3.9 TRAFFIC AND PARKING

3.9.1 Introduction

This Section describes the traffic and parking analysis methodologies used to assess the potential traffic and parking impacts associated with the Shaft 33B project, which are based on guidelines specified in the *CEQR Technical Manual*. Under CEQR, a traffic and parking analysis characterizes whether a proposed action is expected to have potential significant adverse impacts on street and roadway conditions and on parking facilities.

The potential traffic and parking impacts differ based on the various components of the proposed project, including:

- Construction of the shaft;
- Construction of the water main connections;
- Activation of the shaft; and
- Operation of the shaft and water main connections.

The analysis year for the assessment of the potential impacts also varies with each project component. The potential effects associated with the construction of the shaft and the water main connections, such as changes in lane configuration, traffic flow, and parking conditions, were identified and evaluated based on predicted construction conditions in 2008. The analysis year of 2008 was chosen since it is the year that would experience the greatest number of peak daily and hourly traffic from the shaft construction and because it is the first full year during which water main construction could occur, allowing an analysis of traffic conditions during these combined construction activities. The 2008 predicted traffic conditions in the Future With the Project would be conservatively assumed to represent traffic conditions during other years of construction. Since 2012 is the anticipated first year of operation for the shaft and water main connections, it is the appropriate operational analysis year.

Project Construction and Study Areas

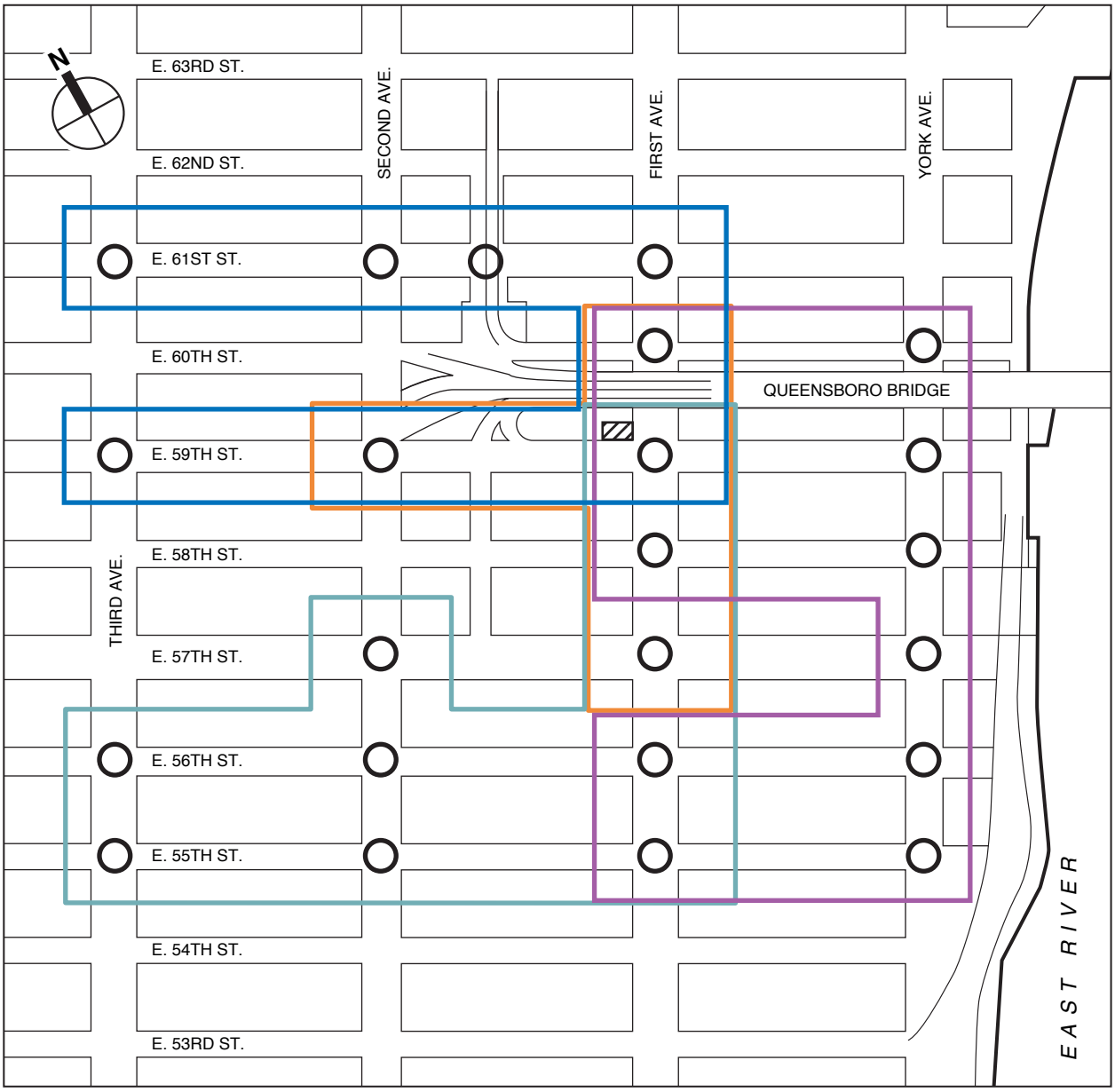
Potential impacts associated with the construction of the shaft include traffic generated by construction workers, trucks delivering or removing materials, and possible lane closures. The preferred Shaft Site at First Avenue and E. 59th Street is evaluated for traffic and parking impacts in Chapter 4, "Preferred Shaft Site," Section 4.9, "Traffic and Parking." In addition, alternative Shaft Site locations at Second Avenue and E. 59th Street (E. 59th Street/Second Avenue Shaft Site), E. 61st Street between First Avenue and Second Avenue (E. 61st Street Shaft Site), and Second Avenue and E. 54th Street (E. 54th Street/Second Avenue Shaft Site) are evaluated in Sections 6.9, 7.9, and 8.9 respectively. Qualitative discussions are provided for the E. 59th Street/Second Avenue and E. 61st Street Shaft Sites, because construction activities at these sites would not substantially encroach onto vehicular and pedestrian space. However, traffic lanes and sidewalk space would be required for construction of the E. 54th Street/Second Avenue Shaft Site; thus, a quantitative analysis was conducted to evaluate the potential construction-related impacts.

As with the shaft construction, potential impacts associated with the construction of the water main connections include traffic generated by construction workers, trucks delivering or removing materials, and lane closures. Since the water mains would likely be constructed primarily within public roadways, lane closures for this component are expected to be more disruptive to local traffic conditions than the shaft. Discussed below is the methodology that was applied to evaluate potential impacts from the reasonable worst-case water main connection route and other representative water main routes (see Chapter 5, "Water Main Connections," Section 5.1, "Project Description," for information on the approach to water main impact assessment). The reasonable worst-case water main route or the First Avenue route would connect from the preferred Shaft Site to the existing trunk main distribution system at Third Avenue between E. 55th and E. 56th Streets via First Avenue and across E. 55th and E. 56th Streets. Additional representative routes evaluated in this EIS include the Sutton Place route and the E. 59th/E. 61st Street route. The Sutton Place route contemplates primarily the same connections between the preferred Shaft Site and the Third Avenue trunk main between E. 55th and E. 56th Streets as the First Avenue Route, but instead of traversing First Avenue, the connections would be made via Sutton Place. The E. 59th /E. 61st Street route contemplates one main traveling west on E. 59th Street to Third Avenue and the other traveling north on First Avenue and then west on E. 61st Street to Third Avenue. At Third Avenue, these mains would connect to the existing trunk main at two separate locations, one between E. 59th and E. 60th Streets and the other between E. 60th and E. 61st Streets. The reasonable worst-case water main connection route and the other representative routes are described in more detail in Section 5.9.

The analysis of conditions during construction of the shaft and water main connections includes certain streets and intersections between E. 55th and E. 61st Streets from Sutton Place to Third Avenue. To distinguish between the area affected by the construction of Shaft 33B, and that affected by the construction of the water main connections under different scenarios, the Study Area is subdivided into several areas, as illustrated in Figure 3.9-1 and described below.

- Preferred Shaft 33B Site Study Area: The streets and intersections along First Avenue from E. 57th Street to E. 60th Street and along E. 59th Street between First and Second Avenues.
- Water Main Connection Route Study Areas:
    1) First Avenue Route: The streets and intersections including First Avenue from E. 55th Street to E. 59th Street, Second Avenue from E. 55th Street to E. 57th Street, and Third Avenue at E. 55th and E. 56th Street.
    2) Sutton Place Route: The streets and intersections including First Avenue at E. 55th, E. 56th, E. 58th, E. 59th, and E. 60th Streets and Sutton Place from E. 55th to E. 60th Street.
    3) E. 59th Street/E. 61st Street Route: The streets and intersections including First Avenue from E. 59th to E. 61st Streets, E. 61st Street from First to Third Avenue, and E. 59th Street from First to Third Avenue.

The preferred Shaft Site Study Area was selected to encompass those roadways and other facilities most likely to be used and affected by the construction of the shaft itself. The water main connection Study Area was selected to encompass a reasonable worst-case water main



Legend:

- *Preferred Shaft 33B Site*
- *Shaft 33B Traffic Study Area Boundary*
- *Water Main Connection - First Avenue Route Traffic Study Area Boundary*
- *Water Main Connection - Sutton Place Route Traffic Study Area Boundary*
- *Water Main Connection - E. 59th Street/ E. 61st Street Route Traffic Study Area Boundary*
- *Traffic Analysis Location*

NOTE: *This figure has been updated for the Final EIS*

NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROPOSED SHAFT 33B TO CITY WATER TUNNEL NO. 3
STAGE 2-MANHATTAN LEG

PREFERRED SHAFT SITE AND WATER MAIN CONNECTIONS TRAFFIC STUDY AREAS

FIGURE 3.9-1

connection route and additional representative routes from the shaft to the existing surface water distribution system.

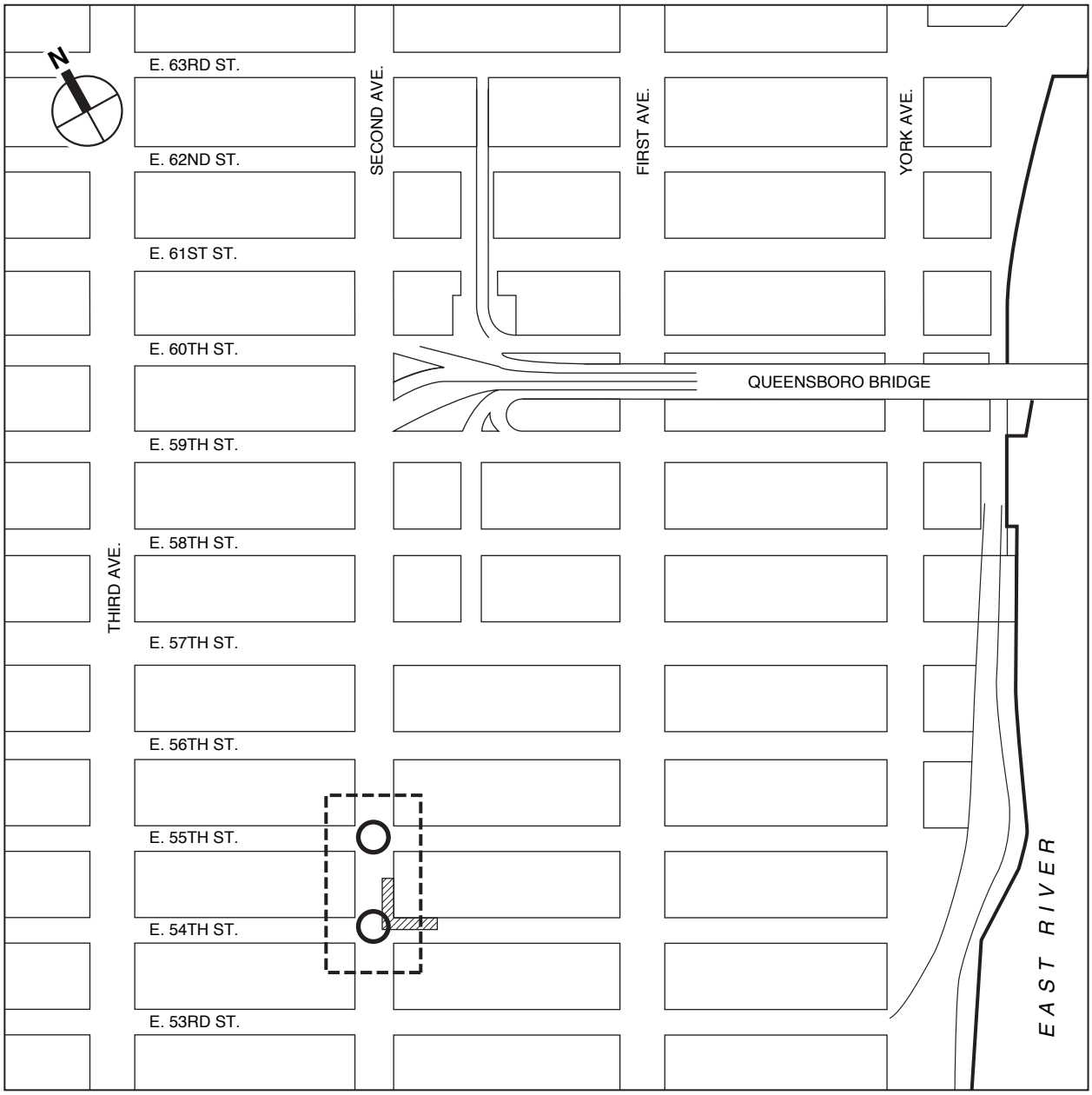
In addition to the analysis of the preferred Shaft Site and its connection to the water distribution system, potential impacts associated with the three alternative Shaft Sites were also assessed. Figure 3.9-2 illustrates the relative locations of these Shaft Sites and the traffic Study Area identified for the analysis of the E. 54th Street/Second Avenue Shaft Site. As discussed in Chapter 2, "Purpose and Need and Project Overview," two methods of construction were considered in evaluating construction of Shaft 33B at the alternative Shaft Sites (the raise bore method and the surface excavation method. The analysis findings are presented in Sections 6.9, 7.9, and 8.9. If a shaft is not constructed, the connection to the water distribution system would require extending the water main connections from the Upper East Side to East Midtown. This scenario, is expected to result in similar traffic impacts depicted for the reasonable worst-case water main connection route, however, at a substantially greater number of locations. Since the locations selected for the analysis of the water main connections to the preferred Shaft Site already encompass numerous critical intersections in the Upper East Side (i.e., proximate to the Queensboro Bridge portals), similarly critical locations, including the Second Avenue intersections with E. 34th Street to E. 37th Street, in East Midtown (i.e., proximate to the Queens-Midtown Tunnel portals) were selected for analysis to provide a full illustration of the range of likely traffic impacts associated with this construction. The analysis findings are presented in Chapter 9, “Water Main Only Alternative,” Section 9.9.

In connection with the evaluation of potential impacts on traffic operations, parking and curbside conditions, as well as pedestrian safety during different phases of the construction process were also addressed. The methodology used to assess transit and pedestrian conditions is presented in Section 3.10, “Transit and Pedestrians,” of this EIS.

3.9.2 Existing Conditions Methodology

Data on existing transportation conditions in the Study Area were developed for 2004, based on field counts conducted at the locations illustrated in Figure 3.9-1. Traffic turning movement counts were conducted on November 15, 2004, while Automatic Traffic Recorder (ATR) counts were conducted from November 11 to November 19, 2004. Traffic counts also included vehicle classification counts, and travel time surveys (where necessary to determine vehicle speeds for air quality assessment). The traffic patterns identified for 2004 are representative of current 2005 conditions. Additional counts were conducted in April, September, and October 2005 to supplement these data for the analysis of other water main connection scenarios, as discussed in Section 5.9.

As part of the data collection effort, field inventories were conducted to document intersection geometry, lane utilization, curbside activities, and bus operations. Signal timing plans for each intersection were obtained from the New York City Department of Transportation (NYCDOT) and accident data for intersections within the Study Area were obtained from the New York State Department of Transportation (NYSDOT).



NOTE: *This figure has been updated for the Final EIS*

NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROPOSED SHAFT 33B TO CITY WATER TUNNEL NO. 3
STAGE 2-MANHATTAN LEG

E. 54TH STREET/SECOND AVENUE SHAFT SITE
TRAFFIC STUDY AREA

FIGURE 3.9-2

Traffic Operations Analysis

Using the *Highway Capacity Manual (HCM)* procedures, intersections within the respective study areas for the preferred Shaft Site and the representative water main connection routes were analyzed for vehicular traffic during the weekday peak hours (see Figure 3.9-1). The periods that represent the highest traffic volumes were identified (8:00 to 9:00 a.m., 12:00 to 1:00 p.m., and 5:00 to 6:00 p.m. on weekdays). These are referred to as the AM, midday, and PM peak hours, respectively.

The capacity analysis at the Study Area intersections was conducted based on the methodology presented in the 2000 *HCM* using the *Highway Capacity Software (HCS) Version 4.1e.* Traffic data required for this analysis includes volumes on each approach and various other physical and operational characteristics such as the number of moving lanes, lane widths, and signal timing. The HCS methodology expresses the quality of flow in terms of LOS, which is based on the amount of delay that a driver typically experiences at an intersection. Levels of service range from A, with minimal delay, to F, which represents long delays and congestion. Generally, both LOS E and LOS F characterize congestion and poor service and the midpoint of LOS D (45 seconds of delay at signalized intersections) is considered the threshold of acceptable operations. Table 3.9-1 defines the LOS/delay relationship for the HCM methodology. For those results that would be rounded to delay values coinciding with the different service level thresholds (i.e., LOS A/B = 10.0 seconds), a "+" or "-" sign is provided after the calculated value for clarification.

The methodology also provides a volume-to-capacity (v/c) ratio for intersection traffic movements. While there is no direct relationship between v/c ratio and delay/LOS, a high v/c ratio typically indicates congested or near congested conditions. For operating levels in Manhattan, a ratio of under 0.85 is generally considered to represent non-congested conditions, whereas above this value, the potential for congestion increases. At a v/c ratio of between 0.95 and 1.00, near-capacity conditions are reached and delays can become substantial. Ratios of greater than 1.05 indicate saturated conditions with queuing.

Table 3.9-1
Traffic Level of Service Definitions

Level of Service	Signalized Intersection Average Delay Per Vehicle (Seconds)
A	10
B	10-20
C	20-35
D	35-55
E	55-80
F	> 80

In characterizing intersection, approach, and movement operating conditions, marginally unacceptable mid-LOS D (delay in excess of 45 seconds), LOS E, and LOS F or a v/c ratio above 0.90 is hereafter characterized as congested. However, it is possible that a high v/c ratio and a low delay could result in an efficient intersection with good traffic progression and short

cycle lengths and a low v/c ratio and a high delay could reflect poor traffic progression and long cycle lengths.

Parking Analysis

Curbside regulations and activities were documented to characterize the existing parking conditions within the Study Area.

Safety Analysis

The most recent three years of available accident data collected from NYSDOT were summarized to identify high vehicular and pedestrian accident locations.

3.9.3 Future Conditions Without the Project Methodology

In the Future Without the Project (also referred to as the No Build conditions), the construction of Shaft 33B and the water main connections would not occur and the Study Area is assumed to generally retain the same land uses as exist in 2004. During the 2004 to 2008 period, it is expected that transportation demands in the Study Area would increase due to anticipated residential, commercial and institutional projects in the area, as well as general background growth. To estimate these demands in the Future Without the Project, an annual growth rate of 0.5 percent per year was applied to existing conditions to reflect general traffic growth, in accordance with the *CEQR Technical Manual* for areas in Manhattan. It is also expected that transportation demands in the Study Area would increase due to development projects in the area. Those that would not be substantially completed are expected to generate a nominal amount of construction traffic that was assumed to be included in the background growth. However, certain future development projects that are scheduled to be completed by the project analysis year were considered in addition to the background growth and their anticipated demands were forecasted in the Future Without the Project. The future development projects considered in this analysis include:

- 731 Lexington Avenue/Bloomberg Financial Headquarters: This recently completed 1.4 million-square-foot mixed-use development has approximately 900,000 square feet of office space with its primary entrance on Lexington Avenue, including the headquarters of the Bloomberg Financial Company, as well as approximately 200,000 square feet of retail commercial space facing Third Avenue. Above the commercial space, the building has 105 dwelling units known as One Beacon Court, with the entrance on E. 58th Street. This building was completed after the collection of traffic data for existing conditions, and therefore is considered as a future development project in the traffic analysis.
- New Memorial Sloan-Kettering Cancer Center: Anticipated to be completed by 2007, this 510,000 square-foot, 23-story research and community facility is proposed for the block bounded by E. 68th and E. 69th Streets and First and York Avenues.

- Cornell-Weill Medical Center: Currently under construction and expected to be completed by the end of 2005, this community facility is an approximately 123,000 square-foot expansion for the Cornell-Weill Medical Center to be located on E. 70th Street at York Avenue.
- 1129-1133 York Avenue (Potamkin Site): A new residential building is proposed on the west side of York Avenue between E. 61st and E. 62nd Streets on a property known as the "Potamkin Site." This project, which is currently undergoing formal public review in the City's Uniform Land Use Review Procedure (ULURP), would include approximately 120 apartments above 6,200 square feet of retail space. The traffic analysis includes trip generation for a different proposed development project, known as the "Solow" site, also on the west side of York Avenue, between E. 60th and E. 61st Streets. The Solow proposal, which was planned for the development of approximately 220 apartments, has been in discussion for years and is currently not active, but its trips would be similar to those that would result from the Potamkin Site development.

Traffic Operations Analysis

As with the traffic operations analysis conducted for existing conditions, an analysis of the Future Without the Project at the Study Area intersections was conducted to account for background growth and traffic induced by the development projects listed above. The Future Without the Project analysis provides the baseline conditions against which potential impacts of the project could be assessed.

Parking Analysis

Anticipated changes to curbside regulations and activities were identified for the No Build conditions.

Safety Analysis

Anticipated changes to traffic and pedestrian safety were identified for the No Build conditions.

3.9.4 Future Conditions With the Project Methodology

Construction

For the assessment of the Future With the Project (also referred to as the Build conditions), the traffic that would be generated by shaft construction was added to the 2008 traffic volumes for the shaft analysis. Both shaft and water main construction-generated traffic was added to the 2008 traffic volumes for the water main connection analysis, as construction at the preferred Shaft Site would also occur in 2008. Three water main connection routes were analyzed to the appropriate levels for each of the Shaft Sites. These include: (1) a First Avenue route, traveling down First Avenue and then over to Third Avenue via E. 55th and E. 56th Streets ("the reasonable worst-case route"); (2) a Sutton Place route, traveling over to Sutton Place on E. 59th Street, down Sutton Place, and then over to Third Avenue via E. 55th and E. 56th Streets; and (3) an

E. 59th Street/E. 61st Street route, in which one water main would travel to Third Avenue via E. 59th Street, and the other would travel to Third Avenue via E. 61st Street.

Traffic Operations Analysis

The Build traffic conditions in the Study Area were analyzed and potential construction-related traffic impacts were determined based on the criteria set forth in the *CEQR Technical Manual* for permanent actions. Based on the CEQR thresholds established for signalized intersections, if a No Build LOS of A, B, or C deteriorates to an unacceptable LOS D, E, or F under Build conditions, then a significant adverse impact is deemed to have occurred. The *CEQR Technical Manual* further states that for a No Build LOS A, B, or C that operates at marginally unacceptable LOS D (more than 45 seconds of average delay for signalized intersections) under Build conditions, mitigation to mid-LOS D is required. For a No Build LOS D, an increase of Build condition delay by five or more seconds beyond the mid-LOS D threshold is considered a significant adverse impact. For a No Build LOS E, the threshold is a four second increase in Build condition delay, and for a No Build LOS F, a three second increase in Build condition delay is considered a significant adverse impact. However, if a No Build LOS F condition has a delay in excess of 120 seconds, an increase in Build condition delay of more than one second is considered significant, unless the project would generate fewer than five vehicles through that intersection in the peak hour. While potential traffic impacts associated with the construction of the shaft and water main connections would not be permanent and therefore would not be considered as significant, the determination of temporary construction-related impacts was made based on the above criteria for permanent actions.

In addition to the intersection analyses, queue lengths were predicted for the reasonable worst-case (First Avenue) water main connection route using the HCM methodology, and an evaluation of the potential delays and queues that could occur due to movements from trucks accessing the Shaft Sites was performed. Where appropriate, discussions of mid-block traffic conditions were also included.

As discussed in Chapter 2, blasting would be necessary at the Shaft Sites. It would not occur at the surface, and blasting procedures are developed on a site-specific basis depending on geological conditions as well as traffic and other environmental conditions at the time of blasting. Blasting will be required to be conducted in a manner that is protective of public health and safety. At the beginning of the blasting phase (up to a depth of about 100 feet below the surface), the expected protective measures would include prohibiting vehicular and pedestrian traffic from traveling adjacent to the site. The typical approach to blasting based on blasting experience at other NYCDEP shaft sites, and other construction projects throughout Manhattan was examined. The likely approach to be taken at the preferred and alternative Shaft Sites was assessed. Initial meetings were held with the FDNY to determine the likely roadway segments that could require temporary stoppage of traffic during the initial phases of blasting. The potential impacts of these discrete blasting events on traffic and emergency vehicle operations in the community for each of the Shaft Sites were assessed.

The duration and extent of the roadway segments that would be affected by the construction and operation of the roadways were evaluated to determine the significance of such potential adverse impacts.

Parking Analysis

The future Build condition parking analysis includes an assessment of parking conditions at the preferred Shaft Site and the anticipated effects on available curbside supply during different stages of the shaft and water main connection construction. For the shaft construction, no changes in the Study Area's parking regulations beyond the affected curbs were assumed. However, it is anticipated that parking supply in the area would be affected due to the closure of curb lanes required for the water main construction and the potential displacement of NYCDOT and New York City Department of Sanitation (DSNY) vehicles from the preferred Shaft Site at First Avenue and E. 59th Street. Estimates on the anticipated number of temporarily displaced spaces were provided for each of the construction segments.

Safety Analysis

Anticipated changes to traffic and pedestrian safety were identified for the Build conditions.

Mitigation

Where appropriate, conceptual mitigation measures such as parking regulation changes, signal timing adjustments, lane re-striping, and other measures that would be recommended to reduce or avoid impacts during construction are identified.

Operation

Once Shaft 33B is operational in 2012, in addition to the underground shaft and distribution chamber, there would be some features of the shaft that would be above ground. These include two at-grade access hatchways to the shaft, a 10-foot-high by 14-inch-diameter air vent located on site or on the sidewalk, and up to two air release hydrants (3-foot-high by 6-inch-diameter). A small crew of NYCDEP personnel would visit the site several times a week for routine inspection and maintenance activities. The average number of anticipated daily trips would be up to 10 vehicle and/or truck trips on a given day during the week. Occasionally, when critical equipment needs to be replaced, additional workers would also be on the site.

Based on the requirements of the *CEQR Technical Manual*, this level of induced traffic does not require a detailed analysis for the operational year (2012) because it falls below the 50 peak hour vehicle trip-end[1] threshold for project-induced traffic that would require a detailed traffic analysis. Traffic flow and parking conditions in the Future With the Project would not be substantially different in the operational year from the Future Without the Project due to the these trips.

[1] A trip-end describes travel in one direction to a destination. For example, driving to a garage would involve one trip-end, while a drop-off would involve two trip-ends (one inbound trip-end and one outbound trip-end).

Because the water main connections (once built) would be located entirely within the streets and would have no above-ground features or other associated above-ground operational activities, no further detailed traffic and parking analysis was conducted and no potential significant adverse impacts to traffic and parking would occur as a result of their operation. Similarly, since the activation of the shaft occurs for a very short period of time (approximately one month), potential changes in traffic and parking would be of short duration and would not have the potential to significantly impact traffic and parking within the Study Area. For these reasons, disruptions caused by the construction of Shaft 33B and the water main connections would be the only source of potential adverse impacts, while limited in duration to the construction period, on traffic and parking conditions. Hence, the construction process is hereafter referred to as the project for impact assessment purposes.

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