CHAPTER 13A. TRAFFIC AND PARKING

13A.1 INTRODUCTION

13A.1.1 CONTEXT

The World Trade Center (WTC) was a major generator of traffic activity before its destruction on September 11, 2001, and, as documented in other studies, the tragic events of September 11 have significantly reduced both vehicular and pedestrian activities in the area. Redevelopment of the Project Site, restoring 10 million square feet of office space and a hotel on the site, doubling the amount of retail space that characterized the Project Site pre-September 11, and adding a performing arts center, the Memorial, *Memorial Center*, and cultural facilities would add a considerable amount of traffic and activity to the streets that border the site, as well as to the north, south, and east. The Memorial, in particular, would increase activity throughout the day, depending on its hours of operation. At the same time, the World Trade Center Memorial and Redevelopment Plan (Proposed Action) calls for the extension of Fulton Street and Greenwich Street through the superblock configuration of the WTC Site, as well as the reconfiguration of Cedar and Washington Streets on the Southern Site. This would connect neighborhoods on all sides and provide access to the Memorial. This street extension plan would not only provide for more direct access to planned uses and buildings on the site. The ability of the streets and roadways in the area to accommodate increased traffic from the Proposed Action is the major issue addressed in this chapter.

This chapter describes traffic and parking conditions in the area under two analysis scenarios: before September 11 (Pre-September 11 Scenario) and in 2003 (Current Conditions Scenario). Under each scenario, conditions are projected in the future (2009 and 2015) both with and without the Proposed Action. The chapter then identifies potentially significant traffic impacts that require the analysis of feasible measures to mitigate those impacts. *Traffic impacts during peak construction periods are addressed in Chapter 21, "Construction."*

13A.1.2 CONCLUSIONS

PRE-SEPTEMBER 11 SCENARIO

Traffic volumes in Lower Manhattan prior to the events of September 11 were generally about 15 to 25 percent higher than current volumes in 2003. Nevertheless, traffic conditions were, for the most part, at acceptable levels of service except for a few locations along Route 9A, particularly near the entrance to the Brooklyn Battery Tunnel, along Chambers Street, and at the approaches to the Holland Tunnel along Canal Street.

Had the events of September 11 not occurred, the extensive set of development projects planned in Lower Manhattan would have added about 600 to 1,000 vehicle trips in the peak traffic hours by 2009, and 1,850 to 2,250 vehicle trips by 2015, about a 10 to 15 percent increase in traffic as compared with pre-September 11 traffic volumes in the area.

The Proposed Action would generate a substantial volume of vehicular and pedestrian activity, including an estimated 1,300 to 1,700 peak hour vehicle trips in 2009 and an estimated additional 850 to 1,250 vehicle trips in 2015. *On an areawide basis*, the Proposed Action would thus represent an increase of approximately 5 percent over traffic volumes that would have been expected in the future had the events of September 11 not occurred. This increase would reflect both the reduced number of trips from office space included in the Proposed Action compared to pre-September 11 conditions and the increased traffic associated with both the Memorial and other uses on the Project Site. *Specific high volume traffic carriers and streets on the immediate periphery of the Project Site would traffic volume increases higher than the areawide average of 5 percent.*

When added to traffic generated by the background development projects, the Proposed Action would have significant traffic impacts at up to 18 of the 40 locations analyzed for 2009 conditions and up to 25 of the 40 locations in 2015. Based on criteria set forth in the *CEQR Technical Manual*, "significant impacts" include increases in average vehicle delays as short as one to five seconds. All significant impacts generated by the Proposed Action would require mitigation analyses, particularly along the Route 9A corridor, near the northeast corner of the WTC Site, at the portals of the Holland Tunnel on Canal Street, and at other locations interspersed in the area. As discussed in Chapter 22, "Mitigation Measures," most but not all significant traffic impacts can be mitigated by standard traffic capacity improvement measures.

During the period between completion of the DGEIS and this FEIS, a potential net of street direction changes near the Project Site was evaluated. Some locations improved while others would be adversely affected. The overall impacts were generally similar to those identified in the DGEIS, but provide guidance to LMDC, the Port Authority, NYCDOT, and NYSDOT for continued Project Site and area-wide traffic planning.

The parking to be provided under the Proposed Action is expected to be sufficient to accommodate projected needs.

CURRENT CONDITIONS SCENARIO

As a result of the events of September 11, current traffic volumes are significantly lower, as noted above, and several streets in Lower Manhattan are closed for security purposes or ongoing construction, including streets bordering the WTC Site on its northern and southern sides. However, currently planned projects would generate about 1,000 to 1,400 vehicle trips in the peak traffic hours by 2009, and 2,500 to 3,000 vehicle trips by 2015, about a 30 to 40 percent increase overall by 2015. The traffic generated by the Proposed Action would increase volumes by about 10 to 15 percent over 2015 No Action levels, in addition to the 30 to 40 percent increase that would occur to the north, south, and east even without redevelopment on the Project Site.

13A.2 METHODOLOGY

The analysis of traffic and parking conditions follows a series of prescribed steps:

- Definition of the analysis scenarios and traffic analysis years;
- Description of the roadway network and definition of the traffic study area and analysis locations;
- Analysis of existing conditions and the determination of traffic levels of service in the area;

- Determination of the volume of trips projected for future conditions with and without the Proposed Action; and
- Analysis of projected future traffic levels of service and identification of significant traffic impacts requiring mitigation analyses.

13A.2.1 ANALYSIS SCENARIOS AND YEARS

The analyses of traffic and parking conditions are built on two different "existing conditions" baseline scenarios—traffic and parking conditions that existed prior to the events of September 11, 2001 (Pre-September 11 Scenario), and traffic and parking conditions that currently exist in 2003 (Current Conditions Scenario). The Pre-September 11 Scenario reflects "existing" traffic and parking conditions at their peak level pre-September 11, while the Current Conditions Scenario reflects the post-September 11 diminished level of vehicular traffic and parking characterizing the area in 2003.

Under both scenarios, the analyses then proceed to projected future conditions in two analysis years, 2009 and 2015, when new development and transportation initiatives are expected to be in place, but without redevelopment of the Project Site (future without the Proposed Action). Two different sets of analyses of anticipated future conditions without the Proposed Action, referred to in this chapter as "No Action" conditions, are presented. Under the Pre-September 11 Scenario, No Action conditions reflect estimated conditions in 2009 and 2015 had the events of September 11 not occurred. They account for development and activities that were present at the Project Site prior to September 11 and then adjust that baseline to account for projects that had been initiated at that time and would likely have been completed by the 2009 and 2015 analysis years. The No Action conditions under the Current Conditions Scenario reflect conditions in 2009 and 2015 after taking into account expected development activity and public transportation initiatives now being planned.

The analyses then proceed to project future conditions in 2009 and 2015 with the Proposed Action. Significant impacts created by the Proposed Action are identified under the Pre-September 11 Scenario. Traffic capacity analyses for mitigation of those impacts are presented in Chapter 22, "Mitigation Measures." These mitigation measures are defined with the objective of returning conditions to levels that would have existed in 2009 and 2015 had the events of September 11 not occurred.

13A.2.2 ROADWAY NETWORK AND TRAFFIC STUDY AREA

The street network within the study area consists primarily of a grid pattern. The major north-south roadway in the study area, and the most heavily traveled of all the roadways analyzed, is New York State Route 9A, also known as West Street, a state-owned urban arterial on the national highway system. Route 9A provides access to and from the Brooklyn Battery Tunnel, the Holland Tunnel, and other points on the west side of Manhattan.

Other north-south roadways within the study area include Trinity Place/Church Street (Trinity Place becomes Church Street at Liberty Street), Broadway, West Broadway, and Greenwich Street. Northbound Trinity Place/Church Street and southbound Broadway form the principal north-south street couplet in the heart of the study area, complementing Route 9A by carrying heavy intra-Manhattan traffic flows, including local and commuter buses, local trucking activity and delivery services.

There are four major east-west streets in the overall study area: Canal, Chambers, Vesey, and Liberty Streets. Although Canal Street is located approximately 1 mile north of the Project Site, it is a key roadway to the regional network as it connects Route 9A on the western edge of Manhattan, the Holland Tunnel and the Manhattan Bridge to the east at the Bowery/Third Avenue, and is also one of the principal truck routes in Lower Manhattan.

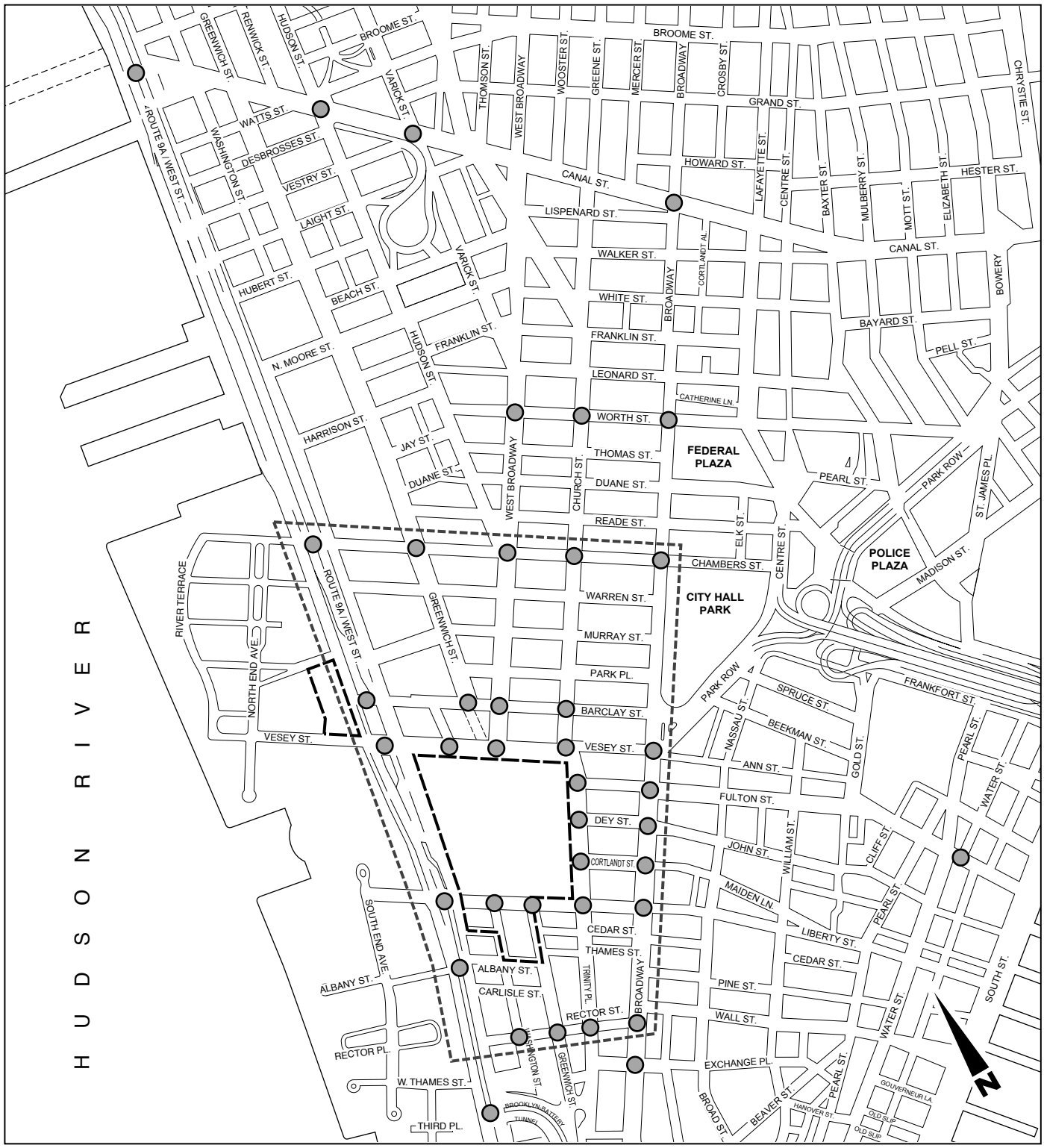
The traffic analyses conducted for this GEIS comprise two distinct study areas: a primary study area, within which traffic generated by the Proposed Action would be most concentrated as it approaches and leaves the immediate Project Site; and a secondary study area, through which generated traffic passes en route to the streets and parking facilities nearest to the site. The primary traffic study area consists of an area bounded to the north by Chambers Street, to the east by Broadway, to the south by Rector Street, and to the west by Route 9A. A set of 30 representative intersections were studied within this area, as shown in Figure 13A-1. Ten additional key intersections were also analyzed in a secondary study area due to their potential to be significantly impacted by the Proposed Action. These 10 intersections (also shown in Figure 13A-1) are located along major approach roads, such as the Route 9A corridor, Broadway north and south of the primary traffic study area, and Canal Street.

The Route 9A corridor in the area of the Project Site is the subject of an independent environmental review being conducted by the New York State Department of Transportation (NYSDOT) that is considering two build alternatives for the Route 9A Reconstruction project: an at-grade arterial design and a short bypass tunnel adjacent to the Project Site. The traffic analyses in this chapter consider conditions *at selected locations* along the Route 9A corridor with both of these alternatives *in order to identify impacts the Proposed Action would have at these locations*. *The environmental impact statement being prepared by NYSDOT will fully evaluate the two alternatives for the Route 9A corridor based on NYSDOT's own analysis methodology and evaluation criteria.*

13A.2.3 TRAFFIC LEVEL OF SERVICE DEFINITIONS

The analysis of traffic conditions in urban areas is based on critical conditions at intersections, and defined in terms of levels of service. According to the *2000 Highway Capacity Manual* (HCM), which was used for these analyses, levels of service (LOS) at signalized intersections are defined in terms of a vehicle's total stopped delay at the intersection, as follows:

- LOS A describes operations with very low delays, i.e., 10.0 seconds or less per vehicle. This occurs when signal progression is extremely favorable and most vehicles arrive during the green phase. Most vehicles do not stop at all.
- LOS B describes operations with delays in the range of 10.1 to 20.0 seconds per vehicle. This generally occurs with good progression and/or short cycle lengths. Again, most vehicles do not stop at the intersection.
- LOS C describes operations with delays in the range of 20.1 to 35.0 seconds per vehicle. These higher delays may result from fair progression and/or longer cycle lengths. The number of vehicles stopping is noticeable at this level, although many still pass through the intersection without stopping.
- LOS D describes operations with delays in the range of 35.1 to 55.0 seconds per vehicle. At LOS D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high volume-to-



Traffic Analysis Locations

Figure 13A-1

World Trade Center Memorial
and Redevelopment Plan

capacity (v/c) ratios. Many vehicles stop, and the proportion of vehicles not stopping declines.

- LOS E describes operations with delays in the range of 55.1 to 80.0 seconds per vehicle. This is considered to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high v/c ratios.
- LOS F describes operations with delays in excess of 80.0 seconds per vehicle. This is considered to be unacceptable to most drivers. This condition often occurs with oversaturation, i.e., when arrival flow rates exceed the capacity of the intersection. It may also occur at high v/c ratios with cycle failures. Poor progression and long cycle lengths may also contribute to such delays. Often, vehicles do not pass through the intersection in one signal cycle.

LOSs A, B, and C are considered acceptable, LOS D is generally considered marginally acceptable up to mid-LOS D (45 seconds of delay for signalized intersections) and unacceptable above mid-LOS D, and LOS E and F indicate congestion.

The majority of analyzed intersections are signalized, while several are not, including those at Rector and Washington Streets, Barclay and Greenwich Streets, and Route 9A and Barclay Street. For unsignalized intersections, delay is defined as the total elapsed time from when a vehicle stops at the end of the queue until the vehicle departs from the Stop line: LOS A describes operations with very low delay, i.e., 10.0 seconds or less per vehicle; LOS B describes operations with delays in the range of 10.1 to 15.0 seconds; LOS C has delays in the range of 15.1 to 25.0 seconds; LOS D, 25.1 to 35.0 seconds per vehicle; and LOS E, 35.1 to 50.0 seconds per vehicle, which is considered to be the limit of acceptable delay. LOS F describes operation with delays in excess of 50.0 seconds per vehicle, which is considered problematic to most drivers. This condition exists when there are insufficient gaps of suitable size to allow side street traffic to cross safely through a major vehicular traffic stream.

13A.2.4 TRIP GENERATION PROCEDURES

The approach used to determine trip generation is similar to that followed in most transportation impact studies under New York City *City Environmental Quality Review (CEQR) Technical Manual* guidelines. That is, relevant sources were utilized to prepare specific estimates of the number of people that would be entering and exiting the various development program elements (office, retail, hotel, etc.); these estimates focus on peak hour periods when the maximum levels of activity would occur, thereby creating the greatest potential for impacts. The total number of daily person-trips (the number of entering and exiting people) is then converted into peak hour trips by applying the percent of the daily total occurring in individual hours of the days; this percentage of trips over time is called the temporal distribution. For the Proposed Action, where office, retail and the Memorial are expected to be the greatest generators of activity, examining peak hours in the morning, midday, and late afternoon conservatively encompasses those times when future total activity in terms of people entering and exiting the site would be at its heaviest.

The estimates of people arriving and leaving during a peak hour is then further sorted by the various means of transportation available to people accessing the site. This distribution is referred to as the modal split. For most land uses in Lower Manhattan, public transportation (specifically the subway, bus and PATH) is the predominant mode for trips to and from the area. However, in some cases, such as midday office trips, the vast majority of the trips are on foot as people are typically walking locally during the midday lunch hour. For people expected to use

auto or taxi, person-trip estimates are translated into vehicle trips by applying average vehicle occupancy rates in order to determine vehicle trips generated by each land use type.

Given the scale of the project and the interconnected character of the uses, trip estimates are adjusted to account for "linkages." This adjustment reflects the fact, for example, that employees at the office buildings will in part be the source of shoppers for the retail space or that hotel guests may also be visitors to the Memorial. This condition of linkage between the uses is accounted for by reducing the number of trips to a given program element. The purposes of such factors, which vary depending upon the character of the use, is to avoid double-counting people who visit more than one of the components on the Project Site.

A variety of sources were consulted in preparing these estimates. This included standard references such as the *CEQR Technical Manual* and Boris Pushkarev and Jeffrey Zupan's *Urban Space for Pedestrians*. These sources provide generic guidelines for uses such as office, where the number of trips and the distribution through the day is fairly standardized and not a function of location. To further refine the estimates and to focus on the modal split, which varies by location (as it is a function of the services available in a specific area), a number of relevant EISs, particularly those prepared for projects in Lower Manhattan, were consulted, as described later in this chapter. Finally, for the proposed Memorial, historical attendance information from a variety of relevant facilities was reviewed in assessing the appropriateness of the estimate.

The volume of vehicular traffic expected to be generated in the study area—both for the Proposed Action and for other development projects expected to be built by 2009 and 2015—is added to assumed levels of background traffic growth expected to pass through the area in addition to these developments, and traffic levels of service are then determined for both future conditions with and without the Proposed Action. *The projected volumes and level of service analyses consider all vehicle types—autos, taxis/black cars, trucks, and buses.*

The trip generation and subsequent traffic level of service impact analyses produced a *condition* with the Proposed Action generating up to about 3,000 new vehicle trips in the area significantly impacting more than half of the 40 locations analyzed. Given Lower Manhattan's extensive public transportation assets and plans for modernization and improvement of these assets, as well as its historically low dependence on autos and taxis, a second set of less conservative trip generation/modal split assumptions was evaluated to test the sensitivity of the potential traffic impact conclusions. The findings of this alternative trip generation/modal split *assumption* are documented as well in this chapter, and later in Chapter 22, "Mitigation Measures," as a means of presenting a range of potential impacts in the study area.

The *CEQR Technical Manual*-based approach and methodology used in this GEIS differs from the approach and methodology used by regional transportation projects. For example, future traffic volume projections developed for this GEIS utilize a different methodology from that used by NYSDOT in its Route 9A Reconstruction Final EIS. Both projects follow accepted procedures that have been in place and have been followed by similar type projects for many years.

Traffic volume projections developed for this EIS followed standard procedures for a development project in New York City, following closely the guidelines presented in the city's *CEQR Technical Manual*. This included increasing existing traffic volumes by an annual traffic growth rate to reflect background traffic growth, plus traffic expected to be generated by developments anticipated to be in place at sites within or proximate to the study area ("soft

sites"), i.e., traffic from anticipated new developments that would pass through the study area and the traffic analysis locations being analyzed in the EIS.

Traffic volume projections developed for the Route 9A Reconstruction Final EIS followed procedures that are considered standard for major transportation projects. Major transportation projects like the Route 9A Project typically utilize a regional or corridor travel model that projects traffic growth based on long-term demographic and employment trends, rather than on a broad range of soft site development projects. Unlike the *CEQR Technical Manual* approach regional transportation models often assume that once capacity is reached, additional traffic demands divert either to other traffic routes, to the "shoulder hours" of the peak period (i.e., just before or just after the peak hour itself, where some residual capacity may be available), or to alternative modes of transportation such as subways or buses.

As a result, these two methodologies for two different types of projects can produce different volume projections following standard analysis procedures for their respective types of projects.

13A.2.5 SIGNIFICANT IMPACT DEFINITIONS

A comparison of traffic conditions in the future with and without the Proposed Action is the basis upon which potentially significant traffic impacts are determined. The definition of significant traffic impacts used in the traffic analyses are those contained in the city's *CEQR Technical Manual*, defined as follows: For signalized intersections, increases in lane group delays of five seconds or more beyond No Action LOS D, four seconds or more beyond No Action LOS E, or three seconds or more beyond No Action LOS F (or one second or more of delay if the No Action LOS F condition already exceeds 120 seconds of delay, unless the proposed action generates fewer than five vehicles through the entire intersection) are considered significant, and require mitigation analyses. Also, should a level of service deteriorate from acceptable LOS A, B, or C to marginally unacceptable mid-LOS D or unacceptable LOS E or F, such impacts are also considered significant. For unsignalized intersections, if the proposed action generates fewer than five passenger car equivalents (PCEs) in the peak along the critical approach, delays are not considered significant. Also, for unsignalized intersections, for the minor street to generate a significant impact, 90 PCEs must be identified in the future Build condition in any peak hour.

Significant traffic impacts for this GEIS are identified by comparing future conditions with the Proposed Action developed from the Current Conditions Scenario, which represents currently expected future traffic conditions in the area, to future conditions without the Proposed Action developed from the Pre-September 11 Scenario which represents what background traffic conditions would have been like had the events of September 11 not occurred and had the WTC been standing. In this way, significant impacts are measured against traffic conditions that would have been present in the area had the events of September 11 not occurred.

13A.3 ROADWAY NETWORK AND TRAFFIC STUDY AREA

The street network within the study area consists primarily of a grid pattern. The major north-south roadway in the study area, and the most heavily traveled of all the roadways analyzed, is New York State Route 9A (West Street), a state-owned urban arterial on the national highway system. Route 9A provides access to and from the Brooklyn Battery Tunnel, the Holland Tunnel, and other points on the West Side of Manhattan. The portion of Route 9A that is within the

primary study area typically has four northbound and four southbound lanes with dedicated left-turn lanes at key locations.

Other north-south roadways within the study area include Trinity Place/Church Street (Trinity Place becomes Church Street at Liberty Street), Broadway, West Broadway, and Greenwich Street. Northbound Trinity Place/Church Street and southbound Broadway form the principal north-south street couplet in the heart of the study area, complementing Route 9A by carrying heavy intra-Manhattan traffic flows, including local and commuter buses, local trucking activity and delivery services. Broadway and Trinity Place/Church Street typically operate with two moving lanes at their southern ends, not including a bus lane, and are wider to the north. Broadway has three moving lanes north of Fulton Street and Trinity Place/Church Street gains a third lane at Liberty Street. Broadway runs the entire length of Manhattan, while Trinity Place/Church Street extends from Morris Street to Canal Street. Greenwich Street operates southbound from West 14th Street to Barclay Street and includes one to four moving lanes plus parking lanes along both curbs. West Broadway operates southbound from East Houston Street to Vesey Street, typically with two moving lanes plus parking on both sides.

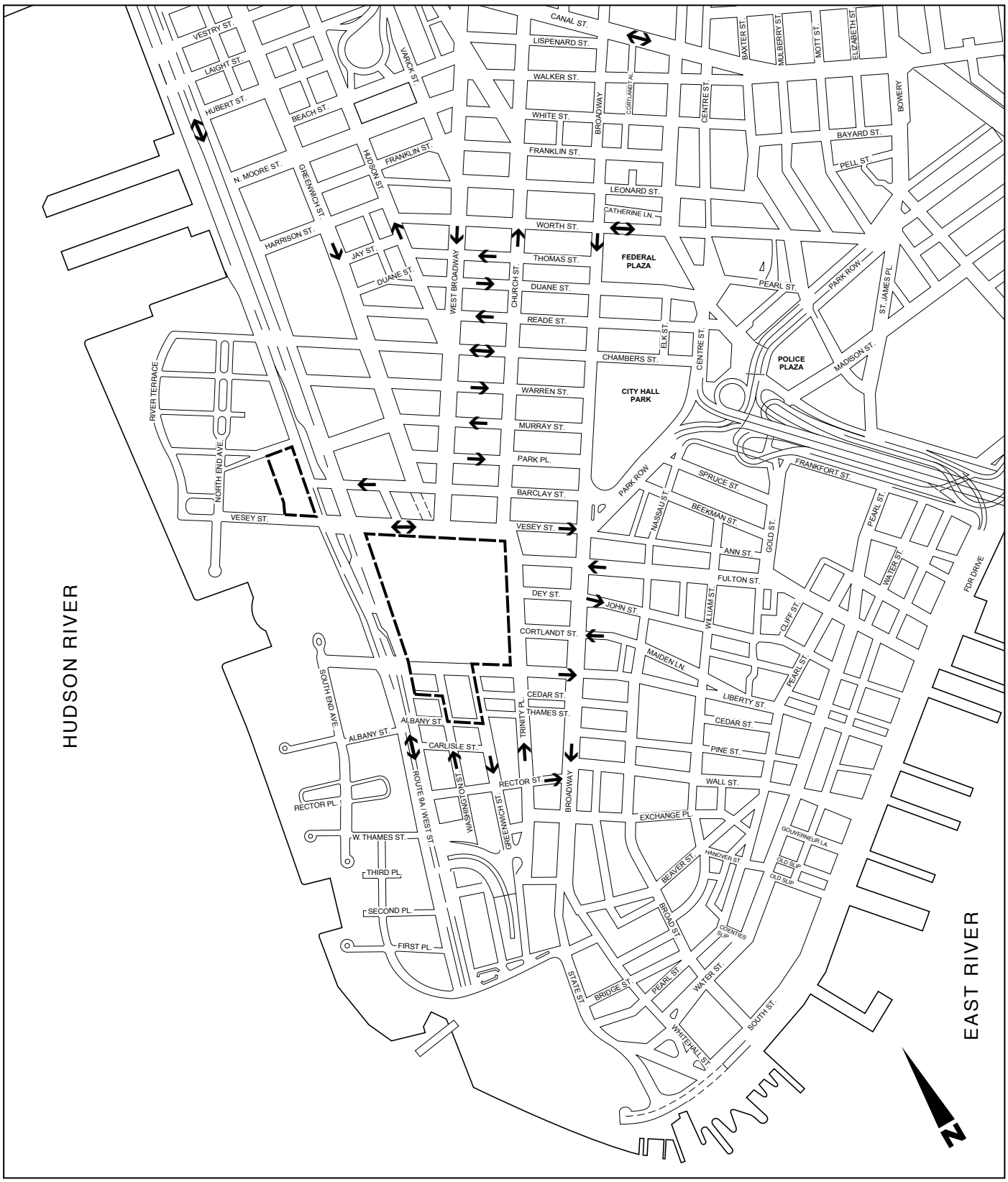
There are four major east-west streets in the overall study area: Canal, Chambers, Vesey, and Liberty Streets. Although Canal Street is not within the primary traffic study area described earlier, it is a key roadway to the regional network as it connects Route 9A on the western edge of Manhattan, the Holland Tunnel and the Manhattan Bridge to the east at the Bowery/Third Avenue. It is also one of the principal truck routes in Lower Manhattan. Canal Street is a two-way roadway consisting of two or more moving lanes and a parking lane in each direction for most of its length.

Chambers, Vesey, and Liberty Streets are all east-west streets within the primary traffic study area. Chambers Street is a two-way roadway with generally one moving lane and one parking lane in each direction. It serves as both a local access and as a through-route connecting Route 9A and the Brooklyn Bridge. The roadway also serves the northern portion of Battery Park City (BPC).

Vesey Street runs from North End Avenue in BPC across Route 9A to Broadway and is the northern border for the WTC Site. Before September 11, Vesey Street operated as a two-way roadway from North End Avenue to Church Street. There were typically two to three moving lanes in each direction, plus parking along both curbs on the block between West Broadway and Church Street. Between Church Street and Broadway, Vesey Street operates one-way eastbound with two moving lanes. Currently, Vesey Street is closed to vehicle traffic between West and Church Streets. Construction vehicles and pedestrians are permitted in this area.

Liberty Street runs from South End Avenue to Gold Street. Before September 11, it operated as a two-way roadway with two moving lanes in each direction and parking on both curbs between South End Avenue and Washington Street, and as a one-way eastbound roadway with two moving lanes and parking on both curbs between Washington Street and Broadway. From Broadway to Gold Street, Liberty Street has just one moving lane with parking on both sides of the street. Liberty Street has been closed to vehicular traffic between Route 9A and Church Street. Construction and emergency vehicles and pedestrians are permitted on Liberty Street.

Traffic flow directions for all the streets in the WTC redevelopment area and selected streets in the surrounding community are shown in Figure 13A-2, which shows both pre- and post-September 11 conditions.



World Trade Center Memorial
and Redevelopment Plan

Street Directions

Figure 13A-2

13A.4 CURRENT CONDITIONS SCENARIO

13A.4.1 EXISTING CONDITIONS 2003

CURRENT TRAFFIC VOLUMES

Weekday AM, midday, and PM peak hour traffic volumes were conducted for and shared by several Lower Manhattan transportation and development projects that are proceeding concurrently in their environmental reviews, including the Metropolitan Transportation Authority's (MTA) proposed Fulton Street Transit Center, the New York State Department of Transportation's (NYSDOT) Route 9A Project, the Port Authority of New York and New Jersey's (the Port Authority) permanent WTC PATH Terminal, and the Proposed Action.

Traffic volumes in Lower Manhattan have generally decreased by approximately 20 percent when compared with pre-September 11 volumes. It should not be assumed, however, that traffic volumes have decreased uniformly on all streets, or even that all streets have experienced lower traffic volumes. For example, due to the closures of Vesey and Liberty Streets, which previously enabled vehicles to travel from the western edge of Lower Manhattan to the interior portion of Lower Manhattan, some traffic has diverted from Route 9A to Broadway, thereby increasing traffic on Broadway over its pre-September 11 volumes. An overview of general traffic volumes on some of the major streets in the area is presented below; detailed volumes are provided in the *Appendix E.1*.

Route 9A (West Street)

As stated above, Route 9A is the primary through traffic route in Lower Manhattan, providing a high level of capacity north-south from the Battery Park area and the Brooklyn Battery Tunnel to points northward in Tribeca, Soho, the Village, Chelsea, and West Midtown. The portion of Route 9A within the primary study area typically has four northbound and four southbound lanes with dedicated left turn lanes at key locations. Some locations where left turns were permitted across Route 9A pre-September 11 are not currently permitted due to street closures in the immediate vicinity of the WTC area, primarily just north and south of it. For example, left turns are not currently permitted from southbound Route 9A onto Vesey Street since Vesey Street is closed for security reasons and to better accommodate ongoing work at the WTC Site. The predominant flow of traffic on Route 9A is northbound in the AM peak period and southbound during the PM peak. In the AM peak hour, northbound Route 9A carries approximately 2,450 vehicles per hour (vph) at both Liberty and Vesey Streets and about 1,850 vph southbound at these two locations. During the midday peak hour, the northbound volume is approximately 1,650 vph at Vesey and Liberty Streets, and the southbound volume is about 1,550 to 1,600 vph at these two cross streets. In the PM peak hour, Route 9A carries approximately 1,900 to 1,950 vph at Vesey and Liberty Streets, with approximately 2,300 to 2,350 vph southbound at these two locations.

Trinity Place/Church Street

Trinity Place/Church Street is a one-way northbound street (Trinity Place becomes Church Street at Liberty Street). Trinity Place generally has two effective moving lanes of traffic while, north of Liberty Street, as Church Street, it carries up to four moving lanes of traffic. Church Street is the eastern border of the WTC Site from Liberty to Vesey Streets. Traffic volumes are also higher north of Liberty Street. In the AM peak hour, Trinity Place carries 750 vph at Liberty Street while 1,100 vph are typical north at Vesey Street. During the midday peak hour, traffic

volumes are approximately 650 vph at Liberty Street and 1,050 vph at Vesey Street. In the PM peak hour, traffic volumes are about 500 vph at Liberty Street and 850 vph at Vesey Street.

Broadway

Broadway is one of Manhattan's major arterials, traversing the entire length of the borough. Within the traffic study area for this GEIS, it is a one-way southbound street which typically carries three moving lanes of traffic through most of the area. Broadway's traffic volumes decrease as the roadway passes southbound through the area until its end in the southern part of Lower Manhattan. In the AM peak hour, Broadway volumes are approximately 1,650 vph at Vesey Street and 1,000 vph at Liberty Street. During the midday peak hour, volume levels are 1,300 vph at Vesey Street and 700 vph at Liberty Street. PM peak hour volumes are comparable to those at midday—approximately 1,300 vph at Vesey Street and 600 vph at Liberty Street.

West Broadway

West Broadway is a one-way street in the southbound direction extending from Houston Street north of the traffic study area to Vesey Street, the northern boundary of the WTC Site. It typically carries two moving lanes of traffic with parking along both sides of the street. Traffic volumes are moderate—approximately 700 vph in the AM peak hour and 550 vph in the midday and PM peak hours at Chambers Street.

Greenwich Street

Greenwich Street operates southbound from West 14th Street to Barclay Street, which is one block north of the WTC Site, and southbound again south of the WTC Site (it does not extend through the WTC Site). The width of Greenwich Street varies considerably, and it carries anywhere from one to four travel lanes north of the WTC Site, and generally two lanes south of it. Prevailing traffic volumes are generally low—in the 200 to 250 vph range at Chambers Street during the AM, midday, and PM peak hours.

Chambers Street

Chambers Street is a two-way, east-west roadway that extends from the Route 9A corridor to Centre Street at the eastern edge of City Hall. Chambers Street generally carries just a single moving lane of traffic although two lanes can be accommodated at some locations, with curb parking/delivery lane allowed on both sides. It serves as both a through route connecting Route 9A and the Brooklyn Bridge and as a local access route. Eastbound and westbound Chambers Street each carry about 400 to 500 vph at Church Street during all three traffic analysis periods.

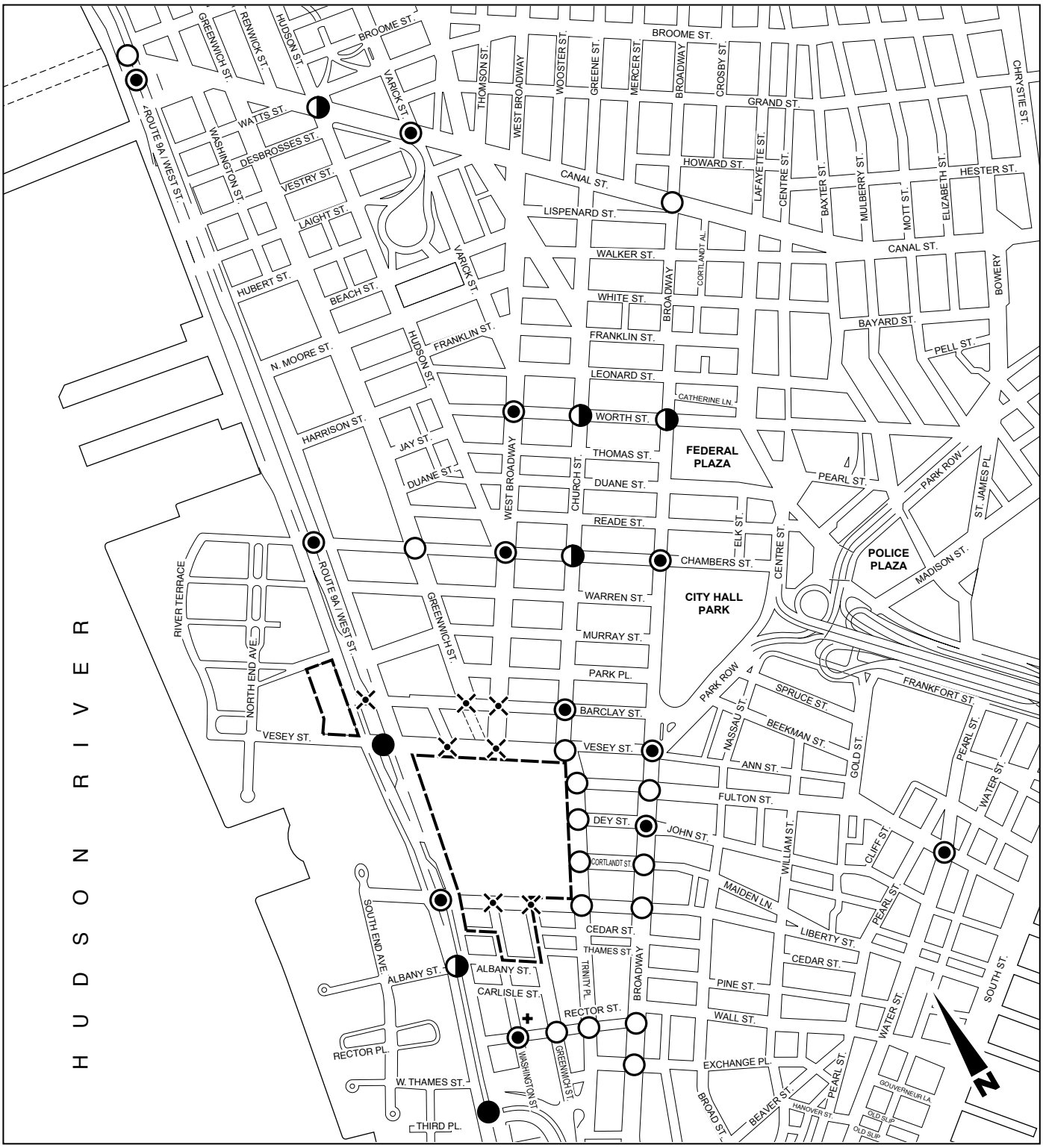
Vesey Street

Currently, Vesey Street is closed to regular vehicle traffic between West and Church Streets. Pre- September 11 conditions and volume levels are presented in a subsequent section of this chapter addressing the Pre-September 11 Scenario.

CURRENT TRAFFIC LEVELS OF SERVICE

Table 13A-1 provides an overview of the levels of service that currently characterize the traffic study area during the AM, midday, and PM peak hours on a typical weekday for the signalized intersections analyzed. Table 13A-1 provides the traffic levels of service for the "overall intersection" as well as the number of specific traffic movements that operate at congested LOS E or F. "Overall" LOS E or F means that serious congestion exists—either one specific traffic

12-03



Project Site Boundary

LOS A or B

LOS C

LOS D

LOS E or F

Closed for Construction

Unsignalized Intersection

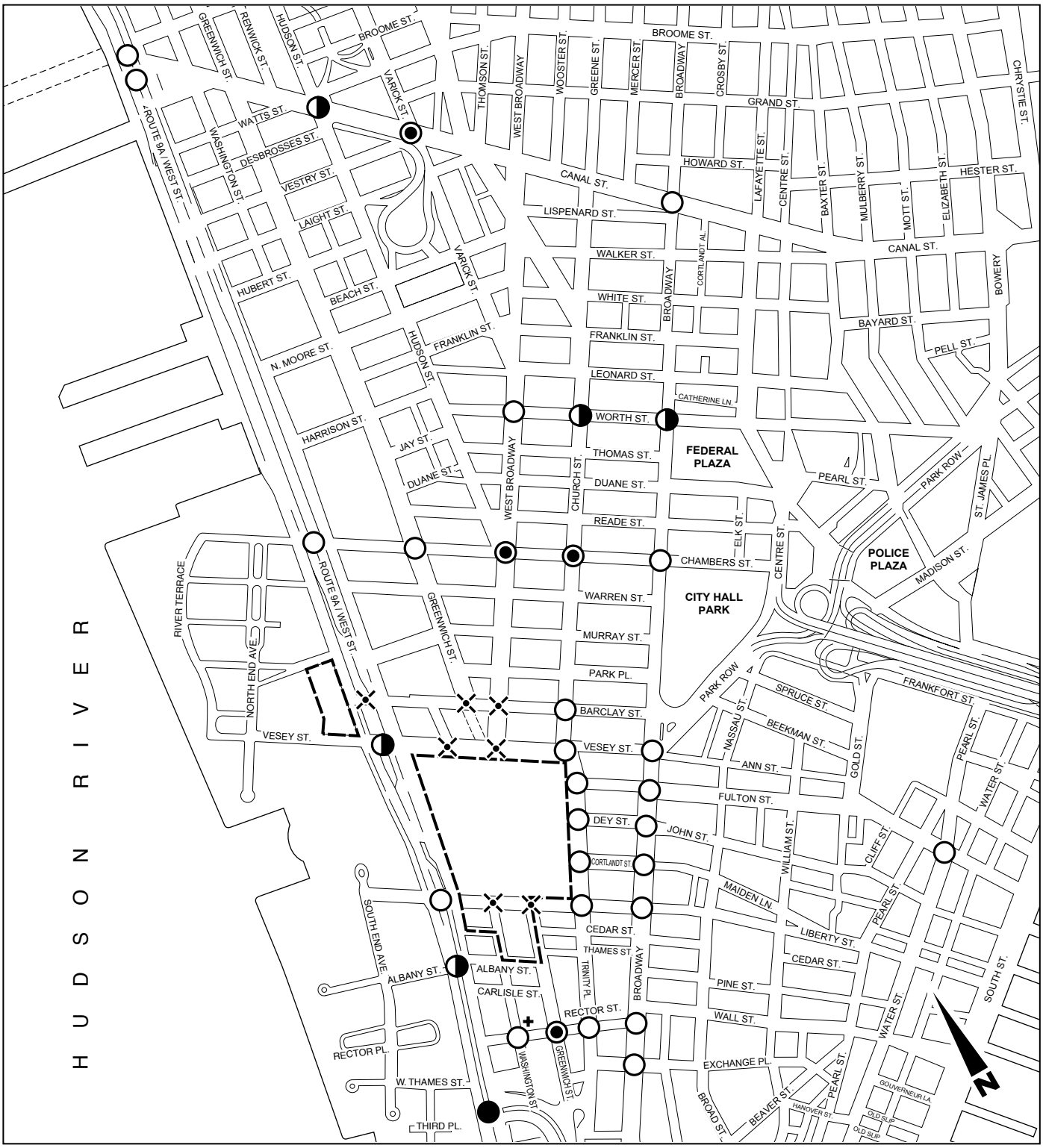
Note: Overall intersection LOS is shown for signalized intersections

Traffic Levels of Service
Current 2003 Conditions
AM Peak Hour

Figure 13A-3

World Trade Center Memorial
and Redevelopment Plan

12-03



Project Site Boundary

LOS A or B

LOS C

LOS D

LOS E or F

Closed for Construction

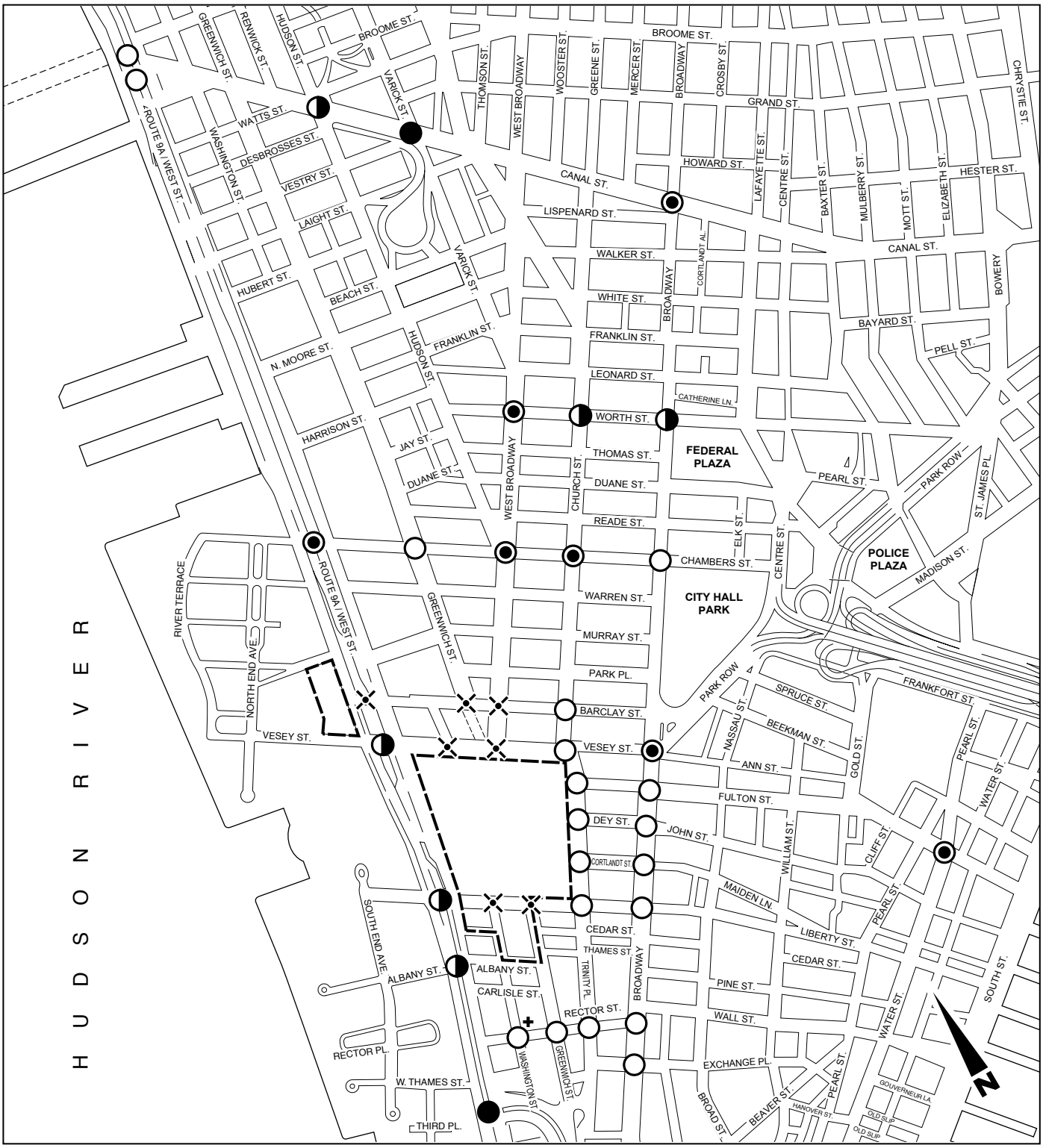
Unsignalized Intersection

Note: Overall intersection LOS is shown for signalized intersections

Traffic Levels of Service
Current 2003 Conditions
Midday Peak Hour

Figure 13A-4

World Trade Center Memorial
and Redevelopment Plan



Project Site Boundary

LOS A or B

LOS C

LOS D

LOS E or F

Closed for Construction

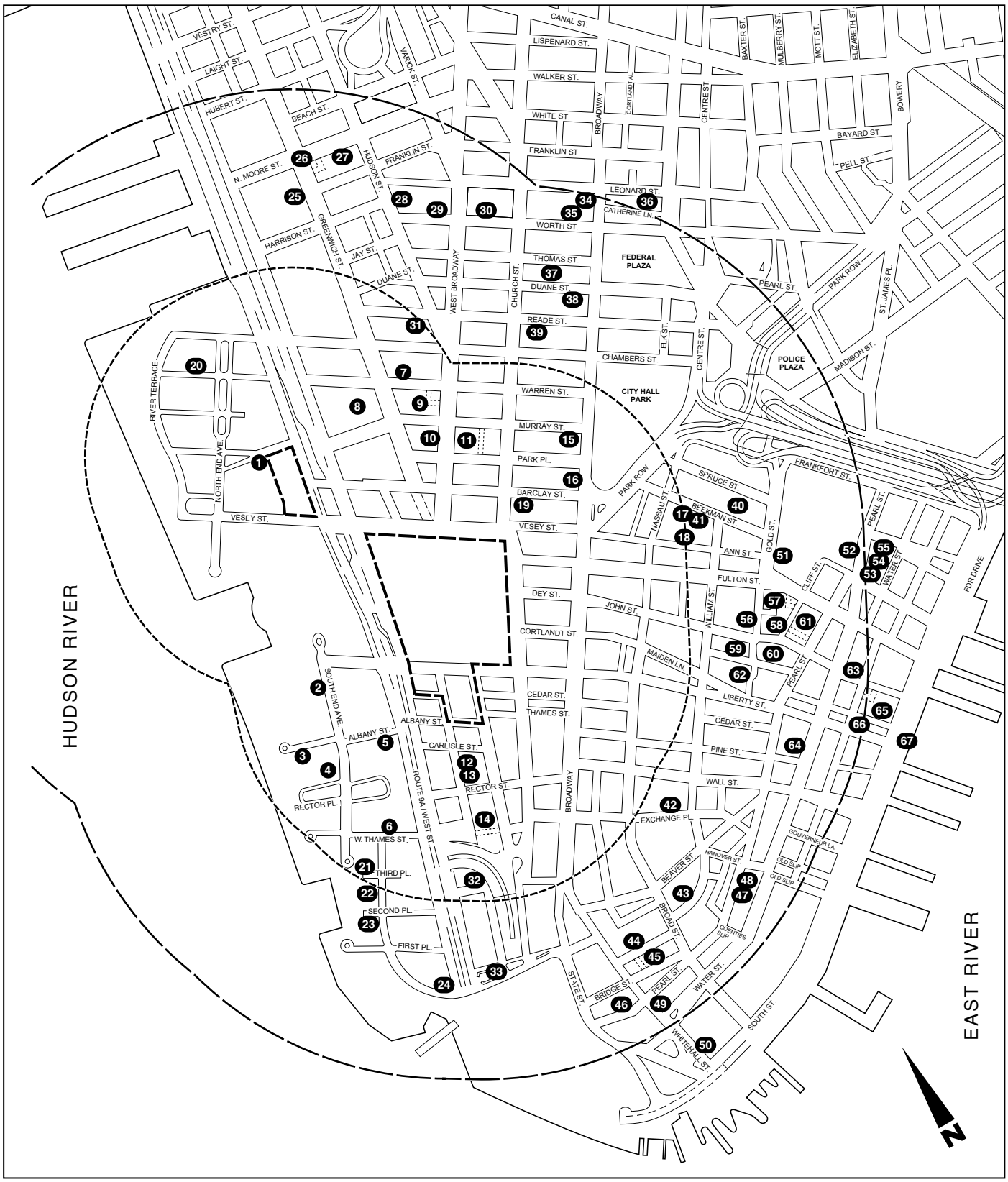
Unsignalized Intersection

Note: Overall intersection LOS is shown for signalized intersections

Traffic Levels of Service
Current 2003 Conditions
PM Peak Hour

Figure 13A-5

World Trade Center Memorial
and Redevelopment Plan



Project Site Boundary

1/2-Mile Perimeter

1/4-Mile Perimeter

❶ Post-9/11 Off-Street Public Parking Facility

Post 9/11 Off-Street Public Parking Facilities

World Trade Center Memorial
and Redevelopment Plan

Figure 13A-6

Table 13A-1
Current (Post-September 11) Traffic Level of Service Summary

Signalized Intersections	Existing AM	Existing Midday	Existing PM
Overall LOS A/B	15	23	18
Overall LOS C	11	4	7
Overall LOS D	5	5	6
Overall LOS E/F	2	1	2
No. of movements at LOS E or F	14	14	11

movement has severe delays, or two or more of the specific traffic movements at the intersection are at LOS E or F with very significant delays (the overall intersection LOS is a weighted average of all of the individual traffic movements). Illustrative overviews of overall intersection levels of service are shown in Figures 13A-3 through 13A-6.

This summary overview indicates that:

- In the AM peak hour, two of the 33 signalized intersections analyzed are operating at overall congested LOS E or F, while five intersections are operating at marginally acceptable LOS D; 14 traffic movements (e.g., left turns from one street to another, through traffic on one street passing through the intersection, etc.) are at LOS E or F conditions. The two locations operating at overall LOS F are the intersections of Route 9A at Vesey Street and at the entrance to the Brooklyn Battery Tunnel.
- In the midday peak hour, one of the 33 signalized intersections analyzed are operating at overall LOS E or F, while five are at overall LOS D; 14 traffic movements are operating at LOS E or F. The one location operating at overall LOS F is the intersection of Route 9A at the entrance to the Brooklyn Battery Tunnel.
- In the PM peak hour, two of the 33 signalized intersections are at overall LOS E or F, and six are at overall LOS D; 11 traffic movements are at LOS E or F. The two locations operating at unacceptable levels of service are the intersection of Canal Street and Varick Street (overall LOS E) and the intersection of Route 9A at the entrance to the Brooklyn Battery Tunnel (overall LOS F).

The one unsignalized intersection analyzed (Washington Street and Rector Street) is operating at overall acceptable conditions throughout the weekday.

These findings—the relatively minimal nature of congested levels of service in the area—reflect the fact that traffic volumes are significantly lower in Lower Manhattan post-September 11 than those before the events of September 11 and the loss of thousands of jobs that generated higher levels of traffic.

Several intersections within the 40-intersection traffic study area defined for this GEIS did not need to be analyzed for existing conditions since they are currently closed for construction.

Figures 13A-3 through 13A-5 illustrate the overall intersection levels of service within the traffic study area. *Appendix E.2* provides further details regarding the level of service analyses for each traffic movement at each of the intersections analyzed.

CURRENT PARKING INVENTORY AND UTILIZATION

Off-Street Parking Facilities

An inventory of public parking lots and garages was compiled in September 2003 for the area within a ½ mile of the WTC Site (see Tables 13A-2 and 13A-3). Table 13A-2 lists the facilities within a ¼ mile of the site, and Table 13A-3 lists facilities between ¼ and ½ mile from the site. Figure 13A-6 indicates the location of each of the identified public parking facilities.

Table 13A-2
Inventory of Current Public Parking Facilities
Within ¼ Mile of the WTC Site

Map #	Name/Operator and Address/Location	Licensed Capacity	Percent Occupied	
			AM	Midday
1	Park Right Inc. / 142 West Street	100	90%	70%
2	Chelink Parking (Gateway Garage) / 345 South End Avenue	687	73%	80%
3	Hudson Tower Garage / 398 Albany Street	49	84%	82%
4	333 Rector Garage Corp. / 333 Rector Street	46	80%	100%
5	Beth Parking Corp. / 225 Rector Place	114	66%	57%
6	Liberty Court Garage / 200 West Thames Street	134	65%	60%
7	Katz Parking Systems / 86-90 Warren Street	52	64%	87%
8	Imperial Parking USA, Inc. / 89-101 Murray Street	205	70%	90%
9	69 Warren Street Parking Corp. / 69 Warren Street	47	32%	32%
10	Central Parking Systems of NY / 75 Park Place	100	Not Available	
11	Church Street Parking, LLC / 110 Church Street	88	40%	70%
12	111 Parking Corp. / 111 Washington Street	450	90%	70%
13	Rector Street LLC / 99 Washington Street	220	25%	75%
14	Allright Parking Management Corp / 56-80 Greenwich Street (Battery Garage)	2,127	38%	90%
15	Washington Street Corp. / 89-91 Murray Street	149	95%	100%
16	BGB Parking System / 6 Barclay Street	86	14%	40%
17	25-27 Beekman Street Associates / 25-27 Beekman Street	149	50%	80%
18	John Street Parking / 57 Ann Street	276	54%	91%
19	Central Parking Systems of NY / 47 Church Street	65	Not Available	
Total		**5,144**	**54%**	**82%**

A parking facility occupancy survey was conducted at approximately 9 AM and at midday (between 11:30 AM and 1:30 PM) on a typical weekday; Tables 13A-2 and 13A-3 contain the data collected from these surveys. Overall, there are 67 public parking facilities in the area, the majority of which have capacities in the 50- to 150-vehicle range.

As shown in Table 13A-2, the 19 public parking facilities surveyed within ¼ mile of the WTC Site contain approximately 5,150 spaces, with an occupancy level of about 54 percent at 9 AM, and reach an occupancy level of 82 percent at midday. This means that at approximately 8 to 9 AM, i.e., the AM peak inbound commuter hour, there are about 2,350 unoccupied spaces available within off-street parking facilities, decreasing to about 900 spaces at midday.

Table 13A-3
Inventory of Current Public Parking Facilities
¼ to ½ Mile from the WTC Site

Map #	Name/Operator and Address Location	Licensed Capacity	Percent Occupied	
			AM	Midday
20	GMC Parking / 400 Chambers Street	123	Not Available	
21	Cove Club Car Park, LLC / 2 South End Avenue	69	80%	50%
22	River Watch Garage / 70 Battery Place	36	92%	100%
23	Battery Place Car Park / 50 Battery Place	42	45%	62%
24	Edison Lafayette Corp. / 100 Washington Street	36	40%	60%
25	Katz Parking Systems / 308-322 Greenwich Street	232	70%	70%
26	Greenwich Street Parking Corp. / Greenwich Street	100	Not Available	
27	Kinney Systems, Inc. / 56 North Moore Street	220	70%	70%
28	Edison NY Parking LLC / 84-88 Leonard Street	150	55%	90%
29	Louis Provenzano Inc. / 180 West Broadway	98	40%	65%
30	Worth Parking Corp. / 52 Leonard Street	150	70%	95%
31	Sky Parking Corp. / 121 Reade Street	89	70%	80%
32	Edison Lafayette Corp. / 2 Morris Street	2,000	0%	0%
33	NYCDOT Muni-Meter / Battery Place	32	100%	100%
34	Edison NY Parking LLC / 341 Broadway	150	40%	95%
35	Worth Street Parking Corp. / 152 Leonard Street	150	40%	95%
36	IZAD / 108 Leonard Street	150	55%	85%
37	Katz Parking Systems / 350-376 Greenwich Street	314	60%	60%
38	Kids Parking Corp. / 105 Duane Street	72	80%	90%
39	RAEM / 93 Chambers Street	48	60%	80%
40	NYU Downtown Hospital / 170 William Street	110	70%	100%
41	Central Parking Systems Inc. / 169 William Street	52	40%	67%
42	45 Wall Parking Corp. / 45 Wall Street	137	100%	100%
43	South William Parking LLC / 14 South William Street	400	80%	90%
44	Kura River Management / 2 Broadway	56	70%	75%
45	Stonehurst Parking Corp. / 8-12 Stone Street	34	53%	82%
46	State Pearl Garage / 1 Battery Park Place	150	25%	40%
47	Guardian Hanover / 7 Hanover Square	67	75%	100%
48	Impark Water LLC / 55 Water Street	545	40%	70%
49	Edison Lafayette Corp. / 228-232 Water Street	120	85%	88%
50	Southern Parking Corp. / Whitehall & South St. (1 NY Plaza)	150	90%	80%
51	Ropetmar Garage Inc. / 80 Gold Street	351	55%	60%
52	Ropetmar Garage Inc. / 299 Pearl Street	310	45%	46%
53	Edison Lafayette Corp. / 288-294 Pearl Street	36	100%	90%
54	Edison Lafayette Corp. / 300-302 Pearl Street	25	100%	100%
55	Edison Lafayette Corp. / 10-12 Peck Slip	105	60%	78%
56	John Street Parking Garage / John Street	60	47%	60%

Table 13A-3 (cont'd)
Inventory of Current Public Parking Facilities
¼ to ½ Mile from the WTC Site

Map #	Name/Operator and Address Location	Licensed Capacity	Percent Occupied	
			AM	Midday
57	Downtown Parking Corp. / 56 Fulton Street	280	60%	50%
58	Cliff Parking LLC / 19-21 Cliff Street	87	35%	60%
59	John Street Parking LLP/ 80 John Street	25	50%	96%
60	Central Parking System / 100 John Street	41	25%	60%
61	Edison Parking Management / 18-24 Cliff Street	150	48%	90%
62	McParking LLC / 13 Gold Street	19	42%	98%
63	Seaport Water Street Parking / 199 Water Street	99	100%	100%
64	Pine Water Street Parking / 80 Pine Street	178	65%	75%
65	Edison NY Parking LLP / 167-175 Front Street	72	68%	72%
66	Jefferson Parking Corp. / 151-159 Maiden Lane	21	76%	100%
67	Edison Lafayette Corp. / South Street under the FDR Drive	60	15%	15%
Total		**8,001**	**45%**	**55%**

Table 13A-3 indicates that there are 48 public parking facilities containing approximately 8,000 spaces a ¼ mile to ½ mile from the WTC Site, including the 2,000 car garage at 2 Morris Street that was closed. The occupancy level of these facilities is 45 percent at 9 AM, reaching an occupancy level of 55 percent at midday (or, 73 percent with the 2,000 car capacity excluded). Thus, there are an additional 4,400 unoccupied spaces available during the AM peak inbound commuter hour, decreasing to about 3,600 spaces at midday (or 2,400 and 1,600 spaces, respectively, with the 2,000 car garage's capacity excluded).

Due to the events of September 11, approximately 2,000 fewer off-street parking spaces currently exist within ¼ mile of the WTC Site, compared with pre-September 11 numbers. This reduction is due to the destruction of the WTC Lot No. 1, which contained 1,850 spaces, and the loss of the Vista Hotel at 3 WTC, which contained 150 public parking spaces. A comparison of pre- and post-September 11 parking facilities that are located between ¼ and ½ mile from the WTC Site shows that the number of parking spaces has increased by about 1,200 spaces. In reality however, due to severe lack of demand, the 2,000-space Edison Lafayette Corp. facility located at 2 Morris Street has closed temporarily because parking demand has decreased so precipitously (a net decrease of 800 spaces). Although the parking supply has decreased in real terms, demand for parking has also decreased, as illustrated by a comparison of parking occupancy levels that have fallen between 5 and 35 percent.

On-Street Parking

On-street parking regulations were inventoried for the area within a ½ mile of the WTC Site. Typical weekday parking regulations were recorded on a block-by-block basis, and the number of legal parking spaces available for non-permitted parkers was detailed.

Overall, within the ½ mile radius study area surveyed, there is an extremely limited number of legal parking spaces available on-street for use by potential new motorists in the area. At 8 to 9 AM, surveys conducted for this GEIS showed that there are approximately 650 legal parking spaces, 87 percent of which are occupied. This indicates that there are about 85 legal on-street

spaces "available" within the study area, which covers about 960 blockfaces, or an average of about one space for every 11 blockfaces. At 12 to 1 PM, there are approximately 830 legal parking spaces, 89 percent of which are occupied. Thus, there are only about 90 legal available parking spaces within the survey area, or approximately one space for every 11 blockfaces.

As detailed in the study conducted for LMDC by Beyer Blinder Belle Architects and Planners LLP and Parsons Brinckerhhoff Quade and Douglas, Inc, following September 11, more than 110 metered curbside spaces in the vicinity of the WTC Site were eliminated. The majority of these (70 spaces) were located north of the WTC Site along Route 9A and segments of Barclay, Murray, Church, and Washington Streets. Portions of these areas are outside of the ½ mile radius study area, however. South of the WTC Site, over 40 metered spaces were eliminated along Route 9A and Washington Street. On-street parking spaces were also lost due to the closure of Vesey and Liberty Streets.

13A.4.2 FUTURE WITHOUT THE PROPOSED ACTION 2009—CURRENT CONDITIONS SCENARIO

Future conditions without the Proposed Action, i.e., the future No Action condition, are established in order to provide the baseline on which trips generated by the Proposed Action can be added and subsequently compared with conditions without the Proposed Action. Future year conditions were analyzed for two years—a first phase build-out on the Project Site (2009) and a full build-out (2015). This section addresses future No Action conditions in year 2009.

2009 NO ACTION TRIP GENERATION

Future No Action traffic volumes were developed by applying a background traffic growth rate of 0.25 percent per year plus traffic expected to be generated by a list of approximately 40 development projects that are expected to be operational by 2009. The list of expected projects included in this analysis is presented below, grouped into several zones, as follows:

Primary Study Area, North of the WTC Site:

- Barclay-Vesey Building (Verizon Building), 140 West Street—1.2 million square feet of office restoration
- 125 Church Street—50 residential units
- 7 World Trade Center—1.7 million square feet of office
- Post Office, 90 Church Street—500,000 square feet of post office and 626,260 square feet of office space
- 10 Barclay Street—375 residential units, 19,341 square feet of community facility, and 90 parking spaces
- Washington Street Urban Renewal Area (WSURA) Site 5C at West and Chambers Streets—488 residential units, 14,000 square feet retail, 18,000 square feet community facility space, and 102 space parking garage
- WSURA Site 5B at 270 Greenwich Street—1,120 residential units and 25,000 square feet retail

Primary Study Area, Broadway Corridor:

- 130 Fulton Street—62 residential units

- 21-23 Maiden Lane—30 residential units
- Woolworth Building, 233 Broadway—150 residential units

Primary Study Area, Greenwich Street South Corridor:

- 90 Washington Street—387 residential units
- 90 West Street—410 residential units

Primary Study Area, Battery Park City:

- Skyscraper Museum, 2 West Street—institutional facility
- Museum of Jewish Heritage Site 14C, BPC South—museum expansion
- Museum of Jewish Heritage Site 2, BPC South—628 residential units
- Museum of Jewish Heritage Site 18B, BPC—268 residential units and 14,000 square feet retail
- Museum of Jewish Heritage Site 19B, BPC—264 residential units
- Museum of Jewish Heritage, Pier A—7,000 square feet retail
- Museum of Jewish Heritage Site 23, BPC North—269 residential units and 7,000 square feet retail
- Museum of Jewish Heritage Site 24, BPC North—250 residential units and 7,000 square feet retail
- Museum of Jewish Heritage Site 3, BPC South—500 residential units and 38,500 square feet institutional space
- Solaire—335 residential units

Secondary Study Area, Tribeca:

- Sugar Warehouse, 79 Laight Street—26 residential units
- 79 Worth Street—35 residential units
- 200 Church Street—20 residential units
- 3-9 Hubert Street—34 residential units
- 416 Washington Street—87 residential units
- New York Law School, Church Street between Leonard and Worth Streets—educational expansion
- 448 Greenwich Street—120 residential units
- 258 West Street—110 residential units

Secondary Study Area, Chinatown:

- 117 Worth Street—330 residential units
- 52 Franklin Street—30 residential units
- 65 Worth Street—30 residential units
- Chinatown Cultural Center—cultural space

Secondary Study Area, Brooklyn Bridge to Battery Park:

- 150 Nassau Street—145 residential units
- 80 South Street—125 residential units
- 10 Liberty Street/William Street—284 residential units and 3,000 square feet retail space
- 2 Gold Street—650 residential units and 24,500 square feet retail space
- Whitehall Ferry Terminal—transportation improvement project and 10,000 square feet retail
- Hampton Inn, 320 Pearl Street—80 hotel rooms

- 63 Wall Street—475 residential units
- 85 South Street—60 residential units
- 23 Wall Street /15 Broad Street—1,321 residential units

Secondary Study Area, Civic Center Area:

- None

As documented later in this section of the GEIS, the volume of traffic expected to be generated by these projects is substantial. Many of these development projects are modest in size and could be assumed to be part of the area's annual background traffic growth; since they have been included in the detailed traffic generation projection, the 0.5 percent annual background traffic growth rate that is cited in the *CEQR Technical Manual* was reduced slightly to 0.25 percent per year.

Trip generation and specific traffic assignments for these development projects were taken directly from their respective EISs or EASs where such information was available. For proposed projects where such information was not readily available, trip generation analyses were conducted to determine the volume of vehicle trips that would be generated by each. The trip generation assumptions used for these background development projects were the same as those used for the Proposed Action.

A summary of vehicle trips—including autos, taxis, and delivery vehicles—is presented by study area zone within Table 13A-4 *(Appendix E.1 presents this information in greater detail)*.

Table 13A-4
Vehicle Trip Generation from Background Development Projects,
Current Conditions 2009 Baseline
(AM, Midday, and PM Peak Hours)

Study Area Zone	AM Peak INS	AM Peak OUTS	MD Peak INS	MD Peak OUTS	PM Peak INS	PM Peak OUTS
North of WTC Zone	460	325	381	359	256	385
Broadway Corridor	7	13	5	5	12	8
Greenwich Street South	23	43	16	15	39	28
Battery Park City	72	135	51	50	124	87
Tribeca	13	23	9	9	21	14
Chinatown	11	21	7	7	18	13
Brooklyn Bridge to Battery Park	87	163	62	60	152	107
Civic Center Area	0	0	0	0	0	0
Total Vehicle Trips	**673**	**723**	**531**	**505**	**622**	**642**

As shown in Table 13A-4, the volume of vehicular traffic that can be expected to be generated by background development projects by the year 2009, based on current development plans and projections, is substantial. In the AM peak hour, approximately 673 vehicles would be generated into the area and 723 vehicles would leave the area, for a total vehicle trip generation of 1,396 vehicle trips. In the midday peak hour, approximately 531 vehicles would be generated in and 505 vehicles would be generated out, for a total vehicle trip generation of 1,036 vehicle trips. In the PM peak hour, approximately 622 vehicles would be generated in and 642 vehicles would be generated out of the area, for a total vehicle trip generation of 1,264 vehicle trips.

This volume of background development project-generated traffic was added to the roadway network and, together with the background traffic growth, established the future 2009 No Action traffic volume baseline for the Current Conditions Scenario. Detailed No Action traffic volume maps are provided in *Appendix E.1*; a summary overview of traffic volume increases along selected streets in the traffic study area is described below.

There are also several public sector transportation initiatives that were considered in the analysis of future conditions without the Proposed Action—the Port Authority's proposed permanent WTC PATH Terminal, MTA's proposed Fulton Street Transit Center and Whitehall Ferry Terminal improvements, and the NYSDOT's reconstruction of Route 9A as either an at-grade arterial throughout its length in Lower Manhattan or with a short bypass section that would extend from about Albany Street to Barclay Street. The permanent PATH Terminal project, the Fulton Street Transit Center project, and the Whitehall Ferry Terminal project are not expected to generate new vehicle trips to the area once they are built; they are public transportation improvements that will improve the flow of transit users and possibly encourage new riders at those locations. Similarly, the proposed improvements along Route 9A are not expected to generate additional traffic, but would better accommodate traffic along that corridor. Construction of these projects would generate additional construction-related traffic, and the potential impacts during their construction are addressed in Chapter 21, "Construction Impacts."

2009 NO ACTION TRAFFIC CONDITIONS

Traffic Volumes and Levels of Service with at-Grade Route 9A Arterial

Traffic volumes on the study area roadway network would increase significantly at many locations, primarily along the Route 9A corridor and along Church Street, the two major traffic carriers in the area. There would also be some shift in local area traffic since streets on the periphery of the WTC Site that are currently closed would be re-opened by 2009; these shifts in traffic back to streets that were closed are accounted for in the traffic analyses.

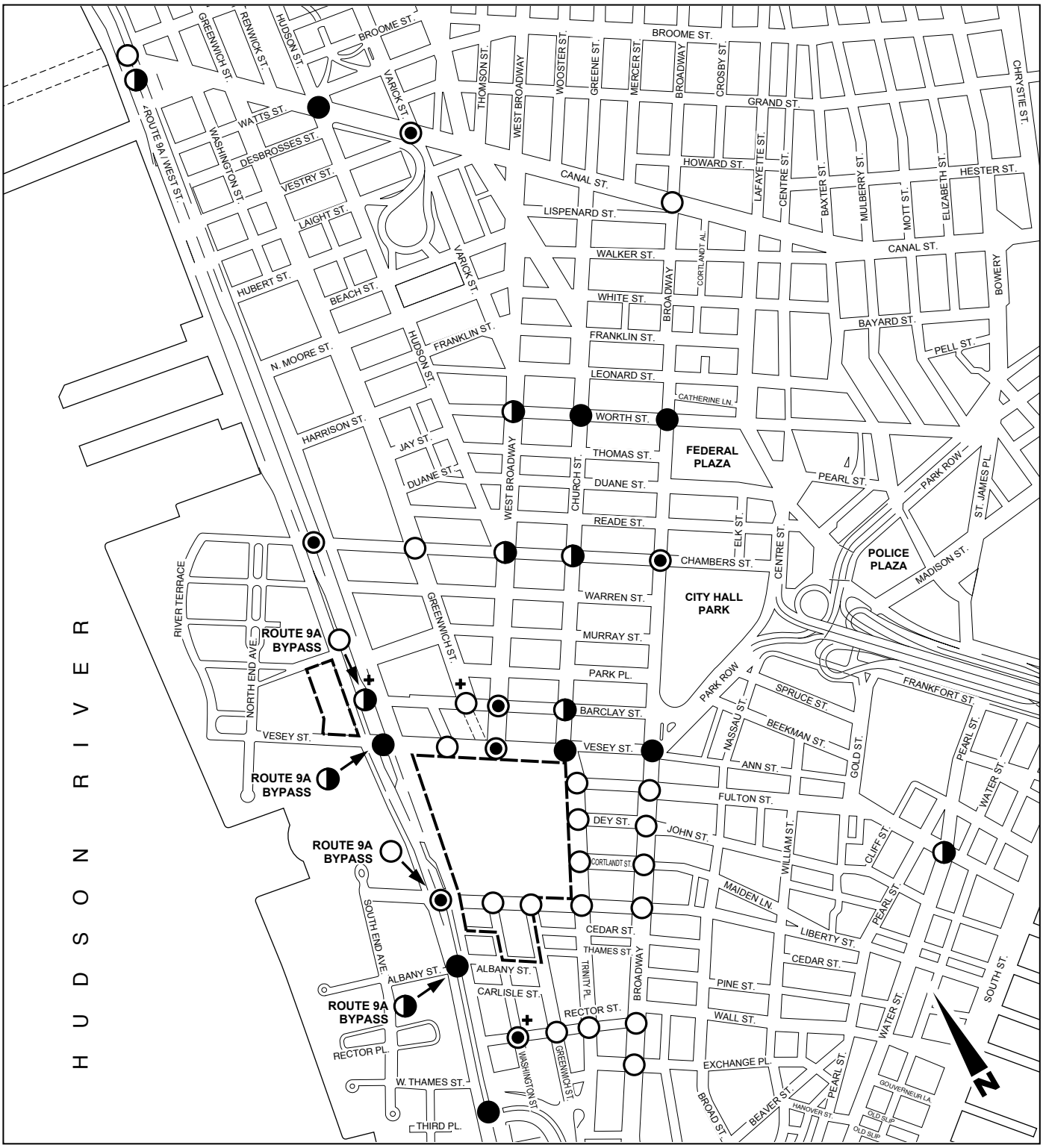
Route 9A traffic volumes can be expected to increase by about 325 vph northbound and 285 vph southbound in the AM peak hour near Vesey Street, by about 280 vph northbound and 390 vph southbound in the midday peak hour, and by about 200 vph northbound and 390 vph southbound in the PM peak hour. These are substantial increases that reflect a heavy reliance by new vehicle traffic on this major traffic carrier into and out of the area as well as some traffic volume diversions back to southbound Route 9A from southbound Broadway reversing diversions that had occurred post-September 11.

West Broadway traffic volumes can be expected to increase by about 105 vph southbound in the AM peak hour near Chambers Street, by about 45 vph in the midday peak hour, and by about 30 vph in the PM peak hour.

Greenwich Street traffic volumes can be expected to increase by about 65 vph southbound in the AM peak hour near Chambers Street, and by about 50 vph in the midday and PM peak hours.

Broadway traffic volumes can be expected to decrease by about 100 to 140 vph southbound in the AM, midday, and PM peak hours near Chambers Street, as a result of some traffic diversions back to Route 9A.

Church Street traffic volumes can be expected to increase by about 415 vph northbound in the AM peak hour near Vesey Street, by about 180 vph in the midday peak hour, and by about 450 vph in the PM peak hour.



Project Site Boundary

Unsignalized Intersection

Note: Overall intersection LOS is shown for signalized intersections

LOS A or B

LOS C

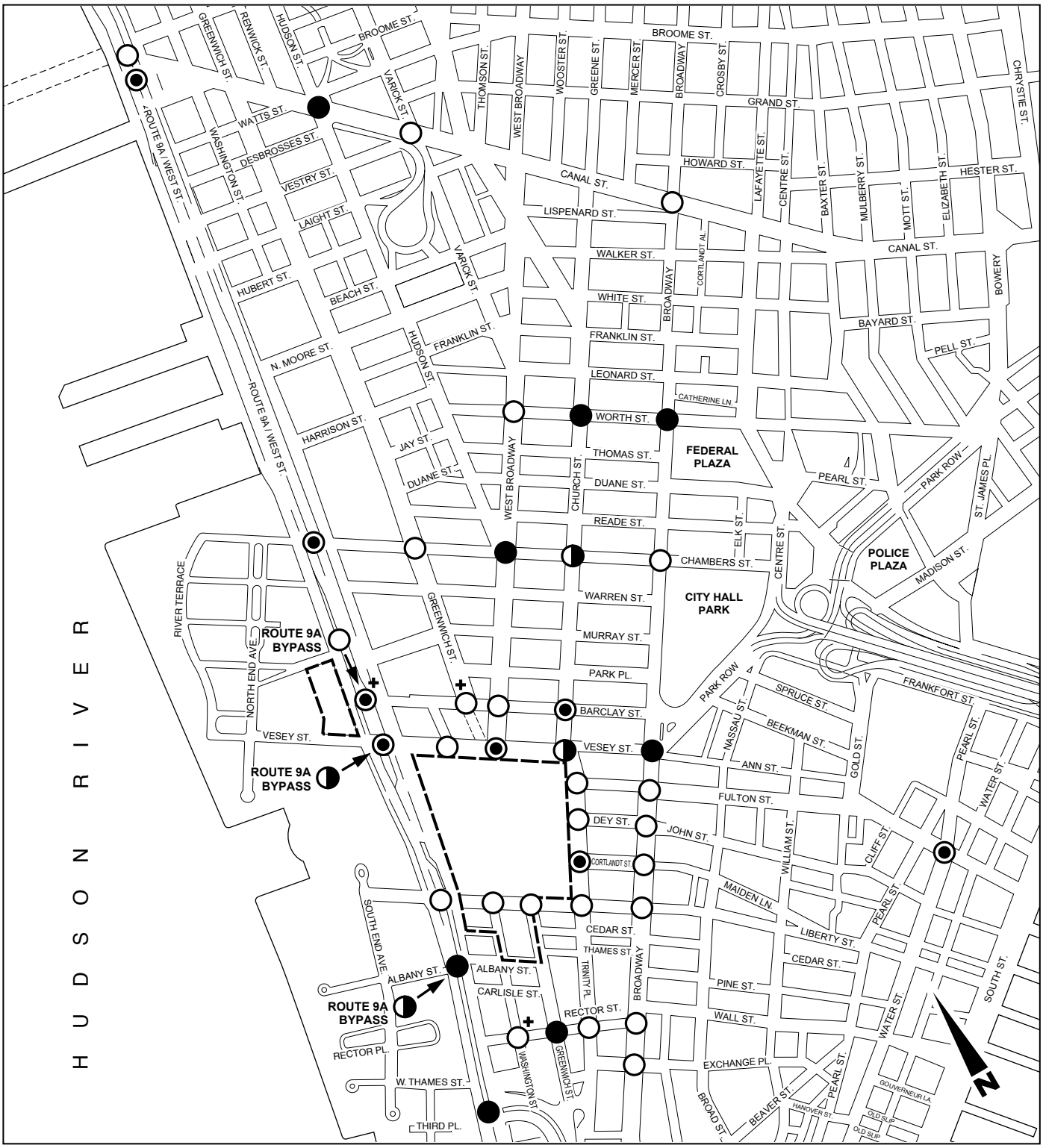
LOS D

LOS E or F

Traffic Levels of Service
2009 No Action Conditions
Current Conditions Scenario
with Route 9A At-Grade
AM Peak Hour

Figure 13A-7

World Trade Center Memorial
and Redevelopment Plan



Project Site Boundary

LOS A or B

LOS C

LOS D

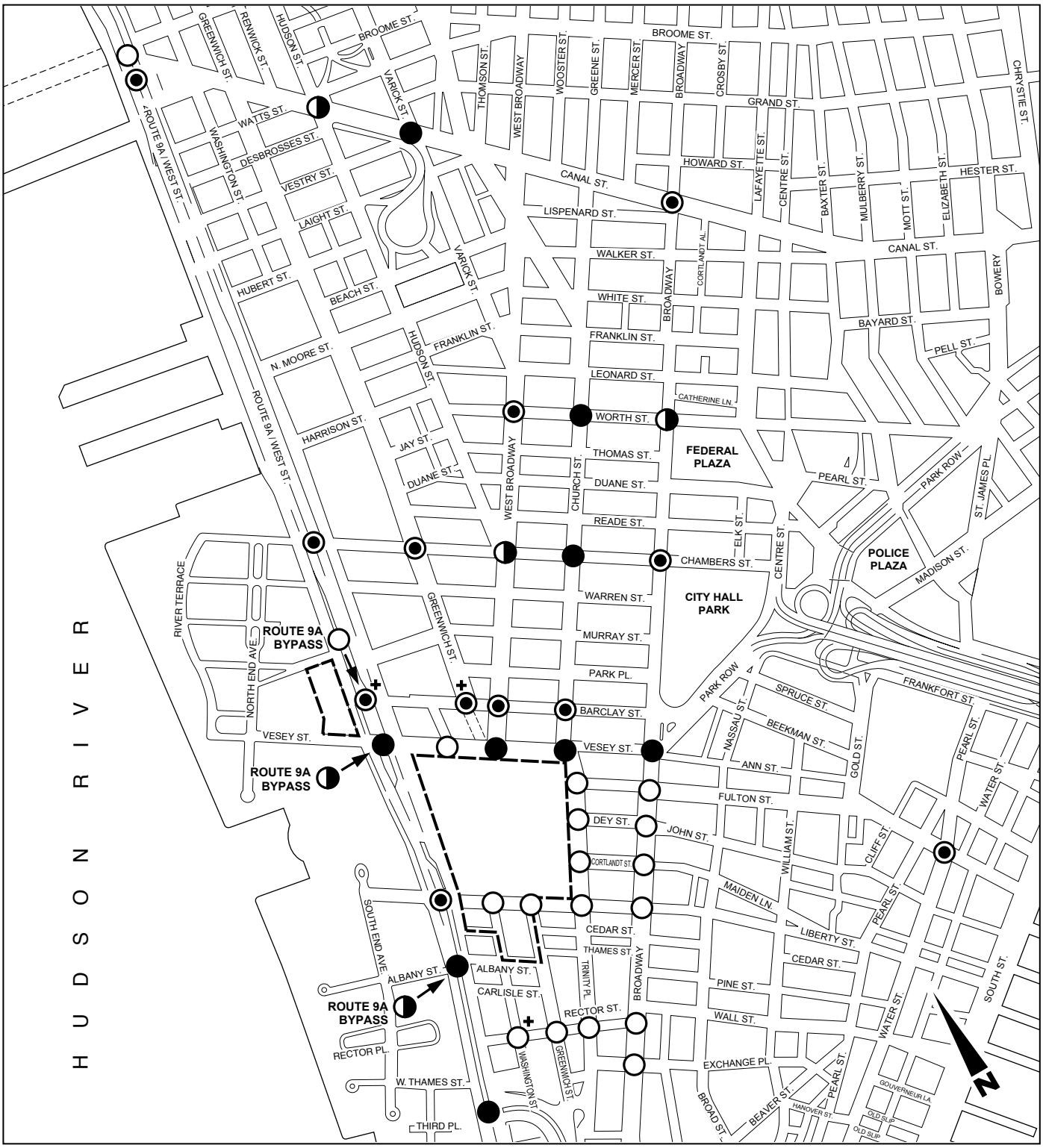
LOS E or F

Unsignalized Intersection

Note: Overall intersection LOS is shown for signalized intersections

Traffic Levels of Service
2009 No Action Conditions
Current Conditions Scenario
with Route 9A At-Grade
Midday Peak Hour

Figure 13A-8



Project Site Boundary

Unsignalized Intersection

LOS A or B

LOS C

LOS D

LOS E or F

Note: Overall intersection LOS is shown for signalized intersections

Traffic Levels of Service
2009 No Action Conditions
Current Conditions Scenario
with Route 9A At-Grade
PM Peak Hour

Figure 13A-9

Changes in traffic volumes along east-west streets in the area are not as easy or meaningful to describe since many of them (including Liberty Street and Vesey Street, for example), are currently closed to traffic, while others currently handle much of the traffic that is currently being diverted. Again, detailed traffic volumes for each intersection in the GEIS's traffic study area are provided in *Appendix E.1*.

Based on these traffic volumes and expected traffic lane configurations, future No Action traffic levels of service were determined for the traffic analysis locations within the study area. A summary of findings, comparing Current 2003 Conditions with future 2009 No Action conditions, is provided in Table 13A-5. An illustrative overview of overall intersection levels of service are presented in Figures 13A-7 through 13A-9.

Table 13A-5
Traffic Level of Service Summary Comparison
Existing vs. Future No Action Conditions (2009)
Current Conditions Scenario with at-Grade Route 9A

Signalized Intersections	Existing AM	Existing Midday	Existing PM	2009 No Action AM	2009 No Action MD	2009 No Action PM
Overall LOS A/B	15	23	18	18	20	16
Overall LOS C	11	4	7	6	7	10
Overall LOS D	5	5	6	6	3	3
Overall LOS E/F	2	1	2	8	8	9
No. of movements at LOS E or F	14	14	11	32	27	26

In the AM peak hour, the number of analysis locations operating at overall LOS E or F are projected to increase from two under Current 2003 Conditions to eight under future 2009 No Action conditions. Six other intersections would operate at overall LOS D. The number of specific traffic movements expected to operate at LOS E or F is projected to increase from 14 under Current 2003 Conditions to 32 under the 2009 No Action condition.

In the midday peak hour, the number of analysis locations operating at overall LOS E or F are projected to increase from one under Current 2003 Conditions to 8 under future 2009 No Action conditions. Three other intersections would operate at overall LOS D. The number of specific traffic movements expected to operate at LOS E or F is projected to increase from 14 under Current 2003 Conditions to 27 under the 2009 No Action condition.

In the PM peak hour, the number of analysis locations operating at overall LOS E or F are projected to increase from two under Current 2003 Conditions to 9 under future 2009 No Action conditions. Three other intersections would operate at overall LOS D. The number of specific traffic movements expected to operate at LOS E or F is projected to increase from 11 under Current 2003 Conditions to 26 under the 2009 No Action condition.

A review of the projected conditions for all three time periods, as illustrated in Figures 13A-7 through 13A-9, indicates that several intersections can be expected to operate at overall unacceptable levels of service during at least two, if not all three, traffic analysis peak hours: Route 9A at Vesey Street, Albany Street, and at the entrance to the Brooklyn Battery Tunnel; Vesey Street at Broadway and at Church Street; Worth Street at Church Street and at Broadway; and Canal Street and Hudson Street. A number of others would be characterized by overall

unacceptable levels of service during one of the three analysis periods. Other intersections would have specific traffic movements at LOS E or F during multiple time periods.

Traffic Volumes and Levels of Service with Route 9A Short Bypass Tunnel

Under the Route 9A at-grade arterial design analyzed above, Route 9A would be constructed with four northbound through traffic lanes and four southbound through traffic lanes at the WTC Site, plus double left turn lanes northbound and southbound at Vesey Street and northbound and southbound at Liberty Street. With the potential reconstruction of Route 9A with a short bypass tunnel section adjacent to the western edge of the WTC Site—from just north of Vesey Street to just south of Liberty Street—the bypass would have two traffic lanes in each direction, while the at-grade "service road' would have three traffic lanes at Liberty and Vesey Streets, narrowing to two lanes at Fulton Street.

The traffic analyses conducted in this GEIS for the bypass tunnel option reflect a significant volume of Route 9A through traffic using the tunnel section with the remaining traffic using the service roads proposed as part of that plan. Traffic volumes on parallel north-south roads "inland," i.e., east of the Route 9A corridor, can be expected to be approximately the same, or actually slightly lower with the assumptions made for the purposes of background conditions in this GEIS that there would be a modest shift of traffic from parallel streets, such as Church Street and Broadway to Route 9A.

Traffic level of service analyses were conducted for a sample set of potentially key intersections along the Route 9A corridor—i.e., at Chambers Street, Barclay Street, Vesey Street, Liberty Street, Albany Street, and at the entrance to the Brooklyn Battery Tunnel. These are locations that could be most different under the potential Route 9A bypass tunnel design being studied by NYSDOT. The 2009 No Action analyses show that levels of service would be similar to those expected for the at-grade design at Chambers Street and at the entrance to the Brooklyn Battery Tunnel, that is, just north and south of the bypass tunnel's portals. At the intersections of Route 9A with Barclay Street, Vesey Street, Liberty Street, and Albany Street, level of service improvements can generally be expected (see Figures 13A-7 through 13A-9).

2009 NO ACTION PARKING CONDITIONS

An analysis was conducted of projected areawide parking lot and garage occupancy levels under the 2009 development and traffic growth *projection*. Areawide parking lot and garage occupancy levels can be expected to be able to accommodate additional parking demands, increasing from about 47 percent utilization in the AM peak hour and 64 percent in the midday peak currently, to about 50 percent and 68 percent, respectively.

13A.4.3 PROBABLE IMPACTS OF THE PROPOSED ACTION 2009—CURRENT CONDITIONS SCENARIO

The assessment of future conditions starts with a determination of the volume of vehicular traffic that can be expected to be generated by the Proposed Action, the distribution of this traffic to the various routes leading to and from the study area and their specific "assignment" to streets and through intersections to their destinations, and the determination of expected traffic levels of service at the locations being analyzed in the traffic study area. The Build analyses also account for the extension of Greenwich Street and Fulton Street through the WTC Site as part of the proposed project plan.

TRIP GENERATION AND MODAL SPLIT

The determination of vehicular traffic generated by the proposed project is developed for each component of the development program and then aggregated. It includes the following:

- 10 million square feet of office space (2.6 million square feet by 2009 and the remainder by 2015);
- 1 million square feet of retail space (2009);
- 800-room hotel plus 150,000 square feet of conference space (2015);
- 2,200 seat performance space (2009);
- the Memorial, *the Memorial Center*, and viewing platforms (2009);
- 240,000 square feet of cultural facilities (2009); and
- 30,000 square feet of restaurant/café uses (2009).

Each type of use generates trips at different rates, with different temporal distributions for those trips (i.e., the distribution of daily trips by hour of the day), modal splits (i.e., the percentage of trips made by travel mode), and average vehicle occupancies (i.e., the average number of people per auto and average number of passengers per taxi). This section defines the rates and factors used.

Office Space

Trips expected to be generated by the proposed 10 million square feet of office uses were estimated based on daily trip rates of 12 employee person-trips per 1,000 square feet, and 6 visitor person-trips per 1,000 square feet, used in the *New York Stock Exchange (NYSE) FEIS*. These rates conform to the rate of 18 person-trips per 1,000 square feet presented in the *CEQR Technical Manual* and are slightly higher than the rate of 17.3 person-trips per 1,000 square feet presented in Pushkarev and Zupan's *Urban Space for Pedestrians.* The temporal distribution for the office use was taken from the *NYSE FEIS* and the *Battery Park City (BPC) FEIS.* Modal split for the AM and PM peak periods and vehicle occupancy were based on rates presented in *Localized Transit Trip Generation and Impact Analysis.* This included 3 percent of office employees using autos in the AM and PM peak hours, and 2 percent doing likewise at midday, and 3.5 percent of office visitors using autos in all analysis time periods. (To account for the possibility of higher taxi usage, an adjustment was made to conservatively increase the taxi share for office employees from 0.8 percent to 2 percent for office visitors, and 3.5 percent was assumed for taxi use during all analysis periods.) Modal split data for office employees the midday peak period was based on rates presented in the *BPC FEIS,* and was adjusted to reflect a combined auto and taxi share of 4 percent, which is slightly higher than that presented in the *BPC FEIS.*

Based on these rates, in 2009, the 2.6 million square feet of office uses are estimated to result in 461 vehicle trips in the AM peak hour, 447 vehicle trips in the midday peak hour, and 347 vehicle trips in the PM peak hour.

Retail Space

Up to 1 million square feet of new retail uses are anticipated by 2009 with the Proposed Action. To account for a variety of retail uses, 500,000 square feet were analyzed as destination retail and 500,000 square feet were analyzed as local retail. Destination retail is characterized by stores drawing dedicated trips from a larger area; local retail is geared towards providing convenience shopping, and draws from a smaller area. Trips expected to be generated by retail uses were estimated based on a weekday daily trip rate of 118.5 person-trips per 1,000 square feet and a Saturday daily trip rate of 273.5 person-trips per 1,000 square feet, as presented in the *Retail and*

Industrial Zoning Text Amendments (Retail) FGEIS. Of these total daily trips, 10 person-trips per 1,000 square feet were estimated to be employee trips. Given the large role that other on-site development will play in generating shoppers, a linkage rate of 80 percent for weekday shopper trips was applied. The linkage is higher than that presented for the *Retail and Industrial Zoning Text Amendments FGEIS* project (60 percent), but slightly lower than presented in the *42nd Street Redevelopment Project FSEIS* (80.5 percent in Phase 1/Year 2000, and 83 percent in Phase 2/Year 2015). Temporal distribution and vehicle occupancy factors were taken from the *Retail FGEIS*. Modal split factors for the local retail use were also taken from the *Retail FGEIS*, but were adjusted to reflect the project's downtown location, which is served by PATH and ferry. For trips made by retail employees and local retail shoppers, a combined auto plus taxi usage of 4 to 5 percent was used; for destination retail shoppers, 5 percent auto use and 4 percent taxi use were utilized in the analyses.

Based on these rates, the 1 million square feet of retail proposed by 2009 is estimated to result in 345 vehicle trips in the AM peak hour, 343 vehicle trips in the midday peak hour, and 235 vehicle trips in the PM peak hour.

Hotel

The proposed hotel and conference space would be built in 2015, so there would be no generated traffic from this component of the development program in 2009.

Performance Space

The Proposed Action anticipates the creation of a new 2,200 seat performance space by 2009. Trip estimates for this use were based on a daily trip rate of 4.0 person-trips per seat, which conservatively assumes that on a weekday, there would be sold-out matinee and evening performances. The modal split and temporal distribution factors were taken from the theater use reported in the *42nd Street Redevelopment Project FSEIS*; the modal split factors were adjusted to account for the project's downtown location. The analyses used an auto mode split of 15 percent and 9 percent for taxis. The relatively small number of trips generated by employees and actors were assumed to occur outside the peak hours of analysis. Based on these rates, in 2009, the performance space use is estimated to result in no vehicle trips in the AM peak hour, 175 vehicle trips in the midday peak hour, and 173 vehicle trips in the PM peak hour.

Memorial, Memorial Center, and Viewing Platforms

The Proposed Action includes the development of a Memorial and *Memorial Center*. These uses are anticipated as part of the project in 2009. In addition, a viewing platform is planned for Freedom Tower. Based on attendance estimates prepared by Economics Research Associates (ERA), and independent review of attendance patterns at other civic memorials (including the Vietnam Veteran's Memorial in Washington, D.C., and the Gettysburg Memorial), and other relevant public facilities (such as the Statue of Liberty/Ellis Island), the Memorial and related uses were estimated to result in approximately 5.5 million visitors per year, or approximately 24,000 visitors on a peak weekday and approximately 32,000 visitors on a peak Saturday. To account for greater levels of activity upon its opening, an analysis of a first-year surge in attendance of up to 9 million visitors was performed for 2009. In addition, a credit was taken for an estimated 2 million visitors at the site in existing conditions. For future conditions, it was estimated that 10 percent of the trips would be linked to other uses, to account for visitors that would also visit other uses on the site, such as the performance space or retail uses. Modal split factors were based on a Port Authority survey at the Statue of Liberty/Ellis Island; 6.3 percent of Memorial-destined trips would be made by auto and 16.3 percent would be made by taxi.

Temporal distribution factors and auto and taxi occupancy rates were based on those presented in the *Museum of Modern Art FEIS* and the *American Museum of Natural History FEIS*. Peak-hour tour bus trips and average tour bus occupancy rates were also taken from estimates provided by the Port Authority.

Based on these rates, the Memorial is estimated to result in the following peak hour vehicle trips: In the surge year (9 million annual visitors), 456 vehicle trips in the AM peak hour, 510 vehicle trips in the midday peak hour, and 723 vehicle trips in the PM peak hour. In the stabilized year (5.5 million annual visitors), 290 vehicle trips in the AM peak hour, 334 vehicle trips in the midday peak hour, and 464 vehicle trips in the PM peak hour.

Cultural Facilities

The Proposed Action includes the development of 240,000 square feet for cultural facilities by 2009. Absent specific programming at this time, this component of the project was assumed to have characteristics of a museum and the trip estimates were based on attendance from the Museum of Modern Art, proportioned for the size of the Proposed Action**.** It was estimated that 10 percent of the trips would be linked to other uses. An additional 10 trips per 1,000 square feet were estimated for employee trips. Modal split and vehicle occupancy factors were estimated to be the same as for the Memorial use.

Based on these rates, in 2009, the cultural facilities are projected to result in 20 vehicle trips in the AM peak hour, 141 vehicle trips in the midday peak hour, and 202 vehicle trips in the PM peak hour.

Restaurant/Café Uses

The Proposed Action includes the development of 30,000 square feet restaurant and café uses by 2009. Trip estimates for these were based on rates presented in the *42nd Street Redevelopment Project FSEIS*. Modal split factors were adjusted for the project's downtown location and include 4 to 5 percent by auto plus taxi for restaurant employees and close to 24 percent combined auto-and-taxi for patrons. Ten person-trips per 1,000 square feet were estimated to be employee trips. It was estimated that 70 percent of patron trips to the restaurant would be linked to other uses; this linkage is consistent with that presented in the *42nd Street FSEIS*. Based on these rates, in 2009, the restaurant and café uses are projected to result in 25 vehicle trips in the AM peak hour, 50 vehicle trips in the midday peak hour, and 29 vehicle trips in the PM peak hour.

Total Proposed World Trade Center Development Program (2009)

Overall, in year 2009, the Proposed Action would generate the following volume of vehicle trips: 1,307 vehicle trips in the AM peak hour; 1,666 vehicle trips in the midday peak hour; and 1,709 vehicle trips in the PM peak hour. A summary tabulation of the volume of vehicular trips generated in 2009 for the interim build-out of the overall development program, respectively, is provided in Table 13A-6.

TRIP DISTRIBUTION AND ASSIGNMENT TO THE ROADWAY NETWORK

The vehicular traffic expected to be generated by the Proposed Action was then assigned to the roadway network based on available sources, such as U.S. Census data, available routes, and professional judgment. The specific routing of vehicular traffic was done separately by vehicular mode—autos, taxis, trucks, and buses—for each component of the development program, is

Table 13A-6
Vehicle Trips Generated by the Proposed WTC Development Program (2009)

	Autos		Taxis		Tour Buses		Trucks		Total	
	In	Out	In	Out	In	Out	In	Out	In	Out
Weekday AM Peak Hour										
Office	145	6	118	118	NA	NA	37	37	300	161
Retail	76	51	85	85	NA	NA	24	24	185	160
Hotel	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Performance Space	0	0	0	0	NA	NA	0	0	0	0
Memorial, *Memorial Center*, Viewing Platforms[1]	57	0	194	194	9	0	1	1	261	195
Cultural Facilities	6	0	5	5	0	0	2	2	13	7
Restaurant/Cafes	1	0	1	1	NA	NA	11	11	13	12
Total	**285**	**57**	**403**	**403**	**9**	**0**	**75**	**75**	**772**	**535**
Weekday Midday Peak Hour										
Office	91	74	98	98	NA	NA	43	43	232	215
Retail	64	61	83	83	NA	NA	26	26	173	170
Hotel	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Performance Space	63	0	55	55	NA	NA	1	1	119	56
Memorial, *Memorial Center*, Viewing Platforms[1]	47	42	183	183	38	15	1	1	269	241
Cultural Facilities	15	14	51	51	3	3	2	2	71	70
Restaurant/Cafes	11	11	6	6	NA	NA	8	8	25	25
Total	**291**	**202**	**475**	**475**	**41**	**18**	**81**	**81**	**889**	**777**
Weekday PM Peak Hour										
Office	7	126	103	103	NA	NA	4	4	114	233
Retail	34	51	56	56	NA	NA	19	19	109	126
Hotel	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Performance Space	0	63	55	55	NA	NA	0	0	55	118
Memorial, *Memorial Center*, Viewing Platforms[1]	74	62	276	276	10	23	1	1	361	362
Cultural Facilities	19	22	74	74	5	4	2	2	100	102
Restaurant/Cafes	5	6	3	3	NA	NA	6	6	14	15
Total	**139**	**330**	**567**	**567**	**15**	**27**	**32**	**32**	**753**	**956**

Note: [1] Based on 9 million annual visitors in the surge year condition.

described below. The assignment of vehicular trips makes significant use of the extension of Fulton and Greenwich Streets through the WTC Site, which helps accommodate those who are going to the various components of the development plan, particularly access to the Memorial.

The proposed site plan would have a 1,200-car underground parking garage that would be available to office tenants only *as well as space for all delivery vehicles serving buildings on the Project Site*. All others driving to the Project Site—e.g., visitors to office towers or to the Memorial, hotel patrons, shoppers, etc.—would need to avail themselves of off-site parking lots and garages in the area. Access into and out of the garage would be only via Vesey Street, with autos destined to the garage from Route 9A having to make left turns from southbound Route 9A

or right turns from northbound Route 9A, at Vesey Street. The original WTC complex that was destroyed by the tragic events of September 11, in contrast, had a 2,000-car garage with a direct underground entrance/exit design off of Route 9A from the middle of Route 9A, that eliminated the need for vehicles to make turning maneuvers across traffic, as they will need to do under the current design.

Taxi trips to the various development sites within the Project Site were assumed to drop off their riders at their specific destinations, be it an office tower lobby, cultural facility "front door", etc. There would be a substantial volume of taxi activity for the overall site, particularly taxi trips heading to or from the Memorial. Memorial-generated taxi trips would be focused on both Greenwich Street and on Fulton Street, with taxi drop-offs and pickups expected to be substantial on both the east side of Greenwich Street across from the Memorial and along the south side of Fulton Street near its intersection with Greenwich Street (with both streets extended through the overall Project Site, specifically to help accommodate Memorial-bound trips).

Office Trips

Traffic expected to be generated by the office space was done separately for autos and taxis. A major portion of the auto trips generated by office employees are expected to originate in New Jersey (about 30 percent), Queens (about 15 percent), Brooklyn and Staten Island (about 10 percent each), Manhattan (about 8 percent), Long Island (about 7 percent), and the Bronx (about 6 percent). The remaining trips (approximately 14 percent) are expected to originate from Westchester County, Connecticut, Upstate New York, or other areas.

Route 9A will be used by many of the auto trips (about 50 percent of the office employee trips) since it provides access to the site from long-haul trips coming from the George Washington Bridge, the Lincoln and Holland Tunnels, and Midtown Manhattan and Northern Manhattan. The various East River crossings can be expected to be used by about 35 percent of the office employee trips, with the Queensboro Bridge, Queens-Midtown Tunnel, Williamsburg and Brooklyn Bridges, and Brooklyn Battery Tunnel each carrying 5 to 10 percent of the trips. The FDR Drive can also be expected to be used by a significant amount (about 15 percent) of office employee trips.

It is expected that the vast majority of taxi trips generated by the development program (about 85 percent) will originate in Manhattan, with most of the remaining taxi trips originating from the other boroughs or Long Island. About 45-50 percent of the office taxi trips are expected to use Route 9A, the FDR Drive to carry 35-40 percent, and the remaining 16 percent of the taxi trips to use local streets in the area.

Trip distribution and assignment analyses were also carried out separately for office visitors using autos and taxis to reach the proposed office tower. It is projected that about 25 percent of the office visitor auto trips would originate in Manhattan, about 20 percent in New Jersey, and about 10 percent each in Brooklyn, Queens, Long Island, and Westchester County/Connecticut/Upstate New York, and about 5 percent in the Bronx. It is assumed that office visitor auto trips would generally follow the same routes as the office employee auto trips.

For the office visitor taxi trips, it is expected that about 50 percent of the trips would originate in Manhattan, while the remaining taxi trips would originate from Queens (about 20 percent), New Jersey (about 15 percent), Brooklyn (about 10 percent), and Staten Island (about 5 percent). It is expected that many of the taxi trips from New Jersey and Queens will originate at the area's major airports.

Retail Trips

It is expected that nearly 60 percent of all retail-generated auto trips would originate in Manhattan, with the remainder coming from Brooklyn (20 percent), New Jersey (13 percent), and Queens (7 percent). It has been assumed that the retail auto trips would generally be expected to follow the same routes as described above for office uses—Route 9A would be expected to carry about 40 percent of these auto trips, the FDR Drive about 20-25 percent, the East River crossings about 15 percent, the Brooklyn Battery Tunnel about 10-15 percent, and local streets about 10 percent. It is expected that the vast majority of retail-generated taxi trips (about 95 percent) would originate in Manhattan, with a modest amount coming from Brooklyn.

Hotel Trips

Even though the hotel and conference center space would not be developed until after 2009, the trip distribution and assignment assumptions are included here for comparison purposes relative to the other proposed land uses for the WTC Site. It was assumed that about 30 percent of hotel-generated auto trips would be Manhattan-based, while an additional 30 percent each would originate from Queens and New Jersey due, in part, to airport trips, and the remaining 10 percent were assumed to originate from Brooklyn. Taxi trips were assumed to have the same trip distributions.

Performance Space Trips

The analyses assumed that about 40 percent of the auto trips generated by the performance space would originate in Manhattan, with approximately 15 percent originating from New Jersey, about 10 percent each from Brooklyn, Queens, and Long Island, and about 5 percent each from Brooklyn, Staten Island, and Westchester. It was assumed that the vast majority of taxi trips (about 95 percent) would originate from Manhattan locations, with about 5 percent coming from Brooklyn.

Memorial, Memorial Center, and Cultural Facility Trips

The analyses assume that approximately 30 percent of the auto trips generated by these uses would originate from New Jersey, with approximately 10-15 percent originating from Brooklyn and another 10-15 percent from Queens, and 10 percent from Manhattan, Long Island, and Westchester or Upstate New York. Another 5 percent each were assumed to originate from the Bronx, Staten Island, and points northeast, such as Connecticut and other parts of New England.

Truck Trips

The analyses assumed that 45-50 percent of all truck trips destined to the Project Site originate in Manhattan or New Jersey, with about 15 percent originating from Queens, 10 percent each from Brooklyn, Long Island, and Westchester, and about 5 percent each from the Bronx and Staten Island. Truck routings to the Project Site would differ from autos and trucks since trucks must adhere to designated truck routes as well as to restrictions on some of the area's bridges, tunnels, and highways, such as the prohibition on commercial traffic on the FDR Drive, for example.

All trucks destined to the Project Site would enter the underground delivery area via Route 9A en route to the one designated and secured truck entrance along Liberty Street (this has been assumed for both the at-grade and bypass tunnel options being considered by NYSDOT in its redesign of the Route 9A roadway). For trucks exiting the Project Site, under the at-grade Route 9A design, all trucks would exit the site at Vesey Street (Liberty Street would be an entrance only). Under the bypass tunnel option, exiting trucks heading north on Route 9A would be able

to use a direct ramp from the WTC garage into the mainline section of Route 9A; southbound trucks would need to exit the garage at Vesey Street and then use westbound Vesey Street in order to turn onto Route 9A southbound. It was assumed that trucks destined to the Project Site would primarily use Route 9A to access the WTC garage truck entrance on Liberty Street.

Tour Buses

Tour buses would be expected to reach the Project Site via Route 9A and Vesey Street and turn onto Greenwich Street, and drop off their patrons destined to the Memorial along the west side of Greenwich Street, within the WTC Site, between Fulton and Liberty Streets. After drop-offs have been completed, tour buses would be able to park in the underground garage while awaiting their pickup of patrons later in the day. The tour buses would enter the garage via the controlled Liberty Street entrance and leave the garage via Vesey Street. The analyses assume that most tour buses would approach the site via Route 9A. Tour buses leaving the Memorial with riders heading home or to their destination at the end of their visit, heading to southbound Route 9A would travel south on Greenwich Street and turn right onto Albany Street—which would need to be reversed from a one-way eastbound street to a one-way westbound street east of Route 9A—and then left onto Route 9A.

PROJECTED TRAFFIC VOLUMES AND LEVELS OF SERVICE

Traffic Volumes and Levels of Service with At-Grade Route 9A Arterial

Based on the vehicle traffic generation projections and the assumed distribution of trips, projected traffic volume increases were determined for each of the streets and intersections in the traffic study areas. This section of the Traffic and Parking chapter provides an overview of the traffic volume increases that are projected at specific locations on the major routes leading into and out of the area; intersection-by-intersection volumes are detailed in *Appendix E.1*.

As would be expected, significant traffic volume increases are projected for Route 9A for a number of reasons—it is the highest capacity traffic carrier in the area, it provides direct access to the Project Site from many of Manhattan's major entry points such as the Holland and Lincoln Tunnels and the Brooklyn Battery Tunnel, and it is a designated truck route so it would be heavily used by trucks and tour buses. Route 9A traffic volumes are projected to increase by about 275 vph northbound and 300 vph southbound in the AM peak hour near Vesey Street, by about 370 to 380 vph northbound and southbound in the midday peak hour, and by about 450 vph northbound and 300 vph southbound in the PM peak hour. These are substantial increases, reflecting about a 10-20 percent increase over projected No Action volumes in year 2009.

West Broadway traffic volumes are projected to increase by about 40 vph southbound in the AM peak hour near Chambers Street, by about 45 vph in the midday peak hour, and by about 30 vph in the PM peak hour. These are approximately 5 percent increases over projected 2009 No Action volumes at this location in the AM and PM peak hours, and about 10 percent at midday.

Greenwich Street traffic volumes are projected to increase by about 30 vph southbound in the AM and midday peak hours near Chambers Street, and by about 10 vph in the PM peak hour. This would be about a 10 percent increase in the AM and midday peak hours, and less than 5 percent in the PM peak hour.

Broadway traffic volumes are projected to increase by about 60-70 vph southbound in the AM, midday, and PM peak hour near Chambers Street, reflecting 5-10 percent increases in the AM and PM peak hours and about 10 percent at midday.

Church Street traffic volumes are projected to increase by about 100 vph northbound in the AM peak hour at Chambers Street, by about 150 vph in the midday peak hour, and by about 170 vph in the PM peak hour. These would represent about 5-10 percent increases in the AM peak hour, and just over 10 percent increases in the midday and PM peak hours.

Based on these traffic volume increases, future traffic levels of service in year 2009 under the Build condition were determined for the traffic analysis locations in the traffic study area. A summary of findings, comparing future conditions in year 2009 with and without the Proposed Action, is provided in Table 13A-7. An illustrative overview of overall intersection levels of service are presented in Figures 13A-10 through 13A-12.

Table 13A-7
Traffic Level of Service Summary Comparison
Future No Action vs Future Build Conditions (2009)
Current Conditions Scenario with at-Grade Route 9A

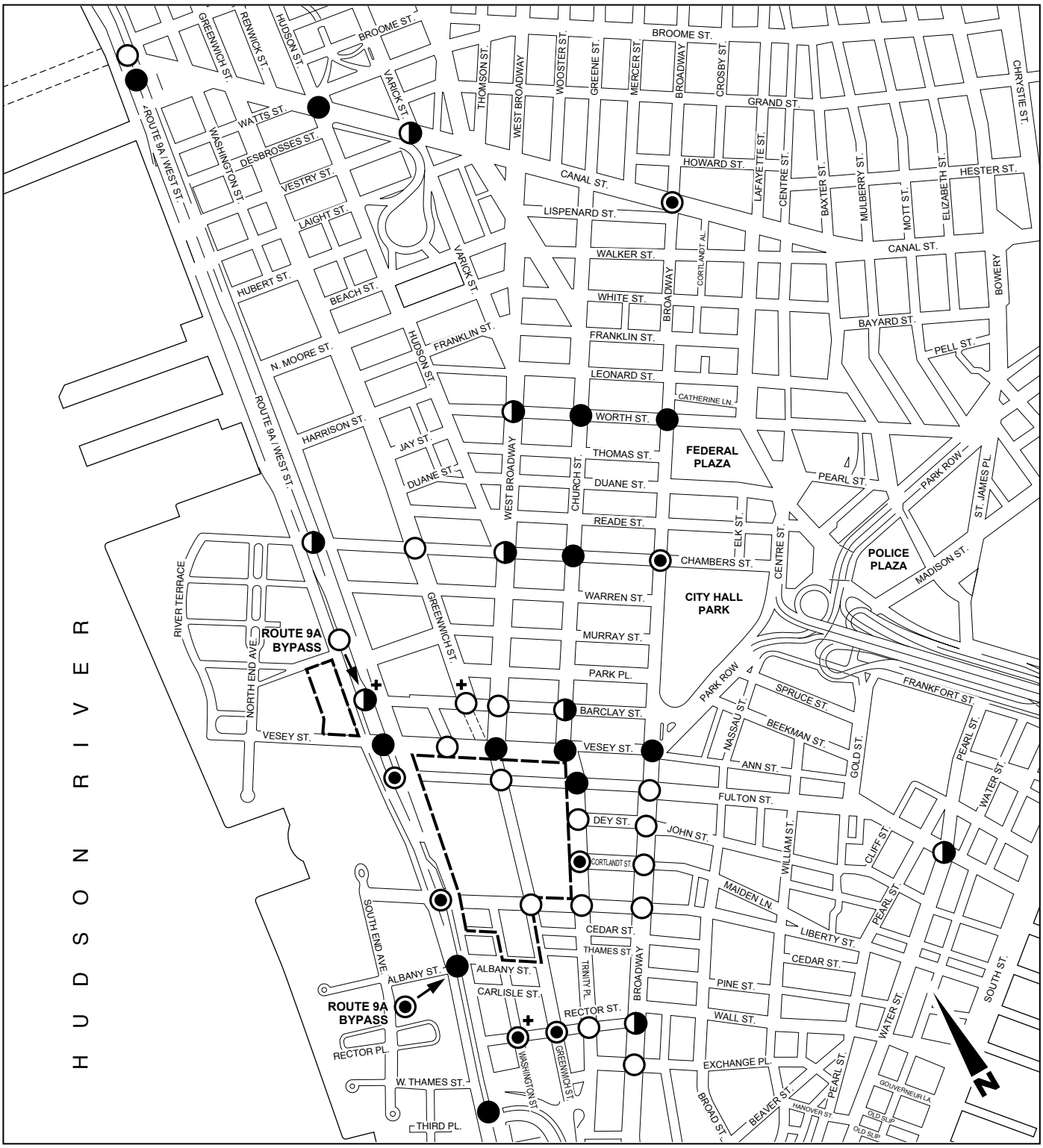
Signalized Intersections	2009 No Action AM	2009 No Action MD	2009 No Action PM	2009 Build AM	2009 Build MD	2009 Build PM
Overall LOS A/B	18	20	16	14	15	11
Overall LOS C	6	7	10	6	9	11
Overall LOS D	6	3	3	7	2	5
Overall LOS E/F	8	8	9	12	13	12
No. of movements at LOS E or F	32	27	26	42	34	34

In the AM peak hour, the number of analysis locations operating at overall LOS E or F is projected to increase from eight under future No Action conditions under the Current Conditions Scenario to 12 with the Proposed Action in year 2009. Seven other intersections would operate at overall LOS D. The number of specific traffic movements expected to operate at LOS E or F is projected to increase from 32 to 42.

In the midday peak hour, the number of analysis locations operating at overall LOS E or F is projected to increase from eight under future No Action conditions under the Current Conditions Scenario to 13 with the Proposed Action in year 2009. Two other intersections would operate at overall LOS D. The number of specific traffic movements expected to operate at LOS E or F is projected to increase from 27 to 34.

In the PM peak hour, the number of analysis locations operating at overall LOS E or F is projected to increase from nine under future No Action conditions under the Current Conditions Scenario to 12 with the Proposed Action in year 2009. Five other intersections would operate at overall LOS D. The number of specific traffic movements expected to operate at LOS E or F is projected to increase from 26 to 34.

A review of projected conditions for all three time periods, as shown in Figures 13A-10 through 13A-12, indicates that an increased number of locations would experience overall unacceptable levels of service in at least two, if not all three, of the traffic analysis hours. These locations would include: Route 9A at Canal Street, Vesey Street, Albany Street, and the entrance to the Brooklyn Battery Tunnel; Vesey Street at West Broadway/Greenwich Street, at Broadway, and at Church Street; Church Street at Worth Street, at Chambers Street, and at Fulton Street; Worth Street and Broadway; and Canal Street and Hudson Street. A number of others would be characterized by overall unacceptable levels of service during one of the three analysis periods.



Project Site Boundary

Unsignalized Intersection

Note: Overall intersection LOS is shown for signalized intersections

LOS A or B

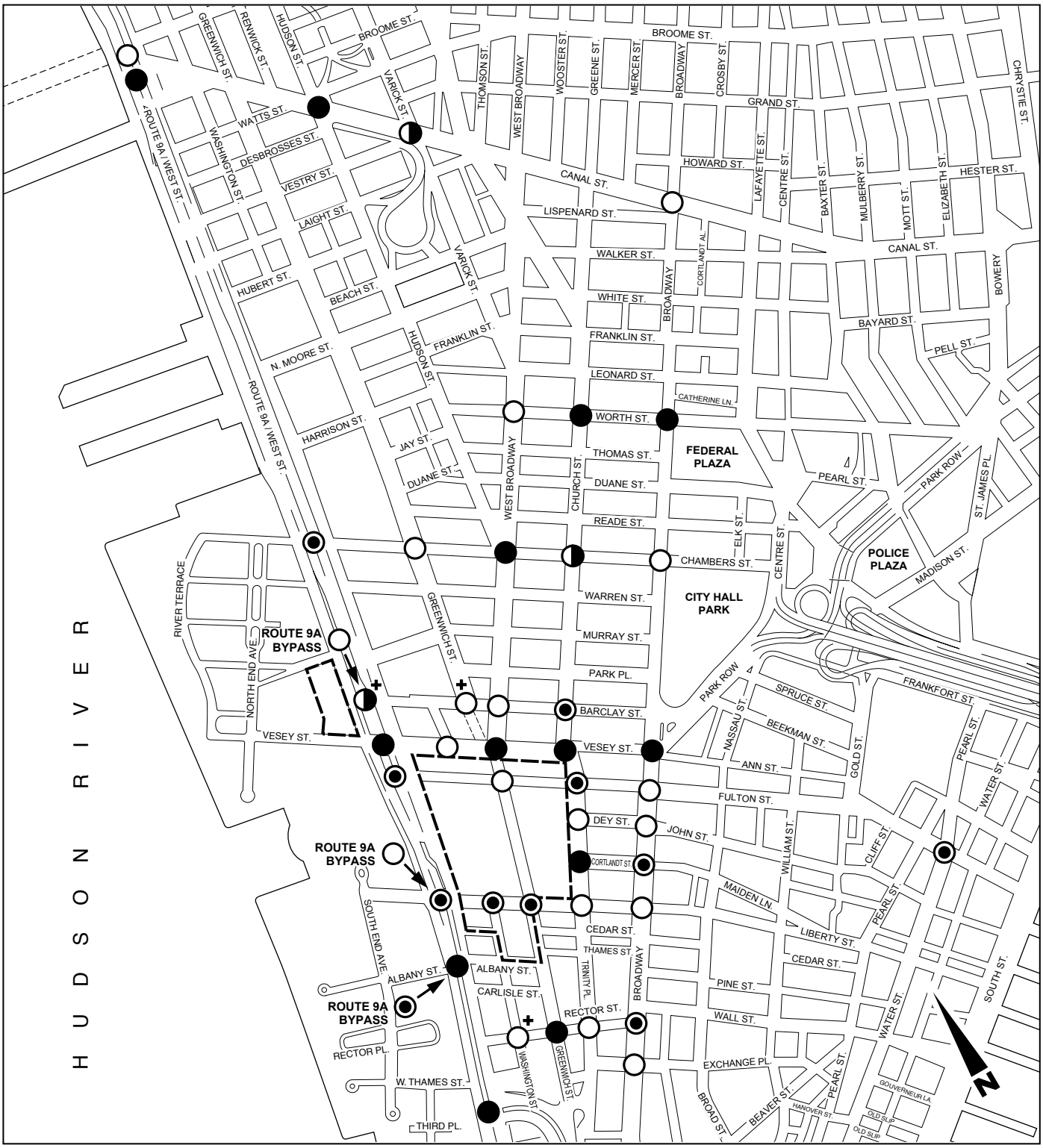
LOS C

LOS D

LOS E or F

Traffic Levels of Service
2009 Build Conditions
Current Conditions Scenario
with Route 9A At-Grade
AM Peak Hour

Figure 13A-10



Project Site Boundary

LOS A or B

LOS C

LOS D

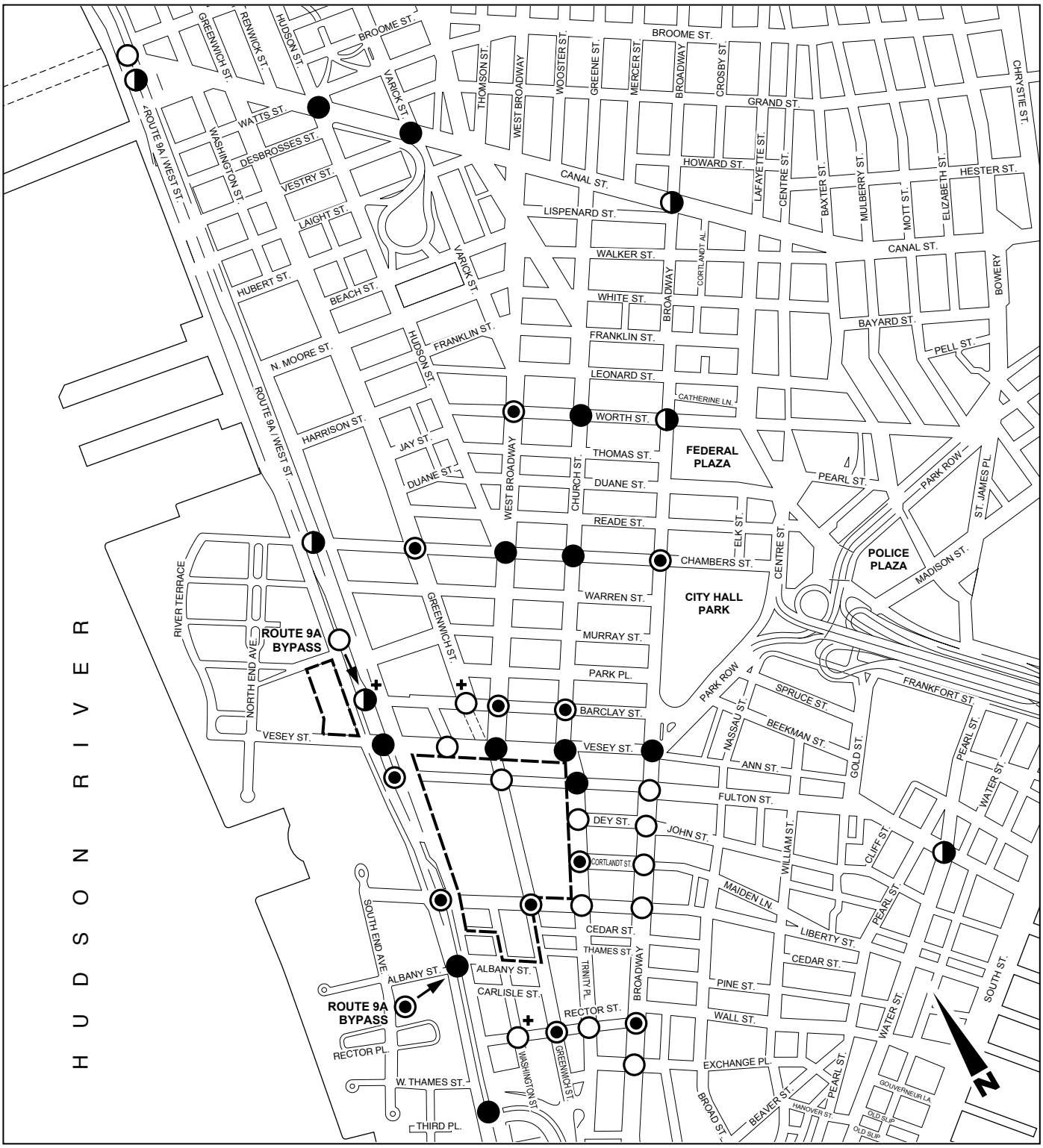
LOS E or F

Unsignalized Intersection

Note: Overall intersection LOS is shown for signalized intersections

Traffic Levels of Service
2009 Build Conditions
Current Conditions Scenario
with Route 9A At-Grade
Midday Peak Hour

Figure 13A-11



Project Site Boundary

Unsignalized Intersection

LOS A or B

LOS C

LOS D

LOS E or F

Note: Overall intersection LOS is shown for signalized intersections

Traffic Levels of Service
2009 Build Conditions
Current Conditions Scenario
with Route 9A At-Grade
PM Peak Hour

Figure 13A-12

Other intersections would have specific traffic movements at LOS E or F during multiple time periods.

A more focused look at the periphery of the WTC Site and the intersections along its edges where both vehicular and pedestrian concentrations can be expected to be greatest shows several findings. The intersection of Route 9A/Vesey Street and several intersections along Vesey Street along the northern edge of the WTC Site and all the way to Broadway, would all operate at LOS E or F during most of the traffic peak hours, as would the intersection of Church Street and Fulton Street, a major entry corridor to the WTC Site. Most of the other intersections on the periphery of the site would operate acceptable overall, even though some may have individual traffic movements operating at LOS E or F.

Significant traffic impacts for year 2009 Build conditions are identified compared with 2009 No Action conditions under the pre-September 11 baseline. As noted in section 13A.2, "Methodology," that is because significant impacts have been defined as significant changes in traffic delay as compared with what conditions would have been like in year 2009 had the WTC complex not been destroyed—the area accommodated vehicular traffic to a certain degree pre-September 11 and projected future impacts are being determined against that baseline condition. Significant traffic impacts are thus identified at the end of this chapter, after the future baseline conditions under the Pre-September 11 Scenario have been presented.

Traffic Volumes and Levels of Service with Route 9A Short Bypass Tunnel

Traffic analyses were also conducted for year 2009 Build conditions with NYSDOT's proposed short bypass tunnel design for Route 9A. These analyses were conducted for the same set of potentially key intersections along the Route 9A corridor cited previously—i.e., at Chambers Street, Barclay Street, Vesey Street, Liberty Street, Albany Street, and at the entrance to the Brooklyn Battery Tunnel, as well as the intersection of Route 9A and the extension of Fulton Street through the WTC Site that is part of the Proposed Action.

Overall levels of service at the intersections analyzed would not be appreciably different from those determined for the at-grade alternative with two exceptions—the unsignalized intersection of Route 9A and Barclay Street would operate at LOS B for the critical stop-controlled westbound Barclay Street movement in all three peak traffic analysis hours with the bypass tunnel alternative, whereas this movement would operate at LOS D under the at-grade design (see Figures 13A-10 through 13A-12). Level of service improvements can also be expected at Albany Street in all three traffic analysis hours and at Liberty Street in the midday peak hour.

PROJECTED 2009 PARKING CONDITIONS

The proposed parking garage with 1,200-1,400 spaces to be constructed as part of the Proposed Action would be available to office tenants only, and not to the general public. It would operate well under its capacity in year 2009, even if the office towers had city, state, regional, or federal agency tenants with needs to park agency fleets overnight, as it did prior to the events of September 11. The maximum parking demand accumulation from just office tenant vehicles is expected to be approximately 10 percent of the garage's capacity. With agency vehicles included for daytime and overnight parking, occupancy could increase to approximately 15 to 30 percent. *All delivery vehicle activities would occur under the Project Site within the underground garage, so demands for on-street curb utilization would be substantially lower than would typically be expected.*

13A.4.4 FUTURE WITHOUT THE PROPOSED ACTION 2015—CURRENT CONDITIONS SCENARIO

This section of the GEIS addresses future No Action conditions in 2015 based on the Current Conditions Scenario.

2015 NO ACTION TRIP GENERATION

The list of expected development projects expected to become operational after 2009 but before 2015, includes approximately 30 developments beyond the more than 40 assumed in the 2009 No Action analysis. These developments are included in the 2015 traffic analyses and are listed below; the same methodology described for year 2009 conditions without the Proposed Action were followed for year 2015.

Primary Study Area, North of and at the WTC Site:

- Fiterman Hall, 30 West Broadway—360,000 square feet institutional space

Primary Study Area, Broadway Corridor:

- 115 Nassau Street—residential conversion
- 10 Broadway—residential conversion
- 5 Beekman Street—residential conversion
- 60 Broad Street—200 residential units and 800,000 square feet office

Primary Study Area, Greenwich Street South Corridor:

- Deutsche Bank, 130 Liberty Street—l.4 million square feet office
- One World Plaza, 140 Liberty Street—500,000 square feet office
- Former Downtown Athletic Club, 16-20 West Street—use unknown
- Battery Garage—600 residential units

Primary Study Area, Battery Park City:

- Site 16/17, BPC North—471 residential units or 223,955 square feet commercial space with public library and playground
- Site 26, BPC North—1.9 million square feet office

Secondary Study Area, Tribeca:

- 130 Duane Street—45 hotel rooms
- 24 Varick Street /240 West Broadway—32 residential units
- 443 Greenwich Street—256 residential units
- 90 Leonard Street—278,838 square feet of either residential or retail space
- Ponte Sites—280 residential units
- 353-59 Broadway—use unknown
- 408 Greenwich Street—44,000 square feet office plus residential
- 55 White Street—20 residential units
- 6 York Street /West Broadway at Sixth Avenue—150 hotel rooms

Secondary Study Area, Chinatown:

- New York Post, Catherine Slip on Water Street
- 150 Madison Street—73,000 square feet of manufacturing

- Two Bridges Site north of Manhattan Bridge—use unknown

Secondary Study Area, Brooklyn Bridge to Battery Park:

- 320 Pearl Street—80 hotel rooms
- 79 Maiden Lane—400 residential units
- Rockrose/Pearl Street—use unknown
- 15 William Street—373 residential units
- 55 Water Street—518,050 square feet office
- 250 Water Street—500 residenial units or 480,950 square feet commercial
- Block 97, Front Street/Beekman Street /Peck Slip—100 residential units
- NYU Downtown Hospital, between Spruce and Beekman Streets—500 residential units and 1.2 million square feet office
- 59 John Street—residential conversion

Secondary Study Area, Civic Center Area:

- None

A summary of vehicle trips expected to be generated by year 2015 (including both the vehicle trips generated by 2009 and trips generated by the developments cited above that would be operational after 2009 but by 2015)—including autos, taxis, and delivery vehicles—is presented by study area zone within Table 13A-8.[1]

Table 13A-8
Vehicle Trip Generation from Background Development Projects,
Current Conditions 2015 Baseline
(AM, Midday, and PM Peak Hours)

Study Area Zone	AM Peak INS	AM Peak OUTS	MD Peak INS	MD Peak OUTS	PM Peak INS	PM Peak OUTS
WTC and North of WTC Zone	460	325	381	359	256	385
Broadway Corridor	104	73	86	81	57	86
Greenwich Street South	258	193	214	201	154	220
Battery Park City	304	278	246	233	232	274
Tribeca	81	100	77	75	88	75
Chinatown	11	21	7	7	18	13
Brooklyn Bridge to Battery Park	381	375	307	291	316	352
Civic Center Area	0	0	0	0	0	0
Total Vehicle Trips	**1,599**	**1,365**	**1,318**	**1,247**	**1,121**	**1,405**

As shown in Table 13A-8, the volume of vehicular traffic that can be expected to be generated by background development projects in total by the year 2015, based on current development plans and projections, is substantial; it is more than double the generated traffic expected between 2003 and 2009. In the AM peak hour, approximately 1,599 vehicles would be generated into the area and 1,365 vehicles would leave the area, totaling 2,964 vehicle trips. In the midday peak hour, approximately 1,318 vehicles would be generated in and 1,247 vehicles would be

[1] Some of the projects assumed in the 2015 analyses may occur earlier (i.e., by 2009). For full buildout traffic analysis purposes, this would not represent a material change.

generated out, totaling 2,565 vehicle trips. In the PM peak hour, approximately 1,121 vehicles would be generated in and 1,405 vehicles would be generated out of the area, totaling 2,526 vehicle trips.

This volume of traffic was added to the roadway network and, together with the background traffic growth, established the future 2015 No Action traffic volume baseline for the Current Conditions Scenario. Detailed No Action traffic volume maps are provided in *Appendix E.1*; a summary overview of traffic volume increases along selected streets in the traffic study area is described below.

2015 NO ACTION TRAFFIC CONDITIONS

Traffic Volumes and Levels of Service with at-Grade Route 9A Arterial

Traffic volumes on the study area roadway network would continue to increase significantly at many locations between 2009 and 2015, most heavily along the Route 9A corridor and Church Street.

Route 9A traffic volumes can be expected to increase by about 250 vph northbound and 520 vph southbound in the AM peak hour near Vesey Street, by about 300 vph northbound and 450 vph southbound in the midday peak hour, and by 270 vph northbound and 250 vph southbound in the PM peak hour.

Traffic volume increases along West Broadway and Greenwich Street would be expected to be modest. West Broadway traffic volumes can be expected to increase by about 15 to 20 vph southbound in all three peak traffic analysis hours, while Greenwich Street traffic volumes can be expected to increase by about 5 to 10 vph southbound during these hours.

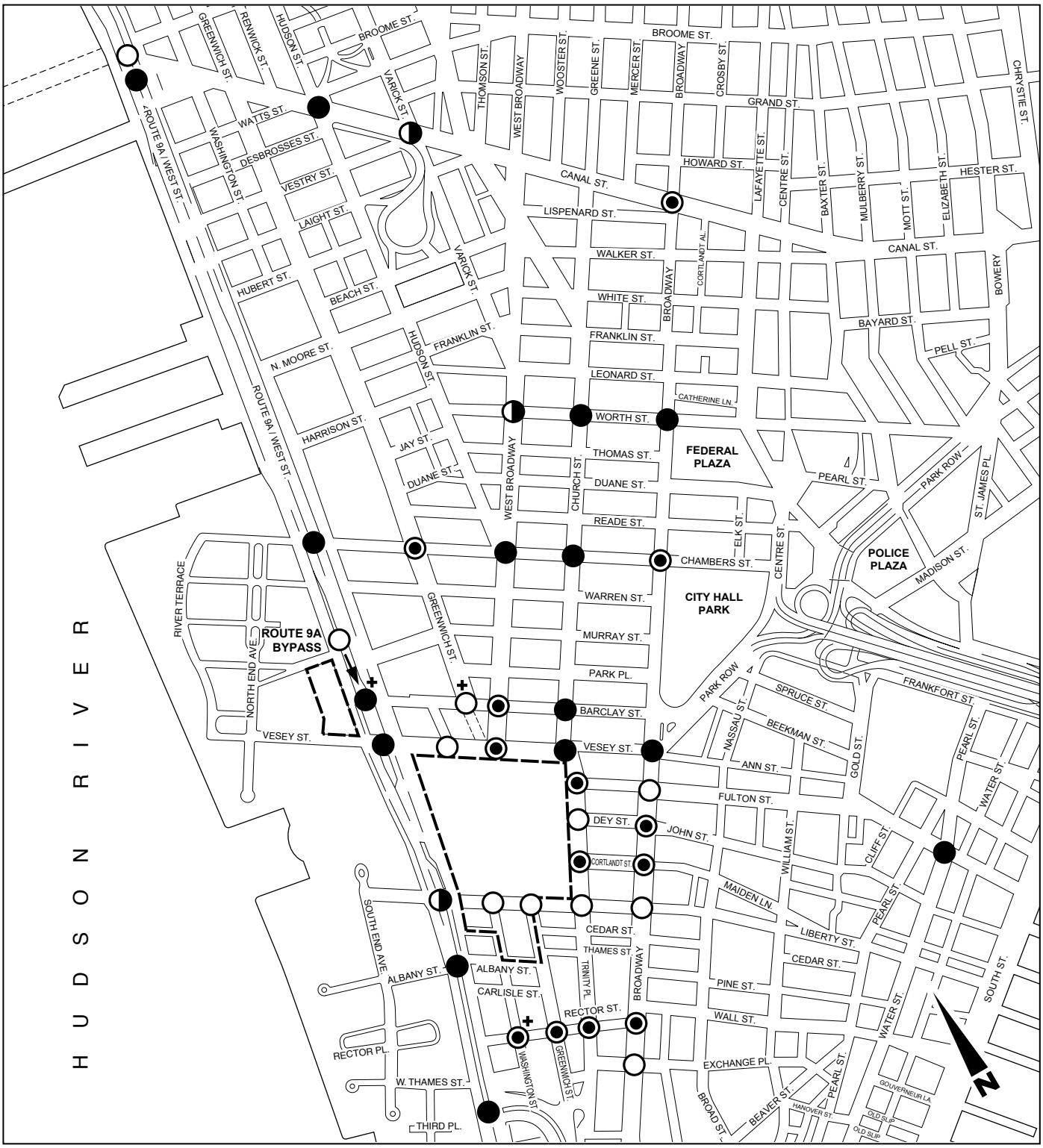
Broadway traffic volumes can be expected to increase by about 130 vph southbound in the AM peak hour near Chambers Street, by about 110 vph in the midday peak hour, and by about 80 vph southbound in the PM peak hour.

Church Street traffic volumes can be expected to increase by about 300 vph northbound in the AM peak hour near Vesey Street, and by about 330-335 vph in the midday and PM peak hours.

Detailed traffic volumes for each intersection in the traffic study area are provided in *Appendix E.1.*

Based on these traffic volumes and expected traffic lane configurations, future No Action traffic levels of service were determined for the traffic analysis locations within the study area. A summary of findings, comparing Current 2003 Conditions with future 2015 No Action conditions, is provided in Table 13A-9. An illustrative overview of overall intersection levels of service are presented in Figures 13A-13 through 13A-15.

In the AM peak hour, the number of analysis locations operating at overall LOS E or F is projected to increase from two under Current 2003 Conditions to 14 under future 2015 No Action conditions. Three other intersections would operate at overall LOS D. The number of specific traffic movements expected to operate at LOS E or F is projected to increase from 14 under Current 2003 Conditions to 44 under the 2015 No Action condition.



Project Site Boundary

Unsignalized Intersection

LOS A or B

LOS C

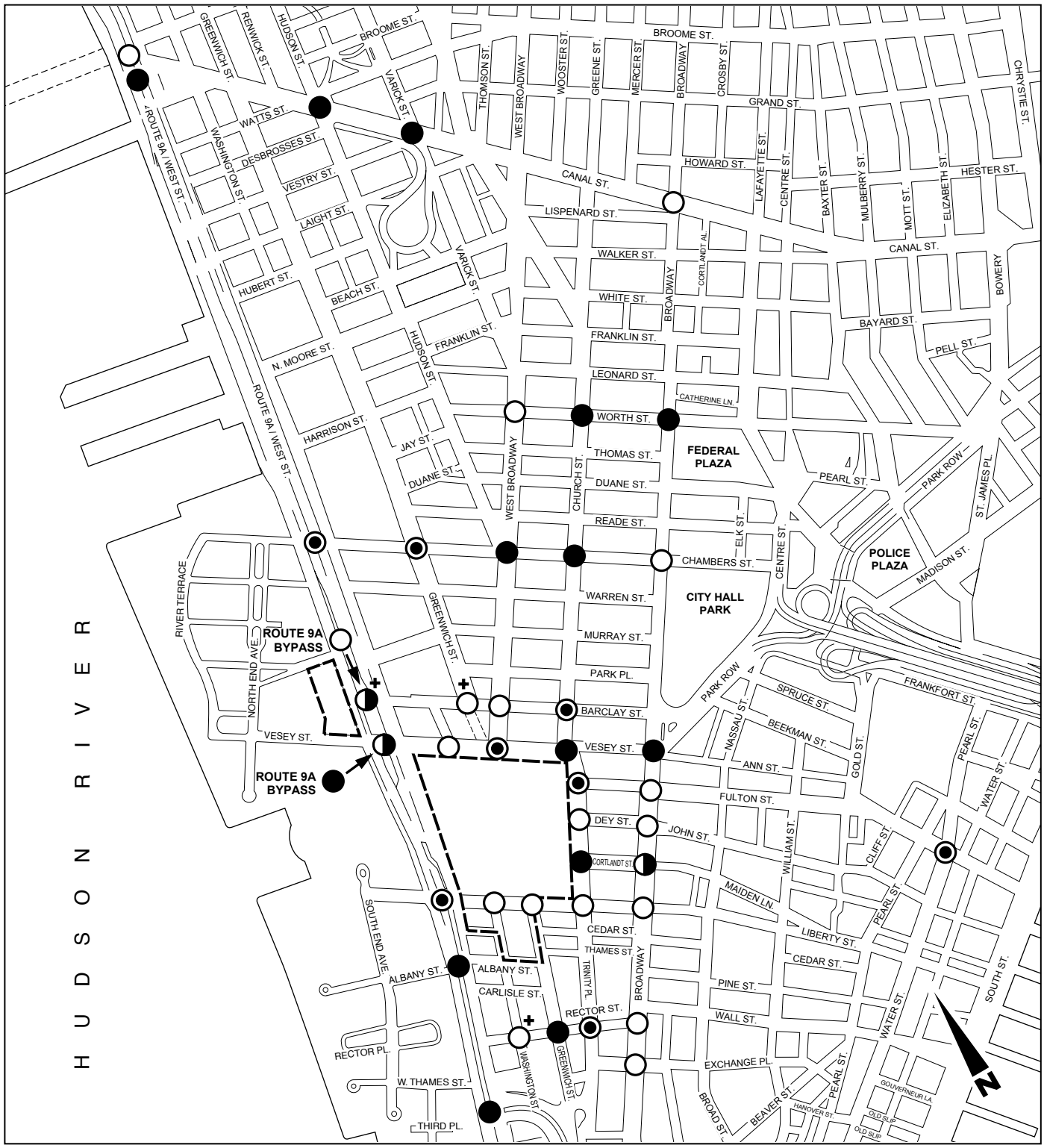
LOS D

LOS E or F

Note: Overall intersection LOS is shown for signalized intersections

Traffic Levels of Service
2015 No Action Conditions
Current Conditions Scenario
with Route 9A At-Grade
AM Peak Hour

Figure 13A-13



Project Site Boundary

LOS A or B

LOS C

LOS D

LOS E or F

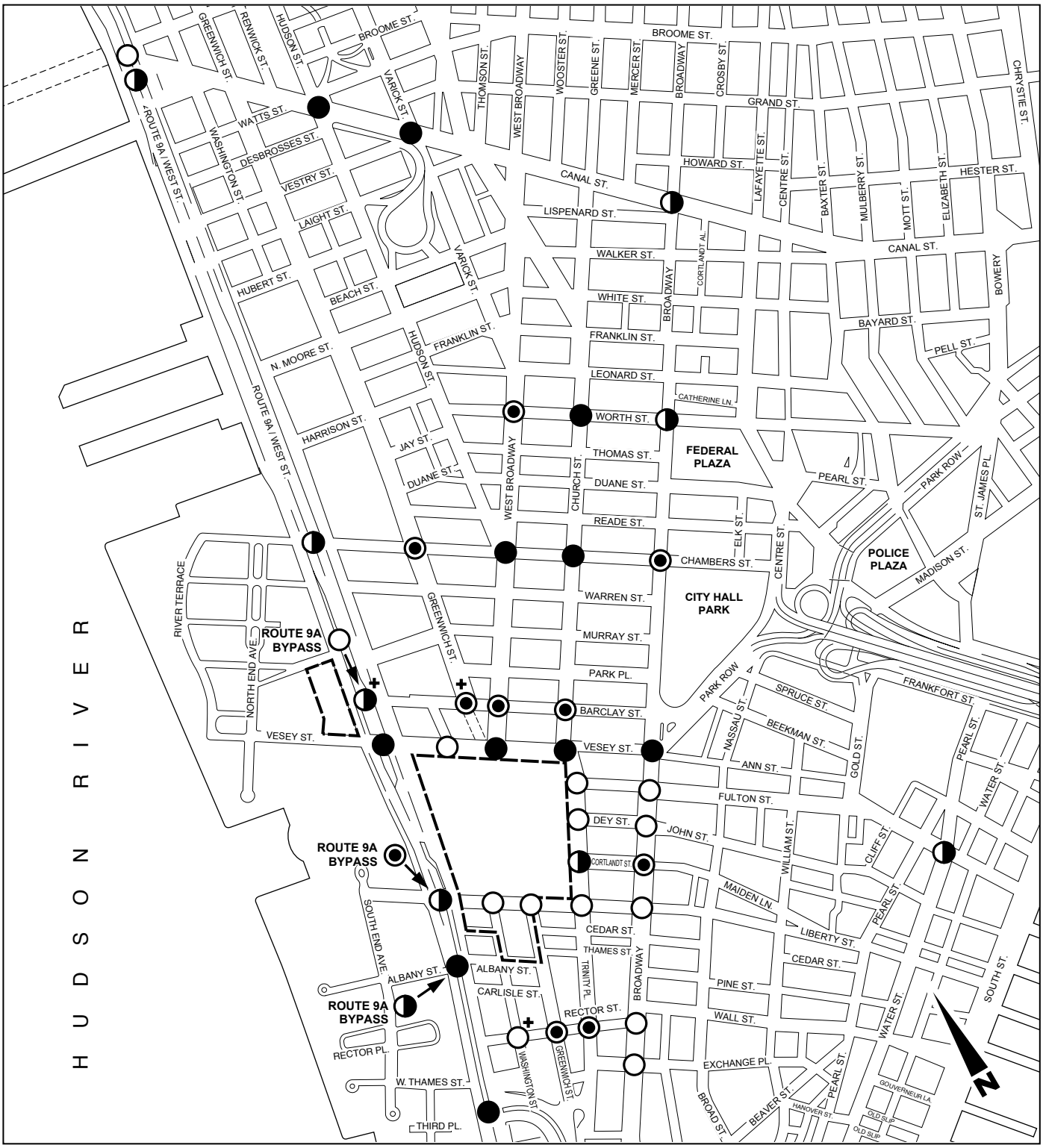
+ Unsignalized Intersection

Note: Overall intersection LOS is shown for signalized intersections

Traffic Levels of Service
2015 No Action Conditions
Current Conditions Scenario
with Route 9A At-Grade
Midday Peak Hour

Figure 13A-14

12-03



Project Site Boundary

LOS A or B

LOS C

LOS D

LOS E or F

+ Unsignalized Intersection

Note: Overall intersection LOS is shown for signalized intersections

Traffic Levels of Service
2015 No Action Conditions
Current Conditions Scenario
with Route 9A At-Grade
PM Peak Hour

Figure 13A-15

Table 13A-9
Traffic Level of Service Summary Comparison
Existing vs. Future No Action Conditions (2015)
Current Conditions Scenario with at-Grade Route 9A

Signalized Intersections	Existing AM	Existing Midday	Existing PM	2015 No Action AM	2015 No Action MD	2015 No Action PM
Overall LOS A/B	15	23	18	9	15	12
Overall LOS C	11	4	7	12	8	8
Overall LOS D	5	5	6	3	2	7
Overall LOS E/F	2	1	2	14	13	11
No. of movements at LOS E or F	14	14	11	44	37	33

In the midday peak hour, the number of analysis locations operating at overall LOS E or F is projected to increase from one under Current 2003 Conditions to 13 under future 2015 No Action conditions. Two other intersections would operate at overall LOS D. The number of specific traffic movements expected to operate at LOS E or F is projected to increase from 14 under Current 2003 Conditions to 37 under the 2015 No Action condition.

In the PM peak hour, the number of analysis locations operating at overall LOS E or F is projected to increase from two under Current 2003 Conditions to 11 under future 2015 No Action conditions. Seven other intersections would operate at overall LOS D. The number of specific traffic movements expected to operate at LOS E or F is projected to increase from 11 under Current 2003 Conditions to 33 under the 2015 No Action condition.

A review of the projected conditions for all three time periods, as illustrated in Figures 13A-13 through 13A-15, indicates that several intersections can be expected to operate at overall unacceptable LOSs during at least two, if not all three, traffic analysis peak hours in addition to those defined in the year 2009 No Action analyses: Route 9A at Canal Street; Canal Street and Varick Street; and Chambers Street at West Broadway and at Church Street. Other intersections would have specific traffic movements at LOS E or F during multiple time periods.

Traffic Volumes and Levels of Service with Route 9A Short Bypass Tunnel

Traffic volume projections and analyses were conducted for a background condition including the proposed reconstruction of Route 9A with a short bypass tunnel section, as described above for year 2009 conditions. The traffic level of service analyses were again conducted for a sample set of potentially key intersections along the Route 9A corridor, and show that there would be the following significant differences from the analyses conducted with the at-grade design: At Route 9A/Vesey Street, the overall intersection would operate at LOS E in the midday and PM peak hours with the bypass tunnel design, and at LOS D in the midday and LOS F in the PM with the at-grade design; at Route 9A/Liberty Street, the overall intersection would operate at LOS C in the PM peak hour with the bypass tunnel design, and at LOS D with the at-grade design. There would be significant overall improvements at Route 9A/Barclay Street in the AM, midday, and PM peak hours and at Route 9A/Albany Street in the PM peak hour (see Figures 13A-13 through 13A-15). There would be differences in levels of service by specific traffic movement.

NO ACTION 2015 PARKING CONDITIONS

An analysis of projected areawide parking lot and garage occupancy levels under the 2015 development and traffic growth *projection* shows that that they would increase from about 47 percent utilization in the AM peak hour and 64 percent in the midday peak currently, and from 53 percent and 73 percent, respectively, in the morning and midday periods in 2003, to about 54 percent and 75 percent, respectively, for year 2015 No Action conditions.

13A.4.5 PROBABLE IMPACTS OF THE PROPOSED ACTION 2015—CURRENT CONDITIONS SCENARIO

TRIP GENERATION AND MODAL SPLIT

The trip generation rates and modal splits used in the analyses are described in section 13A.4.3, "Probable Impacts of the Proposed Action 2009—Current Conditions Scenario," and are the same for year 2015. Between 2009 and 2015, two additional elements of the proposed development program would be built—7.4 million square feet of office space and the 800-room hotel with 150,000 square feet of conference space—and add more traffic to the area's streets, as described below.

Office Space

In 2015, the additional 7.4 million square feet of offices uses are projected to result in an additional 1,313 vehicle trips in the AM peak hour, 1,273 vehicle trips in the midday peak hour, and 989 vehicle trips in the PM peak hour. Total office-generated vehicle trips are shown in Table 13A-10.

Hotel

The Proposed Action would include an 800-room hotel and 150,000 square feet of conference function space by 2015. Trips expected to be generated by the hotel use were estimated based on a weekday daily trip rate of 12.8 person-trips per room, from the *BPC FEIS*. The modal split, temporal distribution, and vehicle occupancy were also taken from that source, which presents rates based on surveys conducted at the former Vista Hotel at the WTC. Four percent of vehicle trips to and from the site would be by auto, and 6 percent would be by taxi.

The Proposed Action includes the development of 150,000 square feet of conference function space associated with hotel use. Trips generated by conference facilities were estimated based on person-trip, modal split, and vehicle occupancy data presented in the *Coliseum Site Redevelopment FSEIS*. Of these total daily trips, 10 person-trips per 1,000 square feet were estimated to be employee trips. The modal split rates were adjusted to reflect the Proposed Action's location. For employees, auto plus taxi trips would be 4 to 5 percent; for visitors, 7 percent auto use and 6 percent taxi use were used. A linkage rate of 25 percent was estimated to account for trips coming from other uses within the Project Site, such as office employees that would use the conference space. Temporal distribution was assumed to be the same as office uses during the AM, midday, and PM peak hours.

Based on these rates, in 2015, the proposed hotel and conference space uses are projected to result in 104 vehicle trips in the AM peak hour, 149 vehicle trips in the midday peak hour, and 120 vehicle trips in the PM peak hour.

Table 13A-10
Vehicle Trips Generated by the Proposed WTC Development Program (2015)

	Autos		Taxis		Tour Buses		Trucks		Total	
	In	Out	In	Out	In	Out	In	Out	In	Out
Weekday AM Peak Hour										
Office	555	23	454	454	NA	NA	144	144	1,153	621
Retail	76	51	85	85	NA	NA	24	24	185	160
Hotel	21	13	30	30	NA	NA	5	5	56	48
Performance Space	0	0	0	0	NA	NA	0	0	0	0
Memorial, *Memorial Center*, Viewing Platforms[1]	36	0	122	122	8	0	1	1	167	123
Cultural Facilities	6	0	5	5	0	0	2	2	13	7
Restaurant/Cafes	1	0	1	1	NA	NA	11	11	13	12
Total	**695**	**87**	**697**	**697**	**8**	**0**	**187**	**187**	**1,587**	**971**
Weekday Midday Peak Hour										
Office	350	286	377	377	NA	NA	165	165	892	828
Retail	64	61	81	81	NA	NA	24	24	169	166
Hotel	30	27	40	40	NA	NA	6	6	76	73
Performance Space	63	0	55	55	NA	NA	1	1	119	56
Memorial, *Memorial Center*, Viewing Platforms[1]	30	26	115	115	33	13	1	1	179	155
Cultural Facilities	15	14	51	51	3	3	2	2	71	70
Restaurant/Cafes	11	11	6	6	NA	NA	8	8	25	25
Total	**563**	**425**	**725**	**725**	**36**	**16**	**207**	**207**	**1,531**	**1,373**
Weekday PM Peak Hour										
Office	26	482	399	399	NA	NA	15	15	440	896
Retail	34	51	56	56	NA	NA	19	19	109	126
Hotel	24	22	37	37	NA	NA	0	0	61	59
Performance Space	0	63	55	55	NA	NA	0	0	55	118
Memorial, *Memorial Center*, Viewing Platforms[1]	46	39	174	174	9	20	1	1	230	234
Cultural Facilities	19	22	74	74	5	4	2	2	100	102
Restaurant/Cafes	5	6	3	3	NA	NA	6	6	14	15
Total	**154**	**685**	**798**	**798**	**14**	**24**	**43**	**43**	**1,009**	**1,550**

Note: [1] Based on 5.5 million annual visitors in the stabilized year condition.

Total Proposed World Trade Center Development Program (2015)

Overall, full build-out of the Proposed Action (including trips generated by uses proposed for both 2009 and 2015) is estimated to result in the following volume of vehicle trips: 2,558 vehicle trips in the AM peak hour, 2,904 vehicle trips in the midday peak hour, and 2,559 vehicle trips in

the PM peak hour. A summary tabulation of the volume of vehicular trips generated in 2015 for the full build-out of the overall development program, respectively, is provided in Table 13A-10.

TRIP DISTRIBUTION AND ASSIGNMENT TO THE ROADWAY NETWORK

Vehicular traffic expected to be generated by the Proposed Action was assigned to the roadway network as was described for the interim build-out condition in 2009. This included vehicular traffic that would be generated by the additional 7.4 million square feet of office space that would be developed between 2009 and 2015, as well as the hotel and conference center space. For the hotel- and conference center-generated space, it was assumed that about 30 percent of auto trips would be Manhattan-based, while an additional 30 percent each would originate from Queens and New Jersey due, in part, to airport trips, and the remaining 10 percent were assumed to originate from Brooklyn. Taxi trips were assumed to have the same trip distributions. All other generated traffic would utilize the roadway network as detailed under year 2009 Build conditions.

PROJECTED TRAFFIC VOLUMES AND LEVELS OF SERVICE

Traffic Volumes and Levels of Service with at-Grade Route 9A Arterial

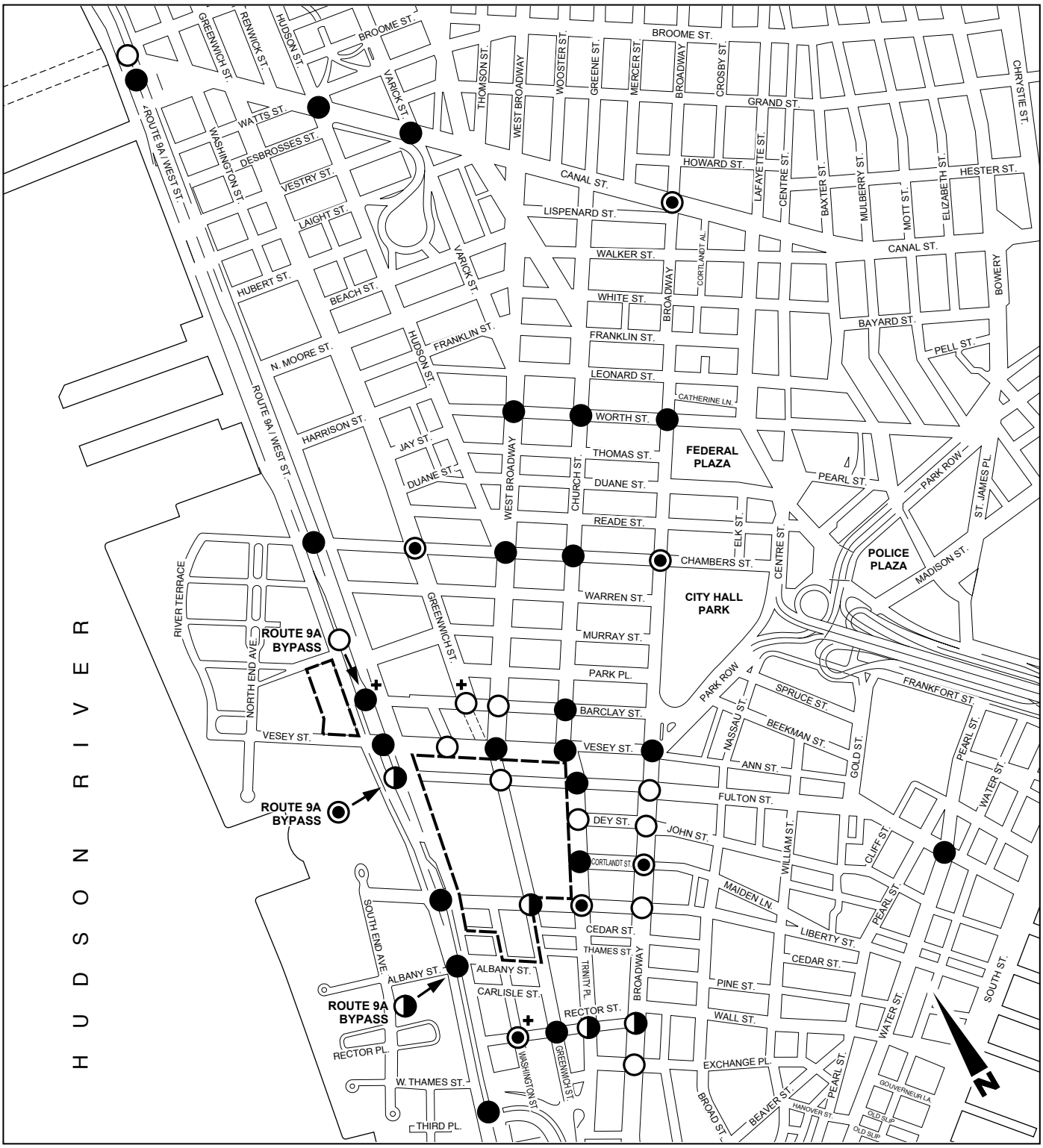
Projected traffic volume increases were again determined for each of the streets and intersections in the traffic study area. An overview of these increases is provided below, while intersection-by-intersection volumes are detailed in *Appendix E.1*.

Route 9A traffic volumes can be expected to increase by an additional 160 vph northbound and 300 vph southbound near Vesey Street in the AM peak hour between 2009 and 2015 due to traffic generated by the Proposed Action, by an additional 125 vph northbound and 275 vph southbound at midday, and by an additional 100 vph northbound and southbound in the PM peak hour. Overall, projected Build volumes in 2015 are thus expected to be about 15 to 25 percent higher than No Action volumes in 2015.

West Broadway traffic volumes are projected to increase by about 20 to 25 vph in the AM and PM peak hours at Chambers Street, and by about 45 vph at midday, between 2009 and 2015 due to Proposed Action-generated traffic. Overall, projected Build volumes in 2015 are thus expected to be about 5 percent higher than No Action volumes in 2015.

Greenwich Street traffic volumes are projected to increase by about 30 vph in the AM peak hour at Chambers Street, 15 vph in the midday peak hour, and 5 vph in the PM peak hour as a result of generated traffic by the Proposed Action between 2009 and 2015. Overall, projected Build volumes in 2015 are thus expected to be about 20 percent higher as compared with 2015 No Action volumes in the AM peak hour, 15 percent higher at midday, and only 5 percent higher in the PM peak hour.

Broadway traffic volumes are projected to increase by about 40 vph in the AM peak hour at Chambers Street, 30 vph at midday, and 20 vph in the PM peak hour due to traffic generated by the Proposed Action between 2009 and 2015. Overall, projected Build volumes on Broadway would be about 10 percent higher than No Action volumes in 2015 at this location.



Project Site Boundary

Unsignalized Intersection

LOS A or B

LOS C

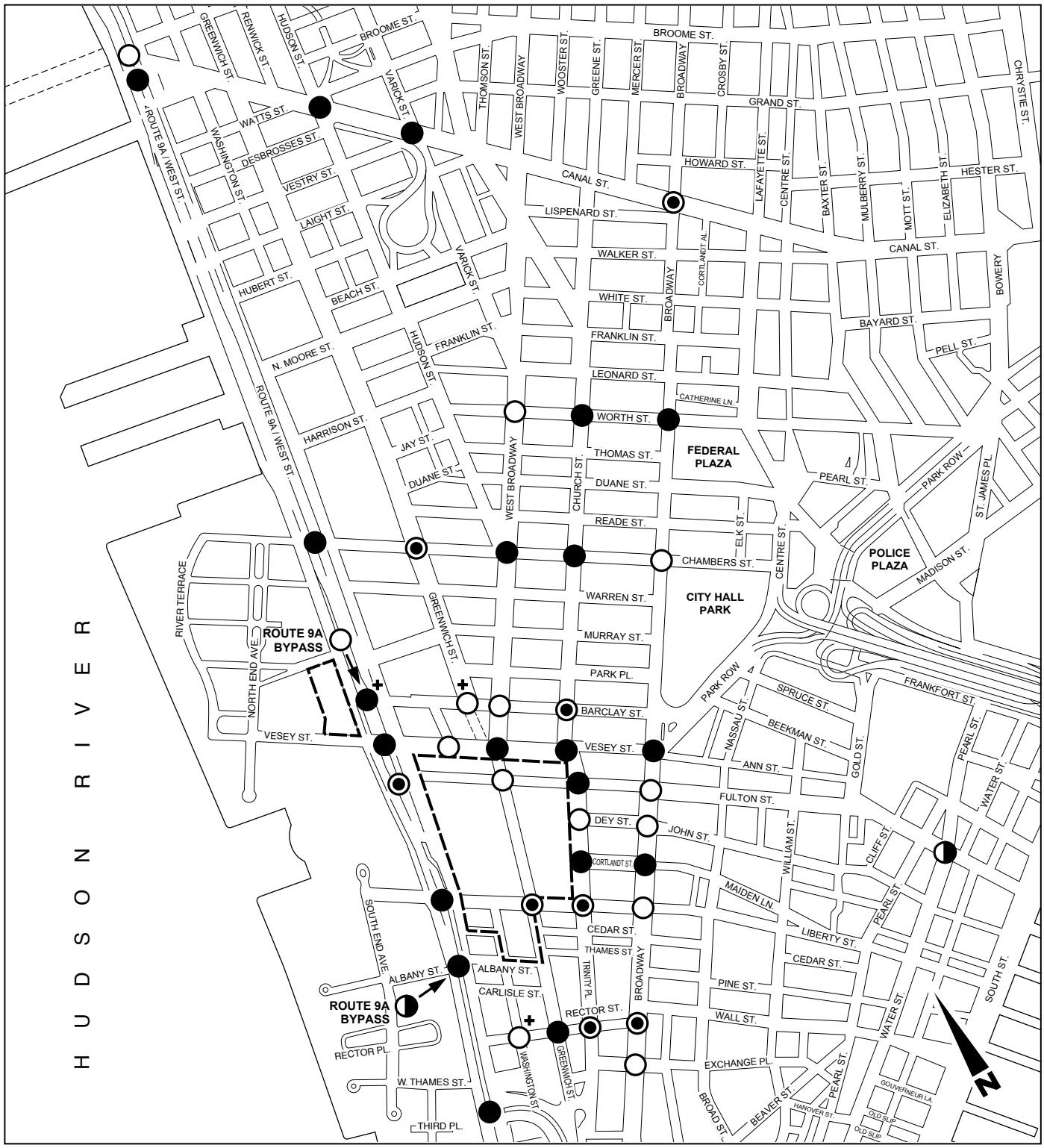
LOS D

LOS E or F

Note: Overall intersection LOS is shown for signalized intersections

Traffic Levels of Service
2015 Build Conditions
Current Conditions Scenario
with Route 9A At-Grade
AM Peak Hour

Figure 13A-16



Project Site Boundary

Unsignalized Intersection

LOS A or B

LOS C

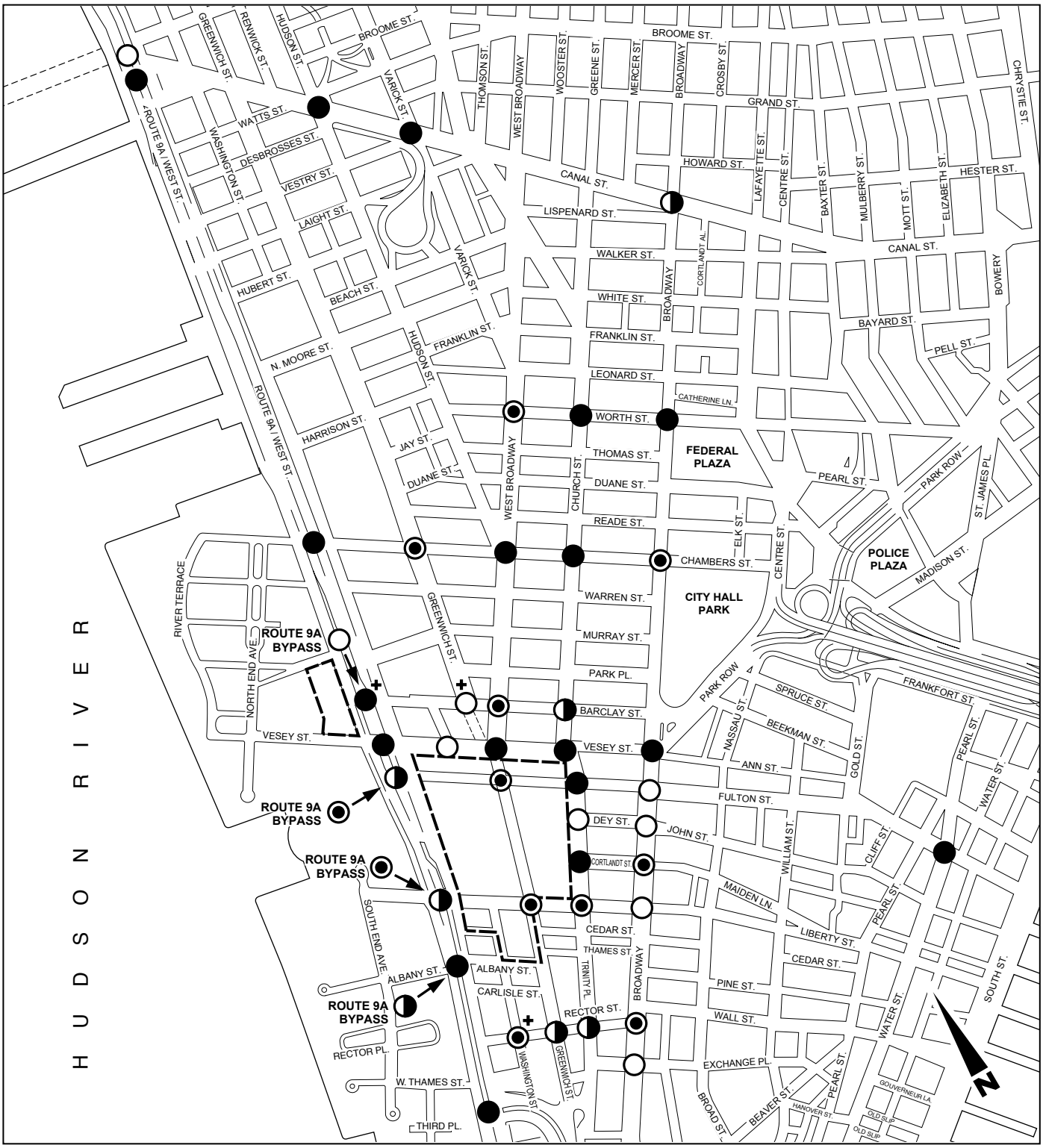
LOS D

LOS E or F

Note: Overall intersection LOS is shown for signalized intersections

Traffic Levels of Service
2015 Build Conditions
Current Conditions Scenario
with Route 9A At-Grade
Midday Peak Hour

Figure 13A-17



Project Site Boundary

Unsignalized Intersection

Note: Overall intersection LOS is shown for signalized intersections

LOS A or B

LOS C

LOS D

LOS E or F

Traffic Levels of Service
2015 Build Conditions
Current Conditions Scenario
with Route 9A At-Grade
PM Peak Hour

Figure 13A-18

Church Street traffic volumes are projected to increase by about 85 vph in the AM peak hour at Chambers Street, and by about 120 to 150 vph in the midday and PM peak hours due to traffic generated by the Proposed Action between 2009 and 2015. Overall, projected 2015 Build volumes on Church Street would be about 10 to 15 percent higher than 2015 No Action volumes in the AM peak hour, and 15 to 20 percent higher than 2015 No Action volumes in the midday and PM peak hours.

Future traffic levels of service in 2015 with the Proposed Action were determined, and a summary of findings comparing future conditions with and without the Proposed Action is provided in Table 13A-11. An illustrative overview of overall intersection levels of services is presented in Figures 13A-16 through 13A-18.

Table 13A-11
Traffic Level of Service Summary Comparison
Future No Action vs. Future Build Conditions (2015)
Current Conditions Scenario with at-Grade Route 9A

Signalized Intersections	2015 No Action AM	2015 No Action Midday	2015 No Action PM	2015 Build AM	2015 Build MD	2015 Build PM
Overall LOS A/B	9	15	12	9	11	7
Overall LOS C	12	8	8	5	8	9
Overall LOS D	3	2	7	4	1	6
Overall LOS E/F	14	13	11	21	19	17
No. of movements at LOS E or F	44	37	33	56	51	43

In the AM peak hour, the number of analysis locations operating at overall LOS E or F is projected to increase from 14 under future 2015 No Action conditions under the Current Conditions Scenario to 21 with the Proposed Action. Four other intersections would operate at overall LOS D. The number of specific traffic movements expected to operate at LOS E or F is projected to increase from 44 to 56.

In the midday peak hour, the number of analysis locations operating at overall LOS E or F is projected to increase from 13 under future 2015 No Action conditions under the Current Conditions Scenario to 19 with the Proposed Action. One other intersection would operate at overall LOS D. The number of specific traffic movements expected to operate at LOS E or F is projected to increase from 37 to 51.

In the PM peak hour, the number of analysis locations operating at overall LOS E or F is projected to increase from 11 under future 2015 No Action conditions under the Current Conditions Scenario to 17 with the Proposed Action. Six other intersections would operate at overall LOS D. The number of specific traffic movements expected to operate at LOS E or F is projected to increase from 33 to 43.

A review of projected conditions for all three time periods, as shown in Figures 13A-16 through 13A-18, indicates that there would be several locations characterized by overall unacceptable levels of service in all three peak traffic analysis hours. These locations would include: Route 9A at Canal Street, Chambers Street, Vesey Street, Albany Street, and the entrance to the Brooklyn Battery Tunnel, while the Route 9A/Liberty Street intersection would have overall unacceptable levels of service during two of the three traffic analysis hours; Canal Street at Hudson Street and

at Varick Street; Vesey Street at Greenwich Street/West Broadway, at Church Street, and at Broadway; Chambers Street at West Broadway and at Church Street; Worth Street at Church Street and at Broadway; and, Church Street at Fulton Street and at Broadway. The intersections of Greenwich Street/Rector Street and Water Street/Fulton Street would be characterized by overall unacceptable levels of service during two of the three peak traffic analysis hours. Other intersections would have specific traffic movements at LOS E or F.

Significant traffic impacts for year 2015 conditions with the Proposed Action are identified compared with 2015 No Action conditions under the pre-September 11 baseline; as noted in the Methodology section of this chapter, significant impacts have been defined as significant changes in traffic delay compared with conditions that would have been expected in 2015 had the WTC complex not been destroyed. Significant traffic impacts are thus identified at the end of this chapter, after the future baseline conditions under the Pre-September 11 Scenario have been presented.

Traffic Volumes and Levels of Service with Route 9A Short Bypass Tunnel

Traffic levels of service at the intersections analyzed for the short bypass tunnel design indicate that the unsignalized intersection of Route 9A and Barclay Street would operate at LOS B for the critical stop-controlled Barclay Street movement in all three peak traffic analysis hours, whereas this traffic movement would be characterized by LOS F in the AM peak hour and by LOS E in the midday and PM peak hours under the at-grade design. Also, traffic conditions would vary appreciably between the two alternative Route 9A configurations movement-by-movement at the intersection of Route 9A and Vesey Street. Overall intersection delays would be appreciably higher in the AM and midday peak hours with the bypass tunnel alternative, with generally comparable delays for the overall intersection in the PM peak hour (with appreciable differences movement by movement), except during the PM peak hour. Other level of service changes are shown in Figures 13A-16 through 13A-18.

PROJECTED 2015 PARKING CONDITIONS

The proposed parking garage with 1,200-1,400 spaces to be constructed as part of the Proposed Action would be available to office tenants only in 2015 as was noted for year 2009 conditions, and not to the general public. It would operate well under its capacity in year 2015 with full build-out of the office space anticipated under the Proposed Action, even if the office towers had city, state, regional, or federal agency tenants with needs to park agency fleets overnight, as it did prior to the events of September 11. The maximum parking demand accumulation from just office tenant vehicles is expected to be approximately 30 to 40 percent of the garage's capacity. With agency vehicles included for daytime and overnight parking, occupancy could increase to approximately 40 to 65 percent. *All delivery vehicle activities would occur under the Project Site within the underground garage, so demands for on-street curb utilization would be substantially lower than would typically be expected.*

13A.5 PRE-SEPTEMBER 11 SCENARIO

13A.5.1 BASELINE CONDITIONS

PRE-SEPTEMBER 11 TRAFFIC VOLUMES

Pre-September 11 weekday AM, midday, and PM peak hour traffic volumes were assembled from a variety of sources for several Lower Manhattan transportation projects, including the

MTA's proposed Fulton Street Transit Center, NYCDOT's Route 9A Project, and the Port Authority's permanent WTC PATH Terminal. An overview of general traffic volumes on some of the major streets in the area is presented below; detailed volumes are provided in *Appendix E.1*.

Route 9A (West Street)

As is the case today, prior to the events of September 11, 2001, the predominant flow of traffic on Route 9A was northbound in the AM peak period and southbound during the PM peak period. In the AM peak hour, northbound Route 9A carried approximately 3,200 vph at Liberty Street and 2,800 vph at Vesey Street, and about 2,150 vph southbound at Vesey Street and 2,350 vph southbound at Liberty Street. During the midday peak hour, the northbound volume was approximately 2,200 vph at Liberty Street and 2,050 vph at Vesey Street, while southbound volumes were about 1,800 vph at Vesey Street and 2,000 vph at Liberty Street. During the PM peak hour, northbound traffic volumes were generally in the 2,250 to 2,300 vph range at both Vesey and Liberty Streets, while southbound volumes were approximately 2,400 vph at Vesey Street and 2,850 vph at Liberty Street.

Trinity Place/Church Street

Pre-September 11 volumes along northbound Trinity Place/Church Street were approximately 1,250 vph in the AM peak hour at Liberty Street and 1,850 vph at Vesey Street. During the midday peak hour, volumes were about 950 vph at Liberty Street and 1,400 vph at Vesey Street. PM peak hour volumes were about 900 vph at Liberty Street and 1,500 vph at Vesey Street.

Broadway

Pre-September 11 volumes along southbound Broadway were about 1,400 vph at Vesey Street and 1,000 vph at Liberty Street in the AM peak hour. Midday peak hour volumes were 1,200 vph at Vesey Street and 900 vph at Liberty Street. PM peak hour volumes were generally comparable to those in the AM peak hour—1,500 vph at Vesey Street and 850 vph at Liberty Street.

West Broadway

In the AM peak hour, West Broadway traffic volumes pre-September 11 were approximately 900 vph at Chambers Street and 700 vph at Vesey Street. Midday peak hour volume levels were about 700 vph at Chambers Street and 400 vph at Vesey Street. PM peak hour volume levels were about 750 vph at Chambers Street and 650 vph at Vesey Street.

Greenwich Street

Pre-September 11 traffic volumes along Greenwich Street in the vicinity of Chambers Street were about 500 vph southbound at Chambers Street. Volumes farther south at Barclay Street were substantially lower—approximately 50 vph in the AM and PM, and about 200 vph at midday.

Chambers Street

Traffic volumes along two-way Chambers Street were generally in the 500 to 700 vph range during all three peak traffic analysis hours in each direction at Church Street.

Vesey Street

Pre-September 11, Vesey Street operated as a two-way roadway between North End Avenue and Church Street (this segment of Vesey Street is currently closed due to ongoing construction activity at the WTC Site), and operated eastbound only east of Church Street just as it does under current conditions. In the AM peak hour, Vesey Street carried approximately 550 eastbound vehicles approaching Route 9A and about 900 vehicles at Church Street. Westbound Vesey Street carried approximately 400 vph approaching Route 9A. At midday, eastbound volumes were about 350 vph approaching Route 9A and 500 vph at Church Street. Westbound volumes were about 400 vph at Route 9A. During the PM peak hour, eastbound volumes were about 500 vph approaching Route 9A and 350 vph at Church Street; westbound volumes were approximately 450 vph at Route 9A.

PRE-SEPTEMBER 11 LEVELS OF SERVICE

Table 13A-12 provides an overview of the levels of service that characterized the traffic study area during the AM, midday, and PM peak hours on a typical weekday, pre-September 11. Table 13A-12 provides the traffic levels of service for the "overall intersection" as well as the number of specific traffic movements that operated at congested LOS E or F; Figures 13A-19 through 13A-21 present these overall levels of service illustratively. There are more intersections analyzed here under Pre-September 11 conditions than under post-September 11 (current) conditions since several intersections that are currently closed due to ongoing construction at the WTC Site, were previously open to traffic.

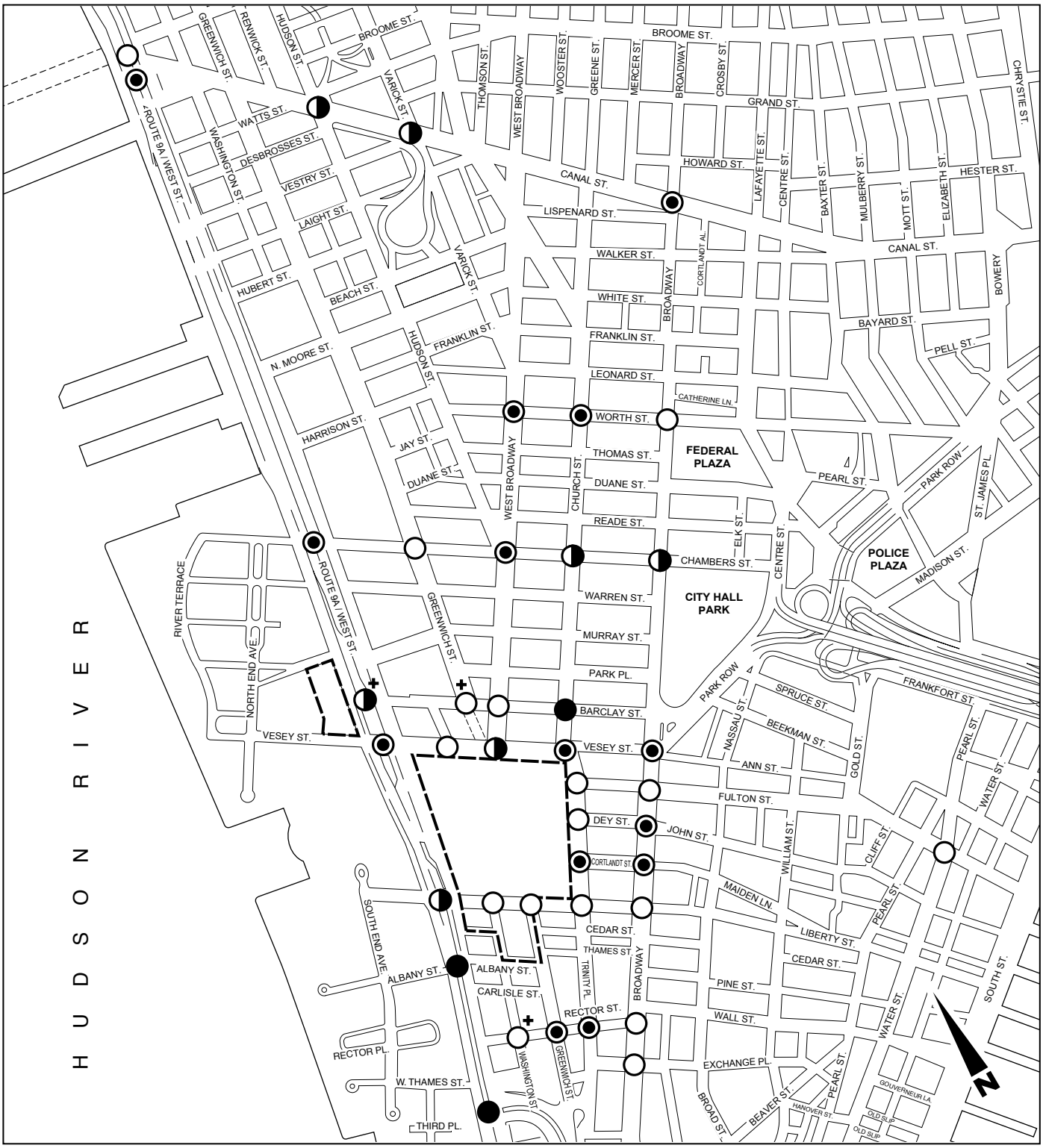
Table 13A-12
Pre-September 11 Traffic Level of Service Summary

Signalized Intersections	Existing AM	Existing Midday	Existing PM
Overall LOS A/B	15	25	19
Overall LOS C	14	6	10
Overall LOS D	6	6	4
Overall LOS E/F	3	1	5
No. of movements at LOS E or F	22	15	23

This summary overview indicates that:

- In the AM peak hour, three of the 38 signalized intersections analyzed operated at overall unacceptable LOS E or F, and six other intersections operated at marginally acceptable/unacceptable LOS D. Twenty-two traffic movements (e.g., left turns from one street to another, through traffic on one street passing through the intersection, etc.) were at LOS E or F conditions.
- In the midday peak hour, one of the 38 signalized intersections operated at overall LOS E or F, while six were at overall LOS D; 15 traffic movements operated at LOS E or F.
- In the PM peak hour, five of the 38 signalized intersections were at overall LOS E or F, and four others were at overall LOS D; 23 traffic movements were at LOS E or F.

Also, one of the three unsignalized intersections analyzed operated with a traffic movement at LOS D during the AM, midday, and PM peak analysis hours. Figures 13A-19 through 13A-21 illustrate the overall intersection LOSs within the traffic study area. A detailed presentation of levels of service is provided in the *Appendix E.2.*



Project Site Boundary

Unsignalized Intersection

LOS A or B

LOS C

LOS D

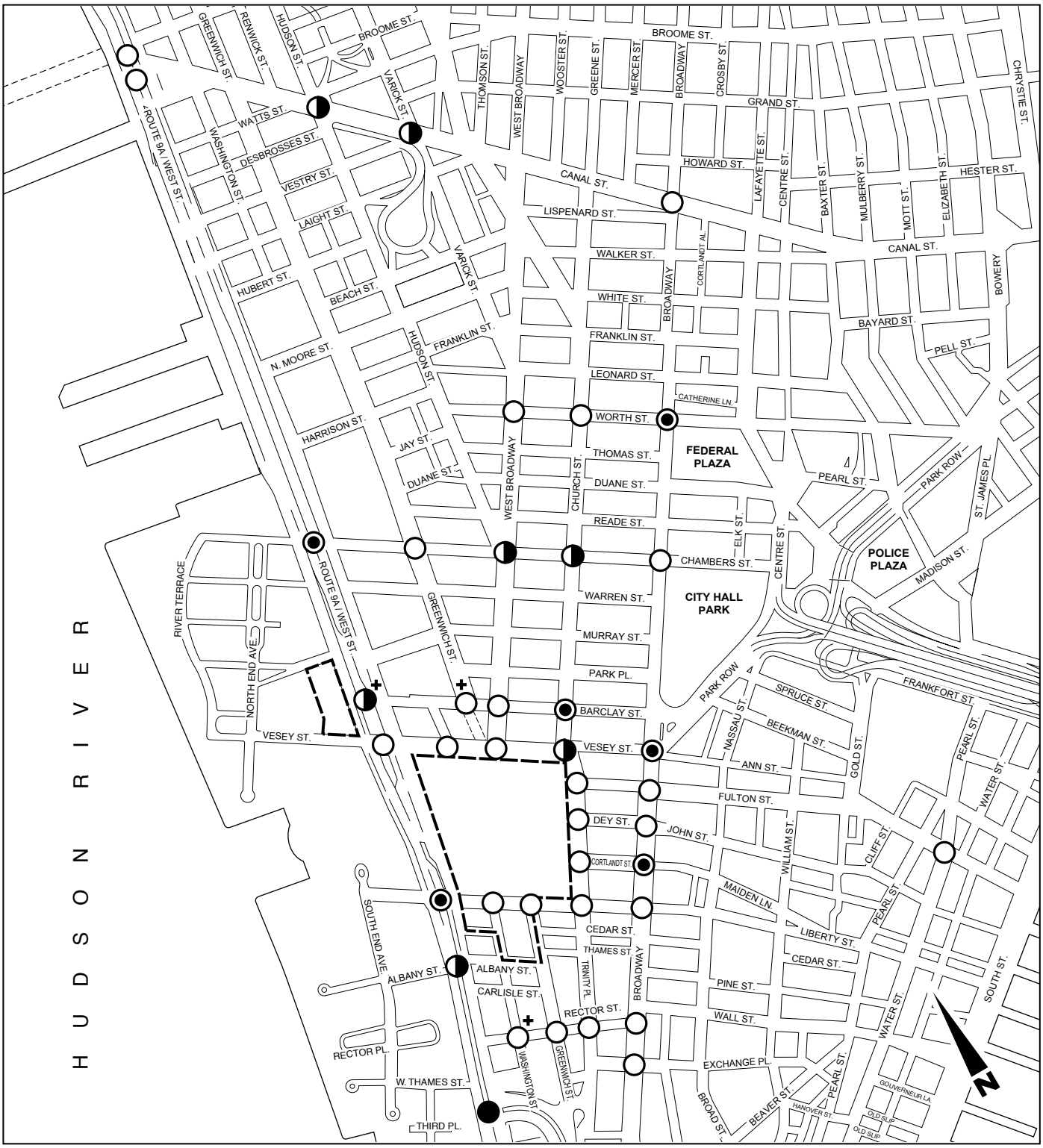
LOS E or F

Note: Overall intersection LOS is shown for signalized intersections

Traffic Levels of Service
Pre-September 11 Existing Conditions
AM Peak Hour

Figure 13A-19

World Trade Center Memorial
and Redevelopment Plan



Project Site Boundary

Unsignalized Intersection

Note: Overall intersection LOS is shown for signalized intersections

LOS A or B

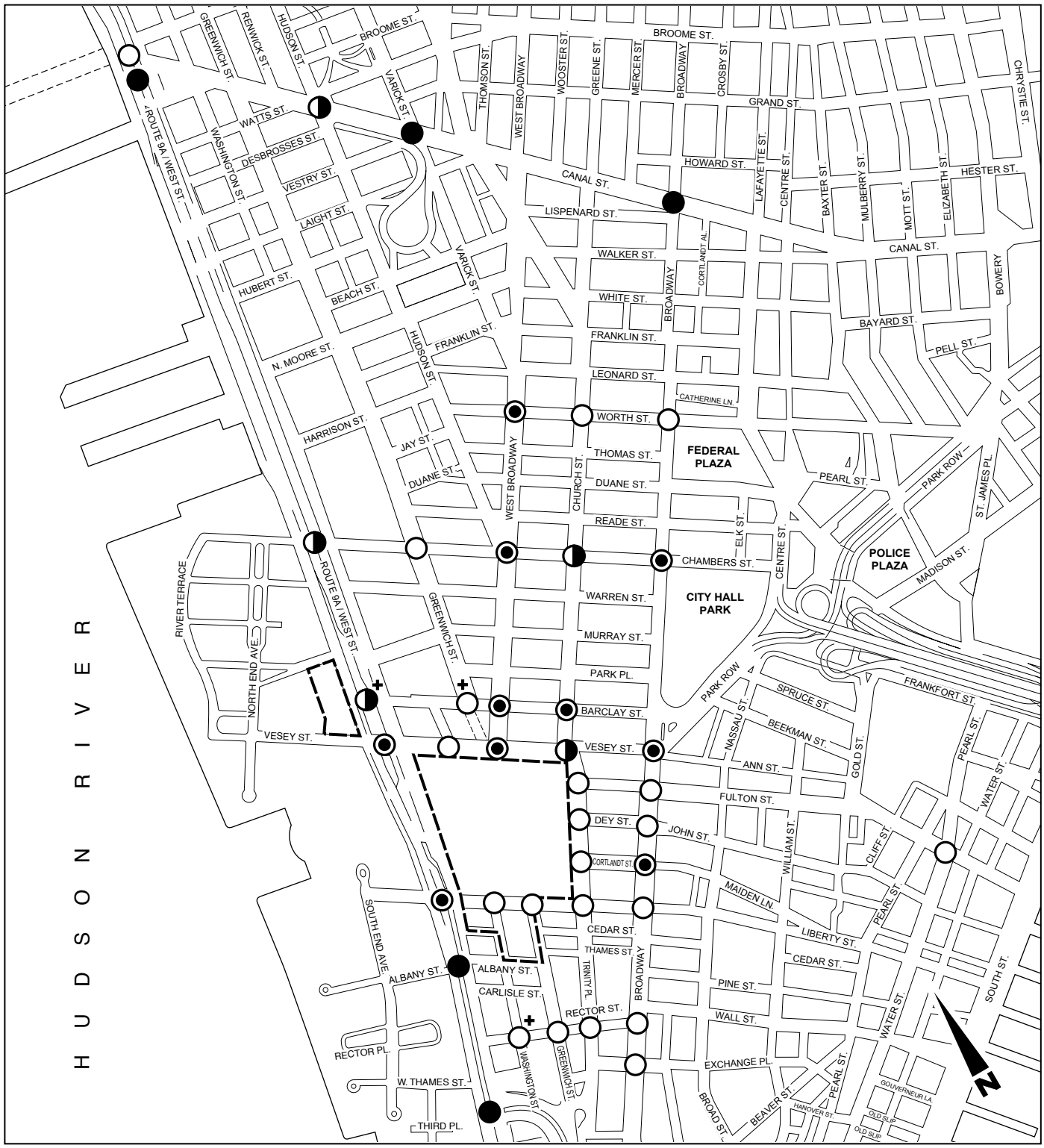
LOS C

LOS D

LOS E or F

Traffic Levels of Service
Pre-September 11 Existing Conditions
Midday Peak Hour

Figure 13A-20



Project Site Boundary

+ Unsignalized Intersection

LOS A or B

LOS C

LOS D

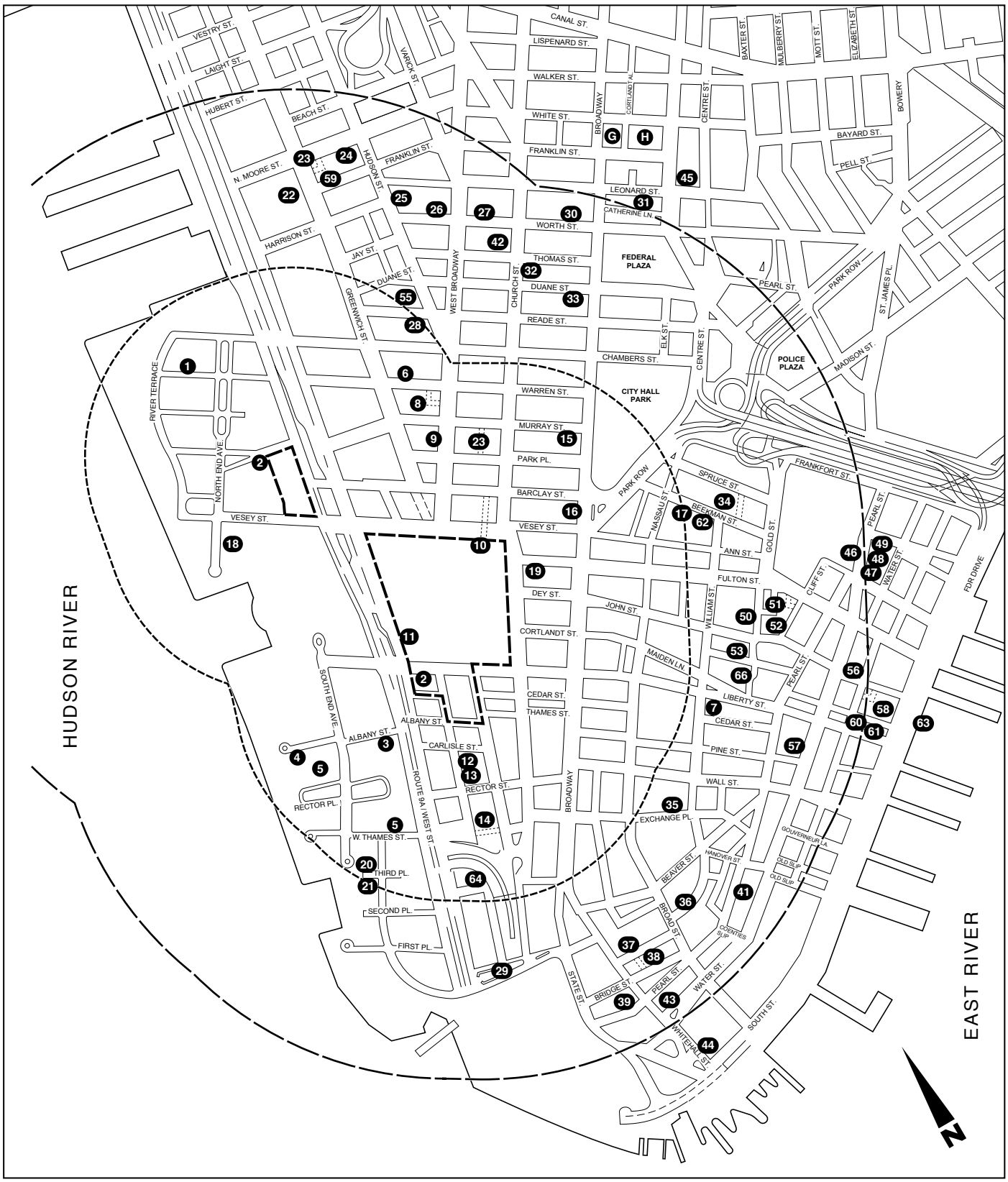
LOS E or F

Note: Overall intersection LOS is shown for signalized intersections

Traffic Levels of Service
Pre-September 11 Existing Conditions
PM Peak Hour

Figure 13A-21

World Trade Center Memorial
and Redevelopment Plan



Project Site Boundary

1/2-Mile Perimeter

1/4-Mile Perimeter

❶ Pre-9/11 Off-Street Public Parking Facility

Pre 9/11 Off-Street Public Parking Facilities

World Trade Center Memorial
and Redevelopment Plan

Figure 13A-22

PRE-SEPTEMBER 11 PARKING INVENTORY AND UTILIZATION

The LMDC study conducted by Beyer Blinder Belle Architects and Planners LLP and Parsons Brinckerhhoff Quade and Douglas, Inc. in 2002 also collected data from a number of previously published reports and from the New York City Department of Transportation (NYCDOT) on pre-September 11 parking conditions. The information presented in the following section was for the most part assembled from this report.

Off-Street Parking Facilities

Prior to September 11, there were 20 identified off-street parking facilities within a ¼ mile of the WTC Site and an additional 46 facilities between ¼ and ½ mile from the site. This public parking facility inventory is provided in Tables 13A-13 and 13A-14. Table 13A-13 lists those facilities that are within a ¼ mile of the site, while Table 13A-14 lists facilities between ¼ and ½ mile from the site. Figure 13A-22 depicts the location of each of the identified public parking facilities, distinguishing between public parking facilities that were a ¼ mile or less from the WTC Site and those that were a ¼ to ½ mile from the site.

Parking facility occupancy data was available for midday (between 11:30 AM and 1:30 PM) on a typical weekday. Overall, there are 66 public parking facilities within about a ½ mile of the WTC Site, the majority of which have capacities in the 50- to 150-vehicle range.

As shown in Table 13A-13, the 20 public parking facilities surveyed within a ¼ mile of the WTC Site contained over 7,000 spaces, with an occupancy level of about 86 percent at midday. This means that at midday there were about 1,000 unoccupied spaces available within off-street parking facilities within a ¼ mile of the WTC Site under pre-September 11 conditions.

Table 13A-14 indicates that there were 46 public parking facilities containing over 6,800 spaces approximately ¼ mile to ½ mile from the WTC Site. The occupancy level of these facilities was approximately 90 percent at midday, i.e., there were about an additional 700 unoccupied spaces available at midday.

It should be noted that although over 7,000 parking spaces were available prior to September 11 within a short (¼-mile) walk from the WTC Site, 900 spaces, or 13 percent, were within BPC, which is to the west of Route 9A. This is significant because Route 9A—eight lanes of fast-moving traffic—served as a pedestrian barrier.

On-Street Parking

Data regarding on-street parking regulations was obtained from several previous EISs that were conducted for such facilities as the New York Stock Exchange and the Second Avenue Subway.

Overall, within the ½-mile-radius parking study area, there was an extremely limited number of legal parking spaces available on-street for use by potential new motorists. At 8 to 9 AM, there were over 775 legal parking spaces; at 12 to 1 PM, there were over 1,075 legal parking spaces. Pre-September 11 on-street occupancy data are not available to quantify the percentage of these spaces that were occupied and the percentage that was available then for public use.

13A.5.2 FUTURE WITHOUT THE PROPOSED ACTION 2009— PRE-SEPTEMBER 11 SCENARIO

Future conditions without the Proposed Action, i.e., the future No Action condition, were also established based on the Pre-September 11 Scenario in order to provide the baseline against

Table 13A-13
Inventory of Pre-September 11 Public Parking Facilities
Within ¼ Mile of the WTC Site

Map #	Name/Operator and Address/Location	Licensed Capacity	Midday	
			No. of Occupied Spaces	Percent Utilization
1	Edison 50th Street Pkg. Corp. / West St. (Thames St.)	515	494	96%
2	Kinney Systems, Inc. / 200 Liberty Street	232	174	75%
3	Hudson Tower Garage / 398 Albany Street	49	44	90%
4	Park Place Garage Ltd. / 225 Rector Place	114	108	95%
5	Edison Parking Management / 200 Rector Place	134	134	100%
6	Katz Parking Systems / 86-90 Warren Street	52	52	100%
7	Edison Parking Management / 140-150 Liberty St.	122	116	95%
8	69 Warren Street Parking Corp. / 69 Warren Street	47	47	100%
9	Central Parking Systems of NY / 75 Park Place	100	85	85%
10	Lot No. 1, World Trade Center	1,850	1,850	100%
11	3 World Trade Center, Visa Hotel	150	150	100%
12	111 Parking Corp. / 111 Washington Street	450	338	75%
13	Rector Street LLC / 99 Washington Street	220	110	50%
14	Allright Parking Management Corp / 56-80 Greenwich Street (Battery Garage)	2,127	1,595	75%
15	Washington Street Corp. / 89-91 Murray Street	149	134	90%
16	BGB Parking System / 6 Barclay Street	86	86	100%
17	25-27 Beekman Street Associates / 25-27 Beekman St.	149	149	100%
18	Kinney Systems, Inc. / 250 Vesey Street	371	260	70%
19	Central Parking Systems of NY / 47 Church Street	65	65	100%
20	Church Street Parking, LLC / 110 Church Street	88	84	95%
Total		**7,070**	**6,075**	**86%**

which the operational impacts of the Proposed Action can be compared. Future year conditions were again analyzed for two years, 2009 and 2015.

2009 NO ACTION TRIP GENERATION

In addition to the annual background traffic growth rate of 0.25 percent per year, year 2009 traffic analyses without the Proposed Action also include traffic that would have been expected to be generated from development projects that were anticipated to be built prior to the events of September 11, 2001. The projects proposed for Lower Manhattan in the summer of 2001 were different from the projects currently proposed or in construction today. For one, buildings damaged and vacated on September 11 were still occupied by their former use. For example, 90 West Street was a fully occupied office building; now it is a vacant structure being restored and redeveloped for residential use. Secondly, a number of sites which were proposed for commercial use are now expected to be residential. For example, the building at 270 Greenwich

Table 13A-14
Inventory of Pre-September 11 Public Parking Facilities
¼ to ½ Mile from the WTC Site

Map #	Name/Operator and Address/Location	Licensed Capacity	Midday	
			No. of Occupied Spaces	Percent Utilization
21	Jade Car Park, LLC / 2 South End Avenue	69	59	85%
22	River Watch Garage / 70 Battery Place	36	36	100%
23	Katz Parking Systems / 308-322 Greenwich Street	232	232	100%
24	Greenwich Street Parking Corp. / Greenwich Street	100	98	98%
25	Kinney Systems, Inc. / 56 North Moore Street	220	209	95%
26	Edison NY Parking LLC / 84-88 Leonard Street	54	50	93%
27	Louis Provenzano Inc. / 180 West Broadway	44	44	100%
28	Worth Parking Corp. / 52 Leonard Street	150	150	100%
29	Sky Parking Corp. / 121 Reade Street	89	85	95%
30	NYCDOT Muni-Meter / Battery Place	32	32	100%
31	Edison NY Parking LLC / 341 Broadway	150	140	93%
32	IZAD / 108 Leonard Street	150	135	90%
33	Katz Parking Systems / 350-376 Greenwich Street	314	188	60%
34	Kids Parking Corp. / 105 Duane Street	72	72	100%
35	NYU Downtown Hospital / 170 William Street	110	110	100%
36	45 Wall Parking Corp. / 45 Wall Street	137	110	80%
37	South William Parking LLC / 14 South William Street	400	320	80%
38	Kura River Management / 2 Broadway	56	50	90%
39	Stonehurst Parking Corp. / 8-12 Stone Street	34	31	90%
40	State Pearl Garage / 1 Battery Park Place	150	150	100%
41	Louis Provenzano Inc. / 180 West Broadway	44	44	100%
42	Guardian Hanover / 7 Hanover Square	67	67	100%
43	US Parking Corp. / 130 Duane Street	40	25	63%
44	Edison Lafayette Corp. / 228-232 Water Street	120	114	95%
45	Southern Parking Corp. / 1 New York Plaza	150	75	50%
46	Municipal Lot / Leonard Street and Lafayette Street	45	45	100%
47	Ropetmar Garage Inc. / 299 Pearl Street	310	295	95%
48	Edison Lafayette Corp. / 288-294 Pearl Street	36	34	95%
49	Edison Lafayette Corp. / 300-302 Pearl Street	25	24	95%
50	Edison Lafayette Corp. / 10-12 Peck Slip	105	100	95%
51	John Street Parking Garage / John Street	60	30	50%
52	Downtown Parking Corp. / 56 Fulton Street	280	238	85%
53	Cliff Parking LLC / 19-21 Cliff Street	74	74	100%

Table 13A-14 (cont'd)
Inventory of Pre-September 11 Public Parking Facilities
¼ to ½ Mile from the WTC Site

Map #	Name/Operator and Address/Location	Licensed Capacity	Midday	
			No. of Occupied Spaces	Percent Utilization
54	John Street Parking LLP/ 80 John Street	25	25	100%
55	Edison Parking Management / 18-24 Cliff Street	150	135	90%
56	Chambers Mgt. Parking Lot Corp. / Corner of Reade, Chambers and Hudson Streets	100	90	90%
57	Seaport Water Street Parking / 199 Water Street	99	79	80%
58	Pine Water Street Parking / 80 Pine Street	178	178	100%
59	Edison NY Parking LLP / 167-175 Front Street	72	54	75%
60	Rector Street Garage / 377 Greenwich Street	46	46	100%
61	Edison Parking / 151-159 Maiden Lane	26	26	100%
62	Jefferson Parking Corp. / 151-159 Maiden Lane	21	21	100%
63	Central Parking Systems Inc. / 169 William Street	52	52	100%
64	Edison Lafayette Corp. / South Street under FDR Dr.	60	30	50%
65	Edison Lafayette Corp. / 2 Morris Street	2,000	1,900	95%
66	RAEM / 93 Chambers Street	48	48	100%
Total		**6,832**	**6,150**	**90%**

Street, a few blocks north of the Project Site, was expected to be an office building, but is now expected to be a residential building. The list of anticipated development projects under this Pre-September 11 Scenario is presented below:

Primary Study Area, North of WTC Site:

- 53 Park Place—116 residential units
- 270 Broadway—87 residential units
- 110-120 Church Street—389 residential units
- Keystone, 38-44 Warren Street—24 residential units
- WSURA Site 5C at West and Chambers Streets—260 residential units with ground floor commercial
- WSURA Site 5B, 270 Greenwich Street—1.35 million square feet office, 25,400 square feet retail, and 100 underground parking spaces
- 125 Church Street—50 residential units

Primary Study Area, Broadway Corridor:

- J&R Music World, Park Row at Ann Street—32,000 square feet retail
- 75-81 Nassau Street—28 residential units
- 130 Fulton Street—62 residential units
- 21-23 Maiden Lane—30 residential units
- Woolworth Building, 233 Broadway—150 residential units

Primary Study Area, Greenwich Street South Corridor:

- 90 Washington Street—387 residential units

Primary Study Area, Battery Park City:

- 22 River Terrace—293 residential units
- Museum of Jewish Heritage Site 2, BPC South—628 residential units
- Museum of Jewish Heritage Site 18B, BPC—268 residential units and 14,000 square feet retail
- Museum of Jewish Heritage Site 19B, BPC—264 residential units
- Museum of Jewish Heritage, Pier A—7,000 square feet retail
- Museum of Jewish Heritage Site 23, BPC North—269 residential units and 7,000 square feet retail
  Museum of Jewish Heritage Site 24, BPC North—250 residential units and 7,000 square feet retail
- Museum of Jewish Heritage Site 3, BPC South—500 residential units
- Solaire—335 residential units

Secondary Study Area, Tribeca:

- 18 Leonard Street—20 residential units
- 25 N. Moore Street—48 residential units
- 124 Hudson Street—26 residential units
- Sugar Warehouse, 79 Laight Street—26 residential units
- 79 Worth Street—35 residential units
- 161 Hudson Street—use unknown
- 200 Church Street—20 residential units
- 3-9 Hubert Street—34 residential units
- 416 Washington Street—87 residential units
- New York Law School, Church Street between Leonard and Worth Streets—educational expansion
- 448 Greenwich Street—120 residential units
- 258 West Street—110 residential units

Secondary Study Area, Chinatown:

- 101 Worth Street—329 residential units
- 117 Worth Street—330 residential units
- 52 Franklin Street—30 residential units
- 65 Worth Street—30 residential units

Secondary Study Area, Brooklyn Bridge to Battery Park:

- 56 Pine Street—78 residential units
- 85 John Street—160 residential units
- 48 Wall Street—324,000 square feet office
- 150 Nassau Street—145 residential units
- 80 South Street—125 residential units
- Millennium High School, 75 Broad Street—92,000 square feet school
- 10 Liberty Street/William Street—284 residential units and 3,000 square feet retail space

- 85 South Street—60 residential units
- 23 Wall Street /15 Broad Street—1.9 million square feet office (600,000 square feet NYSE facility plus 1.3 million square feet office)

Secondary Study Area, Civic Center Area:

- None

A summary of vehicle trips expected to be generated by year 2009 under this pre-September 11 Scenario—including autos, taxis, and delivery vehicles—is presented by study area zone in Table 13A-15.

Table 13A-15
Vehicle Trip Generation from Background Development Projects,
Pre-September 11 Conditions 2009 Baseline
(AM, Midday, and PM Peak Hours)

Study Area Zone	AM Peak INS	AM Peak OUTS	MD Peak INS	MD Peak OUTS	PM Peak INS	PM Peak OUTS
WTC& North of WTC Zone	183	134	150	141	106	154
Broadway Corridor	7	14	5	5	13	9
Greenwich Street South	11	21	7	7	18	13
Battery Park City	80	151	56	55	139	97
Tribeca	15	29	11	11	26	18
Chinatown	20	38	15	15	36	25
Brooklyn Bridge to Battery Park	186	85	64	62	70	170
Civic Center Area	0	0	0	0	0	0
Total Vehicle Trips	**502**	**472**	**308**	**296**	**408**	**486**

As shown in Table 13A-15, the volume of vehicular traffic that could have been expected to be generated by background development projects in 2009, even under the pre-September 11 baseline scenario, would have been substantial. In the AM peak hour, approximately 502 vehicles would be generated into the area and 472 vehicles would leave the area, totaling 974 vehicle trips; in the midday, approximately 308 vehicles would be generated in and 296 vehicles would be generated out, totaling 604 vehicle trips; and, in the PM peak hour, approximately 408 vehicles would be generated in and 486 vehicles would be generated out of the area, totaling 894 vehicle trips.

This volume of background development project-generated traffic was added to the roadway network and, together with the background traffic growth, established the future 2009 No Action traffic volume baseline for the Pre-September 11 Scenario. Detailed No Action traffic volume maps are provided in *Appendix E.1*; a summary overview of traffic volume increases along selected streets in the traffic study area is described below.

2009 NO ACTION TRAFFIC CONDITIONS

Traffic Volumes and Levels of Service with At-Grade Route 9A Arterial

Traffic volumes on the study area roadway network would increase significantly at many locations, primarily along the Route 9A corridor and Church Street, the two major traffic carriers in the area.

Route 9A traffic volumes would be expected to increase by about 200 vph northbound and 130 vph southbound in the AM peak hour near Vesey Street, by about 100 to 110 vph northbound and southbound in the midday peak hour, and by 135 to 145 vph northbound and southbound in the PM peak hour.

West Broadway traffic volumes would be expected to increase by about 35 vph southbound in the AM peak hour near Chambers Street, by about 30 vph in the midday peak hour, and by about 25 vph in the PM peak hour.

Greenwich Street traffic volumes would be expected to increase by about 15 to 20 vph southbound in all three traffic analysis periods near Chambers Street.

Broadway traffic volumes would be expected to increase by about 60 to 65 vph southbound in all three traffic analysis periods near Chambers Street.

Church Street traffic volumes would be expected to increase by about 130 vph northbound in the AM peak hour near Vesey Street, by about 90 vph in the midday peak hour, and by about 145 vph in the PM peak hour.

Detailed traffic volumes for each intersection in the GEIS's traffic study area are provided in *Appendix E.1*.

Based on these traffic volumes and expected traffic lane configurations, future traffic levels of service without the Proposed Action were determined for the traffic analysis locations within the study area. These analyses include the configuration of Route 9A as it existed before the events of September 11. A summary of findings, comparing pre-September 11 existing conditions with future 2009 conditions without the Proposed Action under the pre-September 11 baseline scenario, is provided in Table 13A-16. An illustrative overview of overall intersection levels of service are presented in Figures 13A-23 through 13A-25.

Table 13A-16
Traffic Level of Service Summary Comparison
Existing vs. Future No Action Conditions (2009)
Pre-September 11 Scenario with at-Grade Route 9A

Signalized Intersections	Existing AM	Existing Midday	Existing PM	2009 No Action AM	2009 No Action MD	2009 No Action PM
Overall LOS A/B	15	25	19	13	22	18
Overall LOS C	14	6	10	9	8	8
Overall LOS D	6	6	4	9	3	3
Overall LOS E/F	3	1	5	7	5	9
No. of movements at LOS E or F	22	15	23	36	22	32

In the AM peak hour, the number of analysis locations operating at overall LOS E or F are projected to increase from three under pre-September 11 existing conditions to seven under future 2009 No Action conditions. Nine other intersections would operate at overall LOS D. The number of specific traffic movements expected to operate at LOS E or F is projected to increase from 22 under pre-September 11 existing conditions to 36 under the 2009 No Action condition.

In the midday peak hour, the number of analysis locations operating at overall LOS E or F is projected to increase from one under pre-September 11 existing conditions to five under future

2009 No Action conditions. Three other intersections would operate at overall LOS D. The number of specific traffic movements expected to operate at LOS E or F is projected to increase from 15 under pre-September 11 existing conditions to 22 under the 2009 No Action condition.

In the PM peak hour, the number of analysis locations operating at overall LOS E or F is projected to increase from five under pre-September 11 existing conditions to nine under future 2009 No Action conditions. Three other intersections would operate at overall LOS D. The number of specific traffic movements expected to operate at LOS E or F is projected to increase from 23 under pre-September 11 existing conditions to 32 under the 2009 No Action condition.

A review of the projected conditions for all three time periods, as illustrated in Figures 13A-23 through 13A-25, indicates that three intersections could be expected to operate at overall unacceptable levels of service during all three traffic analysis peak hours—Route 9A at Albany Street and at the entrance to the Brooklyn Battery Tunnel, and Canal Street and Varick Street. Three others—West Broadway and Vesey Street, Canal Street and Hudson Street, and Chambers Street at Church Street—would be characterized by overall unacceptable levels of service during two of the three analysis periods. Other intersections would have specific traffic movements at LOS E or F during multiple time periods.

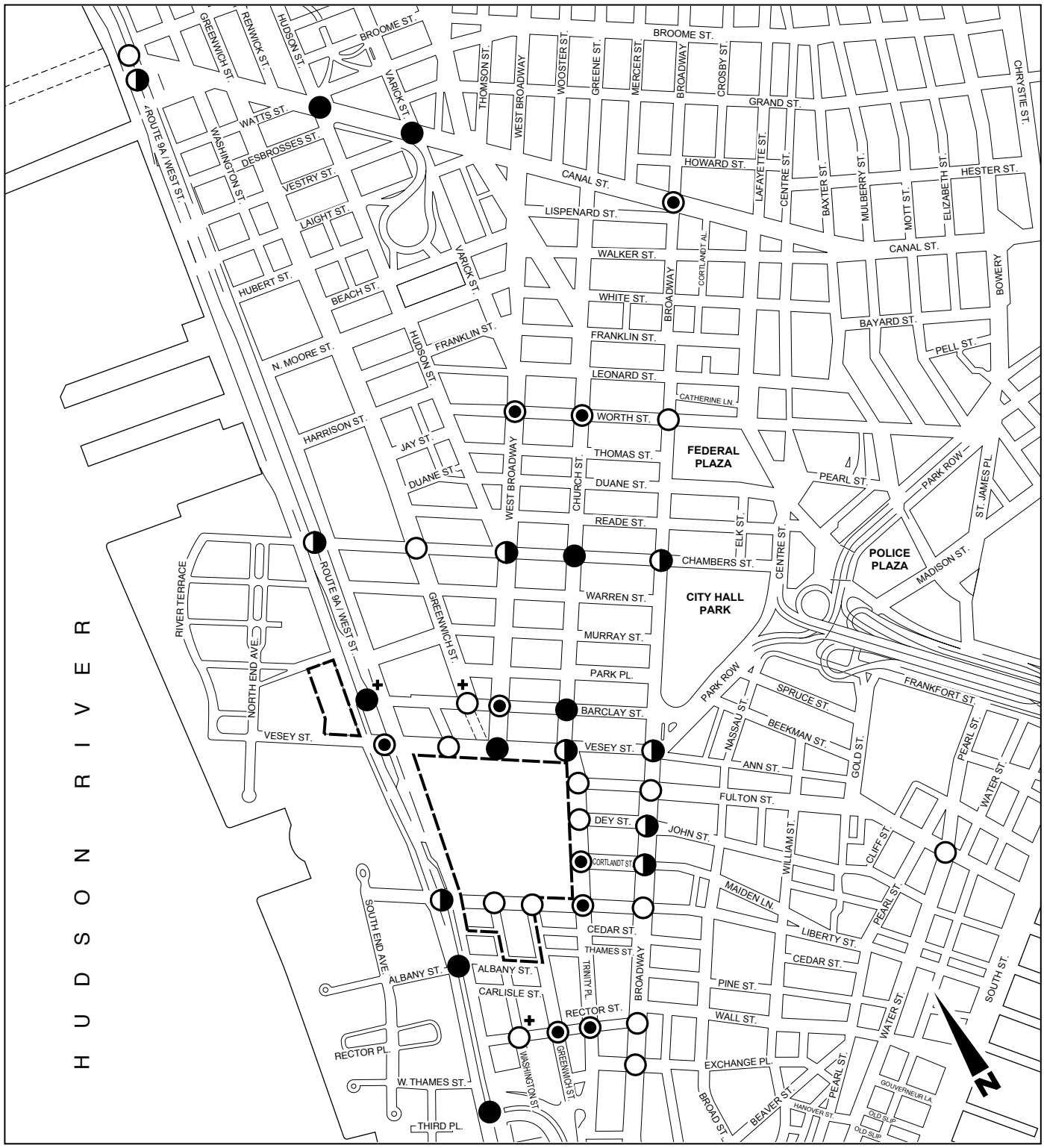
2009 NO ACTION PARKING CONDITIONS

An analysis was conducted of projected areawide parking lot and garage occupancy levels under the 2009 development and traffic growth *projection* for the Pre-September 11 Scenario. Areawide parking lot and garage occupancy levels can be expected to be able to accommodate additional parking demands, increasing from about 88 percent in the midday peak pre-September 11, to about 93 percent with development on the anticipated sites in 2009.

13A.5.3 PROBABLE IMPACTS OF THE PROPOSED ACTION 2009—PRE-SEPTEMBER 11 SCENARIO

The determination of significant traffic impacts generated by the Proposed Action—and thus the impacts requiring an identification and evaluation of traffic improvements that would be needed to mitigate those impacts—is based on a comparison of projected future Build conditions to background or No Action conditions established from the Pre-September 11 Scenario. In this way, currently projected future Build conditions are compared with conditions that would have existed had the tragic events of September 11 not occurred and, thus, WTC complex remained standing and active with the traffic it had been generating before its destruction.

As stated above in the "Methodology" section (section 13A.2.5, "Significant Impact Definitions"), according to New York City's *CEQR Technical Manual*, for signalized intersections, increases in lane group delays of 5 seconds or more beyond No Action LOS D, 4 seconds or more beyond No Action LOS E, or 3 seconds or more beyond No Action LOS F (or 1 second or more of delay if the No Action LOS F condition already exceeds 120 seconds of delay, unless the proposed action generates fewer than five vehicles through the entire intersection) are considered significant, and require mitigation analyses. Also, should a level of service deteriorate from LOS A, B, or C to beyond mid-LOS D or to LOS E or F, such impacts are also considered significant. For unsignalized intersections, if the Proposed Action generates fewer than five passenger car equivalents (PCEs) in the peak along the critical approach, delays are not considered significant. Also, for unsignalized intersections, for the minor street to generate a significant impact, 90 PCEs must be identified in the future Build condition in any peak hour.

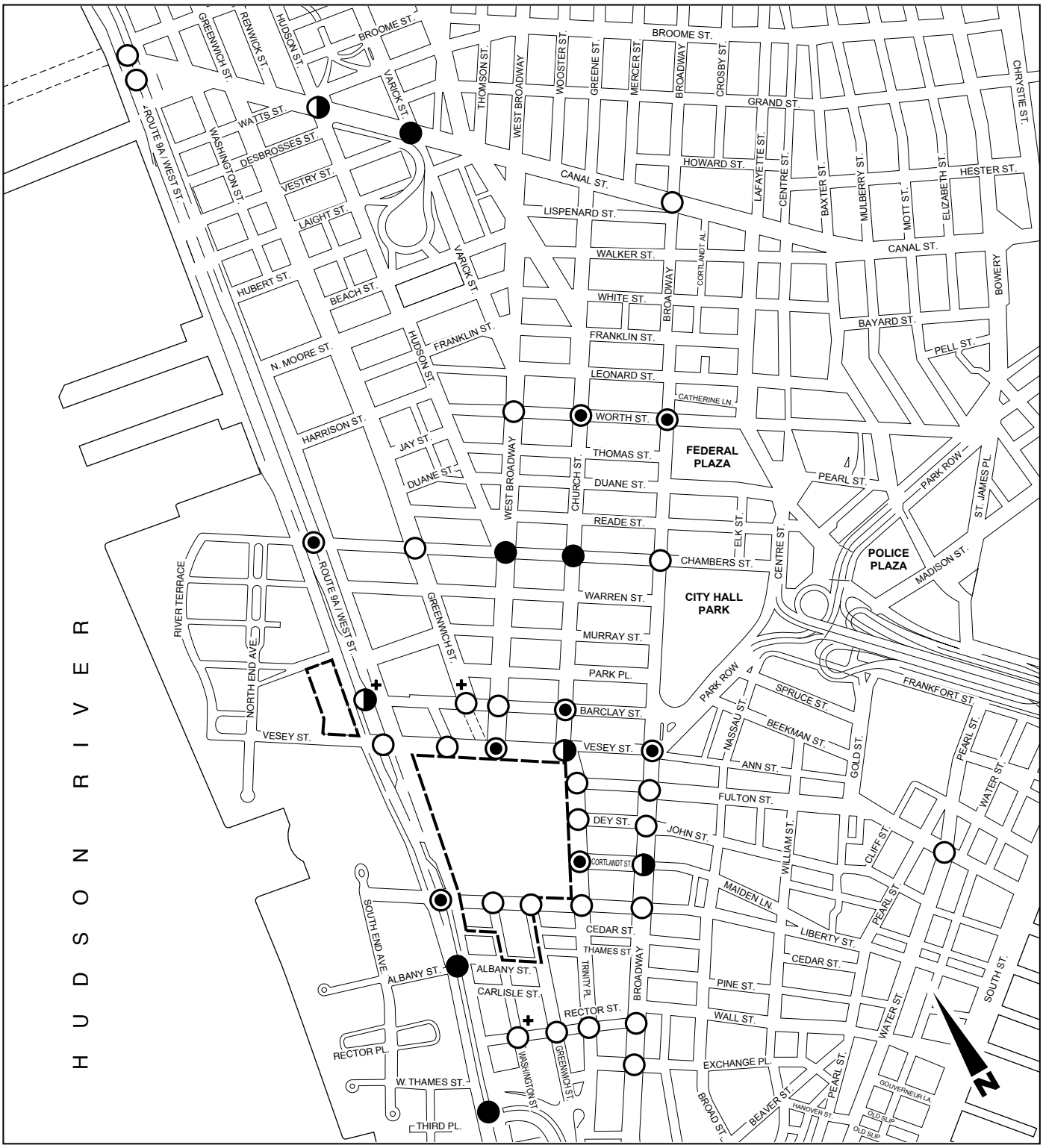


Traffic Levels of Service
2009 No Action Conditions
Pre-September 11 Conditions Scenario with Route 9A At-Grade
AM Peak Hour

Figure 13A-23

World Trade Center Memorial and Redevelopment Plan

12-03



Project Site Boundary

LOS A or B

LOS C

LOS D

LOS E or F

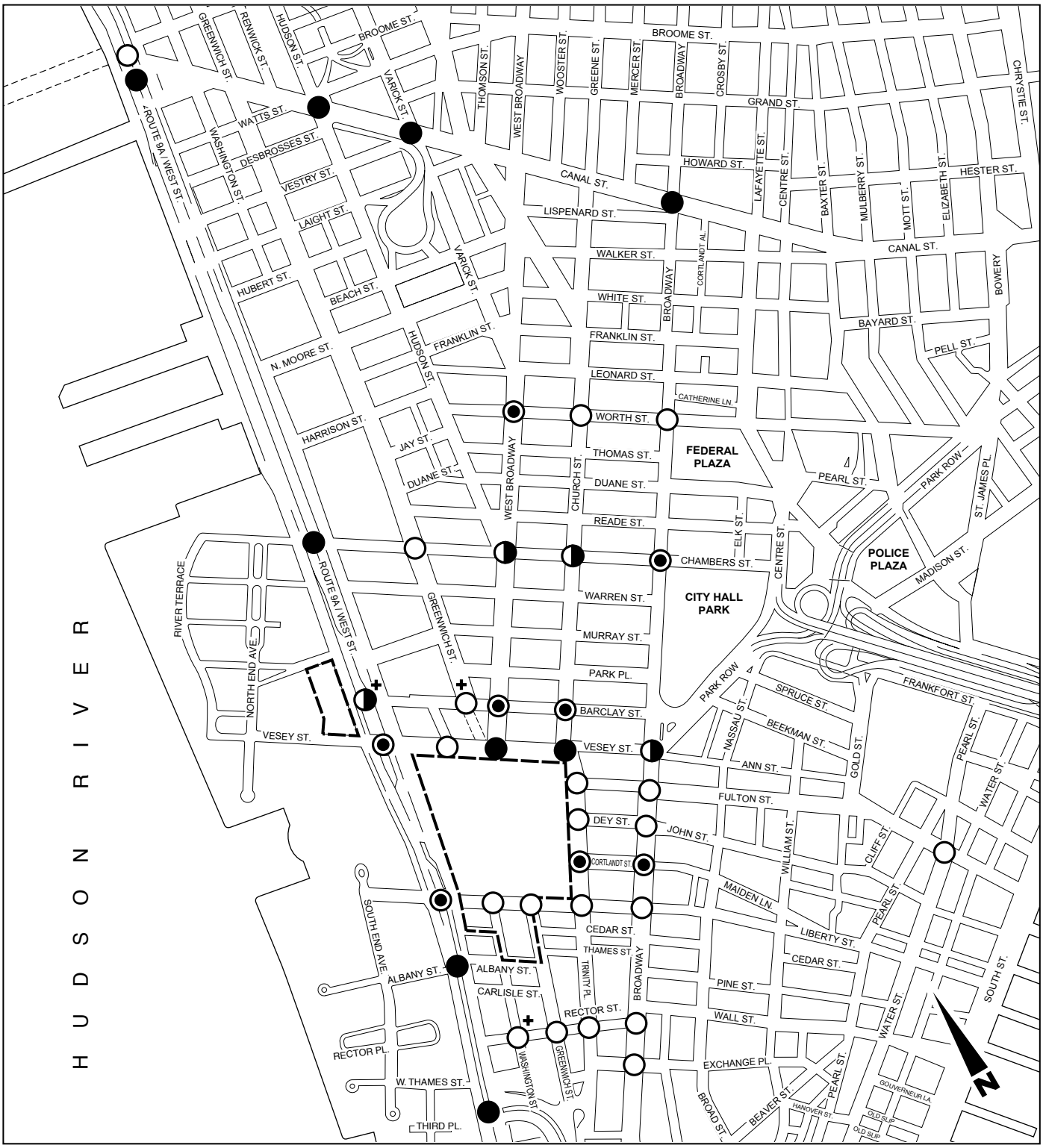
+ Unsignalized Intersection

Note: Overall intersection LOS is shown for signalized intersections

Traffic Levels of Service
2009 No Action Conditions
Pre-September 11 Conditions Scenario with Route 9A At-Grade
Midday Peak Hour

Figure 13A-24

12-03



Project Site Boundary

LOS A or B

LOS C

LOS D

LOS E or F

+ Unsignalized Intersection

Note: Overall intersection LOS is shown for signalized intersections

Traffic Levels of Service
2009 No Action Conditions
Pre-September 11 Conditions Scenario
with Route 9A At-Grade
PM Peak Hour

Figure 13A-25

World Trade Center Memorial
and Redevelopment Plan

In 2009, in the AM and PM peak hours, 18 of the 42 signalized and unsignalized intersections analyzed (including the two newly created intersections of Fulton Street/Greenwich Street and Fulton Street/Route 9A resulting from the extension of Fulton and Greenwich Streets through the WTC Site as part of the Proposed Action) would be significantly impacted with the at-grade arterial design assigned for the Route 9A corridor. In the midday peak hour, 16 of the 42 intersections would be significantly impacted with the at-grade design for Route 9A.

Figures 13A-26 through 13A-28 show the locations where significant impacts can be expected. For the at-grade arterial design for Route 9A, these locations include:

- Route 9A and Canal Street—AM, midday, and PM
- Route 9A and Chambers Street—AM
- Route 9A and Vesey Street—AM, midday, and PM
- Route 9A and Fulton Street—AM
- Route 9A and Albany Street—AM, midday, and PM (no significant impact for Route 9A short bypass)
- Route 9A and entrance to the Brooklyn Battery Tunnel—AM, midday, and PM
- Canal Street and Hudson Street—AM, midday, and PM
- Canal Street and Varick Street—Midday and PM
- West Broadway and Worth Street—AM
- West Broadway and Chambers Street—AM, midday, and PM
- West Broadway/Greenwich Street and Vesey Street—AM, midday, and PM
- Greenwich Street and Rector Street—Midday
- Church Street and Worth Street—AM, midday, and PM
- Church Street and Chambers Street—AM and PM
- Church Street and Vesey Street—AM, midday, and PM
- Church Street and Fulton Street—AM, midday, and PM
- Church Street and Cortlandt Street—Midday and PM
- Broadway and Worth Street—AM, midday, and PM
- Broadway and Vesey Street—AM, midday, and PM
- Broadway and Rector Street—AM and PM
- Water Street and Fulton Street—AM and PM

The magnitude of the traffic impacts can be traced to several factors, including the following: (1) the addition of project-generated traffic to an already congested network that includes nearly 50 development projects proposed in the area; (2) the volume of vehicular traffic expected to be generated by the Proposed Action (especially the Memorial, which generates close to 400 taxi trips in both the AM and midday peak hours and over 550 taxi trips in the PM peak hour under first-year surge conditions); (3) the volume of traffic oriented to Vesey Street via Route 9A (or returning back to Route 9A from the site) to and from the proposed Project Site auto garage and the most likely routing to the Memorial and other land uses on the site; (4) the enormous volume of pedestrian traffic generated to and from the Memorial, which would be among the largest attractions in the city, with this pedestrian traffic conflicting with vehicular traffic for space and signal time at several key intersections. These factors make it difficult for even a major traffic carrier such as Route 9A, and for more local streets like Vesey Street, to handle the traffic flows.

Traffic mitigation analyses are presented in Chapter 22, "Mitigation Measures." Typically, such mitigation measures include: signal phasing and timing changes where possible to reallocate green signal time to traffic movements that most need them at the expense of others that do not;

stricter on-street parking prohibitions, often with stricter enforcement to ensure that curb lanes are fully available for traffic needs during peak periods; intersection channelization improvements and lane striping changes that, for example, create single or double turn lanes, or create shared lanes where needed; and other measures detailed later in this GEIS. The proposed extension of Fulton and Greenwich Streets through the WTC Site helps alleviate some of the potential traffic problems by improving site accessibility, drop-offs at the Memorial, and circulation.

13A.5.4 FUTURE WITHOUT THE PROPOSED ACTION 2015—PRE-SEPTEMBER 11 SCENARIO

This section of the GEIS addresses future conditions without the Proposed Action in 2015 based on existing conditions in the Pre-September 11 Scenario.

2015 NO ACTION TRIP GENERATION

The list of expected development projects expected to become operational after 2009 but before 2015, includes approximately 30 developments beyond the nearly 50 assumed in the 2009 No Action analysis. These developments are included in the 2015 traffic analyses and are listed below; the same trip generation methodology described for year 2009 No Action conditions were followed for year 2015.

Primary Study Area, North of and at the WTC Site:

- 10 Barclay Street—328 residential units and 72,000 square feet office

Primary Study Area, Broadway Corridor:

- 115 Nassau Street—residential conversion
- 10 Broadway—residential conversion
- 5 Beekman Street - residential conversion
- 60 Broad Street—200 residential units and 800,000 square feet office

Primary Study Area, Greenwich Street South Corridor:

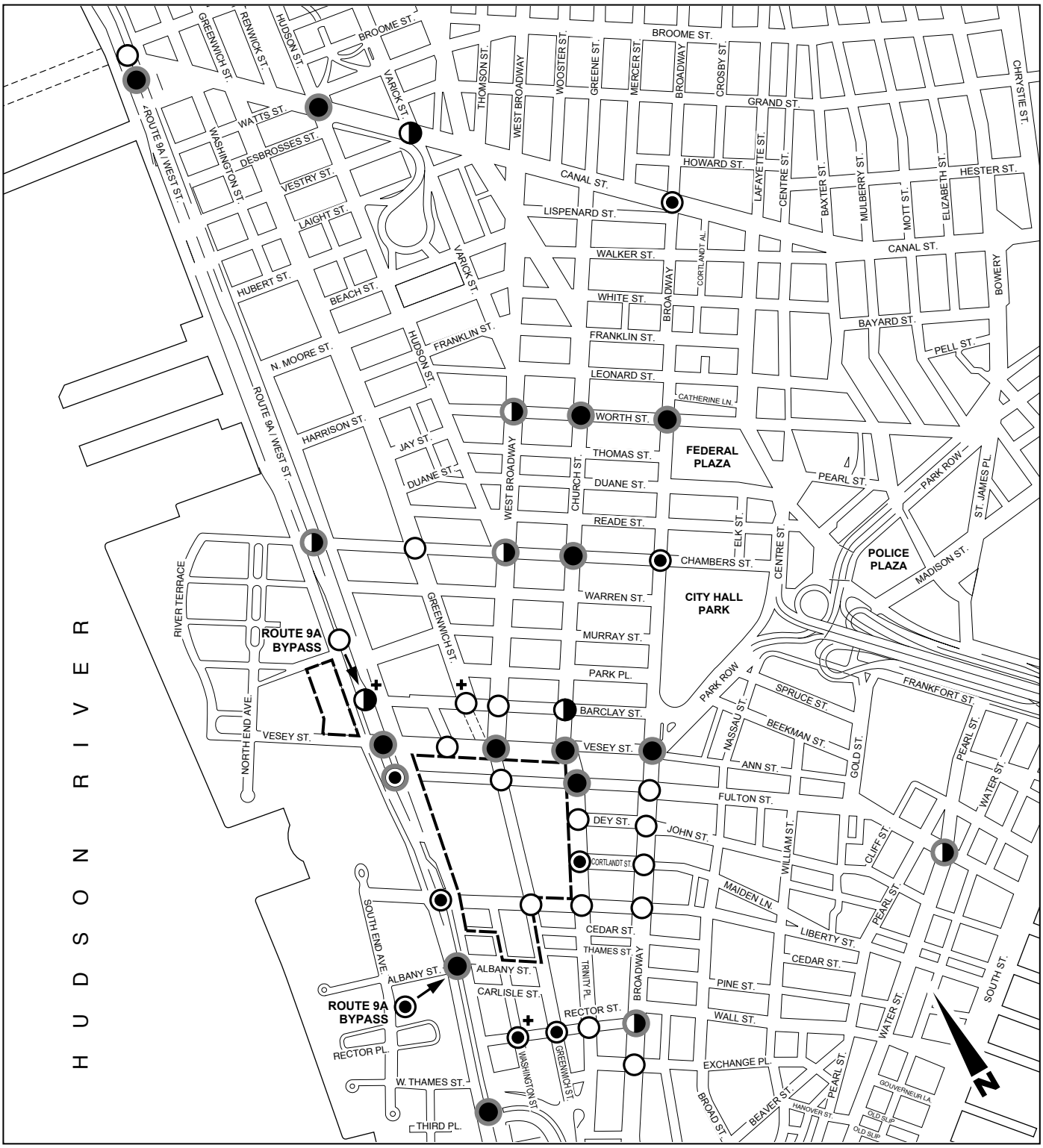
- One World Plaza, 140 Liberty Street—500,000 square feet office
- Former Downtown Athletic Club, 16-20 West Street—use unknown

Primary Study Area, Battery Park City:

- Site 16/17, BPC North—471 residential units
- Site 26, BPC North—1.9 million square feet office

Secondary Study Area, Tribeca:

- 130 Duane Street—45 hotel rooms
- 24 Varick Street / 240 West Broadway—32 residential units
- 443 Greenwich Street—256 residential units
- 90 Leonard Street—275,838 square feet of either residential or retail space
- Ponte Sites—280 residential units
- 353-59 Broadway—use unknown
- 408 Greenwich Street—44,000 square feet office plus residential
- 55 White Street—20 residential units
- 6 York Street / West Broadway at Sixth Avenue—150 hotel rooms



Project Site Boundary

LOS A or B

LOS C

LOS D

LOS E or F

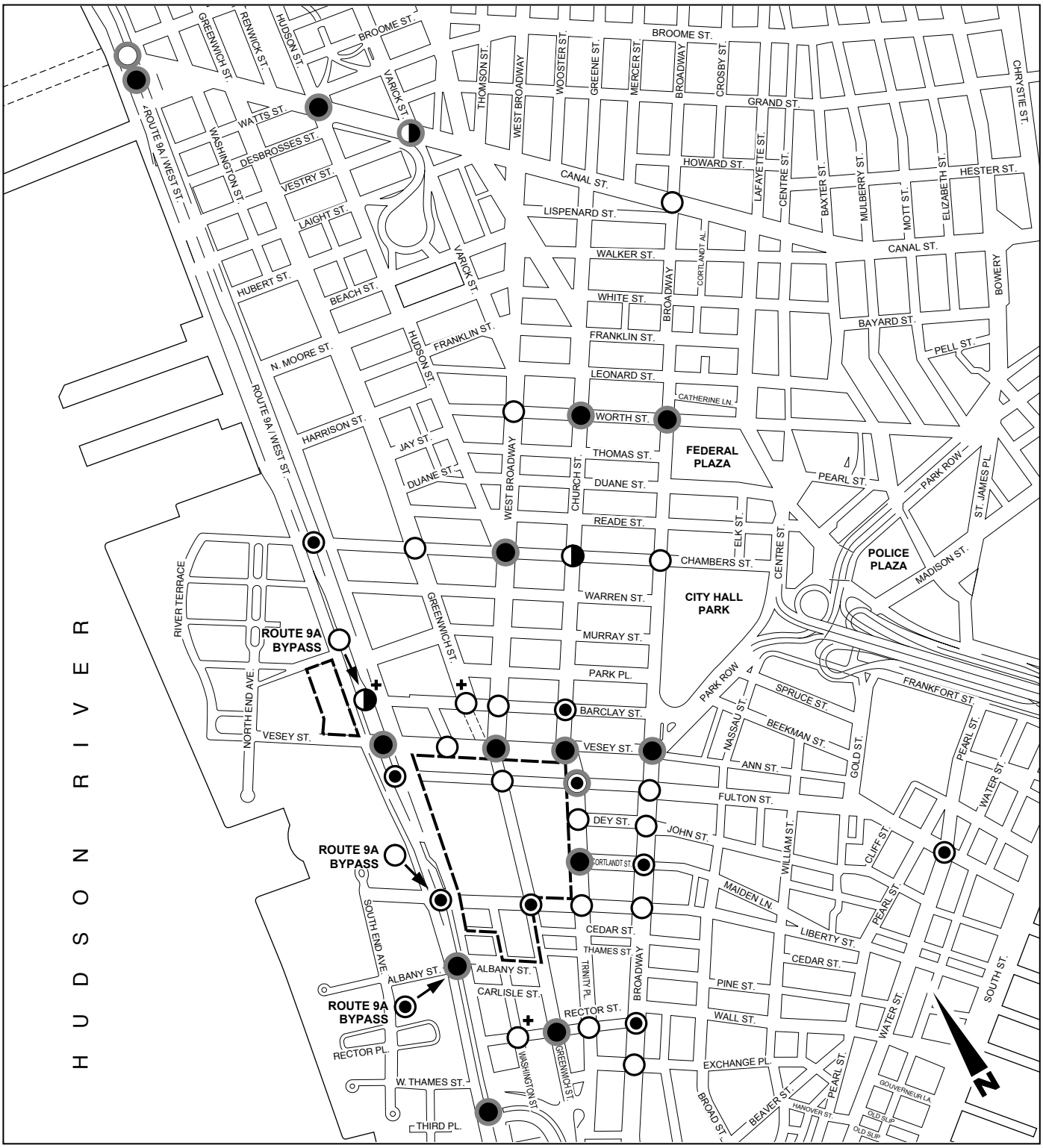
Significant Impact

Unsignalized Intersection

Note: Overall intersection LOS is shown for signalized intersections

Traffic Levels of Service and Significant Impacts
2009 Build Conditions with Route 9A At-Grade
AM Peak Hour

Figure 13A-26



Project Site Boundary

+ Unsignalized Intersection

Note: Overall intersection LOS is shown for signalized intersections

LOS A or B

LOS C

LOS D

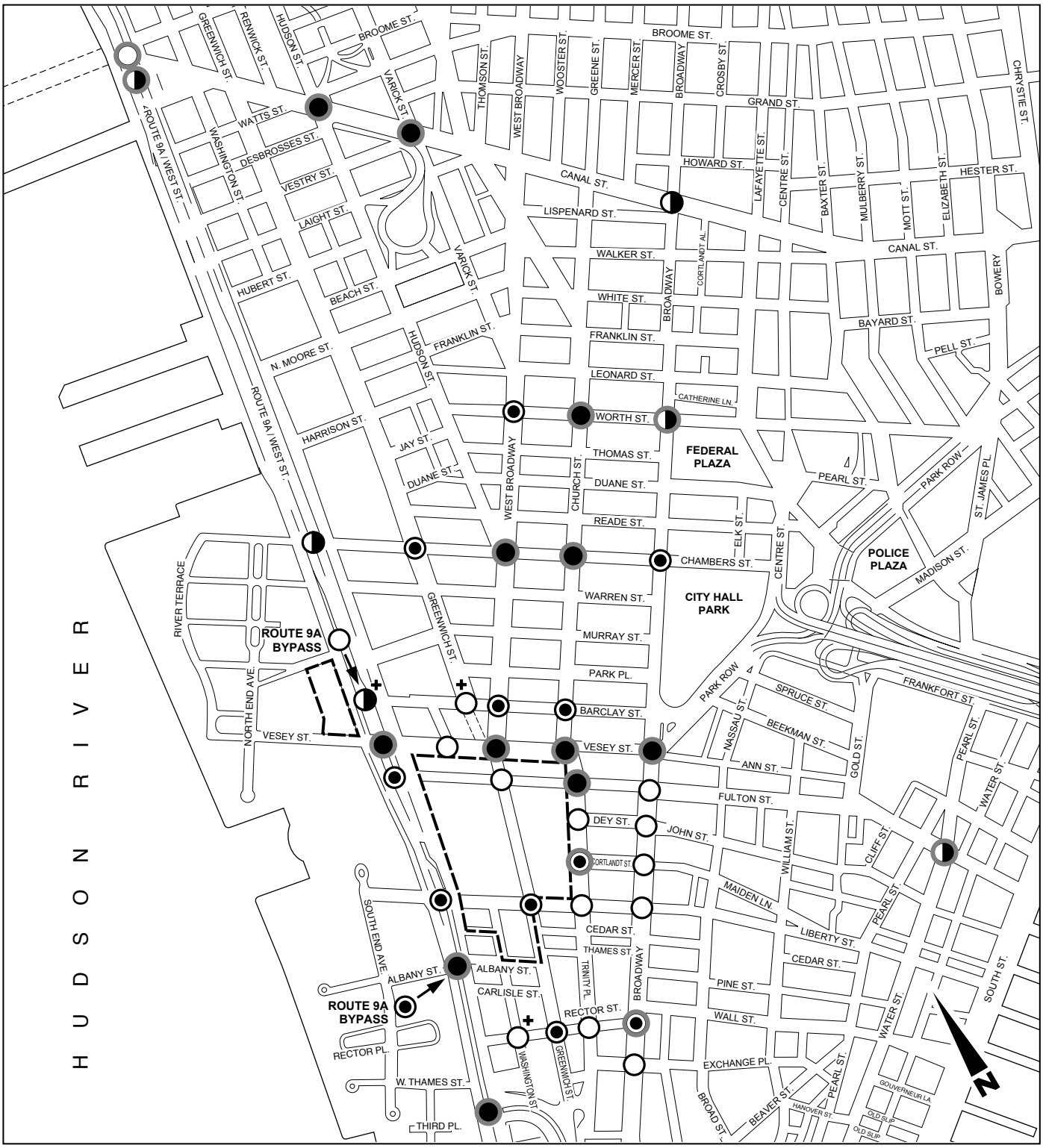
LOS E or F

Significant Impact

Traffic Levels of Service and Significant Impacts 2009 Build Conditions with Route 9A At-Grade Midday Peak Hour

Figure 13A-27

World Trade Center Memorial and Redevelopment Plan



Project Site Boundary

LOS A or B

LOS C

LOS D

LOS E or F

Significant Impact

\+ Unsignalized Intersection

Note: Overall intersection LOS is shown for signalized intersections

Traffic Levels of Service and Significant Impacts 2009 Build Conditions with Route 9A At-Grade PM Peak Hour

Figure 13A-28

Secondary Study Area, Chinatown:

- New York Post, Catherine Slip on Water Street
- 150 Madison Street—73,000 square feet manufacturing

Secondary Study Area, Brooklyn Bridge to Battery Park:

- 320 Pearl Street—80 hotel rooms
- 79 Maiden Lane—400 residential units
- 15 William Street—373 residential units
- 55 Water Street—518,050 square feet office
- Block 97, Front Street/Beekman Street /Peck Slip—100 residential units
- NYU Downtown Hospital, between Spruce and Beekman Streets—500 residential units and 1.2 million square feet office
- 59 John Street—residential conversion

Secondary Study Area, Civic Center Area:

- None

A summary of vehicle trips expected to be generated by year 2015 under this Pre-September 11 Scenario—including autos, taxis, and delivery vehicles—is presented by study area zone in Table 13A-17.[1]

Table 13A-17
Vehicle Trip Generation from Background Development Projects,
Pre-September 11 Conditions 2015 Baseline
(AM, Midday, and PM Peak Hours)

Study Area Zone	AM Peak INS	AM Peak OUTS	MD Peak INS	MD Peak OUTS	PM Peak INS	PM Peak OUTS
WTC and North of WTC	192	151	158	148	122	166
Broadway Corridor	104	74	86	81	58	87
Greenwich Street South	69	52	55	53	41	58
Battery Park City	312	294	251	238	247	284
Tribeca	83	106	79	77	93	79
Chinatown	20	38	15	15	25	61
Brooklyn Bridge to Battery Park	479	296	308	292	234	415
Civic Center Area	0	0	0	0	0	0
Total Vehicle Trips	**1,259**	**1,011**	**952**	**904**	**820**	**1,150**

As shown in Table 13A-17, the volume of vehicular traffic that can be expected to be generated by background development projects in 2015 under the pre-September 11 baseline scenario is expected to be substantial. In the AM peak hour, approximately 1,259 vehicles would be generated into the area and 1,011 vehicles would leave the area, totaling 2,270 vehicle trips; in the midday, approximately 952 vehicles would be generated in and 904 vehicles would be generated out, totaling 1,856 vehicle trips; and, in the PM peak hour, approximately 820 vehicles would be generated in and 1,150 vehicles would be generated out of the area, totaling 1,970 vehicle trips.

[1] Some of the projects assumed in the 2015 analyses may occur earlier (i.e., by 2009). For full buildout traffic analysis purposes, this would not represent a material change.

This volume of background development project-generated traffic was added to the roadway network and, together with the background traffic growth, established the future 2015 No Action traffic volume baseline for the existing conditions in the Pre-September 11 Scenario. Detailed No Action traffic volume maps are provided in *Appendix E.1*; a summary overview of traffic volume increases along selected streets in the traffic study area is described below.

2015 NO ACTION TRAFFIC CONDITIONS

Traffic Volumes and Levels of Service with at-Grade Route 9A Arterial

Traffic volumes on the study area roadway network would increase significantly at many locations, primarily along the Route 9A corridor and along Church Street.

Route 9A traffic volumes would be expected to increase by about 350 vph northbound and 480 vph southbound in the AM peak hour near Vesey Street, by about 270 vph northbound and 400 vph southbound in the midday peak hour, and by 290 vph northbound and 325 vph southbound in the PM peak hour.

West Broadway traffic volumes would be expected to increase by about 60 vph southbound in the AM peak hour near Chambers Street, about 50 vph in the midday peak hour, and about 45 vph in the PM peak hour.

Greenwich Street traffic volumes would be expected to increase by about 30 vph southbound in all three traffic analysis peak hours.

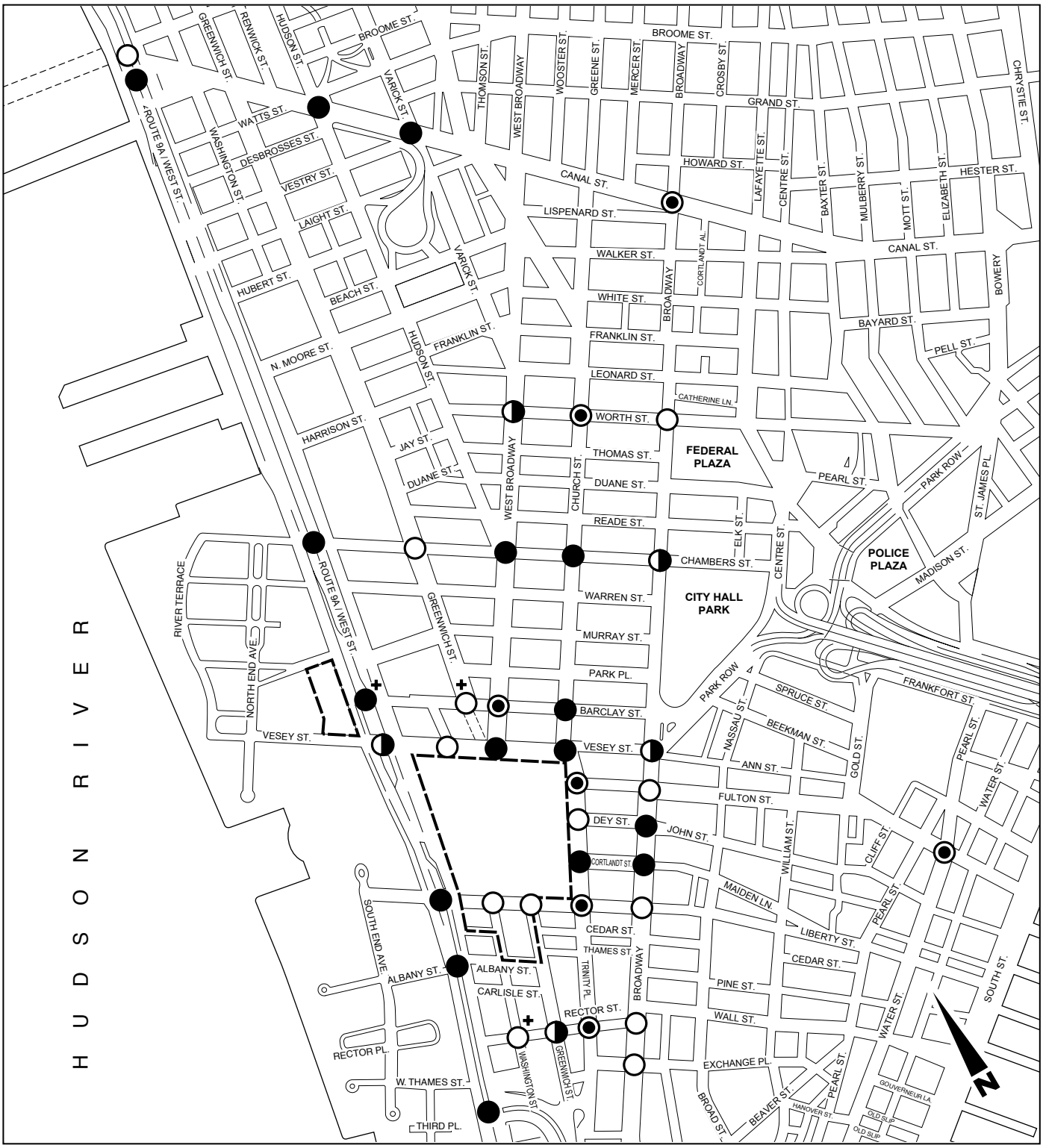
Broadway traffic volumes would be expected to increase by about 150 vph southbound in the AM peak hour near Chambers Street, about 135 vph in the midday peak hour, and about 120 vph in the PM peak hour.

Church Street traffic volumes would be expected to increase by about 355 vph northbound in the AM peak hour near Vesey Street, by about 335 vph in the midday peak hour, and by about 385 vph in the PM peak hour.

Detailed traffic volumes for each intersection in the GEIS's traffic study area are provided in *Appendix E.1*.

Based on these traffic volumes and expected traffic lane configurations, future traffic levels of service without the Proposed Action were determined for the traffic analysis locations within the study area. As noted for year 2009 No Action conditions, these analyses include the configuration of Route 9A as it existed before the events of September 11. A summary of findings, comparing pre-September 11 existing conditions with future 2015 No Action conditions under the pre-September 11 baseline scenario, is provided in Table 13A-18. An illustrative overview of overall intersection levels of service are presented in Figures 13A-29 through 13A-31.

In the AM peak hour, the number of analysis locations operating at overall LOS E or F is projected to increase from three under pre-September 11 existing conditions to 15 under future 2015 No Action conditions. Five other intersections would operate at overall LOS D. The number of specific traffic movements expected to operate at LOS E or F is projected to increase from 22 under pre-September 11 existing conditions to 46 under the 2015 No Action condition.



Project Site Boundary

Unsignalized Intersection

LOS A or B

LOS C

LOS D

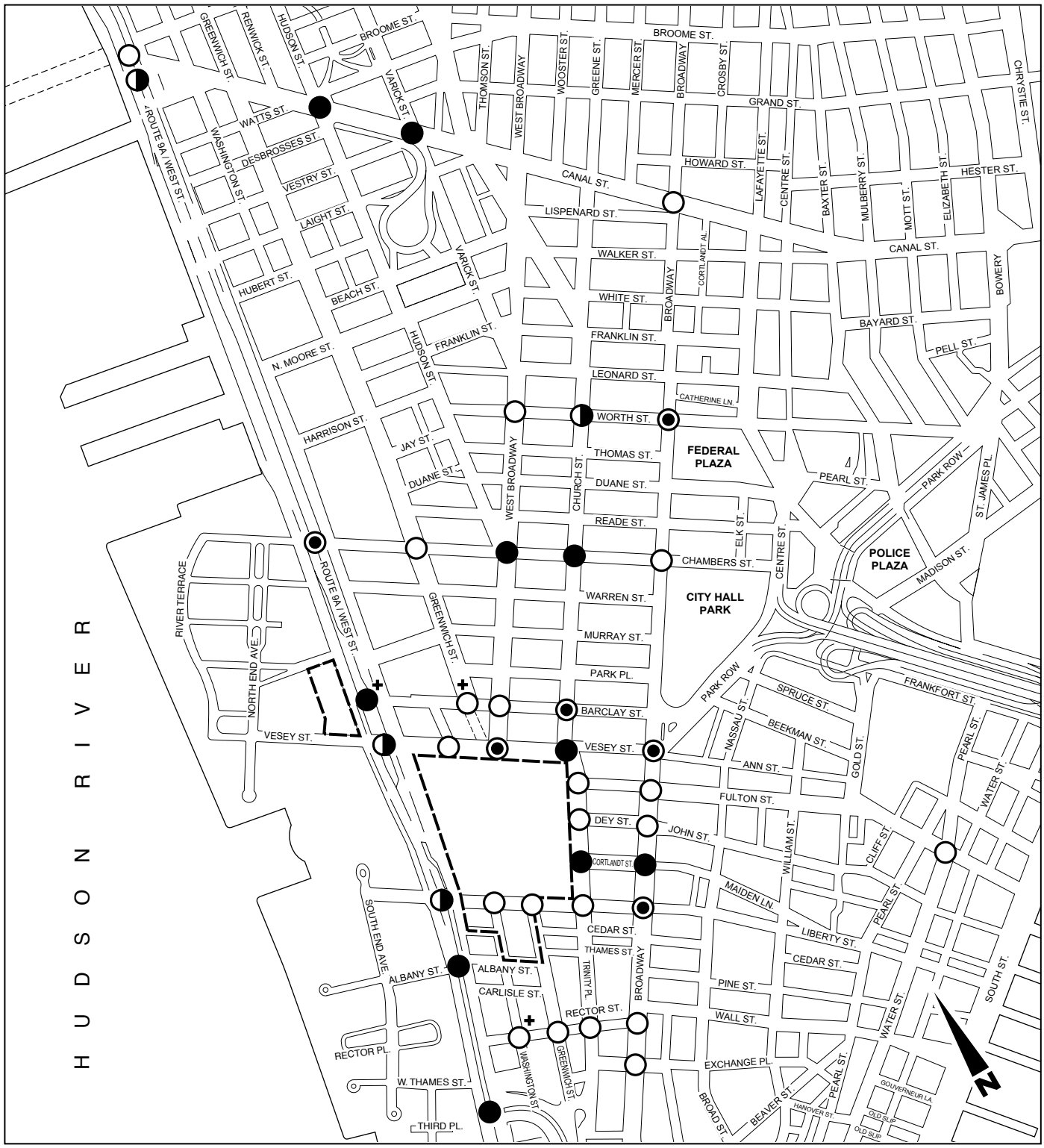
LOS E or F

Note: Overall intersection LOS is shown for signalized intersections

Traffic Levels of Service
2015 No Action Conditions
Pre-September 11 Conditions Scenario with Route 9A At-Grade
AM Peak Hour

Figure 13A-29

World Trade Center Memorial and Redevelopment Plan



Project Site Boundary

Unsignalized Intersection

LOS A or B

LOS C

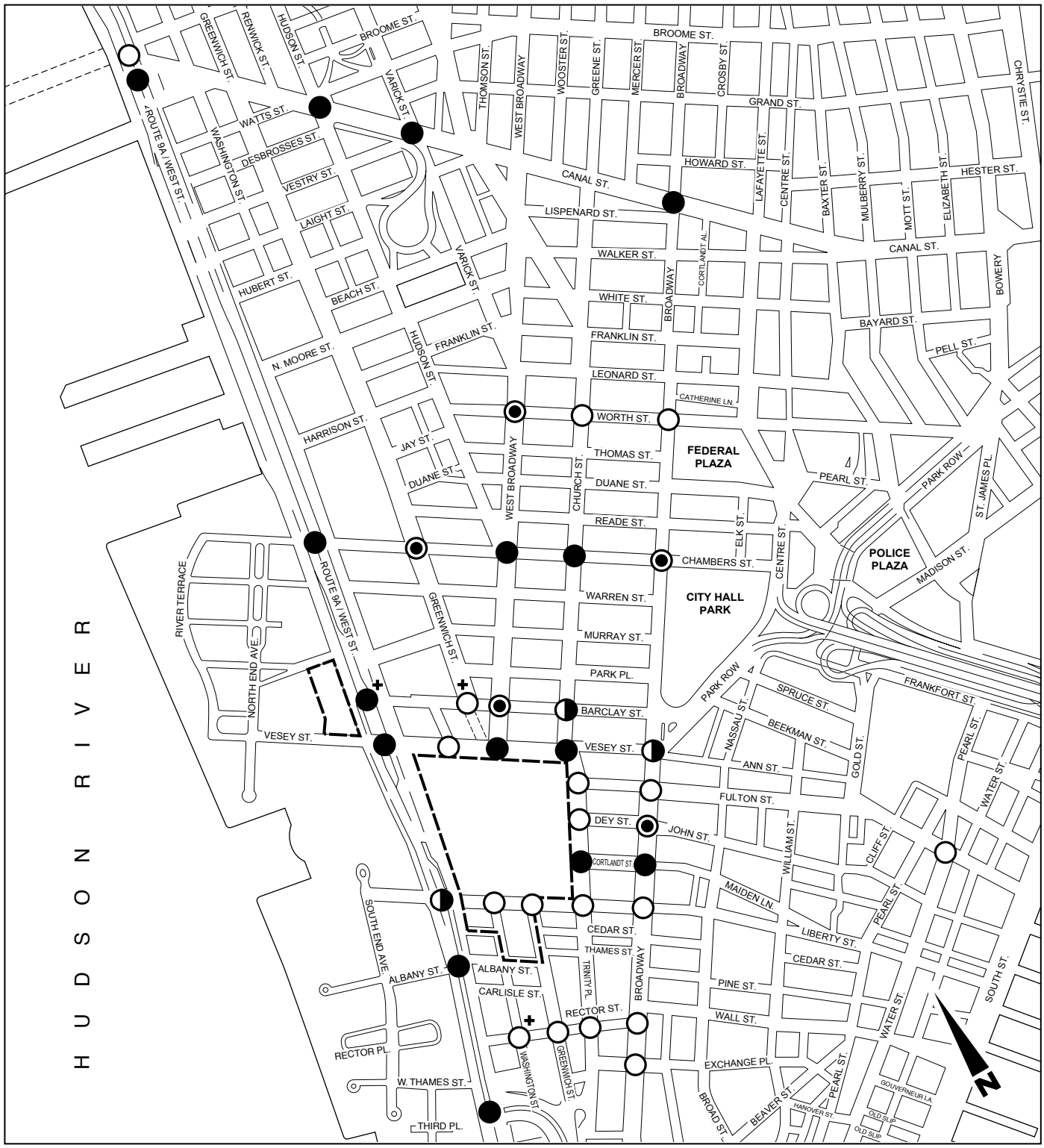
LOS D

LOS E or F

Note: Overall intersection LOS is shown for signalized intersections

Traffic Levels of Service
2015 No Action Conditions
Pre-September 11 Conditions Scenario with Route 9A At-Grade
Midday Peak Hour

Figure 13A-30



Project Site Boundary

Unsignalized Intersection

LOS A or B

LOS C

LOS D

LOS E or F

Note: Overall intersection LOS is shown for signalized intersections

Traffic Levels of Service
2015 No Action Conditions
Pre-September 11 Conditions Scenario with Route 9A At-Grade
PM Peak Hour

Figure 13A-31

Table 13A-18
Traffic Level of Service Summary Comparison
Existing vs. Future No Action Conditions (2015)
Pre-September 11 Scenario with at-Grade Route 9A

Signalized Intersections	Existing AM	Existing Midday	Existing PM	2015 No Action AM	2015 No Action MD	2015 No Action PM
Overall LOS A/B	15	25	19	11	19	16
Overall LOS C	14	6	10	7	6	5
Overall LOS D	6	6	4	5	4	3
Overall LOS E/F	3	1	5	15	9	14
No. of movements at LOS E or F	22	15	23	46	32	37

In the midday peak hour, the number of analysis locations operating at overall LOS E or F are projected to increase from one under pre-September 11 existing conditions to nine under future 2015 No Action conditions. Four other intersections would operate at overall LOS D. The number of specific traffic movements expected to operate at LOS E or F is projected to increase from 15 under pre-September 11 existing conditions to 32 under the 2015 No Action condition.

In the PM peak hour, the number of analysis locations operating at overall LOS E or F are projected to increase from five under pre-September 11 existing conditions to 14 under future 2015 No Action conditions. Three other intersections would operate at overall LOS D. The number of specific traffic movements expected to operate at LOS E or F is projected to increase from 23 under pre-September 11 existing conditions to 37 under the 2015 No Action condition.

A review of the projected conditions for all three time periods, as illustrated in Figures 13A-29 through 13A-31, indicates that several intersections can be expected to operate at overall unacceptable levels of service during all three traffic analysis peak hours: Route 9A at Albany Street and at the entrance to the Brooklyn Battery Tunnel; Canal Street at Hudson Street and at Varick Street; Church Street and Vesey Street; Broadway at Cortlandt Street; Church Street at Chambers Street and at Corlandt Street; and, West Broadway at Chambers Street. Several other intersections would be characterized by overall unacceptable levels of service during two of the three analysis periods, or would have specific traffic movements at LOS E or F during multiple time periods.

2015 NO ACTION PARKING CONDITIONS

The analysis of 2015 No Action indicates that areawide parking lot and garage occupancy levels can be expected to be able to accommodate additional parking demands, increasing from about 88 percent in the midday peak pre-September 11 existing conditions, to about 93 percent with development on the anticipated sites in 2009, and to about 98 percent under 2015 No Action conditions with the increased number of background development projects in place.

13A.5.5 PROBABLE IMPACTS OF THE PROPOSED ACTION 2015—PRE-SEPTEMBER 11 SCENARIO

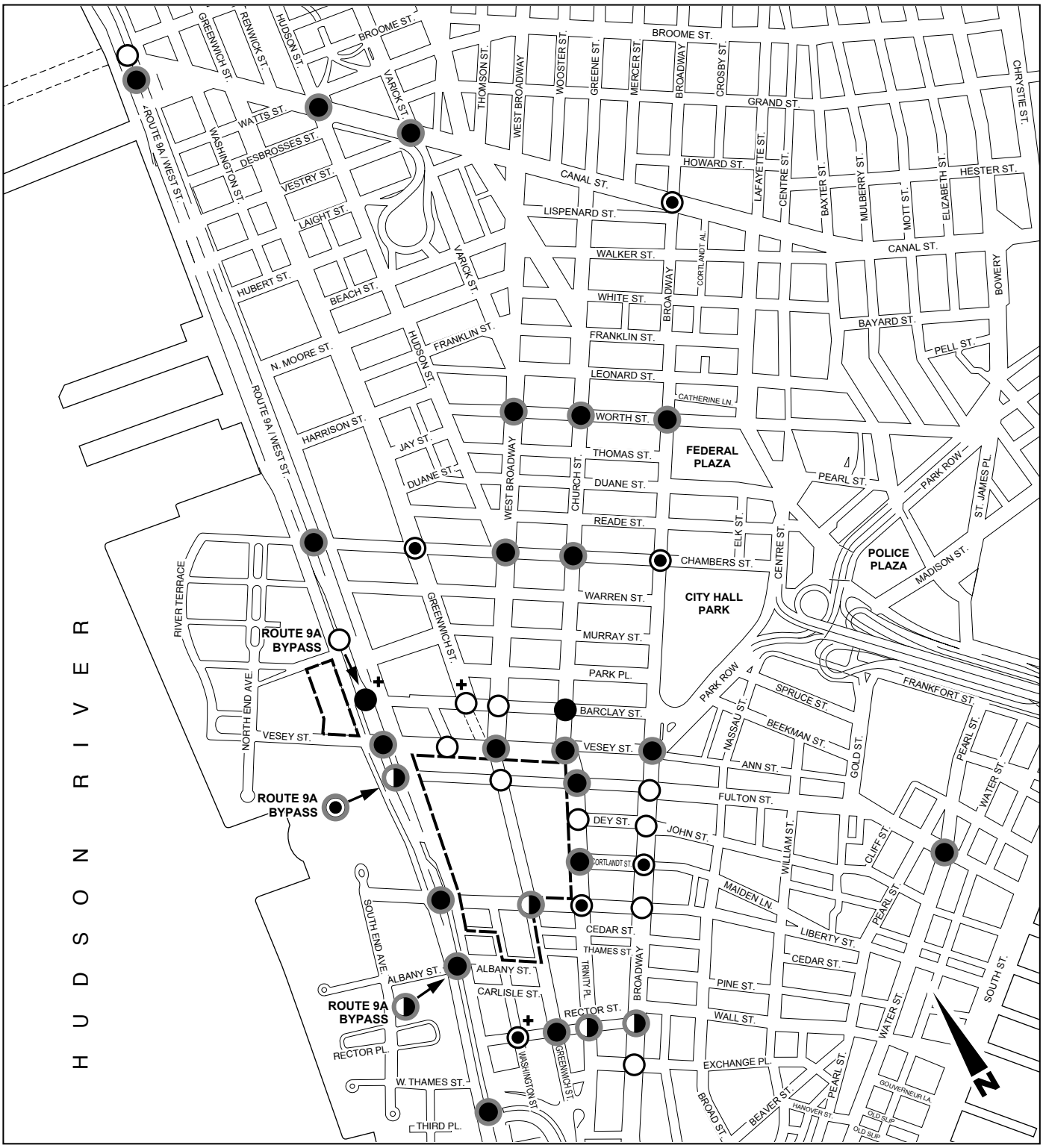
The determination of significant traffic impacts generated by the Proposed Action in 2015 is again defined by comparing projected future Build conditions to background or No Action conditions established from the Pre-September 11 Scenario.

In the AM peak hour, 25 of the 42 signalized and unsignalized intersections analyzed (including the two newly created intersections of Fulton Street/Greenwich Street and Fulton Street/Route 9A resulting from the extension of Fulton and Greenwich Streets through the WTC Site as part of the Proposed Action) would be significantly impacted with the at-grade arterial design for Route 9A. In the midday peak hour, 21 of the 42 intersections would be significantly impacted; in the PM peak hour, 24 of the 42 intersections would be significantly impacted, with the at-grade design for Route 9A.

Figures 13A-32 through 13A-34 show the locations where significant impacts can be expected. For the at-grade arterial design for Route 9A, these locations include (italics indicate new significant impacts as compared with 2009 conditions):

- Route 9A and Canal Street—AM, midday, and PM
- Route 9A and Chambers Street—AM, *midday, and PM*
- Route 9A and Vesey Street—AM, midday, and PM
- Route 9A and Fulton Street—AM
- *Route 9A and Liberty Street—AM, midday, and PM* (no PM significant impact for Route 9A short bypass)
- Route 9A and Albany Street—AM, midday, and PM *(AM significant impact for Route 9A short bypass)*
- Route 9A and Entrance to the Brooklyn Battery Tunnel—AM, midday, and PM
- Canal Street and Hudson Street—AM, midday, and PM
- Canal Street and Varick Street—*AM*, midday and PM
- West Broadway and Worth Street—AM *and PM*
- West Broadway and Chambers Street—AM, *midday*, and PM
- West Broadway/Greenwich Street and Vesey Street—AM, midday, and PM
- *Greenwich Street and Liberty Street—AM and PM*
- Greenwich Street and Rector Street—*AM*, midday, *and PM*
- Church Street and Worth Street—AM, midday, and PM
- Church Street and Chambers Street—AM, *midday*, and PM
- Church Street and Vesey Street—AM, midday, and PM
- Church Street and Fulton Street—AM, midday, and PM
- Church Street and Cortlandt Street—*AM*, midday and PM
- *Church Street and Rector Street—AM*
- Broadway and Worth Street—AM, midday, and PM
- Broadway and Vesey Street—AM, midday, and PM
- Broadway and Rector Street—AM, *midday*, and PM
- Water Street and Fulton Street—AM, *midday*, and PM

The magnitude of the traffic impacts in 2015 can be traced to several factors, as was described for year 2009 impacts, including the following: (1) the addition of project-generated traffic to an already congested network that includes approximately 80 developments proposed in the area; (2) the volume of vehicular traffic expected to be generated by the Proposed Action, and, in particular, the Memorial; (3) the increased volume of traffic oriented to Vesey Street via Route 9A en route to the Project Site auto garage, which prior to the events of September 11 had direct underground connectors to and from Route 9A that did not have to make left turns across oncoming Route 9A traffic; and (4) the enormous volume of pedestrian traffic generated to and from the Memorial.



Project Site Boundary

Unsignalized Intersection

Note: Overall intersection LOS is shown for signalized intersections

LOS A or B

LOS C

LOS D

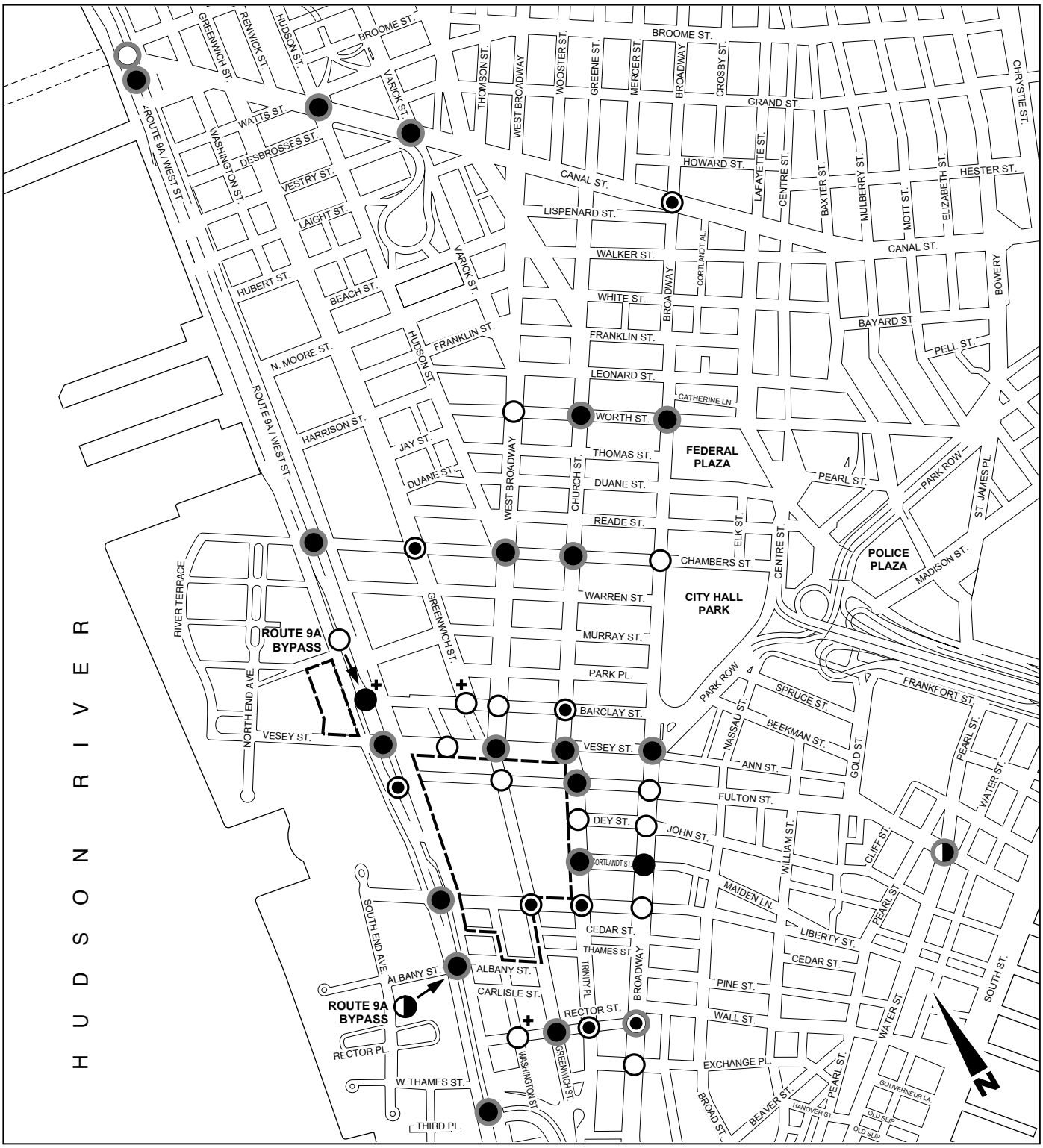
LOS E or F

Significant Impact

Traffic Levels of Service and Significant Impacts
2015 Build Conditions with Route 9A At-Grade
AM Peak Hour

Figure 13A-32

World Trade Center Memorial and Redevelopment Plan



Project Site Boundary

LOS A or B

LOS C

LOS D

LOS E or F

Significant Impact

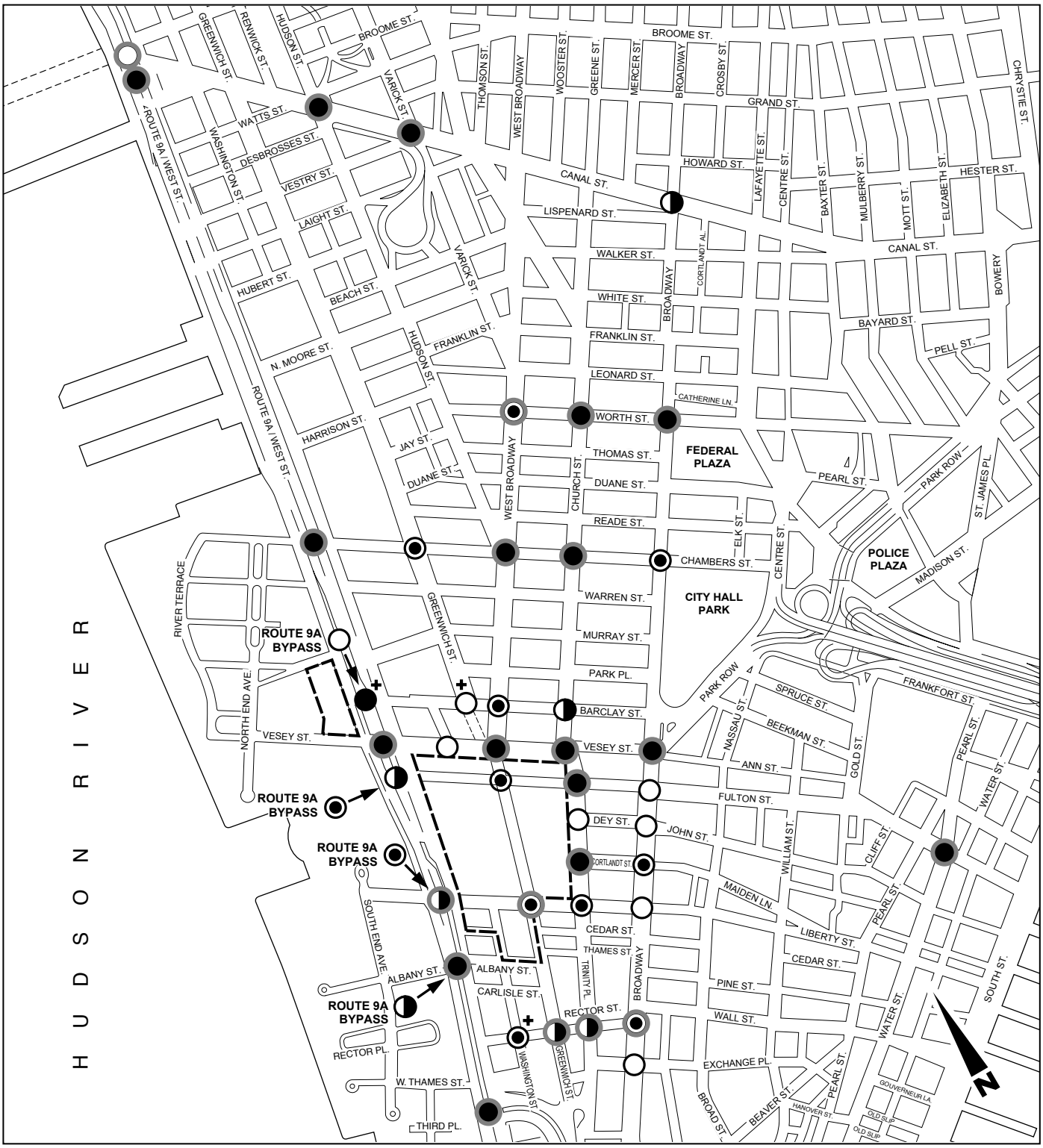
Unsignalized Intersection

Note: Overall intersection LOS is shown for signalized intersections

Traffic Levels of Service and Significant Impacts
2015 Build Conditions with Route 9A At-Grade
Midday Peak Hour

Figure 13A-33

World Trade Center Memorial and Redevelopment Plan



Project Site Boundary

Unsignalized Intersection

Note: Overall intersection LOS is shown for signalized intersections

LOS A or B

LOS C

LOS D

LOS E or F

Significant Impact

Traffic Levels of Service and Significant Impacts
2015 Build Conditions with Route 9A At-Grade
PM Peak Hour

Figure 13A-34

World Trade Center Memorial and Redevelopment Plan

Traffic mitigation analyses are presented in Chapter 22, "Mitigation Measures." As noted for year 2009 impact conditions previously, such mitigation measures typically include: signal phasing and timing changes where possible to reallocate green signal time to traffic movements that most need them at the expense of others that do not; stricter on-street parking prohibitions often with stricter enforcement to ensure that curb lanes are fully available for traffic needs during peak periods; intersection channelization improvements and lane striping changes that, for example, create single or double turn lanes where needed, or create shared lanes where needed; and other measures detailed later in this GEIS. As stated previously for 2009 conditions, the proposed extension of Fulton and Greenwich Streets through the WTC Site would help alleviate some of the potential traffic problems by improving site accessibility, drop-offs at the Memorial, and circulation.

13A.6 PROJECTED CONDITIONS WITH GREENWICH AND FULTON STREET EXTENSIONS CLOSED TO VEHICLES

The Greenwich and Fulton Street extensions through the WTC Site may be closed to vehicular traffic from time to time *for special events*. This section addresses projected changes in future traffic conditions under those circumstances. The Proposed Action would allow both of these streets to be used by all vehicles dropping off and picking up passengers at the Memorial and adjacent uses. Greenwich Street between Fulton and Liberty Streets would be the focus of Memorial tour bus and taxi drop-offs and pickups, with tour buses using the west curb lane and taxis predominantly using the east curb lane. Both tour buses and taxis would be able to serve their patrons directly at the entrances to the Memorial and other uses along Greenwich Street.

With these two streets closed to traffic within the WTC Site, tour buses and taxis would drop off their patrons primarily along Church Street or other east-west streets farther away from the site. *This would put additional burdens on streets away from the Project Site to accommodate curbside pickup and drop-off activities that could no longer be accommodated within the Project Site.* Vehicular traffic would be worse at several key locations. Projected volumes, levels of service, and significant impacts are addressed below for year 2009 and 2015 conditions with the at-grade arterial design for Route 9A, except where noted specifically for the short bypass tunnel design.

13A.6.1 PROJECTED CONDITIONS AND IMPACTS, 2009

The extension of Greenwich Street southward through the WTC Site from Vesey Street to Liberty Street, under the Proposed Action, is expected to attract approximately 450 vehicles per hour (vph) in the AM peak hour, 535 vph in the midday peak hour, and 570 vph in the PM peak hour. The extension of Fulton Street westward through the site from Church Street to Route 9A, under the Proposed Action, is expected to attract approximately 250-260 vph in the AM and midday peak hours, and 320 vph in the PM peak hour. Without vehicular traffic permitted on these two street extensions, the traffic volumes cited above would find other, generally more circuitous, routes to serve their patrons.

The impacts of the changes in traffic access patterns were analyzed at six representative, potentially critical, intersections: Route 9A at Vesey Street and at Liberty Street; West Broadway/Greenwich Street at Vesey Street; Church Street at Vesey Street; and Broadway at Vesey Street. These are intersections that are representative of locations where volume changes, levels of service, and impacts could be most pronounced. For example, under 2009 interim

build-out conditions, traffic volumes on southbound Route 9A (with the at-grade arterial design) would increase by about 175 vph in the AM peak hour and by 235 to 250 vph in the midday and PM peak hours at Liberty Street, while traffic volumes on northbound Church Street would increase by about 135 vph, 215 vph, and 235 vph during these three traffic analysis hours, respectively.

The analysis of traffic levels of service for projected Build conditions without vehicular traffic permitted on the extensions of Greenwich and Fulton Streets indicates that there would be appreciable differences. Some significant impacts that would not be expected with vehicular traffic permitted under the Proposed Action would result from the fact that vehicular traffic would then use other streets.

At Route 9A and Vesey Street, traffic conditions without vehicular traffic permitted on the two street extensions would be at overall intersection LOS F for all three traffic analysis hours, with higher overall intersection delays than expected with vehicular traffic permitted on the extension of Greenwich and Fulton Streets (at-grade arterial design for Route 9A). The same would generally occur with the short bypass tunnel design for Route 9A, with intersection delays being appreciably greater in the PM peak hour for the "no vehicular traffic" condition.

At Route 9A and Liberty Street, there would be significant impacts during all three traffic analysis hours that would not be expected if vehicular traffic were permitted on these two streets (at-grade arterial design). With the short bypass tunnel design for Route 9A, overall intersection delays would be significantly higher for conditions without vehicular traffic on the extensions of Greenwich and Fulton Streets and there would be significant impacts in two of the three traffic analysis hours as opposed to no significant impacts with vehicular traffic permitted.

At the intersection of West Broadway/Greenwich Street and Vesey Street, there would be significant impacts during all three traffic analysis hours even though levels of service would be better, and overall intersection delays would be lower, without vehicular traffic permitted on the extensions of Greenwich and Fulton Streets through the WTC Site.

At the intersection of Church Street and Vesey Street, overall intersection delays would be substantially higher within overall intersection LOS F for conditions without vehicular traffic permitted on the extensions of the two streets through the WTC Site due to the increased traffic volume activity on Church Street. These worsened conditions are expected for all three traffic analysis hours.

At Broadway/Vesey Street, overall intersection delays would also be substantially higher within overall intersection LOS F for conditions without vehicular traffic permitted on the Greenwich and Fulton Street extensions.

At Broadway and Liberty Street, there would be no significant traffic impacts for conditions either with or without vehicular traffic permitted on the extensions of Greenwich and Fulton Streets.

The above findings reflect projected traffic conditions with the at-grade arterial design for the Route 9A corridor, as is being developed by NYSDOT. The analyses for a condition without vehicular traffic permitted on the extension of Greenwich and Fulton Streets through the Project Site were also conducted for the short bypass tunnel design, for two locations—the intersections of Route 9A at Vesey Street and at Liberty Street, i.e., at the two corners of the overall Project Site abutting Route 9A.

For year 2009 traffic conditions, the Route 9A locations analyzed would operate at approximately the same levels of service as the at-grade design. Some traffic movements would operate better with the at-grade design, while others would operate better with the short bypass tunnel design. The Route 9A/Vesey Street intersection would operate with significantly lower overall delays with the at-grade design in the midday peak hour, when traffic activity to the Memorial is pronounced.

Traffic mitigation analyses are presented in Chapter 22, "Mitigation Measures," and indicate that there are significant differences—i.e., deteriorations—for conditions without the extensions of Greenwich and Fulton Streets through the WTC Site.

13A.6.2 PROJECTED CONDITIONS AND IMPACTS, 2015

In year 2015 under full build-out conditions, the extension of Greenwich Street southward through the WTC Site from Vesey Street to Liberty Street, under the Proposed Action, is expected to attract approximately 480 vehicles per hour (vph) in the AM peak hour, and approximately 540 to 560 vph in the midday and PM peak hours. The extension of Fulton Street westward through the site from Church Street to Route 9A, under the Proposed Action, is expected to attract approximately 340 vph in the AM and midday peak hours, and 390 vph in the PM peak hour. Some volumes are projected to be slightly lower under year 2015 conditions than under 2009 conditions, despite increased build-out of the WTC Site, because of stabilized (and somewhat lower) patronage at the Memorial several years after its "surge" patronage in its opening year. Without vehicular traffic permitted on these two street extensions, the traffic volumes cited above would find other, generally more circuitous, routes to serve their patrons.

The impacts of the changes in traffic access patterns were analyzed at the same six intersections analyzed for year 2009 conditions, and the results indicate that there would be appreciable differences and significant impacts that would not be expected with vehicular traffic permitted under the Proposed Action's extension of the two streets through the WTC Site in 2015, just as indicated for year 2009. Traffic volumes on southbound Route 9A at Liberty Street (with the at-grade arterial design) would increase by about 250 vph in the AM peak hour and by about 280 to 290 vph in the midday and PM peak hours, while traffic volumes on northbound Church Street would increase by about 225 vph in the AM peak hour and by about 290-300 vph in the midday and PM peak hours.

At Route 9A and Vesey Street, traffic levels of service without vehicular traffic permitted on the street extensions would be the same as anticipated for year 2009 conditions; the intersection would operate at overall intersection LOS F for all three traffic analysis hours, with higher overall intersection delays than expected with vehicular traffic permitted on the extension of Greenwich and Fulton Streets, for the at-grade arterial design for Route 9A. The same would occur with the short bypass tunnel design for Route 9A, with intersection delays being appreciably greater for the "no vehicular traffic" condition.

At Route 9A and Liberty Street, without vehicular traffic permitted on the two street extensions, traffic level of service F would be expected during all three traffic analysis hours, as opposed to LOS E conditions in the AM and midday peak hours and LOS D in the PM peak hour for conditions with vehicular traffic permitted under the Proposed Action, and with significantly higher intersection delays without vehicular traffic permitted (at-grade arterial design for Route 9A). There would be significant impacts during all three traffic analysis hours under both conditions—with or without vehicular traffic permitted. For the short bypass tunnel design for Route 9A, overall intersection delays would be significantly higher for conditions without

vehicular traffic permitted on the extensions of Greenwich and Fulton Streets than with vehicular traffic permitted.

At the intersection of West Broadway/Greenwich Street and Vesey Street, there would be significant impacts during all three traffic analysis hours, even though overall intersection delays would be lower, without vehicular traffic permitted on the extensions of Greenwich and Fulton Streets through the WTC Site.

At the intersection of Church Street and Vesey Street, overall intersection delays would be substantially higher within overall intersection LOS F for conditions without vehicular traffic permitted due to the increased traffic volume activity on Church Street. These worsened conditions are expected for all three traffic analysis hours (similar projections were identified above for year 2009 conditions).

At Broadway/Vesey Street, overall intersection delays would also be substantially higher within overall intersection LOS F for conditions without vehicular traffic permitted on the Greenwich and Fulton Street extensions (similar conclusions were made above for year 2009 conditions).

At Broadway and Liberty Street, there would be no significant traffic impacts for conditions either with or without vehicular traffic permitted on the two street extensions, as was concluded above for year 2009 conditions.

Traffic mitigation analyses are presented in Chapter 22, "Mitigation Measures," and indicate that there are significant differences—i.e., deteriorations—for conditions without the extensions of Greenwich and Fulton Streets through the WTC Site.

13A.7 PROJECTED CONDITIONS FOR ALTERNATIVE TRIP ASSUMPTIONS

13A.7.1 INTRODUCTION

The previous sets of traffic analyses indicate that the Proposed Action could potentially generate up to approximately 3,000 vehicle trips in the peak traffic hours under full build-out conditions in 2015. These analyses were developed by using a series of "reasonable worst case" assumptions that, when combined together, produce findings that may, in fact, be highly conservative. Together with a substantial volume of projected background traffic from proposed development projects in the area, this level of trip generation could significantly impact more than half of the 40 study area intersections analyzed, as described in the preceding sections of this chapter.

Given Lower Manhattan's extensive public transportation assets—service by all transit modes with the densest concentration of subway service in the city—plus the substantial transit initiatives underway to modernize and improve the area's transit facilities and Lower Manhattan's historically low dependence on autos and taxis, an alternate set of trip generation/modal split assumptions was evaluated to test the sensitivity of the potential traffic impact conclusions. All of the analyses earlier in this chapter identified projected traffic conditions, levels of service, and significant impacts under a set of trip generation and modal split assumptions based on *CEQR Technical Manual* guidelines. There are reasons to believe that use of that set of assumptions leads to conclusions that are exceedingly conservative in this case.

First, the development program analyzed for the Proposed Action is conservative in that it includes up to 1 million square feet of retail space, whereas 600,000 square feet of retail space is the more likely possibility.

Second, there are multiple land uses and development components expected—office, retail, Memorial and *Memorial Center*, cultural facilities, a Performing Arts Center, restaurants, and hotel. Even though the preceding analyses allow for some linkage of trips between the various uses, substantially more linkage can be expected among these uses.

Third, a substantial volume of taxi activity is expected to be attracted to the Project Site, focused primarily on the entrance to the Memorial, where a major taxi service lane is expected, much as occurs today in front of Penn Station on Seventh Avenue. Nearly all incoming taxi trips can be expected to depart from the area with an outbound passenger, even though the preceding analyses assume that a lesser portion of arriving taxis would depart with passengers.

Fourth, some of the modal split assumptions—particularly for taxi access to the Memorial—were considered to be conservative in light of the availability of several public transportation modes, and were adjusted for the analyses completed for the alternative scenario evaluated below.

Fifth, the analyses completed based on these alternative assumptions include a 10 percent shift of employee auto trips to and from the office towers from the peak hours to the shoulder hours just before or just after the conventional 8-9 AM and 5-6 PM peak hours, as motorists recognize that congestion occurring during those peak hours could be at least partially avoided by arriving or leaving slightly earlier or later, or by choosing other modes of travel. This is consistent with traffic models that include capacity constraints at major entry points to Lower Manhattan, such as the Brooklyn Battery Tunnel and the Holland Tunnel.

Sixth, the preceding sets of No Action traffic analyses separately accounted for approximately 80 nearby development projects, including some very modest-sized developments. Traffic generated by the more modest-sized developments has, in the analysis below, been included in the background annual traffic growth.

13A.7.2 TRIP GENERATION AND MODAL SPLIT ASSUMPTION CHANGES

For the reasons indicated above, the following specific changes in assumptions were made for this analysis:

- 600,000 square feet of retail space would be developed under the Proposed Action, rather than one million square feet of retail space
- 40 percent of trips made to the proposed Performing Arts Center would be linked to the Memorial
- 95 percent of the taxi trips made to the Project Site would have passengers in both the taxis' inbound and outbound trips (as opposed to 75 percent assumed previously)
- The taxi "share" of office trips would be 0.8 percent, consistent with the rates typically used for projects in Lower Manhattan (as opposed to 2 percent assumed previously). The taxi share for Memorial trips was assumed to be 10 percent, rather than the 16.3 percent used previously (the 10 percent is more consistent with the overall low taxi shares for Lower Manhattan sites).

- The temporal distribution of auto trips to office space in the AM and PM peak hours was adjusted to shift 10 percent of the peak hour trips to the shoulder hours just outside the specific traffic peak hours

These revised assumptions represent a less conservative picture, yet one that is still conservative. A comparison of trip generation results under the previous set of trip generation/modal split assumptions and this alternative set of assumptions is presented in Table 13A-19.

Table 13A-19
Vehicle Trip Comparison of Alternative
Trip Generation and Modal Split Assumptions

	2009 Build Analysis	2009 Alternative Scenario	Change in Trips	2015 Build Analysis	2015 Alternative Scenario	Change in Trips
AM Peak Hour	1,307	920	-387 (-30%)	2,558	1,985	-573 (-22%)
Midday Peak Hour	1,666	1,085	-581 (-35%)	2,904	1,972	-928 (-32%)
PM Peak Hour	1,709	1,163	-546 (-33%)	2,559	1,885	-674 (-26%)

As shown in Table 13A-19, under year 2009 conditions, the volume of vehicle trips that can be expected to be generated under the alternative, less conservative set of assumptions, would be approximately 387 trips lower in the AM peak hour, 581 trips lower in the midday peak hour, and 546 trips lower in the PM peak hour. These vehicle trip reductions reflect, approximately, a 30-35 percent reduction as compared to vehicle trip projections developed and used in the previous sets of analyses.

Under year 2015 conditions, the volume of vehicle trips that can be expected to be generated under the alternative, less conservative set of assumptions, would be approximately 573 trips lower in the AM peak hour, 928 trips lower in the midday peak hour, and 674 trips lower in the PM peak hour. These vehicle trip reductions reflect, approximately, a 20-25 percent reduction in the AM and PM peak hours and a one-third reduction in the midday as compared to vehicle trip projections developed and used in the previous sets of analyses.

13A.7.3 TRAFFIC LEVEL OF SERVICE AND SIGNIFICANT IMPACT FINDINGS

In order to determine the effects of the reduced trip generation levels on the traffic study area roadway network, a set of 15 key representative analysis locations were selected for traffic level of service and significant impact comparisons. These analysis locations included the following:

- Route 9A at Chambers Street, Vesey Street, Fulton Street, Albany Street, and the entrance to the Brooklyn Battery Tunnel
- West Broadway/Greenwich Street at Vesey Street
- Greenwich Street at Rector Street
- Canal Street at Hudson Street and at Varick Street
- Church Street at Worth Street, Vesey Street, Fulton Street, and Cortlandt Street
- Broadway at Worth Street and at Vesey Street

These are all locations where significant traffic impacts were identified for the previous set of trip generation/modal split assumptions and included locations where the analyses of future conditions with the Proposed Action indicated that congestion could be most pronounced. The traffic level of service analyses and significant impact determinations were conducted for full build-out conditions in year 2015, and the key findings are reviewed below for conditions with the at-grade arterial design for the Route 9A corridor.

The analyses show that, with only a few exceptions, intersections that would be significantly impacted under the original trip generation/modal split assumptions would still be significantly impacted under the alternative set of trip generation/modal split assumptions. At two of the 15 intersections analyzed, there would be no significant impact during one or more periods of the day. At Greenwich Street and Rector Street, significant impacts projected in the AM and PM peak hours under the preceding set of analyses with the original trip generation/modal split assumptions would not be significant impacts under the alternative set of assumptions; mitigation would still be needed at midday and those mitigation measures would still be implemented for the full day because they consist of re-striping the Greenwich Street approach to the intersection to provide two defined traffic lanes. At Canal Street and Varick Street, significant impacts had been projected for all three traffic analysis periods; under the alternative assumptions, there would be no significant impacts in the AM peak hour.

For the Route 9A intersections analyzed under this alternative set of assumptions—at Chambers, Vesey, Fulton, and Albany Streets and at the entrance to the Brooklyn Battery Tunnel—the results are much the same as concluded for the Route 9A corridor analyses for the original set of trip generation/modal split assumptions and as concluded above. Significant impacts would be the same, and levels of service would be slightly better for a small number of specific traffic movements along the Route 9A corridor.

The detailed analyses also show that, although the number of locations at which significant impacts would no longer be expected is few, at several of the intersections analyzed either the overall intersection level of service or several specific traffic movements through the intersections would improve. For example, at the intersection of Route 9A and Chambers Street, northbound and southbound Route 9A levels of service under the at-grade arterial design would be better with lower projected volumes along this important corridor. The greatest improvement under the alternative set of trip generation/modal split assumptions—which project a significantly reduced volume of traffic generated by the Proposed Action—would occur in the ability to mitigate significant impacts, as is described later in Chapter 22, "Mitigation Measures."

13A.8 *PROJECTED CONDITIONS WITH STREET DIRECTION CHANGES*

13A.8.1 *INTRODUCTION*

As planning for the area proceeds, including redevelopment of the Project Site as part of the Proposed Action, several street direction changes and site access/egress route modifications are being considered to improve traffic and pedestrian flows in the area. This section of the traffic analysis has considered one set of such changes that has emerged since publication of the DGEIS, including the following:

- *Converting Vesey Street from two-way traffic flow between Route 9A and Church Street to one-way eastbound, which would also conform to the one-way section of Vesey Street between Church Street and Broadway.*
- *Narrowing the width of Greenwich Street within the Project Site to allow for wider sidewalks in front of the proposed Memorial. Together with the proposed closing off of Greenwich Street in front of 7 World Trade Center (between Vesey and Barclay Streets), this could reduce traffic volumes on Greenwich Street adjacent to the Memorial and serve as a "traffic calming" measure.*
- *Making the Liberty Street truck entrance ramp into the underground garage beneath the Project Site into a two-directional ramp, to allow for increased capacity onto the roadway network. For analyses with the at-grade plan for Route 9A, this two-way ramp would allow for trucks entering eastbound, and for trucks and autos to exit the garage westbound and then turn onto Route 9A. For analyses with the Route 9A short bypass plan, the exit ramp that enables trucks to leave the garage and proceed directly into the northbound mainline of Route 9A would be available for both trucks and autos leaving the garage.*
- *Albany Street would be retained as a one-way eastbound street, not reversed to one-way westbound east of Route 9A as was analyzed in the previous sections of this chapter.*

The analyses conducted along with the proposed street direction changes also assumed that some southbound auto traffic destined to the Project Site would divert off of Route 9A at Chambers Street and then use Greenwich Street or West Broadway to reach the Project Site.

The purpose of this section is to consider the potential advantages and disadvantages of possible street direction changes currently under consideration by the Port Authority with reference to projected traffic levels in both 2009 and 2015.

The detailed traffic level of service and significant impact analyses that follow were conducted for both traffic analysis years, 2009 and 2015, for both the initial set of trip generation and modal split assumptions described in detail in sections 13A.4.3 and 13A.4.4, as well as for the alternative (lower) trip generation and modal split assumptions described in section 13A.7. The traffic level of service and significant impact analyses summarized below were conducted for the full study area network analyzed previously in the DGEIS.

13A.8.2 *TRAFFIC LEVEL OF SERVICE AND SIGNIFICANT IMPACTS, 2009*

For projected year 2009 conditions, Build condition levels of service would, for the most part, remain similar to those determined previously in this chapter without the newly proposed street direction changes. Approximately 30 to 35 of the 40 intersections analyzed would not have any significant changes in their overall levels of service. The intersections where significant changes in projected levels of service are primarily those located on the immediate periphery of the Project Site or close to it. Figures 13A-35 through 13A-37 depict overall intersection levels of service in 2009 with the newly proposed street direction changes with the at-grade arterial design for Route 9A (traffic level of service changes with the short bypass alternative for Route 9A are also shown as insets on these figures). Significant impact locations requiring mitigation analyses are also shown in Figures 13A-35 through 13A-37.

As shown in Table 13A-20, in the AM peak hour, the number of analysis locations operating at overall LOS E or F is projected to increase from eight under future No Action conditions to

Table 13A-20
Traffic Level of Service Summary Comparison
Future No Action vs Future Build Conditions (2009)
Current Conditions Scenario with at-Grade Route 9A and Street Direction Changes

Signalized Intersections	2009 No Action AM	2009 No Action MD	2009 No Action PM	2009 Build AM	2009 Build MD	2009 Build PM
Overall LOS A/B	18	20	16	13	16	11
Overall LOS C	6	7	10	6	8	10
Overall LOS D	6	3	3	9	4	7
Overall LOS E/F	8	8	9	10	10	10
No. of movements at LOS E or F	32	27	26	39	32	30

10 with the Proposed Action in 2009 with the street direction changes described above (the same number of LOS E or F conditions as for the Proposed Action without the street direction changes). Nine other intersections would operate at overall LOS D (without the street direction changes there would be seven such intersections). The number of specific traffic movements expected to operate at LOS E or F is projected to increase from 32 to 39 (without the street direction changes there would be 42 such traffic movements). Significant traffic impact can be expected to occur at 17 of the intersections analyzed; without the street direction changes, significant impacts were projected for 18 of the intersections analyzed.

In the midday peak hour, the number of analysis locations operating at overall LOS E or F is projected to increase from eight under future No Action conditions to 10 with the Proposed Action in 2009 with the street direction changes described above (there would be 13 such locations for the Proposed Action without the street direction changes). Four other intersections would operate at overall LOS D (without the street direction changes there would be two such intersections). The number of specific traffic movements expected to operate at LOS E or F is projected to increase from 27 to 32 (without the street direction changes there would be 34 such traffic movements). Significant traffic impact can be expected to occur at 18 of the intersections analyzed; without the street direction changes, significant impacts were projected for 16 of the intersections analyzed.

In the PM peak hour, the number of analysis locations operating at overall LOS E or F is projected to increase from nine under future No Action conditions to 10 with the Proposed Action in 2009 with the street direction changes described above (there would be 12 such locations for the Proposed Action without the street direction changes). Seven other intersections would operate at overall LOS D (without the street direction changes there would be five such intersections). The number of specific traffic movements expected to operate at LOS E or F is projected to increase from 26 to 30 (without the street direction changes there would be 34 such traffic movements). Significant traffic impact can be expected to occur at 19 of the intersections analyzed; without the street direction changes, significant impacts were projected for 18 of the intersections analyzed.

In comparing projected traffic conditions with the newly proposed street direction changes to conditions without these changes in 2009, several differences in levels of service are noted:

- *Conditions at the intersection of Route 9A and Vesey Street would be much improved with the street direction changes since there would be no westbound traffic movements going through the intersection. With the at-grade design for Route 9A, traffic levels of service in the midday and PM peak hours would improve to overall LOS D as opposed to LOS E/F conditions that would be expected to prevail without the street direction changes. In the AM peak hour, overall LOS E/F conditions would prevail both with and without the street direction changes, even though average vehicle delays would be substantially lower with the street direction changes.*
- *Conditions at the intersection of Vesey Street with Greenwich Street and West Broadway would also be much improved with one-way eastbound traffic. Overall intersection LOS C conditions would be expected in the AM and midday peak hours and LOS D would be expected in the PM peak hour with the street direction changes, rather than overall LOS E/F conditions that would be expected with two-way flow on Vesey Street.*
- *The Greenwich Street/Fulton Street intersection would experience worsened levels of service with the street direction changes since cars exiting the underground Project Site garage wanting to get to Route 9A to leave the area could no longer turn onto a westbound Vesey Street. These vehicles would generally leave the garage and use eastbound Vesey Street for one short block, make a right turn onto southbound Greenwich Street and then another right turn onto westbound Fulton Street in order to get to Route 9A. LOS C conditions are expected in the AM and midday peak hours at the Greenwich Street/Fulton Street intersection, and LOS D in the PM peak hour. Acceptable levels of service are expected at this intersection without the street direction changes being analyzed here.*
- *The intersections of Chambers Street at both Greenwich Street and at West Broadway would be expected to operate at overall LOS C and LOS E/F, respectively, in the AM peak hour with the street direction changes and the assumed shift of a modest amount of traffic generated by the Proposed Action from southbound Route 9A to southbound Greenwich Street and southbound Route 9A. Without the street direction changes, they would operate at overall LOS A/B and LOS D, respectively.*
- *Conditions at the intersection of Route 9A and Liberty Street would be expected to deteriorate under the street direction changes since autos parked in the underground Project Site garage could now exit via the two-directional ramp leading to this intersection. In the midday peak hour, LOS C conditions are expected with the street directions changes versus LOS C without the street direction changes. In the PM peak hour, overall LOS D conditions are projected with the street direction changes as opposed to LOS C conditions without these changes.*
- *Overall intersection level of service would deteriorate at the unsignalized intersection of Route 9A and Barclay Street in the AM peak hour since Barclay Street would be expected to carry some of the westbound traffic that would otherwise use Vesey Street had Vesey Street remained two-way.*

Thus, there would be trade-offs with the street direction changes versus keeping the current street directions. There would be significantly better conditions for vehicles approaching the Project Site and its vicinity along Vesey Street, while there would be worsened conditions approaching the Project Site along Chambers Street, Greenwich Street, and West Broadway, and within the Project Site (and leaving the Project Site) along Fulton Street and along Liberty Street. Chapter 22, "Mitigation Measures," addresses these conditions and analyzes potential improvements to mitigate significant traffic impacts.

Traffic analyses were also conducted for year 2009 Build conditions with NYSDOT's proposed short bypass tunnel design for Route 9A. These analyses were conducted for the same set of potentially key intersections along the Route 9A corridor that were addressed previously—i.e., at Chambers Street, Barclay Street, Vesey Street, Liberty Street, and at the entrance to the Brooklyn Battery Tunnel, as well as at the intersection of Route 9A and the extension of Fulton Street through the WTC Site that is part of the Proposed Action. This analysis of street direction changes also addressed one other intersection – the intersection of Fulton and Greenwich Streets' extensions within the WTC Site, since the short bypass tunnel design appeared to have the potential to considerably improve conditions at this location as compared to the at-grade design.

Several differences in overall intersection level of service were identified with the short bypass tunnel design in year 2009. Overall, there would be improvements at some intersections and deteriorations at others depending upon the analysis hour being considered, as illustrated in Figures 13A-35 through 13A-37. In the AM peak hour, there would be significant level of service improvements at the intersections of Route 9A at Barclay Street and at Fulton Street with some overall intersection level of service deterioration at Route 9A/Liberty Street; and, there would also be significant level of service improvements under the short bypass tunnel design at the intersection of Fulton Street and Greenwich Street. During the midday and PM peak hours, there would be trade-offs of improvements and some deteriorations at some locations, as shown in Figures 13A-35 through 13A-37. More pronounced benefits are subsequently shown for the combination of street direction changes with the short bypass tunnel design for year 2015 Build conditions, as described later in this section of the GEIS.

13A.8.3 *TRAFFIC LEVEL OF SERVICE AND SIGNIFICANT IMPACTS, 2015*

For projected year 2015 conditions, build condition levels of service would also, for the most part, remain similar to those determined previously in this chapter without the newly proposed street direction changes (see Table 13A-21). Approximately 30 to 35 of the 40 intersections analyzed would not have any significant changes in their overall levels of service, which is the same general finding as noted earlier for year 2009 Build conditions with the street direction changes. The intersections where significant changes in projected levels of service are primarily those located on the immediate periphery of the Project Site or close to it. Figures 13A-38 through 13A-40 depict overall intersection levels of service in 2015 with the newly proposed street direction changes with the at-grade arterial design for Route 9A (traffic level of service changes with the short bypass alternative for Route 9A are also shown as insets on these figures). Significant impact locations requiring mitigation analyses are also shown in Figures 13A-38 through 13A-40.

Table 13A-21
Traffic Level of Service Summary Comparison
Future No Action vs. Future Build Conditions (2015)
Current Conditions Scenario with at-Grade Route 9A and Street Direction Changes

Signalized Intersections	*2015 No Action AM*	*2015 No Action Midday*	*2015 No Action PM*	*2015 Build AM*	*2015 Build MD*	*2015 Build PM*
Overall LOS A/B	*9*	*15*	*12*	*6*	*11*	*8*
Overall LOS C	*12*	*8*	*8*	*9*	*6*	*9*
Overall LOS D	*3*	*2*	*7*	*2*	*4*	*5*
Overall LOS E/F	*14*	*13*	*11*	*21*	*17*	*16*
No. of movements at LOS E or F	*44*	*37*	*33*	*54*	*51*	*43*

In the AM peak hour, the number of analysis locations operating at overall LOS E or F is projected to increase from 14 under future No Action conditions to 21 with the Proposed Action in 2015 with the street direction changes described above (the same number of LOS E or F conditions as for the Proposed Action without the street direction changes). Two other intersections would operate at overall LOS D (without the street direction changes there would be four such intersections). The number of specific traffic movements expected to operate at LOS E or F is projected to increase from 44 to 54 (without the street direction changes there would be 56 such traffic movements). Significant traffic impact can be expected to occur at 25 of the intersections analyzed; without the street direction changes, significant impacts were also projected for 25 of the intersections analyzed.

In the midday peak hour, the number of analysis locations operating at overall LOS E or F is projected to increase from 13 under future No Action conditions to 17 with the Proposed Action in 2015 with the street direction changes described above (there would be 19 such locations for the Proposed Action without the street direction changes). Four other intersections would operate at overall LOS D (without the street direction changes there would be one such intersection). The number of specific traffic movements expected to operate at LOS E or F is projected to increase from 37 to 51 (without the street direction changes there would be 51 such traffic movements). Significant traffic impact can be expected to occur at 25 of the intersections analyzed; without the street direction changes, significant impacts were projected for 21 of the intersections analyzed.

In the PM peak hour, the number of analysis locations operating at overall LOS E or F is projected to increase from 11 under future No Action conditions to 16 with the Proposed Action in 2015 with the street direction changes described above (there would be 17 such locations for the Proposed Action without the street direction changes). Five other intersections would operate at overall LOS D (without the street direction changes there would be six such intersections). The number of specific traffic movements expected to operate at LOS E or F is projected to increase from 33 to 43 (without the street direction changes there would be 43 such traffic movements). Significant traffic impact can be expected to occur at 26 of the

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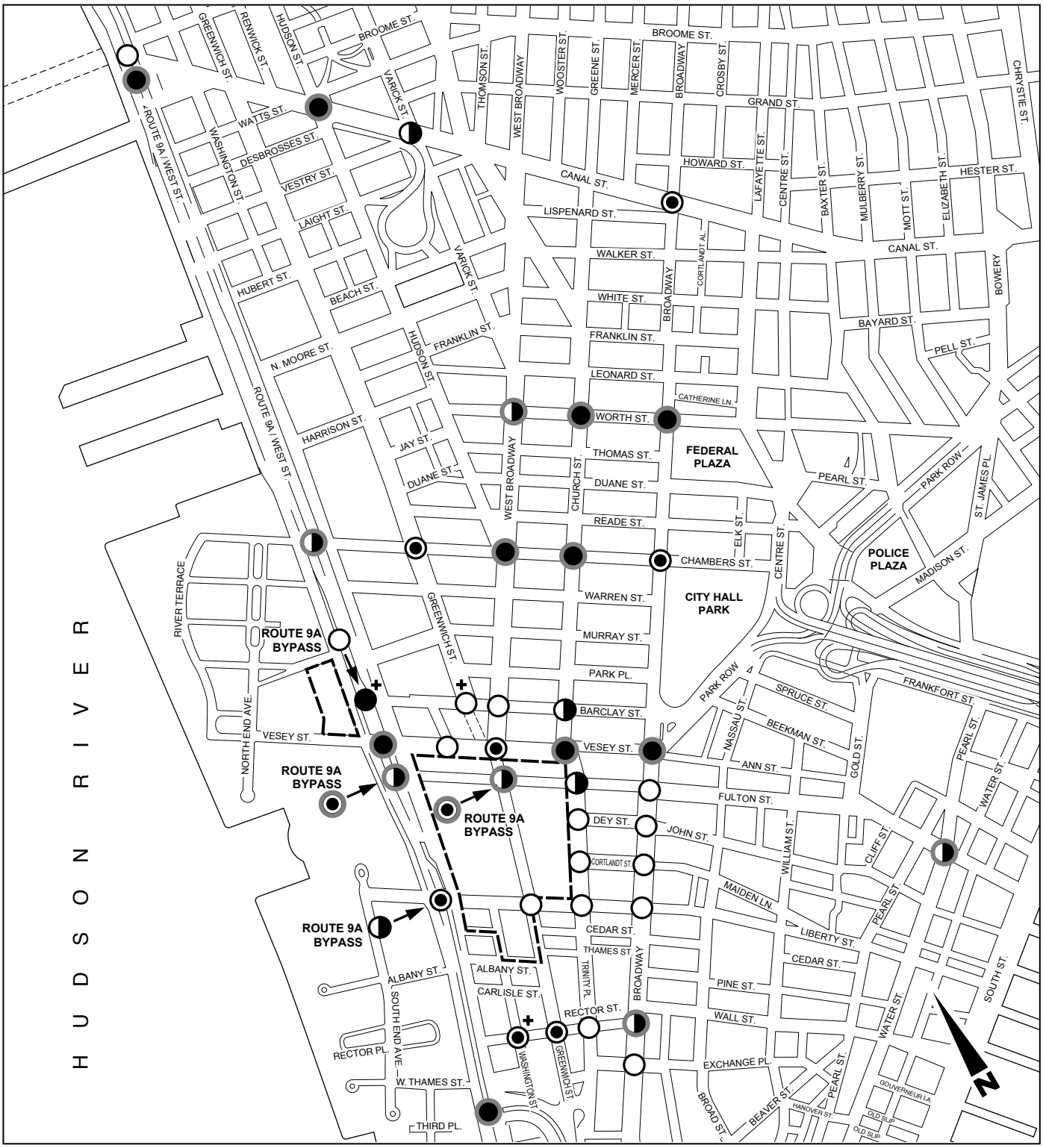


Project Site Boundary

LOS A or B

LOS C

LOS D

LOS E or F

Significant Impact

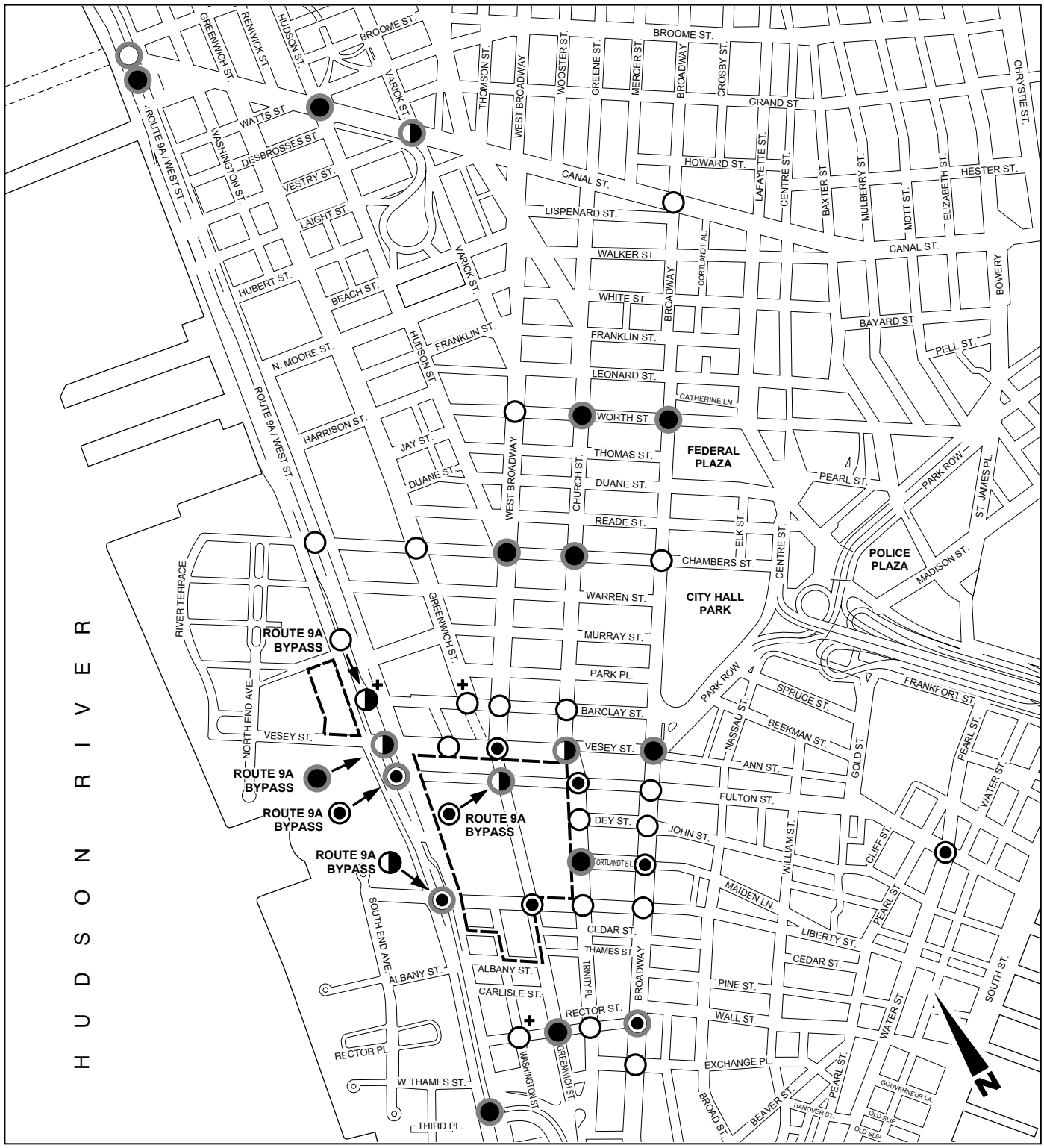
Unsignalized Intersection

Note: Overall intersection LOS is shown for signalized intersections

Traffic Levels of Service and Significant Impacts
2009 Build Conditions
with Route 9A At-Grade and Street Direction Changes
AM Peak Hour

Figure 13A-35

World Trade Center Memorial
and Redevelopment Plan



Project Site Boundary

Unsignalized Intersection

Note: Overall intersection LOS is shown for signalized intersections

LOS A or B

LOS C

LOS D

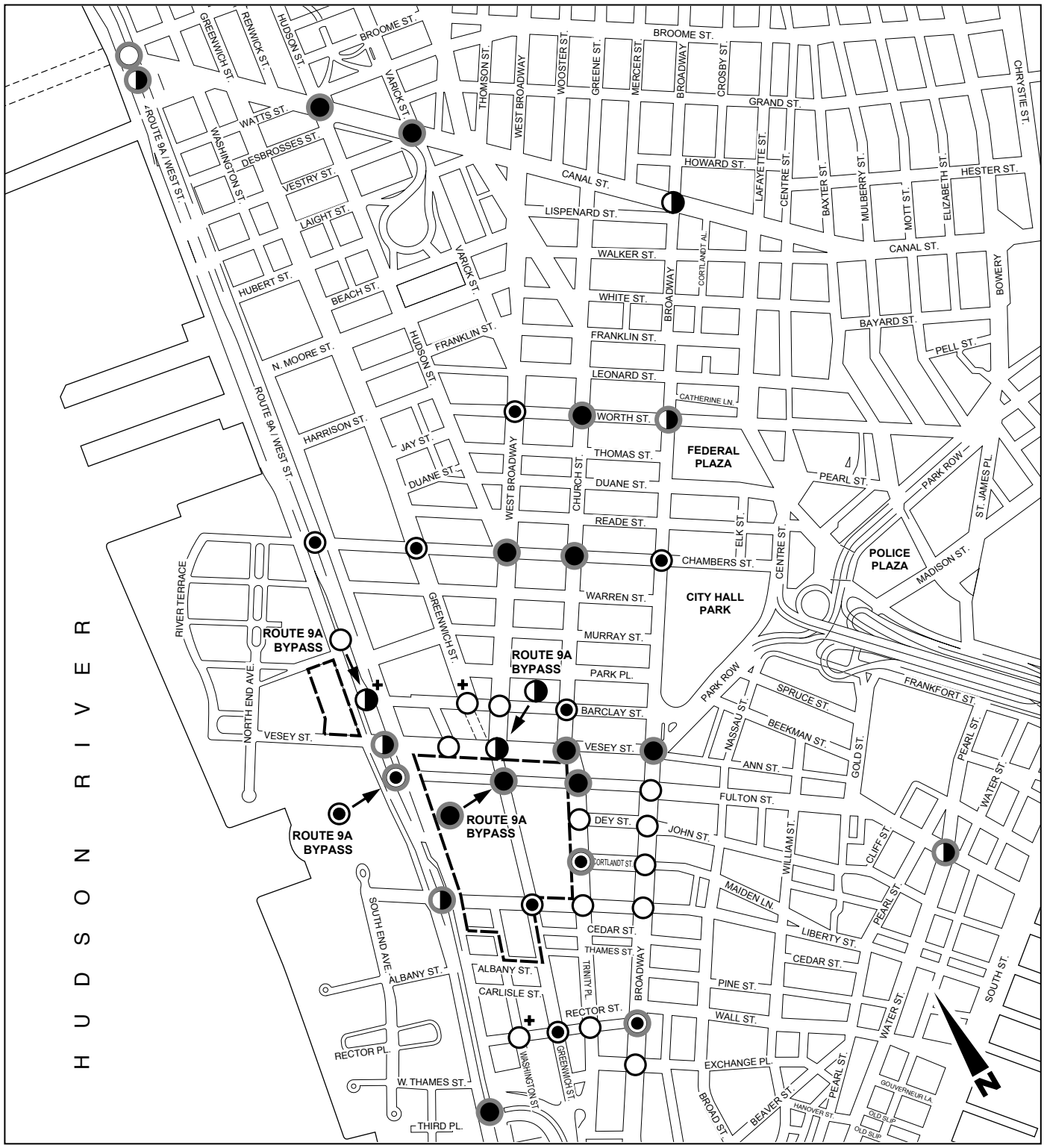
LOS E or F

Significant Impact

Traffic Levels of Service and Significant Impacts
2009 Build Conditions
with Route 9A At-Grade and Street Direction Changes
Midday Peak Hour

Figure 13A-36

World Trade Center Memorial
and Redevelopment Plan



Project Site Boundary

Unsignalized Intersection

Note: Overall intersection LOS is shown for signalized intersections

LOS A or B

LOS C

LOS D

LOS E or F

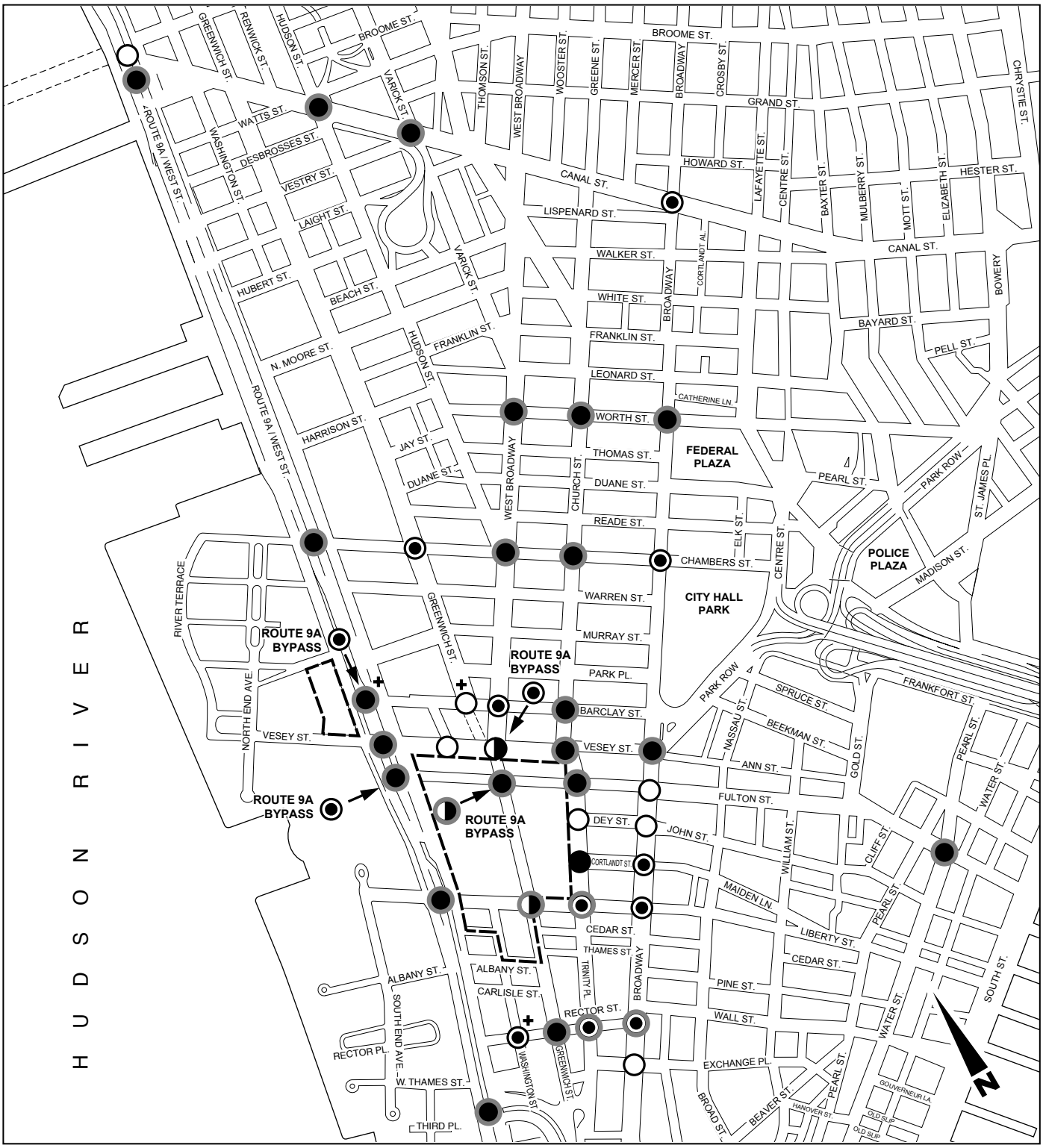
Significant Impact

Traffic Levels of Service and Significant Impacts
2009 Build Conditions
with Route 9A At-Grade and Street Direction Changes
PM Peak Hour

Figure 13A-37

World Trade Center Memorial
and Redevelopment Plan

3.29.04



Project Site Boundary

LOS A or B

LOS C

LOS D

LOS E or F

Significant Impact

Unsignalized Intersection

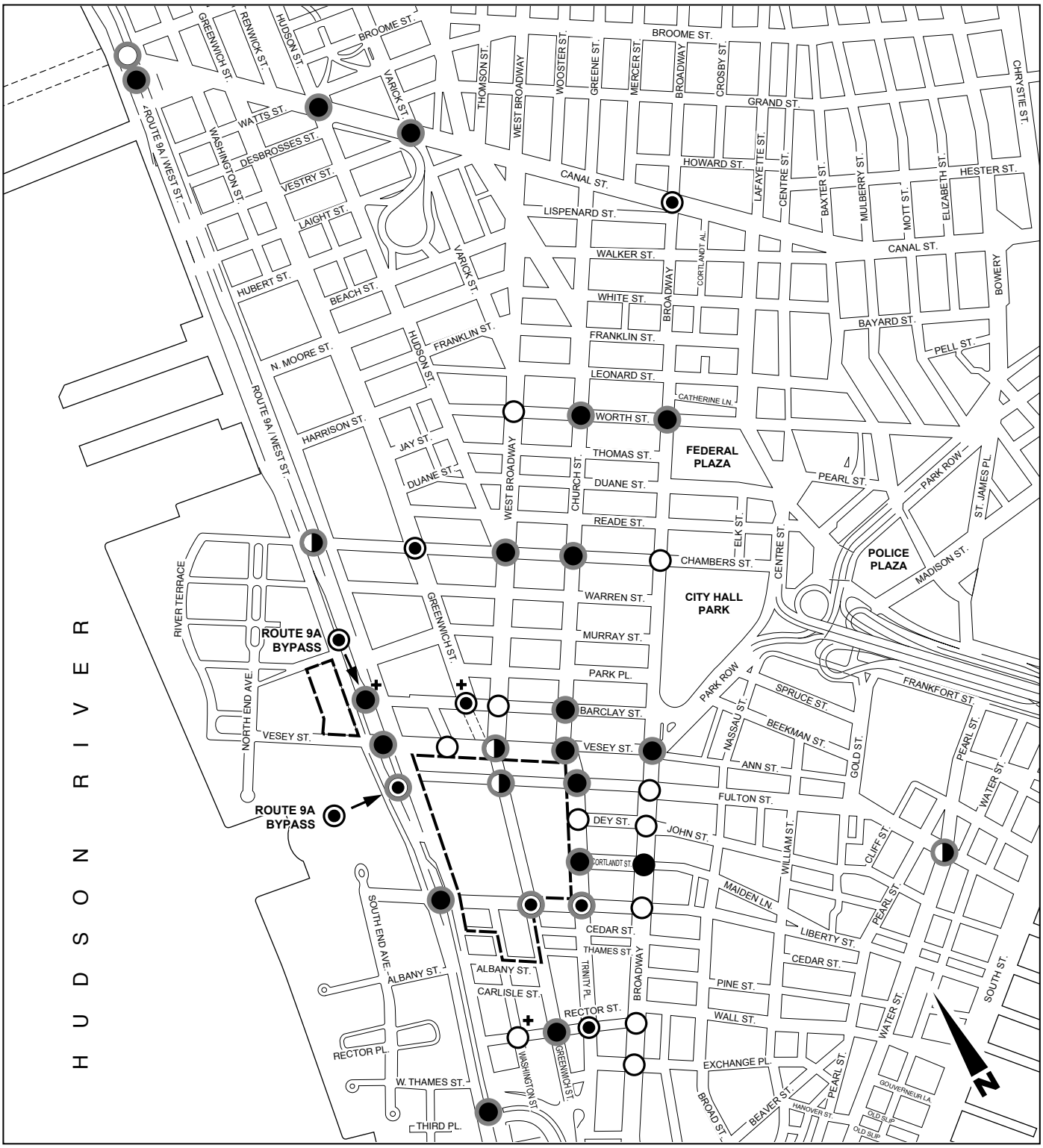
Note: Overall intersection LOS is shown for signalized intersections

Traffic Levels of Service and Significant Impacts
2015 Build Conditions
with Route 9A At-Grade and Street Direction Changes
AM Peak Hour

Figure 13A-38

World Trade Center Memorial
and Redevelopment Plan

3.18.04



Project Site Boundary

LOS A or B

LOS C

LOS D

LOS E or F

Significant Impact

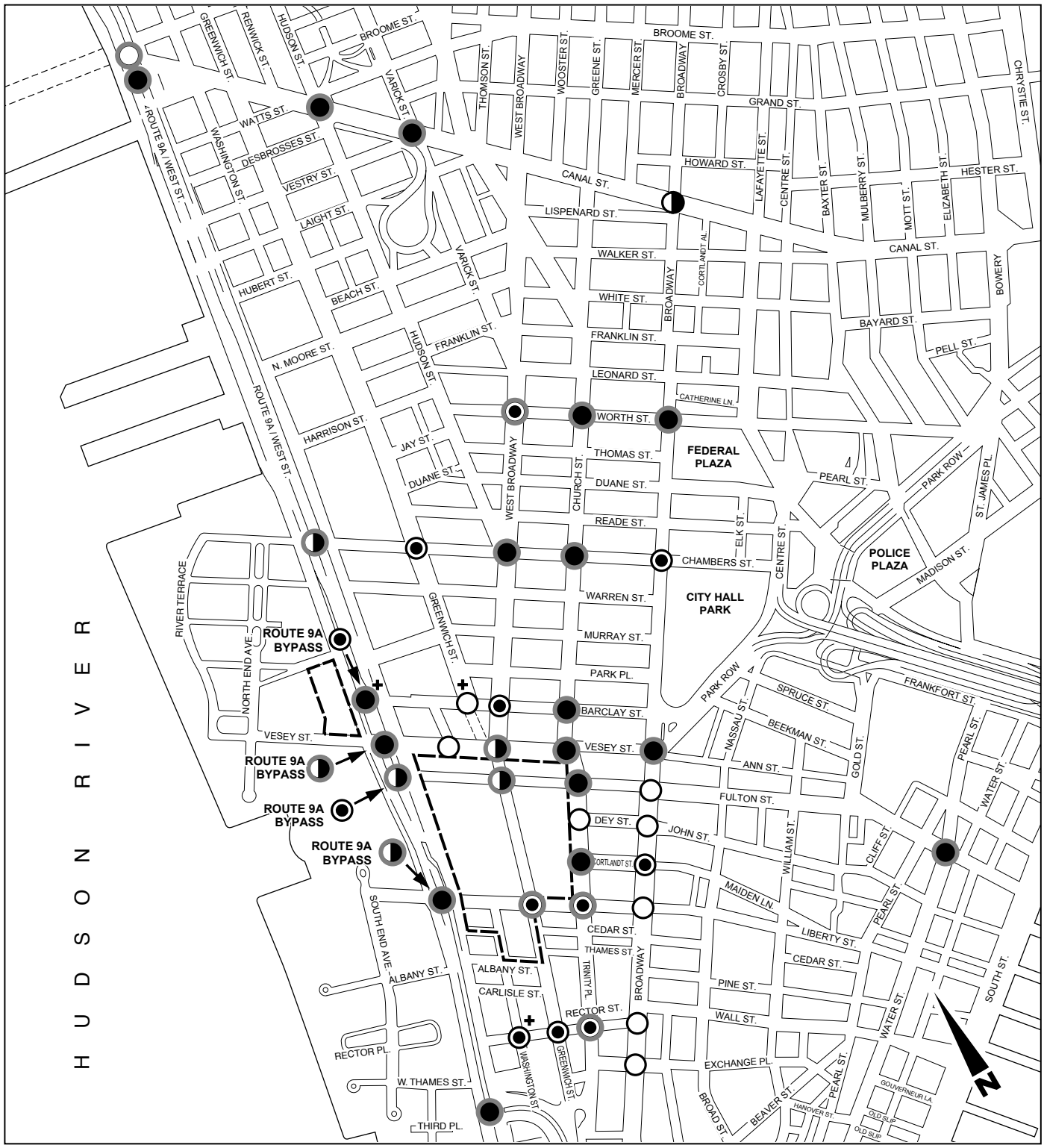
Unsignalized Intersection

Note: Overall intersection LOS is shown for signalized intersections

Traffic Levels of Service and Significant Impacts
2015 Build Conditions
with Route 9A At-Grade and Street Direction Changes
Midday Peak Hour

Figure 13A-39

World Trade Center Memorial
and Redevelopment Plan



Project Site Boundary

Unsignalized Intersection

Note: Overall intersection LOS is shown for signalized intersections

LOS A or B

LOS C

LOS D

LOS E or F

Significant Impact

Traffic Levels of Service and Significant Impacts
2015 Build Conditions
with Route 9A At-Grade and Street Direction Changes
PM Peak Hour

Figure 13A-40

World Trade Center Memorial
and Redevelopment Plan

intersections analyzed; without the street direction changes, significant impacts were projected for 24 of the intersections analyzed.

In comparing projected traffic conditions with the newly proposed street direction changes to conditions without these changes in 2015, several differences in levels of service are noted:

- *Conditions at the intersection of Route 9A and Vesey Street would be much improved with the street direction changes since in terms of the average delays incurred by vehicular traffic at this location, even though overall adverse levels of service are still projected.*
- *Conditions at the intersection of Vesey Street with Greenwich Street and West Broadway would be much improved with one-way eastbound traffic. Overall intersection LOS D conditions would be expected in all three traffic analysis hours with the street direction changes, rather than overall LOS E/F conditions that would be expected with two-way flow on Vesey Street.*
- *The Greenwich Street/Fulton Street intersection would experience worsened levels of service with the street direction changes since cars exiting the underground Project Site garage wanting to get to Route 9A to leave the area could no longer turn onto a westbound Vesey Street. As described for year 2009 conditions, as well, these vehicles would generally leave the garage and use eastbound Vesey Street for one short block, and then make right turns onto southbound Greenwich Street and then onto westbound Fulton Street to get to Route 9A. Overall intersection LOS E/F conditions are expected in the AM peak traffic hour at the Greenwich Street/Fulton Street intersection, LOS D in the midday peak hour, and LOS D in the PM peak hour. Acceptable levels of service are expected at this intersection without the street direction changes being analyzed here.*
- *Conditions at the intersection of Route 9A and Liberty Street would be expected to deteriorate under the street direction changes in the PM peak hour only since autos exiting the on-site garage could now exit via the two-directional ramp leading to this intersection, so additional traffic would be processed at this location.*

Thus, as was described for year 2009 conditions, there would be trade-offs with the street direction changes versus keeping the current street directions. Overall, there would be slightly fewer intersections operating at overall unacceptable LOS E or F, and fewer individual traffic movements operating at LOS E/F conditions. There would be significantly better conditions for vehicles approaching the Project Site and its vicinity along Vesey Street, while there would be worsened conditions along several routes leaving the area. Chapter 22, "Mitigation Measures," addresses these conditions and analyzes potential improvements to mitigate significant traffic impacts.

Traffic analyses were also conducted for year 2015 Build conditions with the proposed short bypass tunnel design for Route 9A. A comparison of overall intersection levels of service for the short bypass tunnel design as compared to the at-grade design, with the newly proposed street direction changes, indicates that traffic conditions would be significantly better with the short bypass tunnel design at a number of intersections. This includes, specifically, AM peak hour conditions at the intersections of Route 9A at Barclay Street and at Fulton Street, as well as the intersections of Vesey Street/West Broadway/Greenwich Street and the intersection of Fulton and Greenwich Streets. In the PM peak hour, there would be level of service improvements with the short bypass tunnel design at several key intersections along Route 9A,

namely at Barclay Street, Vesey Street, Fulton Street, and Liberty Street (see Figures 13A-38 through 13A-40).

13A.8.4 *TRAFFIC LEVEL OF SERVICE AND SIGNIFICANT IMPACTS WITH ALTERNATIVE TRIP GENERATION ASSUMPTIONS AND STREET DIRECTION CHANGES*

Section 13A.7 provided an assessment of projected future traffic conditions with an alternative set of trip generation and modal split assumptions that present a less conservative picture of the volume of vehicular traffic that is likely to occur in the area. Therefore, one additional set of traffic level of service analyses was conducted for the FGEIS and is presented in this final section of the chapter – an assessment of projected future conditions with the alternative set of trip generation and modal assumptions coupled with the newly proposed street direction changes which analyzed together may, in fact, provide the most current assessment of conditions that is likely to occur under full build-out conditions in analysis year 2015.

As part of this analysis, traffic conditions were evaluated at a set of 16 critical locations identified, generally, as problem locations from the previous analyses. They included: Route 9A at Chambers Street, Vesey Street, Fulton Street, Liberty Street, and at the entrance to the Brooklyn-Battery Tunnel; Greenwich Street at Fulton Street and at Rector Street; Canal Street at Hudson Street and at Varick Street; the intersection of West Broadway, Greenwich Street, and Vesey Street; Church Street at Worth Street, Vesey Street, Fulton Street, and Cortlandt Street; and Broadway at Worth Street and at Vesey Street. These analyses were first conducted for the scenario with the at-grade arterial design for Route 9A.

At most locations, overall intersection levels of service was determined to be one level of service category better than under the more conservative trip assumptions analyzed in detail within the majority of this Traffic Chapter (i.e., LOS D as opposed to LOS E). At some locations where overall intersection level of service was at E or F under the more conservative trip generation assumptions, conditions are projected to be better than LOS E or F, or at least have average vehicular delays that are significantly lower even if the overall intersection would still operate at LOS E or F. Two of the 16 intersections would no longer be significantly impacted in the AM and PM peak hours; four of the 16 intersections would no longer be significantly impacted in the midday peak hour. These overall conditions are described below:

- *Route 9A and Chambers Street: there would be no longer be significant impacts in the midday and PM peak hours*
- *Route 9A and Vesey Street; conditions would be significantly improved in the midday and PM peak hours*
- *Route 9A and Fulton Street: overall intersection conditions would be one level of service category better during all analysis periods*
- *Route 9A and Liberty Street: overall intersection conditions would be one level of service category better in the AM and PM peak hours*
- *Route 9A and the Entrance to the Brooklyn-Battery Tunnel: No significant improvements*
- *Greenwich and Fulton Streets: there would be no significant impacts in the midday peak hour*
- *Greenwich and Rector Streets: there would be no significant impacts in the AM peak hour*

- *Canal and Hudson Streets: Overall intersection level of service would improve from LOS F to LOS E in the PM peak hour, and there would be decreased overall vehicular delays in the other traffic analysis hours*
- *Canal and Varick Streets: there would be no significant impacts in the AM peak hour*
- *West Broadway, Greenwich Street, and Vesey Street: there would no longer be significant impacts in the midday and PM peak hours*
- *Church and Worth Streets: there would be reduced intersection delays, but within LOS F*
- *Church and Vesey Streets: there would be reduced intersection delays in the AM and PM peak hours, but within LOS F*
- *Church and Fulton Streets: there would be no significant impacts in the midday peak hour and expected levels of service would be improved in all analysis hours*
- *Church and Cortlandt Streets: there would be improvements only in the AM peak hour*
- *Broadway and Worth Street: No significant improvements*
- *Broadway and Vesey Street: would be reduced intersection delays, but within LOS F*

Traffic conditions were also analyzed for the short bypass tunnel design for Route 9A with the street condition changes and the alternative trip generation assumptions. The analyses show that some locations would be improved with the short bypass tunnel as opposed to the at-grade arterial design, while others would operate better with the at-grade design. Chapter 22, "Mitigation Measures," provides additional information and conclusions regarding the ability of standard traffic capacity improvements to mitigate significant traffic impacts that can be expected under these conditions. ✷