access of unauthorized vehicles from the roadways adjacent to and within the WTC site.

Infrastructure related to the Proposed Action would be located within some streets and on select sidewalks at the periphery of the WTC Campus, and would not entail any new development, or introduce new land uses to the Project Site.[1]

Direct Business and Institutional Displacement

Direct business and institutional displacement (sometimes called primary displacement) is the involuntary physical displacement of businesses or institutions from the site of (or a site directly affected by) a proposed project.

The Proposed Action would not result in significant adverse direct business or institutional impacts. As noted above, the Proposed Action is a security plan which involves the installation and utilization of security infrastructure to restrict vehicular access from roadways situated adjacent to the WTC site (i.e., Project Site). The Proposed Action, which would be located within some streets and sidewalks, does not entail any new development, and does not involve any involuntary displacement of business or institutions within the security zone. Although the Proposed Action would establish a credentialing zone on the east side of West Broadway between Barclay Street and Park Place zone where the Downtown PATH Greenmarket currently operates every Tuesday throughout the year, according to GrowNYC[2] this is a temporary location for the Greenmarket. It is anticipated that the Greenmarket will relocate to a more prominent permanent location when the WTC Site begins to reopen, which is expected to occur prior to the project build year of 2019. Formerly, the Greenmarket had operated at the World Trade Center prior to 9/11, and most recently the Greenmarket had been located at Zuccotti Park, which is located to the southeast of the WTC site, and bounded by Liberty Street, Broadway, Cedar Street, and Trinity Place. Therefore, the Proposed Action would not result in any direct business or institutional displacement and no further analysis is warranted.

Indirect Residential Displacement

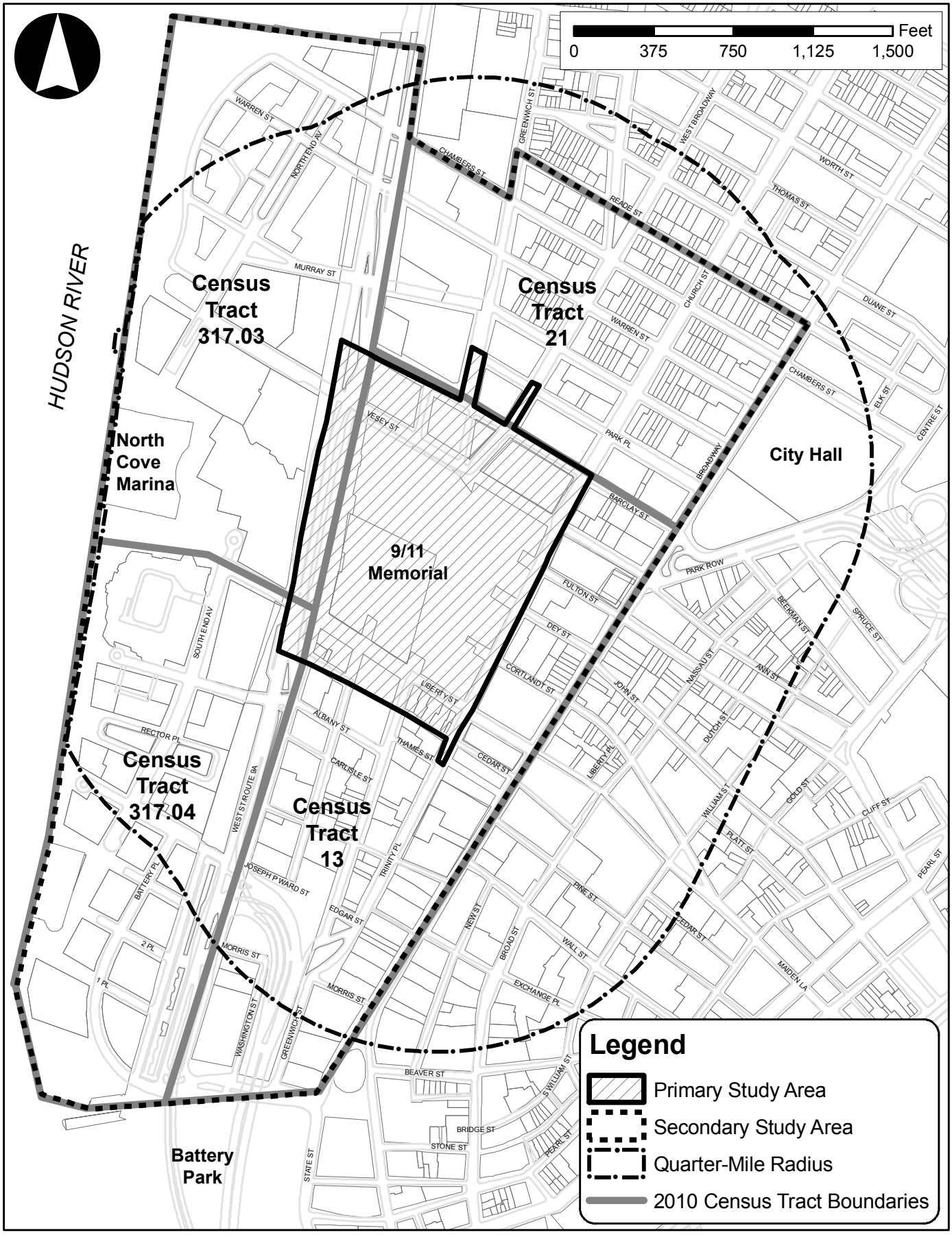
Indirect residential displacement (sometimes called secondary displacement) is the involuntary displacement of residents that results from a change in socioeconomic conditions created by a proposed project. Pursuant to *CEQR Technical Manual* guidelines, the potential for indirect residential displacement is based on whether a project could result in rising property values, and thus rents, making it difficult for some residents to afford their homes.

A preliminary assessment found that the Proposed Action would not result in significant adverse impacts due to indirect residential displacement. As none of the residential units within the primary study area (refer to **Figure 3-1**) house populations at risk of involuntary displacement (i.e., residents that have incomes sufficiently low to be vulnerable to sharp rent increases), the Proposed Action would not result in significant adverse impacts due to indirect residential displacement in the primary study area. Furthermore, as the Proposed Action is a campus security plan that would not result in any new development or introduce any new land uses, it would not result in an indirect residential displacement in the secondary study area.

[1] The Project Site comprises the directly affected area or proposed security zone, which is generally bounded by Barclay, Church, Cedar and West Streets.

[2] GrowNYC is a hands-on non-profit organization which improves New York City's quality of life through environmental programs that transform communities block by block and empower all New Yorkers to secure a clean and healthy environment for future generations. The non-profit organizes the network of outdoor urban farmers markets in New York City.

Socioeconomic Conditions Study Area



The proposed security plan would limit vehicular accessibility within the primary study area, and would result in some changes in vehicular accessibility for the residents of three multi-unit residential buildings (located at 110-112 Liberty Street, 114 Liberty Street, and 120-122 Liberty Street) containing a total of 47 dwelling units within the primary study area. Residents of these three residential buildings could encounter some inconveniences related to vehicular access to their homes and businesses as well as receiving deliveries and guests. However, these residents could choose to enroll in the planned Trusted Access Program (TAP) to make arrangements for vehicular access within the secure perimeter. The TAP program would allow the residents residing within the security zone to obtain expedited vehicle entry through the security stations and into the secure zone. Deliveries and guests of the residential buildings that need to enter the security zone in a vehicle would have to be pre-arranged and scheduled.

As the future traffic network with the Proposed Action would somewhat resemble the existing street network (in terms of free-flow traffic), the proposed security perimeter is not expected to significantly affect accessibility in the secondary study area, as compared to existing conditions. Most of the streets within and immediately adjacent to the WTC site either have not been built, are presently closed to through traffic or have reduced capacity due to construction activity or security concerns.

Lower Manhattan is a dense urban environment that contains a concentration of high profile corporations, financial headquarters, the City's civic center, as well as an increasingly vibrant residential community. It is also home to a number of museums, cultural venues and historic landmarks. In the aftermath of 9/11, the issue of security surrounding major corporate entities, civic operations, and prominent New York landmark locations has become of increased importance and various security measures have been implemented as well as further enhanced to protect these potential targets, especially in Lower Manhattan. There are three multi-block security zones that have been effectuated and maintained south of Canal Street in Lower Manhattan, and all three of these security zones are closed to unauthorized vehicle traffic. Two of the existing security zones, the New York Stock Exchange (NYSE) Security Zone and One Police Plaza Security Zone, encompass buildings that include residential uses. The establishment and maintenance of these controlled security perimeters in Lower Manhattan do not seem to have resulted in the indirect displacement of residents from within these two security zones. For example, the NYSE Security Zone has experienced a large influx of market-rate residential units since the late 1990s subsequent to the establishment of the secure perimeter. As such, it does not appear that the NYSE Security Zone has hindered positive trends for the area, nor has it impeded efforts to attract residential investment in the area or created a climate for disinvestment. Furthermore, the sales prices of the residential cooperative units of Chatham Towers and Chatham Green, which are located immediately adjacent to and within the One Police Plaza Security Zone (established after 9/11) have generally increased since the establishment of the security perimeter. Although the average sale prices and average cost per square-foot of these cooperative apartments are lower than average cost of apartments in Lower Manhattan, Chatham Towers and Chatham Green are older construction (built in the early 1960s) originally built for middle-income housing. The median sales prices of apartments in the Chatham Towers and Chatham Green are comparable to the median sales prices of apartments in the Civic Center area of Lower Manhattan, which includes both Chatham Towers and Chatham Green. Therefore, it is not anticipated that the Proposed Action would result in significant adverse impacts on indirect residential displacement in the study area.

Indirect Business and Institutional Displacement

Indirect business and institutional displacement (sometimes called secondary displacement) is the involuntary displacement of businesses, institutions, or employees that results from a change in socioeconomic conditions created by a proposed project.

A preliminary assessment found that the Proposed Action would not result in significant adverse impacts due to indirect business and institutional displacement. As the Proposed Action is a comprehensive security plan, it would not introduce any new economic activity or alter existing economic patterns, nor would it add to the concentration of a particular sector of the local economy. The Proposed Action also would not directly displace uses of any type that directly support businesses in the area or bring people to the area that form a customer base for local businesses. The study areas already have well-established commercial and residential markets. The Proposed Action would not result in any direct residential displacement and limited business displacement, and the Proposed Action is also not expected to indirectly displace a substantial number of residents, business establishments/institutions, workers, or visitors who form the customer base of existing businesses in the study areas.

The Proposed Action would alter accessibility for vehicles picking up or dropping off people and making pickups from and deliveries to existing residents, businesses, and institutions within and immediately adjacent to the proposed secure zone, potentially disrupting established business routines and customer patterns. Moreover, the Proposed Action could affect conditions in the real estate market due to the increased security measures and changes in vehicular accessibility.

TAP would allow for expedited vehicle entry into the secure zone. While specific operational details of the TAP program cannot be released for security purposes, a brief overview of the program is provided here. Enrollment in the TAP program would be open to:

- WTC office tenants with parking privileges on site;
- For-hire vehicle operators with business on the site;
- Delivery vehicle operators; and
- Residents and owners of businesses located in non-WTC buildings within the secure zone (Liberty Street).

It is anticipated that the program would help to accommodate the needs of businesses and residents located within and immediately adjacent to the secure zone. Both drivers and vehicles would be enrolled in the TAP. TAP credentials would be checked as vehicles approach entry points to the WTC Campus, and authorized vehicles would then be admitted to a sally port for expedited security screening. Drivers and vehicles with business at the WTC site but not enrolled in the TAP would be permitted into the WTC Campus but would be subject to more rigorous credentialing and screening. This arrangement would help to facilitate access for those who seek entry. The New York City Police Department (NYPD) policy for all vehicles without the proper credentials would be to deny entry.

The Proposed Action is not expected to significantly affect vehicular accessibility in the secondary study area as compared to current conditions. The future traffic network with the Proposed Action would somewhat resemble the existing street network (in terms of free-flow traffic).

Adverse Effects on Specific Industries

It may be possible that a given project may affect the operation and vitality of a specific industry not necessarily tied to a specific location. The Proposed Action would not result in significant adverse impacts on specific industries within the study areas, or in the City more broadly. The Proposed Action is not expected to significantly affect business conditions in any industry or any category of business within or outside of the study areas, and would not substantially reduce employment or impair economic viability in any industry or category of business.

C. METHODOLOGY

Under CEQR, the socioeconomic character of an area is defined by its population, housing, and economic activities. The assessment of socioeconomic conditions usually distinguishes between the socioeconomic conditions of an area's residents and businesses. However, proposed projects affect either or both of these segments in the similar ways: they may directly displace residents or businesses, or they may indirectly displace them by altering one or more of the underlying forces that shape socioeconomic conditions in an area.

Direct displacement is the involuntary physical displacement of residents, businesses, or institutions from the actual site of (or sites directly affected by) a proposed project. Examples include proposed redevelopment of a currently occupied site for new uses or structures, or a proposed easement or right-of-way that would take a portion of a parcel and thus render it unfit for its current use. As the occupants of a particular site are usually known, the disclosure of direct displacement focuses on specific businesses and employment, and an identifiable number of residents and workers.

Indirect or secondary displacement is defined as the involuntary displacement of residents, businesses, or employees in an area adjacent or close to a project site that results from changes in socioeconomic conditions created by a proposed project. Examples include rising rents in an area that result from a new concentration of higher-income housing introduced by a project, which ultimately could make existing housing unaffordable to lower income residents; a similar turnover of industrial to higher-rent commercial tenancies induced by the introduction of a successful office project in an area; or the flight from a neighborhood that can occur if a proposed project creates conditions that break down the community (such as a highway dividing the area).

Even if projects do not directly or indirectly displace businesses, they may affect the operation of a major industry or commercial operation in the city. In these cases, CEQR review may assess the economic impacts of the project on the industry in question.

Analysis Format

Following *CEQR Technical Manual* guidelines, the socioeconomic analysis begins with a preliminary assessment. The purpose of the preliminary assessment is to learn enough about the effects of the proposed action to either rule out the possibility of significant adverse impacts, or determine that a more detailed analysis is required to resolve the issue. A detailed analysis, when required, is framed in the context of existing conditions and evaluations of the future without the proposed action and the future with the proposed action by the project build year. In conjunction with the land use task, specific development projects that occur in the area in the future without the proposed action are identified, and the possible changes in socioeconomic conditions that would result, such as potential increases in population, changes in the income characteristics of the study areas, new residential

developments, possible changes in rents or sales prices of residential units, new commercial or industrial uses, or changes in employment or retail sales. Those conditions are then compared with the future with the proposed action to determine the potential for significant adverse impacts. For all five areas of socioeconomic concern—direct residential displacement, direct business displacement, indirect residential displacement, indirect business and institutional displacement, and adverse effects on specific industries—a preliminary assessment was sufficient to conclude that the Proposed Action would not result in any significant adverse socioeconomic impacts. However, due to the unique nature of the Proposed Action, additional screening analyses are provided below.

Study Area Definition

In order to assess the potential socioeconomic effects of the Proposed Action, information was gathered regarding the surrounding area's demographic characteristics, housing inventory, housing market, and industrial, commercial, and retail activity. Typically, the socioeconomic study area boundaries are similar to those of the land use study area. The study area encompasses the area affected by the Proposed Action, and an adjacent area within 400 feet, quarter-mile, or half-mile, depending on project size and area characteristics. The socioeconomic assessment seeks to assess the potential to change socioeconomic character relative to the study area population. For projects that result in an increase in residential population, the scale of the relative change is typically represented as a percent increase in population (i.e., a project that would result in a relatively large increase in population may be expected to affect a larger study area).

Residential and business displacement impacts are considered to be significant if changes are large enough to adversely affect the character of the neighborhood and result in substantial changes to the overall socioeconomic conditions. The Proposed Action would not introduce any new residential units or new residents. Consistent with the land use and zoning analysis in Chapter 2, "Land Use, Zoning, and Public Policy," this assessment includes two study areas: the primary study area (i.e., proposed campus security zone) and the secondary study area (i.e., an approximate quarter-mile area around the primary study area). The primary study area comprises more than 16-acres and is generally bounded by Barclay Street on the north, Church Street on the east, Cedar Street on the south, and West Street/Route 9A on the west. The exact boundary of the secondary study area has been modified to match the 2010 census tracts that most closely define an approximate quarter-mile perimeter surrounding the proposed campus security zone (see **Figure 3-1**).[3] By conforming to census tract boundaries, the socioeconomic analysis more accurately applies Census data to depict the demographic characteristics of the surrounding area. As shown in **Figure 3-1**, the secondary study area is roughly bounded by Reade and Chambers Streets to the north, Broadway to the east, Battery Place to the south, and the Hudson River to the west.

The secondary study area used in the indirect business and institutional displacement section of this chapter is broader than the one used for indirect residential displacement. It generally encompasses all of Lower Manhattan, roughly bounded by Chambers Street to the north, the Hudson River to the west, Battery Park to the south, and the East River to the east. Sections of the analysis further divide the Lower Manhattan study area into smaller office submarkets, conforming to those used by real estate services from Cushman & Wakefield (including City Hall, World Trade/World Financial, Insurance, Finance West, and Financial East).

[3] For analysis purposes, only those census tracts with an area of approximately 50 percent or greater located within a quarter -mile radius of the proposed campus security zone were included within the secondary study area, including Tracts 13, 21, 317.03 and 317.04. Those census tracts with less than approximately 50 percent of their area within a quarter-mile radius of the proposed security zone were excluded.

Information on the office and retail markets in the Borough of Manhattan is presented along with the information on the Lower Manhattan study area. For the office analysis, the Borough of Manhattan is divided into three major submarkets: Lower Manhattan (south of Canal Street), Midtown South (Canal Street to 30th Street), and Midtown (30th Street to 72nd Street). **Figure 3-2** shows the boundaries of these three subareas, and **Figure 3-3** shows the office submarkets in Lower Manhattan.

Data Sources

Information used in the socioeconomic analysis includes data from the U.S. Census Bureau's 2010 Census, the 2000 Census, the 2006-2010 American Community Survey, and the New York City Department of Finance's Real Property Assessment Data (RPAD) 2010 database.

The Census data have been supplemented, where appropriate, with information from local real estate agencies, the Real Estate Board of New York (REBNY) and Citihabitats. Census data on median contract rent provide a statistical basis for identifying trends; these data are affected by the presence of rent-regulated housing units in the study area. Due to the prevalence of rent-regulated housing in the study area, the median contract rent data does not reflect pricing trends experienced by the majority of residents in the area. However, in order to provide a more accurate picture of current market rate rents in the study area, information was gathered from real estate agency web sites, and the New York City Department of Finance.

Retail and office market trends and current conditions for the secondary study area and the greater Lower Manhattan area were obtained from the Alliance for Downtown New York ("Downtown Alliance") and the real estate firm of Cushman & Wakefield. This includes yearly and quarterly market overviews for Lower Manhattan, as well as special reports about the primary and secondary study areas, such as the Downtown Alliance's 2011 "State of Lower Manhattan" and Cushman & Wakefield's 2011 report "Downtown Manhattan, A Decade of Development." Current retail and office conditions were portrayed using data from the second quarter of 2012.

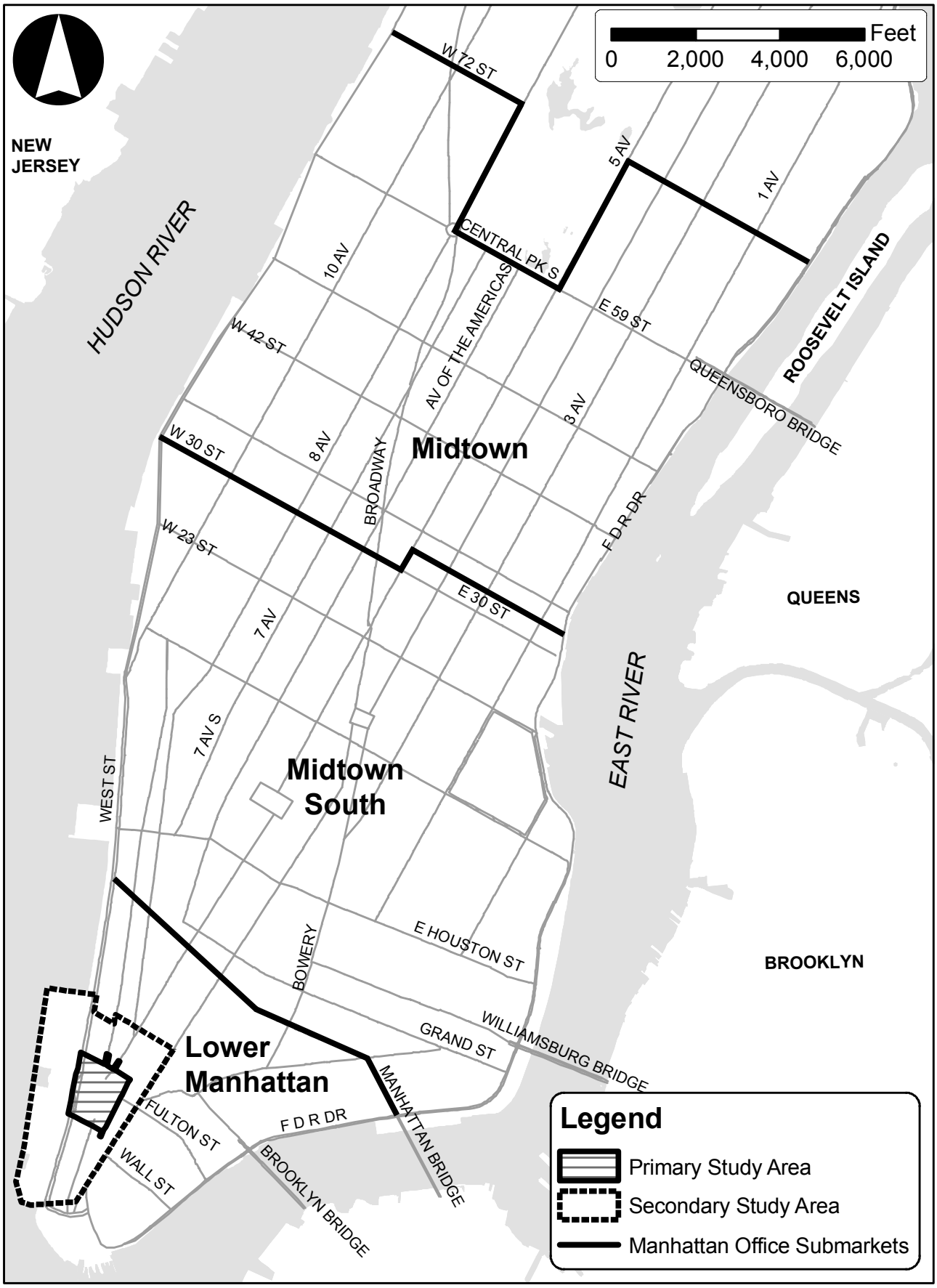
Employment data for the secondary study area, Lower Manhattan, the borough of Manhattan and New York City were obtained from the New York State Department of Labor (NYSDOL), Quarterly Census of Employment and Wages (as compiled by the New York City Department of City Planning). However as NYSDOL employment data are available at the zip code level, rather than smaller geographic areas such as census tracts or block groups, employment estimates for the secondary study area are based on a slightly different geographic area than the actual boundary of the study area, but nevertheless is still representative of conditions in the study area given the proximity of the zip code boundaries to the study boundary (**Figure 3-4**).[4] In addition, field visits to the primary and secondary study areas were made in June and July of 2012

Employment data on specific businesses was estimated based on field surveys conducted in June and July of 2012 and secondary research. When information on a business was not available through various secondary sources (such as Manta.com), employment was estimated using information on comparable businesses of the same size and with similar hours of operation. In some cases, the number of current employees for existing businesses was estimated based on the approximate square-footage and the standard ratios for office and retail workers.[5]

[4] The secondary study area includes the following zip codes: 10006; 10007; 10048; 10280; 10281; and 10282, and Lower Manhattan includes: 10004; 1005; 10006; 10007; 10013; 10038; 10048; 10280; 10281; and 10282.

[5] Standard ratios for office workers: one employee per 250 square feet of office, and retail workers: three workers per 1,000 square feet of retail. The same rates were used in the 2004 World Trade Center Memorial and Redevelopment FGEIS.

Figure 3-2
Manhattan Office Submarkets



Lower Manhattan Office Submarkets

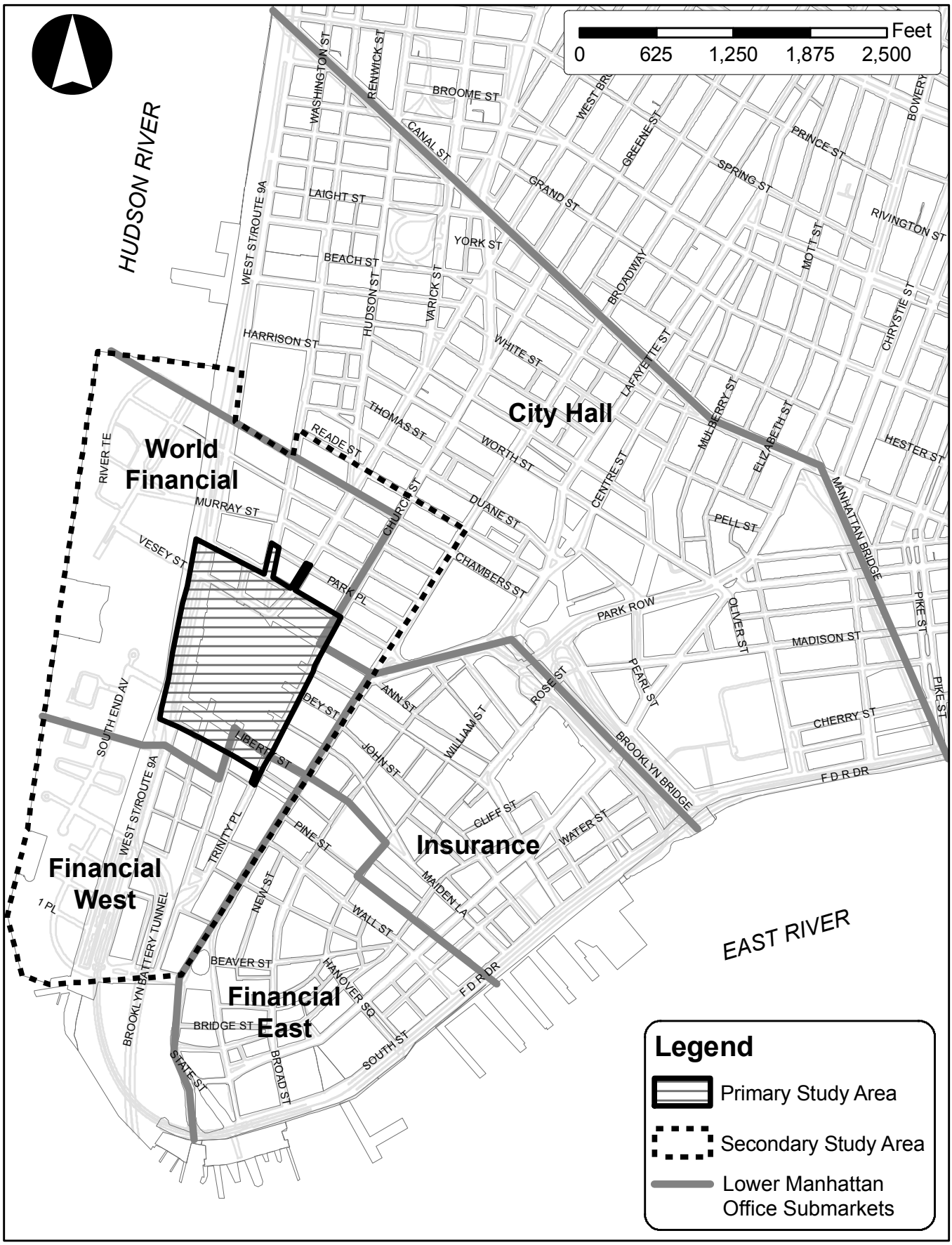
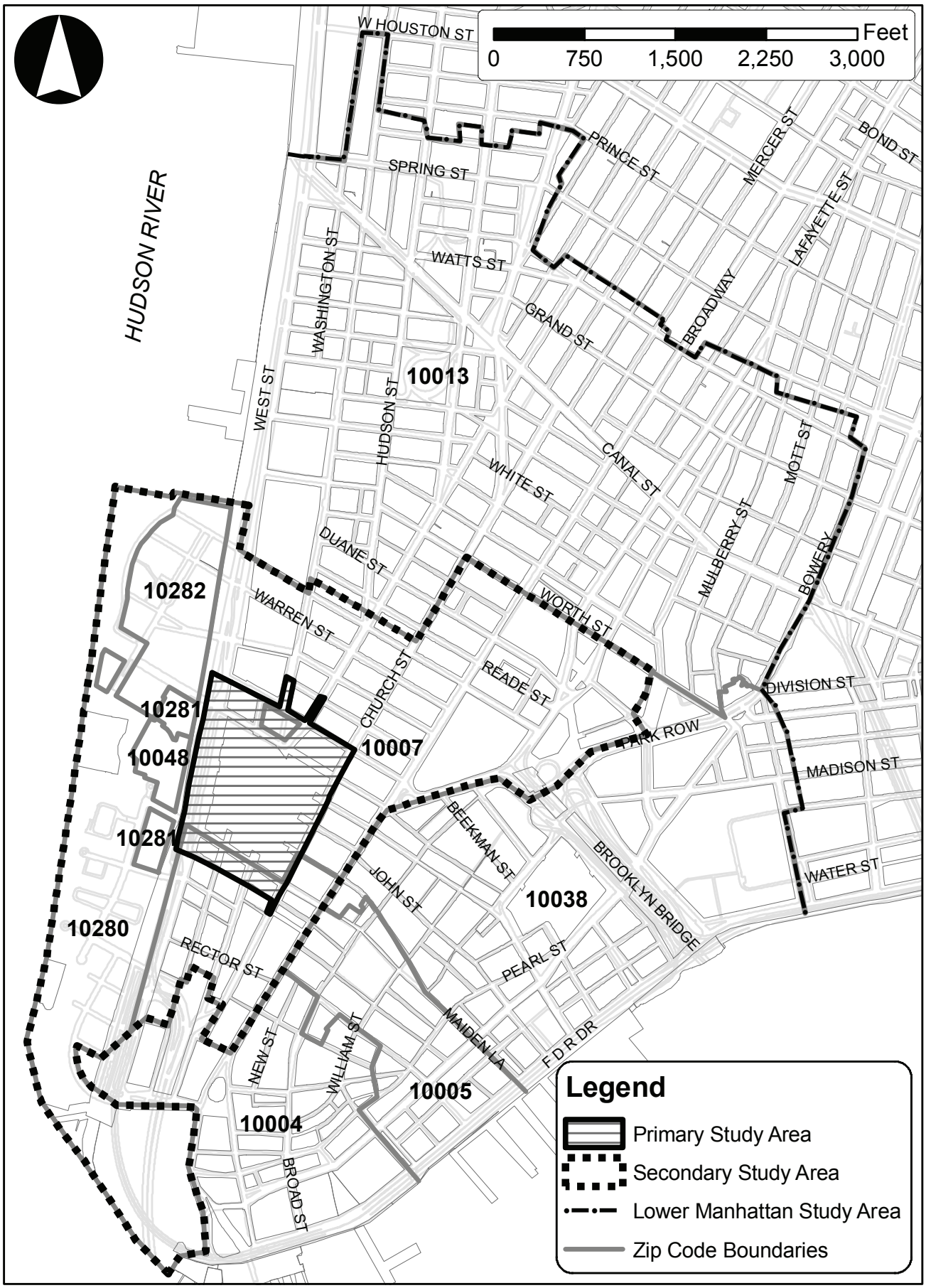


Figure 3-4
Employment Study Areas



D. PRELIMINARY ASSESSMENT

The first step in the analysis of potential socioeconomic impacts is a preliminary assessment to determine the potential significance of socioeconomic change generated by a proposed project. This chapter follows the guidance set forth in the *CEQR Technical Manual* for both the preliminary and, where warranted, detailed assessments. This section examines each of the five areas of socioeconomic concern in relation to the Proposed Action. For all five issue areas—direct residential displacement, direct business and institutional displacement, indirect residential displacement, indirect business displacement and effects on specific industries—the preliminary assessment rules out the possibility that the Proposed Action would have a significant adverse impact as defined by the *CEQR Technical Manual*.

Direct Residential Displacement

Direct residential displacement is the involuntary physical displacement of residents from the site of (or a site directly affected by) a proposed project. Examples include a proposed redevelopment of a currently occupied site for new uses, or proposed easement or right-of-way that would take a portion of a parcel and thus render it unfit for its current use.

As set forth in the 2012 *CEQR Technical Manual*, direct residential displacement is not in and of itself an impact under CEQR. Impacts from residential displacement may occur if the numbers and types of people being displaced would be enough to alter the socioeconomic character of a neighborhood and perhaps lead to indirect displacement of remaining residents.

The Proposed Action would implement a comprehensive Campus Security Plan for the WTC Campus, which involves the installation and utilization of security infrastructure (including attended NYPD checkpoint [personnel] booths, static barriers, operable barriers, etc.) to restrict the access of unauthorized vehicles from the roadways adjacent to and within the WTC site. Infrastructure related to the Proposed Action would be located within some streets and sidewalks at the periphery of the WTC Campus, and would not entail any new development, or introduce new land uses to the Project Site.

The Proposed Action would not directly displace any residents from the proposed security zone. The planned redevelopment of the WTC site does not include any residential units. Although there are three existing buildings within the Project Site that accommodate residential dwelling units, the Proposed Action would not involve the involuntary direct displacement of any residents. Therefore, the Proposed Action would not result in significant adverse direct residential displacement impacts, and no further analysis is warranted.

Direct Business and Institutional Displacement

The *CEQR Technical Manual* defines direct business and institutional displacement as the involuntary displacement of businesses or institutions from the site of (or a site directly affected by) a proposed project.

The Proposed Action would not result in direct business and institutional displacement. As noted above, the Proposed Action is a security plan which involves the installation and utilization of security infrastructure to restrict vehicular access from roadways situated within and immediately adjacent to the WTC site (i.e., Project Site). Land uses within the proposed security zone include commercial, institutional, open space, and residential uses. In addition to the residential uses discussed above, existing uses within the proposed security zone include a fire department, a post office, restaurants,

retail and personal service establishments, medical offices, public utilities, and commercial, government, and non-profit offices, as well as public open space. The planned redevelopment of the WTC site will introduce approximately 8.5 million square feet of office space, approximately 441,000 square feet of retail space, a 1,000-seat performance space, an approximately 290,000 square-foot Memorial Center, approximately 14,000 square feet of restaurant/café uses, and an underground parking garage consisting of up to approximately 500 parking spaces by 2019. In addition, the WTC site will include a new WTC Port Authority Trans-Hudson (PATH) Hub, which will be a multi-story central transit hall with upper and lower concourse levels and include approximately 68,000 square feet of retail space.

The Proposed Action, which would be located within some streets and sidewalks at the periphery of the WTC Campus, does not entail the development of new floor area, and does not involve any involuntary displacement of business or institutions within the security zone. The proposed security plan would establish several credentialing zones at the periphery of the secure zone (refer **Figure 1-2** in Chapter 1, "Conceptual Plan for the Proposed Project"). Although the Proposed Action would establish a credentialing zone on the east side of West Broadway between Barclay Street and Park Place where the Downtown PATH Greenmarket currently operates every Tuesday between the hours of 8:00 AM and 6:00 PM throughout the year[6], according to GrowNYC this is a temporary location for the Greenmarket. Formerly, the Greenmarket had operated at the WTC prior to 9/11, and most recently the Greenmarket had been located at Zuccotti Park, which is located to the southeast of the WTC site, and bounded by Liberty Street, Broadway, Cedar Street, and Trinity Place. It is anticipated that the Greenmarket will relocate to a more prominent permanent location when the WTC Site begins to reopen, which is expected to occur prior to the project build year of 2019. Therefore, the Proposed Action would not result in any significant adverse direct business or institutional displacement impacts, and no further analysis is warranted.

Indirect Residential Displacement

According to CEQR guidelines, indirect residential displacement (also known as secondary displacement) is the involuntary displacement of residents as a result of a change in socioeconomic conditions created by a proposed project. The potential for indirect residential displacement is based on whether a project could result in rising property values, and thus rents, making it difficult for some existing residents to afford their homes. The assessment of indirect residential displacement usually identifies the size and type of groups of residents affected.

The Proposed Action, which is a campus security plan, would not introduce any new housing units, new buildings (other than the proposed NYPD personnel booths), or land uses, nor would it directly displace any existing uses, properties, or populations. It also would not result in substantial new development that is markedly different from existing uses, development and activities within the neighborhood. However, as the street closures implemented as part of the project may affect accessibility to some existing and planned residential developments, they may possibly affect property values in the study areas. It was determined that a socioeconomic impact cannot be ruled out and a preliminary analysis of indirect residential displacement was undertaken.

According to the *CEQR Technical Manual,* the potential for indirect displacement depends not only on the characteristics of the proposed project, but on the characteristics of the study areas. The objective of the preliminary assessment is to gather enough information about conditions in the study areas so

[6] The Downtown Path Greenmarket generally consists of two to three vendors, including: Meredith's Bakery from Ulster County, NY and Migliorelli's Farm from Dutchess County, NY, which park their trucks along the east side of West Broadway between Barclay and Park Place and setup tents along the eastern sidewalk adjacent to their trucks.

that the effect of the change relative to expected future conditions in the study area can be better understood. This section describes the population and housing characteristics of the primary study area (i.e., proposed security zone) and the secondary (quarter-mile radius) study area as they relate to potential indirect residential displacement. It describes the physical characteristics of the existing residential buildings in the primary study area, including general size of structures, configurations, condition, and accessibility. It also outlines trends data since 2000, and compares the secondary study area characteristics with the characteristics of Lower Manhattan, Manhattan, and New York City as a whole. Projections for future conditions in the year 2019 with and without the Proposed Action are also analyzed. The secondary study area comprises portions of three neighborhoods, including Battery Park City, north of the WTC Campus (southern Tribeca), and the Greenwich South Corridor. It is bounded by Reade and Chambers streets to the north, Broadway to the east, Battery Place to the south, and the Hudson River to the west (see **Figure 3-1**).

Demographic Profile of the Primary Study Area

The majority of the primary study area is currently under construction, and will accommodate the new WTC site. As described above, the planned redevelopment of the WTC site does not include any residential units. The WTC site will be redeveloped with commercial, cultural, and transportation-related uses, as well as public open space.

The only residential units included within the proposed WTC Campus security zone occupy the upper floors of three existing mid-rise buildings located at 114 Liberty Street, 110-112 Liberty Street, and 120-122 Liberty Street in the southeast corner of the primary study area (see **Figure 3-5**). These three buildings comprise the midblock of the City block bounded by Liberty Street, Greenwich Street, Cedar Street, and Trinity Place (Manhattan Block 52). They are predominantly residential buildings with ground floor commercial and/or institutional uses that have frontage on the south side of Liberty Street and on the north side of Cedar Street.

All three buildings are older, pre-war structures that range in height from 5-to 13-stories (see **Table 3-1**). The buildings are built to their lot lines and range in size from approximately 40,000 square feet to slightly more than 64,500 square feet. They form strong street walls on both Liberty and Cedar Streets without any setbacks. Two of the buildings—120-122 Liberty Street and 110-112 Liberty Street—have residential lobbies on the north side of Cedar Street, and the remaining building's (114 Liberty Street) residential lobby fronts on the south side of Liberty Street. The building at 110-112 Liberty Street also has a second residential lobby on Liberty Street. None of the buildings include parking garages or accessory parking lots. Two of the buildings—114 Liberty Street and 110-112 Liberty Street—have designated curbside loading areas on the north side of Cedar Street. However, neither building has any curb cuts along Cedar Street.

As shown in **Table 3-1**, the three primarily residential buildings accommodate a total of 47 dwelling units, including both rental apartments and condominium units. Two of the residential buildings—114 Liberty Street and 110-112 Liberty Street—are condominiums that accommodate privately-owned residential units, while the remaining building at 120-122 Liberty Street contains market-rate rental apartment units. According to Elegran Real Estate, apartments at 120-122 Liberty Street have rental rates that range from approximately $4,100 to $6,500 per month.

Existing Buildings with Frontages in the Proposed Security Zone

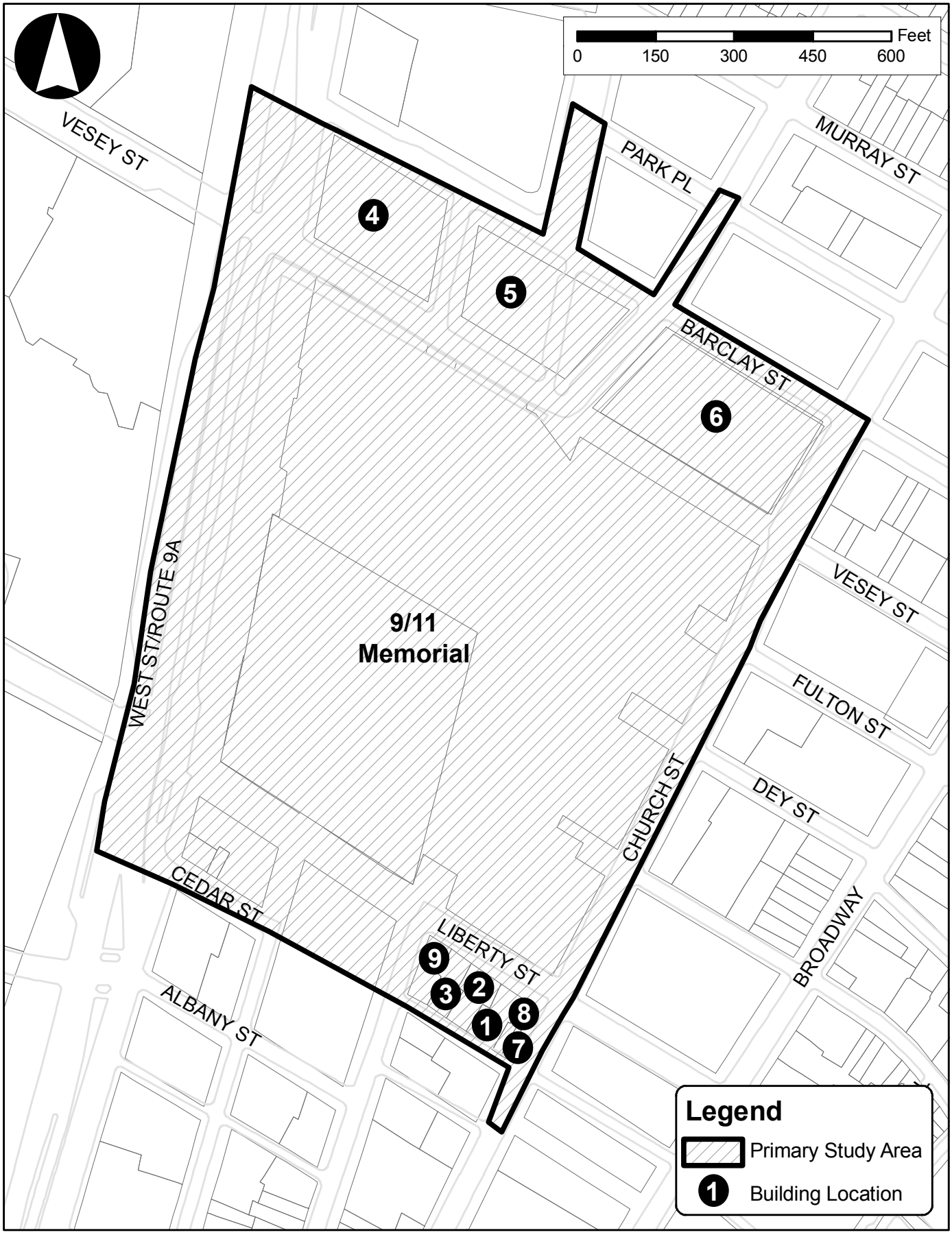


Table 3-1
Existing Residential Uses within the Primary Study Area

Map No.	Building Address	Block, Lot	Building Sq. Ft.	Number of Stories	Number of Dwelling Units (DUs)	Residential Lobby Entrance	Building Description
1	120-122 Liberty St. (123-125 Cedar St.)	Block 52. Lot 21	57,945	13	22	Cedar Street	Pre-war elevator building with rental 2-to 3-bdrm apartments
2	114 Liberty St. (119- 121 Cedar St.)	Block 52, Lot 7502	64,510	11	12	Liberty Street	Pre-war elevator condominium with doorman containing luxury lofts (each unit contains more than 5,000 square feet)
3	110-112 Liberty St. (113- 117 Cedar St.)	Block 52, Lot 7501	40,089	5	13	Cedar Street & Liberty Street	Condominium
Totals			162,544	--	47		

Notes: Map No. corresponds to **Figure 3-5**.
Source: New York City Department of Buildings (NYCDOB), New York City's Primary Land Use Tax Lot Output (PLUTO™) data, New York City Department of Housing Preservation and Development (HPD) online, and PHA Surveys

According to the 2010 Census, only two of these residential units were vacant (4.3 percent), whereas 45 of the dwelling units (95.7 percent) accommodated residential tenants. 2010 Census data also indicated that approximately 80 percent (36 dwelling units) of the occupied units accommodated rental tenants, and the remaining 20 percent (9 dwelling units) were owner-occupied units.

Per the 2010 Census, approximately 119 people resided within these three buildings, a slight increase (of approximately 16 residents) from 103 residents in 2000. The average household size for the block in 2010 was approximately 2.64 persons per housing unit. The median age of residents on the block in 2010 was 30.8 years old. Approximately 23 percent of the population was under the age of 20, 70 percent of the population was between the ages of 20 and 65, and about 8 percent of the population was 65 years or older.

Demographic Profile of the Secondary Study Area

Residential use in the secondary study area is largely concentrated to the north of Murray Street and to the west of West Street/Route 9A in Battery Park City, with additional residential concentrations in Greenwich South and the Financial District. Most of the buildings in close proximity to the primary study area (proposed security zone) accommodate commercial and/or institutional uses. As shown in **Figure 2-1** within Chapter 2, "Land Use, Zoning and Public Policy," most buildings that contain residential use within the secondary study area are mixed-use buildings, which accommodate commercial uses in addition to residential use.

The residential population of the secondary study area is primarily housed within multi-unit mid-to high-rise buildings including both new construction and residential conversions. Based on land use data from PLUTO for 2010 and land use surveys, the quarter-mile secondary study area includes 186 buildings that accommodate residential use. Approximately 31 percent of these buildings contain more than 100 residential dwelling units, about 38 percent accommodate five or fewer housing units, 16 percent contain 6 to 10 dwelling units, and the remaining 15 percent contain 11 to 100 dwelling units.

According to 2010 Census data, the secondary study area contained a total of approximately 13,873 housing units (see **Table 3-2**), a considerable increase from 2000. 2010 Census data show an increase of 6,238 housing units (81.7 percent increase) in the secondary study area between 2000 and 2010, which is comparable to the growth rate of Lower Manhattan (78.4 percent) as a whole, but a considerably higher growth rate than Manhattan (6.1 percent) and New York City (5.3 percent). Most

of the housing stock increase occurred in the northern portion of Battery Park City to the north of Liberty Street (which grew by 3,268 dwelling units). This is reflective of an overall trend of residential conversions and new construction in Lower Manhattan that continues today. According to Cushman and Wakefield, as of mid-2011, there has been a total of 11.4 million square feet of office space converted to residential use in Lower Manhattan, with another 2.4 million proposed to be converted.[7] These conversions have helped Downtown become one of the fastest growing neighborhoods in the City. Residential grant programs have also been successful in keeping many residents in Lower Manhattan, enticing former residents to return, and new residents to relocate to Lower Manhattan.

Table 3-2
Housing Characteristics: Total Housing Units, Occupancy, and Tenure in the Secondary Study Area, Lower Manhattan, the Borough of Manhattan and in New York City

	Total Housing Units			Housing Occupancy				Housing Tenure			
				Occupied		Vacant		Owner		Renter	
	2000	2010	% Change	2000	2010	2000	2010	2000	2010	2000	2010
Secondary Study Area	7,635	13,873	81.7%	83.5%	86.6%	16.5%	13.4%	20.8%	22.8%	79.2%	77.2%
Lower Manhattan	20,325	36,265	78.4%	88.5%	87.0%	11.5%	13.0%	24.5%	24.3%	75.5%	75.6%
Borough of Manhattan	798,144	847,090	6.1%	92.6%	90.2%	7.4%	9.8%	20.1%	22.8%	79.9%	77.2%
New York City	3,200,912	3,371,062	5.3%	94.4%	92.3%	5.6%	7.7%	30.2%	31.0%	69.8%	69.0%

Source: US Census Bureau 2000 and 2010.

In 2010, the vacancy rate in the secondary study area was 13.4 percent, comparable to the vacancy rate in Lower Manhattan (13.0 percent), but higher than both Manhattan (9.8 percent) and New York City (7.7 percent). This discrepancy is likely due to the substantial number of units added to the housing inventory of Lower Manhattan since the 1990s. The overall vacancy rate in the secondary study area has declined by approximately three percent from 16.5 percent in 2000 to 13.4 percent in 2010, but remains higher than the borough. Of the occupied housing units in the secondary study area, almost 23 percent were owner-occupied, a slightly lower percentage than in Lower Manhattan (24.3 percent) overall, but consistent with the overall borough (22.8 percent).

According to 2010 Census data, the secondary study area has a population of 23,905 residents, which represents approximately 36 percent of residential population in Lower Manhattan. As shown in **Table 3-3**, Lower Manhattan has a population of approximately 65,714 residents.

Table 3-3
Population in the Secondary Study Area, Lower Manhattan, the Borough of Manhattan and in New York City

	2000 Population	2010 Population	Absolute Change	Percent Change
Secondary Study Area	11,965	23,905	11,940	99.8%
Lower Manhattan	39,868	65,714	25,846	64.83%
Borough of Manhattan	1,332,650	1,385,108	52,458	3.9%
New York City	8,008,278	8,175,133	166,855	2.1%

Source: US Census Bureau 2000 and 2010.

The secondary study area, like much of the rest of Lower Manhattan, experienced a substantial increase in population between 2000 and 2010. As indicated in **Table 3-3**, the residential population of the secondary study area almost doubled in size from 2000, a 99.8 percent increase. This rate of

[7] Cushman and Wakefield, *Downtown Manhattan A Decade of Development*, September 7, 2011.

increase is more than 1.5 times the rate of increase for Lower Manhattan (64.8 percent) and more than 25 times the rate of increase for Manhattan (3.9 percent).

Similar to the area's increase in population, the number of households in the secondary study area also grew substantially between 2000 and 2010. As shown in **Table 3-4**, the secondary study area contained a total of 14,132 households in 2010, an increase of almost 145 percent over 2000 levels. The household size of the secondary study area is less than that of other compared areas. Area median household incomes in the secondary study area and in Lower Manhattan were high compared to the overall borough and City as a whole as indicated in **Table 3-4**. The median household income in the secondary study area ($155,229) was more than 2.3 times that of the borough of Manhattan ($64,971) in 2010, and the median household income of Lower Manhattan ($117,955) was more than 1.8 times that of Manhattan.

Table 3-4
Household Characteristics in the Secondary Study Area, Lower Manhattan, the Borough of Manhattan and New York City

	Total Households			Average Household Size in 2010	Median Household Income in 2010
	2000	2010	Percent Change		
Secondary Study Area	5,770	14,132	144.9%	1.83	$155,229
Lower Manhattan	17,987	31,567	75.5%	1.94	$117,955
Borough of Manhattan	738,644	763,846	3.4%	1.99	$64,971
New York City	3,021,588	3,109,784	2.9%	2.57	$51,730

Source: US Census Bureau 2000 and 2010, and American Community Survey (ACS) 2006-2010

Table 3-5 provides the percent of population living below the poverty level in the secondary study area, Lower Manhattan, the borough of Manhattan, and New York City as a whole. As indicated in **Table 3-5**, the secondary study area and Lower Manhattan had a much lower percentage of their populations below the poverty level as compared to Manhattan and the City as a whole. Less than 6 percent of the population in the secondary study area was below the poverty level in 2010 and only about 9 percent of the population of Lower Manhattan was below the poverty level, as compared to almost 18 percent in the overall borough and 19 percent in the City as a whole.

Table 3-5
Percent of Population below the Poverty Level in the Secondary Study Area, Lower Manhattan, the Borough of Manhattan and New York City

	Population for whom Poverty Status is Determined	Persons Below Poverty Level	Percent of Population Below the Poverty Level
Secondary Study Area	19,783	1,164	5.9%
Lower Manhattan	51,937	4,746	9.1%
Borough of Manhattan	1,541,275	273,701	17.8%
New York City	7,946,269	1,518,636	19.1%

Source: American Community Survey 2006-2010

The secondary study area's median contract rent (or weighted average of median contract rents) of $2,101 per month was almost double the median rent for Manhattan (**Table 3-6**). The median home value of the secondary study area, at more than one million dollars, was approximately 20 percent higher than the median for Manhattan and about 80 percent higher than the median for New York City.

Table 3-6
Housing Cost Characteristics for the Secondary Study Area, Lower Manhattan, the Borough of Manhattan, and New York City

	Median Contract Rent[1, 2, 3]			Median Housing Value[1, 2]		
	2000	2006-2010	Percent Change	2000	2006-2010	Percent Change
Secondary Study Area	$2,495	$2,101+[4]	N.A.	N.A.	$1,034,209	-
Lower Manhattan	$1,880	$1,755	N.A.	N.A.	$902,157	-
Borough of Manhattan	$1,011	$1,200	N.A.	$497,578	$861,556	73.1%
New York City	$910	$1,042	N.A.	$304,802	$577,147	89.3%

Notes:
[1] All dollars presented in 2012 dollars.
[2] Median values and contract rent presented for the secondary study area and Lower Manhattan are based on weighted average for the Census tracts in the study area and Lower Manhattan, respectively. Median values and contract rent presented for New York City are based on weighted average for the counties in the City.
[3] The median contract rent data in Census 2000 and 2006-2010 American Community Survey are not comparable since the universe in the ACS is "renter occupied" whereas the universe in Census 2000 was "specified renter-occupied housing units," thus comparison cannot be made.
[4] It should be noted that 2010 Census data for all the census tracts included within the secondary study area had median contract rents of greater than $2,000.

Sources: U.S. Census Bureau, 2010 Census, 2000 Census, ACS 2006-2010

REBNY produces quarterly residential market sales reports that provide the average and median sales prices of condominiums and cooperatives in New York City by Manhattan neighborhood. **Table 3-7** provides a comparison of the median sale prices for condominiums and cooperatives in Battery Park City and the Financial/Seaport neighborhoods, which encompass the secondary study area, as well as the Manhattan market overall. As shown in the table, the median home sale prices for all apartments in the Battery Park City and Financial/Seaport neighborhoods were higher than the median prices for the overall borough of Manhattan. The median home sales price for Battery Park City in the Second Quarter of 2012 was $841,000, approximately 4 percent higher than Manhattan as a whole (median home sale $810,000) and the median sales price for Financial/Seaport area was $871,000, approximately 8 percent higher than Manhattan. The median price per square-foot in Battery Park City was $857, approximately $115 less per square-foot than for the entire borough, and the median price per square-foot in the Financial/Seaport area was $917, approximately $55 less per square-foot than Manhattan.

Table 3-7
Median Sale Price for All Apartments (Includes all Condominiums and Cooperatives)

	Median Home Sale Price			Median Price Per Square-foot		
	2nd Quarter '07	2nd Quarter '12	% Change	2nd Quarter '07	2nd Quarter '12	% Change
Manhattan	$790,000	$810,000	2.5%	$1,033	$972	-5.9%
Battery Park City*	$1,350,00	$841,000	-37.7%	$1,047	$857	-18.1%
Financial/Seaport*	$740,000	$871,000	17.7%	$908	$917	1.0%

Notes: *REBNY defines Battery Park City as a 92-acre area located at the southwestern tip of Manhattan bounded by on the east by West Street, and to the west, north, and south, the area is surrounded by the Hudson River. The Financial/Seaport is the southernmost section of the borough of Manhattan, encompassing the area south of City Hall Park but excluding Battery Park City and Battery Park.

Source: REBNY's New York City Residential Sales Reports for the Second Quarters 2012 of 2007.

Table 3-8 provides a comparison of average rent summaries for studio, one-, two-, and three-bedroom apartments in the Wall Street/Battery Park City district, which roughly comprises the secondary study area, and the borough as a whole for the Second Quarter of 2012. Average rental rates in the Wall Street/Battery Park City district are fairly high compared to most residential neighborhoods in Manhattan. As shown in the table, average rental rates in Wall Street/Battery Park City are generally

20 percent higher than in the overall borough. The Second Quarter 2012 average rental rates for apartments in the Wall Street/Battery Park City district are $2,425 for a studio, $3,427 for a one-bedroom unit, $4,683 for a two-bedroom unit, and $5,555 for a three-bedroom unit.

Table 3-8
2012 Average Rent Summary for Apartments in the Secondary Study Area and in Manhattan

	Average Rent Summary			
	Studio	**1-bedroom**	**2-bedroom**	**3-bedroom**
Borough of Manhattan	$2,052	$2,804	$3,930	$5,230
Wall Street/ Battery Park City	$2,425	$3,427	$4,683	$5,555

Notes: * Wall Street (or Financial District) is defined as the area bounded by 1WTC and Park Place to the north, the East River to the east, the tip of Manhattan to the south, and the Westside Highway (Route 9A) to the west. Battery Park City is defined as the area bounded by Chambers Street on the north, West Street on the east, 1st Place to the south, and the Hudson River to the west.

Source: CitiHabitats, Inc., Residential Rental Market Report, Second Quarter 2012.

CEQR Screening Criteria

This preliminary assessment follows the step-by-step analysis described in Section 322.1 of the 2012 *CEQR Technical Manual.* The objective of the indirect residential displacement analysis is to determine whether the proposed project may either introduce a trend or accelerate a trend of changing socioeconomic conditions that may potentially displace a vulnerable population to the extent that the socioeconomic character of the neighborhood would change. Generally, an indirect residential displacement analysis is conducted only in cases in which the potential impact may be experienced by renters living in privately held units unprotected by rent control, rent stabilization, or other government regulations restricting rents, or whose incomes or poverty status indicate that they may not support substantial rent increases.

Step 1: Determine if the proposed project would add new population with higher average incomes compared to the average incomes of the existing populations and any new population expected to reside in the study area without the project.

As described above, the Proposed Action would not introduce any new residential populations, and therefore would not add a new population with higher average incomes compared to the average incomes of the existing populations and any new population expected to reside in the study areas in absence of the Proposed Action.

The Proposed Action is a campus security plan, which would restrict vehicular access within and immediately adjacent to the WTC site as well as involve the installation and utilization of security infrastructure in the immediate vicinity of the WTC site. All infrastructure related to the Proposed Action would be located within some streets and sidewalks at the periphery of the WTC Campus.

The proposed security plan would limit vehicular accessibility within the primary study area, and would result in some changes in vehicular accessibility for residents that are located immediately adjacent to proposed security zone, or adjacent to proposed credentialing and screening zones. All vehicles seeking access to the WTC Campus would be subject to credentialing to determine whether entry should be permitted, and then screening to confirm that these vehicles pose no threat. As shown in **Figure 1-2** in Chapter 1, "Project Description," the proposed secure zone would control vehicular access on the following streets:

- Greenwich Street from Vesey Street to Cedar Street;
- West Broadway from Barclay Street to Vesey Street;
- Washington Street from Barclay Street to Vesey Street;
- Vesey Street from Church Street to West Street/Route 9A;
- Fulton Street from Church Street to West Street/Route 9A; and
- Liberty Street from Church Street to West Street/Route 9A.

Additionally, the Trinity Place/Church Street corridor[8] would be divided by a raised median with a static barrier, from Cedar Street to just north of Vesey Street. It is anticipated that to the east of the median the street would remain open to three lanes of general traffic, while one additional moving lane to the west of the median would be located within the security perimeter and would be accessible only to screened vehicles. Under the Campus Security Plan, pedestrians would have unrestricted access into and throughout the WTC Campus.

As noted above, there are three multi-unit residential buildings, located at 110-112 Liberty Street, 114 Liberty Street, and 120-122 Liberty Street, that would be partially included in the proposed security perimeter for the WTC Campus (i.e., have at least one of the frontages within the proposed secure perimeter). Two of these buildings accommodate privately-owned residential condominium units and the third building houses market-rate rental apartments that reportedly have monthly rates of approximately $4,100 to $6,500. Pursuant to CEQR guidelines, the potential for indirect residential displacement is based on whether a project could result in rising property values, and thus rents, making it difficult for some residents to afford their homes. As none of the residential units within the primary study area house populations at risk of involuntary displacement (i.e., residents that have incomes sufficiently low to be vulnerable to sharp rent increases), the Proposed Action would not result in significant adverse impacts due to indirect residential displacement in the primary study area and a detailed analysis is not warranted. Furthermore, as the Proposed Action is a campus security plan that would not result in any new development or introduce any new land uses, it would not result in an indirect residential displacement in the secondary study area.

The Proposed Action could decrease accessibility for existing residents within close proximity to the WTC site and proposed secure perimeter, and have potential effects on conditions in the real estate market in the area as a result of the increased security measures. Residents within the primary study area could encounter some inconveniences related to vehicular access to their homes and businesses as well as receiving deliveries. As described above, the three existing residential buildings within the primary study area have frontage on the south side of Liberty Street and north side of Cedar Street between Trinity Place and Greenwich Street. Two of these buildings (110-112 Liberty Street and 114 Liberty Street) have their residential lobbies on Liberty Street. However, both of these buildings have their respective loading areas on the north side of Cedar Street. As Liberty Street between Trinity Place and Greenwich Street, as well as Greenwich Street between Liberty and Cedar Streets, would be within the boundaries of the secure perimeter around the WTC site and have controlled vehicular access, vehicular access to the residential buildings at 110-112 Liberty Street, 114 Liberty Street, and 120-122 Liberty Street would be limited. Vehicle access would not be restricted on the southern façade of the buildings along Cedar Street.

Residents of these three buildings could choose to enroll in the planned TAP program to make arrangements for vehicular access within the secure perimeter. As described in Chapter 1, "Project Description," the TAP program would allow for expedited vehicle entry through the security stations

[8] Trinity Place becomes Church Street north of Liberty Street.

and into the secure zone. Enrollment in the TAP program would be open to: (1) WTC office tenants with parking privileges on site; (2) For-hire vehicle operators; (3) Delivery vehicle operators; and, (4) Residents and owners of businesses located in non-WTC buildings within the secure zone (Liberty Street).

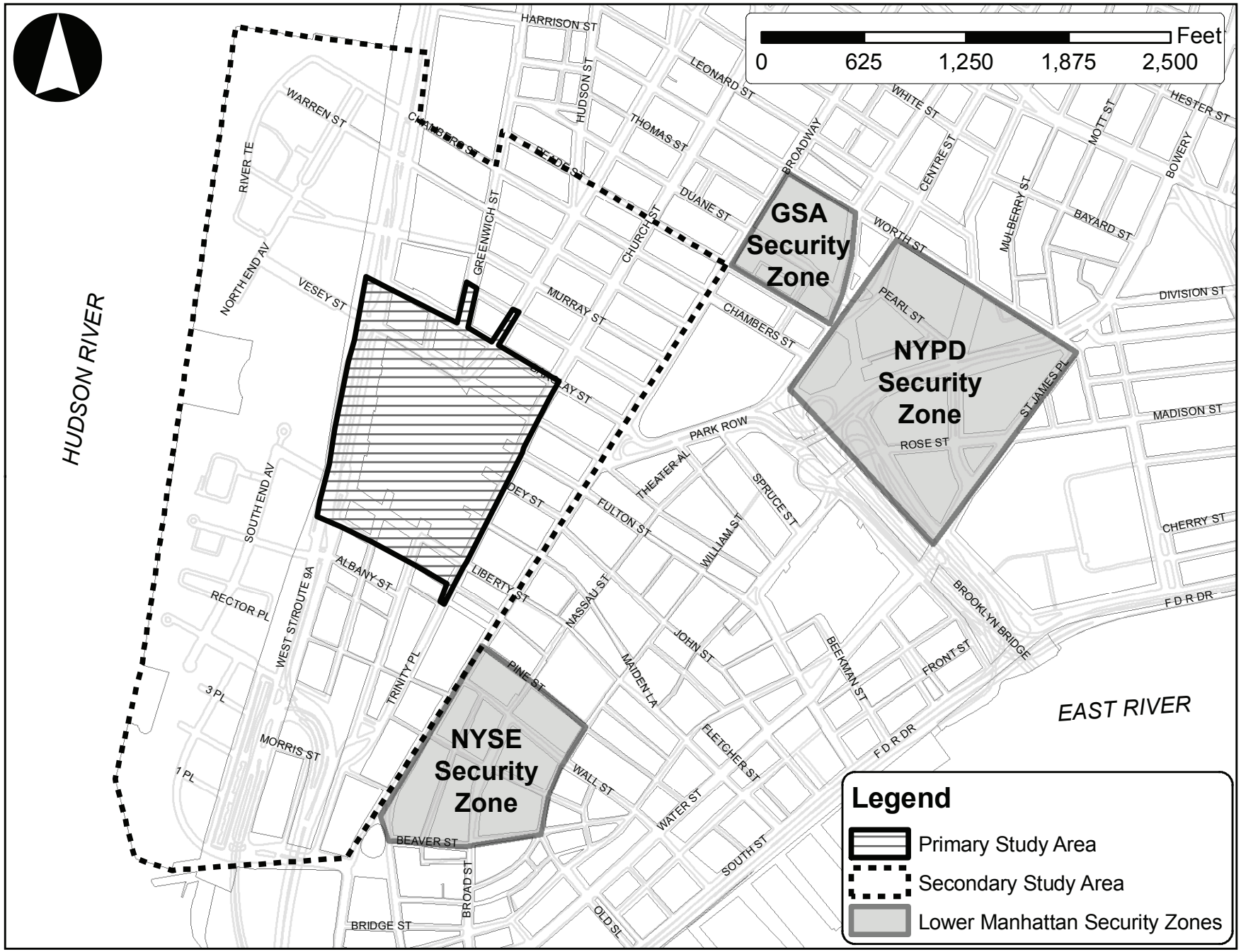
Although the specific operational details of the TAP program cannot be released for security purposes, it is expected that the TAP program would help to accommodate the needs of businesses and residents that are located within the Project Site or immediately adjacent to the proposed credentialing and screening zones. Both drivers and vehicles would be enrolled in the TAP. TAP credentials would be checked as vehicles approach entry points to the WTC Campus, and authorized vehicles would then be admitted to a sally port for expedited security screening. Drivers and vehicles with business at the WTC site but not enrolled in the TAP would be permitted into the WTC Campus but would be subject to more rigorous credentialing and screening. This arrangement would help to facilitate access for those who seek entry. NYPD policy for all vehicles without the proper credentials would be to deny entry. It is expected that residents enrolled in the TAP program would be permitted to enter the secure perimeter with their vehicle using a security station at either West Broadway and Barclay Street, or on Trinity Place at Cedar Street.

None of the proposed screening and credentialing zones and queuing areas for the security plan would be located adjacent to any existing or anticipated residential buildings within the primary or secondary study areas. In addition, as the future traffic network with the Proposed Action would somewhat resemble the existing street network (in terms of free-flow traffic), the proposed security perimeter is not expected to significantly affect accessibility in the secondary study area, as compared to existing conditions. Most of the streets within and immediately adjacent to the WTC site either have not been built, are presently closed to through traffic or have reduced capacity due to construction activity or security concerns. In the future with the Proposed Action, Greenwich Street would be closed to unscreened traffic from Vesey to Cedar Streets, and therefore, the Greenwich South Corridor area[9] would continue to have limited vehicular access to/from the area north of the WTC Campus. However, vehicular access to the Greenwich South neighborhood would be available via northbound West Street/Route 9A to eastbound Albany Street from the west; via Trinity Place/Church Street to westbound Cedar Street from the south; and via Broadway to Cedar Street from the north.

Lower Manhattan is a dense urban environment that contains a concentration of high profile corporations, financial headquarters, the City's civic center, as well as an increasing vibrant residential community. It is also home to a number of museums, cultural venues and historic landmarks. In the aftermath of 9/11, the issue of security surrounding major corporate entities, civic operations, and prominent New York landmark locations has become of increased importance and various security measures have been implemented as well as further enhanced to protect these potential targets, especially in Lower Manhattan. Although established security zones with controlled perimeters, which limit vehicular access have been in place in Lower Manhattan since the 1990s, security concerns have intensified in recent years and the implementation and utilization of security infrastructure (including attended security checkpoint booths, barriers, fencing, planters, bollards, delta barriers, sally ports etc.) has been further expanded and refined since 9/11.

Figure 3-6 shows that three multi-block security zones have been effectuated and maintained south of Canal Street in Lower Manhattan, including NYSE Security Zone, the One Police Plaza Security Zone, and the General Services Administration (GSA) Security Zone (see **Figure 3-6**). All three of

[9] Greenwich South Corridor is the area located directly south of the WTC site, which is roughly bounded by West Street/Route 9A to the west, Cedar Street to the north, Trinity Place/Church Street to the east, and Morris Street to the south.



World Trade Center Campus Security Plan EIS

Figure 3-6

Lower Manhattan Security Zones

these security zones are closed to unauthorized vehicle traffic and have a number of security elements in place. Pedestrian access within all of these security zones is generally not restricted, except for areas immediately adjacent to the NYSE buildings (1 Wall Street, 11 Wall Street and 20 Broad Street) and the NYPD headquarters at One Police Plaza.

Table 3-9
Existing Residential Buildings within the New York Stock Exchange Security Zone

Building Address	Block, Lot	Building Sq. Ft.	Number of Stories	Number of Dwelling Units (DUs)	Year Converted	Building Description
45 Wall Street	Block 26, Lot 21	493,187	28	435	1997	Residential conversion, market-rate rental apartments
Downtown by Philippe Starck 15 Broad Street	Block 26, Lot 7501	810,798	42	382	2006	Residential condominium conversion,
The Exchange 25 Broad Street	Block 25, Lot 19	521,767	21	345	1997	Residential conversion to market-rate rentals
The Setai Wall St. 40 Broad Street	Block 24, Lot 7501	242,980	31	163	2009	Residential condominium conversion
37 Wall Street	Block 26, Lot 14	377,214	26	372	2006	Residential conversion, market-rate, loft-style rental apartments
Totals		**2,445,946**		**1,697**		

Source: PLUTO™ land use data, various real estate websites (including streeteasy.com and trulia.com)

Two of the existing security zones, the NYSE Security Zone and One Police Plaza Security Zone, encompass buildings that include residential uses. The establishment and maintenance of these controlled security perimeters do not seem to have resulted in the indirect displacement of residents from within these two security zones. For example, **Table 3-9** provides a description of the existing residential buildings within the NYSE Security Zone, which is located approximately three blocks southeast of the primary study area just beyond the secondary study area boundaries. The NYSE Security Zone has experienced a large influx of market-rate residential units since the late 1990s.

As shown in **Table 3-9**, approximately 1,697 residential units are located within the NYSE security perimeter. All of these residential units are the result of conversions, which transformed former high-rise office buildings to multiunit residential buildings. Most of these residential conversions occurred subsequent to the establishment of the secure perimeter around the NYSE (vehicular access to and within the NYSE Security Zone has been restricted since 1996). Approximately 68 percent (1,152 units) of the residential units within the NYSE Security Zone are market-rate rental apartments that have rental rates ranging from approximately $2,500 to more than $6,300 per month.[10] The remaining residential units (717 units) in the NYSE Security Zone are condominium units that range in price from approximately $335,000 for a studio to more than $4.3 million for a 2-bedroom unit. Although these residential units are located within the NYSE Security Zone, it does not appear that the security zone has hindered positive trends for the area, nor has it impeded efforts to attract residential investment in the area or created a climate for disinvestment.

The One Police Plaza Security Zone is located further to the east of the secondary study area, and is roughly bounded by Worth Street to the north, Pearl Street and St. James Place to the east, the Brooklyn Bridge access ramps to the south, and Centre Street to the west. The NYPD established the existing secure perimeter following the events of 9/11 to restrict the access of unauthorized vehicles from roadways adjacent to the civic facilities located near One Police Plaza, including NYPD Headquarters, the New York State Supreme Court, and the United States Courthouse. As a result, two

[10] Rental rates for 45 Wall Street, The Exchange and 37 Wall Street were obtained from the respective building's website (25broadnyc.com, tfcornerstone.com, and 37wall.com).

large-scale residential cooperative developments, Chatham Towers and Chatham Green, are partially included within the One Police Plaza Security Zone. Based on available current and historic sales data for cooperative apartment units in Chatham Towers and Chatham Green, the sale prices of the apartments in these two residential developments have generally not declined since the establishment of the secure perimeter around One Police Plaza (refer to **Table 3-10**).

Built in the early to mid-1960's, as middle-income cooperative housing developments, these two residential developments accommodate a total of approximately 660 residential apartments. Chatham Towers (170 and 180 Park Row) is the smaller of the two developments (240 cooperative apartments), consisting of twin 25-story towers with underground parking. It is located at the southwest corner of Worth Street and Park Row, and has pedestrian entrances from both Park Row and Worth Streets, and its below-grade garage entrance is from Worth Street (which is accessible without going through the security zone). According to Cityrealty.com, the average price per square-foot of apartments in Chatham Towers is approximately $684. Recent real estate listings for apartments in Chatham Towers price studios at approximately $369,000, one-bedroom units at approximately $499,000, and two-bedroom units at approximately $875,000. Chatham Green (165, 185 and 215 Park Row) consists of a complex of three attached buildings, located south of Worth Street and Bowery on Park Row. It contains approximately 460 cooperative apartments and at-grade accessory parking. It has pedestrian entrances on Park Row and St. James Place, and its accessory parking is accessible from Park Row, which requires entering the security zone. According to real estate listings from Douglas Elliman Real Estate, Streeteasy.com, and Trulia.com, the average price per square-foot of available apartments in Chatham Green is approximately $694.

Table 3-10 provides a comparison of Chatham Towers and Chatham Green apartment sales prices prior to and post-9/11 for comparable cooperative units. All dollars are presented as 2012 values. As shown in **Table 3-10**, the sales prices for cooperative units in these two residential developments have generally increased since the establishment of the security perimeter, in some cases substantially. According to Streeteasy.com, the median sales prices of apartments in the Civic Center area of Lower Manhattan, which includes both Chatham Towers and Chatham Green, are approximately $359,000 for a studio, $560,000 for a one-bedroom unit, and $812,000 for a two-bedroom unit, which is comparable to currently available cooperative apartments in both Chatham Towers and Chatham Green.

As described above, the secondary study area and the greater Lower Manhattan area have experienced a substantial influx of new housing units within the last 10 years. The residential population of the secondary study area essentially doubled between 2000 and 2010, and Lower Manhattan's population increased by almost 65 percent. Therefore, it is not anticipated that the Proposed Action would result in significant adverse impacts on indirect residential displacement.

Table 3-10
Existing Residential Buildings within the One Police Plaza Security Zone

Apartment Unit	No. of Bedrooms	Sale Price Prior to 9/11	Sale Price Post 9/11	Difference
Chatham Towers				
19B/22B	2-bedroom	8/1996- $398,100	8/2010- $875,000	+ $476,900 (14 years)
19D/ 20D	1-bedroom	11/1997- $263,700	4/2008- $708,000	+ $444,300 (11years)
5D	1-bedroom	11/1997- $248,600	1/2010- $620,600	+ $372,000 (13 years)
9C/3C	2-bedroom	5/2001- $444,100	2/2011- $730,100	+ $286,000 (10 years)
2D	1-bedroom	8/2001- $257,300	6/2008- $574,800	+ $317,500 (7 years)
Chatham Green				
20A/21A	3-bedroom	7/1997- $430,900	7/2008- $1,289,250	+ $858,350 (11 years)
11H/15H	2-bedroom	9/1997- $360,300	5/2010- $774,400	+ $414,100 (13 years)

Source: Douglas Elliman Real Estate, Elegran Real Estate, and Elika Real Estate webpages November 2012.

Indirect Business/Institutional Displacement

According to CEQR guidelines, indirect business/institutional displacement (also known as secondary displacement) is the involuntary displacement of businesses and/or institutions as a result of a change in socioeconomic conditions created by a proposed project. This preliminary assessment of indirect business and institutional displacement focuses on whether the proposed project may introduce trends that could make it difficult for businesses/institutions that provide products or services essential to the local economy or that are targeted to be preserved in their current locations under adopted public plans to remain in the area. In most cases, a project could introduce such a trend by causing a marked increase in rents and property values in the area (such as by stimulating the demand for more lucrative land uses and thus redevelopment or by increasing the demand for new commercial or retail services with which the existing businesses cannot compete). Additionally, it could directly displace business or residents who serve as suppliers or the customer base for nearby businesses, affecting their viability or altering the desirability of their existing location. Finally, it could create enough new retail space to draw substantial sales from existing businesses (i.e., a market saturation impact).

In most cases, the issue for indirect displacement of businesses is that an action would markedly increase property values and rents throughout the study area, making it difficult for some categories of businesses to remain in the area. The assessment of indirect business/institutional displacement usually identifies the size and type of groups of businesses and institutions affected.

While the proposed Campus Security Plan is not a type of project that is identified in the 2012 *CEQR Technical Manual* as a typical action that could result in indirect displacement, the Proposed Action could decrease vehicular accessibility or potentially create other hardships for existing businesses adjacent to the site and have potential effects on conditions in the real estate market in the area as a result of the increased security measures. The following section first presents an economic profile of the study area, followed by responses to the CEQR assessment criteria (in italics below), to determine the potential for significant adverse indirect business/institutional displacement impact.

Existing Conditions

Economic Profile of the Primary Study Area

As described above, the majority of the primary study area, which comprises the WTC site, is currently under construction and does not support any existing businesses or institutional uses. The WTC site is anticipated to be developed with approximately 8.5 million square feet of office space, approximately 441,000 square feet of retail space, a 1,000-seat performance space, an approximately 290,000 square-foot Memorial Center, approximately 14,000 square feet of restaurant/café uses, and an underground parking garage consisting of up to approximately 500 parking spaces by 2019. In addition, the WTC site will include a new WTC PATH transportation hub, which will be a multi-story central transit hall with upper and lower concourse levels and include approximately 68,000 square feet of retail space.

The primary study area also includes existing uses to the north and southeast of the WTC site, which would be located partially within the proposed WTC security zone. As shown in **Table 3-11** and **Figure 3-5**, there are nine buildings on portions of four blocks that would have at least one of their frontages in the proposed security zone. These nine buildings currently accommodate a range of commercial, residential, public utility, and/or institutional uses. Combined they contain more than 4.0 million square feet of office space, 30,000 square feet of retail, and approximately 15,500 square feet of institutional space, as well as 47 residential dwelling units. They are generally fully-occupied with few vacancies. Only one building within the primary study area, 112 Trinity Place, contains vacant space on its upper three floors.

Table 3-11
Existing Buildings with Frontages in the Proposed Security Zone

Map No.	Building Address	Block, Lot	Building Size (sf)	Building Height (Stories)	Existing Use	Main Pedestrian Entrance in Security Zone	Loading/Garage in Security Zone	Storefront in Security Zone
1	120-122 Liberty St.	Block 52, Lot 21	57,945	13	Residential/Ground Floor Institutional	No.	No.	Yes.
2	114 Liberty Street	Block 52, Lot 7502	64,510	11	Residential/Ground Floor Retail	Yes.	No.	Yes.
3	110-112 Liberty St.	Block 52, Lot 7501	40,089	5	Residential/Ground Floor Retail	Yes.	N.A.	Yes.
4	140 West Street Barclay-Vesey Bldg	Block 84, Lot 1	1,300,000	32	Headquarter Offices	Yes.*	No.	N.A.
5	7 WTC (250 Greenwich St.)	Block 84, Lot 36	1,636,000	52	Office/Public Utility	No.	Yes.	N.A.
6	90 Church Street Federal Office Bldg	Block 86, Lot 1	1,154,357	15	Office/Post Office	Yes.**	Yes.	N.A.
7	104-110 Trinity Pl. (109 Cedar Street)	Block 52, Lot 15	2,370	2	Food Service	Yes.	N.A.	Yes.
8	112 Trinity Place	Block 52, Lot 30	13,300	5	Food Service/Office	Yes.	N.A.	Yes.
9	124 Liberty St. (127 Cedar St. and 141-151 Greenwich St.)	Block 52, Lot 22	8,008	3	Fire Station	Yes.	Yes.	N.A.

Note: Map no. refers to **Figure 3-5**.
* The main pedestrian entrances for the building at 140 West Street are located on Barclay Street (within the proposed secure perimeter) and on West Street.
** The main pedestrian entrances for the building at 90 Church Street are located on Church Street and West Broadway. The southernmost pedestrian entrance on Church Street would be located near the proposed sally port on Church Street directly north of Vesey Street.
Source: PHA Field Surveys

The three blocks to the north of the WTC site, bounded by Barclay, Church, Vesey and West Streets, are occupied by high-rise, high-bulk commercial and/or institutional buildings (140 West Street, 7 WTC, and 90 Church Street) that encompass entire blocks. These buildings accommodate a range of office tenants, a post office, and a Con Edison substation. The 32-story building at 140 West Street (the Barclay-Vesey building), which is bounded by Barclay, Washington, Vesey, and West Streets, houses the headquarters of Verizon Communications within approximately 1.3 million square feet of office space. The building's main pedestrian entrances are located on West and Barclay Streets, and its loading area is on Barclay Street. 7 WTC (250 Greenwich Street), which was completed in 2006, occupies the block directly east bounded by Barclay, Greenwich, Vesey, and Washington Streets. It is 52-stories tall, and includes approximately 1.6 million square feet of office space that is fully-occupied and a Con Edison substation that supplies electrical service to downtown Manhattan. Office space in 7 WTC rents for approximately $50 per square-foot to upwards of $70 per square-foot, which is high compared to the average rental rates in Lower Manhattan. The building's main pedestrian entrance is located on Greenwich Street, and its loading area is on Washington Street. The Federal Office Building, located at 90 Church Street, is 1.15 million square feet and occupies the block bounded by Barclay Street, Church Street, Vesey Street and West Broadway. It includes 15-stories and houses a range of local and state government offices, and a post office, which serves as the postal distribution center for Lower Manhattan. The building has pedestrian entrances on Church Street and West Broadway, and its loading area and garage entrances for the postal service are located on West Broadway.

To the southeast of the WTC Campus, the block bounded by Liberty Street, Trinity Place/Church Street, Cedar Street and Greenwich Street is occupied by a six smaller, low-to mid-rise buildings that accommodate a mix of residential, commercial, and/or institutional uses. At the block's western edge is the New York City Fire Department's (FDNY) Engine Company 10/Ladder Company 10 (the "Ten House"), which is housed within a three-story, approximately 8,008 square-foot institutional building that has frontage on the south side of Liberty Street, the east side of Greenwich Street, and the north side of Cedar Street. The two vehicular bays of the firehouse are located on the south side of Liberty Street, and pedestrian access to the firehouse is provided from both Liberty and Cedar Streets.

As described previously under the *Indirect Residential Displacement* section, the midblock is occupied by three predominantly residential buildings (120-122 Liberty Street, 114 Liberty Street, and 110-112 Liberty Street) that have ground floor commercial or institutional space. The 9/11 World Trade Center Tribute Center presently occupies the ground floor of the building at 120-122 Liberty Street. The Tribute Center has it main pedestrian entrance on the south side of Liberty Street with a secondary entrance and loading area on the north side of Cedar Street. The ground floor of 114 Liberty Street includes three retail storefronts with pedestrian entrances on Liberty Street. The building's loading area is also located on the north side of Cedar Street. It currently accommodates a food service establishment and two small retail stores. The building at 110-112 Liberty Street accommodates commercial uses on its ground floor and basement level with storefronts on both Liberty and Cedar Streets. It currently accommodates a hair salon and two food service establishments.

Adjacent to 110-112 Liberty Street, is approximately 13,300 square-foot commercial building with five-stories at 112 Trinity Place, which accommodates retail space and office space. The building has frontage on Liberty Street, Trinity Place and Cedar Street. It currently accommodates an urgent care medical facility on its basement level and a food service establishment on its first and second stories. The upper floors (floors three to five) of the building are currently vacant and are anticipated to be renovated in the future to accommodate additional office space. Pedestrian entrances to the food service establishments are located at the corner of Trinity Place and Liberty Street, and on Trinity Place. The urgent care facility's primary entrance is on Liberty Street, but it also has a secondary entrance on Cedar Street. The southeast corner of the block is occupied by an approximately 2,370

square-foot commercial building at 104 Trinity Place, which includes two-stories. It currently accommodates two food service establishments. The building has frontage on the west side of Trinity Place and the north side of Cedar Street. Both restaurants have storefronts with pedestrian entrances along Trinity Place. Neither of these two commercial buildings has loading facilities.

Table 3-12 characterizes the types of business establishments and institutional uses, currently located in the primary study area and provides an estimate of existing employment in the primary study area.

Table 3-12
Classification of Business Establishments/Institutional Uses Currently Located in the Primary Study Area

Business Type/ Economic Sector	Number of Business Establishments	Approximate Building Square-footage Occupied (gross square feet)	Employee Estimates (Number of Workers)
Construction	1	40,000	130
Retail Trade	2	5,600	17
Information	4	1,386,000	1,800
Finance, Insurance & Real Estate (FIRE)	14	1,286,000	3,650
Professional, Scientific & Technical Services	5	274,800	600
Health Care & Social Assistance	4	55,410	190
Arts, Entertainment & Recreation	2	87,500	118
Accommodation & Food Service	6	20,840	60
Other Services	2	230,980	240
Public Administration	4	935,900	2,473
Totals	44	4,323,030	9,278

Source: PHA Field Surveys

As shown in **Table 3-12**, a total of 44 business establishments are located within the primary study area, which employ an estimated 9,278 workers. More than 60 percent (27 firms) of these business establishments are located within the recently completed 7 WTC. Slightly less than 40 percent of the workers within the primary study area are employed in the FIRE service sector and about 27 percent of workers are employed in the public administration sector. Some of the largest employers within the primary study area include: Verizon, which has its headquarters at 140 West Street; the New York City Housing Authority at 90 Church Street; and Moody's, which occupies 17 floors in 7 WTC.

Economic Profile of the Secondary Study Area

Office Trends

Lower Manhattan is the fourth largest business district in the country and often referred to as the "Financial Capital of the World."[11] It is a dense central business district that is recognized as an international symbol of finance and commerce, and is home to Wall Street and a number of major financial institutions and headquarters offices, as well as the City's civic center. Together, Midtown (the nation's largest Central Business District [CBD]), Midtown South and Lower Manhattan comprise the Manhattan office market, which consists of more than 391 million square feet of office space and makes New York City the business and financial capital of the world.

[11] Lower Manhattan is defined as the area south of Canal Street.

According to Cushman and Wakefield, Lower Manhattan contains approximately 85.5 million square feet of commercial office space, comprising about 22 percent of Manhattan's total office inventory. The quarter-mile secondary study area, which comprises the World Trade/World Financial and Financial West submarket areas, encompasses approximately 21.5 million square feet of office space (or about 25 percent of Lower Manhattan's office stock), and includes such notable office buildings as the World Financial Center, the New York Stock Exchange, and 1 Liberty Plaza.

Table 3-13 presents office inventory, overall vacancy rates, and average rents for the Lower Manhattan submarket (submarkets are defined in **Figure 3-3**) as compared to Midtown and Midtown South. As shown in **Table 3-13**, average rental rates for the second quarter of 2012 in Lower Manhattan ranged from $34.30 per square-foot in Financial West to $45.59 per square-foot in the World Trade/World Financial District. Lower Manhattan has maintained its competitive advantage in pricing as compared to both Midtown and Midtown South, with overall asking rents showing a discount of about $26 compared to Midtown (with average asking rent of $66.44 per square-foot) and a $9 discount from Midtown South (with average asking rent of $49.43 per square-foot).

Vacancy rates in Lower Manhattan vary considerably across submarkets. Overall, the Financial East and the Financial West submarkets have the highest vacancy rates (at 14.1 and 12.1 percent, respectively) and City Hall has the lowest vacancy rate at 2.2 percent. Lower Manhattan's overall vacancy rate at 8.9 percent in the second quarter of 2012 is comparable to that of Midtown (at 9.8 percent) and higher than Midtown South (at 6.1 percent). Since the second quarter of 2011, Lower Manhattan's overall vacancy rate has declined by approximately 0.8 percent, slightly less than that of Midtown South, which declined by approximately 1.0 percent. Midtown's overall vacancy rate has remained stable since 2011 at 9.8 percent.

Table 3-13
Lower Manhattan Office Inventory, Overall Vacancy Rates, and Average Rents

Sub-Market	Inventory	Under Construction	Overall Vacancy Rate			Overall WTD Average Gross Rental Rate		
			2011	2012	Percent Change	2011	2012	Percent Change
City Hall	14,186,204	0	4.5%	2.2%	- 2.3%	$36.03	$35.61	- 1.2%
World Trade Center/ World Financial Center*	15,570,956	4,791,110	6.0%	4.7%	- 1.3%	$48.75	$45.59	- 6.5%
Financial West*	5,986,809	0	16.8%	12.1%	- 4.7%	$34.06	$34.30	0.7%
Financial East	35,611,455	0	13.1%	14.1%	1.0%	$40.07	$41.22	2.9%
Insurance	13,897,097	0	7.4%	5.9%	1.5%	$35.06	$34.56	- 1.4%
Lower Manhattan Total	85,252,521	4,791,110	9.7%	8.9%	- 0.8%	$39.38	$40.06	1.7%
Manhattan Overall	391,709,993	6,330,249	9.4%	9.0%	- 0.4%	$55.52	$58.86	6.0%
Midtown	241,506,257	1,231,300	9.8%	9.8%	0.0%	$63.35	$66.44	4.9%
Midtown South	64,951,215	307,839	7.1%	6.1%	-1.0%	$44.63	$49.43	10.7%

Notes: *Lower Manhattan office submarkets included within the quarter-mile secondary study area.
Source: Cushman & Wakefield *Marketbeat Office Snapshot*: 2012 Quarter 2 and 2011 Quarter 2

Table 3-13 also indicates the current amount of office construction within Manhattan. As shown in **Table 3-13**, approximately 75 percent of all new office construction in Manhattan is occurring south of Canal Street and will add more than 4.7 million square feet of office space to Lower Manhattan's

inventory (for a total of approximately 90.0 million square feet). This new office space is largely concentrated on the WTC site, which is the largest office construction site in the country.

Retail Trends

Residential growth as well as the influx of office workers has made Lower Manhattan increasingly attractive to retailers and restaurants. With $4.77 billion in annual buying power, Lower Manhattan (i.e., area south of Chambers Street) is increasingly becoming a premier retail destination in New York City.[12] Several national and international retailers have opened in Lower Manhattan within the last couple of years, including My.suit, Jos. A. Bank, and Tourbillon.

According to the Downtown Alliance, approximately 1,104 retailers are located in Lower Manhattan, including approximately 640 stores and storefront services, and 460 bars and restaurants. The main retail corridors in Lower Manhattan are Broadway, Wall Street and Fulton Street. Data from Cushman Wakefield's Second Quarter of 2012 Marketbeat Retail Report indicate that average asking rents in Lower Manhattan have been increasing, while the vacancy rate has been decreasing to 12.1 percent. Since 2010, average asking rents along Broadway from Battery Park to Chambers Street rose considerably, by 36 percent, to $184 per square-foot.[13] Ground floor retail in this area is characterized by banks, restaurants and cell phone stores. As of the second quarter of 2012, the asking rental rates for retail space in Lower Manhattan ranged considerably from $85 per square-foot on Fulton Street to upwards of $500 per square-foot on Wall Street, with an average asking rent of $237 per square-foot.

Table 3-14
Classification of Business Establishments/
Institutional Uses in the Secondary Study Area

Business Type/ Economic Sector	Number of Firms	Percent of Total
Mining, Quarrying, Oil & Gas Extraction	1	0.1%
Utilities	2	0.1%
Construction	29	1.4%
Manufacturing	22	1.1%
Wholesale Trade	23	1.1%
Retail Trade	164	8.2%
Transportation & Warehousing	34	1.7%
Information	50	2.5%
Finance, Insurance & Real Estate (FIRE)	345	17.2%
Professional, Scientific & Technical Services	671	33.4%
Management of Companies & Enterprises	19	0.9%
Administrative, Support, Waste Management & Remediation Services	51	2.5%
Educational Services	40	2.0$
Health Care & Social Assistance	96	4.8%
Arts, Entertainment & Recreation	42	2.1%
Accommodation & Food Services	210	10.5%
Other Services	166	8.3%
Public Administration	42	2.1%
Totals	**2,007**	**100%**

Source: PHA Field Surveys, Online Building Directories, Company Websites, Property Shark, and Manta.com.

[12] Alliance for Downtown New York, *Lower Manhattan: A World of Possibilities,* 1st Quarter 2012.
[13] New York Times, *Rise of World Trade Center Spurs Retail Revival*, 07/05/2011.

Employment

As shown in **Table 3-14**, there are slightly more than 2,000 business establishments located in the secondary study area at present. Professional, scientific, and technical services comprise more than 33 percent of the total firms in the area, while 17 percent are classified as FIRE sector. These two industries comprise a total of 50 percent of firms in the secondary study area, reflecting the dominance of the Lower Manhattan CBD. Additionally, there are numerous establishments classified as accommodation and food services, retail trade, and other services in the secondary study area, which comprise a total of 27 percent of firms in the area. These establishments illustrate the recent trend from predominately commercial office uses to more mixed-uses including an influx of retail uses in Lower Manhattan.

According to the Downtown Alliance, the City of New York is the largest employer in Lower Manhattan with a civic staff of more than 21,600 workers occupying more than 4.5 million square feet of space. Finance is also still Lower Manhattan's premier industry. Major institutions headquarters located south of Chambers Street, include American Express, Goldman Sachs, Bank of New York Mellon and Deutsche Bank. However, Lower Manhattan is becoming increasingly diverse. From 2002 to 2010, the proportion of workers employed in the FIRE sector dropped by approximately 19 percent, while professional services increased by 21 percent, hotel and retail increased by 10 percent and education and social services increased by 37 percent. Additionally, the media industry is growing. As of 2011, more than 60 media firms occupied more than 1.3 million square feet of space in Lower Manhattan.

Table 3-15
2010 Employment in the Secondary Study Area, Lower Manhattan, the Borough of Manhattan and New York City

Type of Job by NAICS Category	Secondary Study Area[1]		Lower Manhattan[2]		Borough of Manhattan		New York City	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Ag., Forestry, Fishing &Hunting	0	0.0%	0	0.0%	111	0.0%	249	0.0%
Utilities	0	0.0%	0	0.0%	N.A.	N.A.	15,775	0.5%
Construction	443	0.8%	4,396	2.0%	29,007	1.6%	111,189	3.7%
Manufacturing	53	0.1%	2,638	1.2%	26,288	1.5%	76,321	2.5%
Wholesale Trade	384	0.7%	3,739	1.7%	70,216	3.9%	129,129	4.2%
Retail Trade	3,102	5.8%	11,707	5.3%	139,066	7.7%	300.582	4.2
Transportation & Warehousing	301	0.6%	1,049	0.5%	14,390	0.8%	100,836	3.3%
Information	4,128	7.7%	12,063	5.5%	130,111	7.2%	150,249	4.9%
Finance, Insurance, & Real Estate	16,801	31.4%	60,918	27.8%	347,668	19.2%	425,063	14.0%
Professional, Scientific, & Technical Services, Management of Companies & Enterprises	14,959	28.0%	45,004	20.5%	327,748	18.1%	369,553	12.1%
Administrative, Support & Waste Management & Remediation Services	4,146	7.8%	20,898	9.5%	121,429	6.7%	182,255	6.0%
Education Services	590	1.1%	3,242	1.5%	84,071	4.6%	136,402	4.5%
Health Care & Social Services	2,277	4.3%	23,243	10.6%	203,525	11.2%	568,409	18.7%
Arts, Entertainment, Recreation Accommodations & Food Services	2,694	5.0%	16,504	7.5%	221,394	12.2%	322,445	10.6%
Other Services	3,047	5.7%	9,951	4.5%	84,934	4.7%	141,813	4.7%
Unclassified Establishments	94	0.2%	642	0.3%	4,880	0.%	13,157	0.4%
Total	**53,481**	**100%**	**219,420**	**100.0%**	**1,810,455**	**100.0%**	**3,043,427**	**100.0%**

Notes:
[1] The quarter-mile secondary study area includes the following six Manhattan zip codes: 10006, 10007, 10048, 10280, 10281, & 10282.
[2] Lower Manhattan includes the following 10 Manhattan zip codes: 10004, 10005, 10006, 10007, 10013, 10038, 10048, 10280, 10281, & 10282.
Source: 3rd Quarter of 2010 Quarterly Census of Employment and Wages (QCEW) provided by the New York City Department of City Planning (DCP).

As of 2010, there were an estimated 53,481 employees in the quarter-mile secondary study area (see **Table 3-15**). These employees represented approximately 24.2 percent of Lower Manhattan's employment, about 3.0 percent of Manhattan's employment, and 1.8 percent of the employment in all of New York City. The private economic sectors with the highest employment in the secondary study area (i.e., those that contribute substantially in an economic sense) were the FIRE Services sector (31.4 percent of total employment in the study area, followed by the Professional, Scientific, and Technical Services and Management of Companies and Enterprises sector (28.0 percent).

Future Without the Proposed Action (No-Action Condition)

Primary Study Area

In the future without the Proposed Action, the WTC site will be redeveloped with Class A office space, local and destination retail, cultural, open space and transportation-related uses by 2019. The current development program for the WTC site includes approximately 8.5 million square feet of office space, approximately 441,000 square feet of retail space, a 1,000-seat performance space, an approximately 290,000 square-foot Memorial Center, approximately 14,000 square feet of restaurant/café uses, and an underground parking garage consisting of up to approximately 500 parking spaces by 2019.[14] It will also accommodate one of the largest transportation hubs in New York City. Assuming standard employment ratios and vacancy rates described in the notes of **Table 3-16**, the planned WTC site development is anticipated to add up to approximately 32,927 workers to the primary study area. A vast majority of the employees (approximately 95 percent) would be office workers.

Table 3-16
Anticipated Permanent Employment at the WTC Site in the Future Without the Proposed Action

Category	Size	Employment (Full-Time Equivalent)
Office	8,500,000 gsf*	31,280
Retail	441,000 gsf	1,257
Memorial Center (museum)	290,000 gsf	290
Performing Arts Center	1,000-seat	50
Restaurant/Café	14,000 gsf	40
Parking	Up to 500 spaces	10
Total		**32,927**

Notes: *GSF stands for gross square feet.
Office, one employee per 250 gsf, and an eight percent vacancy; retail, on average for the anticipated type of retail and restaurant/café uses, three employee per 1,000 gsf, and a five percent vacancy; Memorial Center, one employee per 1,000 gsf; Performing Arts Center, estimated for the purposes of this analysis; parking, estimated for purposes of this analysis.

With the addition of approximately 32,927 employees estimated to be working at the WTC site, there would be a projected 42,205 workers in the primary study area by 2019. The estimated workers on the WTC site would represent approximately 78 percent of the total employment in the primary study area.

Several prominent firms and government agencies have announced anticipated relocations to the planned Class A office at the WTC site. More than 50 percent of 1 WTC is currently leased, with

[14] This development program is smaller than what was assumed for the 2004 World Trade Center Memorial and Redevelopment Plan FGEIS which included up to 10 million square feet of office space in five towers, up to 1.03 million square feet of retail space (including 30,000 sf of restaurant/café uses), a hotel with up to 800 rooms and up to 150,000 square feet of conference space, a 2,200-seat performance space, up to 240,000 square feet of cultural (museum) facilities in addition to the Memorial and Memorial Center, and an underground parking garage for office tenants with 1,200 to 1,400 parking spaces.

Condé Nast, a media and creative services firm, leasing more than one million square feet on twenty-one floors (approximately one-third of the building), and the General Services Administration (GSA) leasing an additional 270,000 square feet on six floors. The Vatone China Center has also signed an approximately 190,000 square-foot lease to occupy more than five floors in 1 WTC. Additionally, the City of New York leased 582,000 square feet, approximately one-third of the space of 4 WTC. Office space in 1 WTC has been renting for approximately $65 per square-foot, at the high end of Class A office rents for Lower Manhattan.[15]

Secondary Study Area

As discussed in more detail in Chapter 2, "Land Use, Zoning, and Public Policy," there are many new development projects planned or under construction in Lower Manhattan. Fifteen No-Action development sites are located in the socioeconomic secondary study area, exclusively in the areas directly north and south of the WTC Campus, as detailed in **Table 3-17**. Of these, seven will be new hotels, seven will be new residential buildings, one will be a new mixed-use hotel and residential building, and two will be community facilities. Most of the hotels will be located in the area south of the WTC Campus, whereas the majority of the residential buildings and both community facilities will be located in the area north of the WTC Campus.

Table 3-17
No-Action Development Sites in the Secondary Study Area

Project Name/ Address	Development Proposal Program	Build Year	Estimated Residents[1]	Estimated Workers[2]
Holiday Inn (99 Washington Street)	Hotel: 350 rooms	2013	0	117
133 Greenwich Street	Hotel: 320 rooms; Retail 5,000 sf*	2015	0	122
87 Chambers Street/69 Reade Street	Hotel: 90 rooms	2019	0	30
78-86 Trinity Place	Hotel: 174 rooms; Retail 100,000 sf	2019	0	448
50 Trinity Place	Hotel: 244 rooms	2019	0	81
Four Seasons Hotel (99 Church Street/30 Park Place)	Hotel: 190 rooms	2019	0	63
50 Little West Street/ 50 West Street	Hotel: 155 rooms; Residential: 280 DUs*; Retail: 15,000 sf	2019	512	108
55 Murray Street/55 Warren Street	Residential: 4 DUs	2012	7	0
37 Warren Street/ 136 Church Street	Residential: 24 DUs; Retail: 5,500 sf	2012	44	18
Reade57 (57 Reade Street)	Residential: 84 DUs; Retail: 11,372 sf	2012	154	37
19 Park Place/16 Murray Street	Residential: 25 DUs	2013	46	1
18-22 Thames Street/123 Greenwich Street	Residential: 353 DUs	2019	646	118
111 Washington Street	Residential: 500 DUs; Retail: 30,000 sf	2019	915	110
BMCC Fiterman Hall (30 West Broadway)	Community Facility: 390,000 sf	2012	0	1300
45-51 Park Place	Community Facility: 100,000 sf	2019	0	333

Notes: *SF stands for square feet and DU stands for dwelling units.
[1] Estimated residents based on an assumption of 1.83 residents per unit, based on the average number of residents per occupied housing unit calculated from 2010 Census data for the secondary study area.
[2] Estimated workers based on an assumption of one employee per 250 square feet of office space, three employees per 1,000 square feet of retail space, one employee per three hotel rooms, one employee per 300 square feet of community facility space, and one employee per 25 dwelling units.
Sources: Downtown Alliance Reports, Lower Manhattan Construction Command Center Online, Various newspaper and online articles.

[15] Downtown Alliance Lower Manhattan Real Estate Year in Review (2011) – Page 1

In total, the No-Action developments will result in an additional 2,324 residents in the secondary study area by 2019, reflecting the recent trend of increasingly mixed-uses in Lower Manhattan. The No-Action developments will also introduce 2,886 new workers to the secondary study area by 2019. The majority of these new workers will be at the Borough of Manhattan Community College (BMCC)'s Fiterman Hall at 30 West Broadway, immediately north of the WTC Campus, which was recently completed and occupied. Moreover, the eight new hotels will result in an additional 1,523 hotel rooms in the secondary study area by 2019, dramatically increasing the number of tourists as well as business travelers in the area.

With the addition of approximately 32,927 employees estimated to be working at the WTC site and an additional 2,886 new workers added to the secondary study area, there would be a projected 89,294 workers in the secondary study area by 2019. The estimated workers on the WTC site would represent approximately 37 percent of the total employment in the secondary study area and approximately 13 percent of the total employment in Lower Manhattan by 2019.

CEQR Screening Criteria

In most cases, the issue for indirect displacement of businesses is that an action would markedly increase property values and rents throughout the study area, making it difficult for some categories of businesses to remain in the area.

- ***Would the proposed project introduce enough of a new economic activity to alter existing economic patterns?***

As described above, the Proposed Action would not introduce any new economic activity or alter existing economic patterns. It would implement a comprehensive secure perimeter for the WTC site that would control vehicular access into and within the WTC Campus. Portions of streets in and around the WTC site would be closed to unscreened vehicular traffic. The Proposed Action would involve the installation and utilization of new security infrastructure in the immediate vicinity of the WTC site. All improvements related to the Proposed Action would be located within some streets and sidewalks and would consist of various types of interdiction devices under the control of the NYPD (including static barriers, operable barriers, traffic lane delineators, personnel booths, etc.). The Proposed Action would not introduce any new buildings (other than the proposed NYPD personnel booths). In the future with the Proposed Action, vehicles destined for the WTC site would be subject to credentialing to determine whether entry to the WTC Campus should be permitted, and then screening to confirm that these vehicles pose no threat. Pedestrian flows would be unimpeded by the proposed security measures.

As also described above, established security perimeters in Lower Manhattan are not new, and have been in place in Lower Manhattan since the 1990s. As shown in **Figure 3-6**, there are three multi-block security zones maintained south of Canal Street in Lower Manhattan, which have controlled perimeters that limit vehicular access utilizing a variety of security infrastructure (including attended security checkpoint booths, static barriers, operable barriers etc.). The proposed security plan would be one of several established security zones in Lower Manhattan, and would not be expected to introduce an economic activity or alter existing economic patterns.

- ***Would the proposed project add to the concentration of a particular sector of the local economy enough to alter or accelerate an ongoing trend to alter existing economic patterns?***

As described previously, the Proposed Action would not introduce any new economic activities or add to the concentration of a particular sector of the local economy enough to alter or accelerate an ongoing trend to alter existing economic patterns. As described above, the Proposed Action would implement a comprehensive vehicle security perimeter for the WTC Campus that would control vehicular access to and traffic movement within the WTC Campus. No new economic activity would be introduced as a result of the Proposed Action.

- ***Would the proposed project directly displace uses of any type that directly support businesses in the area or bring people to the area that form a customer base for local businesses?***

As discussed above, the Proposed Action would not result in any direct displacement, and therefore the Proposed Action would not directly displace any type of uses that directly support businesses in the area or bring people to the area that form a customer base for local businesses in the study area.

- ***Would the proposed project directly or indirectly displace residents, workers, or visitors who form the customer base of existing businesses in the study area?***

As detailed in Chapter 1, "Project Description," the Proposed Action is a comprehensive vehicle security perimeter for the WTC Campus that is intended to ensure an open environment hospitable to commerce, culture and remembrance, but also protected from future threats to the extent practicable over the long term. Under this plan, vehicular access to and traffic movement within the WTC site would be controlled through a secure perimeter that would prevent unscreened vehicles from approaching the WTC buildings. Portions of streets in and around the WTC site, including Vesey, Fulton, Liberty and Greenwich Streets as well as the segments of Washington Street and West Broadway south of Barclay Street would be closed to unscreened vehicular traffic. Vehicles destined for the WTC Campus seeking entry onto these streets would be subject to credentialing to determine whether entry to the WTC site should be permitted, and then screening to confirm that these vehicles pose no threat. The proposed traffic network with the new security measures in place would generally resemble the existing traffic network, as most of the streets in and around the WTC site have not yet been built or are presently closed to through-traffic due to ongoing construction and security concerns. Pedestrian access into and throughout the WTC Campus is also currently limited due to extensive construction activities that are underway throughout the WTC site; however, under the Proposed Action, pedestrians would have unrestricted access into and throughout the WTC Campus.

The proposed Campus Security Plan would involve the installation of new security infrastructure and changes to the traffic network in and around the WTC site. The perimeter of the WTC Campus would be secured through the installation of various types of vehicle interdiction devices under the control of the NYPD. These include static barriers and traffic lane delineators, as well as a system of operable vehicle barriers. Screening of all vehicles entering the WTC site would utilize both mechanical and manual processes, and would be facilitated through the use of sally ports which would consist of a guard booth controlling a set of two retractable barriers with sufficient space between them to accommodate one or more motor vehicles undergoing screening. An additional personnel booth would also be installed at each credentialing location.

The quarter-mile secondary study area has well-established commercial and residential markets. Commercial and residential uses are common in the study areas. As described above, the Proposed Action would not result in any direct residential displacement and limited business displacement, and

the Proposed Action is also not expected to indirectly displace a substantial number of residents, business establishments/institutions, workers, or visitors who form the customer base of existing businesses in the study areas.

As described above, there are nine existing buildings, which accommodate a range of commercial, residential, public utility, and institutional uses, that would be partially included in the proposed security perimeter for the WTC Campus (i.e., these buildings would have one or more of their of their frontages within the secure perimeter). In addition, immediately adjacent to the proposed campus security zone are the High School of Economics and Finance, which occupies the eastern portion of the block bounded by Trinity Place and Cedar, Greenwich, and Thames Streets, and the High School of Leadership and Public Service and the American Stock Exchange Building, which occupy the northern portion of the block bounded by Trinity Place and Thames, Greenwich, and Rector Streets; all three of these buildings would be located adjacent to credentialing zones for the security perimeter (refer to **Figure 3-5**). The Proposed Action would alter accessibility for vehicles picking up or dropping off people and making deliveries to these twelve existing buildings within and immediately adjacent to the proposed secure zone, potentially disrupting established business routines and customer patterns. Moreover, the Proposed Action could affect conditions in the real estate market due to the increased security measures and changes in vehicular accessibility.

Tenants of the planned WTC buildings with parking privileges on site, for-hire vehicle operators, delivery vehicle operators, and residents and owners of businesses located in non-WTC buildings within the proposed secure zone would be able to enroll in the TAP, which would allow for expedited vehicle entry into the secure zone. As discussed in Chapter 1, "Project Description," this program would include privately owned vehicles operated by WTC tenants who are authorized to park in the approximately 500 spaces of on-site parking, taxi and black car services expecting to regularly pick-up and/or drop-off passengers at the WTC site, service companies with frequent business at the WTC site, and residents (primarily those living along Liberty and Cedar Streets) who may need to travel through the security perimeter for access to their homes.

Both drivers and vehicles would be enrolled in the TAP. TAP credentials would be checked as vehicles approach entry points to the WTC Campus, and authorized vehicles would then be admitted to a sally port for expedited security screening. Drivers and vehicles with business at the WTC site but not enrolled in the TAP would be permitted into the WTC Campus but would be subject to more rigorous credentialing and screening. This arrangement would help to facilitate access for those who seek entry. It is anticipated that the program would help to accommodate the needs of businesses and residents located within and immediately adjacent to the secure zone.

Washington Street, Barclay Street, Greenwich Street, and West Broadway

Washington Street between Barclay and Vesey Streets is currently closed to general vehicular traffic with an existing operable barrier just south of Barclay Street to prevent unauthorized access to vehicles. Under the Proposed Action, this street would serve as a screening zone for the WTC site and would remain closed with barriers at its northern and southern ends, as shown in **Figure 1-2** of Chapter 1, "Project Description." It is expected that this street segment would serve as an entrance and an exit point for over-sized trucks en route to and from the Performing Arts Center's loading docks, as well as an alternate entry for private vehicles and for-hire vehicles, when conditions allow. As discussed above, the loading facilities of 7 WTC are located on Washington Street between Barclay and Vesey Streets, and there is also a pedestrian entrance to the building at 140 West Street. Trucks en route to the loading area of 7 WTC would be credentialed along the south side of Barclay Street adjacent to the north façade of 7 WTC and then would likely be screened on Washington Street prior to entering the loading facilities of 7 WTC. As pedestrians would have unrestricted access into and

throughout the WTC campus, there would be no changes to the accessibility of the pedestrian entrance to 140 West Street as a result of the Proposed Action. As this segment of Washington Street is currently closed to unauthorized vehicular traffic, there would also be no substantial changes to the accessibility of the 7 WTC loading dock.

As also shown in **Figure 1-2** of Chapter 1, the Proposed Action would result in the creation of credentialing zones on portions of the south side of Barclay Street between Washington and Greenwich Streets and between West Broadway and Church Street, as well as on the east side of West Broadway between Barclay Street and Park Place. None of these proposed credentialing zones on Barclay Street or on West Broadway would be located adjacent to or in the immediate proximity of the loading areas for or main pedestrian entrances of the existing buildings located at 7 WTC, 90 Church Street, and 100 Church Street. Therefore, accessibility to these buildings is not expected to be altered significantly as a result of the establishment of these credentialing zones.

It is anticipated that Greenwich Street from Barclay Street to Vesey Street would be limited for use only by 7 WTC tenants under future conditions (as outlined in a December 5, 2007 reciprocal easement agreement among the City of New York, 7 WTC ownership, the Port Authority of New York and New Jersey [PANYNJ] and the Lower Manhattan Development Corporation [LMDC]); therefore, this section of Greenwich Street would be a controlled access street irrespective of the Proposed Action and would be closed to through traffic. The installation of operable vehicle barriers near the Vesey Street intersection would permit the use of this block for vehicle entry to the WTC campus in emergency situations when other entrances may be unusable. It is possible that operable barriers may also be installed on Greenwich Street near Barclay Street at the northern end of the block. Operable barriers at the north end of the block (default down) and the south end of the block (default up) would allow vehicular access to the adjacent 7 WTC building, but not into the secure zone.

Similar to existing and No-Action conditions, this segment of Greenwich Street would operate with two moving lanes. Taxi and vehicular drop-offs/pickups would be able to occur along this portion of Greenwich Street. There would be no changes to the accessibility of the pedestrian entrance to 7 WTC as a result of the Proposed Action.

In the future with the Proposed Action, West Broadway would function as a vehicular entrance to the WTC site for private tenant vehicles and for-hire vehicles arriving from the north. As shown in **Figure 1-2** of Chapter 1, a secure vehicle entrance with an entry sally port would be installed on the western side of West Broadway between Barclay and Vesey Streets. Static barriers would be used to delineate a single travel lane along the east curb adjacent to the sally port, but outside of the proposed secure perimeter, in order to maintain vehicular access to the adjacent Federal Office Building/U.S. Post Office at 90 Church Street. Postal service vehicles would enter 90 Church Street at the southern end of the block and utilize an internal roadway to exit the facility onto West Broadway near Barclay Street, limiting any disruptions to established business routines. Postal service vehicles would not need to enter the proposed security zone. As the east sidewalk of West Broadway would be located outside of the proposed secure perimeter, accessibility to the existing pedestrian entrance to 90 Church Street on West Broadway would not be affected by the Proposed Action. Private vehicles and taxi dropoffs/pickups to the western façade of 90 Church Street, however, would no longer be permitted on West Broadway and would need to occur on either Barclay Street or Church Street (as described further below).

Trinity Place/Church Street

Under the Proposed Action, the Trinity Place/Church Street corridor would be divided by a raised median with static barriers from Cedar Street on the south to just north of Vesey Street on the north. It is expected that to the east of the median, Church Street/Trinity Place would remain open to general northbound traffic with three moving lanes, while one additional moving lane would be located to the west of the median within the security perimeter and would be accessible only to vehicles that have been screened at one of the four entrances to the WTC Campus. As a result, the Proposed Action is not expected to result in any significant changes to the vehicular accessibility of the existing buildings on the eastern side of Trinity Place/Church Street.

As the Proposed Action would introduce a sally port on the western side of Church Street just north of Vesey Street in front of the Federal Office Building/U.S. Post Office, which would serve as an egress point for vehicles exiting northbound from the WTC site, vehicle drop-offs/pickups along the eastern façade of the Federal Office Building/U.S. Post Office at 90 Church Street could be affected. As described above, the building at 90 Church Street has three main pedestrian entrances on the west side of Church Street between Barclay and Vesey Streets. The proposed sally port and vehicular egress from the WTC site on Church Street would be located directly in front of the southernmost pedestrian entrance to 90 Church Street. Taxi and vehicular drop-offs/pickups to the building at 90 Church Street would need to occur north of the proposed sally port on Church Street or along Barclay Street. The Proposed Action would not affect the existing sidewalk on the west side of Church Street between Barclay and Vesey Street as a curb extension is proposed at this location, nor would it hinder pedestrian accessibility to the building at 90 Church Street.

A secure entrance consisting of a sally port for vehicles entering the WTC site would be located on Trinity Place just north of Cedar Street. Like the sally port north of Vesey Street, this sally port would not result in any changes to the western sidewalk of Trinity Place between Cedar and Liberty Streets. However, a new personnel booth would narrow the west sidewalk of Trinity Place, but pedestrian access to the restaurants at 104 Trinity Place is not expected to be adversely affected. Vehicle and taxi drop-offs and pickups would not be allowed to occur on the west side of Trinity Place between Cedar and Liberty Streets, and would need to occur on Cedar Street, which would only create minor inconveniences. Deliveries would also no longer be allowed on Trinity Place between Cedar and Liberty Streets. Deliveries would have to be planned in advance to occur on Liberty Street, or would have to be off-loaded on one of the nearby streets. This may increase the time needed to make deliveries.

As shown in **Figure 1-2** in Chapter 1, a credentialing zone for the sally port on Trinity Place would be delineated along the western side of the Trinity Place between Cedar Street and just south Thames Street. This zone would be immediately adjacent to the main pedestrian entrances of the High School of Economics and Finance at 96 Trinity Place, the High School of Leadership and Public Service at 88 Trinity Place, and the vacant American Stock Exchange Building at 78-86 Trinity Place. Since high school students typically utilize mass transit or walk to school, they are not expected be significantly affected by the proposed credentialing zones on the street. While it is less common for high school students to take the bus or be driven to school, any vehicle drop-offs/picks or buses in route to the schools would need to occur on either Cedar or Thames Streets, as would any deliveries for the schools.

Liberty Street

To the southeast of the WTC Campus, the block bounded by Liberty Street, Trinity Place/Church Street, Cedar Street, and Greenwich Street is occupied by six small, low- to mid-rise buildings that

accommodate a mix of residential, commercial, and institutional uses. Under the Proposed Action portions of Liberty and Greenwich Streets, which are currently open to vehicular traffic, would be included in the secure zone and thus have limited vehicular access. Prior arrangement could be made to access buildings on Liberty Street through the TAP. Otherwise, workers, visitors and customers would have to be picked up and dropped off on Cedar Street or on the east side of Trinity Place/Church Street and walk to the business establishments in order to avoid the secure zone screening process. Many buildings on this block have entrances on both Liberty and Cedar Streets, allowing some tenants, workers, and visitors to use Cedar Street for vehicular pickups, drop offs, and deliveries. As discussed in Chapter 4, "Community Facilities," FDNY's Ten House fire trucks and emergency vehicles would have access into the proposed secure zone without restriction.

The Proposed Action is not expected to significantly affect vehicular accessibility in the secondary study area as compared to current conditions. The future traffic network with the Proposed Action would somewhat resemble the existing street network (in terms of free-flow traffic). In the future with the Proposed Action, Greenwich Street would be closed to unscreened traffic from Vesey to Cedar Streets, and therefore, the Greenwich South Corridor area would continue to have limited vehicular access to/from the area north of the WTC Campus. However, vehicular access to the Greenwich Street neighborhood would be available via northbound West Street/Route 9A to eastbound Albany Street from the west; via Trinity Place/Church Street to westbound Cedar Street from the south; and via Broadway to Cedar Street from the north.

Conclusion

Based on the preliminary assessment above, the Proposed Action would not result in significant adverse impacts due to indirect business displacement, and additional analysis is not warranted. The Proposed Action would result in minor inconveniences to existing businesses in the study area, including the rerouting of vehicular traffic in and around the WTC. The proposed secure zone would alter accessibility for vehicles picking up or dropping off people as well as making deliveries to existing buildings within and immediately adjacent to the proposed secure zone, potentially disrupting established business routines and customer patterns. Furthermore, several businesses within and immediately adjacent to the proposed secure zone would be required to schedule and coordinate deliveries in advance through the TAP.

Adverse Effect on a Specific Industry

According to the *CEQR Technical Manual*, a significant adverse impact may occur if a project would measurably diminish the viability of a specific industry that has substantial economic value to the city's economy. An example as cited in the 2012 *CEQR Technical Manual* would be new regulations that prohibit or restrict the use of certain processes that are critical to certain industries. A preliminary assessment of the adverse effects on specific industries, using the *CEQR Technical Manual* threshold indicators (in italics below), is provided to determine the potential for significant adverse impacts.

- ***Would the proposed project significantly affect business conditions in any industry or any category of business within or outside the study area?***

The Proposed Action would not significantly affect business conditions in any industry or any category of business within or outside the study areas. As discussed above under the preliminary assessment for direct business and institutional displacement, the Proposed Action would not result in the direct displacement of any businesses or institutional uses.

Furthermore, the Proposed Action would also not result in a substantial change to overall business conditions within any industry through such measures as changes in regulations that affect the basic processes conducted by an industry. Therefore, the Proposed Action would not result in an adverse impact on a particular industry or category of businesses within or outside the study areas.

- ***Would the proposed project indirectly substantially reduce employment or impair the economic viability in the industry or category of businesses?***

The Proposed Action would not result in direct or indirect displacement that would substantially reduce employment or impair the economic viability in an industry or category of business. The Proposed Action would not result in the development of new floor area or introduce any new uses. Furthermore, while the Proposed Action is not expected to cause indirect displacement, any indirect displacement that may occur would not be concentrated in a particular industry. Therefore, there would not be an adverse impact on a particular industry or category of businesses as a result of the Proposed Action.

Conclusion

Overall, the Proposed Action would not result in significant adverse socioeconomic impacts due to adverse effects on specific industries, and, therefore, a detailed analysis of this issue is not warranted.

A. INTRODUCTION

Context

The 2012 *City Environmental Quality Review* (CEQR) *Technical Manual* defines community facilities as public or publicly funded facilities, including schools, health care, day care, libraries, and fire and police protection services. This chapter examines the potential effects of the World Trade Center (WTC) Campus Security Plan (Proposed Action) by 2019 on the public and publicly funded community facilities that serve the Project Site and the area within a quarter-mile of the Project Site. The Proposed Action would result in the implementation of a physical and operations security infrastructure overlay that would be incorporated into the WTC District streetscapes that are currently under construction at the 16-acre WTC site in Manhattan Community District 1. Primary features of the Proposed Action include entry/exit security checkpoints and a secure lane on Church Street between Cedar Street and Vesey Street.

According to CEQR methodology, new population added to an area as a result of a project would use existing services, which may result in potential "indirect" effects on service delivery. Depending on the size, income characteristics, and age distribution of the new population, there may be effects on public schools, libraries, or child care centers. CEQR analysis of indirect effects examines potential impacts on existing facilities and generally focuses in detail on those services that the City is obligated to provide to any member of the community. The CEQR analysis is not a needs assessment for new or additional services. Service providers like schools or libraries conduct their own needs assessments on a continuing basis. As no new residential population would be introduced and no substantial new worker population would be added to the area as a result of the Proposed Action, no indirect effects would occur and no further analysis of indirect effects is warranted.

CEQR methodology focuses on direct impacts on community facilities and services and on increased demand for community facilities and services generated by increases in population. If a project would physically alter a community facility, whether by displacement of the facility or other physical change, this "direct" effect triggers the need to assess the service delivery of the facility and the potential effect that the physical change may have on that service delivery. The Proposed Action would not result in the direct displacement of any existing community facilities or services; however, it has the potential to affect the access to and from local police or fire stations. Therefore, the Proposed Action is assessed for its potential to result in significant adverse direct impacts on response times for emergency services.

B. PRINCIPAL CONCLUSIONS

The Proposed Action would not have a significant adverse impact on community facilities. This conclusion is drawn from the comparison of conditions in the future with the Proposed Action in 2019 (With-Action conditions) to the future without the Proposed Action in 2019 (No-Action conditions), when full development is expected, and therefore the potential for impacts is greatest. This analysis examines potential impact of the Proposed Action under current conditions, and takes into consideration development that is currently planned, proposed, or underway.

The Proposed Action is a result of extensive measures that have been taken on local, state, and national levels to reduce the likelihood of another terrorist attack and increase emergency preparedness. These measures include: the relocation of the city's Office of Emergency Management (OEM) from 7 WTC in Lower Manhattan to a new location; street closings and increased security in Lower Manhattan; increased

training and coordination among emergency response providers including New York City Police Department (NYPD), New York City Fire Department (FDNY), and Port Authority Police Department (PAPD); increased security in building design; and legislation such as the Homeland Security Act. However, even with these measures, the possibility exists for large-scale emergencies in the future. The Proposed Action would not interfere with the emergency service response to such an event and is intended to decrease the likelihood of future threats.

As no new population would be introduced to the area as a result of the Proposed Action, no new demands would be placed on the delivery of the existing community services. The Campus Security Plan would introduce security measures at the perimeter of the WTC Campus to eliminate unscreened vehicles from entering the site.

New York City Fire Department

The Proposed Action would not have an adverse impact on FDNY services or operations. FDNY does not anticipate that the Proposed Action would have any adverse impacts on its level of service in the area surrounding the Project Site. It is expected that the FDNY response within the WTC Campus from Engine Company 10, Ladder Company 10 ("Ten House") would be comparable to the No-Action condition. Response from the Ten House outside the WTC Campus may even improve over No-Action conditions due to the low traffic volumes anticipated within the WTC Campus that would allow for more expedited circulation through the proposed secure zone, even when taking into account the potential for increased traffic surrounding the WTC Campus under the Proposed Action. FDNY response units other than the Ten House would be facilitated through coordination at a centralized emergency response command center, checkpoints and responding units. The Proposed Action would not physically alter any station house. As described below, the Proposed Action includes measures to give priority to emergency vehicles so that the WTC Campus Security Plan would not alter operations of or access to or from any engine or ladder company.

New York City Police Department

The WTC Campus will be a heavily policed area with virtually instantaneous police response. NYPD response by non-WTC Command units would be facilitated through coordination at a centralized emergency response command center, checkpoints and responding units. Overall emergency service delivery to WTC campus would not be affected. As NYPD continually evaluates its level of service and makes changes as they are deemed necessary, no significant adverse impacts are expected as a result of the Proposed Action.

Port Authority Police Department

The Proposed Action would not result in any changes to PAPD staffing or allocation of resources as the NYPD would staff the proposed screening and credentialing locations. As PAPD will be located at the locations on the WTC Campus specified below, the perimeter security plan would not create any impediments to the PAPD services and would not be expected to result in slower response times. As such, the Proposed Action is not expected to adversely impact PAPD services or operations.

Health Care Facilities

The demand for health care facilities in the future with the Proposed Action would be no greater than the demand for health care facilities in the future without the Proposed Action. As described below, ambulances and other emergency vehicles would be granted expedited access into and through the site with the assistance of the central operations coordination center and the NYPD-controlled operable

barriers. Private occupancy vehicles (POV's) headed to local health care facilities would likely avoid the credentialing and screening zones associated with the Proposed Action as the people utilizing these facilities would be familiar with the area and understand the traffic patterns. Instead, most health care facilities would likely be accessed by using the routes that are currently available. As discussed below, patients may have to alter established routines to access the privately funded *Medhattan Immediate Medical Care* urgent care facility at 106 Liberty Street by vehicle; however, pedestrian access would remain largely unchanged from future No-Action conditions to future conditions with the Proposed Action.

Other Community Facilities

No changes to other area community facilities are expected as a direct result of the Proposed Action. As indicated below, no significant new population would be added to the WTC Campus as a result of the Proposed Action. As such, there would be no new demand on other community facilities associated with the Proposed Action.

These proposed security elements would not obstruct pedestrian crosswalks and would introduce limited obstructions on sidewalks, medians, or sidewalk extensions adjacent to select screening and credentialing zones. Pedestrian flow into, out of, and throughout the WTC Campus would generally be unimpeded. Further, all operable barriers that are proposed within the street right-of-way would be set back from pedestrian zones and would include safety features to prevent safety hazards. Vehicle access to the area's existing community facilities is expected to remain similar to the routes currently taken.

C. METHODOLOGY

The analysis of community facilities has been conducted in accordance with the guidelines established in the 2012 *CEQR Technical Manual*. This methodology was used because it was created specifically to examine the potential effects of development projects in New York City. CEQR methodology calls for detailed assessments in areas where a project may have an impact on the provision of public or publicly funded services available to the community. Analyses were conducted to identify the potential effect that the Proposed Action could have on community facilities and the provision of services to the surrounding community. The *CEQR Technical Manual* provides guidelines or thresholds that can be used to make an initial determination of whether a detailed study is necessary to determine potential impacts. The implementation of the WTC Campus Security Plan by 2019 under the Proposed Action has the potential to change access for emergency service vehicles, and detailed analyses follows.

D. SCREENING

As explained in Chapter 1, "Project Description," the Proposed Action would not result in a significant new population as it is a security infrastructure overlay. Therefore, the assessment of the Proposed Action will focus on accessibility as it pertains to local community facilities that are typically studied under CEQR. These facilities include NYPD, FDNY and local health care facilities. However, in this case the Port Authority owns the WTC site, and will be responsible for law enforcement and security operations in certain areas of the site. Therefore, in addition to studying NYPD and FDNY service and access to local healthcare facilities, as outlined in the *CEQR Technical Manual*, this analysis also includes a discussion of the PAPD.

A detailed analysis of community facilities that serve the residential population, such as schools, libraries, health care, and day care facilities would not typically be conducted for a project such as the Proposed Action because there would be no change to the residential population with the Proposed Action. However, the Proposed Action would involve the creation of new security measures at several locations at the perimeter of the WTC site, with new traffic patterns at screening and credentialing zones. As some other community facilities that serve the area are also located within close proximity to the WTC site (such as daycare and headstart facilities, elementary and secondary schools, colleges and other post-secondary institutions, libraries, hospices, ambulatory programs, mental health services and developmental disabilities services), it is possible that pedestrians may have to walk near one or more proposed vehicle screening locations. As such, a discussion of pedestrian access to these publicly funded community facilities is provided below. It should be noted that Chapter 8, "Transportation," provides a more detailed pedestrian and vehicular safety assessment.

Framework of Analysis

New York City Fire Department

Fire protection services include fire stations that house engine, ladder and rescue companies. In New York City, units responding to a fire are not necessarily limited to those closest to it. Normally, more than one engine company and ladder company respond to each call. Rescue companies typically also respond to fires or emergencies in high-rise buildings. FDNY does not allocate resources based on proposed or projected developments, but it continually evaluates the need for changes in personnel, equipment or locations of fire stations and makes any adjustments necessary. According to CEQR methodology, a detailed analysis of fire protection is required when a proposed action would affect the physical operations of, or access to and from, a station house or where a proposed project would create a sizeable new neighborhood where none existed before. This analysis examines the extent to which fire protection would be affected by the Proposed Action.

New York City Police Department

The ability of police to provide public safety for a new project usually does not warrant a detailed assessment under CEQR. The Police Department independently reviews its staffing levels against a precinct's population, area coverage, crime levels, and other local factors. A detailed assessment of service delivery is usually only conducted if a proposed project would affect the physical operations of, or access to and from, a precinct house or where a proposed project would create a sizeable new neighborhood where none existed before. This analysis examines the extent to which police protection would be affected by the Proposed Action.

Port Authority Police Department

As the WTC Campus is owned by the Port Authority, the PAPD will also have a role in policing the WTC site. PAPD will have primary responsibility for law enforcement and security operations at the PATH Hub, the VSC and the below grade vehicle roadway network and podium retail areas. NYPD will have primary responsibility for all other interior and exterior areas of the WTC site. Therefore, although not required under CEQR methodology, the potential effects of the Proposed Action on PAPD operations and service are also described below.

Health Care Facilities

Health care facilities include public, proprietary and non-profit facilities that accept public funds (usually in the form of Medicare and Medicaid reimbursements) and that are available to any member of the

community. Generally, a detailed analysis of service delivery is conducted only if a proposed project would affect the physical operations of, or access to and from, a hospital or public health clinic, or where a proposed project would create a sizeable new neighborhood where none existed before. This analysis examines the extent to which access to health care facilities would be affected by the Proposed Action.

Other Community Facilities

Other community facilities, such as daycare and headstart facilities, elementary and secondary schools, colleges and other post-secondary institutions, libraries, hospices, ambulatory programs, mental health services and developmental disabilities services or religious and cultural facilities are analyzed only if the facility itself is the subject of the proposed project or would be physically displaced or altered by the project. As none of these other community facilities would be physically displaced or altered by the Proposed Action, no assessment is provided for these community facilities. However, a discussion of access to these facilities is provided below.

Study Area

The study area for a community facility analysis is related to the catchment area for each individual facility. As per the 2012 *CEQR Technical Manual*, a quarter-mile radius is drawn around the Project Site, and all community facilities to be analyzed that serve any part of this area are considered in the analysis. For example, only one fire house serves the Project Site, but all of the FDNY resources listed in **Table 4-1** serve the Study Area. Therefore, all facilities that serve this area are included in this analysis.

New York City Fire Department

Response time is the primary factor analyzed when assessing a proposed project's impacts on fire service in a given area. As more than one FDNY unit often responds to emergency calls, all stations that serve the surrounding area are studied, not just the nearest station to a project site. Four engine companies and three ladder companies typically serve the quarter-mile area surrounding the Project Site (as shown in **Table 4-1** and **Figure 4-1**). This analysis primarily focuses on those engine and ladder companies that serve the WTC Campus and surrounding area on a day-to-day basis. However, in the case of significant emergency situations, engine and ladder companies beyond those listed in **Table 4-1** also respond to the WTC Campus.

Table 4-1
Fire Protection Services

Fire Department	Address
Engine Company 10, Ladder Company 10	124 Liberty Street
Engine Company 6	49 Beekman Street
Engine Company 7, Ladder Company 1	100 Duane Street
Engine Company 4, Ladder Company 15	42 South Street

New York City Police Department

The NYPD has the lead role in providing police and security operations for the streets, sidewalks and plazas in and around the WTC Campus, the WTC towers, the Memorial and Museum complex, and the

Performing Arts Center. The NYPD has created a new unit, the WTC Command, to serve the WTC Campus and the surrounding area. The WTC Security Area is bordered by Murray Street, Rector Street, Broadway and the Hudson River. WTC Command will ultimately be staffed by no fewer than 630 sworn law enforcement officers. The WTC Security Area is located entirely within the quarter-mile Study Area and is within the confines of the NYPD's First Precinct. As shown in **Figure 4-1**, the First Precinct boundary extends across Lower Manhattan from Houston Street south to the Battery. The WTC campus will be served directly by resources from the newly created WTC Command and supplemented by the First Precinct. In an extreme emergency situation, such as September 11th, police personnel from other precincts might also serve the WTC site and surrounding areas as conditions warrant.

Port Authority Police Department

The PAPD is directly responsible for select portions of the WTC site, as described above, and other properties owned by the Port Authority. As it is not responsible for providing police services to any area surrounding the WTC site, the PAPD's services and operations are only studied within those areas of the WTC site for which it is responsible.

Health Care Facilities

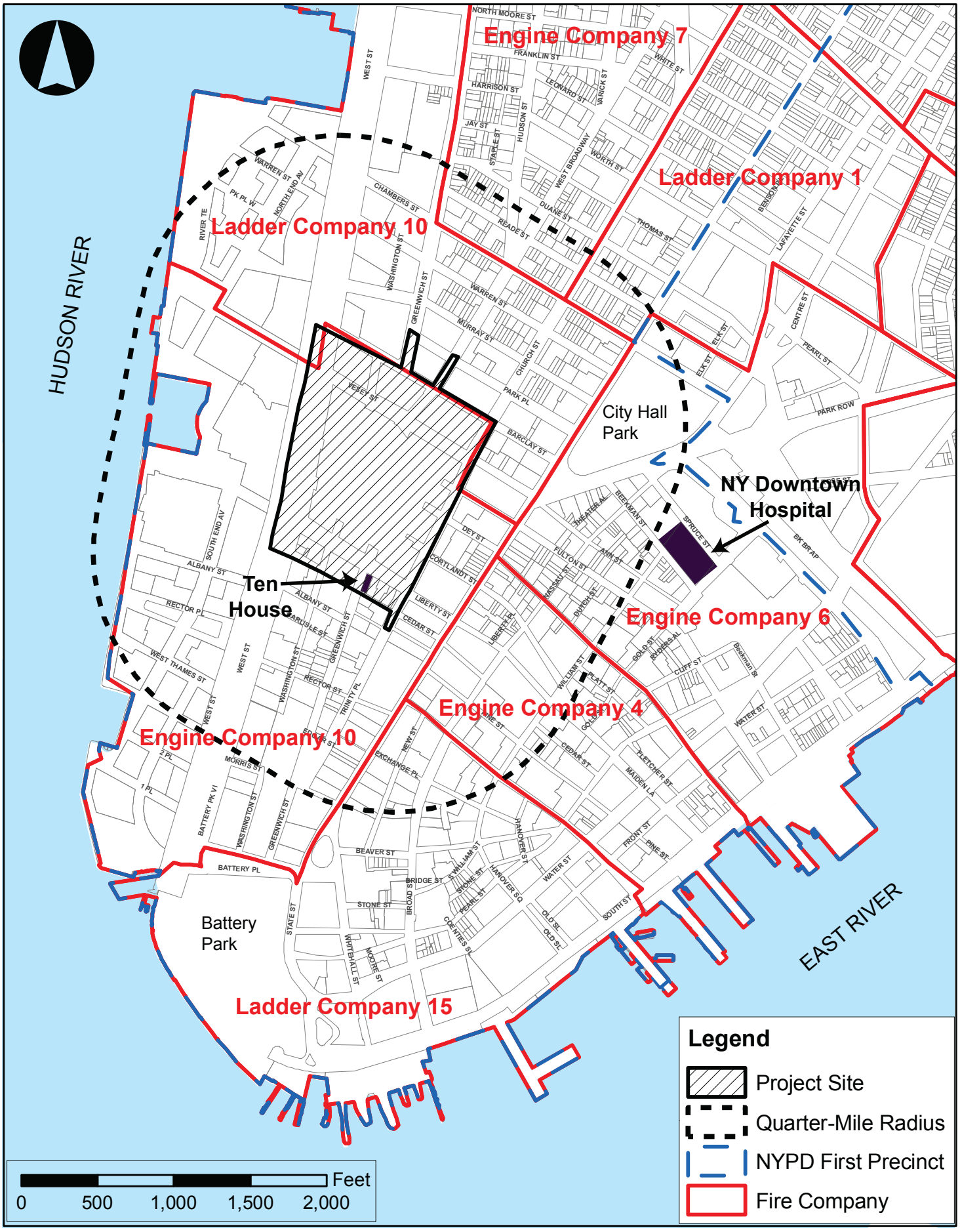
New York Downtown Hospital is the closest hospital to the Study Area. Because the catchment areas for health care facilities can vary substantially, there is no specific study area typically used for a health care analysis. However, as New York Downtown Hospital is the hospital most likely to be used by people who live in, work in and visit the Study Area, it is examined in this analysis.

There are also two privately funded full-service urgent care facilities in the Study Area. *Medhattan Immediate Medical Care* is located at 106 Liberty Street, on the corner of Liberty Street and Trinity Place/Church Street. Emergency Medical Care is located at 200 Chambers Street, on the corner of Chambers Street and West Street/Route 9A. As the two full-service urgent care facilities in the Study Area are privately funded, they do not require analysis under CEQR. However, as the *Medhattan Immediate Medical Care* center is located within the proposed secure zone, it is discussed below.

Other Community Facilities

Several schools, daycare facilities and libraries are located within the quarter-mile Study Area. **Table 4-2** lists the community facilities that are located within the Study Area and **Figure 4-2** shows the location of these community facilities. While no significant new population would be added to the area as a result of the proposed security overlay, access in the area will be evaluated for potential changes.

Community Facilities Study Area



Other Community Facilities within Quarter-Mile Study Area

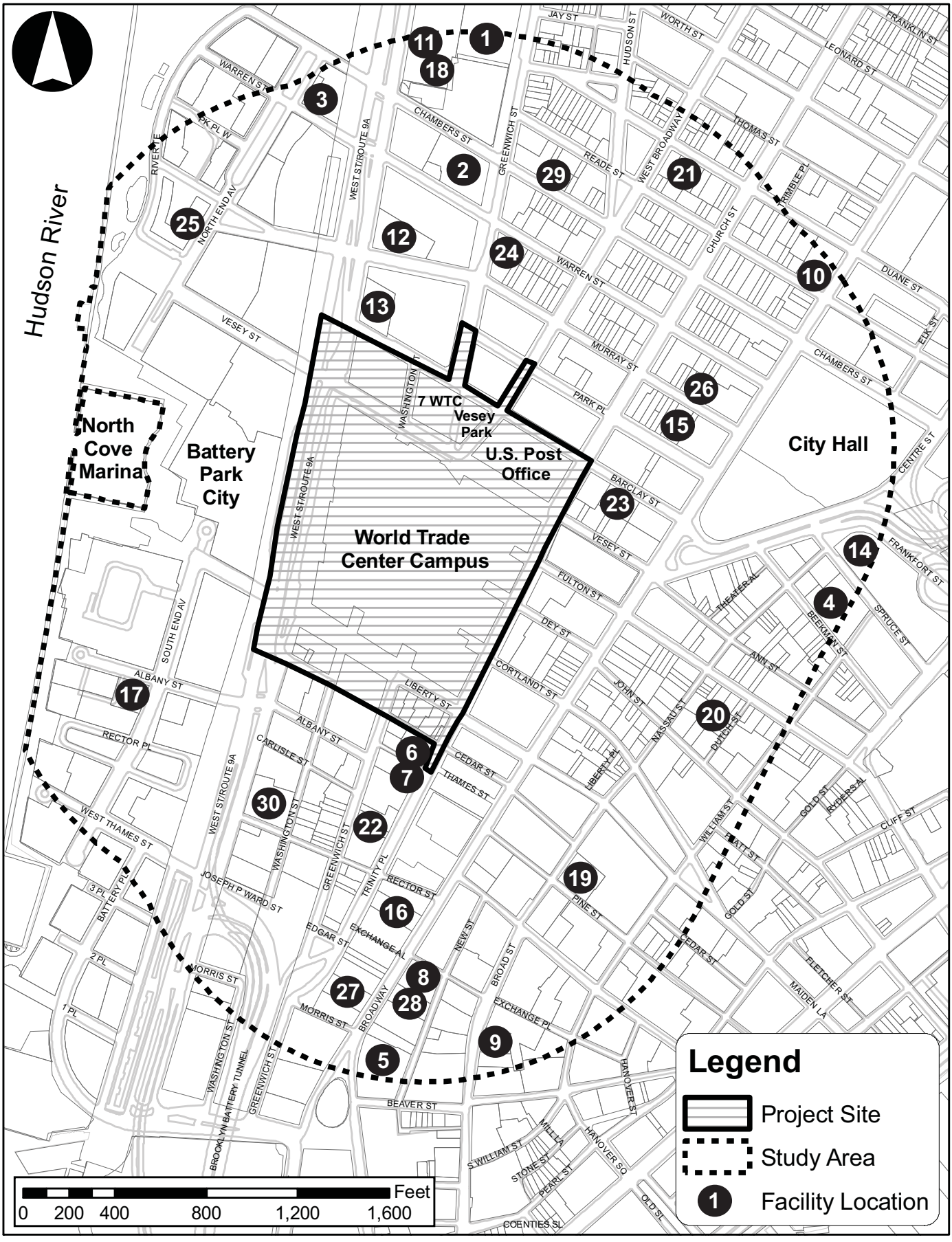


Table 4-2
Other Community Facilities within the Quarter-Mile Study Area

Map ID #	Community Facility Name	Address
	Elementary and Secondary Schools	
1	PS 150	334 Greenwich Street
2	PS 234 Independence School	292 Greenwich Street
3	PS 89 IS 289	201 Warren Street
4	Spruce Street School	8 Spruce Street
5	Lower Manhattan Community Middle School Urban Assembly School of Business for Young Women	26 Broadway
6	High School of Economics and Finances	100 Trinity Place
7	Leadership and Public Service High School	90 Trinity Place
8	Manhattan Academy for Arts and Languages	52 Broadway
9	Léman Manhattan Preparatory School	41 Broad Street
10	The Lang School	291 Broadway
	Colleges and Other Post-Secondary Institutions	
11	Borough of Manhattan Community College (CUNY)	199 Chambers Street
12	College of Insurance (New School University) St. John's University – Manhattan Campus	101 Murray Street
13	College of New Rochelle – DC 37 Campus	125 Barclay Street
14	Pace University	1 Pace Plaza
15	New York Career Institute	11 Park Place
16	Touro College Graduate School	65 Broadway
	Daycare and Headstart Facilities	
17	Battery Park City Day Nursery	300 Albany Street
18	BMCC Early Childhood Center	199 Chambers Street
19	Bright Horizons Children's Center	20 Pine Street
20	Downtown Little School	15 Dutch Street
21	Jewish Community Project of Lower Manhattan Nursery School	146 Duane Street
22	Parish of Trinity Church	68 Trinity Place
23	The Barclay Street School	6-10 Barclay Street
24	The Park Preschool	275 Greenwich Street
	Libraries	
25	Battery Park City Branch	175 North End Avenue
26	New Amsterdam Library	9 Murray Street
	Hospices, Ambulatory Programs, and Mental Health Services	
27	Continuum Hospice Care / Jacob Perlow Hospice / Harlem Comm Hospice	39 Broadway
28	Center for Hearing and Communication Club 647 – Goddard; Mental Health Association	50 Broadway
29	The Mental Health Association of New York City	157 Chambers Street
	Developmental Disabilities Services	
30	Institute for Community Living	40 Rector Street

Data Source:
Selected Facilities and Program Sites in New York City, Release 2008.1 – for Manhattan Community District #1

E. EXISTING CONDITIONS

The 2012 Existing Conditions scenario represents to the best extent possible the current conditions of community facilities in the Study Area. In order to obtain current data and an up-to-date understanding of these conditions, NYPD and FDNY were contacted.

New York City Fire Department

Four engine companies and three ladder companies serve the quarter-mile Study Area, including other areas in Lower Manhattan. These companies are listed in **Table 4-1**. Among them, the Ten House is located within the secure perimeter planned as part of the WTC Campus Security Plan project. As shown in **Figure 4-1** and as indicated in **Table 4-1**, the Ten House is located at 124 Liberty Street, on the corner of Liberty Street and Greenwich Street.

Due to ongoing construction activities and street closures in the vicinity of the WTC site, current routes out of the Ten House are somewhat restricted. Due to the narrow configuration of Liberty Street and the access needed to accommodate the ongoing construction at the WTC site, the traffic flows westbound in this area of Liberty Street. As such, fire trucks must exit the fire house to the west to access southbound Greenwich Street. For calls to the north and east, fire trucks turn left from Greenwich Street onto Cedar Street to access northbound Church Street. Fire trucks then either continue on Church Street or turn right onto one of the eastbound streets. For calls to the south and west, fire trucks either continue southbound on Greenwich Street or turn from Greenwich Street onto Carlisle Street to travel west. For calls to the northwest, the likely route is to head northbound on Church Street to westbound Barclay Street or Murray Street. These travel patterns have been generally the same since the Ten House officially re-opened on November 5, 2003.

Average response times for the Ten House currently range from approximately four minutes for Engine 10 to approximately four and a half minutes for Ladder 10. There is a continuous and committed effort by FDNY to improve these systems resulting in both improved emergency response as well as daily citywide protection.

Emergency Response

Although Engine Company 10 and Ladder Company 10 serve the Project Site, it is common for many fire companies to respond to an emergency. Therefore, this analysis considers the extent to which all companies serving the surrounding area are able to provide satisfactory service.

Daily Protection

Recent communication with FDNY indicates that there are currently no specific plans to change stations or equipment in the area. As indicated above, the Ten House was re-opened in November 2003. As FDNY is required to continually evaluate the need for changes in stations, equipment, and personnel and makes adjustments as necessary, it is assumed that there is currently no shortage of personnel or equipment in the companies serving the area surrounding the Project Site.

New York City Police Department

The NYPD's First Precinct is responsible for serving the area south of Houston Street and west of Broadway, and the area south of the Brooklyn Bridge approach to the Battery in Manhattan. This area

completely encompasses the quarter-mile boundary around the Project Site. The First Precinct station is located at 16 Ericsson Place in Tribeca.

There are currently 175 officers deployed by the First Precinct, who serve the area in three tours. The level of police service changes hourly, as more officers are deployed during daytime hours than in the evenings and on weekends. Approximately 235 additional sworn personnel serve in other capacities, including 22 officers in the First Precinct Scooter Task Force, 15 officers in the First Precinct Detective Squad, 122 officers in the Transit Police in District 2, 54 officers in the Transit Bureau Homeless Outreach Unit, and 22 officers in the Peddler/Panhandler Task Force.

The primary method of patrol for First Precinct personnel is marked department automobile. Additionally, officers are deployed on foot or bicycle. The First Precinct Scooter Task Force routinely patrols on small motorized scooters to facilitate movement on narrow streets in the Financial District.

The adequacy of NYPD service may be measured in many different ways, including an assessment of crime statistics (by precinct) and a measure of average response time (which measures the number of minutes it takes from the receipt of a 911 call for police to arrive at the scene). The first measure indicates that the First Precinct is sufficiently serving its catchment area. Crime complaints have increased by approximately 5.55 percent as compared to this time last year, while they have decreased by approximately 3.74 percent in the last two years, and have decreased approximately 56.20 percent in the last 10 years.[1] The second measure also suggests that the First Precinct is providing adequate service. The average response time for the First Precinct in fiscal year 2012 was 9:32 minutes, approximately 25 seconds slower than the citywide average for the same time period. As of September 30th, the average time for the First Precinct has been 9:26 minutes, approximately 19 seconds slower than the citywide average. While slightly slower than the citywide average, these response times are comparable.

The NYPD WTC Command is responsible for the WTC Site. It was created in 2011 from other existing units within the Department. The unit is currently staffed by approximately 215 officers (including supervisors), though this number is expected to grow to 630 as warranted by construction progress (as buildings open to occupancy and streets open necessitating vehicle screening). WTC Command is currently located at the former Mounted Unit facility next to First Precinct; a substation of the WTC Command is located at 140 Washington Street. NYPD is searching for permanent command facility for WTC Command within or adjacent to WTC Campus. Current responsibilities are primarily for the National September 11th Memorial and associated area (approaches, queuing area, mass transit, etc.). Crime stats and investigations are handled by First Precinct.

Emergency Response

First Precinct personnel are most often needed to investigate security alarms, handle disputes or disorderly persons, investigate suspicious activity, respond to auto accidents, and aid sick or injured persons. The WTC Command is responsible for the WTC Site, as indicated above, and as the site opens to the public, its emergency response responsibilities will increase.

Daily Protection

The First Precinct and WTC Command are responsible for providing services to the area surrounding the WTC Campus, and the WTC Campus itself is served by the NYPD and PAPD (described below).

[1] Data from *CompStat* report for the First Precinct covering the week of 9/3/2012 through 9/9/2012.

Port Authority Police Department

With the exception of the National September 11th Memorial Plaza and the temporary PATH station, the majority of the WTC Campus is currently a construction site. As such, the PAPD is primarily responsible for security and law enforcement operations for those portions of the site that are within the construction zone. PAPD and private security under contract to the Port Authority control access to the construction zone. PAPD also has primary responsibility for the temporary PATH station. NYPD has primary responsibility for the National September 11th Memorial Plaza.

Emergency Response

In the case of an emergency on the WTC Campus, PAPD, NYPD and FDNY coordinate efforts to respond to emergency situations. PAPD officers are trained both in police services as well as fire response; therefore PAPD is able to provide limited fire response in addition to police response.

Daily Protection

The PAPD provides daily police services to the WTC Campus. As a result of the loss of their headquarters in 5 WTC, PAPD operates out of a temporary trailer at the WTC Campus. Currently, these services include patrols of the perimeter of the WTC Campus, site security, and control of site entrances. Additionally the Port Authority contracts a private security company to control access to the WTC Campus. Currently, in addition to providing security services and patrolling the site, PAPD responds to fires and accidents, and investigates such issues as trespassers and suspicious bags.

Health Care Facilities

There is currently one hospital and several other health care facilities (including hospice, ambulatory programs) located within Manhattan Community District 1.

In 2006 New York Downtown Hospital completed an extensive expansion and renovation. A new state-of-the art emergency facility was completed which doubled the size of the space dedicated to emergency care and tripled the capacity. Patient areas were upgraded, including those for women, children, asthma and chest pain patients, and people in the need of routine care. The updated facility includes a decontamination unit for responding to bio-terrorism, as well as other improvements to enhance the hospital's ability to respond to both individual and community-wide emergencies.

Other health care facilities in the vicinity of the Project Site include hospice care facilities, substance abuse centers, mental health facilities and services for the developmentally disabled.

While access to some of these facilities for emergency vehicles, for taxis, and for private occupancy vehicles has changed since 2001, few changes have been made to the street network over the past decade. As such, routes to hospitals and other existing health care facilities within the Study Area, such as the privately funded *Medhattan Immediate Medical Care* and Emergency Medical Care centers, have become well established.

Other Community Facilities

As indicated above, several schools, daycare facilities and libraries are located within the Study Area. Ongoing construction activities in the vicinity of the WTC site limit the ability of pedestrian and vehicular traffic to traverse the street network in certain areas, while other areas are completely inaccessible. As such, access to area schools, daycare facilities and libraries in the area is currently somewhat restricted.

F. FUTURE WITHOUT THE PROPOSED ACTION (NO-ACTION)

New York City Fire Department

With the re-established street network and elimination of lane closures related to WTC reconstruction activities, FDNY access in the area would be improved under anticipated 2019 No-Action conditions. As such, it is anticipated that FDNY response times would likely improve as compared to existing conditions.

FDNY does not anticipate any changes to stations, equipment, or operations by 2019 in the future without the Proposed Action. FDNY continually evaluates the extent to which it provides sufficient protection, and makes changes as necessary.

New York City Police Department

The NYPD has created WTC Command specifically dedicated to policing the WTC site and surrounding area. This command is currently staffed with 215 uniformed members of the service and will ultimately be staffed with no fewer than 630 NYPD personnel. The additional personnel will be assigned to the WTC Command in phases to coincide with demand at the site as new areas open to the public. The primary method of patrol for these officers is on foot supplemented with marked department automobiles and scooters. The NYPD will have primary responsibility for law enforcement and security operations at the streets in and around the WTC site, the towers, the National September 11th Memorial and Museum complex, the Performing Arts Center, and all street level public areas. NYPD and PAPD officers will have equal access to all areas of the site and will participate jointly in a centralized emergency response command center. It is expected that NYPD and PAPD officers will communicate through the central operations coordination center in order to coordinate patrol, investigative, and operational functions.

The central operations coordination center is designed to serve as the focal point for the WTC site, providing continuous situational awareness for law enforcement, security, and facility management personnel. It will be the primary fusion center for business, security, and law enforcement operations across the WTC site. Its principal function is to provide a continuous overview of the site in order to maintain security and economic viability. The central operations coordination center will also function as a communications center for the WTC site allowing representatives from the NYPD, PANYNJ, FDNY, and others to readily exchange vital information affecting the site and surrounding area.

With the re-established street network and elimination of lane closures related to WTC reconstruction activities, NYPD access in the area would be improved under anticipated 2019 No-Action conditions. Further, NYPD WTC Command will add a significant new police presence on the WTC site. Therefore, as a result of improved accessibility and increased NYPD staffing levels within the WTC site, it is anticipated that NYPD response times would improve as compared to existing conditions. Further, NYPD regularly reviews its service and makes adjustments to respond to increases in demand for services.

Port Authority Police Department

PAPD will have personnel present on site in its assigned areas of responsibility (at the PATH Hub, VSC, below ground roadway network, retail spaces). A new PAPD WTC command facility will be constructed in the PATH Hub space. However, PAPD will continue to work with NYPD in the future to respond jointly to emergency calls.

In addition to PAPD patrols, future tenants of the buildings on the Project Site would provide private security personnel. The cultural facilities, Memorial, and the Memorial Center would also likely employ security personnel.

PAPD bases staffing on its ability to respond to calls within the area it is expected to serve. The PAPD continually evaluates its ability to provide sufficient service, and changes its staffing and operations as necessary. As such, it is anticipated that PAPD would continue to have adequate staffing to respond to emergencies.

Health Care Facilities

With the re-established street network and elimination of lane closures related to WTC reconstruction activities, access to area health care facilities would be improved under anticipated 2019 No-Action conditions. Patients would continue to use established routes to access the privately funded *Medhattan Immediate Medical Care* urgent care facility at 106 Liberty Street.

Other Community Facilities

With the re-established street network and elimination of lane closures related to WTC reconstruction activities, access to other area community facilities would be improved under anticipated 2019 No-Action conditions.

G. FUTURE WITH THE PROPOSED ACTION (WITH-ACTION)

New York City Fire Department

FDNY does not anticipate any changes to personnel, equipment, or operations in the 2019 future with the Proposed Action. However, as the Proposed Action would introduce operable and static security elements to the street network around the WTC site, vehicular access in and around the Study Area would be modified. As such, the Proposed Action is assessed for its potential to affect FDNY response times.

The Proposed Action includes design elements that would accommodate the access requirements of the Ten House and other FDNY emergency response units that may require access into or through the site. NYPD personnel would be positioned at each operable barrier to allow expedited access for emergency vehicles. Communication between the central operations coordination center and inbound emergency vehicles and the central operations coordination center and checkpoints would enable priority access for emergency vehicles, including through the operable barrier at Liberty Street and Trinity Place/Church Street. Further, all vehicular site access locations, including dedicated exits, would allow emergency FDNY ingress and egress to facilitate access to and through the site.

In the future with the Proposed Action, vehicle flow on Liberty Street, Church Street, Greenwich Street, Fulton Street, West Broadway and Washington Street within the secure zone is anticipated to be lighter than the No-Action condition. As such, emergency vehicles would be expected to travel more quickly through the secure zone as compared to No-Action conditions. For access into and out of the site, the personnel staffing the operable barriers at access and egress points to the WTC Campus would ensure that emergency vehicles can enter and exit the secure zone at any of these points without delay. Therefore, it is expected that response times for the Ten House would not decline as a result of the Proposed Action.

FDNY response times to the WTC site from other local FDNY facilities is expected to remain similar to existing conditions. FDNY would likely utilize routes that they take to respond to calls in the vicinity of

the WTC Campus. As indicated above, NYPD personnel would staff all access points to the WTC Campus and would allow all emergency vehicles to enter the site at all entry or exit points during emergency responses. As FDNY access into the site would be unrestricted, no impacts are anticipated to FDNY responses to the site from outside of the proposed WTC Campus.

As FDNY continually evaluates its ability to provide sufficient services, changes would be made as they are deemed necessary. Therefore, the Proposed Action is not expected to cause an adverse impact to FDNY services or operations.

New York City Police Department

The Proposed Action is a comprehensive security overlay that would be installed at the perimeter of the WTC Campus on top of the planned street network. As NYPD would control the operable barriers, it is not expected to cause an adverse impact to NYPD services or operations. Additionally, consistent with the No-Action condition, a minimum of 630 NYPD personnel will be assigned to the WTC command. NYPD's WTC command will be responsible for incident and emergency response for most areas of the WTC Campus and will have a robust presence on site to provide virtually instantaneous response.

As indicated above, the Proposed Action includes design elements that would accommodate the access requirements of other NYPD emergency response units that may require access into or through the site. Communication between the central operations coordination center and inbound emergency vehicles and the central operations coordination center and checkpoints would enable priority access for emergency vehicles. NYPD personnel would be positioned at each operable barrier to allow expedited access for emergency vehicles. Further, all vehicular site access locations, including dedicated exits, would allow emergency vehicle ingress and egress to facilitate access to and through the site.

The Proposed Action has the potential to result in traffic diversions for non-emergency vehicles around the Project Site due to the proposed Campus Security Plan; however, the First Precinct is not expected to have to make any specific increase to its level of service. As NYPD continually evaluates its ability to provide sufficient services, changes would be made as they are deemed necessary. Therefore, the Proposed Action is not expected to cause an adverse impact to NYPD services or operations.

Port Authority Police Department

The Proposed Action would not result in any changes to PAPD staffing or allocation of resources as the NYPD would staff the proposed screening and credentialing locations. As PAPD will be located at the locations on the WTC Campus specified above, the perimeter security plan would not create any impediments to the PAPD services and would not be expected to result in slower response times. As such, the Proposed Action is not expected to adversely impact PAPD services or operations.

Health Care Facilities

No changes to health care facilities are expected as a direct result of the Proposed Action. As indicated above, no significant new population would be added to the WTC Campus as a result of the Proposed Action. As such, there would be no new demand on health care facilities associated with the Proposed Action.

The WTC Campus Security Plan would add credentialing zones and screening zones at the perimeter of the WTC site. As described above, ambulances and other emergency vehicles would be granted expedited access into and through the site with the assistance of the central operations coordination center and the NYPD-controlled operable barriers.

POV's headed to local health care facilities would likely avoid the credentialing and screening zones associated with the Proposed Action as people driving to health care facilities in the area would be familiar with the area and understand the traffic patterns. Instead, most health care facilities would likely be accessed by using the routes that are currently available (under existing conditions).

Medhattan Immediate Medical Care is a privately funded urgent care facility that is located in the basement of 106 Liberty Street, on the corner of Liberty Street and Trinity Place/Church Street, within the proposed Campus Security Plan. As the facility is not publicly funded, a detailed analysis is not required under CEQR; however, it is important to note the potential effects of the Proposed Action on this facility. The Proposed Action would not restrict pedestrian access within the secure perimeter; however, vehicles dropping-off or picking-up patients at the urgent care facility would have to enter through the screening and credentialing zones on Trinity Place in order to provide door-to-door service. As an alternative, vehicles could drop-off/pick-up patients on one of the adjacent streets and the people could walk a short distance to the entrance. Patients could also park their cars in nearby public parking facilities or on-street (consistent with existing conditions and No-Action conditions), and then walk to the facility. It should also be noted that this type of facility typically serves non-emergent cases from the local area; so many trips to the *Medhattan Immediate Medical Care* site are likely to be on foot.

Other Community Facilities

No changes to other area community facilities are expected as a direct result of the Proposed Action. As indicated above, no significant new population would be added to the WTC Campus as a result of the Proposed Action. As such, there would be no new demand on other community facilities associated with the Proposed Action.

As indicated above, 30 other community facilities are located within the quarter-mile Study Area. The proposed security overlay would introduce static and operable barriers associated with the WTC Campus Security Plan at credentialing zones and screening zones. These proposed security elements would not obstruct pedestrian crosswalks and would introduce limited obstructions on sidewalks adjacent to select screening and credentialing zones. Pedestrian flow into, out of, and throughout the WTC Campus would generally be unimpeded. Further, all operable barriers that are proposed within the street right-of-way would be set back from pedestrian zones and would include safety features to prevent safety hazards. A detailed discussion of pedestrian conditions, including a vehicular and pedestrian safety assessment, is provided in Chapter 8, "Transportation."

Bike access into, out of, and through the WTC Campus would not be impeded by the Proposed Action. While the static barriers and security points could make it more difficult for cyclists to quickly navigate through the secure zone, access throughout the WTC Campus would not be restricted.

As indicated above in the discussion of healthcare facilities, POV's headed to local community facilities would likely avoid the credentialing and screening zones associated with the Proposed Action when possible as they would be familiar with the area and understand the traffic patterns. Instead, daycare facilities, schools, and libraries would likely be accessed by using the routes that are currently available.

A. INTRODUCTION

This chapter considers the potential of the Proposed Action to affect cultural resources in the Project Area and in the surrounding area. Cultural resources include archaeological and architectural resources. The Project Area is generally bounded by Barclay, West, Albany, and Church Streets. Under the Campus Security Plan vehicular access points would be located at the following four locations: Washington Street at Barclay Street; West Broadway at Barclay Street; Trinity Place/Church Street at Liberty Street; and Liberty Street at West Street/Route 9A. Exits from the secure zone are proposed at the following five locations: Church Street at Vesey Street; Vesey Street at West Street/Route 9A; Fulton Street at West Street/Route 9A; Liberty Street at West Street/Route 9A; and Greenwich Street at Cedar Street (see **Figure 5-1**). This chapter analyzes the conceptual plans for the design and locations of the proposed security infrastructure.

B. PRINCIPAL CONCLUSIONS

The Proposed Action would not be expected to result in significant adverse impacts to the WTC site as the proposed security components would be small in scale and located largely at the perimeter of the WTC site and would not obstruct views or significantly alter the context of the WTC site. The project components also would not obstruct views from the Project Area to nearby architectural resources. Therefore, the Proposed Action would not be expected to adversely affect any architectural resources within the Project Area.

The proposed security checkpoints would not be expected to adversely affect the context of the study areas' architectural resources. However, as described below, a Construction Protection Plan (CPP) would be developed and implemented prior to the commencement of any construction-related activities in the Project Area to protect the architectural resources listed on **Table 5-1** and mapped in **Figure 5-1** that are located within 90 feet of proposed construction activities. The CPP would follow the New York City Department of Buildings (DOB) *Technical Policy and Procedure Notice (TPPN) #10/88,*[1] regarding procedures for the avoidance of damage to historic structures resulting from adjacent construction, and would be prepared in consultation with the New York State Historic Preservation Office (SHPO) and the New York City Landmarks Preservation Commission (LPC). *TPPN #10/88* requires a monitoring program to reduce the likelihood of construction-related damage to adjacent architectural resources (within 90 feet) and to detect at an early stage the beginnings of damage so that construction procedures can be changed.

Therefore, as detailed below, the Proposed Action is not expected to result in any significant adverse impacts to cultural resources on the project site or in the study areas.

[1] *TPPN #10/88* was issued by DOB on June 6, 1988, to supplement Building Code regulations with regard to historic structures. *TPPN #10/88* outlines procedures for the avoidance of damage to historic structures resulting from adjacent construction, defined as construction within a lateral distance of 90 feet from the historic resource.

C. METHODOLOGY

The cultural resources analysis has been prepared in accordance with New York City Environmental Quality Review (CEQR), the New York State Environmental Quality Review Act (SEQRA), and the New York State Historic Preservation Act of 1980 (SHPA). These laws and regulations require that City and State agencies, respectively, consider the impacts of their actions on historic properties. This technical analysis follows the guidance of the 2012 *CEQR Technical Manual*. This analysis has also been prepared in accordance with Section 106 of the National Historic Preservation Act of 1966 (NHPA), since funding from the Department of Homeland Security (DHS)/Federal Emergency Management Agency (FEMA) may be used for all or a portion of the Campus Security Plan.

In accordance with Section 106 regulations, archaeological and architectural resource study areas—Areas of Potential Effect (APEs)—were defined. The archaeological resources APEs for the Proposed Action are the areas of planned construction and disturbance—the security checkpoint location for each vehicular access point to the World Trade Center (WTC) Campus (see **Figure 5-1**). Since the Proposed Action would require excavation, SHPO and LPC were contacted for preliminary evaluations of the archaeological resources APEs' sensitivity. In a March 9, 2012 findings letter, SHPO determined that it has no archaeological concerns for the archaeological resources APEs. In a comment letter dated January 6, 2012, LPC determined that excavations up to depths of four feet within the archaeological resources APEs would not likely impact significant archaeological resources; however, if the depth and/or location of in-ground construction changes, the project sponsor would need to consult with LPC (see **Appendix A** for correspondence with SHPO and LPC). This cultural resources analysis, therefore, focuses on standing structures only.

In general, potential effects to architectural resources can include both direct, physical impacts and indirect, contextual impacts. Direct impacts include demolition of a resource and alterations to a resource that cause it to become a different visual entity. A resource can also be damaged from vibration (i.e. from construction blasting or pile driving) and additional damage from adjacent construction that could occur from falling objects, subsidence, collapse, or damage from construction machinery. Adjacent construction is defined as any construction activity that would occur within 90 feet of an architectural resource, as defined in the DOB's *TPPN #10/88*. Contextual impacts can include the isolation of a property from its surrounding environment, or the introduction of visual, audible, or atmospheric elements that are out of character with a property or that alter its setting.

Therefore, to assess the potential for physical and contextual effects due to on-site construction activities, and also to account for the project's potential visual and/or contextual effects, the APEs - are defined as the areas within 90 feet of each security checkpoint location. These areas generally include the buildings facing each security checkpoint location (see **Figure 5-1**). Consistent with *CEQR Technical Manual* methodology, the architectural resources considered within the architectural resources study areas include: individual properties and historic districts designated as National Historic Landmarks (NHL), listed on the New York State and/or National Registers of Historic Places (S/NR) or determined eligible for such listing; resources recommended by the New York State Board for S/NR listing; NYCLs, Interior Landmarks, Scenic Landmarks, and properties within designated New York City Historic Districts; and resources calendared for consideration as one of the above by LPC ("known architectural resources"). Potential architectural resources are properties that may meet the criteria of eligibility for S/NR listing and/or NYCL designation. A

survey of the study areas was undertaken to identify any properties that could meet S/NR and/or NYCL eligibility criteria.

D. EXISTING CONDITIONS

All known architectural resources located within the Project Area and in the study areas are listed in **Table 5-1** and illustrated on **Figures 5-1 through 5-8**.

Table 5-1
Known Architectural Resources*

Ref. No.	Name	Address	NHL	S/NR	S/NR-eligible	NYCL	NYCL-eligible
Project Area							
1	World Trade Center (WTC) Site	Generally bounded by Vesey, Church, and Liberty Streets and West Street/Route 9A			X		
Study Areas							
2	Barclay-Vesey Building	140 West Street/Route 9A		X		X	
3	Former Dodge Building	53 Park Place			X		
4	Federal Office Building/U.S. Post Office	90 Church Street		X			
5	St. Peter's Roman Catholic Church	22 Barclay Street		X		X	
6	30 Vesey Street	30 Vesey Street			X		
7	St. Paul's Chapel and Graveyard	Broadway and Fulton Street	X	X		X	
8	Former American Telephone & Telegraph (AT&T) Company Building	195 Broadway			X	X	
9	Former East River Savings Bank	26 Cortlandt Street			X		X
10	Wall Street Historic District	Generally bounded by Bridge, South William, Greenwich, Liberty, and Pearl Streets and Maiden Lane		X			
11	United States Realty Building	115 Broadway		X		X	
12	Trinity Building	111 Broadway		X		X	
13	Trinity Church and Graveyard	Broadway and Wall Street	X	X		X	
14	American Stock Exchange	86 Trinity Place	X	X		X	
15	74 Trinity Place	74 Trinity Place			X		
16	Beard Building	125 Cedar Street			X		X
17	90 West Street	90 West Street/Route 9A		X		X	

Notes: Numbering corresponds to **Figure 5-1**.

NHL: National Historic Landmark.

SR: New York State Register of Historic Places.

NR: National Register of Historic Places.

S/NR-eligible: Site has been found eligible for listing on the New York State and National Registers of Historic Places.

NYCL: New York City Landmark.

NYCL-eligible: LPC has determined that the site appears eligible for NYCL designation.

*LPC's 1997 designation report for Historic Street Lampposts identified Lamppost 79 as a NYCL (located at the northeast corner of Albany Street and West Street/Route 9A adjacent to 90 West Street). This lamppost could not be located during a 2003 field inspection, however, a 2012 search of New York City's Zoning and Land Use Application (ZoLa) includes Lamppost 79 as a NYCL.

Project Area

The Project Area includes all streets, sidewalks, and buildings that would be directly affected by the installation of the Campus Security Plan infrastructure. This area is generally bounded by Barclay, West, Albany, and Church Streets and includes the WTC site, a S/NR-eligible cultural resource, described below. Four vehicular entry points are planned under the proposed Campus Security Plan at: Washington Street and Barclay Street; West Broadway and Barclay Street; Trinity Place/Church Street and Liberty Street; and Liberty Street and West Street/Route 9A. Exits from the secure zone are proposed at the following five locations: Church Street at Vesey Street; Vesey Street at West Street/Route 9A; Fulton Street at West Street/Route 9A; Liberty Street at West Street/Route 9A; and Greenwich Street at Cedar Street.

WTC Site (S/NR-eligible)

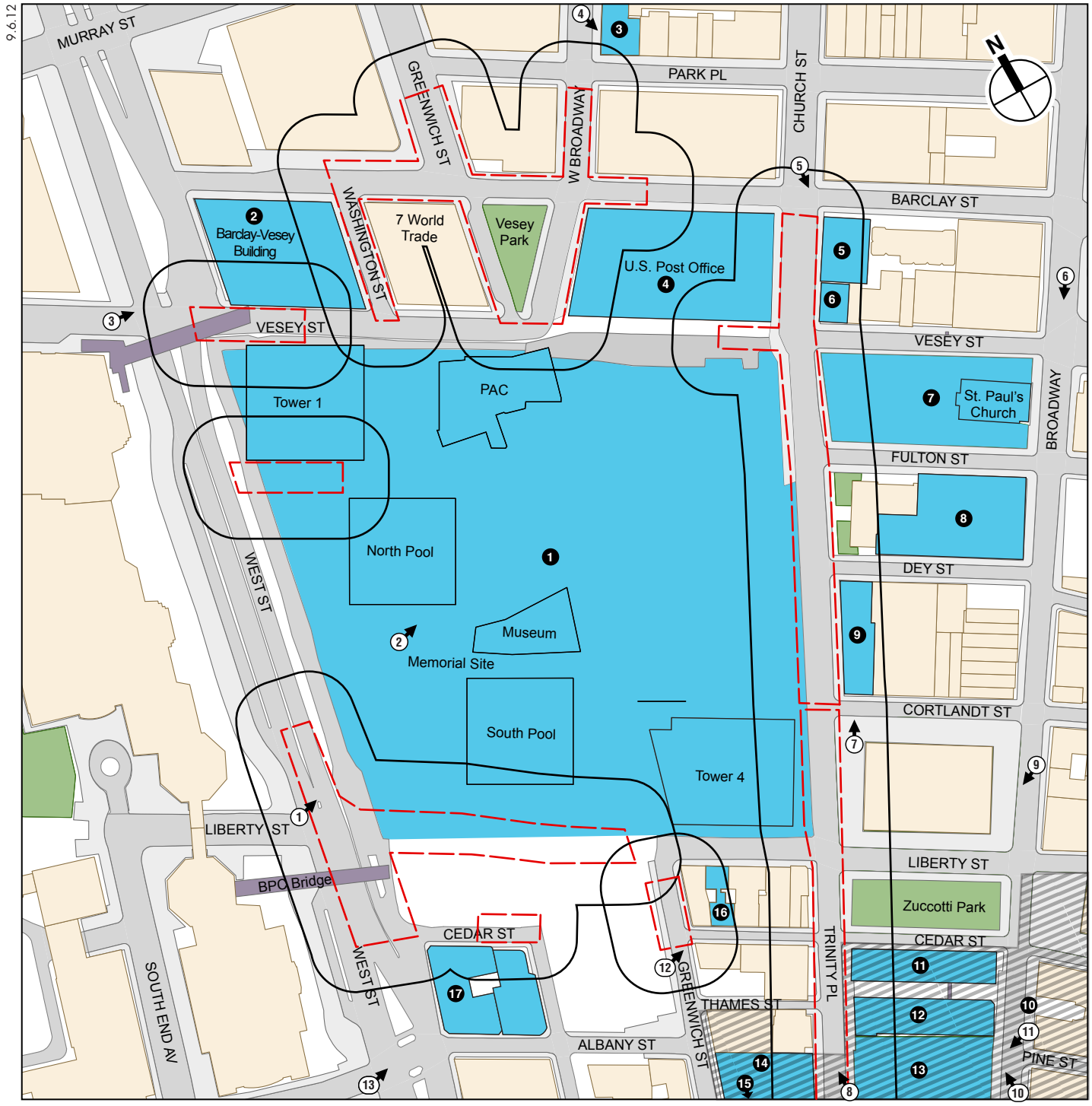
The WTC site is an approximately 16-acre parcel bounded by Vesey, Church, and Liberty Streets and West Street/Route 9A (see **Figure 5-1** and Views 1 and 2 of **Figure 5-2**). The WTC site is significant as the locus of the events of September 11, 2001 and the significance of those events and their aftermath to American history. The WTC site currently contains the National September 11th Memorial and Museum at the World Trade Center—intended as a solemn space where visitors can remember and honor the thousands of lives lost during the 2001 and 1993 terrorist attacks. Construction related to the WTC site's redevelopment continues throughout the WTC site, as described in Chapter 1, "Project Description."

No potential architectural resources were identified within the remainder of the Project Area.

Study Areas

Known Architectural Resources

Barclay-Vesey Building (S/NR, NYCL [interior and exterior])
Built between 1923 and 1927, the Art Deco Barclay-Vesey Building at 140 West Street/Route 9A occupies the block bounded by Barclay, Washington, and Vesey Streets, and West Street/Route 9A. It was the first building in New York City to maximize the requirements of the 1916 Zoning Resolution, leading to the tower's dramatic massing. Designed by Ralph Walker of McKenzie, Voorhees & Gmelin as an office building and switching center for the New York Telephone Company, this 32-story brick, limestone, and terra cotta structure has an 18-story parallelogram base and an 11-story square tower (see View 3 of **Figure 5-3**). At the first and second floors there are terra cotta spandrel panels, and window and door enframements of intricately carved reliefs of people, animals, and vegetation. The ground floor of the Vesey Street façade is an arcade. For ten stories, the base rises flush from the lot lines. Above the tenth floor, there are setbacks on the north and south façades and light courts on the east and west façades. Above the base, the tower is oriented with the Manhattan grid street pattern. The building has flat piers emphasizing the building's verticality; on the tower they create buttresses that cap the structure. Each setback has a limestone cornice.



Project Location Map
Figure 5-1

View east to WTC Site from West Street/Route 9A **1**

View northeast across the WTC Site from near the National September 11 Memorial and Museum at the World Trade Center **2**

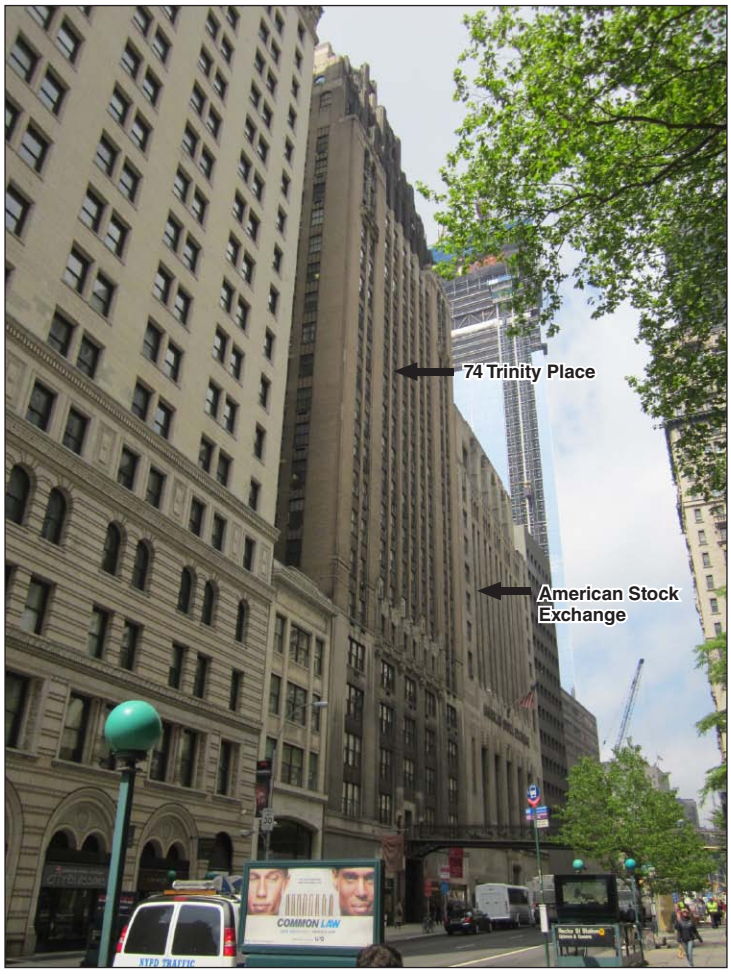
View northeast across West Street/Route 9A to the Barclay-Vesey Building at 140 West Street **3**

View southeast to the former Dodge Building at 53 Park Place **4**

View southeast to St. Peter's Roman Catholic Church at 22 Barclay Street **5**

View southwest to St. Paul's Chapel and Graveyard at Broadway and Fulton Street **6**

View north to the former East River Savings Bank building at 26 Cortlandt Street **7**



View northwest on Trinity Place to buildings within the Wall Street Historic District **8**

View southwest to the United States Realty Building at 115 Broadway **9**

View northwest to the Trinity Building at 111 Broadway **10**

View southwest to Trinity Church and Graveyard at Broadway and Wall Street **11**

View northeast to the Beard Building's Cedar Street façade at 125 Cedar Street/120 Liberty Street **12**

View northeast across West Street/Route 9A to 90 West Street **13**

Former Dodge Building (S/NR-eligible)
The former Dodge Building is a 12-story Classical Revival structure, located at 53 Park Place. It was designed by Willhauer, Shape & Bready, Cross & Cross, and John B. Peterkin and was constructed in 1922. It has a tripartite configuration of base, shaft, and capital. The base and capital are clad with limestone while the middle floors are faced with tan brick. Pilasters, Greek key patterning, and dentilled cornices adorn the façade (see View 4 of **Figure 5-3**).

Federal Office Building/U.S. Post Office (S/NR)
This 15-story limestone-faced building, located at 90 Church Street, was designed by Cross & Cross and Pennington, Lewis & Mills and was constructed in 1934–1938. It has Classical Revival and Art Deco details, with sculptural reliefs by Carl Paul Jennewein (see View 2 of **Figure 5-2**). The building occupies the full block bounded by West Broadway and Barclay, Vesey, and Church Streets.

St. Peter's Roman Catholic Church (S/NR, NYCL)
Located at 22 Barclay Street, this Greek Revival granite-faced church is home to the oldest Roman Catholic parish in New York City. It was designed by John R. Haggerty and Thomas Thomas in 1836-1840, replacing an earlier building dating from 1785. The church has a temple-like façade along Barclay Street with six Ionic columns (see View 5 of **Figure 5-4**).

30 Vesey Street (S/NR-eligible)
The 18-story brick Renaissance Revival building at 30 Vesey Street has a tripartite configuration with a base, shaft, and capital. Fluted pilasters embellish its two-story base, and the upper stories have additional ornamentation (see View 2 of **Figure 5-2**). The building was constructed in 1914.

St. Paul's Chapel and Graveyard (NHL, S/NR, NYCL)
St. Paul's Chapel, located at Broadway and Fulton Street, was erected between 1764 and 1766; its porch was built in 1767–1768; and its tower was designed by James C. Lawrence in 1794 (see View 6 of **Figure 5-4**). It is Manhattan's oldest surviving church and is also considered one of the finest Georgian buildings in the nation. It is a simplified version of James Gibbs's Saint Martin-in-the-Fields on Trafalgar Square in London. The chapel was built of local stone with brownstone trim. It has a modest portico on its towered west façade, which faces the adjacent 18th-century graveyard (and, across Church Street, the WTC site). The Broadway elevation has an imposing brownstone Ionic porch, which was part of the original plan but was not built until 1767–1768. Although the design of the church is often ascribed to Thomas McBean, there is no evidence to support this theory. George Washington worshipped at the church during the brief period when New York was the nation's capital. During the recovery effort at the WTC site, the chapel served as a refuge for rescue workers.

Former American Telephone & Telegraph (AT&T) Company Building (S/NR-eligible, NYCL [interior and exterior])
Designed by William Welles Bosworth and built in three sections between 1912 and 1923, this 29-story Neo-Classical Revival commercial office building is located at 195 Broadway. Its façade consists of eight Ionic colonnades, with three stories located within each set (see View 6 of **Figure 5-4**). The building is clad in Vermont granite and has a Doric colonnade at the first base. It is reported to have more classical columns than any other façade in the world. The building's tower rises to a stepped crown modeled on the Mausoleum of Halicarnassus in

Bodrum, Turkey. Bronze panels above the Broadway entrances were designed by the sculptor Paul Manship. It has a notable lobby with Greek temple-like rows of Doric columns.

Former East River Savings Bank (S/NR-eligible, NYCL-eligible)
Currently occupied by a department store, the five-story former bank building located at 26 Cortlandt Street was designed by Walker & Gillette and built in 1931–1934. It has Classical and Art Deco details with stainless steel winged eagles over the entrances (see View 7 of **Figure 5-5**).

Wall Street Historic District (S/NR)
This historic district is generally bounded by Bridge, South William, Greenwich, Liberty, and Pearl Streets and Maiden Lane (see **Figure 5-1** and View 8 of **Figure 5-5**). It includes 66 contributing historic resources located on all or part of 36 blocks in the inner core of the southern tip of Manhattan Island. The historic district's importance in the history of the city and the country includes this area's history as a 17th century Dutch colony, its 18th century role as the nation's first capital, and its two-centuries-old status as the nation's financial center. The historic district also includes buildings by some of the country's most prominent architects, most famous collection of skyscrapers, and the city's famous Lower Manhattan skyline.

United States Realty Building and Trinity Building (S/NR, NYCL)
Designed by Francis H. Kimball in 1904–1907, the United States Realty Building and the Trinity Building, two skyscrapers located at 115 and 111 Broadway, were designed with Gothic details to harmonize with Trinity Church, located to the south (see Views 9 and 10 of **Figure 5-6**). Both buildings are faced with limestone and feature towers, gables, and delicately carved ornament. Construction of both buildings was a major undertaking, causing the relocation of Thames Street as well as the construction of caissons 80 feet into the marshy subsoil. Both buildings are located within the Wall Street Historic District (S/NR), described above.

Trinity Church and Graveyard (NHL, S/NR, NYCL)
This Lower Manhattan church was designed by Richard Upjohn based on English precedents and was built in 1841–1846. Located at Broadway and Wall Street, the Gothic Revival- style church is clad in brownstone. For many years the steeple of Trinity Church was the tallest structure in the city (see View 11 of **Figure 5-7**). The present church is the third church built on the site for New York's oldest Episcopal congregation. Important additions to the church include the sacristy, Frederick Clarke Withers (1876–1877); All Saint's Chapel, Thomas Nash (1911–1913); and the Manning Wing, Adams & Woodbridge (1966). The church's adjacent cemetery is the oldest in Manhattan and contains the graves of several prominent New Yorkers, including Alexander Hamilton, Robert Fulton, and William Bradford.

American Stock Exchange (NHL, S/NR, NYCL)
The American Stock Exchange (formerly the New York Curb Exchange) is located at 86 Trinity Place. It consists of two components. In 1921, the New York Curb Market Association (so named for being an outdoor market) moved into a new seven-story Renaissance Revival-style office and exchange building at 111-123 Greenwich Street. In 1930–1931, the facility was expanded with a 14-story Art Deco addition designed by Starrett and Van Vleck at 78-86 Trinity Place (see View 8 of **Figure 5-5**). Clad in brick, the building's Greenwich Street façade consists of a largely blank and unornamented wall. The building's most notable features are five large, arched windows in the center of the façade and a stone plaque reading "New York Curb Market" set in the wall above these windows. Other features include arched corner entrances, stone door

and window lintels and sills, brick panels, and a simple cornice. The Art Deco limestone façade on Trinity Place is more ornate.

74 Trinity Place (S/NR-eligible)
Located at 74 Trinity Place/109 Greenwich Street, this 27-story commercial building has decorative terra cotta and bronze spandrel panels (see View 8 of **Figure 5-5**). The building was designed by H.I. Oser in 1925–1927 with Renaissance Revival and Art Deco detailing. It is a contributing building within the Wall Street Historic District (S/NR).

Beard Building (S/NR-eligible, NYCL-eligible)
Architect Oswald Wirz designed the 12-story Beard Building at 125 Cedar Street/120 Liberty Street as an office building. Constructed in 1895–1897, it is a through-block, brick and stone building with Romanesque Revival-style façades (see View 12 of **Figure 5-7**). It has a two-story stone base with pilasters and deeply recessed window bays; the north façade of the base is clad in limestone, while the south façade is clad in sandstone. On the shaft, wide piers frame corner window bays and create a broad central bay broken up by thin, closely spaced mullions. An entablature caps the shaft. The two-story building capital contains pedimented windows. A bracketed cornice crowns the building.

90 West Street (S/NR, NYCL)
90 West Street was designed by architect Cass Gilbert and built in 1905–1907. It is among the most important early 20th century skyscrapers in New York City and is the aesthetic precursor of Gilbert's Woolworth Building constructed in 1910–1913. The 23-story former commercial office building is also the earliest example of the use of Gothic detail on a skyscraper with distinctly vertical massing. The building has a C-shaped plan with a light court facing east and its primary façade fronting on West Street/Route 9A. Its north elevation faces the WTC site across Liberty Street. Above a two-story granite base, the façades of the shaft are clad in white terra cotta with modest marble and polychromed terra cotta trim. The shaft is articulated with recessed window bays and clustered columns that form piers. These piers, along with colonettes between the windows, rise uninterrupted for most of the building's height, emphasizing the building's verticality. The building's heavy three-story capital is ornately designed as an arcade with engaged columns. A mansard roof with dormers and pinnacles crowns the building (see View 13 of **Figure 5-8**).

Potential Architectural Resources

No structures that appear to meet the eligibility criteria for S/NR listing or NYCL designation were identified in the study areas.

Seven buildings in the architectural resources study areas were identified in the 2004 *WTC Memorial and Redevelopment Plan GEIS* by the Lower Manhattan Emergency Preservation Fund (LMEPF) as potential architectural resources for a proposed Greenwich Street South Historic District. These buildings include: 106, 110, and 112 Liberty Street; 113 Cedar Street; 68 Trinity Place; 137-139 Greenwich Street; and the Green Exchange Building at 130 Cedar Street. In 2004, these buildings were determined ineligible for S/NR-listing or NYCL designation by SHPO and LPC. However, the Wall Street Historic District has since been listed on the State/National Registers of Historic Places and includes the former Horn & Hardart Automat

building at 68 Trinity Place (designed by F.P. Platt & Brother and built in 1920-1922) (see **Figure 5-1** and View 8 of **Figure 5-5**).

E. FUTURE WITHOUT THE PROPOSED ACTION (NO-ACTION)

Project Area

In the Future without the Proposed Action, construction activities will continue throughout the WTC site and its immediate vicinity, as described in the Chapter 1, "Project Description." The No-Action scenario assumes that all on-site building programs (along with required infrastructure, including streets) will be completed and fully occupied by the 2019 build year.

Subsequent to the 2005 redesign of 1 WTC it was determined that no unscreened vehicles could be permitted to access Fulton and Vesey Streets immediately adjacent to 1 WTC as a measure to enhance security at-grade. Therefore, the Future without the Proposed Action assumes that a secure zone will be created around 1 WTC by securing and restricting access to Vesey and Fulton Streets between Greenwich Street and West Street/Route 9A. These street segments will be managed streets irrespective of the Proposed Action. Additionally, it is expected that Greenwich Street between Barclay and Vesey Streets will be limited for use by 7 WTC tenants only under the No-Action condition; therefore, this section of Greenwich Street will be a controlled access street irrespective of the Proposed Action.

Study Areas

The status of architectural resources in the study areas could change in the future without the Proposed Action. S/NR-eligible architectural resources could be listed on the Registers and NYCL-eligible properties could be calendared for a designation hearing. It is also possible that some architectural resources in the study areas could deteriorate, while others could be restored. In addition, future projects could affect the settings of architectural resources, or accidentally damage such resources through adjacent construction.

Architectural resources that are listed on the National Register or that have been found eligible for listing are given a measure of protection from the effects of federally sponsored or assisted projects under Section 106 of the NHPA. Although preservation is not mandated, federal agencies must attempt to avoid adverse effects on such resources through a notice, review, and consultation process. Properties listed on the New York State Register are similarly protected against effects resulting from state-sponsored or state-assisted projects under SHPA. Private property owners using private funds can, however, alter or demolish their properties without such a review process. Thus, while the historic buildings in the architectural study area are protected by federal, state, and local regulations, it is possible that they may be altered in the future. Privately-owned sites that are NYCLs, within NYCHDs, or pending designation, are protected under the New York City Landmarks Law, which requires LPC review and approval before any alteration or demolition can occur.

The New York City Building Code provides some measures of protection for all properties against accidental damage from adjacent construction by requiring that all buildings, lots, and service facilities adjacent to foundation and earthwork areas be protected and supported. While

these regulations serve to protect all structures adjacent to construction areas, they do not afford special consideration for historic structures.

There are two known development projects within the architectural resources study areas. An 80-story hotel/condominium under construction at 99 Church Street is expected to be completed by 2014. Construction of this building could cause accidental construction damage to architectural resources located within 90 feet of construction activities. The American Stock Exchange building at 86 Trinity Place will also be redeveloped with a hotel and ground floor retail. The anticipated completion date for this project is currently unknown. The American Stock Exchange is a NHL, listed on the S/NR, and is within the Wall Street Historic District (S/NR); therefore, if there are any state or federal actions associated with the proposed development, it will be subject to the notice, review, and consultation process described above. Development of this project also could cause accidental construction damage to this architectural resource and other contributing historic district buildings located within 90 feet of construction. Adjacent contributing buildings within the historic district would be offered some protection through DOB controls, described above, governing the protection of adjacent historic properties from construction activities.

F. FUTURE WITH THE PROPOSED ACTION (WITH-ACTION)

Project Area

Primary components of the Proposed Action would include entry/exit security checkpoints, screening areas, and a secure lane on Church Street between Cedar and Vesey Streets with a raised median and static barriers (see **Figure 1-2**, in Chapter 1, "Project Description" and **Figures 6-11** through **6-18**, in Chapter 6, "Urban Design and Visual Resources"). It is anticipated that sally ports would be installed at a total of eight locations at the perimeter of the Project Area to provide entry and/or egress to the WTC site. Two sally ports would function as entries, four as exits, and two would be used by both entering and exiting vehicles. Each sally port would consist of a small, approximately 11-foot-tall personnel booth controlling a set of two retractable barriers with sufficient space between them to accommodate a motor vehicle undergoing screening. An additional small 11-foot-tall personnel booth would be installed at each credentialing location. It is anticipated that the sizes and final locations of the booths and any ancillary structures will be developed as project design advances, but the structures are generally anticipated to be small in scale, with small footprints and low heights. Bollards and similar operable and static barriers would also be installed. Credentialing and authorization zones and approaches to the Project Area would vary in size, detail, and security elements depending on location, the anticipated vehicle volumes, and roadway geometries.

The Proposed Action, as described above and detailed in Chapter 1, "Project Description," would not be expected to result in significant adverse impacts to the WTC site as the proposed security screening components would be small in scale and located largely at the perimeter of the WTC site. The Proposed Action would not obstruct views or significantly alter the context of the WTC site, nor would the project components obstruct views from the Project Area to nearby architectural resources. Therefore, the Proposed Action would not be expected to adversely affect any architectural resources within the Project Area.

Study Areas

The proposed security checkpoints would not adversely affect the context of the study areas' architectural resources. The proposed entry/exit security checkpoints, screening areas, and a secure lane on Church Street between Cedar and Vesey Streets would not compete visually with the study areas' architectural resources, as the Proposed Action's various components would not obstruct views or adversely affect the physical or visual context of nearby architectural resources. Further, the Proposed Action would maintain physical and visual access to the study area's architectural resources. Therefore, the Proposed Action would not be expected to result in any indirect, contextual adverse effects on architectural resources in the study areas.

Since the architectural resources study areas have been defined as the area within 90 feet of the Project Area, all of the architectural resources listed on **Table 5-1** and mapped in **Figure 5-1** are located within 90 feet of proposed construction activities. Therefore, to avoid potential adverse physical effects on these architectural resources, a CPP would be developed and implemented prior to the commencement of any construction-related activities in the Project Area. The CPP would follow DOB's *TPPN #10/88*, regarding procedures for the avoidance of damage to historic structures resulting from adjacent construction, and would be prepared in consultation with SHPO and LPC. *TPPN #10/88* requires a monitoring program to reduce the likelihood of construction damage to adjacent NYCLs and S/NR-listed properties (within 90 feet) and to detect at an early stage the beginnings of damage so that construction procedures can be changed.

A. INTRODUCTION

This chapter provides an assessment of the potential effects on urban design and visual resources that could result from a proposed action. Together, the urban design and visual resources of an area define the distinctive physical identity of a neighborhood. As described in Chapter 1, "Project Description," the Proposed Action would facilitate the implementation of the World Trade Center (WTC) Campus Security Plan. As part of the Proposed Action, screening and credentialing zones would be installed at several locations along the perimeter of the WTC Campus. Screening and credentialing zones would contain a variety of streetscape elements, including personnel booths, equipment houses, and static and operable barriers to restrict vehicular access to the interior roadways within the WTC Campus.

Given the above conditions and the guidelines set forth in the 2012 *CEQR Technical Manual*, an analysis of urban design and visual resources is warranted. The analysis of urban design, as stipulated by CEQR, will assess the effects of the Proposed Action on those components of urban design that may affect a pedestrian's experience of public space in the study area. These components include streets; buildings; visual resources; open space; natural features; and wind.

An area's visual resources are its unique and important public view corridors, vistas, and natural or built features, as seen from publicly accessible locations. The Proposed Action would introduce new security elements within the public right-of-way, including static barriers, operable barriers, personnel booths, and related security devices. Since the proposed WTC Campus Security Plan being analyzed in the With-Action condition includes streetscape elements that would restrict vehicular access to certain streets, the analysis of visual resources provided in this chapter will focus on the security elements' effect on the ability of the public to view and enjoy significant view corridors and vistas, natural resources, historic resources, and the waterfront from publicly accessible locations. As such, this chapter considers potential impacts of the Proposed Action on the urban design character and visual resources of the study area. Given the small physical scale and confined setting of the Proposed Action, a general overview of visual resources, such as public parks, and landmarked structures and districts in the area will be provided along with an assessment of the effects of the Campus Security Plan on those resources within its vicinity.

Context

The urban design of Lower Manhattan is characterized by a dense concentration of both historic and modern structures that range in size from small-scale, low-rise buildings to large-scale, high-rise buildings. The diverse architectural styles reflect the development that has occurred in the area over time. For 30 years, the Twin Towers dominated the WTC site and the surrounding landscape, identifiable from miles around. Clad in aluminum, these two 1,350-foot tall buildings were the tallest buildings in New York City, visual resources that dominated the skyline. The WTC site was also distinguished by its unique block form, occupying a superblock. As such, Greenwich and Fulton Streets ended at the perimeter of the WTC site. The WTC's six buildings were situated around the exterior of the WTC site, enclosing a central public space, Austin J. Tobin Plaza. Due to the Twin Towers' distinct architectural style and unsurpassed height, and the unique large-scale plaza, the WTC site had a strong urban design presence in the area.

On September 11, 2001, the Twin Towers were attacked and subsequently collapsed, causing major devastation in Lower Manhattan. An intensive recovery effort took place on the WTC site from September 2001 through July 2002. After the recovery efforts were completed, the WTC Campus

remained closed and in various stages of reconstruction and several streets near the WTC site were closed to vehicular traffic.

The Lower Manhattan Development Corporation (LMDC) issued its Master Plan for the redevelopment of the WTC site in September 2003, which included the September 11th Memorial, the Port Authority Trans-Hudson (PATH) Hub, the Performing Arts Center (PAC), and commercial office towers. As described in Chapter 1, "Project Description," a somewhat smaller development program is now anticipated for the WTC Campus. Adjustments to the development program were made based on aesthetics, commercial viability, cost, technical, security, and practical considerations.

Construction continues throughout the 16-acre WTC site and within its immediate vicinity. For the purposes of this urban design and visual resources analysis, it is assumed that all planned buildings in the WTC site, along with required infrastructure and streets, would be completed and fully occupied by 2019. As described in Chapter 1, "Project Description," 5 WTC is not expected to be developed during this timeframe as no building program has been established for this site.

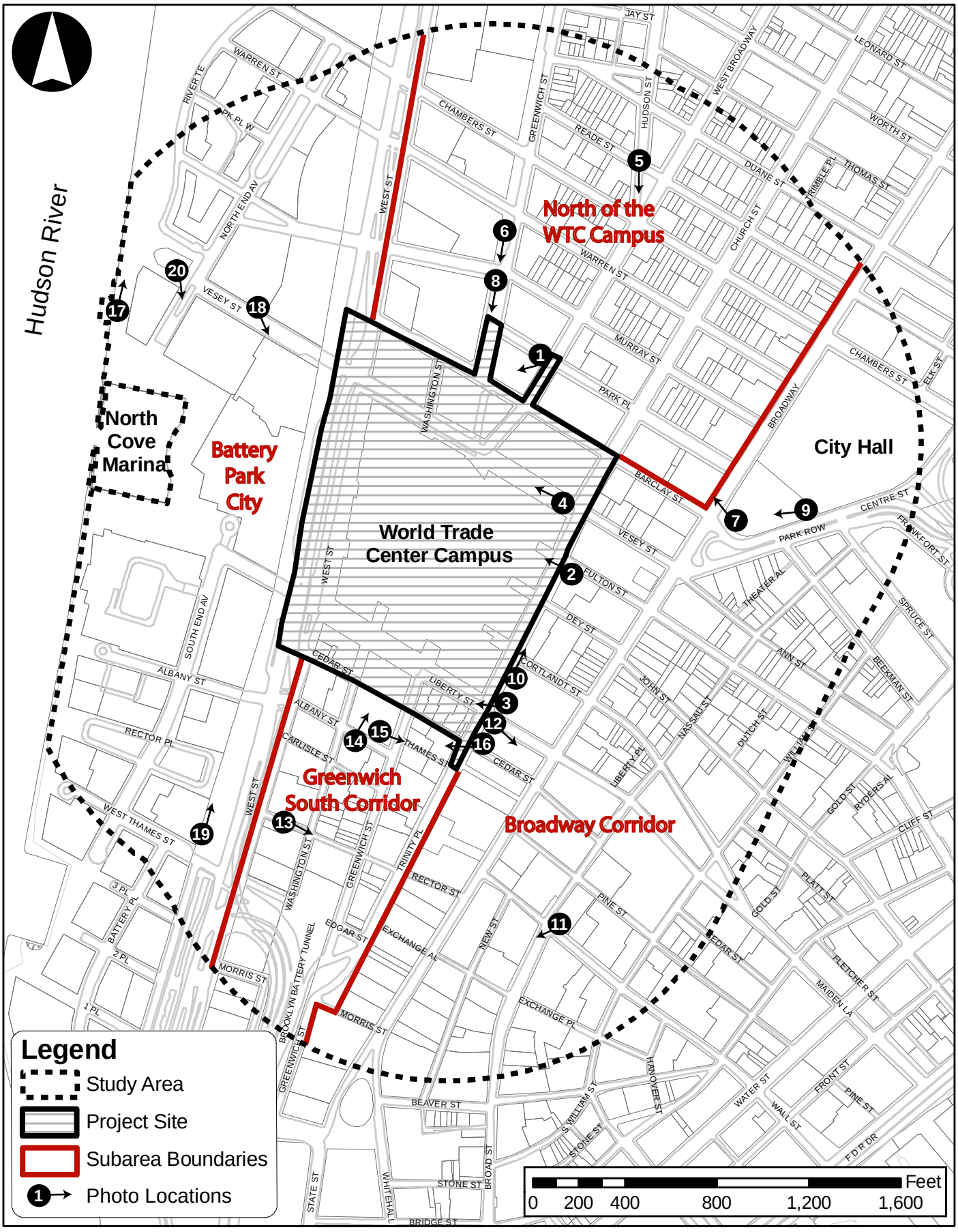
B. PRINCIPAL CONCLUSIONS

According to the 2012 *CEQR Technical Manual,* in terms of streetscape elements, a significant adverse impact would result if a project would add to, eliminate, or alter a critical feature of a streetscape. As described below and in Chapter 1, "Project Description," new security elements would be installed at the perimeter of the WTC Campus within some street beds and on the sidewalks that are immediately adjacent to the proposed credentialing and screening zones. The design of the proposed streetscape elements has been developed to ensure clear pedestrian zones by widening the sidewalk, where possible. According to the New York City Police Department (NYPD), the proposed security measures are necessary to protect the WTC Campus from a vehicle-borne explosive device as it is considered a potential terrorist target. Because there have been two previous attacks on the WTC site, the implementation of increased security precautions is necessary at the WTC Campus.

While security elements are not typically considered to be aesthetically pleasing, they have become more commonplace throughout the City since 2001. The proposed security plan would implement a uniform design approach with standardized security components such as static barriers and booths that resemble commonly used designs, intended to blend with streetscape elements widely-used around the City. However, the Proposed Action also includes some unique design elements that are intended to minimize the visual impact of the Proposed Action. Therefore, the proposed addition of security elements at the perimeter of the WTC Campus has the potential to alter the urban design characteristics of the area. While the changes to the urban design of the area resulting from the Proposed Action could be considered adverse negative impacts, they would not be significant because the plan would implement a cohesive design with elements that are intended to be consistent with other street furniture that is commonly seen around the City. A conscious effort has been made during the initial design phases to use the latest available technology for the security elements and to use materials and finishes that would blend with the surroundings for personnel booths and static and operable barriers. The Proposed Action would not result in any changes to street pattern, block form, or building arrangement. Therefore, the Proposed Action is not expected to result in any significant adverse impacts to urban design in the quarter-mile study area (Study Area) surrounding the WTC Campus (refer to **Figure 6-1**).

As detailed in the following sections, the Proposed Action would not have a significant adverse impact on visual resources or view corridors on the WTC Campus (Project Site) or within the Study Area. Major visual resources in the Project Site and Study Area include historic buildings, such as the Woolworth Building, the Barclay-Vesey Building, and Trinity Church, modern buildings, such as the

Figure 6-1
Urban Design Study Area



World Financial Center (WFC) and the WTC towers (many of which are under construction), and open space and natural features, such as the WTC memorial, Zuccotti Park, the Battery Park City (BPC) esplanade and Hudson River. Personnel booths located at screening and credentialing zones would have small footprints and would be located on sidewalk extensions where possible. All proposed security elements have a low-scale design. As such, the proposed security elements would not adversely affect public views to any visual resources.

C. METHODOLOGY

Determining whether an Urban Design Analysis is Necessary

Urban design is the totality of components that may affect a pedestrian's experience of public space. These components include streets, buildings, visual resources, open space, natural features, wind and sunlight conditions. These elements are defined in the 2012 *CEQR Technical Manual* as:

- ***Streets.*** For many neighborhoods, streets are the primary component of public space. The arrangement and orientation of streets define the location and flow of activity in an area, set street views, and create the blocks on which buildings and open spaces are organized. The apportionment of street space between cars, bicycles, transit, and sidewalk is critical to making a successful streetscape, as is the careful design of street furniture, grade, materials used, and permanent fixtures, including plantings, street lights, fire hydrants, curb cuts, or newsstands.
- ***Buildings.*** Buildings support streets. A building's streetwalls form the most common backdrop in the city for public space. A building's size, shape, setbacks, lot coverage, placement on the zoning lot and block, the orientation of active uses, and pedestrian and vehicular entrances all play major roles in the vitality of the streetscape. The public realm also extends to building facades and rooftops, offering more opportunity to enrich the visual character of an area.
- ***Visual Resources.*** A visual resource is the connection from the public realm to significant natural or built features, including views of the waterfront, public parks, landmark structures or districts, otherwise distinct buildings or groups of buildings, or natural resources.
- ***Open Space.*** For the purpose of urban design, open space includes public and private areas such as parks, yards, cemeteries, parking lots and privately owned public spaces.
- ***Natural Resources.*** Natural features include vegetation and geologic, topographic, and aquatic features. Rock outcroppings, steep slopes or varied ground elevation, beaches, or wetlands may help define the overall visual character of an area.
- ***Wind.*** Channelized wind pressure from between tall buildings and downwashed wind pressure from parallel tall buildings may cause winds that may jeopardize pedestrian safety.

In general, an assessment of urban design and visual resources is needed when the proposed project may have effects on one or more of the elements that contribute to the pedestrian experience, which are described above. As the Proposed Action would result in physical changes to the area by introducing security elements to an area that would not exist under No-Action conditions, it has the potential to alter the appearance and functionality of the built environment, and therefore, change the pedestrian experience in the Study Area.

Per Section 320 of the 2012 *CEQR Technical Manual*, a study of wind conditions and their effect on pedestrian level safety may be warranted under certain circumstances for projects involving the construction of large buildings at locations that experience high wind conditions. The Proposed Action would introduce low-scale security elements at the perimeter of the Project Site within the street bed

and along the sidewalk at entries and exits to the WTC Campus, as described in detail below. The Proposed Action would not result in the construction of large or unusually tall buildings. The maximum building height would be approximately 11-foot tall personnel booths at credentialing and screening zones. Moreover, the Project Site is not located immediately adjacent to the Hudson River, nor are any of the screening or credentialing zones located in areas where winds from the waterfront are not attenuated by buildings or natural features. Therefore, a study of wind conditions and their effect on pedestrian level safety is not warranted in this analysis.

Analysis Year

The analysis year is 2012 for existing conditions and the analysis year for future conditions with and without the Proposed Action is the anticipated completion date of 2019.

Study Area

The study area for urban design and visual resources is the area where the Proposed Action may influence land use patterns and the built environment, and is generally consistent with that used for the land use, zoning, and public policy analysis. For visual resources, the view corridors within the study area from which such resources are publicly viewable should be identified. The analysis of urban design and visual resources is based on field visits, photography, and computer imaging of the WTC Campus and surrounding study area. For the purpose of this assessment, the primary study area (Project Site) is generally coterminous with the WTC Campus, and includes all streets, sidewalks and buildings that would be directly affected by the installation of the proposed security infrastructure. This area is generally bounded by Barclay Street, West Street/Route 9A, Thames Street, and Trinity Place/Church Street, as seen in **Figure 6-1**.

As indicated in Chapter 1, "Project Description," the Proposed Action involves the implementation of a variety of physical security measures at a number of locations at the perimeter of the WTC Campus (refer to **Figure 1-2**). Proposed security infrastructure would be located at the credentialing zones and the secure vehicular entries/exits which provide access to and from the secure zone, as well as along Church Street. Credentialing zones are proposed at the following locations:

- On West Broadway in the two eastern-most lanes at the southbound approach to Barclay Street;
- On Barclay Street in the southern-most lane at the westbound approach to West Broadway;
- On Barclay Street in the southern-most lane at the westbound approach to Washington Street;
- On Trinity Place in the western-most lane at the northbound approach to Thames Street and Cedar Street;
- On West Street/Route 9A in the eastern-most lane at the northbound approach to Liberty Street; and
- On West Street/Route 9A in the two southbound left turn lanes at the southbound approach to Liberty Street.

Secure vehicular entries and exits are proposed at the following locations:

- Washington Street at Barclay Street;
- West Broadway at Barclay Street;
- Trinity Place at Cedar Street;
- Liberty Street at West Street/Route 9A;
- Church Street at Vesey Street;
- Vesey Street at West Street/Route 9A;
- Fulton Street at West Street/Route 9A; and

- Greenwich Street at Cedar Street.

The result of the proposed Campus Security Plan would be the management of vehicular access within the entire 16-acre WTC Campus, including the following areas:

- Greenwich Street from Vesey Street to Cedar Street;
- West Broadway from Barclay Street to Vesey Street;
- Washington Street from Barclay Street to Vesey Street;
- Vesey Street from Church Street to West Street/Route 9A;
- Fulton Street from Church Street to West Street/Route 9A; and
- Liberty Street from Trinity Place/Church Street to West Street/Route 9A.

Additionally, the Trinity Place/Church Street corridor would be divided by a raised median with static barriers from Cedar Street to just north of Vesey Street. It is anticipated that to the east of the median the street would remain open to general traffic with three northbound moving lanes, while one additional moving lane to the west of the median would be located within the security perimeter and would be accessible only to screened vehicles for circulation within the secure zone.

The secondary study area (Study Area) extends an approximate quarter-mile from the boundary of the Project Site and encompasses areas that have the potential to experience indirect impacts as a result of the Proposed Action. The Study Area covers an area generally bounded by Duane Street to the north, William Street to the east, Morris Street to the south, and the Hudson River to the west.

The Study Area has been divided into four subareas based on geographic boundaries and commonly accepted neighborhood boundaries in order to more easily facilitate the discussion and analysis of the Proposed Action's potential impacts. The four subareas are: (1) the area north of the WTC Campus; (2) the Broadway Corridor; (3) the Greenwich South Corridor; and (4) BPC. For the purposes of this analysis, the area to the north of the WTC Campus is roughly bounded by West Street/Route 9A to the west, Duane Street to the north, Broadway to the east, and Barclay Street to the south. The Broadway Corridor extends from Trinity Place/Church Street on the east to William Street on the west and from Barclay Street and Park Row to the north to Morris Street on the south. The Greenwich South Corridor is roughly bounded by West Street/Route 9A to the west, Cedar Street to the north, Trinity Place/Church Street to the east, and Morris Street to the south. BPC extends from the Hudson River on the west to West Street/Route 9A on the east and Chambers Street on the north to West Thames Street on the south (refer to **Figure 6-1**).

D. PRELIMINARY ASSESSMENT

Under CEQR, a preliminary assessment of urban design is appropriate when there is the potential for a pedestrian to observe from the street level a physical alteration beyond that allowed by existing zoning, including the following: 1) projects that permit the modification of yard, height, and setback requirements; and 2) projects that result in an increase in built floor area beyond what would be allowed 'as-of-right' or in the future without the Proposed Action. CEQR stipulates a detailed analysis for projects that would result in substantial alterations to the streetscape of the neighborhood by noticeably changing the scale of buildings. While the Proposed Action would not change building bulk or add significant floor area, it would alter the streetscape of the neighborhood at the pedestrian level. As such, a detailed analysis of urban design and visual resources is provided below.

E. DETAILED ASSESSMENT

Existing Conditions

Project Site

As indicated above, the Project Site is comprised of several locations at the perimeter of the WTC site that would contain new security features as a result of the Proposed Action. As shown in **Figure 6-2** and as described in detail below, several of the areas that would serve as credentialing or screening zones are completely or partially closed due to construction activities related to the redevelopment of the WTC Campus. The following provides a discussion of the urban design characteristics and visual resources of the Project Site.

Natural Features, Street Patterns & Block Shapes

The Project Site is located in a developed area of Lower Manhattan. The entire Project Site is either currently developed or being developed with buildings, asphalt and concrete sidewalks, or landscaped areas. Except for recently planted trees around the National September 11th Memorial and in Vesey Park, no natural features are located within the Project Site.

Figure 6-2 shows an aerial photograph of conditions in the vicinity of the WTC Campus. As shown in the figure, the redevelopment of the WTC Campus is ongoing, with the planned street system through the WTC site not yet constructed. Due to ongoing construction activities, the WTC site's current block form resembles the former WTC superblock configuration, roughly bounded by Vesey Street, Trinity Place/Church Street, Cedar Street, and West Street/Route 9A.

In the northern portion of the Project Site, Greenwich Street and West Broadway intersect at Vesey Street, forming Vesey Park, a small triangular block just below Barclay Street. As Vesey Street remains closed to vehicular traffic, Greenwich Street and West Broadway are dead end streets, primarily serving 7 WTC and the Federal Office Building/U.S. Post Office. As shown in **Figure 6-2**, Vesey Street is open to pedestrians via a narrow passageway enclosed by scaffolding. Washington Street between Barclay and Vesey Streets also remains closed to all vehicles, except those providing deliveries to 7 WTC and the WTC construction site.

At the southern end of the Project Site, Liberty Street is accessible to vehicles from Trinity Place/Church Street to Greenwich Street. Greenwich Street provides access for southbound vehicles to the Greenwich South neighborhood. Between Greenwich Street and West Street/Route 9A, Liberty Street is closed for construction and staging.

At the eastern edge of the Project Site, the left lane of Trinity Place/Church Street is partially closed from Cedar Street to Vesey Street to accommodate construction activities and staging. Construction activities occupy two lanes in some areas.

Planned streets that will traverse the WTC Campus, including Vesey Street from Church Street to West Street/Route 9A, Greenwich Street from Vesey Street to Cedar Street, Fulton Street from Church Street to West Street/Route 9A, and Liberty Street from West Street/Route 9A, have not yet been completed.

Streetscape

The eight-acre National September 11th Memorial opened to the public in September 2011. The Memorial, designed by Michael Arad and Peter Walker, is centered around two waterfalls set within the footprints of the original Twin Towers. The Memorial contains paved walkways surrounding oak trees and large stones that serve as benches for visitors (see **Figure 6-3**). The memorial trees extend to Fulton Street (planned) on the north, Greenwich Street (planned) on the east, Liberty Street (planned) on the south, and West Street/Route 9A on the west.

Vesey Park lies just east of the newly constructed 7 WTC, on the small triangular block bounded by West Broadway, Greenwich Street, and Vesey Street. The park is characterized by a large central fountain encircled by benches, with trees along the northern and southern ends of the block (**Figure 6-5**). Temporary barriers surround the park and two abutting streets, blocking both streets to vehicles.

Construction dominates the streetscape of much of the Project Site. Other than the National September 11th Memorial, the WTC Campus is largely closed for construction and is surrounded by a fence, which obstructs public views into the WTC Campus.

Liberty Park, the Vehicular Security Center (VSC), and the below-grade parking facility are under construction at the southwestern portion of the Project Site, between Liberty and Cedar Streets from West Street/Route 9A to Greenwich Street. Existing commercial and residential uses and the New York City Fire Department's (FDNY) Engine Company 10 and Ladder Company 10 Firehouse (Ten House) are located on the south side of Liberty Street between Church Street and Greenwich Street.

Security elements are another predominant streetscape element at the perimeter of the Project Site (see **Figure 6-4** for examples of personnel booths within the Study Area). Three personnel booths line Washington Street between Barclay and Vesey Streets; one personnel booth is located at the temporary PATH station entry; and one is located on Greenwich Street opposite Thames Street. Flexible bollards and metal and concrete barriers are situated around the perimeter of the Project Site to control vehicular and pedestrian traffic.

Building Uses, Shapes & Forms

Building uses, shapes and forms vary within the Project Site. Existing buildings at the periphery of the Project Site remain largely unchanged since 2001 with the exception of 7 WTC. Construction of 7 WTC has been completed and the office building is now fully leased. The National September 11th Memorial and Museum, and Towers 1 through 4 are under construction, with 1 WTC and 4 WTC constructed to their full heights over summer 2012 at 104-stories and 72-stories, respectively (refer to **Figure 6-5**).

The existing buildings on the northern and southern portions of the Project Site contain a mix of land uses in a variety of building forms. Larger historic buildings, including the Barclay-Vesey Building and the Federal Office Building/U.S. Post Office, are located to the north between Barclay and Vesey Streets. The Barclay-Vesey Building at 140 West Street is a 32-story brick, limestone, and terra cotta structure that has an eighteen-story parallelogram base and an eleven-story square tower. The Federal Office Building/U.S. Post Office is a fifteen-story limestone building which has Classical Revival and Art Deco details and occupies the full block bounded by Church Street, Vesey Street, West Broadway, and Barclay Street. At the southern limits of the Project Site between Liberty and Cedar Streets, buildings range in height from two to thirteen stories, and are predominantly mixed-use buildings. A fire station and the Tribute WTC Visitor Center are also located on this block. The Beard Building, located at 125 Cedar Street/120 Liberty Street, is a 12-story brick and stone building with Romanesque Revival-style facades set on a two-story stone base (**Figure 6-5**).

Figure 6-2

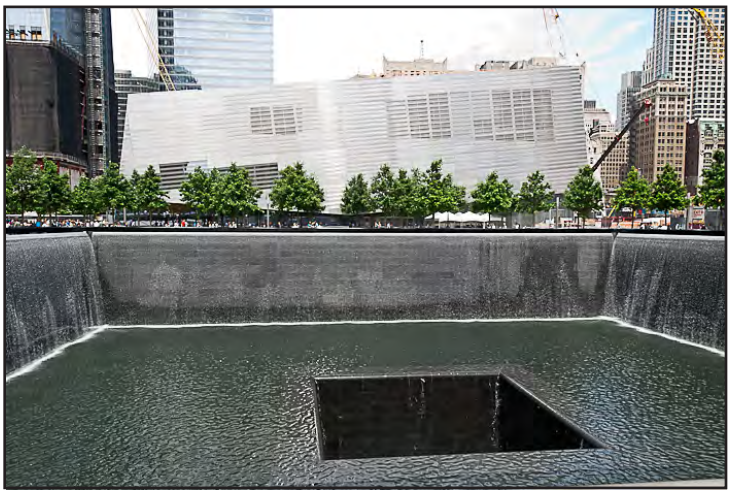
Aerial View of Project Site

Project Site

Image from Google Earth, 2012

Facing southeast across the South Pool with 4 WTC on the left.

Facing southeast across the Memorial Plaza with 4 WTC in the background.



Facing north across the South Pool with the National September 11th Museum in the background.

Telephone booth

Newsstand

Bus shelter

Public restroom

Sally port on Broad Street

Security booth on Greenwich Street at Thames Street

Security booth and vehicle barrier on Washington Street

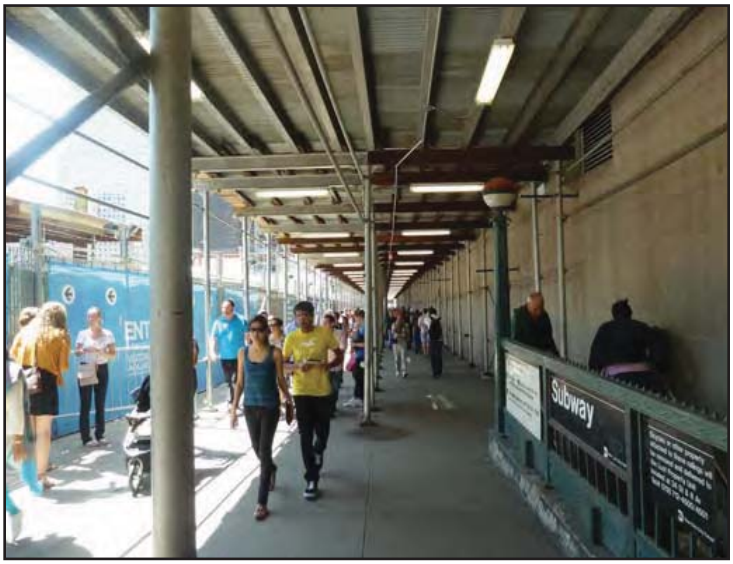
Security booth and sally port in Battery Park City on North End Avenue

Security booth at the Federal Reserve Building

1. Facing southwest across Vesey Park from West Broadway and Barclay Street with 7 WTC and the WFC in the background.

2. View of 1 WTC under construction facing west from Trinity Place/ Church Street.

3. View of south side of Liberty Street from Trinity Place/Church Street.



4. View west on Vesey Street fromTrinity Place/Church Street.

Visual Resources and View Corridors

The recently opened National September 11th Memorial (see **Figure 6-3**) and the rising 1 WTC (see **Figure 6-5**) already serve as important visual resources on the Project Site. The large expanse of the Memorial with its waterfalls and oak trees has become an important visual resource. 1 WTC is now the tallest building in the New York City skyline, visible for miles, and a symbolic reminder of the Twin Towers that formerly occupied the site. The distinctive forms and decorative features of the Barclay-Vesey Building and the Federal Office Building/U.S. Post Office at the perimeter of the Project Site add to the visual resources of the WTC Campus.

In its current condition, the WTC Campus has relatively open view corridors to the north, south, west, and east, although as construction of Towers 1 through 4 continues, views across the WTC Campus would become more limited. Across the Project Site, views of the Barclay-Vesey Building and the Federal Office Building/U.S. Post office are blocked, as well as views from the north. To the east, views of St. Paul's Chapel are becoming more limited as well. Although certain views are blocked by 1 WTC, the resources can still be seen from other locations.

Study Area

North of the WTC Campus

Natural Features, Street Patterns & Block Shapes

The topography of the northern subarea slopes slightly toward the Hudson River to the west. Few natural features exist within this northern subarea as the area is mostly built-out and is a highly populated urban environment. As a result of two separate street grids converging along West Broadway, street patterns and block shapes north of the WTC Campus are somewhat irregular. Blocks east of West Broadway are rectangular with straight east-west and north-south streets. In contrast, the blocks between West Street/Route 9A and West Broadway are predominately trapezoidal due to the varying angles of east-west streets, north-south streets, and the merging of West Broadway and Hudson Street. This merger creates a small triangular park, bounded by West Broadway, Hudson Street, and Chambers Street, which was extended across Hudson Street to create Bogardus Garden in 2010 (refer to **Figure 6-6**).

Streetscape

The area north of the WTC Campus is urban in character, with almost all structures built-out to the property line. Every street is flanked by concrete sidewalks. The sidewalks along Greenwich Street are wider than those typically found in the Study Area, allowing for larger street trees and planters (refer to **Figure 6-6**). Most streets west of Greenwich Street are lined by trees in contrast to the eastern portion of the subarea where there are few tree-lined streets apart from Bogardus Garden and the block bounded by Murray Street, West Broadway, Park Place, and Greenwich Street which is surrounded by large street trees to the west, north, and east.

There are a couple of open space resources in the area north of the WTC Campus. Bogardus Park, discussed above, is located at the meeting points of Hudson Street and West Broadway (refer to **Figure 6-6**). In addition, Washington Market Park is a tree-filled open space with a playground on the northwest corner of Chambers and Greenwich Streets.

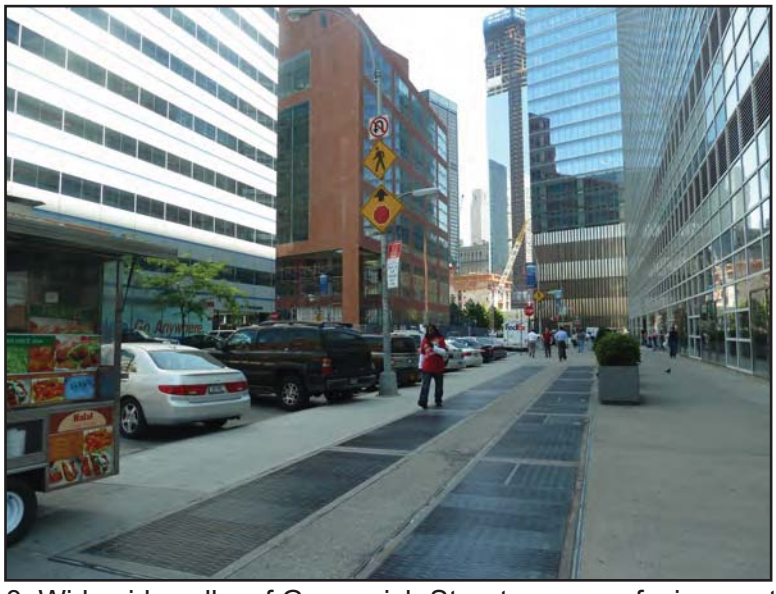
Various kinds of street furniture are situated throughout the area north of the WTC Campus, including fire hydrants, mailboxes, newsstands, lampposts, and food carts (refer to **Figure 6-6**). Construction sheds are also common features of the subarea. Additionally, several roads and sidewalks are fully or partially closed due to building construction and streetscape improvement projects. The reconstruction of Chambers Street from West Street/Route 9A to Broadway is currently underway, with segments of

Existing Conditions: North of the WTC Campus

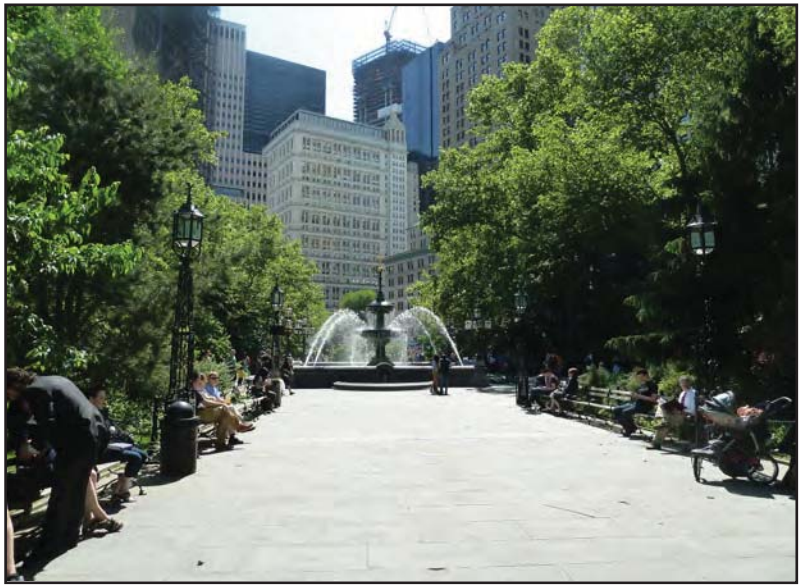
5. Facing south from Reade Street across Bogardus Garden and the pedestrian portion of Hudson Street.

6. Facing south on Greenwich Street between Warren and Murray Streets with newsstand in the foreground and 1 WTC in the background.

7. East facade of the Woolworth Building as seen from City Hall Park.



8. Wide sidewalks of Greenwich Street, as seen facing south from Murray Street.



9. Facing west across City Hall Park with fountain in foreground and WTC in background.

10. View north along Trinity Place/Church Street from Liberty Street.

11. East facade of the New York Stock Exchange and surrounding security barriers, as seen from Wall Street.

12. Facing east across Zucotti Park from Trinity Place/Church Street and Liberty Street.

the street blocked to traffic and pedestrians. A portion of Church Street between Warren and Murray Street is also closed as a result of the construction at 37 Warren Street.

Building Uses, Shapes & Forms

The area north of the WTC Campus is predominately mixed-use with a range of building shapes and forms. Blocks north of Murray Street between Greenwich Street and Broadway are characterized by low-rise, mixed-use buildings on narrow lots, built-out to the property line creating uniform streetwalls. These buildings typically accommodate lower level retail and upper level residences, demonstrating the recent trend of converting historic industrial spaces.

In contrast, the blocks west of Greenwich Street and south of Murray Street typically have taller, modern buildings on larger lots. Buildings west of Greenwich Street and south of Murray Street generally have larger footprints that encompass half or full blocks. The blocks between West Street/Route 9A and Greenwich Street were developed through urban renewal projects, and accommodate large residential buildings, office buildings, and institutions such as P.S. 234, St. John's University, DC 37 Headquarters (also houses The College of New Rochelle), and the Borough of Manhattan Community College (BMCC).

Visual Resources and View Corridors

Due to the street alignment and distance to the waterfront, there are no views of the waterfront in the northern subarea. Most views are of buildings as a result of the densely built-out area and irregular street pattern. The neo-Gothic Woolworth Building at 233 Broadway is an important visual landmark in the area due to its height, distinctive form, decorative features, and historic significance (refer to **Figure 6-6**). The WTC Campus is also an important visual resource in the area. While the WTC site itself is largely concealed by temporary construction fencing, the newly erected 1 WTC can be seen from many vantage points in the area north of the WTC Campus. The southbound roadways of Greenwich Street and West Broadway offer views of the WTC Campus, including the new 7 WTC and the Classical Revival/Art Deco Federal Office Building/U.S. Post Office.

Broadway Corridor

Natural Features, Street Patterns & Block Shapes

The topography of the eastern subarea peaks slightly at Broadway, sloping down on either side of the street. Few natural features exist in the Broadway Corridor as the area is mostly built-out and is a highly populated urban environment. Street patterns in the Broadway Corridor are somewhat irregular, as they do not follow a standard grid. Broadway, Nassau/Broad Street, and William Street are the main north-south thoroughfares in the subarea, although they each have unique curves and are thus not parallel to each other. Broadway is wide, carrying multiple lanes of vehicular traffic, while Nassau and William Streets are narrow. East-west streets in the subarea are also generally narrow, with the exception of Fulton Street, a main east-west thoroughfare. As a result of this irregular street pattern, there are no standard block shapes in the Broadway Corridor. City Hall and City Hall Park are located on the largest block of the Study Area, bounded by Broadway, Chambers Street, Centre Street, and Park Row (refer to **Figure 6-7**).

Streetscape

The Broadway Corridor is urban in character, with most structures built-out to the property line. Concrete sidewalks line the streets of the subarea; few of these sidewalks have street trees. Most trees in the subarea are located within privately-owned public plazas, around historic churches, or in City Hall Park. Zuccotti Park, bounded by Liberty Street, Broadway, Cedar Street, and Trinity Place, is an example of a privately-owned public park with benches and planters provided by the developer of One Liberty Plaza in exchange for a density bonus (refer to **Figure 6-7**). Similar plazas are located around 140 Broadway, 66 John Street, and One Chase Plaza. Historic graveyards with grass and trees

surround Saint Paul's Chapel and Trinity Church. City Hall Park, located in the northeastern corner of the Study Area, is an 8.8-acre landscaped park with a fountain, trees, and a street clock (refer to **Figure 6-7**). South of City Hall Park, a traffic island was landscaped and renamed Millennium Park.

There are many pieces of street furniture throughout the Broadway Corridor. Fire hydrants, mailboxes, newsstands, lampposts and food carts line the streets of the subarea, and an information kiosk is located at the southern tip of City Hall Park. The completion of the first phase of the Fulton Street Corridor improvement project created new sidewalks, granite curbs, lighting, and street furniture on Fulton Street west of Church Street. The City is also in the process of reconstructing Nassau Street, resulting in partial street closures. Construction sheds are common within the Broadway Corridor, as there are multiple building construction and streetscape improvement projects in the area. As a result, sections of streets and sidewalks throughout the Broadway Corridor are temporarily blocked to pedestrian and vehicular traffic (refer to **Figure 6-7**).

Nassau Street will be closed to vehicular traffic during the day on weekdays. The area around the New York Stock Exchange (NYSE), including Broad Street south of Pine Street and north of Beaver Street, and Wall Street east of Broadway and west of William Street, is a restricted access area for vehicles. The street immediately adjacent to the NYSE is also closed to pedestrians (refer to **Figure 6-7**).

Building Uses, Shapes & Forms

The Broadway Corridor is predominately commercial and mixed-use with a range of building heights, shapes, and forms. Tall office and mixed-use buildings, often encompassing half or full blocks, dominate the area south of Cortlandt Street. Taller buildings also line Broadway north of Cortlandt Street, although these buildings are located on smaller sized lots. In contrast, the northeast section of the subarea, roughly bounded by Park Row, Broadway, Cortlandt and John Streets, is characterized by shorter, mixed-use buildings on narrow lots. There are multiple hotel and residential redevelopment projects currently under construction in this mixed-use area, highlighting the recent transformation of Lower Manhattan from a commercial to a mixed-use district. With the exception of the open spaces described above, most buildings in the Broadway Corridor are built-out to the property line, creating uniform streetwalls.

There are also several institutions in the Broadway Corridor. Multiple small churches are located within the subarea, in addition to the much larger Saint Paul's Chapel and Trinity Church. Pace University's main campus is located in the northeast section of the Study Area, encompassing several blocks. City Hall is located on the northern portion of the irregularly shaped block bounded by Broadway, Chambers Street, Centre Street, and Park Row (refer to **Figure 6-7**).

Visual Resources and View Corridors

As a result of the irregular street pattern and densely built-out nature of the Broadway Corridor, most views in the subarea are of buildings. Many historic buildings are important visual landmarks, such as the Beaux-Arts Equitable Building at 120 Broadway and the Art Deco Irving Trust building at 1 Wall Street. The NYSE, on Broad Street, is a unique visual resource with a Greek temple façade, often covered in a large U.S. flag (refer to **Figure 6-7**). The former Chamber of Commerce Building at the corner of Liberty and Nassau Streets is another important visual resource visible from Broadway. This ornate Beaux-Arts structure stands in stark contrast with the modern black glass façade of 140 Broadway.

In addition, Trinity Church, a neo-Gothic structure set between a small yard and historic graveyard, is located at 74 Trinity Place and Saint Paul's Chapel, a Georgian structure also surrounded by a historic graveyard, is at 209 Broadway. Another important visual resource in the area is the landscaped City Hall Park which can be seen from several vantage points in the north-eastern section of the Study Area (refer to **Figure 6-7**).

As in the northern subarea, the WTC Campus is an important visual landmark in the Broadway Corridor. Several east-west streets and the open spaces of Zuccotti Park and Saint Paul's Chapel provide direct views of the WTC Campus's temporary construction fencing and partially constructed buildings. While northern east-west streets provide views of the Classical Revival/Art Deco Federal Office Building/U.S. Post Office, the narrow widths of other streets in the subarea, compounded by the tall and densely developed buildings characteristic of the Broadway Corridor, limit views of the WTC Campus in the southern and eastern sections of the subarea.

Greenwich South Corridor

Natural Features, Street Patterns & Block Shapes

The topography of the Greenwich South Corridor slopes down slightly toward the Hudson River to the west and south. No natural features exist within this southern subarea as the area is built-out, is a highly populated urban environment, and has few open space resources. Street patterns and block shapes are somewhat irregular in the subarea as there is no standard street grid. Of the six east-west streets in the Greenwich South Corridor, Rector Place is the only one that crosses the entire subarea. Trinity Place is not parallel with the other north-south streets in the Greenwich South Corridor, resulting in a small traffic island at the intersection with Greenwich and Edgar Streets. The entrance and exit ramps of the Brooklyn Battery Tunnel connect directly to West Street/Route 9A and Trinity Place, cutting off Greenwich and Washington Streets.

Streetscape

The Greenwich South subarea contains no public plazas or street trees, and has only two small open spaces at the southern edge of the Study Area, bounded by Edgar Street, Trinity Place, and Greenwich Street. The FDNY Memorial Wall is located on the east side of Greenwich Street just south of Liberty Street. Parked cars line most streets and street furniture such as fire hydrants, mailboxes, newsstands, lampposts, and food carts are found throughout the subarea. An elevated pedestrian walkway connects the two portions of Morris Street that lie to the east and west of the Brooklyn Battery Tunnel entrance.

Construction sheds are also common within the subarea. Several roads and sidewalks in the Greenwich South Corridor are fully or partially closed due to building construction and streetscape improvement projects, such as the intersection of Washington Street and Rector Place pictured in **Figure 6-8**. Just south of the WTC Campus, crowd managing devices and barriers line the streets. For example, Thames Street between Trinity Place and Greenwich Street is closed to vehicular traffic between 8AM and 8PM by temporary metal barriers (refer to **Figure 6-8**).

Building Uses, Shapes & Forms

The Greenwich South Corridor has a variety of land uses located in buildings of varying heights and bulks due to irregular block shapes. Most buildings in the subarea are taller structures encompassing half or whole blocks, and are generally built-out to the property line, resulting in uniform streetwalls. The block bounded by Rector Place, Carlisle Street, Greenwich Street, and Washington Street and the block bounded by Greenwich Street, Rector Place, Edgar Street, and Trinity Place are unique to the subarea, with smaller mixed-use buildings on narrow lots.

Office buildings dominate the area west of Greenwich Street, such as the American Stock Exchange and 40 Rector Street. Institutional buildings in the area include the High School for Leadership and Public Service at 88 Trinity Place and the High School of Economics and Finance at 96 Trinity Place. The Brooklyn Battery Tunnel entrance and exit ramps are located at the southern edge of the Study Area, and are accompanied by the large Battery Parking Garage which can accommodate over 2,000 vehicles. There are several hotels directly south of the WTC Campus, and residential and mixed-use buildings dominate the rest of the subarea. Additionally, multiple new hotels and residences are currently being developed in the Greenwich South Corridor. **Figure 6-8** shows the intersection of

Washington and Rector Streets, with a new hotel under construction at 99 Washington Street, a recently converted residential building at 88 Greenwich Street, and a recently developed residential building at 90 Washington Street. Construction sheds are located on the ground level of each building.

Visual Resources and View Corridors

As a result of the irregular street pattern and densely built-out character of the Greenwich South Corridor, most views down east-west streets are of buildings or West Street/Route 9A. The American Stock Exchange, a massive Art Deco structure across from Trinity Place/Church Street, is an important visual resource in the subarea despite its relatively short height of 14 stories. The FDNY Memorial Wall is an important visual resource located on the east side of Greenwich Street just south of Liberty Street that can only be viewed from a short distance. Additionally, the landmarked St. George's Syrian Church and the landmarked American Stock Exchange Building are located within this area. As in the northern and eastern subareas, the WTC Campus is an important visual landmark in the Greenwich South Corridor (refer to **Figure 6-8**). Washington Street, Greenwich Street, and Trinity Place/Church Street provide direct views to the temporary construction fencing at the WTC Campus and the buildings north of Vesey Street, including the Art Deco Barclay-Vesey Building, the Classical Revival/Art Deco Federal Office Building/U.S. Post Office, and the new 7 WTC. Due to the street alignment and distance from the waterfront, there are no views of the waterfront in the Greenwich South Corridor.

Battery Park City

Natural Features, Street Patterns & Block Shapes

BPC was built on land created by land reclamation on the Hudson River, using soil and rocks excavated during the original construction of the WTC as well as sand dredged off Staten Island. There is an abundant amount of open space in the subarea. Although a planned community, the street pattern of BPC is not a standard grid, resulting in irregular block shapes. Except for West Street/Route 9A, there are no north-south through-streets in the area. South End Avenue runs north-south south of the WFC while North End Avenue runs northeast-southwest north of the WFC. North End Avenue has a planted median, and Rector and Vesey Places have landscaped traffic islands. Due to the Hudson River, most east-west streets in the subarea terminate at the west in cul-de-sacs. A pedestrian and bicycle esplanade runs along the Hudson River on the western edge of BPC and a bicycle lane runs along West Street/Route 9A on the eastern edge of the subarea (refer to **Figure 6-9**). Additionally, there are several elevated pedestrian walkways in BPC; two traverse West Street/Route 9A at Vesey Street and Rector Street, and a third connects WFC buildings over Liberty Street.

Streetscape

While still very urban in character, BPC is visually distinct from the rest of the Study Area as open space is far more prevalent than elsewhere in the Study Area. BPC contains a variety of well-designed street furniture, including benches, tables, bollards, and lampposts. Sidewalks in BPC are wider than in the rest of the Study Area, and trees line all of the streets, with more extensive planting along the many pedestrian and bicycle pathways, open plazas, and park spaces. Immediately west of the WFC is the North Cove Marina, which accommodates boats up to 180 feet in length. Vehicular access to the Marina is restricted by a personnel booth with delta barriers on Liberty Street and the southern portion of North End Avenue (refer to **Figure 6-9**).

Unlike the rest of the Study Area, there are no building construction projects taking place or planned for BPC. Along the eastern border of BPC, the New York State Department of Transportation (NYSDOT) has recently revamped much of West Street/Route 9A, extending the design of Promenade north from West Thames Street and raising the road to match the WTC Campus's elevation. The West Street Promenade project improved the boulevard up to Chambers Street with a landscaped median, bike lanes, and improved at-grade crossings (refer to **Figure 6-9**). Segment 2 of this street

13. View east across Rector Street towards the intersection with Washington Street.

14. View of WTC facing north from Albany Street between Greenwich and Washington Streets.

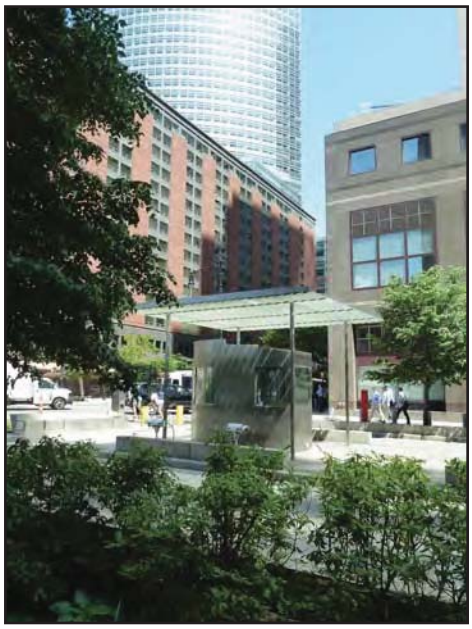
15. Facing east along Thames Street from Greenwich Street.

16. East facade of the High School of Economics and Finance on Trinity Place/ Church Street between Thames and Cedar Streets.

17. View north along the Hudson River Esplanade.

18. Facing southeast from Vesey Street with the WFC in the foreground and 1 WTC in the background.

19. Facing north along the West Street/Route 9A bicycle paths.



20. Guard booth at the intersection of Vesey Street and North End Avenue.

improvement project is currently underway on West Street/Route 9A at the corner of Liberty Street and between Albany and Vesey Streets.

Building Uses, Shapes & Forms

BPC is a predominately commercial, residential, and mixed-use community with substantial open space resources. Buildings are typically bulky and tall, encompassing half or whole blocks. Some buildings are built-out to the property line, but most have surrounding parks and plazas.

North and south of the WFC, buildings are mostly residential with ground-level retail. PS/IS 89 is located in BPC at 450 North End Avenue, and a branch of the New York Public Library is located at 175 North End Avenue. Immediately north of the WFC are the 44-story Goldman Sachs Tower and the Conrad Hotel. The WFC encompasses the central section of BPC, located between Vesey and Albany Streets. It includes Winter Garden, a glass and steel barrel-vaulted public space, an expansive retail mall, and four office towers clad in pink granite (refer to **Figure 6-9**).

Visual Resources and View Corridors

Open space is a significant visual resource in the BPC. The Hudson River and landscaped waterfront can be seen from most of BPC, particularly along the pedestrian and bicycle esplanade, as well as from east-west streets, except for Liberty Street between South End Avenue and West Street/Route 9A which is partially blocked by the WFC's pedestrian bridge. The north-south view corridor along West Street/Route 9A is also blocked by the pedestrian bridges above the highway at Liberty and Vesey Streets. The WTC Campus is an important visual landmark in the area, and can be seen directly from the bicycle lanes and open spaces along West Street/Route 9A. Due to the height of most buildings in the subarea, the temporary construction fencing of the WTC Campus is not visible; however, the Art Deco Barclay-Vesey Building and 1 WTC can be seen from many vantage points in the area north of the WFC (refer to **Figure 6-9**).

F. FUTURE WITHOUT THE PROPOSED ACTION (NO-ACTION)

For the purposes of this urban design and visual resources analysis, it is assumed that all building programs described in the future No-Action conditions section of the land use assessment (refer to Chapter 2, "Land Use, Zoning, and Public Policy"), along with required infrastructure, would be completed and fully occupied by 2019.

Project Site

Natural Features, Street Patterns & Block Shapes

The proposed street configuration under the LMDC Master Plan includes extending Fulton Street east-west and Greenwich Street north-south through the WTC Campus. Within the WTC Campus, Fulton Street would operate one-way westbound. As proposed in the Port Authority of New York and New Jersey's (PANYNJ) Master Plan (Version 10.0), Fulton Street and Vesey Street west of Greenwich Street would be a secure zone with controlled vehicle access. Greenwich Street would operate one-way southbound, while the portion between Barclay and Vesey Streets would be for the private use of 7 WTC tenants pursuant to a December 5, 2007 reciprocal easement agreement among the City of New York, 7 WTC ownership, PANYNJ and LMDC. In the area south of the WTC site, Washington Street would be closed between Liberty and Cedar Streets, with all northbound traffic turning left onto Cedar Street towards West Street/Route 9A.

The planned alignment of Fulton and Greenwich Streets will divide the Project Site into four irregularly shaped quadrants. The two southern-most quadrants, bounded by Liberty Street to the south, will be larger than the two northern quadrants. While the new blocks will still be larger than the surrounding blocks, they will extend the street grid to the west where no streets previously existed.

Streetscape

Additional retail frontage is proposed at street level in many of the planned WTC office buildings. These retail, restaurant, and commercial office uses would bring increased pedestrian traffic to this part of Lower Manhattan. The streetscape would also be enhanced by trees, an element which is expected to play an important role in creating a pedestrian scale adjacent to the new towers. Under the PANYNJ Master Plan, trees would be planted on the southern sidewalk of Vesey Street between West Street/Route 9A and Church Street, on the western side of Church Street, between Liberty and Vesey Streets (with the exception of the segment adjacent to the new WTC PATH Hub), on Liberty Street's northern sidewalk between West Street/Route 9A and Church Street, and throughout the interior of the WTC Campus.

To achieve the secure zones of Vesey and Fulton Streets identified in Version 10.0 of the PANYNJ Master Plan, static barriers, operable barriers and sally ports would be installed to restrict vehicular access adjacent to 1 WTC. Each sally port would consist of a personnel booth controlling a set of operable barriers with sufficient space between them to accommodate a motor vehicle. As shown in **Figure 1-6** in Chapter 1, two sally ports would be located on both Fulton and Greenwich Streets under future No-Action conditions, one immediately east of West Street/Route 9A and the second west of Greenwich Street, to create managed streets. As shown in **Figure 1-7**, it is anticipated that an additional operable barrier would be installed on the Washington Street approach to Vesey Street to control access from the north. This operable barrier would be positioned in the default-up condition, and lowered only as needed to permit entry by authorized vehicles.

Liberty Park would be constructed just south of the Project Site on the block bounded by West Street/Route 9A, Liberty, Greenwich, and Cedar Streets. It would provide a new open space above the planned VSC. The existing pedestrian bridge over West Street/Route 9A would be upgraded and extended onto the elevated park, which would serve as a connection to the green esplanade of BPC.

As an additional streetscape element in the No-Action condition, fixed bollards would be placed at the curb line throughout the WTC Campus, separating the pedestrian sidewalk from the street. These bollards would be located along the perimeter of five blocks: the Liberty Park/VSC block bounded by West Street/Route 9A and Liberty, Greenwich, and Washington Streets; the WTC Memorial block bounded by West Street/Route 9A and Fulton, Greenwich and Liberty Streets; the 1 WTC/PAC block bounded by West Street/Route 9A and Vesey, Greenwich and Fulton Streets; the 2 WTC block bounded by Church Street, Greenwich, Vesey, and Fulton Streets; and the southeastern WTC Campus block bounded by Church Street, Greenwich, Fulton, and Liberty Streets.

Building Uses, Shapes & Forms

In the 2019 No-Action condition, it is anticipated that construction of Towers 1 through 4, the National September 11th Museum, the PAC, and the WTC PATH Hub will be complete. 1 WTC will be the tallest of the structures, at 104 stories. Additionally, an 88-story office building (2 WTC) will be in the northeast quadrant. In the southeast quadrant, a 71-story office building (3 WTC) and a 72-story office building (4 WTC) will be completed. These uses will be in keeping with former uses at the WTC site and will add cultural uses supportive of existing uses in the Study Area. The height and design of the buildings will be in keeping with the tradition of modern development on the WTC Campus and in the broader Study Area. The PAC will be located on the northern area of the WTC site,

at the location currently occupied by the PATH station. The new WTC PATH Hub, designed by Santiago Calatrava, will be located along Church Street, between 2 and 3 WTC. As shown in **Figure 1-6** in Chapter 1, "Project Description," the bulk of the development will circle the WTC Memorial on the north, east, and south sides.

On the southernmost portion of the Project Site, between Liberty and Cedar Streets, the new VSC will conduct screening for all buses, trucks and cars entering the WTC Campus. The VSC will provide access for all delivery and service vehicles and will include up to approximately 500 parking spaces for tenants and approximately 67 parking spaces for buses. Vehicular access to the VSC will be via a ramp on Liberty Street, east of West Street/Route 9A.

Additionally, St. Nicholas Greek Orthodox Church, originally located just south of the WTC Campus at 155 Cedar Street but destroyed by falling rubble from the Twin Towers, would be reconstructed at 130 Liberty Street in the 2019 No-Action condition.

Visual Resources and View Corridors

Four new major WTC towers are expected to be complete by 2019, with 1 WTC serving as an important visual resource for miles. The WTC Memorial and Liberty Park will also be visual amenities for Lower Manhattan residents, workers, and visitors. The Santiago Calatrava-designed PATH Hub, with its glass and steel "wings" will be a unique visual resource in the area. The Art Deco Barclay-Vesey Building and the Classical Revival/Art Deco Federal Office Building/U.S. Post Office will continue to serve as important visual resources in the area.

With the extension of Fulton and Greenwich Streets and the removal of the construction equipment currently surrounding the Project Site, new view corridors will be created, improving visual connection across the entire WTC Campus. Although the new tall modern towers will block some views across the Project Site, the towers will be a visual resource in and of themselves, enhancing the pedestrian experience from its current conditions.

Study Area

North of the WTC Campus

Natural Features, Street Patterns & Block Shapes

No changes are anticipated to natural features, street patterns, or block shapes within the northern subarea by 2019. The extension of Greenwich and Fulton Streets would allow for increased vehicular circulation in the surrounding streets, possibly resulting in minor decreases in traffic volumes on some east-west streets in this subarea. The extension of Greenwich Street through the WTC Campus will restore its historic alignment, likely resulting in higher traffic volumes on Greenwich Street.

Streetscape

No changes are anticipated to the streetscape in the area north of the WTC Campus by 2019. Some active uses at ground level on the WTC Campus will face north towards this subarea. In particular, the new office and retail uses are expected to draw additional pedestrian traffic into the area. Additionally, street trees along Vesey Street will create a green connection between City Hall Park, St. Paul's Chapel, and BPC.

Reconstruction of Chambers Street is expected to be completed by 2019. Construction sheds would be removed, and the pedestrian experience would be enhanced with new roadways, curbs, sidewalks, traffic signals, and trees. Additionally, as part of the PANYNJ Master Plan, bollards would line the southern sidewalk along Vesey Street between West Street/Route 9A and Church Street.

Building Uses, Shapes & Forms
No changes are anticipated to the building uses, shapes and forms within this subarea by 2019. The new office and retail uses along the northern portion of the WTC Campus would be consistent with building uses to the north of the WTC Campus. The PAC will introduce a new cultural institution to the neighborhood that is expected to increase pedestrian traffic. The completion of the BMCC Fiterman Hall reconstruction has resulted in more foot traffic and will contribute to a hub of cultural uses in the subarea. As building heights in this subarea range from three to sixty stories, the height of the new buildings on the WTC Campus would be consistent with the array of sizes of buildings in the Study Area. The modern glass and metal palette of the new buildings would harmonize with the other modern buildings found in the subarea. The passageway between 1 WTC and the PAC would relate to the alignment of the Barclay-Vesey Building and Fiterman Hall to the north.

Visual Resources and View Corridors
No changes are anticipated to existing visual resources and view corridors within the area north of the WTC Campus by 2019. While the construction of new buildings in the northern portion of the WTC Campus would block some views of the northern subarea, the extension of Greenwich Street south through the WTC Campus would provide increased view corridors in this portion of the Study Area.

Broadway Corridor

Natural Features, Street Patterns & Block Shapes
No changes are anticipated to natural features, street patterns, or block shapes within the Broadway Corridor by 2019. The extension of Greenwich and Fulton Streets would allow for increased vehicular circulation in the surrounding streets. The extension of Fulton Street through the WTC Campus would relate better to the street patterns and block shapes of the Broadway Corridor and serve to visually integrate development on the WTC Campus into the surrounding area, especially along Fulton Street.

Streetscape
Several changes are anticipated to the streetscape in this subarea by 2019, including: Broadway from Vesey to Rector Streets will be reconstructed from 2013 to 2017; the Fulton Street Transit Center will open; a new Pace University dormitory will open; Century 21 will have expanded its building; Fulton Street reconstruction will be complete; and the Fulton/Nassau Crossroads Program will be complete. New buildings along Trinity Place/Church Street would provide active retail uses facing the existing retail across the street. The trees along Trinity Place/Church Street's western sidewalk would provide additional visual interest.

Building Uses, Shapes & Forms
The retail bases of the new office towers along Church Street would be consistent with the retail bases and heights of many office buildings found throughout this subarea, especially along Broadway, Nassau and Broad Streets.

The design of the new WTC buildings would be in keeping with the appearance of other modern buildings in the Study Area. It is expected that the building materials used for planned construction would harmonize with the surrounding buildings and continue the modern evolution of building styles in the Study Area. This trend is expected to continue along the Broadway Corridor with several large-scale buildings slated to be completed by 2019, including a new 21-story hotel at 24 John Street replacing the site's existing six-story structure, a 32-story hotel replacing a parking lot at the corner of Beekman and William Streets, an 18-story hotel replacing former low-rise structures at 49 Ann Street, and a new 28-story residential building at 113 Nassau Street. These new structures highlight the shift to more residential and hotel uses in Lower Manhattan, which would be increasingly evident by 2019.

Visual Resources and View Corridors

No changes are anticipated to existing visual resources and view corridors within the eastern subarea by 2019. Development of the WTC Campus would block some view corridors that are available under current conditions: views of St. Paul's Chapel and the East River Savings Bank would be blocked from the west, and views west toward the WFC from the Broadway Corridor would be blocked as well. However, these views are not unique, as views of these visual resources are available from many other locations within the greater Study Area. Views of other important visual resources, such as Trinity Church, the Equitable Building, the Irving Trust Building, and the NYSE would not be blocked.

The extension of Fulton Street west through the WTC Campus would provide increased view corridors in this portion of the Study Area.

Greenwich South Corridor

Natural Features, Street Patterns & Block Shapes

No changes are anticipated to natural features, street patterns, or block shapes within the Greenwich South Corridor by 2019. With Greenwich Street extended through the WTC Campus, the Greenwich South Corridor would be reconnected to the area north of the WTC Campus and Tribeca. Traffic volumes in this area would be expected to increase as a result of extending Greenwich Street through the WTC Campus. The new section of Greenwich Street would serve to reintegrate the urban fabric south of the Project Site. Further, the WTC Campus block arrangement and Liberty Park would help integrate the Project Site with the built fabric of the Greenwich South Corridor.

Streetscape

A number of planned No-Action developments would likely be completed in this subarea by the 2019 build year, modifying the streetscape by filling voids in the street wall. No other substantive changes are anticipated to the streetscape in this subarea by 2019.

Building Uses, Shapes & Forms

Several new high-rise developments would be constructed in the Greenwich South Corridor by 2019. By 2014, a 50-story hotel at 99 Washington Street would replace the parking garage that formerly occupied the site. The modern building would use metal panels to attract and reflect light, mirroring the modern palette of the new WTC Campus towers. Nearby, a 50-story residential building with retail space is planned for 111 Washington Street. A 28-story hotel with 5,000 square feet of retail space would be constructed on the currently vacant parcel at 133 Greenwich Street by 2015. At 50 Trinity Place, a 28-story hotel is planned, and a 60-story residential building would replace the vacant 10-story structure at 18-22 Thames Street. At 50 West Street/50 Little West Street, a 63-story hotel and condominium building with retail, restaurant, and meeting spaces would also be completed by 2019.

Visual Resources and View Corridors

Liberty Park would be a major new visual resource within the northern portion of the Greenwich South Corridor. The street-level view corridor up Greenwich Street would be opened, and Washington Street, while closed to vehicular traffic between Cedar and Liberty Streets, would offer a view corridor of the park and the central buildings around the WTC Memorial.

The construction of the new WTC Campus buildings would block some northern views that are currently available across the Project Site. However, these views are not unique, as views of these visual resources are available from many other locations within the broader Study Area. Views of other important visual resources, such as the American Stock Exchange, 75 West Street and 90 West Street, would not be blocked.

Battery Park City

Natural Features, Street Patterns & Block Shapes
No changes are anticipated to natural features, street patterns, or block shapes within BPC by 2019. The extension of Greenwich and Fulton Streets would allow for increased vehicular circulation on the surrounding streets. The WTC Campus and BPC would remain connected via Liberty and Vesey Streets at ground level and via the two pedestrian bridges over West Street/Route 9A. The pedestrian bridge at Liberty Street would be upgraded and extended to the elevated Liberty Park, improving pedestrian access between BPC and Lower Manhattan.

Streetscape
No changes are anticipated to the streetscape in the western subarea by 2019. With the removal of fencing along West Street/Route 9A, BPC would face a completed streetscape along the west side of the WTC Campus that would be dramatically different from the current condition. Trees along the West Street/Route 9A boundary of the WTC Memorial would be a visual connection to the open spaces located in and around BPC. The enhancements to the elevated pedestrian bridge at Liberty Street would be an additional improvement to the pedestrian experience.

Building Uses, Shapes & Forms
No changes are anticipated to the building uses, shapes and forms within this subarea by 2019. The use and height of the new WTC Campus buildings, as well as their commercial and institutional uses, would be consistent with other buildings in BPC. The modern design of the structures would harmonize with the modern buildings found in BPC. The tall height of the new WTC buildings would serve to unify the towers of BPC with the remainder of the Study Area.

Visual Resources and View Corridors
No changes are anticipated to existing visual resources and view corridors within BPC by 2019. The completion of the WTC Campus redevelopment, with its open space and new modern structures would provide visual resources along the east side of BPC as well. The new structures would limit views across the WTC Campus, including two one-story buildings between West Street/Route 9A and the WTC Memorial, which are necessary for subway ventilation. Additionally, the view corridor along the extended Fulton Street would visually connect BPC with Trinity Place/Church Street and Broadway.

G. FUTURE WITH THE PROPOSED ACTION (WITH-ACTION)

The Proposed Action would not change any of the natural features, street patterns, block shapes, or building uses, shapes or forms on the Project Site or in the greater Study Area. These urban design features would be the same as described in the No-Action condition, and are not detailed further in the With-Action condition. As the Proposed Action would introduce new street furniture (security elements), including static barriers, operable barriers, personnel booths, and related security devices within the public right-of-way, this section considers potential impacts of the Proposed Action on the streetscape and on visual resources and view corridors by 2019.

Project Site

For the purpose of analyzing any potential impacts of the Proposed Action on the urban design and visual resources of the Project Site, the specific security elements of each of the screening zones are analyzed individually. The map in **Figure 6-10** shows the proposed location of these zones.

Table 6-1
Screening Zone Components

Component	Description/Guidelines
Personnel Booth	As the largest component of the screening zone, the personnel booth must be capable of holding 1-2 personnel responsible for the operation of the screening zone. Personnel booths must have security-rated enclosures, all season conditioned interior, 360° vision panels and housing for controls equipment. Each personnel booth would be up to approximately eleven feet tall with a building footprint measuring up to approximately twelve feet by six feet. The materials and size of the personnel booths would be designed to integrate into the existing streetscape and allow unimpeded pedestrian flow to the maximum extent possible, while ensuring WTC Campus safety.
Equipment House	The equipment house would contain the necessary equipment to keep the personnel booth functioning, including power and communication connections, power unit barriers and snow melt systems. The size of these structures would vary depending on the size, type, and number of barriers being controlled and the size and extent of the supporting power and communication equipment. The equipment booths would be designed to be consistent with the personnel booths and to keep the structures' footprint as small as feasible while having access from all sides.
Sally Port	The sally port would range in length from approximately 30 feet to approximately 160 feet, depending on the vehicles each individual sally port would accommodate. Each sally port would be comprised of operable barriers controlled from the personnel booth, lighting and signal poles, and an equipment house. Some sally ports may also have vehicle scales.
Pedestrian Barrier	Connecting the personnel booth and equipment house at some screening zones, these barriers would be low in height and constructed of perforated steel paneling. Pedestrian barriers would be installed on the pedestrian side of the personnel booth and equipment house structures.
POV Scale	POV scales would be located between operable barriers at a few of the screening zones. They would be flush with the street, and would serve as a security measure to screen entering and exiting vehicles.
Denial Barrier	Denial barriers would be located in the roadway at the interior of all screening zones. Their operation would be controlled from the personnel booth.
Access Barrier	Access barriers would be located in the roadway at the exterior of entry screening zones. Their operation would be controlled from the personnel booth.
Egress Barrier	Egress barriers would be located in the roadway at the exterior of exit screening zones. Their operation would be controlled from the personnel booth.
Lighting and equipment Pole	To reduce potential clutter, the minimum number of poles would be erected, and existing light poles would be utilized whenever possible. Their design would match that of the streetscape lighting and they would be placed so as not to impede pedestrian circulation.
Stop/Go Signal Pole	Signal poles would be designed in a cohesive fashion with existing lighting and equipment poles. Conforming to the American Association of State Highway and Transportation Officials (AASHTO) Standards, their mounting height would range from four-feet, six-inches to seven-feet, six-inches depending on the vehicles the screening zone would be serving.
Fixed bollards	To adhere to safety standards, the fixed bollards would be 36-inches tall and placed at four foot intervals. Their design would be consistent with the style of the bollards that are part of the WTC Campus streetscape elements.

While the amount and arrangement of the security elements incorporated into each location would vary, the zones would be developed using a uniform "kit-of-parts" design approach to ensure consistent design throughout the WTC Campus. As such, each booth would be visually similar to the other booths across the WTC Campus. **Table 6-1** provides a general description of each of the screening zone components, along with standardized form and aesthetic guidelines where applicable.

In the design development of each of these components, important consideration was given to the existing context. The choice of material and consistency in the design aims to provide continuity between the WTC streetscape design, the contemporary architecture of the Study Area, and the established streetscape and urban design programs that have been developed elsewhere in New York City. The designs and choice of materials took cues from common standardized area streetscape elements like newsstands, bus shelters, and public restrooms (see **Figure 6-4**).

As impacts to views from vehicles are not considered in a visual resources analysis, the impact on visual corridors will be assessed only for pedestrian views from sidewalks and public spaces. The visual impact analysis will focus on the potential for the proposed security elements to affect visual resources and view corridors. Conceptual graphics showing the proposed placement and form of these structures are included in **Figures 6-11** through **6-18**.

Vesey Street at West Street/Route 9A

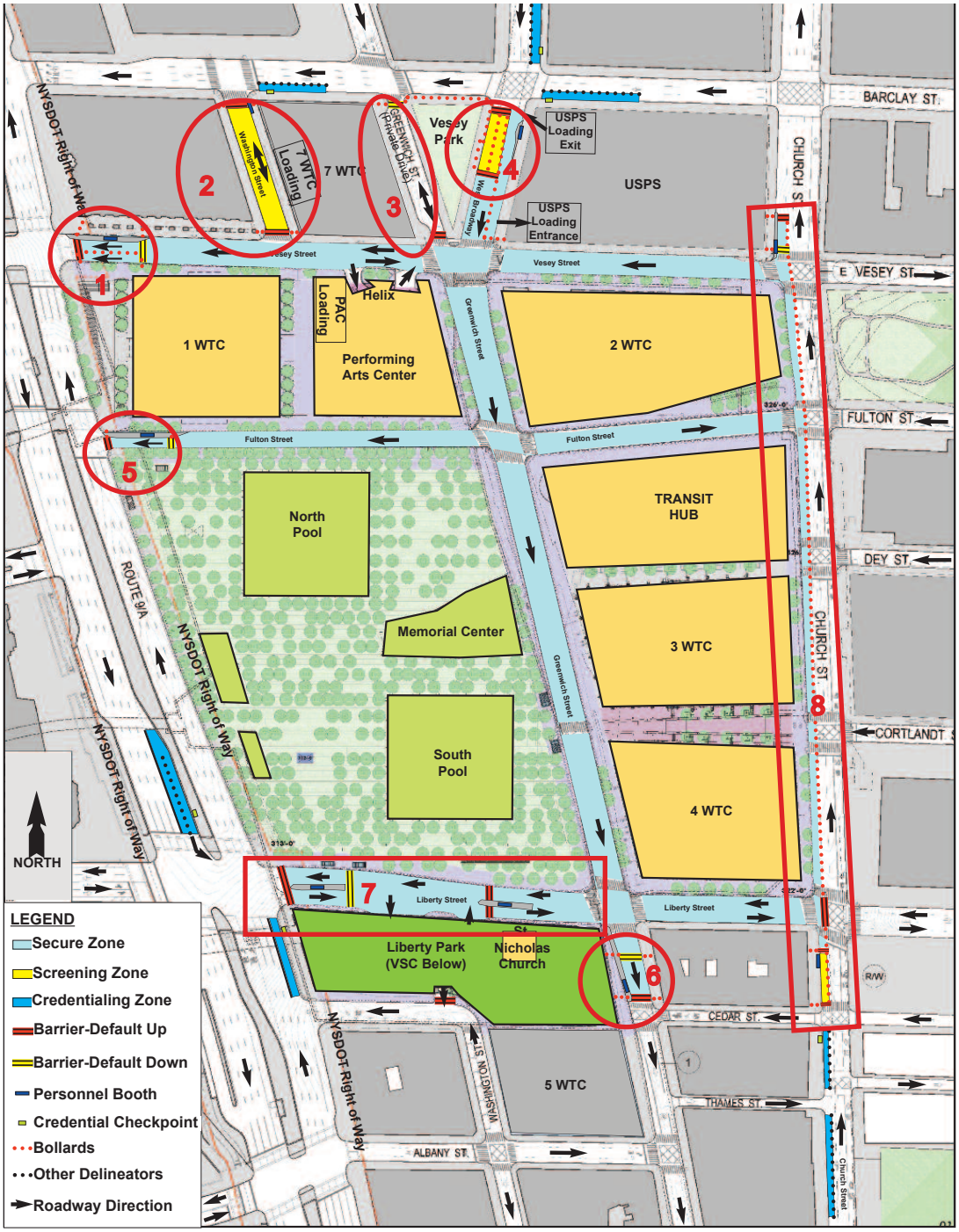
Streetscape

Vesey Street at West Street/Route 9A would become a two-lane exit point to West Street/Route 9A (northbound and southbound) for all vehicles exiting the WTC Campus. New streetscape elements would include a 35-foot-long sally port consisting of a set of operable barriers, a personnel booth and equipment house, fixed bollards, and lighting and signal poles, as well as the extension of a portion of the existing southern sidewalk to accommodate the personnel booth and equipment house. The sidewalk extension would allow the entire width of the sidewalk to remain free of obstructions and available for pedestrian use (see **Figure 6-11**).

The sally port would be 24 feet wide, accommodating two-lanes of westbound exiting vehicles. The vehicles would first pass over the denial barrier, and an egress barrier would be located as the western end of the sally port. Operation of the sally port would be controlled from a personnel booth located on the southern sidewalk extension. The personnel booth would be connected to an equipment house by a canopy to the east, visually connecting the two structures and concealing security lighting, cameras and other necessary screening zone equipment from the surrounding streetscape.

Fixed bollards would be placed to the west of the personnel booth and to the east of the equipment house. These 36-inch bollards would be placed at four-foot intervals, from the northern edge of the sidewalk extension south where they would intersect with the planned bollards at the edge of curb along Vesey Street. Additionally, a light and equipment pole would be located on the sidewalk just south of each barrier, and a stop/go signal pole would be on the southern sidewalk below the access barrier. The material used for these poles would be consistent with the light poles in the surrounding area.

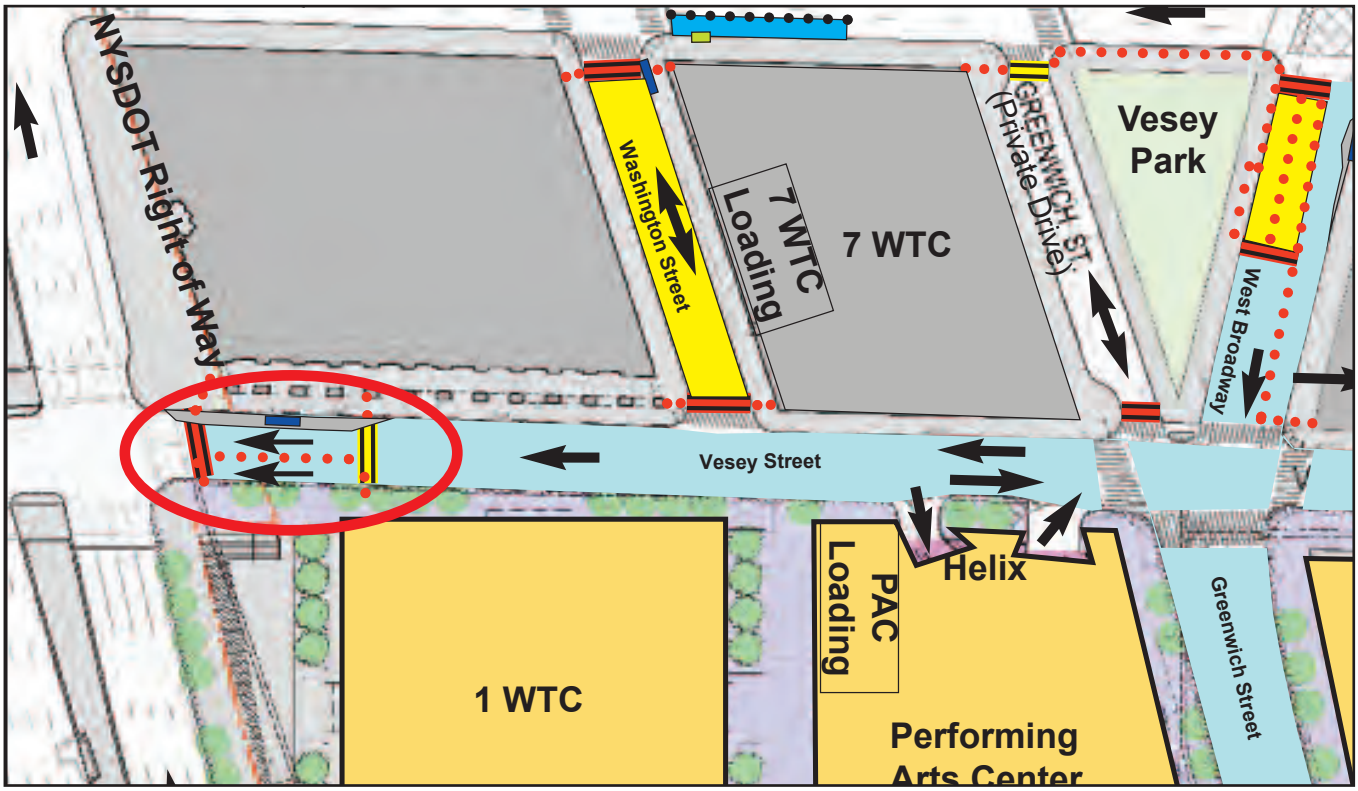
The extension of the sidewalk and the placement of the personnel booth and equipment house on the sidewalk extension would allow for the minimum impact on pedestrian use of the sidewalk in this area. The lack of sidewalk space on the northern side of the street due to the Barclay-Vesey Building arcade and the visually prominent stairway access to 1 WTC on the southern side necessitate the southern sidewalk extension. The extension would create a 17-foot, four-inch clear zone for pedestrian circulation on the southern sidewalk. The narrow six-foot depth of the two structures further facilitates uninterrupted pedestrian flow.



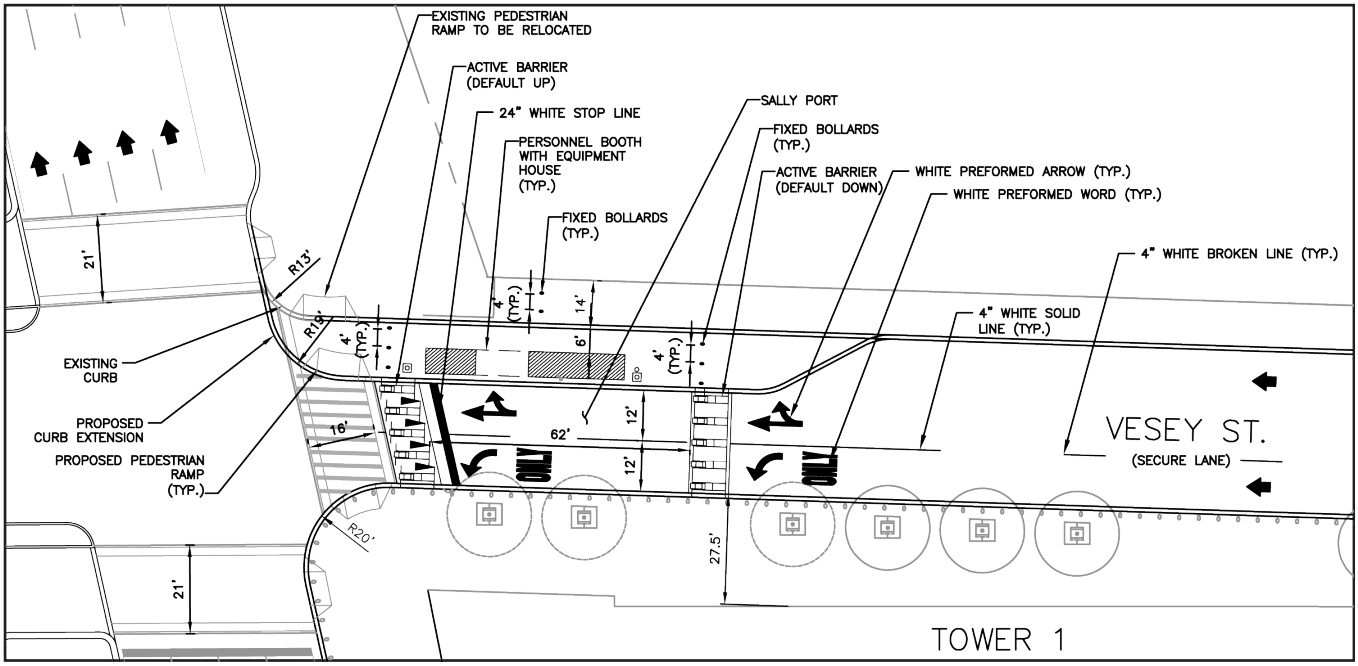
Note: Image is schematic and for conceptual purposes only.

Inset # and Location:

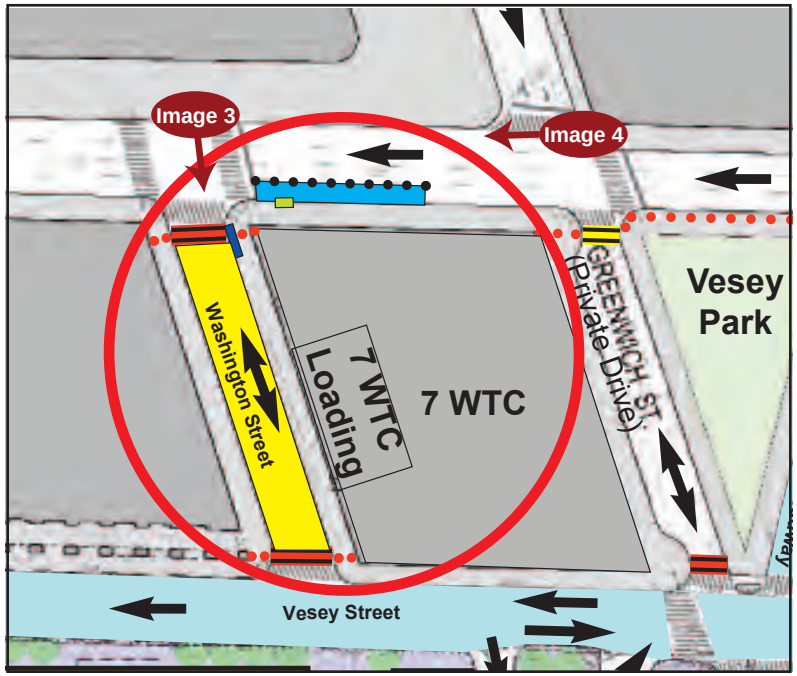
1. Vesey Street at West Street/Route 9A
2. Washington Street between Barclay and Vesey Streets
3. Greenwich Street at Barclay Street
4. West Broadway at Barclay Street
5. Fulton Street at West Street/Route 9A
6. Greenwich Street at Cedar Street
7. Liberty Street between West Street/Route 9A and Greenwich Street
8. Trinity Place/Church Street



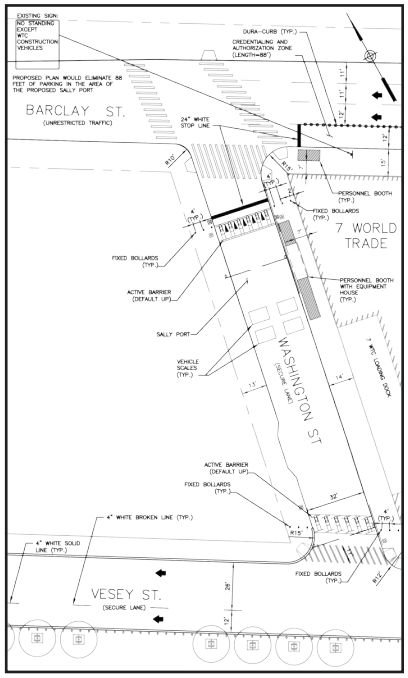
1. Illustrative Campus Security Plan: Vesey Street at West Street/Route 9A (Inset #1, refer to Figure 6-10).



2. Concept Plan View: Vesey Street at West Street/Route 9A.



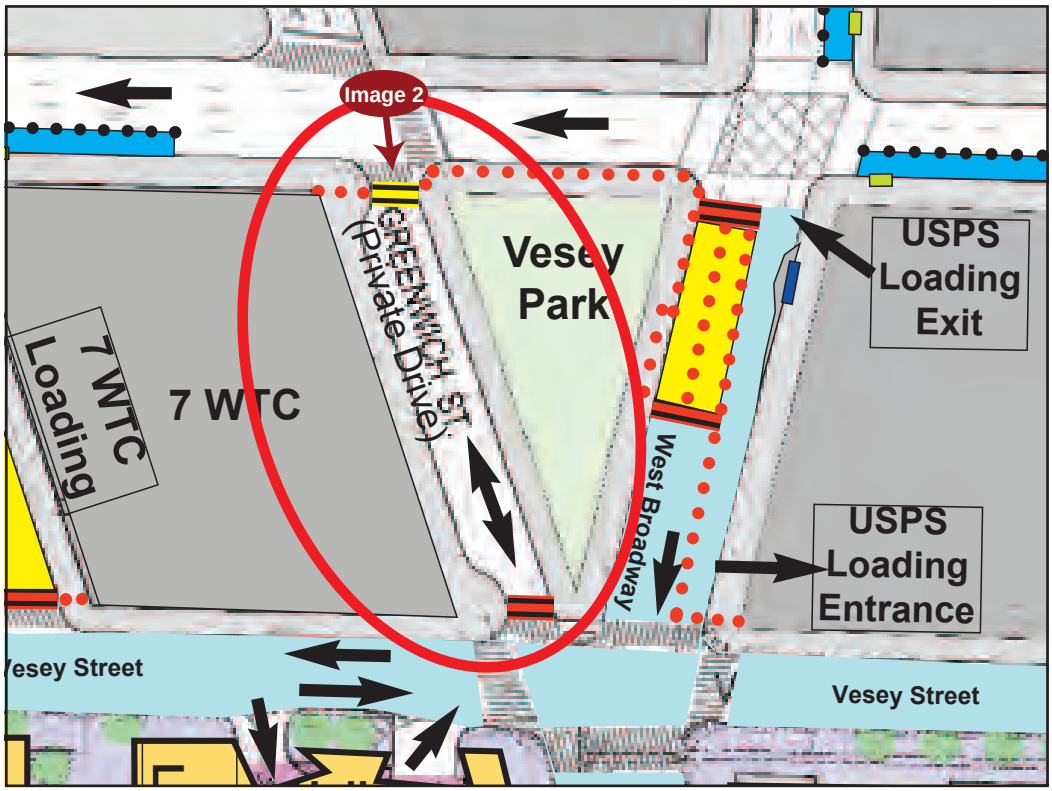
1. Illustrative Campus Security Plan: Washington Street between Barclay and Vesey Streets (Inset #2, refer to Figure 6-10).



2. Concept Plan View: Washington Street between Barclay and Vesey Streets.

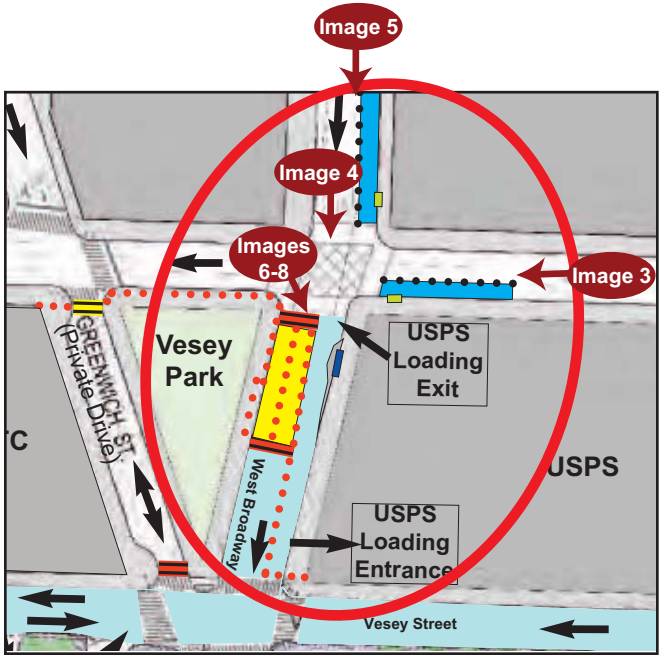
3. Existing view south along Washington Street from Barclay Street.

4. Existing view west along Barclay Street from Greenwich Street.

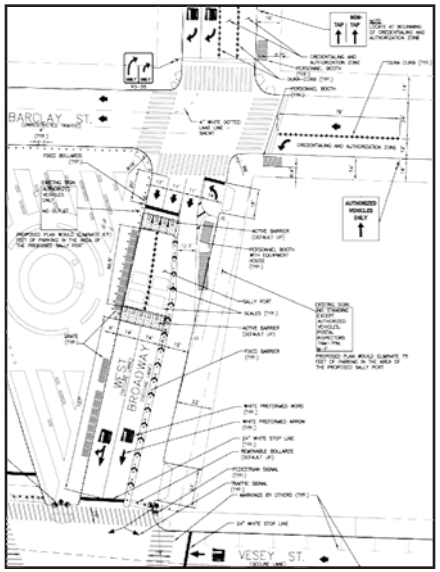


1. Illustrative Campus Security Plan: Greenwich Street (Inset #3, refer to Figure 6-10).

2. Existing view south along Greenwich Street from Barclay Street.



1. Illustrative Campus Security Plan: West Broadway (Inset #4, refer to Figure 6-10).



2. Concept Plan View: West Broadway.

3. Existing view west along Barclay Street from a point west of Church Street.

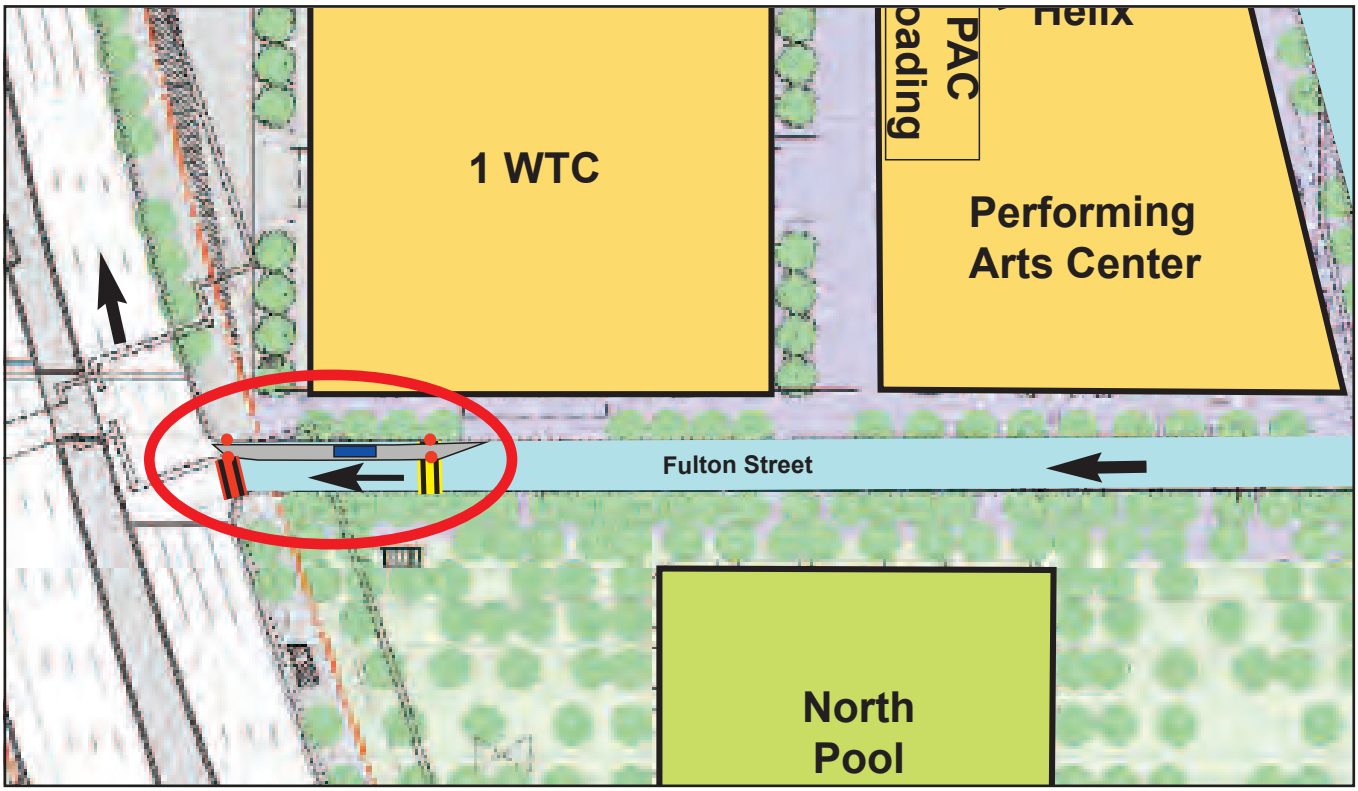
4. Existing view south along West Broadway from area north of Barclay Street.

5. Existing view south along West Broadway from Park Place.

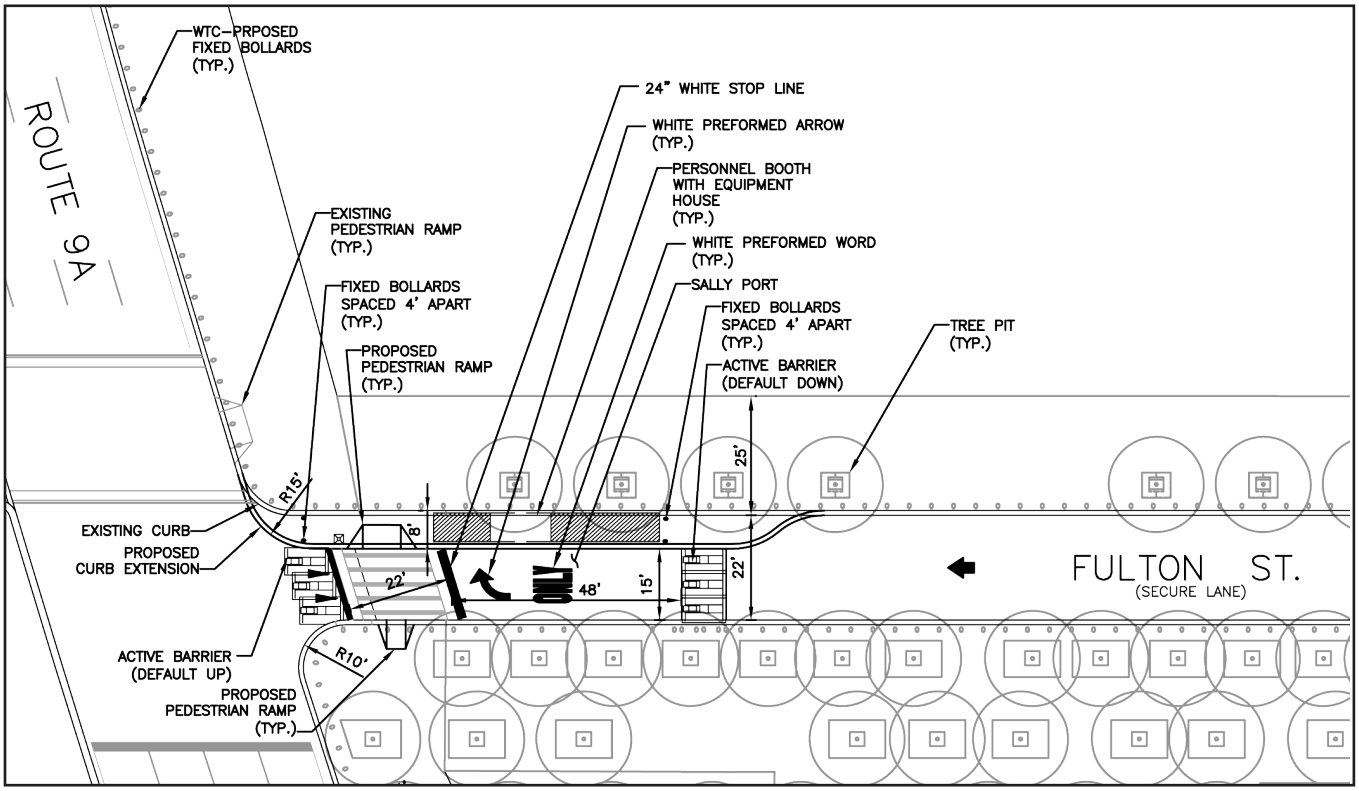
6. Existing view south on West Broadway from Barclay Street.

7. Illustrative pedestrian view south on West Broadway from Barclay Street in the No-Action Condition.

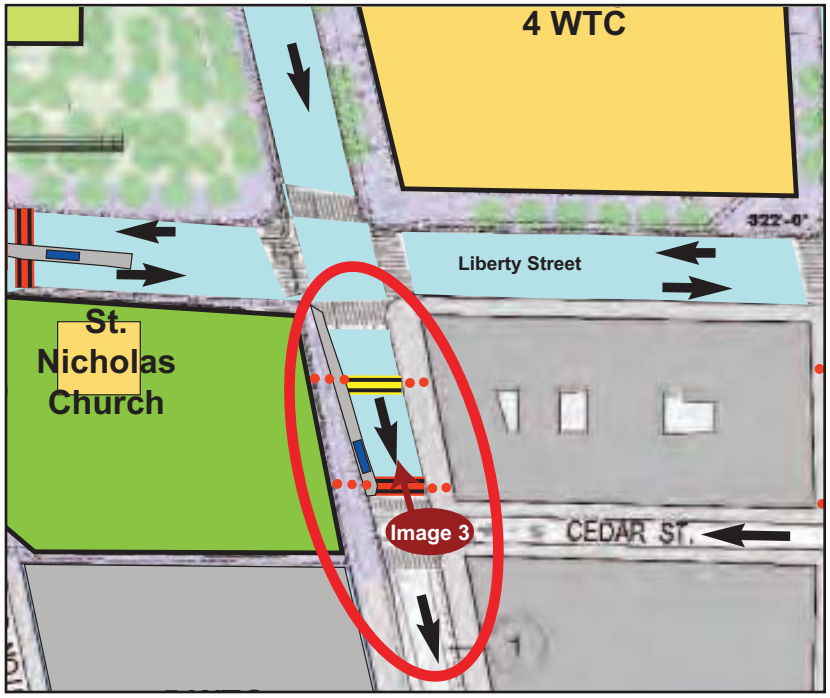
8. Illustrative pedestrian view south on West Broadway from Barclay Street in the With-Action Condition.



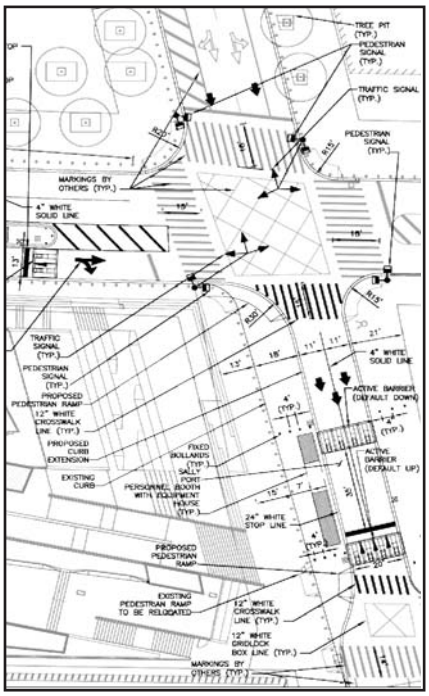
1. Illustrative Campus Security Plan: Fulton Street at West Street/Route 9A (Inset #5, refer to Figure 6-10).



2. Concept Plan View: Fulton Street at West Street/Route 9A.

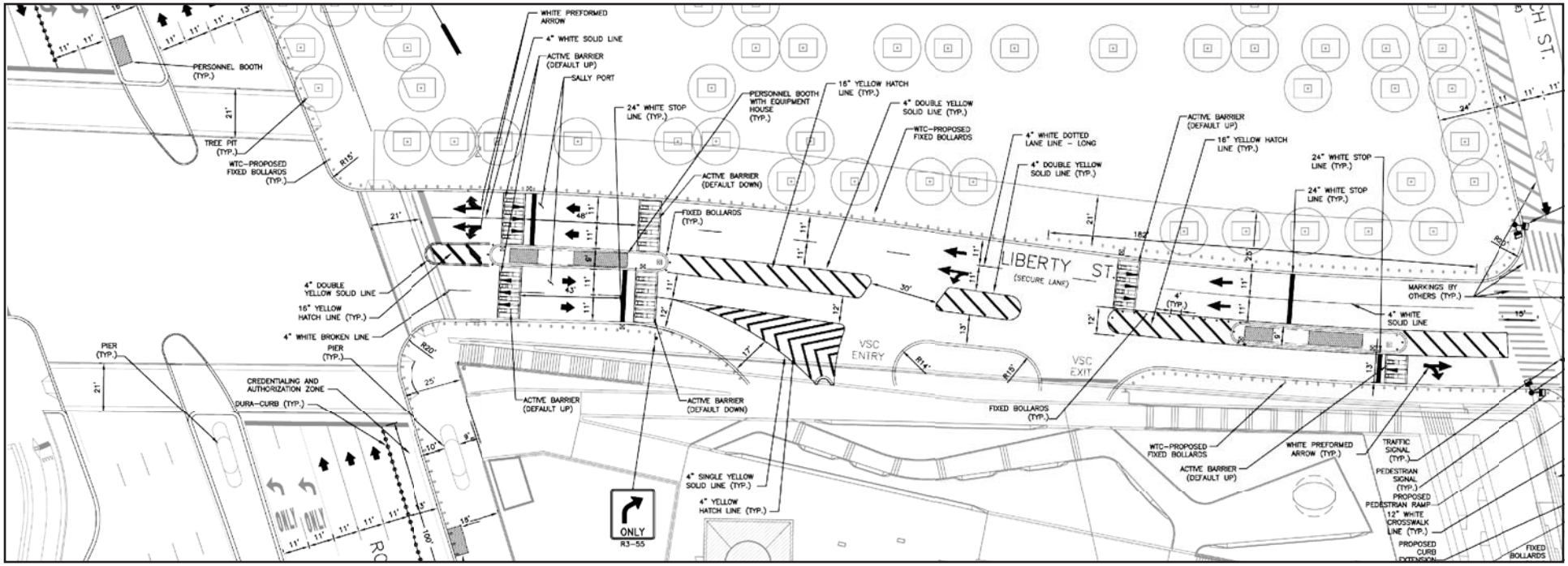


1. Illustrative Campus Security Plan: Greenwich Street at Cedar Street (Inset #6, refer to Figure 6-10).

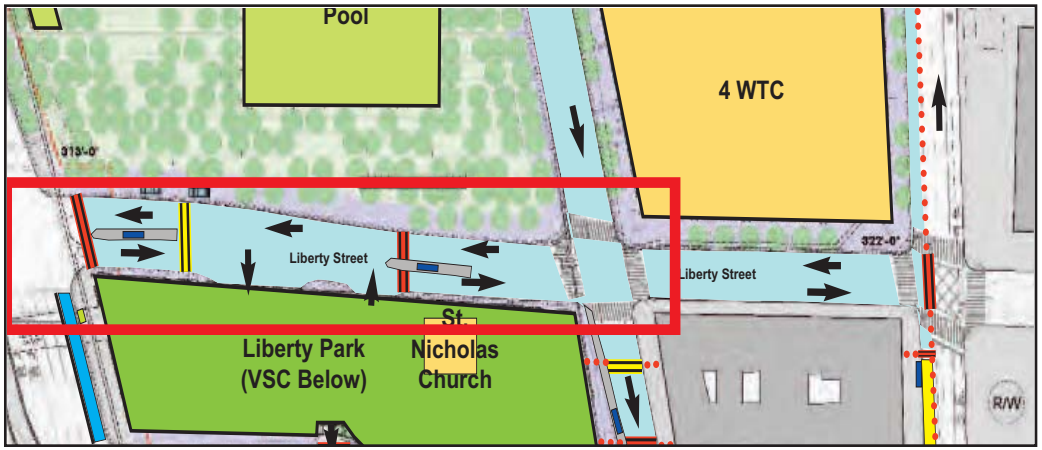


2. Concept Plan View: Greenwich Street at Cedar Street.

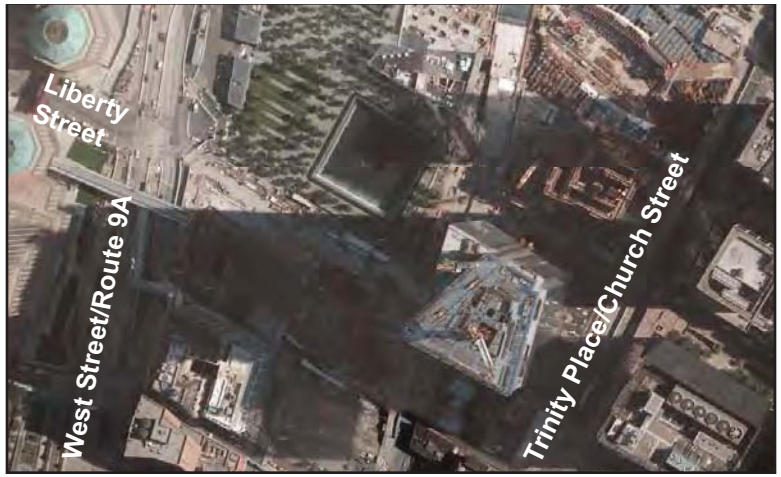
3. Existing view north along Greenwich Street from Cedar Street.



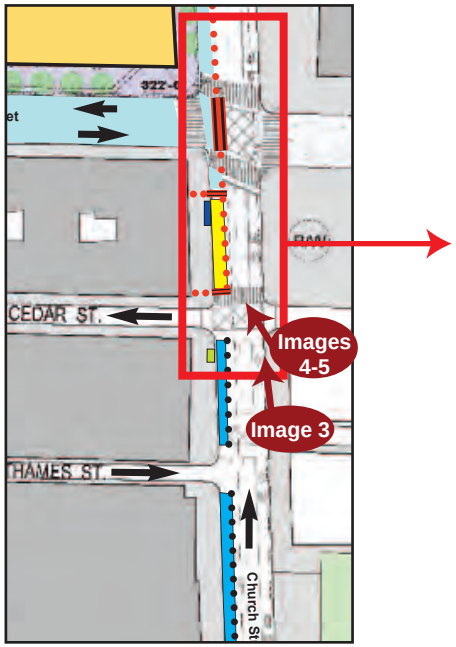
1. Concept Plan View: Liberty Street between West Street/Route 9A and Trinity Place/Church Street.



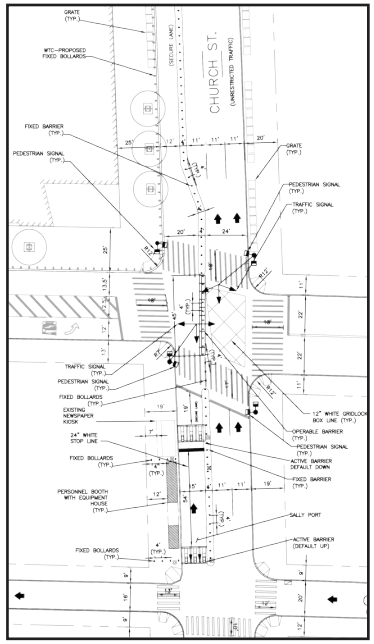
2. Illustrative Campus Security Plan: Liberty Street between West Street/Route 9A and Greenwich Street (Inset #7, refer to Figure 6-10).



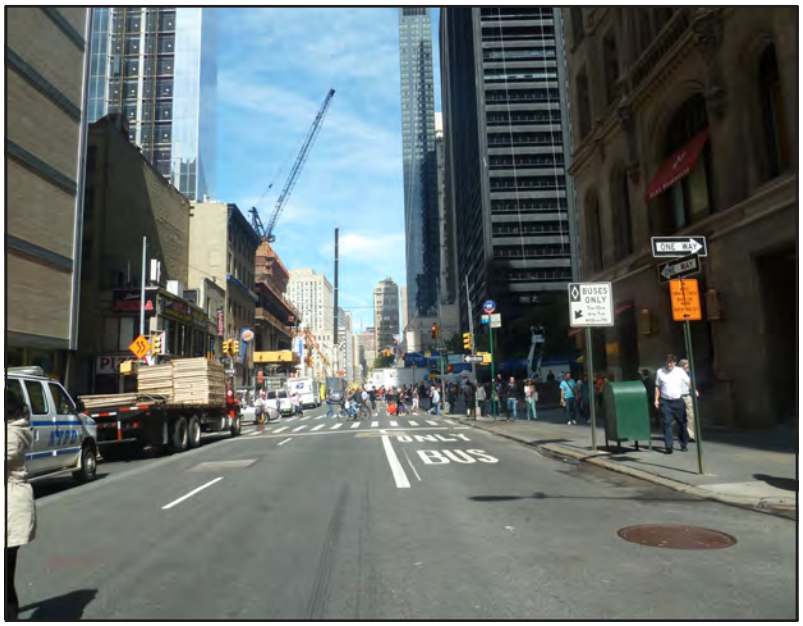
3. Aerial view of Liberty Street between West Street/Route 9A and Trinity Place/Church Street



1. Illustrative Campus Security Plan: Trinity Place/Church Street (Inset #8, refer to Figure 6-10).



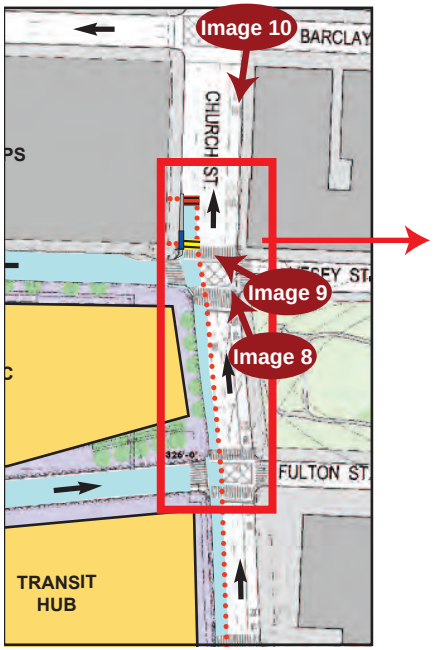
2. Concept Plan View: Trinity Place/ Church Street at Liberty Street.



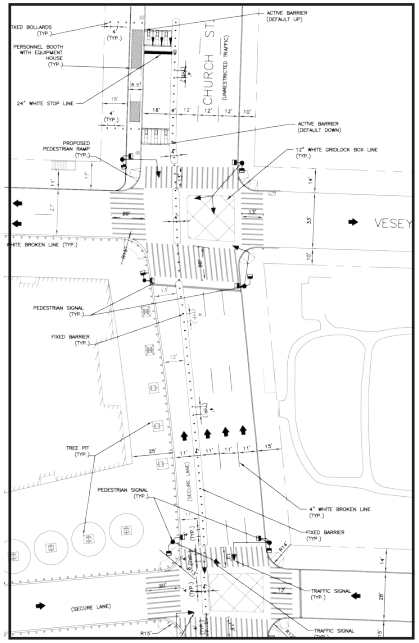
3. Existing view north along Trinity Place from Thames Street.

4. Illustrative pedestrian view of Trinity Place/Church Street from Cedar Street in the No-Action Condition.

5. Illustrative pedestrian view of Trinity Place/Church Street from Cedar Street in the With-Action Condition.



6. Illustrative Campus Security Plan: Church Street (Inset #8, refer to Figure 6-10).

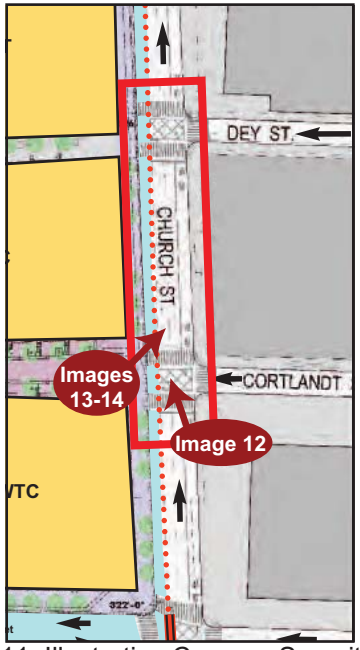


7. Concept Plan View: Church Street at Vesey Street.

8. Existing view north along Church Street from a point south of Vesey Street.

9. Existing view northwest along Church Street from Vesey Street.

10. Existing view south along Church Street from a point north of Barclay Street.



11. Illustrative Campus Security Plan: Trinity Place/Church Street (Inset #8, refer to Figure 6-10).

12. Existing view north along Church Street from Cortlandt Street.

13. Illustrative pedestrian view of Church Street between Cortlandt and Dey Streets in the No-Action Condition.

14. Illustrative pedestrian view of Church Street between Cortlandt and Dey Streets in the With-Action Condition.

The new streetscape elements have been designed to be in visual continuity with the surrounding street furniture. As described in **Table 6-1**, the choice of materials and simplicity of the design would create the minimum streetscape impact while ensuring the safety of visitors to the WTC Campus and in the surrounding area. The new streetscape elements would integrate with the planned streetscape elements associated with the WTC Campus in the No-Action condition.

While the With-Action condition would introduce new elements to the streetscape, as described above, under the PANYNJ Master Plan (Version 10.0), Vesey Street would become a secure zone with controlled vehicle access between Greenwich Street and West Street/Route 9A in the No-Action condition as well. Operable barriers and sally ports would be installed in the No-Action condition. Therefore, there would be no additional urban design impacts in the With-Action condition. Pedestrian circulation on the WTC Campus would be unimpeded.

Visual Resources and View Corridors

The placement of the personnel booth and equipment house on a sidewalk extension would minimize their visual impact to pedestrians. Views east and west on the public sidewalks would not be obstructed. While the structures would block the view of 1 WTC and the Barclay-Vesey Building for pedestrians directly to the north and south of them, respectively, the height of the security elements would be less than that of the trees that would run the length of the southern sidewalk in the No-Action condition. In addition, in the No-Action condition, Vesey Street would be a secure street with comparable security structures. Therefore, the view of this visual resource would not be further obstructed by the presence of the proposed security elements.

Washington Street between Barclay and Vesey Streets

Streetscape

In the With-Action condition, Washington Street between Barclay and Vesey Streets would remain a two-way access for private occupancy vehicles (POVs) entering the Site, for delivery vehicles going to the PAC loading dock and for trucks going to the 7 WTC loading dock. New streetscape elements would include a sally port with a POV scale, a personnel booth and equipment house, fixed bollards, lighting and signal poles, and a credentialing zone (see **Figure 6-12**).

The sally port would be approximately 160-feet-long to accommodate the large vehicles the security point would serve. Access barriers accommodating two lanes of entering vehicles would be at the Barclay Street end of the sally port. Denial barriers would be located at the Vesey Street end of the sally port. POV scales may be placed between the two barriers.

The personnel booth and equipment house would be located along the eastern side of Washington Street, connected by a canopy at the roofline, and by a pedestrian barrier on the east side at their bases. While the placement of the structures on the eastern sidewalk would narrow the pedestrian zone to approximately seven feet immediately adjacent to the personnel booth and equipment house, this side of the street is wider than the western sidewalk in this area (14 feet on the east side of the street and 12 feet on the west side of the street). Further, the active loading dock of 7 WTC located on the eastern side of Washington Street (see **Figure 6-12**) may deter pedestrians from using the eastern sidewalk. Placement of the personnel booth on the eastern side of Washington Street would allow for an unimpeded sidewalk on the more pedestrian-friendly western side of the street, bordering the Barclay-Vesey Building.

Additional sidewalk elements would include fixed 36-inch bollards, placed adjacent to the access and denial barriers at four foot intervals between the curb and the building wall on both the eastern and western sidewalks. Stop and signaling poles would be located at the northern end of the sally port, on

both sidewalks as well. At the southern barrier, a light and equipment pole would be placed on both sides of the sally port.

Credentialing for this entry point would occur on Barclay Street, immediately to the east of Washington Street. A personnel booth would be located on the southern sidewalk of the street near the front of the credentialing lane. The design of the booth would be consistent with the other personnel booth structures. Placement of the booth on the sidewalk would narrow the pedestrian zone from 15 feet to approximately seven feet. Street signs would be placed on the road leading up to the credentialing zone to inform drivers of the upcoming secure zone as they approach the credentialing zone.

While the With-Action condition would introduce new elements to the streetscape, the No-Action condition would require that an operable barrier be installed on Washington Street as well to prevent unscreened vehicles from entering Vesey Street adjacent to 1 WTC. As such, there would only be a minor incremental change in the appearance of the intersection of Washington and Vesey Streets as a result of the Proposed Action.

The new streetscape elements have been designed to be in visual continuity with the surrounding NYC street furniture. As described in **Table 6-1**, the choice of materials and simplicity of the design would create the minimum streetscape impact while ensuring the safety of visitors to the WTC Campus and in the surrounding area. The new streetscape elements would integrate with the planned streetscape elements associated with the WTC Campus in the No-Action condition.

Visual Resources and View Corridors

While the placement of the personnel booth and equipment house on the eastern sidewalk would obstruct certain pedestrian views towards 1 WTC from Barclay Street, views of this visual resource are not unique. The close proximity of the security elements along 7 WTC's western façade would also block views of a portion of this building from the western side of Washington Street, but this side of the building, which serves primarily as a loading dock is often blocked by large trucks, taller than the proposed security structures. Therefore, the impact on the view of this visual resource would not be further obstructed by the presence of the proposed security elements.

Greenwich Street between Barclay Street and Vesey Street

Streetscape

Greenwich Street is expected to operate as a two-way street from Barclay Street to Vesey Street, with an operable barrier to be installed on Greenwich Street at Vesey Street under No-Action conditions. This one block segment of Greenwich Street is privately-controlled and would function as a cul-de-sac for private use by 7 WTC tenants. It is expected that the No-Action condition and the With-Action condition would be very similar in terms of function and appearance (see **Figure 6-13**). The operable barrier to be installed on Greenwich Street just north of Vesey Street would facilitate access to the WTC Campus in emergency situations.

Visual Resources and View Corridors

As the With-Action condition would be the same as the No-Action condition, there would be no change to visual resources and view corridors in this location as a result of the Proposed Action.

West Broadway at Barclay Street

Streetscape

The screening zone on West Broadway at Barclay Street would serve as a two-lane entry point primarily for for-hire vehicles and POVs, with an additional lane outside of the secure zone for use by

vehicles to access the adjacent Federal Office Building/U.S. Post Office. The entry point would facilitate access of multiple vehicles simultaneously entering the WTC Campus. New streetscape elements would include a 55-foot sally port with a POV scale, a personnel booth and equipment house, a pedestrian barrier on the east side at their bases, static bollards, lighting and signal poles, a sidewalk extension, and credentialing zones (see **Figure 6-14**).

The two secure lanes would be separated from the Federal Office Building/U.S. Post Office access lane by static barriers that would extend the length of the block. The 55-foot sally port would include operable barriers at the northern and southern ends, and POV scales between the barriers. Light and equipment poles would be placed at all four corners of the sally port, with signal poles located on the western sidewalk adjacent to the two barriers.

So as not to impede pedestrian circulation through the existing park to the west of the street, the personnel booth and equipment house would be placed on an extension of the eastern sidewalk. By extending the eastern sidewalk for the personnel booth and equipment house, an approximately 16-foot wide pedestrian zone would be maintained between the proposed security structures and the Federal Office Building/U.S. Post Office façade. The two structures would be connected at the roofline by a canopy.

On the western sidewalk, 36-inch tall bollards would be placed along the curb at four-foot intervals. These bollards would begin midblock at the denial barrier and continue around the corner along Barclay Street. Additional bollards would be placed at the southern terminus of the block; operable bollards would be located within the road to restrict access onto the WTC Campus from the Federal Office Building/U.S. Post Office access lane, and the bollards would continue along the sidewalk to the building's façade.

Credentialing for this security point would occur at two locations: credentialing for westbound traffic would occur on the southern side of Barclay Street at the westbound approach to West Broadway; credentialing for southbound traffic would occur in the two eastern-most lanes of West Broadway at the approach to Barclay Street. Credentialing booths would be located near the front of each approach location, narrowing the sidewalks to approximately six and a half feet and approximately eight feet, nine-inches along the length of the structures on Barclay Street and West Broadway, respectively. Street signs would be placed on the road leading up to the credentialing zone to inform drivers of the upcoming secure zone as they approached. Construction of the credentialing zones would result in the removal of authorized parking on both sides of the street.

While the With-Action condition would introduce new security elements to the streetscape, the placement and design of these items would minimize impacts to the pedestrian experience while ensuring the safety of visitors to the WTC Campus and in the surrounding area. By limiting vehicular access, there would be an emphasis on pedestrian circulation on the WTC Campus and in the surrounding areas.

Visual Resources and View Corridors

The placement of the personnel booth and equipment houses on a sidewalk extension would minimize their visual impact. Views south along the sidewalk towards the WTC Campus would not be obstructed. While the structures would potentially block views towards Vesey Park with its central fountain from directly east, this particular view is not unique. From the west, the structures would partially block a portion of the Federal Office Building/U.S. Post Office, a visual resource, but this is not the primary façade of the structure, serving as the main vehicle entry point for delivery vehicles. The credentialing zone for the screening zone would partially obstruct east-west pedestrian views along Barclay Street's southern sidewalk, but no visual resources would be obstructed. Therefore, the

proposed security elements would not have a significant impact on visual resources or view corridors at this location.

Fulton Street at West Street/Route 9A

Streetscape

A screening zone with a single exit lane to West Street/Route 9A for all vehicles exiting the WTC Campus would be constructed at the western end of Fulton Street in the With-Action condition. Streetscape elements related to this secure exit would include an approximately 35-foot-long sally port with a personnel booth and equipment house.

Fixed 36-inch bollards would extend across the sidewalk extension to the west of the personnel booth from the curb to the line of bollards that will encircle 1 WTC to protect the booth from vehicle impact. The design of these bollards would be consistent with the bollards planned for the WTC Campus along both sidewalks of Fulton Street.

Lighting and signal poles would be installed adjacent to the operable barriers. Due to the anticipated pedestrian activity at this location, the northern sidewalk would be extended to accommodate the personnel booth and equipment house. This would allow for approximately 25 feet of unobstructed pedestrian space on the sidewalk in this area (see **Figure 6-15**).

Vehicles exiting the WTC Campus would approach the 15-foot-wide sally port from the east. The vehicle would be met by an operable barrier at the eastern end of the sally port and at the western end of the sally port. Placement of these barriers would not affect the flow of pedestrian traffic on the sidewalks or crosswalks. However, in order to achieve the appropriate standoff distance from 1 WTC, the western set of barriers would have to be placed as far west as possible. As such, it is anticipated that the north-south crosswalk across Fulton Street would be located within the sally port. The personnel booth and equipment house would be located on the northern sidewalk extension, connected by a canopy at the roofline. The visual impact of the booths would be minimized by the overarching trees, which would be planted along Fulton Street in the No-Action condition.

While the With-Action condition would introduce new elements to the streetscape, as proposed in the PANYNJ Master Plan (Version 10.0), Fulton Street is expected to become a secure zone with controlled vehicle access between Greenwich Street and West Street/Route 9A in the No-Action future as well. As such, there would only be a minor incremental change in the appearance of this location.

The design and placement of the proposed security elements would minimize their visual impact while ensuring the safety of the WTC Campus. By limiting vehicular access, the emphasis on pedestrian circulation would be reinforced within the WTC Campus.

Visual Resources and View Corridors

The proposed placement of security structures on a sidewalk extension would minimize their visual impact for pedestrians. Pedestrian views east toward the WTC PATH Hub and west toward West Street/Route 9A along the northern sidewalk would not be obstructed. While the proposed structures would partially obstruct the view of 1 WTC for pedestrians directly to the south, the overall size of the booth is not very large. The height of the proposed security elements would be less than the trees that would run the length of both sidewalks. In addition, in the No-Action condition, Fulton Street would be a secure street with comparable security structures. Therefore, views of this visual resource would not be further obstructed by the presence of the proposed security elements.

Greenwich Street at Cedar Street

Streetscape

Under proposed conditions, an exit sally port would be placed on Greenwich Street at the approach to Cedar Street. Accompanying streetscape elements would include a sally port with a personnel booth and equipment house, fixed bollards, light and signal poles, and a sidewalk extension (see **Figure 6-16**).

For-hire vehicles and POVs exiting the WTC Campus would approach the one-lane exit sally port from the north. Mid-block on Greenwich Street, there would be an operable barrier, followed by a second operable barrier at the southern end of the sally port. Just north of Cedar Street, the personnel booth and equipment house would be located on a western sidewalk extension that would run the length of the block. This extension would allow for an approximately 23-foot-wide clear zone for pedestrian circulation adjacent to Liberty Park.

Additional streetscape elements would include 36-inch-tall fixed bollards and lighting and signal poles. The bollards would be installed across the sidewalks adjacent to the barriers; on the eastern sidewalk they would extend to the building streetwall and on the western sidewalk they would extend the width of the sidewalk extension and would intersect with the bollards planned in conjunction with the WTC streetscape plans. The proposed signal and light poles would be located on the western sidewalk, adjacent to each operable barrier, and one signal and light pole would be located on the eastern sidewalk, just north of the egress barrier.

While the With-Action condition would introduce new security elements to the streetscape, the placement and design of these security elements would minimize impacts to the pedestrian experience while ensuring the safety of visitors to the WTC Campus. Additionally, in the No-Action condition, additional streetscape elements, including fixed bollards that would run the length of the western sidewalk of Greenwich Street, would be introduced. The proposed security features would be in keeping with the design of these planned streetscape elements, and in keeping with their goal of encouraging pedestrian circulation and ensuring pedestrian safety.

Visual Resources and View Corridors

By placing the personnel booth and equipment house on a sidewalk extension, visual impact for pedestrians would be minimized. Pedestrian views north and south on the public sidewalks would not be obstructed. While the location of the structures would be adjacent to a visual resource, Liberty Park, the park would be elevated, so not entirely visible from the street level at this location. Therefore, the Proposed Action would not have any significant impacts on visual resources or view corridors at this location.

Liberty Street between West Street/Route 9A and Greenwich Street

Streetscape

Several operable barriers would be constructed on Liberty Street in the With-Action condition; to the east of the VSC exit and west of the VSC entrance (see **Figure 6-17**). The proposed security elements to the west of the VSC would include a set of operable barriers that would provide two lanes from West Street/Route 9A for POVs, buses and various delivery and service vehicles entering the WTC Campus's subterranean parking areas by way of the VSC. The entry lanes would be approximately 11-feet wide, bounded by operable barriers on the west and on the east. The exiting lanes at this location would accommodate vehicles leaving the VSC and WTC Campus via West Street/Route 9A. This exit would consist of two approximately 11-foot wide lanes, with operable barriers that could be used as a sally port if conditions warrant. Proposed streetscape elements at this location would include a set of

operable barriers set approximately 55 feet apart with a personnel booth and equipment house and lighting and signal poles.

All vehicles entering at West Street/Route 9A would have to enter the VSC for screening. To the east of the VSC, the proposed configuration would accommodate a two-way, three-lane operation for POVs, buses, and various types of delivery and service vehicles. A personnel booth and equipment house would be located east of the VSC exit in the median with one set of operable barriers (default up) across two lanes of westbound traffic and one set of operable barriers (default up) across one lane of eastbound traffic. The operable barriers at this location would not be part of a sally port. One line of barriers is proposed across the entire width of Liberty Street to prevent unauthorized vehicle passage east of the VSC entrance, but to provide emergency vehicles expedited access into and out of the WTC Campus.

The equipment houses, personnel booths and lighting and signal poles would be located on central medians, so as not to impede pedestrian circulation or adversely affect the visual experience of the WTC Memorial or Liberty Park. Seven-foot tall signal poles are proposed on the northern sidewalk, at the edge of the curb, and one lighting pole is proposed on the southern sidewalk at the edge of the curb. These sidewalk elements would be placed in line with the fixed curbside bollards that are part of the No-Action condition.

Credentialing zones for the VSC would be located on West Street/Route 9A, north of Liberty Street for the two southbound left-only designated turning lanes and also south of Liberty Street in the easternmost (curbside) lane for vehicles that make the northbound right turn into the site. All screening would occur inside of the VSC. The northern credentialing zone would be located along West Street/Route 9A's central median, and the southern credentialing zone would be located on the eastern sidewalk, allowing an approximately 17-foot nine-inch clear pedestrian zone. Placement of these credentialing booths would create minimum pedestrian obstructions. Street signs would be placed on West Street/Route 9A leading up to the credentialing zones to inform drivers of the upcoming secure zone as they approached.

While the With-Action condition would introduce new elements to the streetscape, the placement of the proposed security elements would minimize changes to the pedestrian experience while ensuring the safety of visitors to the WTC Campus. The placement of the larger structural elements on medians would ensure that they would not be viewed as part of the Memorial design, and would allow the clear pedestrian zone on the southern sidewalk to be unimpeded. Additionally, the pedestrian crossing point at the western end of Liberty Street, prioritized in the placement of bollards along the northern and southern sidewalk curbs in the No-Action condition, would have continued ease of access with the placement of the western security point not intruding on this crosswalk.

The proposed streetscape elements would be designed to be visually compatible with the surrounding WTC Campus. As described in **Table 6-1**, the choice of materials and simplicity of the design would minimize changes to the streetscape while ensuring the safety of visitors to the WTC Campus. By limiting vehicular access, the emphasis on pedestrian circulation would be reinforced within the WTC Campus.

Visual Resources and View Corridors

The Liberty Street location is sensitive due to its proximity to two visual resources: the WTC Memorial to the north, and Liberty Park to the south. While the proposed personnel booths and equipment houses would partially obstruct views of these two resources for pedestrians directly to the north and south of them, the impact would not be significant. The overall size of the personnel booth is not large. Further, the trees that would line the northern sidewalk on Liberty Street would prevent most views into the WTC Memorial from the southern sidewalk. Therefore, the structures would not create

a significant obstruction. In addition, Liberty Park would be an elevated park, not visible from the street level at this location, so views of this visual resource would not be adversely affected. By placing personnel booths and equipment houses on a central median, eastern and western view corridors towards BPC and the visual resources of the Broadway Corridor to the east would not be obstructed.

Trinity Place/Church Street

Streetscape

In the With-Action condition, Trinity Place/Church Street would be divided into one approximately 11-foot secure lane of northbound traffic on the west side of the street and three unsecured lanes of northbound traffic on the east side of the street. The two sections would be separated by a four-foot-wide median that would run north-south from Cedar Street to Vesey Street. Entry to the secure lane would occur at a screening zone located on Trinity Place at Cedar Street. A screening zone on Church Street, just north of Vesey Street, would serve as an exit point (see **Figure 6-18**).

Security between Trinity Place/Church Street's two traffic zones would be maintained by a static barrier (e.g., bollards), that would be consistent with the style of the other proposed security elements.

Generally, pedestrian crosswalks would be minimally impeded by proposed security elements, as described in detail in Chapter 8, "Transportation." All security devices would be set back from crosswalks to maintain the pedestrian zone. Bollards would be spaced at four-foot intervals within crosswalks or other pedestrian zones to allow pedestrian flow through at all crossings. Within the intersection of Liberty Street and Trinity Place/Church Street, operable barriers would replace the static barriers, to allow emergency vehicle access east-west along Liberty Street when necessary. The appearance of these operable barriers would be consistent with the operable barriers located elsewhere around the WTC Campus.

The southern entry point to the secure Trinity Place/Church Street lane would be located just north of Cedar Street, with a credentialing zone just south of Cedar Street. The screening zone would be a one-lane entry point for POVs and tour buses and would consist of an approximately 55-foot-long sally port with a personnel booth and equipment house, fixed bollards and lighting and signal poles. Vehicles would approach the sally port from the south.

The personnel booth and equipment house would be placed on the approximately 19-foot-wide western sidewalk, decreasing the pedestrian clear zone to approximately 11-feet, nine-inches. This decrease in clear sidewalk space would not result in a significant impact, as the sidewalk is currently occupied by other street furniture, including a phone booth and newsstand, which are of similar width and height to the proposed security structures. The proposed personnel booths would be connected by a canopy, and constructed of materials consistent with the styles of the newsstands and bus stops. Two lighting poles and fixed bollards would also be placed on the western sidewalk, but their visual impact would be minimal. Additional signal and lighting poles would be placed on the central median.

The credentialing booth just south of Cedar Street would be similar to the screening zone structures in both its design and its placement. Its placement on the wide western sidewalk would create an approximately 12-foot-wide clear pedestrian zone adjacent to the booth. Street signs would be placed on Trinity Place leading up to the credentialing zone to inform drivers of the upcoming secure zone as they approached.

A secure exit is proposed on Church Street, just north of Vesey Street. It would be comprised of an approximately 55-foot-long sally port with a personnel booth and equipment house, fixed bollards, and lighting and signal poles. The western sidewalk would be extended to accommodate the personnel

booth. The existing 16-foot-wide clear pedestrian zone adjacent to the Federal Office Building/U.S. Post Office would not be obstructed. Operable barriers would be located at both ends of the sally port. Fixed bollards would extend from the western Church Street curb the Federal Office Building/U.S. Post Office's streetwall. Lighting and equipment poles would also be placed on the western sidewalk at the edge of the curb, adjacent to the two barriers. The signal pole would be placed on the central median at a height to accommodate the variety of vehicles that would be expected to use the exit.

While the With-Action condition would introduce new elements to the streetscape, the placement and design would minimize pedestrian conflicts while ensuring the safety of visitors to the WTC Campus. By limiting vehicular access, the emphasis on pedestrian circulation would be reinforced within the WTC Campus.

Visual Resources and View Corridors

The proposed central median along Trinity Place/Church Street would not be higher than 36-inches above the street level, and therefore would minimally affect visual resources or view corridors since the surrounding buildings, including those buildings that have been identified as visual resources, are tall and would be unobstructed by the proposed median. Views to lower resources, such as the nearby Zuccotti Park, would be partially obstructed, but the median would be located in the middle of Trinity Place/Church Street and would be low scale and below the eye level of the pedestrian. The height of the median would be such that vehicular traffic on Church Street/Trinity Place would be taller than the proposed static barrier. The larger elements (proposed personnel booths) that must be analyzed for their potential impacts would be located on Trinity Place/Church Street at the corners of Cedar and Vesey Streets.

The personnel booth and equipment house at Cedar Street would be located proximate to Zuccotti Park, an important visual resource in the Study Area. While the structures would partially obstruct some views of this resource from the western sidewalk, there is currently a newsstand and a phone booth, similar in size to the proposed structures, at this location. Therefore, the construction of the proposed security elements at this location would not have a significant impact on views of this visual resource. The personnel booths would be located on the wide western sidewalk, partially obstructing pedestrian north-south views on this sidewalk. These views are not unique and no visual resources that are visible from this location would be obstructed.

The placement of the personnel booth and equipment house on a sidewalk extension at Vesey Street would minimize their visual impact. Views north and south on the sidewalk would not be obstructed. While the structures would partially obstruct the view of the Federal Office Building/U.S. Post Office for pedestrians directly to the east across Trinity Place/Church Street, this view is not unique, and therefore this would not be a significant impact.

Assessment

As described above, security elements resulting from the Proposed Action would be similar to security elements in the Existing and No-Action conditions. Proposed security elements would be low scale (e.g., static and operable barriers are typically 36-inches tall). As such, the proposed security elements would not obstruct views. Additionally, sidewalk widths would be maintained by adding NYPD booths on sidewalk extensions so as to maintain existing sidewalk widths, where possible. In some locations where sidewalk extensions would not be possible due to space constraints, sidewalk widths would be narrowed. However, the Proposed Action is not expected to adversely affect pedestrian circulation or the overall pedestrian experience.

Study Area

North of the WTC Campus

From the area north of the WTC Campus, neither the screening zones on Washington Street, West Broadway, or Church Street nor the credentialing zone on West Broadway would be visible. The design of the security elements would ensure that they would not adversely affect the pedestrian experience. The proposed security structures would not obstruct views of any significant visual resources in the area north of the WTC Campus. Additionally, as described in the visual resources analysis within the Project Site, these structures would not obstruct any unique views of visual resources within the WTC Campus.

Broadway Corridor

The screening zones proposed on Trinity Place/Church Street would be the most prominent in the Broadway Corridor. Western views of the screening zones on Vesey, Fulton and Liberty Streets would be minimal due to the small height and footprint of the various security elements. The construction of the median along Trinity Place/Church Street would be the largest streetscape element, running from Liberty Street to Vesey Street. While the median would alter the pedestrian views and the overall pedestrian experience along Trinity Place/Church Street, the change would not be a significant adverse impact. Due to its low height and the permeable nature of the design, the median would not obstruct views of any of the Broadway Corridor's visual resources or views of the Project Site's visual resources from the Broadway Corridor.

The proposed security elements at Cedar Street would be visible from Zuccotti Park, a visual resource; however, as the booths would be similar in size and design to the existing newsstand and phone booth at this location, they would not significantly affect the experience of park visitors. The screening zone at Vesey Street would partially obstruct views of the Federal Office Building/U.S. Post Office from the Broadway Corridor, but this view is not unique and therefore would not signify a significant adverse impact.

Greenwich South Corridor

From the Greenwich South Corridor, the screening zones on Greenwich Street and Trinity Place and the credentialing zone on Trinity Place would be visible. The design of the security elements would ensure that they would not adversely affect the pedestrian experience. The placement of the Greenwich Street screening zone on a sidewalk extension would minimize the impact on views of the WTC Campus from the south. While the placement of the screening zone and credentialing zone directly on the sidewalk on Trinity Place would partially obstruct views north on this street, this is not a primary view corridor, and no significant visual resources would be blocked by the structures.

Battery Park City

From the eastern parts of BPC, the screening zones on Liberty, Fulton and Vesey Streets and the two credentialing zones on West Street/Route 9A would be visible. The screening zones would not have a significant impact on the pedestrian experience in the BPC subarea, and due to the low height and small footprint of the proposed security elements, they would not block any significant visual corridors or visual resources. The two credentialing zones on West Street/Route 9A would be more proximate to the BPC subarea, but they would create minimal visual obstruction of the WTC Memorial because of the trees and landscaping that would line both sides of the street and the planted median. Views of Liberty Park from BPC would not be significantly affected, as the park would be elevated.

A. INTRODUCTION

This chapter presents the findings of the hazardous materials assessment and identifies potential issues of concern with respect to workers, the community, and/or the environment during construction and after implementation of the Proposed Action. The Project Area includes portions of Washington Street, Greenwich Street, West Broadway, Church Street, Vesey Street, Fulton Street, Liberty Street and the WTC construction site. The potential for hazardous materials was evaluated based on a May 2012 *Phase I Environmental Site Assessment* (ESA) prepared by AKRF Inc. (see **Appendix C**).

The Proposed Action would implement a comprehensive perimeter vehicle security plan for the WTC Campus, and would entail roadway and sidewalk improvements associated with WTC Campus security measures, including installation of bollards, medians, guard booths and vehicle barriers. These would entail subsurface disturbance to approximately two to four feet below grade, although some deeper excavation for utility relocation may be necessary.

B. PRINCIPAL CONCLUSIONS

The Phase I ESA identified potential sources of contamination, including: historical fill materials of unknown origin; debris and releases (e.g., petroleum and dielectric oil) associated with the collapse of the WTC, including the electrical substation at 7 WTC, a laboratory and petroleum storage; historical uses in the vicinity of the Property, such as manufacturing and filling stations; off-site regulatory listings (spills, petroleum storage, etc.). Previous studies conducted for the reconstruction of the WTC area indicated that debris associated with the collapse and historical petroleum storage tanks have been removed, significant remediation of soils and groundwater has occurred, and any residual contamination at the WTC campus would be encapsulated (e.g., beneath structures or pavement) to prevent potential exposure. Soil testing conducted in the 2000s in the eastern portion of the WTC Campus and on streets to the south (i.e., in or near the Project Area) indicated no evidence of petroleum impacts or elevated concentrations of asbestos or dioxins. Surface soils in this area contained slightly elevated concentrations of semi-volatile organic compounds (SVOCs) and metals, possibly associated with fill materials and/or the WTC collapse, and groundwater samples in this area contained slightly elevated concentrations of petroleum and solvent-related volatile organic compounds (VOCs). Soils in the vicinity of the former 7 WTC contained no elevated concentrations of polychlorinated biphenyls (PCBs), but soil and groundwater in this area showed evidence of petroleum and/or dielectric oil contamination; however, the testing was conducted prior to the construction of the new 7 WTC building and associated remediation.

Based on the above, soil and groundwater beneath the Project Area may have been affected by past and present, on- and off-site uses. However, significant remediation has occurred as part of WTC Campus redevelopment. Soil disturbance for the Proposed Action is expected to be limited to soils well above the water table – soils at or below the water table have a greater potential for being contaminated as moving groundwater can carry contaminants.

To reduce the potential for human or environmental exposure to contamination during and following construction of the Proposed Action, a Remedial Action Plan (RAP) and associated

Construction Health and Safety Plan (CHASP) would be prepared and submitted to the New York City Department of Environmental Protection (NYCDEP) for review and approval. The RAP and CHASP would be implemented during project construction. The RAP would address requirements for items such as soil stockpiling, soil disposal and transportation; dust control; quality assurance; and contingency measures, should petroleum storage tanks or contamination be unexpectedly encountered. The CHASP would identify potential hazards that may be encountered during construction and specify appropriate health and safety measures to be undertaken to ensure that subsurface disturbance is performed in a manner protective of workers, the community, and the environment (such as personal protective equipment, air monitoring, and emergency response procedures).

Lead-based paint, asbestos-containing materials (ACM) and PCB-containing electrical equipment and fluorescent lighting fixtures may be present on the Project Area. During and following construction for the Proposed Action, regulatory requirements pertaining to ACM, lead-based paint and PCBs and chemical use and storage would be followed.

With these above-described measures, the Proposed Action would not result in any significant adverse impacts related to hazardous materials.

C. EXISTING CONDITIONS

Subsurface Conditions

The Project Area lies at an elevation of approximately 5 to 25 feet above mean sea level, sloping down toward the west. Previous studies of the WTC area indicate that bedrock is expected at a depth of approximately 60 to 100 feet below grade and that the Project Area is located on made land. Fill material of unknown origin, including sand, silt, clay, gravel, stone, macadam, river mud, ash, cinders and brick, is present beneath the Project Area.

The previous studies have encountered groundwater near the Project Area at highly variable depths, ranging from approximately 6 feet below grade in the southern portion of the Project Area to approximately 10 feet below grade in the northern portion of the Project Area to approximately 40 feet below grade in the eastern portion of the Project Area, which is in an area undergoing extensive dewatering for subsurface WTC and transit structure construction. Based on surface topography, groundwater would be expected to flow in a westerly direction toward the Hudson River, approximately 1,000 feet west of the western edge of the Project Area. However, groundwater flow direction is likely affected by ongoing dewatering on and near the Project Area. Groundwater flow may also be affected by bedrock, subsurface openings or obstructions such as basements, underground utilities, parking garages, historical filling and bulkheads, tidal fluctuations, and other factors beyond the scope of this assessment. Groundwater in Manhattan is not used as a source of potable water (the municipal water supply uses upstate reservoirs).

Hazardous Materials Assessment

A Phase I ESA was prepared for the Project Area. The scope of the Phase I ESA included a reconnaissance of the Project Area and surrounding area and review of a variety of information sources, including historical Sanborn fire insurance maps, environmental regulatory agency

databases identifying state and federally listed sites, and previous studies for nearby sites. The Phase I ESA identified the following:

- The Project Area is located on made land. Fill material of unknown origin, including sand, silt, clay, gravel, stone, macadam, river mud, ash, cinders and brick, is present beneath the Project Area. Prior to 1951, the Project Area was predominantly occupied by public streets. A portion of West Broadway between Barclay and Vesey Streets was historically occupied by buildings with unspecified uses, but was shown as a public street by 1922-1923. The Manhattan Railway (a historical elevated railway company) and rail lines on Fulton Street between Church and Greenwich Streets were shown in the Project Area in the early 20th century. By 1971, the majority of the Project Area was part of the WTC Campus. Portions of WTC buildings and the surrounding plaza were located in the Project Area, and the portion of Greenwich Street between Barclay and Vesey Streets included part of a two-story electrical substation (the former 7 WTC). Underground structures, including subway and Port Authority Trans-Hudson (PATH) tunnels, were noted beneath the WTC plaza. The buildings on the WTC campus were destroyed on September 11, 2001. Reconstruction efforts are currently in progress. The area surrounding the Project Area was historically mixed-use and included manufacturing, printers, a laundry, a dye and chemical store and factory, a National Aniline & Chemical Co. building, utility buildings (NY Steam Co., US Electric Light Co., Western Electric Co. and an electrical transformer station), and filling stations in close proximity to the Project Area, and ferry and railroad piers west of the Project Area beyond West Street. More bank and office uses were shown in the surrounding area starting in the mid-20th century, with these uses dominating the surrounding area by the late 20th century.
- Regulatory databases identified one active-status spill, 131 closed-status spills and 51 hazardous waste generator listings potentially in, or near to, the Project Area. Based on listing details, the active spill appeared minor in nature and unlikely to affect subsurface conditions beneath the Project Area. The remaining potentially on-site listings were associated with: minor (i.e., no reported subsurface impact) spills on streets, sidewalks or within utility structures; asbestos releases during utility work and during the collapse of the WTC; releases at the historical and new electrical substations in 7 WTC; listings associated with Con Ed remediation of dielectric oil released during the collapse of the WTC; listings associated with other releases following the collapse of the WTC (e.g., releases from damaged petroleum storage tanks and airplane fuel tanks); and spills at the WTC Campus during reconstruction activities. Some of the listings reported soil and/or groundwater contamination with fuel oil or dielectric oil; all these listings were closed, indicating that remediation was completed to the satisfaction of the New York State Department of Environmental Conservation (NYSDEC), although some residual contamination may remain. The potentially on-site hazardous waste generator listings included generators of heavy metal wastes, solvents, PCB waste, and benzene. Regulatory databases also identified nearby but off-site closed-status spills, hazardous waste generators and petroleum storage facilities with the potential to affect the Project Area.
- No evidence of petroleum storage tanks was observed in the Project Area. However, the reconnaissance noted fill ports and/or vent pipes adjacent to buildings fronting the Project Area. If these fill ports and vent pipes connect to underground storage tanks (USTs), such tanks may be located off-site beneath adjacent buildings or perhaps buried or located in vaults beneath Project Area sidewalks. Regulatory records identified closed-status and active USTs in WTC buildings historically located in the Project Area. Previous studies indicated

that tanks associated with the former WTC buildings have been removed. The active WTC UST listings are for tanks at the new 7 WTC building, which is adjacent to, but not in, the Project Area.

- Previous studies conducted for the reconstruction of 7 WTC, the main WTC Campus, the PATH terminal beneath the WTC Campus, and Route 9A (West Street) were reviewed. These studies indicated that debris associated with the collapse of the WTC has been removed. Subsurface contamination at the former 7 WTC site was remediated as part of the new building's construction, contamination on the main WTC Campus is being remediated as part of reconstruction activities, and any residual contamination would be encapsulated (e.g. beneath structures or pavement) to prevent potential exposure. Soil testing conducted in the 2000s in the eastern portion of the WTC Campus and on streets to the south (i.e., in or near the Project Area) indicated no evidence of petroleum impacts or elevated concentrations of asbestos or dioxins. Surface soils in this area contained slightly elevated concentrations of SVOCs and metals, possibly associated with fill materials and/or the WTC collapse, and groundwater samples in this area contained slightly elevated concentrations of petroleum and solvent-related VOCs. Soils in the vicinity of the former 7 WTC contained no elevated concentrations of PCBs, but soil and groundwater in this area showed evidence of petroleum and/or dielectric oil contamination; however, the testing was conducted prior to the construction of the new building and associated remediation.
- If installed prior to 1979, street lighting fixtures may include PCB-containing components; however, due to significant reconstruction in the vicinity of the Property since September 11, 2001, the fixtures were likely installed in the 2000s and are therefore unlikely to contain PCBs. Consultation with the New York City Department of Transportation (NYCDOT) did not identify any known PCB-containing components in street lighting fixtures. Electrical transformer vaults and underground oil-filled electrical conduits in the Project Area may have utilized PCB-containing equipment, though again it is likely that most of these have been replaced since 2001.
- No suspect asbestos-containing materials (ACM) were observed during the reconnaissance. However, underground utilities and electrical transformer vaults may contain ACM including conduits and piping.
- Lead-based paint may be present on painted surfaces and in underground utility structures. During the reconnaissance, aboveground painted surfaces were observed to be in good condition.

D. FUTURE WITHOUT THE PROPOSED ACTION (NO-ACTION)

In the future without the Proposed Action, construction activities will continue throughout the WTC Campus and its immediate vicinity, as described in the Chapter 1, "Project Description." The proposed security measures would not be constructed. Other security measures which are not part of the Proposed Action (such as the construction of a Vehicle Security Center) would be constructed with or without the Proposed Action. Thus, the potential for soil disturbance would be less in the future without the Proposed Action. As with the Proposed Action, soil disturbance related to WTC reconstruction would be conducted in accordance with health and safety measures determined by the *World Trade Center Memorial and Redevelopment Plan – Final Generic Environmental Impact Statement* (Lower Manhattan Development Corporation, April

2004) as well as legal requirements, including but not limited to requirements for disposal of chemicals or other wastes, NYSDEC regulations relating to removal of unused petroleum tanks along with any associated contaminated soil, and handling and disposal of ACM, lead-based paint and PCBs.

E. FUTURE WITH THE PROPOSED ACTION (WITH-ACTION)

The future with the Proposed Action would involve roadway and sidewalk improvements, including installation of bollards, medians, guard booths and vehicle barriers, with shallow soil disturbance (generally to approximately two-to-four feet below grade). Groundwater is not expected to be encountered during the Proposed Action. Soil that would be disturbed by the Proposed Action likely includes urban fill materials with elevated concentrations of certain metals and SVOCs. As noted above, on-site lighting fixtures and utility structures may contain hazardous materials such as ACM, PCBs and/or lead-based paint. The Proposed Action could disturb these hazardous materials and potentially increase pathways for human or environmental exposure. Impacts would be avoided by implementing the following measures:

- A NYCDEP-approved RAP and associated CHASP would be prepared prior to implementation during project construction. The RAP would address requirements for items such as soil stockpiling, soil disposal and transportation; dust control; quality assurance; and contingency measures, should petroleum storage tanks or contamination be unexpectedly encountered. The CHASP would identify potential hazards that may be encountered during construction and specify appropriate health and safety measures to be undertaken to ensure that subsurface disturbance is performed in a manner protective of workers, the community, and the environment (such as personal protective equipment, air monitoring, and emergency response procedures).
- Any tanks or piping that may be disturbed by the Proposed Action, as well as any petroleum storage tanks unexpectedly encountered during construction, would be properly closed and removed along with any contaminated soil. Any evidence of a petroleum spill would be reported to NYSDEC and addressed in accordance with applicable requirements.
- During future subsurface disturbance, excavated soil would be handled and disposed of in accordance with applicable regulatory requirements. Although groundwater is not expected to be encountered, if dewatering is required during construction activities, it would be performed in accordance with NYCDEP requirements.
- Prior to any activities with the potential to disturb transformer vaults or other subsurface utilities, such utilities would be properly decommissioned. An asbestos survey of the areas to be disturbed would be completed and all ACM would be removed and disposed of in accordance with local, state and federal requirements.
- Any renovation/demolition activities with the potential to disturb lead-based paint would be performed in accordance with the applicable Occupational Safety and Health Administration regulation (OSHA 29 CFR 1926.62—Lead Exposure in Construction).
- Unless there is labeling or test data indicating that suspect PCB-containing lighting fixtures and electrical equipment (e.g., equipment in transformer vaults and electrical manholes) do not contain PCBs, if disposal is required, it would be performed in accordance with applicable federal, state and local requirements.

A. INTRODUCTION

This chapter of the EIS describes the transportation characteristics and potential impacts associated with the implementation of the World Trade Center Campus Security Plan (the Proposed Project), a comprehensive perimeter vehicle security plan for the World Trade Center (WTC) site to protect against vehicle-borne explosive devices while ensuring an open environment that is hospitable to remembrance, culture, and commerce. Under this plan, vehicular access to, and traffic movement within, the WTC site would be controlled through the creation of a secure perimeter that would prevent unscreened vehicles from approaching within a set distance of WTC buildings. Portions of streets in and around the WTC site would be closed to unscreened vehicular traffic. Vehicles destined for the WTC seeking entry onto these streets would be subject to credentialing to determine whether entry to the site should be permitted, and then screening to confirm that these vehicles pose no threat. It is anticipated that access to the WTC site would be managed in a flexible manner to allow maximum throughput and reduce the potential for localized traffic congestion, as conditions allow. The creation of a Trusted Access Program in which tenants, delivery services and car service and taxi operators could enroll is envisioned to expedite vehicle entry.

The current development program for the WTC site includes the construction of a 9/11 Memorial (opened in September 2011) and approximately 290,000 square-feet of museum space in a Memorial Center, 8.49 million square feet of office space in four towers, 455,000 square feet of retail space (including restaurant/café uses), a 1,000-seat Performing Arts Center (PAC) and a new permanent PATH terminal (the Transit Hub). It is expected that up to 500 underground parking spaces for office-tenant autos and 67 spaces for tour buses will be provided on-site, as will a total of approximately 47 truck berths to service Towers 1 through 4, the Memorial Center and the Performing Arts Center. A Vehicular Security Center (VSC) planned in conjunction with the World Trade Center development will control access to the WTC site's underground vehicle circulation system, parking areas and loading docks. With the exception of a very small number of large trucks destined to the PAC, all vehicles parking or making deliveries on-site would be processed and screened at the VSC.

At this time, the building program and anticipated completion date of 5 World Trade Center (Tower 5) is unknown; however, construction and full occupancy is expected to occur only beyond the 2019 analysis year for this project. Additionally, the 5 World Trade Center site is located outside of the proposed security zone and accessed separately (similar to the existing 7 World Trade Center). As such, travel demand from 5 World Trade Center is not included in the analysis.

The proposed Campus Security Plan would involve the installation of new security infrastructure and changes to the traffic and pedestrian networks in and around the WTC site. The perimeter of the WTC site would be secured through the installation of various types of vehicle interdiction devices under the control of the NYPD. These include static barriers and traffic lane delineators, as well as a system of retractable vehicle barriers. Screening of all vehicles entering the WTC site would utilize both mechanical and manual processes, and would be facilitated through the use of sally ports which would consist of a personnel booth and equipment house controlling two lines of retractable barriers with sufficient space between them to accommodate one or more motor vehicles undergoing screening. An additional personnel booth would also be installed at each credentialing location.

The Project Area includes all streets and sidewalks that would be directly affected by the installation of security infrastructure. As shown in **Figure 1-1** in Chapter 1, "Project Description," the Project Area is generally bounded by Barclay Street and Park Place on the north, Albany Street on the south, Trinity Place/Church Street on the east and Route 9A on the west.

The current WTC development program would remain unchanged with implementation of the Campus Security Plan, and no new land uses would be introduced at the WTC site as a result of the Proposed Project. The Proposed Project would therefore not result in new travel demand, and its primary effects on the surrounding traffic network would be the diversion of general background traffic and trips en route to and from the WTC site as a result of the proposed security measures. With the exception of some relatively small changes in pedestrian flow due the relocation of some taxi pickup/drop-off activity, pedestrian flow patterns are not expected to be altered by the proposed security measures. Pedestrian conditions would, however, potentially be affected by the installation of personnel booths and equipment houses, static barriers, and other security-related infrastructure along sidewalks and crosswalks. Demand at, and access to, area transit facilities (PATH, subway, bus and ferry) are not expected to be affected by the Proposed Project. A 2019 analysis year is assumed as the likely timeframe in which all of the WTC site components described above would be fully developed.

This chapter describes in detail the existing transportation conditions in proximity to the WTC site. Future conditions without the Proposed Project (the No-Action condition) are then determined. The No-Action baseline for the transportation analyses incorporates the anticipated travel demand from the full build-out of towers 1 through 4, the Memorial and Memorial Center, the Transit Hub and the Performing Arts Center at the WTC site. Increases in travel demand due to new developments in the area and general background growth are also reflected, as are planned changes to the area's transportation systems, including limited security measures that are expected to be implemented at the WTC site in the absence of the Proposed Project.

Changes to the traffic and pedestrian networks resulting from the Campus Security Plan are then overlaid on the No-Action baseline to reflect conditions in the future with the Proposed Project (the With-Action condition). Significant adverse impacts from these project-related changes are then identified, and described in detail. Where impacts are identified, Chapter 15, "Mitigation" addresses practicable measures to address these impacts.

B. PRINCIPAL CONCLUSIONS

Traffic

Weekday AM, midday and PM peak hour traffic conditions with the Campus Security Plan were evaluated at a total of 42 intersections generally located along the Broadway, Trinity Place/Church Street, West Broadway, Greenwich Street and Route 9A corridors from Chambers Street to Battery Place. A more limited study area was also analyzed for the Saturday midday focusing on a subset of 12 key intersections in the immediate vicinity of the WTC site that are most likely to be affected by diverted trips and weekend demand from visitors to the 9/11 Memorial and Memorial Center.

The traffic impact analysis indicates that there would be the potential for significant adverse impacts at 17 of the 42 analyzed intersections in the weekday AM peak hour, 10 in the midday and 13 in the PM peak hour, and three of the 12 analyzed intersections in the Saturday midday peak hour. The lane groups impacted in each peak hour are outlined below. Chapter 15, "Mitigation," discusses measures to mitigate these significant adverse traffic impacts.

Weekday AM Peak Hour

- Broadway and Chambers Street – eastbound approach;
- Broadway and Park Row/Barclay Street – southbound through movement;
- Broadway and Vesey Street/Park Row/Ann Street – southbound left-through lane group;

- Broadway and Fulton Street – westbound left turn;
- Church Street and Chambers Street – eastbound approach;
- Church Street and Fulton Street – westbound approach;
- Church Street and Cortlandt Street – westbound approach;
- Trinity Place and Rector Street – eastbound approach;
- Greenwich Street and Murray Street – eastbound approach;
- Greenwich Street and Battery Place – eastbound left turn;
- Route 9A and Chambers Street – eastbound approach and westbound left-through lane group;
- Route 9A and Warren Street – northbound left turn;
- Route 9A and Murray Street – eastbound left turn, westbound approach, and northbound through-right and left-turn lane groups;
- Route 9A and Liberty Street – northbound through-right and left-turn lane groups;
- Route 9A and Albany Street – eastbound approach;
- Route 9A and West Thames Street – southbound approach;
- Route 9A at the Brooklyn-Battery Tunnel – southbound approach; and
- Route 9A southbound service road at Battery Place – southbound left-turn and left-/right-turn lane groups.

Weekday Midday Peak Hour

- Broadway and Chambers Street – eastbound approach and southbound left-through lane group;
- Broadway and Park Row/Barclay Street – southbound through movement;
- Broadway and Vesey Street/Park Row/Ann Street – southbound left-through lane group;
- Church Street and Chambers Street – eastbound approach;
- Church Street and Barclay Street – westbound approach;
- Church Street and Fulton Street – westbound approach;
- Church Street and Cortlandt Street – westbound approach;
- Route 9A and Chambers Street – northbound approach;
- Route 9A and Warren Street – northbound left turn; and
- Route 9A and Murray Street – westbound approach and northbound and eastbound left turns.

Weekday PM Peak Hour

- Broadway and Chambers Street – eastbound approach and westbound left turn;
- Broadway and Warren Street – eastbound approach;
- Broadway and Park Row/Barclay Street – southbound through movement;
- Broadway and Vesey Street/Park Row/Ann Street – southbound left-turn and left-through lane groups;
- Broadway and Fulton Street – westbound approach;
- Church Street and Chambers Street – eastbound approach;
- Church Street and Fulton Street – westbound approach;
- Church Street and Cortlandt Street – westbound approach;
- Greenwich Street and Murray Street – eastbound approach;
- Greenwich Street and Battery Place – eastbound left turn;
- Route 9A and Murray Street – westbound left-turn and through-right lane groups and northbound and eastbound left turns;
- Route 9A and Liberty Street – eastbound right turn and northbound and southbound through-right lane groups; and
- Route 9A and Albany Street – eastbound approach.

Saturday Midday Peak Hour

- Broadway and Fulton Street – westbound approach;
- Church Street and Fulton Street – westbound approach; and
- Church Street and Cortlandt Street – westbound approach.

Transit

The proposed Campus Security Plan would not result in any significant adverse transit impacts with respect to subways and buses based on *CEQR Technical Manual* criteria. Much of the access between transit facilities and new and existing development in the vicinity of the WTC site will occur below-grade and would not be directly affected by physical changes to the surface street network associated with the Proposed Project. Increased traffic congestion along some corridors such as Broadway and Chambers Street and increased taxi pickup and drop-off activity in the along the west curb of Church Street as a result of the Proposed Project may, however, lengthen travel times for the local and express bus services operating along these corridors.

The Proposed Project would not result in the development of new land uses that would generate additional demand on the transit systems serving the WTC site, although it is possible that the restrictions on vehicular access resulting from the Proposed Project may potentially reduce vehicular travel for persons en route to and from the World Trade Center and its environs. However, any potential increase in transit trips is expected to be relatively small in the context of the overall demand on the PATH system and the numerous subway, bus and ferry routes serving the site, and the numbers of such trips would be unlikely to exceed *City Environmental Quality Review (CEQR) Technical Manual* analysis thresholds for either the rail or bus modes at any one rail transit station or bus route.

Pedestrians

The Proposed Project would not generate new pedestrian demand or change pedestrian access routes in the vicinity of the WTC site. However, the installation of security infrastructure (e.g., static barriers, personnel booths, etc.) would reduce the amount of space available for pedestrian circulation at some locations. In addition, the Proposed Project may also result in some relatively small changes in pedestrian flow due the relocation of some taxi pickup/drop-off activity. Conditions in the weekday AM, midday and PM peak periods in the future with the Proposed Project were therefore analyzed at a total of 12 sidewalks, three corner reservoir areas and 10 crosswalks in the vicinity of the WTC site. The results of the analysis indicate that the installation of security infrastructure associated with the Proposed Project would result in significant adverse impacts in one or more peak hours at a total of two sidewalks. These include:

- Barclay Street (south) between West Broadway and Church Street in all periods; and
- Trinity Place (west) between Liberty and Cedar streets in the AM and PM.

The installation of static barriers such as bollards within crosswalks in conjunction with the proposed median along Trinity Place/Church Street is also expected to result in significant adverse impacts in one or more peak hours at a total of three analyzed crosswalks along this corridor. These include:

- The north crosswalk at Vesey Street in the AM;
- The north crosswalk at Fulton Street in the midday; and
- The north crosswalk at Cortlandt Street in the midday and PM.

Chapter 15, "Mitigation," discusses measures to mitigate these significant adverse pedestrian impacts.

Vehicular and Pedestrian Safety Evaluation

Four intersections in proximity to the WTC site experienced five or more pedestrian and/or bicyclist injury crashes in one or more years from 2008 through 2010 and are therefore considered high accident locations. These locations include three intersections along Chambers Street at Broadway, West Broadway and Route 9A, and the intersection of Route 9A with Murray Street. None of these intersections (nor any within the traffic and pedestrian study areas) are located within a designated Senior Pedestrian Focus Area (SPFA).

The Campus Security Plan is not expected to generate substantial new vehicular or pedestrian demand within the study area, nor alter pedestrian flow patterns at any of the four intersections identified as high accident locations. However, all four intersections would likely experience changes in traffic flow patterns due to street closures associated with the Proposed Project. Some approaches at these intersections would experience increases in the numbers of turning vehicles conflicting with pedestrians in crosswalks while others would experience decreases.

The Proposed Project would also result in a substantial decrease in vehicular traffic along streets within the WTC Campus, as only pre-authorized vehicles with business at the World Trade Center would be allowed access. The potential for conflicts between vehicular traffic and pedestrians at intersections within the WTC Campus, including the many tourists expected to be visiting the Memorial and Memorial Center, would therefore likely be reduced compared to the No-Action condition.

Parking

The proposed Campus Security Plan would not result in any significant adverse impacts with respect to off-street or on-street parking based on *CEQR Technical Manual* criteria. The Proposed Project would not result in the development of new land uses that would generate additional parking demand, nor displace any existing or future off-street public parking capacity. The installation of credentialing locations and security stations would, however, potentially displace an estimated 23 curbside spaces designated for authorized vehicle parking (Postal Inspector, Department of Labor and NYC Law Department), nine to 11 spaces for truck loading/unloading and four spaces for bus layover along Trinity Place/Church Street, Barclay Street and West Broadway. The displacement of this number of authorized vehicle parking spaces would not be considered a significant adverse impact under *CEQR Technical Manual* criteria, and it is anticipated that NYPD would coordinate with affected agencies and NYCDOT to identify alternative locations for this displaced authorized vehicle, truck and bus parking. The PATH Greenmarket that currently occupies curbside space along the east curb of West Broadway north of Barclay Street on Tuesdays would likely need to be relocated to accommodate the installation of a credentialing zone at this location.

C. PRELIMINARY ANALYSIS METHODOLOGY

The *CEQR Technical Manual* describes a two-level screening procedure for the preparation of a "preliminary analysis" to determine if quantified operational analyses of transportation conditions are warranted. The preliminary analysis begins with a trip generation (Level 1) analysis to estimate the numbers of person and vehicle trips attributable to the proposed project. According to the *CEQR Technical Manual*, if the proposed project is expected to result in fewer than 50 peak hour vehicle trips and fewer than 200 peak hour transit or pedestrian trips, further quantified analyses are not warranted. When these thresholds are exceeded, detailed trip assignments (Level 2) are to be performed to estimate the incremental trips that could be incurred at specific transportation elements and to identify potential locations for further analyses. If the trip assignments show that the proposed project would generate 50 or

more peak hour vehicle trips at an intersection, 200 or more peak hour subway trips at a station, 50 or more peak hour bus trips in one direction along a bus route, or 200 or more peak hour pedestrian trips traversing a sidewalk, corner reservoir area or crosswalk, then further quantified operational analyses may be warranted to assess the potential for significant adverse impacts on traffic, transit, pedestrians, parking, and vehicular and pedestrian safety.

D. LEVEL 1 SCREENING ASSESSMENT

Traffic

As discussed in more detail later in this chapter, the current WTC development program would remain unchanged with implementation of the Campus Security Plan, and no new land uses would be introduced at the WTC site as a result of the Proposed Project. The Proposed Project would therefore not result in new traffic, transit, pedestrian or parking demand. It would, however, result in the diversion of general background traffic and vehicle trips en route to and from the WTC site. As shown in **Table 8-9** later in this chapter, travel demand generated by development at the WTC site is expected to generate approximately 1,463, 1,517, 1,880 and 831 new vehicle trips (in and out combined) in the weekday AM, midday, PM and Saturday midday peak hours, respectively. Many of these vehicles would be diverted or redistributed as a result of the Proposed Project, as would general background traffic that, in the absence of the Proposed Project, would travel along streets within the WTC site. The overall numbers of diverted or redistributed peak hour vehicle trips would therefore exceed the *CEQR Technical Manual* 50-trip analysis threshold.

Transit

The proposed Campus Security Plan would not result in the development of new land uses that would generate additional demand on the transit systems serving the WTC site, although it is possible that the restrictions on vehicular access resulting from the Proposed Project may potentially reduce vehicular travel for persons en route to and from the World Trade Center and its environs. However, any potential increase in transit trips is expected to be relatively small in the context of the overall demand on the PATH system and the numerous subway, bus and ferry routes serving the site, and the numbers of such trips would be unlikely to exceed the *CEQR Technical Manual* analysis thresholds for either the rail or bus modes at any one rail transit station or bus route. In addition, it should be noted that much of the access between rail transit facilities and new and existing development in the vicinity of the WTC site will occur below-grade and would not be directly affected by physical changes to the surface street network associated with the Proposed Project. Therefore, quantitative analyses of subway station and subway and bus line haul conditions are not warranted. As changes to the Project Area street network may potentially affect bus transit services operating along these streets, existing bus services operating in the vicinity of the WTC site and the Proposed Project's potential effects on these services are discussed qualitatively.

Pedestrians

The Proposed Project would not generate additional pedestrian demand or change pedestrian access routes in the vicinity of the WTC site. However, the installation of security infrastructure (e.g., static barriers, personnel booths, etc.) would reduce the amount of space available for pedestrian circulation at some locations, and a quantitative analysis of pedestrian levels of service with the Proposed Project is therefore warranted.

E. LEVEL 2 SCREENING ASSESSMENT

Traffic

A Level 2 screening assessment typically involves the assignment of project-generated trips to the study area street network, pedestrian elements and transit facilities, and the identification of specific locations where the incremental increase in demand may potentially exceed *CEQR Technical Manual* analysis thresholds and therefore require a quantitative analysis. As noted above, the Proposed Project would not result in new traffic, transit, pedestrian or parking demand. It would, however, result in the diversion or redistribution of vehicle trips en route to and from the WTC site as well as general background traffic. Later sections of this chapter discuss in detail the travel demand forecast for future development at the WTC site, the assignment of World Trade Center vehicle trips and general background traffic to the No-Action street network, and the diversion or redistribution of these vehicle trips due to the changes to the Project Area street network under the Campus Security Plan. Based on the net incremental change in peak hour vehicle trips (shown in **Figures 8-13 through 8-16** later in this chapter), and comments from the New York City and New York State departments of transportation, a total of 42 intersections (36 signalized and six unsignalized) generally located along the Broadway, Trinity Place/Church Street, West Broadway, Greenwich Street and Route 9A corridors from Chambers Street to Battery Place were selected for detailed analysis. These intersections are shown in **Figure 8-1**.

Pedestrians

Although the Proposed Project would not generate additional pedestrian demand or change pedestrian access routes in the vicinity of the WTC site, the installation of security infrastructure (e.g., static barriers, personnel booths, etc.) would reduce the amount of space available for pedestrian circulation at some locations. (The Proposed Project may also result in changes in pedestrian flow due the relocation of some taxi pickup/drop-off activity, but the numbers affected would be less than the *CEQR Technical Manual* 200-trips/hour analysis threshold at any one sidewalk or crosswalk). As discussed in detail later in this chapter, a total of 12 sidewalks were selected for analysis based on the expected locations of new security infrastructure. Three corner reservoir areas and 10 representative crosswalks along the Church Street corridor and on the planned extension of Fulton Street were also included in the analysis after consultation with the New York City Department of Transportation (NYCDOT). Crosswalks along Church Street were included to assess the potential effects on pedestrian flow from the installation of static barriers (such as bollards) within each crosswalk. Both the north and south crosswalks at Vesey Street and at Liberty Street were selected for analysis as static barriers would be installed across each, and as they are expected to experience heavy demand en route to and from nearby transit facilities. The north crosswalks on Church Street at Cortlandt, Dey and Fulton streets were included given that static barriers would be installed across each of these crosswalks and, unlike the south crosswalks at these intersections, all three will experience conflicting vehicular turning movements and would therefore be the most likely to experience any significant project-related impacts. The crosswalk on the planned extension of Fulton Street approaching Route 9A was also included for analysis as this crosswalk would potentially be located within a proposed sally port. The locations of all analyzed pedestrian facilities are shown in **Figure 8-2**.

Parking

The Proposed Project would not result in the development of new land uses that would generate additional parking demand, nor would it displace any existing or future off-street public parking capacity. As discussed in more detail later in this chapter, the installation of credentialing locations and security stations would, however, potentially displace an estimated 23 curbside spaces designated for authorized vehicle parking (Postal Inspector, Department of Labor and NYC Law Department), nine to 11 spaces for truck loading/unloading and four spaces for bus layover along Trinity Place/Church Street, Barclay Street

Figure 8-1
Traffic Study Area

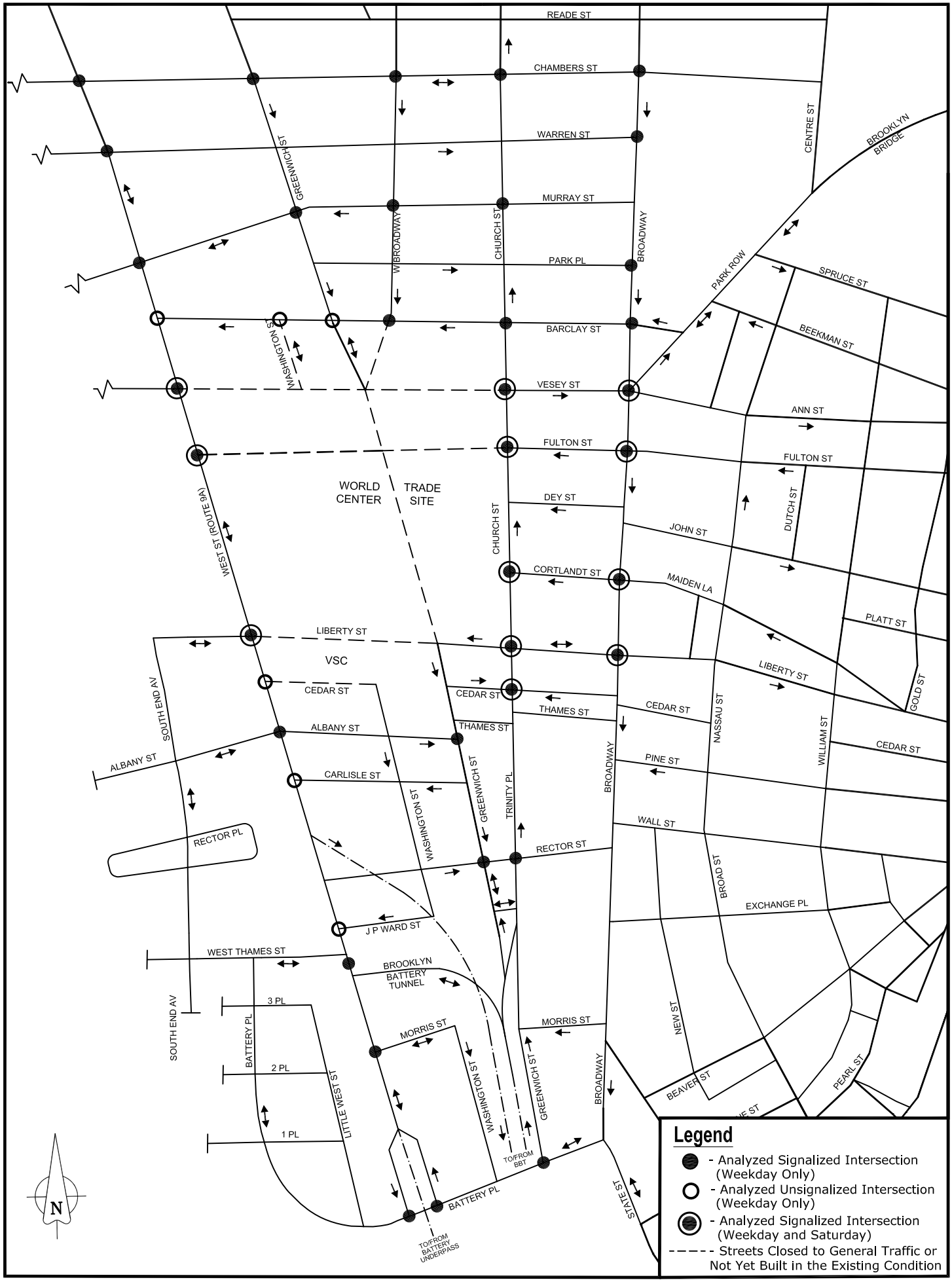


Figure 8-2

Pedestrian Analysis Locations

and West Broadway. The displacement of this number of authorized vehicle, truck and bus parking spaces would not be considered a significant adverse impact under *CEQR Technical Manual* criteria, and a quantitative traffic analysis is not warranted.

F. TRANSPORTATION ANALYSES METHODOLOGIES

Traffic

Analysis Methodology

To establish the existing conditions traffic network for the study area, manual turning movement, vehicle classification, and automatic traffic recorder (ATR) counts, along with speed and delay surveys, were conducted during the weekday AM, midday and PM peak periods and the Saturday midday peak period in May and June 2012. Surveys of off-street public parking capacity and utilization were also conducted at this time. Field surveys of parking regulations, lane configurations, and other physical and operational characteristics of the street network were conducted in July 2012. Current signal timing plans for signalized intersections within the study area were obtained from NYCDOT, and data on future changes to signal timings were obtained from NYCDOT and the New York State Department of Transportation (NYSDOT). As portions of Chambers Street were under reconstruction during the data collection program, secondary sources including NYCDOT's Lower Manhattan Traffic Model, data from previous studies prepared for planned developments, and data from NYCDOT initiatives in the area were also consulted in developing the 2012 existing baseline traffic networks.

The traffic analysis examines conditions in the weekday AM and PM peak hours when commuter travel demand in lower Manhattan is typically highest. The weekday midday and Saturday midday peak hours are also analyzed as these periods typically experience high levels of retail- and tourist-related demand. Based on existing peak traffic volumes along major corridors in the study area, the peak hours selected for the weekday analyses are 8:15-9:15 AM, 11:30 AM - 12:30 PM and 5-6 PM. The Saturday analysis focuses on the 1-2 PM peak hour.

The capacity analyses at study area intersections are based on the methodology presented in the *Highway Capacity Manual (HCM) Software HCS+ Version 5.5*. Traffic data required for these analyses include the hourly volumes on each approach and various other physical and operational characteristics including signal timing plans for signalized intersections and the physical layout, lane markings, curbside parking regulations, and other relevant characteristics of each analyzed intersection.

The HCM methodology provides a volume-to-capacity (v/c) ratio for each signalized intersection approach. The v/c ratio represents the ratio of traffic volumes on an approach to the approach's carrying capacity. A ratio of less than 0.90 is generally considered indicative of non-congested conditions in dense urban areas; when higher than this value, the ratio reflects increasing congestion. At a v/c ratio of between 0.95 and 1.0, near-capacity conditions are reached and delays can become substantial. Ratios of greater than 1.0 indicate saturated conditions with queuing. The HCM methodology also expresses quality of flow in terms of level of service (LOS), which is based on the amount of delay that a driver typically experiences at an intersection. Levels of service range from A, with minimal delay (10 seconds or less per vehicle), to F, which represents long delays (greater than 80 seconds per vehicle).

For unsignalized intersections, the HCM methodology generally assumes that major street traffic is not affected by minor street flows. Left turns from the major street are assumed to be affected by the opposing, or oncoming major street flow. Minor street traffic is obviously affected by all conflicting movements. Similar to signalized intersections, the HCM methodology expresses the quality of flow at

unsignalized intersections in terms of LOS based on the amount of delay that a driver experiences. This relationship differs somewhat from the criteria used for signalized intersections, primarily because drivers expect different levels of performance from the two different kinds of transportation facilities. For unsignalized intersections, levels of service range from A, with minimal delay (10 seconds or less per vehicle), to F, which represents long delays (over 50 seconds per vehicle).

Table 8-1 shows the LOS/delay relationship for signalized and unsignalized intersections using the HCM methodology. Levels of service A, B, and C generally represent highly favorable to fair levels of traffic flow. At LOS D, the influence of congestion becomes noticeable. LOS E is considered to be the limit of acceptable delay, and LOS F is considered to be unacceptable to most drivers. In this study, a signalized lane grouping operating at LOS E or F or a v/c ratio of 0.90 or above is identified as congested. For unsignalized intersections, a lane group with LOS E or F is also identified as congested.

Table 8-1
Intersection Level of Service Criteria

Level of Service (LOS)	Average Delay per Vehicle (seconds)	
	Signalized Intersections	Unsignalized Intersections
A	less than 10.1	less than 10.1
B	10.1 to 20.0	10.1 to 15.0
C	20.1 to 35.0	15.1 to 25.0
D	35.1 to 55.0	25.1 to 35.0
E	55.1 to 80.0	35.1 to 50.0
F	greater than 80.0	greater than 50.0

Source: *2000 Highway Capacity Manual.*

Significant Impact Criteria

The identification of significant adverse traffic impacts at analyzed intersections is based on criteria presented in the *CEQR Technical Manual*. According to *CEQR Technical Manual* criteria, if a lane group under the With-Action condition is within LOS A, B or C, or marginally acceptable LOS D (average control delay less than or equal to 45.0 seconds/vehicle for signalized intersections and 30.0 seconds/vehicle for unsignalized intersections), the impact is not considered significant. If the lane group LOS deteriorates from LOS A, B, or C in the No-Action condition to worse than mid-LOS D (i.e., delay greater than 45 seconds/vehicle at signalized intersections or 30 seconds/vehicle at unsignalized intersections) or to LOS E or F under the With-Action condition, then a significant traffic impact has occurred. For a lane group operating at LOS D under the No-Action condition, an increase of five or more seconds is considered significant if the With-Action delay exceeds mid-LOS D. For a lane group operating at LOS E under the No-Action condition, an increase in projected delay of 4.0 or more seconds is considered significant, and for a lane group operating at LOS F under the No-Action condition, an increase in projected delay of 3.0 or more seconds is considered significant.

The same criteria apply to both signalized and unsignalized intersections, however, for the minor street at an unsignalized intersection to trigger significant impacts, 90 passenger-car equivalents (PCEs) must be identified in the future With-Action condition in any peak hour.

Pedestrians

Analysis Methodology

Data on peak period pedestrian flow volumes were collected along those analyzed sidewalks, corner areas and crosswalks that were open to pedestrian traffic as of May 2012. Peak hours were determined by comparing rolling hourly averages, and the highest 15-minute volumes within the selected peak hours were used for analysis. Based on existing peak pedestrian volumes along major corridors in the study area, the peak hours selected for the analyses are 8:15-9:15 AM, 11:45 AM - 12:45 PM and 5-6 PM.

Peak 15-minute pedestrian flow conditions during the weekday AM, midday and PM peak hours are analyzed using the *2010 Highway Capacity Manual* methodology and procedures outlined in the *CEQR Technical Manual*. Using this methodology, the congestion level of pedestrian facilities is determined by considering pedestrian volume, measuring the sidewalk or crosswalk width, determining the available pedestrian capacity and developing a ratio of volume flows to capacity conditions. The resulting ratio is then compared with LOS standards for pedestrian flow, which define a qualitative relationship at a certain pedestrian traffic concentration level. The evaluation of street crosswalks and corners is more complicated as these spaces cannot be treated as corridors due to the time incurred waiting for traffic lights. To effectively evaluate these facilities a "time-space" analysis methodology is employed which takes into consideration the traffic light cycle at intersections.

LOS standards are based on the average area available per pedestrian during the analysis period, typically expressed as a 15-minute peak period. LOS grades from A to F are assigned, with LOS A representative of free flow conditions without pedestrian conflicts and LOS F depicting significant capacity limitations and inconvenience. **Table 8-2** defines the LOS criteria for pedestrian crosswalk/corner area and sidewalk conditions, as based on the *Highway Capacity Manual* methodology.

The analysis of sidewalk conditions includes a "platoon" factor in the calculation of pedestrian flow to more accurately estimate the dynamics of walking. "Platooning" is the tendency of pedestrians to move in bunched groups or "platoons" once they cross a street where cross traffic required them to wait. Platooning generally results in a level of service one level poorer than that determined for average flow rates.

Impact Criteria

Sidewalks

For areas of Manhattan within the Central Business District (which is typically defined as the area south of 60th Street), *CEQR Technical Manual* criteria define a significant adverse sidewalk impact to have occurred under platoon conditions if the average pedestrian flow rate under the No-Action condition is less than 6.4 pedestrians/minute/foot (pmf) of effective sidewalk width, and the average flow rate under the With-Action condition is greater than 8.5 pmf (worse than LOS D). If the average flow rate under the With-Action condition is less than or equal to 8.5 pmf (mid-LOS D or better), the impact should not be considered significant. If the No-Action pedestrian flow rate is between 6.4 and 19 pmf, an increase in average flow rate under the With-Action condition should be considered significant based on **Table 8-3**, which shows a sliding-scale that identifies what increase is considered a significant impact for a given flow rate. If the increase in the average pedestrian flow rate is less than the value shown in **Table 8-3,** the impact should not be considered significant. If the average pedestrian flow rate under the No-Action condition is greater than 19 pmf, then an increase in pedestrian flow rate greater than or equal to 0.6 pmf should be considered significant.

Table 8-2
Pedestrian Crosswalk/Corner Area and Sidewalk Levels of Service Descriptions

LOS	Crosswalk/Corner	Crosswalk/Corner Area Criteria (sf/ped)	Non-Platoon Sidewalk Criteria (pmf)	Platoon Sidewalk Criteria (pmf)
A	(Unrestricted)	> 60	≤ 5	≤ 0.5
B	(Slightly Restricted)	> 40 - 60	> 5 to 7	> 0.5 to 3
C	(Restricted but fluid)	> 24 - 40	> 7 to 10	> 3 to 6
D	(Restricted, necessary to continuously alter walking stride and direction)	> 15 - 24	> 10 to 15	> 6 to 11
E	(Severely restricted)	> 8 - 15	> 15 to 23	> 11 to 18
F	(Forward progress only by shuffling; no reverse movement possible)	≤ 8	> 23	> 18

Notes: Based on average conditions for 15 minutes
sf/ped – square feet of area per pedestrian
pmf – pedestrians per minute per foot of effective sidewalk width
Source: *2010 Highway Capacity Manual*

Table 8-3
Significant Impact Criteria for Sidewalks with Platooned Flow in a CBD Location

No-Action Condition Pedestrian Flow (pmf)	With-Action Condition Pedestrian Flow Increment to be Considered a Significant Impact (pmf)
< 6.4	With Action Condition > 8.5
6.4 to 7.0	Increment ≥ 2.2
7.1 to 7.8	Increment ≥ 2.1
7.9 to 8.6	Increment ≥ 2.0
8.7 to 9.4	Increment ≥ 1.9
9.5 to 10.2	Increment ≥ 1.8
10.3 to 11.0	Increment ≥ 1.7
11.1 to 11.8	Increment ≥ 1.6
11.9 to 12.6	Increment ≥ 1.5
12.7 to 13.4	Increment ≥ 1.4
13.5 to 14.2	Increment ≥ 1.3
14.3 to 15.0	Increment ≥ 1.2
15.1 to 15.8	Increment ≥ 1.1
15.9 to 16.6	Increment ≥ 1.0
16.7 to 17.4	Increment ≥ 0.9
17.5 to 18.2	Increment ≥ 0.8
18.3 to 19.0	Increment ≥ 0.7
> 19.0	Increment ≥ 0.6

Source: *2012 CEQR Technical Manual*

Corner Areas and Crosswalks

For CBD areas of Manhattan, *CEQR Technical Manual* criteria define a significant adverse corner area or crosswalk impact to have occurred if the average pedestrian space under the No-Action condition is greater than 21.5 square feet/pedestrian (sf/ped) and, under the With-Action condition, the average

pedestrian space decreases to less than 19.5 sf/ped (worse than mid-LOS D). If the pedestrian space under the With-Action condition is greater than or equal to 19.5 sf/ped (mid-LOS D or better), the impact should not be considered significant. If the average pedestrian space under the No-Action condition is between 5.1 and 21.5 sf/ped, a decrease in pedestrian space under the With-Action condition should be considered significant based on **Table 8-4** which shows a sliding-scale that identifies what decrease in pedestrian space is considered a significant impact for a given amount of pedestrian space in the No-Action condition. If the decrease in pedestrian space is less than the value in **Table 8-4**, the impact is not considered significant. If the average pedestrian space under the No-Action condition is less than 5.1 sf/ped, then a decrease in pedestrian space greater than or equal to 0.2 sf/ped should be considered significant.

Table 8-4
Significant Impact Criteria for Corners and Crosswalks in a CBD Location

No-Action Condition Pedestrian Space (sf/ped)			With-Action Condition Pedestrian Space Reduction to be Considered a Significant Impact (sf/ped)
> 21.5			With Action Condition < 19.5
21.3	to	21.5	Reduction ≥ 2.1
20.4	to	21.2	Reduction ≥ 2.0
19.5	to	20.3	Reduction ≥ 1.9
18.6	to	19.4	Reduction ≥ 1.8
17.7	to	18.5	Reduction ≥ 1.7
16.8	to	17.6	Reduction ≥ 1.6
15.9	to	16.7	Reduction ≥ 1.5
15.0	to	15.8	Reduction ≥ 1.4
14.1	to	14.9	Reduction ≥ 1.3
13.2	to	14.0	Reduction ≥ 1.2
12.3	to	13.1	Reduction ≥ 1.1
11.4	to	12.2	Reduction ≥ 1.0
10.5	to	11.3	Reduction ≥ 0.9
9.6	to	10.4	Reduction ≥ 0.8
8.7	to	9.5	Reduction ≥ 0.7
7.8	to	8.6	Reduction ≥ 0.6
6.9	to	7.7	Reduction ≥ 0.5
6.0	to	6.8	Reduction ≥ 0.4
5.1	to	5.9	Reduction ≥ 0.3
< 5.1			Reduction ≥ 0.2

Source: *CEQR Technical Manual*

Pedestrian and Vehicular Safety Evaluation

Under *CEQR Technical Manual* guidelines, an evaluation of vehicular and pedestrian safety is needed for locations within the traffic and pedestrian study areas that have been identified as high accident locations. These are defined as locations where 48 or more total reportable and non-reportable crashes or five or more pedestrian/bicyclist injury crashes have occurred in any consecutive 12 months of the most recent three-year period for which data are available. For these locations, accident trends would be identified to determine whether projected vehicular and pedestrian traffic would further impact safety, or whether existing unsafe conditions could adversely impact the flow of the projected new trips. The determination

of potential significant safety impacts depends on the type of area where the project site is located, traffic volumes, accident types and severity, and other contributing factors. Where appropriate, measures to improve traffic and pedestrian safety should be identified and coordinated with NYCDOT.

G. TRAFFIC

Existing Conditions

Study Area Street Network

Much of the street system in lower Manhattan in the vicinity of the WTC site was originally laid out by early colonists in the 17th and 18th centuries. It is characterized by an irregular grid system of streets that are often narrow and twisting, and that vary both in width and direction from block to block. In more recent times, super-block developments such as the World Trade Center have been superimposed on the network, and the street system has been expanded westward with the development of Battery Park City.

The existing traffic network in the vicinity of the WTC site features a number of major north-south and east-west roadways carrying heavy volumes of through and local traffic, and a mixture of grid and irregular patterns of local one-way streets. **Figures 8-3 through 8-6** show 2012 existing peak hour traffic volumes on the study area street network during the weekday AM, midday, PM and Saturday midday peak hours, respectively. The following describes the primary roadways within the traffic study area.

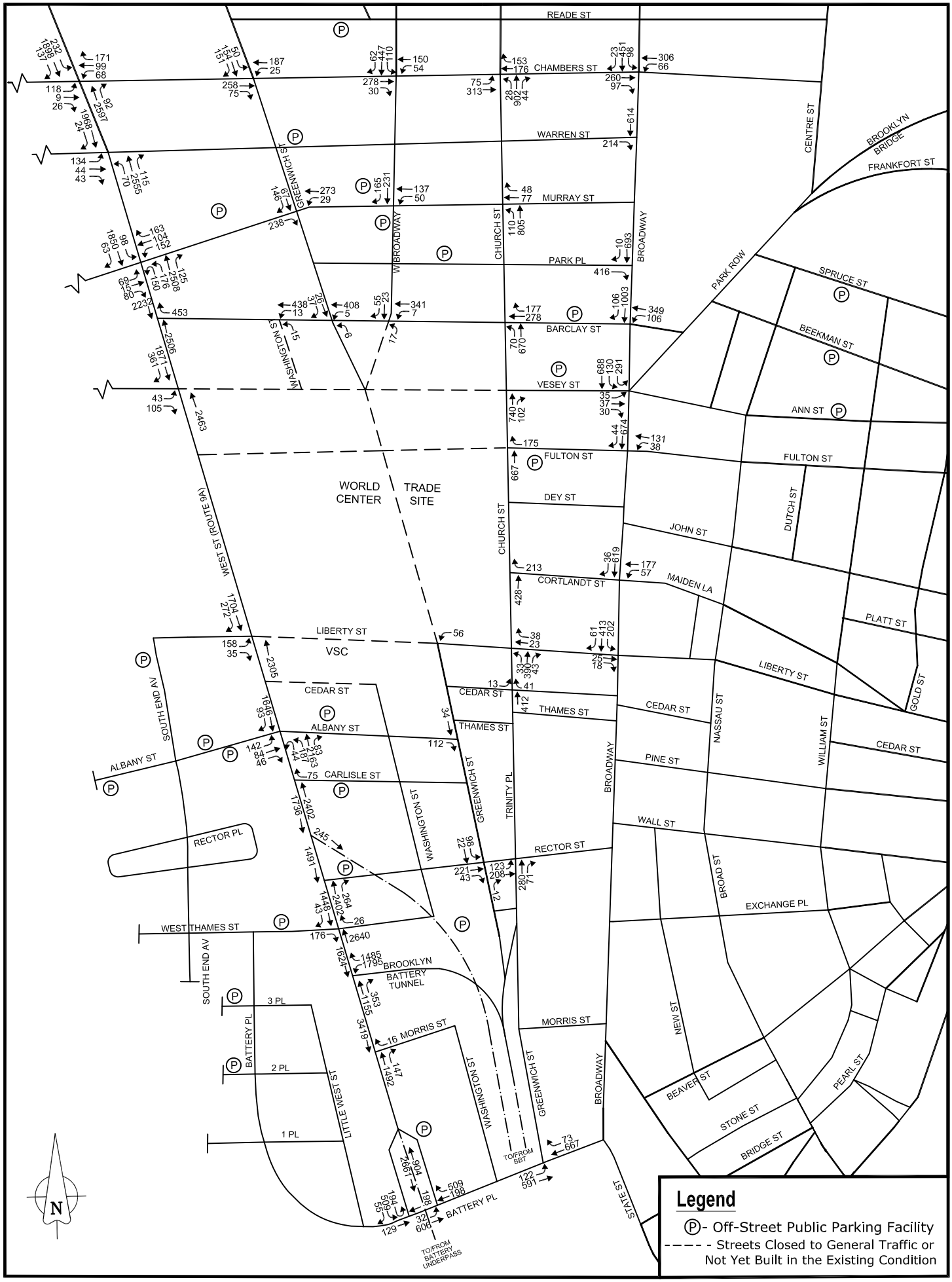
North-South Corridors

Two major north-south arterials bracket the area on the west and east and form part of a loop highway system around Manhattan. On the west is **Route 9A (West Street)** which provides access to and from the Brooklyn-Battery Tunnel and other points of access on the west side of Manhattan, including the Holland and Lincoln tunnels and the George Washington Bridge. In lower Manhattan, Route 9A typically operates with three to four moving lanes in each direction plus dedicated left-turn lanes. The segment of Route 9A adjacent to the WTC site is currently being reconstructed by the New York State Department of Transportation (NYSDOT). Peak hour traffic volumes in the vicinity of Liberty Street currently range from 1,500 to 2,500 northbound and from 1,650 to 2,750 southbound.

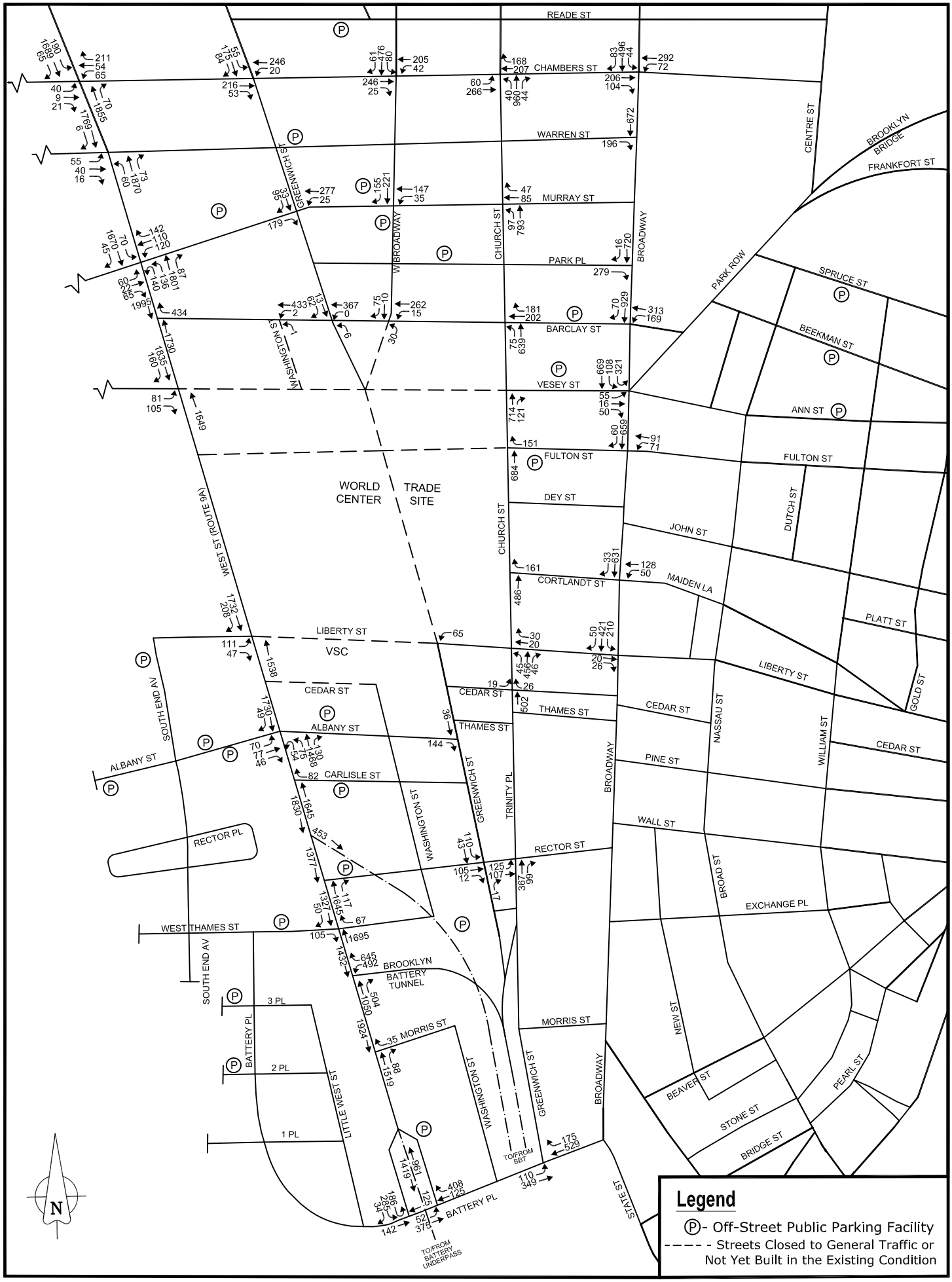
On the east is the **Franklin D. Roosevelt (FDR) Drive**, a limited access, north-south highway with three moving lanes in each direction. In lower Manhattan the highway is elevated over South Street, and comes to grade in the vicinity of South Ferry before continuing below grade through the Battery Underpass beneath Battery Park. The Battery Underpass connects the FDR Drive to Route 9A. Vehicles can enter and exit via ramps in the vicinity of the Brooklyn Bridge, as well as along the at-grade segment north of the Battery Underpass.

Northbound **Trinity Place/Church Street** and southbound **Broadway** form the principal arterial couplet in the area, complimenting Route 9A by carrying intra-Manhattan traffic flows including local trucking activity and delivery services. Trinity Place typically operates with three moving lanes, with the eastern-most lane functioning as an exclusive bus lane during the 7-10 AM and 4-7 PM peak periods on weekdays. North of Liberty Street, the roadway becomes Church Street and currently operates with only two moving lanes due to lane closures associated with construction activity at the adjacent WTC site. North of Vesey Street, Church Street widens to five lanes. The corridor is traversed by approximately 39 local, express and commuter bus routes, and much of the east curb in the vicinity of the WTC site is occupied by stops for these buses. Within the study area, the Trinity Place/Church Street corridor is a

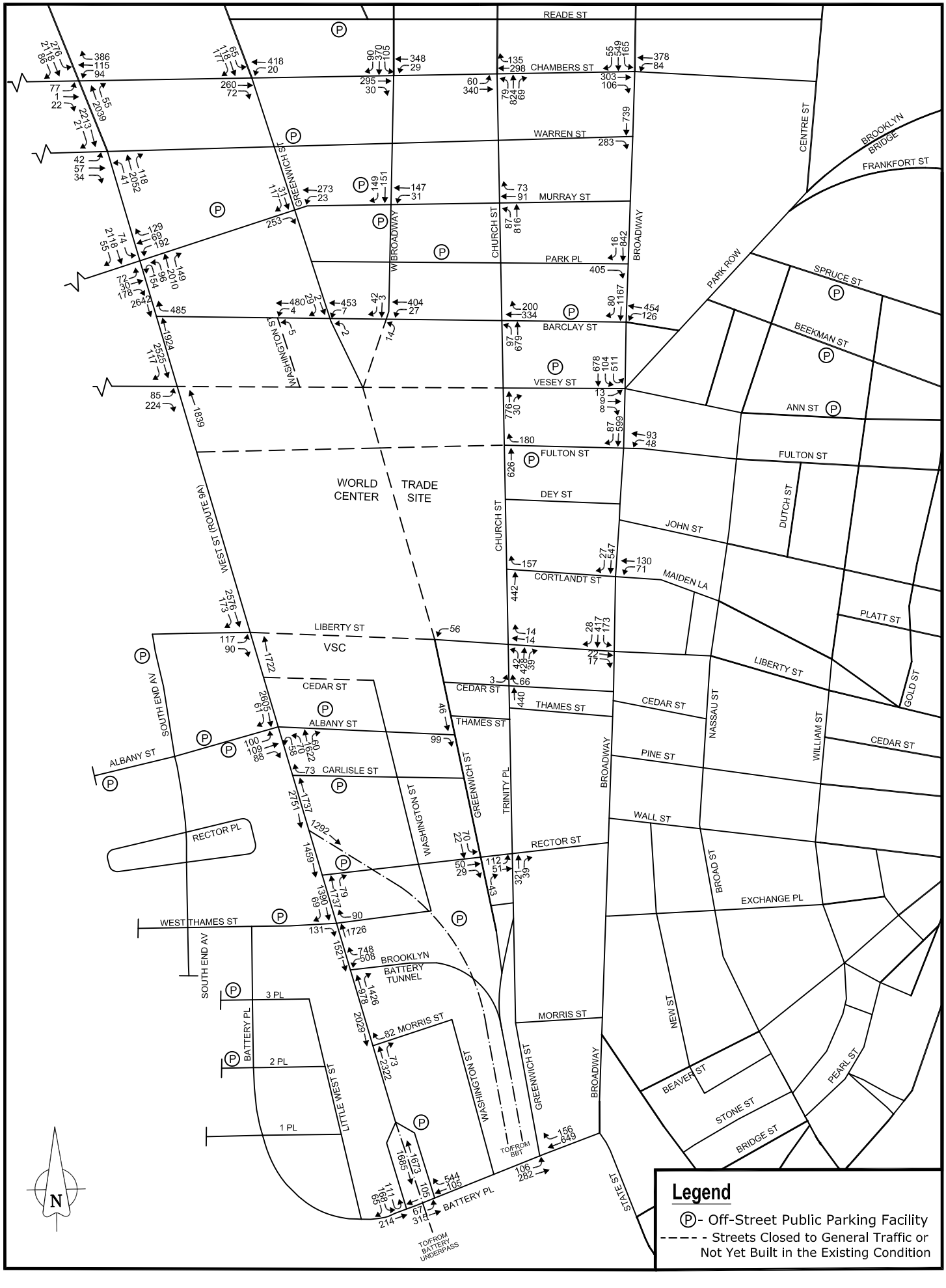
Figure 8-3
Existing Weekday AM Peak Hour Traffic Volumes



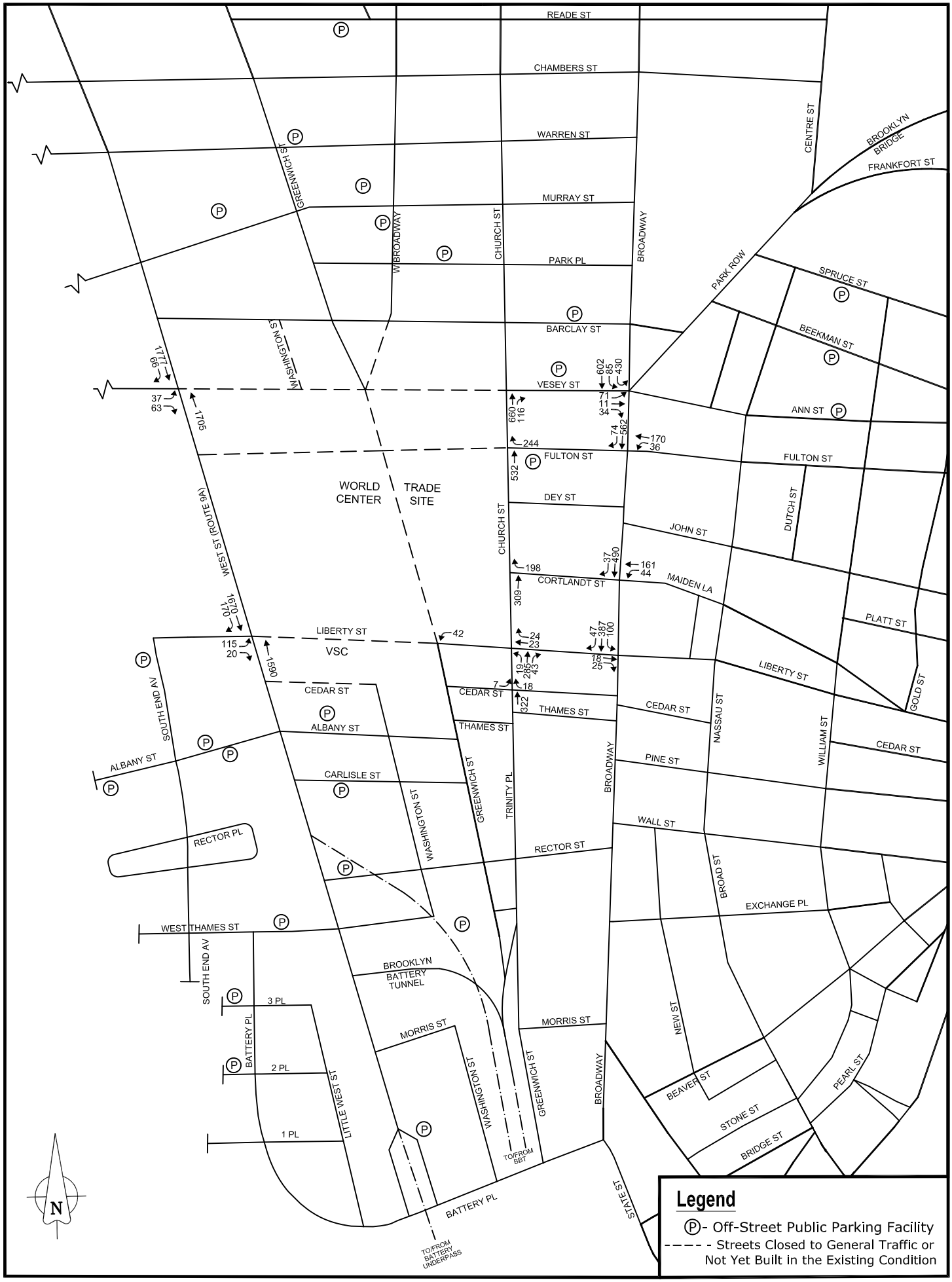
Existing Weekday Midday Peak Hour Traffic Volumes



Existing Weekday PM Peak Hour Traffic Volumes



Existing Saturday Midday Peak Hour Traffic Volumes



designated local truck route. Peak hour traffic volumes approaching Vesey Street typically range from 715 to 805.

Between Chambers and Vesey streets, Broadway typically operates with three moving lanes plus curb lanes along one or both curbs. As the corridor hosts heavy bus traffic (approximately 26 local, express and commuter routes), the western-most moving lane is a designated bus lane from 7 AM to 6 PM, and the west curb lane is used primarily for bus stops, with truck loading/unloading permitted at some locations in non-peak periods. At Vesey Street, a double left-turn is provided to accommodate heavy peak period demand (approximately 420 to 615 vehicles per hour) en route to Park Row and the Brooklyn Bridge. South of Vesey Street, Broadway typically operates with three moving lanes, with the west curb lane designated as an exclusive bus lane in the weekday 7-10 AM and 4-7 PM peak periods. Broadway is a designated local truck route, and truck loading and unloading is generally permitted along the east curb in non-peak periods south of Vesey Street. (Approaching Fulton Street, one moving lane along Broadway is occupied by an NYPD security checkpoint for trucks continuing south on Broadway.) Peak hour volumes typically range from 1,090 to 1,295 approaching Vesey Street/Park Row, and 530 to 685 at Liberty Street.

Other north-south corridors in the vicinity of the WTC site are mainly used for local access and include West Broadway and Greenwich Street. **West Broadway** is a one-way southbound street that provides access to the study area from Varick Street and the Holland Tunnel to the north. It typically operates with three moving lanes plus curbside parking. West Broadway currently terminates at the WTC site (Vesey Street), and the block between Barclay and Vesey streets primarily functions as an access drive for U.S. Postal Service and other vehicles entering and exiting a below-grade loading area beneath the adjacent Federal Office Building at 90 Church Street. Peak hour volumes typically range from 45 to 85 vehicles approaching Barclay Street.

To the west is **Greenwich Street** which generally operates one-way southbound south of Canal Street and is bisected by the WTC site. To the north of the WTC site, Greenwich Street typically operates with two moving lanes plus curbside parking. The dead-end block between Barclay and Vesey streets primarily functions as a two-way access street for the adjacent 7 World Trade Center. Peak hour traffic volumes typically range from 30 to 75 vehicles approaching Barclay Street. Greenwich Street currently resumes south of the WTC site at Liberty Street where it operates one-way southbound until Rector Street, and two-way for the short block between Rector and Edgar Streets where it provides access/egress for the Battery Parking Garage. South of Edgar Street, Greenwich Street is again discontinuous due to an exit roadway from the Brooklyn-Battery Tunnel. The southern-most segment of Greenwich Street operates one-way northbound connecting Battery Place with Trinity Place. It generally operates with two moving lanes with bus stops along the east curb, and metered bus parking along the west curb in off-peak periods, and the entire street is restricted to buses only during the weekday 6-10 AM and 3-7 PM peak periods. As discussed later in this chapter, it is expected that the segments of Greenwich Street to the north and south of the WTC site will be reconnected by extending the street through the WTC site in the 2019 No-Action condition.

East-West Streets

The east-west street system in the study area is often discontinuous and mainly provides local access to and from the primary north-south corridors such as Route 9A. At the northern end of the study area is **Chambers Street**, which operates two-way connecting Route 9A and Battery Park City with Centre Street and the Brooklyn Bridge. Chambers Street typically operates with one moving lane in each direction, and peak hour traffic volumes in the vicinity of Church Street currently range from 285 to 410

eastbound and from 200 to 435 westbound.[1] To the south, **Warren Street** and **Murray Street** function as an eastbound-westbound couplet connecting Route 9A to Broadway. Eastbound Warren Street typically operates with one moving lane plus curbside parking. The north curb approaching Greenwich Street is designated as a bus layover area for MTA buses, and there is also a striped bicycle lane outboard of the north curb lane. At Route 9A, the southbound left-turn onto Warren Street is prohibited. Peak hour traffic volumes on Warren Street approaching Broadway range from 195 to 285. Westbound Murray Street typically operates with one moving lane plus curbside parking; however, between Greenwich Street and Route 9A the street widens in width and operates two-way with one to two moving lanes in each direction. The north curb approaching Route 9A is designated as an MTA bus layover area. Peak hour traffic volumes on Murray Street at Greenwich Street typically range from 175 to 255 eastbound and from 295 to 305 westbound.

Barclay Street, located immediately to the north of the WTC site, operates one-way westbound from Broadway to northbound Route 9A, typically with one to two moving lanes plus curbside parking that is restricted during peak periods. The street functions as an access corridor for traffic en route from the Brooklyn Bridge (via Park Row) to northbound Route 9A. At the intersection with Route 9A, pavement markings narrow the Barclay Street approach to a single lane and vehicles can only turn northbound as there is no access to the southbound lanes of the highway. The Barclay Street intersection with Route 9A is stop controlled as are the intersections with Washington Street and with Greenwich Street (on the Greenwich Street approach). Peak hour traffic volumes on Barclay Street approaching West Broadway typically range from 275 to 435.

Vesey Street connects Route 9A with Broadway and Park Row. The segment between Church Street and Route 9A traverses the WTC site and is currently closed due to construction at the WTC site, leaving only the segment between Church Street and Broadway open to traffic. This block operates one-way eastbound typically with two moving lanes plus truck loading and unloading along the north curb. On weekdays, general traffic is often restricted from 4 PM to 7 PM to reduce conflicts with heavy pedestrian flows en route to and from the temporary PATH station entrance on Vesey Street at West Broadway and thereby facilitate northbound traffic flow on Church Street. Only autos en route to and from a parking garage entrance on the block are permitted access during this period. In other peak periods, hourly traffic volumes typically range from 100 to 125. As discussed later in this chapter, it is expected that Vesey Street will be reopened to traffic through the WTC site in the 2019 No-Action condition.

Fulton Street operates one-way westbound connecting Water Street on the east with Church Street on the west. It typically operates with one to two moving lanes with truck loading and unloading along portions of the south curb. Peak hour traffic volumes approaching Broadway typically range from 140 to 170. As discussed later in this chapter, it is expected that Fulton Street will be extended through the WTC site in the 2019 No-Action condition.

Liberty Street and **Maiden Lane/Cortlandt Street** function as an eastbound-westbound couplet connecting South Street on the east with Church Street on the west. Liberty Street currently operates two-way between Church Street and Broadway, and one-way eastbound from Broadway to a merge with Maiden Lane at Gold Street. The block between Church and Greenwich streets along the southern boundary of the WTC site has been reopened to westbound traffic only. Liberty Street typically operates with one to two moving lanes per direction plus curbside truck loading/unloading along selected segments. Peak hour traffic volumes between Church Street and Broadway typically range from 35 to 50 eastbound and from 25 to 65 westbound. As discussed later in this chapter, it is expected that Liberty Street will be reopened to traffic through the WTC site in the 2019 No-Action condition.

[1]Portions of eastbound Chambers Street were closed to traffic during 2012 due to reconstruction work. The 2012 existing traffic networks reflect conditions without construction-related closures.

Maiden Lane currently operates two-way from South Street on the east to Gold Street on the west. It then continues one-way westbound, becoming Cortlandt Street at Broadway, before terminating at Church Street. The corridor typically operates with one to two moving lanes per direction plus curbside truck loading/unloading along selected segments. Peak hour traffic volumes approaching Church Street typically range from 175 to 235.

South of the WTC site is **Albany Street** which provides access from Battery Park City and northbound Route 9A to Greenwich Street. It operates two-way to the west of Route 9A within Battery Park City, and one-way eastbound from Route 9A to Greenwich Street. A left turn from northbound Route 9A onto Albany Street is currently permitted as a construction-related detour, and is expected to be relocated to Liberty Street in the future No-Action condition. The left-turn from southbound Route 9A onto eastbound Albany Street is prohibited. Approaching Greenwich Street, Albany Street typically operates with one moving lane, and peak hour volumes typically range from 95 to 145 approaching Greenwich Street. Further to the south is **Rector Street**, which operates with one eastbound moving lane between northbound Route 9A and Broadway. Peak hour volumes approaching Greenwich Street range from 75 to 265.

Lastly, at the southern end of the study area is Battery Place which connects Broadway and State Street to Route 9A and Battery Park City. The street generally operates with two moving lanes in each direction, and is heavily used by buses en route to and from the Brooklyn-Battery Tunnel. Bus stops or tour bus loading/unloading is located along both curbs. Peak hour traffic volumes at Greenwich Street range from 385 to 715 eastbound and from 700 to 805 westbound.

Intersection Capacity Analysis

Table 8-5 provides an overview of the levels of service that characterize existing "overall" intersection conditions during the weekday AM, midday, PM and Saturday midday peak hours. The overall level of service of an intersection represents a weighted average of the individual lane groups' levels of service. "Overall" LOS E or F indicates that serious congestion exists – either one specific lane group at the intersection has severe delays or two or more lane groups at the intersection are at LOS E or F with substantial delays. As shown in **Table 8-5**, one analyzed intersection currently operates at LOS E or F in the weekday AM peak hour, one in the weekday midday, two in the weekday PM and none in the Saturday midday peak hour. Five intersections operate at a marginally acceptable LOS D in the AM peak hour, three each in the midday and PM, and none in the Saturday midday peak hour. A total of 17 individual lane groups out of the approximately 134 such lane groups analyzed for the weekday peak hours are at LOS E or F in the AM, eight in the midday, 11 in the PM, and none in the Saturday midday peak hour. Of these lane groups, 16 would be at intersections along Route 9A in the AM peak hour, six in the midday, ten in the PM and none in the Saturday midday.

Table 8-6 shows the volume-to-capacity ratios, delays and levels of service by lane group at each analyzed intersection in each peak hour, and identifies those lane groups that are considered congested in one or more peak hours (i.e., lane groups operating at LOS E or F and/or with a high v/c ratio—0.90 and above). These congested locations are discussed in more detail below.

Broadway

As shown in **Table 8-6**, a total of two intersections along the Broadway corridor currently experience congestion during peak periods. In the weekday midday peak hour, the eastbound approach to Broadway at Chambers Street is congested (LOS E). In the PM, the southbound through movement on Broadway at Park Row/Barclay Street is operating at capacity (LOS E, 1.01 v/c ratio).

Table 8-5
Existing Intersection Levels of Service Summary

	Weekday AM Peak Hour	Weekday Midday Peak Hour	Weekday PM Peak Hour	Saturday Midday Peak Hour
Overall LOS A/B/C	34	36	35	11
Overall LOS D	5	3	3	0
Overall LOS E	1	0	1	0
Overall LOS F	0	1	1	0
No. of lane groups at LOS E or F of the approximately 134 analyzed for the weekday periods and 27 for Saturday	17	8	11	0
No. of lane groups at LOS E or F at Route 9A intersections	16	6	10	0
No. of lane groups at LOS E or F within the Downtown street grid	1	2	1	0

Church Street

A total of two intersections along the Church Street corridor currently experience congestion during peak periods. At Chambers Street, the eastbound approach is congested in the AM and midday peak hours (LOS E and D, respectively), while at Barclay Street, the westbound approach is operating at capacity in the midday peak hour (LOS E, 1.02 v/c ratio).

Route 9A (West Street)

As shown in **Table 8-6**, a total of ten intersections along the Route 9A corridor currently experience congestion in one or more peak hours. At Chambers Street in the AM peak hour, the eastbound approach operates at capacity (LOS F, 1.05 v/c ratio), the westbound left-through lane group operates at LOS E and the northbound approach operates essentially at capacity with a v/c ratio of 0.99. The southbound left turn at this intersection is congested in the AM (LOS E) and in the PM (LOS F, 0.95 v/c ratio). The eastbound Warren Street approach is congested in the AM peak hour (LOS E), while the northbound left-turn movement is congested in both the weekday AM and midday peak hours (LOS F and E, respectively).

At Murray Street, the eastbound left turn and through-right lane groups are congested in the AM peak hour (LOS F and E, respectively), as is the eastbound approach in the PM (LOS E). The westbound approach is operating at capacity in the AM (LOS F, 1.05 v/c ratio) and midday (LOS F, 1.03 v/c ratio). In the PM peak hour, the westbound left-turn movement operates at capacity (LOS F, 1.05 v/c ratio) and the through-right lane group is congested (LOS E). At the same intersection, the northbound left turn on Route 9A operates at capacity (LOS F) in all three weekday peak hours (v/c ratios of 1.05, 1.05 and 1.04, respectively), the northbound through-right lane group is operating at capacity (LOS D, 1.03 v/c ratio) in the AM, and the southbound left turn is congested (LOS E) in all three weekday peak hours.

At Barclay Street, the westbound approach to northbound Route 9A operates at capacity (LOS F) in all three weekday peak hours (v/c ratios of 1.05, 1.02 and 1.03, respectively). At Vesey Street, the northbound Route 9A approach is operating at capacity in the AM peak hour (LOS D, 1.05 v/c ratio) as is the southbound approach in the both the AM and PM periods (LOS D, 1.05 v/c ratio). The southbound approach also experiences congestion in the midday (0.94 v/c ratio). At Liberty Street, the southbound Route 9A approach operates at capacity in the PM peak hour (LOS D, 1.05 v/c ratio).

Table 8-6
Existing Conditions Levels of Service Analysis

	LANE	AM PEAK HOUR			MD PEAK HOUR			PM PEAK HOUR			SAT MD PEAK HOUR		
	GROUP	V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS
1. Chambers St (E-W) @	EB - TR	0.68	30.3	C	0.94	59.4	E *	0.72	31.0	C			
Broadway (SB)	WB - L	0.44	28.8	C	0.48	30.1	C	0.56	35.3	D			
	WB - T	0.70	31.5	C	0.65	29.0	C	0.75	33.6	C			
	SB - L	0.37	24.0	C	0.16	19.8	B	0.66	34.7	C			
	SB - LT	0.65	28.3	C	0.79	35.1	D	0.85	39.3	D			
	SB - R	0.10	18.8	B	0.57	36.4	D	0.39	27.6	C			
2. Warren St (EB) @	EB - R	0.65	29.6	C	0.71	33.2	C	0.85	42.4	D			
Broadway (SB)	SB - T	0.43	17.0	B	0.49	17.9	B	0.53	18.5	B			
3. Park Place (E-W) @	EB - R	0.63	22.2	C	0.41	17.5	B	0.59	20.8	C			
Broadway (SB)	SB - T	0.54	21.1	C	0.59	22.0	C	0.68	24.2	C			
	SB - R	0.06	16.1	B	0.14	18.4	B	0.08	16.3	B			
4. Park Row/Barclay St (WB) @	WB - L	0.27	26.0	C	0.44	29.4	C	0.31	26.8	C			
Broadway (SB)	WB - LT	0.44	27.5	C	0.45	27.7	C	0.54	29.1	C			
	SB - T	0.86	32.7	C	0.79	29.0	C	1.01	55.7	E *			
	SB - R	0.39	23.0	C	0.22	19.2	B	0.22	19.1	B			
5. Vesey St/Park Row/Ann St (EB) @	EB - TR	0.52	45.4	D	0.68	53.7	D	0.14	37.3	D	0.51	44.5	D
Broadway (SB)	SB - L	0.60	19.4	B	0.59	19.3	B	0.83	28.9	C	0.57	18.8	B
	SB - LT	0.82	28.0	C	0.80	26.7	C	0.82	28.1	C	0.56	17.2	B
6. Fulton St (WB) @	WB-L	0.23	27.7	C	0.32	29.1	C	0.25	27.9	C	-	-	-
Broadway (SB)	WB-T	0.39	29.2	C	0.27	27.2	C	0.28	27.2	C	-	-	-
	WB - LT	-	-	-	-	-	-	-	-	-	0.62	35.4	D
	SB - T	0.34	9.1	A	0.43	10.1	B	0.30	8.7	A	-	-	-
	SB - TR	-	-	-	-	-	-	-	-	-	0.32	8.8	A
	SB - R	0.21	9.9	A	0.25	10.3	B	0.39	13.6	B	-	-	-
7. Maiden Lane/Cortlandt St (WB) @	WB - LT	0.70	39.0	D	0.49	31.4	C	0.59	34.3	C	0.62	35.0	C
Broadway (SB)	SB - T	0.32	8.9	A	-	-	-	0.27	8.5	A	-	-	-
	SB - TR	-	-	-	0.50	11.1	B	-	-	-	0.4	9.9	A
	SB - R	0.17	9.1	A	-	-	-	0.11	8.2	A	-	-	-
8. Liberty St (E-W) @	EB - TR	0.18	26.1	C	0.23	27.2	C	0.17	25.8	C	0.16	25.7	C
Broadway (SB)	SB - LT	0.48	11.0	B	-	-	-	0.39	9.8	A	-	-	-
	SB - LTR	-	-	-	0.46	10.5	B	-	-	-	0.33	9.0	A
	SB - R	0.35	13.5	B	-	-	-	0.13	8.4	A	-	-	-
9. Chambers St (E-W) @	EB - LT	0.96	59.5	E *	0.92	50.2	D *	0.71	27.4	C			
Church St (NB)	WB - TR	0.60	23.2	C	0.61	23.3	C	0.71	26.3	C			
	NB - LT	0.58	20.2	C	-	-	-	0.59	20.3	C			
	NB - LTR	-	-	-	0.63	21.0	C	-	-	-			
	NB - R	0.18	16.7	B	-	-	-	0.34	20.4	C			
10. Murray St (WB) @	WB - TR	0.40	25.8	C	0.39	25.2	C	0.55	29.7	C			
Church St (NB)	NB - LT	0.41	12.6	B	0.44	13.0	B	0.40	12.4	B			
11. Barclay St (WB) @	WB - TR	0.60	27.4	C	1.02	74.6	E *	0.57	23.9	C			
Church St (NB)	NB - LT	0.32	11.7	B	0.33	13.8	B	0.37	14.3	B			
12. Vesey St (EB) @	NB - TR	0.76	20.3	C	0.78	26.7	C	0.82	29.0	C	0.70	23.5	C
Church St (NB)	EB	(Closed)			(Closed)			(Closed)			(Closed)		
13. Fulton St (WB) @	WB - R	0.34	19.1	B	0.30	18.5	B	0.37	19.6	B	0.47	21.4	C
Church St (NB)	NB - T	0.68	22.2	C	0.57	19.2	B	0.62	20.6	C	0.42	17.0	B
14. Cortlandt St (WB) @	WB - R	0.55	29.7	C	0.40	26.2	C	0.39	26.1	C	0.53	29.1	C
Church St (NB)	NB - T	0.49	16.6	B	0.41	15.1	B	0.47	16.2	B	0.25	13.3	B
15. Liberty St (E-W) @	WB - TR	0.15	21.1	C	0.12	20.7	C	0.06	20.0	B	0.11	20.5	C
Trinity Place/Church St (NB)	NB - LT	0.23	11.1	B	-	-	-	0.27	11.3	B	-	-	-
	NB - LTR	-	-	-	0.33	11.9	B	-	-	-	0.21	10.8	B
	NB - R	0.25	13.7	B	-	-	-	0.22	13.2	B	-	-	-
16. Cedar St (E-W) @	EB - L	0.06	20.3	C	0.12	21.5	C	0.01	19.5	B	0.02	19.6	B
Trinity Place (NB)	WB - R	0.18	22.1	C	0.12	21.1	C	0.25	22.9	C	0.13	21.0	C
	NB - T	0.21	10.9	B	0.29	11.5	B	0.24	11.2	B	0.17	10.5	B

Table 8-6 (continued)
2012 Existing Traffic Levels of Service

	LANE	AM PEAK HOUR				MD PEAK HOUR				PM PEAK HOUR				SAT MD PEAK HOUR			
	GROUP	V/C RATIO	Delay (sec.)	LOS		V/C RATIO	Delay (sec.)	LOS		V/C RATIO	Delay (sec.)	LOS		V/C RATIO	Delay (sec.)	LOS	
17. Rector St (EB) @	EB - LT	0.84	44.4	D		0.65	33.1	C		0.46	27.6	C					
Trinity Place (NB)	NB - T	0.12	12.1	B		-	-	-		0.16	12.5	B					
	NB - TR	-	-	-		0.51	17.0	B		-	-	-					
	NB - R	0.30	16.1	B		-	-	-		0.15	13.1	B					
18. Chambers St (E-W) @	EB - TR	0.46	19.5	B		0.52	21.1	C		0.47	19.6	B					
West Broadway (SB)	WB - LT	0.37	18.4	B		0.37	18.2	B		0.57	21.6	C					
	SB - LT	0.57	20.7	C		0.53	20.0	B		0.53	20.0	B					
	SB - R	0.23	17.1	B		0.26	18.0	B		0.42	21.9	C					
19. Murray St (WB) @	WB - LT	0.51	27.6	C		0.45	25.8	C		0.43	25.4	C					
West Broadway (SB)	SB - TR	0.25	11.2	B		0.25	11.2	B		0.22	10.9	B					
20. Barclay St (WB) @	WB - LT	0.36	20.5	C		0.61	27.0	C		0.44	21.6	C					
West Broadway (N-S)	NB - L	0.05	11.7	B		0.07	12.0	B		0.04	11.6	B					
	SB - T	0.03	11.5	B		0.01	11.4	B		0.01	11.3	B					
	SB - R	0.13	12.6	B		0.15	12.7	B		0.10	12.3	B					
21. Chambers St (E-W) @	EB - T	0.42	19.0	B		0.37	18.1	B		0.45	19.3	B					
Greenwich St (SB)	EB - R	0.23	16.9	B		0.14	15.5	B		0.22	16.7	B					
	WB - LT	0.35	17.6	B		0.36	17.8	B		0.64	23.3	C					
	SB - LTR	0.77	35.8	D		0.52	26.5	C		0.85	44.3	D					
22. Murray St (E-W) @	EB - R	0.84	47.5	D		0.59	32.1	C		0.80	42.5	D					
Greenwich St (SB)	WB - LT	0.73	35.3	D		0.68	32.4	C		0.68	32.3	C					
	SB - TR	0.51	16.4	B		0.30	12.8	B		0.45	16.3	B					
23. Barclay St (WB) @	WB - LT	0.00	7.6	A		0.00	7.6	A		0.01	7.6	A					
Greenwich St (N-S)	NB - L	0.02	13.9	B		0.02	13.5	B		0.00	13.1	B					
(Unsignalized)	SB - T	0.10	17.8	C		0.04	16.6	C		0.01	17.1	C					
	SB - R	0.07	11.2	B		0.11	11.2	B		0.05	11.1	B					
24. Albany St (EB) @	EB - R	0.44	26.8	C		0.57	31.0	C		0.44	27.2	C					
Greenwich St (SB)	SB - T	0.06	10.3	B		0.06	10.2	B		0.06	10.3	B					
25. Rector St (EB) @	EB - TR	0.59	28.3	C		0.23	21.3	C		0.13	20.0	C					
Greenwich St (N-S)	NB - R	0.07	10.7	B		0.07	10.6	B		0.20	12.6	B					
	SB - LT	0.39	15.4	B		0.39	14.8	B		0.25	12.7	B					
26. Battery Place (E-W) @	EB - L	0.83	51.0	D		0.54	18.6	B		0.81	49.0	D					
Greenwich St (NB)	EB - T	0.53	11.8	B		0.36	9.6	A		0.28	8.8	A					
	WB - TR	0.38	9.3	A		0.36	9.2	A		0.42	9.8	A					
27. Barclay St (WB) @	WB - LT	-	10.4	B		-	8.5	A		-	10.2	B					
Washington St (N-S)	WB-T	-	8.5	A		-	8.6	A		-	8.6	A					
(Unsignalized)	NB - L	-	8.5	A		-	8.1	A		-	8.4	A					
28. Chambers St (E-W) @	EB - LTR	1.05	134.0	F	*	0.31	36.6	D		0.59	47.0	D					
Route 9A (West St) (N-S)	WB - LT	0.73	62.7	E	*	0.45	40.4	D		0.74	50.5	D					
	WB - R	0.36	29.0	C		0.35	22.0	C		0.68	30.2	C					
	NB - TR	0.99	40.3	D	*	0.81	27.4	C		0.87	31.1	C					
	SB - L	0.72	70.4	E	*	0.53	54.5	D		0.95	94.8	F	*				
	SB - TR	0.57	6.3	A		0.53	8.1	A		0.71	12.8	B					
29. Warren St (E-W) @	EB - LTR	0.70	56.3	E	*	0.32	35.8	D		0.39	37.5	D					
Route 9A (West St) (N-S)	NB - L	0.84	122.1	F	*	0.62	78.9	E	*	0.25	52.6	D					
	NB - TR	0.87	19.5	B		0.70	17.6	B		0.85	25.7	C					
	SB - TR	0.63	13.4	B		0.62	16.3	B		0.85	26.0	C					
30. Murray St (E-W) @	EB - DefL	0.78	92.3	F	*	0.54	51.6	D		-	-	-					
Route 9A (West St) (N-S)	EB - TR	0.59	58.8	E	*	0.45	42.5	D		-	-	-					
	EB - LTR	-	-	-		-	-	-		0.86	64.3	E	*				
	WB - DefL	-	-	-		-	-	-		1.05	120.0	F	*				
	WB - TR	-	-	-		-	-	-		0.89	75.3	E	*				
	WB - LTR	1.05	106.4	F	*	1.03	96.5	F	*	-	-	-					
	NB - L	1.05	123.8	F	*	1.05	122.6	F	*	1.04	123.6	F	*				
	NB - TR	1.03	45.1	D	*	0.78	19.0	B		0.88	24.6	C					
	SB - L	0.47	66.9	E	*	0.39	59.4	E	*	0.32	55.4	E	*				
	SB - TR	0.64	15.5	B		0.60	15.3	B		0.78	20.2	C					

Table 8-6 (continued)
2012 Existing Traffic Levels of Service

	LANE	AM PEAK HOUR			MD PEAK HOUR			PM PEAK HOUR			SAT MD PEAK HOUR		
	GROUP	V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS
31. Barclay St (WB) @ Route 9A (West St) (N-S) (Unsignalized)	WB - R	1.05	86.0	F *	1.02	73.4	F *	1.03	75.4	F *			
32. Vesey St (E-W) @ Route 9A (West St) (N-S)	EB - L	0.10	32.2	C	0.19	26.7	C	0.17	26.3	C	0.08	25.1	C
	EB - R	0.27	35.2	D	0.26	27.8	C	0.51	33.7	C	0.16	26.2	C
	NB - T	1.05	48.1	D *	0.78	17.8	B	0.89	22.9	C	0.79	18.1	B
	SB - TR	1.05	50.4	D *	0.94	26.8	C *	1.05	51.4	D *	0.84	19.9	B
33. Fulton St St (WB) @ Route 9A (West St) (N-S)	WB-R	(Closed)			(Closed)			(Closed)			(Closed)		
	NB-T												
34. Liberty St (E-W) @ Route 9A (West St) (N-S)	EB - L	0.42	44.5	D	0.24	33.6	C	0.24	30.0	C	0.27	34.1	C
	EB - R	0.10	38.5	D	0.12	31.8	C	0.22	30.0	C	0.05	30.8	C
	WB-LTR	(Closed)			(Closed)			(Closed)			(Closed)		
	NB - T	0.88	11.3	B	0.65	8.5	A	0.74	13.2	B	0.63	8.2	A
	SB - TR	0.74	7.4	A	0.79	11.1	B	1.05	46.7	D *	0.72	9.5	A
35. Albany St (E-W) @ Route 9A (West St) (N-S)	EB - LTR	0.81	65.5	E *	0.59	44.4	D	0.92	75.6	E *			
	NB - L	1.05	132.0	F *	0.85	91.9	F *	0.61	60.8	E *			
	NB - TR	1.05	39.1	D *	0.86	12.9	B	0.91	14.1	B *			
	SB - TR	0.59	18.2	B	0.70	19.2	B	1.00	39.9	D *			
36. Carlisle St (WB) @ Route 9A (West St) (N-S) (Unsignalized)	WB - R	0.33	24.9	C	0.30	21.3	C	0.29	21.3	C			
37. Cedar Street (WB) @ Route 9A (West St) (N-S) (Unsignalized)	WB-R	(Closed)			(Closed)			(Closed)			(Closed)		
38a. West Thames St/ Brooklyn-Battery Tunnel Exit (E-W) @ Route 9A (West St) (N-S)	EB - R	0.41	25.0	C	0.36	32.3	C	0.48	36.4	D			
	WB - R	0.69	28.8	C	0.42	31.1	C	0.49	32.3	C			
	NB - T	0.51	25.8	C	0.36	10.7	B	0.32	10.3	B			
	SB - TR	1.03	72.2	E *	0.74	22.2	C	0.79	23.7	C			
38b. Brooklyn-Battery Tunnel Entrance/Exit (E-W) @ Route 9A (West St) (N-S)	WB - L	0.58	25.9	C	0.34	30.0	C	0.38	30.7	C			
	NB - T	0.80	40.3	D	0.55	18.3	B	0.48	17.3	B			
	NB - R	0.43	2.7	A	0.56	3.9	A	1.05	43.7	D *			
	SB - T	0.96	45.7	D *	0.67	14.6	B	0.71	15.4	B			
39. Joseph P Ward St(WB) @ Route 9A (West St) (N-S) (Unsignalized)	WB - R	0.18	30.3	D	0.35	29.1	D	0.51	40.0	E *			
40. Morris St (E-W) @ West St (N-S) (West Lanes of Northbound Approach)	WB - R	0.10	48.3	D	0.20	41.9	D	0.42	44.6	D			
	NB - TR	0.37	5.8	A	0.35	6.2	A	0.36	6.3	A			
	NB - T	0.43	6.2	A	0.49	7.4	A	0.80	13.5	B			
	SB-T	0.89	15.1	B	0.52	7.3	A	0.56	7.8	A			
41. Battery Place (E-W) @ Route 9A SB Service Rd (SB)	EB - T	0.32	26.9	C	0.41	28.9	C	0.60	34.0	C			
	WB - T	0.45	29.2	C	0.29	26.4	C	0.24	25.6	C			
	SB - L	1.02	88.4	F *	0.56	31.5	C	0.25	23.2	C			
	SB - LR	1.02	86.9	F *	0.56	31.6	C	0.37	25.3	C			
42. Battery Place (E-W) @ Route 9A NB Service Rd (NB)	EB - LT	0.47	13.1	B	0.38	12.1	B	0.33	11.6	B			
	WB - T	0.26	11.1	B	0.17	10.2	B	0.14	10.0	A			
	WB - R	0.51	14.2	B	0.35	11.8	B	0.54	14.6	B			
	NB - T	0.42	25.8	C	0.37	24.7	C	0.10	20.9	C			

Notes:

EB-Eastbound, WB-Westbound, NB-Northbound, SB-Southbound

L-Left, T-Through, R-Right, Dfl-Analysis considers a defacto left lane on this approach

V/C Ratio - Volume to Capacity Ratio, sec. - Seconds

LOS - Level of Service

***** - Denotes a congested movement (LOS E or F, or V/C ratio greater than or equal to 0.90)

Analysis is based on the 2000 Highway Capacity Manual methodology (HCS+, version 5.5)

To the south at Albany Street, the eastbound Albany Street approach is congested (LOS E) in the AM and PM and the northbound left-turn is congested in the AM, midday and PM peak hours (LOS F, F and E, respectively), with capacity conditions (1.05 v/c ratio) in the AM. The northbound through-right lane group is operating at capacity in the AM (LOS D, 1.05 v/c ratio) and congested in the PM (0.91 v/c ratio). Southbound Route 9A also experiences capacity conditions at this intersection in the PM peak hour (1.00 v/c ratio).

In the AM peak hour, southbound Route 9A is operating at capacity approaching West Thames Street (LOS E, 1.03 v/c ratio) and congested approaching the Brooklyn-Battery Tunnel entrance (0.96 v/c ratio). The northbound right-turn from Route 9A into the tunnel entrance operates at capacity (1.05 v/c ratio) in the PM. Also in the PM peak hour, the westbound right-turn from Joseph P. Ward Street onto northbound Route 9A is congested (LOS E). Lastly, at Battery Place, the southbound Route 9A approach operates at capacity in the AM peak hour (LOS F, 1.02 v/c ratio).

The Future Without the Proposed Project (No-Action)

In the 2019 future without the Proposed Project, it is assumed that towers 1 through 4 and the retail space at the WTC site would be completed and fully occupied, that the Vehicular Security Center on Liberty Street and the permanent WTC PATH terminal (the Transit Hub) would be completed and operational, and that the site plan and vehicle circulation system shown in **Figure 8-7** would be implemented incorporating limited security measures. Measures associated with the proposed Campus Security Plan would not be implemented. Therefore, to establish the No-Action baseline condition for the transportation analyses, it is necessary to forecast the travel demand that would be generated in 2019 by the planned development at the WTC site as well as other major developments in the area, and determine the traffic flow patterns for this new demand and background traffic with the current site plan and circulation system in place.

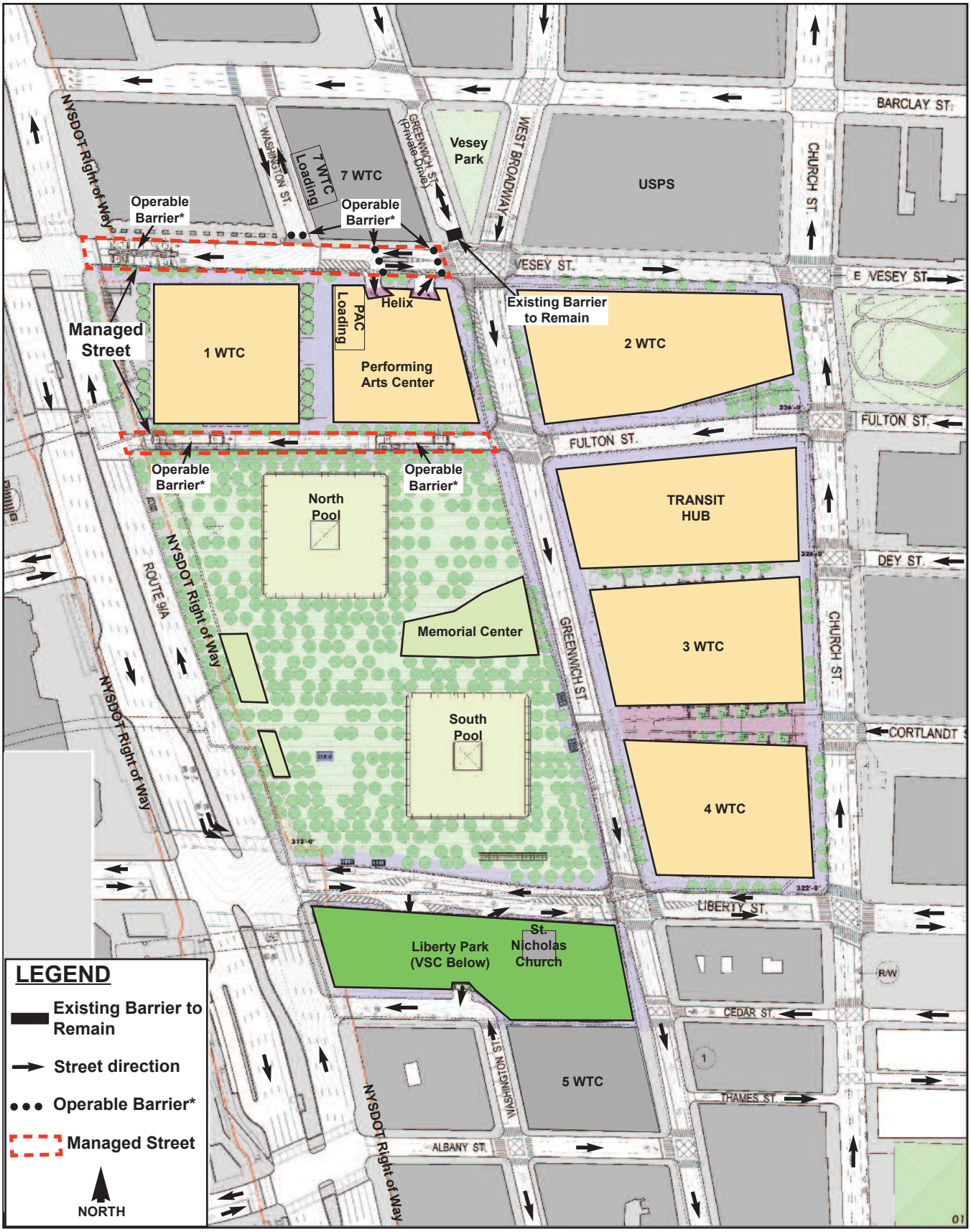
WTC Development Program and Travel Demand Forecast

The current development program for the WTC site includes approximately 8.49 million square feet of office space in towers 1 through 4, 455,000 square feet of retail space (both above and below grade), 290,000 square-feet of Memorial Center (museum) space, a 1,000-seat Performing Arts Center, and up to 500 underground parking spaces for tenant autos and 67 spaces for tour buses. It is expected that a total of approximately 47 truck berths will be provided on the WTC site to service Towers 1 through 4, the Memorial Center and the Performing Arts Center.[1] (The Vehicular Security Center and the Transit Hub are discussed separately below.) For forecasting purposes it is assumed that under the current development program approximately 14,000 square feet of retail space would be restaurant uses, comparable to the proportion of retail to restaurant space reflected in the 2004 *World Trade Center Memorial and Redevelopment Plan FGEIS*. In addition, as per the 2004 FGEIS, it is assumed that the retail component would be comprised of approximately 50 percent local retail uses and 50 percent destination retail uses. The current No-Action site plan for the World Trade Center is shown in **Figure 8-7**.

Table 8-7 shows the transportation planning factors used to forecast the travel demand generated by these uses and other No-Action development sites in the weekday AM, midday and PM peak hours and the

[1] This development program is smaller than what was assumed for the 2004 *World Trade Center Memorial and Redevelopment Plan FGEIS* which included up to 10 million square feet of office space in five towers, up to 1.03 million square feet of retail space (including 30,000 sf of restaurant/café uses), a hotel with up to 800 rooms and up to 150,000 square feet of conference space, a 2,200-seat performance space, up to 240,000 square feet of cultural (museum) facilities in addition to the Memorial and Memorial Center, and an underground parking garage for office tenants with 1,200 to 1,400 parking spaces.

No-Action WTC Site Plan



Note: Image is schematic and for illustrative purposes only.

*Likely location of operable barriers needed to secure 1 WTC.

Table 8-7
Transportation Planning Factors for WTC Development

Land Use:	Local Retail (Patrons)		Destination Retail (Patrons)		Retail (Employees)		Office (Workers)		Office (Visitors)		Performance Space		Restaurant (Patrons)		Restaurant (Employees)	
Trip Generation:	(1)		(1)		(1)		(2)		(2)		(4)		(6)		(6)	
Weekday	195		68.2		10		12		6		4.0		163		10	
Saturday	230		82.5		10		2.6		1.3		4.0		172		10	
	(per 1,000 sf)		(per 1,000 sf)		(per 1,000 sf)		(per 1,000 sf)		(per 1,000 sf)		(per seat)		(per 1,000 sf)		(per 1,000 sf)	
Temporal Distribution:	(3)		(3)		(4,7)		(3)		(3)		(4,7)		(4,6)		(4,7)	
AM	3%		3%		14.7%		12%		12%		0%		0%		14.7%	
Midday	19%		9%		20%		15%		15%		16.7%		9.3%		20%	
PM	10%		9%		12.9%		14%		14%		16.7%		3.9%		12.9%	
Saturday Midday	10%		11%		20%		17%		17%		16.7%		11.5%		20%	
Modal Splits:	(4)		(4)		(4,7)		(4,7)		(4)		(4)		(4)		(4,7)	
	All Periods		All Periods		AM/PM	MD/SMD	AM/PM	MD/SMD	All Periods		All Periods		All Periods		All Periods	MD/SMD
Auto	3%		5%		3%	2%	3%	2%	3.5%		15%		17.4%		3%	2%
Taxi/Black Car	2%		4%		2%	2%	2%	2%	3.5%		9%		6.4%		2%	2%
Subway	15%		20%		61%	5.5%	61%	5.5%	17.3%		8%		15%		61%	5.5%
Local Bus	5%		5%		2%	2%	2%	2%	0.5%		34%		3.4%		2%	2%
Express Bus	0%		0%		8%	0%	8%	0%	2%		0%		0%		8%	0%
PATH	3%		3%		18%	1%	18%	1%	5%		5%		5%		18%	1%
Ferry	2%		2%		4%	0.5%	4%	0.5%	0.5%		5%		5%		4%	0.5%
Walk/Other	70%		61%		2%	87%	2%	87%	67.7%		24%		47.8%		2%	87%
Directional Split:	(4,7)		(4,7)		(4,7)		(4,7)		(4,7)		(4,7)		(4)		(4,7)	
	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out
AM	50.5%	49.5%	50.5%	49.5%	96%	4%	96%	4%	96%	4%	0%	0%	50%	50%	96%	4%
Midday	50.5%	49.5%	50.5%	49.5%	55%	45%	55%	45%	55%	45%	100	0%	50%	50%	55%	45%
PM	53.1%	46.9%	53.1%	46.9%	5%	95%	5%	95%	5%	95%	0%	100%	50%	50%	5%	95%
Saturday Midday	50.5%	49.5%	50.5%	49.5%	55%	45%	55%	45%	55%	45%	100	0%	50%	50%	55%	45%
Vehicle Occupancy:	(4)		(4)		(4)		(4)		(4)		(4)		(4)		(4)	
Auto	1.60		1.60		1.60		1.60		1.25		3.50		2.20		1.60	
Taxi	1.20		1.20		1.20		1.40		1.40		2.40		2.30		1.40	
Truck Trip Generation:					(3)		(3,5)				(4,9)				(4,9)	
Weekday					0.35		See Note 5				0.02				7.2	
Saturday					0.04		0.01				0.02				7.2	
					(per 1,000 sf)		(per 1,000 sf)				(per seat)				(per 1,000 sf)	
Truck Temporal Distribution:					(3)		(8)				(4)				(4,7)	
AM					8%		7.3%				11%				9.7%	
Midday					11%		8.3%				1%				7.8%	
PM					2%		3.2%				1%				5.1%	
Saturday Midday					11%		8.3%				1%				7.8%	
Truck Directional Distribution:					In	Out	In	Out			In	Out			In	Out
All Periods					50%	50%	50%	50%			50%	50%			50%	50%

Notes:
(1) Overall retail trip rates as per the 2012 *City Environmental Quality Review (CEQR) Technical Manual*. Ten trips/1,000 sf allocated to retail employees, consistent with the 2004 *World Trade Center Memorial and Redevelopment FGEIS*, and remaining trips for both local and destination retail allocated to patrons.
(2) Overall office trip rates as per the 2012 *CEQR Technical Manual*. One-third of daily trips (6 trips/1,000 sf on weekdays and 1.3 trips/1,000 sf on Saturdays) allocated to visitors, consistent with the office worker/visitor trip ratio cited in the 2004 *World Trade Center Memorial and Redevelopment FGEIS.*
(3) Source: *2012 CEQR Technical Manual.*
(4) Source: *World Trade Center Memorial and Redevelopment FGEIS,* January 2004.
(5) Weekday truck trip generation determined on a tower-by-tower basis from the following regression equation developed from 2004 survey data collected at four midtown and lower Manhattan office buildings: $Ln(DG) = 0.595 \times Ln(FA) + 4.8$, $R^2 = 0.87$, where DG = daily (two-way) trip generation and FA = floor area in million square feet
(6) Restaurant patron and employee weekday trip rates based on data from the 2004 *World Trade Center Memorial and Redevelopment FGEIS.* (The patron trip rates shown in the FGEIS incorporate a 70 percent linked-trip credit, whereas the trip rates shown above do not reflect linked-trips.) A ratio of weekday to Saturday trips derived from data in *ITE Trip Generation Handbook*, 8th Edition, Land Use Code 931 (Quality Restaurant) was used to adjust the weekday patron trip rate to reflect Saturday demand. Data for ITE Land Use Code 931 were also used to determine the Saturday patron temporal distribution.
(7) Weekday midday factors assumed for Saturday midday period.
(8) Temporal distribution for office truck trips based on 2004 survey data collected at four midtown and lower Manhattan office buildings. Weekday midday distribution assumed for Saturday midday.
(9) Truck trip rates reported in the FGEIS reflect the number of trucks/deliveries whereas the rates shown above reflect the number of one-way trips.

Saturday midday peak hour. These include trip generation rates, temporal and directional distributions, mode choice factors, vehicle occupancies and truck trip factors. The factors in **Table 8-7** are primarily based on those cited in the *CEQR Technical Manual* as well as those cited in the *World Trade Center Memorial and Redevelopment Plan FGEIS.*

The trip generation rate used to determine weekday truck trips for No-Action development at the WTC site was derived from a regression equation based on detailed loading dock survey data collected in 2004 at four large Manhattan office buildings (including two in lower Manhattan in proximity to the WTC site) as part of the planning process for redevelopment of the World Trade Center. All four buildings surveyed are comparable in size (1.05 million to 2.2 million sf) and uses to the buildings planned at the WTC site. The weekday temporal distribution for truck trips was also derived from these survey data. Traffic count data collected at the intersection of Barclay and Washington streets adjacent to 7 WTC as part of the May 2012 data collection program were used to further validate the truck trip forecasting methodology.

The retail and restaurant person-trip and vehicle-trip forecasts reflect a 25 percent linked-trip credit applied to all retail and restaurant patron trips, consistent with the *CEQR Technical Manual*. Use of this linked-trip rate should be considered conservative given the large role that other on-site development (e.g., 8.49 million square feet of office space, the 9/11 Memorial and Memorial Center, the Transit Hub, etc.) is expected to play in generating demand for the retail and restaurant uses.

As the anticipated numbers of annual visitors to the 9/11 Memorial, Memorial Center/Museum, and the viewing platform on Tower 1 are generally independent of recent changes to the WTC site development program, the travel demand forecasts for these uses reflect the forecast in the 2004 FGEIS, and separate travel demand factors for these uses are not shown in **Table 8-7**.[3] It should also be noted that the 9/11 Memorial has been open to the public through a system of timed visitor passes since September 2011, with over four million visitors as of August 2012. Therefore, it is likely that a substantial portion of the travel demand generated by visitors to the 9/11 Memorial is already reflected in the existing conditions traffic and pedestrian networks which are based on data collected in May and June 2012. However, as it is anticipated that timed visitor passes will not be required for admittance in the future, and as the Memorial Center and Tower 1 viewing platform are not yet open, the travel demand forecast for the 9/11 Memorial conservatively does not take credit for these existing trips.

Tables 8-8 and 8-9 show the projected peak hour travel demand (person trips and vehicle trips, respectively) generated by the current WTC development program based on the factors shown in **Table 8-7** and the assumptions discussed above. As shown in **Table 8-8**, it is anticipated that the current development program at the WTC site would generate a net total of 21,929, 35,442, 31,173 and 17,572 person trips (in and out combined) during the weekday AM, midday and PM and Saturday midday peak hours, respectively. Person trips by transit during these periods (in and out combined) would include 9,939, 4,699, 13,006 and 3,250 trips by subway, respectively, 369, 978, 815 and 636 trips, respectively, by local bus, 1,153, 153, 1,328 and 38 trips, respectively, by express bus, 2,746, 931, 3,388 and 518 trips, respectively, by PATH and 619, 379, 869 and 282 trips, respectively, by ferry. Walk-only trips would total 5,294, 24,429, 8,246 and 9,202 during the weekday AM, midday and PM and Saturday midday peak hours, respectively. There would also be a total of approximately 287, 1,513, 958 and 2,015 trips, respectively, by tour bus, most if not all en route to the Memorial, Memorial Center and the viewing platform on Tower 1.

[3] The 2004 FGEIS assumed a first-year surge of nine million visitors and a stabilized attendance of 5.5 million annual visitors to the 9/11 Memorial, Memorial Center and Tower 1 viewing platform. The travel demand forecast for 2019 reflects the stabilized attendance data.

Table 8-8
Travel Demand Forecast for WTC Development - Person Trips

	Auto		Taxi/ Black Car		Subway		Local Bus		Express Bus		Tour Bus		PATH		Ferry		Walk/Other		Total	
	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out
Weekday AM Peak Hour																				
Local Retail (Patrons)[1,2,3]	15	14	10	10	73	72	24	24	0	0	0	0	15	14	10	10	343	336	490	480
Destination Retail (Patrons)[1,2,3]	9	8	7	7	34	34	9	8	0	0	0	0	5	5	3	3	105	102	172	167
Retail (Employees)[1]	19	1	12	1	380	16	12	1	50	2	0	0	111	5	25	1	13	1	622	28
Office (Workers)	352	15	235	10	7,152	298	235	10	938	39	0	0	2,111	88	469	20	232	10	11,724	490
Office (Visitors)	205	9	205	9	1,014	42	29	1	117	5	0	0	293	12	29	1	3,971	165	5,863	244
Performance Space (1,000 seats)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Restaurant (Patrons)[1,3]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Restaurant (Employees)[1]	1	0	0	0	12	1	0	0	2	0	0	0	4	0	1	0	0	0	20	1
Memorial & Memorial Center[4]	103	0	265	0	811	0	16	0	0	0	287	0	83	0	47	0	16	0	1628	0
Total	**704**	**47**	**734**	**37**	**9,476**	**463**	**325**	**44**	**1,107**	**46**	**287**	**0**	**2,622**	**124**	**584**	**35**	**4,680**	**614**	**20,519**	**1,410**
Weekday Midday Peak Hour																				
Local Retail (Patrons)[1,2,3]	93	91	62	61	465	456	155	152	0	0	0	0	93	91	62	61	2,171	2,128	3,101	3,040
Destination Retail (Patrons)[1,2,3]	26	25	21	20	103	101	26	25	0	0	0	0	15	15	10	10	313	307	514	503
Retail (Employees)[1]	10	8	10	8	27	22	10	8	0	0	0	0	5	4	2	2	422	346	486	398
Office (Workers)	168	137	168	137	462	378	168	137	0	0	0	0	84	69	42	34	7,307	5,977	8,399	6,869
Office (Visitors)	147	120	147	120	726	594	21	17	84	69	0	0	210	172	21	17	2,843	2,326	4,199	3,435
Performance Space (1,000 seats)	100	0	60	0	53	0	227	0	0	0	0	0	33	0	33	0	162	0	668	0
Restaurant (Patrons)[1,3]	14	14	5	5	12	12	3	3	0	0	0	0	4	4	4	4	38	37	80	79
Restaurant (Employees)[1]	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	14	12	15	13
Memorial & Memorial Center[4]	85	75	224	199	682	604	14	12	0	0	1,087	426	70	62	41	36	14	12	2,217	1,426
Total	**643**	**470**	**697**	**550**	**2,531**	**2,168**	**624**	**354**	**84**	**69**	**1,087**	**426**	**514**	**417**	**215**	**164**	**13,284**	**11,145**	**19,679**	**15,763**

Table 8-8 (continued)
Travel Demand Forecast for WTC Development - Person Trips

	Auto		Taxi/ Black Car		Subway		Local Bus		Express Bus		Tour Bus		PATH		Ferry		Walk		Total	
	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out
Weekday PM Peak Hour																				
Local Retail (Patrons)[1,2,3]	51	45	34	30	257	227	86	76	0	0	0	0	51	45	34	30	1,203	1,063	1,716	1,516
Destination Retail (Patrons) [1,2,3]	27	24	22	19	108	95	27	24	0	0	0	0	16	14	11	10	329	291	540	477
Retail (Employees) [1]	1	16	1	11	17	330	1	11	2	43	0	0	5	94	1	22	1	14	29	541
Office (Workers)	21	406	14	271	435	8,258	14	271	57	1,083	0	0	128	2,437	28	541	14	272	711	13,539
Office (Visitors)	12	237	12	237	62	1,171	2	34	7	135	0	0	18	338	2	34	241	4,583	356	6,769
Performance Space (1,000 seats)	0	100	0	60	0	53	0	227	0	0	0	0	0	33	0	33	0	162	0	668
Restaurant (Patrons)[1,3]	6	6	2	2	5	5	1	1	0	0	0	0	2	2	2	2	16	16	34	34
Restaurant (Employees)[1]	0	1	0	0	1	10	0	0	0	1	0	0	0	3	0	1	0	1	1	17
Memorial & Memorial Center[4]	136	113	352	294	1,075	897	22	18	0	0	297	661	110	92	64	54	22	18	2,078	2,147
Total	**254**	**948**	**437**	**924**	**1,960**	**11,046**	**153**	**662**	**66**	**1,262**	**297**	**661**	**330**	**3,058**	**142**	**727**	**1,826**	**6,420**	**5,465**	**25,708**
Saturday Midday Peak Hour																				
Local Retail (Patrons)[1,2,3]	58	57	39	38	289	283	96	94	0	0	0	0	58	57	39	38	1,346	1,320	1,925	1,887
Destination Retail (Patrons) [1,2,3]	38	37	30	30	152	149	38	37	0	0	0	0	23	22	15	15	464	454	760	744
Retail (Employees) [1]	10	8	10	8	27	22	10	8	0	0	0	0	5	4	2	2	422	346	486	398
Office (Workers)	41	34	41	34	113	93	41	34	0	0	0	0	21	17	10	8	1,794	1,468	2,061	1,688
Office (Visitors)	36	30	36	30	178	146	5	4	21	17	0	0	52	42	5	4	698	570	1,031	843
Performance Space (1,000 seats)	100	0	60	0	53	0	227	0	0	0	0	0	33	0	33	0	162	0	668	0
Restaurant (Patrons)[1,3]	18	18	7	7	16	16	4	4	0	0	0	0	5	5	5	5	49	49	104	104
Restaurant (Employees)[1]	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	14	12	15	13
Memorial & Memorial Center[4]	108	106	284	278	864	847	17	17	0	0	1,396	619	88	86	51	50	17	17	2,825	2,020
Total	**409**	**290**	**507**	**425**	**1,693**	**1,557**	**438**	**198**	**21**	**17**	**1,396**	**619**	**285**	**233**	**160**	**122**	**4,966**	**4,236**	**9,875**	**7,697**

Notes:
[1]Proportion of restaurant uses to other retail uses from the 2004 FGEIS assumed for current development program.
[2]Includes 50 percent local retail uses and 50 percent destination uses.
[3]Retail and restaurant patron trips reflect a 25 percent linked-trip credit.
[4]Travel demand from the Memorial and Memorial Center based on forecast in the 2004 FGEIS. Includes trips generated by Tower 1 viewing platform.

Table 8-9
Travel Demand Forecast for WTC Development - Vehicle Trips

	Auto		Taxi[5]		Black Car[6]		Tour Bus		Truck		Total	
	In	**Out**	**In**	**Out**	**In**	**Out**	**In**	**Out**	**In**	**Out**	**In**	**Out**
Weekday AM Peak Hour												
Local Retail (Patrons)[1,2,3]	9	9	9	9	1	1	0	0	0	0	19	19
Destination Retail (Patrons)[1,2,3]	6	5	6	6	1	1	0	0	0	0	13	12
Retail (Employees)[1]	12	1	10	10	0	0	0	0	6	6	28	17
Office (Workers)	220	9	159	159	11	11	0	0	28	28	418	207
Office (Visitors)	164	7	139	139	10	10	0	0	0	0	313	156
Performance Space (1,000 seats)	0	0	0	0	0	0	0	0	1	1	1	1
Restaurant (Patrons)[1,3]	0	0	0	0	0	0	0	0	0	0	0	0
Restaurant (Employees)[1]	1	0	0	0	0	0	0	0	5	5	6	5
Memorial & Memorial Center[4]	36	0	118	118	2	2	9	0	1	1	166	121
Total	**448**	**31**	**441**	**441**	**25**	**25**	**9**	**0**	**41**	**41**	**964**	**538**
Weekday Midday Peak Hour												
Local Retail (Patrons)[1,2,3]	58	57	55	55	1	1	0	0	0	0	114	113
Destination Retail (Patrons)[1,2,3]	16	16	17	17	1	1	0	0	0	0	34	34
Retail (Employees)[1]	6	5	9	9	0	0	0	0	9	9	24	23
Office (Workers)	105	86	110	110	23	23	0	0	31	31	269	250
Office (Visitors)	118	96	97	97	21	21	0	0	0	0	236	214
Performance Space (1,000 seats)	29	0	23	23	1	1	0	0	0	0	53	24
Restaurant (Patrons)[1,3]	6	6	2	2	0	0	0	0	0	0	8	8
Restaurant (Employees)[1]	0	0	0	0	0	0	0	0	4	4	4	4
Memorial & Memorial Center[4]	29	26	107	107	4	4	33	13	1	1	174	151
Total	**367**	**292**	**420**	**420**	**51**	**51**	**33**	**13**	**45**	**45**	**916**	**821**
Weekday PM Peak Hour												
Local Retail (Patrons)[1,2,3]	32	28	32	32	1	1	0	0	0	0	65	61
Destination Retail (Patrons)[1,2,3]	17	15	20	20	1	1	0	0	0	0	38	36
Retail (Employees)[1]	1	10	9	9	0	0	0	0	2	2	12	21
Office (Workers)	13	254	181	181	17	17	0	0	12	12	223	464
Office (Visitors)	10	190	157	157	15	15	0	0	0	0	182	362
Performance Space (1,000 seats)	0	29	24	24	1	1	0	0	0	0	25	54
Restaurant (Patrons)[1,3]	3	3	1	1	0	0	0	0	0	0	4	4
Restaurant (Employees)[1]	0	1	0	0	0	0	0	0	3	3	3	4
Memorial & Memorial Center[4]	47	39	171	171	6	6	9	20	1	1	234	237
Total	**123**	**569**	**595**	**595**	**41**	**41**	**9**	**20**	**18**	**18**	**786**	**1,243**

Table 8-9 (continued)
Travel Demand Forecast for WTC Development - Vehicle Trips

	Auto		Taxi[5]		Black Car[6]		Tour Bus		Truck		Total	
	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out
Saturday Midday Peak Hour												
Local Retail (Patrons)[1,2,3]	36	36	40	40	1	1	0	0	0	0	77	77
Destination Retail (Patrons) [1,2,3]	24	23	31	31	1	1	0	0	0	0	56	55
Retail (Employees) [1]	6	5	8	8	0	0	0	0	1	1	15	14
Office (Workers)	26	21	27	27	3	3	0	0	4	4	60	55
Office (Visitors)	29	24	23	23	3	3	0	0	0	0	55	50
Performance Space (1,000 seats)	29	0	22	22	1	1	0	0	0	0	52	23
Restaurant (Patrons)[1,3]	8	8	4	4	0	0	0	0	0	0	12	12
Restaurant (Employees)[1]	0	0	0	0	0	0	0	0	4	4	4	4
Memorial & Memorial Center[4]	39	35	137	137	6	6	42	19	1	1	225	198
Total	**197**	**152**	**292**	**292**	**15**	**15**	**42**	**19**	**10**	**10**	**556**	**488**

Notes:
[1]Proportion of restaurant uses to other retail uses from the 2004 FGEIS assumed for current development program.
[2]Includes 50 percent local retail uses and 50 percent destination uses.
[3]Retail and restaurant patron trips reflect a 25 percent linked-trip credit.
[4]Travel demand from the Memorial and Memorial Center based on forecast in the 2004 FGEIS. Includes trips generated by Tower 1 viewing platform.
[5]Balanced taxi trips are shown. Assumes 75 percent of taxis with inbound passengers depart with outbound passengers.
[6]Retail totals also include a small number of black car trips generated by PATH.

As shown in **Table 8-9**, vehicle trips (in and out combined) would include a total of 479, 659, 692 and 349 auto trips, 932, 942, 1,272 and 614 for-hire vehicle trips (taxi and black car combined), 9, 46, 29 and 61 tour bus trips, and 82, 90, 36 and 20 truck trips during the weekday AM, midday, PM and Saturday midday peak hours, respectively.

As the travel demand characteristics and trip assignment patterns of taxi (yellow cab) and black car (livery service) trips generated by development at the WTC site will differ both with and without the Proposed Project, separate vehicle-trip forecasts were prepared for each of these two types of for-hire vehicles. The numbers of black car trips to and from the WTC site were estimated based on data from a 2011 study that analyzed detailed industry ride data from a sampling of 10 corporations using black car services in Manhattan, as well as data from interviews with various WTC stakeholders. (A more detailed discussion of the methodology employed for forecasting black car trips is provided in the Transportation Planning Factors and Methodologies Technical Memorandum included in Appendix D.) Unlike taxis, black cars arriving with passengers are generally not available to pick up a departing passenger on the same trip. Therefore, each black car arriving to pick-up or drop-off a passenger would represent two vehicle trips. As shown in **Table 8-9**, the numbers of black car trips generated by the WTC site is expected to total 50, 102, 82 and 30 during the weekday AM, midday, PM and Saturday midday peak hours, respectively.

The remaining for-hire vehicle trips would be by taxi. The numbers of taxi trips shown in **Table 8-9** have been balanced to reflect the fact that, unlike black cars, some taxis arriving with passengers would depart with new passengers. Given that the WTC site is considered a transportation hub as it incorporates both a PATH terminal and three subway stations, it is assumed that 75 percent of taxis arriving full will also

depart full. This assumption is consistent with both *CEQR Technical Manual* criteria and the methodology employed for the 2004 FGEIS traffic analysis.

Vehicular Security Center and Tour Bus Parking Facility

Development on the WTC site also includes a Vehicular Security Center (VSC) which will be located on the south side of Liberty Street between Route 9A and Greenwich Street (see **Figure 8-7**). The VSC will serve as a security screening facility for tenant autos, tour buses and delivery vehicles en route to below-grade parking and truck loading areas at the WTC site. (The planned Liberty Park will be located on the roof of the facility.) The primary entrance and exit for the VSC will be located on Liberty Street, and a secondary exit will be located on Cedar Street. Vehicles entering the facility will undergo an initial credentialing check. Drivers with proper authorization will then be permitted to proceed down a ramp to the screening level where their vehicles will undergo a security inspection. (Vehicles arriving unscheduled will be ejected onto Cedar Street to proceed to an off-street reconciliation area located off-site to await proper authorization.) Once the security inspection is complete, drivers will be permitted to proceed to below-grade parking areas or truck loading docks serving towers 1 through 4 and other buildings at the WTC site.

The Liberty Street intersection at the garage entrance/exit will not be signalized; but the exit ramp will be stop-sign controlled. In the No-Action condition, vehicles entering the facility would be permitted to make right turns from eastbound Liberty Street or left turns from westbound Liberty Street. Only right turns would be permitted exiting the facility onto Liberty Street.

It should be noted that there will also be an entrance/exit ramp to and from below-grade levels at the WTC site located on the south side of Vesey Street west of Greenwich Street. However, current plans call for this ramp (referred to as the "Helix") to be used primarily for emergency access, and all vehicles en route to and from below-grade parking and loading areas are expected to use the VSC. A management strategy, including the scheduling of tour buses and truck deliveries, is currently being developed to ensure that the VSC can accommodate demand for on-site delivery, and tour bus and tenant auto parking in an orderly and efficient manner.

Permanent WTC PATH Terminal (Transit Hub)

A permanent terminal for Port Authority Trans Hudson (PATH) trains is currently under development at the WTC site to replace a temporary facility with street-level access on the south side of Vesey Street at Greenwich Street/West Broadway. This new terminal (also referred to as the Transit Hub), will include an above-grade terminal building and below-grade pedestrian concourses on the eastern portion of the site, and additional pedestrian concourses, tracks, platforms, and a mezzanine on the western portion of the site. There will be a total of five levels – platform, mezzanine, two concourse levels, and a street-level terminal building. The terminal will include below-grade connections to offices and retail on the WTC site, an underpass beneath Dey Street connecting to the Fulton Street Transit Center, an underpass beneath Route 9A to the World Financial Center, and the three NYC Transit subway stations at the WTC site – Cortlandt Street (1), Cortlandt Street (R), and World Trade Center (E). The terminal will also include approximately 68,000 square feet of the approximately 455,000 square feet of retail space being developed on the WTC site. As shown in **Figure 8-7**, the street-level terminal building will be located on the eastern portion of the WTC site along Church Street near its intersections with Dey and Fulton streets, and will extend to Greenwich Street. Overall, the new terminal will provide added passenger capacity that will be required with completion of the redevelopment of the WTC site. It will also provide pedestrian linkages to surrounding buildings, all area NYC Transit subway lines, and more convenient access to trans-Hudson ferries. Multiple entrances and exits will reduce walking times to access and egress the new terminal.

Completion of the Transit Hub is not expected to add new vehicle trips to the study area street network. (Vehicles trips would actually be greater in the future without the new terminal as some PATH riders would shift to other modes due to capacity constraints and less convenient access.) The new terminal will, however, result in changes to street-level pedestrian flow patterns as PATH riders will have new access/egress points and new below-grade pedestrian connections (see "Pedestrians" section below).

Other No-Action Developments and Background Growth

In addition to the travel demand that would be generated by the development planned for the WTC site, the traffic network for the EIS analysis of 2019 No-Action conditions also incorporates trips generated by other development projects located in the vicinity of the WTC site and expected to be completed by the 2019 analysis year. The development projects considered for the transportation analyses are shown in **Table 2-2** and **Figure 2-5** in Chapter 2, "Land Use, Zoning and Public Policy." Overall, the analysis of No-Action conditions considers the travel demand from a total of 1,452 dwelling units, 3,715 hotel rooms, 600 dormitory units (beds), 170,000 square feet of destination retail space, 62,285 square feet of local retail space, and 490,000 square feet of school and community facility space associated with these development projects. Travel demand forecasts were prepared for No-Action development aggregated by use, and the total numbers of peak hour vehicle trips generated were compared to study area screen-line traffic volumes to determine the estimated percentage increase in study area travel demand resulting from these developments in each peak hour. Overall, No-Action developments in the vicinity of the WTC site are expected to increase study area traffic by approximately 5.8 percent in the weekday AM peak hour and from 7.5 to 8.0 percent in the other analyzed peak hours.

Lastly, annual background growth rates of 0.25 percent per year for years 2012 through 2017 and 0.125 percent per year for years 2017 through 2019 were applied to existing travel demand as specified in the *CEQR Technical Manual*. These background growth rates are applied to account for smaller projects and general increases in travel demand not attributable to specific development projects in proximity to the study area.

Changes to the WTC Street System

As shown in **Figure 8-7**, with redevelopment of the World Trade Center, both Greenwich Street and Fulton Street would be extended through WTC site and Vesey and Liberty streets would be reopened to traffic. In the No-Action condition, Greenwich Street is expected to operate one-way southbound with three moving lanes from Vesey Street to Fulton Street, and with two moving lanes and two curbside lanes south of Fulton Street. West Broadway between Barclay and Vesey Streets would remain open to southbound through-traffic, providing access to Greenwich Street through the WTC site. However, it is anticipated that the segment of Greenwich Street between Barclay and Vesey streets, which is a privately-controlled street, would be closed to through traffic and would primarily serve as an access point to the adjacent 7 World Trade Center as at present. The parallel segment of Washington Street would operate two-way. It is expected that the intersections of Greenwich Street with Vesey, Fulton and Liberty Streets would be signalized, as would the midblock pedestrian crossing of Greenwich Street at Cortlandt Street.

Fulton Street would operate one-way westbound through the WTC site from Church Street to Route 9A in the No-Action condition. Vesey Street would operate one-way eastbound to the east of Greenwich Street, two-way between Greenwich and Washington Streets, and one-way westbound to the west of Washington Street.

At the south end of the WTC site, Liberty Street would be reopened to traffic between Church Street and Route 9A, and would operate two-way with one to two moving lanes in each direction. As noted above, the exit from the VSC onto this block of Liberty Street would be stop-controlled, and left-turns from the

VSC would be prohibited. It is expected that the segment of Washington Street between Albany and Cedar streets would be reopened to northbound traffic, and that the segment of Cedar Street from Washington Street to Route 9A would be reopened to westbound traffic. It is also expected that the segment of Cedar Street between Church and Greenwich streets would be returned to one-way westbound operation.

With the completion of towers 2, 3 and 4 and the Transit Hub at the WTC site, lane closures associated with construction activity would no longer be needed along Church Street, and it is anticipated that the street would be restored to four lanes from Liberty Street to Vesey Street. The eastern-most lane would continue to function as an exclusive bus lane from 7 AM to 10 AM and from 4 PM to 7 PM on weekdays, and it is expected that a no-standing anytime regulation would be implemented along the west curb, allowing the western-most lane to function as a moving lane in all periods (although it is likely that taxi/black car pickup/drop-off activity associated with the adjacent WTC towers and Transit Hub may periodically impede traffic flow along this lane).

It is also expected that the reconstruction of Route 9A in the vicinity of the WTC site will have been completed in the No-Action condition. This would include the installation of a traffic signal at the new Fulton Street intersection. All traffic westbound on Fulton Street would turn onto northbound Route 9A as there would be no access across the median to the southbound lanes. Two crosswalks would be installed at this location, one on Route 9A on the north side of the intersection, and the second on the Fulton Street approach. To the south at Liberty Street, both northbound and southbound double left-turn lanes would be provided. The existing northbound left-turn at Albany Street would be eliminated. Lastly, it is anticipated that a new traffic signal will be installed at the intersection of Barclay Street with northbound Route 9A to accommodate new traffic generated by development at the WTC site, and that a new traffic signal would also be installed at the intersection of northbound Route 9A with Carlisle Street.

It is also important to note that the current site plan and vehicle circulation system for the WTC site incorporates security measures associated with the 2005 redesign of Tower 1. Under these measures both Vesey Street and Fulton Street would function as "managed streets" west of Greenwich Street. This would be achieved through the installation of retractable barriers and sally ports on Vesey, Fulton and Washington Streets to restrict vehicular access. Each sally port would consist of a personnel booth and equipment house controlling a set of two retractable barriers with sufficient space between them to accommodate one or more motor vehicles. In operation, the first barrier would be lowered to permit authorized vehicles to enter, and then raised to prevent entry by other vehicles. After completing a screening process, the second barrier would be lowered to allow vehicles within the sally port to exit. As shown in **Figure 8-7**, two sally ports would be located on Fulton Street, one at Route 9A and the second west of Greenwich Street. As it is anticipated that the west barrier on Fulton Street at Route 9A would be installed immediately adjacent to the Route 9A travel lanes, the crosswalk on Fulton Street would likely be located within the sally port.

Two sally ports would also be located on Vesey Street, one to the east of Route 9A (set back from the crosswalk) and a second west of Greenwich Street. An additional retractable barrier would be installed on the Washington Street approach to Vesey Street that would be raised in the default condition, and lowered only as needed to permit entry by authorized vehicles.

No-Action Vehicle Trip Assignment

In the No-Action condition, base traffic flows would be redistributed as a result of the changes to the study area street system described above. In addition, new vehicle trips would be generated by the new development at the WTC site. The following describes the assignment of these two components of No-Action traffic flow.

Redistribution of No-Action Base Traffic Flow

In addition to demand from the development planned for the WTC site, the No-Action traffic network incorporates background traffic (including traffic generated by other development sites and general background growth), some of which would be redistributed as a result of the changes to the study area street system described previously. Traffic flow patterns with newly-opened or re-opened streets within the WTC site (i.e., Greenwich, Vesey, Fulton and Liberty streets), the presence of limited security checkpoints on Fulton and Vesey streets, and geometric/control changes planned for implementation by 2019 were developed using the Lower Manhattan Traffic Model, and these patterns were then employed to reassign base traffic flows to reflect the changes to the street network anticipated in the No-Action condition. For example, with West Broadway and Greenwich Street open to through traffic through the WTC site, it is anticipated that there would be some diversion of southbound traffic to this corridor from other southbound corridors such as Broadway. Liberty Street would function as a contiguous two-way corridor between Route 9A and Broadway, and is therefore expected to draw some traffic from other east-west corridors in the area, such as two-way Chambers Street. With both Vesey and Fulton Streets functioning as managed streets and closed to through traffic between Greenwich Street and Route 9A, the opening of these streets through the project site in the No-Action condition is not expected to draw substantial numbers of trips from other east-west corridors.

No-Action World Trade Center Vehicle Trip Assignment

Vehicle trips destined to and from the WTC site in the No-Action condition were distributed to study area portals (e.g., Route 9A, the FDR Drive, the Brooklyn-Battery Tunnel, the Brooklyn Bridge, etc.) based on the assignment patterns cited in the *World Trade Center Memorial and Redevelopment FGEIS* and the *WTC Vehicular Security Center and Tour Bus Parking Facility EA*. They were then assigned to the study area street network based on the most direct routes between these portals and their specific origins/destinations at or in the vicinity of the WTC site.

Auto trips by office tenants were assumed to be en route either to the Vehicular Security Center on Liberty Street to access on-site parking spaces or to off-street public parking facilities on the periphery of the WTC site. Auto trips generated by office visitors and other uses at the WTC site were all assigned to off-site parking. The assignment of auto trips to off-site parking facilities was based on both the available capacity at each facility and its proximity to specific destinations within the WTC site. It should be noted that many of the autos parking off-site would not actually enter the WTC site nor traverse intersections within its boundaries.

In the No-Action condition, taxis and black cars en route to or from the WTC site are expected to pick-up and drop-off passengers along street frontages in proximity to building entrances. Many of these trips would be concentrated along Greenwich Street which would provide access to the main entrances to towers 2, 3 and 4 as well as to the Memorial and Memorial Center, the Transit Hub and the Performing Arts Center. As noted previously, the segments of Vesey and Fulton streets flanking Tower 1 would be closed to through traffic and operated as managed streets with vehicles required to undergo a security screening before being allowed to enter. For the purposes of assigning for-hire vehicle trips to Tower 1 in the No-Action condition, it was therefore assumed that only black cars with passengers en route to or from Tower 1 would undergo the security screening to access the building entrances along the managed segments of Vesey and Fulton streets. Taxis would be expected to pick-up/drop-off passengers primarily along nearby unrestricted streets including Greenwich and Barclay streets and Route 9A. Taxi and black car trips associated with retail uses at the WTC site are expected to pick-up and drop-off passengers primarily along the west side of Church Street where many of these retail uses would be located as well as along intersecting cross-streets. Some of these trips are also expected to occur along Greenwich Street.

With the exception of a small number of large trucks destined to the PAC loading dock along the managed segment of Vesey Street, trucks and vans making deliveries to the World Trade Center would need to be scheduled and would be required to undergo credentialing and security screening at the VSC. Based on data from the *WTC Vehicular Security Center and Tour Bus Parking Facility EA*, it is anticipated that the majority of these vehicles would approach the VSC from southbound Route 9A, with smaller numbers using West Broadway/Greenwich Street as well as the Brooklyn-Battery Tunnel via northbound Route 9A. All delivery vehicles would enter the VSC from Liberty Street. Delivery vehicles departing the VSC would exit onto eastbound Liberty Street as the left-turn from the VSC onto westbound Liberty Street would be prohibited in the No-Action condition. Most are expected to use northbound Route 9A which they would reach via Church Street and Barclay Street, both designated local truck routes. Those en route to the Brooklyn-Battery Tunnel are expected to use Broadway and Battery Place (also designated local truck routes) to reach the tunnel entrance on northbound Route 9A.

As noted previously, delivery vehicles en route to the WTC site would need to be scheduled and would undergo a credentialing check upon entering the VSC. It is anticipated that in the No-Action condition, some would arrive unscheduled, and would be diverted to an off-street reconciliation area located off-site where they would wait until WTC staff could confirm their status before being allowed to return to the VSC. For traffic assignment purposes, it was assumed that 15 percent of delivery vehicles arriving at the VSC in the No-Action condition would be unscheduled. These vehicles would be diverted out of the VSC via the secondary exit on Cedar Street, and it is assumed that they would use Route 9A to travel to an off-site reconciliation area located to the north of the WTC site. As discussed later in this chapter, a more extensive system of security measures would be implemented under the Proposed Project. As vendors and delivery companies become accustomed to the more stringent security procedures, it is anticipated that there would be relatively few unscheduled deliveries in the With-Action condition. Any vehicles making an unscheduled delivery would not be permitted access to the WTC campus or the VSC under the Proposed Project.

Large trucks destined for the PAC loading dock would also have to be scheduled, but would not use the VSC. The numbers of these large trucks are expected to be small – roughly one in any one peak hour – and they would access the loading dock via the segment of Vesey Street that would be managed in the No-Action condition.

It is anticipated that tour buses with passengers en route to the 9/11 Memorial, Memorial Center and Tower 1 viewing platform would unload passengers along the north curb of Liberty Street west of Greenwich Street or along the west curb of Greenwich Street adjacent to the Memorial Center before proceeding to the VSC. Based on data from the *WTC Vehicular Security Center and Tour Bus Parking Facility EA*, it is anticipated that over 80 percent of these buses would approach the WTC site from southbound Route 9A, with the remainder approaching from Broadway or the Brooklyn-Battery Tunnel. Buses departing the VSC onto eastbound Liberty Street were assumed to pick up passengers at one of two locations: the west curb of Greenwich Street adjacent to the Memorial Plaza or the east curb of northbound Route 9A north of Liberty Street.

It is recognized that not all tour buses destined to the Memorial, Memorial Center and Tower 1 viewing platform would reserve on-site parking in the No-Action (as well as the With-Action) condition, and that some would likely proceed to various off-site parking locations after discharging their passengers, as is current practice. As discussed previously, in developing the baseline traffic networks, no credit was assumed for the substantial numbers of existing Memorial-related trips. Therefore, the baseline traffic networks already reflect tour buses discharging passengers in the vicinity of the Memorial and then proceeding to off-site parking. However, the No-Action (as well as the With-Action) traffic assignment conservatively incorporates the full incremental tour bus demand generated by the Memorial, Memorial

Center and Tower 1 viewing platform, and assumes that all of the these trips would circulate through the WTC site en route to and from the VSC and on-site parking.

No-Action Traffic Networks

Figures 8-8 through 8-11 show the expected weekday AM, midday, PM and Saturday midday peak hour traffic volumes at analyzed intersections in the No-Action condition with the changes to the study area street system described above and demand from new development at the World Trade Center site and its vicinity. As shown in **Figures 8-8 through 8-11**, peak hour traffic volumes on the new segment of Greenwich Street traversing the WTC site are expected to range from 321 to 367 approaching Fulton Street. Some of this demand would represent trips diverted from parallel southbound corridors such as Broadway.

The new segment of Fulton Street west of Church Street is expected to experience 127 to 271 vehicles per hour (vph) westbound in the peak hours. Much of this would be local demand generated by uses at the WTC site, as security measures implemented in the No-Action would preclude access to Route 9A along Fulton Street for most through traffic. Peak hour traffic volumes along the managed segment of Fulton Street would be relatively small (fewer than ten vehicles per hour) and would primarily consist of black cars en route to and from Tower 1.

An estimated 165 to 224 vph are expected to approach Church Street along the reopened eastbound segment of Vesey Street. Like the parallel segment of Fulton Street, there would be ten or fewer vehicles per peak hour along the managed segment of Vesey Street west of Greenwich Street, and these would primarily consist of black cars en route to and from Tower 1. Peak hour traffic volumes along the reopened segment of Liberty Street would range from 502 to 628 eastbound and from 190 to 216 westbound approaching Greenwich Street. As Liberty Street would again function as a contiguous two-way corridor between Route 9A and Broadway, some of the traffic traversing it through the WTC site is expected to represent demand diverted from other east-west corridors in the area, such as Chambers Street and Rector Street.

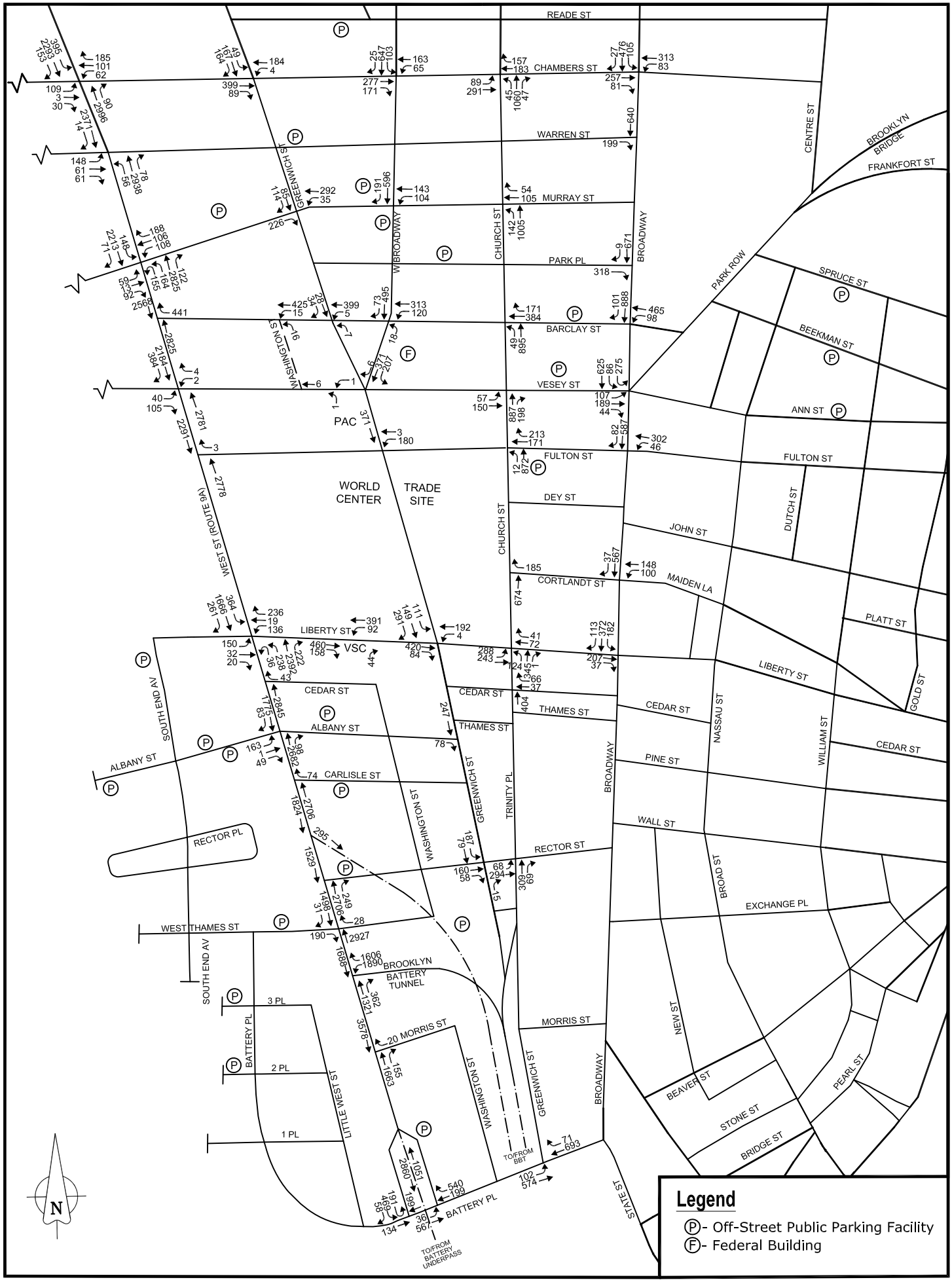
Intersection Capacity Analysis

Table 8-10 shows a summary comparison of intersection levels of service for the existing condition and the future No-Action condition with the street network changes and changes in traffic flows discussed above. (This includes the opening of a new intersection along Route 9A at Fulton Street in the No-Action.) As shown in **Table 8-10**, in the weekday AM peak hour, it is expected that five analyzed intersections would operate at LOS E or F and four would operate at a marginally acceptable LOS D in the No-Action condition. This compares to one intersection operating at LOS E or F and four at LOS D under existing conditions. Twenty-five individual lane groups out of the approximately 146 such lane groups analyzed would operate at LOS E or F in the AM peak hour in the No-Action compared to 17 under existing conditions.

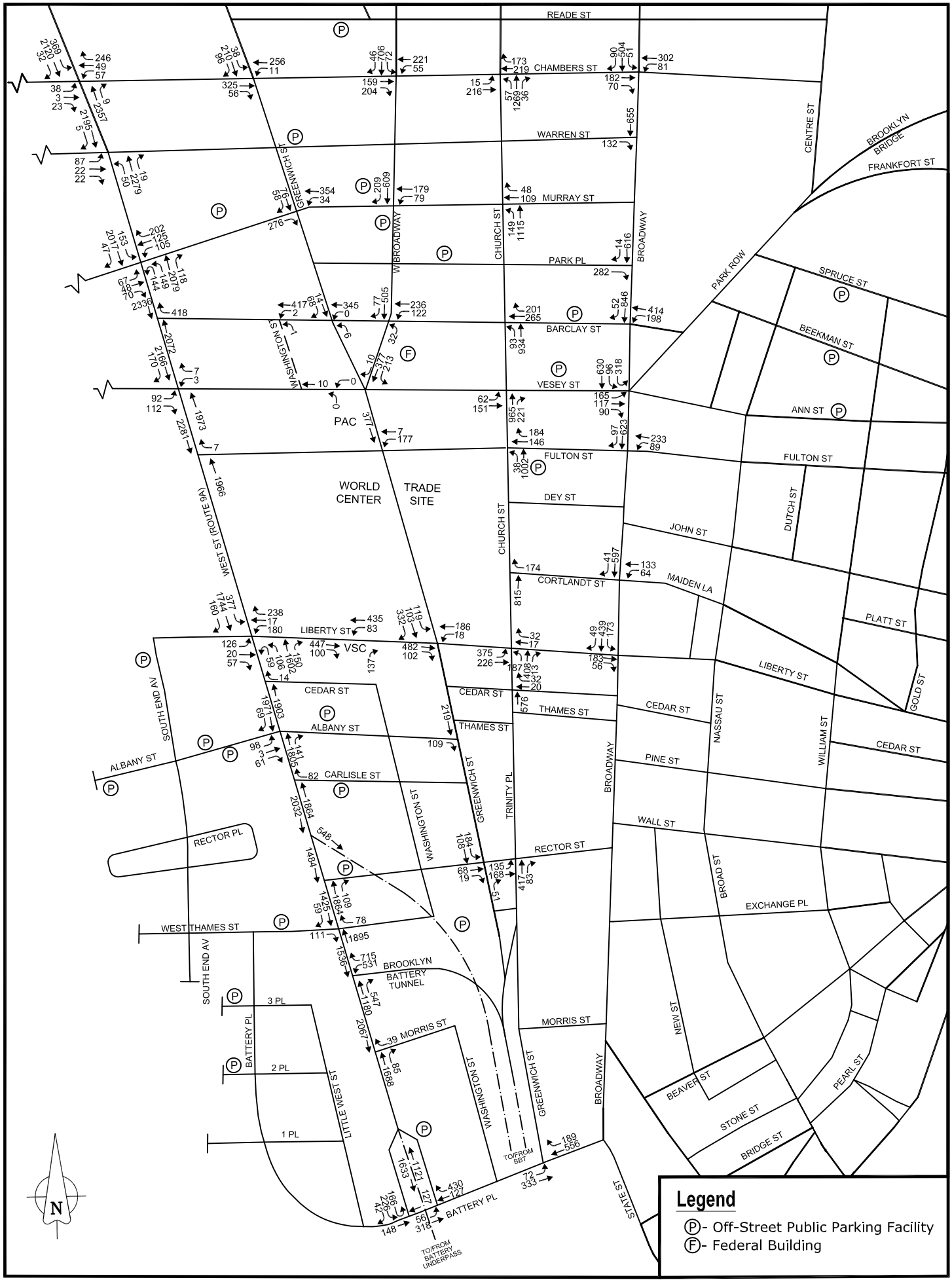
In the weekday midday peak hour, two analyzed intersections would operate at LOS D, and five at LOS E or F in the No-Action condition compared to three intersections operating at LOS D and one at LOS E or F under existing conditions. Sixteen of the approximately 146 individual lane groups analyzed are expected to operate at LOS E or F in the midday peak hour in the No-Action, compared to eight under existing conditions.

In the weekday PM peak hour, eight analyzed intersections would operate at LOS E or LOS F and four at a marginally acceptable LOS D in the No-Action condition. This compares to two intersections operating at LOS E or F and three at LOS D in the PM under existing conditions. Twenty-four individual lane

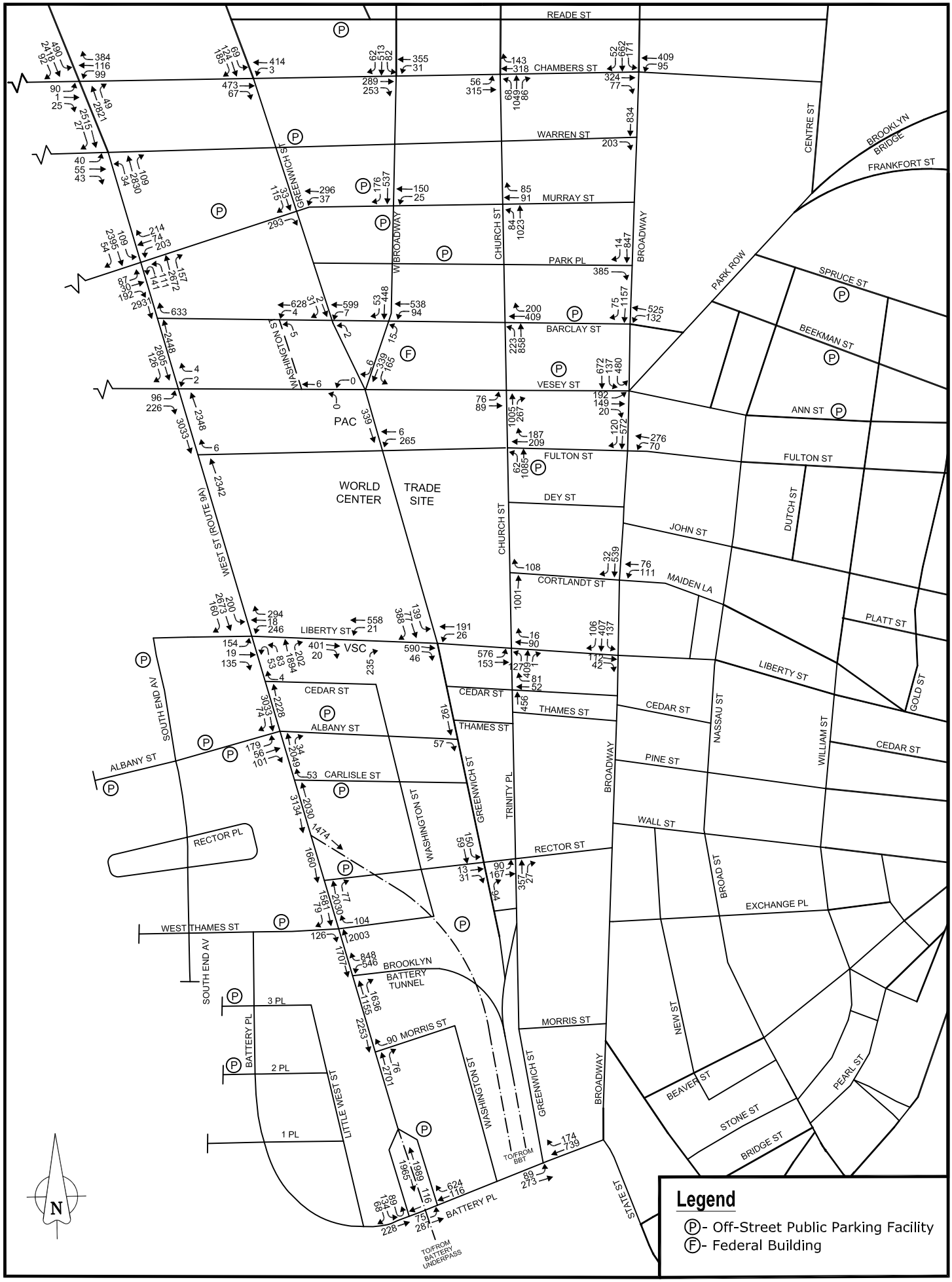
No-Action Weekday AM Peak Hour Traffic Volumes



No-Action Weekday Midday Peak Hour Traffic Volumes



No-Action Weekday PM Peak Hour Traffic Volumes



No-Action Saturday Midday Peak Hour Traffic Volumes

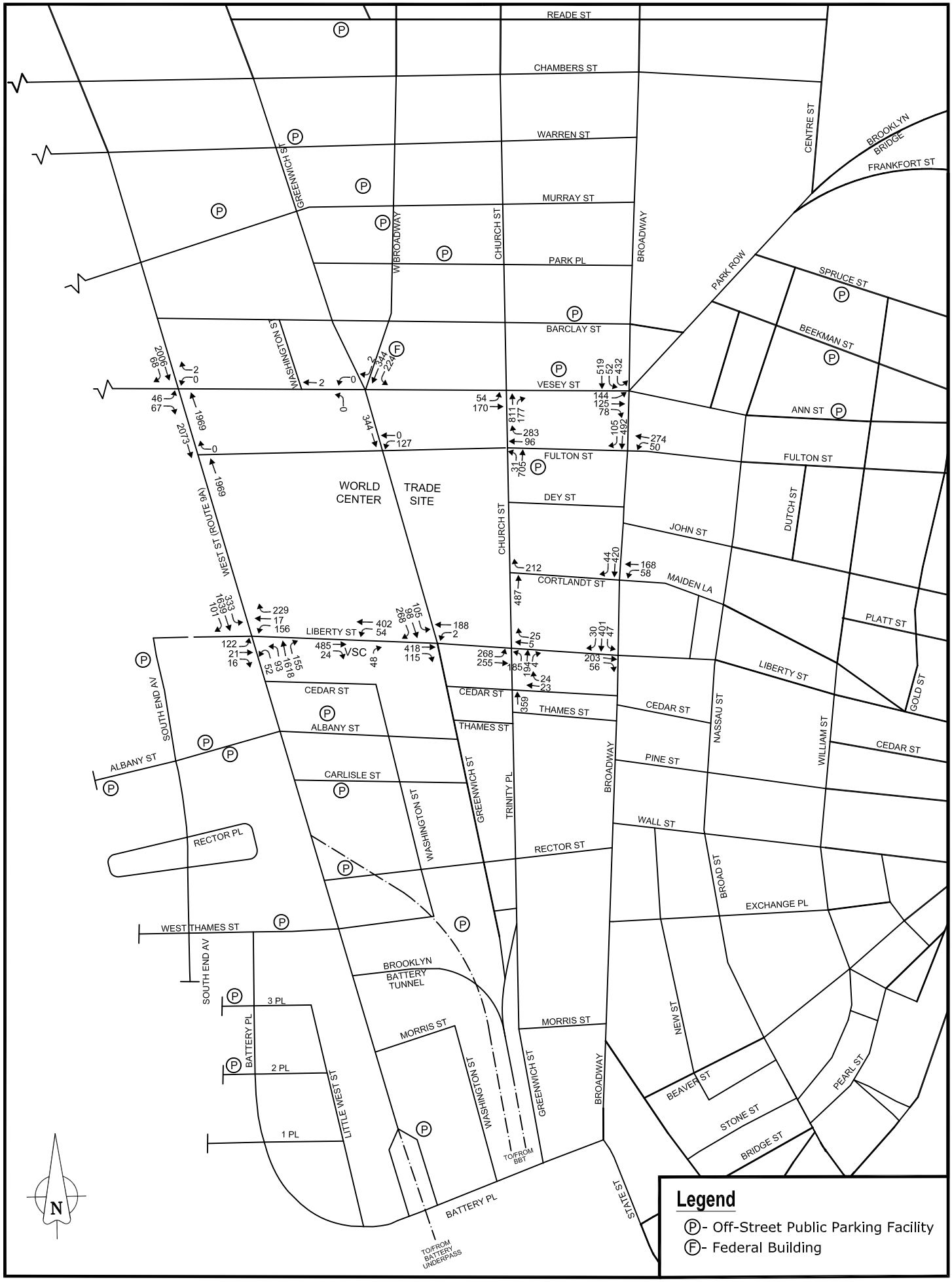


Table 8-10
Intersection Level of Service Summary Comparison
Existing vs. No-Action Conditions

	Existing				No-Action			
	AM	Midday	PM	Saturday Midday	AM	Midday	PM	Saturday Midday
Overall LOS A/B/C	34	36	35	11	32	34	29	7
Overall LOS D	5	3	3	0	4	2	4	2
Overall LOS E	1	0	1	0	2	3	5	1
Overall LOS F	0	1	1	0	3	2	3	2
Total lane groups at LOS E or F (of approximately 134/27 lane groups analyzed in the existing condition and 146/37 in the No-Action for the weekday/Saturday periods)	17	8	11	0	25	16	24	9
No. of lane groups at LOS E or F at Route 9A intersections	16	6	10	0	20	10	18	3
No. of lane groups at LOS E or F within the Downtown street grid	1	2	1	0	5	6	6	6

Notes:
Route 9A/Carlisle Street intersection analyzed as part of the in the Route 9A/Albany Street intersection in the No-Action condition.

groups out of the approximately 146 such lane groups analyzed would operate at LOS E or F in the PM peak hour in the No-Action compared to 11 under existing conditions.

Lastly, in the Saturday midday peak hour, two analyzed intersections would operate at LOS D, and three at LOS E or F in the No-Action condition, compared to none operating at LOS D, E or F under existing conditions. Nine individual lane groups of the approximately 37 such lane groups analyzed would operate at LOS E or F in the Saturday midday peak hour in the No-Action compared to none under existing conditions.

Table 8-11 shows the volume-to-capacity ratios, delays and levels of service by lane group at each analyzed intersection in each peak hour in the No-Action condition, and identifies those lane groups that are considered congested in one or more peak hours. As shown in **Table 8-11**, with continued growth in general travel demand and new demand from development at the WTC site and its vicinity, some intersections that were congested under existing conditions would worsen, and there would be additional locations that would become congested in one or more peak hours by 2019. In addition, conditions would improve at several intersections as a result of traffic diversions associated with the opening of new street linkages through the WTC site as well as completion of the reconstruction of Route 9A. Of the 42 intersections analyzed, 13 would have one or more congested lane groups in the weekday AM peak hour (compared to ten out of 40 intersections under existing conditions), 11 in the midday (eight under existing conditions), 19 in the PM peak hour (nine under existing conditions) and seven in the Saturday midday peak hour (none under existing conditions). Newly congested lane groups are discussed below.

Broadway

As shown in **Table 8-11**, in the No-Action condition the southbound left-through lane group at Chambers Street would be operating at capacity in the PM peak hour while the eastbound Chambers Street approach would no longer be congested in the midday. Continuing south, the eastbound Vesey Street approach to Broadway would be operating well over capacity in all peak periods. The westbound Fulton Street

Table 8-11
No-Action Intersection Level of Service Analysis

	LANE GROUP	AM PEAK HOUR						MIDDAY PEAK HOUR						PM PEAK HOUR						SATURDAY MIDDAY PEAK HOUR					
		EXISTING			NO-ACTION			EXISTING			NO-ACTION			EXISTING			NO-ACTION			EXISTING			NO-ACTION		
		V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS
1. Chambers St (E-W) @	EB - TR	0.68	30.3	C	0.64	28.5	C	0.94	59.4	E *	0.74	35.1	D	0.72	31.0	C	0.68	29.3	C						
Broadway (SB)	WB - L	0.44	28.8	C	0.54	32.8	C	0.48	30.1	C	0.47	28.6	C	0.56	35.3	D	0.63	39.4	D						
	WB - T	0.70	31.5	C	0.72	32.3	C	0.65	29.0	C	0.68	29.8	C	0.75	33.6	C	0.81	37.7	D						
	SB - L	0.37	24.0	C	0.40	24.8	C	0.16	19.8	B	0.19	20.3	C	0.66	34.7	C	0.70	38.2	D						
	SB - LT	0.65	28.3	C	0.69	29.9	C	0.79	35.1	D	0.81	36.1	D	0.85	39.3	D	1.05	78.4	E *						
	SB - R	0.10	18.8	B	0.11	19.1	B	0.57	36.4	D	0.68	46.3	D	0.39	27.6	C	0.40	28.8	C						
2. Warren St (EB) @	EB - R	0.65	29.6	C	0.60	27.8	C	0.71	33.2	C	0.48	23.7	C	0.85	42.4	D	0.62	27.2	C						
Broadway (SB)	SB - T	0.43	17.0	B	0.45	17.3	B	0.49	17.9	B	0.48	17.7	B	0.53	18.5	B	0.61	19.9	B						
3. Park Place (E-W) @	EB - R	0.63	22.2	C	0.48	18.8	B	0.41	17.5	B	0.42	17.7	B	0.59	20.8	C	0.57	20.6	C						
Broadway (SB)	SB - T	0.54	21.1	C	0.52	20.8	C	0.59	22.0	C	0.50	20.5	C	0.68	24.2	C	0.69	24.3	C						
	SB - R	0.06	16.1	B	0.06	16.2	B	0.14	18.4	B	0.12	17.9	B	0.08	16.3	B	0.07	16.1	B						
4. Park Row/Barclay St (WB) @	WB - L	0.27	26.0	C	0.25	25.7	C	0.44	29.4	C	0.52	31.2	C	0.31	26.8	C	0.33	27.1	C						
Broadway (SB)	WB - LT	0.44	27.5	C	0.58	30.0	C	0.45	27.7	C	0.59	30.1	C	0.54	29.1	C	0.62	30.8	C						
	SB - T	0.86	32.7	C	0.75	27.5	C	0.79	29.0	C	0.71	26.3	C	1.01	55.7	E *	1.09	80.7	F *						
	SB - R	0.39	23.0	C	0.38	22.8	C	0.22	19.2	B	0.16	18.4	B	0.22	19.1	B	0.21	18.9	B						
5. Vesey St/Park Row/Ann St (EB) @	EB - TR	0.52	45.4	D	1.53	294.4	F *	0.68	53.7	D	1.81	418.4	F *	0.14	37.3	D	1.44	256.8	F *	0.51	44.5	D	1.46	265.2	F *
Broadway (SB)	SB - L	0.60	19.4	B	0.51	17.5	B	0.59	19.3	B	0.57	18.8	B	0.83	28.9	C	0.83	29.1	C	0.57	18.8	B	0.54	18.1	B
	SB - LT	0.82	28.0	C	0.73	23.6	C	0.80	26.7	C	0.75	24.1	C	0.82	28.1	C	0.81	27.5	C	0.56	17.2	B	0.49	16.1	B
6. Fulton St (WB) @	WB-L	0.23	27.7	C	0.27	28.8	C	0.32	29.1	C	0.41	31.4	C	0.25	27.9	C	0.38	31.2	C	-	-	-	-	-	-
Broadway (SB)	WB-T	0.39	29.2	C	0.89	56.0	E *	0.27	27.2	C	0.70	39.4	D	0.28	27.2	C	0.84	49.1	D	-	-	-	-	-	-
	WB - LT	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.62	35.4	D	0.96	68.2	E *
	SB - T	0.34	9.1	A	0.29	8.7	A	0.43	10.1	B	0.41	9.8	A	0.30	8.7	A	0.28	8.6	A	-	-	-	-	-	-
	SB - TR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.32	8.8	A	0.31	8.8	A
	SB - R	0.21	9.9	A	0.39	13.9	B	0.25	10.3	B	0.40	13.5	B	0.39	13.6	B	0.53	17.9	B	-	-	-	-	-	-
7. Maiden Lane/Cortlandt St (WB) @	WB - LT	0.70	39.0	D	0.83	50.3	D	0.49	31.4	C	0.56	33.4	C	0.59	34.3	C	0.62	36.3	D	0.62	35.0	C	0.70	38.6	D
Broadway (SB)	SB - T	0.32	8.9	A	0.29	8.7	A	-	-	-	-	-	-	0.27	8.5	A	0.27	8.5	A	-	-	-	-	-	-
	SB - TR	-	-	-	-	-	-	0.50	11.1	B	0.49	10.9	B	-	-	-	-	-	-	0.40	9.9	A	0.36	9.4	A
	SB - R	0.17	9.1	A	0.17	9.1	A	-	-	-	-	-	-	0.11	8.2	A	0.13	8.4	A	-	-	-	-	-	-
8. Liberty St (E-W) @	EB - TR	0.18	26.1	C	0.98	79.5	E *	0.23	27.2	C	0.96	74.9	E *	0.17	25.8	C	0.59	35.9	D	0.16	25.7	C	0.93	65.6	E *
Broadway (SB)	SB - LT	0.48	11.0	B	0.43	10.3	B	-	-	-	-	-	-	0.39	9.8	A	0.34	9.3	A	-	-	-	-	-	-
	SB - LTR	-	-	-	-	-	-	0.46	10.5	B	0.43	10.1	B	-	-	-	-	-	-	0.33	9.0	A	0.27	8.5	A
	SB - R	0.35	13.5	B	0.65	26.6	C	-	-	-	-	-	-	0.13	8.4	A	0.47	15.8	B	-	-	-	-	-	-
9. Chambers St (E-W) @	EB - LT	0.96	59.5	E *	1.05	84.8	F *	0.92	50.2	D *	0.51	21.5	C	0.71	27.4	C	0.67	25.5	C						
Church St (NB)	WB - TR	0.60	23.2	C	0.63	23.8	C	0.61	23.3	C	0.64	24.1	C	0.71	26.3	C	0.76	28.4	C						
	NB - LT	0.58	20.2	C	0.70	22.6	C	-	-	-	-	-	-	0.59	20.3	C	0.72	23.0	C						
	NB - LTR	-	-	-	-	-	-	0.63	21.0	C	0.81	25.9	C	-	-	-	-	-	-						
	NB - R	0.18	16.7	B	0.20	17.0	B	-	-	-	-	-	-	0.34	20.4	C	0.45	24.1	C						

Table 8-11 (continued)
No-Action Intersection Level of Service Analysis

	LANE GROUP	AM PEAK HOUR						MIDDAY PEAK HOUR						PM PEAK HOUR						SATURDAY MIDDAY PEAK HOUR					
		EXISTING			NO-ACTION			EXISTING			NO-ACTION			EXISTING			NO-ACTION			EXISTING			NO-ACTION		
		V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS
10. Murray St (WB) @	WB - TR	0.40	25.8	C	0.51	28.3	C	0.39	25.2	C	0.45	26.5	C	0.55	29.7	C	0.60	31.8	C						
Church St (NB)	NB - LT	0.41	12.6	B	0.53	14.0	B	0.44	13.0	B	0.64	15.8	B	0.40	12.4	B	0.49	13.4	B						
11. Barclay St (WB) @	WB - TR	0.60	27.4	C	0.71	30.3	C	1.02	74.6	E *	1.22	144.3	F *	0.57	23.9	C	0.64	25.2	C						
Church St (NB)	NB - LT	0.32	11.7	B	0.42	12.7	B	0.33	13.8	B	0.47	15.4	B	0.37	14.3	B	0.56	16.9	B						
12. Vesey St (EB) @	NB - T	-	-	-	0.28	22.1	C	-	-	-	-	-	-	-	-	-	0.50	18.7	B	-	-	-	-	-	-
Church St (NB)	NB - R	-	-	-	0.35	12.0	B	-	-	-	-	-	-	-	-	-	1.10	109.3	F *	-	-	-	-	-	-
	NB - TR	0.76	20.3	C	-	-	-	0.78	26.7	C	0.59	20.1	C	0.82	29.0	C	-	-	-	0.70	23.5	C	0.47	18.3	B
	EB - LT	(Closed)			0.60	21.2	C	(Closed)			0.22	15.8	B	(Closed)			0.18	15.4	B	(Closed)			0.20	15.6	B
13. Fulton St (WB) @	WB - TR	-	-	-	0.89	44.6	D	-	-	-	0.84	40.1	D	-	-	-	0.92	49.4	D *	-	-	-	1.12	108.9	F *
Church St (NB)	WB - R	0.34	19.1	B	-	-	-	0.30	18.5	B	-	-	-	0.37	19.6	B	-	-	-	0.47	21.4	C	-	-	-
	NB - LT	-	-	-	0.42	16.6	B	-	-	-	0.46	16.9	B	-	-	-	0.58	18.8	B	-	-	-	0.32	15.3	B
	NB - T	0.68	22.2	C	-	-	-	0.57	19.2	B	-	-	-	0.62	20.6	C	-	-	-	0.42	17.0	B	-	-	-
14. Cortlandt St (WB) @	WB - R	0.55	29.7	C	0.78	46.7	D	0.40	26.2	C	0.88	64.3	E *	0.39	26.1	C	0.51	31.9	C	0.53	29.1	C	1.17	142.9	F *
Church St (NB)	NB - T	0.49	16.6	B	0.30	13.6	B	0.41	15.1	B	0.35	14.0	B	0.47	16.2	B	0.48	15.6	B	0.25	13.3	B	0.20	12.7	B
15. Liberty St (E-W) @	EB - L	-	-	-	1.83	424.4	F *	-	-	-	2.23	597.8	F *	-	-	-	2.86	878.4	F *	-	-	-	1.51	284.1	F *
Trinity Place/Church St (NB)	EB - T	-	-	-	0.54	27.6	C	-	-	-	0.49	26.4	C	-	-	-	0.31	23.1	C	-	-	-	0.52	26.9	C
	WB - TR	0.15	21.1	C	0.30	23.2	C	0.12	20.7	C	0.16	21.5	C	0.06	20.0	B	0.22	21.7	C	0.11	20.5	C	0.11	20.8	C
	NB - LT	0.23	11.1	B	0.41	13.3	B	-	-	-	-	-	-	0.27	11.3	B	0.41	13.1	B	-	-	-	-	-	-
	NB - LTR	-	-	-	-	-	-	0.33	11.9	B	0.45	13.4	B	-	-	-	-	-	-	0.21	10.8	B	0.32	11.9	B
	NB - R	0.25	13.7	B	0.00	9.4	A	-	-	-	-	-	-	0.22	13.2	B	0.00	9.4	A	-	-	-	-	-	-
16. Cedar St (E-W) @	EB - L	0.06	20.3	C	-	-	-	0.12	21.5	C	-	-	-	0.01	19.5	B	-	-	-	0.02	19.6	B	-	-	-
Trinity Place (NB)	WB - TR	-	-	-	0.35	24.8	C	-	-	-	0.18	21.8	C	-	-	-	0.41	25.7	C	-	-	-	0.13	20.9	C
	WB - R	0.18	22.1	C	-	-	-	0.12	21.1	C	-	-	-	0.25	22.9	C	-	-	-	0.13	21.0	C	-	-	-
	NB - T	0.21	10.9	B	0.21	10.8	B	0.29	11.5	B	0.34	12.0	B	0.24	11.2	B	0.26	11.3	B	0.17	10.5	B	0.19	10.7	B
17. Rector St (EB) @	EB - LT	0.84	44.4	D	0.83	42.6	D	0.65	33.1	C	0.81	41.9	D	0.46	27.6	C	0.61	30.8	C						
Trinity Place (NB)	NB - T	0.12	12.1	B	0.14	12.3	B	-	-	-	-	-	-	0.16	12.5	B	0.19	12.7	B						
	NB - TR	-	-	-	-	-	-	0.51	17.0	B	0.54	17.4	B	-	-	-	-	-	-						
	NB - R	0.30	16.1	B	0.30	16.1	B	-	-	-	-	-	-	0.15	13.1	B	0.11	12.6	B						
18. Chambers St (E-W) @	EB - TR	0.46	19.5	B	0.82	33.9	C	0.52	21.1	C	0.88	41.7	D	0.47	19.6	B	0.96	51.3	D *						
West Broadway (SB)	WB - LT	0.37	18.4	B	0.52	21.9	C	0.37	18.2	B	0.47	20.2	C	0.57	21.6	C	0.64	24.0	C						
	SB - LT	0.57	20.7	C	0.75	25.3	C	0.53	20.0	B	0.72	24.3	C	0.53	20.0	B	0.62	21.7	C						
	SB - R	0.23	17.1	B	0.10	15.1	B	0.26	18.0	B	0.20	17.0	B	0.42	21.9	C	0.30	19.0	B						
19. Murray St (WB) @	WB - LT	0.51	27.6	C	0.69	34.5	C	0.45	25.8	C	0.66	32.2	C	0.43	25.4	C	0.42	25.1	C						
West Broadway (SB)	SB - TR	0.25	11.2	B	0.45	13.1	B	0.25	11.2	B	0.49	13.6	B	0.22	10.9	B	0.44	13.0	B						

Table 8-11 (continued)
No-Action Intersection Level of Service Analysis

	LANE GROUP	AM PEAK HOUR						MIDDAY PEAK HOUR						PM PEAK HOUR						SATURDAY MIDDAY PEAK HOUR			
		EXISTING			NO-ACTION			EXISTING			NO-ACTION			EXISTING			NO-ACTION			EXISTING		NO-ACTION	
		V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	V/C RATIO	Delay (sec.)
20. Barclay St (WB) @	WB - LT	0.36	20.5	C	0.49	22.3	C	0.61	27.0	C	0.88	44.7	D	0.44	21.6	C	0.63	24.9	C				
West Broadway (N-S)	NB - L	0.05	11.7	B	0.09	12.5	B	0.07	12.0	B	0.16	13.6	B	0.04	11.6	B	0.08	12.3	B				
	SB - T	0.03	11.5	B	0.74	24.5	C	0.01	11.4	B	0.77	26.1	C	0.01	11.3	B	0.74	24.3	C				
	SB - R	0.13	12.6	B	0.17	13.0	B	0.15	12.7	B	0.16	12.8	B	0.10	12.3	B	0.13	12.6	B				
21. Chambers St (E-W) @	EB - T	0.42	19.0	B	0.66	24.4	C	0.37	18.1	B	0.56	21.5	C	0.45	19.3	B	0.81	31.3	C				
Greenwich St (SB)	EB - R	0.23	16.9	B	0.27	17.6	B	0.14	15.5	B	0.15	15.6	B	0.22	16.7	B	0.21	16.5	B				
	WB - LT	0.35	17.6	B	0.28	16.8	B	0.36	17.8	B	0.35	17.7	B	0.64	23.3	C	0.59	21.8	C				
	SB - LTR	0.77	35.8	D	0.83	40.7	D	0.52	26.5	C	0.56	27.2	C	0.85	44.3	D	0.92	54.3	D *				
22. Murray St (E-W) @	EB - R	0.84	47.5	D	0.81	45.3	D	0.59	32.1	C	0.93	63.4	E *	0.80	42.5	D	0.94	61.0	E *				
Greenwich St (SB)	WB - LT	0.73	35.3	D	0.80	39.6	D	0.68	32.4	C	0.88	46.7	D	0.68	32.3	C	0.78	37.1	D				
	SB - TR	0.51	16.4	B	0.45	14.9	B	0.30	12.8	B	0.25	11.8	B	0.45	16.3	B	0.45	16.4	B				
23. Barclay St (WB) @	WB - LT	0.00	7.6	A	0.00	7.6	A	0.00	7.6	A	0.00	7.6	A	0.01	7.6	A	0.01	7.6	A				
Greenwich St (N-S)	NB - L	0.02	13.9	B	0.02	13.8	B	0.02	13.5	B	0.02	13.4	B	0.00	13.1	B	0.01	14.2	B				
(Unsignalized)	SB - T	0.10	17.8	C	0.10	17.7	C	0.04	16.6	C	0.05	16.2	C	0.01	17.1	C	0.01	20.1	C				
	SB - R	0.07	11.2	B	0.06	11.1	B	0.11	11.2	B	0.12	11.2	B	0.05	11.1	B	0.06	11.8	B				
24. Albany St (EB) @	EB - R	0.44	26.8	C	0.32	23.8	C	0.57	31.0	C	0.44	26.9	C	0.44	27.2	C	0.27	23.3	C				
Greenwich St (SB)	SB - T	0.06	10.3	B	0.41	14.3	B	0.06	10.2	B	0.35	13.2	B	0.06	10.3	B	0.27	12.2	B				
25. Rector St (EB) @	EB - TR	0.59	28.3	C	0.55	27.7	C	0.23	21.3	C	0.19	20.8	C	0.13	20.0	C	0.16	20.7	C				
Greenwich St (N-S)	NB - R	0.07	10.7	B	0.09	11.1	B	0.07	10.6	B	0.22	12.8	B	0.20	12.6	B	0.45	18.6	B				
	SB - LT	0.39	15.4	B	0.77	29.2	C	0.39	14.8	B	0.70	23.3	C	0.25	12.7	B	0.56	18.7	B				
26. Battery Place (E-W) @	EB - L	0.83	51.0	D	0.72	36.7	D	0.54	18.6	B	0.37	13.4	B	0.81	49.0	D	0.77	46.5	D				
Greenwich St (NB)	EB - T	0.53	11.8	B	0.47	10.7	B	0.36	9.6	A	0.31	9.0	A	0.28	8.8	A	0.27	8.7	A				
	WB - TR	0.38	9.3	A	0.39	9.4	A	0.36	9.2	A	0.38	9.4	A	0.42	9.8	A	0.48	10.4	B				
27. Barclay St (WB) @	WB-LT	-	10.4	B	-	10.3	B	-	8.5	A	-	8.4	A	-	10.2	B	-	11.6	B				
Washington St (N-S)	WB -T	-	8.5	A	-	8.5	A	-	8.6	A	-	8.53	A	-	8.6	A	-	9.37	A				
(Unsignalized)	NB - L	-	8.5	A	-	8.5	A	-	8.1	A	-	8.0	A	-	8.4	A	-	8.63	A				
28. Chambers St (E-W) @	EB - LTR	1.05	134.0	F *	0.98	114.8	F *	0.31	36.6	D	0.29	36.1	D	0.59	47.0	D	0.70	55.0	E *				
Route 9A (West St) (N-S)	WB - LT	0.73	62.7	E *	0.71	60.5	E *	0.45	40.4	D	0.40	38.8	D	0.74	50.5	D	0.77	53.2	D				
	WB - R	0.36	29.0	C	0.39	29.7	C	0.35	22.0	C	0.41	23.1	C	0.68	30.2	C	0.68	30.0	C				
	NB - TR	0.99	40.3	D *	1.15	97.0	F *	0.81	27.4	C	0.98	41.5	D *	0.87	31.1	C	1.19	120.4	F *				
	SB - L	0.72	70.4	E *	1.24	190.2	F *	0.53	54.5	D	1.03	106.5	F *	0.95	94.8	F *	1.69	379.1	F *				
	SB - TR	0.57	6.3	A	0.84	10.8	B	0.53	8.1	A	0.73	10.7	B	0.71	12.8	B	0.98	29.8	C *				
29. Warren St (E-W) @	EB - LTR	0.70	56.3	E *	0.87	71.3	E *	0.32	35.8	D	0.38	37.1	D	0.39	37.5	D	0.43	38.5	D				
Route 9A (West St) (N-S)	NB - L	0.84	122.1	F *	0.67	96.1	F *	0.62	78.9	E *	0.51	71.0	E *	0.25	52.6	D	0.21	51.6	D				
	NB - TR	0.87	19.5	B	0.98	30.2	C *	0.70	17.6	B	0.82	20.5	C	0.85	25.7	C	1.13	91.2	F *				
	SB - TR	0.63	13.4	B	0.75	15.6	B	0.62	16.3	B	0.77	19.2	B	0.85	26.0	C	0.97	36.6	D *				

Table 8-11 (continued)
No-Action Intersection Level of Service Analysis

	LANE GROUP	AM PEAK HOUR						MIDDAY PEAK HOUR						PM PEAK HOUR						SATURDAY MIDDAY PEAK HOUR					
		EXISTING			NO-ACTION			EXISTING			NO-ACTION			EXISTING			NO-ACTION			EXISTING			NO-ACTION		
		V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS
30. Murray St (E-W) @	EB - DefL	0.78	92.3	F *	0.64	73.1	E *	0.54	51.6	D	0.70	68.5	E *	-	-	-	0.65	59.1	E *						
Route 9A (West St) (N-S)	EB - TR	0.59	58.8	E *	0.67	65.5	E *	0.45	42.5	D	0.52	43.9	D	-	-	-	1.19	167.0	F *						
	EB - LTR	-	-	-	-	-	-	-	-	-	-	-	-	0.86	64.3	E	-	136.6	F *						
	WB - DefL	-	-	-	-	-	-	-	-	-	-	-	-	1.05	120.0	F *	1.20	171.8	F *						
	WB - TR	-	-	-	-	-	-	-	-	-	-	-	-	0.89	75.3	E *	1.42	256.2	F *						
	WB - LTR	1.05	106.4	F *	1.00	91.9	F *	1.03	96.5	F *	1.19	150.3	F *	-	-	-	-	-	-						
	NB - L	1.05	123.8	F *	1.03	117.7	F *	1.05	122.6	F *	1.11	142.4	F *	1.04	123.6	F *	1.05	125.9	F *						
	NB - TR	1.03	45.1	D *	1.15	90.4	F *	0.78	19.0	B	0.93	26.8	C *	0.88	24.6	C	1.11	77.7	E *						
	SB - L	0.47	66.9	E *	0.71	78.4	E *	0.39	59.4	E *	0.85	90.2	F *	0.32	55.4	E *	0.48	59.2	E *						
	SB - TR	0.64	15.5	B	0.76	17.9	B	0.60	15.3	B	0.72	17.4	B	0.78	20.2	C	0.88	23.7	C						
31. Barclay St (WB) @	WB - R	1.05	86.0	F *	0.50	34.8	C	1.02	73.4	F *	0.61	31.9	C	1.03	75.4	F *	0.80	39.1	D						
Route 9A (West St) (N-S)	NB - T	-	-	-	0.95	26.4	C *	-	-	-	0.72	14.3	B	-	-	-	0.86	18.3	B						
32. Vesey St (E-W) @	EB - L	0.10	32.2	C	0.26	37.0	D	0.19	26.7	C	0.56	41.3	D	0.17	26.3	C	0.49	37.5	D	0.08	25.1	C	0.26	29.4	C
Route 9A (West St) (N-S)	EB - R	0.27	35.2	D	0.36	37.8	D	0.26	27.8	C	0.55	38.7	D	0.51	33.7	C	0.65	40.3	D	0.16	26.2	C	0.34	31.3	C
	WB - L	-	-	-	0.01	30.7	C	-	-	-	0.01	24.3	C	-	-	-	0.00	24.1	C	-	-	-	0.00	24.1	C
	WB - TR	-	-	-	0.02	31.1	C	-	-	-	0.04	24.7	C	-	-	-	0.02	24.4	C	-	-	-	0.01	24.2	C
	NB - T	1.05	48.1	D *	0.86	16.4	B	0.78	17.8	B	0.67	15.0	B	0.89	22.9	C	0.83	18.5	B	0.79	18.1	B	0.66	14.7	B
	SB - TR	1.05	50.4	D *	0.90	19.1	B *	0.94	26.8	C *	0.82	18.4	B	1.05	51.4	D *	0.90	21.8	C *	0.84	19.9	B	0.71	15.6	B
33. Fulton St St (WB) @	WB-R	(Closed)			0.01	30.9	C	(Closed)			0.03	24.5	C	(Closed)			0.02	24.4	C	(Closed)			0.00	24.1	C
Route 9A (West St) (N-S)	NB-T	(Closed)			0.86	16.8	B	(Closed)			0.67	14.9	B	(Closed)			0.81	17.9	B	(Closed)			0.66	14.7	B
	SB-T	(Closed)			0.69	12.4	B	(Closed)			0.78	17.1	B	(Closed)			1.00	35.5	D *	(Closed)			0.7	15.4	B
34. Liberty St (E-W) @	EB - L	0.42	44.5	D	-	-	-	0.24	33.6	C	-	-	-	0.24	30.0	C	-	-	-	0.27	34.1	C	-	-	-
Route 9A (West St) (N-S)	EB - DefL	-	-	-	1.41	275.3	F *	-	-	-	0.64	57.6	E *	-	-	-	0.83	72.8	E *	-	-	-	1.06	137.2	F *
	EB - TR	-	-	-	0.20	41.9	D	-	-	-	0.33	38.1	D	-	-	-	0.85	75.1	E *	-	-	-	0.12	33.3	C
	EB - R	0.10	38.5	D	-	-	-	0.12	31.8	C	-	-	-	0.22	30.0	C	-	-	-	0.05	30.8	C	-	-	-
	WB - DefL	-	-	-	-	-	-	-	-	-	1.42	263.1	F *	-	-	-	1.68	373.6	F *	-	-	-	-	-	-
	WB - TR	-	-	-	-	-	-	-	-	-	1.26	189.2	F *	-	-	-	1.06	107.8	F *	-	-	-	-	-	-
	WB-LTR	(Closed)			1.19	159.4	F *	(Closed)			-	-	-	(Closed)			-	-	-	(Closed)			1.19	150.2	F *
	NB - L	-	-	-	1.12	152.4	F *	-	-	-	0.51	54.3	D	-	-	-	0.39	51.3	D	-	-	-	0.41	51.7	D
	NB - T	0.88	11.3	B	-	-	-	0.65	8.5	A	-	-	-	0.74	13.2	B	-	-	-	0.63	8.2	A	-	-	-
	NB - TR	-	-	-	1.08	65.3	E *	-	-	-	0.72	21.9	C	-	-	-	0.81	24.4	C	-	-	-	0.69	21.1	C
	SB - L	-	-	-	1.57	336.8	F *	-	-	-	1.10	127.5	F *	-	-	-	0.56	55.5	E *	-	-	-	0.96	89.1	F *
	SB - TR	0.74	7.4	A	0.87	22.1	C	0.79	11.1	B	0.96	36.4	D *	1.05	46.7	D *	1.12	83.7	F *	0.72	9.5	A	0.67	20.9	C
35. Albany St (E-W)/	EB - LTR	0.81	65.5	E *	0.54	44.2	D	0.59	44.4	D	0.44	35.7	D	0.92	75.6	E *	0.80	50.9	D						
Carlisle St (WB) @	WB - R	-	-	-	0.20	36.5	D	-	-	-	0.20	30.8	C	-	-	-	0.13	29.8	C						
Route 9A (West St) (N-S)	NB - L	1.05	132.0	F *	-	-	-	0.85	91.9	F *	-	-	-	0.61	60.8	E *	-	-	-						
	NB - TR	1.05	39.1	D *	0.84	12.5	B	0.86	12.9	B	0.67	10.4	B	0.91	14.1	B *	0.64	9.9	A						
	SB - TR	0.59	18.2	B	0.45	6.7	A	0.70	19.2	B	0.51	8.4	A	1.00	39.9	D *	0.76	11.5	B						

Table 8-11 (continued)
No-Action Intersection Level of Service Analysis

	LANE GROUP	AM PEAK HOUR						MIDDAY PEAK HOUR						PM PEAK HOUR						SATURDAY MIDDAY PEAK HOUR			
		EXISTING			NO-ACTION			EXISTING			NO-ACTION			EXISTING			NO-ACTION			EXISTING		NO-ACTION	
		V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	V/C RATIO	Delay (sec.)
36. Carlisle St (WB) @ Route 9A (West St) (N-S) (Unsignalized)	WB - R	0.33	24.9	C	(See Albany Street above)			0.30	21.3	C	(See Albany Street above)			0.29	21.3	C	(See Albany Street above)						
37. Cedar Street (WB) @ Route 9A (West St) (N-S) (Unsignalized)	WB-R	(Closed)			0.27	30.6	D	(Closed)			0.07	21.9	C	(Closed)			0.02	21.0	C				
38a. West Thames St/ Brooklyn-Battery Tunnel Exit (E-W) @ Route 9A (West St) (N-S)	EB - R	0.41	25.0	C	0.45	26.1	C	0.36	32.3	C	0.39	33.1	C	0.48	36.4	D	0.47	36.2	D				
	WB - R	0.69	28.8	C	0.74	30.4	C	0.42	31.1	C	0.47	31.9	C	0.49	32.3	C	0.56	33.5	C				
	NB - T	0.51	25.8	C	0.59	27.1	C	0.36	10.7	B	0.41	11.1	B	0.32	10.3	B	0.37	10.7	B				
	SB - TR	1.03	72.2	E *	1.06	79.6	E *	0.74	22.2	C	0.80	24.1	C	0.79	23.7	C	0.90	29.3	C *				
38b. Brooklyn-Battery Tunnel Entrance/Exit (E-W) @ Route 9A (West St) (N-S)	WB - L	0.58	25.9	C	0.61	26.6	C	0.34	30.0	C	0.37	30.4	C	0.38	30.7	C	0.41	31.1	C				
	NB - T	0.80	40.3	D	0.91	47.8	D *	0.55	18.3	B	0.62	19.5	B	0.48	17.3	B	0.57	18.6	B				
	NB - R	0.43	2.7	A	0.44	2.8	A	0.56	3.9	A	0.62	4.8	A	1.05	43.7	D *	1.27	132.8	F *				
	SB - T	0.96	45.7	D *	0.99	53.4	D *	0.67	14.6	B	0.71	15.5	B	0.71	15.4	B	0.80	17.6	B				
39. Joseph P Ward St (WB) @ Route 9A (West Street) (N-S) (Unsignalized)	WB - R	0.18	30.3	D	0.19	31.8	D	0.35	29.1	D	0.45	36.6	E *	0.51	40.0	E *	0.62	49.1	E *				
40. Morris St (E-W) @ Route 9A (West Street) (N-S) (West Lanes of Northbound Approach)	WB - R	0.10	48.3	D	0.12	48.5	D	0.20	41.9	D	0.22	42.2	D	0.42	44.6	D	0.46	45.2	D				
	NB - TR	0.37	5.8	A	0.39	5.9	A	0.35	6.2	A	0.35	6.2	A	0.36	6.3	A	0.39	6.5	A				
	NB - T	0.43	6.2	A	0.50	6.9	A	0.49	7.4	A	0.57	8.4	A	0.80	13.5	B	0.95	25.1	C *				
	SB-T	0.89	15.1	B	0.93	18.2	B	0.52	7.3	A	0.55	7.7	A	0.56	7.8	A	0.62	8.5	A				
41. Battery Place (E-W) @ Route 9A SB Service Rd (SB)	EB - T	0.32	26.9	C	0.33	27.1	C	0.41	28.9	C	0.43	29.3	C	0.60	34.0	C	0.64	35.5	D				
	WB - T	0.45	29.2	C	0.45	29.2	C	0.29	26.4	C	0.30	26.5	C	0.24	25.6	C	0.26	26.0	C				
	SB - L	1.02	88.4	F *	0.95	69.3	E *	0.56	31.6	C	0.31	24.1	C	0.25	23.2	C	0.20	22.4	C				
	SB - LR	1.02	86.9	F *	0.96	71.9	E *	0.56	31.5	C	0.35	24.8	C	0.37	25.3	C	0.34	24.8	C				
42. Battery Place (E-W) @ Route 9A NB Service Rd (NB)	EB - LT	0.47	13.1	B	0.45	12.8	B	0.38	12.1	B	0.34	11.7	B	0.33	11.6	B	0.32	11.5	B				
	WB - T	0.26	11.1	B	0.26	11.2	B	0.17	10.2	B	0.17	10.3	B	0.14	10.0	A	0.15	10.1	B				
	WB - R	0.51	14.2	B	0.54	14.7	B	0.35	11.8	B	0.37	12.0	B	0.54	14.6	B	0.62	16.1	B				
	NB - T	0.42	25.8	C	0.41	25.6	C	0.37	24.7	C	0.33	24.1	C	0.10	20.9	C	0.08	20.7	C				

Notes:

EB-Eastbound, WB-Westbound, NB-Northbound, SB-Southbound

L-Left, T-Through, R-Right, Dfl-Analysis considers a Defacto Left Lane on this approach

V/C Ratio - Volume to Capacity Ratio, sec. - Seconds

LOS - Level of Service

* - Denotes a congested movement (LOS of E or F, or V/C ratio greater than or equal to 0.9)

Analysis is based on the 2000 Highway Capacity Manual methodology (HCS+, version 5.4)

approach to Broadway would become congested in the weekday AM and Saturday midday peak hours, while the eastbound approach at Liberty Street would become congested in the weekday AM, midday and Saturday midday peak hours.

Trinity Place/Church Street

Along the Trinity Place/Church Street corridor, the eastbound Chambers Street approach would no longer be congested in the midday peak hour. The northbound right turn at Vesey Street is expected to operate over capacity in the weekday PM peak hour, and congestion would be evident on the westbound approach at Fulton Street in the PM and Saturday midday, and the westbound approach at Cortlandt Street in the weekday midday and Saturday midday periods. (The westbound Fulton Street and Cortlandt Street approaches would both be operating over-capacity in the Saturday midday.) The restored eastbound left-turn from Liberty Street is expected to be operating well over capacity in all periods. This would be due to conflicts between eastbound traffic using the reopened segment of Liberty Street to access Church Street from Route 9A and the VSC, and westbound traffic and heavy pedestrian flows using the north crosswalk on Church Street at Liberty Street.

West Broadway

In the No-Action condition, the eastbound Chambers Street approach to West Broadway is expected to be congested in the PM peak hour.

Greenwich Street

Southbound Greenwich Street is expected to become congested approaching Chambers Street in the weekday PM peak hour, while the eastbound Murray Street approach to Greenwich Street would become newly congested in both the midday and PM peak hours.

Route 9A

At Chambers Street in the No-Action condition, northbound Route 9A is expected to become congested in the midday peak hour and operate over capacity in the PM, the southbound left turn on Route 9A would be operating at capacity in the midday, and both the eastbound approach and the southbound through-right lane group would become congested in the PM. At Warren Street, northbound Route 9A would become congested in the AM and PM (with over-capacity conditions in the PM), and southbound Route 9A would become congested in the PM.

To the south at Murray Street, the eastbound left-turn would become newly congested in the midday and PM peak hours, and the through-right lane group on this approach would operate over-capacity in the PM. The northbound Route 9A through-right lane group approaching Murray Street would become congested in the midday peak hour and operate over capacity in the PM. Northbound Route 9A would also become newly congested in the AM peak hour approaching Barclay Street, whereas the westbound Barclay Street approach would no longer be congested in the weekday peak hours. (A new traffic signal would be installed at this intersection in the No-Action condition.) Similarly, at Vesey Street it is expected that northbound Route 9A would no longer be congested in the AM peak hour, and southbound Route 9A would no longer be congested in the midday.

At Liberty Street, the northbound through-right lane group is expected to operate over capacity in the AM, while the southbound through-right lane group would become newly congested in the midday. The newly opened northbound Route 9A left-turn is expected to operate over capacity in the AM peak hour, and the southbound left-turn is expected to experience congestion in all peak hours (with over-capacity

conditions in the AM and midday). On the Liberty Street approaches, the eastbound left turn is expected to become congested in all periods (operating over capacity in the AM and Saturday midday), while the eastbound through-right lane group is expected to become congested in the PM. The newly reopened westbound approach is also expected to be operating over-capacity in all periods.

At Albany Street, where the northbound Route 9A left-turn would be eliminated in the No-Action condition, the northbound through-right lane group would no longer be congested in the AM and PM, and the same would be true for the eastbound approach. The southbound through-right lane group would no longer be congested in the PM. At the Brooklyn-Battery Tunnel entrance, the southbound Route 9A approach at West Thames Street would become congested in the PM peak hour as would the northbound through movement at the tunnel entrance in the AM. The westbound Joseph P. Ward Street approach to northbound Route 9A would become newly congested in the midday. Lastly, northbound Route 9A would become newly congested approaching Morris Street in the PM peak hour.

The Future with the Proposed Project (With-Action)

In the 2019 future with the Proposed Project (the With-Action condition), a comprehensive perimeter vehicle security plan for the WTC site would be implemented in order to ensure an open environment that is hospitable to commerce, culture and remembrance, but also protected from future threats to the extent practicable over the long term. Under this plan, vehicular access to, and traffic movement within, the WTC site would be controlled through the creation of a secure perimeter that would prevent unscreened vehicles from approaching within a set distance of WTC buildings. Portions of streets in and around the WTC site would be closed to unscreened vehicular traffic. Vehicles destined for the WTC seeking entry onto these streets would be subject to credentialing to determine whether entry to the site should be permitted, and then screening to confirm that these vehicles pose no threat.

The current WTC development program would remain unchanged with implementation of the Campus Security Plan, and no new land uses would be introduced at the WTC site as a result of the Proposed Project. Therefore, the primary effects of the Proposed Project on the study traffic network would be the diversion of trips en route to and from the WTC site and general background traffic as a result of the proposed security measures.

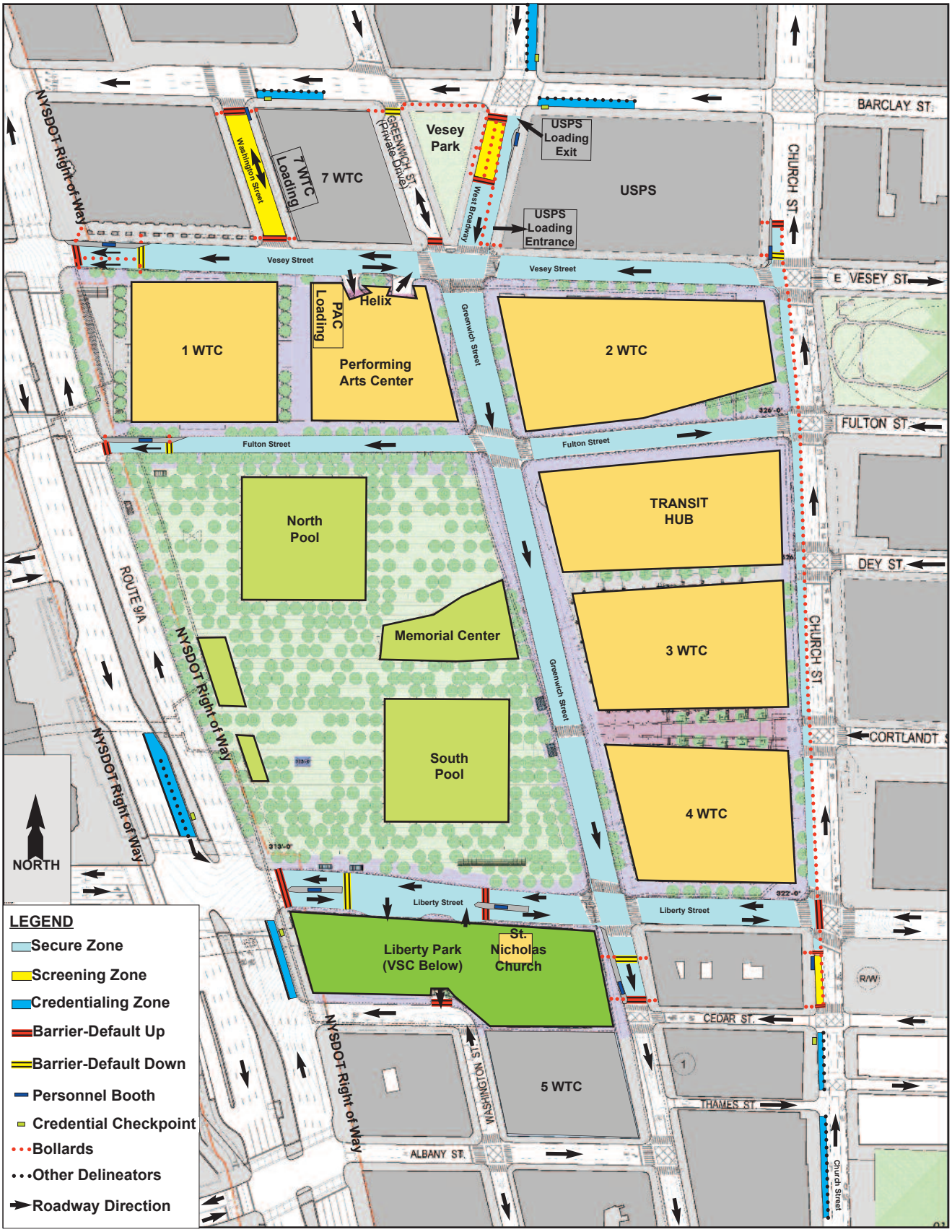
Following is a description of the physical features and operation of the proposed Campus Security Plan including changes to the study area street network and operations at the access points to the WTC site. The effects of the Proposed Project on traffic flow, including the redistribution of study area traffic and changes in levels of service at analyzed intersections, are then assessed and compared with No-Action conditions to identify potential significant adverse impacts.

The Proposed Campus Security Plan

Proposed Street Network Changes

In the future with the Proposed Project, traffic not destined to or from the WTC site would not be able to traverse streets within the security perimeter, including Vesey, Fulton, Liberty and Greenwich streets, the segments of Washington Street and West Broadway south of Barclay Street, and the west side of Church Street. In many respects, the future traffic network with the Proposed Project would therefore resemble the existing traffic network in that most of these street segments either have not yet been built or are presently closed to through traffic due to construction activity. As shown in **Figure 8-12**, Greenwich Street would be closed to unscreened traffic from Vesey Street to Cedar Street, as would West Broadway south of Barclay Street. Both Vesey Street and Fulton Street would be closed to unscreened vehicles from Church Street to Route 9A. To facilitate vehicle circulation around Tower 2, the segment of Fulton Street

Conceptual Plan for the Proposed Project



Note: Image is schematic and for conceptual purposes only.

between Greenwich and Church streets would be converted from one-way westbound to one-way eastbound operation, and the parallel segment of Vesey Street would be converted from one-way eastbound to one-way westbound operation. (This would, for example, allow vehicles approaching from West Broadway to access all street frontages of Tower 2 without having to continue south to Liberty Street.) Liberty Street would be closed to unscreened vehicles Between Church Street and Route 9A. Lastly, an approximately four-foot-wide median with a static barrier would be installed along Church Street from Cedar Street to just north of Vesey Street. Approaching Liberty Street, Church Street is approximately 41 feet in width and general traffic would be accommodated in two lanes located to the east of the median. One lane for traffic entering the WTC site would be provided to the west of the median, and an operable barrier would be provided across Liberty Street to provide emergency egress by fire trucks stationed at the Ten House within the WTC Campus. North of Liberty Street, the roadway widens to approximately 48 feet in width allowing for three approximately 11-foot-wide northbound moving lanes for general traffic. One additional 11-foot-wide moving lane located to the west of the median would be within the security zone and would be accessible only to screened vehicles. Vehicles would not be able to travel from westbound Fulton Street into the security zone on the west side of Church Street, although pedestrian access would be unrestricted.

Campus Security Plan Infrastructure and Operations

As shown in the conceptual plan in **Figure 8-12**, the perimeter of the WTC site would be secured through the installation of various types of vehicle interdiction devices under the control of the NYPD. These include static barriers and traffic lane delineators, as well as a system of retractable vehicle barriers. Vehicular access at security stations would be controlled through the use of sally ports consisting of a personnel booth and equipment house controlling two parallel lines of retractable barriers with sufficient space between them to accommodate a motor vehicle undergoing screening. Screening of all vehicles entering the WTC Campus would utilize both electronic and manual processes.

Overall, it is anticipated that sally ports would be installed at a total of eight locations on the perimeter of the site. Two would function as entry sally ports, four as exit sally ports and two would be used by both entering and exiting vehicles. At entrance locations, vehicles would typically queue at a curbside credentialing zone separated from through traffic lanes by traffic lane delineators. Credentials would be checked to ensure that both driver and vehicle have been authorized for entry into the WTC site. Vehicles with proper authorization would then be allowed to proceed to a screening zone, while those lacking proper credentials would be directed back into the general traffic lanes. Under the proposed Campus Security Plan, only vehicles whose occupants have business at the WTC would be permitted to enter the Campus, and all drivers and vehicles en route to on-site parking or loading areas would be required to be pre-registered.

Access to each screening zone would typically be controlled by a pair of moveable barriers functioning as a sally port. The outer barrier would be lowered to allow vehicles to enter for a security screening that would utilize both manual inspection and electronic processes such as K-9 explosive detection, license plate readers and vehicle scales. Upon completion of the screening process, the outer barrier would be raised and the inner barrier lowered to allow access to the WTC site. Once the inner barrier is returned to the raised position, the outer barrier would again be lowered to allow entry by the next vehicles to be screened. The operation of exit sally ports would be similar, except that exiting vehicles would not need to undergo the credentialing or screening procedures. In addition, as most if not all vehicles entering from Route 9A at Liberty Street would be en route to the VSC where they would be screened, screening is not expected to occur within the sally port on Liberty Street. It is therefore anticipated that the inner (easternmost) barrier at this sally port would remain down in the default condition, with the outer (westernmost) sally port raised and lowered as needed to control access between Liberty Street and Route

9A. All of the barriers would be under manual control by NYPD officers who would coordinate their operation with adjacent traffic signals.

It is anticipated that access to the WTC campus would be managed in a flexible manner to allow maximum throughput and reduce the potential for localized traffic congestion, as conditions allow. Vehicle operators that frequently visit the WTC would have the option of enrolling in a **Trusted Access Program (TAP)** that would allow expedited entry through the security stations. This would include autos operated by WTC tenants who are authorized to park in the up to 500 spaces of on-site parking, black car services expecting to regularly pick-up and/or drop-off passengers at the site, service companies with frequent business at the site, residents (primarily those living along Liberty and Cedar Streets) that may need to travel through the security perimeter for access to their homes, and possibly some taxi operators. Both vehicles and drivers would need to be enrolled. Most black-car pick-ups at the WTC site are expected to involve cars and drivers enrolled in the TAP. Drop-offs by black cars are expected to be split between TAP and non-TAP drivers.

Although only tenant autos destined for on-site parking would typically be permitted to enter the security zone, it is anticipated that in some cases allowances would be made for non-tenant autos dropping-off or picking-up passengers with mobility impairments. However, the numbers of such autos entering the security zone in each peak hour is expected to be *de minimus*.

With the exception of a small number of large trucks destined for the Performing Arts Center loading dock, trucks and vans making deliveries to the WTC site would undergo security screening in the VSC, as they would in the No-Action condition. However, as described below, under the Campus Security Plan all of these vehicles would undergo a credentials check in designated credentialing zones on Route 9A before being allowed to proceed through a sally port on Liberty Street to reach the VSC. No off-site reconciliation area at which unscheduled deliveries could wait for WTC staff to confirm their status would be provided under the Proposed Project. Any vehicles making an unscheduled delivery would not be permitted access to the WTC site or the VSC, and would be sent away to return once properly scheduled. As vendors and delivery companies become accustomed to these enhanced security procedures, it is anticipated that there would be relatively few unscheduled deliveries with the Proposed Project. A management strategy, including the scheduling of tour buses and truck deliveries, is currently being developed to ensure that the VSC can accommodate demand for on-site delivery, and tour bus and auto parking in an orderly and efficient manner.

The following describes the design and location of the security infrastructure that would be installed at the WTC site under the Proposed Project. An assessment of security station operations, including processing times and throughput capacity at the screening and credentialing locations, is provided later in this chapter.

Trinity Place/Church Street

As shown in **Figure 8-12** and described above, the Trinity Place/Church Street corridor would be divided by an approximately four-foot-wide raised median with static barriers such as bollards or planters from Cedar Street to just north of Vesey Street. It is anticipated that to the east of the median the street would remain open to general northbound traffic with three moving lanes, while one additional moving lane located to the west of the median would be within the security perimeter and would be accessible only to screened vehicles. (This compares to a total of four moving lanes for general traffic in the No-Action condition.) A security station with an entry-only sally port for tour buses en route to on-site parking would be located on Trinity Place just north of Cedar Street. It is also anticipated that this security station would be open to tenant autos en route to on-site parking as well as for-hire vehicles during the AM peak period, when there are expected to be fewer tour buses arriving at the WTC site. A credentialing zone for the sally port on Trinity Place would be delineated along the west curb south of Cedar Street and Thames

Street. A second sally port would be located on Church Street just north of Vesey Street to serve as an egress point for all types of vehicles exiting onto northbound Church Street from the WTC site. In addition, the median would include an operable barrier across Liberty Street to provide emergency egress by fire trucks stationed at the Ten House within the WTC Campus.

West Broadway

Southbound West Broadway would function as an entrance to the WTC site for black cars and tenant autos. As shown in **Figure 8-12**, a security station with a two-lane entry sally port would be installed on West Broadway between Barclay and Vesey Streets, and credentialing zones would be located along the east curb of West Broadway north of Barclay Street, and along the south curb of Barclay Street east of West Broadway. Static barriers would be used to delineate a single travel lane along the east side of West Broadway adjacent to the sally port but outside of the secure perimeter in order to maintain access to the below-grade loading docks at the adjacent Federal Building. (U.S. Postal Service and other vehicles would enter the building at the south end of the block and utilize an internal roadway to exit the facility onto West Broadway near Barclay Street.)

Greenwich Street

Greenwich Street between Barclay and Vesey Streets is a privately-controlled street and is expected to remain closed to through traffic. Retractable barriers at the south end of the block (default up) would allow vehicular access to the adjacent 7 World Trade Center tower, but not into the security zone. (West Broadway would provide the primary access to the segment of southbound Greenwich Street traversing the WTC site.) At the south end of the WTC site, an exit-only sally port would be located on Greenwich Street approaching Cedar Street.

Washington Street

The security station at Washington Street between Barclay and Vesey streets would serve as an entrance and exit point for oversize trucks en route to and from the Performing Arts Center's loading dock on Vesey Street, and as an entrance for tenant autos, for-hire vehicles and tour buses if there is congestion at the West Broadway or Trinity Place security stations. Trucks would also use this sally port to access the adjacent 7 World Trade Center loading dock. A credentialing zone would be delineated along the south curb of Barclay Street east of Washington Street.

Barclay Street

As noted above, under the Proposed Project two credentialing zones would be established along the south curb of Barclay Street. One would be located immediately to the east of the security station on West Broadway, and the second would be located immediately to the east of the security station on Washington Street.

Vesey Street

As shown in **Figure 8-12**, under the Proposed Project the block of Vesey Street from Church Street to West Broadway would be converted to one-way westbound operation from one-way eastbound in the No-Action condition. Vesey Street would continue to operate two-way between Greenwich and Washington Streets and one-way westbound between Washington Street and Route 9A. Vesey Street would remain one-way eastbound east of Church Street, and vehicles would not be able to travel from the managed corridor on the west side of Church Street onto eastbound Vesey Street. Pedestrian access across Church Street at Vesey Street would be maintained. A security station with a two-lane exit-only sally port would be installed on Vesey Street approaching Route 9A. A sidewalk extension along the north side of the roadway would likely be installed to accommodate the personnel booth and equipment house at this location.

Fulton Street

Under the Proposed Project, the block of Fulton Street between Greenwich and Church Streets would be converted to one-way eastbound operation from one-way westbound in the No-Build condition to facilitate drop-off and pick-up activity at the adjacent 2 World Trade Center. The segment of Fulton Street west of Greenwich Street would remain one-way westbound as would Fulton Street east of Church Street. Vehicles would not be able to travel from westbound Fulton Street into the security zone on the west side of Church Street, although pedestrian access would be maintained. A security station with a one-lane exit sally port would be installed on Fulton Street at Route 9A, and a sidewalk extension would likely be installed along the north side of the roadway to accommodate the personnel booth and equipment house at this location. As the western-most barrier would be located immediately adjacent to the Route 9A travel lanes, it is anticipated that the crosswalk on Fulton Street would be located within the sally port just east of the barrier.

Liberty Street

Under the Proposed Project, two-way operation would continue on Liberty Street, and it would function as the primary point of access and egress for the Vehicular Security Center. Access to the VSC would be controlled by an entry/exit sally port on Liberty Street immediately east of Route 9A. It is anticipated that the inner (easternmost) barrier at this sally port would remain down in the default condition, with the outer (westernmost) barrier raised and lowered as needed to control access between Liberty Street and Route 9A. The credentialing zones for this entry point would be delineated along the two easternmost lanes of southbound Route 9A north of Liberty Street and along the northbound curb lane south of Liberty Street. Vehicles already within the security perimeter (tour buses, for example) would be able to enter the VSC from the east on Liberty Street, although access would be controlled by a retractable barrier in the default up position located immediately to the east of the VSC entrance/exit. As the left-turn from the VSC exit onto Liberty Street would be permitted under the Proposed Project, most vehicles departing the VSC would exit onto westbound Liberty Street to reach Route 9A. Another retractable barrier in the default up position would be located across Liberty Street within the intersection with Church Street, and would be used to facilitate egress by FDNY fire trucks stationed at the nearby Ten House.

Cedar Street

The segment of Cedar Street west of Washington Street would continue to operate one-way westbound as an outlet to Route 9A for northbound Washington Street. As noted above, a secondary exit from the VSC would be provided on Cedar Street west of Washington Street. In the Build condition, this exit would be used primarily in the event that a vehicle was allowed to enter the VSC in error from the credentialing zone on Route 9A. The segment of Cedar Street between Greenwich Street and Church Street would also continue to operate one-way westbound under the Proposed Project.

Pedestrian Facilities

In addition to changes to the traffic network, implementation of the Proposed Project would also result in some changes to the pedestrian facilities (i.e., sidewalk widths) in and around the WTC site. Static barriers such as bollards would be installed at many locations to prevent unscreened vehicles from entering the security zone via the sidewalks. Personnel booths and equipment houses would be installed at security stations, and as noted above, at some locations sidewalks would be extended to accommodate these installations and maintain adequate effective width for pedestrian flow. Static barriers would also be installed within crosswalks on Church Street in-line with the proposed median. The Proposed Project's potential effects on pedestrian flow are discussed in a later section of this chapter.

Redistribution of Background Traffic Flows with the Proposed Project

In the future with the Proposed Project, background traffic (i.e., future traffic not destined to or from the WTC site) would not be able to traverse streets within the security zone, including Vesey, Fulton, Liberty

and Greenwich Streets as well as the segments of Washington Street and West Broadway south of Barclay Street. In many respects, the future traffic network with the Proposed Project would therefore resemble the existing traffic network in that most of these streets either have not yet been built or are presently closed to through traffic due to construction activity. Consequently, there would be no diversions of background traffic to street segments within the WTC site as was the case for the No-Action condition, and these trips were instead assumed to generally remain along existing travel paths. For example, with West Broadway and Greenwich Street closed to through-traffic through the WTC site under the Proposed Project, it is anticipated that the background traffic that would use this corridor in the No-Action condition would instead remain on other southbound corridors such as Broadway. With Liberty Street closed to two-way through-traffic between Route 9A and Church Street, traffic volumes are expected to be greater than under No-Action conditions along other east-west corridors in the area, such as Chambers, Barclay and Rector streets. At the same time, traffic is expected to be lower along northbound Church Street given that there would be no access to this corridor from Route 9A via Liberty Street as there would be in the No-Action condition. As Vesey Street and Fulton Street would be closed to through-traffic between Greenwich Street and Route 9A in both the No-Action and With-Action conditions, the Proposed Project is not expected to shift substantial numbers of vehicles from these westbound street segments to other westbound corridors in the vicinity when compared to the No-Action condition.

Reassignment of WTC-Site Vehicle Trips with the Proposed Project

No-Action vehicle trips destined to and from the WTC site were reassigned to the study area street network based on the anticipated effects of the security measures that would be implemented under the proposed Campus Security Plan. The reassignment of autos, taxis/black cars, trucks and tour buses under the Proposed Project is described in detail below.

Autos

In the With-Action condition, autos belonging to office tenants in towers 1 through 4 and destined for the VSC and the up to 500 spaces of below-grade parking on-site would enter the WTC Campus through one of three security stations – Liberty Street at Route 9A, West Broadway at Barclay Street, and Trinity Place at Cedar Street (in the AM peak hour only). Although it would not be designated as a regular tenant auto entrance, it is anticipated that the security station at Washington Street would also be available for use by these vehicles in the event of congestion at the West Broadway location. The majority of outbound autos are expected to exit the VSC either onto Route 9A via westbound Liberty Street or onto Church Street via eastbound Liberty Street and the exit-only security station at Vesey Street. (By contrast, in the No-Action condition, left-turns from the VSC onto westbound Liberty Street would be prohibited and all exiting autos would have to proceed east on Liberty Street.) WTC-related auto trips destined to or from off-site public parking facilities would not be affected by the Proposed Project unless they would traverse streets within the WTC site (Greenwich Street for example) in the No-Action condition. Any affected autos were therefore reassigned to alternate routes outside the security perimeter.

Taxis/Black Cars

Black cars are expected to represent approximately 5 to 13 percent of the total for-hire vehicle trips (taxis and black cars combined) generated by the development at the WTC site in each analyzed peak hour (see **Table 8-9**), and it is anticipated that all black cars would enter the WTC Campus through a security checkpoint under the Proposed Project. In the With-Action condition, black cars entering the WTC Campus would primarily use the security station at West Broadway at Barclay Street. A small percentage en route from the Brooklyn-Battery Tunnel may also use the security station on Trinity Place at Cedar Street during the AM peak hour, the only period when vehicles other than tour buses would be permitted to use this entrance. Although it would not be designated as a regular black car entrance, it is anticipated

that the security station at Washington Street would also be available for use by these vehicles in the event of congestion at the West Broadway location. Departing black cars were generally assigned to one of the five exit locations depending on their WTC origin point and direction of travel (Church Street at Vesey Street, Vesey Street at Route 9A, Fulton Street at Route 9A, Liberty Street at Route 9A and Greenwich Street at Liberty Street).

Most taxis serving the WTC site are not expected to enter the security zone and are instead expected to pickup and drop-off passengers along streets on the periphery such as Church, Liberty, Cortlandt, Dey, Fulton and Barclay streets and Route 9A. However, it is anticipated that some taxi operators may possibly enroll themselves and their vehicles in the TAP in order to enter the security zone on a regular basis with passengers destined for the World Trade Center. The With-Action analysis therefore reflects that a portion of taxi trips would enter the WTC Campus in order to assess conditions on approach routes and at security checkpoints with this added taxi demand. However, the number of such taxi trips is difficult to quantify at this time given that specific criteria for the TAP have not yet been finalized and the number of taxi operators who would participate is uncertain. Therefore, 25 percent was selected as a reasonably conservative estimate of the total number of for-hire vehicles (i.e., all black cars plus a portion of taxis) that would enter the WTC Campus through the security checkpoints in each peak hour. Like black cars, taxis would enter the security zone via the security station on West Broadway at Barclay Street, or the checkpoint on Trinity Place at Cedar Street (in the AM peak hour only), and would exit at one of the designated egress locations.

Trucks

Under the Proposed Project, all trucks en route to the below-grade loading docks at the WTC site would arrive and depart the VSC via Liberty Street at Route 9A. The few large trucks en route to or from the Performing Arts Center loading dock are expected to utilize the security station on Washington Street which they would reach via westbound Barclay Street.

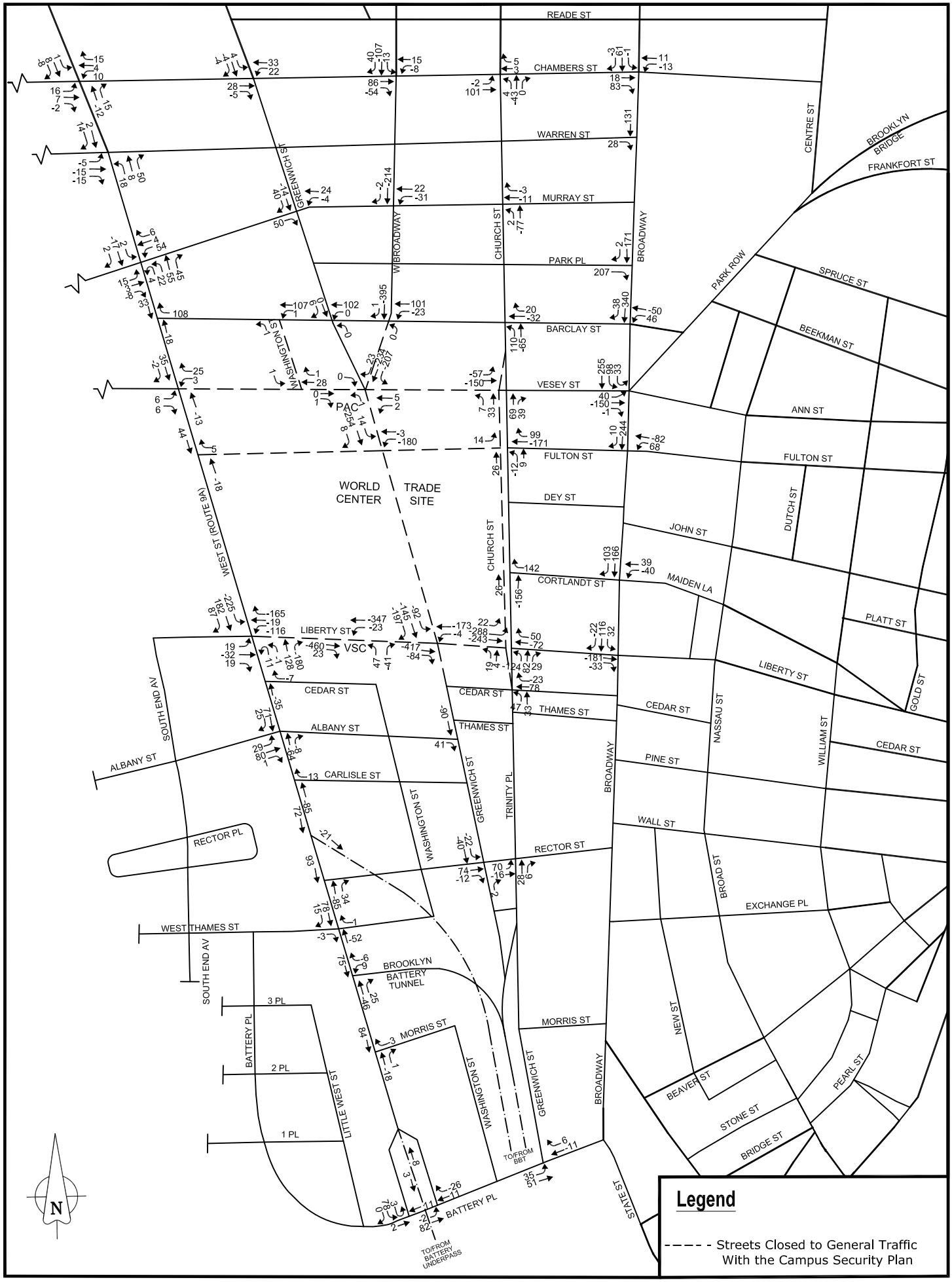
Tour Buses

In the With-Action condition, the security station on Trinity Place at Liberty Street would be the primary entrance for tour buses entering the WTC Campus en route to the 9/11 Memorial, Memorial Center and Tower 1 observation deck. In the weekday and Saturday midday periods when tour bus demand would be greatest, NYPD personnel may also direct some buses to the Washington Street security station in the event of any congestion or queuing at Trinity Place. (The Washington Street security station would be lightly utilized during these periods and would have capacity available to accommodate overflow demand from the Trinity Place and West Broadway entrances.) It is expected that most if not all buses would unload along the north curb of Liberty Street west of Greenwich Street before proceeding to the VSC. Buses departing the VSC were assumed to travel north along the secure lane of Church Street and west on Vesey Street to reach potential loading locations along the west curb of Greenwich Street, the north curb of Liberty Street and possibly the east curb of northbound Route 9A north of Liberty Street, similar to the No-Action condition.

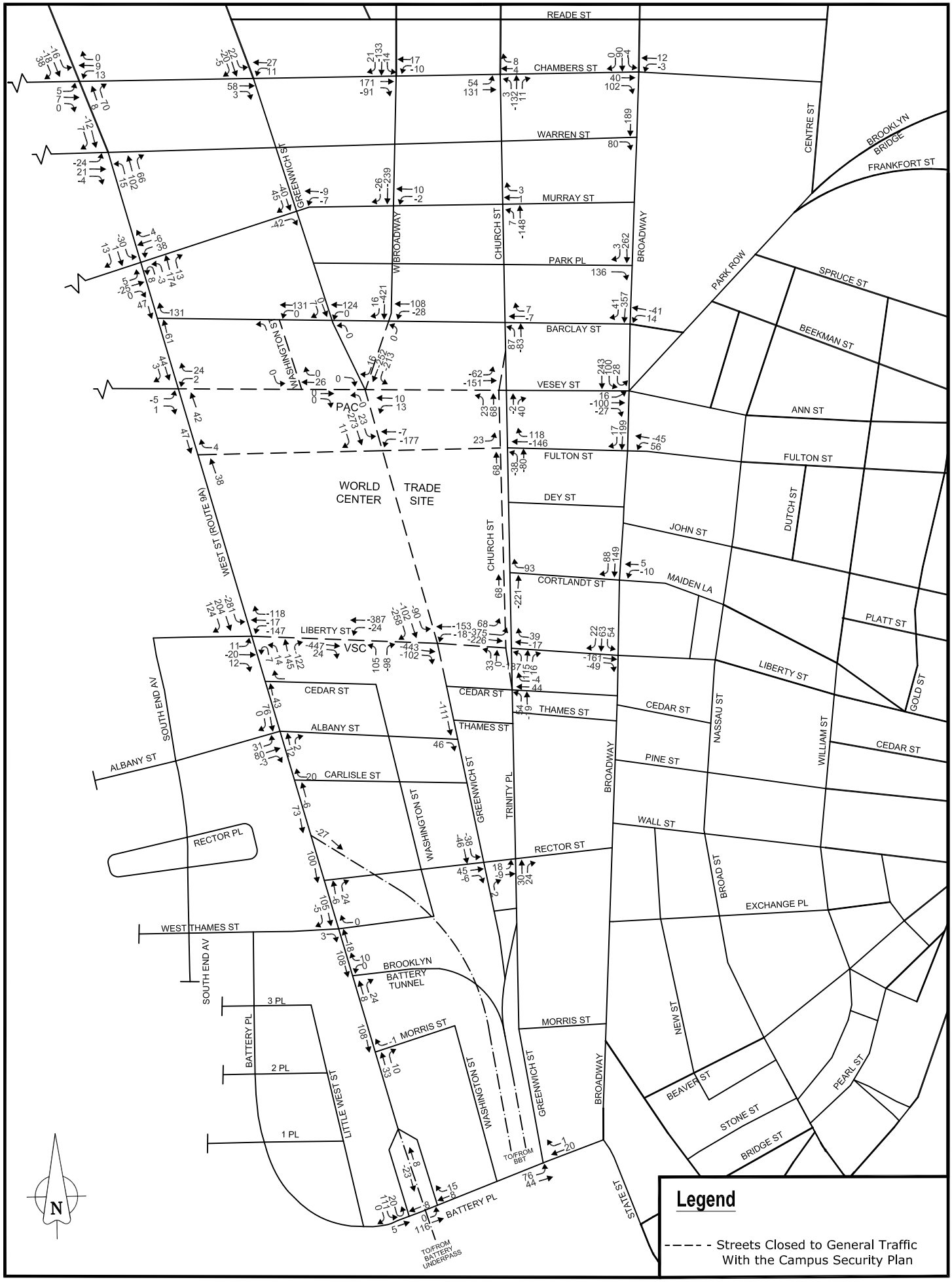
Project Increment and With-Action Traffic Networks

Figures 8-13 through 8-16 show the incremental change in traffic volumes at analyzed intersections expected during the weekday AM, midday, PM and Saturday midday peak hours as a result of the street network changes associated with implementation of the proposed Campus Security Plan. **Figures 8-17 through 8-20** show the resulting total peak hour traffic volumes in the With-Action condition. Overall, traffic on street segments within the security zone would be lower than in the No-Action condition as access by unscreened general traffic would be prohibited. For example, traffic volumes along the segment

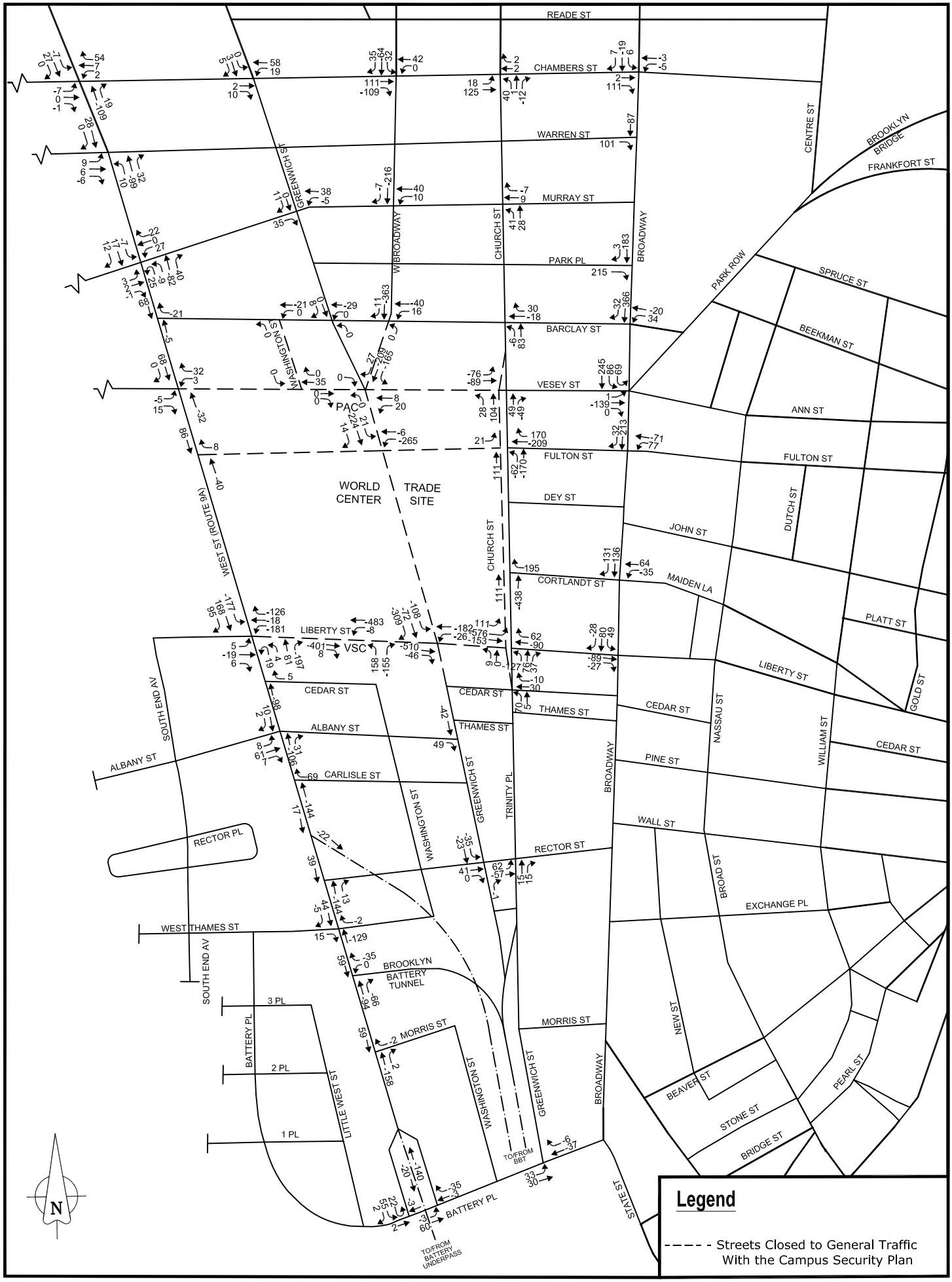
Project Increment Weekday AM Peak Hour Traffic Volumes



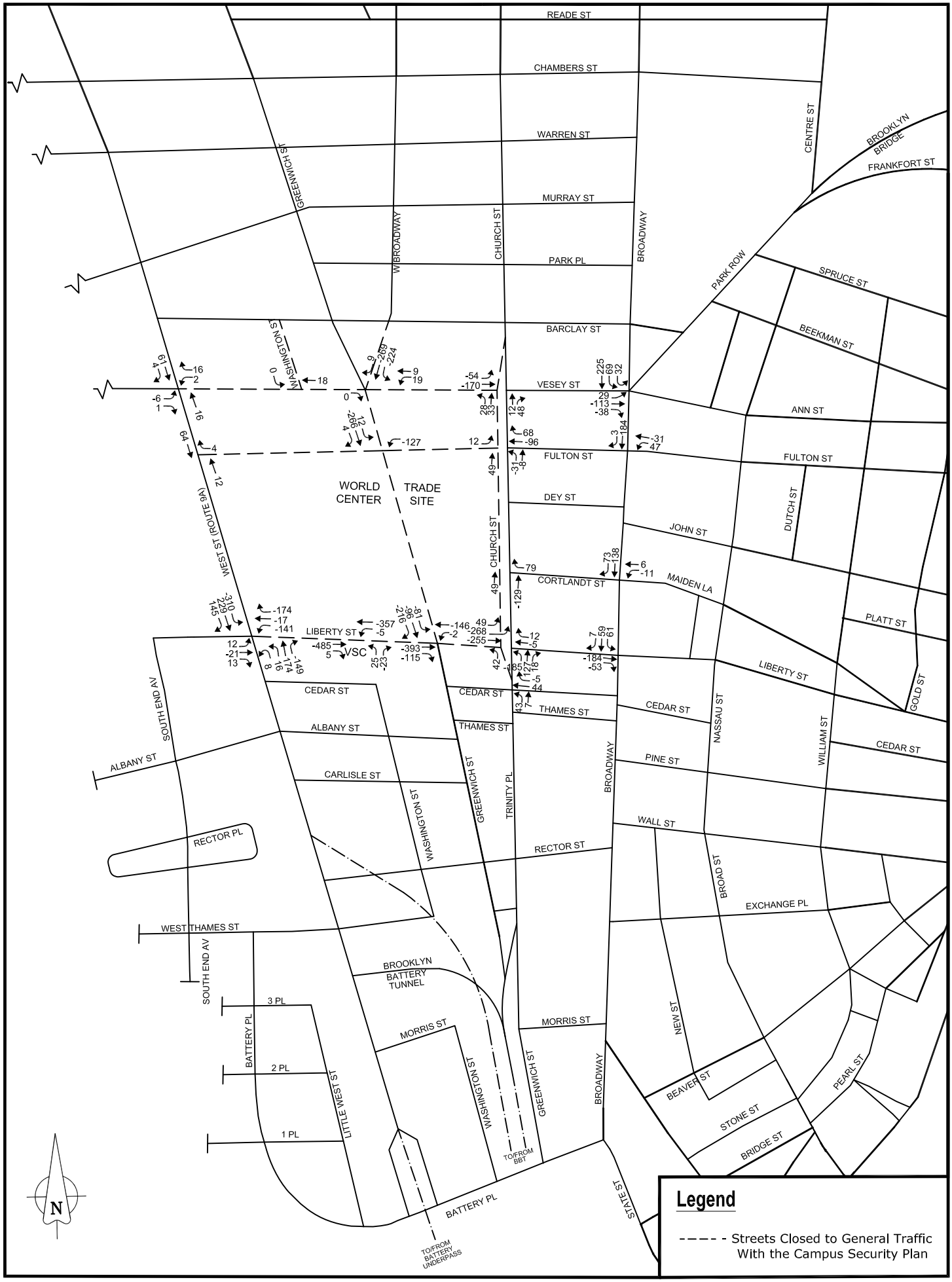
Project Increment Weekday Midday Peak Hour Traffic Volumes



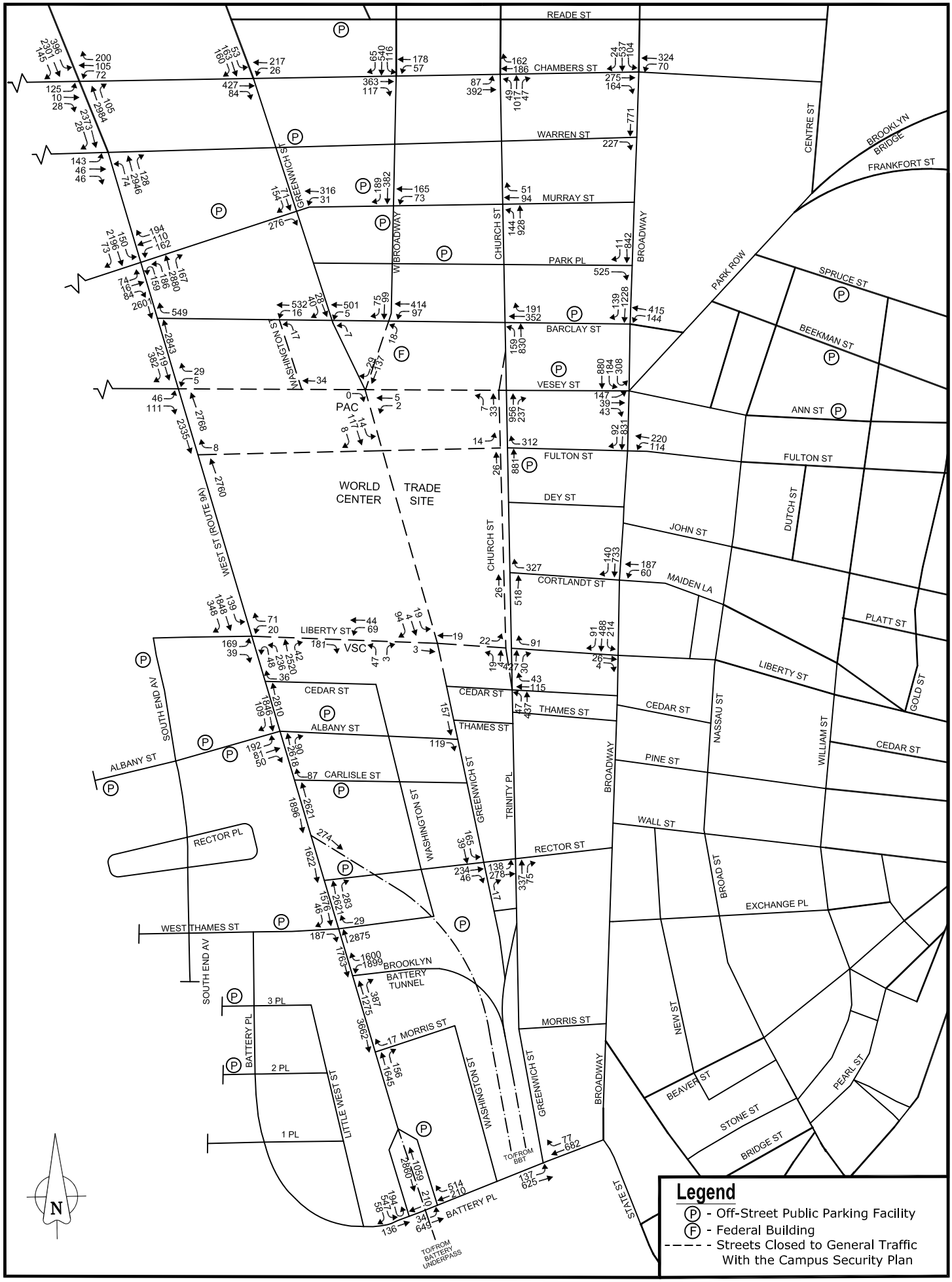
Project Increment Weekday PM Peak Hour Traffic Volumes



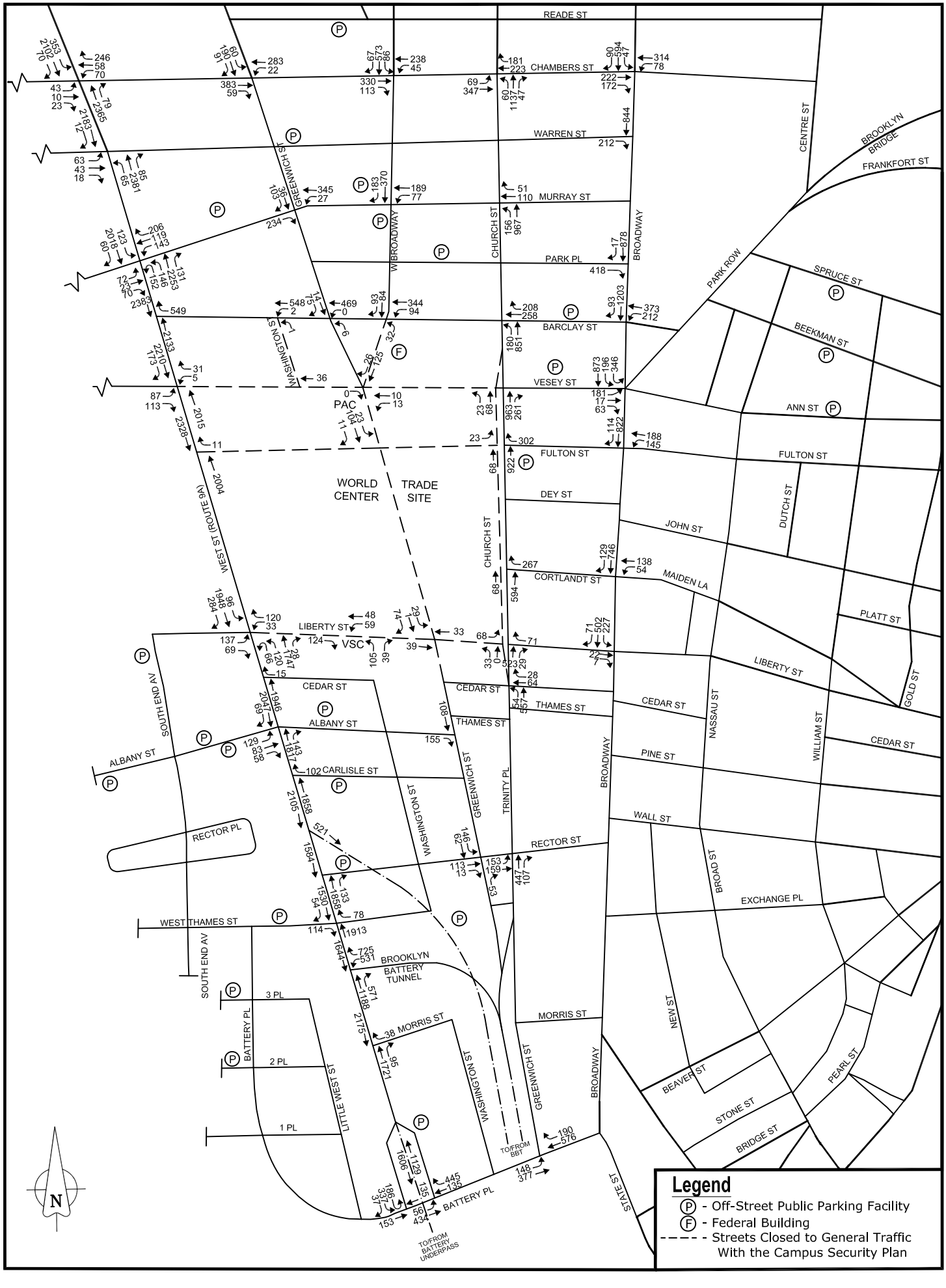
Project Increment Saturday Midday Peak Hour Traffic Volumes



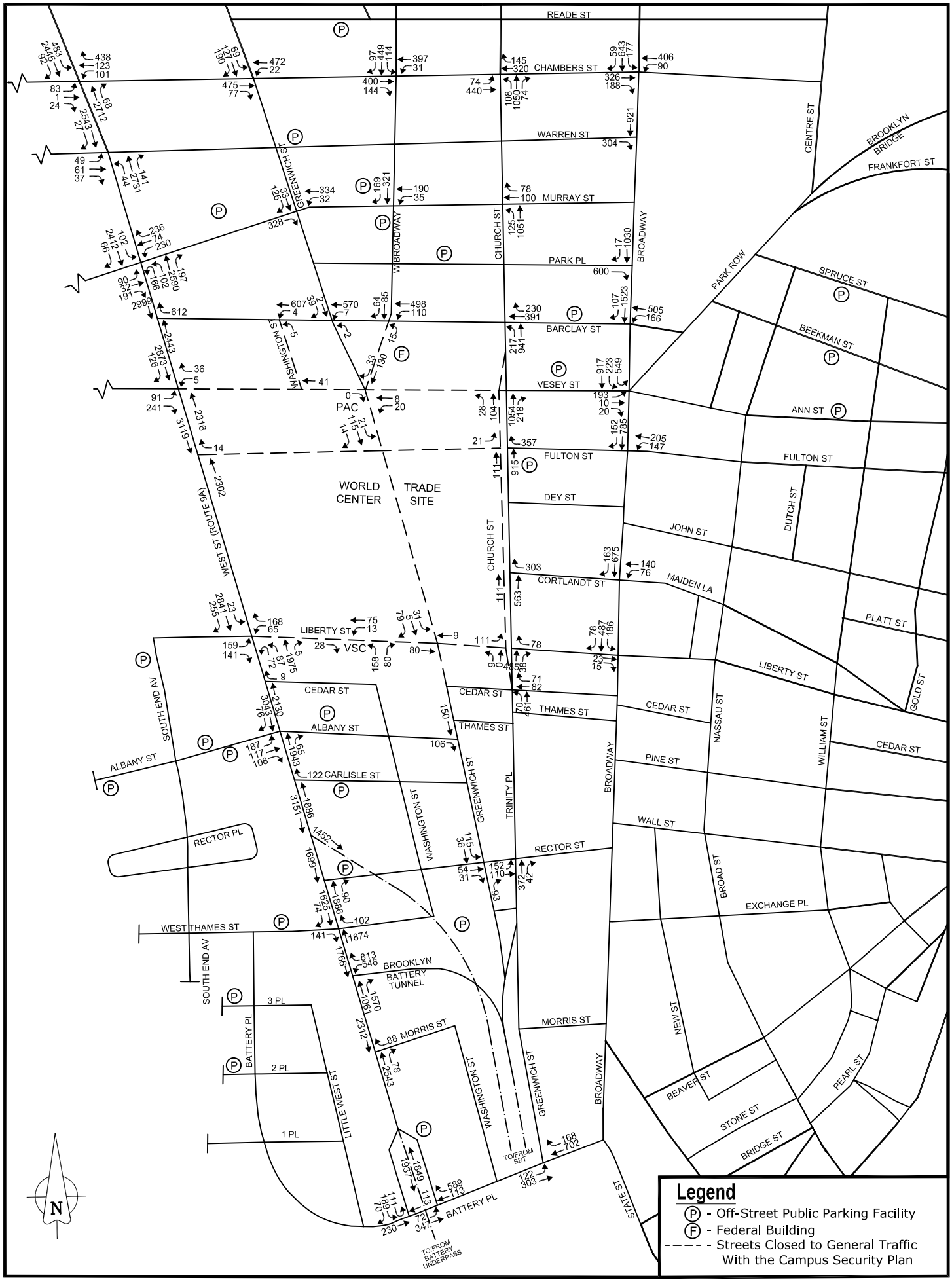
With-Action Weekday AM Peak Hour Traffic Volumes



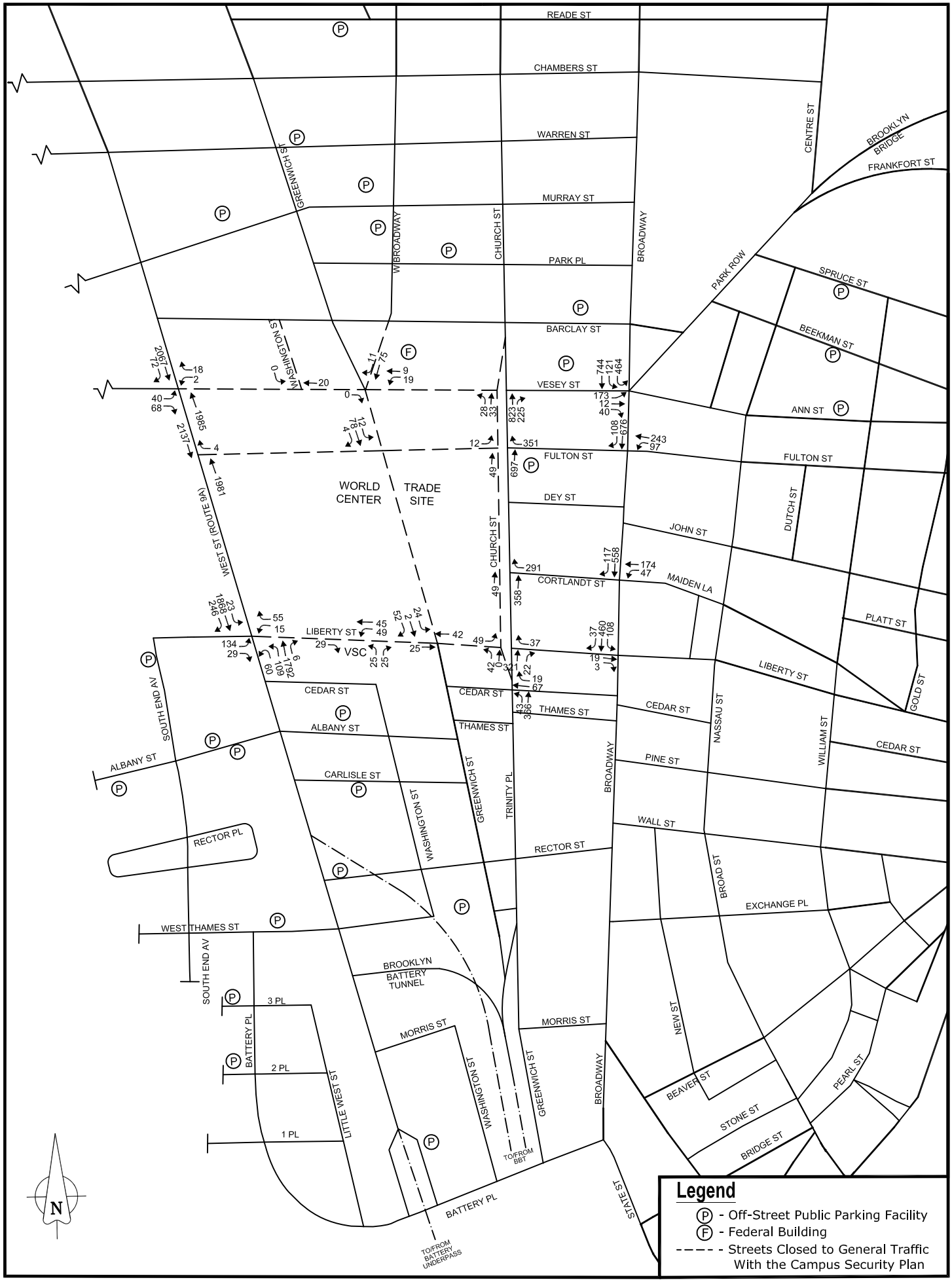
With-Action Weekday Midday Peak Hour Traffic Volumes



With-Action Weekday PM Peak Hour Traffic Volumes



With-Action Saturday Midday Peak Hour Traffic Volumes



of Greenwich Street traversing the WTC site are expected to total 93 to 140 approaching Fulton Street in each peak hour, compared to 321 to 367 in the No-Action condition. Peak hour traffic volumes along Liberty Street would range from three to 80 eastbound and from nine to 27 westbound approaching Greenwich Street compared to 502 to 628 eastbound and from 190 to 216 westbound in the No-Action.

By contrast, several corridors outside of the security zone would see increased traffic. Broadway for example is expected to experience increased traffic due to diversions from Greenwich Street, with from 160 to 248 more trips approaching Fulton Street in each peak hour. Chambers Street is expected to experience from 94 to 171 more trips eastbound approaching Church Street, due in part to the closure of Liberty Street to general traffic. Route 9A would see from 169 to 298 fewer vehicles making the southbound left turn at Liberty Street in each peak hour, and from 122 to 197 fewer making the northbound right-turn movement. By contrast, peak hour traffic volumes on the through movements at this intersection are expected to increase by 80 to 174 northbound and by 168 to 228 southbound. Eastbound Rector Street would see from eight to 56 more vehicles approaching Trinity Place in each peak hour, while westbound Murray Street would see from 35 to 64 additional peak hour trips approaching Route 9A.

Table 8-12 shows the estimated numbers of vehicle trips passing through the proposed security stations under the Campus Security Plan. As shown in **Table 8-12**, vehicles entering through the security station at West Broadway (primarily tenant autos and for-hire vehicles) are expected to total approximately 165, 134, 153 and 70 during the weekday AM, midday, PM and Saturday midday peak hours, respectively. Vehicles entering through the security station on Trinity Place at Cedar Street (tenant autos, for-hire vehicles and tour buses in the AM, and only tour buses at other times) are expected to total approximately 23, 27, 9 and 27 during these periods, respectively, while the security station at Liberty Street and Route 9A is expected to see 181, 124, 28 and 29 delivery vehicles and tenant autos en route to the VSC during these same periods, respectively. Sixteen delivery vehicles are expected to use the security station on Washington Street at Barclay Street to access the loading docks at 7 World Trade Center and at the Performing Arts Center in the weekday AM peak hour, two in the midday, four in the PM and none in the Saturday midday peak hour. This station would therefore have substantial capacity to process any overflow demand from the security station at West Broadway and Trinity Place, if needed. For analysis purposes it is assumed that up to six tour buses would be redirected from the Trinity Place security station to Washington Street in the weekday midday peak hour and up to 15 in the Saturday midday peak hour (the periods of peak tour bus demand at the WTC site).

Exiting vehicles would be most concentrated at the Liberty Street security station where 91, 153, 233 and 70 vehicles would exit onto Route 9A in the weekday AM, midday, PM and Saturday midday peak hours, respectively. These numbers would include all trucks exiting the VSC as well as most tour buses. The exit-only security station on Church Street at Vesey Street would generally experience the second highest number of exiting vehicles in the peak hours, with 32, 58, 99 and 23, respectively. The exit-only security stations at Vesey Street and at Fulton Street would each see from four to 36 exiting vehicles in each peak hour (primarily taxis and black cars). As shown in **Table 8-12**, the exit-only security station on Greenwich Street at Liberty Street is expected to experience the smallest number of exiting vehicles in any peak hour (primarily taxis) as this corridor primarily provides local access and has relatively few outlets.

Security Station Operational Assessment

Under the proposed Campus Security Plan, only vehicles whose occupants have business at the WTC or reside along Liberty Street would be permitted to enter the Campus, and all drivers and vehicles en route to on-site parking or loading areas would be required to be pre-registered. Arriving vehicles would first queue at a curbside credentialing zone where the credentials of both the driver and the vehicle would be

Table 8-12
Estimated Peak Hour Vehicle Trips Through Security Stations

	AM						Midday						PM						Saturday Midday					
	Auto	Taxi	Black Car	Van/Truck	Tour Bus	**Total**	Auto	Taxi	Black Car	Van/Truck	Tour Bus	**Total**	Auto	Taxi	Black Car	Van/Truck	Tour Bus	**Total**	Auto	Taxi	Black Car	Van/Truck	Tour Bus	**Total**
Entry Security Station																								
Liberty St @ Rt. 9A	140	---	---	41	---	**181**	79	---	---	45	---	**124**	10	---	---	18	---	**28**	19	---	---	10	---	**29**
Washington St @ Barclay St	0	0	0	16	---	**16**	0	0	0	2	0	**2**	0	0	0	4	---	**4**	0	0	0	0	0	**0**
West Broadway @ Barclay St	50	90	26	---	---	**166**	26	74	51	---	---	**151**	4	116	43	---	---	**163**	7	61	18	---	---	**86**
Trinity Place @ Liberty St	10	4	0	---	9	**23**	---	---	---	---	33	**33**	---	---	---	---	9	**9**	---	---	---	---	42	**42**
Total Entering	**200**	**94**	**26**	**57**	**9**	**386**	**105**	**74**	**51**	**47**	**33**	**310**	**14**	**116**	**43**	**22**	**9**	**204**	**26**	**61**	**18**	**10**	**42**	**157**
Exit Security Station																								
Liberty St @ Rt. 9A	6	39	5	41	0	**91**	60	24	12	45	12	**153**	140	44	13	18	18	**233**	15	21	7	10	17	**70**
Fulton St @ Rt. 9A	0	5	3	0	0	**8**	0	5	6	0	0	**11**	0	9	5	0	0	**14**	0	2	2	0	0	**4**
Vesey St @ Rt. 9A	0	24	10	0	0	**34**	0	18	18	0	0	**36**	0	27	14	0	0	**41**	0	16	4	0	0	**20**
Washington St @ Barclay St	0	0	0	17	0	**17**	0	0	0	1	0	**1**	0	0	0	5	0	**5**	0	0	0	0	0	**0**
Church St @ Vesey St	3	22	8	0	0	**33**	26	26	15	0	1	**68**	60	31	11	0	2	**104**	6	20	5	0	2	**33**
Greenwich St @ Liberty St	0	4	0	0	0	**4**	0	1	0	0	0	**1**	0	5	0	0	0	**5**	0	2	0	0	0	**2**
Total Exiting	**9**	**94**	**26**	**58**	**0**	**187**	**86**	**74**	**51**	**46**	**13**	**270**	**200**	**116**	**43**	**23**	**20**	**402**	**21**	**61**	**18**	**10**	**19**	**129**

Notes:
Auto totals reflect only those tenant autos en route to on-site parking via the VSC.

verified. Vehicles with proper authorization would then be allowed to proceed to an on-street screening zone located within an adjacent sally port, or into the VSC in the case of autos and all trucks entering from Route 9A en route to on-site parking or loading docks.

Under the proposed Campus Security Plan, all of the security stations and sally ports would be under the control of NYPD officers who would coordinate their operation with adjacent traffic signals to minimize delays. Vehicular access to the WTC site would be managed in a flexible manner to allow maximum throughput and reduce the potential for localized traffic congestion, as conditions allow. As such, it is anticipated that operations of the various security stations would be coordinated to make maximum use of available capacity within the overall campus-wide system. As an example, for-hire vehicles would typically be allowed to enter at West Broadway while tenant autos en route to the VSC would be allowed to enter at either West Broadway or Route 9A. However, both autos and for-hire vehicles would also be permitted to use the designated tour bus entrance on Trinity Place at Liberty Street in the AM peak period when tour bus demand through this security station is expected to be light. The Washington Street security station is expected to be relatively lightly utilized during most if not all peak periods and would therefore have capacity available to accommodate any overflow demand from other entrances such as nearby West Broadway.

Table 8-13 shows the estimated processing times at the credentialing and screening zones, which would vary depending on vehicle type and participation in the Trusted Access Program. Credentialing is expected to take approximately 10 seconds for vehicles and drivers registered in the TAP and 60 seconds for a non-TAP vehicle. Once within the screening zone, the screening time for autos and for-hire vehicles is expected to be approximately 30 seconds, including time for the barrier to open to allow the vehicle to exit. It is estimated that approximately two minutes would be required to screen tour buses (primarily for the inspection of any baggage compartments). With the exception of a small number of large trucks destined for the Performing Arts Center loading dock, trucks and vans making deliveries to the WTC site would undergo security screening in the VSC (and not at a security station), as they would in the No-Action condition. However, under the Campus Security Plan all of these vehicles would undergo a credentials check in designated credentialing zones on Route 9A before being allowed to proceed through a sally port on Liberty Street to reach the VSC.

It is noted that vehicles will not typically arrive uniformly at the entrance security stations, and that other factors such as adjacent traffic signals may affect the actual throughput at each station. Therefore, to evaluate the potential for queuing at credentialing and screening zones, a traffic simulation of the proposed entry security stations for the WTC Campus Security Plan was prepared. Vissim 5.4 software was used to model the operation of the entry security stations at West Broadway, Trinity Place/Liberty Street and Route 9A for the weekday AM, midday and PM peak hours when entering demand as well as demand on the overall street network would be greatest. (As noted above, the Washington Street security station is expected to be relatively lightly utilized during most if not all peak periods, and was therefore not included in the simulation.)

A summary of the results of the traffic simulation is presented in **Table 8-14**. The data presented include the average and 95th percentile queue lengths as measured from the head end of each credentialing lane and the average time spent in queue (by vehicle type) measured from when a vehicle enters the credentialing lane until it exits the screening zone sally port. As shown in **Table 8-14**, at the West Broadway security station, the average queue at the credentialing lane along Barclay Street would extend up to 65 feet (three to four car-lengths assuming 20 feet per car including distance between vehicles), while the 95th percentile queue would extend up to an estimated 169 feet (approximately eight to nine car-lengths). An approximately 200-foot-long credentialing lane is proposed for this location, sufficient to accommodate the 95th percentile queue in all weekday peak periods.

Table 8-13
Estimated Vehicle Credentialing and Screening Times at Security Stations

Vehicle Type	Average Credentialing Time (seconds)	Average Screening Time (seconds)[2]
Tenant Autos (TAP)[1]	10	30
Taxis/Black Cars (TAP)	10	30
Black Cars (non-TAP)	60	60
Tour Buses (TAP)	10	120[3]
Delivery Vehicles (TAP)	10	120[5]
Delivery Vehicles (non-TAP)[4]	60	120[5]

Notes:
[1]All tenant autos allowed entry to WTC Campus assumed to be enrolled in the TAP.
[2]Includes screening time and time for barrier to open.
[3]Estimated time for initial screening of tour buses prior to entering WTC Campus.
Additional screening would likely occur entering the VSC after passengers are discharged.
[4]Although most if not all delivery vehicles would be registered in the TAP, it is conservatively assumed for analysis purposes that a small percentage (10 percent) would be unregistered.
[5]Relatively few delivery vehicles are expected to be screened outside of the VSC.

Average and 95th percentile queue lengths along the two 140-foot-long credentialing lanes adjacent to the east curb of West Broadway would extend up to 48 feet (two to three car-lengths) and 140 feet (seven car-lengths) per lane, respectively in each peak hour. From the time they enter the credentialing lane until they exit the sally port into the WTC Campus, autos, taxis and black cars registered in the TAP are expected to spend an average of 2.1 to 3.6 minutes at the West Broadway security station depending on the peak hour. Black cars not registered in the TAP would take longer, averaging 3.8 to 4.8 minutes depending on peak hour.

The average and 95th percentile queues along the two approximately 115-foot-long credentialing lanes on southbound Route 9A at Liberty Street would extend up to 44 feet (approximately two to three car-lengths) and 150 feet (approximately seven to eight car-lengths) per lane, respectively. The VISSIM simulation indicates that the planned credentialing lanes in combination with an approximately 60-foot-long transition area would be sufficient to accommodate the 95th percentile queues at this location. The single 100-foot-long credentialing lane along northbound Route 9A at Liberty Street is expected to be relatively lightly used, averaging one vehicle or less in all periods, while the 95th percentile queue would extend up to 67 feet (approximately three to four car-lengths). From the time they enter the credentialing lanes until they transit the sally port onto Liberty Street en route to the VSC entrance, autos and delivery vehicles (trucks and vans) registered in the TAP are expected to spend an average of 1.3 minutes or less at the Route 9A/Liberty Street security station; non-TAP delivery vehicles would take slightly longer, averaging 1.8 to 2.1 minutes depending on the peak hour. As vehicles would only be credentialed at this security station (screening would take place within the VSC), much of the time spent at this location would involve waiting for the traffic signal.

The longest queues are expected to occur at the security station on Trinity Place at Liberty Street which would be used by autos, for-hire vehicles and tour buses in the AM peak hour, and only tour buses in the midday, PM and Saturday midday peak hours. The estimated queue lengths at Trinity Place during the weekday midday, PM and Saturday midday peak hours assume approximately 46 feet per bus including the distance between buses. As NYPD personnel would monitor any queues to ensure that cross-street

Table 8-14
Summary of Entry Security Station Vehicle Queue Lengths and Average Times in Queue

Entry Location	Avg. Queue Length (ft.)			95th Percentile Queue Length (ft.)			Average Time at Security Checkpoint (minutes)																				
							Auto			Taxi			Black Car (TAP)			Black Car (Non-TAP)			Truck/Van (TAP)			Truck/Van (Non-TAP)			Tour Bus		
	AM	MD	PM	AM	MD	PM	AM	MD	PM	AM	MD	PM	AM	MD	PM	AM	MD	PM	AM	MD	PM	AM	MD	PM	AM	MD	PM
W. B'way @ Barclay St							2.9	2.6	2.1	3.0	2.6	3.6	2.8	2.5	3.6	3.9	3.8	4.8	----	----	----	----	----	----	----	----	----
W. B'way Credentialing Lane	28	21	48	99	90	140																					
Barclay St. Credentialing Lane	65	37	40	169	131	127																					
Route 9A @ Liberty St							1.1	0.9	0.7	----	----	----	----	----	----	----	----	----	1.3	1.0	0.9	1.9	1.8	2.1	----	----	----
Route 9A NB Credentialing Lane	<20	<20	<20	67	35	30																					
Route 9A SB Credentialing Lane	44	32	<20	150	138	85																					
Trinity Pl @ Liberty St	<20	213	<20	42	372	21	2.1	----	----	1.6	----	----	----	----	----	----	----	----	----	----	----	----	----	----	2.7	12.6	2.9
	Saturday Midday			Saturday Midday			Saturday Midday																				
Trinity Pl @ Liberty St	391			881			----			----			----			----			----			----			16.6		

Notes:
Average and 95th percentile queue lengths in feet as measured from the head end of the credentialing lane.
At locations where two credentialing lanes are provided, the number shown represents the queue length for any one lane.
Average time at security checkpoint in minutes from when a vehicle enters the credentialing lane until it exits the screening zone sally port.
Estimated queue lengths on Trinity Place assume that no buses would be permitted to queue within the Cedar Street, Thames Street and Rector Street approaches.
TAP – Trusted Access Program.
All autos, taxis and tour buses assumed to be registered in the TAP.

approaches such as those at Thames and Rector Streets would remain unobstructed, the estimated queue lengths also include the unoccupied space at the Thames Street and Rector Street intersections (approximately 60 feet and 45 feet, respectively) where appropriate.

As shown in **Table 8-14**, in the AM and PM peak hours (the off-peak periods for tour bus demand), the average queue along the credentialing lane adjacent to the west curb on Trinity Place is expected to total one vehicle or less, while the 95th percentile queue would extend one to two car-lengths or less than one bus-length. Based on the travel demand forecast provided in the 2004 *World Trade Center Memorial and Redevelopment FGEIS,* it is assumed that up to 33 tour buses would enter the Campus through the Trinity Place security station in the weekday midday peak hour. It is estimated that during this peak hour the average queue would extend approximately three to four buses and that, based on the 95th percentile queue, there would be brief periods when up to seven buses would be in queue. The 285 feet of credentialing lane length that would be provided along Trinity Place on the two blocks between Rector Street and Cedar Street would therefore be sufficient to accommodate average queues in the weekday midday; however, based on the 95th percentile queue, the number of buses waiting to enter the Campus may occasionally exceed the capacity of the credentialing lanes for brief periods during this peak hour. On average, buses are expected to spend 2.9 minutes or less at the Trinity Place security station in the weekday AM and PM peak hours, and up to 12.6 minutes in the midday.

Based on the travel demand forecast provided in the 2004 *World Trade Center Memorial and Redevelopment FGEIS* it is assumed that up to 42 tour buses would enter the Campus through the Trinity Place security station in the Saturday midday peak hour. During this period, it is estimated that the average queue would reach seven to eight buses in length, and that based on the 95th percentile queue, there would be brief periods when up to 17 buses would be in queue. The 285-foot-long credentialing lanes along Trinity Place on the two blocks between Rector Street and Cedar Street would therefore be insufficient to accommodate both average and 95th percentile queues in the Saturday midday. On average, buses are expected to spend 16.6 minutes at the Trinity Place security station in the Saturday midday.

As noted above, the numbers of buses forecast to arrive at the WTC site in each peak hour were based on the travel demand forecast provided in the 2004 *World Trade Center Memorial and Redevelopment FGEIS*, and the traffic analyses for this EIS conservatively assume that all of these buses would enter the WTC Campus. The assessment of operational conditions at the Trinity Place security station should therefore also be considered conservative as it likely overstates the numbers of tour buses that would enter the WTC Campus during peak hours. As previously noted, access to the WTC site would be managed in a flexible manner to allow maximum throughput and reduce the potential for localized traffic congestion, as conditions allow. If congestion and excessive queuing were to occur at the Trinity Place security station during periods of peak bus demand, several measures would be considered to mitigate these conditions, including increased staffing at this security station during peak periods to reduce processing times, redirecting some buses to other security stations with available capacity, and implementing a timed reservation system for tour buses entering the Campus. These measures are discussed further in Chapter 15, "Mitigation."

Intersection Capacity Analysis

Table 8-15 shows a summary comparison of intersection levels of service for future No-Action and With-Action conditions, and an overview of the number of significant adverse traffic impacts that would be generated in the future with the Proposed Project based on the *CEQR Technical Manual* criteria discussed previously in Section F, "Transportation Analyses Methodologies." As shown in **Table 8-15**, in the weekday AM peak hour, the number of intersections that are projected to operate at overall LOS E or F would total eight, versus five under the No-Action condition. Overall, 17 of the 42 analyzed intersections

Table 8-15
Intersection Level of Service Summary Comparison
No-Action vs. With-Action Conditions

	No-Action				With-Action			
	AM	Midday	PM	Saturday Midday	AM	Midday	PM	Saturday Midday
Overall LOS A/B/C	32	34	29	5	26	29	30	9
Overall LOS D	4	2	4	4	7	5	1	1
Overall LOS E	2	3	5	2	4	5	3	0
Overall LOS F	3	2	3	1	4	2	7	2
Total number of intersections with significant impacts	---	---	---	---	17	10	13	3
Total lane groups at LOS E or F (of approximately 146/37 lane groups analyzed in the No-Action and 152/41 in the With-Action for the weekday/Saturday periods)	25	16	24	9	31	15	31	4
No. of lane groups at LOS E or F at Route 9A intersections	20	10	18	3	22	6	17	0
No. of lane groups at LOS E or F within the Downtown street grid	5	6	6	6	9	9	14	4

would have significant adverse impacts in the AM peak hour. The number of lane groups projected to operate at LOS E or F in the AM would total 31 versus 25 in the No-Action.

In the weekday midday peak hour, seven intersections are projected to operate at overall LOS E or F with the Proposed Project versus five under the No-Action. Overall, 10 of the 42 analyzed intersections would have significant adverse impacts in the weekday midday. The number of lane groups projected to operate at LOS E or F in the midday would total 15 in the With-Action condition, versus 16 in the No-Action.

In the weekday PM peak hour, the number of intersections that are projected to operate at overall LOS E or F would total ten compared to eight in the No-Action condition. Overall, 13 of the 42 analyzed intersections would have significant adverse impacts in the weekday PM. The number of lane groups projected to operate at LOS E or F would total 31 compared to 24 in the No-Action condition.

Lastly, in the Saturday midday peak hour, two intersections are projected to operate at overall LOS E or F with the Proposed Project compared to three in the No-Action condition. Overall, three of the 12 intersections analyzed for the Saturday midday would have significant adverse impacts. The number of lane groups projected to operate at LOS E or F would total four, compared to nine in the No-Action condition.

The lane groups significantly impacted in each peak hour at each intersection are shown in **Table 18-16** and outlined below. Potential measures to mitigate these significant adverse traffic impacts are discussed in Chapter 15, "Mitigation."

Weekday AM Peak Hour

- Broadway and Chambers Street – eastbound approach;
- Broadway and Park Row/Barclay Street – southbound through movement;

Table 8-16
With-Action Intersection Level of Service Analysis

	LANE GROUP	AM PEAK HOUR							MIDDAY PEAK HOUR							PM PEAK HOUR							SATURDAY MIDDAY PEAK HOUR						
		NO-ACTION			WITH-ACTION				NO-ACTION			WITH-ACTION				NO-ACTION			WITH-ACTION				NO-ACTION SAT			WITH-ACTION			
		V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS		V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS		V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS		V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS	
1. Chambers St (E-W) @	EB - TR	0.64	28.5	C	**0.90**	**47.1**	**D**	*	0.74	35.1	D	**1.29**	**178.9**	**F**	*	0.68	29.3	C	**0.96**	**56.2**	**E**	*							
Broadway (SB)	WB - L	0.54	32.8	C	0.56	36.8	D		0.47	28.6	C	0.66	43.6	D		0.63	39.4	D	**0.79**	**62.4**	**E**	*							
	WB - T	0.72	32.3	C	0.81	39.2	D		0.68	29.8	C	0.70	30.9	C		0.81	37.7	D	0.81	37.2	D								
	SB - L	0.40	24.8	C	0.40	24.7	C		0.19	20.3	C	0.18	20.1	C		0.70	38.2	D	0.73	40.2	D								
	SB - LT	0.69	29.9	C	0.80	35.6	D		0.81	36.1	D	**0.96**	**55.9**	**E**	*	1.05	78.4	E	1.02	68.5	E								
	SB - R	0.11	19.1	B	0.10	18.9	B		0.68	46.3	D	0.68	46.3	D		0.40	28.8	C	0.46	31.3	C								
2. Warren St (EB) @	EB - R	0.60	27.8	C	0.69	32.0	C		0.48	23.7	C	0.77	38.0	D		0.62	27.2	C	**0.93**	**54.1**	**D**	*							
Broadway (SB)	SB - T	0.45	17.3	B	0.56	18.9	B		0.48	17.7	B	0.63	20.3	C		0.61	19.9	B	0.68	21.5	C								
3. Park Place (E-W) @	EB - R	0.48	18.8	B	0.80	29.2	C		0.42	17.7	B	0.63	22.0	C		0.57	20.6	C	0.89	36.9	D								
Broadway (SB)	SB - T	0.52	20.8	C	0.67	23.9	C		0.50	20.5	C	0.72	25.4	C		0.69	24.3	C	0.85	30.8	C								
	SB - R	0.06	16.2	B	0.07	16.4	B		0.12	17.9	B	0.15	18.6	B		0.07	16.1	B	0.09	16.5	B								
4. Park Row/Barclay St (WB) @	WB - L	0.25	25.7	C	0.36	27.5	C		0.52	31.2	C	0.56	32.4	C		0.33	27.1	C	0.41	28.6	C								
Broadway (SB)	WB - LT	0.58	30.0	C	0.52	28.8	C		0.59	30.1	C	0.53	29.1	C		0.62	30.8	C	0.60	30.3	C								
	SB - T	0.75	27.5	C	**1.06**	**72.2**	**E**	*	0.71	26.3	C	**1.04**	**62.8**	**E**	*	1.09	80.7	F	**1.34**	**187.7**	**F**	*							
	SB - R	0.38	22.8	C	0.52	26.8	C		0.16	18.4	B	0.30	20.6	C		0.21	18.9	B	0.30	20.3	C								
5. Vesey St/Park Row/Ann St (EB) @	EB - TR	1.53	294.4	F	1.06	113.8	F		1.81	418.4	F	1.27	187.8	F		1.44	256.8	F	0.92	74.1	E		1.46	265.2	F	0.91	74.6	E	
Broadway (SB)	SB - L	0.51	17.5	B	0.70	22.3	C		0.57	18.8	B	0.75	24.5	C		0.83	29.1	C	**1.09**	**82.0**	**F**	*	0.54	18.1	B	0.53	18.0	B	
	SB - LT	0.73	23.6	C	**1.08**	**77.6**	**E**	*	0.75	24.1	C	**1.07**	**74.3**	**E**	*	0.81	27.5	C	**1.09**	**82.3**	**F**	*	0.49	16.1	B	0.74	21.4	C	
6. Fulton St (WB) @	WB-L	0.27	28.8	C	**0.67**	**45.8**	**D**	*	0.41	31.4	C	0.67	42.4	D		0.38	31.2	C	**0.80**	**55.7**	**E**	*	-	-	-	-	-	-	
Broadway (SB)	WB-T	0.89	56.0	E	0.65	36.7	D		0.70	39.4	D	0.57	33.8	C		0.84	49.1	D	0.62	35.7	D		-	-	-	-	-	-	
	WB - LT	-	-	-	**-**	**-**	**-**		-	-	-	**-**	**-**	**-**		-	-	-	**-**	**-**	**-**		0.96	68.2	E	**1.08**	**101.2**	**F**	*
	SB - T	0.29	8.7	A	0.44	10.0	B		0.41	9.8	A	0.54	11.4	B		0.28	8.6	A	0.41	9.7	A		-	-	-	-	-	-	
	SB - TR	-	-	-	-	-	-		-	-	-	-	-	-		-	-	-	-	-	-		0.31	8.8	A	0.40	9.5	A	
	SB - R	0.39	13.9	B	0.44	15.3	B		0.40	13.5	B	0.47	15.6	B		0.53	17.9	B	0.68	26.0	C		-	-	-	-	-	-	
7. Maiden Lane/Cortlandt St (WB) @	WB - LT	0.83	50.3	D	0.74	40.9	D		0.56	33.4	C	0.53	32.5	C		0.62	36.3	D	0.63	35.9	D		0.70	38.6	D	0.67	37.0	D	
Broadway (SB)	SB - T	0.29	8.7	A	0.39	9.6	A		-	-	-	-	-	-		0.27	8.5	A	0.35	9.2	A		-	-	-	-	-	-	
	SB - TR	-	-	-	-	-	-		0.49	10.9	B	0.72	15.5	B		-	-	-	-	-	-		0.36	9.4	A	0.56	12.0	B	
	SB - R	0.17	9.1	A	0.65	24.2	C		-	-	-	-	-	-		0.13	8.4	A	0.67	24.2	C		-	-	-	-	-	-	
8. Liberty St (E-W) @	EB - TR	0.98	79.5	E	0.12	25.0	C		0.96	74.9	E	0.12	25.0	C		0.59	35.9	D	0.16	25.8	C		0.93	65.6	E	0.08	24.4	C	
Broadway (SB)	SB - LT	0.43	10.3	B	0.54	11.8	B		-	-	-	-	-	-		0.34	9.3	A	0.45	10.4	B		-	-	-	-	-	-	
	SB - LTR	-	-	-	-	-	-		0.43	10.1	B	0.54	11.4	B		-	-	-	-	-	-		0.27	8.5	A	0.36	9.3	A	
	SB - R	0.65	26.6	C	0.52	19.5	B		-	-	-	-	-	-		0.47	15.8	B	0.35	12.5	B		-	-	-	-	-	-	
9. Chambers St (E-W) @	EB - LT	1.05	84.8	F	**1.26**	**161.8**	**F**	*	0.51	21.5	C	**1.24**	**152.5**	**F**	*	0.67	25.5	C	**1.01**	**65.7**	**E**	*							
Church St (NB)	WB - TR	0.63	23.8	C	0.64	24.4	C		0.64	24.1	C	0.66	24.9	C		0.76	28.4	C	0.77	28.9	C								
	NB - LT	0.70	22.6	C	0.68	22.0	C		-	-	-	-	-	-		0.72	23.0	C	0.76	24.2	C								
	NB - LTR	-	-	-	-	-	-		0.81	25.9	C	0.75	23.9	C		-	-	-	-	-	-								
	NB - R	0.20	17.0	B	0.20	17.0	B		-	-	-	-	-	-		0.45	24.1	C	0.38	22.1	C								

Table 8-16 (continued)
With-Action Intersection Level of Service Analysis

	LANE GROUP	AM PEAK HOUR						MIDDAY PEAK HOUR						PM PEAK HOUR						SATURDAY MIDDAY PEAK HOUR					
		NO-ACTION			WITH-ACTION			NO-ACTION			WITH-ACTION			NO-ACTION			WITH-ACTION			NO-ACTION SAT			WITH-ACTION		
		V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS
10. Murray St (WB) @	WB - TR	0.51	28.3	C	0.46	27.2	C	0.45	26.5	C	0.47	26.9	C	0.60	31.8	C	0.60	31.4	C						
Church St (NB)	NB - LT	0.53	14.0	B	0.50	13.6	B	0.64	15.8	B	0.57	14.7	B	0.49	13.4	B	0.53	14.1	B						
11. Barclay St (WB) @	WB - TR	0.71	30.3	C	0.71	30.4	C	1.22	144.3	F	**1.23**	**148.6**	**F** *	0.64	25.2	C	0.66	26.0	C						
Church St (NB)	NB - LT	0.42	12.7	B	0.46	13.2	B	0.47	15.4	B	0.50	15.8	B	0.56	16.9	B	0.60	17.5	B						
12. Vesey St (E-W) @	NB - LT (SZ)	-	-	-	0.06	9.8	A	-	-	-	0.24	16.8	B	-	-	-	0.27	16.9	B	-	-	-	0.16	15.7	B
Church St (NB)	NB - T (ML)	0.28	22.1	C	0.54	14.4	B	-	-	-	-	-	-	0.50	18.7	B	0.72	23.7	C	-	-	-	-	-	-
	NB - R (ML)	0.35	12.0	B	0.77	31.7	C	-	-	-	-	-	-	1.10	109.3	F	0.96	70.9	E	-	-	-	-	-	-
	NB - TR (ML)	-	-	-	-	-	-	0.59	20.1	C	0.86	29.3	C	-	-	-	-	-	-	0.47	18.3	B	0.71	23.1	C
	EB - LT	0.60	21.2	C	-	-	-	0.22	15.8	B	-	-	-	0.18	15.4	B	-	-	-	0.20	15.6	B	-	-	-
13. Fulton St (E-W) @	EB - L	-	-	-	0.08	16.3	B	-	-	-	0.26	22.3	C	-	-	-	0.11	16.9	B	-	-	-	0.13	18.3	B
Church St (NB)	WB - TR	0.89	44.6	D	-	-	-	0.84	40.1	D	-	-	-	0.92	49.4	D	-	-	-	1.12	108.9	F	-	-	-
	WB - R	-	-	-	**1.12**	**112.1**	**F** *	-	-	-	**1.31**	**191.6**	**F** *	-	-	-	**1.37**	**209.4**	**F** *	-	-	-	**1.51**	**274.3**	**F** *
	NB - LT	0.42	16.6	B	-	-	-	0.46	16.9	B	-	-	-	0.58	18.8	B	-	-	-	0.32	15.3	B	-	-	-
	NB - T (SZ)	-	-	-	0.04	13.2	B	-	-	-	0.14	14.1	B	-	-	-	0.22	15.0	B	-	-	-	0.12	14.0	B
	NB - T (ML)	-	-	-	0.61	20.1	C	-	-	-	0.55	18.4	B	-	-	-	0.63	20.4	C	-	-	-	0.40	16.4	B
14. Cortlandt St (WB) @	WB - R	0.78	46.7	D	**1.56**	**299.8**	**F** *	0.88	64.3	E	**1.52**	**289.6**	**F** *	0.51	31.9	C	**1.61**	**325.4**	**F** *	1.17	142.9	F	**1.81**	**414.4**	**F** *
Church St (NB)	NB - T (SZ)	-	-	-	0.04	11.6	B	-	-	-	0.13	12.4	B	-	-	-	0.20	13.2	B	-	-	-	0.11	12.3	B
	NB - T (ML)	0.30	13.6	B	0.31	13.9	B	0.35	14.0	B	0.35	14.2	B	0.48	15.6	B	0.35	14.3	B	0.20	12.7	B	0.20	12.8	B
15. Liberty St (E-W) @	EB - L	1.83	424.4	F	0.05	19.8	B	2.23	597.8	F	0.19	21.6	C	2.86	878.4	F	0.30	23.2	C	1.51	284.1	F	0.16	21.5	C
Trinity Place/Church St (NB)	EB - T	0.54	27.6	C	-	-	-	0.49	26.4	C	-	-	-	0.31	23.1	C	-	-	-	0.52	26.9	C	-	-	-
	WB - TR	0.30	23.2	C	-	-	-	0.16	21.5	C	-	-	-	0.22	21.7	C	-	-	-	0.11	20.8	C	-	-	-
	WB - R	-	-	-	0.53	33.1	C	-	-	-	0.44	29.6	C	-	-	-	0.46	30.1	C	-	-	-	0.21	23.2	C
	NB - LT	0.41	13.3	B	-	-	-	-	-	-	-	-	-	0.41	13.1	B	-	-	-	-	-	-	-	-	-
	NB - LT (SZ)	-	-	-	0.10	10.5	B	-	-	-	0.22	13.5	B	-	-	-	0.08	10.8	B	-	-	-	0.37	19.1	B
	NB - LTR	-	-	-	-	-	-	0.45	13.4	B	-	-	-	-	-	-	-	-	-	0.32	11.9	B	-	-	-
	NB - T (ML)	-	-	-	0.40	13.4	B	-	-	-	-	-	-	-	-	-	0.48	14.4	B	-	-	-	-	-	-
	NB - TR (ML)	-	-	-	-	-	-	-	-	-	0.43	13.1	B	-	-	-	-	-	-	-	-	-	0.26	11.3	B
	NB - R	0.00	9.4	A	-	-	-	-	-	-	-	-	-	0.00	9.4	A	-	-	-	-	-	-	-	-	-
	NB - R (ML)	-	-	-	0.15	11.4	B	-	-	-	-	-	-	-	-	-	0.22	13.0	B	-	-	-	-	-	-
16. Cedar Street (WB) @	WB - TR	0.35	24.8	C	0.44	26.2	C	0.18	21.8	C	0.25	22.4	C	0.41	25.7	C	0.51	28.6	C	0.13	20.9	C	0.21	21.7	C
Trinity Place (NB)	NB - LT	-	-	-	0.53	15.8	B	-	-	-	0.51	14.4	B	-	-	-	0.62	17.7	B	-	-	-	0.32	11.9	B
	NB - T	0.21	10.8	B	-	-	-	0.34	12.0	B	-	-	-	0.26	11.3	B	-	-	-	0.19	10.7	B	-	-	-
17. Rector St (EB) @	EB - LT	0.83	42.6	D	**1.04**	**80.8**	**F** *	0.81	41.9	D	0.85	46.5	D	0.61	30.8	C	0.70	35.1	D						
Trinity Place (NB)	NB - T	0.14	12.3	B	0.16	12.5	B	-	-	-	-	-	-	0.19	12.7	B	0.20	12.9	B						
	NB - TR	-	-	-	-	-	-	0.54	17.4	B	0.61	18.9	B	-	-	-	-	-	-						
	NB - R	0.30	16.1	B	0.33	16.7	B	-	-	-	-	-	-	0.11	12.6	B	0.16	13.4	B						
18. Chambers St (E-W) @	EB - TR	0.82	33.9	C	0.80	31.1	C	0.88	41.7	D	0.91	44.6	D	0.96	51.3	D	0.86	35.5	D						
West Broadway (SB)	WB - LT	0.52	21.9	C	0.51	21.5	C	0.47	20.2	C	0.48	20.3	C	0.64	24.0	C	0.71	26.2	C						
	SB - LT	0.75	25.3	C	0.67	23.0	C	0.72	24.3	C	0.63	21.8	C	0.62	21.7	C	0.62	21.8	C						
	SB - R	0.10	15.1	B	0.25	17.6	B	0.20	17.0	B	0.29	18.7	B	0.30	19.0	B	0.46	23.5	C						

Table 8-16 (continued)
With-Action Intersection Level of Service Analysis

	LANE GROUP	AM PEAK HOUR						MIDDAY PEAK HOUR						PM PEAK HOUR						SATURDAY MIDDAY PEAK HOUR			
		NO-ACTION			WITH-ACTION			NO-ACTION			WITH-ACTION			NO-ACTION			WITH-ACTION			NO-ACTION SAT			WITH-ACTION	
		V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS
19. Murray St (WB) @	WB - LT	0.69	34.5	C	0.65	32.3	C	0.66	32.2	C	0.67	32.8	C	0.42	25.1	C	0.55	28.0	C					
West Broadway (SB)	SB - TR	0.45	13.1	B	0.35	12.0	B	0.49	13.6	B	0.35	12.1	B	0.44	13.0	B	0.33	11.8	B					
20. Barclay St (WB) @	WB - L	-	-	-	0.32	21.6	C	-	-	-	0.28	20.5	C	-	-	-	0.39	23.5	C					
West Broadway (N-S)	WB - T	-	-	-	0.39	20.7	C	-	-	-	0.68	28.6	C	-	-	-	0.44	21.4	C					
	WB - LT	0.49	22.3	C	-	20.9	C	0.88	44.7	D	-	26.9	C	0.63	24.9	C	-	21.8	C					
	NB - L	0.09	12.5	B	0.05	11.8	B	0.16	13.6	B	0.08	12.0	B	0.08	12.3	B	0.04	11.7	B					
	SB - T	0.74	24.5	C	0.08	11.8	B	0.77	26.1	C	0.06	11.7	B	0.74	24.3	C	0.06	11.7	B					
	SB - R	0.17	13.0	B	0.15	12.7	B	0.16	12.8	B	0.11	12.1	B	0.13	12.6	B	0.14	12.6	B					
21. Chambers St (E-W) @	EB - T	0.66	24.4	C	0.70	26.0	C	0.56	21.5	C	0.66	24.2	C	0.81	31.3	C	0.82	31.6	C					
Greenwich St (SB)	EB - R	0.27	17.6	B	0.26	17.4	B	0.15	15.6	B	0.16	15.8	B	0.21	16.5	B	0.24	16.9	B					
	WB - LT	0.28	16.8	B	0.40	18.5	B	0.35	17.7	B	0.42	18.7	B	0.59	21.8	C	0.73	26.3	C					
	SB - LTR	0.83	40.7	D	0.83	40.1	D	0.56	27.2	C	0.58	27.7	C	0.92	54.3	D	0.94	58.1	E					
22. Murray St (E-W) @	EB - R	0.81	45.3	D	**0.99**	**76.3**	**E** *	0.93	63.4	E	0.79	44.1	D	0.94	61.0	E	**1.05**	**89.2**	**F** *					
Greenwich St (SB)	WB - LT	0.80	39.6	D	0.84	43.3	D	0.88	46.7	D	0.84	42.3	D	0.78	37.1	D	0.85	43.1	D					
	SB - TR	0.45	14.9	B	0.55	17.6	B	0.25	11.8	B	0.17	10.7	B	0.45	16.4	B	0.50	17.6	B					
23. Barclay St (WB) @	WB - LT	0.00	7.6	A	0.00	7.6	A	0.00	7.6	A	0.00	7.6	A	0.01	7.6	A	0.01	7.6	A					
Greenwich St (N-S)	NB - L	0.02	13.8	B	0.02	15.0	C	0.02	13.4	B	0.01	10.9	B	0.01	14.2	B	0.01	14.1	B					
(Unsignalized)	SB - T	0.10	17.7	C	0.12	20.2	C	0.05	16.2	C	0.03	11.3	B	0.01	20.1	C	0.01	19.4	C					
	SB - R	0.06	11.1	B	0.08	11.8	B	0.12	11.2	B	0.10	9.6	A	0.06	11.8	B	0.08	11.8	B					
24. Albany St (EB) @	EB - R	0.32	23.8	C	0.48	28.0	C	0.44	26.9	C	0.63	33.9	C	0.27	23.3	C	0.51	29.8	C					
Greenwich St (SB)	SB - T	0.41	14.3	B	0.26	12.3	B	0.35	13.2	B	0.17	11.2	B	0.27	12.2	B	0.21	11.6	B					
25. Rector St (EB) @	EB - TR	0.55	27.7	C	0.63	29.5	C	0.19	20.8	C	0.25	21.5	C	0.16	20.7	C	0.21	21.1	C					
Greenwich St (N-S)	NB - R	0.09	11.1	B	0.10	11.2	B	0.22	12.8	B	0.22	12.9	B	0.45	18.6	B	0.45	18.5	B					
	SB - LT	0.77	29.2	C	0.68	25.0	C	0.70	23.3	C	0.53	17.8	B	0.56	18.7	B	0.43	15.6	B					
26. Battery Place (E-W) @	EB - L	0.72	36.7	D	**0.97**	**80.7**	**F** *	0.37	13.4	B	0.77	35.7	D	0.77	46.5	D	**1.01**	**95.7**	**F** *					
Greenwich St (NB)	EB - T	0.47	10.7	B	0.56	12.3	B	0.31	9.0	A	0.39	9.9	A	0.27	8.7	A	0.30	9.0	A					
	WB - TR	0.39	9.4	A	0.39	9.5	A	0.38	9.4	A	0.39	9.5	A	0.48	10.4	B	0.46	10.2	B					
27. Barclay St (WB) @	WB - LT	-	10.3	B	-	11.4	B	-	8.4	A	-	10.25	B	-	11.6	B	-	11.4	B					
Washington St (N-S)	WB-T	-	8.5	A	-	9.1	A	-	8.5	A	-	10.4	B	-	9.4	A	-	9.25	A					
(Unsignalized)	NB - L	-	8.5	A	-	8.7	A	-	8.0	A	-	8.5	A	-	8.6	A	-	8.6	A					
28. Chambers St (E-W) @	EB - LTR	0.98	114.8	F	**1.18**	**178.2**	**F** *	0.29	36.1	D	0.36	38.0	D	0.70	55.0	D	0.67	53.4	D					
Route 9A (West St) (N-S)	WB - LT	0.71	60.5	E	**0.78**	**67.2**	**E** *	0.40	38.8	D	0.48	41.6	D	0.77	53.2	D	0.79	55.6	E					
	WB - R	0.39	29.7	C	0.42	30.4	C	0.41	23.1	C	0.41	23.1	C	0.68	30.0	C	0.77	34.8	C					
	NB - TR	1.15	97.0	F	1.15	98.3	F	0.98	41.5	D	**1.02**	**52.1**	**D** *	1.19	120.4	F	1.16	106.0	F					
	SB - L	1.24	190.2	F	1.24	191.4	F	1.03	106.5	F	0.99	95.6	F	1.69	379.1	F	1.67	367.6	F					
	SB - TR	0.84	10.8	B	0.84	10.8	B	0.73	10.7	B	0.74	10.9	B	0.98	29.8	C	1.00	32.3	C					

Table 8-16 (continued)
With-Action Intersection Level of Service Analysis

	LANE GROUP	AM PEAK HOUR						MIDDAY PEAK HOUR						PM PEAK HOUR						SATURDAY MIDDAY PEAK HOUR					
		NO-ACTION			WITH-ACTION			NO-ACTION			WITH-ACTION			NO-ACTION			WITH-ACTION			NO-ACTION SAT			WITH-ACTION		
		V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS
29. Warren St (E-W) @	EB - LTR	0.87	71.3	E	0.75	59.1	E	0.38	37.1	D	0.35	36.5	D	0.43	38.5	D	0.44	38.7	D						
Route 9A (West St) (N-S)	NB - L	0.67	96.1	F	**0.89**	**131.4**	**F** *	0.51	71.0	E	**0.67**	**83.5**	**F** *	0.21	51.6	D	0.27	53.0	D						
	NB - TR	0.98	30.2	C	1.01	35.7	D	0.82	20.5	C	0.89	23.5	C	1.13	91.2	F	1.12	84.3	F						
	SB - TR	0.75	15.6	B	0.76	15.7	B	0.77	19.2	B	0.77	19.2	B	0.97	36.6	D	0.98	38.7	D						
30. Murray St (E-W) @	EB - DefL	0.64	73.1	E	**0.96**	**139.2**	**F** *	0.70	68.5	E	**0.82**	**88.1**	**F** *	0.65	59.1	E	**0.70**	**63.8**	**E** *						
Route 9A (West St) (N-S)	EB - TR	0.67	65.5	E	0.61	60.2	E	0.52	43.9	D	0.48	43.7	D	1.19	167.0	F	1.18	164.4	F						
	EB - LTR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
	WB - DefL	-	-	-	-	-	-	-	-	-	-	-	-	1.20	171.8	F	**1.36**	**233.5**	**F** *						
	WB - TR	-	-	-	-	-	-	-	-	-	-	-	-	1.42	256.2	F	**1.55**	**312.9**	**F** *						
	WB - LTR	1.00	91.9	F	**1.18**	**151.7**	**F** *	1.19	150.3	F	**1.33**	**210.5**	**F** *	-	-	-	-	-	-						
	NB - L	1.03	117.7	F	**1.11**	**143.4**	**F** *	1.11	142.4	F	**1.13**	**148.8**	**F** *	1.05	125.9	F	**1.12**	**147.5**	**F** *						
	NB - TR	1.15	90.4	F	**1.22**	**120.3**	**F** *	0.93	26.8	C	1.02	42.8	D	1.11	77.7	E	1.10	73.1	E						
	SB - L	0.71	78.4	E	0.71	79.0	E	0.85	90.2	F	0.68	72.7	E	0.48	59.2	E	0.45	58.3	E						
	SB - TR	0.76	17.9	B	0.75	17.8	B	0.72	17.4	B	0.73	17.6	B	0.88	23.7	C	0.89	24.4	C						
31. Barclay St (WB) @	WB - R	0.50	34.8	C	0.69	40.7	D	0.61	31.9	C	0.82	40.9	D	0.80	39.1	D	0.82	40.6	D						
Route 9A (West St) (N-S)	NB - T	0.95	26.4	C	0.95	27.1	C	0.72	14.3	B	0.74	14.7	B	0.86	18.3	B	0.86	18.2	B						
32. Vesey St (E-W) @	EB - L	0.26	37.0	D	0.29	38.0	D	0.56	41.3	D	0.52	39.0	D	0.49	37.5	D	0.46	36.0	D	0.26	29.4	C	0.23	28.6	C
Route 9A (West St) (N-S)	EB - R	0.36	37.8	D	0.38	38.3	D	0.55	38.7	D	0.56	39.1	D	0.65	40.3	D	0.70	42.6	D	0.34	31.3	C	0.35	31.4	C
	WB - L	0.01	30.7	C	0.02	30.9	C	0.01	24.3	C	0.02	24.4	C	0.00	24.1	C	0.01	24.2	C	0.00	24.1	C	0.01	24.2	C
	WB - TR	0.02	31.1	C	0.17	34.2	C	0.04	24.7	C	0.15	26.8	C	0.02	24.4	C	0.18	27.3	C	0.01	24.2	C	0.09	25.5	C
	NB - T	0.86	16.4	B	0.85	16.3	B	0.67	15.0	B	0.69	15.2	B	0.83	18.5	B	0.82	18.2	B	0.66	14.7	B	0.66	14.8	B
	SB - TR	0.90	19.1	B	0.91	19.7	B	0.82	18.4	B	0.84	19.0	B	0.90	21.8	C	1.03	43.0	D	0.71	15.6	B	0.73	16.1	B
33. Fulton St St (WB) @	WB-R	0.01	30.9	C	0.03	31.2	C	0.03	24.5	C	0.04	24.7	C	0.02	24.4	C	0.05	24.8	C	0.00	24.1	C	0.01	24.2	C
Route 9A (West St) (N-S)	NB-T	0.86	16.8	B	0.86	16.5	B	0.67	14.9	B	0.68	15.2	B	0.81	17.9	B	0.79	17.5	B	0.66	14.7	B	0.66	14.8	B
	SB-T	0.69	12.4	B	0.70	12.6	B	0.78	17.1	B	0.79	17.5	B	1.00	35.5	D	1.03	43.4	D	0.70	15.4	B	0.72	15.9	B
34. Liberty St (E-W) @	EB - L	-	-	-	0.75	64.3	E	-	-	-	0.65	52.4	D	-	-	-	0.78	63.3	E	-	-	-	0.67	53.0	D
Route 9A (West St) (N-S)	EB - DefL	1.41	275.3	F	-	-	-	0.64	57.6	E	-	-	-	0.83	72.8	E	-	-	-	1.06	137.2	F	-	-	-
	EB - TR	0.20	41.9	D	-	-	-	0.33	38.1	D	-	-	-	0.85	75.1	E	-	-	-	0.12	33.3	C	-	-	-
	EB - R	-	-	-	0.26	44.7	D	-	-	-	0.41	42.3	D	-	-	-	**0.92**	**94.0**	**F** *	-	-	-	0.18	35.1	D
	WB - DefL	-	-	-	-	-	-	1.42	263.1	F	-	-	-	1.68	373.6	F	-	-	-	-	-	-	-	-	-
	WB - TR	-	-	-	-	-	-	1.26	189.2	F	-	-	-	1.06	107.8	F	-	-	-	-	-	-	-	-	-
	WB-LTR	1.19	159.4	F	0.19	41.0	D	-	-	-	0.41	38.3	D	-	-	-	0.46	38.4	D	1.19	150.2	F	0.2	34.5	C
	NB - L	1.12	152.4	F	**1.16**	**167.4**	**F** *	0.51	54.3	D	0.58	56.3	E	0.39	51.3	D	0.45	52.6	D	0.41	51.7	D	0.48	53.1	D
	NB - T	-	-	-	1.50	257.6	F	-	-	-	0.93	33.3	C	-	-	-	1.00	45.3	D	-	-	-	0.90	29.9	C
	NB - R	-	-	-	0.07	14.0	B	-	-	-	0.06	17.2	B	-	-	-	0.01	16.6	B	-	-	-	0.01	16.7	B
	NB - TR	1.08	65.3	E	**-**	**252.9**	**F** *	0.72	21.9	C	-	32.7	C	0.81	24.4	C	**-**	**45.2**	**D** *	0.69	21.1	C	-	29.9	C
	SB - L	1.57	336.8	F	0.58	68.6	E	1.10	127.5	F	0.30	49.9	D	0.56	55.5	E	0.07	46.7	D	0.96	89.1	F	0.07	46.7	D
	SB - TR	0.87	22.1	C	0.79	18.4	B	0.96	36.4	D	0.95	33.0	C	1.12	83.7	F	**1.24**	**137.2**	**F** *	0.67	20.9	C	0.83	25.1	C

Table 8-16 (continued)
With-Action Intersection Level of Service Analysis

	LANE GROUP	AM PEAK HOUR						MIDDAY PEAK HOUR						PM PEAK HOUR						SATURDAY MIDDAY PEAK HOUR			
		NO-ACTION			WITH-ACTION			NO-ACTION			WITH-ACTION			NO-ACTION			WITH-ACTION			NO-ACTION SAT		WITH-ACTION	
		V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	V/C RATIO	Delay (sec.)
35. Albany St (E-W)/	EB - LTR	0.54	44.2	D	**0.78**	**55.6**	**E** *	0.44	35.7	D	0.69	43.4	D	0.80	50.9	D	**0.97**	**73.3**	**E** *				
Carlisle St (WB) @	WB - R	0.20	36.5	D	0.24	37.2	D	0.20	30.8	C	0.24	31.6	C	0.13	29.8	C	0.31	32.7	C				
Route 9A (West St) (N-S)	NB - L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
	NB - TR	0.84	12.5	B	0.82	11.8	B	0.67	10.4	B	0.68	10.4	B	0.64	9.9	A	0.63	9.7	A				
	SB - TR	0.45	6.7	A	0.47	6.9	A	0.51	8.4	A	0.53	8.6	A	0.76	11.5	B	0.76	11.5	B				
36. Carlisle St (WB) @ Route 9A (West St) (N-S) (Unsignalized)	WB - R	(See Albany Street above)			(See Albany Street above)			(See Albany Street above)			(See Albany Street above)			(See Albany Street above)			(See Albany Street above)						
37. Cedar Street (WB) @ Route 9A (West St) (N-S) (Unsignalized)	WB-R	0.27	30.6	D	0.23	28.9	D	0.07	21.9	C	0.08	22.0	C	0.02	21.0	C	0.05	21.2	C				
38a. West Thames St/	EB - R	0.45	26.1	C	0.45	25.9	C	0.39	33.1	C	0.40	33.3	C	0.47	36.2	D	0.53	38.1	D				
Brooklyn Battery Tunnel Exit (E-W) @	WB - R	0.74	30.4	C	0.74	30.3	C	0.47	31.9	C	0.47	32.0	C	0.56	33.5	C	0.53	33.1	C				
Route 9A (West St) (N-S)	NB - T	0.59	27.1	C	0.57	26.8	C	0.41	11.1	B	0.41	11.1	B	0.37	10.7	B	0.35	10.5	B				
	SB - TR	1.06	79.6	E	**1.13**	**105.6**	**F** *	0.80	24.1	C	0.85	26.3	C	0.90	29.3	C	0.92	31.0	C				
38b. Brooklyn Battery Tunnel	WB - L	0.61	26.6	C	0.61	26.6	C	0.37	30.4	C	0.37	30.4	C	0.41	31.1	C	0.37	30.4	C				
Entrance/Exit (E-W) @	NB - T	0.91	47.8	D	0.88	45.0	D	0.62	19.5	B	0.62	19.6	B	0.57	18.6	B	0.47	17.1	B				
Route 9A (West St) (N-S)	NB - R	0.44	2.8	A	0.47	3.1	A	0.62	4.8	A	0.65	5.3	A	1.27	132.8	F	1.10	60.0	E				
	SB - T	0.99	53.4	D	**1.04**	**65.4**	**E** *	0.71	15.5	B	0.76	16.7	B	0.80	17.6	B	0.74	15.9	B				
39. Joseph P Ward St (WB) @ Route 9A (West St) (N-S) (Unsignalized)	WB - R	0.19	31.8	D	0.20	32.0	D	0.45	36.6	E	0.46	36.9	E	0.62	49.1	E	0.51	35.8	E				
40. Morris St (E-W) @	WB - R	0.12	48.5	D	0.10	48.3	D	0.22	42.2	D	0.21	42.1	D	0.46	45.2	D	0.46	45.1	D				
Route 9A (West St) (N-S)	NB - TR	0.39	5.9	A	0.37	5.8	A	0.35	6.2	A	0.37	6.4	A	0.39	6.5	A	0.38	6.5	A				
(West Lanes of Northbound Approach)	NB - T	0.50	6.9	A	0.50	7.0	A	0.57	8.4	A	0.57	8.4	A	0.95	25.1	C	0.89	17.9	B				
	SB-T	0.93	18.2	B	0.95	20.6	C	0.55	7.7	A	0.58	8.1	A	0.62	8.5	A	0.63	8.7	A				
41. Battery Place (E-W) @	EB - T	0.33	27.1	C	0.33	27.2	C	0.43	29.3	C	0.44	29.6	C	0.64	35.5	D	0.65	35.7	D				
Route 9A SB Service Rd (SB)	WB - T	0.45	29.2	C	0.48	29.8	C	0.30	26.5	C	0.31	26.8	C	0.26	26.0	C	0.26	25.9	C				
	SB - L	0.95	69.3	E	**1.10**	**112.1**	**F** *	0.31	24.1	C	0.65	35.8	D	0.20	22.4	C	0.28	23.7	C				
	SB - LR	0.96	71.9	E	**1.09**	**108.7**	**F** *	0.35	24.8	C	0.64	35.3	D	0.34	24.8	C	0.41	26.1	C				
42. Battery Place (E-W) @	EB - LT	0.45	12.8	B	0.50	13.6	B	0.34	11.7	B	0.44	12.8	B	0.32	11.5	B	0.37	11.9	B				
Route 9A NB Service Rd (NB)	WB - T	0.26	11.2	B	0.28	11.3	B	0.17	10.3	B	0.18	10.4	B	0.15	10.1	B	0.15	10.1	B				
	WB - R	0.54	14.7	B	0.52	14.2	B	0.37	12.0	B	0.38	12.2	B	0.62	16.1	B	0.58	15.4	B				
	NB - T	0.41	25.6	C	0.42	25.8	C	0.33	24.1	C	0.37	24.7	C	0.08	20.7	C	0.10	20.9	C				

Notes:
EB-Eastbound, WB-Westbound, NB-Northbound, SB-Southbound
L-Left, T-Through, R-Right, Dfl-Analysis considers a Defacto Left Lane on this approach
V/C Ratio - Volume to Capacity Ratio, sec. - Seconds
LOS - Level of Service
***** - Denotes a significant adverse impact based on *CEQR Technical Manual* criteria.
Analysis is based on the 2000 Highway Capacity Manual methodology (HCS+, version 5.5)

- Broadway and Vesey Street/Park Row/Ann Street – southbound left-through lane group;
- Broadway and Fulton Street – westbound left turn;
- Church Street and Chambers Street – eastbound approach;
- Church Street and Fulton Street – westbound approach;
- Church Street and Cortlandt Street – westbound approach;
- Trinity Place and Rector Street – eastbound approach;
- Greenwich Street and Murray Street – eastbound approach;
- Greenwich Street and Battery Place – eastbound left turn;
- Route 9A and Chambers Street – eastbound approach and westbound left-through lane group;
- Route 9A and Warren Street – northbound left turn;
- Route 9A and Murray Street – eastbound left turn, westbound approach, and northbound through-right and left-turn lane groups;
- Route 9A and Liberty Street – northbound through-right and left-turn lane groups;
- Route 9A and Albany Street – eastbound approach;
- Route 9A and West Thames Street – southbound approach;
- Route 9A at the Brooklyn-Battery Tunnel – southbound approach; and
- Route 9A southbound service road at Battery Place – southbound left-turn and left-/right-turn lane groups.

Weekday Midday Peak Hour

- Broadway and Chambers Street – eastbound approach and southbound left-through lane group;
- Broadway and Park Row/Barclay Street – southbound through movement;
- Broadway and Vesey Street/Park Row/Ann Street – southbound left-through lane group;
- Church Street and Chambers Street – eastbound approach;
- Church Street and Barclay Street – westbound approach;
- Church Street and Fulton Street – westbound approach;
- Church Street and Cortlandt Street – westbound approach;
- Route 9A and Chambers Street – northbound approach;
- Route 9A and Warren Street – northbound left turn; and
- Route 9A and Murray Street – westbound approach and northbound and eastbound left turns.

Weekday PM Peak Hour

- Broadway and Chambers Street – eastbound approach and westbound left turn;
- Broadway and Warren Street – eastbound approach;
- Broadway and Park Row/Barclay Street – southbound through movement;
- Broadway and Vesey Street/Park Row/Ann Street – southbound left-turn and left-through lane groups;
- Broadway and Fulton Street – westbound approach;
- Church Street and Chambers Street – eastbound approach;
- Church Street and Fulton Street – westbound approach;
- Church Street and Cortlandt Street – westbound approach;
- Greenwich Street and Murray Street – eastbound approach;
- Greenwich Street and Battery Place – eastbound left turn;
- Route 9A and Murray Street – westbound left-turn and through-right lane groups and northbound and eastbound left turns;

- Route 9A and Liberty Street – eastbound right turn and northbound and southbound through-right lane groups; and
- Route 9A and Albany Street – eastbound approach.

Saturday Midday Peak Hour

- Broadway and Fulton Street – westbound approach;
- Church Street and Fulton Street – westbound approach; and
- Church Street and Cortlandt Street – westbound approach.

As discussed previously, there would be extensive changes to the lower Manhattan street system compared to the existing condition under both the No-Action and With-Action scenarios (e.g., the opening/reopening of street segments, changes in street directions, substantial new demand from development at the WTC site, etc.). It is therefore important to note that in many cases the significant traffic impacts identified above reflect the application of existing signal timings, which would be sub-optimal with respect to future conditions. Potential changes to traffic signal timings that would optimize capacity, reduce both No-Action and With-Action delays, and eliminate significant impacts, are discussed in Chapter 15, "Mitigation."

Vesey Street/Fulton Street "Streets-Open" No-Action Scenario

Both the 2004 *World Trade Center Memorial and Redevelopment FGEIS* and the subsequent 2006 *Environmental Assessment (EA) for Proposed Further Refinements to the Approved Plan* assumed that Fulton Street and Vesey Street would be open to general, unscreened vehicular traffic between Church Street and Route 9A with redevelopment of the World Trade Center site. It was assumed that Fulton Street would provide contiguous westbound access from Water Street/Pearl Street on the east to Route 9A on the west. Vesey Street was assumed to provide contiguous eastbound access from Battery Park City and Route 9A through the WTC site to Broadway/Park Row. However, the 2004 FGEIS also acknowledged that there would potentially be a need to periodically close street segments within the WTC site, and presented a detailed assessment of the potential traffic effects of closing both Fulton Street and Greenwich Street through the site.

Subsequent to the publication of the 2004 FGEIS, changes were implemented to the design of 1 WTC that necessitated more robust security measures in proximity to this tower than were previously considered. Based on security engineering for the new design, it was determined that unscreened vehicles would need to be prohibited from accessing the portions of Fulton and Vesey streets adjacent to the building. Security measures identified by the PANYNJ and the NYPD to address this need included operating both Fulton Street and Vesey Street as "managed streets" between Greenwich Street and Route 9A, along with a change in the direction of traffic flow along Vesey Street from Church Street to Route 9A. This would be achieved through the installation of retractable barriers and sally ports on Vesey, Fulton and Washington streets to restrict vehicular access immediately adjacent to 1 WTC to only vehicles that have undergone security screening. In addition, the surrounding transportation infrastructure has been designed to accommodate this condition. As an example, Route 9A is now being constructed without a southbound left-turn lane at Vesey Street.

As discussed previously in this chapter, these security measures would have to be implemented in the absence of the Proposed Project, and are therefore reflected in the No-Action condition in this EIS. Consequently, the transportation analyses assume that in the No-Action condition, no general, unscreened vehicular traffic would traverse the reopened Vesey Street or the new extension of Fulton Street between Greenwich Street and Route 9A. As this condition was not considered in earlier environmental assessments, a qualitative discussion is provided below comparing the analyzed No-

Action condition to a "streets-open" No-Action scenario which does not include these limited security measures.

Comparison of the No-Action Street Systems

Analyzed No-Action Condition

As shown in **Figure 8-7** and discussed previously, with redevelopment of the WTC site, both Vesey Street and Liberty Street will be reopened to traffic between Church Street and Route 9A, Fulton Street will be extended through the site from Church Street to northbound Route 9A, and Greenwich Street will be extended through the site from Vesey Street south to Liberty Street. Under the analyzed No-Action condition, the segments of Vesey and Fulton streets west of Greenwich Street would be operated as managed streets with access controlled by sally ports and retractable barriers, and only vehicles that have undergone a security screening would be permitted entry. The new extension of Fulton Street would operate one-way westbound along its length, and at Route 9A all traffic would turn right onto the northbound lanes as current NYSDOT plans for Route 9A do not provide for access to the southbound lanes at this location. Vesey Street would operate one-way eastbound from Greenwich Street to Church Street, two-way between Greenwich and Washington streets, and one-way westbound from Washington Street to Route 9A. Westbound operation of Vesey Street from Washington Street to Route 9A eliminates the potential need for vehicles to queue on Route 9A to enter the sally port adjacent to 1 WTC. It is also consistent with current NYSDOT plans for Route 9A which do not provide for a southbound left turn from Route 9A onto Vesey Street.

Streets-Open No-Action Condition

Under the streets-open scenario, the security measures needed to secure 1 WTC would not have been implemented, both Vesey Street and Fulton Street would be open to general traffic, and Vesey Street would operate one-way eastbound along its length. Vehicles would be able to turn onto Vesey Street from both northbound and southbound Route 9A. Fulton Street would operate one-way westbound as it would in the analyzed No-Action condition, but westbound vehicles would be able to access the southbound lanes of Route 9A as well as the northbound lanes.

Comparison of No-Action Traffic Flow

Analyzed No-Action Condition

Under the analyzed No-Action condition, it is anticipated that the managed portions of Vesey and Fulton streets would be primarily used by for-hire vehicles (black cars) serving passengers en route to and from 1 WTC. Other traffic en route to Route 9A from 1 WTC and other WTC development, as well as general background traffic, is not expected to use these street segments as drivers and vehicles would have to undergo security screening. This traffic is instead expected to utilize alternate unrestricted streets for access to/from Route 9A, such Liberty Street to the south or Barclay or Warren streets to the north. As a result, traffic volumes during analyzed peak hours along the managed segments of Vesey and Fulton streets within the WTC site are expected to be relatively small, totaling ten or fewer vehicles per hour. Higher traffic volumes would be found along the unmanaged segments east of Greenwich Street, with from 165 vph to 224 vph eastbound on Vesey Street approaching Church Street, and from 127 vph to 265 vph westbound on Fulton Street approaching Greenwich Street (see **Figures 8-8 through 8-11**).

Streets-Open No-Action Condition

Under the streets-open scenario considered in earlier environmental assessments, Vesey Street would function as an unrestricted eastbound outlet from Route 9A into the WTC site and through to Broadway/Park Row. Fulton Street would provide contiguous westbound crosstown access from points east and the WTC site to both northbound and southbound Route 9A. Therefore, traffic volumes along these streets within the WTC site would be higher under this scenario than in the analyzed No-Action condition. These volumes would include both general background traffic that would divert from other routes in lower Manhattan, and new trips generated by development at the WTC site. Traffic volumes along both northbound and southbound Route 9A approaching Vesey Street would also increase as additional vehicles would continue along the Route 9A corridor to reach eastbound Vesey Street rather than enter the local street network at an upstream location.

With a shift of some general background traffic and WTC demand to Vesey and Fulton streets, it is expected that there would be a corresponding reduction in traffic along nearby alternate east-west corridors compared to the analyzed No-Action condition. Two-way Liberty Street at the south end of the WTC site is expected to see fewer trips, as are east-west corridors to the north of the WTC site such as eastbound Park Place, Warren Street and Chambers Street, and westbound Barclay and Murray streets. With fewer vehicles using eastbound Liberty Street to access Church Street, northbound traffic along Church Street adjacent to the WTC site is expected to be lower than in the analyzed No-Action condition. West Broadway would also see less traffic as some southbound drivers opt instead to continue along Route 9A to Vesey Street before entering the local street network.

Overall, the streets-open scenario would result in peak hour traffic networks with more dispersed eastbound-westbound flows than under the analyzed No-Action condition. Consequently, No-Action levels of service along crosstown corridors such as Chambers, Warren, Murray, Barclay and Liberty streets may be somewhat better under the streets-open scenario than under the analyzed No-Action condition. As there would likely be additional traffic along southbound Route 9A approaching Vesey Street, levels of service may be somewhat worse on this approach, which is already congested in the weekday AM, midday and PM peak hours under existing conditions. By contrast, there would likely be fewer vehicles using local north-south streets in the vicinity of the WTC site such as Broadway, West Broadway and Church Street, and levels of service along these corridors may be improved compared to the analyzed No-Action condition.

Implications of the Streets-Open No-Action Scenario with Respect to the With-Action Analysis

The streets-open No-Action scenario would not result in any change in the absolute numbers of peak hour vehicle trips projected to occur at analyzed intersections in the With-Action condition. It would, however, result in a change in the baseline condition from which the magnitude of the traffic diversions associated with the Proposed Project is measured. **Table 8-17** presents a comparison of the anticipated differences in traffic volume changes attributable to the Proposed Project in the weekday AM and PM commuter peak periods under the streets-open scenario and the analyzed No-Action condition. For example, there would likely be a greater number of vehicles traversing the WTC site along both Vesey and Fulton streets in the No-Action condition under the streets-open scenario, and therefore a correspondingly greater number of diversions from these streets to alternate crosstown corridors such as Park Place and Chambers, Warren, Murray and Barclay streets attributable to the Proposed Project. It is also likely that fewer vehicles would be using portions of West Broadway and Greenwich, Liberty and Church streets under a streets-open No-Action condition, and there would therefore be a smaller net reduction in traffic along these corridors attributable to the Proposed Project under this scenario. Traffic diversions to Broadway under the Proposed Project are expected to be somewhat higher under a streets-open scenario than under the analyzed No-Action condition.

Table 8-17
Potential Differences in AM and PM Peak Hour Net Project Increment Traffic Volumes Under the Streets-Open Scenario Compared to the Analyzed No-Action

Corridor	Potential Changes in Traffic Volumes Attributable to the Proposed Project	
	Analyzed No-Action Baseline	Streets-Open No-Action Baseline
Broadway	Increased traffic between Chambers St and Liberty St	Additional traffic diverted to Broadway from Park Pl to Vesey St
Trinity Place/Church Street	Reduced traffic between Liberty St and Fulton St	Smaller net reduction in traffic north of Liberty St
West Broadway	Reduced traffic	Smaller net reduction in traffic
Greenwich Street	Reduced traffic south of Barclay St	Smaller net reduction in traffic south of Barclay St
Route 9A (northbound)	Reduced traffic south of Barclay St	Greater net reduction in traffic south of Barclay St
Route 9A (southbound)	Increased traffic south of Murray St	Reduced traffic north of Barclay St
Chambers Street	Increased traffic	Additional traffic diverted to eastbound Chambers St
Warren Street	Increased traffic	Additional traffic diverted to Warren St west of Church St
Murray Street	Increased traffic	Additional traffic diverted to Murray St west of Church St
Park Place	Increased traffic	Additional traffic diverted to Park Pl
Barclay Street	Increased traffic	Additional traffic diverted to Barclay St
Vesey Street	Reduced traffic	Greater net reduction in traffic
Fulton Street	Reduced traffic	Greater net reduction in traffic
Liberty Street	Reduced traffic	Smaller net reduction in traffic

Notes:
Data represent corridors where a net change of $\geq$ 50 trips per hour would potentially occur.

With vehicles able to access an eastbound Vesey Street from Route 9A under a streets-open scenario, the Proposed Project would likely result in some net reductions in traffic along Route 9A in the vicinity of Vesey Street that would not occur under the analyzed No-Action condition (which has Vesey Street operating as a managed westbound street). Also, westbound operation of Vesey Street under the Proposed Project would eliminate the need for a southbound left-turn signal phase on Route 9A, potentially allowing more signal green time for other movements.

Implications of the Streets-Open No-Action Scenario with Respect to Pedestrian Conditions

The streets-open scenario would not result in any change in the numbers of peak hour pedestrian trips or pedestrian flow patterns projected to occur at analyzed sidewalks, corner areas or crosswalks compared to the analyzed No-Action scenario. However, associated changes in traffic flow patterns would likely result in some change in the interaction of vehicles and pedestrians at crosswalks under No-Action conditions. For example, there would likely be a greater number of vehicles traversing the WTC site along both Vesey and Fulton streets in the No-Action condition under the streets-open scenario, and therefore a correspondingly greater potential for vehicle-pedestrian conflicts along these corridors within the WTC Campus. With fewer vehicles projected to use alternate crosstown streets such as Park Place and Chambers, Warren, Murray and Barclay streets, there would likely be a corresponding reduction in vehicle-pedestrian interactions along these corridors. Portions of some north-south corridors such as West Broadway and Greenwich, Liberty and Church streets are also

expected to see fewer vehicles and therefore less potential for vehicle-pedestrian interaction at crosswalks in the No-Action condition under a streets-open scenario.

Eastbound operation of Vesey Street under a streets-open scenario would eliminate conflicts between westbound turning vehicles on the north and south crosswalks at Route 9A in the No-Action, but would instead result in additional potential for conflicts between turning vehicles and pedestrians along the east crosswalk on Vesey Street. Increased westbound traffic on Fulton Street under the streets-open scenario would also result in additional potential for conflicts with turning vehicles along the north crosswalk on Route 9A.

Summary

In summary, previous environmental reviews assumed that with redevelopment of the WTC site, Vesey Street would operate one-way eastbound, Fulton Street would operate one-way westbound with access to both northbound and southbound Route 9A, and both streets would be open to general traffic. Subsequent changes implemented to the design of 1 WTC necessitate more robust security measures in proximity to this tower than were previously considered, and current plans call for one-way westbound operation of Vesey Street approaching Route 9A and operation of both Vesey and Fulton streets as "managed streets" adjacent to 1 WTC. Route 9A is currently being constructed to accommodate this configuration, and will not include provision for either a southbound left turn from Route 9A onto an eastbound Vesey Street nor access to the southbound lanes of Route 9A from Fulton Street. This traffic network configuration is reflected in the No-Action baseline analyzed in this EIS.

Were the traffic analyses to assume a No-Action baseline condition with Vesey Street operating eastbound and both it and Fulton Street fully open to traffic, the result would be peak hour traffic networks with more dispersed eastbound-westbound flows than under the analyzed No-Action condition. It would also likely reflect additional traffic along the Route 9A corridor approaching Vesey Street and fewer vehicles using local north-south streets in the vicinity of the WTC site such as Broadway, West Broadway and Church Street. The incremental change attributable to the Proposed Project would therefore differ under the streets-open scenario compared to the analyzed No-Action condition. Traffic flows and levels of service at analyzed intersections with the Campus Security Plan would, however, remain unchanged irrespective of the baseline condition assumed.

H. TRANSIT

The proposed Campus Security Plan would not result in the development of new land uses that would generate additional demand on the transit systems serving the WTC site, although it is possible that the restrictions on vehicular access resulting from the Proposed Project may potentially reduce vehicular travel for persons en route to and from the World Trade Center and its environs. However, any potential increase in transit trips is expected to be relatively small in the context of the overall demand on the PATH system and the numerous subway, bus and ferry routes serving the site, and the numbers of such trips would be unlikely to exceed *CEQR Technical Manual* analysis thresholds for either the rail or bus modes at any one rail transit station or on any one bus route. For example, it is estimated that development at the WTC site will generate up to 2,368 peak hour person trips by auto and for-hire vehicle (in the PM). Even conservatively assuming that as much as 25 percent of these trips would shift from motor vehicles to transit as a result of measures associated with the proposed Campus Security Plan, this would represent a total increase in transit demand of only 592 trips per hour. Under *CEQR Technical Manual* criteria, the addition of fewer than 200 new trips at any one transit station or 50 trips on any one bus route (per direction) is considered unlikely to result in significant adverse impacts. Given that any trips potentially shifted from vehicular modes to transit would be distributed

among three on-site subway stations plus the Fulton Transit Center complex, more than two dozen local and express bus routes, the PATH system and up to three ferry terminals, this level of new demand would be unlikely to exceed the *CEQR Technical Manual* transit analysis thresholds in any peak hour. In addition, it should be noted that much of the access between rail transit facilities and new and existing development in the vicinity of the WTC site will occur below-grade and would not be directly affected by physical changes to the surface street network associated with the Proposed Project. Therefore, quantitative analyses of subway station and subway and bus line haul conditions are not warranted. As changes to the Project Area street network may potentially affect bus transit services operating along these streets, existing bus services operating in the vicinity of the WTC site and the Proposed Project's potential effects on these services are qualitatively discussed below.

Existing Condition

The street network in proximity to the WTC site is traversed by a substantial number of bus routes providing local, express and commuter services. Many of these services operate along the Broadway and Trinity Place/Church Street corridors and are en route to and from the Brooklyn-Battery Tunnel. The bus services operating in the study area are shown in **Tables 8-18 and 8-19** and **Figures 8-21 and 8-22**, and briefly discussed below.

Local Bus Services

The study area is served by six NYC Transit local bus routes that connect Downtown with other parts of Manhattan. As shown in **Table 8-18** and **Figure 8-21**, these include the M5, M5 Limited, M9, M20, M22 and M103 services. All of these routes operate on weekdays and weekends, although there is no M5 local service during weekday periods when the M5 Limited service is operating. All of these routes also originate/terminate in lower Manhattan, with the M5 and M20 operating to/from a connection to the Staten Island Ferry at South Ferry, the M103 operating to/from Park Row at City Hall, the M9 operating to/from South End Avenue in Battery Park City, and the M22 operating to/from North End Avenue in Battery Park City. The M5 provides local service along Broadway and the Greenwich Street/Trinity Place/Church Street corridor, while the M22 provides local service along Chambers Street.

Express and Commuter Bus Services

As shown in **Table 8-18** and **Figure 8-22**, a total of approximately 22 express bus routes operated by MTA NYC Transit and MTA Bus currently operate through the study area. These routes typically connect lower Manhattan with outlying areas in the outer boroughs. Four of the routes connect lower Manhattan with Brooklyn, one with the Bronx, four with Queens and 13 with Staten Island. Many of these express bus services operate only during the AM and PM peak periods on weekdays, and only seven operate on weekends. Frequencies vary from six to 30 minutes during weekday peak periods, with hourly frequencies common during the midday and on weekends. Broadway and Greenwich Street/Trinity Place/Church Street are the primary corridors for express bus services through lower Manhattan, with Battery Place and Route 9A providing access to and from the Brooklyn-Battery Tunnel. Three Staten Island express bus routes (the X3, X4 and X10) operate along Murray and Warren Streets, and a bus layover area for these routes has been designated along the north curb of Murray Street just east of Route 9A.

In addition to MTA NYC Transit and MTA Bus, a number of other bus operators also provide commuter service to lower Manhattan. These include Academy, Coach USA, Lakeland, New Jersey Transit and Suburban Transit which provide service from communities in New Jersey, and Martz Trailways and Trans-Bridge which provide service from Pennsylvania. As shown in **Table 8-19**, these

Table 8-18
Study Area MTA/NYC Transit Local and Express Bus Services

Bus Route	Route End Points		Lower Manhattan Corridors	Frequency of Service (minutes)			
				AM	MD	PM	Sat MD
NYCT Local Bus Service							
M5	South Ferry	Washington Heights	Broadway/Trinity Pl/Church St	-----	-----	-----	12
M5 Limited	South Ferry	Washington Heights	Broadway, Trinity Pl/Church St	6	11	11	-----
M9	City Hall	East 23rd Street	Park Row	11	15	12	15
M20	South Ferry	Lincoln Center	Chambers St, Rt. 9A, Battery Pl	17	15	15	15
M22	Battery Park City	Lower East Side	Chambers St	10	20	15	15
M103	City Hall	East 125th Street	Park Row	12	12	12	10
MTA/NYCT Brooklyn Express Bus Service							
BM1	Mill Basin	Midtown/Downtown	Trinity Pl/Church St	20	60	20	60
BM2	Canarsie/Spring Creek	Midtown/Downtown	Trinity Pl/Church St	20	60	30	60
BM3	Sheepshead Bay	Midtown/Downtown	Trinity Pl/Church St	15	60	20	60
BM4	Gerritsen Beach	Midtown/Downtown	Trinity Pl/Church St	15	60	30	60
MTA/NYCT Bronx Express Bus Service							
BxM18	Riverdale	Downtown	Trinity Pl/Church St, Broadway	15	--	30	--
MTA/NYCT Queens Express Bus Service							
QM7	Fresh Meadows	Downtown	Trinity Pl/Church St	8	--	20	--
QM8	Glen Oaks	Downtown	Trinity Pl/Church St	15	--	9	--
QM11	Forest Hills	Downtown	Trinity Pl/Church St	10	--	20	--
QM25	Glendale	Downtown	Trinity Pl/Church St	20	--	30	--
MTA/NYCT Staten Island Express Bus Service							
X1	Eltingville	Midtown	Trinity Pl/Church St	8	15	5	20
X3	New Dorp	Downtown	Trinity Pl/Church St, Warren St, Murray St	10	--	20	--
X4	Eltingville	Downtown	Trinity Pl/Church St, Warren St, Murray St	12	--	15	--
X8	Eltingville	Downtown	Trinity Pl/Church St	8	--	12	--
X10	Port Richmond	Midtown	Route 9A, Warren St, Trinity Pl/Church St, Broadway	10	30	20	30
X11	Travis	Downtown	Trinity Pl/Church St, Broadway	10	--	9	--
X12	Mariners Harbor	Midtown	Trinity Pl/Church St, Broadway	7	--	9	--
X14	Port Richmond	Midtown	Battery Pl	10	--	10	--
X15	Eltingville	Downtown	Trinity Pl/Church St	9	--	10	--
X17	Huguenot	Midtown	Trinity Pl/Church St, Broadway	6	--	8	60
X19	Huguenot	Downtown	Trinity Pl/Church St, Broadway	10	--	10	--
X27	Bay Ridge	Midtown	Trinity Pl/Church St, Broadway	7	30	10	--
X28	Sea Gate/ Bensonhurst	Manhattan	Trinity Pl/Church St, Broadway	8	60	8	--

Notes:
Frequency of service in peak direction is shown where frequency varies by direction.

Table 8-19
Study Area Non-MTA Commuter Bus Services

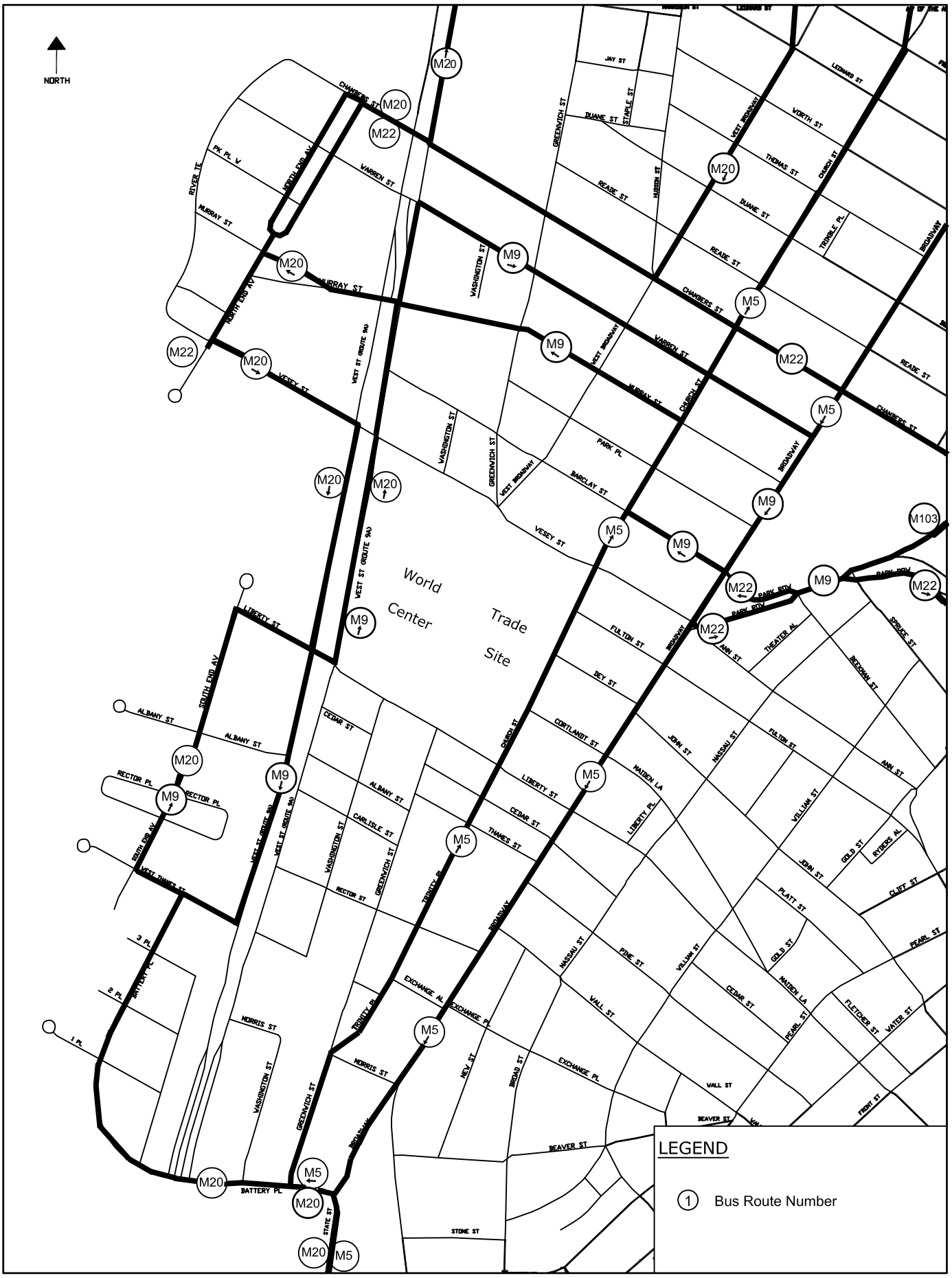
Bus Route	Route End Points		Lower Manhattan Corridors	Number of Peak Hour Buses			
				AM	MD	PM	Sat MD
Academy							
8A	East Windsor/Twin Rivers	Wall Street	Broadway/Trinity Pl/ Church St	4	---	4	---
Cheesequake	Cheesequake Service Area	Wall Street	Broadway/Trinity Pl/ Church St	7	---	6	---
Exit 109	GSP Exit 109 Park & Ride	Wall Street	Broadway/Trinity Pl/ Church St	3	---	0	---
Jackson	Lakewood	Wall Street	Broadway/Trinity Pl/ Church St	0	---	1	---
Parkway Express	Tom's River/Forked River/Brick	Wall Street	Broadway/Trinity Pl/ Church St	4	---	3	---
Red Bank	Red Bank NJT Rail Station	Wall Street	Broadway/Trinity Pl/ Church St	3	---	3	---
Route 36	Highlands/ Long Branch	Wall Street	Broadway/Trinity Pl/ Church St	4	---	3	---
Route 9	Lakewood/ Schibanoff	Wall Street	Broadway/Trinity Pl/ Church St	8	---	10	---
Sayreville	Winding Woods/ Harbor Club	Wall Street	Broadway/Trinity Pl/ Church St	3	---	3	---
Willingboro/ Westhampton	Willingboro	Wall Street	Broadway/Trinity Pl/ Church St	1	---	2	---
Coach USA							
Northern District-Nanuet	Nanuet	Wall Street	Broadway/Trinity Pl/ Church St	2	---	2	---
Lakeland Bus Lines							
Downtown/Wall Street	Mt. Arlington	Wall Street	Broadway/Trinity Pl/ Church St	1	---	2	---
New Jersey Transit							
120	Bayonne	Wall Street	Broadway/Trinity Pl/ Church St	2	---	2	---
Suburban Transit							
600	Princeton/ Old Bridge	Wall Street	Broadway/Trinity Pl/ Church St	10	---	8	---
Other							
Martz Trailways	Stroudsburg/ Blakeslee/Tobyhanna	Wall Street	Broadway/Trinity Pl/ Church St	7	---	3	---
Trans-Bridge Lines	Bethlehem	Wall Street	Broadway/Trinity Pl/ Church St	2	---	3	---

services add approximately 61 buses to the Broadway and Trinity Place/Church Street corridors during the AM commuter peak hour and 55 in the PM peak hour.

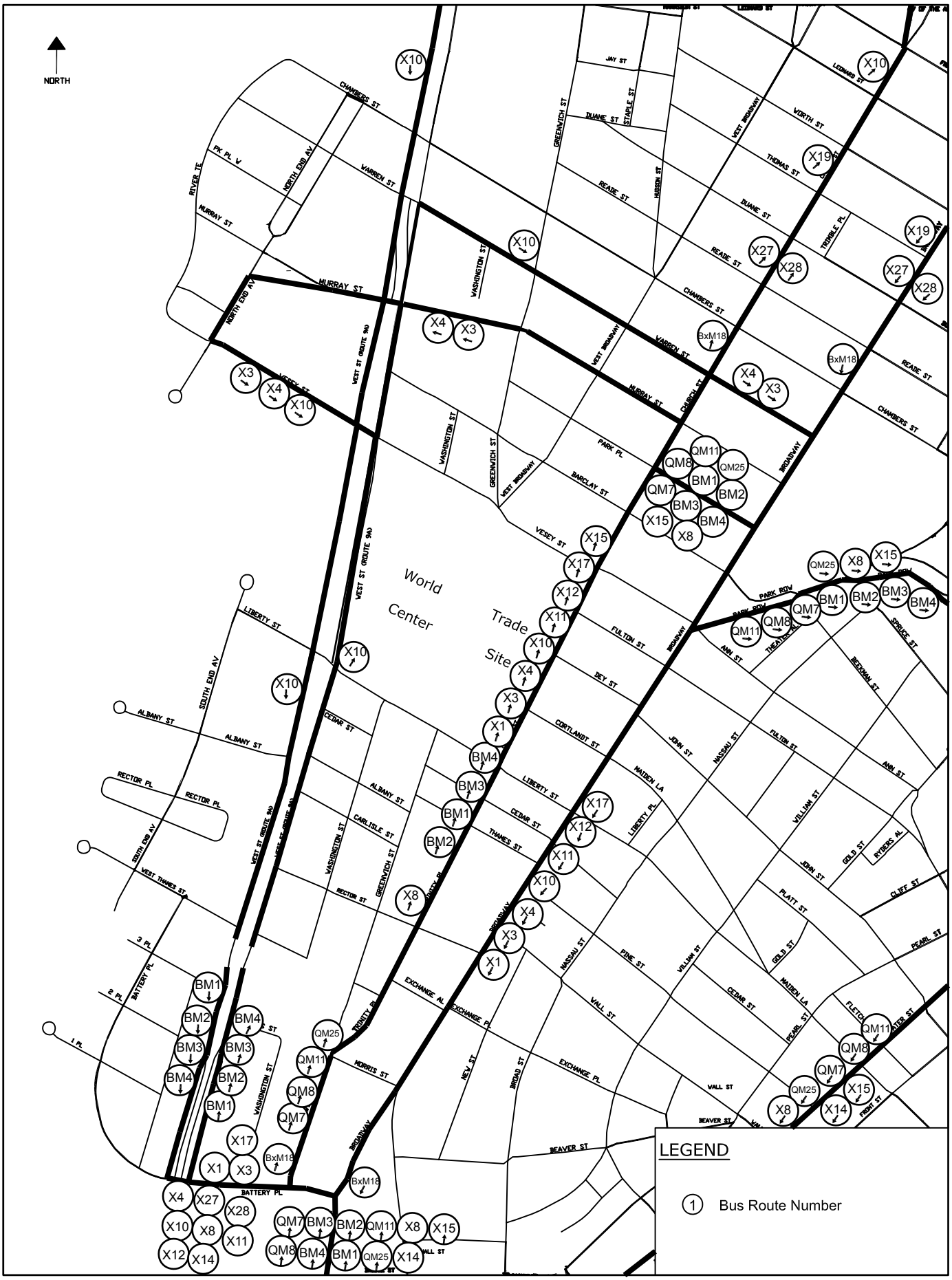
Other Bus Services

In addition to the local and commuter bus services described above, the Downtown Alliance (the local Business Improvement District in lower Manhattan) operates the Downtown Connection, a circulator bus service that connects the South Street Seaport area with South Ferry, Battery Park City and Tribeca. Within the study area the buses generally operate along Battery Place, West, Warren and Murray streets, and Broadway.

Local Bus Routes



Express Bus Routes



Tour buses are also a common presence along the study area street network. These include double-decker tour buses that provide hop-on, hop-off service along set routes (operators include CitySights, Gray Line and Big Taxi Tours), and charter buses bringing tour groups to attractions in lower Manhattan such as the 9/11 Memorial. Curbside locations that have been designated by NYCDOT for passenger loading/unloading by charter tour buses include:

- Battery Place south curb (except between 6 AM and 10 AM);
- Trinity Place east curb between Rector and Cedar streets (10 AM to 4 PM, Mo-Fr and 7 AM to 7 PM, Sa & Su);
- Church Street east curb from Barclay Street to Park Place (10 AM to 4 PM, Mo-Fr, and 7 AM to 7 PM, Sa & Su); and
- Vesey Street south curb (7 AM to 7 PM, Sa & Su only).

General tour bus parking (metered, three-hour maximum) is provided along the west curb of Greenwich Street between Battery Place and Morris Street. Parking for tour buses with NYCDOT placards (also metered, three-hour maximum) is provided along the north curb of Barclay Street between Church Street and Route 9A, and the east curb of Route 9A between Vesey and Murray Streets (both 10 AM to 4 PM, Mo-Fr and 7 AM to 7 PM, Sa & Su). Additional general tour bus parking is located along South Street to the east of the study area.

The Future Without the Proposed Project (No-Action)

In the 2019 No-Action condition, it is anticipated that demand on local and express bus routes operating in lower Manhattan is expected to increase as a result of background growth and demand from new development at the World Trade Center and other sites in the vicinity. As shown in **Table 8-8**, development at the WTC site is expected to add approximately 369 new local bus trips (in and out combined) in the weekday AM peak hour, 978 in the midday, 815 in the PM and 636 in the Saturday midday peak hour. New trips by express bus will total approximately 1,153, 153, 1,328 and 38 during these same periods, respectively. Tour bus trips generated primarily by the Memorial, Memorial Center and Tower 1 viewing platform are expected to total approximately 287, 1,513, 958 and 2,015, respectively. (As shown in **Table 8-9**, this would represent an estimated nine tour bus arrivals in the weekday AM peak hour, 33 in the midday, nine in the PM and 42 in the Saturday midday peak hour.)

As standard practice, NYC Transit and MTA Bus routinely conduct periodic ridership counts and increase service where operationally warranted and fiscally feasible. It is therefore anticipated that bus service frequency would be increased to address any shortfalls in capacity in the No-Action condition.

The Future With the Proposed Project (With-Action)

Under *CEQR Technical Manual* criteria, a proposed action is considered unlikely to cause significant adverse bus impacts if it is projected to result in fewer than 50 peak hour trips being assigned to a single bus line (in one direction). The proposed Campus Security Plan would not result in the development of new land uses that would generate additional demand on the bus services or other transit systems serving the project site, although it is possible that the restrictions on vehicular access resulting from the Proposed Project may potentially reduce vehicular travel for persons en route to and from the World Trade Center and its environs. However, any potential increase in transit trips is expected to be relatively small in the context of the overall demand on the numerous local, express and commuter bus routes serving the site (as well as the PATH system and numerous subway and ferry routes serving the area), and the numbers of such trips would be unlikely to exceed the 50-trip *CEQR Technical Manual* analysis threshold for any one bus route. Therefore, the Proposed Project is not expected to result in significant adverse bus impacts based on *CEQR Technical Manual* criteria.

It should also be noted that most of the segments of West Broadway and Greenwich, Washington, Vesey, Fulton and Liberty Streets that would be closed to general traffic under the Proposed Project are not currently traversed by any bus routes and are not expected to be used by scheduled bus services in the future No-Action. It is anticipated that the exclusive bus lane and the existing bus stops along the east side of Trinity Place and Church Street would be maintained with the introduction of a median along this corridor from Cedar Street to Vesey Street and the closure of the western-most travel lane to general traffic under the Proposed Project. In addition, the installation of curbside credentialing zones and security stations associated with the Proposed Project is not expected to result in the displacement of any existing bus stops or designated curbside bus parking areas.

As reflected in the traffic analysis data in **Table 8-16**, the Proposed Project is not expected to result in significant adverse impacts to northbound traffic flow along the Trinity Place/Church Street corridor, and at some locations would actually result in a reduction in peak hour vehicle trips and improved levels of service in one or more peak hours. This would potentially benefit the numerous bus services traversing this corridor. However, it should also be noted that there would be a potential for increased taxi pickup/drop-off activity along the east curb lane on Church Street adjacent to the WTC site, which functions as an exclusive bus lane in the AM and PM peak hours, and where numerous bus stops are located. In the No-Action condition, it is anticipated that much of the taxi and black car pickup and drop-off activity associated with WTC demand would occur within the WTC site (along Greenwich Street, for example). As much of the WTC retail development would be concentrated along Church Street, some taxi pickup/drop-off activity associated with retail uses in the No-Action condition would also likely occur along the west curb of Church Street between Liberty and Vesey streets as well as intersecting streets to the east (i.e., Liberty, Cortlandt, Dey and Fulton streets).

In the With-Action condition, it is anticipated that non-TAP taxis would not enter the WTC Campus and would instead pickup and drop-off passengers along nearby streets on the periphery. Non-TAP taxi trips associated with office and retail uses at Towers 2, 3 and 4 are the most likely to pickup/drop-off along Church Street. As the west curb adjacent to the WTC towers would no longer be accessible (due to the presence of the proposed security median), any relocated taxi activity occurring along Church Street would be expected to pickup/drop-off along the east curb lane and would therefore potentially affect the buses using this lane. However, it is important to note that (1) the majority of relocated taxi trips are expected to approach the WTC site from the east along Liberty, Cortlandt, Dey and Fulton streets, (2) most taxi passengers would be crossing to and from the west side of Church Street and will want to be dropped-off in proximity to the intersection crosswalks (rather than mid-block along Church Street), and (3) the very heavy bus traffic using the east curb lane on Church Street (especially in the weekday AM and PM peak hours) will likely discourage taxis from picking up and dropping off passengers along this curb. It is therefore anticipated that most of the non-TAP taxi pickup/drop-off activity would occur on the cross-street approaches to Church Street rather than on Church Street itself and would therefore not conflict with buses using the corridor. (Most of the effects of this pickup and drop-off activity would likely be felt along the cross-street approaches to Church Street which are not typically traversed by transit buses).

By contrast, as shown in **Table 8-16** and discussed above, the Proposed Project is expected to result in significant adverse impacts to traffic flow at three locations along Broadway, another heavily-traveled bus corridor that hosts an exclusive bus lane. Increased weekday peak period congestion along Broadway at Park Row/Barclay Street and Vesey Street/Park Row could potentially lengthen travel times for the bus services using this corridor, including NYC Transit's M5 route, eight MTA express bus routes, and a number of the non-MTA commuter bus services operating in lower Manhattan. Significant adverse traffic impacts and increased congestion are also expected in the With-Action condition along the Chambers Street corridor (used by NYC Transit's M20 and M22 buses) and Warren and Murray streets (used by NYC Transit's M9 buses). Potential mitigation to address the

Proposed Project's significant adverse traffic impacts (and thereby any potential effects on bus services) at these locations is discussed in Chapter 15, "Mitigation."

I. PEDESTRIANS

Although the Proposed Project would not generate additional pedestrian demand or change pedestrian access routes in the vicinity of the WTC site compared to the No-Action condition, the installation of security infrastructure (e.g., static barriers, personnel booths and equipment houses, etc.) would potentially reduce the amount of space available for pedestrian circulation at some locations. A total of 12 sidewalks were therefore selected for analysis based on the expected locations of new security infrastructure. Three corner reservoir areas and 10 crosswalks along the Church Street corridor and on the planned extension of Fulton Street were also included in the analysis in consultation with NYCDOT. The locations of these analyzed pedestrian facilities are shown in **Figure 8-2**. The following sections describe existing conditions at each analyzed pedestrian facility, expected future levels of service in the No-Action condition, physical changes proposed as part of the Campus Security Plan, and future levels of service with the Proposed Project.

Existing Conditions

Study Area Pedestrian Network

Sidewalks along the primary streets in the study area are typically 15 feet to 20 feet in width, and the area is characterized by heavy peak period pedestrian flows along corridors providing access to and from transit facilities (i.e., the PATH terminal, subway stations, ferry terminals and bus stops). On weekdays, pedestrian flows are predominantly comprised of a mix of workers, tourists and shoppers, while on Saturdays, tourists and shoppers predominate.

Much of the street network in the vicinity of the WTC site is currently disrupted by construction activity. Vesey Street is closed to vehicular traffic from Route 9A to Church Street, and currently functions as a pedestrian-only corridor that experiences very heavy pedestrian flows en route to and from the temporary PATH terminal entrance located at the intersection with Greenwich Street/West Broadway. The west sidewalk along Church Street is currently closed adjacent to the WTC site, and all pedestrians along this corridor are restricted to the east side of the street. Consequently, there are no crosswalks on Church Street between the north side of Liberty Street and the south side of Vesey Street. As the south crosswalk on Church Street at Vesey Street is currently closed, much of the demand en route between the temporary PATH terminal entrance and points east is concentrated on the north crosswalk. Pedestrian safety personnel are routinely stationed at this intersection to help control pedestrians.

The east side of Route 9A is currently closed to pedestrians from Cedar Street to Vesey Street, and there is no at-grade pedestrian crossing of Route 9A at either Vesey Street or Liberty Street. A temporary pedestrian bridge is provided across Route 9A at Vesey Street, and a second permanent pedestrian bridge is located at Liberty Street. Liberty Street is currently closed to pedestrians (and traffic) between Greenwich Street and Route 9A, and the nearest pedestrian corridor between the Liberty Street bridge and points east is at Albany Street.

Existing levels of service at analyzed sidewalks, corner reservoir areas and crosswalks are shown in **Tables 8-20 through 8-22** and described below.

Table 8-20
Existing Conditions Sidewalk Analysis

No.	Location	Effective Width (feet)	Peak 15-Minute Volumes			Flow Rate (PMF)			Platoon-Adjusted Level of Service		
			AM	MD	PM	AM	MD	PM	AM	MD	PM
S1	Vesey St between Route 9A & Washington St (North)	12.0	1,600	400	1,267	8.9	2.2	7.0	D	B	C
S2	Washington St between Barclay St & Vesey St (East)	2.5	63	129	37	1.7	3.4	1.0	B	C	B
S3	Washington St between Barclay St & Vesey St (West)	2.0	371	127	322	12.4	4.2	10.7	E	C	D
S4	Barclay St between Washington St & Greenwich St (south)	9.0	312	182	280	2.3	1.3	2.1	B	B	B
S5	West Broadway between Park Pl & Barclay St (East)	10.0	910	455	886	9.3	4.7	9.1	D	C	D
S6	Barclay St between West Broadway & Church St (south)	8.0	703	257	502	5.5	2.1	4.2	C	B	C
S7	Church St between Barclay St & Vesey St (West)	5.5	227	244	284	2.8	3.0	3.4	B	B	C
S8	Trinity Pl between Liberty St & Cedar St (West)	7.5	130	349	222	1.2	3.1	2.0	B	C	B
S9	Trinity Pl between Cedar St & Thames St (West)	10.0	190	440	321	1.3	2.9	2.1	B	B	B
S10	Greenwich St between Liberty St & Cedar St (East)	9.0	64	349	251	0.5	2.6	1.9	A	B	B
S11	Route 9A between Liberty St & Cedar St (East)	n/a	Closed			Closed			Closed		
S12	West Broadway between Barclay St & Vesey St (East)	6.0	823	263	940	9.1	2.9	10.4	D	B	D

Notes:
Methodology based on *CEQR Technical Manual* guidelines.
PMF – persons per minute per foot of effective width.

Table 8-21
Existing Conditions Corner Analysis

No.	Intersection	Corner	SFP			Level of Service		
			AM	MD	PM	AM	MD	PM
C1	Church Street @ Vesey Street	Northwest	<0.1	33.9	10.8	F	C	E
C2	Church Street @ Liberty Street	Northwest	Closed			Closed		
C3	Church Street @ Liberty Street	Southwest	161.7	25.2	71.8	A	C	A

Notes:
Methodology based on *CEQR Technical Manual* guidelines.
SFP – square feet per pedestrian.

Table 8-22
Existing Conditions Crosswalk Analysis

No.	Location	Crosswalk	Crosswalk Length (feet)	Crosswalk Width (feet)	Peak 15-Minute Volumes			SFP			Level of Service		
					AM	MD	PM	AM	MD	PM	AM	MD	PM
X1	Fulton Street at Route 9A	East	Closed	Closed	Closed			Closed			Closed		
X2	Vesey Street at Church Street	West	Closed	Closed	Closed			Closed			Closed		
X3	Church Street at Vesey Street	North	59.5	16	4,190	1,175	3,446	1.6	12.4	3.0	F	E	F
X4	Church Street at Fulton Street	North	Closed	Closed	Closed			Closed			Closed		
X5	Church Street at Dey Street	North	Closed	Closed	Closed			Closed			Closed		
X6	Liberty Street at Church Street	West	Closed	Closed	Closed			Closed			Closed		
X7	Church Street at Liberty Street	North	Closed	Closed	Closed			Closed			Closed		
X8	Church Street at Liberty Street	South	41	10	246	1,303	524	34.4	4.1	14.2	C	F	E
X9	Church Street at Vesey Street	South	Closed	Closed	Closed			Closed			Closed		
X10	Church Street at Cortlandt Street	North	Closed	Closed	Closed			Closed			Closed		

Notes:
Methodology based on *CEQR Technical Manual* guidelines.
SFP – square feet per pedestrian.
n/a – data not available in Existing condition.

Sidewalks

Vesey Street

The north sidewalk along Vesey Street between Washington Street and Route 9A (location S1 on **Figure 8-2**) was selected for analysis as it is expected that static barriers would be placed across this sidewalk near Route 9A in both the No-Action and With-Action conditions to prevent vehicles from using it to enter the WTC Campus. The effective width of this sidewalk includes space under an arcade that is part of the adjacent Verizon Building (140 West Street). Due to ongoing construction activity, approximately 15 feet of sidewalk width is currently available for pedestrian circulation, and the west end of the sidewalk terminates at the landing for the temporary pedestrian bridge over Route 9A. As shown in **Table 8-20**, this sidewalk currently operates at LOS D, B and C in the weekday AM, midday and PM peak hours, respectively.

Washington Street

The entry/exit sally port planned for Washington Street between Barclay and Vesey streets under the Proposed Project is expected to include a personnel booth and equipment house along the east sidewalk (S2) and static barriers along the west sidewalk (S3), and both sidewalks were therefore selected for

analysis. They are approximately 14 feet and 13 feet in width respectively; however, the effective width available for pedestrian flow is currently constrained by existing security infrastructure located midblock. This includes personnel booths on the west sidewalk and gate supports and large concrete blocks along both sidewalks. Sidewalk S2 currently operates at LOS B in the AM and PM peak hours and LOS C in the midday. Sidewalk S3 currently operates at a congested LOS E in the AM and at LOS C and D in the midday and PM peak hours, respectively.

Barclay Street

Along Barclay Street, both the south sidewalk between Greenwich and Washington streets (S4) and the south sidewalk between Church Street and West Broadway (S6) were selected for analysis as it is expected that personnel booths for credentialing would be installed at these locations under the Proposed Project. These sidewalks are approximately 15 and 14 feet in width, respectively, and S4 currently operates at LOS B in all analyzed peak hours, while S6 currently operates at LOS C in the AM and PM and LOS B in the midday peak hour. Field observations indicate that existing pedestrian volumes along Barclay Street east of West Broadway reflect demand en route to and from the temporary PATH terminal entrance one block to the south.

It is also anticipated that curbside static barriers would be installed on the perimeter of a triangular pedestrian plaza bounded by West Broadway and Barclay and Greenwich streets. These static barriers would be located along the south sidewalk on Barclay Street between West Broadway and Greenwich streets as well as at the southwest corner of Barclay Street and West Broadway and the southeast corner of Barclay Street and Greenwich Street. It should be noted, however, that (1) pedestrian volumes are typically dispersed among various pathways through the plaza and not solely concentrated on adjacent sidewalks; (2) the northbound Greenwich Street approach to Barclay Street is stop-controlled, therefore pedestrians crossing at the south crosswalk at this intersection have the right of way and the pedestrian movement is considered uninterrupted (and therefore not analyzed); (3) the locations of the plaza's planting beds provide ample space for pedestrian circulation and queuing at the southwest corner of West Broadway and Barclay Street; and (4) under future conditions, the installation of a sally port on West Broadway south of Barclay Street would meter vehicular traffic conflicting with pedestrians on the south crosswalk at this location -- i.e., when the outer barrier is raised, pedestrians would be able to cross at this location uninterrupted, regardless of the signal. Given these factors, the installation of curbside static barriers adjacent to this pedestrian plaza is not expected to significantly affect pedestrian flows in and around the plaza, and these pedestrian elements were therefore not selected for analysis.

West Broadway

The east sidewalk on West Broadway between Park Place and Barclay Street (S5) was selected for analysis as it is expected that a personnel booth for credentialing would be installed at this location with the Proposed Project. This sidewalk is approximately 16 feet in width, and currently operates at LOS D in the AM and PM peak hours and LOS C in the midday.

Under the Proposed Project, a sally port would be located on West Broadway between Barclay and Vesey streets. Although it is anticipated that the personnel booth and equipment house for this sally port would be accommodated on an extension of the adjacent east sidewalk (S12) with little or no reduction in pedestrian space, this sidewalk is included in the analysis to assess the potential effects of static barriers located at the south end of the block. This sidewalk is approximately 25 feet in width, and two curb cuts located at its southern and northern ends provide access and egress, respectively, for U.S. Post Office trucks serving a below-grade loading area beneath the adjacent Federal Office Building (90 Church Street). Sidewalk S12 currently operates at LOS D in the AM and PM peak hours and LOS B in the

midday. Much of the existing pedestrian demand is generated by the temporary PATH terminal entrance at the south end of the block.

Church Street

The west sidewalk on Church Street between Vesey and Barclay streets (S7) was selected for analysis to assess the potential effects of the installation of static barriers adjacent to the exit-only sally port planned for this location under the Proposed Project. (It is anticipated that the personnel booth and equipment house for this sally port would be accommodated on a sidewalk extension and would not occupy space on the existing sidewalk.) This sidewalk is approximately 15 feet in width and currently operates at LOS B in the AM and midday peak hours and LOS C in the PM. Field observations indicate that during peak periods much of the existing pedestrian demand on this sidewalk is generated by the temporary PATH terminal entrance one block to the east on Vesey Street, and by subway station entrance/exit stairs at both ends of the block.

Trinity Place

The west sidewalk on Trinity Place between Cedar and Liberty streets (S8) is analyzed to assess the potential effects of the installation of a personnel booth, equipment house and static barriers adjacent to the entry sally port at this location under the Proposed Project. This sidewalk is approximately 19 feet in width and currently operates at LOS B in the AM and PM peak hours and LOS C in the midday.

The west sidewalk on Trinity Place between Thames and Cedar streets (S9) is analyzed to assess the potential effects of the installation of a personnel booth for credentialing at this location under the Proposed Project. This sidewalk is approximately 20 feet in width approaching Cedar Street (and somewhat wider at its southern end), and currently operates at LOS B in all three analyzed peak hours.

Greenwich Street

The east sidewalk on Greenwich Street between Liberty and Cedar streets (S10) is analyzed to assess the potential effects of the installation of static barriers adjacent to the exit-only sally port at this location under the Proposed Project. (It is anticipated that the west sidewalk at this location would be extended to accommodate a personnel booth, equipment house and additional static barriers for this sally port with little or no reduction in pedestrian space.) Sidewalk S10 narrows from approximately 20 feet in width at its northern end to 15.5 feet in width approaching Cedar Street, and there is presently a temporary construction fence along the curb. It currently operates at LOS A in the AM peak hour and LOS B in the midday and PM at its most constrained point at the south end of the block. It should be noted, however, that field observations did identify periodic congestion at the north end of the block due to pedestrians congregating at the adjacent FDNY Memorial Wall.

Route 9A (West Street)

The east sidewalk on Route 9A between Cedar and Liberty streets (S11) is analyzed to assess the potential effects of the installation of a personnel booth for credentialing at this location under the Proposed Project. This sidewalk is currently closed to pedestrians due to construction.

Corner Areas and Crosswalks

Church Street at Vesey Street

As noted above, Vesey Street is closed to traffic west of Church Street and it currently functions as a pedestrian-only corridor that experiences very heavy pedestrian flows en route to and from the temporary bridge over Route 9A at Vesey Street and the temporary PATH terminal entrance located at its intersection with Greenwich Street/West Broadway. There is currently no west crosswalk on Vesey Street (location X2 in **Figure 8-2**), and as the south crosswalk on Church Street (X9) is also closed, much of the demand en route between the temporary PATH terminal entrance and points east is concentrated on the 16-foot-wide north crosswalk (X3). Pedestrian safety personnel are routinely stationed at this intersection to help control pedestrians. As shown in **Tables 8-21 and 8-22**, crosswalk (X3) currently operates at a congested LOS F in the AM and PM peak hours and LOS E in the midday, and the adjacent northwest corner area (location C1 in **Figure 8-2**) currently operates at LOS F, C and E during the AM, midday and PM peak hours, respectively, reflecting the heavy pedestrian flows currently using the Vesey Street corridor.

Church Street at Liberty Street

The north crosswalk on Church Street at Liberty Street (X7) is currently closed due to construction at the WTC site, as is the west crosswalk on Liberty Street (X6) and the adjacent northwest corner area (C2). All of the demand crossing Church Street at this intersection is therefore concentrated on the 10-foot-wide south crosswalk (X8) which currently operates at LOS C in the AM and a congested LOS F and E in the midday and PM peak hours, respectively. The adjacent southwest corner area (C3) currently operates at LOS A, C and A during these periods, respectively.

Other Church Street Locations

As noted above, the west sidewalk along Church Street is currently closed adjacent to the WTC site, and all pedestrians along this corridor are restricted to the east side of the street. Consequently, none of the crosswalks on Church Street between the north side of Liberty Street and the south side of Vesey Street are open to pedestrians in the existing condition. In addition to the north crosswalk at Liberty Street (X7) and the south crosswalk at Vesey Street (X9), analyzed crosswalks along Church Street that are not open in the existing condition include the north crosswalk at Fulton Street (X4), the north crosswalk at Dey Street (X5) and the north crosswalk at Cortlandt Street (X10). As described below, all of these crosswalks are expected to be open to pedestrians in the No-Action condition.

Fulton Street

With redevelopment of the WTC site, it is expected that Fulton Street will be extended to Route 9A from its current terminus at Church Street. The crosswalk planned for Fulton on the east side of Route 9A (X1) is included in the analysis as it would likely traverse a planned sally port at this location in both the No-Action and With-Action conditions.

The Future Without the Proposed Project (No-Action)

In the 2019 future without the Proposed Project, it is expected that towers 1 through 4 and the retail space at the WTC site will be completed and fully occupied; that the Performing Arts Center, the Vehicular Security Center, the Memorial Center and the Transit Hub will be completed and operational; and that the temporary PATH entrance on Vesey Street will be closed. It is also expected that the reconstruction of Route 9A adjacent to the WTC site will have been completed and that the Cortlandt Street (1) subway

station will reopen at Greenwich and Cortlandt streets. These No-Action projects are expected to result in both physical changes to the study area pedestrian network and in substantial changes to pedestrian flow patterns. These changes and the anticipated No-Action levels of service at analyzed sidewalks, corner areas and crosswalks are discussed below.

Changes to the Study Area Pedestrian Network in the No-Action Condition

The following changes to the pedestrian network in the vicinity of the WTC site are anticipated in the 2019 future without the Proposed Project:

- As shown in **Figure 8-7**, Greenwich Street will be extended through the WTC site and open to vehicular traffic and pedestrians.

- Fulton Street will be extended through the WTC site and open to pedestrians from its current terminus at Church Street to a new signalized intersection with northbound Route 9A. It is expected that vehicular traffic along the segment of Fulton Street adjacent to Tower 1 will be managed through the installation of two sally ports, one adjacent to Route 9A and a second at midblock. As the outer barrier for the sally port at Route 9A would be located immediately adjacent to the Route 9A travel lanes, it is anticipated that a 22-foot-wide crosswalk will be provided through the sally port (location X1 in **Figure 8-2**), and that the stop line for vehicles within the sally port will be set back to accommodate this crosswalk. A crosswalk will also be provided across Route 9A on the north leg of the intersection.

- Currently closed portions of Vesey Street and Liberty Street will be reopened to vehicular traffic and pedestrians. Like the parallel segment of Fulton Street, vehicular traffic along the segment of Vesey Street adjacent to Tower 1 is expected to be managed through the installation of two sally ports, one near Route 9A and a second west of Greenwich Street. It is anticipated that the sally port at Route 9A will be set back from the crosswalk on Vesey Street and that the north sidewalk on Vesey Street east of Route 9A will be extended to accommodate a personnel booth, equipment house. Static barriers will also likely be placed across this sidewalk (Location S1 in **Figure 8-2**) near in proximity to the sally port to prevent vehicles from using it to enter the WTC site.

- It is expected that the existing security infrastructure along Washington Street between Barclay and Vesey streets (a personnel booth on the west sidewalk [S3] and gate supports and large concrete blocks along both sidewalks) will be replaced by a movable barrier at the south end of the block with a personnel booth along the east sidewalk (S2) and static barriers across both sidewalks.

- The west sidewalk along Church Street will be reopened to pedestrians and all currently closed crosswalks along the Church Street corridor will be restored. It is expected that the restored crosswalks on Church Street -- locations X4, X5, X7, X9 and X10 in **Figure 8-2** -- will be 12 feet, 15 feet, 18 feet, 20 feet and 15 feet in width, respectively. The west crosswalk on Liberty Street (X6) is expected to be 18 feet in width and the west crosswalk on Vesey Street (X2) is expected to be 20 feet in width.

- New pedestrian corridors will be created between Church and Greenwich streets along the approximate alignments of Dey Street and Cortlandt Street.

- A new underground concourse will extend through the WTC site from the World Financial Center (via a pedestrian tunnel beneath Route 9A) to Church Street, with below-grade connections to all four office towers, the Transit Hub and retail concourses, and the Cortlandt

Street (1), Cortlandt Street (R) and World Trade Center (E) subway stations. A passageway beneath Dey Street will connect this concourse to the Fulton Transit Center at Broadway.

- Street-level access to the Cortlandt Street (R) station from the west side of Church Street will be restored.

- The east sidewalk along Route 9A adjacent to the WTC site will be reopened to pedestrians and will be 25 feet in width.

- The temporary pedestrian bridge over Route 9A at Vesey Street will be closed and the crosswalks reopened on all four approaches at this intersection.

- The temporary access from Albany Street to the Route 9A pedestrian bridge at Liberty Street will be closed, and the bridge will connect the World Financial Center to the new Liberty Park above the VSC.

- Unrestricted pedestrian access to the Memorial Plaza will be provided at two locations along each of the four street frontages (Greenwich Street on the east, Route 9A on the west, Fulton Street on the north and Liberty Street on the south.

- Static barriers will be installed along most sidewalks on the perimeter and within the WTC Campus to protect towers 1 through 4, the Transit Hub, the PAC and the Memorial and Memorial Center from vehicle-borne threats.

Pedestrian Flows in the No-Action Condition

As shown in **Table 8-8**, travel demand from new development planned by 2019 at the World Trade Center is expected to add a total of approximately 21,929, 35,442, 31,173 and 17,572 new person trips to and from the WTC site in the weekday AM, midday, PM and Saturday midday peak hours. These include 5,294, 24,429, 8,246 and 9,202 walk-only trips per hour in each period, respectively, and 14,826, 7,140, 19,406 and 4,724 trips per hour, respectively, en route to and from area transit facilities (the Transit Hub, subway stations, bus stops and ferry terminals). There would also be additional pedestrian demand from new development outside of the WTC site as well as from general background growth.

In addition to a substantial increase in pedestrian travel demand by 2019, flow patterns will be markedly different from existing conditions due to the many planned changes to the pedestrian network outlined above. Primary among these will be the opening of the underground concourse through the WTC site. With below-grade connections to all new office and retail developments, the Transit Hub and all area subway stations, much of the new pedestrian demand at the WTC site as well as many existing pedestrian trips are expected to use this concourse and would therefore not occur on sidewalks and crosswalks at street-level. With the closure of the temporary PATH entrance on Vesey Street, pedestrian flows along the Vesey Street corridor will likely decrease during commuter peak periods compared to current demand.

Creating a complete No-Action baseline pedestrian network from new count data proved infeasible as current pedestrian flows at many of the analysis locations have been disrupted or diverted due to ongoing construction activity, and six of the eight crosswalks and two of the three corner areas recommended for analysis by NYCDOT, as well as one of the analyzed sidewalks, do not currently exist. Given this and the fact that future pedestrian flow patterns with the Transit Hub and below-grade pedestrian connections will be substantially different from current conditions, the future No-Action pedestrian network for this analysis was developed based on the 2025 design year AM, midday and PM peak hour pedestrian volumes developed for the May 2005 *Permanent WTC PATH Terminal FEIS*. These volumes, included in

the *Transportation Planning Factors Technical Memorandum* provided in Appendix D, reflect anticipated future conditions with completion of all development and transportation improvements at the WTC site, including the Transit Hub and below-grade pedestrian connections. They were calculated as a joint effort between the Port Authority of New York and New Jersey for the *Permanent WTC PATH Terminal FEIS*, and the Metropolitan Transportation Authority, New York State Department of Transportation and Lower Manhattan Development Corporation for other EISs prepared by these respective agencies.

Use of these 2025 networks for the analysis of 2019 conditions with and without the proposed Campus Security Plan can be considered a conservative approach as they reflect a substantially larger development program (and therefore greater pedestrian travel demand) at the WTC site than is currently planned, and include development of Tower 5, which is now not expected to occur by the 2019 analysis year for the Campus Security Plan. They also incorporate a background growth rate of 0.5 percent per year through 2025 in addition to demand from numerous other development projects planned for lower Manhattan. By contrast, the 2012 *CEQR Technical Manual* specifies a smaller 0.25 percent annual background growth rate for years 1 through 5 and a 0.125 percent annual growth rate for all subsequent years.

Pedestrian Levels of Service in the No-Action Condition

Sidewalks

Table 8-23 shows the forecasted No-Action peak 15-minute pedestrian flow volumes and levels of service along analyzed sidewalks during the weekday AM, midday and PM peak hours. As shown in **Table 8-23**, all but four sidewalks are expected to operate at a marginally acceptable LOS D or better in all peak hours in the No-Action condition. These include the east sidewalk on West Broadway north of Barclay Street (S5) which is expected to operate at LOS E in the midday; the south sidewalk on Barclay Street west of Church Street (S6) and the west sidewalk along Trinity Place south of Liberty Street (S8), both of which are expected to operate at LOS E in the AM peak hour; and the west sidewalk on Church Street between Barclay and Vesey streets (S7) which is expected to operate at LOS E in the PM.

Corner Areas and Crosswalks

Tables 8-24 and 8-25 show the forecasted No-Action peak 15-minute pedestrian flow volumes and levels of service along analyzed corner areas and crosswalks during the weekday AM, midday and PM peak hours. As shown in **Table 8-24**, all three analyzed corner areas are expected to operate at LOS D or better in all peak hours in the No-Action condition. As shown in **Table 8-25**, four crosswalks are expected to operate at LOS E or F in one or more periods in the No-Action. The east crosswalk on Fulton Street at Route 9A (X1) is expected to operate at LOS E in the midday, as is the west crosswalk on Vesey Street at Church Street (X2) in the PM and the west crosswalk on Liberty Street at Church Street (X6) in the AM. The north crosswalk on Church Street at Liberty Street (X7) is expected to operate at LOS F in both the AM and PM peak hours, primarily due to conflicts between heavy pedestrian flows and vehicles turning from eastbound and westbound Liberty Street onto Church Street. During other peak periods, these four crosswalks are expected to operate at LOS D or better, as are all other analyzed crosswalks in all periods.

Table 8-23
No-Action Conditions Sidewalk Analysis

No.	Location	Effective Width (feet)	Peak 15-Minute Volumes			Flow Rate (PMF)			Platoon-Adjusted Level of Service		
			AM	MD	PM	AM	MD	PM	AM	MD	PM
S1	Vesey St between Route 9A & Washington St (North)	11	558	786	477	3.4	4.8	2.9	C	C	B
S2	Washington St between Barclay St & Vesey St (East)	2.5	59	262	17	1.6	7.0	0.5	B	D	A
S3	Washington St between Barclay St & Vesey St (West)	4.5	140	251	122	2.1	3.7	1.8	B	C	B
S4	Barclay St between Washington St & Greenwich St (south)	9	141	358	120	1.0	2.7	0.9	B	B	B
S5	West Broadway between Park Pl & Barclay St (East)	6.5	892	1,409	833	9.2	14.5	8.5	D	E	D
S6	Barclay St between West Broadway & Church St (south)	8	1,349	1,179	827	11.2	9.8	6.9	E	D	D
S7	Church St between Barclay St & Vesey St (West)	5.5	828	778	979	10.0	9.4	11.9	D	D	E
S8	Trinity Pl between Liberty St & Cedar St (West)	7.5	1,334	316	739	11.9	2.8	6.6	E	B	D
S9	Trinity Pl between Cedar St & Thames St (West)	14	1,256	337	759	6.0	1.6	3.6	C	B	C
S10	Greenwich St between Liberty St & Cedar St (East)	12.5	760	941	562	4.1	5.0	3.0	C	C	B
S11	Route 9A between Liberty St & Cedar St (East)	11.5	202	259	206	1.2	1.5	1.2	B	B	B
S12	West Broadway between Barclay St & Vesey St (East)	19	850	1,400	871	3.0	4.9	3.1	B	C	C

Note:
Methodology based on *CEQR Technical Manual* guidelines.
PMF – persons per minute per foot of effective width.

Table 8-24
No-Action Conditions Corner Analysis

No.	Intersection	Corner	SFP			Level of Service		
			AM	MD	PM	AM	MD	PM
C1	Church Street at Vesey Street	Northwest	23.5	27.9	17.0	D	C	D
C2	Church Street at Liberty Street	Northwest	25.2	119.6	49.1	C	A	B
C3	Church Street at Liberty Street	Southwest	18.5	62.4	25.7	D	A	D

Notes:
Methodology based on *CEQR Technical Manual* guidelines.
SFP – square feet per pedestrian.

Table 8-25
No-Action Conditions Crosswalk Analysis

No.	Location	Crosswalk	Crosswalk Length (feet)	Crosswalk Width (feet)	Peak 15-Minute Volumes			SFP			Level of Service		
					AM	MD	PM	AM	MD	PM	AM	MD	PM
X1	Fulton St at Route 9A	East	22	22	897	1,657	1,120	23.8	9.9	16.1	D	E	D
X2	Vesey St at Church St	West	27	20	914	867	1,312	21.0	17.9	10.8	D	D	E
X3	Church St at Vesey St	North	65	13	587	461	503	16.1	28.9	25.4	D	C	C
X4	Church St at Fulton St	North	48	12	294	679	297	37.2	15.4	37.6	C	D	C
X5	Church St at Dey St	North	48	15	209	333	238	62.0	44.4	64.2	A	B	A
X6	Liberty St at Church St	West	38	18	1,623	365	913	9.5	59.2	19.4	E	B	D
X7	Church St at Liberty St	North	48	18	1,685	601	1,110	5.4	19.4	6.6	F	D	F
X8	Church St at Liberty St	South	41	17	475	273	327	29.7	55	48.3	C	B	B
X9	Church St at Vesey St	South	48	20	535	523	686	29.2	38.4	28.4	C	C	C
X10	Church St at Cortlandt St	North	48	15	320	507	473	41.7	25.2	28.8	B	C	C

Notes:
Methodology based on *CEQR Technical Manual* guidelines.
SFP – square feet per pedestrian.

The Future with the Proposed Project (With-Action)

The Proposed Project would not generate additional pedestrian demand nor is likely to change pedestrian access routes in the vicinity of the WTC site compared to the No-Action condition. However, the installation of security infrastructure would potentially reduce the amount of space available for pedestrian circulation at some locations. Although designs for this infrastructure have not been finalized, it is assumed for analysis purposes that personnel booths and equipment houses would occupy approximately seven feet of sidewalk width (including a one-foot setback from the curb), and that static barriers would typically be one foot in diameter with a maximum of four feet of space to either side. (However, as there is existing sidewalk furniture at many of the locations where new security infrastructure would be installed, the net reduction in effective sidewalk width from the No-Action condition would often be less.) The following describes the physical changes proposed at each pedestrian analysis location as part of the Campus Security Plan, and future levels of service with the Proposed Project.

Changes to the Study Area Pedestrian Network with the Proposed Project

The following outlines the changes to the pedestrian network in the vicinity of the WTC site that are anticipated to result from implementation of the Proposed Project.

Vesey Street at Route 9A

It is anticipated that an exit-only sally port would be installed on Vesey Street immediately east of Route 9A under both No-Action and With-Action conditions, and that the north sidewalk on Vesey Street east of Route 9A (Location S1 in **Figure 8-2**) would be extended to accommodate the personnel booth and equipment house. Under both No-Action and With-Action conditions, static barriers would also be placed across the north sidewalk in proximity to the sally port as well as at curbside along the south sidewalk to prevent vehicles from using either sidewalk to enter the WTC site. Therefore, no net change in effective width is anticipated along the north sidewalk from the No-Action condition to the With Action condition is anticipated.

Washington Street at Barclay Street

Under both No-Action and With-Action conditions, an entry/exit sally port would be installed on Washington Street between Barclay and Vesey streets, along with a personnel booth and equipment house along the east sidewalk and static barriers across both the east and west sidewalks (S2 and S3). Therefore, no changes in sidewalk effective widths are expected with implementation of the Proposed Project. However, the personnel booth for credentialing that would be installed on the south sidewalk on Barclay Street east of Washington Street (S4) under the Proposed Project is expected to reduce the effective width of this sidewalk from nine feet to approximately 5.5 feet.

West Broadway at Barclay Street

The east sidewalk on West Broadway between Barclay and Vesey streets (S12) would be extended to accommodate a personnel booth and equipment house for an adjacent sally port, with an approximately 16.5-foot clear path provided for pedestrians at the north end of the block. However, static barriers installed at the south end of the block would reduce the effective sidewalk width at this location from 19 feet to approximately 11 feet. The personnel booth for credentialing that would be installed along the south sidewalk on Barclay Street east of West Broadway (S6) would reduce the effective width at this location to approximately 4.5 feet from eight feet. As an existing food vendor occupies the location of the proposed credentialing booth on the east sidewalk of West Broadway north of Barclay Street (S5), there would be no net change in the effective width of this sidewalk under the Proposed Action.

Church Street at Vesey Street

The west sidewalk along Church Street north of Vesey Street (S7) would be extended to accommodate a personnel booth and equipment house for an adjacent sally port, with an approximately 16-foot clear path provided for pedestrians. However, static barriers installed across the existing sidewalk in proximity to the personnel booth would result in an effective width of approximately 7.5 feet on this sidewalk compared to an effective width of approximately 5.5 feet adjacent to existing subway stairs at the north end of the block (the most restricted location in the No-Action condition). It is also anticipated that two static barriers would be installed within the north crosswalk on Church Street (X3) and four within the south crosswalk (X9) in line with the proposed median along the street.

Church Street at Fulton Street, Dey Street and Cortlandt Street

At both the Dey Street/Church Street and Cortlandt Street/Church Street intersections, it is expected that three static barriers would be installed within the analyzed north crosswalks (X5 and X10, respectively) in line with the proposed median along Church Street. It is expected that two static barriers would be installed within the 12-foot-wide north crosswalk at the Fulton Street/Church Street intersection (X4).

Trinity Place/Church Street at Liberty Street

A sally port personnel booth and equipment house as well as static barriers would be installed along the west sidewalk on Trinity Place south of Liberty Street (S8). (An existing newsstand would likely need to be relocated.) The sidewalk effective width would decrease from 7.5 feet to approximately 5.5 feet. Three static barriers would also be installed within both the north (X7) and south (X8) crosswalks on Trinity Place/Church Street in line with the proposed median along this corridor.

Trinity Place at Cedar Street

A credentialing personnel booth would be installed along the west sidewalk on Trinity Place south of Cedar Street (S9), reducing the effective sidewalk width from 14 feet to 10.5 feet.

Greenwich Street at Liberty Street

The west sidewalk on Greenwich Street south of Liberty Street would be extended to accommodate a sally port personnel booth and equipment house at this location, and no reduction in overall pedestrian space is anticipated. However, static barriers placed across the east sidewalk (S10) would reduce the effective width from 12.5 feet to approximately eight feet.

Route 9A at Liberty Street

A credentialing personnel booth would be installed along the east sidewalk on Route 9A south of Liberty Street (S11), reducing the effective width at this location from 11.5 feet to approximately six feet.

Fulton Street at Route 9A

It is anticipated that an exit-only sally port would be installed on Fulton Street immediately adjacent to Route 9A under both No-Action and With-Action conditions, and that the north sidewalk on Fulton Street would be extended to accommodate the sally port personnel booth and equipment house with no net reduction in effective sidewalk width. As the outer barrier for this sally port would be located immediately adjacent to the Route 9A travel lanes, it is anticipated that the 22-foot-wide crosswalk (X1) at this location would be extended through the sally port in both the No-Action and With-Action conditions.

Pedestrian Flows with the Proposed Project

The Proposed Project would not generate additional pedestrian demand or change pedestrian access routes in the vicinity of the WTC site compared to the No-Action condition. There would be some redistribution of taxi pick-up/drop-off locations in the vicinity of the WTC site under the Proposed Project, and pedestrians associated with these redistributed taxi trips, although relatively small in number compared to overall demand in the study area, have been assigned to analyzed pedestrian facilities (primarily crosswalks along Church Street). Overall, however, peak hour pedestrian volumes on analyzed

sidewalks, corner areas and crosswalks with the Proposed Project are expected to be generally comparable to those in the No-Action condition.

Pedestrian Levels of Service with the Proposed Project

As discussed below, the installation of security infrastructure associated with the Proposed Project would result in significant adverse impacts in one or more peak hours at a total of two sidewalks and three crosswalks. Potential measures to mitigate these significant adverse sidewalk and crosswalk impacts are discussed in Chapter 15, "Mitigation."

Sidewalks

Table 8-26 shows the peak 15-minute pedestrian flow volumes, effective widths and levels of service along analyzed sidewalks during the weekday AM, midday and PM peak hours in the With-Action condition. As shown **Table 8-26**, the installation of security infrastructure associated with the Proposed Project would result in significant adverse impacts in one or more peak hours at a total of two sidewalks. These include:

- (S6) Barclay Street (south) between West Broadway and Church Street in all periods (LOS F in the AM peak hour and LOS E in the midday and PM); and

- (S8) Trinity Place (west) between Liberty and Cedar streets in the AM (LOS E) and PM (LOS D).

Corner Reservoir Areas and Crosswalks

Tables 8-27 and 8-28 show the forecasted levels of service along analyzed corner reservoir areas and crosswalks during the weekday AM, midday and PM peak hours under the Proposed Project. As shown in **Table 8-26**, all three analyzed corner areas are expected to operate at a marginally acceptable LOS D or better in all three peak hours, with no significant adverse impacts as a result of the Proposed Project. However, as shown in **Table 8-28**, the installation of static barriers within crosswalks in conjunction with the proposed median along Trinity Place/Church Street is expected to result in significant adverse impacts in one or more peak hours at a total of three analyzed crosswalks along this corridor. These include:

- (X3) The north crosswalk at Vesey Street in the AM (LOS E). It should be noted that an extension of the west sidewalk along Church Street would decrease the length of this crosswalk under the Proposed Project. Although this would have the effect of shortening the pedestrian crossing distance, it would also reduce the amount of crosswalk space available for pedestrian circulation, thereby contributing to the significant impact at this location;

- (X4) The north crosswalk at Fulton Street in the midday (LOS E); and

- (X10) The north crosswalk at Cortlandt Street in the midday (LOS D) and PM (LOS D).

Table 8-26
With-Action Conditions Sidewalk Analysis

No.	Location	Effective Width (feet)	Peak 15-Minute Volumes			Flow Rate (PMF)			Platoon-Adjusted Level of Service		
			AM	MD	PM	AM	MD	PM	AM	MD	PM
S1	Vesey Street between Route 9A & Washington St (North)	11	558	786	477	3.4	4.8	2.9	C	C	B
S2	Washington Street between Barclay Street & Vesey Street (East)	2.5	59	274	32	1.6	7.3	0.9	B	D	B
S3	Washington Street between Barclay Street & Vesey Street (West)	4.5	146	254	128	2.2	3.8	1.9	B	C	B
S4	Barclay Street between Washington Street & Greenwich Street (south)	5.5	141	371	133	1.7	4.5	1.6	B	C	B
S5	West Broadway between Park Place & Barclay Street (East)	6.5	892	1,409	833	9.2	14.5	8.5	D	E	D
S6	Barclay Street between West Broadway & Church Street (south)	4.5	1,349	1,179	827	20.0	17.5	12.2	**F***	**E***	**E***
S7	Church Street between Barclay Street & Vesey Street (West)	5.5	828	778	979	10.0	9.4	11.9	D	D	E
S8	Trinity Place between Liberty Street & Cedar Street (West)	5.5	1,334	316	739	16.2	3.8	9.0	**E***	C	**D***
S9	Trinity Place between Cedar Street & Thames Street (West)	10.5	1,256	337	759	8.0	2.1	4.8	D	B	C
S10	Greenwich Street between Liberty Street & Cedar Street (East)	8	760	941	562	6.3	7.8	4.7	D	D	C
S11	Route 9A between Liberty Street & Cedar Street (East)	6	202	259	206	2.2	2.9	2.3	B	B	B
S12	West Broadway between Barclay Street & Vesey Street (East)	11	850	1,400	871	5.1	8.5	5.3	C	D	C

Notes:
PMF – persons per minute per foot of effective width.
***** - denotes a significant adverse impact based on *CEQR Technical Manual* criteria.

Table 8-27
With-Action Conditions Corner Analysis

No.	Intersection	Corner	SFP			Level of Service		
			AM	MD	PM	AM	MD	PM
C1	Church Street @ Vesey Street	Northwest	37.0	46.2	29.4	C	B	C
C2	Church Street @ Liberty Street	Northwest	25.0	118.2	48.5	C	A	B
C3	Church Street @ Liberty Street	Southwest	18.5	62.4	25.7	D	A	C

Notes:
Methodology based on *CEQR Technical Manual* guidelines.
SFP – square feet per pedestrian.

Table 8-28
With-Action Conditions Crosswalk Analysis

No.	Location	Crosswalk	Crosswalk Length (feet)	Crosswalk Width (feet)	Peak 15-Minute Volumes			SFP			Level of Service		
					AM	MD	PM	AM	MD	PM	AM	MD	PM
X1	Fulton St at Route 9A	East	22	22	897	1,657	1,120	23.8	9.9	16.1	D	E	D
X2	Vesey St at Church St	West	27	20	914	867	1,312	20.8	17.6	10.5	D	D	E
X3	Church St at Vesey St	North	56.5	13	587	461	503	13.9	25.1	22.1	**E***	C	D
X4	Church St at Fulton St	North	48	12	310	691	318	27.1	11.3	25.7	C	**E***	C
X5	Church St at Dey St	North	48	15	209	338	237	49.9	35.3	51.6	B	C	B
X6	Liberty St at Church St	West	38	18	1,623	365	913	10.0	64.2	20.6	E	A	D
X7	Church St at Liberty St	North	48	18	1,713	613	1,308	5.2	19.0	7.4	F	D	F
X8	Church St at Liberty St	South	41	17	475	273	327	23.9	44.3	35.4	D	B	C
X9	Church St at Vesey St	South	48	20	535	523	686	23.8	31.2	23.1	D	C	D
X10	Church St at Cortlandt St	North	48	15	347	538	509	26.9	17.8	18.3	C	**D***	**D***

Notes:
SFP – square feet per pedestrian.
***** - denotes a significant adverse impact based on *CEQR Technical Manual* criteria.

J. VEHICULAR AND PEDESTRIAN SAFETY EVALUATION

Under *CEQR Technical Manual* guidelines, an evaluation of vehicular and pedestrian safety is needed for locations within the traffic and pedestrian study areas that have been identified as high accident locations. These are defined as locations where 48 or more total reportable and non-reportable crashes or five or more pedestrian/bicyclist injury crashes have occurred in any consecutive 12 months of the most recent three-year period for which data are available. (Reportable accidents are defined as those involving injuries, fatalities, and/or $1,000 or more in property damage.)

Table 8-29 shows summary accident data for the years 2008 through 2010 that were obtained from the New York City Department of Transportation. This is the most recent three year period for which data are available. The table shows the total number of reportable and non-reportable crashes each year and the numbers of crashes each year involving pedestrians and cyclists at intersections within the traffic and pedestrian study areas. As shown in **Table 8-29**, no intersections were found to have experienced a total of 48 or more crashes in any one year. However, four intersections experienced five or more pedestrian and/or bicyclist injury crashes in one or more years and are therefore considered high accident locations.

Table 8-29
Summary Motor Vehicle Accident Data 2008-2010

Intersection		Pedestrian Injury Accidents			Bicycle Injury Accidents			Total Pedestrian/Bicyclist Injury Accidents			Total Accidents (Reportable + Non-Reportable)		
		2008	2009	2010	2008	2009	2010	2008	2009	2010	2008	2009	2010
Broadway @	Chambers St	4	3	5	1	0	0	**5***	3	**5***	11	6	10
	Warren St	1	1	0	0	0	0	1	1	0	1	1	4
	Murray St	0	0	1	0	0	0	0	0	1	1	1	1
	Park Pl	1	1	0	1	0	0	2	1	0	3	1	3
	Barclay St	1	0	3	0	1	0	1	1	3	2	6	5
	Vesey St	2	1	1	0	0	1	2	1	2	2	2	6
	Fulton St	0	0	0	0	1	0	0	1	0	1	2	3
	Dey St	0	1	0	0	0	0	0	1	0	1	1	2
	Cortlandt St	0	1	1	1	1	0	1	1	2	2	1	3
	Liberty St	0	0	0	0	0	0	0	0	0	0	0	1
	Cedar St	0	0	0	0	0	0	0	0	0	0	0	0
	Thames St	0	0	0	0	0	0	0	0	0	0	0	0
Trinity Pl/ Church St @	Chambers St	2	2	2	0	1	0	2	3	2	6	4	5
	Warren St	0	0	1	1	0	0	1	0	1	1	0	3
	Murray St	0	0	0	0	0	0	0	0	0	1	2	0
	Park Pl	1	0	0	0	0	0	1	0	0	6	1	2
	Barclay St	0	1	1	0	0	0	0	1	1	1	3	1
	Vesey St	0	0	0	0	0	0	0	0	0	0	1	0
	Fulton St	0	0	0	1	0	0	1	0	0	1	1	1
	Dey St	0	0	0	0	0	0	0	0	0	0	0	0
	Cortlandt St	1	0	0	0	0	0	1	0	0	3	0	0
	Liberty St	0	2	2	0	0	0	0	2	2	0	4	4
	Cedar St	0	2	1	0	0	1	0	2	2	0	2	2
	Thames St	1	0	0	0	0	0	1	0	0	1	0	0
	Rector St	2	0	1	0	0	0	2	0	1	2	1	4
	Edgar St	1	0	0	0	0	0	1	0	0	1	0	0
Greenwich St @	Chambers St	1	1	2	0	0	2	1	1	4	2	2	7
	Warren St	0	1	0	1	0	0	1	1	0	1	1	1
	Murray St	0	1	0	0	0	0	0	1	0	2	1	0
	Park Pl	0	2	0	0	0	0	0	2	0	0	2	0
	Barclay St	0	0	0	0	0	1	0	0	1	0	0	1
	Cedar St	0	1	0	0	0	0	0	1	0	0	1	0
	Thames St	0	0	0	0	0	0	0	0	0	0	1	0
	Albany St	0	0	0	0	1	0	0	1	0	0	1	0
	Carlisle St	0	0	0	0	0	0	0	0	0	0	0	1
	Rector St	2	0	0	0	0	0	2	0	0	2	1	2
	Morris St	2	0	0	0	0	0	0	0	0	2	0	3
	Battery Pl	0	0	0	0	0	0	0	0	0	2	0	0

Table 8-29 (continued)
Summary Motor Vehicle Accident Data 2008-2010

Intersection		Pedestrian Injury Accidents			Bicycle Injury Accidents			Total Pedestrian/Bicyclist Injury Accidents			Total Accidents (Reportable + Non-Reportable)		
		2008	2009	2010	2008	2009	2010	2008	2009	2010	2008	2009	2010
W. Broadway @	Chambers St	3	4	1	0	1	0	3	**5***	1	8	5	2
	Warren St	1	0	2	0	0	0	1	0	2	4	0	2
	Murray St	0	0	0	0	1	0	0	1	0	0	1	0
	Park Pl	0	0	0	0	0	0	0	0	0	0	0	2
	Barclay St	0	0	1	0	0	0	0	0	1	0	0	1
Washington St @	Barclay St	0	0	0	0	0	0	0	0	0	2	0	0
	Carlisle St	0	0	0	0	0	0	0	0	0	1	0	0
	Rector St	0	0	0	0	0	0	0	0	0	1	0	0
Route 9A @	Chambers St	1	4	2	2	1	4	3	**5***	**6***	15	17	15
	Warren St	0	1	0	0	0	0	0	1	0	1	4	6
	Murray St	3	0	1	2	0	3	**5***	0	4	20	5	10
	Barclay St	0	0	0	0	0	0	0	0	0	0	4	2
	Vesey St	1	1	1	0	0	0	1	1	1	4	6	6
	Liberty St	0	0	0	0	0	2	0	0	2	18	2	8
	Albany St	0	4	2	0	0	1	0	4	3	11	5	4
	Carlisle St	1	0	0	0	0	0	1	0	0	3	0	1
	Rector St	1	1	0	0	0	0	1	1	0	3	1	2
	W. Thames St	0	0	0	0	0	1	0	0	1	5	4	2
	BBT Entrance	2	0	0	0	0	0	2	0	0	4	0	0
	Morris St	0	0	0	0	0	0	0	0	0	4	2	2
	First Pl	0	0	0	0	0	0	0	0	0	1	0	0
	Battery Pl	0	0	0	0	0	0	0	0	0	4	3	3

Notes:
* Denotes 48 or more total reportable and non-reportable crashes or five or more total pedestrian and/or bicycle injury accidents at an intersection in one year.
Source: NYCDOT data.

These locations, include Broadway at Chambers Street (five pedestrian/bicyclist injury crashes in both 2008 and 2010), West Broadway at Chambers Street (five pedestrian/bicyclist injury crashes in 2009), Route 9A at Chambers Street (five pedestrian/bicyclist injury crashes in 2009 and six in 2010), and Route 9A at Murray Street (five pedestrian/bicyclist injury crashes in 2008). At all other locations in the study area, the number of pedestrian/bicyclist injury crashes per year totaled four or fewer during the 2008 through 2010 period.

None of the four intersections identified as high accident locations (nor any within the traffic and pedestrian study areas) are located within a designated Senior Pedestrian Focus Area (SPFA). Along Chambers Street, high visibility crosswalks have been installed at the intersections with both Broadway and West Broadway. Along the Route 9A corridor, a pedestrian bridge is provided across Route 9A in place of the north crosswalk at Chambers Street (to accommodate pedestrian demand from the adjacent Stuyvesant High School), and distinctive paving has been installed along the remaining crosswalks to

increase their visibility to drivers. Similar paving has been installed along all crosswalks at the Route 9A/Murray Street intersection.

The Campus Security Plan is not expected to generate substantial new vehicular or pedestrian demand within the study area, nor alter pedestrian flow patterns at any of the four intersections identified as high accident locations. However, all four intersections would likely experience changes in traffic flow patterns due to street closures associated with the Proposed Project. As shown in **Figures 8-13 through 8-16**, depending on peak hour, some turning movements at each intersection would likely experience increased traffic volumes (and therefore increased potential for vehicle/pedestrian conflicts at crosswalks), while traffic volumes for other turning movements would be reduced (thereby lessening the potential for vehicle/pedestrian conflicts). It is estimated that the projected increases in turning vehicle volumes would amount to an average of no more than two to three vehicles per signal cycle for any one movement at any of the four high accident locations.

As discussed above, high visibility crosswalks or distinctive crosswalk pavement treatments have already been installed at all four high accident locations, and a pedestrian bridge has been provided over Route 9A at Chambers Street. Additional measures that may help to reduce the potential for vehicle/pedestrian conflicts at these locations are discussed in Chapter 15, "Mitigation."

It should be noted that the Proposed Project would result in a substantial decrease in vehicular traffic along streets within the WTC Campus, as only pre-authorized vehicles with business at the World Trade Center would be allowed access. For example, as shown in **Figures 8-13 through 8-16**, peak hour traffic volumes along Greenwich Street at Fulton Street are expected to decrease by approximately 183 to 243 vehicles per hour, and two-way traffic volumes on Liberty Street west of Church Street are expected to decrease by approximately 627 to 847 vehicles per hour. The potential for conflicts between vehicular traffic and pedestrians at intersections within the WTC Campus, including the many tourists expected to be visiting the Memorial and Memorial Center, would therefore likely be reduced compared to the No-Action condition under which both Greenwich and Liberty streets would be open to general traffic within the WTC site. Of note is the intersection of Liberty and Church streets where there would be 225 to 487 fewer vehicles making the eastbound left turn from Liberty Street onto Church Street, resulting in a substantial reduction in the potential for conflicts with future pedestrian flows along the north crosswalk on Church Street.

As discussed previously, the Proposed Project would include the installation of an approximately four-foot-wide median with static barriers along Trinity Place/Church Street from Cedar Street to a point north of Vesey Street. North of Liberty Street, three lanes would be maintained for general northbound traffic to the east of this median, and a single 11-foot-wide northbound travel lane would be provided for traffic within the security zone. It is anticipated that static barriers such as bollards would be installed in place of the median at each crosswalk location on Church Street, that the crosswalks would continue across the single traffic lane within the security zone, and that traffic flow along this lane would be controlled at each intersection by the same signals controlling traffic along the three unrestricted lanes to the east of the median. Therefore, crosswalks on Church Street adjacent to the WTC site are expected to continue to function as uninterrupted facilities with respect to pedestrian flow, and the median is not expected to result in an increased potential for vehicle-pedestrian conflicts along the Church Street corridor compared to the No-Action condition.

With the possible exception of the west crosswalk on Fulton Street at Route 9A, the barriers that would be installed as part of the Proposed Project are generally not expected to result in physical changes to crosswalks in the vicinity of the WTC site. All of the barriers would be under manual control by on-site NYPD officers who would coordinate their operation with adjacent traffic signals and help to ensure that vehicles entering and exiting the WTC site would not come into conflict with pedestrians.

In both the No-Action and With-Action conditions, a retractable barrier would be installed on Fulton Street immediately adjacent to the Route 9A travel lanes as part of an exit-only sally port at this location. It is anticipated that the crosswalk on Fulton Street would be located within the sally port just east of the barrier, and that the stop bar for traffic within the sally port would be set back to so that traffic would remain clear of the crosswalk. As with other sally ports that would be installed under the Proposed Project, the barriers on Fulton Street would be under manual control by on-site NYPD officers who would coordinate their operation with the adjacent traffic signal and help to ensure that vehicles and pedestrians do not come into conflict. In addition, it should be noted that peak hour traffic volumes on Fulton Street approaching Route 9A are expected to be relatively low – ranging from only four to 14 vehicles per hour with the Proposed Project (see **Figures 8-17 through 8-20**).

K. PARKING

Existing Condition

Off-Street

As the proposed Campus Security Plan would not generate new parking demand nor directly affect the supply of off-street public parking, a quantitative analysis of off-street public parking conditions is not warranted for this environmental review. The location, capacity and weekday AM and midday peak period utilization of off-street public parking facilities within ¼-mile of the WTC site have, however, been documented to facilitate the assignment of auto trips to the study area street network for the No-Action and With-Action conditions.

As shown in **Figure 8-23** and **Table 8-30**, there are 28 off-street public parking facilities with a total licensed capacity of approximately 5,337 spaces within ¼-mile of the Project Area. The largest of these is the Battery Parking Garage which is located on Route 9A to the south of the WTC site and has a total licensed capacity of 2,055 spaces. Currently, off-street public parking facilities in the vicinity of the WTC site are approximately 55 percent utilized in the weekday AM peak period (2,425 spaces available) and 88 percent utilized (642 spaces available) in the midday.

On-Street

As shown in **Figure 8-24** and **Table 8-31**, on-street parking in proximity to the WTC site (and much of lower Manhattan in general) is characterized by no standing and no parking regulations to facilitate traffic flow and street cleaning, especially during the weekday daytime hours. There is relatively little on-street parking permitted with the exception of truck loading and unloading and bus layover areas. Authorized vehicle parking is also not uncommon given the prevalence of government agencies in lower Manhattan.

The Future Without the Proposed Project (No-Action)

By 2019, demand at off-street public parking facilities in proximity to the WTC site is expected to increase as a result of the redevelopment of the World Trade Center, other new developments, and general background growth. The off-street public parking supply at the WTC site would total up to approximately 500 spaces for autos and 67 spaces for tour buses in a below-grade facility with access via the Vehicular Security Center on Liberty Street. It is not expected that on-street parking would be allowed along new or

Off-Street Public Parking Facilities in Vicinity of the WTC Site

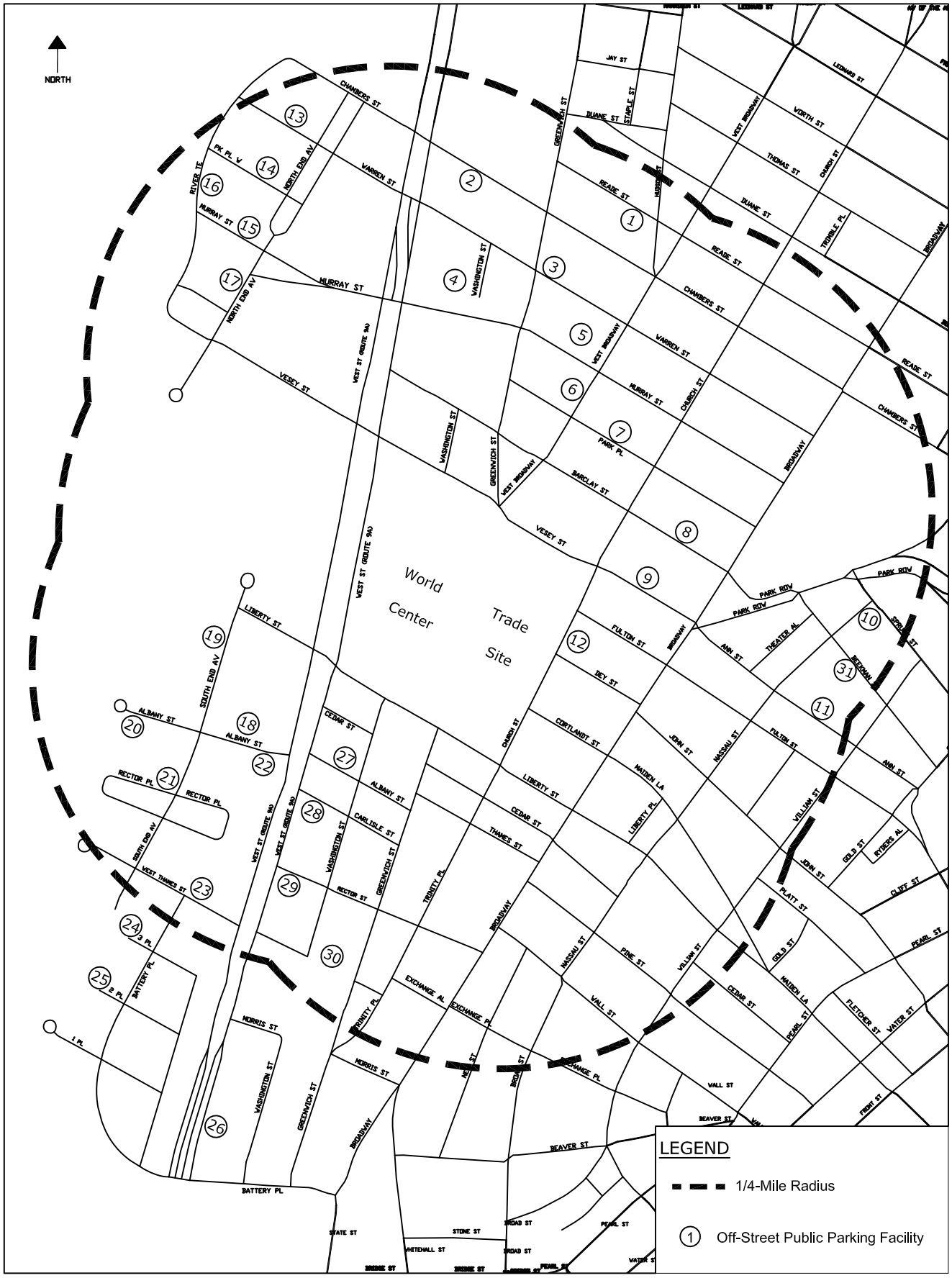


Table 8-30
Existing Off-Street Public Parking Utilization Within ¼-Mile of the WTC Site

Map No.	Garage Name	Address	License No.	Licensed Capacity	Weekday AM		Weekday Midday	
					Estimated Utilization	Available Capacity	Estimated Utilization	Available Capacity
1	Sky Parking Corp.	121 Reade St	0981503	89	70%	27	90%	9
2	Central Parking System of NY	200 Chambers St	1253687	60	70%	18	85%	9
3	Katz Parking Systems	86-90 Warren St	1280753	52	50%	26	90%	5
4	Central Parking System of NY	103 Warren St	1308793	400	50%	200	80%	80
5	69 Warren Street Parking Corp.	69 Warren St	427285	50	20%	40	100%	0
6	Central Parking System of NY	75 Park Place	896827	100	50%	50	90%	10
7	Church Street Parking, LLC	110 Church St	1126970	88	40%	53	70%	26
8	Barclay Street Parking, LLC	233 Broadway	1170235	150	60%	60	100%	0
9	Barclay Street Parking, LLC	10 Barclay St	1269988	81	60%	32	100%	0
11	Nassau Street Garage Corp.	2 Spruce St	1182276	25	60%	10	100%	0
10	Ann Park, LLC	57 Ann St	1154973	276	55%	124	91%	25
12	Central Parking System of NY	47 Church St	0929603	65	80%	13	100%	0
13	MP 400, LLC	400 Chambers St	1367106	123	60%	49	80%	25
14	MP 325, LLC	325 North End Ave	1367120	55	70%	16	90%	5
15	Little Liberty, LLC	211 North End Ave	1373957	25	100%	0	100%	0
16	Impark River, LLC	20 River Terrace	1184260	41	100%	0	100%	0
17	Liberty View Parking, LLC	2 River Terrace	1307224	369	65%	129	90%	37
18	1 World Financial Center Garage	200 Liberty St	N/A	N/A	N/A	N/A	N/A	N/A
19	Central Parking System of NY	345 South End Ave	1399983	415	75%	104	80%	84
	224 Battery Park City	365 South End Ave	1400316	42	75%	10	80%	8
	225 Battery Park City	385 South End Ave	1402813	62	75%	15	80%	12
	226 Battery Park City	355 South End Ave	1400324	41	75%	10	80%	8
20	Hudson Tower Garage	350 Albany St	1316344	49	84%	8	86%	7
21	Central Parking System of NY	333 Rector St	1303088	46	80%	9	100%	0
22	MP 225, LLC	225 Rector Place	1381789	113	70%	34	80%	23
23	Rector West, LLC	200 Rector Place	1412773	134	70%	40	84%	22
24	Albany Street Parking, LLC	90 West St	1230602	65	50%	32	80%	13
25	Carlisle Parking, LLC	75 West St	1181110	38	80%	8	80%	8
26	90 Washington Car Park, LLC	90 Washington St	1175732	79	90%	8	90%	8
27	Laz Parking	56-80 Greenwich St	1382731	2,055	40%	1,233	90%	205
28	25-27 Beekman St. Associates	25-27 Beekman St	367147	149	55%	67	91%	13
			Total	**5,337**	**55%**	**2,425**	**88%**	**642**

Notes:
N/A – data not available
Source: PHA May 2012 field survey.

On-Street Parking Regulations in Vicinity of the WTC Site

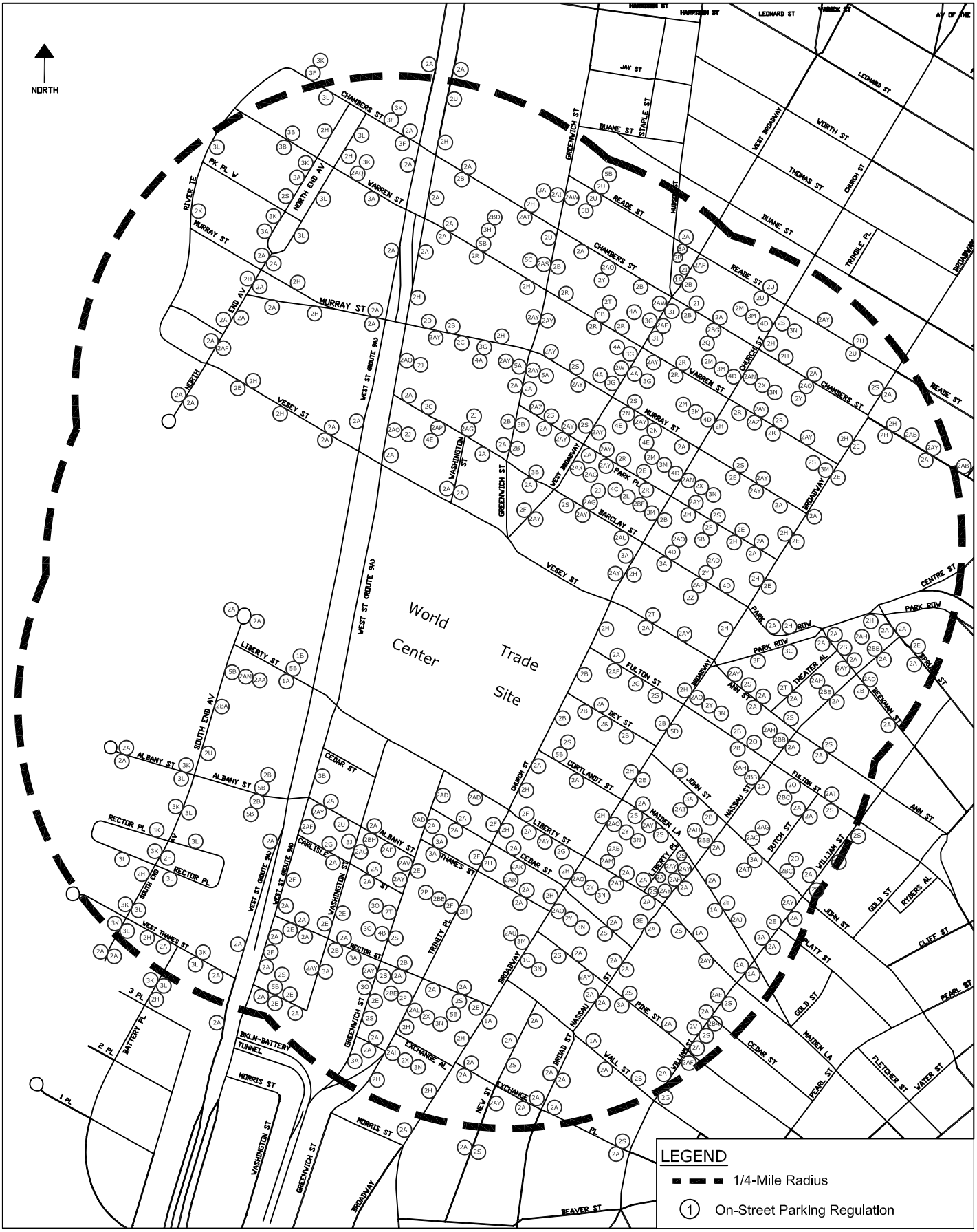


Table 8-31

Existing On-Street Parking Regulations in the Vicinity of the WTC Site (see Figure 8-24)

MAP #	REGULATION
1 - NO STOPPING	
1A	Anytime
1B	Anytime (Temporary Construciton Regulation)
1C	7AM-7PM, Mon-Fri
2 - NO STANDING	
2A	Anytime
2B	Anytime (Temporary Construction Regulation)
2C	Anytime, Access-A-Ride Bus Stop
2D	Anytime, Bus Layover Area
2E	Anytime Except Authorized Vehicles
2F	Anytime Except World Trade Center Construction Vehicles
2G	Anytime, Taxi Stand
2H	Bus Stop
2I	Bus Stop (Temporary Construction Regulation)
2J	Except Buses with Permit, Metered Parking, 3 Hour Limit, 10AM-4PM, Mon-Fri, 7AM-7PM Sat, 3 Hour Limit, 7AM - 7PM Sun
2K	Except Trucks Loading & Unloading
2L	Except Trucks Loading & Unloading, 7AM-10AM, Mon-Fri
2M	Except Trucks Loading & Unloading, 7AM-10AM, 4PM-7PM, Mon-Fri
2N	Except Trucks Loading & Unloading, 7AM-10AM, 4PM-7PM, Except Sun
2O	Except Trucks Loading & Unloading, 7AM-11AM, 2PM-7PM, Mon-Fri
2P	Except Trucks Loading & Unloading, 7AM-3PM, Mon-Fri
2Q	Except Trucks Loading & Unloading, 7AM-4PM, Mon-Fri
2R	Except Trucks Loading & Unloading, 7AM-6PM, Mon-Fri
2S	Except Trucks Loading & Unloading, 7AM-7PM, Mon-Fri
2T	Except Trucks Loading & Unloading, 7AM-7PM, Except Sun
2U	Except Trucks Loading & Unloading, 8AM-6PM, Mon-Fri
2V	Except Trucks Loading & Unloading, 8AM-7PM, Mon-Fri
2W	Except Trucks Loading & Unloading, 8AM-7PM, Except Sun
2X	Except Trucks Loading & Unloading, 10AM-3PM, Mon-Fri
2Y	Except Trucks Loading & Unloading, 10AM-4PM, Mon-Fri
2Z	Except Trucks Loading & Unloading, 10AM-4PM, Except Sun
2AA	Except Trucks Loading & Unloading, 10AM-6PM, Mon-Fri
2AB	Except Trucks Loading & Unloading, 10AM-7PM, Mon-Fri
2AC	Except Trucks Loading & Unloading, 1PM-7PM, Mon-Fri
2AD	Fire Zone
2AE	FRBNY Checkpoint
2AF	Hotel Loading Zone
2AG	Other Times
2AH	Other Times, Except Trucks Loading & Unloading
2AI	6AM-5PM, Wed & Sat, Except Farmers' Market Vehicles
2AJ	6AM-6PM, Mon-Fri, Except Authorized Vehicles
2AK	6AM-7AM, 6PM-7PM, Tue & Thu, Except Farmers' Market Vehicles
2AL	6AM-10AM, 3PM-7PM, Mon-Fri
2AM	7AM-10AM, Mon-Fri
2AN	7AM-10AM, 3PM-7PM, Mon-Fri, Bus Stop
2AO	7AM-10AM, 4PM-7PM, Mon-Fri

MAP #	REGULATION
2 - NO STANDING	
2AP	7AM-10AM, 4PM-7PM, Except Sun
2AQ	7AM-4PM, School Days, Except School Buses
2AR	7AM-6PM, Mon-Fri
2AS	7AM-6PM, Mon-Fri, Except School Buses
2AT	7AM-7PM, Mon-Fri
2AU	7AM-7PM, Except Sun
2AV	7AM-7PM, Including Sun
2AW	7AM-7PM, Including Sun (Temporary Construction Regulation)
2AX	7AM-7PM, Tue, Thu, & Fri Except Farmers' Market Vehicles
2AY	7AM-7PM, Mon-Fri, Except Authorized Vehicles
2AZ	7AM-7PM, Including Sun, Except Authorized Vehicles
2BA	8AM-6PM, Mon-Fri, Except Authorized Vehicles
2BB	10AM-6PM, Including Sun
2BC	11AM-2PM, Mon-Fri
2BD	2PM-7PM, Mon-Fri, Bus Layover Area
2BE	3PM-7PM, Mon-Fri, Bus Layover Area
2BF	3PM-7PM, Except Sun, Bus Layover Area
2BG	4PM-7PM, Mon-Fri
2BH	5PM - 8PM, Taxi Stand
3 - NO PARKING	
3A	Anytime
3B	Anytime (Temporary Construction Regulation)
3C	7AM-10AM, Except Taxi, 1 Hour Relief
3D	7AM-4PM, School Days
3E	7AM-7PM, Mon-Fri, Taxi Stand
3F	7AM-7PM, Including Sun, Loading Zone
3G	7:30AM-8AM, Except Sun (street cleaning)
3H	8AM-2PM, Mon-Fri
3I	8AM-6PM, Mon-Fri
3J	8AM-6PM, Except Sun
3K	9AM-10:30 AM, Mon & Thu (street cleaning)
3L	9AM-10:30 AM, Tue & Fri (street cleaning)
3M	2AM-6AM, Mon & Thu (street cleaning, night regulation)
3N	2AM-6AM, Tue & Fri (street cleaning, night regulation)
3O	2AM-6AM, Wed & Sat (street cleaning, night regulation)
4 - 1 HOUR PARKING	
4A	8AM-7PM, Except Sun
4B	9AM-7PM, Except Sun
4C	10AM-3PM, Except Sun
4D	10AM-4PM, Mon-Fri, 9AM-7PM, Sat
4E	10AM-4PM, Except Sun
5 - MISCELLANEOUS	
5A	Back-In 60-Degree Parking Only
5B	No Permit Zone
5C	Parallel Parking Only
5D	No Parking, Stopping, Standing, Loading, or Unloading Anytime

reopened streets within the WTC Campus. As there is relatively limited on-street parking in lower Manhattan, most, if not all of the WTC parking demand not accommodated on-site is expected to utilize off-street public parking facilities in the vicinity. Parking demand generated by other new developments not otherwise accommodated in accessory parking facilities is also expected to utilize off-street public parking.

The Future With the Proposed Project (With-Action)

Off-Street

The Proposed Project would not result in the development of new land uses that would generate additional parking demand, nor displace any existing or future off-street public parking capacity. It would therefore not result in any significant adverse impacts to off-street parking.

On-Street

Much of the curbside space that would be occupied by credentialing or security zones under the Proposed Project is governed by no standing anytime regulations or currently unavailable for general parking due to ongoing construction activity. However, some curbside parking designated for authorized vehicles (Postal Inspector, Department of Labor and NYC Law Department) from 7 AM to 7 PM, Monday through Friday would be displaced from the east curb of West Broadway between Barclay and Vesey Streets (approximately eight parking spaces), the south curb of Barclay Street east of West Broadway (approximately nine spaces) and the west curb of Church Street north of Vesey Street (approximately six parking spaces). Some curbside parking currently designated for truck loading/unloading activity and/or bus layover would also be displaced from the south curb of Barclay Street east of West Broadway (approximately three truck spaces), and the west curb of Trinity Place between Rector and Thames streets (approximately six to eight truck spaces in the AM and midday, and four bus spaces in the PM). The displacement of these numbers of authorized vehicle, truck and bus parking spaces would not be considered a significant adverse impact under *CEQR Technical Manual* criteria. However, it is anticipated that the NYPD would work with NYCDOT and the affected agencies to identify potential alternative locations for the authorized vehicle parking that would be displaced by the Proposed Project.

It should also be noted that curbside regulations allow for the parking of farmer's market vehicles along the east curb of West Broadway north of Barclay Street from 7AM to 7 PM, Tuesdays, Thursdays and Fridays. (A no standing regulation is in effect at other times.) This is to accommodate the PATH Greenmarket (previously located in Zuccotti Park) which currently takes place along this block on Tuesdays. As a credentialing zone would be located along this block of West Broadway, this Greenmarket would likely need to be relocated under the Proposed Project.

A. INTRODUCTION

The potential for air quality impacts from the Proposed Action is examined in this chapter. Air quality impacts can be either direct or indirect. Direct impacts result from emissions generated by stationary sources (e.g., from on-site fuel combustion for heat and hot water systems); there are no direct emission sources associated with the Proposed Action. Indirect impacts are impacts that are caused by the effect of a project on emissions from non-project sources, such as emissions from on-road vehicle trips generated by a project or other changes to future traffic conditions due to a project. Since the Proposed Action has the potential to change future traffic conditions, the potential for indirect mobile source impacts from the Proposed Action was analyzed. Projected changes in the emission of greenhouse gases (GHG) with the Proposed Action are also disclosed.

B. PRINCIPAL CONCLUSIONS

The air quality analysis concluded that maximum predicted pollutant concentrations and concentration increments from mobile sources with the Proposed Action would be below the corresponding guidance thresholds and ambient air quality standards. The Proposed Action would have an insignificant impact on region-wide criteria pollutant and greenhouse gas emissions, and would not require an analysis of conformity with the New York State Implementation Plans (SIP). Thus, the Proposed Action would have no significant adverse impact on air quality

C. POLLUTANTS FOR ANALYSIS

Ambient air quality is affected by air pollutants produced by both motor vehicles and stationary sources. Emissions from motor vehicles are referred to as mobile source emissions, while emissions from fixed facilities are referred to as stationary source emissions. Ambient concentrations of carbon monoxide (CO) are predominantly influenced by mobile source emissions. Particulate matter (PM), volatile organic compounds (VOCs), and nitrogen oxides (nitric oxide, NO, and nitrogen dioxide, NO_2, collectively referred to as NO_x) are emitted from both mobile and stationary sources. Fine PM is also formed when emissions of NO_x, sulfur oxides (SO_x), ammonia, organic compounds, and other gases react or condense in the atmosphere. Emissions of sulfur dioxide (SO_2) are associated mainly with stationary sources, and some other sources utilizing high-sulfur non-road diesel such as large international marine engines. On-road diesel vehicles currently contribute very little to SO_2 emissions since the sulfur content of on-road diesel fuel, which is federally regulated, is extremely low. Ozone is formed in the atmosphere by complex photochemical processes that include NO_x and VOCs. Ambient concentrations of CO, PM, NO_2, SO_2, and lead are regulated by the U.S. Environmental Protection Agency (EPA) under the Clean Air Act, and are referred to as 'criteria pollutants'; emissions of VOCs, NO_x, and other precursors to criteria pollutants are also regulated by EPA.

Carbon Monoxide

CO, a colorless and odorless gas, is produced in the urban environment primarily by the incomplete combustion of gasoline and other fossil fuels. In urban areas, approximately 80 to 90 percent of CO emissions are from motor vehicles. CO concentrations can diminish greatly over relatively short distances; elevated concentrations are usually limited to locations near crowded intersections, heavily traveled and congested roadways, parking lots, and garages. Consequently, CO concentrations must be predicted on a local, or microscale, basis.

The Proposed Action would result in changes in traffic patterns in the study area and vehicles queuing at the security checkpoints. Therefore, a mobile source analysis was conducted at critical intersections in the study area to evaluate future CO concentrations with and without the Proposed Action.

Nitrogen Oxides, VOCs, and Ozone

NO_x are of principal concern because of their role, together with VOCs, as precursors in the formation of ozone. Ozone is formed through a series of reactions that take place in the atmosphere in the presence of sunlight. Because the reactions are slow, and occur as the pollutants are advected downwind, elevated ozone levels are often found many miles from sources of the precursor pollutants. The effects of NO_x and VOC emissions from all sources are therefore generally examined on a regional basis. The contribution of any action or project to regional emissions of these pollutants would include any added stationary or mobile source emissions. The Proposed Action would potentially result in changes to the regional vehicular travel patterns in the study area. Therefore, the change in regional NO_x and VOC emissions was analyzed.

In addition to being a precursor to the formation of ozone, NO_2 (one component of NO_x) is also a regulated pollutant. Since NO_2 is mostly formed from the transformation of NO in the atmosphere, it has mostly been of concern further downwind from large stationary point sources, and not a local concern from mobile sources. (NO_x emissions from fuel combustion consist of approximately 90 percent NO and 10 percent NO_2 at the source.) However, with the promulgation of the 2010 1-hour average standard for NO_2, local sources such as vehicular emissions may become of greater concern for this pollutant, and are therefore discussed in this chapter. The Proposed Action would not involve the addition of any new stationary emission sources. Therefore, an analysis of potential local impacts on NO_2 concentrations was not warranted.

Lead

Airborne lead emissions are currently associated principally with industrial sources. Lead in gasoline has been banned under the Clean Air Act, and therefore, lead is not a pollutant of concern for the Proposed Action.

Respirable Particulate Matter

PM is a broad class of air pollutants that includes discrete particles of a wide range of sizes and chemical compositions, as either liquid droplets (aerosols) or solids suspended in the

atmosphere. The constituents of PM are both numerous and varied, and they are emitted from a wide variety of sources (both natural and anthropogenic). Natural sources include the condensed and reacted forms of naturally occurring VOC; salt particles resulting from the evaporation of sea spray; wind-borne pollen, fungi, molds, algae, yeasts, rusts, bacteria, and material from live and decaying plant and animal life; particles eroded from beaches, soil, and rock; and particles emitted from volcanic and geothermal eruptions and from forest fires. Naturally occurring PM is generally greater than 2.5 micrometers in diameter. Major anthropogenic sources include the combustion of fossil fuels (e.g., vehicular exhaust, power generation, boilers, engines, and home heating), chemical and manufacturing processes, all types of construction, agricultural activities, as well as wood-burning stoves and fireplaces. PM also acts as a substrate for the adsorption (accumulation of gases, liquids, or solutes on the surface of a solid or liquid) of other pollutants, often toxic and some likely carcinogenic compounds.

As described below, PM is regulated in two size categories: particles with an aerodynamic diameter of less than or equal to 2.5 micrometers ($PM_{2.5}$), and particles with an aerodynamic diameter of less than or equal to 10 micrometers (PM_{10}, which includes $PM_{2.5}$). $PM_{2.5}$ has the ability to reach the lower regions of the respiratory tract, delivering with it other compounds that adsorb to the surfaces of the particles, and is also extremely persistent in the atmosphere. $PM_{2.5}$ is mainly derived from combustion material that has volatilized and then condensed to form primary PM (often soon after the release from a source exhaust) or from precursor gases reacting in the atmosphere to form secondary PM.

Diesel-powered vehicles, especially heavy duty trucks and buses, are a significant source of respirable PM, most of which is $PM_{2.5}$; PM concentrations may, consequently, be locally elevated near roadways with high volumes of heavy diesel powered vehicles. An analysis was conducted to assess the worst case PM impacts due to the increased traffic associated with the Proposed Action.

Sulfur Dioxide

SO_2 emissions are primarily associated with the combustion of sulfur-containing fuels (oil and coal). SO_2 is also of concern as a precursor to $PM_{2.5}$ and is regulated as a $PM_{2.5}$ precursor under the New Source Review permitting program for large sources. Due to the federal restrictions on the sulfur content in diesel fuel for on-road and non-road vehicles, no significant quantities are emitted from vehicular sources. Vehicular sources of SO_2 are not significant and therefore, analysis of SO_2 from mobile sources was not warranted. The Proposed Action would not affect any stationary emission sources. Therefore, an analysis of potential increases in SO_2 emissions was not warranted.

Greenhouse Gases

GHG are those gaseous constituents of the atmosphere, from both natural and anthropogenic sources, that absorb and emit radiation at specific wavelengths within the spectrum of infrared radiation emitted by the earth's surface, the atmosphere, and clouds. This property causes the general warming of the earth's atmosphere, or the "greenhouse effect." Water vapor, carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and ozone are the primary GHGs in the earth's atmosphere.

There are also a number of entirely anthropogenic (*i.e.*, resulting from human activity) GHGs in the atmosphere, such as the halocarbons and other chlorine- and bromine-containing substances, which also damage the stratospheric ozone layer (contributing to the "ozone hole"). Since these compounds are being replaced and phased out due to the 1987 Montreal Protocol, they are not addressed in project-related GHG assessments for most projects. Ozone itself is also a substantial GHG; however, long-term project-level impacts on ozone emissions as a GHG do not need to be analyzed at the project level since it is a rapidly reacting chemical and efforts are ongoing to reduce the tropospheric formation of ozone as a criteria pollutant by reducing the emission of its precursors.

Although water vapor is of great importance to global climate change, it is not directly of concern as an emitted pollutant since the negligible quantities emitted from anthropogenic sources are inconsequential.

CO_2 is the primary pollutant of concern from anthropogenic sources. CO_2 is by far the most abundant and, therefore, has the greatest overall impact on global average atmospheric temperature. CO_2 is emitted from any combustion process (both natural and anthropogenic), and from some industrial and natural processes. CO_2 is removed ("sequestered") from the lower atmosphere by natural processes such as photosynthesis and uptake by the oceans.[1] CO_2 is included in any analysis of GHG emissions.

CH_4 and N_2O also play an important role since they have longer atmospheric lifetimes and a greater ability to absorb infrared radiation than an equal quantity of CO_2. Emissions of these compounds, therefore, are included in GHG emissions analyses when the potential for substantial emission of these gases exists, and are generally included as a small component of GHG from mobile sources.

Other GHGs—including certain hydrofluorocarbons (HFCs), used as refrigerants and foam blowers and released as byproducts from the production of other HFCs; some perfluorocarbons (PFCs), produced as byproducts of traditional aluminum production, among other activities; and sulfur hexafluoride (SF_6), used as an electrical insulating fluid in power distribution equipment—are sometimes included in GHG emissions analyses where relevant (e.g., analysis of manufacturing facilities), but are not included in the analysis of the Proposed Action, since the Proposed Action would not result in significant emissions of these GHGs.

Since the Proposed Action would affect traffic patterns in the region (due to diversions), GHG emissions are included in the regional analysis presented in this chapter.

D. AIR QUALITY REGULATIONS, STANDARDS, AND BENCHMARKS

National and State Air Quality Standards

As required by the CAA, primary and secondary National Ambient Air Quality Standards (NAAQS) have been established for six major air pollutants: CO, NO_2, ozone, respirable PM (both $PM_{2.5}$ and PM_{10}), SO_2, and lead. The primary standards represent levels that are requisite to protect the public health, allowing an adequate margin of safety. The secondary standards are intended to protect the nation's welfare, and account for air pollutant effects on soil, water, visibility, materials, vegetation, and other aspects of the environment. The primary standards are

[1] Biological and chemical processes by which CO_2 is removed from the atmosphere and stored in the oceans.

Table 9-1
National Ambient Air Quality Standards (NAAQS)

Pollutant	Primary		Secondary	
	ppm	$\mu g/m^3$	ppm	$\mu g/m^3$
Carbon Monoxide (CO)				
8-Hour Average (1)	9	10,000	None	
1-Hour Average (1)	35	40,000		
Lead				
Rolling 3-Month Average (2)	NA	0.15	NA	0.15
Nitrogen Dioxide (NO_2)				
1-Hour Average (3)	0.100	188	None	
Annual Average	0.053	100	0.053	100
Ozone (O_3)				
8-Hour Average (4,5)	0.075	150	0.075	150
Respirable Particulate Matter (PM_{10})				
24-Hour Average (1)	NA	150	NA	150
Fine Respirable Particulate Matter ($PM_{2.5}$)				
Annual Mean (6)	NA	12	NA	15
24-Hour Average (7)	NA	35	NA	35
Sulfur Dioxide (SO_2) (8)				
1-Hour Average(9)	0.075	197	NA	NA
Maximum 3-Hour Average (1)	NA	NA	0.50	1,300

Notes:

ppm – parts per million (unit of measure for gases only)

$\mu g/m^3$ – micrograms per cubic meter (unit of measure for gases and particles, including lead)

NA – not applicable

All annual periods refer to calendar year.

Standards are defined in ppm. Approximately equivalent concentrations in $\mu g/m^3$ are presented.

(1) Not to be exceeded more than once a year.

(2) EPA has lowered the NAAQS down from 1.5 $\mu g/m^3$, effective January 12, 2009.

(3) 3-year average of the annual 98th percentile daily maximum 1-hr average concentration. Effective April 12, 2010.

(4) 3-year average of the annual fourth highest daily maximum 8-hr average concentration.

(5) EPA has proposed lowering the primary standard further to within the range 0.060-0.070 ppm, and adding a secondary standard measured as a cumulative concentration within the range of 7 to 15 ppm-hours aimed mainly at protecting sensitive vegetation. A final decision on this standard has been postponed but is expected to occur in 2013.

(6) 3-year average of annual mean. EPA has lowered the primary standard from 15 µg/m3, effective March 2013.

(7) Not to be exceeded by the annual 98th percentile when averaged over 3 years.

(8) EPA revoked the 24-hour and annual primary standards, replacing them with a 1-hour average standard. Effective August 23, 2010.

(9) 3-year average of the annual 99th percentile daily maximum 1-hr average concentration.

Source: 40 CFR Part 50: National Primary and Secondary Ambient Air Quality Standards.

generally either the same as the secondary standards or more restrictive. The NAAQS are presented in **Table 9-1**.

The NAAQS for CO, annual NO_2, and 3-hour SO_2 have also been adopted as the ambient air quality standards for New York State, but are defined on a running 12-month basis rather than for calendar years only. New York State also has standards for total suspended PM, settleable particles, non-methane hydrocarbons, 24-hour and annual SO_2, and ozone which correspond to federal standards that have since been revoked or replaced, and for the non-criteria pollutants beryllium, fluoride, and hydrogen sulfide.

EPA has revised the NAAQS for PM, effective December 18, 2006. The revision included lowering the level of the 24-hour $PM_{2.5}$ standard from 65 $\mu g/m^3$ to 35 $\mu g/m^3$ and retaining the level of the annual standard at 15 $\mu g/m^3$. The PM_{10} 24-hour average standard was retained and the annual average PM_{10} standard was revoked. EPA recently announced a final decision to lower the primary annual-average standard from 15 $\mu g/m^3$ to 12 $\mu g/m^3$, effective March 2013.

EPA has also revised the 8-hour ozone standard, lowering it from 0.08 to 0.075 parts per million (ppm), effective as of May 2008. On January 6, 2010, EPA proposed a change in the 2008 ozone NAAQS, lowering the primary NAAQS from the current 0.075 ppm level to within the range of 0.060 to 0.070 ppm. EPA is also proposing a secondary ozone standard, measured as a cumulative concentration within the range of 7 to 15 ppm-hours aimed mainly at protecting sensitive vegetation. A final decision on this standard has been postponed but is expected to occur in 2013.

EPA lowered the primary and secondary standards for lead to 0.15 $\mu g/m^3$, effective January 12, 2009. EPA revised the averaging time to a rolling 3-month average and the form of the standard to not-to-exceed across a 3-year span.

EPA established a 1-hour average NO_2 standard of 0.100 ppm, effective April 12, 2010, in addition to the annual standard. The statistical form is the 3-year average of the 98th percentile of daily maximum 1-hour average concentration in a year.

EPA also established a 1-hour average SO_2 standard of 0.075 ppm, replacing the 24-hour and annual primary standards, effective August 23, 2010. The statistical form is the 3-year average of the 99th percentile of the annual distribution of daily maximum 1-hour concentrations (the 4th highest daily maximum corresponds approximately to 99th percentile for a year.)

NAAQS Attainment Status and State Implementation Plans

The CAA, as amended in 1990, defines non-attainment areas (NAA) as geographic regions that have been designated as not meeting one or more of the NAAQS. When an area is designated as non-attainment by EPA, the state is required to develop and implement a SIP, which delineates how a state plans to achieve air quality that meets the NAAQS under the deadlines established by the Clean Air Act, followed by a plan for maintaining attainment status once the area is in attainment.

In 2002, EPA re-designated New York City as in attainment for CO. Under the resulting maintenance plan, New York City is committed to implementing site-specific control measures

throughout the city to reduce CO levels, should unanticipated localized growth result in elevated CO levels during the maintenance period.

Manhattan has been designated as a moderate NAA for PM_{10}. On January 30, 2013, New York State requested that EPA approve its withdrawal of the 1995 SIP and redesignation request for the 1987 PM_{10} NAAQS, and that EPA make a clean data finding instead, based on data monitored from 2009-2011 indicating PM_{10} concentrations well below the 1987 NAAQS. Although not yet a redesignation to attainment status, if approved, this determination would remove further requirements for related SIP submissions.

On December 17, 2004, EPA took final action designating the five New York City counties and Nassau, Suffolk, Rockland, Westchester, and Orange Counties as a $PM_{2.5}$ non-attainment area under the Clean Air Act due to exceedance of the annual average standard. Based on recent monitoring data (2006-2009), annual average concentrations of $PM_{2.5}$ in New York City no longer exceed the annual standard. EPA has determined that the area has attained the 1997 annual $PM_{2.5}$ NAAQS, effective December 15, 2010. As stated above, EPA has recently lowered the annual average primary standard to 12 $\mu g/m^3$. EPA will make initial attainment designations by December 2014. Based on analysis of 2009-2011 monitoring data, it is likely that the region will be in attainment for the new standard.

As described above, EPA has revised the 24-hour average $PM_{2.5}$ standard. In November 2009, EPA designated of the New York City Metropolitan Area as nonattainment with the 2006 24-hour $PM_{2.5}$ NAAQS. The nonattainment area includes the same 10-county area originally designated as nonattainment with the 1997 annual $PM_{2.5}$ NAAQS. Based on recent monitoring data (2007-2011), EPA determined that the area has attained the standard. Although not yet a redesignation to attainment status, this determination removes further requirements for related SIP submissions.

Nassau, Rockland, Suffolk, Westchester, Lower Orange County Metropolitan Area (LOCMA), and the five New York City counties (the New York–New Jersey–Long Island, New York portion) had been designated as a severe non-attainment area for ozone (1-hour average standard, 0.12 ppm). In November 1998, New York State submitted its *Phase II Alternative Attainment Demonstration for Ozone*, which was finalized and approved by EPA effective March 6, 2002, addressing attainment of the 1-hour ozone NAAQS by 2007. The 1-hour standard was revoked in 2004 when it was replaced by the 8-hour ozone standard, but certain further requirements remained ('anti-backsliding'). On December 7, 2009, EPA determined that the Poughkeepsie nonattainment area (Dutchess, Orange, Ulster, and Putnam counties) has attained the 1-hour standard. On June 18, 2012, EPA determined that the New York–New Jersey–Long Island NAA has also attained the standard. Although not yet a redesignation to attainment status, this determination removes further requirements under the 1-hour standard.

Effective June 15, 2004, EPA designated these same counties as moderate non-attainment for the 1997 8-hour average ozone standard (LOCMA was moved to the Poughkeepsie moderate non-attainment area for 8-hour ozone). On February 8, 2008, NYSDEC submitted final revisions to the SIP to EPA to address the 1997 8-hour ozone standard. Based on recent monitoring data (2007-2011), EPA determined that the Poughkeepsie and the NY-NJ-CT nonattainment areas have attained the 1997 8-hour ozone NAAQS (0.08 ppm). Although not yet a redesignation to

attainment status, this determination removes further requirements under the 1997 8-hour standard.

In March 2008 EPA strengthened the 8–hour ozone standards. EPA designated the counties of Suffolk, Nassau, Bronx, Kings, New York, Queens, Richmond, Rockland, and Westchester (NY portion of the New York–Northern New Jersey–Long Island, NY-NJ-CT NAA) as a marginal non-attainment area for the 2008 ozone NAAQS, effective July 20, 2012. SIPs will be due in 2015.

New York City is currently in attainment of the annual-average NO_2 standard. EPA has designated the entire state of New York as "unclassifiable/attainment" of the new 1-hour NO_2 standard effective February 29, 2012. Since additional monitoring is required for the 1-hour standard, areas will be reclassified once three years of monitoring data are available (2016 or 2017).

EPA has established a 1-hour SO_2 standard, replacing the former 24-hour and annual standards, effective August 23, 2010. Based on the available monitoring data, all New York State counties currently meet the 1-hour standard. Additional monitoring will be required. EPA plans to make final attainment designations in June 2013. SIPs for nonattainment areas will be due by June 2015.

Conformity with State Implementation Plans

The conformity requirements of the CAA and regulations promulgated thereunder (conformity requirements) limit the ability of federal agencies to assist, fund, permit, and approve transportation projects in non-attainment and maintenance areas that do not conform to the applicable SIP. When subject to these requirements, the lead federal agency is responsible for demonstrating conformity of its proposed action. Since the Department of Homeland Security may provide funding for the project, an analysis has been prepared to assess whether a conformity determination would be required. Conformity determinations for federal actions related to programs, and projects which are not implemented, funded, or approved under title 23 U.S.C. or the Federal Transit Act (49 U.S.C. 1601 et seq.) must be made in accordance with 40 CFR § 93 Subpart B (federal general conformity regulations).

The general conformity regulations apply to those federal actions in non-attainment or maintenance areas where the action's direct and indirect emissions have the potential to emit one or more of the six criteria pollutants at rates equal to or exceeding the prescribed rates. In the case of New York City, the prescribed annual rates are 50 tons of VOCs and 100 tons of NO_x (ozone precursors, ozone non-attainment area in transport region), 100 tons of CO (CO maintenance area), and 100 tons of $PM_{2.5}$, SO_2, or NO_x ($PM_{2.5}$ and precursors in $PM_{2.5}$ non-attainment area), and in Manhattan only, 100 tons of PM_{10} (moderate PM_{10} non-attainment area).

Determining the Significance of Air Quality Impacts

The State Environmental Quality Review Act (SEQRA) regulations and the *City Environmental Quality Review (CEQR) Technical Manual* state that the significance of a predicted consequence of a project (i.e., whether it is material, substantial, large or important) should be assessed in connection with its setting (e.g., urban or rural), its probability of occurrence, its duration, its

irreversibility, its geographic scope, its magnitude, and the number of people affected.[1] In terms of the magnitude of air quality impacts, any action predicted to increase the concentration of a criteria air pollutant to a level that would exceed the concentrations defined by the NAAQS (see **Table 9-1**) would be deemed to have a potential significant adverse impact.

In addition, in order to maintain concentrations lower than the NAAQS in attainment areas, or to ensure that concentrations will not be significantly increased in non-attainment areas, threshold levels have been defined for certain pollutants; any action predicted to increase the concentrations of these pollutants above the thresholds would be deemed to have a potential significant adverse impact, even in cases where violations of the NAAQS are not predicted.

De Minimis Criteria Regarding CO Impacts

New York City has developed *de minimis* criteria to assess the significance of the increase in CO concentrations that would result from the impact of proposed projects or actions on mobile sources, as set forth in the *CEQR Technical Manual*. These criteria set the minimum change in CO concentration that defines a significant environmental impact. Significant increases of CO concentrations in New York City are defined as: (1) an increase of 0.5 ppm or more in the maximum 8-hour average CO concentration at a location where the predicted No-Action 8-hour concentration is equal to or between 8 and 9 ppm; or (2) an increase of more than half the difference between baseline (i.e., No Action) concentrations and the 8-hour standard, when No-Action concentrations are below 8.0 ppm.

$PM_{2.5}$ Interim Guidance Criteria

NYSDEC has published a policy to provide interim direction for evaluating $PM_{2.5}$ impacts.[2] This policy applies only to facilities applying for permits or major permit modifications under SEQRA that emit 15 tons of PM_{10} or more annually. The policy states that such a project will be deemed to have a potentially significant adverse impact if the project's maximum impacts are predicted to increase $PM_{2.5}$ concentrations by more than 0.3 $\mu g/m^3$ averaged annually or more than 5 $\mu g/m^3$ on a 24-hour basis. Projects that exceed either the annual or 24-hour threshold will be required to prepare an Environmental Impact Statement (EIS) to assess the severity of the impacts, to evaluate alternatives, and to employ reasonable and necessary mitigation measures to minimize the $PM_{2.5}$ impacts of the source to the maximum extent practicable.

In addition, New York City uses interim guidance criteria for evaluating the potential $PM_{2.5}$ impacts for projects subject to CEQR. The interim guidance criteria currently employed to determine the potential significant adverse $PM_{2.5}$ impacts under CEQR are as follows:

- 24-hour average $PM_{2.5}$ concentration increments which are predicted to be greater than 5 $\mu g/m^3$ at a discrete receptor location would be considered a significant adverse impact on air quality under operational conditions (i.e., a permanent condition predicted to exist for many years regardless of the frequency of occurrence);

[1] *CEQR Technical Manual*, Chapter 17, section 410, Jan 2012 (Rev. 6/18/12); and State Environmental Quality Review Regulations, 6 NYCRR § 617.7

[2] CP33/Assessing and Mitigating Impacts of Fine Particulate Emissions, NYSDEC 12/29/2003.

- 24-hour average $PM_{2.5}$ concentration increments which are predicted to be greater than 2 $\mu g/m^3$ but no greater than 5 $\mu g/m^3$ would be considered a significant adverse impact on air quality based on the magnitude, frequency, duration, location, and size of the area of the predicted concentrations;
- Annual average $PM_{2.5}$ concentration increments which are predicted to be greater than 0.1 $\mu g/m^3$ at ground level on a neighborhood scale (i.e., the annual increase in concentration representing the average over an area of approximately 1 square kilometer, centered on the location where the maximum ground-level impact is predicted for stationary sources; or at a distance from a roadway corridor similar to the minimum distance defined for locating neighborhood scale monitoring stations); or
- Annual average $PM_{2.5}$ concentration increments which are predicted to be greater than 0.3 $\mu g/m^3$ at a discrete receptor location (elevated or ground level).

Actions under CEQR predicted to increase $PM_{2.5}$ concentrations by more than the above interim guidance criteria will be considered to have a potential significant adverse impact.

The Proposed Action's annual emissions of PM_{10} are estimated to be well below the 15-ton-per-year threshold under NYSDEC's $PM_{2.5}$ policy guidance, which is only applicable to permitted sources of emissions. The above interim guidance criteria have been used to evaluate the significance of predicted impacts of the Proposed Action on $PM_{2.5}$ concentrations and determine the need to minimize particulate matter emissions from the Proposed Action.

Greenhouse Gases

Although GHGs have been recognized as pollutants under the CAA, the regulatory approach to GHGs is quite different from the approach used for criteria pollutants, largely because GHGs do not have direct local health impacts, and the concern with GHGs is generally focused on global emissions rather than local concentrations.

Countries around the world have undertaken efforts to reduce emissions by implementing both global and local measures that address energy consumption and production, land use, and other sectors. In a step toward the development of national climate change regulation, the U.S. has committed to reducing emissions such that emissions in 2020 would be 17 percent lower than 2005 levels and emissions in 2050 would be 83 percent lower than 2005 levels (pending legislation) via the Copenhagen Accord.[1] Without legislation focused on this goal, the U.S. Environmental Protection Agency (USEPA) is required to regulate GHGs under the Clean Air Act (CAA), and has already begun issuing regulations. The U.S. Department of Transportation (USDOT) and USEPA have established GHG emissions standards for vehicles that will reduce vehicular GHG emissions over time.

There are also regional, state, and local efforts to reduce GHG emissions. In 2009, Governor David Paterson issued Executive Order No. 24, establishing a goal of reducing GHG emissions in New York State by 80 percent, compared to 1990 levels, by 2050, and creating a Climate Action Council tasked with preparing a climate action plan outlining the policies required to attain the GHG reduction goal (that effort is currently under way[2]).

[1] Todd Stern, U.S. Special Envoy for Climate Change, letter to Mr. Yvo de Boer, UNFCCC, January 28, 2010.

[2] http://www.nyclimatechange.us/

Many local governments worldwide, including New York City, are participating in the Cities for Climate Protection campaign and have committed to adopting policies and implementing quantifiable measures to reduce local GHG emissions, improve air quality, and enhance urban livability and sustainability. New York City's long-term sustainability program, PlaNYC 2030, includes GHG emissions reduction goals and identifies specific initiatives that can result in emission reductions and initiatives targeted at adaptation to climate change impacts. As mentioned, the PlaNYC 2030 goal to reduce citywide GHG emissions to 30 percent below 2005 levels by 2030 was codified by Local Law 22 of 2008. Projects that require a GHG assessment under CEQR are evaluated with this goal as the benchmark. The city is also currently undertaking a study to evaluate and expand the City's current GHG mitigation strategies to create a roadmap for the city to achieve an 80 percent reduction of GHG emissions by 2050.

Although the contribution of any single project to climate change is infinitesimal, the combined GHG emissions from all human activity are believed to have a severe adverse impact on global climate. NYSDEC has published guidance on the analysis of GHG emissions for projects where GHG emissions or energy use have been identified as significant and where NYSDEC is the lead agency,[1] and the City of New York has formulated guidance for analysis under CEQR.[2] However, while the increments of criteria pollutants and toxic air emissions are assessed in the context of health-based standards and local impacts, there are no established thresholds for assessing the significance of a project's contribution to climate change. Therefore, projects analyzed under SEQRA or CEQR disclose potential GHG emissions, and assess the various practicable options available for reducing such emissions. Since the Proposed Action would only affect traffic patterns (not trip generation) and does not introduce any new energy systems or influence other relevant systems such as waste or water management systems, the analysis of GHG for the Proposed Action focuses on disclosure of the potential change in GHG emissions that would be associated with the Proposed Action.

E. METHODOLOGY

Intersection Analysis

The prediction of vehicle-generated emissions and their dispersion in an urban environment incorporates meteorological phenomena, traffic conditions, and physical configuration. Air pollutant dispersion models mathematically simulate how traffic, meteorology, and physical configuration combine to affect pollutant concentrations. The mathematical expressions and formulations contained in the various models attempt to describe an extremely complex physical phenomenon as closely as possible. However, because all models contain simplifications and approximations of actual conditions and interactions, and since it is necessary to predict the reasonable worst-case condition, most dispersion analyses predict conservatively high concentrations of pollutants, particularly under adverse meteorological conditions.

[1] NYSDEC, Guide for Assessing Energy Use and Greenhouse Gas Emissions in an Environmental Impact Statement, July 15, 2009.

[2] *CEQR Technical Manual*, Chapter 18, section 300, June 2012.

The mobile source analyses for the Proposed Action employ a model approved by EPA that has been widely used for evaluating air quality impacts of projects in New York City, other parts of New York State, and throughout the country. The modeling approach includes a series of conservative assumptions relating to meteorology, traffic, and background concentration levels resulting in a conservatively high estimate of expected pollutant concentrations that could ensue from the Proposed Action.

Vehicle Emissions

Engine Emissions

Vehicular CO and PM engine emission factors were computed using the EPA mobile source emissions model, MOBILE6.2[1]. This emissions model is capable of calculating engine emission factors for various vehicle types, based on the fuel type (gasoline, diesel, or natural gas), meteorological conditions, vehicle speeds, vehicle age, roadway types, number of starts per day, engine soak time, and various other factors that influence emissions, such as inspection maintenance programs. The inputs and use of MOBILE6.2 incorporate the most current guidance available from NYSDEC and NYCDEP.

Vehicle classification data were based on field studies. Appropriate credits were used to accurately reflect the inspection and maintenance program. The inspection and maintenance programs require inspections of automobiles and light trucks to determine if pollutant emissions from each vehicle exhaust system are lower than emission standards. Vehicles failing the emissions test must undergo maintenance and pass a repeat test to be registered in New York State.

All taxis were assumed to be in hot stabilized mode (i.e. excluding any start emissions). The general categories of vehicle types for specific roadways were further categorized into subcategories based on their relative breakdown within the fleet.[2]

An ambient temperature of 50.0° Fahrenheit was used as per the 2012 *CEQR Technical Manual* guidance.

Road Dust

The contribution of re-entrained road dust to PM_{10} concentrations, as presented in the PM_{10} SIP, is considered to be significant; therefore, the PM_{10} estimates include both exhaust and road dust. In accordance with the $PM_{2.5}$ interim guidance criteria methodology, $PM_{2.5}$ emission rates were determined with fugitive road dust to account for their impacts in local microscale analyses. However, fugitive road dust was not included in the annual neighborhood scale $PM_{2.5}$ microscale analyses, since NYCDEP considers it to have an insignificant contribution on that scale. Road

[1] EPA, User's Guide to MOBILE6.1 and MOBILE6.2: Mobile Source Emission Factor Model, EPA420-R-03-010, August 2003.

[2] The MOBILE6.2 emissions model utilizes 28 vehicle categories by size and fuel. Traffic counts and predictions are based on broader size categories, and then broken down according to the fleet-wide distribution of subcategories and fuel types (diesel, gasoline, or alternative).

dust emission factors were calculated according to the latest procedure delineated by EPA[1] and the 2012 *CEQR Technical Manual*.

Traffic Data

Traffic data for the air quality analysis were derived from existing traffic counts, projected future growth in traffic (background and WTC Campus), and other information developed as part of the traffic analysis for the Proposed Action (see Chapter 8, "Transportation"), including the diversion of traffic associated with the Proposed Action. Traffic data for the future without and with the Proposed Action were employed in the respective air quality modeling scenarios. For CO, the weekday morning (8:15 to 9:15 AM), midday (11:30 AM to 12:30 PM), and evening (5 to 6 PM) peak periods were analyzed. These time periods were selected for the mobile source analysis because they produce the maximum anticipated project-generated traffic and therefore have the greatest potential for significant air quality impacts.

For particulate matter, the peak morning, midday, and evening period traffic volumes were used as a baseline for determining off-peak volumes. Off-peak traffic volumes in the future without the Proposed Action and with the Proposed Action were determined by adjusting the peak period volumes by the 24-hour distributions of actual 24-hour vehicle counts collected at appropriate locations by automatic traffic recorders.

Dispersion Model for Microscale Analyses

Maximum CO concentrations adjacent to the analysis sites resulting from vehicular emissions were predicted using the CAL3QHC model Version 2.0.[2] The CAL3QHC model employs a Gaussian (normal distribution) dispersion assumption and includes an algorithm for estimating vehicular queue lengths at signalized intersections. CAL3QHC predicts emissions and dispersion of CO from idling and moving vehicles. The queuing algorithm includes site-specific traffic parameters, such as signal timing and delay calculations (from the 2000 *Highway Capacity Manual* traffic forecasting model), saturation flow rate, vehicle arrival type, and signal actuation (i.e., pre-timed or actuated signal) characteristics to accurately predict the number of idling vehicles. The CAL3QHC model has been updated with an extended module, CAL3QHCR, which allows for the incorporation of hourly meteorological data into the modeling, instead of worst-case assumptions regarding meteorological parameters. This refined version of the model, CAL3QHCR, can be employed if maximum predicted future CO concentrations are greater than the applicable ambient air quality standards or when *de minimis* thresholds are exceeded using the first level of CAL3QHC modeling, and was applied for PM modeling. This refined version of the model can utilize hourly traffic and meteorology data, and is therefore more appropriate for calculating the 24-hour and annual average concentrations required to address the timescales of the PM NAAQS.

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[1] EPA, Compilations of Air Pollutant Emission Factors AP-42, Fifth Edition, Volume I: Stationary Point and Area Sources, Ch. 13.2.1, NC, http://www.epa.gov/ttn/chief/ap42, January 2011.

[2] EPA, User's Guide to CAL3QHC, A Modeling Methodology for Predicted Pollutant Concentrations Near Roadway Intersections, Office of Air Quality, Planning Standards, Research Triangle Park, North Carolina, EPA-454/R-92-006.

Meteorology

In general, the transport and concentration of pollutants from vehicular sources are influenced by three principal meteorological factors: wind direction, wind speed, and atmospheric stability. Wind direction influences the direction in which pollutants are dispersed, and atmospheric stability accounts for the effects of vertical mixing in the atmosphere. These factors, therefore, influence the concentration at a particular prediction location (receptor).

CO Analyses—CAL3QHC
In applying the CAL3QHC model, the wind angle was varied to determine the wind direction resulting in the maximum concentrations at each receptor.

Following the EPA guidelines[1], CAL3QHC computations were performed using a wind speed of 1 meter per second, and the neutral stability class D. The 8-hour average CO concentrations were estimated by multiplying the predicted 1-hour average CO concentrations by a factor of 0.79 to account for persistence of meteorological conditions, per the 2012 *CEQR Technical Manual* guidance. A surface roughness of 3.21 meters was chosen. At each receptor location, concentrations were calculated for all wind directions, and the highest predicted concentration was reported, regardless of frequency of occurrence. These assumptions ensured that worst-case meteorology was used to estimate impacts.

PM Analyses—CAL3QHCR
Analysis performed with the CAL3QHCR model includes the modeling of hourly concentrations based on hourly traffic data and five years of monitored hourly meteorological data. The data consists of surface data collected at LaGuardia Airport and upper air data collected at Brookhaven, New York for the period 2007-2011. All hours were modeled, and the highest resulting concentration for each averaging period is presented.

Analysis Year

The microscale analyses were performed for 2019, the year by which the Proposed Action is likely to be completed. The future analysis was performed both without the Proposed Action (the No-Action condition) and with the Proposed Action (the With-Action condition).

Background Concentrations

Background concentrations are those pollutant concentrations originating from distant sources that are not directly included in the modeling analysis (which directly accounts only for vehicular emissions on intersecting streets within 1,000 feet of the analyzed intersection). Background concentrations must be added to modeling results to obtain total pollutant concentrations at an analysis site.

The background concentrations used in the mobile source analysis were based on the existing concentrations recorded at the monitoring stations nearest to the Proposed Action site from 2007 to 2011. The background concentrations represent the highest measured 3-year average $PM_{2.5}$

[1] *Guidelines for Modeling Carbon Monoxide from Roadway Intersections*, EPA Office of Air Quality Planning and Standards, Publication EPA-454/R-92-005.

concentration, the 98th percentile 24-hour average $PM_{2.5}$ concentration, and the second highest 24-hour PM_{10} and 8-hour and 1-hour CO concentrations, consistent with the form of the NAAQS. A full description of the concentrations can be found in Section F, "Existing Conditions," and in **Table 9-4**.

Analysis Sites

Intersections in the study area were reviewed for microscale analysis based on the 2012 *CEQR Technical Manual* guidance. The incremental traffic volumes for the AM, midday, PM, and Saturday midday periods were reviewed and intersections with increments exceeding the CO and PM volume thresholds were identified. Of those intersections, two were selected for microscale analysis (see **Table 9-2**): Site 1 was selected because it is projected to have the largest incremental traffic volume; Site 2 represents the site with the highest total traffic volumes. The potential impact from vehicle emissions of CO, PM_{10}, and $PM_{2.5}$ was analyzed at each site.

Table 9-2
Mobile Source Analysis Sites

Analysis Site	Location	Pollutants Analyzed
1	Barclay Street and Broadway	CO, PM_{10}, $PM_{2.5}$
2	West Street/Route 9A and Murray Street	CO, PM_{10}, $PM_{2.5}$

Receptor Placement

Multiple receptors (i.e. precise locations at which concentrations are predicted) were modeled at each of the selected sites; receptors were placed along the approach and departure links at spaced intervals. Receptors were placed at sidewalk or roadside locations near intersections with continuous public access. Receptors in the analysis models for predicting annual average neighborhood-scale $PM_{2.5}$ concentrations were placed at a distance of 15 meters, from the nearest moving lane at each analysis location, based on the *CEQR Technical Manual* procedure for neighborhood-scale corridor $PM_{2.5}$ modeling.

Security Screening Analysis

Vehicles entering the WTC Campus area would pass through a two-stage security process, including inspection of credentials and vehicle screening, as described in Chapter 1, "Project Description," and depicted in **Figure 1-2**. This process would occur at four sites:

- West Broadway and Barclay Street
- Washington Street and Barclay Street
- Trinity Place and Liberty Street
- West Street/Route 9A and Liberty Street

The four sites were reviewed and compared to determine the worst-case site(s) to be analyzed to evaluate the impact of idling vehicles on air quality in the immediate vicinity.

Since the processing time would vary by stage (credentialing and screening), by vehicle type, and by enrollment in the Trusted Access Program (TAP), the best comparison of activity at the four sites is obtained by comparing the total vehicle idle time by vehicle type at each location. Total vehicle idle time (the number of vehicles processed multiplied by the processing time) was summed and is presented in **Table 9-3**.

Table 9-3
Total Estimated Peak Hour Security Screening Idle Time by Intersection

Intersection	Idle Time (veh·minutes / hr)			Peak Period	Change in Intersection Vehicle Volume[(1)]
	Light Duty Vehicle	Truck/Van	Bus		
West Broadway and Barclay Street	121.3	0	0	PM	(-376)
Washington Street and Barclay Street	0	6.0	0	AM	109
Trinity Place and Liberty Street	10.3	0	**91.0**	AM / **Sat. Midday**	(-521) / (-464)
Route 9A and Liberty Street	23.3	16.7	0	AM / Midday	(-292) / (-188)

Notes: Values in **bold** represent the highest idle time and period selected for analysis.
(1) Change in Intersection Vehicle Volume represents the net change in traffic volume expected at the intersection as a result of the Proposed Action's vehicle diversions. A negative number represents a reduction in traffic volume.

With the exception of the intersection of Washington Street and Barclay Street, a net reduction in traffic volume is expected at these intersections as a result of the Proposed Action's vehicle diversions, and is presented in **Table 9-3** alongside the idle time. The net reduction in traffic volume would reduce emissions at these locations, partially or fully offsetting the increase in emissions associated with vehicle idling during the security processing.

For the most part, the idle times represent a small increase in emissions, and would be offset by the reduction in traffic at most locations. At West Broadway and Barclay Street, the processed vehicles would all be light duty vehicles, and the idle time is equivalent to approximately three cars idling at the intersection at peak hour, offset by a reduction of 376 vehicles of mixed types and sizes passing through the intersection. At Washington Street and Barclay Street, the processed vehicles would all be trucks and vans, likely including mostly vans and medium duty trucks, and the idle time is equivalent to less than one vehicle idling at peak hour. (There would also be a net increase of 109 vehicles passing through this intersection at the peak hour—however, a worst-case analysis of the nearby Barclay Street and Broadway intersection, representing a much larger increase in traffic volume, is included in the intersection analysis.) At West Street/Route 9A and Liberty Street, the idle times would be limited because this location would include only credentialing, and the screening would take place within the Vehicle Security Center (VSC). Idle time at this intersection (including both the northbound and the southbound areas, cars and trucks) would be equivalent to less than one vehicle idling during the peak hour, and would be offset by reduced traffic volumes passing through the intersection. Overall, at all three of these locations, the changes are expected to be insignificant and therefore, no further analysis was performed.

The vehicle idle emissions at the intersection of Trinity Place and Liberty Street would be the highest of all four sites because the 91 minutes of idle time at peak hour at this location would all be associated with tour buses, which are classified heavy duty diesel vehicles and emit much

larger amounts of particulate matter than light duty vehicles. Therefore, this intersection was analyzed in detail to evaluate the effect of the security processing on air quality in the immediate vicinity.

The security screening analysis followed the methodology described above for intersection analysis, with the addition of line sources representing the idling vehicles in the credentialing and screening areas. The total traffic volume projected to be processed by hour of the day and vehicle type is presented in **Table 9-4**.

Table 9-4
Security Processing Vehicle Volumes at Trinity Place and Liberty Street

Hour	Tour Bus		LDV	
	Weekday	Saturday	Weekday	Saturday
7 to 8 AM	0	0	1	0
8 to 9 AM	0	0	14	0
9 to 10 AM	9	12	12	0
10 to 11 AM	12	15	0	0
11 to 12 PM	13	17	0	0
12 to 1 PM	33	24	0	0
1 to 2 PM	18	42	0	0
2 to 3 PM	16	20	0	0
3 to 4 PM	12	15	0	0
4 to 5 PM	9	12	0	0
5 to 6 PM	9	12	0	0

Bus Drop-off and Pick-Up Analysis

According to the original plan for the WTC campus (detailed in the *WTC Memorial and Redevelopment Plan GEIS*), tour buses would mostly be dropping off and collecting visitors to the National September 11th Memorial, Memorial Center and Tower 1 observation deck along the west side of Greenwich Street south of Fulton Street, and some possibly along the north curb of Liberty Street west of Greenwich Street. The Proposed Action would result in changes to bus drop-off procedures. Under the Proposed Action, tour buses would either drop off visitors on the north side of Liberty Street west of Greenwich Street, on the west side of Greenwich Street north of Liberty Street, or possibly on the east side of West Street/Route 9A north of Liberty Street and would pick up passengers along the west side of Greenwich Street, the north side of Liberty Street west of Greenwich Street, and possibly on the east side of West Street/Route 9A just north of Liberty Street.

The emissions from idling tour buses were analyzed in detail in the *WTC Memorial and Redevelopment Plan GEIS,* assuming, as a worst-case assumption, that all bus emissions would occur along Greenwich Street. The possible change in location and its effect on pollutant concentrations in the vicinity of bus drop-off and pick-up locations under the Proposed Action is discussed qualitatively, based on the previous analysis.

Area-Wide (Mesoscale) Emissions Analysis

An analysis was performed to estimate the impact of the Proposed Action on regional (mesoscale) criteria pollutant burdens in New York City. This type of analysis is used in estimating the significance of potential changes in regional pollutant emissions to help ensure that SIPs fulfill their goal (i.e., reduce or maintain regional pollutant emissions to achieve or maintain compliance with NAAQS in New York State). This analysis, therefore, utilizes assumptions and methods that are consistent with the planning of potential changes in regional emissions as reported by the New York Metropolitan Transportation Council (NYMTC) in the Transportation Improvement Program (TIP) conformity determinations.

As described above, the criteria pollutants of concern on a regional basis in New York City are NO_x and VOCs (precursors for ozone for which New York City is in nonattainment status, exceeding the NAAQS), CO (the City is in maintenance status, having attained the NAAQS), and PM (the City is nonattainment for $PM_{2.5}$, and Manhattan, having achieved levels below the PM_{10} NAAQS, is still formally in nonattainment status for PM_{10}).

Therefore, regional direct emissions of CO, NO_x, VOCs, $PM_{2.5}$, and PM_{10} were calculated quantitatively and estimates of potential impacts on regional secondary formation of $PM_{2.5}$ were performed qualitatively.

In addition to the criteria pollutants, total GHG emissions were also estimated, including CH_4 and N_2O, and are presented as carbon dioxide equivalent (CO_2e). CO_2e represents the quantity of CO_2 which would have an impact on global climate equivalent to that of the GHGs in question, and is calculated by adding CO_2 to the sum of CH_4 and N_2O multiplied by their global warming potentials, 21 and 310, respectively. The impact of the Proposed Action on CO_2e emissions was examined on a regional basis.

Projected changes in the quantity of pollutants emitted in New York City due to the Proposed Action were calculated by multiplying the predicted increase in vehicle miles traveled (VMT) by the vehicular emission factor for each vehicle class by speed, as described below.

Increased Vehicle Miles Traveled

VMT is the total number of miles traveled over a given segment multiplied by the number of vehicles traveling any given segment over a period of time. For example, if during one day three vehicles were to travel five miles, the VMT would be 15 vehicle-miles per day. The Proposed Action is predicted to result in the diversion of traffic due to the proposed managed street system. This would result in some vehicles traveling longer distances.

The net change in VMT (No-Action to With-Action) was estimated separately for the WTC Campus trips and for background traffic. For the WTC Campus trips, the specific routing of the trips was developed as described in Chapter 8, "Transportation," and the number of vehicles of each type was multiplied by the distance on local roadways, Route 9A/West Street, and the FDR Drive (more on roadway types below). The projected reduction in taxi miles traveled was not included in the mesoscale emissions analysis, since it is assumed that the number of taxis on area roads will not change as a result of the Proposed Action.

The Lower Manhattan Traffic Simulation Model (LMTSM) was used to estimate the net VMT associated with diverted background traffic. LMTSM, developed by the LiRo Group, Inc. for the Lower Manhattan Construction Command Center, implements heuristic dynamic assignment to emulate dynamics of time-dependent traffic phenomena in Lower Manhattan. LMTSM applies the AIMSUN microscopic simulator platform developed by Transport Simulation Systems of Spain. AIMSUN incorporates the latest advancements in traffic simulation with integrated microscopic, mesoscopic, macroscopic and pedestrian simulation capabilities. The model incorporates drivers' behavioral characteristics such as reaction time, gap acceptance, acceleration, deceleration and car following. Its output includes measures of effectiveness such as flow, speed, delay, queue length, as well as vehicle-mile-traveled and vehicle-time-traveled for different types of vehicles and transport modes.

LMTSM for morning (AM), midday (MD), and evening (PM) peak periods were updated with the latest field data to represent the 2012 base traffic conditions. The study area was bounded by Chambers Street to the north, Battery Place to the south, Broadway to the east and West Street/Route 9A to the west. AIMSUN is capable of conducting replications with different random seeds which stochastically affect the simulation and its results. Multiple replications are run to account for probable variations in traffic simulations during the analysis period and results obtained are averaged, after eliminating any unrealistic values (outliers), representing the average behavior. LMTSM was calibrated based on the average of 10 replications and the models complied with the NYCDOT validation criteria.

Since the data required for modeling all off-peak periods and days to obtain an annual VMT estimate was not available, a conservative estimate was prepared based on the peak period data. After verifying that the ratio of MD to AM/PM VMT from the simulation was similar to, or lower than the ratio of traffic volumes recorded at those hours obtained by automated traffic recorders (ATR) located on West Street/Route 9A and local streets, the MD VMT was multiplied by the ratio of MD/daily-average vehicle counts from the ATR data and multiplied by 365 days per year to obtain a conservative estimate of increased annual VMT associated with the Proposed Action. Since the calculated VMT for the hours other than the mid-day peak period is derived from ATR data rather than actual traffic projections, an additional factor of 20 percent was added to the estimated increase in background traffic VMT to account for any potential uncertainties regarding the estimated future condition and the actual future condition with WTC Campus traffic. Although the LMTSM model projected a decrease in bus miles, this decrease was not included since city bus operations are not expected to be reduced as a consequence of the Proposed Action (tour bus miles are addressed separately under the WTC Campus trips.)

Roadway Type and Vehicle Speed

In most cases, the amount of pollutants emitted from motor vehicle engines is dependent on the speed of the vehicle. The emission factors by roadway type take into account vehicle speed profiles and congestion, such that lower average speeds include a fraction of idling emissions from stop-and-go traffic and traffic lights. It should be noted that the current PM emission factors are not affected by vehicle speed, and therefore there is effectively no change in emission rates per mile when diverting traffic from one roadway type to another, and therefore the only change for PM emissions is due to the increase in VMT. For all other pollutants, predicted emissions are affected by vehicle speed.

The diversions would not be expected to significantly change the average vehicle speeds on any roadway. Since the diversions would occur on many different streets and roads and during all hours of the day and days of the year, speeds would vary greatly and both the VMT and corresponding speeds cannot be evaluated at such detailed time and geographic scales. Therefore, a simplifying conservative estimate was used, applying average speed of 10 miles per hour (mph) for all local roadways and 15 mph for the FDR Drive and Route 9A. These speeds were selected based on a review of the projected speeds used for microscale analyses. The projected average speed along Route 9A at peak hours ranged from 14.2 to 24.0 mph in the northbound direction, and 17.2 to 22.5 mph in the southbound direction. The projected average speed on local streets at peak hours ranged from 7.7 to 15.7 mph. Since lower speeds would yield higher emission factors, the selected speeds were conservatively low.

Emission Factors

Emission factors, which are the rate of emission of any given pollutant per unit, in this case per vehicle mile, are calculated using the EPA's emissions models—MOBILE6.2 for tailpipe emissions, and AP-42 for resuspended road dust as a component of PM. In addition to being speed–correlated, emissions are also dependent on various engine and ambient conditions. All emissions modeling was based on factors employed in the TIP and SIP calculations. Average emission factors were calculated for the roadway types and speeds described above. Since the EPA's emissions models predict that emission factors will decrease in future years, the worst-case factors would be the conditions in 2019, and emission factors would be lower in later years.

The projected change in emissions due to traffic diverted by the Proposed Action was calculated by multiplying the total change in VMT for each road type by the corresponding emission factor.

CO_2e emission factors for the mix of vehicles were based on the EPA MOVES model. Although full detailed assumptions for using MOVES for criteria pollutant emissions are not yet available, EPA considers MOVES to be an appropriate model for GHG emissions and it can be used for GHG emissions since it incorporates vehicle speed-dependence and various fuel and vehicle type effects which are not addressed in MOBILE6.2 and since sufficient information is available for GHG modeling with MOVES from the New York State Department of Transportation.

F. EXISTING CONDITIONS

The most recent concentrations of all criteria pollutants at NYSDEC air quality monitoring stations nearest to the Proposed Action site are presented in **Table 9-5**. All concentrations are presented in the statistical format as defined by the NAAQS for each applicable pollutant and averaging period. In cases where the available stations were not near the Proposed Action, the highest values were selected from available stations. As shown, the recently monitored concentrations did not exceed the NAAQS. The existing concentrations are based on recent measurements obtained in from 2007-2011, the most recent year for which data are available. Note that in most cases, since concentrations are diminishing over the years, concentrations in 2011 were lower than the highest of the last five years, presented here.

Table 9-5
Representative Monitored Ambient Air Quality Data

Pollutant	Location	Units	Averaging Period	Concentration	NAAQS
CO	Queens College 2, Queens	ppm	8-hour	2.0	9
			1-hour	3.4	35
SO_2	Queens College 2, Queens	µg/m^3	3-hour	88.9	1,300
			1-hour	78.5 [1]	196
PM_{10}	Division Street, Manhattan	µg/m^3	24-hour	48	150
$PM_{2.5}$	Division Street, Manhattan	µg/m^3	Annual	11.7	15
			24-hour	28	35
NO_2	PS 59, Manhattan Queens College 2, Queens	ppm	Annual	0.034	0.053
			1-hour	0.067 [2]	0.100
Lead	Morrisania, Bronx	µg/m^3	3-month	0.008	0.15
Ozone	CCNY, Manhattan	ppm	8-hour	0.072 [3]	0.075

Notes:

The form of all concentrations is the same as defined for the NAAQS of the corresponding pollutant and time average.

1. Based on a three-year average of the 99th percentile of daily maximum 1-hour average concentrations for 2009-2011. EPA replaced the 24-hr and the annual standards with the 1-hour standard in 2010, and these values are not available prior to that period.
2. Based on a three-year average of the 98th percentile of daily maximum 1-hour average concentrations for 2009-2011. EPA introduced this new standard in 2010, and these values are not available prior to that period.
3. 8-Hour average ozone concentrations are the average of the 4th highest daily values from 2009-2011.

Source: DEC, New York State Ambient Air Quality Data.

Modeled Concentrations for Existing Traffic Conditions

As noted previously, receptors were placed at multiple sidewalk locations next to the intersections selected for the analysis. The receptor with the highest predicted CO concentrations was used to represent these intersection sites for the existing conditions. CO concentrations were calculated for each receptor location, at each intersection, for each peak period analyzed.

The maximum modeled existing (2012) CO 8-hour average concentrations at the receptor sites for the peak period when those concentrations are greatest are presented in **Table 9-6**. (No 1-hour values are shown since predicted values are much lower than the 1-hour standard of 35 ppm.) At all receptor sites, the maximum predicted 8-hour average concentrations are well below the national standard of 9 ppm.

Table 9-6
Modeled Existing (2012) Maximum 8-hour Average CO Concentrations (ppm)

Receptor Site	Location	Time Period	8-Hour Concentration
1	Barclay Street and Broadway	PM	3.5
2	West Street/Route 9A and Murray Street	PM	4.5
3	Trinity Place and Liberty Street (security screening analysis intersection)	Midday	2.7

Note: 8-hour standard (NAAQS) is 9 ppm.

G. FUTURE WITHOUT THE PROPOSED ACTION (NO-ACTION)

Relative to the existing condition, in the future without the Proposed Action (No-Action) there would be some background growth in traffic and some diversion of traffic associated with the operation of the WTC Campus. The No-Action scenario was analyzed in the same manner as the With-Action scenario for all analyses, as described above. Maximum predicted future 8-hour average CO concentrations at the analyzed intersections without the proposed action, including background concentrations, are presented in **Table 9-7**. The values shown are the highest predicted concentrations at any receptor location for each of the time periods analyzed. No-Action CO concentrations are predicted to be well below the 8-hour CO standard of 9 ppm.

Table 9-7
Maximum No-Action 8-hour Average CO Concentrations (ppm)

Receptor Site	Location	Time Period	8-Hour Concentration
1	Barclay Street and Broadway	Midday/PM	3.3
2	West Street/Route 9A and Murray Street	PM	4.4
3	Trinity Place and Liberty Street (security screening analysis intersection)	PM	3.3

Note: 8-hour standard (NAAQS) is 9 ppm.

PM_{10} concentrations without the Proposed Action are presented in **Table 9-8,** representing the highest predicted concentrations for all receptor locations analyzed at each analysis site, and include the PM_{10} ambient background concentration. The results indicate that the No-Action would not result in PM_{10} concentrations that would exceed the NAAQS.

Table 9-8
Maximum No-Action 24-Hour Average PM_{10} Concentrations ($\mu g/m^3$)

Analysis Site	Location	Concentration
1	Barclay Street and Broadway	59.1
2	West Street/Route 9A and Murray Street	75.9
3	Trinity Place and Liberty Street (security screening analysis intersection)	69.0

Note: 24-hour average PM_{10} NAAQS is 150 $\mu g/m^3$.

H. FUTURE WITH THE PROPOSED ACTION (WITH-ACTION)

Intersection Analysis

CO and PM concentrations with the Proposed Action were determined for the 2019 Build year using the methodology described above. **Table 9-9** shows the future maximum predicted 8-hour average CO concentration with and without the Proposed Action at each intersection studied. (No 1-hour values are shown, since no exceedances of the NAAQS would occur and the *de minimis* criteria are only applicable to 8-hour concentrations; therefore, the 8-hour values are the most critical for impact assessment.) These values represent the highest predicted concentrations for any of the receptors analyzed. The results indicate that the Proposed Action would not result in any violations of the 8-hour CO standard. In addition, the projected increases in 8-hour average CO concentrations are small and consequently concentrations would not exceed the *de minimis* CO criteria.

Table 9-9
Projected Maximum 8-Hour Average CO Concentrations (ppm)

Analysis Site	Location	Time Period	8-Hour Concentration (ppm)			
			No-Action	With-Action	Increment	*De Minimis*
1	Barclay Street and Broadway	PM	3.3	3.4	0.1	6.1
2	West Street/Route 9A and Murray Street	PM	4.4	4.5	0.1	6.7
Notes: 8-hour average CO NAAQS is 9 ppm.						

PM_{10} concentrations with and without the Proposed Action are presented in **Table 9-10,** representing are the highest predicted concentrations for all receptor locations analyzed at each analysis site, and include the PM_{10} ambient background concentration. The results indicate that the Proposed Action would not result in PM_{10} concentrations that would exceed the NAAQS.

Future maximum predicted 24-hour and annual average $PM_{2.5}$ concentration increments were calculated for comparison with the interim guidance criteria. The maximum predicted local 24-hour average and neighborhood-scale annual average incremental $PM_{2.5}$ concentrations are presented in **Tables 9-11** and **9-12**, respectively. Note that $PM_{2.5}$ concentrations without the Proposed Action are not presented, since impacts are assessed on an incremental basis.

Table 9-10
Projected Maximum 24-Hour Average PM_{10} Concentrations ($\mu g/m^3$)

Analysis Site	Location	No-Action	With-Action
1	Barclay Street and Broadway	59.1	61.3
2	West Street/Route 9A and Murray Street	75.9	76.5
Note: 24-hour average PM_{10} NAAQS is 150 $\mu g/m^3$.			

Table 9-11
Projected Maximum 24-Hour Average $PM_{2.5}$ Concentration Increments ($\mu g/m^3$)

Analysis Site	Location	Increment
1	Barclay Street and Broadway	0.9
2	West Street/Route 9A and Murray Street	0.3
Note: 24-hour average $PM_{2.5}$ interim guidance criteria is 2 $\mu g/m^3$ (5 $\mu g/m^3$ not-to-exceed).		

Table 9-12
Maximum Predicted Annual Average $PM_{2.5}$ Concentration Increments ($\mu g/m^3$)

Receptor Site	Location	Increment
1	Barclay Street and Broadway	0.059
2	West Street/Route 9A and Murray Street	0.026
Note: Annual average $PM_{2.5}$ interim guidance criteria (neighborhood scale) is 0.1 $\mu g/m^3$.		

The results show that the annual average and 24-hour average $PM_{2.5}$ increments would be well below the interim guidance criteria and, therefore, the Proposed Action would not result in significant adverse air quality impacts from mobile sources.

Security Screening Analysis

CO and PM concentrations with the Proposed Action were determined for the 2019 Build year using the methodology described above. The future maximum predicted 8-hour average CO concentrations with and without the Proposed Action at the intersection studied are presented in **Table 9-13**. (1-hour values are not presented, since no exceedances of the NAAQS would occur and the *de minimis* criteria are only applicable to 8-hour concentrations; therefore, the 8-hour values are the most critical for impact assessment.) These values represent the highest predicted concentrations for any of the receptors analyzed. A net decrease in 8-hour average CO concentration is predicted. A net decrease in concentration indicates that the effect of roadway configuration changes near the intersection of Trinity Place and Liberty Street is larger than that of increased idle time due to security screening. The Proposed Action would not result in any violations of the 8-hour CO standard or *De Minimis* criterion.

Table 9-13
Projected Maximum 8-Hour Average CO Concentrations (ppm)

Analysis Site	Location	Time Period	8-Hour Concentration (ppm)			
			No-Action	With-Action	Increment	*De Minimis*
3	Trinity Place and Liberty Street	**MD**	**3.1**	**2.6**	**-0.5**	**6.0**
Notes: 8-hour average CO NAAQS is 9 ppm.						

PM_{10} concentrations with and without the Proposed Action are presented in **Table 9-14,** representing the highest predicted concentrations for all receptor locations analyzed at the

analysis site, and include the PM_{10} ambient background concentration. The Proposed Action would not result in PM_{10} concentrations that would exceed the NAAQS.

Maximum predicted future 24-hour and annual average $PM_{2.5}$ concentration increments were calculated for comparison with the interim guidance criteria. The maximum predicted local 24-hour average and neighborhood-scale annual average incremental $PM_{2.5}$ concentrations are presented in **Tables 9-15** and **9-16**, respectively. Note that $PM_{2.5}$ concentrations without the Proposed Action are not presented, since impacts are assessed on an incremental basis.

Table 9-14
Projected Maximum 24-Hour Average PM_{10} Concentrations ($\mu g/m^3$)

Analysis Site	Location	No-Action	With-Action
3	Trinity Place and Liberty Street	69.0	61.1
Note: 24-hour average PM_{10} NAAQS is 150 $\mu g/m^3$.			

Table 9-15
Projected Maximum 24-Hour Average $PM_{2.5}$ Concentration Increments ($\mu g/m^3$)

Analysis Site	Location	Increment
3	Trinity Place and Liberty Street	-1.3
Note: 24-hour average $PM_{2.5}$ interim guidance criteria is 2 $\mu g/m^3$ (5 $\mu g/m^3$ not-to-exceed).		

Table 9-16
Maximum Predicted Annual Average $PM_{2.5}$ Concentration Increments ($\mu g/m^3$)

Receptor Site	Location	Increment
3	Trinity Place and Liberty Street	-0.08
Note: Annual average $PM_{2.5}$ interim guidance criteria (neighborhood scale) is 0.1 $\mu g/m^3$.		

The results show that net decreases in annual average and 24-hour average $PM_{2.5}$ concentrations are predicted and, therefore, the Proposed Action would not result in significant adverse air quality impacts from mobile sources.

Bus Idling Analysis

The emissions from idling tour buses and the dispersion of those emissions were analyzed in detail in the WTC GEIS. The WTC GEIS concluded that along Greenwich Street, in the area where buses will be loading and unloading visitors, the predicted increment in $PM_{2.5}$ concentrations from all local mobile sources were a maximum of 1.14 $\mu g/m^3$ and 0.14 $\mu g/m^3$ on a 24-hour and local annual average basis, respectively. Total predicted PM_{10} concentrations, including background, were 62.1 and 25.8 $\mu g/m^3$ on a 24-hour and annual average basis, respectively.

The WTC GEIS analysis was based on the projected peak opening year (2009) bus volumes. The appropriate bus volumes for this analysis are the stabilized bus volumes projected for future years, which are 11 to 13 percent lower, as presented in **Table 9-17**. Note that bus idling for longer than three minutes is prohibited under City local laws. Furthermore, the WTC GEIS analysis utilized bus emissions which did not account for Local Law 41 of 2006 and associated regulations, which required best available technology to be used, which reduce PM from bus engine emissions by 40 to 90 percent.

Table 9-17
Tour Bus Trips Generated by the Proposed WTC Development Program

Period	2015		2009		Total Change
	In	Out	In	Out	
AM	8	0	9	0	-11%
MD	33	13	38	15	-13%
PM	9	20	10	23	-12%

Sources: LMDC, *WTC Memorial and Redevelopment Plan GEIS, 2004.*

Since most buses with the Proposed Action would be dropping off on the relatively short stretch of Liberty Street west of Greenwich Street and east of the VSC, some of the emissions associated with drop-off would be more spatially concentrated. However, since the WTC GEIS assumed higher volumes and substantially higher emission factors, and further assumed all pick up and drop off would occur only on Greenwich Street, the net change would be minor. The WTC GEIS analysis resulted in $PM_{2.5}$ increments well below significant impact thresholds; therefore, exceedances of thresholds or NAAQS with the Proposed Action would not occur. Overall, the effect of the Proposed Action associated with idle emissions from buses during drop-off and pick-up would be less than projected in the WTC GEIS, and, therefore, would not result in any significant adverse air quality impacts.

Area-Wide (Mesoscale) Emissions Analysis and Conformity with SIPs

The net projected change in VMT by roadway and vehicle types associated with the Proposed Action are presented in **Table 9-18**. The net projected emissions increments associated with this increased travel and the fraction of Manhattan-wide on-road emissions these increments represent are presented in **Table 9-19**.

Table 9-18
Net Projected Annual VMT, 2019

Vehicle Type	Route 9A	local	FDR
Auto	443,295	-46,857	49,329
Taxi	24,279	64,239	0
Black Car	-2,610	11,233	-2,088
Truck	147,045	-100,216	0
Bus	42,543	1,305	0

Notes: Negative numbers indicate a reduction in VMT associated with the Proposed Action.

The total increase in VMT associated with the Proposed Action is 1,723 miles per day on average, which represents less than 0.02 percent of the roughly 10 million daily VMT in Manhattan projected for 2020 by NYMTC.[1] The projected increase in emissions for all pollutants would represent a negligible fraction of Manhattan-wide emissions. Although projections of PM_{10} emissions in Manhattan are not available, based on the VMT fraction and on the fraction of other pollutants, the increment in PM_{10} emissions from the Proposed Action would also represent a negligible fraction of Manhattan-wide emissions. These emissions would also be much lower than the prescribed emission rates which would require a general conformity analysis.

The region-wide emissions increment associated with the Proposed Action would not be a significant contribution to region wide emissions, and are not expected to interfere with the SIP for region–wide attainment of the ozone NAAQS, maintenance of the CO NAAQS, or current and future SIPs for attaining the $PM_{2.5}$ NAAQS. The resulting CO_2e increment from diversions would not be a significant contribution to region-wide emissions, and are not expected to interfere with current plans for reducing GHG emissions.

Table 9-19
Net Projected Annual Emissions, 2019

Pollutant	Net Emissions (ton/year)	Fraction of Manhattan-Wide On-Road Emissions
CO	5.1	0.015% (1)
VOC	0.51	0.021% (2)
NO_x	0.64	0.045% / 0.033% (3)
PM_{10}	0.22	Not Available
$PM_{2.5}$	0.061	0.13%
CO_2e	417	0.0039% (4)

Notes:
All region-wide emissions were obtained from NYMTC 2012, other than as noted.
1. Compared on a daily basis, winter.
2. Compared on a daily basis, summer.
3. Compared on a daily basis, summer / annual.
4. Manhattan emissions not available. Compared with NY City (5-county) 2010 emissions. Source: City of New York, 2011. According to the NY State Interim Climate Action Plan GHG inventory, on-road emissions are not expected to change substantially by 2020.

[1] NYMTC, Transportation Conformity Determination--2011-2015 TIP and 2010-2035 RTP, adopted August 20, 2012.

A. INTRODUCTION

Noise pollution in an urban area comes from many sources. Some sources are activities essential to the health, safety, and welfare of a city's inhabitants, such as noise from emergency vehicle sirens, garbage collection operations, and construction and maintenance equipment. Other sources, such as traffic, are essential to the viability of a city as a place to live and do business. Although these and other noise-producing activities are necessary to a city, the noise they produce is undesirable. Urban noise detracts from the quality of the living environment, and there is increasing evidence that excessive noise represents a threat to public health.

The noise analysis for the World Trade Center (WTC) Campus Security Plan consisted of two parts:

- A screening analysis to determine whether there are any locations where traffic diversions associated with the Proposed Action or stationary noise sources (i.e., operations of security barriers) would have the potential to result in significant noise impacts; and,
- A detailed analysis at any location where traffic diversions associated with the Proposed Action or stationary noise sources would have the potential to result in significant noise impacts, to determine the magnitude of the increase in noise levels.

B. PRINCIPAL CONCLUSIONS

The noise analysis determined that traffic diversions associated with the Proposed Action and stationary noise sources (i.e., operation of security barriers) would not result in any predicted exceedances of the suggested incremental thresholds in the city's *CEQR Technical Manual* at the selected receptors. Therefore, there would be no predicted significant adverse noise impacts from the Proposed Action.

C. ACOUSTICAL FUNDAMENTALS

Quantitative information on the effects of airborne noise on people is well documented. If sufficiently loud, noise may adversely affect people in several ways. For example, noise may interfere with human activities, such as sleep, speech communication, and tasks requiring concentration or coordination. It may also cause annoyance, hearing damage, and other physiological problems. Although it is possible to study these effects on people on an average or statistical basis, it must be remembered that all the stated effects of noise on people vary greatly with the individual. Several noise scales and rating methods are used to quantify the effects of noise on people. These scales and methods consider such factors as loudness, duration, time of occurrence, and changes in noise level with time.

Noise Measurement

A number of factors affect sound, as it is perceived by the human ear. These include the actual level of the sound (or noise), the frequencies involved, the period of exposure to the noise, and changes or fluctuations in the noise levels during exposure. Levels of noise are measured in units called decibels (dB). Since the human ear cannot perceive all pitches or frequencies equally well, these measures are adjusted or weighted to correspond to human hearing. A measurement system that simulates the response of the human ear, the "A-weighted sound level" or "dBA," is used in view of its widespread recognition and its close correlation with human judgment of loudness and annoyance. In the current study, all measured levels are reported in dBA or A-weighted decibels. Sound levels for typical daily

activities are shown in **Table 10-1**.

Table 10-1
Common Noise Levels

Sound Source	(dBA)
Military jet, air raid siren	130
Amplified rock music	110
Jet takeoff at 500 meters	100
Freight train at 30 meters	95
Train horn at 30 meters	90
Heavy truck at 15 meters	
Busy city street, loud shout	80
Busy traffic intersection	
Highway traffic at 15 meters, train	70
Predominantly industrial area	60
Light car traffic at 15 meters, city or commercial areas or residential areas close to industry	
Background noise in an office	50
Suburban areas with medium density transportation	
Public library	40
Soft whisper at 5 meters	30
Threshold of hearing	0

Note: A 10 dBA increase in level appears to double the loudness, and a 10 dBA decrease halves the apparent loudness.
Source: Cowan, James P. Handbook of Environmental Acoustics. Van Nostrand Reinhold, New York, 1994. Egan, M. David, Architectural Acoustics. McGraw-Hill Book Company, 1988.

Although sound levels from a sound level meter are generally given in dBA, measurements are sometimes made in octave band format. An octave band is one of a series of bands that cover the normal range of frequencies included in sound measurements. Such octave bands serve to define the sound in term of its pitch components. Octave band levels are “unweighted” levels corresponding to the overall acoustical energy in the corresponding octave band.

Response To Changes In Noise Levels

The average ability of an individual to perceive changes in noise levels is well documented (see **Table 10-2**). Generally, changes in noise levels less than 3 dBA are barely perceptible to most listeners, whereas 10 dBA changes are normally perceived as doublings (or halvings) of noise levels. These guidelines permit direct estimation of an individual's probable perception of changes in noise levels.

Table 10-2
Average Ability to Perceive Changes in Noise Levels

Change (dBA)	Human Perception of Sound
2-3	Barely perceptible
5	Readily noticeable
10	A doubling or halving of the loudness of sound
20	A dramatic change
40	Difference between a faintly audible sound and a very loud sound

Source: Bolt Beranek and Neuman, Inc., *Fundamentals and Abatement of Highway Traffic Noise*, Report No. PB-222-703. Prepared for Federal Highway Administration, June 1973.

It is also possible to characterize the effects of noise on people by studying the aggregate response of people in communities. The rating method used for this purpose is based on a statistical analysis of the fluctuations in noise levels in a community, and integrates the fluctuating sound energy over a known period of time, most typically during 1 hour or 24 hours. Various government and research institutions have proposed criteria that attempt to relate changes in noise levels to community response. One commonly applied criterion for estimating this response is incorporated into the community response scale proposed by the International Standards Organization (ISO) of the United Nations (see **Table 10-3**). This scale relates changes in noise level to the degree of community response and permits direct estimation of the probable response of a community to a predicted change in noise level.

Table 10-3
Community Response to Increases in Noise Levels

Change (dBA)	Category	Description
0	None	No observed reaction
5	Little	Sporadic complaints
10	Medium	Widespread complaints
15	Strong	Threats of community action

Source: International Standards Organization, Noise Assessment with Respect to Community Responses, ISO/TC 43 (New York: United Nations, November 1969).

Statistical Noise Levels

Since dBA describes a noise level at just one moment and very few noises are constant, other ways of describing noise over extended periods are needed. One way of describing fluctuating sound is to describe the fluctuating noise heard over a specific time period, as if it had been a steady, unchanging sound. For this condition, a descriptor called the equivalent sound level, L_{eq} can be computed. L_{eq} is the constant sound level that, in a given situation and time period (e.g., 1 hour, $L_{eq(1)}$, or 24 hours, $L_{eq(24)}$, conveys the same sound energy as the actual time-varying sound. Statistical sound level descriptors such as L_1, L_{10}, L_{50}, L_{90}, and L_x are sometimes used to indicate noise levels that are exceeded 1, 10, 50, 90 and x percent of the time, respectively. Discrete event peak levels are given as L_1 levels. L_{eq} is used in the prediction of future noise levels, by adding the contributions from new sources of noise (i.e., increases in traffic volumes) to the existing levels and in relating annoyance to increases in noise levels.

The relationship between L_{eq} and levels of exceedance is worth noting. Because L_{eq} is defined in energy rather than straight numerical terms, it is simply related to the levels of exceedance. If the noise fluctuates very little, L_{eq} will approximate L_{50} or the median level. If the noise fluctuates broadly, the

L_{eq} will be approximately equal to the L_{10} value. If extreme fluctuations are present, the L_{eq} will exceed L_{90} or the background level by 10 or more decibels. Thus the relationship between L_{eq} and the levels of exceedance will depend on the character of the noise. In community noise measurements, it has been observed that the L_{eq} is generally between L_{10} and L_{50}. The relationship between L_{eq} and exceedance levels has been used in the current studies to characterize the noise sources and to determine the nature and extent of their impact at all receptor locations.

Noise Descriptors Used In Impact Assessment

For the purposes of this project, the maximum 1-hour equivalent sound level ($L_{eq(1)}$) has been selected as the noise descriptor to be used in the noise impact evaluation. $L_{eq(1)}$ is the noise descriptor used in the City Environmental Quality Review (CEQR) standards. Hourly statistical noise levels were used to characterize the relevant noise sources and their relative importance at each receptor location.

D. NOISE STANDARDS AND CRITERIA

The New York City Department of Environmental Protection (NYCDEP) has set external noise exposure guideline levels. These guideline levels are shown in **Table 10-4**. Noise Exposure is classified into four categories: acceptable, marginally acceptable, marginally unacceptable, and clearly unacceptable.

Table 10-4
Noise Exposure Guidelines
For Use in City Environmental Impact Review[1]

Receptor Type	Time Period	Acceptable General External Exposure	Airport[3] Exposure	Marginally Acceptable General External Exposure	Airport[3] Exposure	Marginally Unacceptable General External Exposure	Airport[3] Exposure	Clearly Unacceptable General External Exposure	Airport[3] Exposure
1. Outdoor area requiring serenity and quiet[2]		$L_{10} \leq 55$ dBA	---------- Ldn ≤ 60 dBA ----------		---------- 60 < Ldn ≤ 65 dBA ----------		(1) 65 < Ldn ≤ 70 dBA, (II) 70 ≤ Ldn		---------- Ldn ≤ 75 dBA ----------
2. Hospital, Nursing Home		$L_{10} \leq 55$ dBA		$55 < L_{10} \leq 65$ dBA		$65 < L_{10} \leq 80$ dBA		$L_{10} > 80$ dBA	
3. Residence, residential hotel or motel	7 AM to 10 PM	$L_{10} \leq 65$ dBA		$65 < L_{10} \leq 70$ dBA		$70 < L_{10} \leq 80$ dBA		$L_{10} > 80$ dBA	
	10 PM to 7 AM	$L_{10} \leq 55$ dBA		$55 < L_{10} \leq 70$ dBA		$70 < L_{10} \leq 80$ dBA		$L_{10} > 80$ dBA	
4. School, museum, library, court, house of worship, transient hotel or motel, public meeting room, auditorium, out-patient public health facility		Same as Residential Day (7 AM-10 PM)		Same as Residential Day (7 AM-10 PM)		Same as Residential Day (7 AM-10 PM)		Same as Residential Day (7 AM-10 PM)	
5. Commercial or office		Same as Residential Day (7 AM-10 PM)		Same as Residential Day (7 AM-10 PM)		Same as Residential Day (7 AM-10 PM)		Same as Residential Day (7 AM-10 PM)	
6. Industrial, public areas only[4]	Note 4	Note 4		Note 4		Note 4		Note 4	

Notes:
(i) In addition, any new activity shall not increase the ambient noise level by 3 dBA or more;
[1] Measurements and projections of noise exposures are to be made at appropriate heights above site boundaries as given by American National Standards Institute (ANSI) Standards; all values are for the worst hour in the time period.
[2] Tracts of land where serenity and quiet are extraordinarily important and serve an important public need and where the preservation of these qualities is essential for the area to serve its intended purpose. Such areas could include amphitheaters, particular parks or portions of parks or open spaces dedicated or recognized by appropriate local officials for activities requiring special qualities of serenity and quiet. Examples are grounds for ambulatory hospital patients and patients and residents of sanitariums and old-age homes.
[3] One may use the FAA-approved L_{dn} contours supplied by the Port Authority, or the noise contours may be computed from the federally approved INM Computer Model using flight data supplied by the Port Authority of New York and New Jersey.
[4] External Noise Exposure standards for industrial areas of sounds produced by industrial operations other than operating motor vehicles or other transportation facilities are spelled out in the New York City Zoning Resolution, Sections 42-20 and 42-21. The referenced standards apply to M1, M2, and M3 manufacturing districts and to adjoining residence districts (performance standards are octave band standards).
Source: New York City Department of Environmental Protection (adopted policy 1983).

Impact Definition

As recommended in the *CEQR Technical Manual*, this study uses the following criteria to define a significant adverse noise impact:

- An increase of 5 dBA, or more, in With-Action $L_{eq(1)}$ noise levels at sensitive receptors over those calculated for the No-Action condition, if the No-Action levels are less than or equal to 60 dBA $L_{eq(1)}$ and the analysis period is not a nighttime period.
- An increase of 4 dBA, or more, in With-Action $L_{eq(1)}$ noise levels at sensitive receptors over those calculated for the No-Action condition, if the No-Action levels are 61 dBA $L_{eq(1)}$ and the analysis period is not a nighttime period.
- An increase of 3 dBA, or more, in With-Action $L_{eq(1)}$ noise levels at sensitive receptors over those calculated for the No-Action condition, if the No-Action levels are greater than or equal to 62 dBA $L_{eq(1)}$ and the analysis period is not a nighttime period.
- An increase of 3 dBA, or more, in With-Action $L_{eq(1)}$ noise levels at sensitive receptors over those calculated for the No-Action condition, if the analysis period is a nighttime period (defined by the CEQR Technical Manual criteria as being between 10 PM and 7 AM).

E. NOISE PREDICTION METHODOLOGY

Introduction

The noise impact assessment predicted separately the effects of noise from project-increased traffic and noise from security barriers. Total noise levels with the Proposed Action (With-Action values) were obtained by adding noise due to traffic diversions associated with the Proposed Action and security barriers to noise levels without the Proposed Action (No-Action values). The methodologies used to determine noise effects from traffic and security barriers are discussed below. Impacts were determined based upon the combined effects of both of these noise sources.

Mobile Noise Sources

In the study area, the major noise sources are vehicular traffic on adjacent and nearby streets, commercial uses, and crowds of people. Noise from traffic diversions and vehicles queuing at the security checkpoints associated with the Proposed Action would be one of the dominant noise sources to contribute to total future noise levels.

To screen vehicular traffic in the study area for a potential significant project impact, a proportional modeling technique was used to determine approximate increases in noise levels. When the screening analysis indicated that the Proposed Action would result in a doubling of passenger car equivalents (PCEs), a detailed mobile source noise analysis was performed. To calculate noise from traffic on adjacent and nearby streets and roadways, the Federal Highway Administration [FHWA] Traffic Noise Model (TNM, version 2.5) was used. The proportional modeling and TNM procedures used for analysis are described below.

Proportional Modeling

Proportional modeling was used to determine locations with the potential for having significant noise impacts. Proportional modeling is one of the techniques recommended in the *CEQR Technical Manual* for mobile source analysis.

Using this technique, the prediction of future noise levels, where traffic is the dominant noise source, is based on a calculation using measured existing noise levels and predicted changes in traffic volumes

to determine No-Action and With-Action levels. Using this methodology, vehicular traffic volumes were converted into passenger car equivalent (PCE) values, for which one medium-duty truck (having a gross weight between 9,900 and 26,400 pounds) is assumed to generate the noise equivalent of 13 cars; one heavy-duty truck (having a gross weight of more than 26,400 pounds) is assumed to generate the noise equivalent of 47 cars; and one bus (vehicles designed to carry more than nine passengers) is assumed to generate the noise equivalent of 18 cars. Future noise levels are calculated using the following equation:

$F\ NL - E\ NL = 10 * \log_{10} (F\ PCE / E\ PCE)$
where:

F NL = Future Noise Level
E NL = Existing Noise Level
F PCE = Future PCEs
E PCE = Existing PCEs

With this methodology, assuming traffic is the dominant noise source at a particular location if the existing traffic volume on a street is 100 PCE and if the future traffic volume were increased by 50 PCE to a total of 150 PCE, the noise level would increase by 1.8 dBA. Similarly, if the future traffic were increased by 100 PCE, or doubled to a total of 200 PCE, the noise level would increase by 3.0 dBA.

TNM Model

The TNM is a computerized model developed for the FHWA that calculates the noise contribution of each roadway segment to a given noise receptor. The noise from each vehicle type is determined as a function of the reference energy-mean emission level, corrected for vehicle volume, speed, roadway grade, roadway segment length, and source-receptor distance. Further considerations included in modeling the propagation path include identifying the shielding provided by rows of buildings, analyzing the effects of different ground types, identifying source and receptor elevations, and analyzing the effects of any intervening noise barriers.

Stationary Noise Sources – Security Barriers

Under the Proposed Action, a system of retractable vehicle security barriers would be installed on roadways surrounding the WTC site. Noise from security barrier operations would increase ambient noise levels at sensitive receptor sites in the study area. No specific barrier product has been selected; however, HT1 Raptor barriers from HEALD[1] or similar systems are being considered. Based upon sound data provided by HEALD, the L_{eq} sound pressure level for a representative security barrier would be 45 dBA at a distance of 1.0 meter (3.3 feet). Predicted noise levels due to the security barrier operation at noise-sensitive receptor sites were calculated using the following formula:

$L_{eq1} = L_{eq2} - 20 * LOG (d_1/d_2)$
where:

L_{eq1} is the predicted noise level at the receptor location;
L_{eq2} is the measured source noise level at 3.3 feet;
d_1 is the distance from the source to the receptor; and
d_2 is the distance at 3.3 feet from the security barrier.

Noise levels were calculated at receptors based upon a function of distance only, ignoring any shielding by terrain features or buildings/structures and absorptions due to ground, air, etc. It is noted that this method results in a conservative estimation of the noise environment in urban areas.

[1]www.heald.uk.com

F. EXISTING NOISE LEVELS

Five (5) receptor sites were selected for the noise analysis (see **Figure 10-1**). **Table 10-5** lists the receptor site locations and their representative uses. All five receptor sites were used to evaluate potential noise impacts due to the traffic diversions associated with the Proposed Action, and receptor Sites 4 and 5 were used to evaluate potential noise impacts due to the operation of security barriers. The selected receptors, due to their proximity to the project site, represent the nearby sensitive noise receptors with the greatest potential to experience significant noise increases as a result of the Proposed Action. Sensitive receptors further from the project site would be less likely to experience significant noise increases as a result of the Proposed Action.

Table 10-5
Noise Receptor Locations

Receptor	Location	Land Use
1	Carlisle Street between Route 9A and Washington Street	Residential
2	Cedar Street between Greenwich and Church Streets	Residential
3	Barclay Street between Route 9A and Greenwich Street	Commercial/Institutional
4	Vesey Street between Route 9A and Greenwich Street	Commercial/Open space
5	Fulton Street between Route 9A and Greenwich Street	Commercial

The noise monitoring was conducted for three weekday periods and one weekend period: AM, midday, PM, and Saturday midday. The selected time periods are when the project would have maximum traffic generation and/or the maximum potential for significant adverse noise impacts based on the traffic studies presented in Chapter 8, "Transportation."

At receptor Sites 1, 2 and 3, existing noise levels were measured for 20-minute periods during three weekday periods—AM (8:15 AM to 9:15 AM), midday (MD) (11:30 AM to 12:30 PM), PM (5:00 to 6:00 PM), and Saturday midday (MD) (1:00 PM to 2:00 PM). Measurements were taken on October 2, 3, 6, 9 and 10, 2012. At receptor Sites 4 and 5, noise monitoring was not performed since traffic lanes and sidewalks on Fulton and Vesey Streets between Route 9A and Washington Street were closed. However, existing noise values were calculated using the TNM model based on existing traffic components and adjusted by baseline measured values at nearby receptor Site 3.

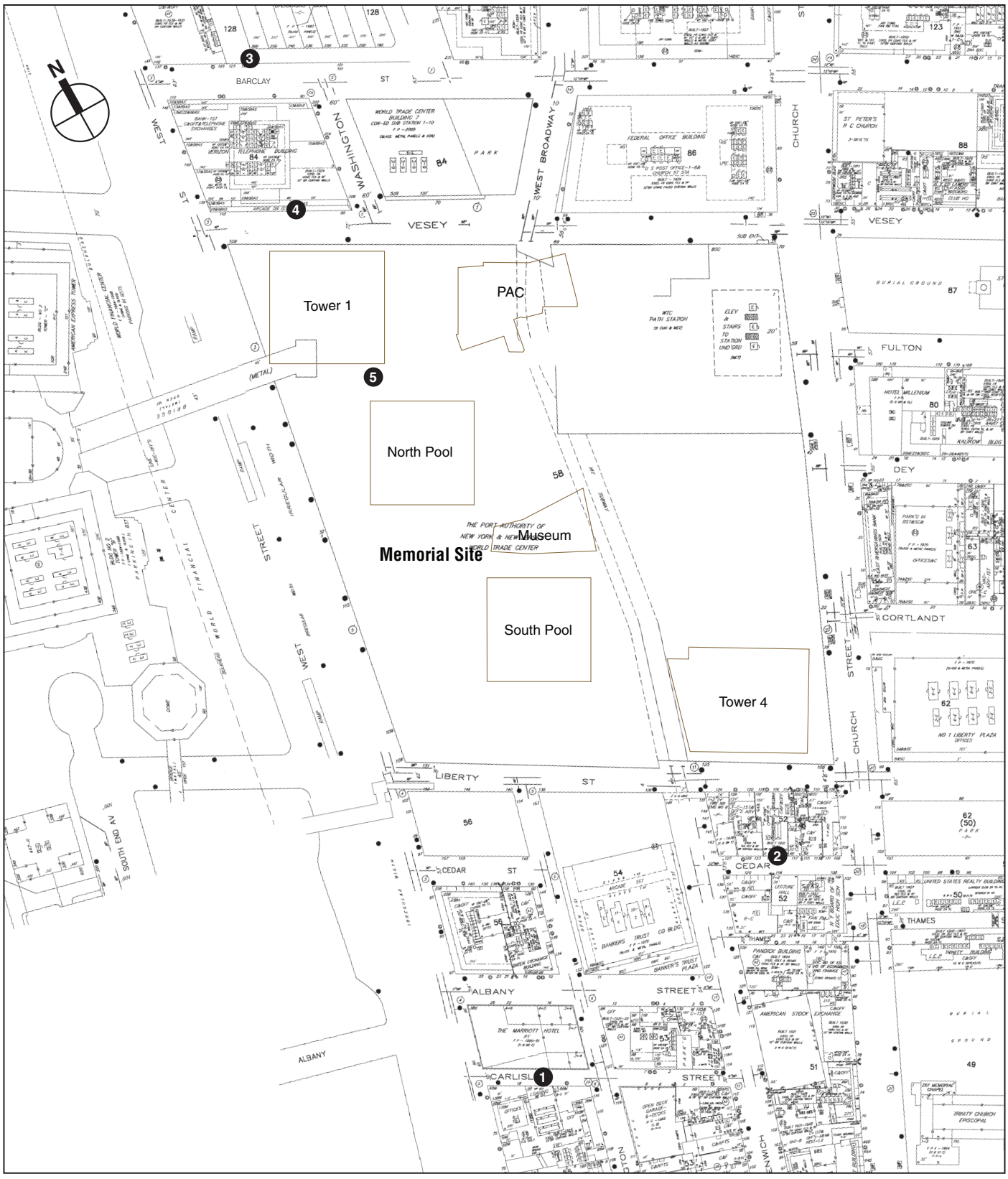
Equipment Used During Noise Monitoring

Measurements were performed using a Brüel & Kjær Sound Level Meter (SLM) Type 2260, a Brüel & Kjær ½-inch microphone Type 4189), and a Brüel & Kjær Sound Level Calibrator Type 4231. The Brüel & Kjær SLM is a Type 1 instrument according to ANSI Standard S1.4-1983 (R2006). For all receptor sites the instrument/microphone was mounted on a tripod at a height of approximately 5 feet above the ground. Microphones were mounted at least approximately 5 feet away from any large reflecting surfaces. The SLM was calibrated before and after readings with a Brüel & Kjær Type 4231 Sound Level Calibrator using the appropriate adaptor. Measurements at each location were made on the A-scale (dBA). The data were digitally recorded by the sound level meter and displayed at the end of the measurement period in units of dBA. Measured quantities included L_{eq}, L_1, L_{10}, L_{50}, L_{90}, and 1/3 octave band levels. A windscreen was used during all sound measurements except for calibration. All measurement procedures were based on the guidelines outlined in ANSI Standard S1.13-2005.

Results

The results of the existing noise levels are summarized in **Table 10-6**.

11.30.12



0 400 1000 FEET
SCALE

1 *Noise Receptor Location*

Noise Receptor Locations
Figure 10-1

At all receptor sites, while noise from commercial uses, crowds of people, and construction activities contributed to the total ambient noise levels vehicular traffic noise on adjacent and nearby roadways was the dominant noise source. Measured levels at receptor sites were relatively high and reflect the level of vehicular activity on the adjacent and nearby streets. In terms of the CEQR criteria, the existing noise levels are in the "marginally unacceptable" category at all five receptor sites. These values are based on existing $L_{10(1)}$ values.

Table 10-6
Existing Noise Levels (in dBA)

Receptor	Location	Date	Time	$L_{eq(1)}$	$L_{10(1)}$
1	Carlisle Street between Route 9A and Washington Street	Weekday	AM	69.2	71.0
			MD	67.3	69.3
			PM	67.7	69.9
		Saturday	MD	71.5	74.2
2	Cedar Street between Greenwich and Church Streets	Weekday	AM	71.7	73.2
			MD	70.5	71.4
			PM	67.7	69.7
		Saturday	MD	68.7	69.6
3	Barclay Street between Route 9A and Greenwich Street	Weekday	AM	70.8	71.9
			MD	70.3	71.1
			PM	68.1	69.8
		Saturday	MD	68.5	69.6
4*	Vesey Street between Route 9A and Greenwich Street	Weekday	AM	71.9	73.0
			MD	71.5	72.3
			PM	69.7	71.4
		Saturday	MD	71.5	72.6
5*	Fulton Street between Route 9A and Greenwich Street	Weekday	AM	69.3	70.4
			MD	69.0	69.8
			PM	67.2	68.9
		Saturday	MD	68.7	69.8

Note: Field measurements were performed by AKRF, Inc. on October 2, 3, 6, 9 and 10, 2012.
* Existing noise levels at Sites 4 and 5 were calculated by TNM.

G. FUTURE WITHOUT THE PROPOSED ACTION (NO-ACTION)

Using the methodology previously described, future noise levels without the Proposed Action were calculated for the five receptors for the 2019 analysis year. These No-Action values are shown in **Table 10-7**. (details see **Appendix E**).

In 2019, the increase in $L_{eq(1)}$ noise levels without the Proposed Action would be less than 3 dBA at all receptor sites. Changes of these magnitudes would be barely perceptible and insignificant. In terms of the CEQR criteria, the future noise levels without the Proposed Action would remain in the "marginally unacceptable" category at all five receptor sites. These values are based on predicted $L_{10(1)}$ values.

Table 10-7
Future without the Proposed Action Noise Levels (in dBA)

Receptor	Location	Date	Time	Existing		No-Action		Change
				$L_{eq(1)}$	$L_{10(1)}$	$L_{eq(1)}$	$L_{10(1)}$	
1	Carlisle Street between Route 9A and Washington Street	Weekday	AM	69.2	71.0	69.6	71.4	0.4
			MD	67.3	69.3	68.0	70.0	0.7
			PM	67.7	69.9	68.4	70.6	0.7
		Saturday	MD	71.5	74.2	71.5	74.2	0.0
2	Cedar Street between Greenwich and Church Streets	Weekday	AM	71.7	73.2	72.5	74.0	0.8
			MD	70.5	71.4	71.3	72.2	0.8
			PM	67.7	69.7	69.9	71.9	2.2
		Saturday	MD	68.7	69.6	69.5	70.4	0.8
3	Barclay Street between Route 9A and Greenwich Street	Weekday	AM	70.8	71.9	70.9	72.0	0.1
			MD	70.3	71.1	70.5	71.3	0.2
			PM	68.1	69.8	68.8	70.5	0.7
		Saturday	MD	68.5	69.6	68.6	69.7	0.1
4	Vesey Street between Route 9A and Greenwich Street	Weekday	AM	71.9	73.0	72.1	73.2	0.2
			MD	71.5	72.3	72.0	72.8	0.5
			PM	69.7	71.4	70.3	72.0	0.6
		Saturday	MD	71.5	72.6	71.7	72.8	0.2
5	Fulton Street between Route 9A and Greenwich Street	Weekday	AM	69.3	70.4	69.7	70.8	0.4
			MD	69.0	69.8	69.7	70.5	0.7
			PM	67.2	68.9	67.9	69.6	0.7
		Saturday	MD	68.7	69.8	68.7	69.8	0.0

H. FUTURE WITH THE PROPOSED ACTION (WITH-ACTION)

Using the methodology previously described, future noise levels with the Proposed Action were calculated for the five receptors for the 2019 analysis year. These With-Action values are shown in **Table 10-8**. Conservatively, a distance of five feet from receptor sites (i.e., Sites 4 and 5) to any nearby security barrier location was assumed for noise calculations, as well as noise from vehicles queuing at security checkpoints. The total $L_{eq(1)}$ values in **Table 10-8** were predicted based upon a combination of traffic noise and noise from security barrier operations (details see **Appendix E**).

In 2019, the increase in $L_{eq(1)}$ noise levels with the Proposed Action would be 2 dBA or less at all receptor sites. Changes of these magnitudes would be barely perceptible and insignificant, and they would be below the CEQR threshold for a significant adverse impact. In terms of the CEQR criteria, the future noise levels with the Proposed Action would remain in the "marginally unacceptable" category at all five receptors. These values are based on predicted $L_{10(1)}$ values.

Table 10-8
Future with the Proposed Action Noise Levels (in dBA)

Receptor	Location	Date	Time	No-Action		With-Action		Change
				$L_{eq(1)}$	$L_{10(1)}$	Total $L_{eq(1)}$	$L_{10(1)}$	
1	Carlisle Street between Route 9A and Washington Street	Weekday	AM	69.6	71.4	70.0	71.8	0.4
			MD	68.0	70.0	68.7	70.7	0.7
			PM	68.4	70.6	68.7	70.9	0.3
		Saturday	MD	71.5	74.2	71.5	74.2	0.0
2	Cedar Street between Greenwich and Church Streets	Weekday	AM	72.5	74.0	73.9	75.4	1.4
			MD	71.3	72.2	72.9	73.8	1.7
			PM	69.9	71.9	71.9	73.9	2.0
		Saturday	MD	69.5	70.4	70.0	70.9	0.6
3	Barclay Street between Route 9A and Greenwich Street	Weekday	AM	70.9	72.0	71.4	72.5	0.4
			MD	70.5	71.3	71.0	71.8	0.5
			PM	68.8	70.5	68.9	70.6	0.1
		Saturday	MD	68.6	69.7	68.6	69.7	0.0
4	Vesey Street between Route 9A and Greenwich Street	Weekday	AM	72.1	73.2	73.1	74.2	1.0
			MD	72.0	72.8	72.9	73.7	0.9
			PM	70.3	72.0	71.2	72.9	0.9
		Saturday	MD	71.7	72.8	71.9	73.0	0.2
5	Fulton Street between Route 9A and Greenwich Street	Weekday	AM	69.7	70.8	70.2	71.3	0.6
			MD	69.7	70.5	70.2	71.0	0.5
			PM	67.9	69.6	68.2	69.9	0.3
		Saturday	MD	68.7	69.8	68.7	69.8	0.0

The goal of the Proposed Action is to establish a security overlay at the perimeter of the World Trade Center (WTC) Campus in Manhattan Community District 1. Primary features of the Proposed Action include entry/exit security checkpoints and a secure travel lane on Trinity Place/Church Street between Cedar and Vesey Streets. This chapter addresses the Proposed Action's overall effect on public health. Public health is the organized effort of society to protect and improve the health and well-being of the population through monitoring; assessment and surveillance; health promotion; prevention of disease, injury, disorder, disability, and premature death; and reducing inequalities in health status. The goal of CEQR with respect to public health is to determine whether adverse impacts on human health may occur as a result of a proposed project, and if so, to identify measures to mitigate such effects. This chapter examines the potential for adverse impacts to public health resulting from the Proposed Action.

The 2012 *CEQR Technical Manual* states that a public health assessment is not necessary for most actions. Where no significant unmitigated adverse impact is found in other CEQR analysis areas, such as air quality, water quality, hazardous materials, or noise, no public health analysis is warranted. If, however, an unmitigated significant adverse impact is identified in any of these other CEQR analysis areas, the lead agency may determine that a public health assessment is warranted for that specific technical area. As described in the preceding chapters of this Environmental Impact Statement (EIS), the Proposed Action would not result in unmitigated significant adverse impacts in technical areas such as hazardous materials (refer to Chapter 7), air quality (refer to Chapter 9), and noise (refer to Chapter 10). Furthermore, as described in Chapter 13, "Construction," the Proposed Action would not result in any significant adverse impacts related to construction noise levels or construction air quality. Therefore, the Proposed Action would not result in significant adverse public health impact, and an analysis of public health is not warranted.

While not specifically related to public health as defined by CEQR, public safety is a contributing factor to the overall health and well-being of the area residents, workers and other visitors. As discussed in Chapter 4, "Community Facilities," the proposed Campus Security Plan would have no significant adverse impacts on emergency responses in the WTC Campus (Project Site) or in the quarter-mile study area surrounding the WTC Campus (Study Area). In the case of an emergency on the WTC Campus, Port Authority Police Department (PAPD), the New York City Police Department (NYPD), and the New York City Fire Department (FDNY) coordinate efforts to respond to emergency situations. The NYPD's WTC Command is responsible for serving the Project Site and the immediate area while the NYPD's First Precinct is responsible for serving the Study Area. Additionally, PAPD will have personnel present on site in its assigned areas of responsibility (at the WTC Port Authority Trans-Hudson (PATH) Hub, Vehicular Security Center (VSC), below ground roadway network, retail spaces). A new PAPD WTC command facility will be constructed in the WTC PATH Hub space. PAPD will continue to work with NYPD in the future to respond jointly to emergency calls.

Four FDNY engine companies and three FDNY ladder companies serve the Study Area; Engine Company 10, Ladder Company 10 ("Ten House") is the closest of the FDNY facilities, located within the Project Site at 124 Liberty Street. While Ten House primarily serves the Project Site, it is common for many fire companies to respond to an emergency.

The Proposed Campus Security Plan is a result of extensive measures that have been taken on local, state, and national levels to reduce the likelihood of another terrorist attack and increase emergency preparedness, including street closings and increased security in Lower Manhattan and increased training and coordination among emergency response providers including PAPD, NYPD, and FDNY. The Campus Security Plan is intended for increased public safety in and around the WTC Campus. The implementation of the Proposed Action would be in keeping with the protection and improvement of the health and well-being of the population required by a CEQR analysis.

A. INTRODUCTION

Neighborhood character is an amalgam of various elements that give neighborhoods their distinct "personality." These elements may include a neighborhood's land use, urban design, visual resources, historic resources, socioeconomics, traffic, and/or noise. A neighborhood character assessment under CEQR considers how elements of the natural and built environment combine to create the context and feeling of a neighborhood and how a proposed action may affect that context and feeling. To determine a project's effects on neighborhood character, a neighborhood's contributing elements are considered together.

An assessment of neighborhood character is generally needed when a proposed project has the potential to result in significant adverse impacts in any of several technical areas that are assessed separately in other EIS sections, or when the proposed project may have moderate effects on several of the elements that define a neighborhood's character. The relevant technical areas are: land use, zoning, and public policy; socioeconomic conditions; open space; historic and cultural resources; urban design and visual resources; shadows; transportation; and noise. A significant impact identified in one of these technical areas is not automatically equivalent to a significant impact on neighborhood character. Rather, it serves as an indication that neighborhood character should be examined.

As described in further detail in Chapter 1, "Project Description," the Proposed Action includes the implementation of a perimeter vehicle security plan for the WTC Campus to protect against vehicle-borne explosive devices while ensuring an open environment that is hospitable to remembrance, culture, and commerce. The WTC Campus Security Plan bars unscreened vehicles from entering the WTC Campus and certain areas at the perimeter of the WTC site, and creates increased stand-off distances to reduce the risk of catastrophic damage to persons and property. A vehicle seeking to enter restricted areas would be subject to credentialing to determine whether entry is authorized, and screening to ensure that the vehicle does not contain dangerous material. The creation of a Trusted Access Program (TAP) in which WTC office tenants with parking privileges on site, residents and owners of businesses located in non-WTC buildings within the secure zone (Liberty Street), for-hire vehicle operators, and delivery vehicle operators could enroll, is expected to facilitate entry for those vehicles with destinations within the WTC Campus. It is also anticipated that yellow cabs would be permitted to enroll in TAP.

B. PRINCIPAL CONCLUSIONS

The Proposed Action is a physical and operational security infrastructure overlay that would be incorporated into the planned World Trade Center streetscapes. The proposed security elements would be installed on City streets and sidewalks in a well-developed area of Lower Manhattan. As described in earlier chapters in this EIS, the Proposed Action would not cause significant adverse impacts regarding land use, zoning, and public policy; socioeconomic conditions; open space; historic and cultural resources; urban design and visual resources; shadows; or noise. The redistribution of traffic due to the closure of street segments within the WTC site to unscreened vehicles under the Proposed Action would, however, result in a total of seven unmitigated significant adverse traffic impacts in the AM peak hour, four in the midday, two in the PM and one in the Saturday midday peak hour. These unmitigated impacts would occur primarily at intersections along Broadway, Church Street and Route 9A, all of which are known as heavily trafficked corridors. Additional traffic volumes on these streets would not significantly adversely affect the character of these major thoroughfares or the neighborhood's defining features.

The introduction of personnel booths and other security infrastructure elements along sidewalks and crosswalks in the vicinity of the WTC site is not expected result in unmitigated significant adverse pedestrian impacts, nor alter pedestrian flow patterns or the ability of pedestrians to freely access the Campus compared to the No-Action condition. The Proposed Action would, however, result in a decrease in vehicular traffic along streets within the WTC Campus, as only pre-authorized vehicles with business at the World Trade Center would be allowed access. The potential for conflicts between vehicular traffic and pedestrians at intersections within the WTC Campus, including the many tourists expected to be visiting the Memorial and Memorial Center, would therefore likely be reduced compared to the No-Action condition. The Proposed Action is therefore not expected to significantly adversely affect the character of pedestrian travel in the vicinity of the WTC site.

Overall, the Proposed Action would help to provide a secure and safe environment for visitors and workers at the World Trade Center while also ensuring that the site is hospitable to remembrance, culture, and commerce. It is not expected to have significant adverse neighborhood character impacts, as discussed in further detail below.

C. METHODOLOGY

The purpose of a neighborhood character preliminary assessment is to determine whether changes expected in specified technical areas may adversely affect a contributing element of neighborhood character. According to the 2012 *CEQR Technical Manual*, the assessment should answer the following two questions:

1. What are the defining features of the neighborhood(s)?
2. Does the project have the potential to affect the defining features of the neighborhood, either through the potential for a significant adverse impact or a combination of moderate effects in relevant technical areas?

The preliminary assessment therefore begins with a description of the existing conditions and defining features of the neighborhoods that comprise the study area, followed by an assessment of the potential for the Proposed Action to affect the defining features of the neighborhood, either through the potential for a significant adverse impact or a combination of moderate effects in relevant technical areas. If the assessment results indicate that the anticipated impacts and effects related to those technical areas would not have the potential to adversely affect any defining feature of neighborhood character, then, according to the 2012 *CEQR Technical Manual*, a detailed analysis is not warranted.

Study Area

In accordance with the 2012 *CEQR Technical Manual*, the study area for a preliminary analysis of neighborhood character is consistent with the study areas in the relevant technical areas assessed under CEQR that contribute to the defining elements of a neighborhood. The primary study area (Project Site) is generally coterminous with the WTC Campus, and includes all streets, sidewalks and buildings that would be directly affected by the installation of the Site's security infrastructure. This area is generally bounded by Barclay Street, West Street/Route 9A, Thames Street and Trinity Place/Church Street.

The secondary study area (Study Area) consists of the area within a quarter-mile radius of the WTC Campus. The Study Area has been divided into four subareas based on geographic boundaries and commonly accepted neighborhood boundaries in order to more easily facilitate the discussion and analysis of the Proposed Action's potential impacts on neighborhood character. The four subareas are:

(1) the area north of the WTC Campus; (2) the Broadway Corridor; (3) the Greenwich South Corridor; and (4) Battery Park City (BPC). For the purposes of this analysis, the area to the north of the WTC Campus is roughly bounded by West Street/Route 9A to the west, Duane Street to the north, Broadway to the east, and Barclay Street to the south. The Broadway Corridor extends from Trinity Place/Church Street on the east to William Street on the west and from Barclay Street and Park Row to the north to Morris Street on the south. The Greenwich South Corridor is roughly bounded by West Street/Route 9A to the west, Cedar Street to the north, Trinity Place/Church Street to the east, and Morris Street to the south. BPC extends from the Hudson River on the west to West Street/Route 9A on the east and Chambers Street on the north to West Thames Street on the south (see **Figure 12-1**).

D. PRELIMINARY ASSESSMENT

Existing Neighborhood Character and Defining Features

Project Site

The Project Site is currently dominated by construction activities related to WTC redevelopment, the construction of the PATH Hub, and the reconstruction of West Street/Route 9A. Further, many of the streets immediately adjacent to the Project Site have temporary lane and/or street closures due to construction activity. For example, the easternmost lanes of West Street/Route 9A have been closed during the construction of the National September 11th Memorial and 1 WTC, which has recently constructed to its full height. Additionally, 4 WTC has been constructed to its full height, the 3 WTC podium has been constructed, and the foundation of 2 WTC is under construction, resulting in the closure of the westernmost lane of Church Street between Vesey and Liberty Streets.

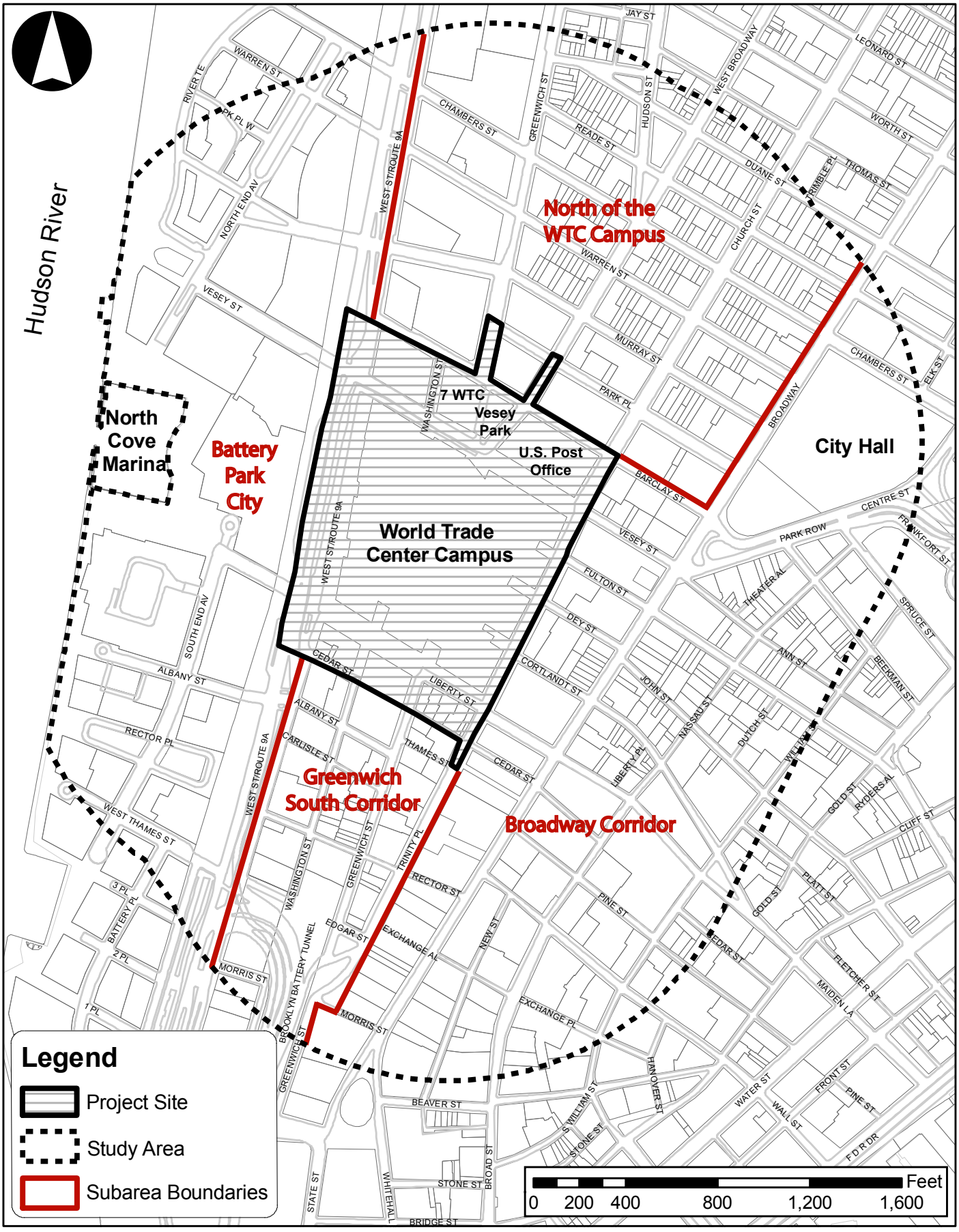
Study Area

The Lower Manhattan Study Area accommodates a variety of land uses, including commercial, residential, mixed-use, and institutional buildings as well as a variety of open space resources. Nearly every street in the Study Area is lined with concrete sidewalks, facilitating a significant amount of pedestrian traffic. The area is defined by both historic resources and new construction projects. A recent trend in the Study Area is the conversion of previously industrial and commercial spaces to residential and mixed-uses. As discussed in Chapter 2, "Land Use, Zoning, and Public Policy," almost 40 sites in the Study Area, including several within the Project Site, are currently under construction or slated to be redeveloped by the 2019 analysis year. More than half of these projects involve the construction of new hotels and residences, highlighting Lower Manhattan's recent transformation from a predominately commercial neighborhood to a 24-hour, mixed-use community.

Tall buildings are currently being constructed on the Project Site and are located in many parts of the Study Area. Streets to the south and east are typically narrow and winding with buildings that front uniformly onto the street. Many of the local open spaces and historic resources are in shadows cast by the tall skyscrapers in the area.

The Study Area is also identified as a hub of converging transportation networks, including the PATH trains, multiple New York City subway lines, the Brooklyn Battery Tunnel, West Street/Route 9A, and the Brooklyn Bridge. This transportation infrastructure results in an increased amount of pedestrian and vehicular traffic in the Study Area during peak hours. The PATH Transit Hub and Fulton Center are currently being redeveloped, and multiple through-streets in the area are being improved, all to accommodate heavy pedestrian and vehicular traffic. However, as a result of these various construction activities, there are frequent sidewalk and road closures and an abundance of construction sheds and daytime noise in the Study Area.

Figure 12-1
Neighborhood Character Study Area



As recovery efforts and construction have been ongoing throughout the WTC Campus since September 2001, local businesses, residents and institutions have continued to adapt to the changing surroundings. Tourists have continued to visit the WTC site in record numbers, with approximately five million visitors expected to visit the National September 11th Memorial by the end of 2012. Additionally, the surrounding area continues to exhibit signs of recovery, with continued investment in new construction and conversion projects (refer to Chapter 2, "Land Use, Zoning, and Public Policy."

Assessment of Proposed Action's Potential Effects on Neighborhood Character

Technical Area Significant Adverse Impacts and Moderate Adverse Effects

The analysis below presents the potential changes in the technical areas which contribute to the neighborhood character of the Study Area. As stated above, this analysis focuses on the potential changes to neighborhood character resulting from changes in land use, zoning, and public policy; socioeconomic conditions; open space; historic and cultural resources; urban design and visual resources; shadows; transportation; and noise. While detailed open space and shadows analyses are not warranted for the Proposed Action, detailed technical analyses for the remaining technical areas listed above are presented in their respective chapters of this EIS. As discussed in greater detail in these chapters, environmental and social changes in the areas with respect to neighborhood character are as follows:

Land Use, Zoning, and Public Policy

As detailed in Chapter 2, "Land Use, Zoning, and Public Policy," the Proposed Action would change the way some people are able to access the WTC Campus by vehicle and eliminate general through traffic. However, it is expected that the proposed security measures would not have any significant adverse impacts on land use, zoning and public policy as other routes are available around the site. Arrangements would be made for deliveries and to accommodate limited vehicular access for tenants. Approximately 40 new developments are currently under construction in and around the WTC site and others are in the planning process or development sites have recently changed hands. As details of the Campus Security Plan have been made public and planning activities for new developments has not slowed, and the Proposed Action would not have significant adverse impacts on existing or planned land uses in the area. The Proposed Action, a security overlay, would not be incompatible with underlying zoning, nor would it cause existing structures to become non-conforming. Furthermore, the Proposed Action intends to provide a secure and safe environment which would be supportive of the public policies applicable to the Project Site or Study Area. Therefore, no significant adverse impacts on land use, zoning, or public policy are anticipated in the future with the Proposed Action.

Socioeconomic Conditions

The security infrastructure related to the Proposed Action, as detailed in Chapter 1, "Project Description," would be located within some streets and sidewalks at the periphery of the WTC Campus, and would not entail any new development, or introduce new land uses to the Project Site. As detailed in Chapter 3, "Socioeconomic Conditions," the Proposed Action would not directly displace any residents, and therefore, would not result in significant adverse direct residential impacts. The Proposed Action would also not result in significant adverse direct business or institutional impacts.

A preliminary assessment found that the Proposed Action would not result in significant adverse impacts due to indirect residential displacement. As none of the residential units within the primary study area house populations at risk of involuntary displacement (i.e., residents that have incomes sufficiently low to be vulnerable to sharp rent increases), the Proposed Action would not result in

significant adverse impacts due to indirect residential displacement in the primary study area. The proposed security plan would limit vehicular accessibility within the primary study area, and would result in some changes in vehicular accessibility for the residents of three multi-unit residential buildings (located at 110-112 Liberty Street, 114 Liberty Street, and 120-122 Liberty Street) containing a total of 47 dwelling units within the primary study area. Residents of these three residential buildings could encounter some inconveniences related to vehicular access to their homes and businesses as well as receiving deliveries. However, these residents could enroll in the planned TAP to make arrangements for vehicular access within the secure perimeter. The TAP program would allow for expedited vehicle entry through the security stations into the WTC Campus.

All businesses within the WTC Campus would receive deliveries through the VSC. As the on-site parking garage has limited capacity, up to approximately 500 tenant vehicles would be able to park on-site. Tenants parking on-site would have to have a monthly parking pass for their vehicle and would have to enroll in TAP in order to access the WTC parking facility. As described in Chapter 8, "Transportation," those who work at or visit the WTC site would have to utilize a local public parking facility (off-site) for daily parking, irrespective of the Campus Security Plan.

A preliminary assessment found that the Proposed Action would not result in significant adverse impacts due to indirect business and institutional displacement. As the Proposed Action is a campus-wide security plan, it would not introduce any new economic activity or alter existing economic patterns, nor would it add to the concentration of a particular sector of the local economy. The Proposed Action also would not directly displace uses of any type that directly support businesses in the area or bring people to the area that form a customer base for local businesses. The study area already has well-established commercial and residential markets. The Proposed Action would not result in any direct residential displacement and limited business displacement, and the Proposed Action is also not expected to indirectly displace a substantial number of residents, business establishments/institutions, workers, or visitors who form the customer base of existing businesses in the study area.

The Proposed Action would also not result in significant adverse impacts on specific industries within the Study Area, or in the City more broadly. As discussed in Chapter 3, "Socioeconomic Conditions," the Proposed Action would not directly displace any uses or result in a substantial change to overall business conditions within any industry, nor would it result in direct or indirect displacement that would substantially reduce employment or impair the economic viability in an industry or category of business. Therefore, the Proposed Action is not expected to significantly affect business conditions in any industry or any category of business within or outside of the Study Area.

As pedestrian access would be unrestricted by the Proposed Action, there would be no reduction in pedestrian activity to existing or planned businesses under proposed future conditions. Lower vehicle volumes within the WTC Campus would help to create a friendlier pedestrian environment. Further, the Proposed Action's provision of a secure environment would not impact existing or planned uses. As such, the Proposed Action is not expected to result in significant adverse impacts to socioeconomic conditions.

Open Space

Direct Open Space effects may occur when a proposed project would encroach on, or cause a loss of, open space. Direct effects may also occur if the facilities within an open space would be so changed that the open space no longer serves the same user population. Limitation of public access and changes in the type and amount of public open space may also be considered direct effects. Other direct effects include the imposition of noise, air pollutant emissions, odors, or shadows on public open space that may alter its usability. Assessments of these effects are addressed in the relevant technical chapters of

the manual and should be referenced for the open space analysis. It should be noted that direct effects may not always result in adverse effects to open space. Alterations and reprogramming of parks may be beneficial or may result in beneficial changes to some resources and may or may not have an adverse effect on others.

If a proposed project would have a direct effect on an open space, an assessment of the effects on open space and its users may be appropriate. Direct effects occur if the proposed project would:

- Result in a physical loss of public open space (by encroaching on an open space or displacing an open space);
- Change the use of an open space so that it no longer serves the same user population (*e.g.*, elimination of playground equipment);
- Limit public access to an open space; or
- Cause increased noise or air pollutant emissions, odors, or shadows on public open space that would affect its usefulness, whether on a permanent or temporary basis.

When the direct effect would be so small that it would be unlikely to change use of the open space, an assessment may not be needed. A simple comparison of conditions with and without the project and a discussion of the users affected may be adequate. However, most direct effects on open space do require some assessment, particularly when more information on users of that open space may be appropriate or there is ambiguity as to whether the project would reduce the usability of an open space, detract from its aesthetic qualities, or impair its operation. As detailed in Chapter 9, "Air Quality" and Chapter 10, "Noise," the Proposed Action would not result in any significant adverse impacts to air quality or noise, so there would be no direct effects on open space resources as a result of the Proposed Action.

Indirect effects may occur when the population generated by the proposed project overtaxes the capacity of existing open spaces so that their service to the future population of the affected area would be substantially or noticeably diminished. If a project may add population to an area, demand for existing open space facilities would typically increase. Since the Proposed Action is the implementation of security infrastructure, it would not introduce new populations to the area and therefore would not result in any indirect effects to open space resources.

Historic and Cultural Resources

As detailed in Chapter 5, "Historic and Cultural Resources," the Proposed Action would not obstruct views or significantly alter the context of the WTC site, which is eligible to be listed on the S/NR. In addition, the Proposed Action would not adversely affect the physical or visual context of, visually compete with, or obstruct views of architectural resources in the Study Area as the proposed security elements are low scale and would be constructed within select roadways and along select sidewalks at the perimeter of the WTC Campus. Construction activities related to the proposed Campus Security Plan would be limited to shallow depths in areas of streets and sidewalks that have already been disturbed by previous construction activities. Further, the scope of construction activities would not be such that it would threaten to harm existing historic and cultural resources in the area.

The proposed security elements would not be out of context. A variety of street furniture exists in the vicinity of the WTC Campus as well as Lower Manhattan, including: security booths, newsstands, bus shelters, bollards, and vehicle barriers. Further, bollards or similar static barriers are planned at the edge of the curb around all blocks within the WTC Campus. Therefore, the Proposed Action is not expected to result in any significant adverse impacts to historic and cultural resources in the Project Site or Study Area.

Urban Design and Visual Resources

As detailed in Chapter 6, "Urban Design and Visual Resources," while the changes to the urban design of the area resulting from the Proposed Action could be considered significant, they would not be adverse. The Proposed Action would not result in any changes to street pattern, block form, or building arrangement. The Campus Security Plan would implement a cohesive, low-scale design with elements that are intended to be consistent with other street furniture that exists in the vicinity of the WTC Campus and throughout the City. Several personnel booths are located in the vicinity of the WTC site, including one on Washington Street and one on West Broadway between Vesey Street and Barclay Street. Other comparable street furniture such as newsstands and bus shelters are located throughout the City. Personnel booths located at screening and credentialing zones would have small footprints and would be located on sidewalk extensions where possible. Therefore, the main features of the proposed security plan are not atypical and they would not be expected to result in significant adverse impacts to the area's urban design.

The proposed Church Street median would modify views along Church Street from Liberty Street to Vesey Street. This proposed median would change the context of some views under future conditions with the Proposed Action; however, the With-Action condition would not be inconsistent with the planned streetscape on the WTC Campus (e.g. bollards or other static barriers are planned at the edge of the western curb along Church Street as part of the WTC streetscape). As such, while the change could be considered significant, it would not be an adverse change to visual resources.

Shadows

Pursuant to the 2012 *CEQR Technical Manual*, shadow assessments consider projects that would result in new shadows long enough to reach a sunlight-sensitive resource. A shadow assessment is required only if the project would either result in (a) new structures (or additions to existing structures including the addition of rooftop mechanical equipment) of 50 feet or more or (b) be located adjacent to, or across the street from, a sunlight-sensitive resource. However, where a project's height increase is ten feet or less and it is located adjacent to, or across the street from, a sunlight-sensitive open space resource, which is not a designated New York City Landmark or listed on the State/National Registers of Historic Places or eligible for these programs, the lead agency may determine, in consultation with DPR, whether a shadow assessment is required in that case.

As described in Chapter 6, "Urban Design and Visual Resources," the proposed security elements are predominantly low scale. Personnel booths would be the tallest of the proposed security elements with a height of approximately 10 feet. No significant new shadows would result from the Proposed Action and as such a detailed shadows assessment is not warranted. Based on the size of the security elements, shadows resulting from the Proposed Action would not substantially change the pedestrian experience.

Transportation

As discussed in previous chapters of this EIS, the Proposed Action is a comprehensive perimeter vehicle security plan for the World Trade Center site to protect against vehicle-borne explosive devices while ensuring an open environment that is hospitable to remembrance, culture, and commerce. Under this plan, vehicular access to, and traffic movement within, the WTC site would be controlled through the creation of a secure perimeter that would prevent unscreened vehicles from approaching within a set distance of WTC buildings. Portions of streets in and around the WTC site would be closed to unscreened vehicular traffic; however, the Proposed Action would not result in the

introduction of new uses at the WTC site, nor is it expected to generate a substantial amount of new transportation demand.

In the future with the Proposed Action, traffic not destined to or from the WTC site would not be able to traverse streets within the security perimeter, including Vesey, Fulton, Liberty and Greenwich streets, the segments of Washington Street and West Broadway south of Barclay Street, and the west side of Church Street. In many respects, the future traffic network with the Proposed Action would therefore resemble the existing traffic network in that most of these street segments either have not yet been built or are presently closed to through traffic due to construction activity. Compared to the No-Action condition, the redistribution of traffic due to the closure of street segments within the WTC site to unscreened vehicles would result in a total of seven unmitigated significant adverse impacts in the AM peak hour, four in the midday, two in the PM and one in the Saturday midday peak hour. These unmitigated impacts would occur primarily along Broadway, Church Street and Route 9A, all of which are known as heavily trafficked corridors. Additional traffic volumes on these streets would not significantly affect the character of these major thoroughfares.

The pedestrian impact analysis in Chapter 8, "Transportation" indicates that installation of security infrastructure associated with the Proposed Action would result in significant adverse impacts due to reductions in pedestrian space in the weekday AM, midday, and/or PM peak hours at a total of two sidewalks and three crosswalks in the vicinity of the WTC site. However, as discussed in Chapter 15, "Mitigation," each of these significant adverse sidewalk and crosswalk impacts would be fully mitigated with recommended pedestrian mitigation measures. The introduction of personnel booths and other security infrastructure elements along sidewalks and crosswalks in the vicinity of the WTC site is not expected to alter pedestrian flow patterns, or the ability of pedestrians to freely access the Campus compared to the No-Action condition. The Proposed Action would, however, result in a decrease in vehicular traffic along streets within the WTC Campus, as only pre-authorized vehicles with business at the World Trade Center would be allowed access. The potential for conflicts between vehicular traffic and pedestrians at intersections within the WTC Campus, including the many tourists expected to be visiting the Memorial and Memorial Center, would therefore likely be reduced compared to the No-Action condition. The Proposed Action is therefore not expected to significantly adversely affect the character of pedestrian travel in the vicinity of the WTC site.

The Proposed Action would displace an estimated 23 curbside spaces designated for authorized vehicle parking (Postal Inspector, Department of Labor and NYC Law Department), nine to 11 spaces for truck loading/unloading and four spaces for bus layover along Trinity Place/Church Street, Barclay Street and West Broadway. The displacement of this number of authorized vehicle parking spaces would not be considered a significant adverse impact under *CEQR Technical Manual* criteria, and it is anticipated that NYPD would coordinate with affected agencies and NYCDOT to identify alternative locations for this displaced authorized vehicle, truck and bus parking. Therefore, the displacement of curbside parking spaces associated with the Proposed Action is not expected to affect the character of the street system in the vicinity of the WTC site.

Noise

As described in Chapter 10, "Noise," no noise impacts are anticipated as a result of the Proposed Action. The net change in vehicular traffic at any given location would not be large enough to result in a noise impact. Similarly, the operable barriers and other security devises proposed as part of the WTC Campus Security Plan would not introduce a substantial new noise source.

Potential to Affect a Defining Feature of the Neighborhood

If the Proposed Action would have the potential to affect the defining features of the neighborhood, either through the potential for a significant adverse impact or a combination of moderate effects in relevant technical areas, then a detailed assessment is required to determine whether the Proposed Action may have a significant adverse neighborhood character impact. Of the relevant technical areas specified in the 2012 *CEQR Technical Manual*, the Proposed Action would result in significant adverse impacts to transportation; however, as discussed in Chapter 15, "Mitigation," the majority of these impacts would be mitigated. However, as the Proposed Action also has the potential to result in moderate effects to urban design and visual resources, a detailed assessment is provided below.

E. DETAILED ASSESSMENT

If a proposed project would have the potential to affect the defining features of the neighborhood, either through the potential for a significant adverse impact or a combination of moderate effects in relevant technical areas, then a detailed assessment is required to determine whether the proposed project may have a significant adverse neighborhood character impact. After a preliminary assessment has been performed and it has been established that a project would affect a contributing element of neighborhood character, a detailed assessment is used to examine potential effects of the Proposed Action, with future No-Action and With-Action conditions projected and compared. Of the relevant technical areas specified in CEQR, the Proposed Campus Security Plan would not cause significant adverse impacts regarding land use, zoning, and public policy; socioeconomic conditions; historic and cultural resources; or noise, but may have significant adverse impacts on urban design and visual resources and transportation. Therefore a detailed assessment of neighborhood character impacts is necessary. As discussed below, three main changes to neighborhood character that could result from the Proposed Action are:

1. Changes to vehicle circulation;
2. Minor sidewalk obstructions in select locations; and,
3. Overall feel of the area with the security measures in place.

EXISTING CONDITIONS

Project Site

Construction activities are currently underway throughout much of the WTC Project Site. Many of the streets immediately adjacent to the WTC site currently have lane closures to accommodate construction activities and staging, as described in detail in Chapter 8, "Transportation." Currently the only publicly accessible areas of the site are the WTC Memorial at the southwest corner of the site and the temporary PATH station at Vesey Street near Washington Street. Under existing conditions, the WTC site is characterized as a construction zone.

The Project Site is located within an area of Lower Manhattan that has a number of heavily trafficked thoroughfares, including West Street/Route 9A, Trinity Place/Church Street and Broadway. As described in detail in Chapter 8, "Transportation," Fulton and Vesey Streets are closed from Church Street to West Street/Route 9A, Liberty Street is closed from Greenwich Street to West Street/Route 9A and Greenwich Street is closed from Vesey Street to Liberty Street to accommodate construction. Additionally, West Street/Route 9A and Church Street are operating with reduced capacity to accommodate construction. It is expected that all buildings and streets within the WTC Campus would be constructed and open by the 2019 analysis year.

The only pedestrian access onto the WTC Campus is available for visitors with passes to the National September 11th Memorial. Pedestrian access is otherwise restricted to construction workers only within the WTC Campus. In many ways the Project Site's current block form resembles the former WTC superblock configuration due to limited site access. However, the National September 11th Memorial, which opened to the public in September 2011, continues to draw visitors from around the world. Additionally, the temporary PATH station located on Vesey Street continues to serve a substantial number of commuters.

The newly erected towers on the WTC site, such as the completed 7 WTC, and 1 WTC and 4 WTC, have become an important part of the skyline in Lower Manhattan. With 2 WTC and 3 WTC still under construction, the skyline will continue to evolve through 2019 as the site is fully built out. While the pedestrian-level views immediately adjacent to the Project Site are still dominated by construction fences which obstruct views into the WTC Campus, new visual resources are being created as construction of the towers continues to progress. Overall, construction activities define the WTC site and the area immediately surrounding the WTC site.

Another contributing characteristic of the WTC site is its historic significance. As discussed in Chapter 5, "Cultural Resources," the WTC site is eligible for listing on the New York State and National Registers of Historic Places (S/NR). There are also several architectural resources located in close proximity to the WTC Campus, including: the Federal Office Building/U.S. Post Office at 90 Church Street and the Barclay-Vesey Building at 140 West Street. These architectural resources contrast with newer buildings that have been constructed in the area over time. The historic significance of the WTC site and the historic resources immediately adjacent to the WTC Campus, while important to the area's character, are not key features of the area.

Vehicular access to buildings at the northern and southern limits of the project site has been diverted and restricted at times to accommodate construction. However, pedestrian access in these areas has been maintained. With the exception of the National September 11th Memorial, no other uses on the WTC site have been opened to the public yet. As discussed in Chapter 3, "Socioeconomic Conditions," residential and commercial uses at the periphery of the site have not been displaced by construction activities.

Traffic and noise on the Project Site are both a result of construction activities at the WTC site. Street closures due to construction activity have resulted in traffic diversions and reduced capacity in some locations, such as the western lane of Church Street between Vesey and Liberty Streets which has been closed during the construction of 2 WTC, 3 WTC, and 4 WTC. Construction vehicle staging also occurs at the periphery of the WTC site. Noise from construction equipment and vehicles is commonplace in the area.

Pedestrian activity continues to be high along Vesey Street due to the temporary PATH station. Liberty Street and Church Street are also crowded with pedestrians. The National September 11th Memorial, which is currently accessed from Liberty and Albany Streets to the south, drew approximately five million visitors in 2012.

Study Area

The Lower Manhattan Study Area is a vibrant, mixed-use community with one of the largest CBDs in the U.S. The Study Area is comprised of four subareas, discussed in more detail below. Each subarea has distinct features which contribute to the unique range of neighborhood characteristics that define Lower Manhattan.

North of the WTC Campus

This area is a transition zone between the mainly commercial office buildings of the financial district to the south and the more residential and institutional development in Tribeca to the north. The subarea is developed with a mix of historic and modern, low- and high-rise buildings. Many of the buildings were originally constructed as office buildings, although several have been converted to residential use. East of Greenwich Street between Park Place and Chambers Street, the dominant use changes from commercial to retail and residential. West of Greenwich Street contains commercial and institutional uses. Institutions in this subarea include the Borough of Manhattan Community College, New York University, Saint John's University, DC37/The College of New Rochelle, P.S. 234, and Fire Ladder House 1. Retail uses are more heavily concentrated along the north-south streets and along Chambers Street, with smaller businesses along the east-west streets.

The blocks north of Murray Street and east of Greenwich Street are characterized by smaller, mixed-use buildings on narrow lots which are built-out to the property line, creating uniform streetwalls. These buildings typically accommodate lower level retail and upper level residences. In contrast, the blocks west of Greenwich Street and south of Murray Street have larger, modern buildings encompassing half or full blocks, accommodating commercial offices, institutions, and mixed-uses.

Many of the streets north of the WTC Campus have sidewalks that are busy with daytime activity, especially during the daytime when school is in session. There are multiple subway lines serving the area, also contributing to pedestrian activity. Vehicular traffic tends to be heavier on north-south streets, with the exception of east-west Chambers Street. There are several new construction and street improvement projects in the area north of the WTC Campus, particularly in the area immediately north of the WTC Campus. Noise levels in the subarea represent a relatively noisy urban environment with streets that have high levels of vehicular and pedestrian activity and due to construction activity in the subarea.

Broadway Corridor

The Broadway Corridor is predominately commercial, with clusters of mixed-use buildings northeast of Broadway and Cortlandt Street and south of Broad and Wall Streets. This subarea includes part of the historic financial district, the traditional home of financial institutions and corporate headquarters and the smaller businesses and industries which serve them. Additionally, multiple institutions are scattered throughout the subarea, such as City Hall, Pace University, Trinity Church, Saint Paul's Chapel, and other churches. The area is densely built out with several pockets of open space, including City Hall Park and Zuccotti Park. Large office and mixed-use buildings, often encompassing half or full blocks, dominate the area south of Cortlandt Street. In contrast, the area of mixed-use buildings in the northeast is characterized by narrow lots and shorter buildings. As described in Chapter 2, "Land Use, Zoning, and Public Policy," several hotel and residential conversion and redevelopment projects are planned or currently under construction in the northeast portion of this subarea. As a result of these construction projects, construction sheds are common within the Broadway Corridor. The New York Stock Exchange security zone is immediately southeast of the Study Area, bounded by Broadway to the west, Pine Street to the north, William Street to the east, and Beaver Street to the south. This pedestrian-only zone has barriers and guard booths limiting vehicular access.

Sidewalks line the streets of the Broadway Corridor; few of these sidewalks have trees due to the subway below. Also, as many of the adjacent sidewalks are narrow, most trees in the subarea are located within the privately-owned public plazas south of Cortlandt Street like Zuccotti Park, or large open spaces like City Hall Park. Additionally, there is open space surrounding both Trinity Church and Saint Paul's Chapel, which are also NHLs, S/NR-listed, and NYCLs. As discussed in Chapter 5, "Cultural Resources," there are numerous historic resources in the Broadway Corridor. For example,

the Wall Street Historic District, roughly bounded by Bridge, South William, Greenwich, Liberty, and Pearl Streets, is listed on the S/NR with 66 contributing buildings. Other designated and eligible landmarks in the Broadway Corridor include the United States Realty Building, the Trinity Building, the American Stock Exchange, the Former AT&T Company Building, the Woolworth Building, 74 Trinity Place, and 30 Vesey Street.

The streets east of Broadway and south of Wall Street and continuing beyond the boundary of the study area are part of the historic Street Plan of New Amsterdam and Colonial New York. These narrow and winding streets retain the original street plan that dates to the 17th century and define the historic character of the area. As a result of these irregular street patterns, blocks in this area tend to have irregular shapes. Blocks between Park Row and Nassau Street tend to have triangular shapes, while blocks to the south are generally trapezoidal in shape. The blocks east of Broadway between Liberty and Fulton Streets, and extending east beyond the study area boundary comprise the John Street/Maiden Lane Historic District. This district is characterized by late 19th and early 20th-century skyscraper office buildings.

Broadway and Trinity Place/Church Street carry substantial traffic during the weekday. Many of the area's narrow streets and alleys to the east of Broadway are stop-controlled and do not have substantial vehicular traffic. Pedestrian traffic is a defining characteristic of the Broadway Corridor. This subarea attracts large numbers of workers and visitors throughout the day and evening traveling to and from work, shopping, visiting the WTC site, or visiting the Lower Manhattan tourist destinations. Broad and Wall Streets are closed to vehicular traffic with security barriers. The Fulton Center transit hub is currently under construction at Broadway and Fulton Street, which will accommodate riders from several subway lines as well as upper level retail space. Access to the Brooklyn Bridge is located immediately outside this subarea, emphasizing this area as a hub of multiple different types of transportation networks.

Greenwich South Corridor

The Greenwich South Corridor has a variety of land uses, building types, and block sizes. Buildings generally occupy their entire lots. Sidewalks line many streets in the subarea and there are few street trees. Multiple sites are under construction or slated for residential development in the Greenwich South Corridor. This area has experienced significant growth in its residential population in recent years, mainly due to a number of conversions of office buildings to residential use. There are already several new hotels in operation immediately to the south of the WTC site; seven more are expected to be constructed by 2019. These hotels generate pedestrian activity 24 hours a day, especially in the area immediately south of the WTC Campus. Other portions of the subarea have more moderate levels of activity throughout the day with office workers, students, hotel guests, and residents present throughout both the day and night.

The Brooklyn Battery Tunnel has an entrance and exit at the southern edge of the Study Area. This busy thoroughfare is accompanied by the large Battery Parking Garage which can accommodate over 2,000 vehicles. Moreover, West Street/Route 9A is a major vehicular thoroughfare on the lower west side of Manhattan that comprises the western edge of this subarea. Currently there is only one east-west through-street in the Greenwich South Corridor, Rector Street, and only the subarea's boundaries of West Street/Route 9A and Trinity Place/Church Street are north-south through-streets. West Street/Route 9A and Trinity Place at the edges of the corridor carry the greatest levels of vehicular traffic. Traffic on interior streets is light with none of the streets extending more than a few blocks in any direction.

Battery Park City

BPC is located to the west of West Street/Route 9A. BPC is unique in that it is a planned community within Manhattan, which is somewhat isolated from the rest of the Study Area because of West Street/Route 9A. BPC is a mixed-use community with a commercial center, two residential neighborhoods, schools, cultural facilities, hotels, and neighborhood amenities such as grocery stores, restaurants, shopping opportunities, movie theaters, dry cleaners, and an extensive network of open spaces and a major waterfront esplanade along the Hudson River.

Many buildings in the northern area of BPC are residential high-rises, often with ground level retail. In the middle is a business district, comprised of several free-standing office towers and the World Financial Center. The south neighborhood contains low- and mid-rise residential buildings in addition to cultural and hotel uses. All of the buildings in BPC are surrounded with landscaped open spaces, wide sidewalks, and tree-lined streets. There are multiple parks and fields throughout BPC providing active and passive recreation, as well as a landscaped esplanade along the Hudson River waterfront. The abundance of open space in BPC is a defining characteristic of the subarea.

There is moderate vehicular traffic in the subarea throughout the day as BPC is separated from the Manhattan grid by West Street/Route 9A. Several public parking garages are located in the area. During weekday work hours, large numbers of employees are the predominant population in the area. At other times, visitors to the shopping opportunities which are located in the vicinity of the Winter Garden or those using the open space amenities contribute to the high level of activity. Additionally, the presence of Stuyvesant High School and P.S./I.S. 89 increases pedestrian activity during daytime hours. The World Financial Center Ferry Terminal, located at the end of Vesey Street at the Hudson River, supports five different ferry services to and from New Jersey.

FUTURE WITHOUT THE PROPOSED ACTION (NO-ACTION)

Project Site

In the future without the Proposed Action, the Project Site would be fully developed with commercial and institutional buildings, open space, and the new PATH Hub. By 2019, the on-site development would add new office, retail and cultural uses to Lower Manhattan. The addition of approximately 8.5 million square feet of office space on the WTC site would enhance Lower Manhattan's status as one of the largest CBDs in the U.S.

With redevelopment of the WTC Campus, both Greenwich Street and Fulton Street would be extended through WTC site and Vesey and Liberty Streets would be reopened to traffic. In the No-Action condition, Greenwich Street is expected to operate one-way southbound from Vesey Street to Liberty Street. West Broadway between Barclay and Vesey Streets would remain open to southbound through-traffic, providing access to Greenwich Street through the WTC site. However, it is anticipated that the segment of Greenwich Street between Barclay and Vesey Streets would primarily serve as access to the adjacent 7 WTC as at present. The parallel segment of Washington Street would operate two-way as a service street. It is expected that the intersections of Greenwich Street with Vesey, Fulton and Liberty Streets would be controlled, as would the midblock pedestrian crossing of Greenwich Street at Cortlandt Street.

Fulton Street would operate one-way westbound through the WTC site from Church Street to West Street/Route 9A in the No-Action condition. Vesey Street would operate one-way eastbound to the east of Greenwich Street, two-way between Greenwich and Washington Streets, and one-way westbound to the west of Washington Street.

At the south end of the WTC site, Liberty Street would be reopened to traffic between Church Street and West Street/Route 9A, and would operate two-way. It is expected that the segment of Washington Street between Albany and Cedar Streets would be reopened to northbound traffic, and that the segment of Cedar Street from Washington Street to West Street/Route 9A would be reopened to westbound traffic. It is also expected that the segment of Cedar Street between Church and Greenwich Streets would be returned to one-way westbound operation.

With the completion of WTC towers 2, 3 and 4 and the Transit Hub at the WTC site, lane closures associated with construction activity would no longer be needed along Church Street, and it is anticipated that the street would be restored to four lanes from Liberty Street to Vesey Street. The eastern-most lane would again function as an exclusive bus lane from 7 AM to 10 AM and from 4 PM to 7 PM on weekdays.

It is also expected that the reconstruction of West Street/Route 9A in the vicinity of the WTC site would be completed in the No-Action condition. This would include the installation of a traffic signal at the new Fulton Street intersection. All traffic westbound on Fulton Street would turn onto northbound West Street/Route 9A as there would be no access across the median to the southbound lanes. It is anticipated that two crosswalks would be installed at this location, one on Route 9A on the north side of the intersection, and the second on the Fulton Street approach. To the south at Liberty Street, both northbound and southbound double left-turn lanes would be provided. The existing northbound left-turn at Albany Street would be eliminated. Lastly, it is anticipated that a new traffic signal will be installed at the intersection of Barclay Street with West Street/Route 9A northbound to accommodate new traffic generated by development at the WTC site.

It is also important to note that the current site plan and vehicle circulation system for the WTC site incorporates limited security measures identified by the PANYNJ and the NYPD. Under these measures, which were identified as the design of 1 WTC was finalized, both Vesey Street and Fulton Street would function as "managed streets" west of Greenwich Street. This would be achieved through the installation of operable barriers and sally ports on Vesey, Fulton and Washington Streets to restrict vehicular access. Each sally port would consist of a guard booth and equipment house controlling a set of two operable barriers with sufficient space between them to accommodate one or more motor vehicles. Two sally ports would be located on Fulton Street, one at West Street/Route 9A and the second west of Greenwich Street. As it is anticipated that the west barrier on Fulton Street at West Street/Route 9A would be installed immediately adjacent to the Route 9A travel lanes, the crosswalk on Fulton Street would likely be located within the sally port.

Two sally ports would also be located on Vesey Street, one to the east of West Street/Route 9A (set back from the crosswalk) and a second west of Greenwich Street. An additional operable barrier would be installed on the Washington Street approach to Vesey Street that would be raised in the default condition, and lowered only as needed to permit entry by authorized vehicles.

Each block of the WTC Campus will include a line of bollards near the edge of the curb as part of the WTC District streetscape. This is a security feature that has become more commonplace throughout the City in recent years. The bollards are typically round with a shiny metallic finish. Bollards are spaced at regular intervals.

Several plazas are planned throughout the WTC site, including around 1 WTC and 2 WTC. Additionally, the continuation of Dey Street and Cortlandt Street (between Greenwich Street and Church Street) would be closed to vehicular traffic to accommodate pedestrian volumes. Finally, Liberty Park is a new open space that is planned above the VSC on the block bounded by Liberty Street to the north, Greenwich Street to the east, Cedar Street to the south and West Street/Route 9A to the west.

In addition to the worker population anticipated in conjunction with the planned WTC buildings, the site will serve thousands of daily commuters in the PATH Terminal, shoppers and restaurant patrons, and tourists who will visit the site. The PAC, the Memorial and Memorial Center, and Liberty Park will also draw people to the WTC site.

Major changes to the area's neighborhood character would involve the opening of most of the street network to all vehicular traffic. As indicated above, Greenwich Street from Barclay to Vesey Streets would operate as a two-way dead end street as this segment of Greenwich Street is privately-controlled. Washington Street from Barclay to Vesey Streets would operate as a two-way dead end street with an operable barrier at the south end of the street and Vesey and Fulton Streets would operate as managed streets. Management of these street segments would be implemented as a security precaution to enhance security around 1 WTC.

Study Area

In the future without the Proposed Action, Lower Manhattan will remain a vibrant mixed-use community with one of the largest CBDs in the U.S. The area will experience moderate growth in commercial, office, retail, residential, hotel, and community facility uses by 2019. Streets and transit centers in the Study Area will be redeveloped and opened, emphasizing the importance of the area as a focal point of transportation networks, and buildings will continue to be converted and redeveloped, advancing the transformation of Lower Manhattan into a mixed-use community. In addition to short-term street and sidewalk closures, scaffolding, and construction noise, these new projects will create more long-term pedestrian and vehicular rush hour traffic in the area.

Continuing Greenwich Street through the site to the Greenwich South neighborhood would help to improve access to that neighborhood. It is also anticipated that opening Vesey Street, Fulton Street and Liberty Street to cross-town traffic would help to alleviate pressure on other cross-town routes in Lower Manhattan.

FUTURE WITH THE PROPOSED ACTION (WITH-ACTION)

Project Site

By 2019, it is estimated that the redevelopment of the WTC site would be complete, as described above. The Proposed Action would be implemented in conjunction with the overall construction schedule for the WTC site, where feasible, to include the proposed security measures within the street and construction. This would be done to control vehicular access into the WTC Campus through the creation of a secure perimeter around the WTC site. All pedestrian flows would essentially remain unchanged from the No-Action condition. The secure perimeter would include restricted vehicular access in and around the WTC site as well as the installation and utilization of security infrastructure in the immediate vicinity of the WTC site. Vehicles destined for the WTC site seeking entry onto these streets would be subject to credentialing to determine whether entry to the WTC Campus should be permitted, and then screening to confirm that these vehicles pose no threat.

Three main changes to neighborhood character that could result from the Proposed Action are:

1. Changes to vehicle circulation;
2. Minor sidewalk obstructions in select locations; and,
3. The overall feel of the area with the security measures in place.

Conditions in the future with the Proposed Action would be similar to existing conditions in and around the WTC Campus. The Proposed Action would result in some changes to localized vehicle

circulation in the vicinity of the WTC site and would result in some traffic diversions when compared to No-Action conditions as general traffic would not be able to circulate through the WTC site. As described in detail in Chapter 8, "Transportation," compared to the No-Action condition, the anticipated vehicle diversions would not result in unmitigated impacts at most of the analyzed intersections. Further, any potential vehicle queuing at credentialing zones would be accommodated at a curbside lane to prevent conflicts with adjacent travel lanes. In most cases, the lanes that would be used for credentialing under proposed conditions would be used as on-street parking under No-Action conditions (the elimination of these on-street parking spaces is also addressed in Chapter 8). The major exception would be the proposed credentialing lanes on West Street/Route 9A. Under the No-Action condition, the two southbound left turn lanes would provide access to the VSC and to eastbound Liberty Street, while the northbound curb lane would be a shared through/right lane. Screening would occur at all access points to the WTC Campus and through traffic would be eliminated for general traffic (refer to **Figures 6-10** through **6-18** from Chapter 6, "Urban Design and Visual Resources"). However, none of these security elements or subsequent changes to vehicular circulation are anticipated to result in significant adverse impacts to neighborhood character.

The pedestrian impact analysis in Chapter 8, "Transportation" indicates that installation of security infrastructure associated with the Proposed Action would result in significant adverse impacts due to reductions in pedestrian space in the weekday AM, midday, and/or PM peak hours at a total of only four sidewalks and four crosswalks in the Study Area. Proposed installation of personnel booths on the public sidewalk would have the potential to obstruct pedestrian flow in some areas where sidewalk extensions were not feasible. However, there is a lot of existing street furniture in the Study Area which obstructs pedestrian flow, such as bus stops, newsstands, and planters. As described in Chapter 8, no significant adverse impacts are anticipated to pedestrian flow as a result of the Proposed Action. Therefore, from a neighborhood character perspective, the proposed security elements would not be expected to change pedestrian flow patterns nor alter the defining features of the neighborhood for pedestrians. As discussed in Chapter 15, "Mitigation," each of these significant adverse sidewalk and crosswalk impacts would be fully mitigated with recommended pedestrian mitigation measures subject to review and approval by NYCDOT.

The proposed security measures could also change the overall experience of the area in the With-Action condition. While each separate screening and credentialing zone is located at least a few blocks away from the other screening and credentialing zones, the proposed security measures could make the area unwelcoming to vehicles. As the proposed security plan is a cohesive design with booths and barriers consistent with other street furniture that is commonplace in the City, and pedestrians would have unrestricted access throughout the WTC Campus, it is not anticipated that the Proposed Action would have impacts on the pedestrian experience. For example, static barriers being considered for the Campus Security Plan would be consistent with the bollards that are already planned for the WTC streetscape. Personnel booths would appear similar to the new newsstands that have been installed around the City. Operable barriers being considered would be shallow mount steel barriers, approximately three feet tall and one-foot wide (refer to **Figures 6-14b**, **6-18a**, and **6-18c** from Chapter 6, "Urban Design and Visual Resources"). The operable barriers would be visually consistent with other barriers currently located in Lower Manhattan. Overall, it is anticipated that the Proposed Action's provision of a secure and safe environment would overshadow potential negative pedestrian experiences that may occur due to the additional security infrastructure, as it is expected that most people would understand the necessity for increased security measures at the WTC site.

Study Area

As discussed above, Lower Manhattan is anticipated to remain a vibrant mixed-use community with one of the largest CBDs in the U.S., experiencing moderate growth in commercial, office, retail, residential, hotel, and community facility uses by 2019. There has been an increase in security

measures within the Study Area around City Hall and other government and office buildings as a result of the 2001 attacks. These security measures include an increase in law enforcement and/or security personnel, static barriers, operable barriers, and planters along sidewalks in many areas. The security measures have contributed to the changing character of the area around the WTC site over time. Consequently, the WTC Campus Security Plan would not be a unique feature that would alter the character of the surrounding area. Although the Proposed Action has the potential to alter travel patterns in a way that could result in increased vehicular traffic at some Study Area intersections, the overall neighborhood character would not be affected as this area is already heavily trafficked.

North of the WTC Campus

The Proposed Action would not alter any defining characteristics of the area North of the WTC Campus. The proposed Campus Security Plan would not affect the northern subarea's current character as a transitional zone between the mainly commercial office buildings of the financial district to the south and the more residential and institutional development in Tribeca to the north, nor would it affect the subarea's mix of historic and modern, low- and high-rise buildings. The Proposed Action would introduce new vehicular traffic in the area and potentially create queuing on West Broadway north of the credentialing zone, but it is anticipated that neither of these outcomes would result in significant increases of vehicles, and that there would be no significant adverse impacts to neighborhood character. The vibrant daytime pedestrian activity in the northern subarea would not be affected by the Campus Security Plan. Therefore, the Proposed Action would not result in any significant adverse impacts to the neighborhood character in the area North of the WTC Campus.

Broadway Corridor

The neighborhood character of the Broadway Corridor would not be altered by the implementation of the proposed Campus Security Plan. The Proposed Action would not affect the predominately commercial and mixed-uses in the subarea, nor would it affect the multiple institutions or historic resources located in the subarea. The proposed Campus Security Plan has the potential to alter travel patterns in a way that could introduce new vehicular traffic at some area intersections, but it is anticipated that it would not be a significant increase so that there would be significant adverse impacts to neighborhood character. As discussed in Chapter 8, "Transportation," the Proposed Action could result in LOS F at several intersections in the Broadway Corridor, causing traffic impacts. The resultant traffic could change the pedestrian experience and effect neighborhood character. However, while these impacts could be considered significant they would not be adverse. The implementation of the Proposed Action would not affect the large numbers of pedestrians traveling in the subarea during the daytime and evening. Therefore, the Proposed Action would not result in any significant adverse impacts to the neighborhood character in the Broadway Corridor subarea.

Greenwich South Corridor

Implementation of the Proposed Action would not alter any defining characteristics of the Greenwich South Corridor. The proposed Campus Security Plan would not affect the southern subarea's variety of land uses, building types, and block sizes, nor would it have an impact on the multiple construction sites in the subarea. The proposed Campus Security Plan would introduce new vehicular traffic in the area, but it is anticipated that it would not be a significant increase so that there would be significant adverse impacts to neighborhood character. Its implementation would not affect the large numbers of pedestrians traveling in the subarea during the daytime and evening. Therefore, the Proposed Action would not result in any significant adverse impacts to the neighborhood character in the Greenwich South Corridor.

Battery Park City

The neighborhood character of BPC would not be altered by the implementation of the proposed Campus Security Plan. BPC is somewhat isolated from the rest of the Study Area because of separation created by at-grade West Street/Route 9A, so the proposed Campus Security Plan would have minimal impact on the neighborhood character within this subarea. The moderate vehicular traffic and vibrant pedestrian activity in BPC would not be affected by the Proposed Action. The proposed Campus Security Plan would introduce new vehicular traffic in the area, but it is anticipated that it would not be a significant increase so that there would be significant adverse impacts to neighborhood character. Therefore, the Proposed Action would not result in any significant adverse impacts to the neighborhood character in BPC.

A. INTRODUCTION

This chapter assesses potential construction impacts from a proposed project. The following sections discuss the potential impacts resulting from the construction of the World Trade Center (WTC) Campus Security Plan as described in detail in Chapter 1, "Project Description." Construction impacts, although temporary, can include noticeable and disruptive effects from an action that is associated with construction or could induce construction. Determination of the significance of construction impacts and need for mitigation is generally based on the duration and magnitude of the impacts. Construction impacts are usually important when construction activity could affect traffic conditions, hazardous materials, archaeological resources, the integrity of historic resources, noise patterns, and air quality conditions.

As described in Chapter 1, "Project Description," the Proposed Action would control vehicular access to and traffic movement within the WTC through the creation of a secure perimeter around the WTC Campus intended to prevent unscreened vehicles from driving within close proximity to the WTC site. Therefore, selected portions of streets in and around the WTC Campus would be restricted access streets that would be closed to general vehicular traffic. No restrictions or controls would be applied to pedestrians as a result of the Proposed Action. Implementation of the Proposed Action would involve installation and utilization of security infrastructure in the immediate vicinity of the WTC Campus. The Proposed Action would not alter the building program that is currently planned for the WTC site.

According to the 2012 *CEQR Technical Manual*, construction duration is often broken down into short-term (less than two years) and long-term (two or more years). When the duration of construction is expected to be short-term, any impacts resulting from construction generally do not require detailed assessment. As described below, it is anticipated that construction of the security measures associated with the Proposed Action would commence in 2013 and be implemented as construction of the WTC buildings progresses through 2019. Sequencing of the construction would be coordinated with ongoing and planned WTC construction to ensure that the proposed security measures are incorporated into the WTC street and sidewalk construction where feasible. It is expected that the actual construction of specific Campus Security Plan elements would take less than two years and thus be considered short-term. However, as construction of the Proposed Action would likely involve some lane closures, narrowing, or otherwise impede moving lanes, roadways, and key pedestrian facilities (e.g., sidewalks, crosswalks, corners/corner reservoirs), a preliminary assessment of potential construction impacts was prepared in accordance with the guidelines of the *CEQR Technical Manual*, and is presented in this chapter.

B. PRINCIPAL CONCLUSIONS

Where possible, the Proposed Action would be constructed in sections of the roadways and sidewalks that would be closed for construction of the WTC towers and street system before those spaces are open to the public. Construction activities would be coordinated to ensure that the Proposed Action would be taken into consideration when streets and sidewalks are constructed within the WTC site so newly constructed streets and sidewalks would not have to be disturbed to accommodate the proposed security elements. Security elements proposed on streets and sidewalks outside of the WTC Campus which are accessible to the public would be constructed in halves so that no sidewalk or street would be completely closed to pedestrian or vehicular traffic as a result of the Proposed Action.

The inconvenience and disruption arising from the construction of WTC Campus Security Plan would likely result in some limited temporary diversions of pedestrians and vehicles, and would result in additional truck traffic in the area related to construction activities. Some of the construction would occur within the WTC site in locations that would still be construction zones that are off limits to the public (e.g., Vesey Street, Fulton Street, Liberty Street, and portions of Church Street), while construction would also occur in some areas that would remain publicly accessible (e.g., West Street/Route 9A, Washington Street, West Broadway, Trinity Place and Greenwich Street south of Liberty Street). Given the limited nature of the proposed security measures and the potential to complete some of the elements of the Campus Security Plan while the construction of the WTC buildings, streets and sidewalks is ongoing and the areas of disturbance would be part of the larger WTC construction site, the Proposed Action would not directly result in lengthy street closures or diversions. However, as the Proposed Action has the potential to affect elements of the City's transportation system at several locations, a preliminary assessment of potential construction impacts was prepared in accordance with the guidelines of the *CEQR Technical Manual*, and is presented in this chapter. As detailed below, construction for the Proposed Action has the potential to result in some short-term construction-period impacts related to traffic and pedestrian circulation.

Throughout the construction period, access to surrounding residences, businesses, institutions, and open spaces in the area would be maintained (see discussions below in "Socioeconomic Conditions," and "Transportation"). In addition, throughout the construction period, measures would be implemented to control noise, vibration, and dust on the construction sites and minimize impacts on the surrounding areas in conformance with the City's building code. These measures would primarily include the erection of construction fencing and permitting to restrict work hours. Even with these measures in place, temporary impacts are predicted to occur. However, because none of these impacts would be continuous in any one location or permanent, they would not create significant impacts on land use patterns or neighborhood character in the area.

As discussed below, construction would likely begin in 2013 with various segments advancing through 2019 as the WTC street system is constructed and as the adjacent WTC buildings are completed. It is anticipated that much of the activities and traffic specifically related to the construction of the Campus Security Plan would occur in 2014 and 2015, with both years expected to have similar levels of construction activity. At peak construction, a maximum of 28 workers would be on-site to construct the proposed security measures (includes approximately ten workers per block, with up to ten additional trade workers required for some phases of construction and up to eight workers related to deliveries). With less than one third of the workers expected to drive to work on a typical work day, there would be less than ten new vehicle trips related to construction workers commuting to and from the area during the 6:00 to 7:00 AM and 3:00 to 4:00 PM peak hours. Further, the peak hours related to construction trips would not occur during the peak hour for general traffic in this area. As such, no new intersections are expected to experience significant adverse traffic impacts during the peak construction activities.

Due to the limited scope of the construction activities that would be required to install the security elements associated with the proposed Campus Security Plan on existing or planned streets and sidewalks, it is unlikely that any inadvertent damage would occur to local historic (architectural or archaeological) resources. However, the protective measures of the New York City Department of Building's (DOB) *Technical Policy and Procedure Notice (TPPN) #10/88* would apply and indirect significant adverse impacts resulting from construction would be avoided.[1]

[1] TPPN #10/88 was issued by DOB on June 6, 1988, to supplement Building Code regulations with regard to historic structures. TPPN #10/88 outlines procedures for the avoidance of damage to historic structures resulting from adjacent construction, defined as construction within a lateral distance of 90 feet from the historic resource.

It should be noted that, based on observations made at the Project Site, and on documentation provided in previous environmental impact statements which were conducted for the redevelopment of the WTC site, for the reconstruction of West Street/Route 9A, and for the permanent WTC Port Authority Trans-Hudson (PATH) Terminal, the Proposed Action would not affect any natural resources or endangered species. The proposed Campus Security Plan would be constructed in a dense urban environment on existing or planned streets and sidewalks in areas that have previously been disturbed. While the site is partially located within the City's coastal zone boundary, the Waterfront Revitalization Plan (WRP) assessment conducted for the Proposed Action concluded that the Campus Security Plan would not conflict with the goals of the WRP policies.

As also discussed below, construction-related activities resulting from the Proposed Action are not expected to have any long-term significant adverse impacts on transit or pedestrian conditions, air quality, noise, archaeological resources, or hazardous materials conditions, and a detailed analysis of construction impacts is not warranted. Moreover, the construction process in New York City is highly regulated to ensure that construction period impacts are reduced.

C. REGULATORY FRAMEWORK

Governmental Coordination and Oversight

The governmental oversight of construction in New York City is extensive and involves a number of city, state, and federal agencies. **Table 13-1** shows the main agencies involved in construction oversight and each agency's areas of responsibility. The primary responsibilities lie with New York City agencies. The DOB has the primary responsibility for ensuring that the construction meets the requirements of the New York City Building Code and that buildings are structurally, electrically, and mechanically safe. In addition, the DOB enforces safety regulations to protect both construction workers and the public. The areas of responsibility include installation and operation of construction equipment, such as cranes and lifts, sidewalk sheds, and safety netting and scaffolding. The New York City Department of Environmental Protection (DEP) enforces the Noise Code, approves Remedial Action Plans (RAPs) and Construction Health and Safety Plans (CHASPs), and regulates water disposal into the sewer system. The New York City Fire Department (FDNY) has primary oversight for compliance with the Fire Code and for the installation of tanks containing flammable materials, as well as ensuring that any construction maintains access for emergency response / operations. The New York City Department of Transportation (NYCDOT) reviews and approves any traffic lane and sidewalk closures, any designs involving public roadways / sidewalks, any work zones, all Maintenance and Protection of Traffic (MPT) plans, and also issues construction permits. New York City Transit (NYCT) is in charge of bus stop relocations and must permit any subsurface construction within 200 feet of a subway. The City's Landmarks Preservation Commission (LPC) approves studies and testing to prevent loss of archaeological materials and to prevent damage to fragile historic structures.

On the state level, the New York State Department of Environmental Conservation (NYSDEC) regulates discharge of water into rivers and streams, disposal of hazardous materials, and construction, operation, and removal of bulk petroleum and chemical storage tanks. The New York State Department of Labor (NYSDOL) licenses asbestos workers. The New York State Department of Transportation (NYSDOT) has jurisdiction over work within the West Street/Route 9A right-of-way.

On the federal level, the US Environmental Protection Agency (EPA) has wide ranging authority over environmental matters, including air emissions, noise, hazardous materials, and the use of poisons.

Much of the responsibility is delegated to the state level. The US Occupational Safety and Health Administration (OSHA) sets standards for work site safety and construction equipment.

Table 13-1
Construction Oversight in New York City

Agency	Area(s) of Responsibility
New York City	
Department of Buildings (DOB)	Primary oversight for Building Code and site safety
Department of Environmental Protection (DEP)	Noise, hazardous materials, dewatering
Fire Department (FDNY)	Compliance with Fire Code, tank operation
Department of Transportation (NYCDOT)	Traffic lane and sidewalk closures; work zones; MPT plans; construction permits
New York City Transit (NYCT)	Bus stop relocation; any subsurface construction within 200 feet of a subway
New York City Department of Design and Construction (DDC)	Design and construction oversight for many civic facilities
Landmarks Preservation Commission (LPC)	Archaeological and historic architectural protection
New York State	
Department of Labor (NYSDOL)	Asbestos workers
Department of Environmental Conservation (NYSDEC)	Dewatering, hazardous materials, tanks, Stormwater Pollution Prevention Plan, Industrial SPDES, if any discharge into Hudson River
Department of Transportation (NYSDOT)	West Street/Route 9A right-of-way
United States	
Environmental Protection Agency (EPA)	Air emissions, noise, hazardous materials, toxic substances
Occupational Safety and Health Administration (OSHA)	Worker safety

Environmental Performance Commitments

In response to federal guidance provided by the Federal Transit Agency (FTA), the governmental entities involved with the recovery efforts in Lower Manhattan – the Lower Manhattan Development Corporation (LMDC), Metropolitan Transportation Authority (MTA), NYSDOT, and the Port Authority of New York and New Jersey (PANYNJ) - developed and used an environmental analysis framework for review of their recovery projects. Local project sponsors have been introduced to this framework, as appropriate, when additional federally sponsored recovery projects are identified and prioritized.

The framework considers the regulations set forth by the Council on Environmental Quality (CEQ) and accounts for the guidance of the New York State Environmental Quality Review Act (SEQRA) regulations, the 2012 *CEQR Technical Manual*, industry best practices, and public input.

The framework consists of the following components:

- Green Design, Green Construction, and Sustainable Design Principles; and
- Construction Involvement and Governmental Entities Coordination Plan.

Green Design, Green Construction, and Sustainability Principles

The project sponsors for the Lower Manhattan Recovery Projects developed a common set of environmental performance commitments (EPCs) that they will each undertake, including design elements, construction techniques, and operating procedures to lower the potential for adverse environmental impacts.

Table 13-2
Environmental Performance Commitments

Air Quality
Use ultra low sulfur diesel (ULSD) fuel for all non-road vehicles that operate with diesel engines.
Develop a plan with Con Edison, as appropriate, to disperse grid power throughout the contraction zone. In contract documents, require all contractors and subcontractors to use electrically powered equipment for air compressors, pumps, mixing, de-sanding and grout plants, welding machines, and any other diesel powered equipment that can be replaced with an electrically powered version.
Use of post-1995 fuel injection engines, which meet the Tier II engine emissions standards, as defined in Title 40, Part 89.112. Exception will be made only for specific engines that are not yet commercially available as Tier II, and where the task cannot be reasonably accomplished using alternative engines or means which do comply with these demands. In such cases, the contractor would submit a request for an exception for review and approval prior to implementation.
Use of Diesel Particle Filters (DPFs) or other measures with equivalent particulate matter removal efficiency for all non-road diesel engines of 50 horsepower or greater. In cases where DPFs would not be feasible for safety considerations, mechanical reasons, or where the technology would not function properly, the constructor would submit a request for an exception for review and approval prior to implementation, and in these cases, Diesel Oxidation Catalysts (DOCs) may be used. Only in cases where, for technical reasons, neither DPFs or DOCs can be used effectively, and where the operation cannot be performed by another engine or other means, would the use of diesel engines greater than 50 horsepower be allowed without tailpipe reduction measures, subject to the above-described approval process.
Prepare a Diesel Emission Mitigation Plan that shall address the control of emissions from all engines and vehicles including those that are not equipped with emission control devices. The Plan would limit idling times on diesel powered engines to three minutes and would require that contractors locate diesel powered engines away from fresh air intakes.
Require contractors to submit a Dust Control Plan. Among other things, the plan would contain protocols and procedures for the spraying of dust piles, containment of fugitive dust, and appropriate adjustment measures to accommodate changes in meteorological conditions.
Continue to investigate additional means (e.g., fuel emulsions) to reduce NO_x (NO and NO_2) emissions, but it is not yet known whether these measures would reduce the effectiveness of the above described mitigation. Therefore, specific means to further reduce NO_x have not been identified at this time. If this investigation results in additional means to reduce NO_x without jeopardizing the particulate matter reduction measures, and if other constraints such as technological availability are resolved, then these additional mitigation techniques would be implemented, as appropriate.
Implement verification procedures through construction specifications and contract documents. Verify mitigation and identify opportunities to expand its implementation as part of its ongoing oversight and auditing of the Project's construction. Implement project-specific verification procedures in accordance with decisions of the Lower Manhattan Construction Command Center (LMCCC), including procedures for reporting updates to the public.
Noise and Vibration
Where practicable, schedule individual project construction activities to avoid or minimize adverse impacts.
Coordinate construction activities with projects under construction in adjacent and nearby locations to avoid or minimize adverse impacts.
Consider condition of surrounding buildings, structures, infrastructures, and utilities where appropriate.
Prepare contingency measures in the event that established limits are exceeded.
Access and Circulation
Establish a project-specific pedestrian and vehicular maintenance and protection plan.
Promote public awareness through mechanisms such as: (a) signage; (b) telephone hotline; and (c) website updates.
Ensure sufficient alternate street, building, and station access during construction period.
Regular communication with New York City Department of Transportation and participation in its construction efforts.
Cultural and Historic Resources
Establish coordination among projects to avoid or minimize interruption in access to cultural and historic sites.
Initiate public information and involvement outreach with sensitivity to local cultural resources.
Identify public information outlets that will receive and provide current information about access during construction.
Consult with SHPO and LPC regarding potentially impacted, culturally significant sites. Monitor noise and vibration during construction at such sites as appropriate.
Economic Conditions
Coordinate with LMDC, Downtown Alliance, or other entities to minimize residential and retail impacts as required through: (a) relocation assistance, as applicable, to persons and businesses physically displaced by the project; and (b) focus on essential business and amenities to remain in Lower Manhattan.
Add appropriate signage for affected businesses and amenities.

Unlike a typical environmental review process, which responds to potential impacts with appropriate mitigation, the EPCs provide specific measures for the avoidance and reduction of potential impacts in

advance of the environmental review process (see **Table 13-2**). These EPCs incorporate design features and construction practices to preserve the capacity of the local environment and successfully allow for the development of all of the Lower Manhattan Recovery Project.

PANYNJ and DDC would construct different sections of the Proposed Action. Construction would be undertaken in accordance with the EPCs that have been developed for the Lower Manhattan Recovery Projects. The EPCs were originally developed through a coordinated effort of the Lower Manhattan project sponsors and were contained in a letter signed in September 2003. Throughout the ongoing environmental review process for the Lower Manhattan Recovery Projects (*World Trade Center Memorial and Redevelopment Plan*, *Fulton Street Transit Center*, *South Ferry Terminal*, *Route 9A Project*, and *Permanent WTC PATH Terminal*), the project sponsors continually evaluated the original EPCs and made additional commitments to ensure further reduction of potential project-generated impacts. In a joint letter signed by PANYNJ, LMDC, NYSDOT, and MTA on April 21, 2006 to FTA, project sponsors further committed to common EPC implementation and verification procedures to ensure that EPCs are consistently implemented at the project's construction sites.

The EPCs also establish a general guidance for developing green design and sustainability principles to reduce the demand for, and use of, resources during construction once projects are operational. Subsequently, PANYNJ outlined preliminary sustainable design guidelines for its projects, which will continue to be formalized as design advances.

The sustainable design principles and actions for the Proposed Action are organized into six component areas, consistent with the previous WTC projects, including: urban considerations, site, water, energy, materials, and indoor environment. These guidelines are consistent with criteria contained in the New York City Transit Environmental Guidelines, the U.S. Green Building Council, Leadership in Energy Efficiency (LEED) Guidelines, and requirements of New York State Executive Order 111, "Green and Clean State Buildings and Vehicles," which direct State agencies to be more energy-efficient and environmentally aware, and the New York State Green Building Tax Credit (Chapter 63 of the NYS Laws of 2000), which promotes environmentally sound building practices through a package of tax incentives.

Construction Environmental Protection Plan

As the design and environmental review of the Proposed Action is advanced, PANYNJ and/or DDC will provide any updates necessary to the existing EPCs and any other procedures to be implemented to protect sensitive resources that may be affected by the construction of the Proposed Action. It is expected that the plan would describe how the initial condition of the resources would be assessed, how the construction work would be implemented to avoid or minimize impacts, and how the Proposed Action would be monitored during construction. The plan would use the best available information from the ongoing construction coordination process for projects in Lower Manhattan. The plan would also provide for an effective means of circulating current information to the public and other developers.

Public Involvement and Governmental Entities Coordination Plan

As per the framework, it is expected that PANYNJ and/or DDC would maintain on-going communication with the community (including environmental groups, interested governmental entities, and the general public) as the Proposed Action is advanced through the design and construction process.

PANYNJ has developed an existing public involvement plan that would guide the outreach for the Proposed Action. A key goal of the plan is to communicate potential impacts during construction and

to coordinate with other project sponsors in the vicinity to avoid or minimize adverse effects on the environment. As the process continues, this plan would be updated to identify a protocol for (1) addressing comments received during the construction phase; (2) communicating appropriate current information to the public, including the implementation schedules; and (3) means and measures of on-going coordination with other projects. The process would build on an existing construction coordination protocol among parties already involved in WTC construction and other construction projects within the vicinity of the WTC site.

The DDC Office of Community Outreach and Notification has outreach programs providing on-going communication with the community. The DDC employs Community Construction Liaisons (CCL's) to assist the community with inquiries and concerns about infrastructure projects. On a quarterly basis, DDC sends lists of infrastructure projects to respective community boards and distributes brochures with project information to neighborhood residents, businesses, community boards, civic associations and local institutions. In addition, DDC attends community meetings to explain projects and answer questions, and provides tours of project areas for community boards.

As described above, the existing EPCs for the site would likely be implemented to help ensure that the Proposed Action would not result in significant adverse construction impacts.

Hours of Work

Construction activities for buildings in New York City generally take place Monday through Friday, with exceptions that are discussed separately below. In accordance with City laws and regulations, construction work would generally begin at 7:00 AM on weekdays, with workers arriving to prepare work areas between 6:00 AM and 7:00 AM. Normally, work would end at 3:30 PM, but at times the workday could be extended to complete some specific tasks beyond normal work hours, such as complex utility work which could require overnight hours. The extended workday would generally last until about 6:00 PM and would not include all construction workers on-site, but just those involved in the specific task requiring additional work time.

Occasionally Saturday or overtime hours may be required to complete some time-sensitive tasks. Weekend work under the jurisdiction of DOB requires a permit from the DOB and, in certain instances, approval of a noise mitigation plan from the DEP under the City's Noise Code. The New York City Noise Control Code, as amended December 2005 and effective July 1, 2007, limits construction (absent special circumstances as described below) to weekdays between the hours of 7:00 AM and 6:00 PM, and sets noise limits for certain specific pieces of construction equipment. Construction activities occurring after hours (weekdays between 6:00 PM and 7:00 AM and on weekends) may be permitted only to accommodate: (i) emergency conditions; (ii) public safety; (iii) construction projects by or on behalf of City agencies; (iv) construction activities with minimal noise impacts; and (v) undue hardship resulting from unique site characteristics, unforeseen conditions, scheduling conflicts and/or financial considerations. In such cases, the numbers of workers and pieces of equipment in operation would be limited to those needed to complete the particular authorized task. Therefore, the level of activity for any weekend work would be less than a normal workday. The typical weekend workday would be on Saturday from 7:00 AM with worker arrival and site preparation to 5:00 PM for site cleanup.

Weekend work under the jurisdiction of NYCDOT requires a permit from the NYCDOT and, in certain instances, requires a noise variance from the Office of Construction Mitigation and Coordination (OCMC). The NYCDOT requires all weekend work to occur during the hours of 9 AM and 6 PM, with no noisy work permitted until 10 AM.

It should be noted that PANYNJ is not bound by the same set of rules and permitting as the City or work on City property would be. For example, PANYNJ has more flexibility on hours of work without needed authorization from DOB. Nonetheless, PANYNJ typically adheres to the City requirements detailed above.

D. DESCRIPTION OF CONSTRUCTION ACTIVITIES AND SCHEDULE

Construction Stages and Activities

Construction of the Campus Security Plan within the WTC Campus would occur in conjunction with the ongoing construction related to the WTC redevelopment and permanent WTC PATH terminal. As a result, and as described below, only some of the proposed security installations would require additional street and/or sidewalk closures. Security elements that would be constructed on streets and sidewalks outside of the WTC Campus which are accessible to the public would be constructed in halves so that no street would be completely closed to pedestrian or vehicular traffic due to the Proposed Action. Since the construction of the proposed security infrastructure would only require shallow excavation, it is anticipated that construction of each element would not last more than several months. Construction activities on PANYNJ property may require night or weekend work, but work on City property would likely be conducted during typical constructions hours.

During construction of the Proposed Action, it is anticipated that construction of each screening location and the static barrier proposed in Church Street would require a modest amount of construction equipment and a relatively small construction crew, as described in more detail below. Construction of the security elements proposed at the various screening and credentialing locations would occur in conjunction with the ongoing WTC redevelopment in many cases, and therefore is expected to require limited additional street or sidewalk closures. As detailed below, construction activities in the following areas would require partial lane and/or sidewalk closures to accommodate the construction of personnel booths, lane delineation devices, static barriers or operable barriers:

- Barclay Street between Washington Street and Greenwich Street;
- Washington Street between Barclay Street and Vesey Street;
- Barclay Street between West Broadway and Church Street;
- West Broadway between Barclay Street and Park Place;
- West Broadway between Barclay Street and Vesey Street;
- Church Street between Rector Street and Barclay Street;
- Trinity Place between Liberty Street and Rector Street;
- Greenwich Street between Liberty Street and Cedar Street;
- The two southbound left turn lanes on West Street/Route 9A at Liberty Street; and,
- The curbside lane on the northbound approach at West Street/Route 9A and Liberty Street.

It is anticipated that all other construction would occur in areas that would be located within the construction zone of the WTC Redevelopment and as such these areas would not be accessible to vehicular or pedestrian traffic.

Some traffic diversions may be required as a result of the construction of the Proposed Action. Many locations would only require short-term lane closures (e.g., the construction of the credentialing lanes

and/or screening zones on Barclay Street, West Broadway, West Street/Route 9A, and Church Street/Trinity Place), or where construction would span the entire width of the street, construction would be scheduled in a way that would maintain half of the travelway for traffic and emergency access (e.g., the construction of the screening zones on Washington Street and West Broadway and the exit sally port on Greenwich Street would be constructed first on one side of the street and then the other side of the street).

Some pedestrian diversions are anticipated due to temporary sidewalk closures. However, as all of the construction activities associated with the Proposed Action would be short-term, potential effects on traffic and pedestrian conditions would be limited.

As indicated above, the security elements would all involve shallow construction in order to minimize utility conflicts. Further, as plans are developed further, design considerations would be made to account for and avoid potential utility conflicts. Finally, in cases where utility conflicts could not be avoided, private utilities or DEP would be consulted. The design will identify locations where relocations are required in coordination with utility companies and DEP.

Personnel Booths

Under the Proposed Action, eight personnel booths would be constructed adjacent to sally ports that provide access into or out of the WTC Campus and six personnel booths would be installed around the perimeter of the WTC Campus adjacent to credentialing zones. Personnel booths would be located adjacent to sally ports at the intersections of Washington and Barclay Streets, West Broadway and Barclay Street, Church and Vesey Streets, Trinity Place and Liberty Street, Greenwich and Cedar Streets, Liberty Street and West Street/Route 9A, Fulton Street and West Street/Route 9A, and Vesey Street and West Street/Route 9A. Personnel booths would be located near credentialing zones that are proposed at the intersections of Barclay and Washington Streets, Barclay Street and West Broadway (one on West Broadway at the southbound approach and one on Barclay Street at the westbound approach), Trinity Place and Cedar Street, and West Street/Route 9A and Liberty Street (one adjacent to the two southbound left turn lanes and one adjacent to the curbside lane on the northbound approach).

It is anticipated that all personnel booths would be prefabricated and would be delivered to the site with limited on-site assembly required. Construction activities related to the installation of the personnel booths include: setting up maintenance and protection of traffic (MPT) in any areas that would be publicly accessible (i.e., outside of the WTC's active construction zone); preparation of the site, including asphalt and concrete removal, installing conduit, pouring the foundation, grading, etc.; using crane trucks to off-load the personnel booths from delivery trucks; installing booths in the proposed locations; connecting electrical, computer and communication systems; and restoring the sidewalk.

Static Barriers

The proposed Campus Security Plan includes the installation of static barriers (it is anticipated that bollards would be used) across certain sidewalks from the curb-edge to a point no greater than four-feet from an adjacent building façade. Static barriers would be installed adjacent to each sally port to ensure that vehicles could not obtain unauthorized access into the WTC Campus. Additionally, a static barrier is proposed within Church Street/Trinity Place from Cedar Street to a point just north of Vesey Street to increase the stand-off distance from WTC buildings on the west side of Church Street.

It is anticipated that the static barriers would be prefabricated and would be delivered to and assembled on site. Construction activities related to the installation of the static barriers include:

setting up MPT in any areas that would be publicly accessible (i.e., outside of the WTC's active construction zone); preparation of the site, including removal of asphalt and concrete, excavation in the area of the proposed barriers and possible utility relocation; using crane trucks to off-load the barriers from delivery trucks; assembly and installation of barriers; and backfill and pour new concrete to restore the sidewalks or restoration of streets with backfill, concrete base, asphalt, lane markings, etc.

Active Barriers

Under the Proposed Action, active barriers would be used at all entrances and exits to the WTC Campus to create sally ports. The type of active barriers to be installed under the Proposed Action would be shallow mount barriers that would help to eliminate conflicts with existing utilities. These barriers would be prefabricated and would be delivered to and assembled on site. Construction activities related to the installation of the static barriers include: setting up MPT in any areas that would be publicly accessible (i.e., outside of the WTC's active construction zone); preparation of the site, including removal of asphalt and concrete, excavation in the area of the proposed barriers; protection and/or relocation of utilities; using crane trucks to off-load the barriers from delivery trucks; assembly and installation of barriers; connecting electrical components; and restoration of streets with backfill, concrete base, asphalt, lane markings, etc.

Sidewalk Extensions

The proposed Campus Security Plan includes the extension of sidewalks in some areas to accommodate several of the proposed personnel booths. Sidewalk extensions are proposed at the following locations: on the eastern side of West Broadway just south of Barclay Street; on the western side of Church Street just north of Vesey Street; on the west side of Greenwich Street, just north of Cedar Street; on the southern side of Vesey Street, just east of West Street/Route 9A; and on the northern side of Fulton Street, just east of West Street/Route 9A.

Construction of sidewalk extensions would require MPT in any areas that would be publicly accessible (i.e., outside of the WTC's active construction zone); partial demolition of existing sidewalks and streets in the area of the proposed extension; backfill and pour new concrete to restore the sidewalks; and restoration of streets with backfill, concrete base, asphalt, lane markings, etc.

Number of Daily Construction Vehicles

It is anticipated that the Proposed Action would require one construction crew of approximately ten workers at each location, with up to ten additional trade workers required for some phases of construction, as described below. This small amount of workers would not result in a large amount of vehicular activity. Based on the auto share calculations of 26 percent from the Atlantic Yards Final Environmental Impact Statement (FEIS) dated November 27, 2006, it is anticipated that less than one third of the workers would drive to the WTC site. Furthermore, the WTC Campus is adjacent to multiple forms of public transit, potentially decreasing the amount of vehicles workers would use to commute to the site. Parking of private vehicles within a construction site is expressly forbidden, and vigorously enforced, by NYCDOT in their permitting process.

Since many of the proposed security elements would be prefabricated, it is expected that each location would receive deliveries each day via flatbed or crane truck. Due to the nature of the construction required to install the booths and static and operable barriers, and curb extensions, construction activities are not expected to last more than six months at each location. Further, since the different locations would be built over the course of multiple years to coincide with adjacent WTC construction activities, multiple crews would not be working simultaneously on adjacent blocks.

It is anticipated that materials would be delivered to the Project Site on an as-needed basis as there would not be a great deal of space available for materials storage. However, some limited curbside storage may be required. The static barriers, operable barriers, personnel booths and related material would be delivered on flatbed trucks or crane trucks. If crane trucks are not used for deliveries, a hi-lift or similar fork-truck would be needed on-site to offload the material from the delivery truck. Security devices for most entry or exit locations would not require a substantial number of deliveries – it is anticipated that a maximum of five flatbed delivery trucks would be required per day for any single location. Additional material deliveries would be required for construction of the static barrier that is proposed in Church Street, though it is expected that the construction of this barrier would take place in three or four stages in conjunction with adjacent WTC construction before Church Street is reopened to traffic. The contractor would be responsible for implementing an MPT plan to manage any temporary lane closures. Up to five concrete trucks could be anticipated per day in conjunction with the construction of the barriers. Once the concrete work is completed, asphalt trucks would deliver material required to complete the road reconstruction.

Additional on-site equipment could include a compressor, an excavator, a backhoe, and a front end loader, dump trucks, a roller (for compaction), and asphalt spreader, and a roller (for asphalt).

Number of Daily Construction Workers

The Proposed Action would require one construction crew per block of construction activity. The on-site crew would likely include one foreman, five to seven laborers, and two machine operators. Additionally, up to ten workers from specialized trades, such as electricians, welders, or masons may be required at some locations to install various security elements, but it is unlikely that all ten trades would be working concurrently. Due to the nature of the Proposed Action, construction activities are not expected to last more than six months on each block. Since the Proposed Action would be implemented over the course of multiple years, multiple crews would not be working simultaneously on adjacent blocks.

E. PRELIMINARY ASSESSMENT

In accordance with the guidelines of the 2012 *CEQR Technical Manual*, a preliminary assessment of construction impacts evaluates the effects associated with the Proposed Action's construction related activities, including transportation, air quality, noise, and other technical areas as appropriate. A description of the No-Action condition is provided below, followed by a description of the proposed With-Action condition, along with a preliminary assessment of the Proposed Action's construction related activities.

FUTURE WITHOUT THE PROPOSED ACTION (NO-ACTION)

In the future without the proposed Campus Security Plan, it is anticipated that there would be multiple street closings in and around the WTC Campus as a result of ongoing WTC redevelopment. In the No-Action condition, it is anticipated that most streets within the WTC Campus would be opened by the end of 2015, with the exception of the pedestrian sidewalks surrounding the Performing Arts Center (PAC) and the adjacent portion of Greenwich Street between Vesey and Fulton Streets, and the western-most lane on Church Street in the area of 2 WTC and 3 WTC which are expected to be fully open by 2019.

Barclay Street

Under the No-Action condition, Barclay Street would remain a westbound street as it exists today. No changes are anticipated to Barclay Street by 2019.

Washington Street

In the future without the Proposed Action, it is anticipated that Washington Street between Barclay Street and Vesey Street would remain closed to vehicular access by the general public (similar to existing conditions) as a measure to enhance security around 1 WTC. The sidewalks would continue to be open for unrestricted pedestrian access. Delivery vehicles would continue to have access to the 7 WTC loading dock on the eastern side of the street.

When the western portion of Vesey Street opens under managed conditions by the end of 2014, it is anticipated that an operable barrier would be constructed at the southern end of Washington Street at the intersection with Vesey Street in order to provide access to 1 WTC for screened vehicles (mostly black cars). No other changes are anticipated on Washington Street by 2019 under No-Action conditions.

West Broadway

Under the No-Action condition, West Broadway would remain closed to the general public for vehicular traffic until 2015 due to construction activities on the WTC site. The sidewalks on both sides of West Broadway would continue to be open for pedestrians, and post office and delivery vehicles would continue to have access to the Federal Office Building/U.S. Post Office on the eastern side of the street. Vesey Street is expected to open to vehicular traffic by the end of 2015. Once Vesey Street is opened to vehicular traffic, the existing vehicle barriers on West Broadway north of Vesey Street would be removed. However, as demolition of the temporary WTC PATH terminal and construction of the PAC and 2 WTC would likely require use of the Greenwich Street roadbed, it is anticipated that Greenwich Street would not be available for use by through traffic until after 2019. As such, West Broadway would provide access to Vesey Street from 2015 through 2019 when Greenwich Street would be open to general vehicular traffic.

Vesey Street

In the future without the Proposed Action, Vesey Street between West Street/Route 9A and Church Street would continue to be closed to vehicular traffic through the end of 2013. It is anticipated that the sally port and associated personnel booth, and operable and static barriers planned on Vesey Street at the intersection with West Street/Route 9A would be installed by 2014 while this area of Vesey Street is still closed for construction. Pedestrians would continue to have access to the northern sidewalk on the portion of Vesey Street between Greenwich Street and Church Street during this time. By the time 1 WTC is open in 2014, the section of Vesey Street from Washington Street to West Street/Route 9A would be opened in a limited capacity for screened livery vehicles that are picking up or dropping off passengers at 1 WTC. Access to 1 WTC would be available via southbound Washington Street to westbound Vesey Street, with all vehicles exiting onto West Street/Route 9A. Pedestrian access in this area would be unimpeded.

East of Washington Street, Vesey Street would continue to function as a pedestrian corridor due to ongoing construction activities at the PAC and 2 WTC. No vehicle access would be provided on Vesey Street from Church Street to Greenwich Street/West Broadway until the end of 2015. While pedestrian access would be provided along Vesey Street on the northern sidewalk from Church Street

to West Street/Route 9A, the southern sidewalk would likely be closed from Church Street to Washington Street through 2019 to accommodate construction activities at the PAC and the full build-out of 2 WTC. By 2019 Vesey Street would be open to vehicular and pedestrian traffic.

Fulton Street

Under the No-Action condition, Fulton Street would continue to be closed to vehicular and pedestrian between West Street/Route 9A and Church Street through the end of 2013 due to construction activities. It is anticipated that the sally port and associated personnel booth, and operable and static barriers planned on Fulton Street at the intersection with West Street/Route 9A would be installed by 2014 while this area of Fulton Street is still closed for construction. It is anticipated that Fulton Street would open—with limited capacity and security restrictions in place—from Church Street to Greenwich Street to coincide with the opening of 4 WTC (anticipated by the end of 2013). Access on Fulton Street would likely be limited to a single lane to accommodate construction at the adjacent 2 WTC and the new WTC PATH Terminal. It is anticipated that access would be permitted for black cars and others with business at 4 WTC, but not for general traffic.

It is anticipated that the northern section of Fulton Street adjacent to the PAC would remain closed to vehicular and pedestrian traffic through mid-2014, with a single lane of traffic expected to open on the southern portion of the street in this area by the end of 2014 to allow for access on Fulton Street from Greenwich Street to West Street/Route 9A. The southern sidewalk would also be opened to pedestrian traffic in this area by the end of 2014. As indicated above, construction of the PAC is anticipated to be completed by 2019. As such, the northern portion of Fulton Street would continue to be used for construction purposes until the PAC is completed in 2019, with Fulton Street becoming fully operational thereafter.

Greenwich Street

In the future without the Proposed Action, the northern section of Greenwich Street between Barclay Street and Vesey Street would operate as a cul-de-sac for private use by 7 WTC through 2019 and beyond. Operable barriers would be installed on Greenwich Street just north of Vesey Street. Pedestrian access would be unrestricted on the public sidewalks on this section of Greenwich Street.

The section of Greenwich Street between Vesey Street and Fulton Street would likely remain closed to vehicular and pedestrian access through 2019, when the construction of the PAC and full build-out of 2 WTC is completed. As indicated above, it is anticipated that Vesey Street would be restored for vehicle access across Greenwich Street by the end of 2015.

The section of Greenwich Street between Vesey Street and Liberty Street would remain closed for WTC construction through mid-2013. By the end of 2013, a portion of Greenwich Street below Fulton Street would be partially opened to provide vehicular access to 4 WTC. Access on Greenwich Street would likely be limited to a single lane to accommodate construction at the adjacent WTC PATH Terminal, National September 11th Museum, and 3 WTC. It is anticipated that access would be permitted for black cars and others with business at 4 WTC, but not for general traffic. Pedestrian access would likely be permitted only around 4 WTC at this time as the Greenwich Street sidewalks would not yet be completed.

By the end of 2014, Greenwich Street between Fulton Street and Dey Street would be open; however, the eastern-most lanes on Greenwich Street from Dey Street to Cortlandt Street would remain closed to accommodate construction activities until mid-2015. In the area of 4 WTC, Greenwich Street would be accessible by the end of 2013, as indicated above, to coincide with the building occupancy.

In the future without the Proposed Action, the southern section of Greenwich Street between Liberty Street and Thames Street would continue to be open to vehicles traveling south from Liberty Street. The western sidewalk would remain closed to pedestrians through the end of 2015, when construction of Liberty Park and the Greek Orthodox Church, both atop the Vehicle Security Center (VSC) are completed.

Liberty Street

Under the No-Action condition, the northern portion of Liberty Street between Greenwich Street and Church Street/Trinity Place would continue to be closed through the beginning of 2013, with construction fencing still located at the perimeter of the 4 WTC construction site. By the end of 2013 it is anticipated that the north side of the street on the eastern half of this block would remain occupied by construction equipment, while the western half of the block would be opened to vehicular traffic. By early 2015, this portion of Liberty Street would be fully open for vehicles and pedestrians.

The section of Liberty Street between West Street/Route 9A and Greenwich Street would continue to be closed to public access through the end of 2013. As the VSC is expected to be operable by the end of 2013, Liberty Street would be used for construction vehicles bringing construction materials into the site. During construction of the WTC Campus, Liberty Street would remain secured by operable barriers. By the end of 2014, the northern half of Liberty Street would be open to vehicular and pedestrian traffic in this area; the southern half of the street would be completely open by the end of 2015 when construction of Liberty Park and the Greek Orthodox Church is completed.

Cedar Street

Under the No-Action condition, Cedar Street between West Street/Route 9A and Washington Street would continue to be closed due to the ongoing construction of the VSC. It is anticipated that the roadway would be open by the end of 2014, and the northern sidewalk would be open by the end of 2015, when construction of Liberty Park and the Greek Orthodox Church is completed.

West Street/Route 9A

As detailed in the Route 9A Lower Manhattan Redevelopment FEIS from May of 2005, NYSDOT and the Federal Highway Administration are reconstructing the section of West Street/Route 9A between Chambers Street and West Thames Street. The reconstruction project adds a median and turn lanes on the multi-lane highway. It is expected that reconstruction of West Street/Route 9A between Vesey Street and Cedar Street would continue through mid-2013. It is anticipated that the portion of the West Street/Route 9A between Fulton Street and Vesey Street would be accessible by the end of 2013, while the segment between Fulton Street and Liberty Street would be accessible by the end of 2014. By the end of 2015, all of West Street/Route 9A would be open to vehicular and pedestrian traffic.

Church Street/Trinity Place

Under the No-Action condition, the western lane of Church Street/Trinity Place between Vesey Street and Liberty Street would continue to be closed for construction through mid-2013. Construction fencing in the area around 4 WTC (Liberty to Cortlandt) would be removed by the end of 2013 and it is anticipated that traffic lanes and sidewalks along the west side of Church Street would be restored. By 2014, it is anticipated that the western lane on Church Street would be restored north of Dey Street, while the western lane between Cortlandt Street and Dey Street would remain closed to traffic for construction of 3 WTC and the sidewalk on the western side of Church Street from Dey Street to Fulton Street would remain closed for construction of the WTC PATH Terminal. (Construction of 2 WTC would continue without additional lane closures on Church Street by staging on the west side of

the site). The western portion of Church Street between Cortlandt Street and Dey Street is anticipated to open in 2019, upon completion of 3 WTC.

FUTURE WITH THE PROPOSED ACTION (WITH-ACTION)

Construction Activities Associated with the Proposed Action

In the future with the proposed WTC Campus Security Plan, it is anticipated that most of the construction activities associated with the implementation of the proposed security elements would occur in conjunction with the ongoing development of the WTC Campus. As a result, few additional street or sidewalk closures would be required in the future with the Proposed Action. Any street or sidewalk closures associated with the Proposed Action would not last for more than six months. To minimize the effects of the construction, street disturbance would be limited to half of the roadway at a time to maintain vehicular access on the other half. Pedestrian paths would be maintained wherever possible to reduce the inconvenience to pedestrians. Since the Proposed Action would be implemented over the course of multiple years, it is expected that multiple crews would not be working simultaneously on adjacent blocks for extended periods of time.

Where possible, the construction of the proposed security elements would be planned to avoid disturbing newly constructed streets or sidewalks. It is anticipated that the majority of construction would be completed in conjunction with planned WTC street and sidewalk reconstruction by integrating the design of the security measures into the WTC plans. Coordination of construction would help to reduce the overall cost and duration of constructing the Proposed Action.

Barclay Street

In the future with the Proposed Action, a new credentialing zone would be created on Barclay Street, just east of West Broadway and on Barclay Street, just east of Washington Street. Physical elements associated with these two credentialing zones include personnel booths on the sidewalk (one near the front of the queue at each location) and lane delineators to provide a visual indication that the credentialing lane is separate from general traffic flow. Personnel booths would be pre-fabricated and would involve little on-site assembly. The most disruptive activities associated with the construction of personnel booths would be running conduit to the booth and pouring the foundation. No long-term obstruction of traffic lanes or sidewalks would be anticipated for these activities. Additional construction activities associated with installation of the personnel booths would be limited to a very small area in the immediate vicinity of the booths. Installation of lane delineators would be short-term, lasting a day or two at each proposed credentialing location. Installation involves bolting the lane delineator into the existing asphalt. These security elements would be installed along Barclay Street by the end of 2013.

Washington Street

Under the With-Action condition, it is anticipated that Washington Street would continue to be closed to general vehicular traffic. The sidewalks would continue to be open for pedestrians, and delivery vehicles would continue to have access to the 7 WTC loading dock on the eastern side of the street. In preparation for the opening of the western portion of Vesey Street as a managed street by the end of 2014, the temporary barriers that are currently located on Washington Street just south of the intersection with Barclay Street and just north of Vesey Street would be replaced with the proposed security elements, including: static barriers (bollards) across the sidewalk adjacent to the proposed sally port, a sally port consisting of two sets of operable barriers, a personnel booth, and lighting and signal poles. These security elements would comprise the proposed Washington Street screening zone

and would be one of the vehicular entry points into the WTC Campus. Since this section of Washington Street is currently closed to through-traffic and anticipated to accommodate limited traffic through the end of 2013 as a result of the ongoing construction of the WTC Campus, the installation of these security elements would not cause any additional street closings. The construction of security elements would be phased to maintain access to 7 WTC and construction access to 1WTC.

This work would not be conducted within areas of the WTC site that are fully closed to the public, so there would be noticeable, short-term effects due to the installation of the proposed security elements. Since many of the proposed security elements would be prefabricated and the excavation required for the security elements would be shallow, it is expected that construction would not last more than six months at this location. It is anticipated that this proposed screening location would be constructed and fully operational before 1 WTC is opened in 2014.

West Broadway

Under proposed conditions, a credentialing zone would be created on West Broadway between Barclay Street and Park Place. Physical elements associated with this credentialing zone include a personnel booth on the sidewalk (near the front of the queue) and lane delineators to provide a visual indication that the credentialing lane is separate from general traffic flow. As indicated above, the personnel booth would be pre-fabricated and would require little on-site assembly. The most disruptive activities associated with the construction of personnel booth would be running conduit and pouring the foundation for the booth. No long-term obstruction of traffic lanes or sidewalks would be anticipated for these activities. Additional construction activities associated with installation of the personnel booth would be limited to a very small area in the immediate vicinity of the booths. Installation of lane delineators would be short-term, lasting a day or two at each location. Installation involves bolting the lane delineator into the existing asphalt. These security elements would be installed along Barclay Street by the end of 2013.

West Broadway between Barclay Street and Vesey Street would remain closed to public vehicular traffic through 2015 when it would be opened to provide access to screened black cars and other authorized vehicles bound for 4 WTC via westbound Vesey Street. It is anticipated that Greenwich Street between Vesey Street and Fulton Street would remain closed through 2019 due to ongoing construction at the PAC and at 2 WTC. Through 2015, the sidewalks would continue to be open for pedestrians, and post office and delivery vehicles would continue to have access to the Federal Office Building/U.S. Post Office on the eastern side of the street.

In preparation of opening the western portion of Vesey Street as a managed street by the end of 2015, the existing temporary barriers on West Broadway would be replaced with the proposed security elements, including: static barriers (bollards) across the sidewalk adjacent to the proposed sally port, a sally port consisting of two sets of operable barriers, lighting and signal poles, and a personnel booth on a sidewalk extension. This location would be a two-lane entry point into the WTC Campus, primarily for use by for-hire vehicles and private occupancy vehicles (POVs). An additional lane would be maintained to the east of the screening zone for use by vehicles accessing the adjacent Federal Office Building/U.S. Post Office. Since this section of West Broadway is currently closed to through-traffic and anticipated to be closed through the end of 2015 as a result of the ongoing construction of the WTC Campus, the installation of these security elements would not cause any additional street closings. To maintain access to the Federal Office Building/U.S. Post Office on the eastern side of the street, construction of the proposed security elements would be conducted on the eastern and western halves of West Broadway in two different stages.

Construction work at this location would not be conducted within areas of the WTC site that are fully closed to the public, so there would be noticeable, short-term effects due to the installation of the

proposed security elements. Since many of the proposed security elements would be prefabricated and the excavation required for the security elements would be shallow, it is expected that construction would not last more than six months at this location. It is anticipated that this proposed screening location would be constructed and fully operational in 2015.

Vesey Street

Construction activity along Vesey Street would not change through 2019 as a result of the Proposed Action as compared to the No-Action condition. In the future with the Proposed Action, Vesey Street between West Street/Route 9A and Church Street would continue to be closed to vehicular traffic through the end of 2013 when vehicular access would be provided via the Washington Street screening zone to 1 WTC. It is anticipated that the sally port and associated personnel booth, and operable and static barriers planned on Vesey Street at the intersection with West Street/Route 9A would be installed by 2014 while this area of Vesey Street is still closed for construction, as described above in the description of No-Action conditions. Pedestrian access on Vesey Street between Greenwich Street and Church Street would be maintained during this time. By the time 1 WTC is open in 2014, the section of Vesey Street from Washington Street to West Street/Route 9A would be opened in a limited capacity for screened for-hire vehicles that are picking up or dropping off passengers at 1 WTC, consistent with the No-Action condition. Access to 1 WTC would be available via southbound Washington Street to westbound Vesey Street, with all vehicles exiting onto West Street/Route 9A. Pedestrian access in this area would be unimpeded.

East of Washington Street, Vesey Street would continue to function as a pedestrian corridor due to ongoing construction activities at the PAC and 2 WTC. No vehicle access would be provided on Vesey Street from Church Street to Greenwich Street/West Broadway until the end of 2015. By the end of 2015, Vesey Street would no longer be needed for access to the temporary WTC PATH Terminal and the WTC construction activity requiring Vesey Street to be closed would be completed. Vehicular traffic on Vesey Street would be managed through the proposed Campus Security Plan, with northern access from Washington Street and West Broadway.

Most of the pedestrian sidewalks on Vesey Street would be restored by 2015, except for the section of sidewalk around the PAC and 2 WTC which would continue to be closed off with a construction fence until the completion of these buildings in 2019. By 2019 Vesey Street would be fully open to pedestrian traffic.

Fulton Street

Construction activity along Fulton Street would not change through 2019 as a result of the Proposed Action as compared to the No-Action condition. Consistent with the No-Action condition, Fulton Street would be closed to vehicular and pedestrian traffic between West Street/Route 9A and Church Street through the end of 2013 due to construction activities. It is anticipated that the sally port and associated personnel booth, and operable and static barriers planned on Fulton Street at the intersection with West Street/Route 9A would be installed regardless of the Proposed Action by 2014 while this area of Fulton Street is still closed for construction. It is anticipated that Fulton Street would open—with limited capacity and security restrictions in place—from Church Street to Greenwich Street to coincide with the opening of 4 WTC (anticipated by the end of 2013). Access on Fulton Street would likely be limited to a single lane to accommodate construction at the adjacent 2 WTC and the new WTC PATH Terminal. It is anticipated that access would be permitted for black cars and others with business at 4 WTC, but not for general traffic.

It is anticipated that the northern section of Fulton Street adjacent to the PAC would remain closed to vehicular and pedestrian traffic through mid-2014, with a single lane of traffic expected to open on the

southern portion of the street in this area by the end of 2014 to allow for access on Fulton Street from Greenwich Street to West Street/Route 9A. The southern sidewalk would also be opened to pedestrian traffic in this area by the end of 2014. As indicated above, construction of the PAC is anticipated to be completed by 2019. As such, the northern portion of Fulton Street would continue to be used for construction purposes until the PAC is completed in 2019, with Fulton Street becoming fully operational thereafter.

Greenwich Street

Under both No-Action and With-Action conditions, the northern section of Greenwich Street between Barclay Street and Vesey Street would continue to operate as a cul-de-sac for use by 7 WTC. An operable barrier would be installed on Greenwich Street just north of Vesey Street. Pedestrian access would be unrestricted on the public sidewalks on this section of Greenwich Street. This section of Greenwich Street would operate as a cul-de-sac for private use by 7 WTC through 2019 and beyond.

Consistent with the No-Action condition, the section of Greenwich Street between Vesey Street and Fulton Street would likely remain closed to vehicular and pedestrian access through 2019, when the construction of the PAC and full build-out of 2 WTC is completed. As indicated above, it is anticipated that Vesey Street would be restored for vehicle access across Greenwich Street by the end of 2015.

As with the No-Action condition, under the With-Action condition the section of Greenwich Street between Vesey Street and Liberty Street would remain closed for WTC construction through mid-2013. By the end of 2013, the portion of Greenwich Street below Fulton Street would be partially opened to provide vehicular access to 4 WTC. Access on Greenwich Street would likely be limited to a single lane to accommodate construction at the adjacent WTC PATH Terminal, National September 11th Museum, and 3 WTC. It is anticipated that access would be permitted for black cars and others with business at 4 WTC, but not for general traffic. Pedestrian access would likely be permitted only around 4 WTC at this time as the Greenwich Street sidewalks would not yet be completed.

By the end of 2014, Greenwich Street between Fulton Street and Dey Street would be open; however, the eastern-most lanes on Greenwich Street from Dey Street to Cortlandt Street would remain closed to accommodate construction activities until mid-2015. In the area of 4 WTC, Greenwich Street would be accessible by the end of 2013, as indicated above, to coincide with the building occupancy.

Unlike the No-Action condition, a new sally port would be created on Greenwich Street between Liberty Street and Thames Street in the future with the Proposed Action. The proposed security elements at this location would include: static barriers (bollards) across the sidewalk adjacent to the proposed sally port, a sally port consisting of two sets of operable barriers, lighting and signal poles, and a personnel booth on a sidewalk extension. This location would be an approximately 22-foot-wide, single-lane exit from the WTC Campus.

Since this section of Greenwich Street is currently open and in use, the installation of these security elements would require partial lane closures. To maintain an adequate travel way, construction of the proposed security elements would be conducted on the eastern and western halves of Greenwich Street in two different stages. This work would not be conducted within areas of the WTC site that are fully closed to the public, so there would be noticeable, short-term effects due to the installation of the proposed security elements. Since many of the proposed security elements would be prefabricated and the excavation required for the security elements would be shallow, it is expected that construction would not last more than six months at this location. As discussed above, construction machinery would potentially include a compressor, an excavator, a backhoe, delivery and dump trucks, an asphalt spreader, and rollers. As such, construction noise would be minimal in comparison to the on-going

WTC development. It is anticipated that this proposed secure exit would be constructed and fully operational in 2015, and the sidewalks would be completely open for pedestrians.

Liberty Street

As with the No-Action condition, the northern portion of Liberty Street between Greenwich Street and Church Street/Trinity Place would continue to be closed through the beginning of 2013, with construction fencing still located at the perimeter of the 4 WTC construction site. By the end of 2013 it is anticipated that the north side of Liberty Street on the eastern half of this block would remain occupied by construction equipment, while the western half of the block would be opened to vehicular traffic. By early 2015, this portion of Liberty Street would be fully open for vehicles and pedestrians. In the future with the Proposed Action, vehicle flow on Liberty Street within the secure zone is anticipated to be lighter than the No-Action condition. As such, emergency vehicles would be expected to travel more quickly through the secure zone as compared to No-Action conditions. For access into and out of the site, the personnel staffing the operable barriers at access and egress points to the WTC Campus would ensure that emergency vehicles could enter and exit the secure zone at any of these points without delay. Therefore, it is expected that response times for the FDNY Ten House would not decline as a result of the Proposed Action.

The section of Liberty Street between West Street/Route 9A and Greenwich Street would continue to be closed to public access through the end of 2013. Construction fencing would separate Liberty Street and the VSC from the publicly-accessible Memorial to the north. Unlike the No-Action condition, a new sally port would be created on Liberty Street to the east of West Street/Route 9A and an operable barrier would be constructed across Liberty Street just east of the VSC access in the future with the Proposed Action. It is anticipated that the proposed security elements would be installed in 2013 prior to the opening of the northern half of this section of the road to vehicular access in 2014. The proposed security elements at this location would include: static barriers (bollards) across the northern sidewalk adjacent to the proposed sally port, a sally port consisting of two sets of operable barriers, lighting and signal poles, and a personnel booth in the median, with another operable barrier located east of the VSC access. As this section of Liberty Street would still be closed to through-traffic as a result of the ongoing construction of the WTC Campus, the installation of these security elements would not directly cause any street or sidewalk closings.

The security elements proposed in the southern half of Liberty Street to the east of West Street/Route 9A would be installed in late 2014 or early 2015, prior to the opening of the street by the end of 2015. The proposed security elements at this location would include: static barriers (bollards) across the southern sidewalk adjacent to the proposed sally port, a sally port consisting of two sets of operable barriers, and lighting and signal poles, with another operable barrier located east of the VSC access across Liberty Street. It is expected that the personnel booth would be constructed when the northern section of Liberty Street opens in 2014. As this section of Liberty Street would still be closed to through-traffic as a result of the ongoing construction of the WTC Campus, the installation of these security elements would not directly cause any street or sidewalk closings.

As discussed above, construction activity would be short-term, lasting no more than two months at each location, and construction machinery would potentially include a compressor, an excavator, a backhoe, delivery and dump trucks, an asphalt spreader, and rollers. As construction of the Proposed Action only requires shallow excavations, construction noise would be minimal in comparison to the on-going WTC development.

Cedar Street

The Proposed Action would not change the anticipated No-Action construction schedule for this area. As with No-Action conditions, under With-Action conditions Cedar Street between West Street/Route 9A and Washington Street would remain closed due to the ongoing construction of the VSC until the end of 2014, when the street and southern sidewalk would be open. The northern sidewalk would be open by the end of 2015 when construction of the VSC is completed. As a result of construction activity on Trinity Place and Greenwich Street, the accessibility of Cedar Street between these thoroughfares may be interrupted for short periods of time.

West Street/Route 9A

Under the No-Action and With-Action conditions, the easternmost lanes of West Street/Route 9A between Vesey Street and Cedar Street would continue to be closed to traffic through the end of 2012 as a result of the ongoing WTC redevelopment. The section of West Street/Route 9A between Fulton Street and Vesey Street would be open by the end of 2013, and the portion of the street between Fulton Street and Liberty Street would be accessible by the end of 2014.

In the future with the Proposed Action, a new credentialing zone would be created in the median of West Street/Route 9A on the north side of Liberty Street to serve the two southbound left-turn lanes and a new credentialing zone would be created in the eastern-most lane of northbound West Street/Route 9A to accommodate northbound right-turn movements onto Liberty Street. Physical elements associated with these two credentialing zones include personnel booths on the sidewalk (one near the front of the queue at each location) and lane delineators (dura-curb, a plastic, raised separator system that provides a physical and visual barrier for motorists, or other type of lane delineator) to provide a visual indication that the credentialing lane is separate from general traffic flow. Personnel booths would be pre-fabricated and would involve little on-site assembly. The most disruptive activities associated with the construction of personnel booths would be running conduit to the booth and pouring the foundation. No long-term obstruction of traffic lanes or sidewalks would be anticipated for these activities. Additional construction activities associated with installation of the personnel booths would be limited to a very small area in the immediate vicinity of the booths. Installation of lane delineators would be short-term, lasting a day or two at each location. Installation involves bolting the lane delineator into the existing asphalt. These security elements would be installed by the end of 2015 to coincide with the opening of the VSC.

Church Street/Trinity Place

Under the No-Action condition, the two western lanes of Church Street/Trinity Place between Vesey Street and Liberty Street would continue to be closed for construction through mid-2013. It is anticipated that construction fencing in the area around 4 WTC would be removed by the end of 2013. Under the Proposed Action, the first section security elements proposed on Church Street/Trinity Place would be installed before the construction barriers for the on-going WTC development are removed to make the westernmost lane of Church Street/Trinity Place a secure lane.

North of Liberty Street in the area of 4 WTC, the security elements consist of shallow-mount static barriers that would create a median with one secure interior lane to the west of the median and three lanes of unscreened northbound traffic to the east. This work would not be conducted within areas of the WTC site that are accessible to the public, so there would not be noticeable effects due to the installation of the proposed security elements. Since the proposed security elements would be prefabricated and the excavation required for the static barriers would be shallow, it is expected that construction would not last more than three months at this location.

From the intersection of Church Street/Trinity Place and Liberty Street, south to Cedar Street, proposed security elements include the static barriers that would comprise the proposed median and the various elements that comprise the screening zone, including: static barriers (bollards) across the western sidewalk adjacent to the proposed sally port, a sally port consisting of two sets of operable barriers, lighting and signal poles, and a personnel booth on the west sidewalk at the northern end of the proposed sally port. Since this section of Church Street/Trinity Place is currently open and in use, the installation of these security elements would require partial lane closures. This work would not be conducted within areas of the WTC site that are fully closed to the public, so there would be some noticeable, short-term effects due to the installation of the proposed security elements. Since many of the proposed security elements would be prefabricated and the excavation required for the security elements would be shallow, it is expected that construction would not last more than six months at this location. It is anticipated that this proposed screening zone south of Liberty Street and the section of the proposed static barrier that would create the secure lane from Cedar Street to Cortlandt Street would be constructed and fully operational in 2013.

A credentialing zone is proposed on Trinity Place, south of Cedar Street, and would be designed around a potential building vault beneath the sidewalk. Physical elements associated with this credentialing zone include a personnel booth on the sidewalk (near the front of the queue) and lane delineators to provide a visual indication that the credentialing lane is separate from general traffic flow. As indicated above, the personnel booth would be pre-fabricated and would require little on-site assembly. The most labor-intensive activities associated with the construction of personnel booth would be running conduit and pouring the foundation for the booth. No long-term obstruction of traffic lanes or sidewalks would be anticipated for these activities. Additional construction activities associated with installation of the personnel booth would be limited to a very small area in the immediate vicinity of the booths. Installation of lane delineators would be short-term, lasting a day or two at each location. Installation involves bolting the lane delineator into the existing asphalt. These security elements would be installed along Trinity Place by the end of 2013.

Construction activities north of Cortlandt Street related to the WTC redevelopment would continue to occupy the western-most lanes of Church Street through 2014, with the segment between Cortlandt Street and Dey Street anticipated to last until 2019. It is anticipated that construction of the static barrier in Church Street would continue from Dey Street to the exit sally port north of Vesey Street by the end of 2015 in conjunction with the WTC schedule. (Construction of 2 WTC is anticipated to be staged from the west of the site, allowing Church Street to reopen in this area by 2015.) The static barrier would be installed before the existing construction barriers for the on-going WTC development are removed from the western lane of Church Street. As such, this work would not be conducted within areas of the WTC site that would be accessible to the public, so there would not be noticeable effects due to the installation of the proposed security elements. Since the proposed security elements would be prefabricated and the excavation required for the static barrier would be shallow, it is expected that construction would not last more than approximately three months for installation of the static barrier between Dey Street and Vesey Street.

North of Vesey Street, an exit sally port would be constructed to provide an exit from the secure zone. The proposed security elements at this location would include: a static barrier (likely to be bollards) across the west sidewalk adjacent to the proposed sally port, a sally port consisting of two sets of operable barriers, lighting and signal poles, and a personnel booth on a sidewalk extension. This location would be a single-lane exit from the WTC Campus. Since this section of Church Street is currently open to vehicular traffic, the installation of these security elements would require partial lane closures. This work would not be conducted within areas of the WTC site that are fully closed to the public, so there would be some noticeable, short-term effects due to the installation of the proposed security elements. Since many of the proposed security elements would be prefabricated and the excavation required for the security elements would be shallow, it is expected that construction would

not last more than six months at this location. It is anticipated that this proposed exit sally port would be constructed and fully operational in 2015.

As Church Street from Dey Street to Cortlandt Street would be used for staging associated with the construction of 3 WTC through 2019, the static barrier could not be installed in this area until 2019. As described above, the static barrier would be installed before the existing construction barriers are removed from the western lane of Church Street. As such, this work would not be conducted within areas of the WTC site that would be accessible to the public, so there would not be noticeable effects due to the installation of the proposed security elements. Since the proposed security elements would be prefabricated and the excavation required for the static barrier would be shallow, it is expected that construction would not last more than three months for installation of the static barrier between Dey Street and Vesey Street.

The construction of the Trinity Place/Church Street median would not have any impact on the on-going redevelopment of the WTC Campus, including 3 WTC, 4 WTC, and the WTC PATH Hub. The western sidewalk along Church Street between Liberty Street and Vesey Street would remain closed as a result of the on-going WTC development in conjunction with the implementation of the Proposed Action. Therefore, current pedestrian movements would not be changed during construction in this area. In the blocks north of Vesey Street and south of Liberty Street, construction of the Proposed Action would result in short-term, partial sidewalk closures, temporarily changing pedestrian flows. Additionally, as discussed in Chapter 4, "Community Facilities," FDNY Ten House access into and out of the site would not be impeded as personnel staffing the operable barriers at access and egress points to the WTC Campus would ensure that emergency vehicles could enter and exit the secure zone at any of these points without delay. Therefore, it is expected that response times for the Ten House would not decline as a result of the Proposed Action.

Preliminary Assessment

Transportation

As discussed in the 2012 *CEQR Technical Manual*, an assessment of transportation for construction activities is likely warranted if the project's construction activities:

1. Would be located in a Central Business District (CBD) or along an arterial or major thoroughfare;
2. Would require closing, narrowing, or otherwise impeding moving lanes, roadways, key pedestrian facilities (for example, sidewalks, crosswalks, corners, or corner reservoirs), parking lanes and/or parking spaces in on-site or nearby parking lots and garages, bicycle routes and facilities, bus lanes or routes, or access points to transit in an area with high pedestrian activity or near sensitive land uses such as a school, hospital, or park; and,
3. Would involve construction on multiple development sites in the same geographic area, such that there is the potential for several construction timelines to overlap, and last for more than two years overall.

The Proposed Action is located in the Lower Manhattan CBD and some of the proposed security elements would be installed along West Street/Route 9A and Church Street/Trinity Place. Additionally, construction would occur adjacent to two high schools on Trinity Place and the National September 11th Memorial. However, as indicated above, construction of the security elements on Vesey Street, Fulton Street, Liberty Street, and within Church Street from Liberty Street to Vesey Street would occur in conjunction with the ongoing development of the WTC Campus (including the street and sidewalk reconstruction). For example, construction activity adjacent to the National September 11th Memorial is expected to occur in conjunction with the reconstruction of the Liberty

Street and Fulton Street roadway and sidewalks, before these areas are publicly accessible. Construction activity in the area of the high schools would consist of one personnel booth and installation of lane delineators within the roadway. Both of these activities would result in short-term disruption to adjacent uses. All other locations would require short-term closures of some travel lanes and sidewalks, or temporary relocation of bus stops, as described above.

No traffic rerouting would be required during construction of the Proposed Action as vehicle access would be maintained. Similar to existing conditions with two functional lanes on Church Street, construction activities would require continued lane closures for construction of the proposed median. Therefore, the existing congestion related to ongoing construction activities would remain in place to accommodate construction of the proposed Church Street median. Pedestrian access to the National September 11th Memorial and Museum, which is currently limited due to the WTC redevelopment construction activities, would not be hindered by the construction of the Proposed Action, and pedestrian access to the two high schools would not be impeded.

Air Quality

According to the 2012 *CEQR Technical Manual*, an assessment of air quality for construction activities is likely not warranted if the project's construction activities:

1. Are considered short-term;
2. Are not located near sensitive receptors;
3. Do not involve construction of multiple buildings where there is a potential for on-site receptors on buildings to be completed before the final build-out; and,
4. The pieces of diesel equipment that would operate in a single location at peak construction are limited in number.

If a project meets one or more of the criteria listed above, or one of the above criteria is unknown at the time of review, a preliminary air quality or noise assessment is not automatically required. Instead, various factors should be considered, such as the types of construction equipment (gas, diesel, electric), the nature and extent of any commitment to use Best Available Technology (BAT) for construction equipment, the physical relationship of the Project Site to nearby sensitive receptors, the type of construction activity, and the duration of any heavy construction activity.

The Proposed Action primarily involves installation of personnel booths, various security elements, and reconstruction of roadways and sidewalks in the areas that are disturbed as a result of the construction activities. Construction of the proposed Campus Security Plan would not result in a significant number of construction vehicles at each installation location. Since installation of the proposed security elements related to the credentialing and screening zones would only require shallow excavations, the presence of heavy construction activities would be short-term (a maximum of six months is anticipated for each entry and exit location, with construction advancing to coincide with the WTC construction). While construction of the Proposed Action would occur adjacent to sensitive receptors, its implementation within the WTC site would occur in conjunction with the ongoing redevelopment of the WTC Campus and would therefore not result in any additional negative impacts to these sensitive receptors. As indicated above, the construction activity adjacent to the National September 11th Memorial is expected to occur in conjunction with the reconstruction of the Liberty Street and Fulton Street roadway and sidewalks, before these areas are publicly accessible. Construction activity in the area of the public high schools on Trinity Place would consist of the installation of one personnel booth and installation of lane delineators within the roadway. Both of these activities would result in very little disruption to adjacent uses. As there would not be a

substantial increase in construction equipment required or deliveries to the site, an assessment of air quality for construction activities is not warranted for the Proposed Action.

As described above, the existing EPCs for the site, including use of BAT, would likely be implemented to help ensure that the Proposed Action would not result in significant adverse construction impacts related to air quality.

Noise

According to the 2012 *CEQR Technical Manual*, an assessment of noise for construction activities is likely not warranted if the project's construction activities:

1. Are considered short-term;
2. Are not located near sensitive receptors;
3. Do not involve construction of multiple buildings where there is a potential for on-site receptors on buildings to be completed before the final build-out; and,
4. The pieces of diesel equipment that would operate in a single location at peak construction are limited in number.

If a project meets one or more of the criteria listed above, or one of the above criteria is unknown at the time of review, a preliminary air quality or noise assessment is not automatically required. Instead, various factors should be considered, such as the types of construction equipment (gas, diesel, electric), the nature and extent of any commitment to use BAT for construction equipment, the physical relationship of the Project Site to nearby sensitive receptors, the type of construction activity, and the duration of any heavy construction activity.

The Proposed Action primarily involves installation of personnel booths, various security elements, and reconstruction of roadways and sidewalks in the areas that are disturbed as a result of the construction activities. Construction of the proposed Campus Security Plan would not result in a significant number of construction vehicles at each installation location. Since installation of the proposed security elements related to the credentialing and screening zones would only require shallow excavations, heavy construction activities would be short-term (a maximum of six months is anticipated for each entry and exit location, with construction advancing to coincide with the WTC construction). While construction of the Proposed Action would occur adjacent to sensitive receptors, its implementation would occur in conjunction with the ongoing redevelopment of the WTC Campus and would therefore not result in any additional negative impacts to these sensitive receptors. As indicated above, the construction activity adjacent to the National September 11th Memorial is expected to occur in conjunction with the reconstruction of the Liberty Street and Fulton Street roadway and sidewalks, before these areas are publicly accessible. Construction activity in the area of the public high schools on Trinity Place would consist of one personnel booth and installation of lane delineators within the roadway. Both of these activities would result in very little disruption to adjacent uses. As such, an assessment of noise for construction activities is not warranted for the Proposed Action.

As described above, it is anticipated that the existing EPCs for the site, including use of BAT, would be implemented to help ensure that the Proposed Action would not result in significant adverse construction impacts related to noise.

Historic and Cultural Resources

According to the guidelines in the 2012 *CEQR Technical Manual*, construction impacts may occur on historic and cultural resources if in-ground disturbances or vibrations associated with project construction could undermine the foundation or structural integrity of nearby resources. As discussed in Chapter 5, "Cultural Resources," construction of the Proposed Action would only result in shallow excavation (two to four feet below grade) and would therefore not affect the foundations or structural integrity of any nearby historic or cultural resources within a 400-foot radius. As such, the Proposed Action is not expected to result in any significant adverse impacts to historic or cultural resources during construction, and a detailed analysis is not warranted.

The New York City Building Code provides some measures of protection for all properties against accidental damage from adjacent construction by requiring that all buildings, lots, and service facilities adjacent to foundation and earthwork areas be protected and supported. Additional protective measures apply to LPC-designated Landmarks and State/National Register-listed (S/NR) historic buildings located within 90 linear feet of a proposed construction site. For these structures, the DOB's TPPN #10/88 applies. TPPN #10/88 supplements the standard building protections afforded by the Building Code by requiring, among other things, a monitoring program to reduce the likelihood of construction damage to adjacent LPC-designated or S/NR-listed resources (within 90 feet) and to detect at an early stage the beginnings of damage so that construction procedures can be changed.

Adjacent historic resources, as defined in the procedure notice, only include designated New York City Landmarks (NYCLs), properties within NYCL historic districts, and listed S/NR properties that are within 90 feet of a lot under development or alteration. They do not include S/NR-eligible, NYCL-eligible, potential, or unidentified architectural resources. Construction period impacts on any designated historic resources would be minimized, and the historic structures would be protected, by ensuring construction resulting from the Proposed Action adheres to all applicable construction guidelines and follows the requirements laid out in TPPN #10/88.

As discussed in Chapter 5, "Cultural Resources," in order to avoid potential adverse physical effects on surrounding architectural resources, a Construction Protection Plan (CPP) would be developed and implemented prior to the commencement of any construction-related activities in the Project Site. The CPP would follow DOB's TPPN #10/88.

Hazardous Materials

According to the guidelines in the 2012 *CEQR Technical Manual*, a construction assessment is not needed for hazardous materials unless the construction activities would disturb a site, or be located adjacent to a site containing hazardous materials. As discussed in Chapter 7, "Hazardous Materials," the Proposed Action would not result in any significant adverse impacts related to hazardous materials.

To reduce the potential for human or environmental exposure to contamination during and following construction of the Proposed Action, a RAP and associated CHASP would be prepared and submitted to the DEP for review and approval before construction activities begin. The RAP and CHASP would be implemented during project construction. The RAP would address requirements for items such as soil stockpiling, soil disposal and transportation; dust control; quality assurance; and contingency measures, should petroleum storage tanks or contamination be unexpectedly encountered. The CHASP would identify potential hazards that may be encountered during construction and specify appropriate health and safety measures to be undertaken to ensure that subsurface disturbance is performed in a manner protective of workers, the community, and the environment (such as personal protective equipment, air monitoring, and emergency response procedures).

Soil and groundwater beneath the Project Site may have been affected by past and present, on- and off-site uses. However, significant remediation has occurred as part of WTC Campus redevelopment. Construction of the Proposed Action is anticipated to result in shallow soil disturbance well above the water table (two to four feet below grade) which would not be at high risk for being contaminated. Lead-based paint, ACM and PCB-containing electrical equipment may be present on the Project Site. During and following construction for the Proposed Action, regulatory requirements pertaining to ACM, lead-based paint and PCBs and chemical use and storage would be followed.

Other Technical Areas

Land Use, Zoning, and Public Policy
According to the 2012 *CEQR Technical Manual*, a construction impact analysis of land use, zoning, and public policy is typically needed if construction would require continuous use of property for an extended duration, thereby having the potential to affect the nature of the land use of the neighborhood. A land use, zoning, and public policy assessment for construction impacts looks at the construction activities that would occur on the site (or portions of the site) and their duration. The analysis determines whether the type and duration of the activities would affect neighborhood land use patterns.

Construction of the Proposed Action would occur in conjunction with the WTC construction over a period of six years, with construction of each proposed security zone at an entry or exit to the site anticipated to last a maximum of six months. Construction of each location would be planned in conjunction with the redevelopment of the WTC Campus. Because none of the construction activities associated with the Proposed Action would be continuous over an extended period of time or permanent, they would not create significant impacts on land use patterns, generate land uses that would be incompatible with underlying zoning, or result in land uses that conflict with public policies applicable in the Study Area. Therefore a further preliminary assessment is not needed for the disclosure of potential impacts to land use, zoning, and public policy.

Socioeconomic Conditions
According to the 2012 *CEQR Technical Manual*, construction impacts to socioeconomic conditions are possible if the project would entail construction of a long duration that could affect the access to and therefore viability of a number of businesses, and if the failure of those businesses has the potential to affect neighborhood character.

Construction of the Proposed Action would occur in conjunction with the WTC construction over a period of six years, with construction of each proposed security zone at an entry or exit to the site anticipated to last a maximum of six months. Construction of each location would be planned in conjunction with the redevelopment of the WTC Campus. Because none of the construction activities associated with the Proposed Action would be long-term, continuous or permanent, they would not result in significant changes in accessibility for adjacent businesses as compared to existing conditions. Therefore a further preliminary assessment is not needed for the disclosure of potential impacts to socioeconomic conditions.

Community Facilities
According to the 2012 *CEQR Technical Manual*, construction impacts to community facilities are possible if a community facility would be directly affected by construction. The FDNY Ten House is located within the boundaries of the Campus Security Plan; however, it would neither be directly displaced nor would its services be disrupted by construction of the Proposed Action. Travel lanes would be maintained on Liberty Street, Greenwich Street, and Trinity Place/Church Street to ensure unimpeded access to and from the Ten House during construction of the proposed security elements. It

would not be necessary to alter the entrance to the firehouse, nor would it be necessary to close the facility at any time during the construction period.

As described above, construction of the Proposed Action would be incorporated into the WTC construction where possible to reduce the potential for additional construction-related impacts. Planned WTC construction would continue to limit vehicular and pedestrian accessibility in some areas adjacent to the WTC Campus. Therefore, users of local community facilities would continue to use alternate routes around the project site while construction continues. However, as indicated above, some streets and sidewalks would be opened prior to 2019 as construction is completed. The incremental construction impacts due to the Proposed Action would be minor as construction activities would either be wholly confined to the WTC site where public access would not be permitted, or would be scheduled to only take place on one half of the street at a time to maintain pedestrian and vehicular access on one half of the street at all times. As construction activities related to the Proposed Action would overlap with the WTC Campus construction and would be staged and scheduled to maintain pedestrian and vehicular access, a further preliminary assessment is not needed for the disclosure of potential impacts to community facilities.

Neighborhood Character

According to the 2012 *CEQR Technical Manual*, a construction impact analysis of neighborhood character is typically needed if construction would require continuous use of property for an extended duration, thereby having the potential to affect the character of the neighborhood. A neighborhood character assessment for construction impacts looks at the construction activities that would occur on the site (or portions of the site) and their duration. The analysis determines whether the type and duration of the activities would affect neighborhood character.

Construction of the Proposed Action would occur in conjunction with the WTC construction over a period of six years, with construction of each proposed security zone at an entry or exit to the site anticipated to last a maximum of six months. Construction of each location would be planned in conjunction with the redevelopment of the WTC Campus. Because none of the construction activities associated with the Proposed Action would be continuous over an extended period of time or permanent, they would not create significant impacts on neighborhood character as construction associated with the WTC Campus development would be ongoing on the WTC site through 2019 regardless of the Proposed Action. Therefore, while construction of the Proposed Action may cause temporary impacts, it is expected that such impacts would be relatively short-term, and therefore not create a neighborhood character impact.

Natural Resources

According to the 2012 *CEQR Technical Manual*, natural resources may be affected during construction, particularly during such activities as excavation; grading; site clearance or other vegetation removal; cutting; filling; installation of piles, bulkheads or other waterfront structures; dredging; dewatering; or soil compaction from construction vehicles and equipment. A preliminary construction assessment is not required for natural resources unless the construction activities would disturb a site or be located adjacent to a site containing natural resources.

Since the Project Site is located within a heavily developed urban area and would be constructed on existing (or planned) streets and sidewalks, there are no natural resources in the areas that would be directly affected or in the immediate vicinity of the anticipated areas of disturbance. The Hudson River is a natural resource located to the west of the WTC site; however, the limited scope of the construction work involved with the proposed WTC Campus Security Plan would not result in any impacts on the Hudson River. Therefore, no natural resources would be directly impacted by construction on the Project Site, and a further preliminary assessment is not needed for the disclosure of potential impacts to natural resources.

Conclusion

As described in detail above, construction of the Campus Security Plan would result in some minor short-term disruptions to vehicular and pedestrian traffic. In many locations, construction of the proposed security elements would be incorporated into the construction of WTC construction of streets and sidewalks in areas that would be within the WTC construction site and not publicly accessible. In areas located outside of the WTC construction fencing, construction would be scheduled to avoid the full closure of any street (e.g. Greenwich Street south of Liberty Street, Washington Street between Vesey Street and Barclay Street, and West Broadway between Vesey Street and Barclay Street) by completing construction activities in one half of the street before moving ahead with construction of the second half of the street, thereby maintaining a travelway and/or access to loading and receiving areas.

The scope of the construction work would be limited. The manpower, construction-related vehicle trips, and equipment associated with the construction of the WTC Campus Security Plan would be well below the CEQR thresholds that would require a detailed analysis, as indicated above. Finally, none of the technical areas assessed above in the preliminary assessment would warrant further study as no impacts are anticipated due to the anticipated construction activities.

A. INTRODUCTION AND BACKGROUND

As federal funding may be used to finance a portion of the Proposed Action, an environmental justice assessment is warranted. To satisfy Executive Order 12898 (EO 12898), *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* (February 11, 1994), this environmental justice analysis has been prepared to identify and address any disproportionate and adverse impacts on minority or low-income populations that could result from the Proposed Action.

EO 12898 also requires federal agencies to work to ensure greater public participation in the decision-making process. For the Proposed Action, this requirement has been satisfied by the review process for this Environmental Impact Statement (EIS) under the New York City Environmental Quality Review (CEQR) process, which satisfies both the New York State Environmental Quality Review Act (SEQRA) and National Environmental Policy Act (NEPA).

This chapter analyzes the Proposed Action's potential effects on minority and low-income populations, to determine if disproportionately high and adverse impacts on those populations would result. This environmental justice analysis assesses the potential effects of the Proposed Action over the full range of environmental and health effects on minority and low-income populations.

In summary, the principal conclusion of the following assessment is that the proposed Campus Security Plan is not expected to result in any disproportionately high and adverse effects on minority and low-income populations and no environmental justice concerns are expected with the Proposed Action.

B. PRINCIPAL CONCLUSIONS

As discussed throughout the DEIS, the Proposed Action would implement a variety of security measures at the perimeter of the WTC Campus to enhance safety for tenants and visitors to the Site. At the same time, however, the Proposed Action could result in some localized significant adverse impacts, as detailed above and in Chapter 8, "Transportation." Mitigation strategies for these potential significant adverse impacts are discussed in Chapter 15, "Mitigation."

As there are no large, concentrated minority or low-income communities located within the Study Area, the Proposed Action is not expected to result in any disproportionately high or adverse effects on minority and low-income populations. As described below, there is a sizeable Asian community in the Study Area; however, the size of the population does not exceed the CEQR threshold of 50 percent. In addition, the Proposed Action would be in compliance with all applicable NEPA regulations related to environmental justice protections, including public outreach and participation for the communities within the potentially affected area, as detailed in **Table 14-3**. Therefore, there are no environmental justice concerns expected with the Proposed Action.

C. METHODOLOGY

The environmental justice analysis for the Proposed Action follows the guidance and methodologies recommended in the federal Council on Environmental Quality (CEQ)'s *Environmental Justice Guidance under the National Environmental Policy Act* (December 1997), as summarized below.

CEQ Guidance

The CEQ, which has oversight of the federal government's compliance with EO 12898 and NEPA, developed its guidance to assist federal agencies with their NEPA procedures so that environmental justice concerns are effectively identified and addressed.

The CEQ methodology involves collecting demographic information on the area where the project may cause significant adverse effects; identifying low-income and minority populations in that area using census data; and identifying whether the project's adverse effects are disproportionately high on the low-income and minority populations in comparison with those on other populations. Mitigation measures should be developed and implemented for any disproportionately high and adverse effects. Under NEPA, the potential for disproportionately high and adverse effects on minority and/or low-income populations should then be one of the factors the federal agency considers in making its finding on a project and issuing a Finding of No Significant Impact or a Record of Decision.

Methodology Used For This Assessment

The assessment of environmental justice for the Proposed Action was based on CEQ guidance, as described above. It involved four basic steps:

1. Identify the area where the project may cause significant and adverse effects (i.e., the study area);

2. Compile population and economic characteristics for the study area and identify potential environmental justice areas (i.e., minority or low-income communities);

3. Identify the Proposed Action's potential adverse effects on minority and low-income communities; and,

4. Evaluate the Proposed Action's potential adverse effects on minority and low-income communities relative to its overall effects to determine whether any potential adverse impacts on those communities would be disproportionate.

Delineation of Study Area

The study area for environmental justice encompasses the area most likely to be affected by the proposed Campus Security Plan and considers the area where potential impacts resulting from construction and operation of the Proposed Action could occur. The study area for environmental justice includes the census block groups that are at least 50 percent within the area of potential effect, which is generally the area within a quarter-mile of the project site, based on the other impact analyses included in this EIS. As shown in **Figures 14-1** and **14-2**, the Study Area includes 13 census block groups and eleven census tracts.

Identification of Potential Environmental Justice Areas

Data on race, ethnicity, and poverty status were gathered from the U.S. Census Bureau for the block groups and tracts located within the Study Area, and then aggregated for the Study Area as a whole. Data on race and ethnicity were found in the "Race" and "Hispanic or Latino Origin" files from the 2010 Census Summary File 1, Total Population, while data on poverty was found in "Poverty Status in the Past 12 Months" from the 2006-2010 American Community Survey, Five Year Estimates. For comparison purposes, data for Manhattan and New York City were also compiled for each subject. Based on census data and CEQ guidance described above, potential environmental justice areas were identified as follows:

• ***Minority communities:*** The percent of minorities living in each census block group, available in the 2010 Census, was used to identify minority populations. CEQ guidance defines minorities to include

Figure 14-1
Population Characteristics Study Area

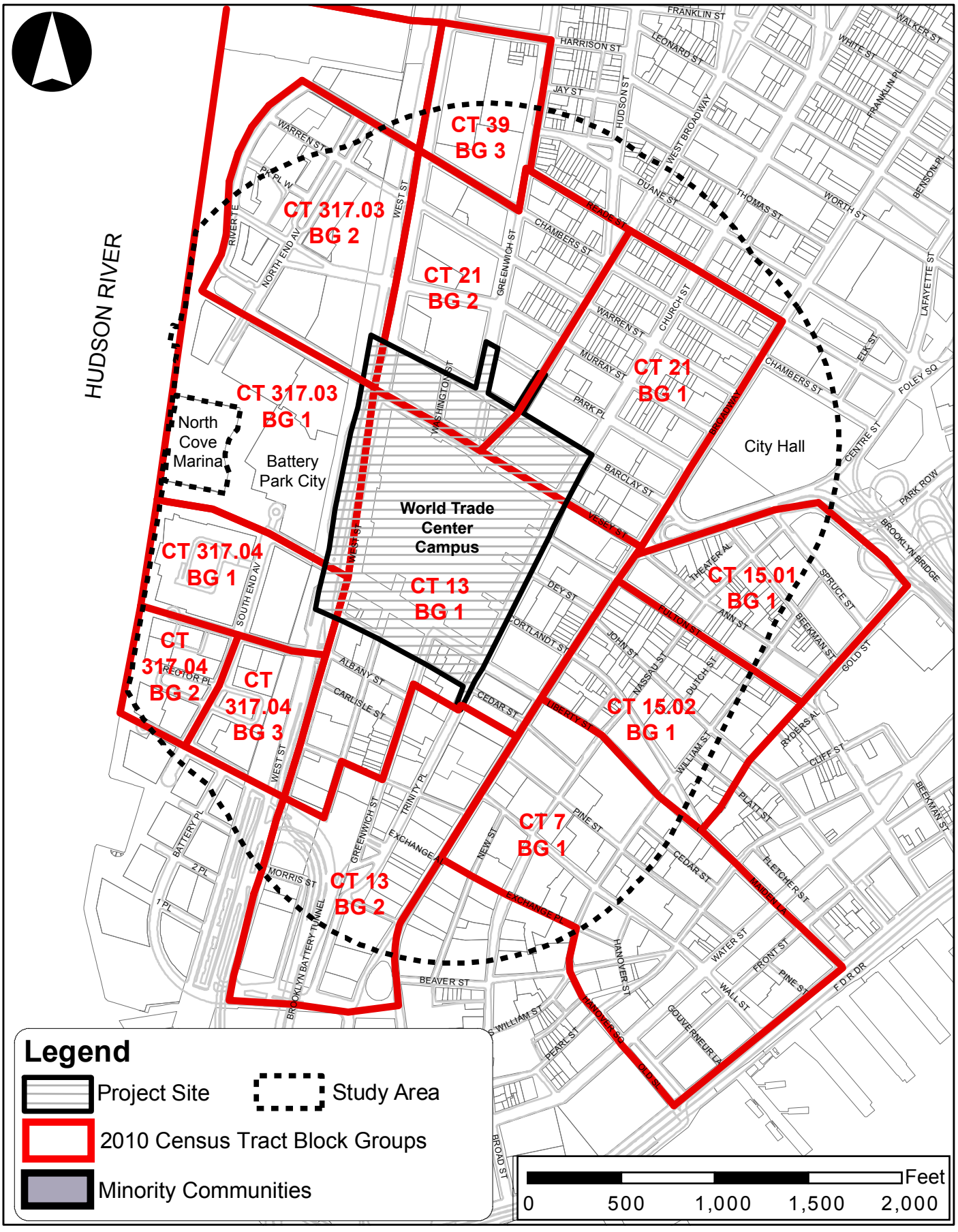
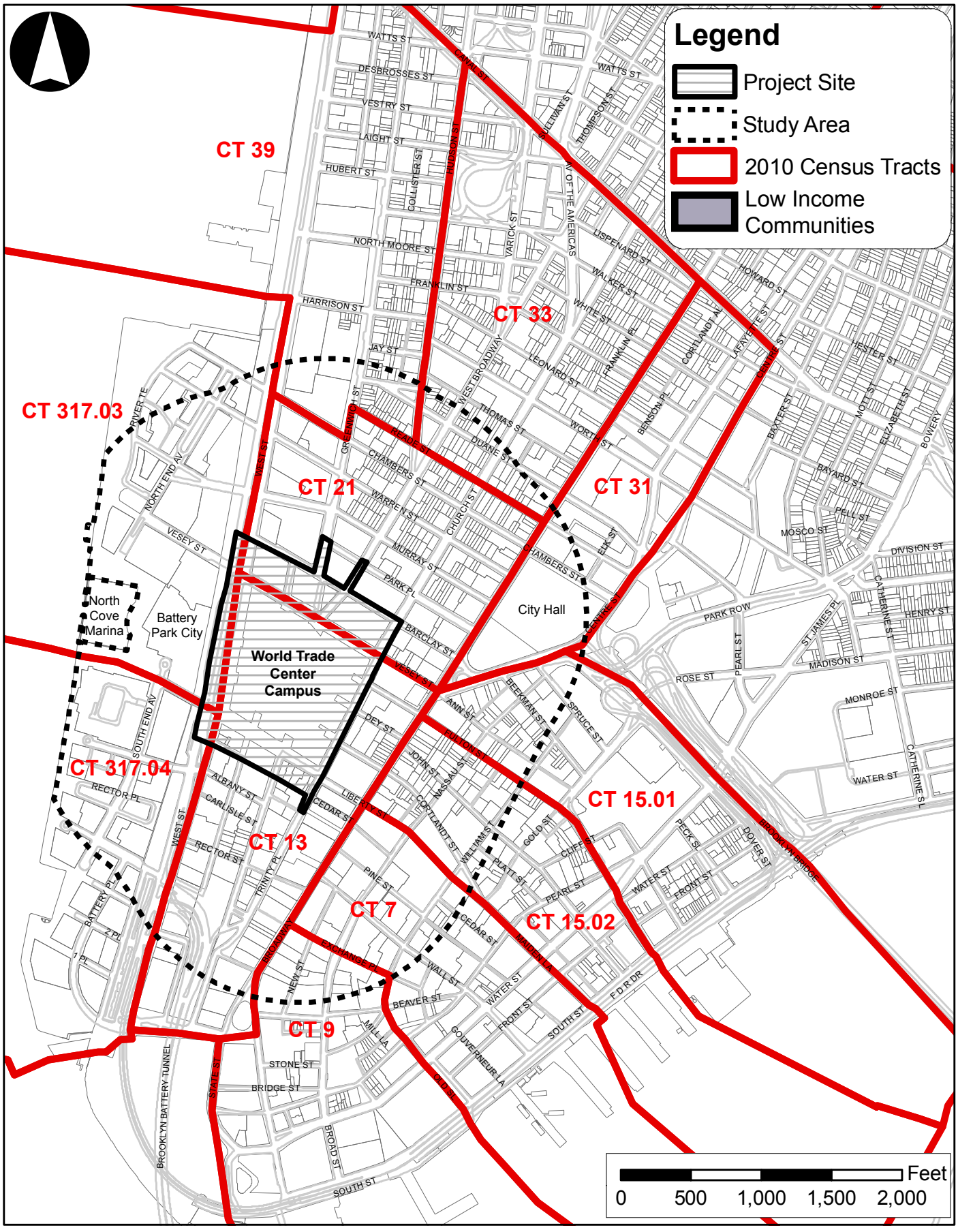


Figure 14-2
Economic Characteristics Study Area



African Americans or Black persons, Asians, American Indians or Alaskan Natives, Native Hawaiians or Other Pacific Islanders, and Hispanic or Latino persons. This environmental justice analysis also considers minority populations to include persons who identified themselves as being either "some other race" or "two or more races" in the 2010 Census. Following CEQ guidance, minority communities were identified where the minority population of the affected area exceeds 50 percent.

• ***Low-income communities:*** The percent of individuals living below the poverty level in each census tract, available in the 2006-2010 American Community Survey, was used to identify low-income populations. Because CEQ guidance does not specify a threshold for identifying low-income communities, all census tracts with a low-income population percentage meaningfully greater than Manhattan—the Proposed Action's primary statistical reference area—were considered low-income communities. In Manhattan, approximately 19 percent of the total population is living below the federal poverty threshold, so any census tract with a low-income population equal to or greater than 25 percent was considered a low-income community.

D. ENVIRONMENTAL JUSTICE POPULATIONS IN THE STUDY AREA

The environmental justice Study Area includes 13 census block groups, as shown in **Figure 14-1**, and 11 census tracts, as shown in **Figure 14-2**. **Table 14-1** details the Study Area's population characteristics in terms of race and ethnicity while **Table 14-2** details the Study Area's economic characteristics in terms of poverty status. The Study Area had a total population of 45,933 in 2010, or approximately three percent of the total population of Manhattan. Approximately 17 percent of the Study Area's population identified themselves as Asian, making up the largest racial or ethnic group in the area. The largest percentage of Asian residents (31.5 percent) lived in the block group bounded by Liberty Street to the north, West Street/Route 9A to the east, Albany Street to the south, and the Hudson River to the west. The highest percentages of black (8.5 percent) and Hispanic or Latino residents (13.5 percent) lived in the block group bounded by Harrison Street to the north, Greenwich Street to the east, Chamber Street to the south, and West Street/Route 9A to the west. The largest percentage of other races (6.8 percent) lived in the block group bounded by Fulton Street to the north, Gold Street to the east, Liberty Street to the south, and Broadway to the west.

Approximately 26 percent of the residents of the Study Area are minority—a substantially smaller proportion than in Manhattan (with approximately 43 percent) and New York City as a whole (with 56 percent). The largest percentage of minority residents (40.7 percent) lived in the block group bounded by Liberty Street to the north, West Street/Route 9A to the east, Albany Street to the south, and the Hudson River to the west, while the smallest percentage of minority residents (19.2) lived in the block group bounded by Reade Street to the north, Broadway to the east, Vesey Street to the south, and West Broadway to the west. Because the Study Area's total minority percentage does not exceed CEQ's 50 percent threshold, and none of the individual block groups in the Study Area have minority populations that exceed the 50 percent threshold, the Study Area as a whole is not considered a minority community.

In addition, none of the census tracts in the Study Area have low-income population percentages that are greater than in Manhattan or New York City. Overall, the Study Area has a low income population of approximately eight percent, compared to approximately 18 percent in Manhattan and approximately 19 percent in New York City. Thus, the Study Area is not considered a low-income community.

In summary, minority representation in the Lower Manhattan Study Area is low and does not exceed the 50 percent minority threshold and the Study Area's low-income population does not exceed 25 percent. Therefore, the Study Area is not considered a potential environmental justice area and no

Table 14-1
Study Area Population Characteristics

	2010 Total	Race and Ethnicity								Total % Minority	Total % Hispanic or Latino
		White	%	Black	%	Asian	%	Other	%		
CT 7, BG 1	8,109	5,696	70.2%	273	3.4%	1,680	20.7%	460	5.7%	32.1%	7.2%
CT 13, BG 1	2,067	1,457	70.5%	103	5.0%	374	18.1%	133	6.4%	32.9%	7.9%
CT 13, BG 2	2,412	1,627	67.5%	85	3.5%	574	23.8%	126	5.2%	34.6%	7.3%
CT 15.01, BG 1	2,202	1,496	67.9%	134	6.1%	425	19.3%	147	6.7%	34.6%	9.5%
CT 15.02, BG 1	3,699	2,638	71.3%	159	4.3%	651	17.6%	251	6.8%	31.2%	9.0%
CT 21, BG 1	3,173	2,608	82.2%	50	1.6%	352	11.1%	163	5.1%	19.2%	5.9%
CT 21, BG 2	2,867	2,111	73.6%	109	3.8%	480	16.7%	167	5.8%	27.7%	5.3%
CT 39, BG 3	851	651	76.5%	72	8.5%	73	8.6%	55	6.5%	27.5%	13.5%
CT 317.03, BG 1	3,570	2,695	75.5%	105	2.9%	583	16.3%	187	5.2%	26.6%	7.1%
CT 317.03, BG 2	4,139	3,284	79.3%	82	2.0%	556	13.4%	206	5.0%	21.6%	7.5%
CT 317.04, BG 1	1,100	664	60.4%	41	3.7%	346	31.5%	49	4.5%	40.7%	6.6%
CT 317.04, BG 2	1,284	891	69.4%	27	2.1%	317	24.7%	49	3.8%	31.4%	6.9%
CT 317.04, BG 3	431	291	67.5%	24	5.6%	105	24.4%	11	2.6%	33.6%	10.7%
Study Area	45,933	34,026	74.1%	1,526	3.3%	7,872	17.1%	2,489	5.4%	25.9%	5.9%
Manhattan	1,585,873	911,073	57.4%	246,687	15.6%	179,552	11.3%	248,561	15.7%	42.6%	25.4%
New York City	8,175,133	3,597,341	44.0%	2,088,510	25.5%	1,038,388	12.7%	1,450,894	17.7%	56.0%	28.6%

Notes: From the 2010 Census Summary File 1, Total Population: "Race" and "Hispanic or Latino Origin"
- The racial and ethnic categories provided are further defined as: White; African American or Black; Asian; Other (American Indian or Alaskan Native; Native Hawaiian or Other Pacific Islander; Other Race; Two or More Races)
- Persons of Hispanic Latino origin may be of any race

Table 14-2
Study Area Economic Characteristics

Census Tract	% of Individuals with Incomes Below Poverty Level
7	10.6%
9	2.3%
13	10.9%
15.01	10.7%
15.02	9.4%
21	0.8%
31	12.4%
33	7.5%
39	5.5%
317.03	7.9%
317.04	4.0%
Study Area	7.6%
Manhattan	17.8%
NYC	19.1%

Notes: From the 2006-2010 American Community Survey 5-Year Estimates: "Poverty Status in the Past 12 Months"

impacts on minority or low-income populations are expected as a result of the Proposed Campus Security Plan.

E. PUBLIC PARTICIPATION

EO 12898 requires federal agencies to work to ensure greater public participation in the decision-making process. In addition, CEQ guidance suggests that federal agencies should acknowledge and seek to overcome linguistic, cultural, institutional, geographic, and other barriers to meaningful participation.

The Proposed Action's public outreach and participation component required by EO 12898 has been satisfied by the review process for this EIS under guidelines established in the *CEQR Technical Manual*. The public outreach and public participation also satisfies NEPA requirements. Under NEPA, federal agencies are required to encourage early and meaningful public participation in the decision-making process.

To this end, the New York City Police Department (NYPD) has conducted extensive public outreach for the project to communities within the potentially affected area, including those communities with minority and low-income populations. To seek public involvement in the decision-making process, the Proposed Action's public outreach and participation program began with a series of five stakeholder meetings with local elected officials, community boards, civic organizations, and public agencies in the potentially affected communities, as shown in **Table 14-3**.

Then, a public scoping meeting for the EIS was held on March 14, 2012, from 4:00 PM until 8:00 PM at the New York City Department of City Planning at 22 Reade Street in Lower Manhattan. The public scoping meeting was held in close proximity to the Project Site for four hours, providing all affected parties with ample opportunity to discuss the studies to be included and the critical issues to be addressed in the DEIS. Community members and civic organization representatives came out to the scoping meeting to speak on the project, including members of Community Board 1, Downtown Alliance, the New York City Taxi Alliance, and City Council representatives. Relevant scoping comments were considered and incorporated into the DEIS.

Table 14-3
Stakeholder Meetings

Date	Meeting/Group
12/20/2011	DHS/FEMA
12/21/2011	NYCDOT
3/6/2012	Downtown Alliance
3/12/2012	Senator Squadron
3/12/2012	Manhattan Community Board 1
3/14/2012	Public Hearing on Draft Scoping Document
3/23/2012	PANYNJ
3/29/2012	Silverstein Properties
4/3/2012	PANYNJ
4/30/2012	NYCDOT
5/24/2012	PANYNJ
6/15/2012	PANYNJ
6/20/2012	NYSDOT
6/27/2012	NYSDOT

Public meetings with stakeholder groups in the potentially affected communities have continued through completion of this DEIS.

F. SUMMARY OF ADVERSE IMPACTS IDENTIFIED IN THE EIS

As discussed throughout this DEIS, the Proposed Action would implement a variety of security measures at the perimeter of the WTC Campus to enhance safety for tenants and visitors to the Site. At the same time, however, the Proposed Action could result in some localized significant adverse impacts described throughout this DEIS. The potential adverse impacts of the Proposed Action are summarized below.

Transportation

Based on the traffic analysis included in Chapter 8, "Transportation," the Proposed Action would result in significant adverse impacts on traffic operations, which requires an examination of mitigation measures. With respect to the Proposed Action, there is potential for adverse traffic impacts from diverted trips and subsequent travel delays associated with the proposed security measures when compared to the No-Action condition. The traffic impact analysis in Chapter 8, "Transportation," indicates that there would be the potential for one or more significant adverse impacts at 17 intersections in the weekday AM peak hour, 10 in the midday, 13 in the PM and three in the Saturday midday peak hour. All but seven of these significant impacts in the AM peak hour, four in the midday, two in the PM and one in the Saturday midday could be fully mitigated through a combination of traffic signal timing/phasing modifications, lane restriping, and changes to curbside parking regulations without any additional significant impacts to pedestrian or parking conditions.

The pedestrian impact analysis in Chapter 8, "Transportation," indicates that installation of security infrastructure associated with the Proposed Action would result in significant adverse impacts due to reductions in pedestrian space in the weekday AM, midday and/or PM peak hours at a total of two sidewalks and three crosswalks. Recommended mitigation measures, which are subject to review and approval by NYCDOT, generally consist of sidewalk and crosswalk widening and minor signal timing changes. All of the significant adverse sidewalk and crosswalk impacts would be fully mitigated with the recommended pedestrian mitigation measures

The Proposed Action would not result in the development of new land uses that would generate additional parking demand, nor would it displace any existing or future off-street public parking capacity. While the Proposed Action would decrease the supply of public on-street parking in the study area, any resultant shortfalls are not considered a significant adverse impact based on *CEQR Technical Manual* criteria.

Noise

As described in Chapter 10, "Noise," no noise impacts are anticipated as a result of the Proposed Action. The net change in vehicular traffic at any given location would not be large enough to result in a noise impact. Similarly, the operable barriers and other security devises proposed as part of the WTC Campus Security Plan would not introduce a substantial new noise source.

Construction

As discussed in Chapter 13, "Construction," potential impacts resulting from construction of the Proposed Action would generally be insignificant and temporary. To the extent that there would be any disruption in traffic flow from construction activities associated with the Proposed Action, the

changes would generally be minor and would be coordinated with the reconstruction of the streets that traverse the WTC Campus, where feasible. Further, the NYC Department of Design and Constriction's (DDC) Office of Community Outreach and Notification has outreach programs providing on-going communication with the community. The NYC DDC employs Community Construction Liaisons (CCL's) to assist the community with inquiries and concerns about infrastructure projects. On a quarterly basis, NYC DDC sends lists of infrastructure projects to respective community boards and distributes brochures with project information to neighborhood residents, businesses, community boards, civic associations and local institutions. In addition, NYC DDC attends community meetings to explain projects and answer questions, and provides tours of project areas for community boards.

G. IDENTIFICATION OF DISPROPORTIONATE IMPACTS ON MINORITY AND LOW-INCOME COMMUNITIES

Following CEQ's guidance, a project's adverse effects fall disproportionately on a community of concern for environmental justice if they are adverse and are predominantly borne by a minority and/or low-income community, or they are appreciably more severe or greater in magnitude than the adverse effects that will be suffered by the non-minority or non-low-income population. The determination of disproportionate impacts on minority and/or low-income communities involved consideration of cumulative effects, mitigation measures, and offsetting benefits to the affected minority and low-income communities.

As there are no large, concentrated minority or low-income communities in the Study Area, none of the Proposed Action's potential adverse impacts would fall disproportionately on minority or low-income communities. While not exceeding the *CEQR Technical Manual* threshold of 50 percent, there is a sizeable Asian community residing in the Study Area; 10 of the 13 2010 Census Tract Block Groups detailed in **Table 14-1** have Asian populations of 15 percent or higher.

With respect to traffic impacts, none of the intersections that may experience significant adverse impacts as a result of the Proposed Action are located in minority or low-income communities. While the Proposed Action would result in potential significant adverse traffic impacts at several intersection approaches located in the Study Area, most of these impacts could be mitigated using a combination of measures, including signal timing or signal phasing changes to the Study Area, re-striping of intersection approaches, and parking regulation changes, as described in Chapter 8, "Transportation."

No significant adverse noise or air quality impacts are anticipated during construction at planned open spaces that will be created under No-Action conditions. The anticipated traffic increase during the construction period would be temporary and would be avoided or mitigated to the extent practical by coordinating construction with NYC DDC. Regardless, these impacts would not affect minority or low-income communities as there are no concentrated minority populations located in the Study Area. Therefore, the Proposed Action would not result in any disproportionately high or adverse effects on environmental justice populations.

A. INTRODUCTION

In accordance with the *City Environmental Quality Review (CEQR) Technical Manual*, where significant adverse impacts are identified, mitigation measures to reduce or eliminate the impacts to the fullest extent practicable are developed and evaluated. This chapter discusses the mitigation measures proposed to minimize or avoid the significant adverse impacts that have been identified to result from implementation of the proposed Campus Security Plan in the area of transportation. Significant adverse impacts that cannot be fully mitigated through reasonably practicable measures are also identified and discussed in Chapter 17, "Unavoidable Adverse Impacts." Measures to further mitigate adverse impacts may also be refined and evaluated between the Draft Environmental Impact Statement (DEIS) and Final EIS (FEIS). Therefore, the FEIS may include more complete information and commitments on all practicable mitigation measures to be implemented with the Proposed Project.

B. PRINCIPAL CONCLUSIONS

The significant adverse impacts listed in earlier chapters of this DEIS and the number of impacts that could be mitigated through the implementation of practicable mitigation measures are described below. Impacts were identified in the area of transportation.

Transportation

Traffic

The traffic impact analysis in Chapter 8, "Transportation," indicates that there would be the potential for significant adverse impacts at 17 intersections in the weekday AM peak hour, 10 in the midday, 13 in the PM and three in the Saturday midday peak hour, as outlined below. All but seven of these significant impacts in the AM peak hour, four in the midday, two in the PM and one in the Saturday midday could be fully mitigated through a combination of traffic signal timing/phasing modifications, lane restriping, and changes to curbside parking regulations without any additional significant impacts to pedestrian or parking conditions. Based on *CEQR Technical Manual* criteria, the following significant adverse impacts would remain unmitigated:

AM Peak Hour

- Fulton Street at Church Street – westbound right turn;
- Chambers Street at Route 9A – Eastbound approach and westbound left-through lane group;
- Route 9A at Murray Street – eastbound left-turn, westbound approach and northbound through-right lane group; and
- Route 9A at Liberty Street – northbound through-right lane group.

Midday Peak Hour

- Chambers Street at Broadway – eastbound approach;
- Fulton Street at Church Street – westbound approach; and
- Murray Street at Route 9A – eastbound left turn and westbound approach.

PM Peak Hour

- Fulton Street at Church Street – westbound approach; and
- Route 9A at Liberty Street – southbound through-right lane group.

Saturday Midday Peak Hour

- Fulton Street at Church Street – westbound approach.

Pedestrians

The pedestrian impact analysis in Chapter 8, "Transportation," indicates that installation of security infrastructure associated with the Proposed Project would result in significant adverse impacts due to reductions in pedestrian space in the weekday AM, midday and/or PM peak hours at a total of two sidewalks and three crosswalks. Recommended mitigation measures, which are subject to review and approval by NYCDOT, generally consist of sidewalk and crosswalk widening and minor signal timing changes. All of the significant adverse sidewalk and crosswalk impacts would be fully mitigated with the recommended pedestrian mitigation measures.

C. TRANSPORTATION

As discussed in Chapter 8, "Transportation," the analyses identified the potential for significant adverse traffic and pedestrian impacts, while impacts to parking and area transit facilities and services are not anticipated. Where traffic and pedestrian impacts were identified, practicable measures that could be implemented to mitigate these impacts are discussed below.

Traffic

The traffic impact analysis indicates that there would be the potential for significant adverse impacts at 17 intersections in the weekday AM peak hour, 10 in the midday, 13 in the PM and three in the Saturday midday peak hour. **Table 15-1** summarizes the recommended mitigation measures to address these impacts, which are subject to review and approval by NYCDOT. As shown in **Table 15-1**, these measures consist of modifications to traffic signal timing/phasing, lane restriping and changes to parking regulations.

Tables 15-2 through 15-5 compare the v/c ratios, delays and levels of service with implementation of these measures to both the No-Action and With-Action conditions. Under *CEQR Technical Manual* criteria, a significant adverse traffic impact is considered fully mitigated when the resulting level of service (LOS) degradation under the Action-with-Mitigation condition compared to the No-Action condition is no longer deemed significant following the impact criteria described in Section F in Chapter 8, "Transportation." Under these criteria, if a lane group under the Action-with-Mitigation condition is within LOS A, B or C, or marginally acceptable LOS D (average control delay less than or equal to 45.0 seconds/vehicle for signalized intersections and 30.0 seconds/vehicle for unsignalized intersections), the impact has been mitigated. If the lane group is projected to operate at worse than mid-LOS D (i.e., delay greater than 45 seconds/vehicle at signalized intersections or 30 seconds/vehicle at unsignalized intersections) or at LOS E or F under the Action-With-Mitigation condition, then the impact is considered mitigated when:

- The lane group would operate at LOS D under the No-Action condition and would experience an increase of less than five seconds of delay under the Action-With-Mitigation condition;

TABLE 15-1

RECOMMENDED TRAFFIC MITIGATION MEASURES

Intersection	Signal Phase	No-Action Signal Timing (Seconds) (1) AM	MD	PM	SAT MD	Proposed Signal Timing (Seconds) (1) AM	MD	PM	SAT MD	Recommended Mitigation
1. Chambers St (EB/WB) @	EB/WB	39	39	39		40	39	41		- Restripe SB exclusive left-turn lane to shared left-through lane.
Broadway (SB)	SB	39	39	39		38	39	37		- Implement no standing 7 AM to 7 PM , Mon-Fri regulation for 100' along the
	Peds	6	6	6		6	6	6		south curb of the EB approach.
	Peds	6	6	6		6	6	6		- Transfer 1s of green time from SB to EB/WB in AM and 2s in PM.
2. Warren St (EB) @	EB	43	43	43		43	43	45		- Transfer 2s of green time from SB to EB in PM
Broadway (SB)	SB	47	47	47		47	47	45		
4. Park Row/Barclay St (WB) @	WB	32	32	32		32	32	28		- Implement no standing anytime regulation along the east curb of Broadway.
Broadway (SB)	SB	41	41	41		41	41	45		- Transfer 4s of green time from WB to SB in PM.
	Peds	17	17	17		17	17	17		
5. Vesey St/Park Row/	EB	15	15	15	15	15	15	15	15	- Transition exclusive bus lane to the west curb lane to provide additional
Ann St (EB) @	SB	50	50	50	50	50	50	50	50	moving lane for general traffic.
Broadway (SB)	Peds	25	25	25	25	25	25	25	25	
6. Fulton St (WB) @	WB	30	30	30	30	31	30	32	33	- Implement no standing 4-7 PM, Mon-Fri regulation for 100' feet along
Broadway (SB)	SB	60	60	60	60	59	60	58	57	the south curb of the WB approach.
										- Transfer 1s of green time from SB to WB in AM, 2s in PM and 3s in Sat. midday.
9. Chambers St (EB/WB) @	EB/WB	45	45	45		45	45	47		- Implement no standing 7 AM-7 PM, Mon-Fri regulation for 100' along the
Church St (NB)	NB	45	45	45		45	45	43		south curb of the EB approach.
										- Transfer 2s of green time from NB to EB/WB in PM.
11. Barclay St (WB) @	WB	36	40	40		36	41	40		- Transfer 1s of green time from NB to WB in midday.
Church St (NB)	NB	54	50	50		54	49	50		
13. Fulton St (EB/WB) @	WB	43	43	43	43	46	46	46	46	- Transfer 3s of green time from NB to WB in the AM, midday and PM
Church St (NB)	NB	47	47	47	47	44	44	44	44	and Saturday midday.
14. Cortland St (WB) @	WB	34	34	34	34	34	34	35	34	- Transfer 1s of green time from NB to WB in PM.
Church St (NB)	NB	50	50	50	50	50	50	49	50	- Implement no standing 7 AM-7 PM regulation for 100' along the north
	Peds	6	6	6	6	6	6	6	6	curb of the WB approach.
17. Rector St (EB) @	EB	34	34	34		38	34	34		- Transfer 4s of green time from NB to EB in AM.
Trinity Place (NB)	NB	50	50	50		46	50	50		
	Peds	6	6	6		6	6	6		
22. Murray St (EB/WB) @	EB/WB	36	36	36		39	36	39		- Transfer 3s of green time from NB to EB/WB in AM and PM.
Greenwich St (SB)	SB	54	54	54		51	54	51		- Implement no standing 7 AM-10 AM regulation for 100' along the south
										curb of the EB approach.
26. Battery Place (EB/WB) @	EB/WB	60	60	60		47	47	47		- Introduce new 13s EB leading signal phase.
Greenwich St (NB)	Peds	30	30	30		30	30	30		
	EB-only	---	---	---		13	13	13		
28. Chambers St (EB/WB) @	EB/WB	40	40	44		40	39	44		- Transfer 1s of green time from EB/WB to NB/SB in midday.
Route 9A (NB/SB)	NB/SB	73	58	57		73	59	57		
	SB-only/WB-R	22	22	19		22	22	19		
29. Warren St (EB) @	EB	40	40	40		39	40	40		- Transfer 1s of green time from NB/SB to NB-L and 1s from EB to NB-L in AM.
Route 9A (NB/SB)	NB/SB	82	67	62		81	66	62		- Transfer 1s of green time from NB/SB to NB-L in midday.
	NB-L	13	13	18		15	14	18		
30. Murray St (EB/WB) @	EB/WB	38	38	38		38	39	40		- Implement no standing 7 AM-7PM, Mon-Fri regulation for 100' along
Route 9A (NB/SB)	NB/SB	64	55	51		63	54	49		the north curb of the WB approach.
	NB-only	17	13	15		18	14	16		- Transfer 1s of green time from NB/SB to NB-only in AM and MD.
	SB-only	16	14	16		16	13	15		- Transfer 1s of green time from SB-only to EB/WB in midday.
										- Transfer 2s of green time from NB/SB to EB/WB in PM.
										- Transfer 1s of green time from SB-only to NB-only in PM.
34. Liberty St (EB/WB) @	EB/WB	38	38	38	38	39	38	38	38	- Introduce new signal timing plan with a 135s cycle length in AM
Route 9A (NB/SB)	NB/SB	80	62	62	62	65	49	45	49	and 120s in other periods.
	NB-L/SB-L	17	20	20	20	---	---	---	---	
	NB-only/EB-R	---	---	---	---	18	20	19	20	
	SB-only	---	---	---	---	13	13	18	13	
35. Albany St (EB/WB)/	EB/WB	45	43	43		49	43	47		- Transfer 4s of green time from NB/SB to EB/WB in AM and PM.
Carlisle St (WB) @	NB/SB	90	77	77		86	77	73		
Route 9A (NB/SB)										
38a. West Thames St (EB/WB/	EB-R/WB-L/WB-R	72	48	48		69	48	48		- Transfer 3s of green time from EB-R/WB-L/WB-R to NB/SB in AM.
Bklyn-Battery Tunnel (EB/WB) @	NB/SB	54	63	63		57	63	63		
Route 9A (NB/SB)	NB-only/SB-only	9	9	9		9	9	9		
38b. West Thames St (EB/WB/	EB-R/WB-L/WB-R	72	48	48		69	48	48		- Transfer 3s of green time from EB-R/WB-L/WB-R to NB/SB in AM.
Bklyn-Battery Tunnel (EB/WB) @	NB/SB	54	63	63		57	63	63		
Route 9A (NB/SB)	NB-only/SB-only	9	9	9		9	9	9		
41. Battery Place (EB/WB) @	EB/WB	31	31	31		27	31	31		- Transfer 4s of green time from EB/WB to SB-only in AM.
Route 9A Service Rd (SB)	SB-only	35	35	35		39	35	35		
	Peds	24	24	24		24	24	24		

Notes :

(1) Signal timings shown indicate green plus yellow (including all red) for each phase.

Table 15-2
Action With Mitigation Intersection Level of Service Analysis - AM Peak Hour

		NO-ACTION			WITH-ACTION				ACTION WITH MITIGATION			
INTERSECTION	LANE GROUP	V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS		V/C RATIO	Delay (sec.)	LOS	
1. Chambers St (E-W) @	EB - TR	0.64	28.5	C	**0.90**	**47.1**	**D**	*	0.87	42.7	D	
Broadway (SB)	WB - L	0.54	32.8	C	0.56	36.8	D		0.53	33.2	C	
	WB - T	0.72	32.3	C	0.81	39.2	D		0.63	27.2	C	
	SB - L	0.40	24.8	C	0.40	24.7	C		---	---	---	
	SB - LT	0.69	29.9	C	0.80	35.6	D		0.60	25.7	C	
	SB - R	0.11	19.1	B	0.10	18.9	B		0.11	19.6	B	
4. Park Row/Barclay St (WB) @	WB - L	0.25	25.7	C	0.36	27.5	C		0.36	27.5	C	
Broadway (SB)	WB - LT	0.58	30.0	C	0.52	28.8	C		0.52	28.8	C	
	SB - T	0.75	27.5	C	**1.06**	**72.2**	**E**	*	0.96	44.1	D	
	SB - R	0.38	22.8	C	0.52	26.8	C		0.52	26.8	C	
5. Vesey St/Park Row/Ann St (EB) @	EB - TR	1.53	294.4	F	1.06	113.8	F		1.06	113.8	F	
Broadway (SB)	SB - L	0.51	17.5	B	0.70	22.3	C		0.59	19.3	B	
	SB - LT	0.73	23.6	C	**1.08**	**77.6**	**E**	*	0.62	18.2	B	
6. Fulton St (WB) @	WB - L	0.27	28.8	C	**0.67**	**45.8**	**D**	*	0.65	42.7	D	
Broadway (SB)	WB - T	0.89	56.0	E	0.65	36.7	D		0.62	34.8	C	
	SB - T	0.29	8.7	A	0.44	10.0	B		0.44	10.6	B	
	SB - R	0.39	13.9	B	0.44	15.3	B		0.46	16.5	B	
9. Chambers St (E-W) @	EB - LT	1.05	84.8	F	**1.26**	**161.8**	**F**	*	0.91	44.5	D	
Church St (NB)	WB - TR	0.63	23.8	C	0.64	24.4	C		0.64	24.4	C	
	NB - LT	0.70	22.6	C	0.68	22.0	C		0.68	22.0	C	
	NB - R	0.20	17.0	B	0.20	17.0	B		0.20	17.0	B	
13. Fulton St (WB) @	EB - L	---	---	---	0.08	16.3	B		0.07	14.4	B	
Church St (NB)	WB - TR	0.89	44.6	D	---	---	---		---	---	---	
	WB - R	---	---	---	**1.12**	**112.1**	**F**	*	**1.02**	**77.6**	**E**	*
	NB - LT	0.42	16.6	B	---	---	---		---	---	---	
	NB - T (SZ)	---	---	---	0.04	13.2	B		0.05	14.9	B	
	NB - T (ML)	---	---	---	0.61	20.1	C		0.66	23.1	C	
14. Cortlandt St (WB) @	WB - R	0.78	46.7	D	**1.56**	**299.8**	**F**	*	0.85	45.6	D	
Church St (NB)	NB - T (SZ)	---	---	---	0.04	11.6	B		0.04	11.6	B	
	NB - T (ML)	0.30	13.6	B	0.31	13.9	B		0.31	13.9	B	
17. Rector St (EB) @	EB - LT	0.83	42.6	D	**1.04**	**80.8**	**F**	*	0.90	47.2	D	
Trinity Place (NB)	NB - T	0.14	12.3	B	0.16	12.5	B		0.18	14.8	B	
	NB - R	0.30	16.1	B	0.33	16.7	B		0.39	21.0	C	
22. Murray St (E-W) @	EB - R	0.81	45.3	D	**0.99**	**76.3**	**E**	*	0.88	48.9	D	
Greenwich St (SB)	WB - LT	0.80	39.6	D	0.84	43.3	D		0.77	34.6	C	
	SB - TR	0.45	14.9	B	0.55	17.6	B		0.60	21.0	C	
26. Battery Place (E-W) @	EB - L	0.72	36.7	D	**0.97**	**80.7**	**F**	*	0.68	35.0	C	
Greenwich St (NB)	EB - T	0.47	10.7	B	0.56	12.3	B		0.56	12.3	B	
	WB - TR	0.39	9.4	A	0.39	9.5	A		0.51	17.9	B	
28. Chambers St (E-W) @	EB - LTR	0.98	114.8	F	**1.18**	**178.2**	**F**	*	**1.18**	**178.2**	**F**	*
Route 9A (West St) (N-S)	WB - LT	0.71	60.5	E	**0.78**	**67.2**	**E**	*	**0.78**	**67.2**	**E**	*
	WB - R	0.39	29.7	C	0.42	30.4	C		0.42	30.4	C	
	NB - TR	1.15	97.0	F	1.15	98.3	F		1.15	98.3	F	
	SB - L	1.24	190.2	F	1.24	191.4	F		1.24	191.4	F	
	SB - TR	0.84	10.8	B	0.84	10.8	B		0.84	10.8	B	
29. Warren St (E-W) @	EB - LTR	0.87	71.3	E	0.75	59.1	E		0.77	61.8	E	
Route 9A (West St) (N-S)	NB - L	0.67	96.1	F	**0.89**	**131.4**	**F**	*	0.71	93.1	F	
	NB - TR	0.98	30.2	C	1.01	35.7	D		1.02	40.2	D	
	SB - TR	0.75	15.6	B	0.76	15.7	B		0.77	16.7	B	
30. Murray St (E-W) @	EB - DefL	0.64	73.1	E	**0.96**	**139.2**	**F**	*	**0.96**	**139.2**	**F**	*
Route 9A (West St) (N-S)	EB - TR	0.67	65.5	E	0.61	60.2	E		0.61	60.2	E	
	WB - LTR	1.00	91.9	F	**1.18**	**151.7**	**F**	*	**1.10**	**121.4**	**F**	*
	NB - L	1.03	117.7	F	**1.11**	**143.4**	**F**	*	1.03	117.3	F	
	NB - TR	1.15	90.4	F	**1.22**	**120.3**	**F**	*	**1.22**	**120.3**	**F**	*
	SB - L	0.71	78.4	E	0.71	79.0	E		0.71	79.0	E	
	SB - TR	0.76	17.9	B	0.75	17.8	B		0.76	18.8	B	
34. Liberty St (E-W) @	EB - L	---	---	---	0.75	64.3	E		0.72	61.3	E	
Route 9A (West St) (N-S)	EB - DefL	1.41	275.3	F	---	---	---		---	---	---	
	EB - TR	0.20	41.9	D	---	---	---		---	---	---	
	EB - R	---	---	---	0.26	44.7	D		0.17	28.5	C	
	WB-LTR	1.19	159.4	F	0.19	41.0	D		0.18	40.2	D	
	NB - L	1.12	152.4	F	**1.16**	**167.4**	**F**	*	1.07	133.9	F	
	NB - T	---	---	---	1.50	257.6	F		1.44	229.2	F	
	NB - R	---	---	---	0.07	14.0	B		0.07	12.7	B	
	NB - TR	1.08	65.3	E	**---**	**252.9**	**F**	*	**---**	**225.0**	**F**	*
	SB - L	1.57	336.8	F	0.58	68.6	E		0.87	105.7	F	
	SB - TR	0.87	22.1	C	0.79	18.4	B		0.82	20.6	C	
35. Albany St (E-W)/	EB - LTR	0.54	44.2	D	**0.78**	**55.6**	**E**	*	0.71	47.8	D	
Carlisle St (WB) @	WB - R	0.20	36.5	D	0.24	37.2	D		0.22	34.0	C	
Route 9A (West St) (N-S)	NB - TR	0.84	12.5	B	0.82	11.8	B		0.86	16.1	B	
	SB - TR	0.45	6.7	A	0.47	6.9	A		0.49	9.2	A	
38a. West Thames St/	EB - R	0.45	26.1	C	0.45	25.9	C		0.48	28.6	C	
Brooklyn-Battery Tunnel Exit (E-W) @	WB - R	0.74	30.4	C	0.74	30.3	C		0.77	33.4	C	
Route 9A (West St) (N-S)	NB - T	0.59	27.1	C	0.57	26.8	C		0.54	23.9	C	
	SB - TR	1.06	79.6	E	**1.13**	**105.6**	**F**	*	1.06	77.7	E	
38b. Brooklyn-Battery Tunnel	WB - L	0.61	26.6	C	0.61	26.6	C		0.64	29.1	C	
Entrance/Exit (E-W) @	NB - T	0.91	47.8	D	0.88	45.0	D		0.83	39.1	D	
Route 9A (West St) (N-S)	NB - R	0.44	2.8	A	0.47	3.1	A		0.47	3.0	A	
	SB - T	0.99	53.4	D	**1.04**	**65.4**	**E**	*	0.99	48.7	D	
41. Battery Place (E-W) @	EB - T	0.33	27.1	C	**0.33**	**27.2**	**C**		0.40	31.5	C	
Route 9A Service Rd (SB)	WB - T	0.45	29.2	C	0.48	29.8	C		0.57	35.4	D	
	SB - L	0.95	69.3	E	**1.10**	**112.1**	**F**	*	0.97	70.3	E	
	SB - LR	0.96	71.9	E	**1.09**	**108.7**	**F**	*	0.96	67.2	E	

Notes:
EB-eastbound, WB-westbound, NB-northbound, SB-southbound
L-left, T-through, R-right, Dfl-analysis considers a defacto left lane on this approach
V/C Ratio - volume to capacity ratio, sec. - seconds, LOS - level of service
* - Denotes impacted location
Analysis is based on the 2000 Highway Capacity Manual methodology (HCS+, version 5.5)

Table 15-3
Action With Mitigation Intersection Level of Service Analysis - Midday Peak Hour

		NO-ACTION			WITH-ACTION				ACTION WITH MITIGATION			
INTERSECTION	LANE GROUP	V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS		V/C RATIO	Delay (sec.)	LOS	
1. Chambers St (E-W) @	EB - TR	0.74	35.1	D	**1.29**	**178.9**	**F**	*	**0.93**	**52.7**	**D**	*
Broadway (SB)	WB - L	0.47	28.6	C	0.66	43.6	D		0.66	43.6	D	
	WB - T	0.68	29.8	C	0.70	30.9	C		0.61	27.1	C	
	SB - L	0.19	20.3	C	0.18	20.1	C		---	---	---	
	SB - LT	0.81	36.1	D	**0.96**	**55.9**	**E**	*	0.58	24.4	C	
	SB - R	0.68	46.3	D	0.68	46.3	D		0.68	46.3	D	
4. Park Row/Barclay St (WB) @	WB - L	0.52	31.2	C	0.56	32.4	C		0.56	32.4	C	
Broadway (SB)	WB - LT	0.59	30.1	C	0.53	29.1	C		0.53	29.1	C	
	SB - T	0.71	26.3	C	**1.04**	**62.8**	**E**	*	0.94	39.9	D	
	SB - R	0.16	18.4	B	0.30	20.6	C		0.30	20.6	C	
5. Vesey St/Park Row/Ann St (EB) @	EB - TR	1.81	418.4	F	1.27	187.8	F		1.27	187.8	F	
Broadway (SB)	SB - L	0.57	18.8	B	0.75	24.5	C		0.64	20.5	C	
	SB - LT	0.75	24.1	C	**1.07**	**74.3**	**E**	*	0.62	18.2	B	
9. Chambers St (E-W) @	EB - LT	0.51	21.5	C	**1.24**	**152.5**	**F**	*	0.89	42.2	D	
Church St (NB)	WB - TR	0.64	24.1	C	0.66	24.9	C		0.66	24.9	C	
	NB - LTR	0.81	25.9	C	0.75	23.9	C		0.75	23.9	C	
11. Barclay St (WB) @	WB - TR	1.22	144.3	F	**1.23**	**148.6**	**F**	*	1.19	132.5	F	
Church St (NB)	NB - LT	0.47	15.4	B	0.50	15.8	B		0.51	16.5	B	
13. Fulton St (WB) @	EB - L	---	---	---	0.26	22.3	C		0.21	18.1	B	
Church St (NB)	WB - TR	0.84	40.1	D	---	---	---		---	---	---	
	WB - R	---	---	---	**1.31**	**191.6**	**F**	*	**1.18**	**133.8**	**F**	*
	NB - LT	0.46	16.9	B	---	---	---		---	---	---	
	NB - T (SZ)	---	---	---	0.14	14.1	B		0.15	16.0	B	
	NB - T (ML)	---	---	---	0.55	18.4	B		0.59	21.0	C	
14. Cortlandt St (WB) @	WB - R	0.88	64.3	E	**1.52**	**289.6**	**F**	*	0.83	47.2	D	
Church St (NB)	NB - T (SZ)	-	-	-	0.13	12.4	B		0.13	12.4	B	
	NB - T (ML)	0.35	14.0	B	0.35	14.2	B		0.35	14.2	B	
26. Battery Place (E-W) @	EB - L	0.37	13.4	B	0.77	35.7	D		0.55	23.1	C	
Greenwich St (NB)	EB - T	0.31	9.0	A	0.39	9.9	A		0.39	9.9	A	
	WB - TR	0.38	9.4	A	0.39	9.5	A		0.51	18.0	B	
28. Chambers St (E-W) @	EB - LTR	0.29	36.1	D	0.36	38.0	D		0.37	39.3	D	
Route 9A (West St) (N-S)	WB - LT	0.40	38.8	D	0.48	41.6	D		0.50	43.0	D	
	WB - R	0.41	23.1	C	0.41	23.1	C		0.42	23.9	C	
	NB - TR	0.98	41.5	D	**1.02**	**52.1**	**D**	*	1.00	46.0	D	
	SB - L	1.03	106.5	F	0.99	95.6	F		0.99	95.6	F	
	SB - TR	0.73	10.7	B	0.74	10.9	B		0.73	10.1	B	
29. Warren St (E-W) @	EB - LTR	0.38	37.1	D	0.35	36.5	D		0.35	36.5	D	
Route 9A (West St) (N-S)	NB - L	0.51	71.0	E	**0.67**	**83.5**	**F**	*	0.59	73.8	E	
	NB - TR	0.82	20.5	C	0.89	23.5	C		0.90	25.2	C	
	SB - TR	0.77	19.2	B	0.77	19.2	B		0.78	20.3	C	
30. Murray St (E-W) @	EB - DefL	0.70	68.5	E	**0.82**	**88.1**	**F**	*	**0.78**	**78.9**	**E**	*
Route 9A (West St) (N-S)	EB - TR	0.52	43.9	D	0.48	43.7	D		0.47	42.3	D	
	WB - LTR	1.19	150.3	F	**1.33**	**210.5**	**F**	*	**1.21**	**155.4**	**F**	*
	NB - L	1.11	142.4	F	**1.13**	**148.8**	**F**	*	1.03	113.6	F	
	NB - TR	0.93	26.8	C	1.02	42.8	D		1.02	42.8	D	
	SB - L	0.85	90.2	F	0.68	72.7	E		0.78	85.0	F	
	SB - TR	0.72	17.4	B	0.73	17.6	B		0.76	19.6	B	
34. Liberty St (E-W) @	EB - L	---	---	---	0.65	52.4	D		0.65	52.4	D	
Route 9A (West St) (N-S)	EB - DefL	0.64	57.6	E	---	---	---		---	---	---	
	EB - TR	0.33	38.1	D	---	---	---		---	---	---	
	EB - R	---	---	---	0.41	42.3	D		0.25	23.2	C	
	WB-LTR	-	-	-	0.41	38.3	D		0.41	38.3	D	
	NB - L	0.51	54.3	D	0.58	56.3	E		0.58	56.3	E	
	NB - T	---	---	---	0.93	33.3	C		0.83	20.4	C	
	NB - R	---	---	---	0.06	17.2	B		0.05	13.6	B	
	NB - TR	0.72	21.9	C	---	32.7	C		---	20.3	C	
	SB - L	1.10	127.5	F	0.30	49.9	D		0.56	66.1	E	
	SB - TR	0.96	36.4	D	0.95	33.0	C		0.95	33.0	C	

Notes:

EB-eastbound, WB-westbound, NB-northbound, SB-southbound

L-left, T-through, R-right, Dfl-analysis considers a defacto left lane on this approach

V/C Ratio - volume to capacity ratio, sec. - seconds, LOS - level of service.

***** - Denotes impacted location

Analysis is based on the 2000 Highway Capacity Manual methodology (HCS+, version 5.5)

Table 15-4
Action With Mitigation Intersection Level of Service Analysis - PM Peak Hour

		NO-ACTION			WITH-ACTION				ACTION WITH MITIGATION			
INTERSECTION	LANE GROUP	V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS		V/C RATIO	Delay (sec.)	LOS	
1. Chambers St (E-W) @	EB - TR	0.68	29.3	C	**0.96**	**56.2**	**E**	*	0.90	44.5	D	
Broadway (SB)	WB - L	0.63	39.4	D	**0.79**	**62.4**	**E**	*	0.67	44.1	D	
	WB - T	0.81	37.7	D	0.81	37.2	D		0.67	27.4	C	
	SB - L	0.70	38.2	D	0.73	40.2	D		---	---	---	
	SB - LT	1.05	78.4	E	1.02	68.5	E		0.87	37.8	D	
	SB - R	0.40	28.8	C	0.46	31.3	C		0.52	37.9	D	
2. Warren St (EB) @	EB - R	0.62	27.2	C	**0.93**	**54.1**	**D**	*	0.87	43.3	D	
Broadway (SB)	SB - T	0.61	19.9	B	0.68	21.5	C		0.71	23.7	C	
4. Park Row/Barclay St (WB) @	WB - L	0.33	27.1	C	0.41	28.6	C		0.49	33.6	C	
Broadway (SB)	WB - LT	0.62	30.8	C	0.60	30.3	C		0.70	36.2	D	
	SB - T	1.09	80.7	F	**1.34**	**187.7**	**F**	*	1.10	79.4	E	
	SB - R	0.21	18.9	B	0.30	20.3	C		0.27	17.2	B	
5. Vesey St/Park Row/Ann St (EB) @	EB - TR	1.44	256.8	F	0.92	74.1	E		0.92	74.1	E	
Broadway (SB)	SB - L	0.83	29.1	C	**1.09**	**82.0**	**F**	*	0.76	25.2	C	
	SB - LT	0.81	27.5	C	**1.09**	**82.3**	**F**	*	0.75	21.2	C	
6. Fulton St (WB) @	WB - L	0.38	31.2	C	**0.80**	**55.7**	**E**	*	0.72	44.7	D	
Broadway (SB)	WB - T	0.84	49.1	D	0.62	35.7	D		0.57	32.1	C	
	SB - T	0.28	8.6	A	0.41	9.7	A		0.42	10.8	B	
	SB - R	0.39	13.9	B	0.44	15.3	B		0.73	32.1	C	
9. Chambers St (E-W) @	EB - LT	0.67	25.5	C	**1.01**	**65.7**	**E**	*	0.91	42.7	D	
Church St (NB)	WB - TR	0.76	28.4	C	0.77	28.9	C		0.73	25.6	C	
	NB - LT	0.72	23.0	C	0.76	24.2	C		0.80	27.0	C	
	NB - R	0.45	24.1	C	0.38	22.1	C		0.42	25.0	C	
13. Fulton St (WB) @	EB - L	---	---	---	0.11	16.9	B		0.10	14.4	B	
Church St (NB)	WB - TR	0.92	49.4	D	---	---	---		---	---	---	
	WB - R	---	---	---	**1.37**	**209.4**	**F**	*	**1.24**	**155.9**	**F**	*
	NB - LT	0.58	18.8	B	---	---	---		---	---	---	
	NB - T (SZ)	---	---	---	0.22	15.0	B		0.24	17.2	B	
	NB - T (ML)	---	---	---	0.63	20.4	C		0.68	23.5	C	
14. Cortlandt St (WB) @	WB - R	0.51	31.9	C	**1.61**	**325.4**	**F**	*	0.83	44.7	D	
Church St (NB)	NB - T (SZ)	---	---	---	0.20	13.2	B		0.21	13.8	B	
	NB - T (ML)	0.48	15.6	B	0.35	14.3	B		0.36	14.9	B	
22. Murray St (E-W) @	EB - R	0.94	61.0	E	**1.05**	**89.2**	**F**	*	0.94	57.5	E	
Greenwich St (SB)	WB - LT	0.78	37.1	D	0.85	43.1	D		0.77	34.3	C	
	SB - TR	0.45	16.4	B	0.50	17.6	B		0.55	21.2	C	
26. Battery Place (E-W) @	EB - L	0.77	46.5	D	**1.01**	**95.7**	**F**	*	0.67	36.8	D	
Greenwich St (NB)	EB - T	0.27	8.7	A	0.30	9.0	A		0.30	9.0	A	
	WB - TR	0.48	10.4	B	0.46	10.2	B		0.60	19.6	B	
30. Murray St (E-W) @	EB - DefL	0.65	59.1	E	**0.70**	**63.8**	**E**	*	0.64	55.8	E	
Route 9A (West St) (N-S)	EB - TR	1.19	167.0	F	1.18	164.4	F		1.12	137.5	F	
	WB - DefL	1.20	171.8	F	**1.36**	**233.5**	**F**	*	1.19	164.6	F	
	WB - TR	1.42	256.2	F	**1.55**	**312.9**	**F**	*	1.35	221.1	F	
	NB - L	1.05	125.9	F	**1.12**	**147.5**	**F**	*	1.02	113.3	F	
	NB - TR	1.11	77.7	E	1.10	73.1	E		1.12	81.5	F	
	SB - L	0.48	59.2	E	0.45	58.3	E		0.50	61.2	E	
	SB - TR	0.88	23.7	C	0.89	24.4	C		0.94	30.5	C	
34. Liberty St (E-W) @	EB - L	---	---	---	0.78	63.3	E		0.78	63.3	E	
Route 9A (West St) (N-S)	EB - DefL	0.83	72.8	E	---	---	---		---	---	---	
	EB - TR	0.85	75.1	E	---	---	---		---	---	---	
	EB - R	---	---	---	**0.92**	**94.0**	**F**	*	0.59	35.1	D	
	WB-LTR	---	---	---	0.46	38.4	D		0.46	38.4	D	
	NB - L	0.39	51.3	D	0.45	52.6	D		0.48	54.4	D	
	NB - T	---	---	---	1.00	45.3	D		0.97	36.1	D	
	NB - R	---	---	---	0.01	16.6	B		0.01	15.6	B	
	NB - TR	0.81	24.4	C	**---**	**45.2**	**D**	*	---	36.0	D	
	SB - L	0.56	55.5	E	0.07	46.7	D		0.08	48.6	D	
	SB - TR	1.12	83.7	F	**1.24**	**137.2**	**F**	*	**1.22**	**127.0**	**F**	*
35. Albany St (E-W)/	EB - LTR	0.80	50.9	D	**0.97**	**73.3**	**E**	*	0.87	53.3	D	
Carlisle St (WB) @	WB - R	0.13	29.8	C	0.31	32.7	C		0.28	29.4	C	
Route 9A (West St) (N-S)	NB - TR	0.64	9.9	A	0.63	9.7	A		0.66	12.8	B	
	SB - TR	0.76	11.5	B	0.76	11.5	B		0.81	15.4	B	

Notes:

EB-eastbound, WB-westbound, NB-northbound, SB-southbound

L-left, T-through, R-right, Dfl-analysis considers a defacto left lane on this approach

V/C Ratio - volume to capacity ratio, sec. - seconds, LOS - level of service

***** - Denotes impacted location

Analysis is based on the 2000 Highway Capacity Manual methodology (HCS+, version 5.5)

Table 15-5
Action With Mitigation Intersection Level of Service Analysis - Saturday Midday Peak Hour

		NO-ACTION			WITH-ACTION				ACTION WITH MITIGATION			
INTERSECTION	LANE GROUP	V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS		V/C RATIO	Delay (sec.)	LOS	
1. Fulton St (WB) @	WB - LT	0.96	68.2	E	**1.08**	**101.2**	**F**	*	0.95	64.4	E	
Broadway (SB)	SB - TR	0.31	8.8	A	0.40	9.5	A		0.42	11.3	B	
13. Fulton St (WB) @	EB - L	---	---	---	0.13	18.3	B		0.11	15.6	B	
Church St (NB)	WB - TR	1.12	108.9	F	---	---	---		---	---	---	
	WB - R	---	---	---	**1.51**	**274.3**	**F**	*	**1.36**	**204.7**	**F**	*
	NB - LT	0.32	15.3	B	---	---	---		---	---	---	
	NB - T (SZ)	---	---	---	0.12	14.0	B		0.13	15.9	B	
	NB - T (ML)	---	---	---	0.40	16.4	B		0.43	18.6	B	
14. Cortlandt St (WB) @	WB - R	1.17	142.9	F	**1.81**	**414.4**	**F**	*	0.98	73.2	E	
Church St (NB)	NB - T (SZ)	-	-	-	0.11	12.3	B		0.11	12.3	B	
	NB - T (ML)	0.20	12.7	B	0.20	12.8	B		0.20	12.8	B	
34. Liberty St (E-W) @	EB - L	---	---	---	0.67	53.0	D		0.67	53.0	D	
Route 9A (West St) (N-S)	EB - DefL	1.06	137.2	F	---	---	---		---	---	---	
	EB - TR	0.12	33.3	C	---	---	---		---	---	---	
	EB - R	---	---	---	0.18	35.1	D		0.11	20.4	C	
	WB-LTR	1.19	150.2	F	0.20	34.5	C		0.20	34.5	C	
	NB - L	0.41	51.7	D	0.48	53.1	D		0.48	53.1	D	
	NB - T	---	---	---	0.90	29.9	C		0.80	19.2	B	
	NB - R	---	---	---	0.01	16.7	B		0.01	13.2	B	
	NB - TR	0.69	21.1	C	---	29.9	C		---	19.2	B	
	SB - L	0.96	89.1	F	0.07	46.7	D		0.13	54.1	D	
	SB - TR	0.67	20.9	C	0.83	25.1	C		0.83	25.1	C	

Notes:
EB-eastbound, WB-westbound, NB-northbound, SB-southbound
L-left, T-through, R-right, Dfl-analysis considers a defacto left lane on this approach
V/C Ratio - volume to capacity ratio, sec. - seconds, LOS - level of service
***** - Denotes impacted location
Analysis is based on the 2000 Highway Capacity Manual methodology (HCS+, version 5.5)

- The lane group would operate at LOS E under the No-Action condition and would experience an increase in projected delay of less than four seconds; and

- The lane group would operate at LOS F under the No-Action condition and would experience an increase in projected delay of less than three seconds.

As shown in **Tables 15-2 through 15-5**, with implementation of the recommended mitigation measures, seven significant adverse impacts would remain unmitigated in the AM peak hour, four in the midday, two in the PM and one in the Saturday midday peak hour. The recommended mitigation measures at intersections along each study area corridor and their effects on traffic conditions are discussed below. These are generally restricted to minor signal timing modifications, lane restriping, and implementation of new curbside parking regulations. In addition, a new signal phase is proposed at one location, and a new signal timing plan is proposed for the intersection of Liberty Street and Route 9A. Additional measures to further address all unmitigated significant adverse traffic impacts will be explored between the DEIS and the FEIS. In addition, relevant WTC stakeholders (e.g., PANYNJ, NYPD, NYCDOT, etc.) will work together to develop and implement a program to monitor the effectiveness of proposed traffic mitigation measures and conditions at security stations as the WTC Campus Security Plan is implemented.

Broadway

As shown in **Table 15-1**, the measures recommended for impacted intersections along the Broadway corridor include signal timing adjustments of up to four seconds at Park Row/Barclay Street and three seconds or less at other locations; implementing a new no standing 7 AM - 7 PM, Monday to Friday curbside regulation along eastbound Chambers Street approaching Broadway; implementing a new no standing anytime regulation along

the east curb of Broadway approaching Park Row/Barclay Street; implementing a new no standing 4-7 PM curbside regulation along the south curb of westbound Fulton Street approaching Broadway; and transitioning the exclusive bus lane on Broadway to the west curb lane approaching Vesey Street to provide an additional moving lane for general traffic. (Currently, the west curb lane is occupied by a designated bus stop lane that ends at Vesey Street and the exclusive bus lane transitions to the curb lane one block to the south approaching Fulton Street.) In addition, southbound Broadway would be restriped approaching Chambers Street to include a through lane and a shared left-through lane in place of the existing shared left-through lane and exclusive left-turn lane. A curb lane and the exclusive bus lane would remain along the west side of Broadway at this location.

As shown in **Tables 15-2 through 15-5**, with these recommended mitigations measures, all of the Proposed Project's significant adverse traffic impacts along the Broadway corridor would be fully mitigated in all analyzed peak hours with the exception of the significant adverse impact to the eastbound Chambers Street approach in the midday peak hour. Delay for this approach would total 52.7 seconds (LOS D) in the midday in the Action-with-Mitigation condition compared to 178.9 seconds (LOS F) in the With-Action condition and 35.1 seconds (LOS D) in the No-Action. Although conditions would be improved, the eastbound Chambers Street approach at Broadway would remain significantly adversely impacted under *CEQR Technical Manual* criteria.

Trinity Place/Church Street

As shown in **Table 15-1**, measures recommended for impacted intersections along the Trinity Place/Church Street corridor include minor signal timing adjustments (typically four seconds or less); implementing a new no standing 7 AM –7 PM, Monday to Friday curbside regulation along eastbound Chambers Street approaching Church Street; and implementing a new no standing 7 AM –7PM (all days) curbside regulation along the north curb of westbound Cortlandt Street approaching Church Street. With these recommended mitigation measures, all of the Proposed Project's significant adverse traffic impacts along the Trinity Place/Church Street corridor would be fully mitigated with the exception of the significant adverse impacts to the westbound Fulton Street approach to Church Street in all peak hours. Delay for the westbound right-turn movement on Fulton Street would total 77.6, 133.8, 155.9 and 204.7 seconds of delay in the AM, midday, PM and Saturday midday peak hours, respectively, in the Action-with-Mitigation condition compared to 112.1, 191.6, 209.4 and 274.3 seconds of delay during these periods, respectively, in the With-Action condition. This movement would improve from LOS F to LOS E in the AM peak hour and continue to operate at LOS F in all other periods.

Greenwich Street

Measures recommended for the two significantly impacted intersections along the Greenwich Street corridor include a minor signal timing adjustment of three seconds at Murray Street; implementing a new no standing 7–10 AM, Monday to Friday curbside regulation along the south curb of eastbound Murray Street approaching Greenwich Street; and the introduction of a new 13-second leading signal phase for eastbound Battery Place. With these recommended mitigations measures, all of the Proposed Project's significant adverse traffic impacts along the Greenwich Street corridor would be fully mitigated.

Route 9A (West Street)

Measures recommended for significantly impacted intersections along the Route 9A corridor include minor signal timing adjustments (typically four seconds or less) and implementing a new no standing 7 AM to 7 PM, Monday to Friday curbside regulation along the north curb of westbound Murray Street approaching Route 9A. In addition, with the reopening of Liberty Street east of Route 9A to WTC traffic, the relocation of the Route 9A northbound left-turn movement from Albany Street to Liberty Street, and increased traffic from development at the WTC site, traffic movements through the Route 9A/Liberty Street intersection in both the No-Action and With-Action would be substantially different from current conditions. Recommended mitigation for this intersection therefore includes implementation of a new signal timing plan incorporating split signal phasing

(i.e., exclusive northbound and southbound signal phases along with a northbound/southbound phase), with cycle lengths of 135 seconds in the AM peak period and 120 seconds in other periods, consistent with other intersections along the corridor.

With these recommended mitigation measures, all of the Proposed Project's significant adverse traffic impacts along the Route 9A corridor would be fully mitigated in the Saturday midday peak hour; however, six significant adverse impacts would remain unmitigated in the AM peak hour and two in the midday and one in the PM. At Chambers Street, the AM peak hour impacts to the eastbound approach and the westbound left-through lane group would remain unmitigated with delays of 178.2 seconds (LOS F) and 67.2 seconds (LOS E), respectively, unchanged from the With-Action condition. At Murray Street, significant impacts to the northbound left turn would be fully mitigated in the AM, midday and PM peak hours, as would impacts to the eastbound left turn and the westbound through-right lane group in the PM. However, no practicable mitigation was identified that would also address the following significant impacts:

- The eastbound left-turn movement would remain impacted in the AM with a delay of 139.2 seconds (LOS F), unchanged from the With-Action condition, and in the midday with a delay of 78.9 seconds (LOS E) versus 88.1 seconds in the With-Action;

- The westbound approach would remain impacted in the AM and midday, with an AM delay of 121.4 seconds (LOS F) compared to 151.7 seconds (LOS F) in the With-Action condition, and a midday delay of 155.4 seconds (LOS F) compared to 210.5 seconds (LOS F) in the With-Action; and

- The northbound through-right lane group would remain impacted in the AM with a delay of 120.3 seconds (LOS F), unchanged from the With-Action condition.

Lastly, at the Route 9A/Liberty Street intersection, AM peak hour delay for the northbound through-right lane group would decrease to 225 seconds (LOS F) from 252.9 seconds (LOS F) in the With-Action condition, and PM peak hour delay for the southbound through-right lane group would decrease to 127 seconds (LOS F) from 137.2 seconds (LOS F) in the With-Action condition. However, both of these lane groups would remain significantly impacted during these periods.

Trinity Place/Liberty Street Security Station

As discussed in Chapter 8, "Transportation," the number of buses forecast to arrive at the WTC site in each peak hour was based on the travel demand forecast provided in the 2004 *World Trade Center Memorial and Redevelopment FGEIS*, and the traffic analyses for this EIS conservatively assume that all of these buses would enter the WTC Campus. Based on this conservative assumption, it is estimated that in the weekday midday peak hour up to 33 tour buses would enter the WTC Campus through the Trinity Place security station. It is estimated that during this peak hour the average queue would extend approximately three to four buses and that, based on the 95th percentile queue, there would be brief periods when up to seven buses would be in queue. The 285 feet of credentialing lane length that would be provided along Trinity Place on the two blocks between Rector Street and Cedar Street would therefore be sufficient to accommodate average queues in the weekday midday; however, based on the 95th percentile queue, the number of buses waiting to enter the Campus may occasionally exceed the capacity of these credentialing lanes for brief periods during this peak hour. In addition, the analyses assume that up to 42 buses would arrive at the Trinity Place security station in the Saturday midday peak hour. During this period, it is estimated that the average queue would reach seven to eight buses in length, and that based on the 95th percentile queue, there would be brief periods when up to 17 buses would be in queue. The 285-foot-long credentialing lanes along Trinity Place on the two blocks between Rector Street and Cedar Street would therefore be insufficient to accommodate both the average and 95th percentile queues in the Saturday midday.

As noted in previous chapters of this EIS, access to the WTC Campus would be managed in a flexible manner to allow maximum throughput and reduce the potential for localized traffic congestion, as conditions allow. If congestion and excessive queuing were to occur at the Trinity Place security station during periods of peak tour bus demand, a number of measures would be considered to mitigate these conditions, including the following:

Increased Staffing Levels

Increased staffing levels would be provided at the Trinity Place security station during periods of peak demand to reduce vehicle screening times and thereby reduce queues and waiting times.

Coordinated Operation of Security Stations to Maximize Throughput

Under the proposed Campus Security Plan, all of the security stations would be under the control of NYPD officers and operated in a coordinated manner. In the event that congestion and excessive queuing were to occur at the Trinity Place security station during periods of peak tour bus demand, some buses could be redirected to other security stations with available capacity.

Implement a Timed Reservation System for Tour Buses

A management strategy for vehicular access to the WTC Campus, including the scheduling of tour buses and truck deliveries, is currently being developed to ensure that the Vehicular Security Center can accommodate demand for on-site delivery, and tour bus and auto parking, in an orderly and efficient manner. With implementation of such a management strategy, it is anticipated that tour bus (as well as truck) arrivals at entrance security stations would be more evenly distributed over the course of the day, and not as concentrated in peak travel periods as was conservatively assumed for the security station operational assessment.

It is anticipated that increased staffing levels, coordinated operation of security stations and implementation of a timed reservation system for tour buses would be effective at addressing the potential for congestion and excessive queuing at the Trinity Place security station during the weekday and Saturday midday peak periods. As the Campus Security Plan becomes operational, conditions at this and all other entry security stations will be monitored, and the measures outlined above would be considered for implementation should future conditions warrant.

As noted previously, additional measures to address any unmitigated significant adverse traffic impacts will be further explored between the DEIS and the FEIS, and relevant WTC stakeholders (e.g., PANYNJ, NYPD, NYCDOT, etc.) will work together to develop and implement a program to monitor the effectiveness of proposed traffic mitigation measures and conditions at security stations as the WTC Campus Security Plan is implemented.

Pedestrians

The Proposed Project would not generate additional pedestrian demand or change pedestrian access routes in the vicinity of the WTC site. However, the installation of security infrastructure (e.g., static barriers, personnel booths, etc.) would potentially reduce the amount of space available for pedestrian circulation at some locations. (The Proposed Project may also result in some relatively small changes in pedestrian flow due the relocation of some taxi pickup/drop-off activity.) The results of the analysis of pedestrian conditions in the weekday AM, midday and PM peak hours in the With-Action condition indicate that the installation of security infrastructure associated with the Proposed Project would result in significant adverse impacts in one or more peak hours at a total of two sidewalks. In addition, the installation of static barriers such as bollards within crosswalks in conjunction with the proposed median along Trinity Place/Church Street is also expected to result in significant adverse impacts in one or more peak hours at a total of three analyzed crosswalks along this corridor.

Discussed below are recommended mitigation measures to address these pedestrian impacts. The mitigation measures, which are subject to review and approval by NYCDOT, generally consist of sidewalk and crosswalk widening and minor signal timing changes. Where a sidewalk or crosswalk widening is proposed, the analysis reflects the addition of one or more static barriers where necessary to maintain the four-foot spacing required for security purposes. **Table 15-6** summarizes the recommended mitigation measures and **Tables 15-7 and 15-8** compare the levels of service with implementation of the mitigation measures to both the No-Action and With-Action conditions. Under *CEQR Technical Manual* criteria, a significant adverse pedestrian impact is considered fully mitigated when the resulting level of service (LOS) degradation under the Action-with-Mitigation condition compared to the No-Action condition is no longer deemed significant following the impact criteria described in Section F in Chapter 8, "Transportation."

Table 15-6
Recommended Pedestrian Mitigation Measures

Sidewalks			
No.	**Location**	**Side**	**Recommended Mitigation**
S6	Barclay St between Church St & West Broadway	South	- Widen sidewalk by 3 ft. adjacent to credentialing booth. - Refinements to credentialing personnel booth design to be explored between DEIS and FEIS.
S8	Trinity Place between Cedar St & Liberty St	West	- Widen sidewalk by 2 ft.
Crosswalks			
No.	**Location**	**Approach**	**Recommended Mitigation**
X3	Church St at Vesey St	North	- Widen crosswalk from 13 ft. to 14 ft.
X4	Church St at Fulton St	North	- Modify traffic signal timing and widen crosswalk from 12 ft. to 14 ft.
X10	Church St at Cortlandt St	North	- Modify traffic signal timing and widen crosswalk from 15 ft. to 16 ft.

Sidewalks

Barclay Street (South Side) Between West Broadway and Church Street (S6)

The installation of a credentialing personnel booth on sidewalk S6 would result in significant adverse impacts in all three analyzed peak hours. A potential measure to mitigate these impacts would be to extend this 14.5-foot-wide sidewalk by three feet adjacent to the personnel booth. Approximately 33 feet of roadway width would remain, sufficient to maintain two 11-foot-wide travel lanes, plus an 11-foot-wide credentialing lane. As shown in **Table 15-7**, with this mitigation measure the significant adverse impacts to sidewalk S6 in all three peak hours would be fully mitigated. Alternatively, additional sidewalk space could be achieved through the use of a narrower credentialing personnel booth design. Refinements to the design of the credentialing personnel booths will be explored between the DEIS and FEIS.

Trinity Place (West Side) Between Liberty and Cedar Streets (S8)

The installation of a personnel booth for screening and static barriers on sidewalk S8 under the Proposed Action would result in significant adverse impacts in the AM and PM peak hours. A potential measure to mitigate these impacts would be to extend this 19-foot-wide sidewalk by two feet adjacent to the personnel booth and static barriers. This could be achieved by (1) narrowing the planned sally port from 15 feet to 14 feet in width; and (2) installing a three-foot-wide median along this block of Trinity Place rather than a four-foot-wide median. Two 11-foot-wide travel lanes would be maintained along Trinity Place. As shown in **Table 15-7**, with this

Table 15-7
Action-With-Mitigation Conditions Sidewalk Analysis

No.	Location	No-Action						With-Action						Action-With-Mitigation					
		Flow Rate (PMF)			Platoon-Adjusted Level of Service			Flow Rate (PMF)			Platoon-Adjusted Level of Service			Flow Rate (PMF)			Platoon-Adjusted Level of Service		
		AM	MD	PM	AM	MD	PM	AM	MD	PM	AM	MD	PM	AM	MD	PM	AM	MD	PM
S6	Barclay Street between West Broadway & Church Street (south)	11.2	9.8	6.9	E	D	D	20.0	17.5	12.2	**E***	**E***	**E***	12.0	10.5	7.3	E	D	D
S8	Trinity Place between Liberty Street & Cedar Street (West)	11.9	2.8	6.6	E	B	D	16.2	3.8	9.0	**E***	C	**D***	11.9	2.8	6.6	E	B	D

Notes:
PMF – persons per minute per foot of effective width.
***** - denotes a significant adverse impact based on *CEQR Technical Manual* criteria.

Table 15-8
Action-With-Mitigation Conditions Crosswalk Analysis

No.	Location	No-Action						With-Action						Action-With-Mitigation					
		SFP			Level of Service			SFP			Level of Service			SFP			Level of Service		
		AM	MD	PM	AM	MD	PM	AM	MD	PM	AM	MD	PM	AM	MD	PM	AM	MD	PM
X3	Church St at Vesey St (North)	16.1	28.9	25.4	D	C	C	13.9	25.1	22.1	**E***	C	D	15.4	27.5	24.3	D	C	C
X4	Church St at Fulton St (North)	37.2	15.4	37.6	C	D	C	27.1	11.3	25.7	C	**E***	D	36.5	15.4	34.7	C	D	C
X10	Church St at Cortlandt St (North)	41.7	25.2	28.8	B	C	C	26.9	17.8	18.3	C	**D***	**D***	29.4	19.5	20.8	C	D	D

Notes:
SFP – square feet per pedestrian.
***** - denotes a significant adverse impact based on *CEQR Technical Manual* criteria.

mitigation measure the significant adverse impacts to sidewalk S8 in the AM and PM peak hours would be fully mitigated.

Crosswalks

Church Street at Vesey Street

The installation of static barriers within the north crosswalk (X3) on Church Street at Vesey Street would result in a significant adverse impact to this crosswalk in the AM peak hour. Recommended mitigation is to widen this crosswalk from 13 feet to 14 feet (see **Table 15-6**). As shown in **Table 15-8**, with this mitigation measure the significant adverse impact to the north crosswalk in the AM peak hour would be fully mitigated.

Church Street at Fulton Street

Changes in traffic flow and the installation of static barriers such as bollards within the north crosswalk on Church Street at Fulton Street (X4) would result in a significant adverse impact to this crosswalk in the midday peak hour. Recommended mitigation is to widen this crosswalk from 12 feet to 14 feet. In addition, the transfer of three seconds of signal green time from the northbound approach to the westbound approach in the midday as part of the traffic mitigation plan (see **Table 15-1**) would increase pedestrian crossing time on this crosswalk. As shown in **Table 15-8**, with the recommended widening and the traffic mitigation measure, the significant adverse impact to the north crosswalk in the midday peak hour would be fully mitigated.

Church Street at Cortlandt Street

Changes in traffic flow and the installation of static barriers such as bollards within the north crosswalk on Church Street at Cortlandt Street (X10) would result in significant adverse impacts to this crosswalk in the midday and PM peak hours. Recommended mitigation is to widen this crosswalk from 15 feet to 16 feet. In addition, the transfer of one second of signal green time from the northbound approach to the westbound approach in the PM as part of the traffic mitigation plan (see **Table 15-1**) would increase pedestrian crossing time on this crosswalk. As shown in **Table 15-8**, with the recommended widening and the traffic mitigation measure, the significant adverse impacts in the midday and PM peak hours would be fully mitigated.

As noted in Chapter 8, "Transportation," static barriers would also be installed across the south crosswalks on Church Street at Cortlandt, Dey and Fulton streets. However, the analyses focused on only the north crosswalks at these locations as, unlike the south crosswalks, the north crosswalks will experience conflicting vehicular turning movements and would therefore be the most likely to experience any significant project-related impacts. As discussed above, both the north crosswalk at Fulton Street and the north crosswalk at Cortlandt Street would be significantly adversely impacted by the installation of static barriers under the Proposed Project. Should similar impacts become evident at the south crosswalks at these locations, mitigation measures similar to those recommended above for the north crosswalks (i.e., crosswalk widening and modest signal timing adjustments) would likely be equally effective at mitigating any impacts.

Measures to Improve Pedestrian Safety

As discussed in Chapter 8, "Transportation," four study area intersections experienced five or more pedestrian and/or bicyclist injury crashes in one or more years and are therefore considered high accident locations, including Broadway at Chambers Street, West Broadway at Chambers Street, Route 9A at Chambers Street and Route 9A at Murray Street. The Campus Security Plan is not expected to generate substantial new vehicular or pedestrian demand, nor alter pedestrian flow patterns at any of these four intersections. However, all four intersections would likely experience changes in traffic flow patterns due to street closures associated with the Proposed Project. Depending on peak hour, some turning movements at each intersection would likely

experience increased traffic volumes (and therefore increased potential for vehicle/pedestrian conflicts at crosswalks), while traffic volumes for other turning movements would be reduced (thereby lessening the potential for vehicle/pedestrian conflicts). It is estimated that the projected increases in turning vehicle volumes would amount to an average of no more than two to three vehicles per signal cycle per movement at any of the four high accident locations.

The *CEQR Technical Manual* identifies a range of available measures to mitigate significant pedestrian impacts. A number of these would also potentially improve pedestrian safety including providing additional signal green time or new pedestrian phases such as a leading pedestrian interval; providing curb extensions or neck downs to reduce pedestrian crossing distance; providing a pedestrian refuge island where there would be insufficient time for pedestrians to fully cross the street; construction of a pedestrian bridge; and creating high visibility crosswalks to alert motorists of the pedestrian crossing. As noted in Chapter 8, "Transportation," many of these measures have already been implemented at the four study area intersections considered high accident locations. The specific measures already in place at each intersection and the potential for introducing additional measures are discussed below.

Broadway at Chambers Street

Implementation of the Proposed Project would add an average of from two to three additional right-turning vehicles per signal cycle at the south crosswalk on Broadway in each peak hour compared to the No-Action condition, with the highest number in the PM. High visibility crosswalks have already been installed at this intersection, and the signal timing plan currently includes leading pedestrian intervals for both the Broadway and the Chambers Street signal phases. The proposed traffic mitigation plan would add one additional second of signal time to the Chambers Street phase in the AM and two seconds in the PM, providing additional time for pedestrians crossing both the north and south crosswalks on Broadway during these periods.

West Broadway at Chambers Street

With implementation of the Proposed Project, there would be from 61 to 108 fewer turning vehicles in each peak hour along the south crosswalk on West Broadway, thereby reducing the potential for vehicle/pedestrian conflicts at this location. Although the numbers of turning vehicles on the east and west crosswalks on Chambers Street would increase in some periods with the Proposed Project, they would average no more than one additional vehicle per signal cycle in any peak hour. It should be noted that this segment of Chambers Street was undergoing reconstruction in 2012. Installing high visibility crosswalks once construction at this intersection is complete would help to enhance pedestrian safety.

Route 9A at Chambers Street

Implementation of the Proposed Project would add an average of no more than two turning vehicles per signal cycle at any of the crosswalks at the Route 9A/Chambers Street intersection in any peak hour. (The numbers of turning vehicles at the west crosswalk – where the Hudson River Greenway crosses Chambers Street -- would actually decrease slightly in the AM with the Proposed Project.) As noted in Chapter 8, "Transportation," substantial measures to enhance pedestrian and bicyclist safety have already been implemented at this intersection, including the installation of a pedestrian bridge across Route 9A in place of the north crosswalk (to accommodate pedestrian demand from the adjacent Stuyvesant High School and Borough of Manhattan Community College); distinctive paving along the remaining crosswalks to increase their visibility to drivers; and installation of a pedestrian refuge in the median along the south crosswalk. Dedicated bicycle signals and bicycle and pedestrian pavement markings have also been installed along the west leg of the intersection where the Hudson River Greenway crosses Chambers Street. The modest traffic signal modification proposed as part of the traffic mitigation plan would slightly increase the time provided for pedestrians crossing both the east and west crosswalks on Chambers Street in the midday. As substantial pedestrian and bicyclist safety measures have

already been implemented at this intersection, options for implementing further, practicable measures without adversely affecting the heavy vehicular traffic at this location may be limited.

Route 9A at Murray Street

Implementation of the Proposed Project would add an average of no more than two turning vehicles per signal cycle at any of the crosswalks at the Route 9A/Murray Street intersection in any peak hour. As was the case at Chambers Street two blocks to the north, substantial measures to enhance pedestrian and bicycle safety have already been implemented at this intersection, including the installation of distinctive paving along all four crosswalks to increase their visibility to drivers, the installation of pedestrian refuges in the Route 9A medians on both the north and south crosswalks, and the installation of dedicated bicycle signals and bicycle and pedestrian pavement markings along the west leg of the intersection where the Hudson River Greenway crosses Murray Street. Given the substantial pedestrian and bicyclist safety measures that have already been implemented at this intersection, options for implementing further, practicable measures without adversely affecting the heavy vehicular traffic at this location may be limited.

Effects of Traffic Mitigation on Pedestrian Conditions

As discussed above, the recommended traffic mitigation measures would include changes to existing signal timings of up to four seconds at a total of 16 intersections where significant adverse traffic impacts are forecast. With these recommended signal timing changes, pedestrians would continue to have sufficient time to cross the street at all of these locations. It is also proposed to introduce a new eastbound leading signal phase at the intersection of Battery Place and Greenwich Street. However, the existing 30-second pedestrian-only phase would be maintained at this location and pedestrians would therefore still have sufficient crossing time. Lastly, it is expected that a new signal timing plan would be implemented at the intersection of Liberty Street with Route 9A in the No-Action condition, and that further signal timing changes would be needed as mitigation to address potential significant adverse traffic impacts. Under the signal timing plan proposed for the Action-with-Mitigation condition, the pedestrian crossing time provided to cross Route 9A at Liberty Street would be consistent with the minimum crossing times provided at other nearby intersections along the corridor (e.g., Murray Street).

Effects of Traffic Mitigation on Parking Conditions

As discussed in Chapter 8, "Transportation," the proposed Campus Security Plan would not result in any significant adverse impacts with respect to off-street or on-street parking as it would not generate new parking demand, nor displace any existing or future off-street public parking capacity. Although the installation of credentialing locations and security stations would potentially displace an estimated 23 on-street spaces designated for authorized vehicle parking, nine to 11 spaces for truck loading/unloading and four spaces for bus layover, the displacement of this number of parking spaces would not be considered a significant adverse impact under *CEQR Technical Manual* criteria.

As also noted above, traffic mitigation measures associated with the Proposed Project would include changes to curbside regulations at a number of locations. The potential effects of these measures on truck deliveries and on-street parking are discussed in more detail below. Overall, it is expected that the proposed mitigation measures would potentially affect up to 12 existing on-street parking spaces (including approximately nine spaces of authorized vehicle parking). Some truck loading/unloading activity would also potentially be affected, and a layover area for several MTA bus routes would likely need to be relocated. However, the effects to on-street parking from the implementation of the proposed traffic mitigation measures would not be considered new significant adverse impacts under *CEQR Technical Manual* criteria.

It is anticipated that the NYPD would work with NYCDOT, the MTA and other affected agencies to identify potential alternative locations for the bus and authorized vehicle parking that would be displaced by the Proposed Project or proposed traffic mitigation measures.

Chambers Street at Broadway

Under the proposed traffic mitigation plan, a no standing 7 AM-7 PM, Monday to Friday regulation would be implemented for 100 feet along the south curb of the eastbound Chambers Street approach to Broadway. The current regulations at this location are no standing 7-10 AM and 4-7 PM, Monday through Friday with truck loading/unloading permitted 10 AM-4 PM. While this proposed mitigation measure would restrict midday truck loading activity along a 100-foot segment of eastbound Chambers Street, it would not displace any existing on-street parking.

Broadway at Park Row/Barclay Street

A no standing anytime regulation would be implemented along the length of the east curb of Broadway approaching Park Row/Barclay Street (adjacent to City Hall Park). The current parking regulation at this location is no standing anytime except authorized vehicles (Mayor's Office – City Hall). Therefore, with this proposed mitigation, approximately nine on-street parking spaces would no longer be available for these authorized vehicles during weekday daytime hours.

Chambers Street at Church Street

A no standing 7 AM-7 PM, Monday to Friday regulation would be implemented for 100 feet along the south curb of eastbound Chambers Street approaching Church Street. The current regulations at this location are no standing 4-7 PM, Monday through Friday with truck loading/unloading permitted 7 AM-4 PM. While this proposed mitigation measure would restrict truck loading activity along a 100-foot segment of eastbound Chambers Street during the 7 AM-4 PM period, it would not displace any existing on-street parking.

Cortlandt Street at Church Street

A no standing 7 AM-7 PM regulation would be implemented for 100 feet along the north curb of westbound Cortlandt Street approaching Church Street. Curbside usage at this location, which is adjacent to the Century 21 department store, is currently governed by a no standing except truck loading/unloading 7 AM-7 PM, Monday to Friday regulation. Therefore, no on-street parking would be displaced by the proposed mitigation. In addition, it should be noted that the presence of a fire hydrant and large planters at curbside limits the utility of this street segment for truck loading/unloading.

Murray Street at Greenwich Street

A no standing 7-10 AM, Monday to Friday regulation would be implemented for 100 feet along the south curb of eastbound Murray Street approaching Greenwich Street. As the current regulation at this location permits one-hour parking from 8 AM-7 PM Monday through Saturday, approximately three on-street parking spaces would be displaced in the AM peak period as a result of the proposed mitigation. (The presence of a fire hydrant limits the number of vehicles that can legally park along the affected curb space.)

Murray Street at Route 9A

A no standing 7 AM-7 PM regulation would be implemented for 100 feet along the north curb of westbound Murray Street approaching Route 9A. Currently this curb lane is designated as a bus layover area for several MTA express routes, and no standing is permitted by other vehicles at anytime. Therefore, the proposed

mitigation would not displace any existing on-street parking capacity. It is anticipated that the NYPD and NYCDOT would work with the MTA to identify potential alternative bus layover locations.

A. INTRODUCTION

In accordance with the 2012 *CEQR Technical Manual* and the New York State Environmental Quality Review Act (SEQRA), this chapter examines three alternatives to the proposed WTC Campus Security Plan (Proposed Action). As detailed in Chapter 1, "Project Description," the Proposed Action would establish a security overlay at the perimeter of the WTC Campus, including multiple entry/exit security checkpoints and a secure lane on Trinity Place/Church Street.

As described in the 2012 *CEQR Technical Manual*, 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 project while meeting some or all of the goals and objectives of the proposed project. This chapter considers in detail the following alternatives to the Proposed Action:

- A No-Action Alternative, which is mandated by CEQR and SEQRA, and is intended to provide the lead and involved agencies with an assessment of the expected environmental impacts of a No-Action alternative on their part;
- A No Unmitigated Significant Adverse Impacts Alternative, which considers a development scenario that would not result in any identified significant, unmitigated adverse impacts; and,
- An Unrestricted Liberty Street Alternative, which would remove Liberty Street from the Campus Security Plan and allow unscreened traffic to flow east-west on Liberty Street with no security controls. This would provide an additional east-west route in Lower Manhattan.

B. PRINCIPAL CONCLUSIONS

No-Action Alternative

The No-Action Alternative examines future conditions within the Study Area, but assumes the absence of the Proposed Action. Under the No-Action Alternative, the proposed Campus Security Plan would not be implemented, but Vesey Street and Fulton Street between Greenwich Street and West Street/Route 9A would operate as managed streets, as described in Chapter 1, "Project Description." It is anticipated that the WTC Campus would be developed (including 1 WTC through 4 WTC, the VSC, the PAC, the PATH terminal and the National September 11th Memorial and Museum) and Lower Manhattan would remain a vibrant mixed-use community with one of the largest central business districts in the U.S. In the future without the Proposed Action, the Study Area would continue to experience growth in commercial, office, retail, residential, hotel, and community facility uses by 2019, including almost forty new developments, conversions, and street improvement projects discussed in further detail in Chapter 2, "Land Use, Zoning, and Public Policy."

The technical chapters of the EIS have described the No-Action Alternative as the "Future Without the Proposed Action." The significant adverse impacts anticipated for the Proposed Action would not occur with the No-Action Alternative. However, the No-Action Alternative would not meet the needs and goals of the Proposed Action and the benefits expected from the proposed Campus Security Plan would not be realized. The WTC Campus has been the target of two terrorist attacks in the past, and these types of attacks remain a threat to the WTC site in the future. Therefore, implementation of the

No-Action Alternative would not be feasible as it would not provide the security measures needed to prevent potential future attacks.

No Unmitigated Significant Adverse Impact Alternative

The No Unmitigated Significant Adverse Impact Alternative examines a scenario in which components of the Proposed Action are changed specifically to avoid the unmitigated significant adverse impacts associated with the Proposed Action.

The Proposed Action would result in unmitigated significant adverse traffic impacts at four intersections during the AM peak hour, three intersections during the midday peak hour, two intersections during the PM peak hour and one intersection during the Saturday midday peak hour. The specific lane groups with unmitigated significant impacts in each peak hour would include the following:

AM Peak Hour

- Fulton Street at Church Street – westbound right turn;
- Chambers Street at Route 9A – Eastbound approach and westbound left-through lane group;
- Route 9A at Murray Street – eastbound left-turn, westbound approach and northbound through-right lane group; and
- Route 9A at Liberty Street – northbound through-right lane group.

Midday Peak Hour

- Chambers Street at Broadway – eastbound approach;
- Fulton Street at Church Street – westbound approach; and
- Murray Street at Route 9A – eastbound left turn and westbound approach.

PM Peak Hour

- Fulton Street at Church Street – westbound approach; and
- Route 9A at Liberty Street – southbound through-right lane group.

Saturday Midday Peak Hour

- Fulton Street at Church Street – westbound approach.

The Proposed Action's significant traffic impacts are generally a consequence of the redistribution of traffic associated with the closures of various street segments within the WTC Campus to unscreened traffic, and the installation of a median along Church Street and curbside credentialing lanes on the perimeter of the Campus. These features are integral to providing the level of security deemed necessary to safeguard the WTC Campus, and the need to maintain traffic flow capacity to the greatest extent possible was considered in their design. Modifying the scale or the design of the proposed security measures to eliminate all of the unmitigated significant adverse traffic impacts would therefore not be practicable, as such modifications would likely compromise the Proposed Action's ability to provide the needed level of security. Consequently, the No Unmitigated Significant Adverse Impacts Alternative is not a practicable alternative to the Proposed Action as it would fail to meet the objective of protecting the WTC site against vehicle-borne threats.

Unrestricted Liberty Street Alternative

Under this alternative, the vehicle restrictions proposed in conjunction with the Proposed Action would be modified to allow unscreened traffic to flow east-west on Liberty Street with no security controls. This would provide an additional east-west route in Lower Manhattan.

This proposed alternative was reviewed and evaluated by NYPD's Counter Terrorism Bureau and it was determined that this alternative would not allow sufficient protection for the WTC Campus. This proposed alternative would allow all types of vehicles onto Liberty Street and there would be no feasible way to mitigate against a possible threat with the stand-off distance that would be available under this alternative. As this stand-off distance would be reduced to an unsafe level, this alternative would not reach the objectives of the NYPD's Counter Terrorism Bureau to protect the WTC Campus, an area that is considered a potential terrorist target. This alternative would allow unrestricted vehicular access to the VSC entry point via Liberty Street, eliminating a layer of security for vulnerable areas of the WTC Campus. The Unrestricted Liberty Street Alternative, while improving traffic flow, is not feasible as it would not meet the security goals and objectives of the Proposed Action.

The following provides a more detailed review and evaluation of each of these three alternatives, including detailed analyses as appropriate.

C. NO-ACTION ALTERNATIVE

The No-Action Alternative assumes that the proposed WTC Campus Security Plan would not be implemented. However, Vesey Street and Fulton Street between Greenwich Street and West Street/Route 9A would operate as managed streets, as shown in **Figure 1-6** and **Figure 1-7**, from Chapter 1, "Project Description." The other entry/exit security checkpoints that are proposed around the WTC Campus and the secure lane on Trinity Place/Church Street would not be constructed. All No-Action conditions are described in Chapters 2 through 15 in the "Future Without the Proposed Action" section and described below.

Land Use, Zoning, and Public Policy

The No-Action Alternative would not result in any significant adverse impacts to land use, zoning, or public policy. Under the No-Action Alternative, it is anticipated that the WTC site would be fully developed and occupied. The current program for the WTC Campus includes the National September 11th Memorial and Museum, approximately 8.5 million square feet of office space, approximately 441,000 square feet of retail space, a 1,000-seat performance space, an approximately 290,000 square-foot Memorial Center, approximately 14,000 square feet of restaurant/café uses, and an underground parking garage consisting of up to approximately 500 parking spaces for autos and 67 bus parking spaces. The WTC PATH terminal would be constructed and operational. Additionally, the VSC would be operational and would be used for screening of all vehicles that seek access into the below grade parking garage and loading areas.

Existing land uses at the periphery of the Project Site are anticipated to remain unchanged under the No-Action Alternative through 2019 and it is anticipated that the Study Area would remain a vibrant, mixed-use community with one of the largest central business districts in the U.S. The Study Area is expected to experience growth in commercial, office, retail, residential, hotel, and community facility uses, consistent with existing land use trends, zoning, and public policy. There are no zoning or public policy changes anticipated for the Study Area.

Socioeconomic Conditions

The No-Action Alternative would not result in any significant adverse impacts to socioeconomic conditions. Under the No-Action Alternative, the WTC site would be fully developed. The development of the WTC site is expected to result in approximately 33,000 additional workers in the Project Site.

Under the No-Action Alternative, development would occur on all of the No-Action development sites in the Study Area, resulting in a total of seven hotels, seven residential buildings, one hotel/residential building, and two community facilities. These developments would result in approximately 2,886 additional workers in the area, approximately 2,324 new residents, and an additional 1,523 hotel rooms.

The following summarizes the potential socioeconomic effects of the No-Action Alternative for the applicable issues of socioeconomic concern under the *CEQR.*

The No-Action Alternative would not result in significant adverse impacts due to direct residential displacement, would not result in significant adverse impacts due to direct business displacement, and is not expected to have a significant adverse indirect residential displacement impact.

Indirect Business Displacement

The No-Action Alternative is not expected to cause significant adverse impacts due to indirect business displacement in the Project Site or Study Area. The No-Action Alternative would not introduce new economic activities that would substantially alter existing land uses or economic patterns in the Study Area. The Study Area already has prominent and well-established commercial and institutional uses, and the No-Action Alternative would not substantially alter commercial real estate trends in the area. As detailed in **Table 2-2** in Chapter 2, "Land Use, Zoning, and Public Policy," the No-Action Alternative would introduce over 660,000 square feet of retail, over 7.28 million square feet of other commercial uses, and over 690,000 square feet of community facility space, in addition to over 2,000 hotel rooms and over 1,900 residential dwelling units in the Study Area by 2019.

Adverse Effects on Specific Industries

The No-Action Alternative would not have a significant adverse impact on any of the City's economic sectors. A significant adverse impact on a specific industry would generally occur only in the case of a regulatory change affecting the City as a whole or in the case of a local action that affects an area in which a substantial portion of that sector is concentrated, relative to the City as a whole. The No-Action Alternative would not introduce new land uses or economic activities, nor would it affect citywide policy or regulatory mechanisms that could alter existing conditions. Any businesses that could be indirectly displaced as a result of the No-Action Alternative conduct a variety of business activities and do not have strong linkages to the local economy. Therefore, they would not be critical to the continued viability of other nearby businesses or any City industries, because the land use changes would follow existing trends rather than initiate or accelerate such trends.

Community Facilities

New York City Fire Department

With the established street network and elimination of lane closures related to current WTC construction activities, it is anticipated that FDNY access in the area would be improved under

anticipated 2019 No-Action conditions. As such, FDNY response times would likely improve as compared to existing conditions. FDNY does not anticipate any changes to stations, equipment, or operations by 2019 in the future without the Proposed Action. Typically, FDNY continually evaluates the extent to which it provides sufficient protection, and makes changes as necessary.

New York City Police Department

With the established street network and elimination of lane closures related to current WTC reconstruction activities, NYPD access in the area would also be improved under anticipated 2019 No-Action conditions. The NYPD WTC Command is responsible for the WTC Site. It was created in 2011 from other existing units within the Department. The unit is currently staffed by approximately 215 officers (including supervisors), though this number is expected to grow to 630 as warranted by construction progress (as buildings open to occupancy and streets open necessitating vehicle screening). NYPD will have a permanent command facility for WTC Command within or adjacent to WTC Campus. Therefore, as a result of improved accessibility and increased NYPD staffing levels within the WTC site, it is anticipated that NYPD response times would improve as compared to existing conditions. Further, NYPD also regularly reviews its service and makes adjustments to respond to increases in demand for services.

Port Authority Police Department

Under the No-Action Alternative, PAPD will have personnel present on site in its assigned areas of responsibility (at the PATH Hub, VSC, below ground roadway network, retail spaces). A new PAPD WTC command facility will be constructed on the WTC site. However, PAPD will continue to work with NYPD in the future to respond jointly to emergency calls.

PAPD bases staffing on its ability to respond to calls within the area it is expected to serve. The PAPD continually evaluates its ability to provide sufficient service, and changes its staffing and operations as necessary. As such, it is anticipated that PAPD would continue to have adequate staffing to respond to emergencies.

In addition to PAPD patrols, future tenants of the buildings on the project site would provide private security personnel. The cultural facilities, Memorial, and the Memorial Center would also likely employ security personnel.

Health Care Facilities

With the re-established street network south along Greenwich Street and east-west along Liberty Street, and the elimination of lane closures related to current WTC reconstruction activities, access to area health care facilities would be improved under anticipated 2019 No-Action conditions versus existing conditions. New York Downtown Hospital, located immediately northeast of the Study Area, is the closest hospital to the Project Site and Study Area. Therefore, it is most likely to be used by people who live in, work in, and visit the Project Site and Study Area. However, no impacts are anticipated on area health care facilities under the No-Action Alternative.

Other Community Facilities

With the re-established street network south along Greenwich Street and east-west along Liberty Street, and the elimination of lane closures related to WTC reconstruction activities, access to other area community facilities would be improved under anticipated 2019 No-Action conditions. As detailed in **Table 4-2** from Chapter 4, "Community Facilities," 19 schools, eight preschool/daycare facilities, two libraries, and five medical service programs are located within the Study Area.

However, the new worker population added to the area in the No-Action Alternative is not expected to place significant new demand on schools or the other community facilities.

Cultural Resources

Under the No-Action Alternative, there would be no significant adverse impacts to cultural resources. Although there are many No-Action construction projects anticipated in the Project Site and Study Area, there would be no underground disturbances to archaeological resources, and architectural resources would be protected through DOB controls over construction activities.

Urban Design and Visual Resources

Natural Features, Street Patterns & Block Shapes

Under the No-Action Alternative, there would not be any changes to topography or natural features in the Project Site or Study Area. Within the Project Site, it is anticipated that the WTC Campus would be fully developed, with Greenwich Street open to through-traffic except for the privately-controlled portion between Barclay and Vesey Streets. Vesey and Fulton Streets would become secure zones with controlled vehicle access between Greenwich Street and West Street/Route 9A. In the area south of the WTC site, Washington Street would be closed between Liberty and Cedar Streets.

Within the Project Site, the planned alignment of Fulton and Greenwich Streets would divide the Project Site into four irregularly shaped quadrants. The new blocks would be larger than the surrounding blocks and would extend the street grid to the west. Street patterns and block shapes in the broader Study Area would not be changed under the No-Action Alternative.

Streetscape

In the Project Site under the No-Action Alternative, additional retail frontage is proposed at street level in all of the planned WTC office buildings except for 1 WTC. These commercial office and retail uses would increase pedestrian traffic to this part of Lower Manhattan. Another streetscape element planned under the No-Action Alternative is the metallic bollards that would be placed at the curb line throughout the WTC Campus, separating the pedestrian sidewalk from the street.

The redesign of 1 WTC in 2005 included a requirement that unscreened vehicles would be prohibited from portions of Vesey and Fulton Street between Greenwich Street and West Street/Route 9A. This requirement is integral to the security engineering design of this building. The Port Authority has never publicly released details which describe how the management of these streets would be accomplished, so, for the purpose of describing the No-Action condition it has been assumed that standard, commonly used vehicle checkpoint design would be used. This includes the installation of sally ports with personnel booths and operable barriers. It is assumed that two sally ports would be located on both Fulton and Greenwich Streets, one immediately east of West Street/Route 9A and the second west of Greenwich Street, to create managed streets, and an additional operable barrier would be installed on the Washington Street approach to Vesey Street to control access from the north.

Liberty Park would be constructed just south of the WTC Site on the block bounded by West Street/Route 9A, Liberty, Greenwich, and Cedar Streets. It would provide a new open space above the planned VSC. The existing pedestrian bridge over West Street/Route 9A would be upgraded and extended onto the elevated park, which would serve as a connection to the green esplanade of BPC.

Several streetscape changes are anticipated in subareas of the Study Area. In the area North of the WTC Campus, the Broadway Corridor, and the Greenwich South Corridor, a number of planned No-

Action developments are expected to be completed, modifying the streetscape by filling voids in the street wall. Several infrastructure improvement projects are also expected to occur in these subareas by 2019.

Building Uses, Shapes & Forms

Under the No-Action Alternative, it is anticipated that construction of Towers 1 through 4, the National September 11th Memorial and Museum, the PAC, and the WTC PATH Hub would be complete. 1 WTC would be the tallest of the structures, at 104 stories. Additionally, an 88-story office building (2 WTC) would be in the northeast quadrant, and a 71-story office building (3 WTC) and 72-story office building (4 WTC) would be in the southeast quadrant. The height and design of the buildings would be in keeping with the trend of modern development in the Project Site and Study Area. The PAC would be located on the northern area of the WTC site, at the location currently occupied by the temporary PATH station. The new PATH Hub would be located along Church Street, between 2 WTC and 3 WTC. The planned buildings on the WTC site would circle the WTC Memorial on the north, east, and south sides.

On the southernmost portion of the Project Site, between Liberty and Cedar Streets, the VSC would contain screening activities for all buses, trucks and cars entering the WTC Campus. The VSC would provide access for all delivery and service vehicles and would include access to the below-grade parking. Vehicular access to the VSC would be via a ramp on Liberty Street, east of West Street/Route 9A. Additionally, St. Nicholas Greek Orthodox Church would be reconstructed at 130 Liberty Street by 2019.

Several new high-rise developments would also be constructed in the subareas, as described in detail in Chapter 2, "Land Use, Zoning, and Public Policy."

Visual Resources and View Corridors

Four new major WTC towers are expected to be complete under No-Action conditions, with 1 WTC serving as an important visual resource for miles. The WTC Memorial and Liberty Park would also be visual amenities for Lower Manhattan residents, workers, and visitors. The Santiago Calatrava-designed PATH Hub would be a unique visual resource in the area. The Art Deco Barclay-Vesey Building and the Classical Revival/Art Deco Federal Office Building/U.S. Post Office would also continue to serve as important visual resources in the area.

With the extension of Fulton and Greenwich Streets and the removal of the construction equipment currently surrounding the Project Site, new view corridors would be created, improving visual connection across the entire WTC Campus. Although the new tall modern towers would block some existing views across the Project Site, the towers would be a visual resource in and of themselves, and views of these visual resources are available from most locations within the Study Area.

Under the No-Action Alternative, the view corridor up and down Greenwich Street would be opened, and Washington Street, while closed to vehicular traffic between Cedar and Liberty Streets, would offer a view corridor of the park and the central buildings around the WTC Memorial.

Hazardous Materials

Under the No-Action Alternative, construction activities would continue throughout the WTC Campus and in the immediate vicinity. As some of the street and sidewalk locations at the periphery of the site that would be disturbed under With-Action conditions would not be disturbed under No-Action conditions, there would be less potential for soil disturbance.

Any soil disturbance related to WTC reconstruction would be conducted in accordance with health and safety measures determined by the WTC Memorial and Redevelopment Plan FGEIS (Lower Manhattan Development Corporation, April 2004) as well as legal requirements, including but not limited to requirements for disposal of chemicals or other wastes, NYSDEC regulations relating to removal of unused petroleum tanks along with any associated contaminated soil, and handling and disposal of ACM, lead-based paint and PCBs. As such, no hazardous material impacts are anticipated under No-Action conditions.

Transportation

Under the No-Action Alternative, it is assumed that towers 1 through 4 and the retail space at the WTC site would be completed and fully occupied, that the Vehicular Security Center on Liberty Street and the permanent WTC PATH terminal would be completed and operational, that the reconstruction of Route 9A would be completed, and that the site plan and vehicle circulation system for the WTC site shown in **Figure 8-7** in Chapter 8, "Transportation," would be implemented, including limited security measures around Tower 1. Measures associated with the proposed Campus Security Plan would not be implemented.

Traffic

With the exception of the portions of Fulton and Vesey Streets adjacent to Tower 1 which would be restricted to screened vehicles only, vehicular access to and within the WTC site would be open to general traffic under the No-Action Alternative. Consequently, there would be some redistribution of background traffic to the newly-opened or reopened streets from other study area corridors. Traffic diversions associated with the Proposed Action would not occur.

Overall study area traffic volumes would increase under the No-Action Alternative as a result of general background growth and future developments in the area, as well as demand from new development at the WTC site expected by 2019. Background growth plus No-Action developments in the vicinity of the WTC site by 2019 are expected to increase study area traffic by approximately 5.8 percent in the weekday AM peak hour and from 7.5 to 8.0 percent in the other analyzed peak hours versus existing conditions. In addition, new demand from development at the WTC site is expected to add a total of 479, 659, 692 and 349 auto trips, 932, 942, 1,272 and 614 for-hire vehicle trips (taxi and black car combined), 9, 46, 29 and 61 tour bus trips, and 82, 90, 36 and 20 truck trips during the weekday AM, midday, PM and Saturday midday peak hours, respectively.

With the changes to the street system and new demand anticipated under the No-Action Alternative, some intersections congested under existing conditions would worsen, and there would be additional locations that would become congested in one or more peak hours by 2019. In addition, conditions would improve at several intersections as a result of traffic diversions associated with the opening of the new street linkages through the WTC site as well as completion of the reconstruction of Route 9A.

As shown in **Table 16-1**, it is expected that five analyzed intersections would operate at LOS E or F and four would operate at a marginally acceptable LOS D under the No-Action Alternative. This compares to five intersections operating at LOS D and one at LOS E under existing conditions. Twenty-five individual lane groups out of the approximately 146 such lane groups analyzed would operate at LOS E or F in the AM peak hour in the No-Action compared to 17 under existing conditions.

In the weekday midday peak hour, two analyzed intersections would operate at LOS D, and five at LOS E or F under the No-Action Alternative compared to three intersections operating at LOS D and

one at LOS F under existing conditions. Sixteen of the approximately 146 individual lane groups analyzed are expected to operate at LOS E or F in the midday peak hour in the No-Action, compared to eight under existing conditions.

In the weekday PM peak hour, eight analyzed intersections would operate at LOS E or LOS F and four at a marginally acceptable LOS D under the No-Action Alternative. This compares to two intersections operating at LOS E or F and three at LOS D in the PM under existing conditions. Twenty-four individual lane groups out of the approximately 146 such lane groups analyzed would operate at LOS E or F in the PM peak hour in the No-Action compared to 11 under existing conditions.

Lastly, in the Saturday midday peak hour, two analyzed intersections would operate at LOS D, and three at LOS E or F under the No-Action Alternative, compared to none operating at LOS D, E or F under existing conditions. Nine individual lane groups of the approximately 37 such lane groups analyzed would operate at LOS E or F in the Saturday midday peak hour in the No-Action compared to none under existing conditions.

Table 16-1
Intersection Level of Service Summary Comparison:
Existing Conditions vs. No-Action Alternative

	Existing				No-Action			
	AM	**Midday**	**PM**	**Saturday Midday**	**AM**	**Midday**	**PM**	**Saturday Midday**
Overall LOS A/B/C	34	36	35	11	32	34	29	7
Overall LOS D	5	3	3	0	4	2	4	2
Overall LOS E	1	0	1	0	2	3	5	1
Overall LOS F	0	1	1	0	3	2	3	2
Total lane groups at LOS E or F (of approximately 131/27 lane groups analyzed in the existing condition and 142/37 in the No-Action for the weekday/Saturday periods)	17	8	11	0	25	16	24	9
No. of lane groups at LOS E or F at Route 9A intersections	16	6	10	0	20	10	18	3
No. of lane groups at LOS E or F within the Downtown street grid	1	2	1	0	5	6	6	6

Notes:
Route 9A/Carlisle Street intersection analyzed as part of the in the Route 9A/Albany Street intersection in the No-Action condition.

Transit

Under the No-Action Alternative, demand for transit service in lower Manhattan is expected to increase as a result of background growth and demand from new development at the World Trade Center and other sites in the vicinity. As shown in **Table 8-8** in Chapter 8, "Transportation," development at the WTC site is anticipated to add approximately 369 new local bus trips (in and out combined) in the weekday AM peak hour, 978 in the midday, 815 in the PM, and 636 in the Saturday midday peak hour. New trips by express bus would total approximately 1,153, 153, 1,328, and 38 during these same periods, respectively. Tour bus trips generated primarily by the National September 11th Memorial, Memorial Center, and Tower 1 viewing platform are expected to total approximately 287, 1,513, 958, and 2,015, respectively.

As standard practice, NYC Transit and MTA Bus routinely conduct periodic ridership counts and increase service where operationally warranted and fiscally feasible. It is therefore anticipated that bus service frequency would be increased to address any shortfalls in capacity under the No-Action Alternative.

Under the No-Action Alternative, it is expected that the WTC Transit Hub would be completed and operational and the temporary PATH entrance on Vesey Street would be closed. It is also expected that the Cortlandt Street (1) subway station will reopen at Greenwich and Cortlandt Streets.

Pedestrians

Under the No-Action Alternative, developments within and around the WTC site would be completed, resulting in both physical changes to the pedestrian network and changes to pedestrian flow patterns, as detailed in Chapter 8, "Transportation." Primary among these would be the opening of the underground concourse through the WTC site. With below-grade connections to all new office and retail developments, the Transit Hub, and all area subway stations, much of the new pedestrian demand at the WTC site as well as many existing pedestrian trips are expected to use this concourse and would therefore not occur on sidewalks and crosswalks at street-level. With the closure of the temporary PATH entrance on Vesey Street, pedestrian flows along the Vesey Street corridor would also likely be lower compared to current levels.

As shown in **Table 8-8** in Chapter 8, "Transportation," it is anticipated that the current development program at the WTC site would generate a net total of 21,929, 35,442, 31,173 and 17,572 person trips (in and out combined) during the weekday AM, midday and PM and Saturday midday peak hours, respectively, under the No-Action Alternative. These include 5,294, 24,429, 8,246 and 9,202 walk-only trips per hour in each period, respectively, and 14,826, 7,140, 19,406 and 4,724 trips per hour, respectively, en route to and from area transit facilities (the Transit Hub, subway stations, bus stops and ferry terminals). There would also be additional pedestrian demand from new development outside of the WTC site as well as from general background growth.

As shown in **Tables 8-23 through 8-25** in Chapter 8, four analyzed sidewalks are expected to operate at a congested LOS E or F in one or more peak hours under the No-Action Alternative compared to one under existing conditions. All three analyzed corner areas are expected to operate at LOS D or better in all peak hours under the No-Action Alternative compared to one at LOS E or F (and one closed) under existing conditions, while four crosswalks would operate at LOS E or F in one or more periods compared to two under existing conditions. (All other analyzed crosswalks are currently closed due to construction at the WTC site.)

Parking

Under the No-Action Alternative, demand at off-street public parking facilities in proximity to the WTC site is expected to increase as a result of the redevelopment of the World Trade Center, other new developments in the vicinity, and general background growth. The off-street public parking supply at the WTC site would total up to approximately 500 spaces for autos and 67 spaces for tour buses in a below-grade facility with access via the Vehicular Security Center on Liberty Street. It is not expected that on-street parking would be allowed along new or reopened streets within the WTC Campus. As there is relatively limited on-street parking in lower Manhattan, most, if not all of the WTC parking demand not accommodated on-site is expected to utilize off-street public parking facilities in the vicinity. Parking demand generated by other new developments not otherwise accommodated in accessory parking facilities is also expected to utilize off-street public parking.

Air Quality/Greenhouse Gas Emissions

In the future No-Action condition, construction would continue throughout various areas of the WTC site through 2019. Additionally, certain changes will occur that will affect air quality in the study area. In general, some growth is expected, increasing both local and through traffic. In addition, the WTC site will be operational, generating new stationary source emissions and traffic in the region as compared to existing conditions. However, no air quality or green house gas impacts would be anticipated under future No-Action conditions as various environmental performance commitments (EPCs) that have been developed for the site in conjunction with previous environmental assessments would help to minimize air quality impacts.

Noise

In the future No-Action condition, construction would continue throughout various areas of the WTC site through 2019. Additionally, certain changes will occur that will add new noise sources in the study area, including increased traffic volumes. However, no noise impacts would be anticipated under future No-Action conditions as the EPCs that have been developed for the site would help to minimize noise impacts.

Public Health

Based on the available information from the previously completed environmental assessment documents that have been prepared for the WTC site, mechanisms have been implemented to ensure public health during the reconstruction of the WTC site. In addition to the commitments made in the previous environmental assessments and environmental impact statements that have been conducted for the site, EPCs have been created for the WTC site and many local developments in Lower Manhattan to ensure that conditions are monitored to avoid public health concerns. As such, no public health impacts would be anticipated under No-Action conditions by 2019.

Neighborhood Character

In the future without the Proposed Action, the Project Site would be fully developed with commercial and community facility buildings, open space, and the new PATH Hub. The addition of approximately 8.5 million square feet of office space on the WTC site would enhance Lower Manhattan's status as one of the largest CBDs in the U.S. The full build-out of the site would alter the character of the neighborhood.

As described in detail throughout the EIS, the street system on the WTC Campus would be restored, though Vesey and Fulton Street would operate as managed streets from Greenwich Street to West Street/Route 9A and Greenwich Street would operate as a cul-de-sac from Barclay Street to Vesey Street, providing private access for 7 WTC. With the completion of WTC development, it is anticipated that both Church Street and West Street/Route 9A would be fully reopened.

In the No-Action Alternative, each block of the WTC Campus will include a line of metallic bollards near the edge of the curb as part of the WTC District streetscape. This is a security feature that has become more commonplace throughout the City in recent years.

Several plazas are planned throughout the WTC site, including around 1 WTC and 2 WTC. Additionally, the continuation of Dey Street and Cortlandt Street (between Greenwich Street and Church Street) would be pedestrian corridors. Finally, Liberty Park is a new open space that is planned above the VSC on the block bounded by Liberty Street to the north, Greenwich Street to the east, Cedar Street to the south and West Street/Route 9A to the west.

In addition to the worker population anticipated in conjunction with the planned WTC buildings, the site would serve thousands of daily commuters in the PATH Terminal, shoppers and restaurant patrons, and tourists who would visit the site in the No-Action Alternative. The PAC, the Memorial and Memorial Center, and Liberty Park would also draw people to the WTC site.

Construction

The potential construction impacts due to the WTC redevelopment have been disclosed in previous environmental review documents. Construction activities are ongoing throughout much of the WTC Campus, along West Street/Route 9A, and at many other sites in the vicinity of the WTC Campus. By the end of 2019, all of the WTC buildings are expected to be occupied. In addition to the commitments made in the previous environmental assessments and environmental impact statements that have been conducted for the site, EPCs have been created for the WTC site and many local developments in Lower Manhattan to ensure that conditions are monitored to avoid impacts due to construction.

Environmental Justice

Under No-Action conditions, there would be no impacts to environmental justice as no impacts are anticipated on minority or low-income communities.

Conclusion

In the No-Action Alternative, a variety of mitigation measures or EPCs have been proposed to address impacts related to planned developments on the WTC site and in the vicinity of the WTC Campus. Additionally, LMCCC has been tasked with coordinating projects in Lower Manhattan to reduce potential impacts on existing and planned uses.

D. NO UNMITIGATED SIGNIFICANT ADVERSE IMPACTS ALTERATIVE

According to the 2012 *CEQR Technical Manual*, when a proposed project would result in significant adverse impacts that cannot be mitigated, it is often CEQR practice to include an assessment of an alternative to the proposed project that would result in no unmitigated impacts. This alterative typically demonstrates the types of changes in the scale or design of a proposed project that would be needed to eliminate all of the proposed project's unmitigated impacts.

As discussed in detail in previous chapters of this EIS, the proposed WTC Campus Security Plan is a comprehensive perimeter vehicle security plan for the World Trade Center site to protect against vehicle-borne explosive devices while ensuring an open environment that is hospitable to remembrance, culture, and commerce. The Proposed Action has been designed to provide the level of security deemed necessary to safeguard the WTC Campus while at the same time providing for needed vehicular and pedestrian access to, from and within the site.

As discussed in Chapter 15, "Mitigation," the Proposed Action would result in significant adverse traffic and pedestrian impacts. One or more lane groups at a total of 17 intersections in the weekday AM peak hour, 10 in the midday, 13 in the PM and three in the Saturday midday peak hour would be significantly impacted, as would two sidewalks and three crosswalks in one or more peak hours. The majority of the traffic impacts and all of the pedestrian impacts could be fully mitigated through standard mitigation measures such as modifications to traffic signal timing/phasing, lane restriping, changes to parking regulations, and sidewalk and crosswalk widenings. However, practicable mitigation measures could not be identified for seven of the significant traffic impacts in the AM peak

hour, four in the midday, two in the PM and one in the Saturday midday. Therefore, based on *CEQR Technical Manual* criteria, the Proposed Action would result in unmitigated significant adverse traffic impacts.

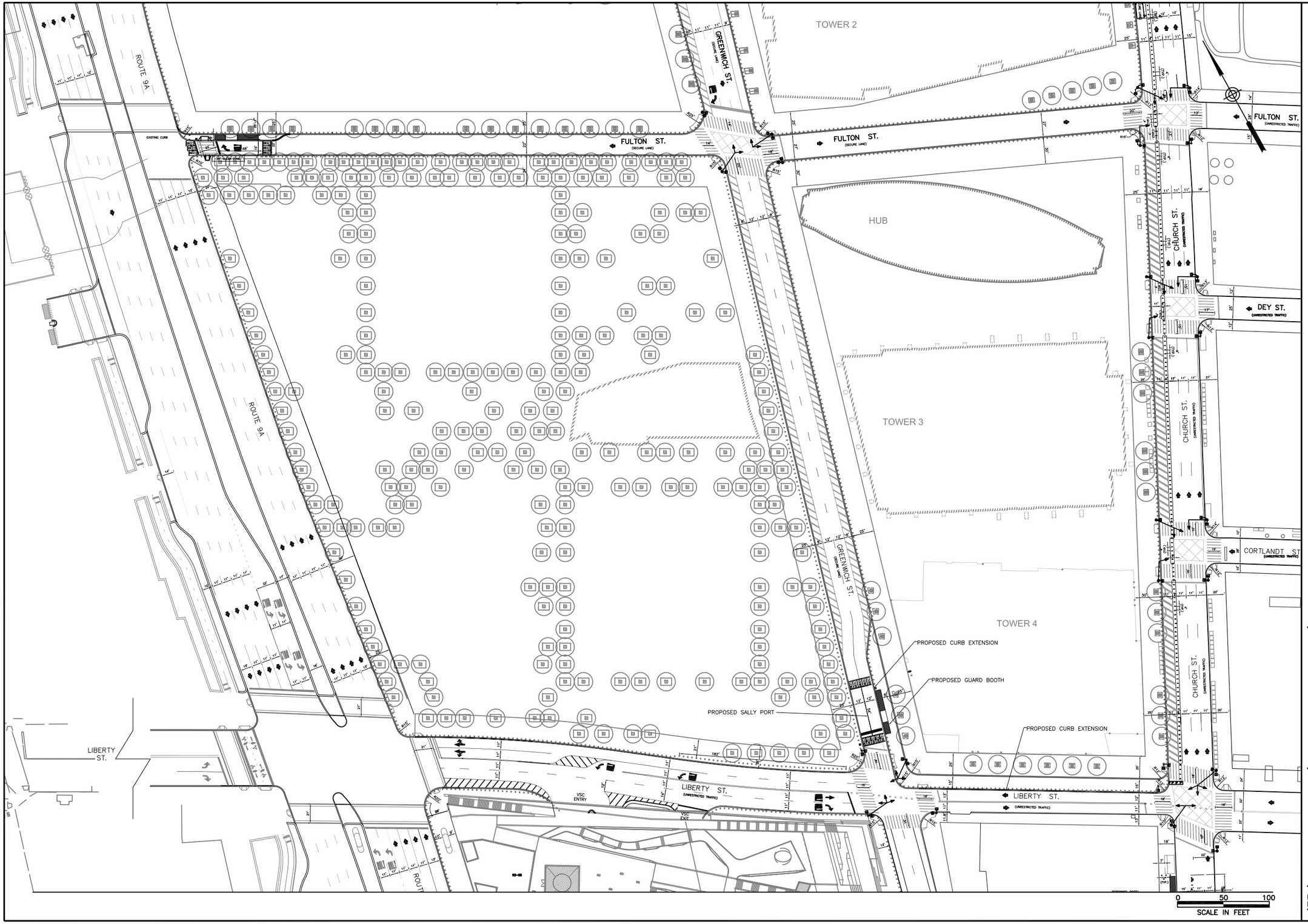
The Proposed Action's significant traffic impacts are generally a consequence of the redistribution of traffic associated with the closures of various street segments within the WTC Campus to unscreened traffic, and the installation of a median along Church Street and curbside credentialing lanes on the perimeter of the Campus. These features are integral to providing the level of security deemed necessary to safeguard the WTC Campus, and the need to maintain traffic flow capacity to the greatest extent possible was considered in their design. Modifying the scale or the design of the proposed security measures to eliminate all of the unmitigated significant adverse traffic impacts would therefore not be practicable, as such modifications would likely compromise the Proposed Action's ability to provide the needed level of security. Consequently, the No Unmitigated Significant Adverse Impacts Alternative is not a practicable alternative to the Proposed Action as it would fail to meet the objective of protecting the WTC site against vehicle-borne threats.

E. UNRESTRICTED LIBERTY STREET ALTERNATIVE

As discussed in previous chapters of this EIS, under the Proposed Action, Liberty Street would be closed to general vehicular traffic between Church Street and Route 9A. Credentialing zones would be established on Route 9A along the two southbound left-turn lanes and the northbound curb lane approaching Liberty Street for tenant autos and delivery vehicles en route to the Vehicular Security Center. In addition, both Fulton Street and Vesey Street would be closed to general traffic adjacent to Tower 1 in the No-Action condition. An alternative under which Liberty Street would be the southern edge of the Campus and would remain open to unrestricted traffic flow east-west between Church Street and Route 9A was therefore evaluated as a means of providing an additional crosstown vehicular travel corridor and reducing the Proposed Action's potential effects on other east-west corridors as well as on Route 9A.

As shown in **Figure 16-1**, under the Unrestricted Liberty Street Alternative, Liberty Street would remain open to unrestricted vehicular traffic flow between Church Street and Route 9A, with one to two travel lanes in each direction. There would be no barriers or sally ports along this street segment as there would be under the Proposed Action, and the credentialing lanes along Route 9A would be eliminated. The sally port on Greenwich Street would be relocated from south of Liberty Street to north of Liberty Street, and the sally port and credentialing lane along Trinity Place would also be eliminated. Adjacent to Tower 4, the north sidewalk along Liberty Street would be extended by 15 feet and the east sidewalk along Greenwich Street would be extended by 18 feet to provide additional standoff distance. The median and secure lane proposed under With-Action conditions along Church Street would remain; however, this lane would be primarily used as a pedestrian zone/emergency access lane south of Fulton Street and north of Liberty Street. North of Fulton Street the secure lane would be used for vehicular circulation, as it would under the Proposed Action.

Under the Unrestricted Liberty Street Alternative, autos and delivery vehicles en route to the VSC entrance on Liberty Street could approach from both the east and west, and all credentialing would take place within the VSC rather than on Route 9A. Tour buses would no longer need to be credentialed and screened along Trinity Place prior to discharging their passengers and entering the VSC. (The north curb lane along Liberty Street between Route 9A and Greenwich Street would likely be used for tour bus pick-up and drop-off activity under this alternative, as it would under the Proposed Action.)



Drawing

SCHEMATIC CONCEPT PLAN FOR UNRESTRICTED LIBERTY ST.

Drawing Number FIGURE 16-1

The WTC Campus would remain closed to unscreened vehicles north of Liberty Street, and all authorized autos, taxis and black cars would enter the Campus via the security station at West Broadway (with the Washington Street security station available to accommodate overflow demand.) As under the Proposed Action, exiting vehicles would be accommodated at sally ports on Fulton Street and Vesey Street approaching Route 9A and on Church Street north of Vesey Street. Vehicles would also be able to exit the Campus via the relocated sally port on Greenwich Street at the southbound approach to Liberty Street.

Traffic flow patterns under the Unrestricted Liberty Street Alternative would differ from those under the Proposed Action. With Liberty Street available for unrestricted east-west traffic flow between Church Street and Route 9A, traffic volumes along this corridor are expected to be greater than under the Proposed Action, while volumes along other east-west corridors in the vicinity would likely be somewhat lower. Therefore, some of the Proposed Action's significant adverse traffic impacts along eastbound and westbound corridors such Chambers, Murray, Barclay, Cortlandt, and Rector Streets may not occur under this alternative. With the elimination of the credentialing lane along northbound Route 9A approaching Liberty Street, the Proposed Action's significant AM and PM peak hour impacts on this approach would also be less likely to occur under this alternative. However, with Liberty Street open to general traffic from Route 9A to Church Street, there would likely be greater numbers of vehicles turning onto Church Street from eastbound Liberty Street under this alternative, and therefore a somewhat greater potential for significant adverse traffic impacts due to the introduction of a median along this corridor. (There would also be a greater potential for pedestrian impacts to the analyzed north crosswalk on Church Street at Liberty Street as there would be increased numbers of conflicting turning vehicles.)

With unrestricted access to Greenwich Street from Liberty Street under this alternative, traffic volumes along Greenwich Street south of Liberty Street would likely be somewhat higher than under the Proposed Action, although not as high in the No-Action condition where Greenwich Street would function as an unrestricted southbound corridor through the WTC site.

Overall, the Proposed Action's unmitigated significant adverse impacts to eastbound and westbound approaches along Chambers and Murray Streets would be less likely to occur under the Unrestricted Liberty Street Alternative, as would the impacts to northbound and southbound Route 9A at Liberty Street. The significant adverse traffic impact to westbound Fulton Street at Church Street would likely remain, as much of the incremental traffic on this approach would be en route to and from Tower 1 or the West Broadway security station and would not utilize an unrestricted Liberty Street. There would also likely be an increased potential for significant adverse traffic impacts along Church Street north of Liberty Street. In addition, greater numbers of vehicles turning onto Church Street from eastbound Liberty Street would also likely increase the potential for significant adverse pedestrian impacts at the north crosswalk at this intersection compared to the Proposed Action.

The Unrestricted Liberty Street Alternative was evaluated by NYPD's Counter Terrorism Bureau with respect to achieving the objective of protecting the WTC site against vehicle-borne threats. It was determined that this alternative, by exposing the southern boundary of the WTC site (north and south sides of Liberty Street) to unrestricted vehicles, would likely not provide the level of security deemed necessary to safeguard the WTC Campus, as there would be no feasible way to mitigate against a possible threat with the stand-off distance that would be available. The Unrestricted Liberty Street Alternative is therefore not considered a practicable alternative to the Proposed Action as it would not meet the objective of protecting the WTC site against vehicle-borne threats.

A. INTRODUCTION

According to the 2012 *CEQR Technical Manual*, unavoidable significant adverse impacts occur when significant adverse impacts would be unavoidable if a project is implemented regardless of the mitigation employed (or if mitigation is not feasible or practical). As described in Chapter 15, "Mitigation" and as indicated below, traffic impacts have been identified in each analyzed peak period. It is anticipated that some of the traffic impacts would be unmitigated at several study area intersections. No other unavoidable adverse impacts are anticipated in any other technical areas analyzed in this EIS. The following analysis describes these unavoidable adverse traffic impacts.

B. TRAFFIC

As discussed in Chapter 8, "Transportation," there would be the potential for significant adverse impacts to one or more lane groups at a total of 17 intersections in the weekday AM peak hour, 10 in the midday, 13 in the PM and three in the Saturday midday peak hour and at two sidewalk locations and three crosswalk locations in one or more peak hours. The majority of the traffic impacts and all of the pedestrian impacts could be fully mitigated through standard mitigation measures such as modifications to traffic signal timing/phasing, lane restriping, changes to parking regulations, and sidewalk and crosswalk widenings. However, as described in detail in Chapter 15, "Mitigation," practicable mitigation measures could not be identified for seven of the significant traffic impacts in the AM peak hour, four in the midday, two in the PM and one in the Saturday midday, as described below:

Based on *CEQR Technical Manual* criteria, the following significant adverse impacts would remain unmitigated:

AM Peak Hour

- Fulton Street at Church Street – westbound right turn;
- Chambers Street at Route 9A – Eastbound approach and westbound left-through lane group;
- Route 9A at Murray Street – eastbound left-turn, westbound approach and northbound through-right lane group; and
- Route 9A at Liberty Street – northbound through-right lane group.

Midday Peak Hour

- Chambers Street at Broadway – eastbound approach;
- Fulton Street at Church Street – westbound approach; and
- Murray Street at Route 9A – eastbound left turn and westbound approach.

PM Peak Hour

- Fulton Street at Church Street – westbound approach; and
- Route 9A at Liberty Street – southbound through-right lane group.

Saturday Midday Peak Hour

- Fulton Street at Church Street – westbound approach.

As the Proposed Action is a security overlay, it would not be feasible to modify or scale down the project in a manner that would achieve the required level of security and also eliminate the unmitigated impacts, as described in Chapter 16, "Alternatives." The conclusion of the Alternatives chapter is that there are no alternatives which would eliminate or substantially reduce the traffic impacts while also meeting the security goals and objectives of the Proposed Action. Additional measures to further address all unmitigated significant adverse traffic impacts will be explored between the Draft and Final EIS. Absent the identification and implementation of such feasible and practicable measures, the Proposed Action could have unmitigated significant adverse traffic impacts at the locations identified above.

As set forth in the 2012 *CEQR Technical Manual*, growth-inducing aspects of a proposed action generally refer to "secondary" impacts of a proposed action that trigger further development. Proposals that add substantial new land use, new residents, or new employment could induce additional development of a similar kind or of support uses (e.g., stores to serve new residential uses). Actions that introduce or greatly expand infrastructure capacity (e.g., sewers, central water supply) might also induce growth.

The goal of the Proposed Action is to protect against vehicle-borne explosive devices while ensuring an open environment that is hospitable to remembrance, culture, and commerce. The Proposed Action bars unscreened vehicles from entering the WTC Campus and certain areas at the perimeter of the WTC Site and creates increased stand-off distances between unscreened vehicles and WTC buildings. A vehicle seeking to enter restricted areas would be subject to credentialing to determine whether entry is authorized and screening to ensure the vehicle does not contain dangerous material. The proposed security measures are intended to safeguard the WTC Campus while allowing access for screened vehicles.

As discussed in detail in Chapter 1, "Project Description," the Project Site is generally bounded by Barclay Street and Park Place on the north, Albany Street on the south, Trinity Place/Church Street on the east and West Street/Route 9A on the west. The perimeter of the WTC Campus would be secured through the installation of various types of vehicle interdiction devices under the control of the NYPD. These could include static and operable barriers and traffic lane delineators. Screening of all vehicles entering the WTC Campus would utilize both mechanical and manual processes, and would be facilitated through the use of sally ports which, as described previously, would consist of a personnel booth controlling a set of two operable barriers with sufficient space between them to accommodate a motor vehicle undergoing screening. An additional personnel booth would be installed at each credentialing location. The Proposed Action would be fully implemented by 2019. The environmental consequences of this growth are the subject of Chapters 2 through 17 of this EIS. No new residential or worker population would result from the Proposed Action as it is a security overlay that would be staffed by NYPD who would otherwise be working on the WTC Campus under No-Action conditions.

The Proposed Action would not result in more intensive land uses. However, it is expected that the enhanced safety measures would help to create a secure environment that would be supportive of existing and planned land uses on the WTC site. As stated in Chapter 3, "Socioeconomic Conditions," the Proposed Action would not introduce a new economic activity that would alter existing economic patterns within the study area. As the study area already has a well-established residential market under existing conditions and a critical mass of non-residential uses, including retail, office, hotel and community facility uses, the Proposed Action would not create the critical mass of uses or populations that would induce additional development. Moreover, the proposed WTC Campus Security Plan does not include the introduction of new infrastructure or an expansion of infrastructure capacity that would result in indirect residential or commercial development. Therefore, the Proposed Action would not induce significant new growth in the surrounding area.

This chapter addresses the Proposed Action's impacts on the loss of environmental resources, both in the immediate future and in the long-term. Resources, both natural and man-made, would be expended in the construction and operation of the Proposed Action. These resources include the building materials used during construction; energy in the form of gas and electricity consumed during construction and operation of the proposed security elements by various mechanical and processing systems; and the human effort required to construct and operate various elements of the Campus Security Plan. This chapter addresses the extent to which the Proposed Action forecloses future options or involves trade-offs between short-term environmental gains and long-term losses as well as trade-offs between short-term environmental losses and long-term benefits.

The Proposed Action is the implementation of a Campus Security Plan developed in response to the continued security concerns at the WTC site. The plan is intended to enhance public safety in and around the WTC Campus. As discussed in Chapter 1, "Project Description," the Proposed Action bars unscreened vehicles from entering the WTC Campus and certain areas at the perimeter of the WTC site and creates increased stand-off distances between unscreened vehicles and WTC buildings. This would occur through the implementation of sally ports with static and operable barriers as well as personnel booths.

The building materials, energy, and human efforts used to construct and operate the proposed WTC Campus Security Plan are considered irretrievably committed because their reuse for some other purpose would be highly unlikely. The security elements that would be implemented in the Proposed Action are intended to safeguard the WTC Campus while allowing access for screened vehicles. While their use would be considered a short-term environmental loss, they would produce long-term benefits in enhancing public safety in and around the WTC Campus. The use of public roadway and sidewalk space to accommodate these proposed security elements could be considered a resource loss, though these areas would continue to be shared with vehicular and pedestrian traffic, respectively. Further, funds committed to the design, construction, and operation of the proposed security elements under the Proposed Action would not be available for other projects. However, the use of these irretrievable resources is necessary in order to maintain a secure and safe environment in the WTC Campus.

Appendix A

WRP Consistency Assessment Form

For Internal Use Only:
Date Received: _____

WRP no._____
DOS no._____

NEW YORK CITY WATERFRONT REVITALIZATION PROGRAM
Consistency Assessment Form

Proposed actions that are subject to CEQR, ULURP or other local, state or federal discretionary review procedures, and that are within New York City's designated coastal zone, must be reviewed and assessed for their consistency with the *New York City Waterfront Revitalization Program (WRP)*. The WRP was adopted as a 197-a Plan by the Council of the City of New York on October 13, 1999, and subsequently approved by the New York State Department of State with the concurrence of the United States Department of Commerce pursuant to applicable state and federal law, including the Waterfront Revitalization of Coastal Areas and Inland Waterways Act. As a result of these approvals, state and federal discretionary actions within the city's coastal zone must be consistent to the maximum extent practicable with the WRP policies and the city must be given the opportunity to comment on all state and federal projects within its coastal zone.

This form is intended to assist an applicant in certifying that the proposed activity is consistent with the WRP. It should be completed when the local, state, or federal application is prepared. The completed form and accompanying information will be used by the New York State Department of State, other state agencies or the New York City Department of City Planning in their review of the applicant's certification of consistency.

A. APPLICANT

1. Name: New York City Police Department
2. Address: One Police Plaza, New York, NY 10038
3. Telephone: 646-610-4557 Fax:_____ E-mail: WTCEIS@nypd.org
4. Project site owner: City of New York

B. PROPOSED ACTIVITY

1. Brief description of activity:

The Proposed Action is the implementation of a comprehensive perimeter vehicle security plan for the World Trade Center (WTC) Site (the "Security Plan"). The Security Plan bars unscreened vehicles from entering the Site and certain areas at the perimeter of the Site and creates stand-off distances to guard against the risk of progressive collapse of buildings and other catastrophic damage to persons and property. A vehicle seeking to enter restricted areas would be subject to credentialing to determine whether entry is authorized and screening to ensure that the vehicle does not contain dangerous material. The creation of a Trusted Access Program, in which tenants, car services, taxis and delivery vans could enroll, is envisioned to expedite vehicle entry. The Vehicular Security Center planned in conjunction with the WTC development will control access to the WTC site's underground traffic network, loading docks, and parking areas. All vehicles parking or making deliveries at the site would be processed and screened at the VSC. As it is anticipated that demand for on-site delivery, tour bus and private occupancy vehicle parking will be considerable, it is expected that a management strategy including scheduling of tour buses and truck deliveries will be developed to ensure orderly and efficient operations.

2. Purpose of activity:

Now that the WTC Site is being rebuilt, new consideration is being given to increase on-site security. The Campus Security Plan is intended to protect against vehicle-borne explosive devices while ensuring an open environment that is hospitable to remembrance, culture, and commerce.

3. Location of activity: (street address/borough or site description):

The Proposed Action would be implemented in Lower Manhattan in the vicinity of the WTC Site. The Project Area includes all streets, sidewalks and buildings that would be directly affected by the installation of the Site's security infrastructure. This area is generally bounded by Barclay, West, Thames and Church streets.

Proposed Activity Cont'd

4. If a federal or state permit or license was issued or is required for the proposed activity, identify the permit type(s), the authorizing agency and provide the application or permit number(s), if known:

   N/A

5. Is federal or state funding being used to finance the project? If so, please identify the funding source(s).

   Department of Homeland Security (DHS)/FEMA – possible funding source.
   Port Authority of New York and New Jersey (PANYNJ) – possible funding source.

6. Will the proposed project require the preparation of an environmental impact statement?
   Yes _____✓_____ No _____ If yes, identify Lead Agency:

   New York City Police Department

7. Identify **city** discretionary actions, such as a zoning amendment or adoption of an urban renewal plan, required for the proposed project.

   Direct undertaking by the NYPD.

C. COASTAL ASSESSMENT

Location Questions:	**Yes**	**No**
1. Is the project site on the waterfront or at the water's edge?		✓
2. Does the proposed project require a waterfront site?		✓
3. Would the action result in a physical alteration to a waterfront site, including land along the shoreline, land underwater, or coastal waters?		✓

Policy Questions	**Yes**	**No**
The following questions represent, in a broad sense, the policies of the WRP. Numbers in parentheses after each question indicate the policy or policies addressed by the question. The new Waterfront Revitalization Program offers detailed explanations of the policies, including criteria for consistency determinations. Check either "Yes" or "No" for each of the following questions. For all "yes" responses, provide an attachment assessing the effects of the proposed activity on the relevant policies or standards. Explain how the action would be consistent with the goals of those policies and standards.		
4. Will the proposed project result in revitalization or redevelopment of a deteriorated or under-used waterfront site? (1)		✓
5. Is the project site appropriate for residential or commercial redevelopment? (1.1)	✓	
6. Will the action result in a change in scale or character of a neighborhood? (1.2)	✓	

Policy Questions cont'd	Yes	No
7. Will the proposed activity require provision of new public services or infrastructure in undeveloped or sparsely populated sections of the coastal area? (1.3)		✓
8. Is the action located in one of the designated Significant Maritime and Industrial Areas (SMIA): South Bronx, Newtown Creek, Brooklyn Navy Yard, Red Hook, Sunset Park, or Staten Island? (2)		✓
9. Are there any waterfront structures, such as piers, docks, bulkheads or wharves, located on the project sites? (2)		✓
10. Would the action involve the siting or construction of a facility essential to the generation or transmission of energy, or a natural gas facility, or would it develop new energy resources? (2.1)		✓
11. Does the action involve the siting of a working waterfront use outside of a SMIA? (2.2)		✓
12. Does the proposed project involve infrastructure improvement, such as construction or repair of piers, docks, or bulkheads? (2.3, 3.2)		✓
13. Would the action involve mining, dredging, or dredge disposal, or placement of dredged or fill materials in coastal waters? (2.3, 3.1, 4, 5.3, 6.3)		✓
14. Would the action be located in a commercial or recreational boating center, such as City Island, Sheepshead Bay or Great Kills or an area devoted to water-dependent transportation? (3)		✓
15. Would the proposed project have an adverse effect upon the land or water uses within a commercial or recreation boating center or water-dependent transportation center? (3.1)		✓
16. Would the proposed project create any conflicts between commercial and recreational boating? (3.2)		✓
17. Does the proposed project involve any boating activity that would have an impact on the aquatic environment or surrounding land and water uses? (3.3)		✓
18. Is the action located in one of the designated Special Natural Waterfront Areas (SNWA): Long Island Sound- East River, Jamaica Bay, or Northwest Staten Island? (4 and 9.2)		✓
19. Is the project site in or adjacent to a Significant Coastal Fish and Wildlife Habitat? (4.1)		✓
20. Is the site located within or adjacent to a Recognized Ecological Complex: South Shore of Staten Island or Riverdale Natural Area District? (4.1and 9.2)		✓
21. Would the action involve any activity in or near a tidal or freshwater wetland? (4.2)		✓
22. Does the project site contain a rare ecological community or would the proposed project affect a vulnerable plant, fish, or wildlife species? (4.3)		✓
23. Would the action have any effects on commercial or recreational use of fish resources? (4.4)		✓
24. Would the proposed project in any way affect the water quality classification of nearby waters or be unable to be consistent with that classification? (5)		✓
25. Would the action result in any direct or indirect discharges, including toxins, hazardous substances, or other pollutants, effluent, or waste, into any waterbody? (5.1)		✓
26. Would the action result in the draining of stormwater runoff or sewer overflows into coastal waters? (5.1)		✓
27. Will any activity associated with the project generate nonpoint source pollution? (5.2)		✓
28. Would the action cause violations of the National or State air quality standards? (5.2)		✓

Policy Questions cont'd	Yes	No
29. Would the action result in significant amounts of acid rain precursors (nitrates and sulfates)? (5.2C)		✓
30. Will the project involve the excavation or placing of fill in or near navigable waters, marshes, estuaries, tidal marshes or other wetlands? (5.3)		✓
31. Would the proposed action have any effects on surface or ground water supplies? (5.4)		✓
32. Would the action result in any activities within a federally designated flood hazard area or state-designated erosion hazards area? (6)		✓
33. Would the action result in any construction activities that would lead to erosion? (6)		✓
34. Would the action involve construction or reconstruction of a flood or erosion control structure? (6.1)		✓
35. Would the action involve any new or increased activity on or near any beach, dune, barrier island, or bluff? (6.1)		✓
36. Does the proposed project involve use of public funds for flood prevention or erosion control? (6.2)		✓
37. Would the proposed project affect a non-renewable source of sand ? (6.3)		✓
38. Would the action result in shipping, handling, or storing of solid wastes, hazardous materials, or other pollutants? (7)		✓
39. Would the action affect any sites that have been used as landfills? (7.1)		✓
40. Would the action result in development of a site that may contain contamination or that has a history of underground fuel tanks, oil spills, or other form or petroleum product use or storage? (7.2)		✓
41. Will the proposed activity result in any transport, storage, treatment, or disposal of solid wastes or hazardous materials, or the siting of a solid or hazardous waste facility? (7.3)		✓
42. Would the action result in a reduction of existing or required access to or along coastal waters, public access areas, or public parks or open spaces? (8)	✓	
43. Will the proposed project affect or be located in, on, or adjacent to any federal, state, or city park or other land in public ownership protected for open space preservation? (8)	✓	
44. Would the action result in the provision of open space without provision for its maintenance? (8.1)		✓
45. Would the action result in any development along the shoreline but NOT include new water-enhanced or water-dependent recreational space? (8.2)		✓
46. Will the proposed project impede visual access to coastal lands, waters and open space? (8.3)		✓
47. Does the proposed project involve publicly owned or acquired land that could accommodate waterfront open space or recreation? (8.4)		✓
48. Does the project site involve lands or waters held in public trust by the state or city? (8.5)		✓
49. Would the action affect natural or built resources that contribute to the scenic quality of a coastal area? (9)		✓
50. Does the site currently include elements that degrade the area's scenic quality or block views to the water? (9.1)		✓

Policy Questions cont'd	Yes	No
51. Would the proposed action have a significant adverse impact on historic, archeological, or cultural resources? (10)		✓
52. Will the proposed activity affect or be located in, on, or adjacent to an historic resource listed on the National or State Register of Historic Places, or designated as a landmark by the City of New York? (10)	✓	

D. CERTIFICATION

The applicant or agent must certify that the proposed activity is consistent with New York City's Waterfront Revitalization Program, pursuant to the New York State Coastal Management Program. If this certification cannot be made, the proposed activity shall not be undertaken. If the certification can be made, complete this section.

"The proposed activity complies with New York State's Coastal Management Program as expressed in New York City's approved Local Waterfront Revitalization Program, pursuant to New York State's Coastal Management Program, and will be conducted in a manner consistent with such program."

Applicant/Agent Name: Lieutenant David Kelly

Address: One Police Plaza, New York, NY 10038

Telephone 646-610-4557

Applicant/Agent Signature: _____ Date: February 2, 2012

Appendix B

LPC and SHPO Correspondence

NYC Landmarks Preservation Commission

1 Centre Street
9th Floor North
New York, NY 10007

Voice (212)-669-7700
Fax (212)-669-7960
http://nyc.gov/landmarks

ARCHAEOLOGY

Project number: NYC POLICE DEPARTMENT / LA-CEQR-M
Project: WTC Campus Security Plan
Date received: 12/28/2011

Comments:

The LPC has reviewed the following streetbed locations to determine whether excavation of up to 4' in depth might impact potentially significant archaeological resources:

Vesey Street between West Street and West Broadway;
Washington Street between Barclay and Vesey Streets;
Barclay Street between Washington Street and Church Street;
Greenwich Street between Liberty and Cedar Streets;
West Broadway between Barclay and Vesey Streets;
Church Street between Barclay and Thames Streets;
Fulton Street between West and Washington Streets (this area is currently included within Block 58, Lot 1);
Liberty Street between West and Greenwich Streets.

Given the extent of recent excavation in the proposed area, and the presence of subway lines in many of these locations, the LPC does not believe that excavation up to depths of 4' is likely to impact significant archaeological resources. However, if the project area and/or the proposed depth of excavation changes (in areas outside of those with subway lines) please submit the revisions to LPC for review.

1/6/2012

SIGNATURE DATE
Amanda Sutphin, Director of Archaeology

File Name: 27873_FSO_ALS_01062012.doc

Andrew M. Cuomo
Governor

Rose Harvey
Commissioner

New York State Office of Parks, Recreation and Historic Preservation

Division for Historic Preservation • Peebles Island, PO Box 189, Waterford, New York 12188-0189
518-237-8643

www.nysparks.com

March 9, 2012

Lieutenant David Kelly
New York City Police Department
One Police Plaza
New York, NY 10038

Re: DHS/PA
World Trade Center Campus Security Plan
New York County
12PR00397

Dear Lieutenant David Kelly:

Thank you for requesting the comments of the New York State Historic Preservation Office (SHPO). We have reviewed the Draft Environmental Assessment Statement, the Positive Declaration, the Draft Scope Document and the letter from Elizabeth D. Meade at AKRF in regards to archeological potential. We have reviewed these documents in accordance with Section 106 of the National Historic Preservation Act of 1966. These comments are those of the SHPO and relate only to Historic/Cultural resources. They do not include other potential environmental impacts to New York State Parkland that may be involved in or near your project. Such impacts must be considered as part of the environmental review of the project pursuant to the National Environmental Policy Act and/or the State Environmental quality Review Act (New York Environmental Conservation Law Article 8).

Based upon our review, we concur that the proposed action has the potential to impact historic resources within the Area of Potential Effects (APE). We concur with the Scope of Work for the Environmental Impact Statement (EIS) and look forward to review of this document when it becomes available. We also would like to remind you that there are several other projects already occurring at the World Trade Center Site. Currently these project meet to evaluate the potential cumulative effects of these projects. This project should be included in future evaluations.

Douglas Mackey of our Archeological Unit has reviewed the potential for archeological impacts. He has no archeological concerns based upon this review.

If you have any questions, I can be reached at (518) 237-8643, ext. 3282. Please refer to the SHPO Project Review (PR) number in any future correspondences regarding this project.

Sincerely,

Beth A. Cumming
Historic Site Restoration Coordinator
e-mail: Beth.cumming@oprhp.state.ny.us

cc: Elizabeth Meade – AKRF via e-mail only

Appendix C

Phase I Environmental Site Assessment

Environmental and Planning Consultants

440 Park Avenue South
7th Floor
New York, NY 10016
tel: 212 696-0670
fax: 212 213-3191
www.akrf.com

May 16, 2012

Mr. Philip Habib, PE
Philip Habib & Associates
102 Madison Avenue, 11th Floor
New York, NY 10016

Re: Phase I Environmental Site Assessment
World Trade Center Campus Security Plan – New York, New York
AKRF Project Number 20393

Dear Mr. Habib:

AKRF, Inc. is pleased to submit this Phase I Environmental Site Assessment Report for the above-referenced property. This report includes the findings of a reconnaissance of the property, an evaluation of readily available historical information and selected environmental databases and electronic records. AKRF, Inc. met the requirements of American Society for Testing and Materials (ASTM) as established by ASTM Standard E1527-05 unless noted otherwise in Section 8.0: "Limitations and Data Gaps".

We appreciate the opportunity to provide you with our services. If you should have any questions or comments regarding the enclosed report, please do not hesitate to contact us.

Sincerely,
AKRF, Inc.

Marcus Simons
Senior Vice President

Asya Kleyn
Environmental Engineer

Enc.

EXECUTIVE SUMMARY

AKRF, Inc. (AKRF) was retained by Philip Habib & Associates (PHA) to perform a Phase I Environmental Site Assessment (ESA) of a Property consisting of portions of Washington Street, Greenwich Street, West Broadway, Church Street, Vesey Street, Fulton Street, Liberty Street and the World Trade Center construction site in Manhattan. A site location map and a site plan are provided as Figures 1 and 2, respectively.

This Phase I Environmental Site Assessment was performed in conformance with ASTM Standard E1527-05, *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Practice*. Any exceptions to, or deletions from, this practice are described in Section 8.0. The term "Recognized Environmental Condition" means the presence or likely presence of hazardous substances or petroleum at the property, including the ground, groundwater, or surface water at or under the property.

At the time of AKRF's reconnaissance, the Property consisted of streets, sidewalks and a portion of the World Trade Center construction site which will be occupied by extensions of Greenwich, Fulton, Liberty and Washington Streets in the future. The portion of the Property located on the World Trade Center construction site was not accessible for inspection; this area has been extensively excavated and is relatively unlikely to contain contaminated soils or buried tanks. The surrounding area was occupied predominantly by multistory office buildings (some with ground-floor commercial uses), with some residential uses, institutional buildings (churches and government buildings) and parkland.

This assessment revealed evidence of Recognized Environmental Conditions (first four bullets). A summary of the assessment findings is presented below:

- The assessment found that the Property is located on made land. Fill material of unknown origin, including sand, silt, clay, gravel, stone, macadam, river mud, ash, cinders and brick, is present beneath the Property. Prior to 1951, the Property was predominantly occupied by public streets. A portion of West Broadway between Barclay and Vesey Streets was historically occupied by buildings with unspecified uses, but was shown as a public street by 1922-1923. The Manhattan Railway (a historical elevated railway company) and rail lines on Fulton Street between Church and Greenwich Streets were shown on the Property in the early 20th century. By 1971, the majority of the Property was part of the World Trade Center Campus. Portions of World Trade Center buildings and the surrounding plaza were located on the Property, and the portion of Greenwich Street between Barclay and Vesey Streets was part of a two-story electrical substation (the former 7 World Trade Center). Underground structures, including subway and Port Authority Trans-Hudson (PATH) tunnels, were noted beneath the World Trade Center plaza. The buildings on the World Trade Center campus were destroyed on September 11, 2001. Reconstruction efforts are currently in progress. The area surrounding the Property was historically mixed-use and included manufacturing, printers, a laundry, a dye and chemical store and factory, a National Aniline & Chemical Co. building, utility buildings (NY Steam Co., US Electric Light Co., Western Electric Co. and an electrical transformer station), and filling stations in close proximity to the Property, and ferry and railroad piers west of the Property beyond West Street. More bank and office uses were shown in the surrounding area starting in the mid-20th century, with these uses dominating the surrounding area by the late 20th century.
- Regulatory databases identified one active-status spill, 131 closed-status spills and 51 hazardous waste generator listings potentially on, or adjacent to, the Property. Based on listing details, the active spill appeared minor in nature (a leak of transformer oil reportedly contained within a manhole) and unlikely to affect subsurface conditions beneath the Property. The remaining potentially on-site listings were associated with: minor (i.e. no reported subsurface impact) spills on streets, sidewalks or

within utility structures; asbestos releases during utility work and during the collapse of the World Trade Center; releases at the historical and new electrical substations in 7 World Trade Center; listings associated with Con Ed remediation of dielectric oil released during the collapse of the World Trade Center; listings associated with other releases following the collapse of the World Trade Center (e.g., releases from damaged petroleum storage tanks and airplane fuel tanks); and spills at the World Trade Center Campus during reconstruction activities. Some of the listings reported soil and/or groundwater contamination with fuel oil or dielectric oil; all these listings were closed, indicating that remediation was completed to the satisfaction of NYSDEC, although some residual contamination may remain. The potentially on-site hazardous waste generator listings included generators of heavy metal wastes, solvents, PCB waste, and benzene. Regulatory databases also identified off-site closed-status spills, hazardous waste generators and petroleum storage facilities with the potential to affect the Property.

- No evidence of petroleum storage tanks was observed on the Property. However, the reconnaissance noted fill ports and/or vent pipes adjacent to buildings fronting the Property. If these fill ports and vent pipes pertained to underground storage tanks (USTs), such USTs may be located off-site beneath adjacent buildings or perhaps buried or located in vaults beneath Property sidewalks. Regulatory records identified closed-status USTs in World Trade Center buildings historically located on the Property. Previous studies indicated that tanks associated with the former World Trade Center buildings have been removed. The active World Trade Center UST listings are for tanks at the new 7 World Trade Center building, which is adjacent to, but not on, the Property.
- Previous studies conducted for the reconstruction of 7 World Trade Center, the main World Trade Center Campus, the PATH terminal beneath the World Trade Center Campus, and Route 9A (West Street) were reviewed. These studies indicated that debris associated with the collapse of the World Trade Center has been removed. Subsurface contamination at the former 7 World Trade Center site was remediated as part of the new building's construction, contamination on the main World Trade Center Campus is being remediated as part of reconstruction activities in this area, and any residual contamination would be encapsulated (e.g. beneath structures or pavement) to prevent potential exposure. Soil testing conducted in the 2000s in the eastern portion of the World Trade Center Campus and on streets to the south (i.e., on or near the Property) indicated no evidence of petroleum impacts or elevated concentrations of asbestos or dioxins. Surface soils in this area contained slightly elevated concentrations of semi-volatile organic compounds (SVOCs) and metals, possibly associated with fill materials and/or the World Trade Center collapse, and groundwater samples in this area contained slightly elevated concentrations of petroleum and solvent-related volatile organic compounds (VOCs). Soils in the vicinity of the former 7 World Trade Center contained no elevated concentrations of polychlorinated biphenyls (PCBs), but soil and groundwater in this area showed evidence of petroleum and/or dielectric oil contamination; however, the testing was conducted prior to the construction of the new building and associated remediation.
- If installed prior to 1979, street lighting fixtures may include PCB-containing components; however, due to significant reconstruction in the vicinity of the Property since September 11, 2001, the fixtures were likely installed in the 2000s and are therefore unlikely to contain PCBs. Electrical transformer vaults noted in the Vesey Street and West Broadway sidewalks, electrical manholes, and underground oil-filled electrical conduits may have utilized PCB-containing equipment, though again it is likely that most of these have been replaced since 2001.
- No suspect asbestos-containing materials (ACM) were observed during the reconnaissance. However, underground utilities and electrical transformer vaults may include ACM including conduits and piping.

- Lead-based paint may be present on painted surfaces and in underground utility structures. During the reconnaissance, aboveground painted surfaces were observed to be in good condition.

RECOMMENDATIONS

- Soil and groundwater beneath the Property may have been affected by past and present, on- and off-site uses. However, significant remediation has occurred as part of World Trade Center Campus redevelopment. Soil disturbance for the proposed project is expected to be limited to soils well above the water table, where a greater potential for encountering contamination exists. It is expected that during the project design phase, soil characterization testing targeted to the areas of disturbance for disposal purposes would occur. AKRF recommends that soil disturbance for the proposed project be conducted in accordance with a Remedial Action Plan (RAP) and Construction Health and Safety Plan (CHASP). The RAP would address requirements for items such as soil stockpiling, soil disposal and transportation; dust control; quality assurance; and contingency measures, should petroleum storage tanks or contamination be unexpectedly encountered. The CHASP would identify potential hazards that may be encountered during construction and specify appropriate health and safety measures to be undertaken to ensure that subsurface disturbance is performed in a manner protective of workers, the community, and the environment (such as personal protective equipment, air monitoring, and emergency response procedures).
- Any tanks or piping that may be disturbed by the proposed project, as well as any petroleum storage tanks unexpectedly encountered during construction, should be properly closed and removed along with any contaminated soil and tank registrations should be updated as required with NYSDEC and/or the New York City Fire Department, if applicable. Any evidence of a petroleum spill must be reported to NYSDEC and addressed in accordance with applicable requirements.
- During future subsurface disturbance, excavated soil should be handled and disposed of in accordance with applicable regulatory requirements. Although groundwater is not expected to be encountered, if dewatering is required during construction activities, it should be performed in accordance with New York City Department of Environmental Protection (NYCDEP) requirements.
- Prior to any activities with the potential to disturb transformer vaults or other subsurface utilities, such utilities should be properly decommissioned. An asbestos survey of the areas to be disturbed should be completed and all ACM should be removed and disposed of in accordance with local, state and federal requirements.
- Unless there is labeling or test data indicating that suspect PCB-containing lighting fixtures and electrical equipment (e.g., equipment in transformer vaults and electrical manholes) do not contain PCBs, if disposal is required, it should be performed in accordance with applicable federal, state and local requirements.
- Any activities with the potential to disturb lead-based paint must be performed in accordance with applicable requirements (including federal Occupational Safety and Health Administration regulation 29 CFR 1926.62 - *Lead Exposure in Construction*).

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FIGURES

APPENDICES

1.0 INTRODUCTION

AKRF, Inc. (AKRF) was retained by Philip Habib & Associates (PHA) to perform a Phase I Environmental Site Assessment of a Property consisting of portions of Washington Street, Greenwich Street, West Broadway, Church Street, Vesey Street, Fulton Street, Liberty Street and the World Trade Center construction site in Manhattan. A site location map and a site plan are provided as Figures 1 and 2, respectively.

At the time of AKRF's reconnaissance, the Property consisted of streets, sidewalks and a portion of the World Trade Center construction site which will be occupied by extensions of Greenwich, Fulton, Liberty and Washington Streets in the future. The portion of the Property located on the World Trade Center construction site was not accessible for inspection; this area has been extensively excavated and is relatively unlikely to contain contaminated soils. The surrounding area was occupied predominantly by multistory office buildings (some with ground-floor commercial uses), with some residential uses, institutional buildings (churches and government buildings) and parkland.

The scope of services for this assessment was in conformance with ASTM Standard E1527-05 (*Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Practice)*. Any exceptions to, or deletions from, this practice are described in Section 8.0. The scope included the following:

- Observations of the Property (reconnaissance) to identify potential sources or indications of hazardous substances, including: aboveground storage tanks (ASTs); underground storage tanks (USTs); tank vents and fill ports; transformers and other items that could contain polychlorinated biphenyls (PCBs), drums or areas where hazardous materials were used, stored, or disposed; stained surfaces and soils; stressed vegetation, leaks, odors. In addition, neighboring properties were viewed, but only from public rights-of-way, to identify similar concerns.
- Readily available geological and groundwater (hydrogeological) information was evaluated to assist in determining the potential for contamination migration within, from and onto the Property.
- The reconnaissance of the Property included preliminarily identifying visible suspect asbestos-containing materials (ACMs) and the potential lead-based paint. However, no samples were collected or analyzed.
- A state database of radon concentrations was used to determine whether indoor radon levels in the general area (data are by county) generally comply with United States Environmental Protection Agency (USEPA) guidelines.
- Historical fire insurance maps for the site and adjacent properties were reviewed to evaluate historic land uses.
- The following federal regulatory databases were reviewed to determine the regulatory status of the Property and other properties within the ASTM-defined radii: National Priority List (NPL); Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS); Emergency Response Notification System (ERNS); Toxic Chemical Release Inventory System (TRIS); the Permit Compliance System of Toxic Wastewater Discharges (WWD); the Air Discharge Facilities Index (ADF) and the USEPA Civil Enforcement Docket. The federal listing of facilities which are subject to corrective action under the Resource Conservation and Recovery Act (CORRACTS) is discussed with the State databases of RCRA listings.

- The following state regulatory databases were reviewed to determine the regulatory status of the Property, adjacent properties, and properties within a predetermined study area; the listings of hazardous material spills (SPILLS); Resource Conservation and Recovery Act Notifiers (RCRA); Chemical Bulk Storage (CBS); Solid Waste Facilities (SWF); Petroleum Bulk Storage (PBS); State Inactive Hazardous Waste Disposal Sites (SHWS); Major Oil Storage Facilities (MOSF); Brownfield Sites; and Historic Utility Sites.
- A review of NYC Fire Department (obtained as part of the database search) and online Buildings Department records for the Property was conducted to obtain information likely to be pertinent to this assessment.

2.0 PHYSICAL SITE DESCRIPTION

On January 10, 2011, Ms. Asya Kleyn of AKRF conducted a reconnaissance of the Property. Neighboring properties were also viewed, but only from public rights-of way. The weather was clear and approximately 45 ^{o}F. Photographs from the reconnaissance are included in Appendix A.

2.1 General Site Conditions

Portions of the Property (the southern portion of Vesey Street, the western portion of Church Street, Greenwich Street between Vesey and Cedar Streets, Fulton Street between Church and West Streets, Liberty Street between Greenwich and West Streets, and Washington Street between Liberty and Cedar Streets) were part of the fenced World Trade Center construction site and were not accessible for inspection; this area has been extensively excavated and is relatively unlikely to contain contaminated soils or buried tanks.

Street beds and sidewalks in the accessible portion of the Property were generally in good condition. Some patches, possibly associated with roadwork or utility repair, were noted. Underground electrical transformer vaults were noted on the north side of Vesey Street between Church Street and West Broadway, and on the east side of West Broadway between Barclay and Liberty Streets. Suspect historical fill ports were noted in sidewalks east-adjacent to the on-site portion of Church Street and east-adjacent to the on-site portion of West Broadway; these structures may indicate past or present petroleum storage tanks in the adjacent buildings. Ventilation grates for subway tunnels were observed in Church Street and Greenwich Street sidewalks, and an entrance to an underground PATH terminal was noted south of the intersection of West Broadway, Greenwich Street and Vesey Street. Various manholes, including electrical manholes, were noted in Property roadways and sidewalks. The locations of the transformer vaults, fill ports and subway tunnels are shown on Figure 2. Minor surface staining (likely due to leaks from vehicles) was noted on some Property roadways, but did not appear likely to affect subsurface conditions beneath the Property. No significant staining or odors were observed.

2.2 Topography and Hydrogeology

The Property topography slopes down toward the west. Based on U.S. Geological Survey mapping (Jersey City Quadrangle), Property elevations range from approximately 5 to 25 feet above mean sea level. The previous studies summarized in Section 7.0 indicated that bedrock is expected at a depth of approximately 60 to 100 feet below grade. According to the previous studies and an 1865 topographical map, the Property is located on made land. Fill material of unknown origin, including sand, silt, clay, gravel, stone, macadam, river mud, ash, cinders and brick, is present beneath the Property.

The previous studies indicated that groundwater depth in the vicinity of the Property is highly variable, ranging from approximately 6 feet below grade in the southern portion of the Property to approximately 10 feet below grade in the northern portion of the Property to approximately 40 feet below grade in the eastern portion of the Property, which is in an area undergoing extensive dewatering for subsurface World Trade Center and transit structures. Based on surface topography, groundwater would be expected to flow in a westerly direction toward the Hudson River, approximately 1,000 feet west of the western edge of the Property. However, groundwater flow direction is likely affected by ongoing dewatering on and near the Property. Groundwater flow may also be affected by bedrock, subsurface openings or obstructions such as basements, underground utilities, parking garages, historical filling and bulkheads, tidal fluctuations, and other factors beyond the scope of this assessment. Groundwater in Manhattan is not used as a source of potable water (the municipal water supply uses upstate reservoirs).

2.3 Storage Tanks

2.3.1 Underground Storage Tanks (USTs)

During the reconnaissance, fill ports and/or vent pipes were noted adjacent to buildings fronting the Property, as shown on Figure 2. If these fill ports and vent pipes connect to USTs, such USTs may be located off-site beneath adjacent buildings or buried beneath Property sidewalks.

Regulatory records identified closed-status and active USTs in World Trade Center buildings historically located on the Property, and computerized New York City Buildings Department records identified three oil burner applications dated 1946, 1951 and 2002 for the former 7 World Trade Center, which was located in the northern portion of the Property. No USTs were identified on the Property in computerized NYC Fire Department records. Previous studies discussed in Section 7.0 indicated that tanks associated with the former World Trade Center buildings have been removed. The active UST listings and the 2002 oil burner application likely pertain to tanks at the new 7 World Trade Center building constructed adjacent to the Property.

Off-site USTs are discussed in Section 5.2.2.

2.3.2 Aboveground Storage Tanks (ASTs)

As noted above, during the reconnaissance, fill ports and/or vent pipes were noted adjacent to buildings fronting the Property, as shown on Figure 2. Although no evidence of ASTs, such as vaults, was noted in the accessible portions of the Property and any ASTs are most likely located off-site in adjacent buildings, it is possible ASTs are present in vaults beneath Property sidewalks.

Regulatory records identified closed-status ASTs in a World Trade Center building historically located on the Property, and computerized New York City Buildings Department records identified three oil burner applications dated 1946, 1951 and 2002 for 7 World Trade Center, formerly located in the northern portion of the Property. No ASTs were identified on the Property in computerized NYC Fire Department records. Previous studies discussed in Section 7.0 indicated that tanks associated with the former World Trade Center buildings have been removed. The 2002 oil burner application likely pertains to tanks at the new 7 World Trade Center building constructed adjacent to the Property.

Off-site ASTs are discussed in Section 5.2.2.

2.4 Polychlorinated Biphenyls (PCBs)

Until 1979, polychlorinated biphenyls (PCBs), which provided beneficial insulating properties, were manufactured for use in a wide variety of products, primarily in electrical equipment such transformers, capacitors, fluorescent light fixtures (especially ballasts), and voltage regulators, but also in hydraulic fluids and some other products.

If installed prior to 1979, street lighting fixtures may include PCB-containing components; however, due to significant reconstruction in the vicinity of the Property since September 11, 2001, the fixtures were likely installed after 2001 and are unlikely to contain PCBs. Electrical transformer vaults noted in the Vesey Street and West Broadway sidewalks and on-site electrical manholes may utilize PCB-containing equipment. In addition, underground oil-filled electrical feeders (transmission lines) owned by Consolidated Edison may have historically contained PCBs.

2.5 Lead-Based Paint

Lead-based paint was generally not used inside residential buildings after 1960 in NYC or after 1977 nationwide. After 1977, its use inside the interiors of commercial structures was restricted and its use elsewhere became much less common, but lead-based paint may still sometimes be used outdoors and may still be present beneath layers of more recent lead-free paint. Lead-based paint can present a hazard, particularly to children and especially when it is in a deteriorating condition.

Painted surfaces observed on the Property (e.g., road striping, signs, security barriers and construction fencing) were in good condition. Lead-based paint could also be present in underground utility structures, which were not accessible during AKRF's reconnaissance. Any renovation or demolition activities with the potential to disturb lead-based paint must be performed in accordance with the applicable Occupational Safety and Health Administration regulation (OSHA 29 CFR 1926.62—*Lead Exposure in Construction*).

2.6 Utilities

The Property was supplied with electricity and was connected to the municipal sewer system. Plans of the proposed construction provided by PHA indicated numerous utilities beneath the Property, including electric, water, sewer, steam, gas and telecommunications lines. The plans also indicated that storm drains observed on the Property are connected to the municipal sewer system. Test pits dug on the Property by the Port Authority of NY & NJ (PANYNJ) in August 2011 indicated that oil-filled electrical conduits (which may have historically contained PCBs) are present beneath the Property.

2.7 Waste Management and Chemical Handling

Public wastebaskets (which are emptied by the NYC Department of Sanitation) were observed in the vicinity of the Property. These containers were in good condition and were not overfilled. No chemical storage was observed in the accessible portions of the Property.

2.8 Radon

Radon is a colorless, odorless gas most commonly produced by the radioactive decay of certain rocks. According to a New York State Department of Health database the average level of radon found in basements in Manhattan is 2.15 picocuries/liter, below the USEPA recommended action level of 4.0 picocuries/liter.

3.0 ASBESTOS-CONTAINING MATERIALS (ACM)

Asbestos is a name applied to a group of natural minerals, with particularly good fire resistant and insulation properties. In addition to insulation/fireproofing products, it is also commonly found in vinyl flooring, plaster, sheetrock, joint compound, ceiling tiles, roofing materials, gaskets, mastics, caulks and a range of other products. Materials containing more than one percent asbestos are considered asbestos-containing materials (ACM). ACM are classified as friable or non-friable: friable (e.g., most spray-on fireproofing) ACM more readily release asbestos fibers than non-friable ACM (e.g., vinyl flooring and most roofing materials).

The reconnaissance was conducted by Ms. Asya Kleyn, a New York State-certified asbestos inspector. Although no suspect ACM were observed during the reconnaissance, underground utilities, transformers and vaults can sometimes include ACM including conduits and piping. Should such materials require disturbance/removal during construction activities, they should be identified prior to disturbance and managed in accordance with all applicable regulations.

4.0 ADJACENT LAND USE

The surrounding area was occupied predominantly by multistory office buildings (some with ground-floor commercial uses), with some residential uses, institutional buildings (churches and government buildings) and parkland.

5.0 PROPERTY HISTORY AND RECORDS REVIEW

5.1 Prior Ownership and Usage

5.1.1 Historical Land Use maps

Historical insurance maps were reviewed for indications of uses (or other evidence) suggesting hazardous materials generation, usage or disposal on or near the Property. Specifically, Sanborn Fire Insurance Maps from 1894, 1922-1923, 1951, 1977, 1985, 1994 and 2007 were reviewed.

1894

The majority of the Property was occupied by streets. The area currently occupied by West Broadway between Barclay and Vesey Streets consisted of buildings with unspecified uses. Elevated Manhattan Railway stations were shown on the Property at the intersections of Church and Cortlandt Streets, Cortlandt and Greenwich Streets, and Barclay and Greenwich Streets.

The surrounding area was occupied by buildings with unspecified uses and commercial, institutional (churches, schools and a post office), hotel and light manufacturing (candy and tobacco) uses. Boilers were shown beneath sidewalks in front of several buildings along Fulton, Church and Liberty Streets. A NY Steam Co. boiler house was adjacent to the Property, west of Greenwich Street between Cortlandt and Dey Streets. Other nearby utility buildings included a NY Steam Co. building and a US Electric Light Co. building west of the Property at the intersection of Cortlandt and Washington Streets, and a Western Electric Co. building southeast of the Property at the intersection of Greenwich

and Thames Streets. Ferry and railroad piers were shown west of the Property across West Street, with the Hudson River beyond.

1922-1923

The Property, including the on-site portion of West Broadway, was occupied by streets. Hudson Company tunnels were shown west of the Property beneath Fulton and Cortlandt Streets, potentially extending eastward beneath the Property.

The surrounding area was mixed-use, including residential, commercial, office, manufacturing and institutional uses. A church with a cemetery was located east of Church Street between Vesey and Fulton Streets. Of note, nearby land uses included commercial-manufacturing buildings adjacent to the Property; a paint and printing shop at the current Vesey Park site, between West Broadway and Greenwich Streets; a New York Steam Corp. building with coal bunkers west-adjacent to Greenwich Street between Fulton and Dey Streets; a laundry west-adjacent to Greenwich Street between Dey and Cortlandt Streets; a dye and chemical store and factory southwest of the intersection of Cedar and Washington Streets; an electrical transformer station on Cedar Street between Washington and Greenwich Streets. The former Western Electric Co. building southeast of the Property at the intersection of Greenwich and Thames Streets was shown as a factory.

1951

The Property was occupied by streets. Manhattan Railroad rail lines were shown on Fulton Street between Church and Greenwich Streets. The Hudson Company tunnels shown west of the Property on the 1922-1923 map remained on the 1951 map.

The surrounding area remained mixed-use, with more multistory bank and office buildings compared to the 1922-1923 map. Of note, nearby land uses included commercial-manufacturing buildings adjacent to the Property; a pharmaceutical warehouse northeast of the intersection of Greenwich and Barclay Streets; two filling stations along West Street between Cortlandt Streets; and a National Aniline & Chemical Co. building southwest of the intersection of Dey and Washington Streets. An elevated highway was shown west-adjacent to the Property over West Street.

1977

The Property was reconfigured significantly compared to the 1951 map. Greenwich Streets between Vesey and Liberty Streets and Fulton Street between Church and West Streets were shown as part of the Port Authority of New York and New Jersey World Trade Center, with portions of buildings and the surrounding plaza located on these streets. A subway tunnel was shown beneath the former Greenwich Streets between Vesey and Liberty Streets and Fulton Street. Underground structures were noted beneath the World Trade Center plaza. The portion of Greenwich Street between Barclay and Vesey Streets was shown as part of a two-story electrical substation for the World Trade Center. The remainder of the Property remained unchanged from the 1951 map.

The land bounded by Vesey, West, Church and Liberty Streets was occupied by the World Trade Center buildings and plaza. The surrounding area was occupied predominantly by multistory office buildings, with some institutional uses (churches and schools) and parking lots. Two commercial-manufacturing buildings were shown south-adjacent to an on-site portion of Liberty Street.

1985

No significant changes from the 1977 map were noted on the Property.

The Manhattan shoreline had been expanded west of West Street, with multistory office buildings and parkland shown on the new land. No further significant changes from the 1977 map were noted in the surrounding area.

1994

The World Trade Center electrical substation partially located on the Property was labeled as an electrical substation and office building. A hotel was shown in the southwestern (off-site) portion of the World Trade Center plaza. No further significant changes from the 1985 map were noted on the Property or in the surrounding area.

2007

Although not reflected on the map, the World Trade Center buildings shown on the 2007 map had been destroyed in the September 11, 2001 attacks, and reconstruction activities were in progress by 2007.

To summarize, the Sanborn maps indicated that the Property was predominantly occupied by public streets prior to 1951. The portion of West Broadway between Barclay and Vesey Streets consisted of buildings with unspecified uses by 1894, but was shown as a public street by 1922-1923. Stations for the Manhattan Railway (a historical elevated railway company) were shown on the Property in the early 20th century. The 1951 map showed rail lines on Fulton Street between Church and Greenwich Streets. By 1971, the Property was reconfigured significantly, with the majority of the Property shown as part of the World Trade Center campus. Portions of World Trade Center buildings and the surrounding plaza were located on the Property, and underground structures were noted beneath the World Trade Center plaza. A subway tunnel was shown beneath the former Greenwich Streets between Vesey and Liberty Streets and Fulton Street. The portion of Greenwich Street between Barclay and Vesey Streets was shown as part of a two-story electrical substation for the World Trade Center.

The surrounding area was historically mixed-use and included manufacturing, printers, a laundry, a dye and chemical store and factory, a National Aniline & Chemical Co. building, utility buildings (NY Steam Co., US Electric Light Co., Western Electric Co. and an electrical transformer station), and filling stations in close proximity to the Property, and ferry and railroad piers west of the Property beyond West Street. More bank and office uses were shown in the surrounding area starting in the mid-20th century, with these uses dominating the surrounding area by the late 20th century.

5.1.2 Historical Aerial Photographs

Since historical fire insurance maps were available for the Property (and surrounding area) and these maps included information relating to land use, aerial photographs would, most likely, not provide additional useful information relevant to the potential for recognized environmental conditions or other environmental concerns. As such, aerial photographs were not reviewed.

5.1.3 Property Tax Files and Zoning Records

NYC Department of City Planning's Primary Land Use Tax Output (PLUTO) information provided by Toxics Targeting, Inc. of Ithaca identified on-site portions of Greenwich Street between Vesey and Liberty Streets, and Fulton Street between Church Street and West Street as part of Tax Block 58, Lot 1, and an on-site part of Greenwich Street between Vesey and Barclay Streets as part of Tax Block 84, Lot 36. These tax lots were located in zoning districts C5-3, C5-5, C6-4 and C6-9 (commercial/office districts). PLUTO records identified no tax block and lot information for the remainder of the Property.

5.1.4 Recorded Land Title Records

Copies of title records were not provided to AKRF for review.

5.1.5 Local Street Directories

Since the Property consisted of public streets, with no addresses searchable in a City Directory associated with it, no City Directory records were searched. However, information about historical uses of the Property was available from historical land use maps, regulatory databases and previous reports for surrounding sites (summarized in Section 7.0).

5.2 Regulatory Review

Regulatory database information, as shown in Appendix B, was obtained from Toxics Targeting, Inc. of Ithaca, New York. The Introduction of Appendix B includes summaries of the databases searched, their radii around the Property and limitations of the data. The databases searched and associated radii were consistent with ASTM E1527-05.

5.2.1 Federal

The federal databases searched included the National Priority List (NPL); Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS); Emergency Response Notification System (ERNS); Toxic Chemical Release Inventory System (TRIS); the Permit Compliance System of Toxic Wastewater Discharges (WWD); the Air Discharge Facilities Index (ADF); and the USEPA Civil Enforcement Docket. The federal listing of facilities which are subject to corrective action under the Resource Conservation and Recovery Act (CORRACTS) is discussed with the State databases of RCRA listings.

National Priority List (NPL)

The NPL is the USEPA's compilation of some sites that probably remedial action under the Superfund Program. NPL sites can pose a significant risk of stigmatizing surrounding properties and thus impacting property values.

No NPL sites were identified within a one-mile radius of the Property.

Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS)

CERCLIS is a compilation of sites which the USEPA has investigated, or plans to investigate, pursuant to the Superfund Act of 1980 (CERCLA). As such, some of these

sites may ultimately present concerns and others may not (but could still pose a perceived threat, thus affecting property values).

Four CERCLIS sites were identified within a ½-mile radius of the Property. The nearest listing to the Property was for U.S. Customs Service/Merchandise Control, located in 6 World Trade Center, room 114, adjacent to the Property (west of Greenwich Street between Fulton and Vesey Streets). This listing was archived after preliminary assessment and assigned a No Further Remedial Action Planned (NFRAP) status. The remaining CERCLIS sites were located more than ⅛-mile from the Property. Two of these sites were archived after preliminary assessment, and the third was archived after anthrax removal activities, with all three facilities assigned an NFRAP status.

Based on listing details and status, the identified CERCLIS facilities are not expected to have affected subsurface conditions beneath the Property.

Emergency Response Notification System (ERNS)

This federal database, compiled by the Emergency Response Notification System, records and stores information on certain reported releases of petroleum and other potentially hazardous substances.

Five ERNS listings were identified as being potentially located on the Property. However, based on listing details, four of the releases were to the Hudson River. The fifth listing pertained to an off-site release at 2-10 Broadway (approximately ¼-mile south of the Property). Based on the distance and nature of the listings, the ERNS listings are not expected to have affected the Property.

Toxic Chemical Release Inventory System (TRIS)

The TRIS contains information reported by a variety of industries on their annual estimated releases of certain chemicals.

One TRIS site was identified within a ⅛-mile radius of the Property. The U.S. Customs Service Firing Range was listed in 6 World Trade Center, adjacent to the Property (west of Greenwich Street between Fulton and Vesey Streets). This site was listed as a closed facility where lead removal occurred in 2001. Based on its nature, this listing is not likely to have affected the Property.

Permit Compliance System of Toxic Wastewater Discharge (WWD)

This database includes certain sites which discharge wastewater containing potentially hazardous chemicals.

Two WWD facilities were reported within a ⅛-mile radius of the Property as follows:

- The World Trade Center, located at One World Trade Center, approximately 190 feet southwest of the Property, was listed minor, active industrial facility discharging unspecified wastewater to the Hudson River.
- The Battery Park Commercial Center, located at One Liberty Plaza, approximately 180 feet east-southeast of the Property, was listed as a minor, active industrial facility discharging unspecified wastewater to the Hudson River.

Based on listing details and status, discharges to the River from these facilities are not likely to have affected subsurface conditions beneath the Property.

United States Environmental Protection Agency Civil Enforcement Docket

This database tracks civil judiciary cases filed on behalf of the USEPA by the Department of Justice.

Seven facilities were listed in the USEPA's Civil Enforcement Docket within a ⅛-mile radius of the Property as follows:

- The Port Authority - One World Trade Center, located approximately 190 feet southwest of the Property, was listed for a violation of the Marine Protection, Research and Sanctuaries Act, with the case opened in 1993 and concluded with a fine in 1993.
- Sinochem USA, Inc., located at Two World Trade Center, approximately 60 feet east-northeast of the Property, was listed for a violation of the Toxic Substances Control Act. The case was opened in June 1997 and concluded with a fine in October 1997.

The Enforcement Docket facilities are not likely to have affected the Property based on the nature of the listings.

Air Discharge Facilities Index (ADF)

This federal database includes information on certain air emission sources.

Sixteen Air Discharge Facilities were identified within a ⅛-mile radius of the Property. The nearest ADF facilities are listed as follows:

- Star Brite Press, Inc., located at 130 Cedar Street, approximately 30 feet southwest of the Property, was listed with potential emissions of volatile organic compounds (VOCs), and was reportedly in compliance with regulatory requirements.
- Two Asbestos Abate Tech listings were listed for Two World Trade Center, approximately 70 feet east-northeast of the Property. No air pollutant information was provided in the listings.
- The Federal Building, located at 90 Church Street, approximately 115 feet east of the Property, was listed with potential emissions of unspecified "default pollutant," and was reportedly in compliance with regulatory requirements.
- U.S. Immigration/Naturalization, located at 20 West Broadway, approximately 140 feet north-northeast of the Property, was listed with potential emissions of unspecified "default pollutant," and was reportedly in compliance with regulatory requirements.
- Auto Cleaner, located at 111 Broadway, approximately 210 feet southeast of the Property, was listed with potential tetrachloroethylene emissions and was reportedly in violation with regard to regulatory compliance.

Based on their proximity and the nature of the listings, potential releases from Star Brite Press and Auto Cleaner may have affected subsurface conditions beneath the Property. The remaining ADF facilities are not likely to have affected the Property based on listing details.

5.2.2 State

The state records reviewed included the listings of hazardous material spills (SPILLS); Resource Conservation and Recovery Act Notifiers (RCRA); Chemical Bulk Storage (CBS); Solid Waste Facilities (SWF); Petroleum Bulk Storage (PBS); State Inactive Hazardous Waste Disposal Sites (SHWS); Major Oil Storage Facilities (MOSF); Brownfield Sites; and Historic Utility Sites.

New York SPILLS Database

This database includes releases reported to the NYSDEC, including tank test failures (for USTs only) and tank failures.

One active-status spill and 131 closed-status spills were reported potentially on or adjacent to the Property. The active-status spill occurred in December 1996, when a leak of PCB-containing transformer oil was reported in Consolidated Edison (Con Ed) Vault 4934/4696 in front of 81 Barclay Street (Spill #9611541). The listing indicated that the oil was contained in the vault, but some oil may have entered the sewer system through a sump in the vault. The listing was cleaned up and was to be closed. However, the listing remains active for unspecified reasons. The remaining potentially on-site listings were closed-status and were associated with: minor (i.e., no reported subsurface impact) spills on streets, sidewalks or within utility structures; asbestos releases during utility work and during the collapse of the World Trade Center; releases at the historical and new electrical substations in 7 World Trade Center; listings associated with Con Ed remediation of dielectric oil released during the collapse of the World Trade Center; listings associated with other releases following the collapse of the World Trade Center (e.g., releases from damaged petroleum storage tanks and airplane fuel tanks); and spills at the World Trade Center Campus during reconstruction activities. Some of the listings reported soil and/or groundwater contamination with fuel oil or dielectric oil; the listings were closed, indicating that remediation was completed to the satisfaction of NYSDEC, although some residual contamination may remain.

In addition, 26 active status spills and 719 closed-status spills were reported within a ½-mile radius of the Property. No off-site active spills with significant potential to affect the Property were identified. However, given the number of closed-status spills reported in the vicinity of the Property, some of these spills may have affected subsurface conditions beneath the Property. Details from all spills are included in Appendix D.

Resource Conservation and Recovery Act (RCRA) Notifiers Listings

This database lists sites which have filed notification forms regarding hazardous waste activity, including: treatment, storage and disposal facilities (TSDs); small-quantity (SQG) and large-quantity generators (LQG); and transporters regulated under RCRA. The discussion below includes any CORRACTS listings of facilities which are subject to corrective action under RCRA.

No CORRACTS sites were identified within a one-mile radius of the Property.

One TSD facility was identified within a ½-mile radius of the Property. The listing was for a Con Ed vault at 1 Murray Street, approximately 700 feet east of the Property, which was listed as a Treater, Storer or Disposer of benzene in 2007. No spill was reported in connection with this listing, which is not likely to have affected the Property based on its distance and nature.

Fifty-one RCRA Generators/Transporters were reported potentially on, or adjacent to, the Property. Most of these listings were utility-related (e.g., Con Ed) and reported generation of various wastes including PCB waste, heavy metal waste and/or benzene. The potentially on-site listings also included: three World Trade Center listings for generation of heavy metal waste in 2002, ignitable solid waste and solvents in 2001, and heavy metal waste, ignitable and corrosive solid waste, solvents, PCB waste and benzene between 1985 and 2010 (the latter listing included two RCRA violations in 1987 and 1990 with returns to compliance within a year); two Metropolitan Transit Authority (MTA) listings for generation of heavy metal waste in 2002 and 2007; and one listing for the World Trade Center – Barclay Street Con Ed electrical substation (which was historically partly located on the Property according to Sanborn maps) for generation of PCB waste, heavy metal waste, ignitable solid waste and benzene between 1998 and 2011.

Additionally, 249 RCRA Generators/Transporters were reported within a ⅛-mile radius of the Property. The nearest off-site listings with reported RCRA violations were: a U.S. Customs Service Laboratory at former 6 World Trade Center, south-adjacent to the Vesey Street portion of the Property, which was listed as a generator of heavy metal waste, various chemicals, and solvents and reported three RCRA violations in 1994 with returns to compliance within a same year; and a Verizon facility at 140 West Street, north-adjacent to the Vesey Street portion of the Property, which was listed as a generator of heavy metals, ignitable and corrosive waste and pesticides and reported six RCRA violations between 1984 and 2010, with returns to compliance within a year. Based on their proximity and/or listing details, the potentially on-site listings and off-site hazardous waste generators may have affected subsurface conditions beneath the Property, although it should be noted that the potential for impact for utility-related listings is typically minor as the utility structures tend to be self-contained.

Chemical Bulk Storage (CBS) Database

The New York CBS is a list of facilities that store regulated non-petroleum substances in aboveground tanks with capacities greater than 185 gallons and/or in underground tanks of any size.

No CBS facilities were listed within a ⅛-mile radius of the Property.

Solid Waste Facilities (SWF)

This database includes certain landfills, incinerators, transfer stations, recycling centers, and other sites which manage solid waste.

No Solid Waste Facilities were identified within a ½-mile radius of the Property.

Petroleum Bulk Storage (PBS) Database

This database lists facilities that registered having either aboveground or underground petroleum tanks with total storage exceeding 1,100 gallons. Facilities with more than 400,000 gallons appear on the Major Oil Storage Facilities (MOSF) database (see below).

Fifty PBS facilities were listed within a ⅛-mile radius of the Property, including three potentially on-site facilities and 11 facilities adjacent to the Property. Details of adjacent facilities with greater potential to affect the Property, based on the nature of the listing and/or associated spills with the potential to affect the Property, are given in Table 1.

Table 1
Area Petroleum Bulk Storage Facility Data

Location	Capacity (gallons)	Product Stored	Status	Location
7 World Trade Center	11,690 UST x2 8,000 UST x5	No. 2 Fuel Oil	Closed-Removed In Service	Potentially on-site
Salomon Smith Barney 7 World Trade Center	6,000 UST x2	No. 2 Fuel Oil	Closed-Removed	Potentially on-site
PANYNJ 5 World Trade Center	10,000 AST x2	No. 2 Fuel Oil	Adm. Closed*	Potentially on-site
1 World Trade Center	2,500 AST x2	No. 2 Fuel Oil	Adm. Closed*	World Trade Center construction site
PANYNJ, 1 World Trade Center, 88th Floor	10,000 AST 5,000 AST 275 AST x3 1,080 AST 55 AST	No. 2 Fuel Oil No. 2 Fuel Oil No. 2 Fuel Oil No. 2 Fuel Oil Empty	Adm. Closed* Adm. Closed* Adm. Closed* Adm. Closed* Closed-Removed	World Trade Center construction site
Bell Atlantic 2 World Trade Center	10,000 AST 275 AST x3 100 AST	Diesel	In Service	World Trade Center construction site
Former Deutsche Bank Building 130 Liberty Street	Unspecified AST	Unspecified	Unspecified	World Trade Center construction site
Verizon New York Inc. 140 West Street	17,000 AST x3 3,500 AST 14,000 AST 20,000 AST 275 AST x3 60 AST	Kerosene Diesel Kerosene Kerosene Kerosene Kerosene	Closed In Place In Service In Service In Service In Service In Service	Northwest of intersection of Vesey and Washington Streets
Engine 10/Ladder 10 124 Liberty Street	550 UST x2 550 UST x2 1,000 UST 330 UST	Diesel Gasoline Diesel Diesel	Closed In Place Closed In Place In Service In Service	Southeast of intersection of Liberty and Greenwich Streets
130 Cedar Street	3,000 UST 9,500 UST	No. 2 Fuel Oil No. 6 Fuel Oil	In Service	Southwest of intersection of Washington and Cedar Streets

Notes: PANYNJ - Port Authority of New York & New Jersey
AST - aboveground storage tank
UST - underground storage tank
*Administratively closed tank, installed pre-9/11/2001 in a former World Trade Center building

Previous studies summarized in Section 7.0 indicated that historical tanks associated with the World Trade Center Campus have been closed and removed. The USTs listed as "in service" at 7 World Trade Center were registered with a 2005 installation date indicating they are off-site, but west-adjacent to the on-site portion of Greenwich Street between Barclay and Vesey Streets.

Closed-status spills were associated with some of the above PBS sites. Based on details provided in the State SPILLS database and/or the anticipated groundwater flow direction, the reported spills and potential undetected releases may have affected subsurface conditions beneath the Property. Details of the remaining 40 PBS facilities located within a ⅛-mile radius of the Property are included in Appendix D.

State Inactive Hazardous Waste Disposal Site Registry (SHWS)

This program (also known as State Superfund) lists information regarding a variety of sites likely requiring cleanup.

No SHWS sites were reported within a one-mile radius of the Property.

State Hazardous Substance Waste Disposal Site Study (SHSWDS)

This database tracks certain sites that were not listed on SHWS, but may still require investigation and/or cleanup.

One SHSWDS was identified within a ½-mile radius of the Property. Radium Luminous Materials, located at 55 Liberty Street, approximately 680 feet east-southeast of the Property, was listed due to historical use of radium in the building. The listing indicated that the site was removed from the SHWS registry due to radium being a non-qualifying waste. The listing also noted that no evidence of hazardous substance use at this site was identified, and the site did not present a threat to public health or the environment. Based on its distance and listing details, this facility is not expected to have affected the Property.

Major Oil Storage Facilities (MOSF) Database

These facilities have petroleum storage of 400,000 gallons or more.

No Major Oil Storage Facilities were reported within a ⅛-mile radius of the Property.

Environmental Restoration Program

These sites (which are generally municipally-owned) are receiving New York State funding for site investigation and remediation. Some sites in this program have known contamination, whereas others have not had sufficient investigation to determine whether contamination is present.

No ERP sites were identified within a ½-mile radius of the Property.

Voluntary Cleanup Program

The Voluntary Cleanup Program is a NYSDEC program for investigation and remediation of (generally) privately-owned sites. Some sites in this program have known contamination, whereas others have not had sufficient investigation to determine whether contamination is present.

One VCP site was listed within a ½-mile radius of the Property. Based on its distance (more than ¼-mile east-northeast of the Property) and listing details, this site is not expected to have affected the Property.

Brownfield Cleanup Program

This NYSDEC program is the successor to the Voluntary Cleanup Program. Again, some sites have known contamination, whereas others have not had sufficient investigation to determine whether contamination is present.

One BCP site was listed within a ½-mile radius of the Property. Based on its location more than ¼ mile north of the Property (in an anticipated cross-gradient groundwater flow direction), this site is not expected to have affected the Property.

Historic Utility Sites

This is an inventory of certain power generating stations, manufactured gas plants, gas storage facilities, maintenance yards and other gas and electric utility sites identified in various historic documents, maps and annual reports from 1898 to 1950.

Two historical utility sites were reported within a ⅛-mile radius of the Property as follows:

- Two listings were identified for a Cedar Street facility. One listing indicated an unknown utility facility in 1922. The second listing, for 120-124 Cedar Street, approximately 80 feet south of the Property, indicated a Con Ed substation in 1948.
- 49-51 Park Place, located approximately 295 feet northeast of the Property, was listed as a Con Ed substation in 1948.

Based on historical Sanborn maps, neither facility was located adjacent to the Property. Based on the nature and location of the listings, these facilities are not likely to have significantly affected subsurface conditions beneath the Property.

5.2.3 Local

Records available online from the New York City Fire and Buildings Departments were viewed for the Property. The Fire Department records were obtained by Toxics Targeting, Inc. as part of the regulatory database search. Since the records typically address a multitude of issues, the review focused on items likely to relate to the potential presence of hazardous materials, e.g., petroleum tank installation applications and permits, and records indicating prior uses. Copies of pertinent information are included in Appendix C (Fire Department Records) and Appendix D (Buildings Department Records).

Buildings Department

No specific address information was available for the Property. On-site portions of Greenwich Street between Vesey and Liberty Streets, and Fulton Street between Church and West Streets were identified as part of Tax Block 58, Lot 1, and an on-site part of Greenwich Street between Vesey and Barclay Streets was identified as part of Tax Block 84, Lot 36. No block and lot information was available for the remainder of the Property.

Computerized Buildings Department records for Tax Block 58, Lot 1 (the main World Trade Center campus) included construction-related permit applications, but no Certificates of Occupancy or oil burner applications. Computerized Buildings Department records for Tax Block 84, Lot 36 (7 World Trade Center) included seven Certificates of Occupancy dated 1928 through 1969 for: commercial and warehouse uses; a factory in 1937; and a photo studio, leather shop and auto repair in 1951, and three oil burner applications dated 1946, 1951 and 2002.

Fire Department

The New York City Fire Department Tanks database was searched regarding past or current motor vehicle fuel and heating oil tank listings within a ⅛-mile radius of the Property. Computerized NYC Fire Department records identified 10 locations with aboveground or underground storage tanks within this radius. Details of the nearest Fire Department tank listings are given as follows:

- 120 Liberty Street Foundation Co., located at 125 Cedar Street, south-adjacent to the Property, was listed with a 4,000-gallon fuel oil tank (an active No. 2 fuel oil AST, according to the PBS database).
- Liberty Grocery Corp., located at 115 Cedar Street, south-adjacent to the Property, was listed with a 1,100-gallon, No. 2 fuel oil tank (not listed in the PBS database).
- National Car Rental, located at 111 Washington Street, approximately 235 feet south-southwest of the Property, was listed with a 3,000-gallon tank (a closed-in-place gasoline UST, according to the PBS database) and a 2,000-gallon gasoline tank (not listed in the PBS database).

No spills were reported for the above facilities. Two closed-status spills were reported for the remaining Fire Department facilities, but were not likely to have affected the Property based on listing details. Details of the remaining 7 Fire Department facilities within a ⅛-mile radius of the Property are included in Appendix C.

5.2.4 Additional Environmental Record Sources

To enhance the search, ASTM requires that additional local records be checked when, in judgment of the environmental professional, such records are: 1) reasonably ascertainable; 2) useful, accurate and complete in light of the objective of the records review; and 3) are obtained in initial ESAs. These records include:

- Local Brownfields Lists
- Local Lists of Landfill/solid waste disposal sites
- Local Lists of Hazardous Waste/Contaminated Sites
- Local Lists of Registered Tanks
- Local Land Records (for activity use limitations)
- Records of emergency release reports
- Records of contaminated public wells

Sources for these records include:

- Department of Heath/Environmental Division
- Fire Department
- Building Permit/Inspection Department
- Local/Regional Pollution Control Agency
- Local/Regional Water Quality Agency
- Local Electric Utility (for PCB records)

In AKRF's judgment, no additional local records meeting the ASTM criteria are pertinent for the Property.

6.0 USER-PROVIDED INFORMATION

Philip Habib & Associates representatives indicated that the Phase I was performed to evaluate the site prior to proposed roadway and sidewalk improvements associated with World Trade Center Campus

security measures, including installation of bollards, medians, guard booths and vehicle barriers. The soil disturbance is expected to be generally shallow (approximately two to four feet below grade), although some deeper excavation for utility relocation may be necessary. Philip Habib & Associates representatives also provided concept plans of the proposed project, which included a plan of subsurface utilities on-site. To the extent that pertinent additional information was provided, it has been summarized elsewhere in this report.

7.0 PREVIOUS STUDIES

7 World Trade Center Reconstruction Project, Lower Manhattan, New York – SEQR Negative Declaration – Notice of Determination of No Significance, Empire State Development, May 23, 2002

Part of the former 7 World Trade Center building was located on the Property, on Greenwich Street between Barclay and Vesey Streets. The Notice of Determination of No Significance (the Notice) was prepared as a statement that the proposed reconstruction of 7 World Trade Center "will not have a significant adverse effect on the environment." A subsurface investigation including the collection of soil and groundwater sampling was undertaken by Con Ed in December 2001. The Notice indicated that remediation of contamination associated with September 11, 2001 was ongoing independent of the 7 World Trade Center reconstruction project, and identified the following at the 7 World Trade Center site:

- Debris associated with the collapse of the World Trade Center had been removed as part of World Trade Center recovery efforts.
- The World Trade Center electrical substation was located in the historical 7 World Trade Center building. Damage due to the World Trade Center collapse caused the release of approximately 130,000 gallons of dielectric oil, with impact to soil and groundwater. No elevated concentrations of volatile organic compounds (VOCs) were detected in soil beneath the 7 World Trade Center site. Although some oil removed from this site was PCB-containing, no elevated PCB concentrations were detected by Con Ed soil and groundwater sampling. Excavation proposed for the reconstruction of 7 World Trade Center would remove any contaminated soils and treatment of groundwater recovered during dewatering. In a letter to Con Ed dated April 26, 2002, NYSDEC indicated that these measures would serve as effective remediation of the 7 World Trade Center site.
- Four diesel USTs ranging from 6,000 to 11,690 gallons in size were located in the southern portion of the 7 World Trade Center site, and have been closed and removed. Two of the USTs had been damaged by the World Trade Center collapse, with impact to soil and groundwater. Remediation by excavation of affected soil was in progress at the time of the Notice, with any remaining contaminated soil and groundwater to be remediated during the 7 World Trade Center redevelopment.
- The potential for ACM and PCB-containing utility lines was noted beneath the 7 World Trade Center site. Any such utilities encountered during excavation were to be properly handled and removed in accordance with the applicable regulations.
- The redevelopment was to be conducted under a site-specific Health and Safety Plan (HASP).

At the time of AKRF's reconnaissance, the new 7 World Trade Center building was located west-adjacent to Greenwich Street between Barclay and Vesey Streets.

World Trade Center Memorial and Redevelopment Plan – Final Generic Environmental Impact Statement, Lower Manhattan Development Corporation, April 2004

The Final Generic Environmental Impact Statement (FGEIS) was prepared for the reconstruction of the World Trade Center Campus, which included the majority of the Property (between Vesey Street to the

north and by Albany Street to the south) and the creation of the September 11 memorial. The evaluation of potential hazardous materials impacts included collection of soil and groundwater samples from the southeastern portion of the World Trade Center site, including samples collected on or in close proximity to the Property. The FGEIS indicated the following:

- The World Trade Center site was constructed on land created by filling in the 18th century. Fill materials of unknown origin, including sand, silt, clay, gravel, stone, macadam, river mud, ash, cinders and brick, have been identified beneath this site.
- Debris associated with the World Trade Center collapse had been removed to the depths of the World Trade Center subgrade levels (ranging from 35 to 70 feet below grade).
- A large quantity of fuel oil, diesel and lube oil was released at the Deutsche Bank building south-adjacent to the Property (south-adjacent to Liberty Street between Greenwich and Washington Streets) due to damage during the World Trade Center collapse. An oil collection system was subsequently established.
- Up to 27,000 gallons of fuel oil were historically stored at the World Trade Center site's subgrade levels, and may have been released during the World Trade Center collapse. Some oil may have been consumed by fire, with the remainder removed during the cleanup operations. Laboratory analysis of soil samples collected for the FGEIS did not reveal evidence of petroleum impacts or elevated concentrations of PCBs, asbestos or dioxins. The surface soils contained slightly elevated concentrations of semi-volatile organic compounds (SVOCs) and metals, possibly associated with fill materials and/or the World Trade Center collapse. A groundwater sample collected at the intersection of Washington and Albany Streets contained slightly elevated concentrations of petroleum-related VOCs potentially indicative of a nearby subsurface release and chloroform (attributed to leakage from chlorinated potable water lines). Chloroform was also detected at a slightly elevated concentration in another groundwater sample in the eastern portion of the World Trade Center site. The groundwater sample collected adjacent to the Deutsche Bank also contained slightly elevated concentrations of the solvent tetrachloroethylene.
- Some contaminated soil was to be removed from the World Trade Center site during redevelopment activities. Any remaining contaminated soil was to be encapsulated (e.g., beneath structures, pavement etc.). The redevelopment activities were to be conducted under site-specific Health and Safety Plans (HASPs), which would specify appropriate health and safety measures to be undertaken to ensure that subsurface disturbance is performed in a manner protective of workers, the community, and the environment.

Final Supplemental Environmental Impact Statement - Route 9A Project, West Thames Street to Chambers Street, U.S. Department of Transportation, Federal Highway Administration and New York State Department of Transportation, May 2005

The Final Supplemental Environmental Impact Statement (FSEIS) was prepared for the reconstruction of a portion of Route 9A between Chambers and West Thames Streets, west-adjacent to the World Trade Center campus. The evaluation of potential hazardous materials impacts included collection of soil and groundwater samples along West Street. The FSEIS indicated that three groundwater samples were collected, two of which were located west of the Property (i.e., in the anticipated downgradient groundwater flow direction). A slightly elevated concentration of a petroleum-related VOC (toluene) was detected in one groundwater sample collected at the southwestern corner of Liberty and West Streets. No elevated concentrations of other VOCs in groundwater or other evidence of contamination migrating from the Property and/or the World Trade Center site were detected during the sampling.

Permanent WTC PATH Terminal - Final Environmental Impact Statement, U.S. Department of Transportation - Federal Transit Administration, the Port Authority of NY & NJ and PATH, May 2005

The Final Environmental Impact Statement (FEIS) was prepared for the reconstruction of the Port Authority Trans-Hudson (PATH) transit terminal, located beneath the World Trade Center Campus including the majority of the Property (between Vesey Street to the north and by Albany Street to the south). The FEIS indicated that all petroleum storage tanks associated with the former World Trade Center complex had been removed, and all spills associated with the historical World Trade Center complex (including listings associated with the World Trade Center collapse) had been closed. As described in the World Trade Center Memorial and Redevelopment Plan FGEIS summary above, some residual contamination may be present at the World Trade Center site, and was to be addressed under the World Trade Center Memorial and Redevelopment Plan. The redevelopment of the PATH terminal was to be conducted under a site-specific HASP.

8.0 LIMITATIONS AND DATA GAPS

This assessment met the requirements of the American Society for Testing and Materials (ASTM) as established by ASTM Standard E1527-05 at the time it was performed, with the following limitations:

- Results of this investigation are valid as of the dates on which the investigation was performed.
- Portions of the Property (the southern portion of Vesey Street, the western portion of Church Street, Greenwich Street between Vesey and Cedar Streets, Fulton Street between Church and West Streets, Liberty Street between Greenwich and West Streets, and Washington Street between Liberty and Cedar Streets) were part of the fenced World Trade Center construction site and were not accessible for inspection; this area has been extensively excavated and is relatively unlikely to contain contaminated soils or buried tanks.
- As the Property consists of public and private streets and sidewalks, no Property representatives were available to be interviewed regarding the Property. However, information regarding the history and environmental conditions on the Property was available from historical land use maps and regulatory databases. To the extent that interviews were not conducted with the list of interviewees cited in the ASTM Standard (past and present owners, operators, and occupants of the Property and local government officials), AKRF does not believe that this represents a significant data gap likely to result in additional or significantly changed recognized environmental conditions or conclusions. Extensive information regarding history and environmental conditions on the Property and nearby sites was available based on AKRF experience in the project area, including the previous studies summarized in Section 7.0.
- The Property and area history was not conducted in five-year intervals. However, sufficient information about the history could be obtained from the available historical Sanborn maps and regulatory records, and this data gap is not likely to alter the conclusions of this report.

9.0 CONCLUSIONS AND RECOMMENDATIONS

This Phase I Environmental Site Assessment was performed in conformance with ASTM Standard E1527-05, *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Practice*. Any exceptions to, or deletions from, this practice are described in Section 8.0. The term "Recognized Environmental Condition" means the presence or likely presence of hazardous substances or petroleum at the property, including the ground, groundwater, or surface water at or under the property.

At the time of AKRF's reconnaissance, the Property consisted of streets, sidewalks and a portion of the World Trade Center construction site which will be occupied by extensions of Greenwich, Fulton, Liberty and Washington Streets in the future. The portion of the Property located on the World Trade Center construction site was not accessible for inspection; this area has been extensively excavated and is relatively unlikely to contain contaminated soils or buried tanks. The surrounding area was occupied predominantly by multistory office buildings (some with ground-floor commercial uses), with some residential uses, institutional buildings (churches and government buildings) and parkland.

This assessment revealed evidence of Recognized Environmental Conditions (first four bullets). A summary of the assessment findings is presented below:

- The assessment found that the Property is located on made land. Fill material of unknown origin, including sand, silt, clay, gravel, stone, macadam, river mud, ash, cinders and brick, is present beneath the Property. Prior to 1951, the Property was predominantly occupied by public streets. A portion of West Broadway between Barclay and Vesey Streets was historically occupied by buildings with unspecified uses, but was shown as a public street by 1922-1923. The Manhattan Railway (a historical elevated railway company) and rail lines on Fulton Street between Church and Greenwich Streets were shown on the Property in the early 20th century. By 1971, the majority of the Property was part of the World Trade Center Campus. Portions of World Trade Center buildings and the surrounding plaza were located on the Property, and the portion of Greenwich Street between Barclay and Vesey Streets was part of a two-story electrical substation (the former 7 World Trade Center). Underground structures, including subway and Port Authority Trans-Hudson (PATH) tunnels, were noted beneath the World Trade Center plaza. The buildings on the World Trade Center campus were destroyed on September 11, 2001. Reconstruction efforts are currently in progress. The area surrounding the Property was historically mixed-use and included manufacturing, printers, a laundry, a dye and chemical store and factory, a National Aniline & Chemical Co. building, utility buildings (NY Steam Co., US Electric Light Co., Western Electric Co. and an electrical transformer station), and filling stations in close proximity to the Property, and ferry and railroad piers west of the Property beyond West Street. More bank and office uses were shown in the surrounding area starting in the mid-20th century, with these uses dominating the surrounding area by the late 20th century.
- Regulatory databases identified one active-status spill, 131 closed-status spills and 51 hazardous waste generator listings potentially on, or adjacent to, the Property. Based on listing details, the active spill appeared minor in nature (a leak of transformer oil reportedly contained within a manhole) and unlikely to affect subsurface conditions beneath the Property. The remaining potentially on-site listings were associated with: minor (i.e. no reported subsurface impact) spills on streets, sidewalks or within utility structures; asbestos releases during utility work and during the collapse of the World Trade Center; releases at the historical and new electrical substations in 7 World Trade Center; listings associated with Con Ed remediation of dielectric oil released during the collapse of the World Trade Center; listings associated with other releases following the collapse of the World Trade Center (e.g., releases from damaged petroleum storage tanks and airplane fuel tanks); and spills at the World

Trade Center Campus during reconstruction activities. Some of the listings reported soil and/or groundwater contamination with fuel oil or dielectric oil; all these listings were closed, indicating that remediation was completed to the satisfaction of NYSDEC, although some residual contamination may remain. The potentially on-site hazardous waste generator listings included generators of heavy metal wastes, solvents, PCB waste, and benzene. Regulatory databases also identified off-site closed-status spills, hazardous waste generators and petroleum storage facilities with the potential to affect the Property.

- No evidence of petroleum storage tanks was observed on the Property. However, the reconnaissance noted fill ports and/or vent pipes adjacent to buildings fronting the Property. If these fill ports and vent pipes pertained to underground storage tanks (USTs), such USTs may be located off-site beneath adjacent buildings or perhaps buried or located in vaults beneath Property sidewalks. Regulatory records identified closed-status USTs in World Trade Center buildings historically located on the Property. Previous studies indicated that tanks associated with the former World Trade Center buildings have been removed. The active World Trade Center UST listings are for tanks at the new 7 World Trade Center building, which is adjacent to, but not on, the Property.
- Previous studies conducted for the reconstruction of 7 World Trade Center, the main World Trade Center Campus, the PATH terminal beneath the World Trade Center Campus, and Route 9A (West Street) were reviewed. These studies indicated that debris associated with the collapse of the World Trade Center has been removed. Subsurface contamination at the former 7 World Trade Center site was remediated as part of the new building's construction, contamination on the main World Trade Center Campus is being remediated as part of reconstruction activities in this area, and any residual contamination would be encapsulated (e.g. beneath structures or pavement) to prevent potential exposure. Soil testing conducted in the 2000s in the eastern portion of the World Trade Center Campus and on streets to the south (i.e., on or near the Property) indicated no evidence of petroleum impacts or elevated concentrations of asbestos or dioxins. Surface soils in this area contained slightly elevated concentrations of semi-volatile organic compounds (SVOCs) and metals, possibly associated with fill materials and/or the World Trade Center collapse, and groundwater samples in this area contained slightly elevated concentrations of petroleum and solvent-related volatile organic compounds (VOCs). Soils in the vicinity of the former 7 World Trade Center contained no elevated concentrations of polychlorinated biphenyls (PCBs), but soil and groundwater in this area showed evidence of petroleum and/or dielectric oil contamination; however, the testing was conducted prior to the construction of the new building and associated remediation.
- If installed prior to 1979, street lighting fixtures may include PCB-containing components; however, due to significant reconstruction in the vicinity of the Property since September 11, 2001, the fixtures were likely installed in the 2000s and are therefore unlikely to contain PCBs. Electrical transformer vaults noted in the Vesey Street and West Broadway sidewalks, electrical manholes, and underground oil-filled electrical conduits may have utilized PCB-containing equipment, though again it is likely that most of these have been replaced since 2001.
- No suspect asbestos-containing materials (ACM) were observed during the reconnaissance. However, underground utilities and electrical transformer vaults may include ACM including conduits and piping.
- Lead-based paint may be present on painted surfaces and in underground utility structures. During the reconnaissance, aboveground painted surfaces were observed to be in good condition.

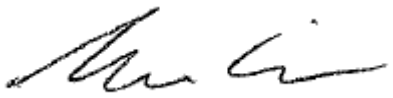
RECOMMENDATIONS

- Soil and groundwater beneath the Property may have been affected by past and present, on- and off-site uses. However, significant remediation has occurred as part of World Trade Center Campus redevelopment. Soil disturbance for the proposed project is expected to be limited to soils well above the water table, where a greater potential for encountering contamination exists. It is expected that during the project design phase, soil characterization testing targeted to the areas of disturbance for disposal purposes would occur. AKRF recommends that soil disturbance for the proposed project be conducted in accordance with a Remedial Action Plan (RAP) and Construction Health and Safety Plan (CHASP). The RAP would address requirements for items such as soil stockpiling, soil disposal and transportation; dust control; quality assurance; and contingency measures, should petroleum storage tanks or contamination be unexpectedly encountered. The CHASP would identify potential hazards that may be encountered during construction and specify appropriate health and safety measures to be undertaken to ensure that subsurface disturbance is performed in a manner protective of workers, the community, and the environment (such as personal protective equipment, air monitoring, and emergency response procedures).
- Any tanks or piping that may be disturbed by the proposed project, as well as any petroleum storage tanks unexpectedly encountered during construction, should be properly closed and removed along with any contaminated soil and tank registrations should be updated as required with NYSDEC and/or the New York City Fire Department, if applicable. Any evidence of a petroleum spill must be reported to NYSDEC and addressed in accordance with applicable requirements.
- During future subsurface disturbance, excavated soil should be handled and disposed of in accordance with applicable regulatory requirements. Although groundwater is not expected to be encountered, if dewatering is required during construction activities, it should be performed in accordance with New York City Department of Environmental Protection (NYCDEP) requirements.
- Prior to any activities with the potential to disturb transformer vaults or other subsurface utilities, such utilities should be properly decommissioned. An asbestos survey of the areas to be disturbed should be completed and all ACM should be removed and disposed of in accordance with local, state and federal requirements.
- Unless there is labeling or test data indicating that suspect PCB-containing lighting fixtures and electrical equipment (e.g., equipment in transformer vaults and electrical manholes) do not contain PCBs, if disposal is required, it should be performed in accordance with applicable federal, state and local requirements.
- Any activities with the potential to disturb lead-based paint must be performed in accordance with applicable requirements (including federal Occupational Safety and Health Administration regulation 29 CFR 1926.62 - *Lead Exposure in Construction*).

10.0 SIGNATURE PAGE

I declare that, to the best of my professional knowledge and belief, I meet the definition of Environmental Professional as defined in §312.10 of 40 CFR 312.

I have the specific qualifications based on education, training, and experience to assess a property of the nature, history, and setting of the property for which the assessment was performed. I have performed all the appropriate inquiries in conformance with standards and practices set forth in 40 CFR Part 312.



Marcus Simons
Senior Vice President

Asya Kleyn
Environmental Engineer

11.0 QUALIFICATIONS

The purpose of this assessment was to convey a professional opinion about the potential presence or absence of contamination, or possible sources of contamination on the property, and to identify existing and/or potential environmental problems associated with the property including *Recognized Environmental Conditions* as defined in ASTM Standard E1527-05, *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Practice*.

The assessment was performed in accordance with customary principles and practices in the environmental consulting industry, and in accordance with the above-referenced ASTM Standard, except as noted otherwise in Section 8.0. It should only be used as a guide in determining the possible presence or absence of hazardous materials on the property at the time of the reconnaissance, as it is based upon the review of readily available records relating to both the property and the surrounding area, as well as a visual reconnaissance of current conditions.

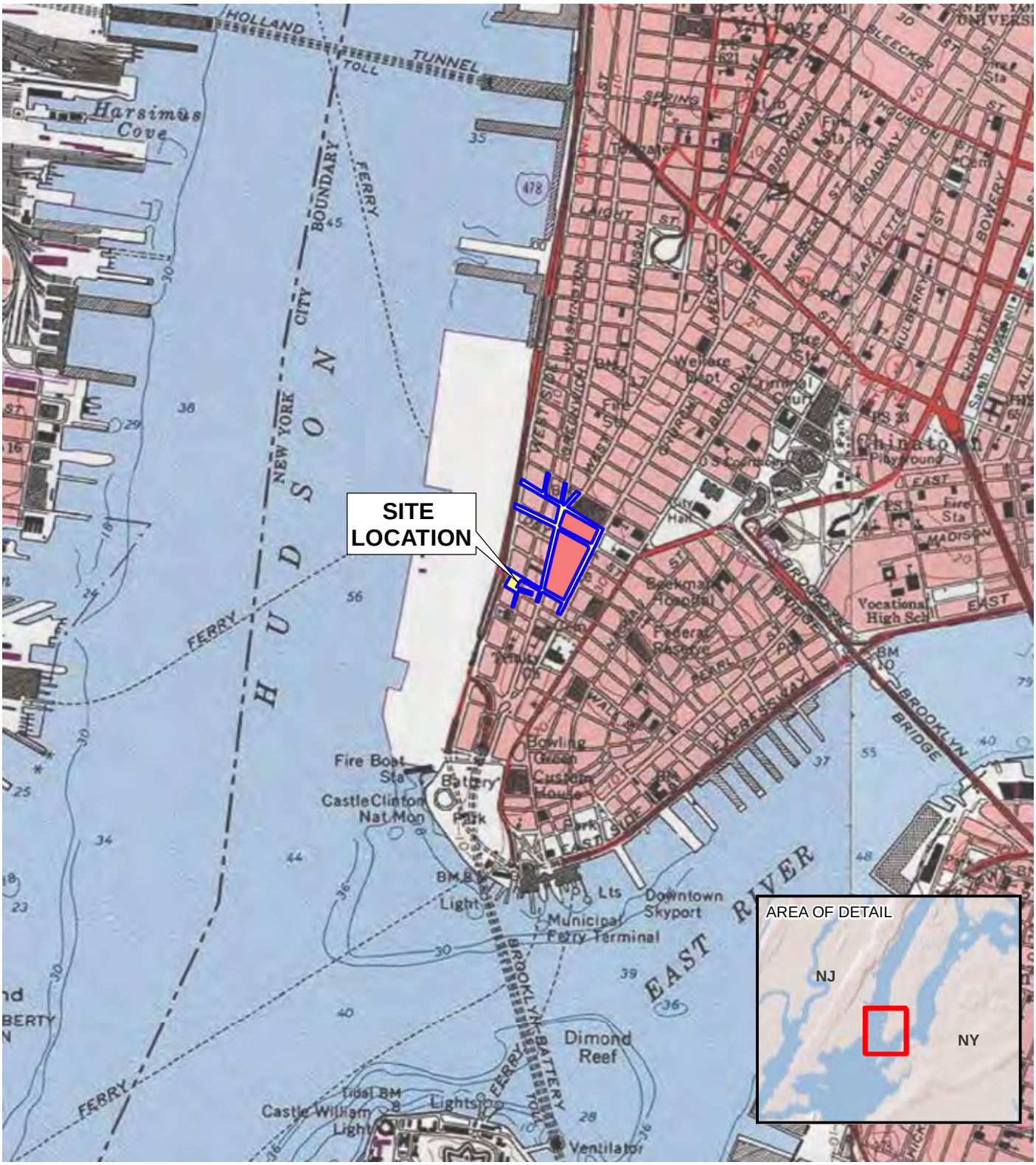
This Phase I Assessment is not, and should not be construed as, a guarantee, warranty, or certification of the presence or absence of hazardous substances, which can be made only with testing, and contains no formal plans or recommendations to rectify or remediate the presence of any hazardous substances which may be subject to regulatory approval. This report is not a regulatory compliance audit.

This report is based on services performed by AKRF, Inc. professional staff and observation of the property and its surroundings. We represent that observations made in this assessment are accurate to the best of our knowledge, and that no findings or observations concerning the potential presence of hazardous substances have been withheld or amended. The research and reconnaissance have been carried to a level that meets accepted industry and professional standards. Nevertheless, AKRF and the undersigned shall have no liability or obligation to any party other than Philip Habib & Associates and their successors or assignees, and AKRF's obligations and liabilities to the above, their successors or assignees is limited to fraudulent statements made, or grossly negligent or willful acts or omissions.

12.0 REFERENCES

1. Toxics Targeting, Inc.; WTC Security Plan – New York, NY 10048; Regulatory Radius Search; December 28, 2011.
2. U.S. Geological Survey; *Jersey City, N.J. – N.Y. Quadrangle*; 7.5 minute Series (Topographic); Scale 1:24,000; 1967; Photorevised 1981.
3. U.S. Geological Survey; Open Files Report 89-462; Bedrock and Engineering Geologic Maps of New York County and Parts of Kings and Queens Counties, New York, and Parts of Bergen and Hudson Counties, New Jersey; Sheet 3 - Bedrock Contours and Outcrops; 1990.
4. New York State Department of Health: Office of Public Health - Environmental Radiation Section; Basement Radon Screening Data; October 2011.
5. *Sanitary & Topographical Map of the City and Island of New York*, Egbert L. Viele, 1865.
6. Sanborn Insurance Maps dated 1894, 1922-1923, 1951, 1977, 1985, 1994 and 2007.
7. *World Trade Center Test Pit Program*, The Port Authority of NY & NJ, August 2011.
8. *7 World Trade Center Reconstruction Project, Lower Manhattan, New York – SEQR Negative Declaration – Notice of Determination of No Significance*, Empire State Development, May 23, 2002.
9. *World Trade Center Memorial and Redevelopment Plan – Final Generic Environmental Impact Statement*, Lower Manhattan Development Corporation, April 2004.
10. *Final Supplemental Environmental Impact Statement - Route 9A Project, West Thames Street to Chambers Street*, U.S. Department of Transportation, Federal Highway Administration and New York State Department of Transportation, May 2005.
11. *Permanent WTC PATH Terminal - Final Environmental Impact Statement*, U.S. Department of Transportation - Federal Transit Administration, the Port Authority of NY & NJ and PATH, May 2005.

FIGURES



SOURCE
USGS 7.5 Minute Topographic Map
Jersey City Quad 1995

0 1,000 2,000
Feet

WORLD TRADE CENTER CAMPUS SECURITY PLAN
NEW YORK, NEW YORK

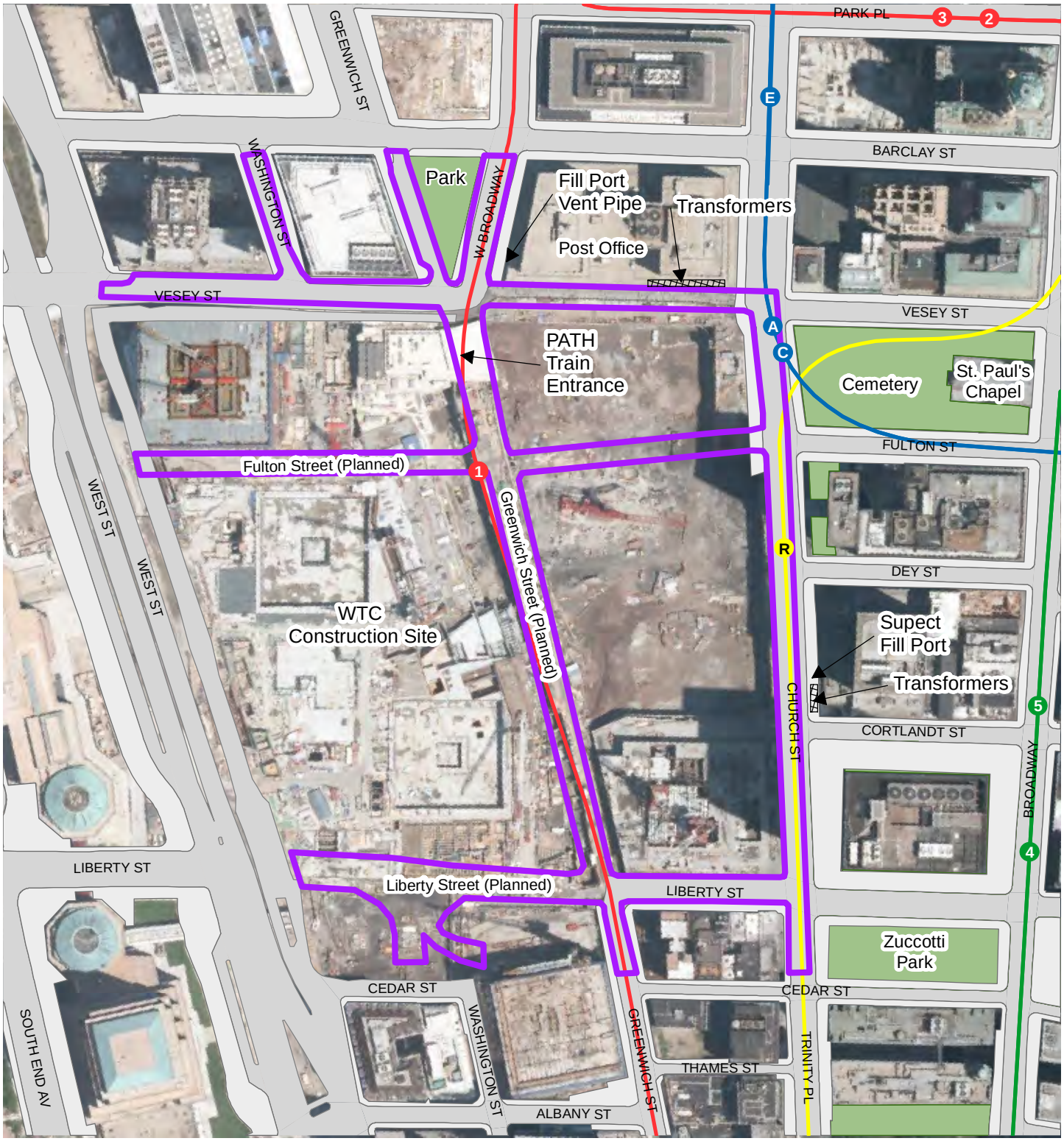
PROJECT SITE LOCATION

AKRF
Environmental Consultants
440 Park Avenue South, New York, N.Y. 10016

DATE
1/12/2012

PROJECT No.
20393

FIGURE
1



0 250 500
Feet

Legend

Project Site Location

WORLD TRADE CENTER CAMPUS SECURITY PLAN

NEW YORK, NEW YORK

SITE PLAN

AKRF

Environmental Consultants

440 Park Avenue South, New York, N.Y. 10016

DATE 5/10/2012

PROJECT No. 20393

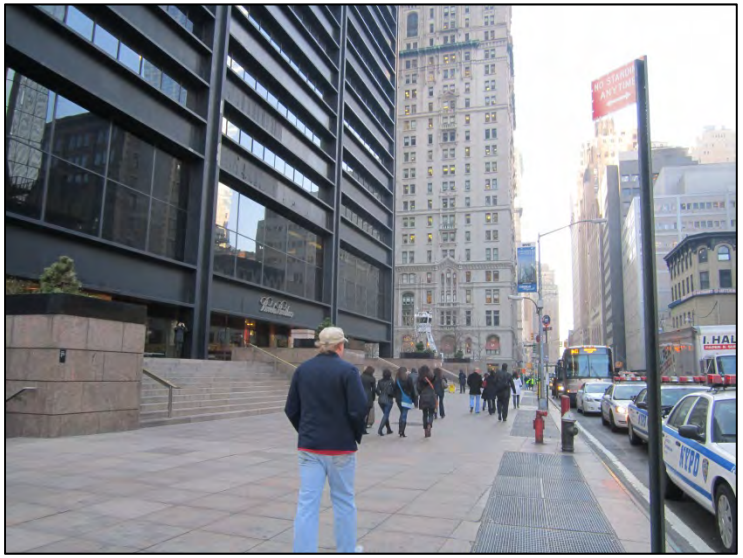
FIGURE 1

APPENDIX A
PHOTOGRAPHIC DOCUMENTATION

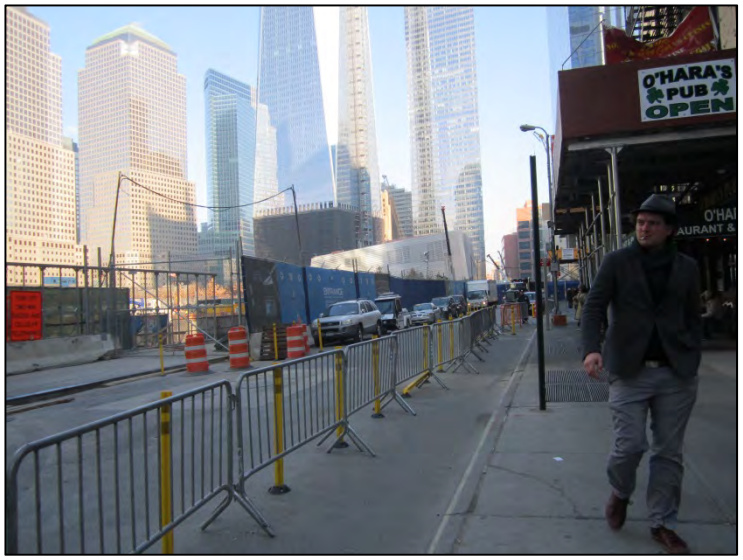
Photograph 1. On-site portion of Church Avenue north of Cortlandt Street and the west-adjacent World Trade Center construction site, view north.

Photograph 2. On-site portion of Church Avenue south of Dey Street and the west-adjacent World Trade Center construction site, view south.

Photograph 3. On-site portion of Church Avenue between Liberty and Cedar Streets, view southeast.



Photograph 4. Office buildings west of the Property along Church Street, between Cortlandt and Liberty Streets, view south.



Photograph 5. On-site portion of Greenwich Street north of Cedar Street and the west-adjacent World Trade Center construction site, view north.

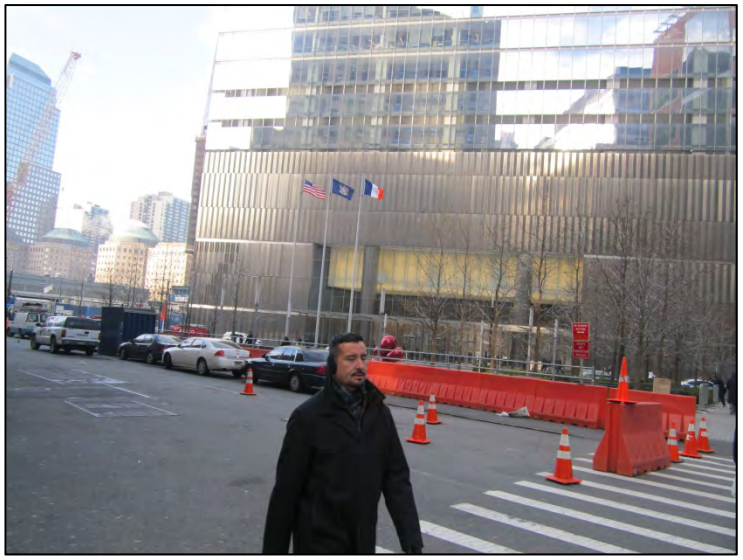
Photograph 6. The World Trade Center construction site west-adjacent to Greenwich Street between Cedar and Liberty Streets, view west.

Photograph 7. On-site portion of Washington Street north of Albany Street, view north.

Photograph 8. On-site intersection of Greenwich Street and West Broadway and PATH train entrance, view south.

Photograph 9. On-site portion of Washington Avenue north of Vesey Street, view north.

Photograph 10. On-site portion of Greenwich Street north of Vesey Street and the east-adjacent park, view north.



Photograph 11. On-site portion of West Broadway north of Vesey Street and the east-adjacent park, view southeast.

Photograph 12. Office buildings northwest of the Property, view south along Church Avenue from Barclay Street.

Appendix D

Transportation Planning Factors Memorandum

Philip Habib & Associates
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TECHNICAL MEMORANDUM

TO: **New York City Police Department**

FROM: **Philip Habib & Associates**

DATE: **March 27, 2013**

PROJECT: **World Trade Center Campus Security Plan (PHA No. 1158)**

RE: **Transportation Planning Factors and Methodologies**

This memorandum summarizes the transportation planning assumptions and methodologies used for the analyses of traffic, transit, pedestrian and parking conditions for the World Trade Center Campus Security Plan Environmental Impact Statement (EIS). The memorandum provides an overview of the findings of previous transportation studies conducted in the vicinity of the World Trade Center (WTC) site, and a detailed discussion of the anticipated street network changes and traffic reassignments and diversions that would be associated with the proposed Campus Security Plan (the Proposed Project). Factors for estimating travel demand from planned development at the WTC site are presented, as is a travel demand forecast. The anticipated incremental net change in peak hour vehicle trips at analyzed intersections as a result of the Proposed Project is also provided.

I. BACKGROUND

The Proposed Project is the implementation of a Campus Security Plan for the World Trade Center site in Lower Manhattan. The Lower Manhattan Development Corporation (LMDC) originally issued a Master Plan for the WTC site in September 2003 contemplating the development of a Memorial, Memorial Center, cultural facilities, up to 10 million square feet of Class A office space with 1,200 to 1,400 spaces of below-grade parking for office tenants, up to one million square feet of retail space, a hotel with up to 800 rooms and up to 150,000 square feet of conference space, and open space areas. A Final Generic Environmental Impact Statement (FGEIS) assessing the potential effects of this development was issued in April 2004. Since that time, there have been changes to the proposed site plan, and a smaller development program is now contemplated. The following briefly summarizes the World Trade Center Memorial and Redevelopment Plan as analyzed in the 2004 FGEIS, subsequent changes that have been made to the site plan and development program unrelated to the Proposed Project, and other recent environmental reviews that have been prepared for projects at or in the vicinity of the WTC site. It should be noted that implementation of any proposed mitigation measures based on the findings of the impact analyses in these various studies is dependent on acceptance by the relevant city and state agencies, including the New

York City and New York State departments of transportation. NYCDOT has indicated that some of the traffic mitigation measures proposed in the 2004 *World Trade Center Memorial and Redevelopment Plan FGEIS* may no longer be feasible or may no longer be needed given the smaller development program now contemplated. Therefore, as requested by NYCDOT, implementation of the measures outlined in the 2004 FGEIS were not assumed for the future without the Proposed Project (the No-Action condition), nor for the future with the Proposed Project (the With-Action condition) in the traffic analyses for the *WTC Campus Security Plan EIS*.

2004 WORLD TRADE CENTER MEMORIAL AND REDEVELOPMENT PLAN

Project Site

As shown in **Figure 1**, the WTC site was defined in the 2004 FGEIS as the approximately 16-acre parcel bounded by Vesey Street on the north, Liberty Street on the south, Church Street on the east and Route 9A (West Street) on the west. Also included in the overall project site were two adjacent blocks bounded by Liberty Street on the north, Albany and Cedar Streets on the south, Greenwich Street on the east and Washington Street and Route 9A on the west (referred to in the Master Plan as the "Southern Site").

Development Program

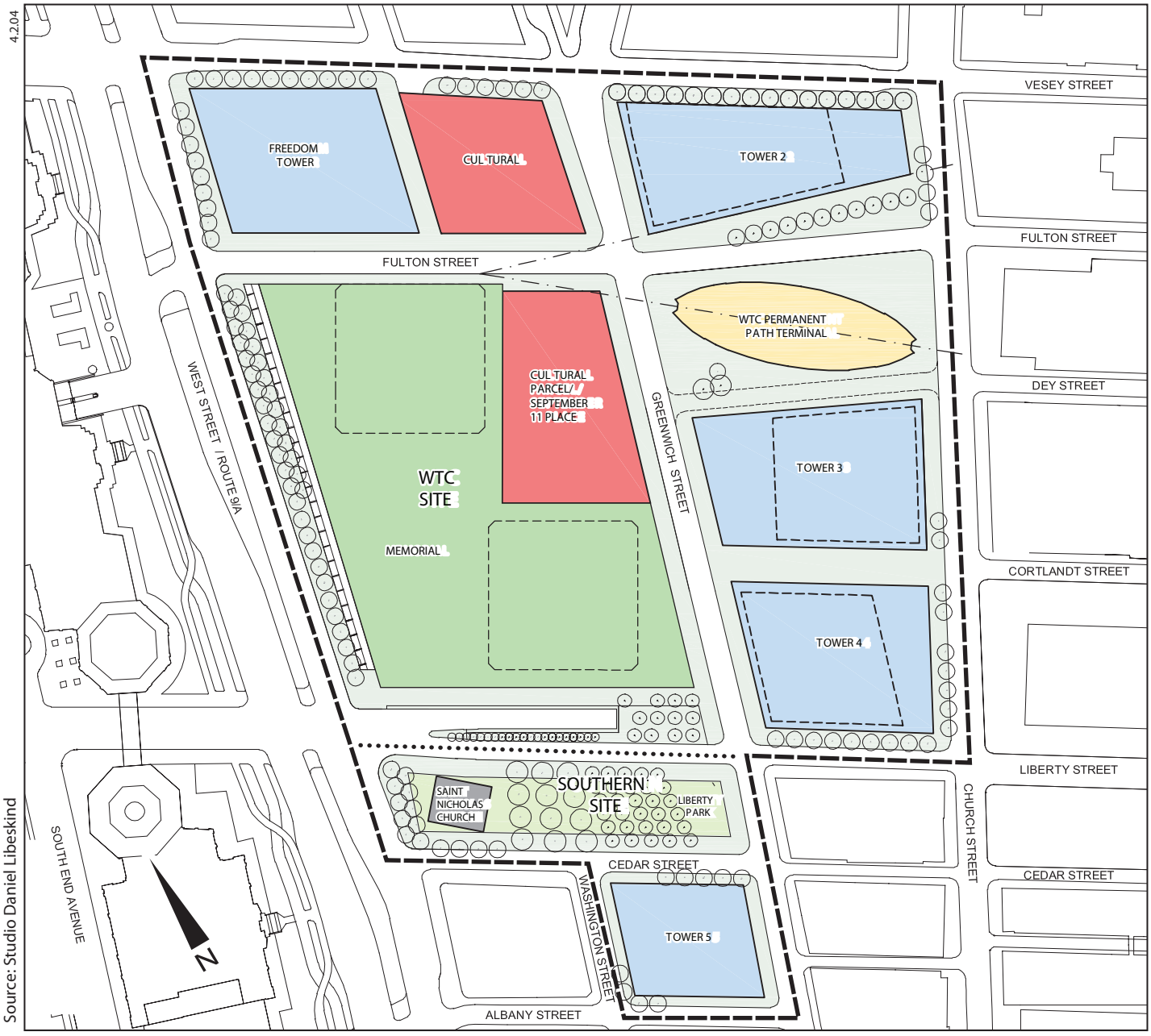
As shown in **Table 1**, the development program contemplated under the Master Plan provided for the construction of a Memorial and Memorial Center, up to 10 million square feet of office space in five towers, up to 1.03 million square feet of retail space (including 30,000 sf of restaurant/café uses), a hotel with up to 800 rooms and up to 150,000 square feet of conference space, a 2,200-seat performance space, up to 240,000 square feet of cultural facilities, and an underground parking garage for office tenants with 1,200 to 1,400 parking spaces. Also present on the project site (but not included as part of the proposed project) would be a permanent terminal for Port Authority Trans-Hudson (PATH) trains to New Jersey (the "Transit Hub").

Table 1
Comparison of 2004 FGEIS and Current WTC Development Programs

Project Component	2004 FGEIS Program	Current Estimated Program	Net Change
Office	10 million sf	8.49 million sf	(1.51 million sf)
Retail (including restaurant/café uses)	1.03 million sf	455,000 sf	(530,000 sf)
Hotel/Conference Space	800 rooms/150,000 sf	0 rooms/0 sf	(800 rooms/150,000 sf)
Memorial Center	290,000 sf	290,000 sf	0 sf
Performing Arts Center	2,200 seats	1,000 seats	(1,200 seats)
Cultural Facilities	240,000 sf	0 sf	(240,000 sf)
Parking Spaces	1,200-1,400	+/- 500	(approx. 700 – 900)
Notes: Memorial included in both programs.			

Site Plan and Vehicular Circulation

The proposed street configuration under the Master Plan included extending Fulton Street east-west through the site and Greenwich Street north-south through the site (see **Figure 1**).



2004 FGEIS Proposed Site Plan
Shown with Route 9A At-Grade Alternative

Figure 1

World Trade Center Memorial
and Redevelopment Plan

Fulton Street would operate one-way westbound and Greenwich Street would operate one-way southbound, and it was understood that both streets might be restricted or closed to traffic from time to time. The Southern Site would be reconfigured to open Cedar Street between Greenwich Street and Route 9A and close Washington Street between Liberty and Cedar streets. Cedar Street would operate one-way westbound, with all traffic northbound on Washington Street turning left onto Cedar Street to Route 9A.

As shown in **Figure 1**, the extensions of Fulton and Greenwich streets would divide the project site into four quadrants of unequal size. It was planned that the Memorial, Memorial Center and cultural buildings would occupy the southwest quadrant, while the tallest of five proposed towers (Tower 1, then referred to as the "Freedom Tower") and cultural space would occupy the northwest quadrant. Three additional towers and the Transit Hub would occupy the two eastern quadrants while the fifth tower would be located at the south end of the Southern Site.

Under the Master Plan, it was assumed that tour buses would stop to discharge and pick up passengers along the west side of Greenwich Street adjacent to the Memorial, and that these buses would be parked in a below-grade parking area which they would enter via a ramp on Liberty Street east of Route 9A. Trucks en route to below-grade service levels on the WTC site were also assumed to enter via this ramp, while autos belonging to office tenants would be allowed to enter and exit the 1,200 to 1,400 below-grade parking spaces via a ramp on the south side of Vesey Street at Washington Street. All vehicle types could exit the on-site service and parking areas via the Liberty Street or Vesey Street ramps, or via an exit ramp onto the northbound Route 9A median.

Traffic Analysis and Mitigation

To assess the effects on traffic flow from vehicle trips generated by the 10 million square feet of office space, 1.03 million square feet of retail space and other uses planned for the WTC site, the 2004 FGEIS examined conditions at a total of 40 intersections within a study area bounded by Canal Street on the north, Rector Street on the south, Broadway and Water Street on the east and West Street on the west (see **Figure 13A-1** from the FGEIS provided in **Appendix A**). It was estimated that full build out of the WTC development program would generate a net total of 2,558 vehicle trips in the weekday AM peak hour, 2,904 in the midday and 2,559 in the PM peak hour. The determination of significant adverse traffic impacts resulting from these project-generated trips for a 2015 analysis year was defined in the FGEIS as significant changes in traffic delay compared with conditions that would have been expected in 2015 had the WTC complex not been destroyed (a Pre-September 11 Scenario). Methodologies and impact criteria from the 2000 *City Environmental Quality Review (CEQR) Technical Manual* were used for the analysis. As shown in **Table 2**, below, the FGEIS analysis identified a total of 24 intersections as being significantly adversely impacted in one or more of the weekday AM, midday and PM peak hours assuming implementation of the Route 9A At-Grade Alternative. The magnitude of these impacts were traced to several factors, including the addition of project-generated trips to an already congested network; the volume of project-generated vehicular traffic; the increased volume of traffic that would turn onto Vesey Street from Route 9A to reach the on-site parking garage; and the volume of pedestrian traffic expected to be generated by the Memorial.

Table 2
FGEIS Impacted Intersections and Traffic Mitigation Plan for 2015

Intersection		Recommended Mitigation Measures	Weekday Peak Hour		
			AM	Midday	PM
Route 9A (West Street) and	Canal Street	• re-stripe WB Canal Street to 2x11' left-turn lanes & 1x11' right turn lane • relocate southern-most crosswalk • signal timing/phasing modifications • enhanced enforcement	F	F	F
	Chambers Street	• signal timing/phasing modifications	P	P	P
	Vesey Street	• no practicable mitigation identified	U	U	U
	Fulton Street	• signal timing/phasing modifications	U	----	----
	Liberty Street	• signal timing/phasing modifications	F	F	F
	Albany Street	• implement new parking restrictions on Albany Street • provide 13'-wide right-turn lane on WB Albany Street • signal timing/phasing modifications	F	P	P
	BBT Entrance	• no practicable mitigation identified	U	U	U
Canal Street and	Hudson Street	• re-stripe EB Canal Street left-turn lane from 11' to 12' by reducing median • implement new parking restrictions on Hudson Street to achieve additional NB travel lane • signal timing/phasing modifications	F	P	F
	Varick Street	• signal timing/phasing modifications	F	F	F
West Broadway and	Worth Street	• signal timing/phasing modifications • enhanced enforcement	F	----	F
	Chambers Street	• signal timing/phasing modifications	F	F	F
West Broadway/ Greenwich Street and	Vesey Street	• prohibit left-turns from SB Greenwich Street onto Vesey Street • right-turns from SB Greenwich to be stop controlled • signal timing/phasing modifications	F	F	F
Greenwich Street and	Liberty Street	• signal timing/phasing modifications	F	----	F
	Rector Street	• re-stripe NB + SB Greenwich Street to provide 12' exclusive right-turn lanes adjacent to curb lanes • re-stripe SB Greenwich Street to provide a 12' exclusive left-turn lane and one through lane • signal timing/phasing modifications • implement new parking restrictions on EB Rector Street	F	F	F
Church Street and	Worth Street	• implement new parking restrictions on Church and Worth Streets • provide a new travel lane and a new right-turn only lane on Church Street • re-stripe Worth Street to provide a 12' through lane and a 12' right-turn only lane • signal timing/phasing modifications	F	F	F
	Chambers Street	• signal timing/phasing modifications • eliminate truck loading/unloading zone on Church Street to provide an additional through lane • enhanced enforcement	F	F	F

Table 2 (continued)
FGEIS Impacted Intersections and Traffic Mitigation Plan for 2015

Intersection		Recommended Mitigation Measures	Weekday Peak Hour		
			AM	Midday	PM
Church Street and	Vesey Street	• re-stripe EB Vesey Street to provide one through lane and a shared through-left lane • relocate bus layover zone on west side of Church Street to far-side block to provide additional travel lane	F	F	F
	Fulton Street	• Re-stripe WB Fulton Street to one 12' through lane and one 12' shared through-right lane • implement new parking restrictions on Fulton Street	F	F	P
	Cortlandt Street	• implement new parking restrictions on Cortlandt Street • re-stripe Cortlandt Street to 2x12' right-turn lanes	F	F	F
	Rector Street	• signal timing/phasing modifications	F	----	F
Broadway and	Worth Street	• relocate near-side bus stop on Worth Street to far-side • increase EB lane width form 14' to 15' • prohibit truck loading/unloading on Broadway to gain a travel lane • enhanced enforcement • re-stripe Worth Street to provide a through lane and a left-turn only lane • signal timing/phasing modifications	F	P	F
	Vesey Street	• implement new parking restrictions on EB Vesey Street • re-stripe Broadway to provide two through lanes and two left-turn only lanes • signal timing/phasing modifications	F	P	F
	Rector Street	• signal timing/phasing modifications	F	F	F
Water Street and	Fulton Street	• Re-stripe NB Water Street to one through lane and one shared through-left turn lane	F	F	F
	Notes: Assumes implementation of the Route 9A At-Grade Alternative. F – Impacts fully mitigated P – Impacts partially mitigated U – Impacts remain unmitigated ---- No significant impacts				

Potential mitigation measures for these significant adverse impacts were explored in the FGEIS, and the analysis determined that the majority of impacted locations could be mitigated with standard traffic engineering improvements, including:

- signal phasing and/or timing changes;
- prohibition of on-street parking at the approaches to a number of intersections in order to add a travel lane at the intersection;
- enforcement of existing parking prohibitions at several locations to ensure that traffic lanes are available to moving traffic and are not blocked during key peak hours;
- lane restriping and lane designation changes to make more efficient use of available street widths;

- relocating pedestrian crosswalks at key locations to minimize conflicts between vehicular and pedestrian traffic, and/or adding all-pedestrian phases at specific high pedestrian activity locations; and
- relocating bus stops at a few key locations from the near side of the intersection to the far side of the intersection.

Table 2 also shows a summary of the mitigation measures proposed in the FGEIS for each intersection and their expected effectiveness. As shown in **Table 2**, with the traffic mitigation plan outlined in the FGEIS, 20 out of 24 impacted intersections were expected to be fully mitigated in the AM peak hour, 13 out of 20 in the midday, and 18 out of 23 in the PM peak hour. Impacts at a total of four intersections in the AM peak hour, seven in the midday and five in the PM peak hour were expected to be partially mitigated or would remain unmitigated. (The FGEIS included a discussion of additional area-wide traffic management and improvement strategies that could be considered in order to address those traffic impacts that would remain partially mitigated or unmitigated under the proposed traffic mitigation plan.)

As noted previously, NYCDOT has indicated that some of the traffic mitigation measures proposed in the 2004 *World Trade Center Memorial and Redevelopment Plan FGEIS* may no longer be feasible or may no longer be needed given the smaller development program now contemplated. Therefore, as requested by NYCDOT, implementation of the measures outlined in the 2004 FGEIS were not assumed for the No-Action and With-Action traffic analyses for the *WTC Campus Security Plan EIS*.

Transit and Pedestrian Analyses

Full build-out of the WTC development program would generate increased demand on the subway stations and bus routes serving the WTC site. However, the analyses in the FGEIS indicated that no subway station element would be significantly adversely impacted in either the AM or PM peak hours. The FGEIS analyses also did not indicate any significant adverse impacts on subway line haul conditions or on any bus route serving the area in either of these peak hours.

The pedestrian analysis in the FGEIS assessed conditions during the weekday AM, midday and PM peak hours at a total of 16 intersections along Route 9A, West Broadway, Greenwich Street, Church Street and Broadway. The analysis of 2015 conditions with the Proposed Action identified a total of 13 significant adverse peak hour impacts to seven crosswalks at five intersections: Church Street/Vesey Street, Church Street/Liberty Street, Broadway/Fulton Street, Greenwich Street/Liberty Street and West Broadway/Vesey Street. The FGEIS indicated that seven of these impacts could be fully mitigated by widening the impacted crosswalks. The remaining impacts could be minimized by widening the affected crosswalks to a maximum of 20 feet, but these impacts would otherwise remain unmitigated. Pedestrians would be able to cross at these crosswalk locations with slightly more peak hour congestion but with little or no appreciable change in crossing time.

Parking

The parking analysis in the FGEIS anticipated that the 1,200 to 1,400 parking spaces that were to be provided under the Proposed Action would be equivalent to the demand generated at the WTC site, and therefore sufficient to accommodate projected needs.

CURRENT WORLD TRADE CENTER SITE DEVELOPMENT PROGRAM

Development Program

As shown in **Table 1**, a somewhat smaller development program is now contemplated for the WTC site than was assessed in the 2004 FGEIS. This smaller program still includes the construction of a Memorial and a 290,000 square-foot Memorial Center, but the amount of office space has been reduced to 8.49 million square feet, retail space (including restaurant/café uses) has been reduced to approximately 455,000 square feet, the performance space has been reduced to a 1,000-seat performing arts center, and there are expected to be up to 500 underground parking spaces for office-tenant autos and 67 for tour buses compared to the 1,200 to 1,400 parking spaces under the original program. The development program no longer includes a hotel component and 240,000 square feet of additional cultural facilities. Based on current plans, it is anticipated that a total of 47 truck berths will be provided on the WTC site to service Towers 1 through 4, the Memorial Center and the Performing Arts Center.

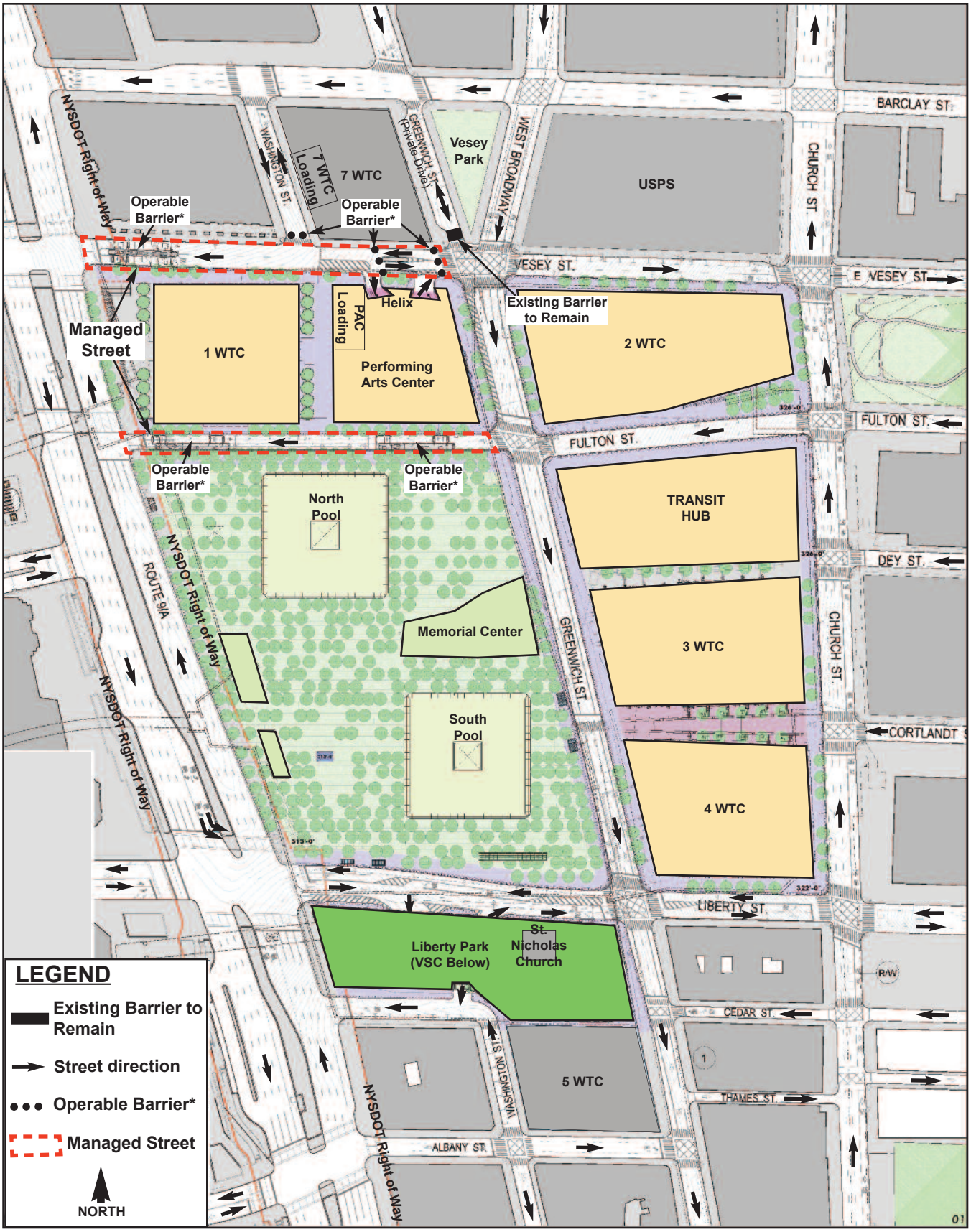
Site Plan and Vehicular Circulation

As shown in **Figure 2**, the current site plan for the WTC site includes the development of a Vehicular Security Center (VSC) on the south side of Liberty Street east of Route 9A. All autos and tour buses en route to below-grade parking at the WTC site would undergo screening at this facility, as would trucks en route to below-grade loading areas. The entrance to the VSC would be located on the south side of Liberty Street, whereas the 2004 FGEIS contemplated an entrance to below-grade parking located on the north side of Liberty Street. All vehicles would exit onto eastbound Liberty Street as the left-turn onto westbound Liberty Street would be prohibited. While there would continue to be an entrance/exit ramp on Vesey Street (referred to as the “Helix”), current plans call for it to be used primarily for emergency access. There are expected to be a total of up to 500 parking spaces for autos and 67 spaces for tour buses located in below-grade facilities on the WTC site.

As shown in **Figure 2**, under the current site plan, Greenwich Street would operate one-way southbound and Fulton Street would operate one-way westbound through the WTC site. Vesey Street would be reopened to traffic and would operate one-way eastbound to the east of Greenwich Street, two-way between Greenwich and Washington streets, and one-way westbound to the west of Washington Street. West Broadway between Barclay and Vesey streets would remain open to southbound through-traffic, providing access to Greenwich Street through the WTC site. However, it is anticipated that the segment of Greenwich Street between Barclay and Vesey streets, which is a privately-owned street, would be closed to through traffic and would primarily serve as an access point to the adjacent 7 World Trade Center tower as at present. The parallel segment of Washington Street would operate two-way.

At the south end of the WTC site, Liberty Street would be reopened to traffic between Church Street and Route 9A, and would operate two-way. Unlike the street configuration analyzed in the 2004 FGEIS, current plans now call for Cedar Street to remain closed between Greenwich and Washington streets. Washington Street would remain closed between Cedar and Liberty streets, and all traffic northbound on Washington Street would turn westbound onto Cedar Street to reach Route 9A. As shown in **Figure 2**, an exit from the VSC onto Cedar Street would be provided for vehicles arriving unscheduled and rejected for entry into the below-grade parking or loading areas. (Under the No-Action condition, unscheduled vehicles are expected to proceed to an off-site reconciliation area to await proper authorization.)

No-Action WTC Site Plan



Note: Image is schematic and for illustrative purposes only.

*Likely location of operable barriers needed to secure 1 WTC.

The current site plan and vehicle circulation system also incorporates security measures associated with the 2005 redesign of 1 World Trade Center. Under these measures, both Vesey Street and Fulton Street would function as "managed streets" west of Greenwich Street. This would be achieved through the installation of retractable barriers and sally ports on Vesey, Fulton and Washington Streets to restrict vehicular access. Each sally port would consist of a personnel booth and equipment house controlling a set of two retractable barriers with sufficient space between them to accommodate one or more motor vehicles. In operation, the first barrier would be lowered to permit authorized vehicles to enter, and then raised to prevent entry by other vehicles. After completing a screening process, the second barrier would be lowered to allow the vehicles within the sally port to exit. As shown in **Figure 2**, two sally ports would be located on Fulton Street, one immediately east of Route 9A and the second west of Greenwich Street. Two sally ports would also be located on Vesey Street, one immediately to the east of Route 9A and a second west of Greenwich Street. An additional retractable barrier would be installed on the Washington Street approach to Vesey Street that would be raised in the default condition, and lowered only as needed to permit entry by authorized vehicles.

With the security measures proposed under the current circulation plan, there would continue to be unrestricted vehicular access along Greenwich Street through the WTC site. Autos and trucks destined for the below-grade parking or loading docks at the WTC site would have unrestricted access to the Vehicular Security Center via Liberty Street, while a small number of oversize trucks en route to the loading dock at the Performing Arts Center are expected to pass through the barriers on Washington Street.

It is anticipated that tour buses with passengers en route to the 9/11 Memorial would unload and load passengers along the north curb of Liberty Street west of Greenwich Street, along the west curb of Greenwich Street adjacent to the Memorial and/or along the east curb of northbound Route 9A immediately north of Liberty Street. (Curbside bollards would be set further back from the curb along the north side of Liberty Street and possibly along the east side of Route 9A to facilitate bus loading/unloading at these locations.

Taxi and black (livery) car pick-up/drop-off activity would likely occur along Greenwich Street as well as along Church Street and Route 9A. While black cars would also be expected to traverse the sally ports along Fulton and Vesey streets to access Tower 1, taxis would be less likely to do so, and would be expected to primarily pick-up/drop-off passengers en route to or from Tower 1 along nearby unrestricted streets, such as Greenwich and Barclay streets and Route 9A.

As noted above, there are now expected to be up to 500 underground parking spaces for office-tenant autos and 67 for tour buses at the WTC site compared to the 1,200 to 1,400 parking spaces under the original program. It is therefore anticipated that under the current development program, some of the parking demand generated by WTC office tenants as well as all of the parking demand generated by other uses at the WTC site would be distributed among off-street public parking facilities on the periphery. Many of these autos would therefore not actually enter the WTC site nor traverse intersections within its boundaries.

OTHER ENVIRONMENTAL REVIEWS

The following briefly summarizes the findings of the transportation analyses conducted for the environmental assessments of four other major projects in the vicinity of the World Trade Center site in recent years – the Fulton Street Transit Center, the World Trade Center PATH

Terminal, the Route 9A Project, and the Vehicular Security Center and Tour Bus Parking Facility.

Fulton Street Transit Center Final Environmental Impact Statement (FEIS) and Section 4(f) Evaluation (October 2004)

Project Overview

In October 2004, the Federal Transit Administration (FTA), in cooperation with the Metropolitan Transportation Authority (MTA) issued an FEIS for the construction and operation of the Fulton Street Transit Center (FSTC); a rehabilitated, reconfigured and enhanced multi-level, street-level and subsurface station complex in lower Manhattan that will serve ten New York City Transit subway lines. When completed, the complex will extend from Church Street in the west to William Street in the east. The entry facility will be located on Broadway between Fulton and John streets with a subsurface pedestrian passageway on Dey Street west to Church Street. The FSTC will include improvements to four existing connected subway stations at Fulton Street serving the 2, 3, 4, 5, A, C, J and Z trains. In addition, the FSTC will also include improvements to the Cortlandt Street (R) station and the World Trade Center (E) station. Project completion is expected by 2014.

Transportation Impacts and Mitigation

The FEIS did not anticipate any significant adverse traffic impacts at intersections in the vicinity of the project due to construction-related truck traffic and lane closures. Development and operation of the FSTC is expected to generate minimal to no vehicular traffic, and therefore the FEIS did not anticipate any significant adverse impacts on traffic or parking conditions or the need for mitigation. As a portion of pedestrians currently traversing Broadway and Church Street are expected to use the new Dey Street passageway, the amount of pedestrian traffic crossing these streets will be reduced, and the FEIS anticipated that circulation conflicts between pedestrians and vehicular traffic will be less likely to occur, especially during peak hours.

Permanent World Trade Center PATH Terminal Final Environmental Impact Statement and Section 4(f) Evaluation (May 2005)

Project Overview

In May 2005, the Port Authority of New York and New Jersey in cooperation with the Federal Transit Administration (FTA) issued an FEIS for the reconstruction of a permanent terminal for the PATH system at the World Trade Center site in lower Manhattan. This terminal will provide a permanent replacement for the previous PATH terminal at the WTC site that was destroyed during the terrorist attacks of September 11, 2001. The new facility will combine an above-grade terminal building and sub-level pedestrian concourses on the eastern portion of the WTC site with additional pedestrian concourses, tracks, platforms and a mezzanine on the western portion of the site. There will be a total of five levels – platform, mezzanine, two concourse levels, and a street-level terminal building.

Transportation Impacts and Mitigation

The FEIS identified a significant adverse impact at the intersection of Route 9A and Liberty Street in the PM peak hour as a result of project-generated vehicle traffic during the project's construction period. A significant adverse pedestrian impact was also identified in the FEIS at

the intersection of Church and Liberty Streets where the north and west crosswalks and the northwest corner area would operate at level of service (LOS) F conditions in the AM and PM peak hours in the project's 2025 design year. The FEIS indicated that this adverse impact is to be considered in the design of the crosswalks and corner area; however, it concluded that the LOS F condition could not be eliminated.

Route 9A Project Final Supplemental Environmental Impact Statement (FSEIS) (May 2005)

Project Overview

In May 2005, the New York State Department of Transportation in cooperation with the Federal Highway Administration (FHWA) issued an FSEIS for the reconstruction of the portion of Route 9A between Chambers and West Thames streets in lower Manhattan which was severely damaged in the terrorist attacks of September 11, 2001. Under the At-Grade Alternative (the Preferred Alternative), the segment of Route 9A from Albany Street to Murray Street adjacent to the WTC site is being restored to the four through-lanes in each travel direction plus left-turn lanes that existed prior to September 11, 2001. However, the roadway is being shifted westward to allow widening of the east sidewalk to provide more pedestrian frontage area adjacent to the WTC site. A new at-grade pedestrian crossing is also to be provided at Fulton Street. Although the FSEIS assumed that a single southbound left-turn lane would be provided at Vesey Street, this is no longer planned. To the south between West Thames and Albany Streets, the current configuration of four northbound and three southbound lanes separated by the West Street (Battery) Underpass is being maintained, although the northbound parking lane is being eliminated to accommodate a wider sidewalk. To the north between Murray and Chambers streets, the four-lane northbound and southbound roadways are being retained, with a new southbound left-turn movement added at Warren Street to help facilitate southbound Route 9A left-turn movements. A 2009 Build year was assumed in the FSEIS.

Transportation Impacts and Mitigation

The traffic study area assessed in the FSEIS included intersections along Route 9A from Chambers Street south to West Thames Street. The analyses identified no significant adverse traffic, transit or pedestrian impacts during the construction period. In the opening and design years, the Preferred Alternative is expected to increase traffic volumes on Route 9A compared to the No-Action condition, resulting in lower traffic volumes on inland streets including Broadway, Greenwich Street and Trinity Place/Church Street. The FSEIS anticipated that the number of analyzed intersection movements experiencing poor levels of service (i.e., LOS E or F) would be reduced to 21 and 22 in the weekday AM and PM peak hours, respectively, compared to 30 and 26 in the No-Action condition. The number of intersections affected by significant queues would be reduced to one, compared with five in the AM and seven in the PM in the No-Action condition. No significant transit impacts were identified in the FSEIS, and pedestrian facilities were expected to operate at LOS D or better at all locations resulting in an improved condition over the No-Action.

World Trade Center Vehicular Security Center and Tour Bus Parking Facility Environmental Assessment (January 2007)

Project Overview

The World Trade Center Vehicular Security Center (VSC) and Tour Bus Parking Facility was originally proposed as part of the WTC Memorial and Redevelopment Plan, and the potential

environmental effects were studied in previous documentation prepared by the Lower Manhattan Development Corporation. Subsequently, Federal Transit Administration funding was committed to the project, and an environmental assessment (EA) was prepared by the FTA and the Port Authority to evaluate the potential effects of the VSC and Tour Bus Parking Facility consistent with the FTA's evaluation criteria pursuant to NEPA.

The Preferred Alternative for the VSC and Tour Bus Parking Facility consists of four levels with an entrance/exit located on the south side of Liberty Street between Route 9A and Greenwich Street. (The planned Liberty Park will be located on the roof of the facility.) Autos, trucks and buses that have been authorized for entry and comply with screening standards will be directed down a ramp for access to below-grade auto and bus parking and truck loading areas. The analysis in the EA assumed that a total of 80 bus parking spaces would be provided in the facility, sufficient to accommodate average weekday demand as well as the higher demand expected during peak months of visitation and on weekends. It was also assumed that a total of approximately 1,300 below-grade auto parking spaces would be provided on the WTC site, (1,000 on the eastern portion of the WTC site and 300 in proximity to Tower 1), and that vehicles failing screening in the VSC would exit back onto Liberty Street. (As noted previously, the amount of below-grade parking planned for the WTC site is now anticipated to total up to approximately 500 parking spaces for tenant autos and 67 for tour buses.) A 2010 Build year was assumed in the EA.

Transportation Impacts and Mitigation

The transportation analyses in the EA were based on data previously presented in the *World Trade Center Memorial and Redevelopment Plan FGEIS*. The No-Action condition assumed for the analyses reflects future conditions independent of the project, and accounts for potential accommodations that would be made absent the VSC and Tour Bus Parking Facility. For example, delivery vehicles were assumed to access the below-grade loading areas of towers 1 and 2 from Vesey Street via truck elevators, while loading and unloading for towers 3 and 4 and the Transit Hub was assumed to be at-grade with access from Greenwich Street. Tour buses were assumed to load and unload on Greenwich Street, parking at designated on-street and off-street locations in Manhattan, New Jersey, Brooklyn and Staten Island while their passengers visited the WTC site.

The VSC and Tour Bus Parking Facility will not generate new vehicle trips, but it would result in changes in travel patterns in the vicinity of the WTC site as compared to the No-Action condition assumed in the EA. For traffic, a total of 11 intersections along Route 9A, Church Street and Greenwich Street from Liberty Street on the south to Vesey Street on the north were analyzed for potential traffic impacts for a 2015 Build year. In general, the EA determined that the Preferred Alternative would improve levels of service and delays compared to the No-Action. Although the EA analyses found that there would be some increase in delays at certain locations, these increases were not expected to result in substantial changes in LOS. Eight of the 11 locations analyzed in the EA were expected to be improved in the AM peak hour, six in the midday and nine in the PM peak hour. The Preferred Alternative was also expected to improve midblock operations on Vesey and Greenwich streets since truck deliveries would not be at-grade. The EA indicates that queues on Liberty Street at the entrance and exit driveway would not be as extreme as expected under the No-Action condition, the circulation of through-traffic and tour buses would be substantially improved, and traffic spillovers onto adjacent roadways would be avoided. Vehicle delays would, however, be expected to increase for the southbound left-turn movement from Route 9A onto Liberty Street in the AM, midday and PM peak hours compared to the No-Action condition.

Lastly, the EA anticipates that the VSC and Tour Bus Parking Facility would not result in significant adverse transit or pedestrian impacts, and would benefit lower Manhattan's express and local bus services by improving street-level circulation compared to the No-Action condition.

II. THE PROPOSED PROJECT

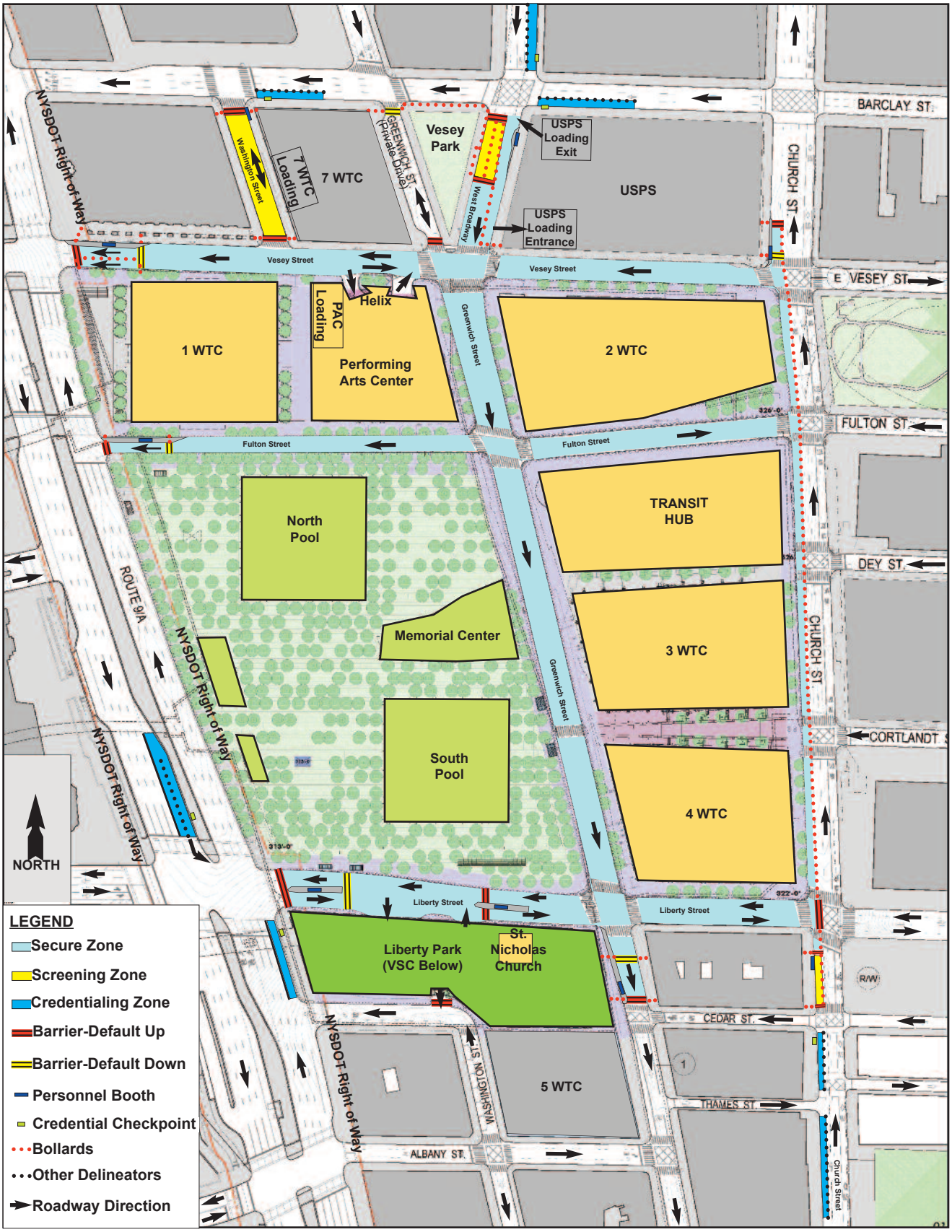
The Proposed Project is the implementation of a comprehensive perimeter vehicle security plan for the WTC Campus in order to ensure an open environment that is hospitable to commerce, culture and remembrance, but also protected from future threats to the extent practicable over the long term. Under this plan, vehicular access to, and traffic movement within, the WTC site would be controlled through the creation of a secure perimeter that would prevent unscreened vehicles from approaching within a set distance of WTC buildings. Portions of streets in and around the WTC site would be closed to unscreened vehicular traffic. Vehicles destined for the WTC seeking entry onto these streets would be subject to credentialing to determine whether entry to the site should be permitted, and then screening to confirm that these vehicles pose no threat.

It is anticipated that access to the WTC site would be managed in a flexible manner to allow maximum throughput and reduce the potential for localized traffic congestion, as conditions allow. For example, it is anticipated that vehicle operators that frequently visit the WTC would have the option of enrolling themselves and their vehicles in a Trusted Access Program (TAP) that would allow expedited entry.

Figure 3 shows a conceptual plan developed by the New York City Police Department (NYPD) for the design and location of the security infrastructure that would be installed under the Proposed Project. The Project Area includes all streets and sidewalks that would be directly affected by the installation of this security infrastructure. As shown in **Figure 3**, the Project Area is generally bounded by Barclay Street and Park Place on the north, Albany Street on the south, Trinity Place/Church Street on the east and Route 9A on the west. The perimeter of the WTC site would be secured through the installation of various types of vehicle interdiction devices under the control of the NYPD. These include traffic lane delineators and static barriers such as bollards, as well as a system of retractable vehicle barriers. Screening of all vehicles entering the WTC site would utilize both mechanical and manual processes, and would be facilitated through the use of sally ports which, as described previously, would consist of a personnel booth and equipment house controlling a set of two retractable barriers with sufficient space between them to accommodate one or more motor vehicles undergoing screening. It is anticipated that an additional booth would also be installed at each credentialing location.

Overall, as shown in **Figure 3**, it is anticipated that sally ports would be installed at a total of eight locations on the perimeter of the WTC campus. Two would function as entry sally ports, four as exit sally ports and two would be used by both entering and exiting vehicles. The following describes the security infrastructure and traffic and pedestrian network changes that would be implemented as part of the Proposed Project.

Conceptual Plan for the Proposed Project



Note: Image is schematic and for conceptual purposes only.

TRINITY PLACE/CHURCH STREET

As shown in **Figure 3**, the Trinity Place/Church Street corridor[1] would be divided by a four-foot-wide median with a static barrier from Cedar Street to just north of Vesey Street. It is anticipated that to the east of the median the street would remain open to general traffic with three approximately 11-foot-wide northbound moving lanes, while one additional 11-foot-wide moving lane located to the west of the median would be within the security perimeter and would be accessible only to screened vehicles. A security station with an entry-only sally port for tour buses en route to on-site parking would be located on Trinity Place just north of Cedar Street. It is also anticipated that this security station would be open to tenant autos en route to on-site parking as well as for-hire vehicles during the AM peak period, when there are expected to be fewer tour buses arriving at the WTC site. A credentialing zone for the sally port on Trinity Place would be delineated along the west curb south of Cedar Street and Thames Street. A second sally port would be located on Church Street just north of Vesey Street to serve as an egress point for all types of vehicles exiting onto northbound Church Street from the WTC site. An operable barrier would also be provided across Liberty Street to provide emergency egress by fire trucks stationed at the Ten House within the WTC Campus.

WEST BROADWAY/GREENWICH STREET

Southbound West Broadway would function as an entrance to the WTC site for taxis, black cars and tenant autos. As shown in **Figure 3**, a security station with an entry sally port would be installed on West Broadway between Barclay and Vesey streets, and credentialing zones would be located along the east curb of West Broadway north of Barclay Street, and along the south curb of Barclay Street east of West Broadway. Static barriers would be used to delineate a single travel lane along the east curb adjacent to the sally port but outside of the secure perimeter in order to maintain access to the below-grade loading docks at the adjacent Federal Building. (U.S. Postal Service and other vehicles would enter the building at the south end of the block and utilize an internal roadway to exit the facility onto West Broadway near Barclay Street.)

GREENWICH STREET

Greenwich Street between Barclay and Vesey streets is a privately-controlled street and is expected to remain closed to through traffic. Retractable barriers at the south end of the block (default up) would allow vehicular access to the adjacent 7 World Trade Center building, but not into the security zone. (As noted above, West Broadway would provide the primary access to the segment of southbound Greenwich Street traversing the WTC site.) At the south end of the WTC site, a sally port would be located on Greenwich Street approaching Cedar Street.

WASHINGTON STREET

The security station at Washington Street between Barclay and Vesey streets would serve as an entrance and exit point for oversize trucks en route to and from the Performing Arts Center's loading dock on Vesey Street, and as an entrance for tenant autos and for-hire vehicles when there is congestion at the security station at West Broadway. Trucks would also use this sally port to access the adjacent 7 World Trade Center loading dock. A credentialing zone would be delineated along the south curb of Barclay Street east of Washington Street.

[1] Trinity Place becomes Church Street north of Liberty Street.

BARCLAY STREET

As noted above, under the Proposed Project two credentialing zones would be established along the south curb of Barclay Street. One would be located immediately to the east of the security station on West Broadway, and the second would be located immediately to the east of the security station on Washington Street.

VESEY STREET

As shown in **Figure 3**, under the Proposed Project the block of Vesey Street from Church Street to West Broadway would be converted to westbound operation from one-way eastbound in the No-Action condition. Vesey Street would continue to operate two-way between Greenwich and Washington Streets and one-way westbound between Washington Street and Route 9A. Vesey Street would remain one-way eastbound east of Church Street, and vehicles would not be able to travel from the managed corridor on the west side of Church Street onto eastbound Vesey Street. Pedestrian access across Church Street at Vesey Street would be maintained. A security station with a two-lane exit-only sally port would be installed on Vesey Street approaching Route 9A. A sidewalk extension along the north side of the roadway would likely be installed to accommodate the personnel booth and equipment house at this location.

FULTON STREET

Under the Proposed Project, the block of Fulton Street between Greenwich and Church streets would be converted to eastbound operation from one-way westbound in the No-Action condition to facilitate drop-off and pickup activity at the adjacent Tower 2. The segment of Fulton Street west of Greenwich Street would remain one-way westbound as would Fulton Street east of Church Street. Vehicles would not be able to travel from westbound Fulton Street into the security zone on the west side of Church Street, although pedestrian access would be maintained. A security station with a one-lane exit sally port would be installed on Fulton Street approaching Route 9A, and a sidewalk extension would likely be installed along the north side of the roadway to accommodate the security booth and equipment house at this location.

LIBERTY STREET

As shown in **Figure 3**, under the Proposed Project, two-way operation would continue on Liberty Street, and it would function as the primary point of access and egress for the Vehicular Security Center. Access to the VSC would be controlled by a security station and entry/exit sally port on Liberty Street immediately east of Route 9A. It is anticipated that the inner (easternmost) barrier at this sally port would remain down in the default condition, with the outer (westernmost) barrier raised and lowered as needed to control access between Liberty Street and Route 9A. Credentialing zones for this sally port would be delineated along the two easternmost lanes of southbound Route 9A north of Liberty Street and along the northbound curb lane south of Liberty Street. Vehicles already within the security perimeter (tour buses, for example) would also be able to enter the VSC from the east on Liberty Street, although access would be controlled by a retractable barrier in the default up position located immediately to the east of the VSC entrance/exit. As the left-turn from the VSC exit onto Liberty Street would be permitted under the Proposed Project, most vehicles departing the VSC would exit onto westbound Liberty Street to reach Route 9A. Another retractable barrier in the default up position would be located across Liberty Street within the intersection with

Church Street, and would be used to facilitate egress by FDNY fire trucks stationed at the Ten House located within the WTC Campus.

Under the Proposed Project, it is anticipated that tour buses with passengers en route to the 9/11 Memorial and Tower 1 viewing platform would continue to unload and load along the north curb of Liberty Street west of Greenwich Street, as well as the west curb of Greenwich Street adjacent to the Memorial Center and/or the east curb of Route 9A north of Liberty Street, unchanged from the circulation plan in the No-Action condition.

CEDAR STREET

In the future both with and without the Proposed Project, Cedar Street would be eliminated between Greenwich and Washington streets, with the segment west of Washington Street operating one-way westbound as an outlet to Route 9A for northbound Washington Street. As noted above, a secondary exit from the VSC would be provided on Cedar Street west of Washington Street. In the Build condition, this exit would be used primarily in the event that a vehicle was allowed to enter the VSC in error from the credentialing zone on Route 9A. The segment of Cedar Street between Greenwich Street and Church Street would also continue to operate one-way westbound under the Proposed Project.

PEDESTRIAN FACILITIES

In addition to changes to the traffic network, implementation of the Proposed Project would also result in some changes to the pedestrian facilities (i.e., sidewalk widths) in and around the WTC site. Static barriers such as bollards would be installed at many locations to prevent unscreened vehicles from entering the security zone via the sidewalks. Personnel booths and equipment houses would be installed at security stations, and as noted above, at some locations sidewalks would be extended to accommodate these installations and maintain adequate effective width for pedestrian flow. Static barriers would also be installed within crosswalks on Church Street in-line with the proposed median.

III. TRANSPORTATION ANALYSIS METHODOLOGIES

The following sections outline the methodologies employed to assess the effects of the Proposed Project on the transportation systems in lower Manhattan.

ANALYSIS YEAR

As discussed in more detail below, the No-Action baseline and With-Action conditions for the transportation analyses incorporate the anticipated travel demand from the full build-out of towers 1 through 4, the Memorial and Memorial Center, the Transit Hub and the Performing Arts Center at the World Trade Center site. A 2019 analysis year is assumed as the likely timeframe in which all of these WTC site components would be fully developed.

ANALYSIS PEAK HOURS

The traffic and pedestrian analyses primarily focus on the three weekday peak periods when overall travel demand in the vicinity of the WTC site is expected to be greatest; specifically, the weekday AM and PM commuter peak periods as well as the weekday midday, a peak period for lunchtime activity in the Financial District. Based on data from automatic traffic recorder (ATR) machine counts conducted on streets in the vicinity of the WTC site in May 2012, the

peak hours analyzed during the AM and PM commuter periods are 8:15 AM to 9:15 AM and 5 PM to 6 PM, consistent with the commuter peak hours analyzed for other recent lower Manhattan traffic studies including those for Route 9A and the redevelopment of the WTC site. Based on the ATR data, an 11:30 AM to 12:30 PM peak hour was selected for the midday analysis period.

Given the predominantly commercial nature of lower Manhattan in the vicinity of the WTC site as well as the development planned for the site, it is anticipated that there will typically be less traffic and overall travel demand in the area on weekends than on weekdays. However, it is recognized that there may also be somewhat less capacity on the street network as there tend to be fewer restrictions on parking and lower levels of enforcement on weekends than on weekdays. Therefore, a more limited study area is also analyzed for the Saturday midday focusing on a subset of 12 key intersections in the immediate vicinity of the WTC site that are most likely to be affected by diverted trips and weekend demand from visitors to the 9/11 Memorial and Memorial Center. Based on the ATR data, a 1 PM to 2 PM peak hour was selected for the Saturday midday analysis period.

EXISTING CONDITIONS

The Existing conditions traffic and pedestrian networks for the EIS transportation analyses were developed from data collected during a count program conducted in May 2012 as well as from March 2010 data collected for the development of the Lower Manhattan Traffic Model. The 2012 traffic count program included a mix of ATR machine counts and manual turning movement counts (TMCs), along with vehicle classification counts and travel time studies using the floating car technique. The ATR counts were conducted for a minimum of nine days (including two Saturdays) while the TMCs were conducted during the weekday AM, midday and PM peak periods as well as during the Saturday midday peak period. Pedestrian counts were conducted during the same time periods at sidewalk locations identified for analysis. All counts were conducted in accordance with 2012 *CEQR Technical Manual* criteria.

As discussed in detail in a memorandum entitled *Data Collection and Reduction Efforts for Supporting Lower Manhattan Traffic Simulation Model Development* (Liro Group, July 20, 2010), the March 2010 data collection effort for the Lower Manhattan Traffic Model included manual turning movement counts at 51 locations, vehicle classification counts at 45 mid-block locations, and automatic traffic recorder counts at 153 locations throughout lower Manhattan south of Houston Street (see **Figure 2** in **Appendix B**). The TMCs and vehicle classification counts were conducted on two weekdays from 7 AM to 10 AM and from 4 PM to 7 PM. Travel time studies were also conducted along five routes during the weekday 6 AM to 10 AM and 3 PM to 7 PM periods. Travel time study routes in proximity to the WTC site included Route 9A, Trinity Place/Church Street and Broadway (see **Figure 4** in **Appendix B**). These 2010 count data were used to help validate the AM and PM peak period count data collected during the 2012 data collection effort.

It should be noted that at present, most of the streets at the WTC site have not yet been built, while some streets on the periphery of the site are partially closed to pedestrians and/or vehicular traffic due to construction activity. Pedestrian and traffic flow patterns and volumes are also substantially different from what will occur in the No-Action condition when new developments, including the Transit Hub, are complete and an underground pedestrian concourse will traverse the site in an east-west direction. Vesey Street is currently open only to pedestrians between Church Street and Route 9A, and a temporary bridge is provided for pedestrians wishing to cross Route 9A at this location. Heavy pedestrian flows use this corridor en route to and from the temporary PATH terminal entrance located on the south side

of Vesey Street at West Broadway/Greenwich Street. Neither Greenwich Street nor Fulton Street have been constructed through the WTC site, and there are no outlets for the segments of West Broadway and Washington and Greenwich streets south of Barclay Street. Through traffic on Church Street is restricted to as few as two lanes to accommodate construction needs at the WTC site. To the west of Church Street, Liberty Street is open only as far as Greenwich Street, and only to westbound traffic, and the north sidewalk on this block is closed to pedestrians. A pedestrian bridge over Route 9A is provided at the Liberty Street intersection; however, the nearest pedestrian corridor between this bridge and points east is currently Albany Street. Also, Washington Street is closed to through traffic north of Albany Street.

The Existing conditions traffic and pedestrian analyses reflect the current (2012) street network at the WTC site. It should be noted that in many respects this network is similar to the future network with the Proposed Project in that most of the streets on the site that are currently closed to traffic – i.e., portions of Vesey, Liberty, Greenwich and Fulton Streets and the west side of Church Street – would also be closed to through traffic under the proposed Campus Security Plan.

In addition to the temporary changes to the street system associated with redevelopment of the WTC site, other projects are also currently affecting traffic and pedestrian flow in the vicinity. One notable example is the reconstruction of Chambers Street between Broadway and Route 9A which was initiated by the city Department of Design and Construction in the summer of 2010 and is expected to be completed in 2013. To facilitate ongoing reconstruction work, segments of Chambers Street temporarily operate one-way westbound and are then returned to two-way operation once work on the affected segment is complete. Displaced eastbound traffic is being accommodated on Warren Street and other nearby eastbound corridors. Data collected in 2010 for the Lower Manhattan Traffic Model as well as the model itself were used to adjust the 2012 traffic network to reflect existing volumes along Chambers and Warren streets without the temporary construction-related changes in directional flow and capacity.

NO-ACTION CONDITION

In the 2019 future without the Proposed Project, it is assumed that development at the WTC site (excluding Tower 5) would be completed and fully occupied, that the Vehicular Security Center on Liberty Street would be completed and operational, and that the current site plan and vehicle circulation system would be implemented incorporating the security measures associated with the 2005 redesign of Tower 1. Measures associated with the proposed Campus Security Plan would not be implemented. Therefore, to establish the No-Action baseline condition for the transportation analyses, it is necessary to forecast the travel demand that would be generated in 2019 by the planned development at the WTC site as well as other major developments in the area, and determine the traffic and pedestrian flow patterns for this new demand and background traffic with the current site plan and circulation system in place.

For the analysis of No-Action traffic conditions, a travel demand forecast and vehicle trip assignments were prepared for development at the WTC site. Travel demand forecasts were also prepared for other No-Action developments in the vicinity of the WTC site aggregated by use, and the total numbers of peak hour vehicle trips generated were compared to study area screen-line traffic volumes to determine the estimated percentage increase in study area travel demand resulting from these developments in each peak hour. Overall, No-Action developments in the vicinity of the WTC site are expected to increase study area traffic by

approximately 5.8 percent in the weekday AM peak hour and from 7.5 to 8.0 percent in the other analyzed peak hours.

The percentage increase over screen-line traffic volumes from other No-Action developments, data on off-street public parking utilization, and background growth rates cited in the *CEQR Technical Manual* were then used to update the Lower Manhattan Traffic Model (LMTM) to reflect conditions in the 2019 future without the Proposed Project. The model reflects newly-opened or re-opened streets within the WTC site (i.e., Greenwich, Vesey, Fulton and Liberty streets), the presence of security checkpoints on Fulton and Vesey streets, and geometric/control changes planned for implementation on the street network by the 2019 analysis year. Physical data for those intersections that are currently inaccessible due to construction or are on streets that have not yet been built were obtained from NYCDOT, the Port Authority and/or other agencies. The No-Action diversion patterns derived from the LMTM along with background growth, demand from No-Action developments and demand from development at the WTC site were then used to prepare a 2019 No-Action traffic network based on 2012 existing traffic network volumes.

WTC Site Travel Demand Forecast

As discussed earlier and shown in **Table 1**, the current anticipated development program for the WTC site includes the construction of a Memorial and 290,000 square feet of Memorial Center (museum) space, approximately 8.49 million square feet of office space, 455,000 square feet of retail and restaurant space, a 1,000-seat performing arts center and up to 500 underground parking spaces for autos and 67 spaces for tour buses. **Table 3** shows the transportation planning factors used to forecast the travel demand generated by these uses and other No-Build soft-sites in the weekday AM, midday and PM peak hours and the Saturday midday peak hour. These include trip generation rates, temporal and directional distributions, mode choice factors, vehicle occupancies and truck trip factors. The factors in **Table 3** are primarily based on those cited in the 2012 *CEQR Technical Manual* as well as those used for the travel demand forecast in the 2004 *World Trade Center Memorial and Redevelopment Plan FGEIS*. It is assumed that the total retail square footage in the current program includes some restaurant space, which was treated as a distinct use in the 2004 FGEIS. For forecasting purposes it is therefore assumed that approximately 14,000 square feet of retail space would be restaurant uses in the current program, comparable to the proportion of retail to restaurant space reflected in the 2004 FGEIS.[1] In addition, as per the 2004 FGEIS, it is assumed that the retail component would be comprised of approximately 50 percent local retail uses and 50 percent destination retail uses.

The trip generation rate used to determine weekday truck trips for No-Action development at the WTC site was derived from a regression equation based on detailed loading dock survey data collected in 2004 at four large Manhattan office buildings (including two in lower Manhattan in proximity to the WTC site) as part of the planning process for redevelopment of the World Trade Center. All four buildings surveyed are comparable in size (1.05 million to 2.2 million sf) and uses to the buildings planned at the WTC site. The weekday temporal distribution for truck trips was also derived from these survey data. Data collected at 7 WTC as part of the May 2012 traffic count program were used to further validate the truck trip forecasting methodology.

[1] The development program in the 2004 FGEIS assumed one million sf of retail space and 33,000 sf of restaurant/café space.

The retail and restaurant person-trip and vehicle-trip forecasts reflect a 25 percent linked-trip credit applied to all retail and restaurant patron trips, consistent with the *CEQR Technical Manual*. Use of this linked-trip rate should be considered conservative given the large role that other on-site development (e.g., 8.49 million square feet of office space, the 9/11 Memorial and Memorial Center, the Transit Hub, etc.) is expected to play in generating demand for the retail and restaurant uses.

As the anticipated numbers of annual visitors to the 9/11 Memorial, Memorial Center/Museum, and the viewing platform on Tower 1 are generally independent of recent changes to the WTC site development program, the travel demand forecasts for these uses reflect the forecast in the 2004 FGEIS, and separate travel demand factors for these uses are not shown in **Table 3**. It should also be noted that the 9/11 Memorial has been open to the public through a system of timed visitor passes since September 2011, with over four million visitors as of August 2012. Therefore, it is likely that a substantial portion of the travel demand generated by visitors to the 9/11 Memorial is already reflected in the existing conditions traffic network which is based on data collected in May and June 2012. However, as timed visitor passes will not be required for admittance in the future, and as the Memorial Center and Tower 1 viewing platform are not yet open, the travel demand forecast for the 9/11 Memorial conservatively does not take credit for these existing trips.

Tables 4 and 5 show the projected peak hour travel demand (person trips and vehicle trips, respectively) generated by the current WTC development program based on the factors shown in **Table 3** and the assumptions discussed above. As shown in **Table 4**, it is anticipated that the current development program at the WTC site would generate a net total of 21,929, 35,442, 31,173 and 17,572 person trips (in and out combined) during the weekday AM, midday and PM and Saturday midday peak hours, respectively. Person trips by transit during these periods (in and out combined) would include 9,939, 4,699, 13,006 and 3,250 trips by subway, respectively, 369, 978, 815 and 636 trips, respectively, by local bus, 1,153, 153, 1,328 and 38 trips, respectively, by express bus, 2,746, 931, 3,388 and 518 trips, respectively, by PATH and 619, 379, 869 and 282 trips, respectively, by ferry. Walk-only trips would total 5,294, 24,429, 8,246 and 9,202 during the weekday AM, midday and PM and Saturday midday peak hours, respectively. There would also be a total of approximately 287, 1,513, 958 and 2,015 trips, respectively, by tour bus, most if not all en route to the Memorial, Memorial Center and the viewing platform on Tower 1.

As shown in **Table 5**, vehicle trips (in and out combined) include a total of 479, 659, 692 and 349 auto trips, 932, 942, 1,272 and 614 for-hire vehicle trips (taxi and black car combined), 9, 46, 29 and 61 tour bus trips, and 82, 90, 36 and 20 truck trips during the weekday AM, midday, PM and Saturday midday peak hours, respectively.

As the travel demand characteristics and trip assignment patterns of taxi (yellow cab) and black car trips generated by development at the WTC site will differ both with and without the Proposed Project, separate vehicle-trip forecasts have been prepared for each of these two types of for-hire vehicles. The numbers of black car trips to and from the WTC site were estimated based on data presented in a June 20, 2011 *Black Car Traffic Volume Analysis – World Trade Center Redevelopment* study prepared for the Port Authority by JSL Management, Inc. This study analyzed detailed industry ride data for all of 2010 from a sampling of 10 corporations using black car service in Manhattan, as well as data from interviews with various WTC stakeholders. (A total of approximately 214,000 rides over the course of 2010 were represented in the data.) Users of black car services were categorized as light users (government agencies for example), medium users, and heavy users such as large financial institutions. The analysis in the study took a conservative approach by assuming the

Table 3
Transportation Planning Factors for WTC Development

Land Use:	Local Retail (Patrons)	Destination Retail (Patrons)	Retail (Employees)	Office (Workers)	Office (Visitors)	Performance Space	Restaurant (Patrons)	Restaurant (Employees)
Trip Generation:	(1)	(1)	(1)	(2)	(2)	(4)	(6)	(6)
Weekday	195	68.2	10	12	6	4.0	163	10
Saturday	230	82.5	10	2.6	1.3	4.0	172	10
	(per 1,000 sf)	(per 1,000 sf)	(per 1,000 sf)	(per 1,000 sf)	(per 1,000 sf)	(per seat)	(per 1,000 sf)	(per 1,000 sf)
Temporal Distribution:	(3)	(3)	(4,7)	(3)	(3)	(4,7)	(4,6)	(4,7)
AM	3%	3%	14.7%	12%	12%	0%	0%	14.7%
Midday	19%	9%	20%	15%	15%	16.7%	9.3%	20%
PM	10%	9%	12.9%	14%	14%	16.7%	3.9%	12.9%
Saturday Midday	10%	11%	20%	17%	17%	16.7%	11.5%	20%
Modal Splits:	(4)	(4)	(4,7)	(4,7)	(4)	(4)	(4)	(4,7)
	All Periods	All Periods	AM/PM MD/SMD	AM/PM MD/SMD	All Periods	All Periods	All Periods	All Periods MD/SMD
Auto	3%	5%	3% 2%	3% 2%	3.5%	15%	17.4%	3% 2%
Taxi/Black Car	2%	4%	2% 2%	2% 2%	3.5%	9%	6.4%	2% 2%
Subway	15%	20%	61% 5.5%	61% 5.5%	17.3%	8%	15%	61% 5.5%
Local Bus	5%	5%	2% 2%	2% 2%	0.5%	34%	3.4%	2% 2%
Express Bus	0%	0%	8% 0%	8% 0%	2%	0%	0%	8% 0%
PATH	3%	3%	18% 1%	18% 1%	5%	5%	5%	18% 1%
Ferry	2%	2%	4% 0.5%	4% 0.5%	0.5%	5%	5%	4% 0.5%
Walk/Other	70%	61%	2% 87%	2% 87%	67.7%	24%	47.8%	2% 87%
Directional Split:	(4,7)	(4,7)	(4,7)	(4,7)	(4,7)	(4,7)	(4)	(4,7)
	In Out	In Out	In Out	In Out	In In	In Out	In Out	In Out
AM	50.5% 49.5%	50.5% 49.5%	96% 4%	96% 4%	96% 4%	0% 0%	50% 50%	96% 4%
Midday	50.5% 49.5%	50.5% 49.5%	55% 45%	55% 45%	55% 45%	100 0%	50% 50%	55% 45%
PM	53.1% 46.9%	53.1% 46.9%	5% 95%	5% 95%	5% 95%	0% 100%	50% 50%	5% 95%
Saturday Midday	50.5% 49.5%	50.5% 49.5%	55% 45%	55% 45%	55% 45%	100 0%	50% 50%	55% 45%
Vehicle Occupancy:	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)
Auto	1.60	1.60	1.60	1.60	1.25	3.50	2.20	1.60
Taxi	1.20	1.20	1.20	1.40	1.40	2.40	2.30	1.40
Truck Trip Generation:			(3)	(3,5)		(4,9)		(4,9)
Weekday			0.35	See Note 6		0.02		7.2
Saturday			0.04	0.01		0.02		7.2
			(per 1,000 sf)	(per 1,000 sf)		(per seat)		(per 1,000 sf)
Truck Temporal Distribution:			(3)	(8)		(4)		(4,7)
AM			8%	7.3%		11%		9.7%
Midday			11%	8.3%		1%		7.8%
PM			2%	3.2%		1%		5.1%
Saturday Midday			11%	8.3%		1%		7.8%
Truck Directional Distribution:			In Out	In Out		In Out		In Out
All Periods			50% 50%	50% 50%		50% 50%		50% 50%

Notes:

(1) Overall retail trip rates as per the 2012 *City Environmental Quality Review (CEQR) Technical Manual*. Ten trips/1,000 sf allocated to retail employees, consistent with the 2004 *World Trade Center Memorial and Redevelopment FGEIS*, and remaining trips for both local and destination retail allocated to patrons.

(2) Overall office trip rates as per the 2012 *CEQR Technical Manual*. One-third of daily trips (6 trips/1,000 sf on weekdays and 1.3 trips/1,000 sf on Saturdays) allocated to visitors, consistent with the office worker/visitor trip ratio cited in the 2004 *World Trade Center Memorial and Redevelopment FGEIS*.

(3) Source: *2012 CEQR Technical Manual.*

(4) Source: *World Trade Center Memorial and Redevelopment FGEIS,* January 2004.

(5) Weekday truck trip generation determined on a tower-by-tower basis from the following regression equation developed from 2004 survey data collected at four midtown and lower Manhattan office buildings: $Ln(DG) = 0.595 \times Ln(FA) + 4.8$, $R^2 = 0.87$, where DG = daily (two-way) trip generation and FA = floor area in million square feet

(6) Restaurant patron and employee weekday trip rates based on data from the 2004 *World Trade Center Memorial and Redevelopment FGEIS.* (The patron trip rates shown in the FGEIS incorporate a 70 percent linked-trip credit, whereas the trip rates shown above do not reflect linked-trips.) A ratio of weekday to Saturday trips derived from data in *ITE Trip Generation Handbook*, 8th Edition, Land Use Code 931 (Quality Restaurant) was used to adjust the weekday patron trip rate to reflect Saturday demand. Data for ITE Land Use Code 931 were also used to determine the Saturday patron temporal distribution.

(7) Weekday midday factors assumed for Saturday midday period.

(8) Temporal distribution for office truck trips based on 2004 survey data collected at four midtown and lower Manhattan office buildings. Weekday midday distribution assumed for Saturday midday.

(9) Truck trip rates reported in the FGEIS reflect the number of trucks/deliveries whereas the rates shown above reflect the number of one-way trips.

Table 4

Travel Demand Forecast for the Current WTC Development Program - Person Trips

	Auto		Taxi/ Black Car		Subway		Local Bus		Express Bus		Tour Bus		PATH		Ferry		Walk/Other		Total	
	In	**Out**	**In**	**Out**	**In**	**Out**	**In**	**Out**	**In**	**Out**	**In**	**Out**	**In**	**Out**	**In**	**Out**	**In**	**Out**	**In**	**Out**
Weekday AM Peak Hour																				
Local Retail (Patrons)[1,2,3]	15	14	10	10	73	72	24	24	0	0	0	0	15	14	10	10	343	336	490	480
Destination Retail (Patrons) [1,2,3]	9	8	7	7	34	34	9	8	0	0	0	0	5	5	3	3	105	102	172	167
Retail (Employees) [1]	19	1	12	1	380	16	12	1	50	2	0	0	111	5	25	1	13	1	622	28
Office (Workers)	352	15	235	10	7,152	298	235	10	938	39	0	0	2,111	88	469	20	232	10	11,724	490
Office (Visitors)	205	9	205	9	1,014	42	29	1	117	5	0	0	293	12	29	1	3,971	165	5,863	244
Performance Space (1,000 seats)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Restaurant (Patrons)[1,3]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Restaurant (Employees)[1]	1	0	0	0	12	1	0	0	2	0	0	0	4	0	1	0	0	0	20	1
Memorial & Memorial Center[4]	103	0	265	0	811	0	16	0	0	0	287	0	83	0	47	0	16	0	1628	0
Total	**704**	**47**	**734**	**37**	**9,476**	**463**	**325**	**44**	**1,107**	**46**	**287**	**0**	**2,622**	**124**	**584**	**35**	**4,680**	**614**	**20,519**	**1,410**
Weekday Midday Peak Hour																				
Local Retail (Patrons)[1,2,3]	93	91	62	61	465	456	155	152	0	0	0	0	93	91	62	61	2,171	2,128	3,101	3,040
Destination Retail (Patrons) [1,2,3]	26	25	21	20	103	101	26	25	0	0	0	0	15	15	10	10	313	307	514	503
Retail (Employees) [1]	10	8	10	8	27	22	10	8	0	0	0	0	5	4	2	2	422	346	486	398
Office (Workers)	168	137	168	137	462	378	168	137	0	0	0	0	84	69	42	34	7,307	5,977	8,399	6,869
Office (Visitors)	147	120	147	120	726	594	21	17	84	69	0	0	210	172	21	17	2,843	2,326	4,199	3,435
Performance Space (1,000 seats)	100	0	60	0	53	0	227	0	0	0	0	0	33	0	33	0	162	0	668	0
Restaurant (Patrons)[1,3]	14	14	5	5	12	12	3	3	0	0	0	0	4	4	4	4	38	37	80	79
Restaurant (Employees) [1]	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	14	12	15	13
Memorial & Memorial Center[4]	85	75	224	199	682	604	14	12	0	0	1,087	426	70	62	41	36	14	12	2,217	1,426
Total	**643**	**470**	**697**	**550**	**2,531**	**2,168**	**624**	**354**	**84**	**69**	**1,087**	**426**	**514**	**417**	**215**	**164**	**13,284**	**11,145**	**19,679**	**15,763**

Table 4 (continued)

Travel Demand Forecast for the Current WTC Development Program - Person Trips

	Auto		Taxi/ Black Car		Subway		Local Bus		Express Bus		Tour Bus		PATH		Ferry		Walk		Total	
	In	**Out**	**In**	**Out**	**In**	**Out**	**In**	**Out**	**In**	**Out**	**In**	**Out**	**In**	**Out**	**In**	**Out**	**In**	**Out**	**In**	**Out**
Weekday PM Peak Hour																				
Local Retail (Patrons)[1,2,3]	51	45	34	30	257	227	86	76	0	0	0	0	51	45	34	30	1,203	1,063	1,716	1,516
Destination Retail (Patrons) [1,2,3]	27	24	22	19	108	95	27	24	0	0	0	0	16	14	11	10	329	291	540	477
Retail (Employees) [1]	1	16	1	11	17	330	1	11	2	43	0	0	5	94	1	22	1	14	29	541
Office (Workers)	21	406	14	271	435	8,258	14	271	57	1,083	0	0	128	2,437	28	541	14	272	711	13,539
Office (Visitors)	12	237	12	237	62	1,171	2	34	7	135	0	0	18	338	2	34	241	4,583	356	6,769
Performance Space (1,000 seats)	0	100	0	60	0	53	0	227	0	0	0	0	0	33	0	33	0	162	0	668
Restaurant (Patrons)[1,3]	6	6	2	2	5	5	1	1	0	0	0	0	2	2	2	2	16	16	34	34
Restaurant (Employees)[1]	0	1	0	0	1	10	0	0	0	1	0	0	0	3	0	1	0	1	1	17
Memorial & Memorial Center[4]	136	113	352	294	1,075	897	22	18	0	0	297	661	110	92	64	54	22	18	2,078	2,147
Total	**254**	**948**	**437**	**924**	**1,960**	**11,046**	**153**	**662**	**66**	**1,262**	**297**	**661**	**330**	**3,058**	**142**	**727**	**1,826**	**6,420**	**5,465**	**25,708**
Saturday Midday Peak Hour																				
Local Retail (Patrons)[1,2,3]	58	57	39	38	289	283	96	94	0	0	0	0	58	57	39	38	1,346	1,320	1,925	1,887
Destination Retail (Patrons) [1,2,3]	38	37	30	30	152	149	38	37	0	0	0	0	23	22	15	15	464	454	760	744
Retail (Employees) [1]	10	8	10	8	27	22	10	8	0	0	0	0	5	4	2	2	422	346	486	398
Office (Workers)	41	34	41	34	113	93	41	34	0	0	0	0	21	17	10	8	1,794	1,468	2,061	1,688
Office (Visitors)	36	30	36	30	178	146	5	4	21	17	0	0	52	42	5	4	698	570	1,031	843
Performance Space (1,000 seats)	100	0	60	0	53	0	227	0	0	0	0	0	33	0	33	0	162	0	668	0
Restaurant (Patrons)[1,3]	18	18	7	7	16	16	4	4	0	0	0	0	5	5	5	5	49	49	104	104
Restaurant (Employees)[1]	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	14	12	15	13
Memorial & Memorial Center[4]	108	106	284	278	864	847	17	17	0	0	1,396	619	88	86	51	50	17	17	2,825	2,020
Total	**409**	**290**	**507**	**425**	**1,693**	**1,557**	**438**	**198**	**21**	**17**	**1,396**	**619**	**285**	**233**	**160**	**122**	**4,966**	**4,236**	**9,875**	**7,697**

Notes:

[1]Proportion of restaurant uses to other retail uses from the 2004 FGEIS assumed for current development program.

[2]Includes 50 percent local retail uses and 50 percent destination uses.

[3]Retail and restaurant patron trips reflect a 25 percent linked-trip credit.

[4]Travel demand from the Memorial and Memorial Center based on forecast in the 2004 FGEIS. Includes trips generated by Tower 1 viewing platform.

Table 5
Travel Demand Forecast for the Current WTC Development Program - Vehicle Trips

	Auto		Taxi[5]		Black Car[6]		Tour Bus		Truck		Total	
	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out
Weekday AM Peak Hour												
Local Retail (Patrons)[1,2,3]	9	9	9	9	1	1	0	0	0	0	19	19
Destination Retail (Patrons)[1,2,3]	6	5	6	6	1	1	0	0	0	0	13	12
Retail (Employees)[1]	12	1	10	10	0	0	0	0	6	6	28	17
Office (Workers)	220	9	159	159	11	11	0	0	28	28	418	207
Office (Visitors)	164	7	139	139	10	10	0	0	0	0	313	156
Performance Space (1,000 seats)	0	0	0	0	0	0	0	0	1	1	1	1
Restaurant (Patrons)[1,3]	0	0	0	0	0	0	0	0	0	0	0	0
Restaurant (Employees)[1]	1	0	0	0	0	0	0	0	5	5	6	5
Memorial & Memorial Center[4]	36	0	118	118	2	2	9	0	1	1	166	121
Total	**448**	**31**	**441**	**441**	**25**	**25**	**9**	**0**	**41**	**41**	**964**	**538**
Weekday Midday Peak Hour												
Local Retail (Patrons)[1,2,3]	58	57	55	55	1	1	0	0	0	0	114	113
Destination Retail (Patrons)[1,2,3]	16	16	17	17	1	1	0	0	0	0	34	34
Retail (Employees)[1]	6	5	9	9	0	0	0	0	9	9	24	23
Office (Workers)	105	86	110	110	23	23	0	0	31	31	269	250
Office (Visitors)	118	96	97	97	21	21	0	0	0	0	236	214
Performance Space (1,000 seats)	29	0	23	23	1	1	0	0	0	0	53	24
Restaurant (Patrons)[1,3]	6	6	2	2	0	0	0	0	0	0	8	8
Restaurant (Employees)[1]	0	0	0	0	0	0	0	0	4	4	4	4
Memorial & Memorial Center[4]	29	26	107	107	4	4	33	13	1	1	174	151
Total	**367**	**292**	**420**	**420**	**51**	**51**	**33**	**13**	**45**	**45**	**916**	**821**
Weekday PM Peak Hour												
Local Retail (Patrons)[1,2,3]	32	28	32	32	1	1	0	0	0	0	65	61
Destination Retail (Patrons)[1,2,3]	17	15	20	20	1	1	0	0	0	0	38	36
Retail (Employees)[1]	1	10	9	9	0	0	0	0	2	2	12	21
Office (Workers)	13	254	181	181	17	17	0	0	12	12	223	464
Office (Visitors)	10	190	157	157	15	15	0	0	0	0	182	362
Performance Space (1,000 seats)	0	29	24	24	1	1	0	0	0	0	25	54
Restaurant (Patrons)[1,3]	3	3	1	1	0	0	0	0	0	0	4	4
Restaurant (Employees)[1]	0	1	0	0	0	0	0	0	3	3	3	4
Memorial & Memorial Center[4]	47	39	171	171	6	6	9	20	1	1	234	237
Total	**123**	**569**	**595**	**595**	**41**	**41**	**9**	**20**	**18**	**18**	**786**	**1,243**

Table 5 (continued)
Travel Demand Forecast for the Current WTC Development Program - Vehicle Trips

	Auto		Taxi[5]		Black Car[6]		Tour Bus		Truck		Total	
	In	**Out**	**In**	**Out**	**In**	**Out**	**In**	**Out**	**In**	**Out**	**In**	**Out**
Saturday Midday Peak Hour												
Local Retail (Patrons)[1,2,3]	36	36	40	40	1	1	0	0	0	0	77	77
Destination Retail (Patrons) [1,2,3]	24	23	31	31	1	1	0	0	0	0	56	55
Retail (Employees) [1]	6	5	8	8	0	0	0	0	1	1	15	14
Office (Workers)	26	21	27	27	3	3	0	0	4	4	60	55
Office (Visitors)	29	24	23	23	3	3	0	0	0	0	55	50
Performance Space (1,000 seats)	29	0	22	22	1	1	0	0	0	0	52	23
Restaurant (Patrons)[1,3]	8	8	4	4	0	0	0	0	0	0	12	12
Restaurant (Employees)[1]	0	0	0	0	0	0	0	0	4	4	4	4
Memorial & Memorial Center[4]	39	35	137	137	6	6	42	19	1	1	225	198
Total	**197**	**152**	**292**	**292**	**15**	**15**	**42**	**19**	**10**	**10**	**556**	**488**

Notes:
[1]Proportion of restaurant uses to other retail uses from the 2004 FGEIS assumed for current development program.
[2]Includes 50 percent local retail uses and 50 percent destination uses.
[3]Retail and restaurant patron trips reflect a 25 percent linked-trip credit.
[4]Travel demand from the Memorial and Memorial Center based on forecast in the 2004 FGEIS. Includes trips generated by Tower 1 viewing platform.
[5]Balanced taxi trips are shown. Assumes 75 percent of taxis with inbound passengers depart with outbound passengers.
[6]Retail totals also include a small number of black car trips generated by PATH.

presence of a large (1 million sf) heavy user in all but Tower 4, which is expected to be mostly filled by light users including the Port Authority and other government agencies. As Conde Nast has been identified as the largest projected tenant of Tower 1, a separate forecast of black car demand was prepared for this firm based on observations at their current location in Times Square. (Conde Nast was categorized in the study as a medium user.)

Detailed data on the temporal distribution of black car trips were also reported in the study. Black car trips were found to have very different peaking characteristics than trips by taxi or auto. Pick-ups and drop-offs by black cars typically peak at different times, with the majority of drop-offs occurring between 7 AM and 11 AM and the majority of pick-ups occurring between 9 PM and 1 AM.

Table 6 shows the estimated numbers of black car trips expected to be generated during the analyzed peak hours by towers 1 through 4 at the WTC site based on the methodology presented in *Black Car Traffic Volume Analysis – World Trade Center Redevelopment*. (More detailed data are presented in **Tables D-1 and D-2** in **Appendix D**.) Also shown are the numbers of trips expected to be generated by other planned uses at the site, including retail, the Performing Arts Center and the Memorial and Memorial Center. Black car trips for these uses were estimated based on data reported in both the 2011 *Black Car Traffic Volume Analysis – World Trade Center Redevelopment* and an earlier 2006 study prepared by The Louis Berger Group, Inc. for the Lower Manhattan Development Corporation entitled *Taxi and Black Car Study for the World Trade Center Memorial and Redevelopment Plan*. As shown in **Table 6**, black cars arriving at the WTC site to pick up passengers are expected to average

Table 6

Black Car Vehicle Trip Forecast for the Current WTC Development Program

Average Arrivals for Pick-up per Hour[1]								
Peak Hour	**Tower 1**	**Tower 2**	**Tower 3**	**Tower 4**	**Retail[3]**	**Memorial[2]**	**PAC[2]**	**Total**
AM	3.0	2.4	2.3	0.3	0.2	0.0	0.0	8.2
Midday	13.9	11.0	10.7	1.4	0.2	2.0	0.0	39.2
PM	11.0	8.7	8.5	1.1	0.2	3.0	0.0	32.5
Saturday Midday	1.6	1.3	1.2	0.2	0.2	3.0	0.0	7.5
Average Arrivals for Drop-Off per Hour[1,3]								
Peak Hour	**Tower 1**	**Tower 2**	**Tower 3**	**Tower 4**	**Retail[3]**	**Memorial[2]**	**PAC[2]**	**Total**
AM	5.1	3.8	3.7	0.4	1.6	2.0	0.0	16.6
Midday	2.8	2.1	2.0	0.2	1.6	2.0	1.0	11.7
PM	1.0	0.7	0.7	0.1	1.6	3.0	1.0	8.1
Saturday Midday	0.9	0.6	0.6	0.1	1.6	3.0	1.0	7.8

Notes:
[1]Source: Data from *Black Car Traffic Volume Analysis, WTC Redevelopment,* JSL Management, 6/20/2011, unless otherwise noted.
[2]Assumes that black cars account for approximately 2% of PAC and Memorial person trips by for-hire vehicles based on data from *Taxi and Black Car Study for the WTC Memorial and Redevelopment Plan*, Louis Berger Group, Inc., 2006.
[3]Also includes a small number of black car trips generated by PATH.

approximately 8.2, 39.2, 32.5 and 7.5 in the weekday AM, midday, PM and Saturday midday peak hours, respectively, while black cars arriving to drop off passengers are expected to total 16.6, 11.7, 8.1 and 7.8, during these same periods, respectively. Black car trips generated at the WTC site by retail uses and PATH are expected to be a very small component of the total demand, averaging a combined 1.6 drop-offs/hour and 0.2 pick-ups per hour. Black car trips generated by the Performing Arts Center and by the Memorial and Memorial Center are also expected to be a relatively small component of total demand, accounting for roughly two percent of the total person trips by for-hire vehicle for these uses. As shown in **Table 6**, the Performing Arts Center is expected to average one black car arriving to drop-off passengers in the weekday midday and PM and Saturday midday peak hours. Black cars arriving at the Memorial and Memorial Center to pick up passengers are expected to average approximately two in the weekday midday peak hour, three each in the PM and Saturday midday peak hours, and none in the weekday AM. Black cars arriving to drop off passengers at the Memorial are expected to total two each in the Weekday AM and midday peak hours and three each in the weekday PM and Saturday midday peak hours.

Unlike taxis, black cars arriving with passengers are generally not available to pick up a departing passenger on the same trip. Therefore, each black car arriving to pick-up or drop-off a passenger would represent two vehicle trips. As shown in **Table 5**, based on this forecast, the numbers of vehicle trips by black car generated by the WTC site (in and out combined) would total approximately 50, 102, 82 and 30 during the weekday AM, midday, PM and Saturday midday peak hours, respectively.

The remaining for-hire vehicle trips are assumed to be by taxi. The numbers of taxi trips shown in **Table 5** have been balanced to reflect the fact that, unlike black cars, some taxis arriving with passengers would depart with new passengers. Given that the WTC site is considered a transportation hub as it incorporates both a PATH terminal and several subway stations, it is assumed that 75 percent of taxis arriving full will also depart full. This assumption is consistent

with both 2012 *CEQR Technical Manual* criteria and the methodology employed for the 2004 FGEIS traffic analysis.

WTC Site Vehicle Trip Assignment

Assignments by portal for vehicle trips generated by the different land uses that would be developed at the WTC site in the future without the Proposed Project were derived from the vehicle trip assignment patterns described in the 2004 FGEIS and in the 2007 *WTC Vehicular Security Center and Tour Bus Parking Facility EA*. The primary routes for vehicle trips to and from the WTC site are expected to be Route 9A, the FDR Drive, East River crossings (primarily the Brooklyn and Manhattan bridges and the Brooklyn-Battery Tunnel), and local streets. To be conservative, all auto and taxi trips expected to enter or exit the area via local streets were assumed to be concentrated on the primary north-south corridors on the west side of lower Manhattan, including southbound Broadway and West Broadway and northbound Church Street. Vehicles were generally assigned between individual portals and their specific origins/destinations at the WTC site by the most direct routes available, accounting for changes to the street system anticipated to be in place in the No-Action condition. These changes include the extension of Greenwich, Vesey and Fulton Streets through the WTC site, the reopening of Liberty Street to two-way traffic between Church Street and Route 9A, and the conversion of Cedar Street to one-way westbound operation from Trinity Place to Greenwich Street. In addition, the No-Action assignments reflect the operation of both Vesey Street and Fulton Street as managed streets between Greenwich Street and Route 9A.

The No-Action assignments of WTC vehicle trips are discussed in more detail below.

Autos

Depending on land use and trip type (i.e., worker versus visitor), approximately 30 to 50 percent of auto trips en route to and from the WTC site are expected to use Route 9A to access the site from the George Washington Bridge, Lincoln and Holland tunnels and midtown and northern Manhattan. Approximately 15 to 30 percent are expected to use the FDR Drive with the remaining 35 to 45 percent distributed among the East River crossings and local streets.

Autos belonging to office tenants in towers 1 through 4 were assumed to be destined to either on-site parking via the Vehicular Security Center, or to other off-street public parking facilities in the vicinity. For assignment purposes it was assumed that the equivalent of 40 percent of the up to 500-space capacity of the on-site parking facilities – i.e., 200 autos – would arrive at the VSC in the AM peak hour. Autos associated with other on-site uses as well as all visitor autos were assigned to off-site public parking facilities as these vehicles are not expected to have access to on-site parking. The assignment of autos to individual off-site public parking facilities was based on the proximity of each facility to destinations at the WTC site and its capacity and estimated utilization based on May 2012 survey data.

Taxis/Black Cars

Approximately 85 percent of office worker trips by for-hire vehicles (taxis and black cars) and 50 percent of office visitor trips are expected to originate in Manhattan, with the remaining trips distributed among the outer boroughs, Long Island and New Jersey. The lower percentage of Manhattan-based office visitor trips reflects the fact that many visitors will be en route to or from airports in Queens and New Jersey. By contrast, Manhattan is expected to account for approximately 95 percent of taxi and black car trips to and from the retail, performance space

and Memorial Center uses at the WTC site, with the remaining trips mostly to and from Brooklyn. Approximately 35 to 50 percent of taxi and black car trips are expected to use Route 9A, 25 to 40 percent the FDR Drive and 15 to 40 percent the East River crossings and local streets.

For the No-Action traffic assignment, taxis and black cars were assigned to the most direct routes to and from their specific destination buildings at the WTC site. Black cars en route to and from Tower 1 were assumed to traverse the portions of Vesey and Fulton Streets that would be managed for security purposes in the No-Action condition. Taxis en route to and from Tower 1 were generally assumed to drop-off/pick-up on nearby non-managed streets including Barclay Street, Greenwich Street and Route 9A.

Trucks

The arrival and departure routes of truck trips generated by development at the World Trade Center are based on assignment data from the *WTC Vehicular Security Center and Tour Bus Parking Facility EA* and also reflect designated local truck routes in the vicinity of the WTC site. (Route 9A is a designated through-truck route while Broadway, Trinity Place/Church Street, Vesey Street and Barclay Street are designated local truck routes.) It is estimated that 63 percent of inbound truck trips will use Route 9A, 32 percent local streets and five percent the Brooklyn-Battery Tunnel. The percentages of outbound trips using these corridors are expected to total 76 percent, 19 percent and five percent, respectively.

All trucks destined to the WTC site in the No-Action condition would use the Vehicular Security Center with the exception of a small number of large trucks destined for the Performing Arts Center loading dock. Trucks would approach the VSC predominantly on Route 9A to Liberty Street, with approximately 65 to 70 percent turning right into the facility (including approximately five percent en route from the Brooklyn-Battery Tunnel), and the remaining 30 to 35 percent approaching on West Broadway/Greenwich Street to Liberty Street and turning left into the facility. As left-turns from the VSC onto westbound Liberty Street would be prohibited in the No-Action condition, all trucks would exit the facility by turning onto eastbound Liberty Street from which they would either return to Route 9A via Church and Barclay Streets[1], continue north on Church Street, or proceed to the Brooklyn-Battery Tunnel via Broadway, westbound Battery Place and northbound Route 9A. The small number of large trucks expected to travel to and from the Performing Arts Center would traverse the managed portion of Vesey Street to access the facility's loading dock.

It should be noted that delivery vehicles en route to the WTC site would need to be scheduled and would undergo a credentialing check upon entering the VSC. It is anticipated that in the No-Action condition, some would arrive unscheduled, and would be diverted to an off-site reconciliation area where they would wait until WTC staff could confirm their status before being allowed to return to the VSC. For traffic assignment purposes, it was assumed that 15 percent of delivery vehicles arriving at the VSC in the No-Action condition would be

[1] The analysis in the *WTC Vehicular Security Center and Tour Bus Parking Facility EA* assumed that trucks would return to Route 9A via Fulton Street, and that Fulton Street would have unrestricted access to both northbound and southbound Route 9A. However, it is currently anticipated that Fulton Street would be a managed street with security checkpoints adjacent to Tower 1 in the No-Action condition, and there would be no access from it to southbound Route 9A. Therefore, trucks destined for northbound Route 9A in the No-Action condition were instead assigned to Barclay Street which is a designated local truck route, while all trucks destined for the Brooklyn-Battery Tunnel were assumed to use Broadway, also a designated local truck route.

unscheduled.[1] These vehicles would be diverted out of the VSC via the secondary exit on Cedar Street, and it is assumed that they would use Route 9A to travel to an off-site reconciliation area located to the north of the WTC site.

Tour Buses

It is anticipated that tour buses with passengers en route to the 9/11 Memorial, Memorial Center and Tower 1 viewing platform would unload passengers along the north curb of Liberty Street west of Greenwich Street or along the west curb of Greenwich Street adjacent to the Memorial Center before proceeding to the VSC. Based on data from the WTC Vehicular Security Center and Tour Bus Parking Facility EA, it is anticipated that over 80 percent of these buses would approach the WTC site from southbound Route 9A, with the remainder approaching from Broadway or the Brooklyn-Battery Tunnel. Buses departing the VSC onto eastbound Liberty Street were assumed to loop north on Church Street and west on Fulton Street to reach potential loading locations along the west curb of Greenwich Street and possibly the east curb of northbound Route 9A north of Liberty Street.

It is recognized that not all tour buses destined to the Memorial, Memorial Center and Tower 1 viewing platform would reserve on-site parking in the No-Action (as well as the With-Action) condition, and that some would likely proceed to various off-site parking locations after discharging their passengers, as is current practice. As discussed previously, in developing the baseline traffic networks, no credit was assumed for the substantial numbers of existing Memorial-related trips. Therefore, the baseline traffic networks already reflect tour buses discharging passengers in the vicinity of the Memorial and then proceeding to off-site parking. However, the No-Action (as well as the With-Action) traffic assignment conservatively incorporates the full incremental tour bus demand generated by the Memorial, Memorial Center and Tower 1 viewing platform, and assumes that all of the these trips would circulate through the WTC site en route to and from the VSC and on-site parking.

Other No-Action Developments and Background Growth

In addition to the travel demand that would be generated by the development planned for the WTC site, the traffic network for the EIS analysis of 2019 No-Action conditions also incorporates trips generated by other development projects located in the vicinity of the WTC site and expected to be completed by the 2019 analysis year. Travel demand forecasts were prepared for these sites aggregated by use, and the total numbers of peak hour vehicle trips generated were compared to study area screen-line traffic volumes to determine the overall percentage increase in study area travel demand resulting from these developments in each peak hour. Overall, No-Action developments in the vicinity of the WTC site are expected to increase study area traffic by approximately 5.8 percent in the weekday AM peak hour and from 7.5 to 8.0 percent in the other analyzed peak hours.

Annual background growth rates of 0.25 percent per year for years 2012 through 2017 and 0.125 percent per year for years 2017 through 2019 were also applied to existing travel demand as specified in the *CEQR Technical Manual*. These background growth rates are applied to account for smaller projects and general increases in travel demand not attributable to specific development projects in proximity to the study area.

[1] Source: *Delivery Vehicle Reconciliation Study*, Sam Schwartz Engineering, June 20, 2011.

Reassignment of No-Action Background Traffic

In addition to demand from the development planned for the WTC site, the No-Action traffic network incorporates background traffic (including traffic generated by other development sites and general background growth), some of which would be redistributed as a result of the changes to the study area street system described previously. Traffic flow patterns developed using the Lower Manhattan Traffic Model were applied to these background volumes in order to reassign these trips to reflect the changes to the street network anticipated in the 2019 No-Action condition. For example, with West Broadway and Greenwich Street open to through traffic through the WTC site in the No-Action condition, it is anticipated that there would be some diversion of southbound traffic to this corridor from other southbound corridors such as Broadway. Liberty Street would function as a contiguous two-way corridor between Route 9A and Broadway, and would therefore potentially draw some traffic from other east-west corridors in the area, such as two-way Chambers Street. With both Vesey and Fulton Streets functioning as managed streets and closed to through traffic between Greenwich Street and Route 9A, the opening of these streets through the project site in the No-Action condition is not expected to draw substantial numbers of trips from other east-west corridors.

WITH-ACTION CONDITION

In the 2019 future with the Proposed Project (the With-Action condition), a comprehensive perimeter vehicle security plan for the WTC site would be implemented in order to ensure an open environment that is hospitable to commerce, culture and remembrance, but also protected from future threats to the extent practicable over the long term. Under this plan, vehicular access to, and traffic movement within, the WTC site would be controlled through the creation of a secure perimeter that would prevent unscreened vehicles from approaching within a set distance of WTC buildings. Portions of streets in and around the WTC site would be closed to unscreened vehicular traffic. Vehicles destined for the WTC seeking entry onto these streets would be subject to credentialing to determine whether entry to the site should be permitted, and then screening to confirm that these vehicles pose no threat.

As shown in the conceptual plan in **Figure 3** and described previously, the perimeter of the WTC site would be secured through the installation of various types of vehicle interdiction devices under the control of the NYPD. These include traffic lane delineators and static barriers such as bollards, as well as a system of retractable vehicle barriers. Screening of all vehicles entering the WTC Campus would utilize both electronic and manual processes, and would be facilitated through the use of sally ports consisting of a personnel booth controlling a set of two retractable barriers with sufficient space between them to accommodate one or more motor vehicles undergoing screening. Overall, it is anticipated that sally ports would be installed at a total of eight locations on the perimeter of the site. Two would function as entry sally ports, four as exit sally ports and two would be used by both entering and exiting vehicles.

It is anticipated that access to the WTC campus would be managed in a flexible manner to allow maximum throughput and reduce the potential for localized traffic congestion, as conditions allow. Vehicle operators that frequently visit the WTC would have the option of enrolling in a Trusted Access Program (TAP) that would allow expedited entry through the security checkpoints. This would include autos operated by WTC tenants who are authorized to park in the up to 500 spaces of on-site parking, black car services expecting to regularly pick-up and/or drop-off passengers at the site, service companies with frequent business at the site, residents (primarily those living along Liberty and Cedar Streets) that may need to travel through the security perimeter for access to their homes, and possibly some taxi

operators. Both vehicles and drivers would need to be enrolled. Most black-car pick-ups at the WTC site are expected to involve cars and drivers enrolled in the TAP. Drop-offs by black cars are expected to be evenly split between TAP and non-TAP drivers.

The current WTC development program would remain unchanged with implementation of the Campus Security Plan, and no new land uses would be introduced at the WTC site as a result of the Proposed Project. Therefore, the primary effects of the Proposed Project on the study traffic network would be the diversion of trips en route to and from the WTC site and general background traffic as a result of the proposed security measures.

Reassignment of WTC-Site Vehicle Trips

No-Action vehicle trips destined to and from the WTC site were reassigned to the study area street network based on the anticipated effects of the security measures that would be implemented under the Proposed Campus Security Plan. The reassignment of autos, taxis/black cars, trucks and tour buses under the Proposed Project is described in detail below.

Autos

In the With-Action condition, autos belonging to office tenants in towers 1 through 4 and destined to the up to 500 spaces of below-grade parking on-site would enter the WTC Campus through one of three security stations – Liberty Street at Route 9A, West Broadway at Barclay Street, and Trinity Place at Cedar Street (in the AM peak period only). Although it would not be designated as a regular tenant auto entrance, it is anticipated that the security station at Washington Street would also be available for use by tenant autos in the event of congestion at the West Broadway location. Outbound autos are expected to exit the VSC primarily onto Route 9A via westbound Liberty Street or onto Church Street via eastbound Liberty Street and the exit-only security station at Vesey Street. (By contrast, in the No-Action condition, left-turns from the VSC onto westbound Liberty Street would be prohibited and all exiting autos would have to proceed east on Liberty Street.) WTC-related auto trips destined to or from off-site public parking facilities would not be affected by the Proposed Project unless they would traverse streets within the WTC site (Greenwich Street for example) in the No-Action condition. Any affected autos were therefore reassigned to alternate routes outside the security perimeter.

Taxis/Black Cars

Black cars are expected to represent approximately 5 to 11 percent of the total for-hire vehicle trips (taxis and black cars combined) generated by the development at the WTC site in each analyzed peak hour (see **Table 5**). In the With-Action condition, black cars entering the WTC Campus would primarily use the security checkpoint at West Broadway at Barclay Street. A small percentage en route from the Brooklyn-Battery Tunnel are also expected to use the checkpoint on Trinity Place at Cedar Street during the AM peak period, the only period when vehicles other than tour buses would be permitted to use this entrance. Although it would not be designated as a regular black car entrance, it is anticipated that the security checkpoint at Washington Street would also be available for use by these vehicles in the event of congestion at the West Broadway location. Departing black cars were generally assigned to one of four exit locations depending on their WTC origin point and direction of travel – Church Street at Vesey Street, Vesey Street at Route 9A, Fulton Street at Route 9A and Liberty Street at Route 9A.

Most taxis serving the WTC site are not expected to enter the security zone and are instead expected to pick up and drop off passengers along streets on the periphery such as Church, Liberty, Cortlandt, Fulton and Barclay streets and Route 9A. However, to be conservative it was assumed for analysis purposes that some taxi operators may enroll themselves and their vehicles in the TAP program and enter the WTC Campus on a regular basis. The assignment of taxi trips therefore assumes that up to 25 percent of all for-hire vehicles (taxis and black cars combined) would enter the WTC Campus through a security station in each peak hour, with the remaining taxi trips picking up and dropping off passengers on the periphery. Taxis would enter the security zone via the security station on West Broadway at Barclay Street, or the checkpoint on Trinity Place at Cedar Street (in the AM peak period only). Departing taxis are expected to exit the WTC Campus at Church Street at Vesey Street, Vesey Street at Route 9A, Fulton Street at Route 9A, Liberty Street at Route 9A, or Greenwich Street at Cedar Street.

Trucks

Under the Proposed Project, all trucks en route to the below-grade loading docks at the WTC site would arrive and depart the VSC via Liberty Street at Route 9A. The few large trucks en route to or from the Performing Arts Center loading dock are expected to utilize the security station on Washington Street which they would reach via westbound Barclay Street.

Tour Buses

In the With-Action condition, tour buses en route to the 9/11 Memorial and Tower 1 observation deck would enter the WTC Campus via the security station on Church Street at Cedar Street, and it is expected that most if not all would unload along the north curb of Liberty Street west of Greenwich Street before proceeding to the VSC. Buses departing the VSC were assumed to load along the west curb of Greenwich Street and possibly the east curb of northbound Route 9A north of Liberty Street, similar to the No-Action condition.

Reassignment of Background Traffic

In the future without the Proposed Project, background traffic (i.e., traffic not destined to or from the WTC site) would no longer be able to traverse streets within the security perimeter, including Vesey, Fulton, Liberty and Greenwich Streets as well as the segments of Washington Street and West Broadway south of Barclay Street. In many respects, the future traffic network with the Proposed Project would therefore resemble the existing traffic network in that most of these streets either have not yet been built or are presently closed to through traffic due to construction activity or security concerns. Background traffic that would use these street segments in the No-Action condition was therefore reassigned to reflect the changes to the street network under the Campus Security Plan based on traffic flow patterns developed from the existing (2012) data collection program and the Lower Manhattan Traffic Model. For example, with West Broadway and Greenwich Street closed to through-traffic through the WTC site, it is anticipated that the southbound traffic using this corridor in the No-Action condition would instead use other southbound corridors such as Broadway. With Liberty Street closed to two-way through-traffic between Route 9A and Church Street, traffic would likely increase along other east-west corridors in the area, such as Chambers, Barclay and Rector streets. At the same time, traffic is expected to be lower along northbound Church Street as there would no longer be access to this corridor from Route 9A via Liberty Street as there would be in the No-Action condition. As both Vesey Street and Fulton Street would be closed to through traffic between Greenwich Street and Route 9A in both the No-Action and With-Action conditions, the Proposed Project is not expected to shift substantial numbers of

vehicles from these westbound street segments to other westbound corridors in the vicinity when compared to the No-Action condition.

TRAFFIC ANALYSIS LOCATIONS

Under *CEQR Technical Manual* criteria, a screening assessment to identify traffic analysis locations typically involves the assignment of project-generated trips to the study area street network, and the identification of specific locations where the incremental increase in demand may potentially exceed *CEQR Technical Manual* analysis thresholds and therefore require a quantitative analysis. The proposed Campus Security Plan would not result in new traffic demand on the lower Manhattan street network. It would, however, result in the diversion or redistribution of vehicle trips en route to and from the WTC site as well as general background traffic. Based on a preliminary screening of the net incremental change in peak hour vehicle trips, and comments from the New York City and New York State departments of transportation, a total of 42 intersections (36 signalized and six unsignalized) generally located along the Broadway, Trinity Place/Church Street, Greenwich Street, West Broadway and Route 9A corridors from Chambers Street to Battery Place were selected for detailed analysis. **Figure 4** shows these analyzed intersections and **Figures 5 through 8** show the peak hour project increment vehicle trips at each location.

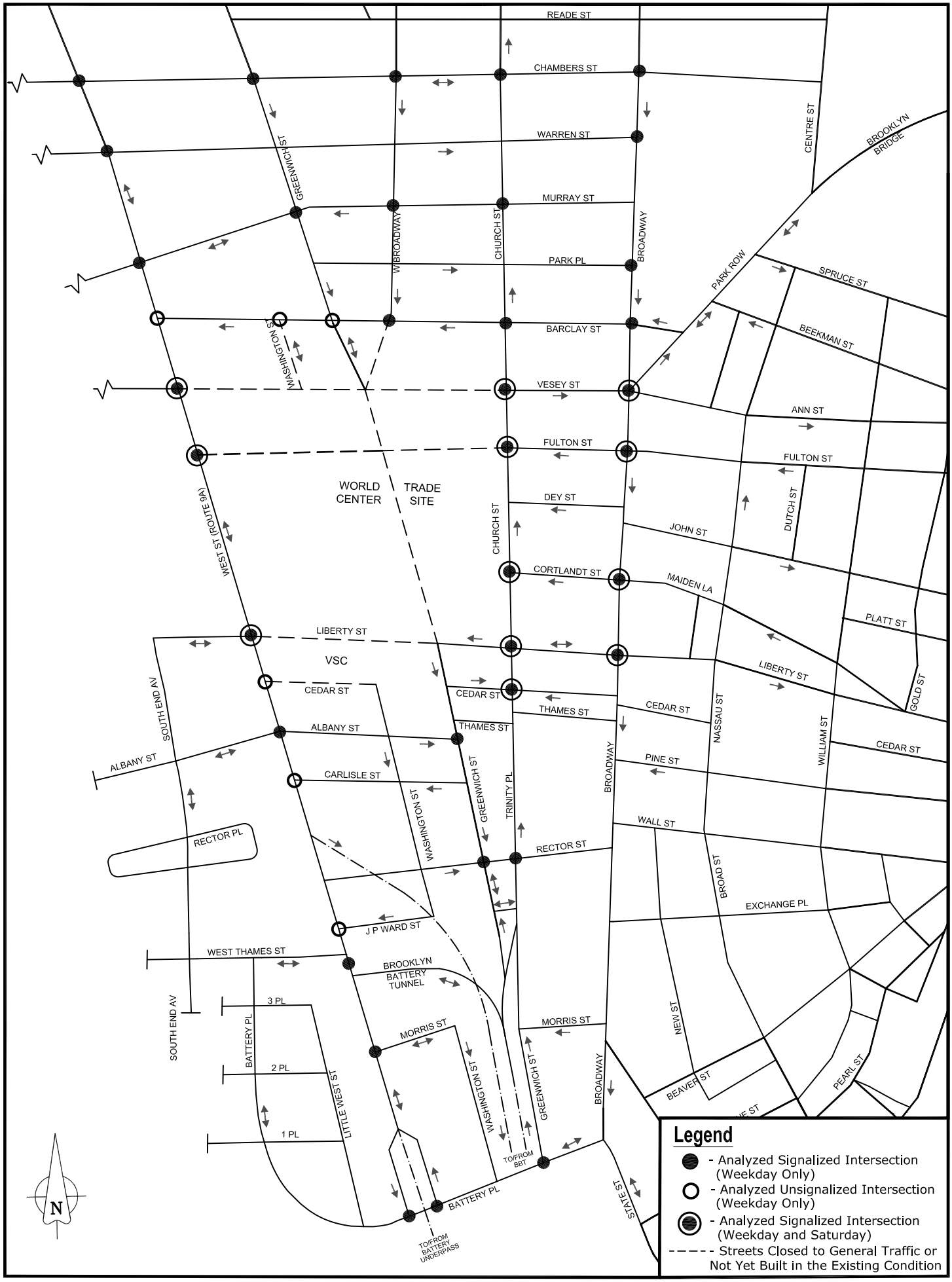
TRANSIT ANALYSES

According to the general thresholds used by the Metropolitan Transportation Authority (MTA) and specified in the *CEQR Technical Manual*, detailed transit analyses are generally not required if a proposed action is projected to result in fewer than 200 peak hour rail or bus transit trips. If a proposed action would result in 50 or more bus trips being assigned to a single bus line (in one direction), or if it would result in an increase of 200 or more trips at a single subway station or on a single subway line, a detailed bus or subway analysis would be warranted.

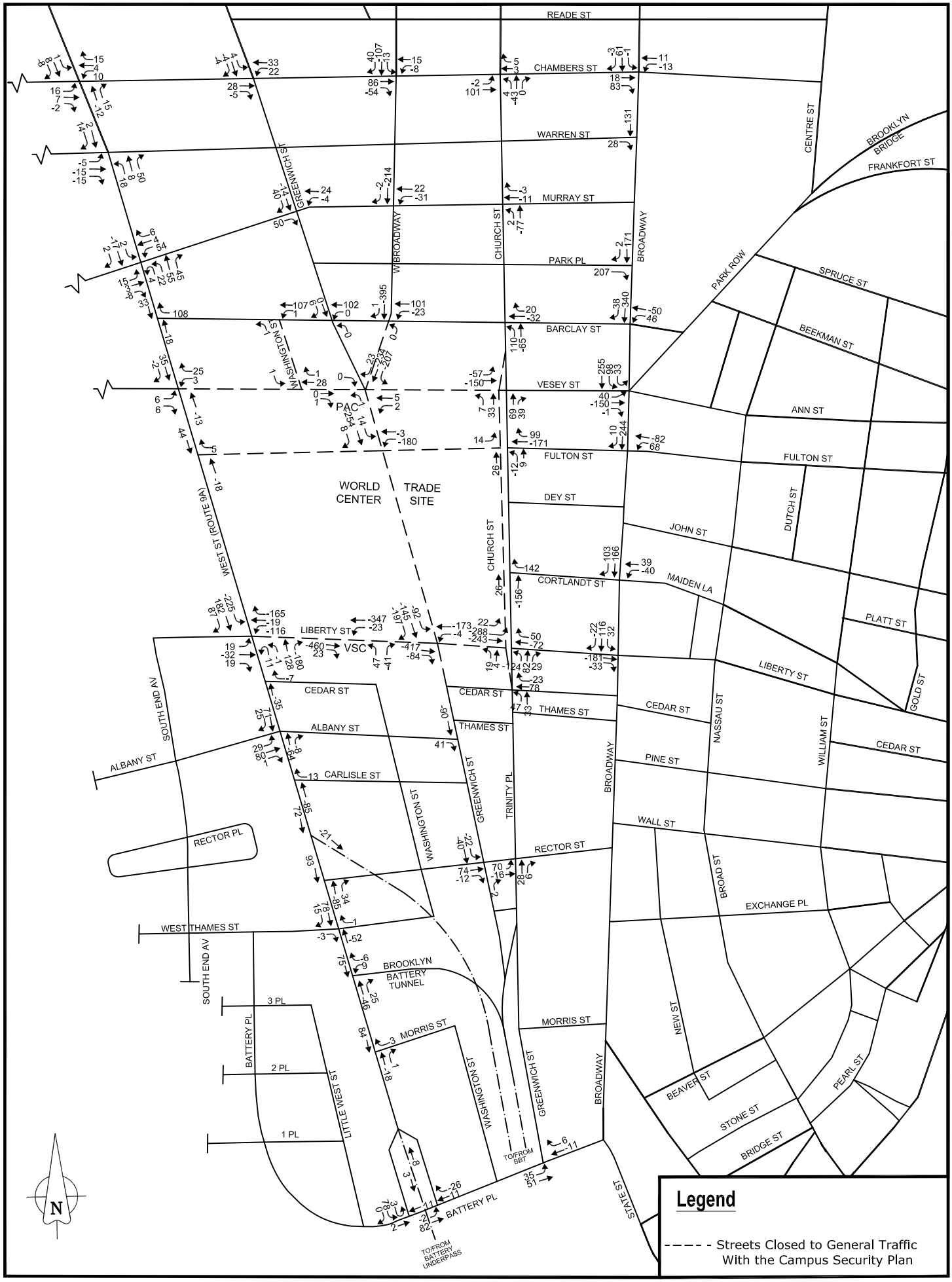
The proposed Campus Security Plan would not result in the development of new land uses that would generate additional demand on the transit systems serving the project site, although it is possible that the restrictions on vehicular access resulting from the Proposed Project may potentially reduce vehicular travel for persons en route to and from the World Trade Center and its environs. However, any potential increase in transit trips is expected to be relatively small in the context of the overall demand on the PATH system and the numerous subway, bus and ferry routes serving the site, and the numbers of such trips would be unlikely to exceed the *CEQR Technical Manual* analysis thresholds for either the rail or bus modes at any one rail transit station or bus route. The transportation analyses for this EIS take a conservative approach with respect to identifying potential significant adverse traffic impacts, and do not assume any shift from vehicles to transit.

It should also be noted that much of the access between transit facilities and new and existing development in the vicinity of the WTC site would occur below-grade and would not be directly affected by physical changes to the surface street network associated with the proposed Campus Security Plan. However, some of these changes may potentially affect transit bus services operating along these streets. For example, one lane on Church Street, which is traversed by numerous local, express and commuter bus routes, would be incorporated into the secure area of the WTC campus through the installation of a median. The potential effects of this and other proposed street network changes on bus service operations are therefore assessed in the EIS.

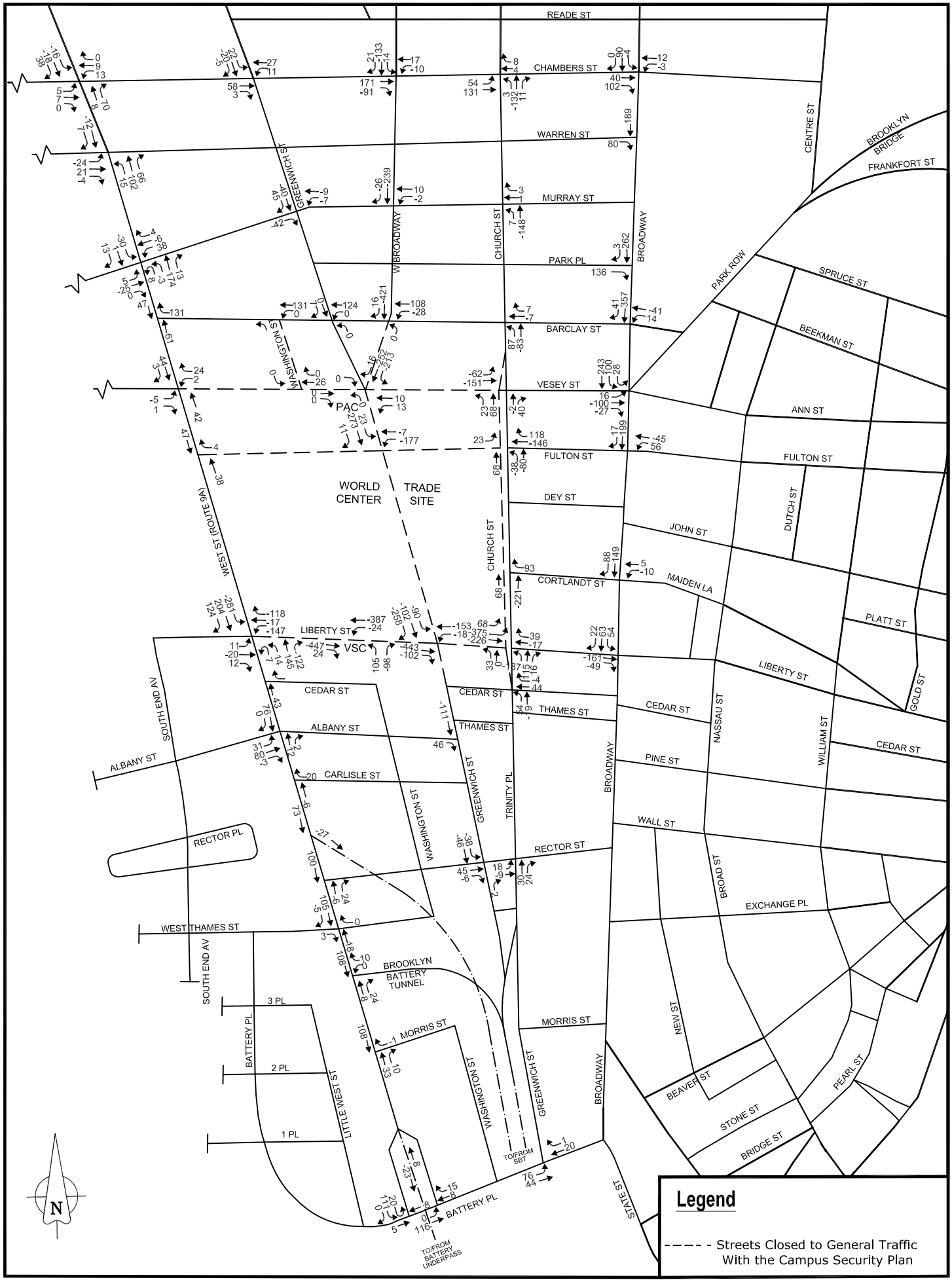
Traffic Study Area



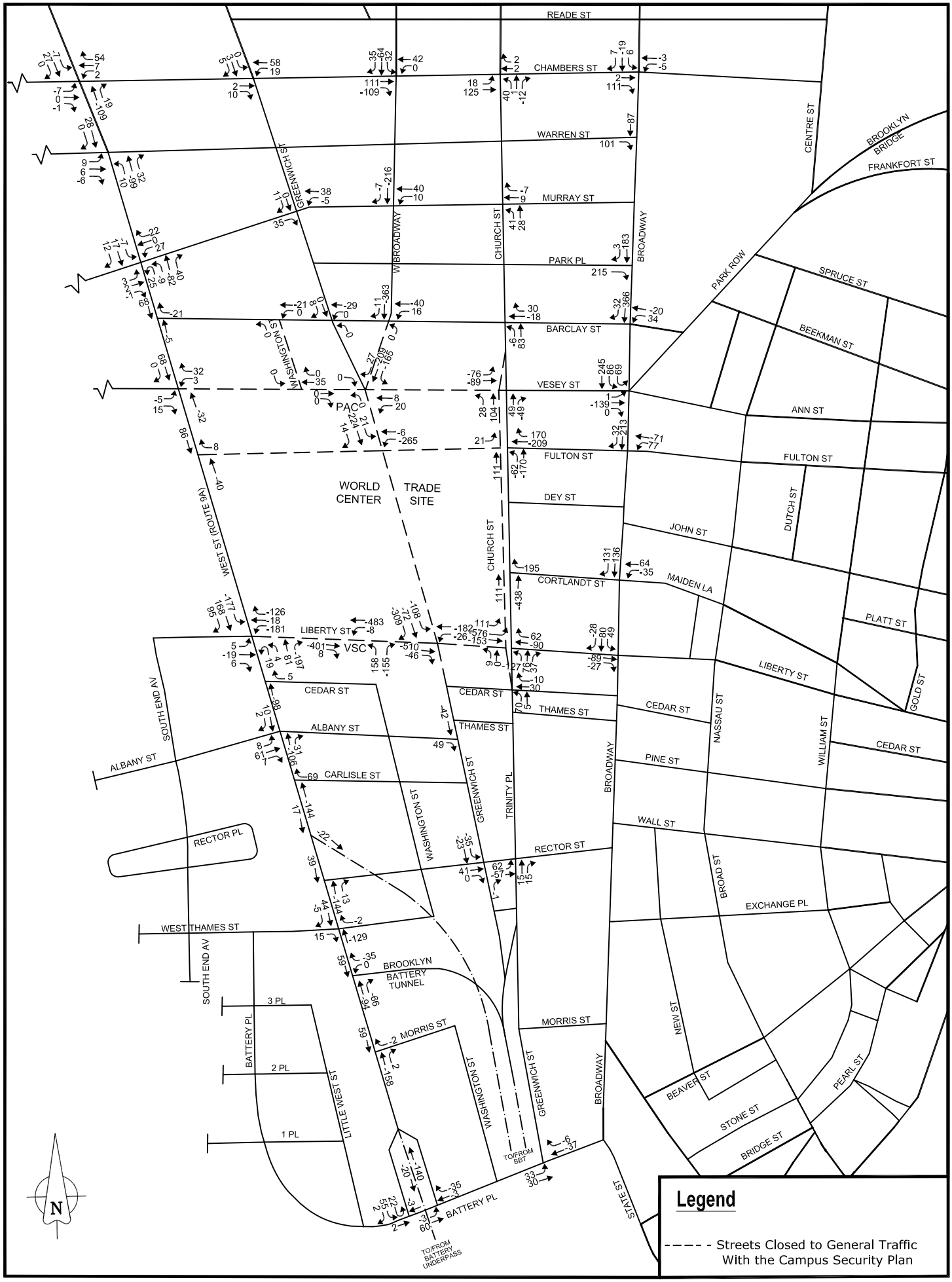
Project Increment Weekday AM Peak Hour Traffic Volumes



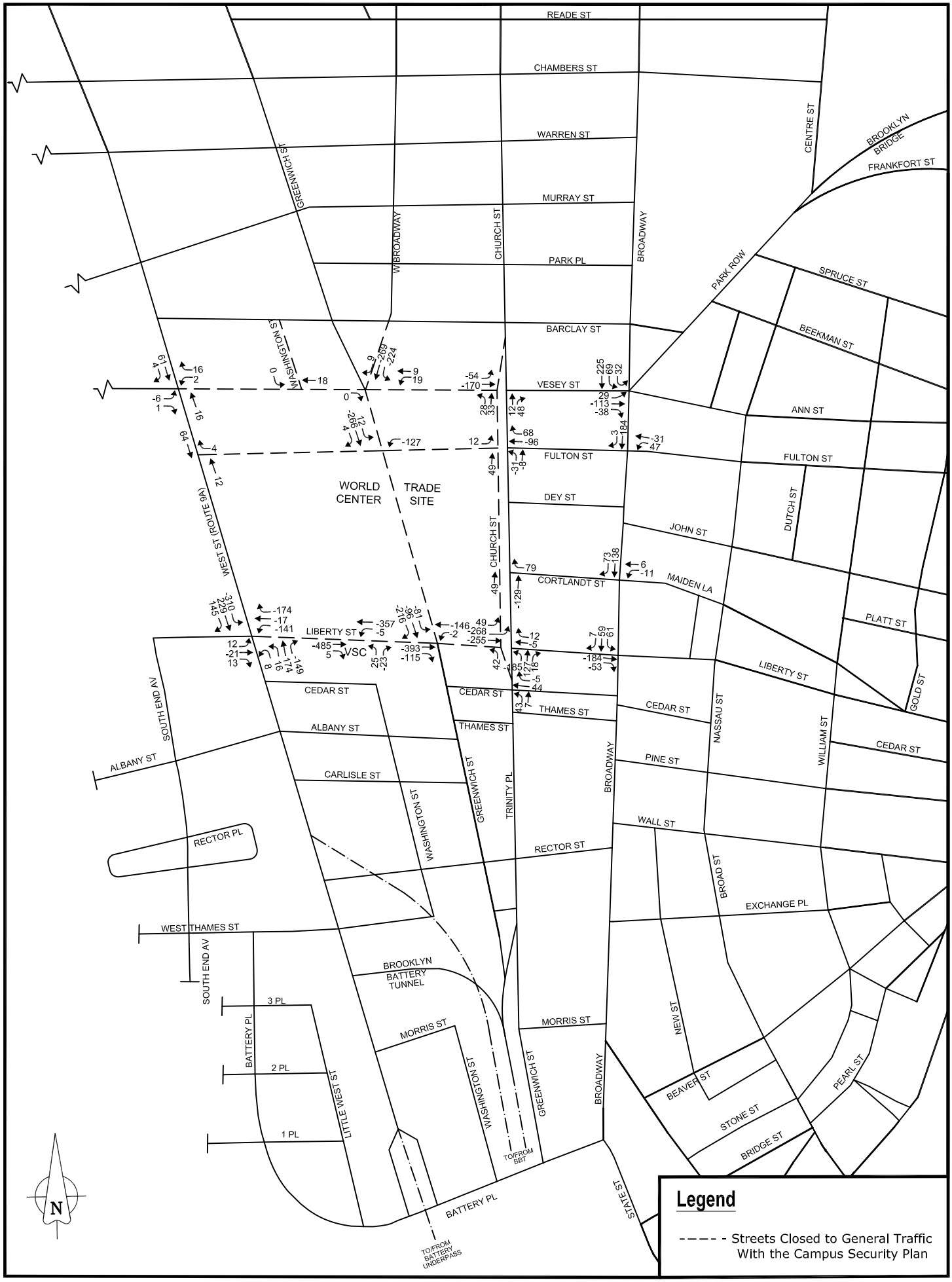
Project Increment Weekday Midday Peak Hour Traffic Volumes



Project Increment Weekday PM Peak Hour Traffic Volumes



Project Increment Saturday Midday Peak Hour Traffic Volumes



PEDESTRIAN ANALYSES

According to *2012 CEQR Technical Manual* criteria, projected pedestrian volume increases of less than 200 persons per hour at any pedestrian element (sidewalks, corner reservoir areas and crosswalks) would not typically be considered a significant impact, since that level of increase would not generally be noticeable and therefore would not require further analysis. Although the proposed Campus Security Plan would not directly generate new peak period pedestrian trips nor result in substantial diversions of pedestrian flows, it would alter the available pedestrian space at a number of locations as a result of the installation of personnel booths, equipment booths, static barriers, and sidewalk extensions. The EIS therefore includes a quantitative pedestrian impact analysis focusing on affected sidewalks, as well as a number of crosswalk locations along the Church Street corridor and on the planned extension of Fulton Street that were requested for inclusion in the analysis by NYCDOT. These locations are shown in **Figure 9** and briefly described below.

Pedestrian Analysis Locations

Vesey Street at Route 9A

Under both the No-Action and With-Action conditions, the north sidewalk on Vesey Street east of Route 9A would be extended to accommodate a sally port personnel booth and equipment house as well as static barriers. The north sidewalk on Vesey Street east of Route 9A (S1 on **Figure 9**) is therefore analyzed in the EIS.

Washington Street Between Barclay and Vesey Streets

The entry/exit sally port that would be installed at this location in both the No-Action and With-Action conditions is expected to include a personnel booth and equipment house along the east sidewalk (S2) and static barriers along the west sidewalk (S3). Both of these sidewalks are therefore analyzed.

Barclay Street at Washington Street

The south sidewalk on Barclay Street east of Washington Street (S4) is analyzed as it is expected that a personnel booth for credentialing would be installed on this sidewalk.

West Broadway at Barclay Street

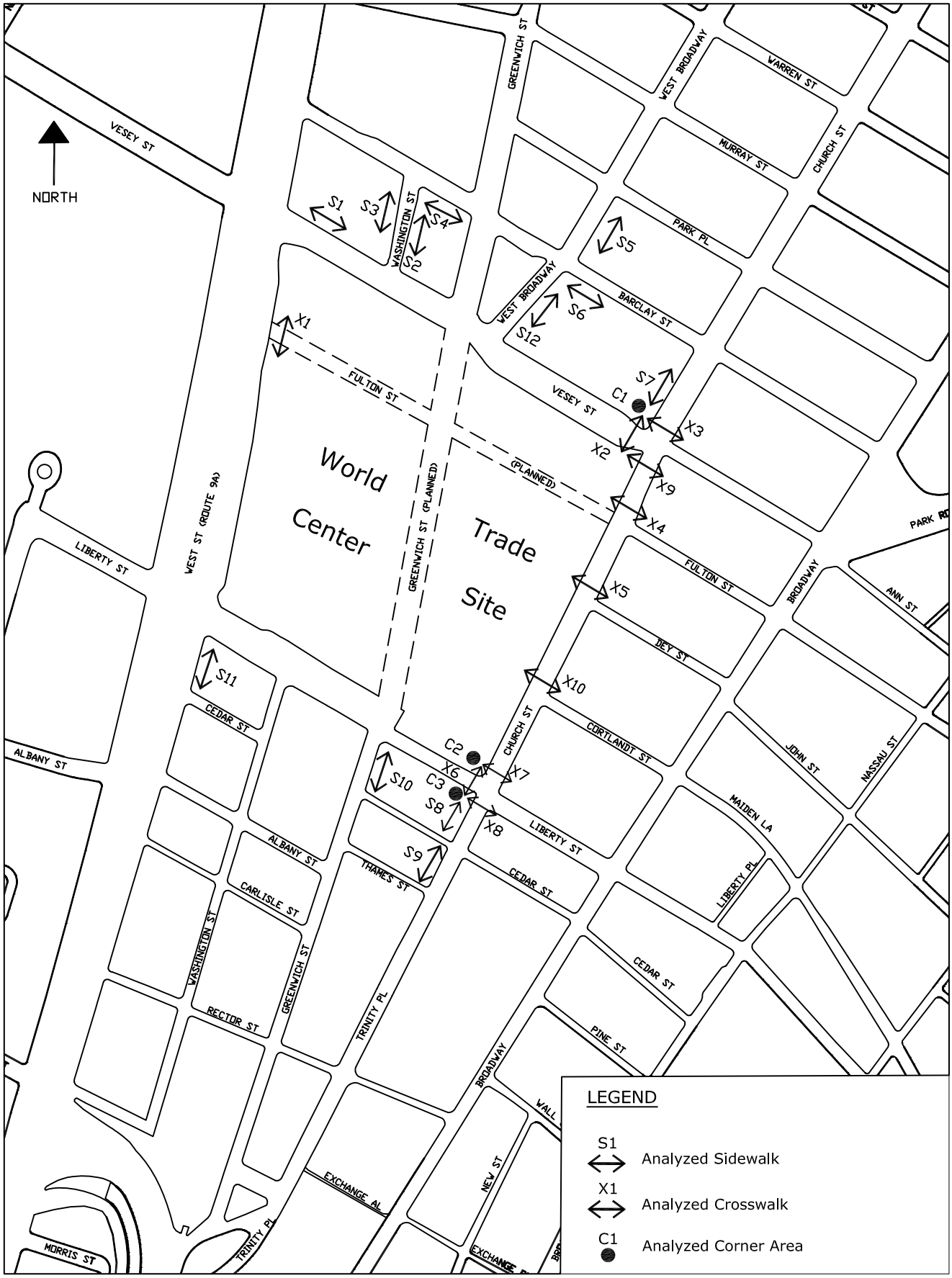
The east sidewalk on West Broadway north of Barclay Street (S5) and the south sidewalk on Barclay Street east of West Broadway (S6) are analyzed to assess the effects of the installation of personnel booths for credentialing at these locations. Although it is anticipated that the personnel booth and equipment house for the sally port on West Broadway would be accommodated on an extension of the adjacent east sidewalk (S12) with little or no reduction in pedestrian space, this sidewalk is included in the analysis to assess the potential effects of static barriers that would be located at the south end of the block.

Church Street at Vesey Street

The west sidewalk on Church Street north of Vesey Street (S7) is analyzed to assess the effects of the installation of static barriers adjacent to the exit-only sally port at this location. In addition, as the installation of a median and static barriers may potentially affect the heavy pedestrian flows through this intersection, the north and south crosswalks on Church Street

Figure 9

Pedestrian Analysis Locations



(X3 and X9) and the west crosswalk on Vesey Street (X2) along with the adjacent northwest corner area (C1) have also been included in the analysis as specified by NYCDOT.

Church Street at Fulton, Dey and Cortlandt Streets

As the installation of a median along with static barriers along Church Street may potentially affect pedestrian flows through these intersections, the north crosswalks on Church Street at Fulton Street (X4), Dey Street (X5) and Cortlandt Street (X10) have been included in the analysis as specified by NYCDOT.

Trinity Place/*Church Street at Liberty Street*

The west sidewalk on Trinity Place south of Liberty Street (S8) is analyzed to assess the effects of the installation of a personnel booth, equipment house and static barriers adjacent to the entry sally port at this location. In addition, as the installation of a median and static barriers may potentially affect the heavy pedestrian flows through this intersection, the north (X7) and south (X8) crosswalks on Church Street and the west crosswalk on Liberty Street (X6) along with the adjacent northwest (C2) and southwest (C3) corner areas have also been included in the analysis as specified by NYCDOT.

Trinity Place at Cedar Street

The west sidewalk on Trinity Place south of Cedar Street (S9) is analyzed to assess the potential effects of the installation of a personnel booth for credentialing at this location.

Greenwich Street at Liberty Street

The east sidewalk on Greenwich Street south of Liberty Street (S10) is analyzed to assess the potential effects of the installation of static barriers adjacent to the exit-only sally port at this location. (It is anticipated that the west sidewalk at this location would be extended to accommodate the personnel booth, equipment house and additional static barriers for this sally port with little or no reduction in pedestrian space.)

Route 9A at Liberty Street

The east sidewalk on Route 9A south of Liberty Street (S11) is analyzed to assess the potential effects of the installation of a personnel booth for credentialing at this location.

Fulton Street at Route 9A

An exit-only sally port would be installed on Fulton Street immediately adjacent to Route 9A under both No-Action and With-Action conditions. Under the Proposed Project, the north sidewalk on Fulton Street would be extended to accommodate the personnel booth and equipment house at this location, and no reduction in overall pedestrian space is anticipated. However, the crosswalk on Fulton Street at Route 9A (X1) is included in the analysis as it would likely traverse the sally port at this location.

Other Pedestrian Locations Affected by the Proposed Project

It is anticipated that curbside static barriers would also be installed on the perimeter of a triangular pedestrian plaza bounded by West Broadway and Barclay and Greenwich streets. These static barriers would be located along the south sidewalk on Barclay Street between

West Broadway and Greenwich streets as well as at the southwest corner of Barclay Street and West Broadway and the southeast corner of Barclay Street and Greenwich Street. It should be noted, however, that (1) pedestrian volumes are typically dispersed among various pathways through the plaza and not solely concentrated on adjacent sidewalks; (2) the northbound Greenwich Street approach to Barclay Street is stop-controlled, therefore pedestrians crossing at the south crosswalk at this intersection have the right of way and the pedestrian movement is considered uninterrupted (and therefore not analyzed); (3) the locations of the plaza's planting beds provide ample space for pedestrian circulation and queuing at the southwest corner of West Broadway and Barclay Street; and (4) under future conditions, the installation of a sally port on West Broadway south of Barclay Street would meter vehicular traffic conflicting with pedestrians on the south crosswalk at this location -- i.e., when the outer barrier is raised, pedestrians would be able to cross at this location uninterrupted, regardless of the signal. Given these factors, the installation of curbside static barriers adjacent to this pedestrian plaza is not expected to significantly affect pedestrian flows in and around the plaza, and these pedestrian elements were therefore not selected for analysis.

Future No-Action and With-Action Pedestrian Flows

It is important to note that creating a complete No-Action baseline pedestrian network from new count data proved infeasible as current pedestrian flows at many of the analysis locations have been disrupted or diverted due to ongoing construction activity (the temporary relocation of the PATH terminal entrance to Vesey Street at West Broadway being one example). In addition, six of the eight crosswalks and two of the three corner areas recommended for analysis by NYCDOT, as well as one of the analyzed sidewalks, do not currently exist. Given this and the fact that future pedestrian flow patterns with the Transit Hub and below-grade pedestrian connections will be substantially different from current conditions, the future No-Action pedestrian network for this analysis was developed based on the 2025 design year AM, midday and PM peak hour pedestrian volumes developed for the May 2005 *Permanent WTC PATH Terminal FEIS*. These volumes, provided in **Appendix C** for reference, reflect anticipated future conditions with completion of all development and transportation improvements at the WTC site, including the Transit Hub and below-grade pedestrian connections. They were calculated as a joint effort between the Port Authority of New York and New Jersey for the *Permanent WTC PATH Terminal FEIS*, and the Metropolitan Transportation Authority, New York State Department of Transportation and Lower Manhattan Development Corporation for other EISs prepared by these respective agencies.

Use of these 2025 networks for the analysis of 2019 conditions with and without the proposed Campus Security Plan can be considered a conservative approach as they reflect a substantially larger development program (and therefore greater pedestrian travel demand) at the WTC site than is currently planned, and include development of Tower 5, which is now not expected to occur by the 2019 analysis year for the Campus Security Plan. They also incorporate a background growth rate of 0.5 percent per year through 2025 in addition to demand from numerous other development projects planned for lower Manhattan. By contrast, the *CEQR Technical Manual* currently specifies a smaller 0.25 percent annual background growth rate for years 1 through 5 and a 0.125 percent annual growth rate for all subsequent years.

PARKING

As noted above, the off-street parking supply at the WTC site would total up to approximately 500 spaces for autos and 67 spaces for tour buses in a below-grade facility with access via the

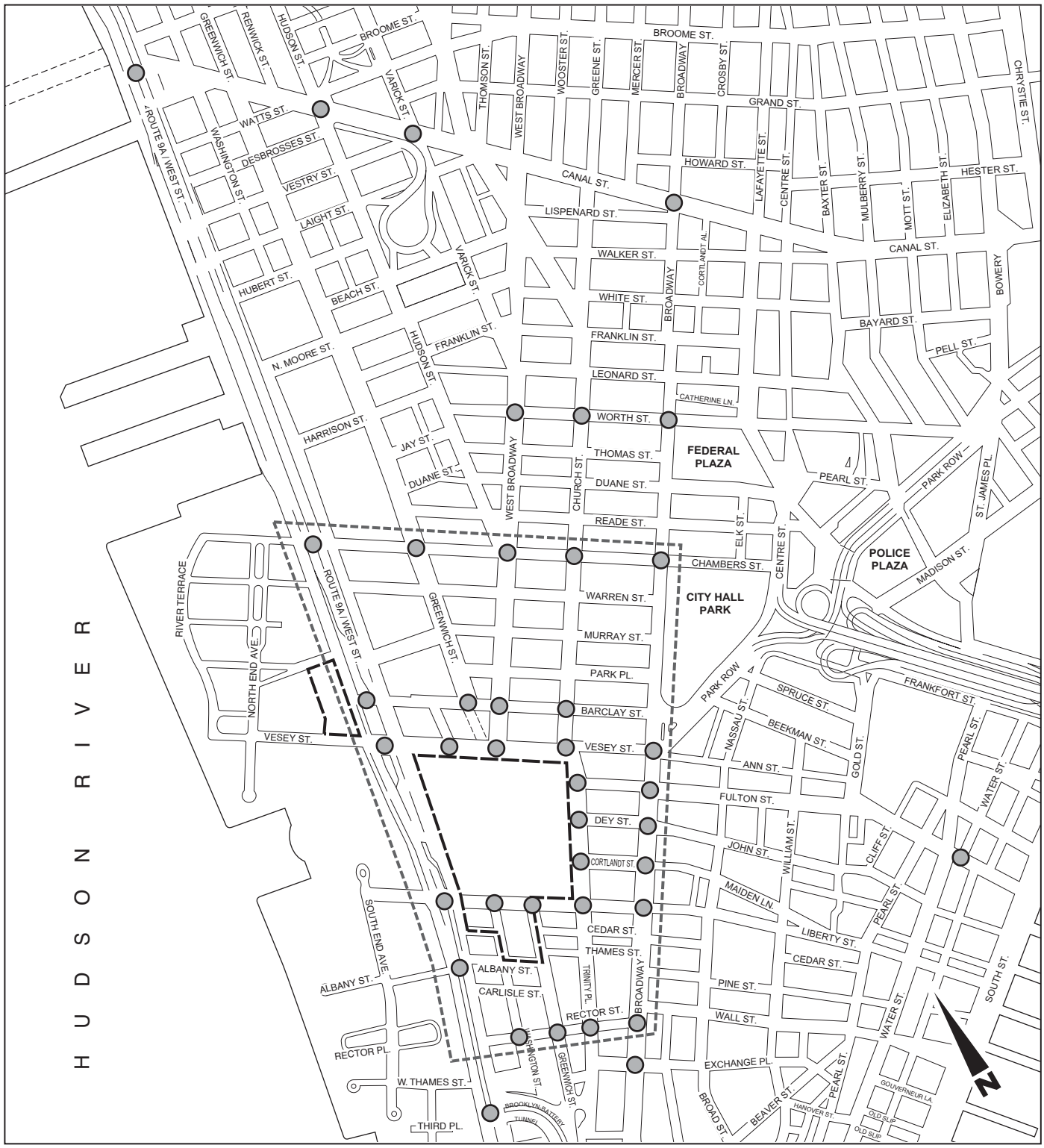
Vehicular Security Center on Liberty Street. Therefore, the assignment of auto trips to the WTC site reflects the up to 500-space capacity of on-site parking. As there is relatively limited on-street parking in lower Manhattan, the auto trip assignment also reflects that WTC parking demand not accommodated on-site is expected to utilize off-street public parking facilities in the vicinity.

As the proposed Campus Security Plan would not generate new parking demand nor directly affect the supply of off-street public parking, a quantitative analysis of off-street public parking conditions is not warranted for this environmental review. The location, capacity and weekday AM and midday peak period utilization of off-street public parking facilities within one quarter-mile of the WTC site have, however, been documented to facilitate the assignment of auto trips to the study area street network for the No-Action and With-Action conditions.

Implementation of the Proposed Project would likely affect access to curbside space along streets where credentialing zones, sally ports and other security measures would be implemented. Existing curbside parking regulations have therefore been documented along streets within one quarter-mile of the WTC site to the extent practicable given construction activity and street closures in the area, and the Proposed Project's potential effects to curbside access and the supply of on-street parking are assessed.

APPENDIX A

TRAFFIC ANALYSIS LOCATIONS FOR THE 2004 *WORLD TRADE CENTER MEMORIAL AND REDEVELOPMENT PLAN FGEIS*



Traffic Analysis Locations

Figure 13A-1

World Trade Center Memorial
and Redevelopment Plan

APPENDIX B

MARCH 2010 DATA COLLECTION PROGRAM SUPPORTING LOWER MANHATTAN TRAFFIC SIMULATION MODEL DEVELOPMENT

Figure 2: March 2010 ATR and TMC data collection locations

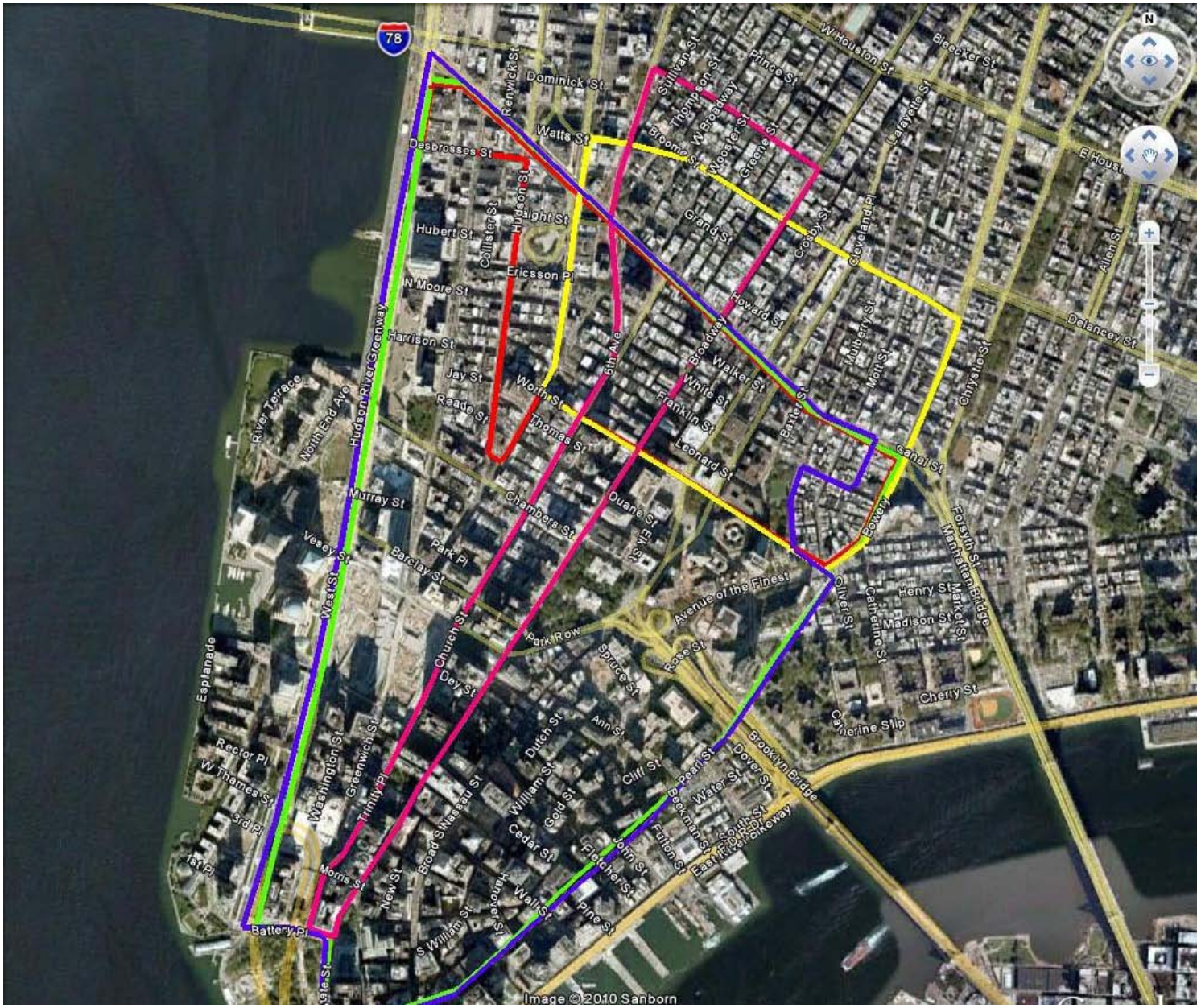
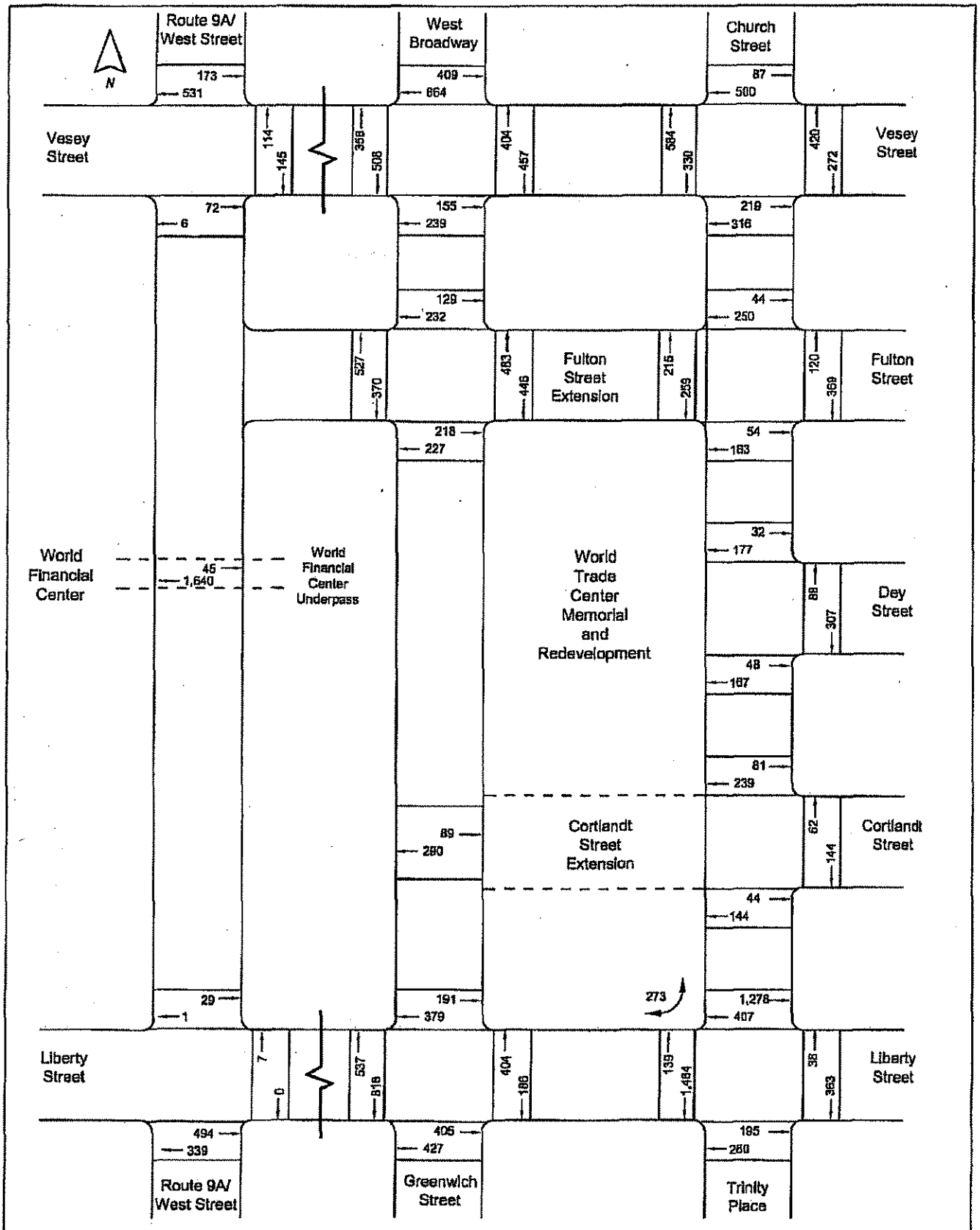


Figure 4: Travel time routes

APPENDIX C

PERMANENT WTC PATH TERMINAL EIS
ON-STREET PEDESTRIAN VOLUMES
2025 PROPOSED ACTION CONDITIONS



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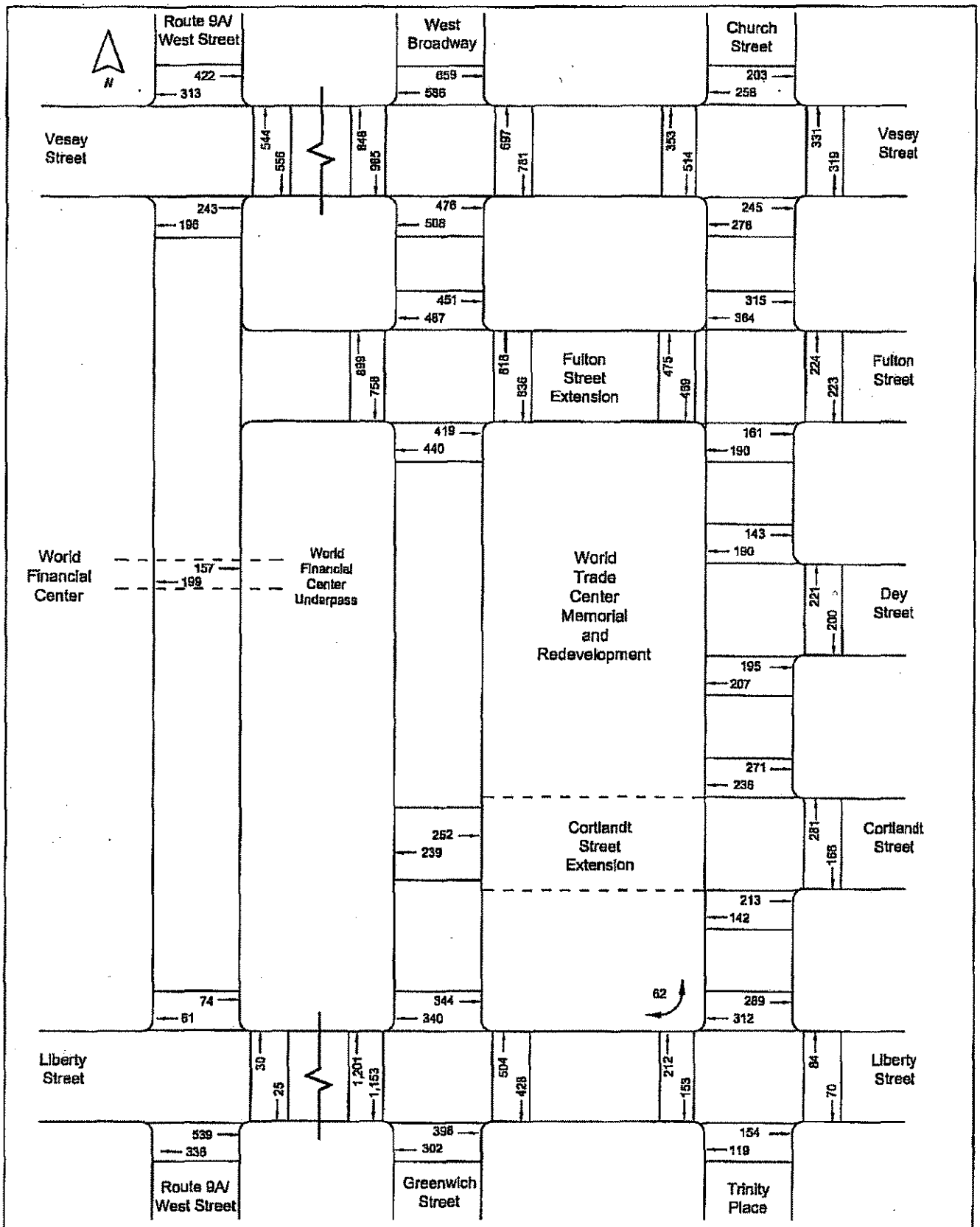
Traffic and Transportation Consultants

Permanent WTC PATH Terminal EIS
On-Street Pedestrian Volumes

2025 Proposed Action Conditions
AM Peak 15-Minute Volumes
Figure 37



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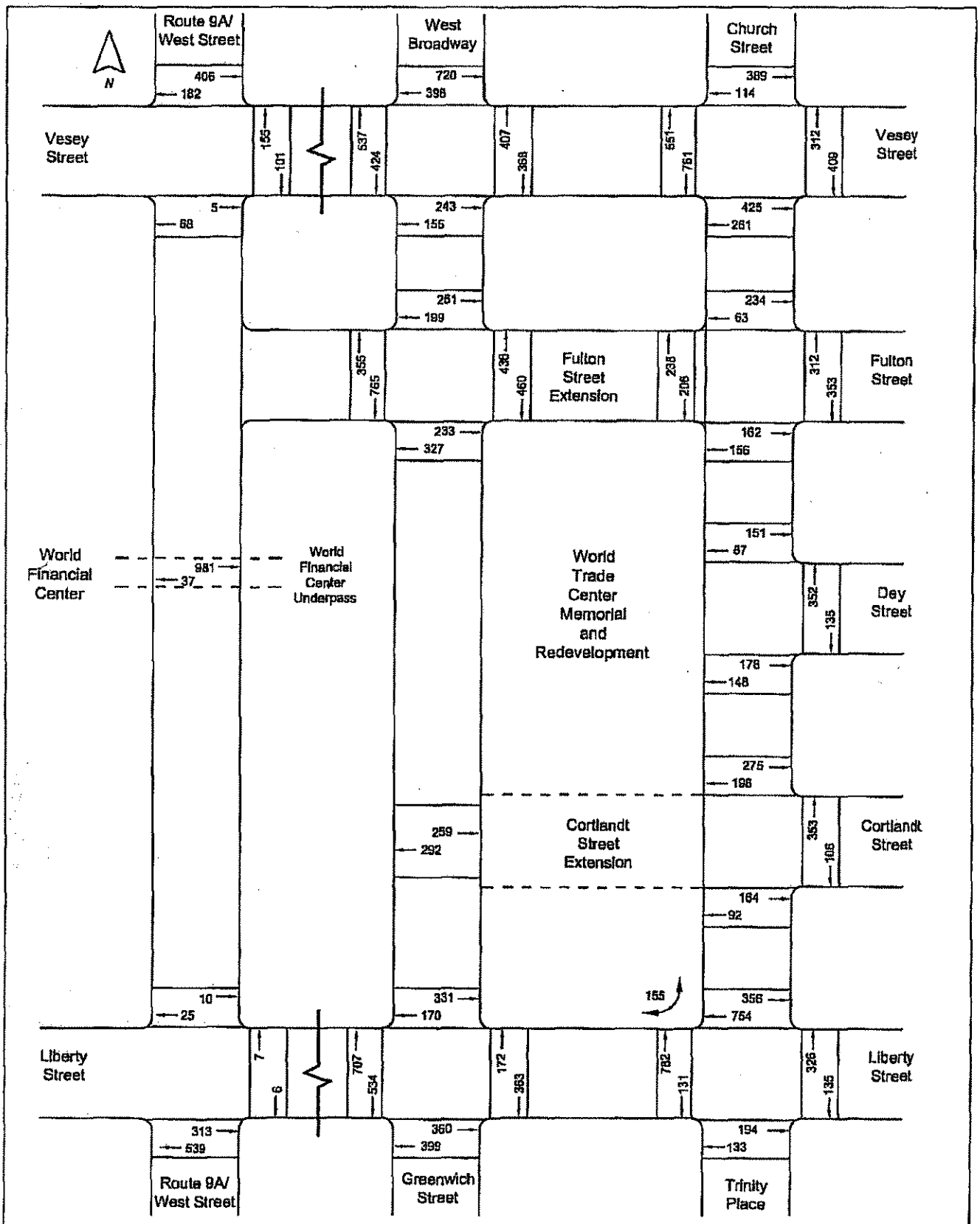
Permanent WTC PATH Terminal EIS
On-Street Pedestrian Volumes

2025 Proposed Action Conditions
Midday Peak 15-Minute Volumes
Figure 39



Eng-Wong, Taub & Associates
Traffic and Transportation Consultants

Permanent WTC PATH Terminal EIS
On-Street Pedestrian Volumes

2025 Proposed Action Conditions
PM Peak 15-Minute Volumes
Figure 41

APPENDIX D

BLACK CAR TRAVEL DEMAND FORECAST FOR WORLD TRADE CENTER OFFICE USES

Table D-1
Black Car Travel Demand - Weekday

Average Black Car Arrivals For Pick-up
per Million SF of Office Space by User Type on a Heavy Day

Time	Light Users	Medium Users	Heavy Users	Conde Nast
0:00 - 0:59	3.65	7.97	50.29	18.37
1:00 - 1:59	1.17	2.55	16.11	5.88
2:00 - 2:59	0.62	1.36	8.58	3.14
3:00 - 3:59	0.36	0.79	4.97	1.82
4:00 - 4:59	0.23	0.51	3.22	1.17
5:00 - 5:59	0.15	0.32	2.01	0.74
6:00 - 6:59	0.13	0.28	1.78	0.65
7:00 - 7:59	0.10	0.21	1.33	0.49
8:00 - 8:59	0.15	0.34	2.13	0.78
9:00 - 9:59	0.27	0.58	3.68	1.34
10:00 - 10:59	0.35	0.75	4.76	1.74
11:00 - 11:59	0.38	0.82	5.17	1.89
12:00 - 12:59	0.71	1.55	9.79	3.58
13:00 - 13:59	0.38	0.83	5.25	1.92
14:00 - 14:59	0.43	0.94	5.92	2.16
15:00 - 15:59	0.52	1.14	7.18	2.62
16:00 - 16:59	0.45	0.98	6.18	2.26
17:00 - 17:59	0.56	1.23	7.74	2.83
18:00 - 18:59	0.62	1.35	8.49	3.10
19:00 - 19:59	0.62	1.35	8.52	3.11
20:00 - 20:59	2.78	6.08	38.38	14.02
21:00 - 21:59	4.99	10.90	68.77	25.13
22:00 - 22:59	3.84	8.41	53.02	19.37
23:00 - 23:59	3.89	8.50	53.60	19.58
Pick-Up Total:	27.35	59.74	376.87	137.69

Average Black Car Arrivals For Drop-off
per Million SF of Office Space by User Type on a Heavy Day

Time	Light Users	Medium Users	Heavy Users	Conde Nast
0:00 - 0:59	0.13	0.47	2.04	1.03
1:00 - 1:59	0.02	0.06	0.26	0.13
2:00 - 2:59	0.01	0.05	0.22	0.11
3:00 - 3:59	0.05	0.18	0.78	0.39
4:00 - 4:59	0.02	0.08	0.35	0.18
5:00 - 5:59	0.07	0.26	1.10	0.56
6:00 - 6:59	0.09	0.33	1.41	0.71
7:00 - 7:59	0.17	0.60	2.60	1.32
8:00 - 8:59	0.21	0.76	3.26	1.65
9:00 - 9:59	0.18	0.65	2.78	1.41
10:00 - 10:59	0.17	0.59	2.54	1.28
11:00 - 11:59	0.12	0.41	1.77	0.89
12:00 - 12:59	0.12	0.42	1.82	0.92
13:00 - 13:59	0.08	0.28	1.19	0.60
14:00 - 14:59	0.11	0.38	1.66	0.84
15:00 - 15:59	0.09	0.33	1.44	0.73
16:00 - 16:59	0.08	0.28	1.21	0.61
17:00 - 17:59	0.04	0.15	0.64	0.33
18:00 - 18:59	0.02	0.09	0.37	0.19
19:00 - 19:59	0.02	0.06	0.26	0.13
20:00 - 20:59	0.03	0.09	0.40	0.20
21:00 - 21:59	0.09	0.32	1.37	0.69
22:00 - 22:59	0.15	0.51	2.21	1.12
23:00 - 23:59	0.33	1.17	5.06	2.55
Drop-Off Total:	2.40	8.52	31.68	18.57
Daily Total:	29.75	68.26	408.55	156.26

Millions of Square Feet of Office Space

	Tower 1	Tower 2	Tower 3	Tower 4	Total
Light User	0.7	0.6	0.4	1.9	3.6
Medium User	0.0	0.5	0.4	0.0	0.9
Heavy User	1.0	1.0	1.0	0.0	3.0
Conde Nast	1.0	0.0	0.0	0.0	1.0
	2.7	2.1	1.8	1.9	8.5

Average Arrivals for Pick-Up per Hour

Peak Hour	Tower 1	Tower 2	Tower 3	Tower 4	Total
AM	3.02	2.39	2.33	0.29	**8.02**
MD	13.87	10.99	10.69	1.35	**36.90**
PM	10.96	8.69	8.46	1.06	**29.17**

Average Arrivals for Drop-Off per Hour

Peak Hour	Tower 1	Tower 2	Tower 3	Tower 4	Total
AM	5.06	3.77	3.65	0.40	**12.87**
MD	2.82	2.10	2.04	0.23	**7.19**
PM	1.00	0.74	0.72	0.08	**2.53**

Notes:
Source: *Black Car Traffic Volume Analysis, WTC Redevelopment* , JSL Management, 6/20/11, Appendix Tables 3, 4, 5, 7 & 8.

Table D-2
Black Car Travel Demand - Saturday

Average Black Car Arrivals For Pick-up
per Million SF of Office Space by User Type on a Heavy Day

Time	Light Users	Medium Users	Heavy Users	Conde Nast
0:00 - 0:59	1.74	3.81	24.04	8.78
1:00 - 1:59	0.54	1.19	7.51	2.74
2:00 - 2:59	0.34	0.73	4.62	1.69
3:00 - 3:59	0.16	0.36	2.27	0.83
4:00 - 4:59	0.10	0.22	1.40	0.51
5:00 - 5:59	0.06	0.13	0.85	0.31
6:00 - 6:59	0.08	0.18	1.14	0.42
7:00 - 7:59	0.10	0.21	1.31	0.48
8:00 - 8:59	0.08	0.18	1.13	0.41
9:00 - 9:59	0.10	0.22	1.36	0.50
10:00 - 10:59	0.06	0.14	0.89	0.32
11:00 - 11:59	0.06	0.14	0.90	0.33
12:00 - 12:59	0.15	0.33	2.05	0.75
13:00 - 13:59	0.08	0.18	1.11	0.41
14:00 - 14:59	0.10	0.22	1.38	0.50
15:00 - 15:59	0.10	0.22	1.40	0.51
16:00 - 16:59	0.11	0.25	1.58	0.58
17:00 - 17:59	0.16	0.35	2.23	0.81
18:00 - 18:59	0.23	0.50	3.14	1.15
19:00 - 19:59	0.25	0.56	3.51	1.28
20:00 - 20:59	0.38	0.84	5.29	1.93
21:00 - 21:59	0.43	0.94	5.95	2.17
22:00 - 22:59	0.32	0.70	4.44	1.62
23:00 - 23:59	0.43	0.95	5.98	2.18
Pick-Up Total:	6.16	13.55	85.48	31.21

Millions of Square Feet of Office Space

	Tower 1	Tower 2	Tower 3	Tower 4	Total
Light User	0.7	0.6	0.4	1.9	3.6
Medium User	0.0	0.5	0.4	0.0	0.9
Heavy User	1.0	1.0	1.0	0.0	3.0
Conde Nast	1.0	0.0	0.0	0.0	1.0
	2.7	2.1	1.8	1.9	8.5

Average Arrivals for Pick-Up per Hour

Peak Hour	Tower 1	Tower 2	Tower 3	Tower 4	Total
SAT MD	1.58	1.25	1.21	0.15	**4.19**

Average Arrivals for Drop-Off per Hour

Peak Hour	Tower 1	Tower 2	Tower 3	Tower 4	Total
SAT MD	0.86	0.64	0.62	0.08	**2.19**

Average Black Car Arrivals For Drop-off
per Million SF of Office Space by User Type on a Heavy Day

Time	Light Users	Medium Users	Heavy Users	Conde Nast
0:00 - 0:59	0.03	0.11	0.46	0.23
1:00 - 1:59	0.01	0.05	0.20	0.10
2:00 - 2:59	0.01	0.03	0.12	0.06
3:00 - 3:59	0.01	0.03	0.13	0.06
4:00 - 4:59	0.00	0.02	0.07	0.04
5:00 - 5:59	0.02	0.08	0.34	0.17
6:00 - 6:59	0.06	0.23	0.98	0.50
7:00 - 7:59	0.05	0.18	0.77	0.39
8:00 - 8:59	0.07	0.26	1.11	0.56
9:00 - 9:59	0.05	0.17	0.73	0.37
10:00 - 10:59	0.05	0.19	0.82	0.42
11:00 - 11:59	0.07	0.24	1.03	0.52
12:00 - 12:59	0.04	0.15	0.65	0.33
13:00 - 13:59	0.04	0.13	0.55	0.28
14:00 - 14:59	0.02	0.07	0.30	0.15
15:00 - 15:59	0.02	0.06	0.24	0.12
16:00 - 16:59	0.01	0.05	0.20	0.10
17:00 - 17:59	0.02	0.06	0.24	0.12
18:00 - 18:59	0.02	0.07	0.30	0.15
19:00 - 19:59	0.04	0.13	0.55	0.28
20:00 - 20:59	0.02	0.06	0.28	0.14
21:00 - 21:59	0.01	0.05	0.21	0.11
22:00 - 22:59	0.07	0.26	1.12	0.56
23:00 - 23:59	0.12	0.43	1.87	0.94
Drop-Off Total:	0.86	3.11	13.27	6.70
Daily Total:	7.02	16.66	98.75	37.91

Notes:

Source: *Black Car Traffic Volume Analysis, WTC Redevelopment* , JSL Management, 6/20/11, Appendix Tables 3, 4, 5, 7 & 8.

Appendix E

Noise Back-Up

WTC SECURITY PLAN - NOISE LEVEL CALCULATIONS

Site	Hour	Time	Existing				Project without Action					Project with Action					
			Measured Leq	Measured L10	TNM Leq	Correction Factor	TNM Leq	Increase Leq	Actual Leq	Actual L10	Change	TNM Leq	Traffic Increase Leq	Barrier Operation Increase Leq	Actual Leq	Actual L10	Change
1	Carlisle St between Washington and West	AM	69.2	71.0	68.3		68.8	59.2	69.6	71.4	0.4	69.3	59.7	0.0	70.0	71.8	0.4
		MD	67.3	69.3	67.4		68.1	59.8	68.0	70.0	0.7	68.8	60.5	0.0	68.7	70.7	0.7
		PM	67.7	69.9	66.4		67.3	60.0	68.4	70.6	0.7	67.7	57.1	0.0	68.7	70.9	0.3
		SMD	71.5	74.2	65.1		65.1	0.0	71.5	74.2	0.0	65.2	48.8	0.0	71.5	74.2	0.0
2	Cedar St between Trinity and Greenwich	AM	71.7	73.2	69.1		70.4	64.5	72.5	74.0	0.8	72.5	68.3	0.0	73.9	75.4	1.4
		MD	70.5	71.4	67.0		68.6	63.5	71.3	72.2	0.8	71.3	68.0	0.0	72.9	73.8	1.7
		PM	67.7	69.7	67.2		69.6	65.9	69.9	71.9	2.2	71.7	67.5	0.0	71.9	73.9	2.0
		SMD	68.7	69.6	63.8		65.8	61.5	69.5	70.4	0.8	67.0	60.8	0.0	70.0	70.9	0.6
3	Barclay between West and Washington	AM	70.8	71.9	69.2		69.4	55.9	70.9	72.0	0.1	70.0	61.1	41.4	71.4	72.5	0.4
		MD	70.3	71.1	67.9		68.3	57.7	70.5	71.3	0.2	69.1	61.4	41.4	71.0	71.8	0.5
		PM	68.1	69.8	67.2		68.1	60.8	68.8	70.5	0.7	68.2	51.8	41.4	68.9	70.6	0.1
		SMD	68.5	69.6	64.4		64.6	51.1	68.6	69.7	0.1	64.7	48.3	41.4	68.6	69.7	0.0
4	Vesey St. between Route 9A & Greenwich	AM	71.9	73.0	70.3	-1.1	70.6	58.8	72.1	73.2	0.2	71.9	66.0	41.4	73.1	74.2	1.0
		MD	71.5	72.3	69.1	-1.2	70.0	62.7	72.0	72.8	0.5	71.3	65.4	41.4	72.9	73.7	0.9
		PM	69.7	71.4	68.8	-1.6	69.5	61.2	70.3	72.0	0.6	70.6	64.1	41.4	71.2	72.9	0.9
		SMD	71.5	72.6	67.4	-3.0	67.8	57.2	71.7	72.8	0.2	68.3	58.7	41.4	71.9	73.0	0.2
5	Fulton St. between Route 9A & Greenwich	AM	69.3	70.4	67.7	1.5	68.2	58.6	69.7	70.8	0.4	69.0	61.3	41.4	70.2	71.3	0.6
		MD	69.0	69.8	66.6	1.3	67.8	61.6	69.7	70.5	0.7	68.5	60.2	41.4	70.2	71.0	0.5
		PM	67.2	68.9	66.3	0.9	67.1	59.4	67.9	69.6	0.7	67.5	56.9	41.4	68.2	69.9	0.3
		SMD	68.7	69.8	64.6	-0.2	64.6	0.0	68.7	69.8	0.0	64.7	48.3	41.4	68.7	69.8	0.0

At receptor sites 4 and 5 existing noise levels were calculated using the TNM model based on existing traffic components and adjusted by baseline measured values at receptor Site 3

Security Barrier

			Structures			
uipme	**Leq @ 3.3 ft**	**Utilization**	**Distance**	**Number**	**shielding**	**Leq**
Site 1	45	100	3.3	1		45.0
Sum						**45.0**