

## CHAPTER 9: WATER MAIN ONLY ALTERNATIVE

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### 9.1 DESCRIPTION OF THE WATER MAIN ONLY ALTERNATIVE

#### 9.1.1 Introduction

If Shaft 33B were not sited in the northern portion of East Midtown, another source of water supply redundancy would have to be provided to the MIPZ without a new shaft. This Chapter analyzes an alternative to constructing Shaft 33B—the Water Main Only Alternative—and assesses whether the alternative would meet the objectives of the proposed action. This Chapter also contains a summary of the potential adverse environmental impacts of this alternative.

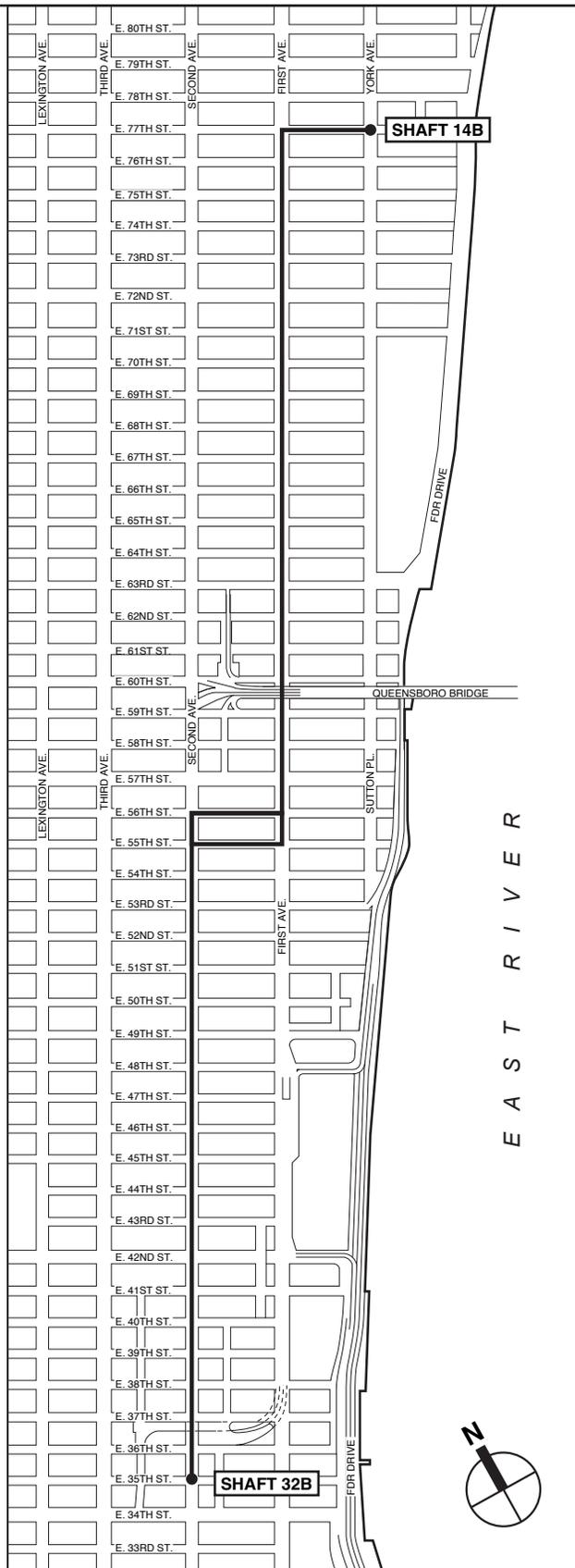
The Water Main Only Alternative would consist of a connection between two existing shafts located in proximity to the Middle Intermediate Pressure Zone (MIPZ). Two 48-inch water mains would be constructed to connect the two shafts. Approximately 40 blocks of water main construction would be required to ensure sufficient water supply delivery capacity in the northern part of East Midtown.

#### 9.1.2 Conceptual Route

This alternative would consist of constructing two 48-inch water mains from Shaft 14B on York Avenue between E. 77<sup>th</sup> Street and E. 78<sup>th</sup> Street to Shaft 32B on E. 35<sup>th</sup> Street and Second Avenue. A conceptual route for the water mains has been developed for evaluation purposes. This route begins at E. 77<sup>th</sup> Street and York Avenue and runs west to First Avenue, then runs down First Avenue (Figure 9.1-1). The route then crosses from First Avenue to Second Avenue at E. 56<sup>th</sup> Street and E. 55<sup>th</sup> Street and then runs along Second Avenue until reaching Shaft 32B, located on E. 35<sup>th</sup> Street.

This conceptual route (referred to as the Water Main Only route) represents a likely route for this alternative, since it is the most direct route that avoids certain sensitive uses in the area, including the concentration of hospitals on York Avenue, the United Nations (U.N.), and the primary ingress/egress point to the Queensboro Bridge. If this alternative were selected, a detailed design would have to be undertaken. During this process, a more specific block by block route would be identified. There are a number of other potential routes that could connect Shaft 14B and Shaft 32B, however, the conceptual route presented in this Chapter addresses the range of potential environmental impacts that would likely occur on other potential routes.

The Water Main Only route is substantially longer than the water main routes discussed in Chapter 5, “Water Main Connections.” Overall, the conceptual route overlaps with the reasonable worst-case water main connection route described, in Chapter 5, as the First Avenue route.



**Legend:**

— Water Main Only Alternative

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

POTENTIAL WATER MAIN ONLY ROUTE

FIGURE 9.1-1



### **9.1.3 Construction**

#### **Construction Method**

The construction practices for the Water Main Only Alternative are expected to be the same as those used for constructing the water mains for the Preferred Site. The cut-and-cover construction method is described in detail in Chapter 5, “Water Main Connections.” As described in that Chapter, there are different options in terms of the specific width of sidewalk and/or traffic lanes that must be closed for the water main construction zone.

Construction of the Water Main Only Alternative may include construction of valve chambers and venturi chambers to regulate or monitor flow. The number, placement, and type of chambers that may be installed would not be determined until a detailed design was developed for the Water Main Only Alternative.

#### **Construction Schedule**

Construction of the Water Main Only Alternative would be expected to occur over approximately 5 to 7 years. Similar to the water main connections construction discussed in Chapter 5 for the preferred Shaft Site, all construction work would occur in the street and/or, in some construction scenarios, the sidewalk. Cut-and-cover construction work would proceed one block at a time in a sequenced fashion. Work would last approximately 10 to 12 weeks per construction segment. It is assumed that construction of the Water Main Only Alternative would require multiple work crews working simultaneously along different sections of the route to minimize the amount of time required to complete construction of water main. For example, one crew could begin working south from Shaft 14B while a second crew could begin working north from Shaft 32B.

#### **Construction Costs**

Construction costs for the Water Main Only Alternative are estimated to be \$38 million.

## **9.2 EVALUATION OF THE WATER MAIN ONLY ALTERNATIVE**

### **9.2.1 Consistency with Objectives**

Construction of the water main alternative would achieve NYCDEP’s goal of providing increased reliability and operational redundancy servicing the North Intermediate Pressure Zone (NIPZ) and the MIPZ; if either Shaft 14B or Shaft 32B were to be taken off-line for maintenance or as a result of an emergency condition, the Water Main Only Alternative would provide continued water supply to both the NIPZ and the MIPZ by providing water from the other shaft. Without a new source of water supply redundancy, it would be difficult to maintain adequate pressure in the MIPZ once City Tunnel No. 1 is removed from service for rehabilitation. The Water Main Only alternative would not provide the same level of operational reliability as the

proposed terminal shaft but it would provide a similar amount of water distribution in the area Shaft 33B is intended to service.

### **9.2.2 Probable Impacts of the Water Main Only Alternative**

The water mains would be located completely below-ground beneath City streets and sidewalks, similar to other water mains in the Study Area and throughout New York City. The water mains would deliver drinking water and fire protection to surrounding residential, community facility, commercial, and manufacturing uses. Except for additional manholes and fire hydrants located at street levels, once operational, these mains would not be visible or otherwise evident, and therefore, after being placed in operation, would have no significant adverse impacts on land use, community facilities, zoning, or public policies; open space; socioeconomic conditions; historic resources; urban design and visual resources; neighborhood character; infrastructure and energy; traffic and parking; transit and pedestrians; air quality; noise; vibration; hazardous materials; and public health. Therefore, the assessment of the Water Main Only Alternative focuses on the potential for impacts during the construction period.

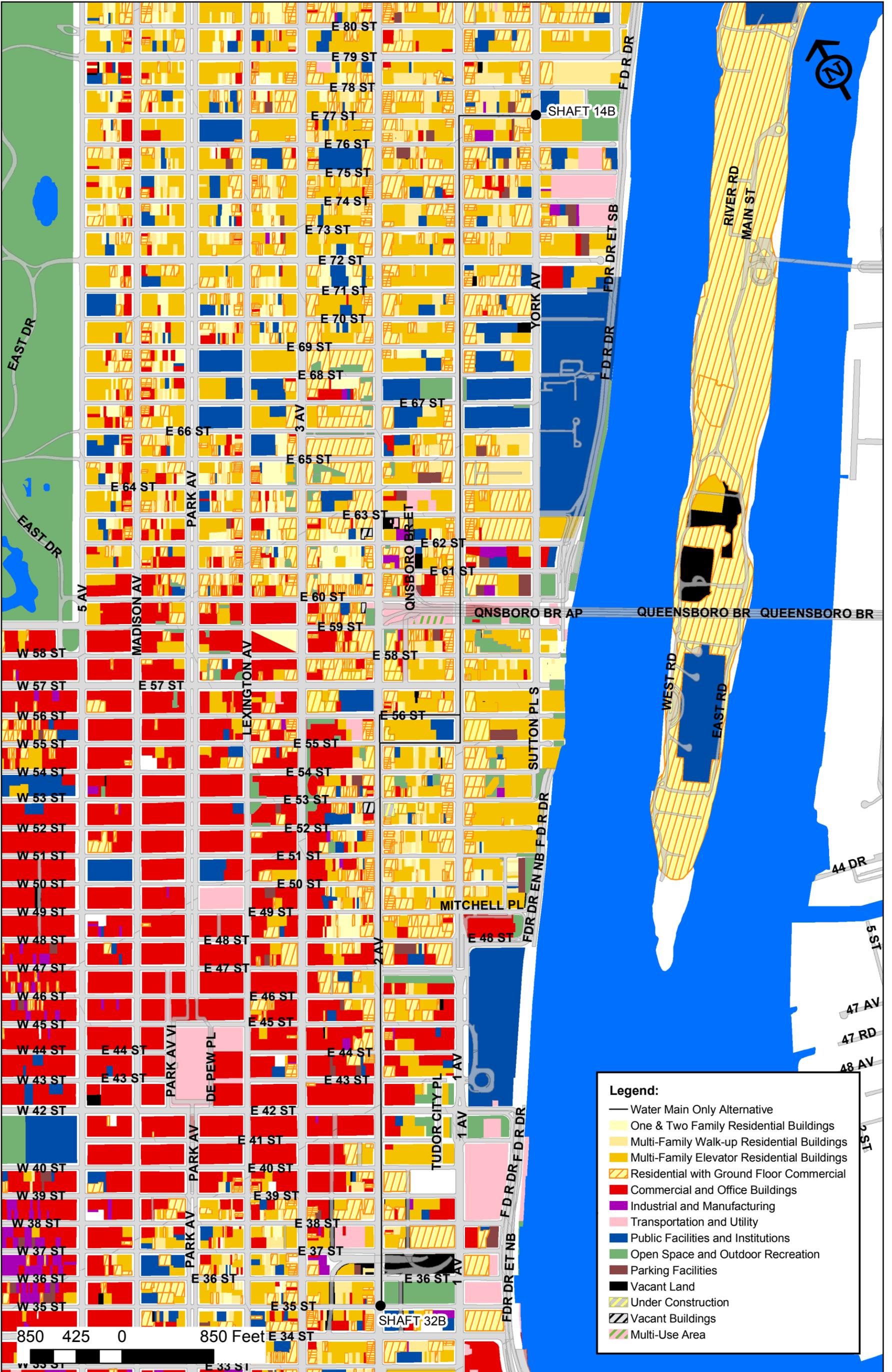
#### **Land Use and Community Facilities, Zoning, and Public Policy**

As discussed above, the Water Main Only route would extend from approximately E. 77<sup>th</sup> Street and York Avenue to E. 35<sup>th</sup> Street and Second Avenue. The water main route would pass through a substantial area of Manhattan's east side, including the neighborhoods of Lenox Hill in the northern portion of the route; Turtle Bay and Far East Midtown in the mid section of the route, and Murray Hill in the southern portion of the route (see Figure 9.2-1). A brief discussion of land uses in these neighborhoods follows.

The northern portion of the water main route would run along First Avenue in Lenox Hill. Overall, First Avenue is predominantly developed with residential uses of varying heights and density; almost all residential buildings along First Avenue contain ground floor retail and commercial uses that provide neighborhood-oriented convenience shops and services. First Avenue between E. 77<sup>th</sup> Street and E. 68<sup>th</sup> Street contains a mix of older tenement and newer high rise residential buildings. Between E. 68<sup>th</sup> Street and E. 66<sup>th</sup> Street, there are several institutional and open space uses. South of 66th Street, residential uses continue, with the area between roughly E. 61<sup>st</sup> Street and E. 64<sup>th</sup> Street containing a higher concentration of 5-story residential tenements and entertainment-oriented retail such as restaurants and night clubs.

In this area, the east-west streets to the east and west of First Avenue tend to be developed with lower or medium density uses. In general, the midblocks have 4-and 5-story tenements interspersed with larger luxury apartment complexes. There is some limited neighborhood-oriented retail.

The First Avenue corridor between E. 61<sup>st</sup> Street and E. 55<sup>th</sup> Street and the E. 56<sup>th</sup> Street and E. 55<sup>th</sup> Street sections of the water main route are described in Chapter 5, "Water Main Connections."



**Legend:**

- Water Main Only Alternative
- One & Two Family Residential Buildings
- Multi-Family Walk-up Residential Buildings
- Multi-Family Elevator Residential Buildings
- Residential with Ground Floor Commercial
- Commercial and Office Buildings
- Industrial and Manufacturing
- Transportation and Utility
- Public Facilities and Institutions
- Open Space and Outdoor Recreation
- Parking Facilities
- Vacant Land
- Under Construction
- Vacant Buildings
- Multi-Use Area

Map Document: (S:\Projects\2175158\GIS\_Figures\Shaft\_33B\EIS\_Field\_Work\WMA\_Alternative2.mxd) 9/30/2005 - 1:11:05 PM



**NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION**  
**PROPOSED SHAFT 33B TO CITY TUNNEL NO. 3**  
**STAGE 2- MANHATTAN LEG**  
**WATER MAIN ONLY ALTERNATIVE**  
**LAND USE FOR POTENTIAL ROUTE**

**FIGURE 9.2-1**

The Water Main Only route would continue south along Second Avenue from E. 55<sup>th</sup> Street, through the neighborhoods of Turtle Bay (which consists roughly of the area east of Third Avenue and north of E. 48<sup>th</sup> Street), Far East Midtown (which consists of the area between E. 48<sup>th</sup> Street and E. 40<sup>th</sup> Street) and Murray Hill (which consists of the area between E. 34<sup>th</sup> and E. 40<sup>th</sup> Streets) to E. 35<sup>th</sup> Street. In general, these neighborhoods contain a mixture of residential towers, smaller residential buildings, ground-floor retail uses primarily along the avenue, and smaller office buildings.

In Turtle Bay, the Second Avenue corridor is lined with residential uses in a mixture of smaller tenement buildings, brownstones, and newer high-rises. There are ground floor retail uses that tend to be neighborhood oriented—shops, restaurants and delis, and local commercial establishments and services. These retail uses are concentrated in the ground floors of buildings along the avenue.

In Far East Midtown, the area contains a mix of residential uses and more commercial uses, reflecting the proximity of the Midtown Central Business District (CBD) to the west and the U.N. to the east. While this segment of Second Avenue is located between Midtown’s dense office commercial corridor along Third Avenue and the U.N, commercial uses along the avenue are neighborhood oriented, like in Turtle Bay.

In Murray Hill, the Second Avenue corridor is again more residential with a mixture of smaller apartment buildings, tenements, and newer high-rises. The ramps and entrances to the Queens Midtown Tunnel are prominent within this area. Specifically, the Queens Midtown Tunnel occupies virtually the entire block between First and Second Avenues, East 36<sup>th</sup> to East 37<sup>th</sup> Street, and a portion of the block to the west.

It is not expected that future construction work under this alternative would change land uses at any location in the Study Area. Active construction work on a particular block or intersection would likely be disruptive to surrounding land uses. Work would likely occur between 7: 00 a.m. and 11:00 p.m. and therefore could be disruptive to nearby residences during the day and evening, and to nearby institutional uses (including any high schools, elementary schools, and nursery schools in the Study Area) and commercial uses during the daytime. The most noticeable effects on land uses in the affected Study Area would be the construction-generated traffic and noise. Along the construction route, the locations that are currently most congested would encounter additional queuing and traffic delays similar to those projected for the reasonable worst-case water main connections route described in Section 5.9. Delayed traffic could, in turn, be disruptive to nearby land uses.

Vehicular access to surrounding land uses could be disrupted when water main construction was occurring in front of a particular loading dock and public or private parking garage. Section 5.1, “Project Description” provides an overview of the procedures that exist to address and minimize disruption from water main construction activities.

On any given block, construction would typically last 12 weeks for the street segment and 10 weeks for each intersection segment. Construction segments involving the construction of regulator, valve or venturi chambers would take longer, with venturi segments taking

approximately 20 weeks to complete. Following construction, all roadways and sidewalks would be restored. Each segment of construction would be disrupted for a short duration, and therefore, construction activity associated with the water main would not be anticipated to result in any change to land use or land use trends in the larger Study Area.

It is expected that if the Water Main Only Alternative were to be constructed, the New York City Department of Design and Construction (NYCDDC) would employ an extensive community outreach program to keep the affected neighbors informed about construction activities.

### **Open Space**

Open spaces within the Study Area for the Water Main Only Alternative would include City parks as well as publicly accessible plazas associated with residential and commercial property. Water main construction occurs in street and sidewalk areas and would not be anticipated to occur in open spaces in the Study Area; therefore, no direct effects to open spaces would occur during construction. In general, the most noticeable effects on open spaces in the affected Study Area would be traffic and noise from construction. During those times, people would likely seek other open space areas in their respective neighborhoods. Because of the short-term nature of the project-related effect in each area, this temporary disruption is not anticipated to result in a potential significant adverse impact to open spaces.

### **Socioeconomic Conditions**

The Water Main Only route would be located within City streets and, therefore, would not result in the direct displacement of businesses or residents. Residents and businesses facing the water main construction would experience noticeable noise and possible vibration effects. On any given block, construction would typically last 12 weeks for the street segment and another 10 weeks for each intersection.

The noise and vibration levels from construction activities would be noticeable and, at times, intrusive and annoying to certain residents, business owners, and customers of local businesses along the Water Main Only route. However, they would not be expected to prevent the conduct of routine activities. The existing environment surrounding the water main routes is very noisy resulting from high traffic volumes and/or its urban setting. Therefore, retail and other businesses in the immediate area are accustomed to elevated noise levels and traffic congestion. The noise from the construction site may make several of these businesses, especially restaurants, less attractive to customers, particularly during intense construction activities. Restaurants with sidewalk café areas or grocers that display food or flowers on the street would be temporarily impacted. Other businesses that are not highly dependent on the environment outside their stores would be expected to be minimally affected.

In addition, many pedestrians, and therefore potential customers, may choose to avoid walking along the portion of the Avenue that supports the work zone. These effects could lower sales to these businesses for a temporary period. Although many existing restaurants and shops on First Avenue and Second Avenue have a stable customer base, the relative abundance of such business in the area, may encourage customers to take their businesses elsewhere during periods when

construction is most intense. However, several businesses are neighborhood-based destinations and it is unlikely that customers would change shopping habits or would travel longer distances to do business that could, otherwise, be done in their neighborhoods.

Access to the residents and businesses would be maintained throughout the construction period in accordance with procedures to be put in place by NYCDDC which would be constructing the Water Main Only Alternative (see Section 5.8, “Infrastructure and Energy” for details on these procedures). No significant adverse environmental impacts on these businesses or residents are expected. Construction activities along any street segment would be short term and temporary. Although local economic conditions in the immediate vicinity of the construction site could decline somewhat during intense construction periods, the net effect on the area’s economy would be negligible. It is very unlikely that businesses or residents would relocate from the area as a result of construction of the Water Main Only Alternative. Overall, the effects of the proposed project are not unlike the effects from other major construction in Manhattan that involves the use of heavy construction in close proximity to residential and commercial uses. Therefore, it is not anticipated that water main construction would result in the potential for significant adverse socioeconomic effects during construction.

The costs for the Water Main Only route—\$38 million—would be lower than the cost of construction for Shaft 33B, since a shaft would not be constructed under this alternative. If constructed, this cost would result in an increase to water and sewer rates of less than \$0.15 per household per month. This increase would be negligible to all users. Based on these costs, it is unlikely that renters or owners of residential units would relocate from the City as a result of the Water Main Only Alternative and construction of this alternative would not be expected to result in potential significant adverse socioeconomic impacts on New York City residential water consumers.

## **Historic Resources**

### *Archaeological Resources*

As discussed in Section 5.5, portions of the First Avenue reasonable worst-case route from the preferred Shaft Site could contain potential historic-period archaeological resources. These consist of shaft features associated with two former structures located in the area of First Avenue between E. 55<sup>th</sup> and E. 57<sup>th</sup> Streets, as well as remains of the structural supports of the Second Avenue elevated railroads (the “Els”). To avoid any potential significant adverse impacts on these potential archaeological resources should the Water Main Only Alternative be selected, archaeological monitoring by a professional archaeologist will be undertaken for the portion of the route that extends on First Avenue between E. 55<sup>th</sup> and E. 57<sup>th</sup> Streets, where the shaft features may be located. Another portion of the Water Main Only route was evaluated for its archaeological potential as part of the Final Environmental Impact Statement (FEIS) for the MTA New York City Transit Second Avenue Subway Project (April 2004). The FEIS determined that there were a number of locations on Second Avenue between E. 56<sup>th</sup> and E. 35<sup>th</sup> Streets that are sensitive for archaeological resources. The sensitive locations and the types and depth of the potential archaeological resources are as follows:

- Second Avenue between E. 45<sup>th</sup> and E. 44<sup>th</sup> Streets: potential for early 19<sup>th</sup> century farm residential features at 0-16 feet below grade.
- Second Avenue at E. 42<sup>nd</sup> Street: potential for Native American resources at 2-6 feet below grade.
- Second Avenue between E. 39<sup>th</sup> and E. 38<sup>th</sup> Streets: potential for early 19<sup>th</sup> century farm residential features at 0-12 feet below grade.
- Second Avenue between E. 36<sup>th</sup> and E. 35<sup>th</sup> Street: potential for early 19<sup>th</sup> century residential features at 0-18 feet below grade.

However, the remaining portions of the Water Main Only route have not been evaluated for archaeological sensitivity. Therefore, while the prospect of finding Native American remains in disturbed urban streetbeds is remote unless they have been protected by a substantial fill overmantle, the potentially sensitive area identified on Second Avenue at E. 42<sup>nd</sup> Street confirms that such potential exists. It is also possible that historic-period archaeological resources, such as building foundations and associated shaft features such as wells, privies, and cisterns, could also be located in the streetbeds if such structures were once located in the area of the Water Main Only route where road construction and previous utility installation have not impacted the areas.

Therefore, until Native American predictive models, pre-development topography, historic maps, and disturbance episodes have been reviewed, it is possible that portions of the Water Main Only route that have not been assessed archaeologically could contain Native American and/or other historic-period resources. Similar to water main connection routes assessed in the EIS that have not been evaluated archaeologically, if the Water Main Only Alternative were selected, NYCDEP will consult with the New York City Landmarks Preservation Commission (NYCLPC) to determine if an archaeological study would be warranted. If requested by NYCLPC, a Phase 1A Archaeological Assessment will be prepared to determine if the other portions of the selected route contains any potential Native American or historic-period archaeological resources. Should any potential resources be identified, a monitoring plan would be developed in consultation with the NYCLPC prior to any project construction. Any resources encountered would be properly documented in consultation with NYCLPC. Thus, no potential significant adverse impacts to archaeological resources would occur as a result of this construction.

#### *Architectural Resources*

The Water Main Only route does not contain any architectural resources within the route itself, since the route would consist of avenue and street roadbeds that do not contain structures. However, the Study Area along the route contains architectural resources, including those resources discussed in Chapter 5, Section 5.5, for the portion of the Water Main Only route that overlaps with the water main connections routes described in Chapter 5, as well as architectural resources identified along Second Avenue between E. 56<sup>th</sup> and E. 35<sup>th</sup> Streets identified in the Second Avenue Subway FEIS. The resources identified in the Second Avenue Subway FEIS are as follows:

- 312 E. 53<sup>rd</sup> Street House (NYCL)
- Beaux Arts Apartments, 307 E. 44<sup>th</sup> Street (NYCL)
- Daily News Building, 220 E. 42<sup>nd</sup> Street (NHL, S/NR, NYCL)
- Tudor City Historic District (S/NR, NYCL)
- Civic Club, 243 E. 34<sup>th</sup> Street (S/NR, NYCL)

The Water Main Only route as currently conceived would not pass through any Historic Districts.

As discussed in Chapter 5, construction of the water main connections to the preferred Shaft Site would not be anticipated to result in potential adverse impacts to architectural resources given the short duration of the work and the limited vibration associated with the construction activities. If this alternative was chosen, NYCLPC would be consulted regarding construction in historic districts or located near historic structures to avoid any potential significant adverse impacts to historic resources.

Therefore, it also is not expected that construction of the Water Main Only route would result in potential significant adverse impacts to architectural resources.

## **Urban Design and Visual Resources**

### *Urban Design*

Construction of the water main connections would not involve any changes to block form; street pattern or hierarchy; topography; natural features; or building arrangement, bulk, use, or type. During construction, the sidewalk area could be reduced, street pavement would be cut up, and construction equipment would be located in the street. These changes are typical of construction projects in Manhattan.

As described in Section 5.6, every effort would be made to protect and maintain street trees along the water main route before and during construction. However, it is possible that some street trees along the water main route would be removed. For street segments that would involve use of a 2-foot-wide strip of sidewalk, such as a potential sidewalk alignment or work on a side street, all street trees and street furniture located within the affected sidewalk areas may be removed during construction. These would be returned or replaced following construction.

It is also possible that some additional street trees would be lost in locations where no sidewalk work is proposed, because of the excavation activities close to those trees. The loss of street trees along entire blocks to facilitate water main construction would change the appearance of those blocks. As discussed in Section 5.6, “Urban Design and Visual Resources” in Chapter 5, where possible along the water main routes, the NYCDDC would replace any removed street trees in accordance with the requirements of the New York City Department of Parks and Recreation (NYCDPR), which administers the street tree program in New York City. The replacement trees would in most cases be smaller than the trees that were lost. NYCDPR street tree replacement policy typically requires that areas affected by such construction be re-vegetated with additional street greenery to compensate for the loss of established plantings in the neighborhood. As

described in Section 5.6, NYCDDC, working with NYCDPR, would endeavor to provide more trees than the ones that were removed. The provision of additional trees would maintain the greenery of the Study Area, although the visual character of certain block segments would be altered.

The potential elimination of mature street trees would have a temporary adverse impact on urban design that would be offset by additional tree planting in the community. The elimination of these trees is not considered to be a significant impact because the urban design and visual resources characteristic of this area is not defined by this element. For the Water Main Only Alternative, a far greater number of trees could potentially be affected given the much longer length of the water main construction work than for the other alternatives.

Overall, due to the limited nature of the potential changes, no potential significant adverse impacts to the urban design of the Study Area are anticipated as a result of construction activities required for the water main connections.

As described in Chapter 2, “Purpose and Need and Project Overview” construction work could occur on the water main connections at night. To facilitate this work, lighting would be installed around the street segment under construction. This lighting would be noticeable from the surrounding area, but would not be substantially different from the lighting that already illuminates the Study Area at night.

#### *Visual Resources*

During construction, the disturbance to the streetbed and sidewalk and construction equipment would be visible from elsewhere in the Study Area, but would not eliminate views from the Study Area to surrounding visual resources; nor would they become a dominant element of such views. The appearance of the construction activities would be consistent with other water main projects that occur throughout the City.

#### **Neighborhood Character**

Construction of the Water Main Only route would disturb streetbeds and/or portions of the sidewalks along the selected route. The area of disturbance and all associated construction equipment would be confined to a narrow corridor along the street segment being constructed. For analysis purposes, it is assumed that cut-and-cover construction would be used and the length of the construction corridor would be limited to minimize the period of disturbance at any one location. The entire route would not be affected simultaneously. Each construction segment would be directly affected by construction for approximately 10 to 12 weeks.

Water main construction would be typical of other construction projects in Manhattan. When construction work is under way, it would likely be disruptive to surrounding land uses. This work would typically occur during the daytime, but may include evening work and therefore could be disruptive to nearby residences during the day and evening, and to nearby institutional and commercial uses during the daytime. The most noticeable effects on neighborhood character in the Study Area would be construction-generated traffic and noise. Noise from construction equipment could be intrusive to land uses and sensitive receptors nearest to the construction

segments. Traffic delays would depend on the particular construction scenario and water main route, but would be similar in severity to those projected for the reasonable worst-case route for the preferred and alternative Shaft Sites. These types of impacts could occur in a similar fashion for the entire five to seven year construction period. However, construction of the Water Main Only route would occur in densely populated, noisy, busy, and thriving sections of Manhattan, already characterized by substantial traffic volumes and high noise levels. Curbside deliveries, drop-offs, and pick-ups at buildings adjacent to the construction work would be relocated to areas away from the construction, resulting in some inconvenience to the residents, businesses, and visitors of affected buildings. Some construction scenarios would encroach on sidewalks.

To facilitate the construction work that could occur at night (if required), lighting would be installed around the street segment under construction. This lighting would be noticeable from the surrounding area, but would not be substantially different from the lighting that already illuminates the Study Area at night. Construction of the Water Main Only route would not involve any changes to block form; street pattern or hierarchy; topography; natural features; or building arrangement, bulk, use, or type within the Study Areas. Street trees and street furniture located within the affected sidewalks would be removed during construction, potentially including traffic or walk signals, street lights, signs, fire hydrants, and bus shelters. These streetscape elements and street trees would be returned or replaced following construction; however, the size of the replacement street trees would be much smaller than the typical existing street tree, and therefore the streetscape would look different until the replacement trees grow to maturity.

Construction of the Water Main Only Alternative would not be anticipated to result in potential significant adverse impacts to architectural resources within the Study Areas, given the short duration of the work and the limited vibration. Disturbance to the streetbed and sidewalk and construction equipment would be visible from elsewhere in the Study Area, but would not eliminate views from the Study Areas to surrounding visual resources; nor would they become a dominant element of such views. While the construction equipment and related activity would temporarily become part of surrounding views, they would not adversely affect the views. The period of diminished visual quality would be short-term along each street segment.

Overall, given the brief duration of the construction disturbance in specific areas, and the limited nature of the potential changes, the construction activities associated with the new water mains would not be anticipated to result in any significant adverse impacts to neighborhood character.

### **Infrastructure and Energy**

The specific, detailed route of the water main construction in each street would not be determined until a detailed design was prepared for the Water Main Only route. It is possible that some of the utilities that currently exist in the streets along the Water Main Only route would have to be relocated within the street to allow construction of the water mains.

Based on the current knowledge of the existing infrastructure for the route as currently conceived, it is not anticipated that any utilities would be relocated to different streets. Future planning and design would be necessary in the future to determine the type of utility relocation

or movement that may be required for such an extensive water main construction project. It is expected that NYCDDC would plan the route with a goal of minimizing the surface disturbance that utility relocation would require. During utility relocation within the street, it is possible that service provided by the utilities would potentially be interrupted for short periods of time while the utility turns off the service for a segment of the utility line during relocation of that segment. In order to minimize such disruptions for any of these services, the NYCDDC has existing procedures which require representatives of each utility to participate in utility coordination meetings to develop a scope of work and schedule for the relocation of utilities so there is a clear lane for the construction of the new water mains, and a coordinated schedule of relocations if necessary. During these meetings, the utility representatives would determine where temporary service would be needed to continue service to their customers. During or prior to construction of the water mains, the utility companies would conduct any necessary relocations, and provide temporary service as necessary. Due to the existence of these established procedures which are customarily used for all construction within City streets, no potential significant adverse service disruption impacts would be anticipated to occur as a result of water main construction in the streets.

Storm water runoff from the streets potentially would be generated during certain water main construction activities. NYCDDC would implement appropriate soil erosion and sediment control measures to control storm water runoff from the areas of construction. Storm water runoff generated within the Study Area is directed to storm drains that are connected to the combined sewer lines located in the area. No additional paved surfaces would be created along the Water Main Only route since the street and sidewalk areas in the construction corridor are currently paved. Therefore, no significant increase in storm water volume would be expected to occur during or following construction.

Because standard street construction practices are managed by the NYCDDC to minimize potential infrastructure and other impacts, construction of the water main in the street and sidewalk areas would not be anticipated to cause potential significant adverse infrastructure impacts.

Based on historical NYCDDC water main construction, it is expected that mobile construction equipment would be utilized for this method of construction and would be powered using diesel fuel. Therefore, no potential significant adverse energy impacts would be anticipated to occur.

### **Traffic and Parking**

As described in Section 5.9, “Traffic and Parking” for water main connections to the preferred Shaft Site, construction along the reasonable worst-case First Avenue Route under the Base Scenario would result in potential temporary adverse traffic impacts on First Avenue intersections between E. 55<sup>th</sup> and E. 59<sup>th</sup> Streets and at the Second Avenue intersection with E. 56<sup>th</sup> Street. The Water Main Only route would extend from Shaft 14B in the Upper East Side, overlap the First Avenue Route in the area of the Queensboro Bridge, and connect to Shaft 32B in the Kips Bay area of Manhattan. Since the terminus of the Water Main Only route is also situated in a sensitive area for traffic flow, encompassing access and egress routes to and from

the Queens-Midtown Tunnel, an analysis of selected Kips Bay intersections was performed to depict the nature of potential construction-related traffic impacts in this area.

### *Traffic Operations Analysis*

#### *Queens-Midtown Tunnel*

The 2004 existing, 2008 No Build, and 2008 Build traffic volumes along Second Avenue between E. 34<sup>th</sup> and E. 37<sup>th</sup> Streets are illustrated in Figures 9.2-2, 9.2-3, and 9.2-4, respectively. Traffic volumes along Second Avenue are approximately 3,100 vehicles per hour (vph) during the AM peak hour, 1,700 vph during the midday peak hour, and 1,800 vph during the PM peak hour at its approach to E. 35<sup>th</sup> Street. The substantially higher AM peak hour volume is attributed to one of the lanes within the south tube of the Queens-Midtown Tunnel being reversed for Manhattan-bound traffic during the AM peak period. Traffic enforcement agents (TEAs) are present to facilitate this operation and traffic flow at the intersection of Second Avenue and E. 36<sup>th</sup> Street.

Similar to the construction staging detailed for various segments of construction under the First Avenue Route, the construction of the Water Main Only route in the Kips Bay area would require temporary closure of two lanes during the AM and PM peak periods and three lanes during the midday peak period along Second Avenue. For purposes of this analysis and reasonably recognizing that the construction of water main connections could not feasibly take place directly adjacent to the Queen-Midtown Tunnel portals, anticipated lane closures were assumed to occur on the west side of Second Avenue. Curbside uses, which include daytime deliveries and bus-only operations during the AM and PM peak periods, would be discontinued through the construction area. An impact analysis considering the above assumptions was conducted and is presented in Table 9.2-1. The traffic movements that are expected to experience adverse traffic impacts during construction are described below.

#### AM Peak Hour

- Second Avenue and E. 35<sup>th</sup> Street – The southbound approach would deteriorate from LOS B to LOS D with delays increasing from 15.9 seconds per vehicle (spv) for the through movement and 13.5 spv for right-turn movement to 45.3 spv for the combined through-right movement.
- Second Avenue and E. 36<sup>th</sup> Street – The southbound approach would deteriorate from LOS D to LOS F with delays increasing from 49.1 spv to 142.7 spv.

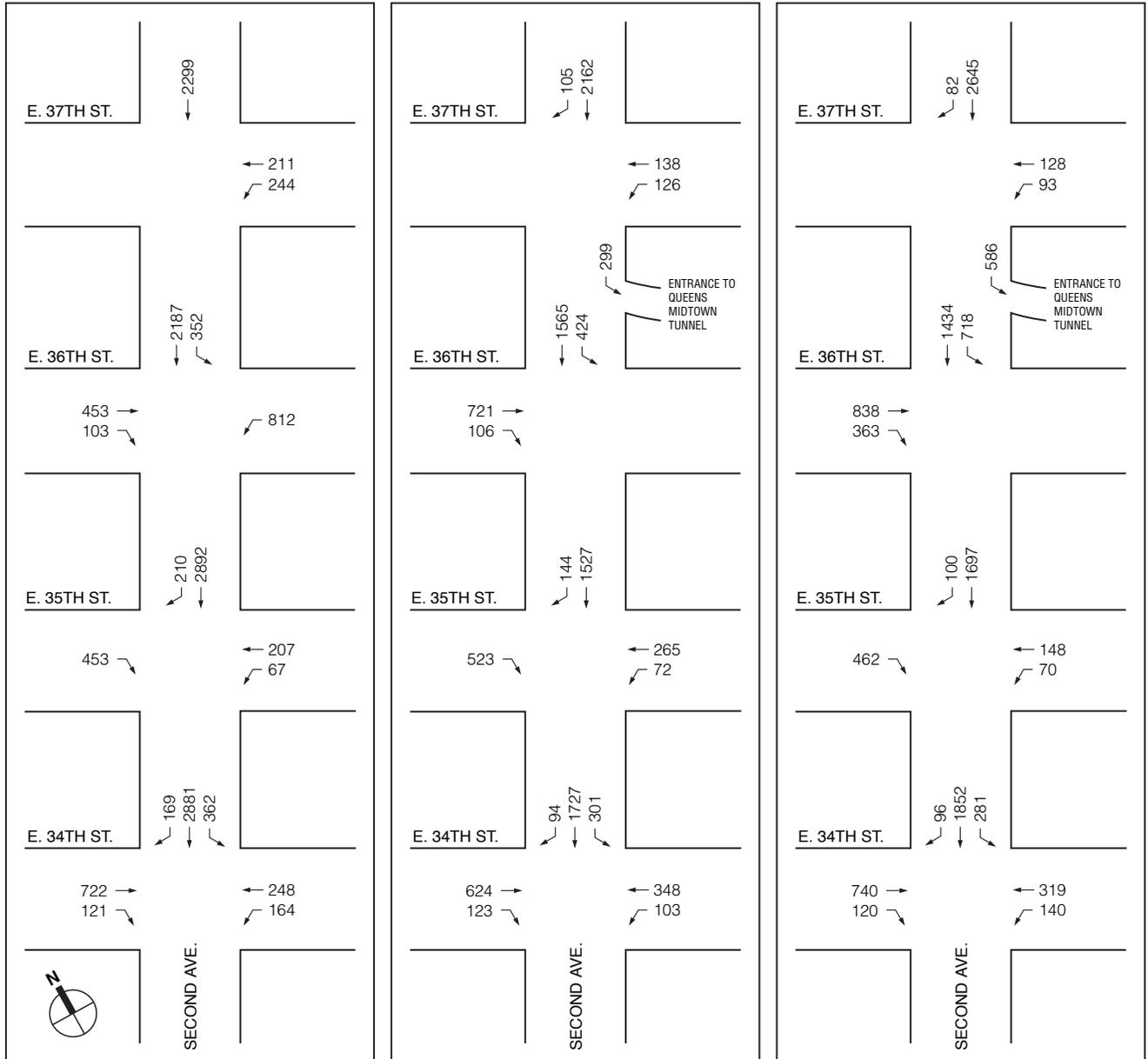
#### Midday Peak Hour

- Second Avenue and E. 37<sup>th</sup> Street – The southbound approach would deteriorate from LOS B to LOS F with delays increasing from 11.9 spv to 113.6 spv.
- Second Avenue and E. 36<sup>th</sup> Street – The southbound through movement would deteriorate from LOS B to LOS F with delays increasing from 14.0 spv to 138.7 spv.

**AM PEAK HOUR**

**MIDDAY PEAK HOUR**

**PM PEAK HOUR**



NOT TO SCALE



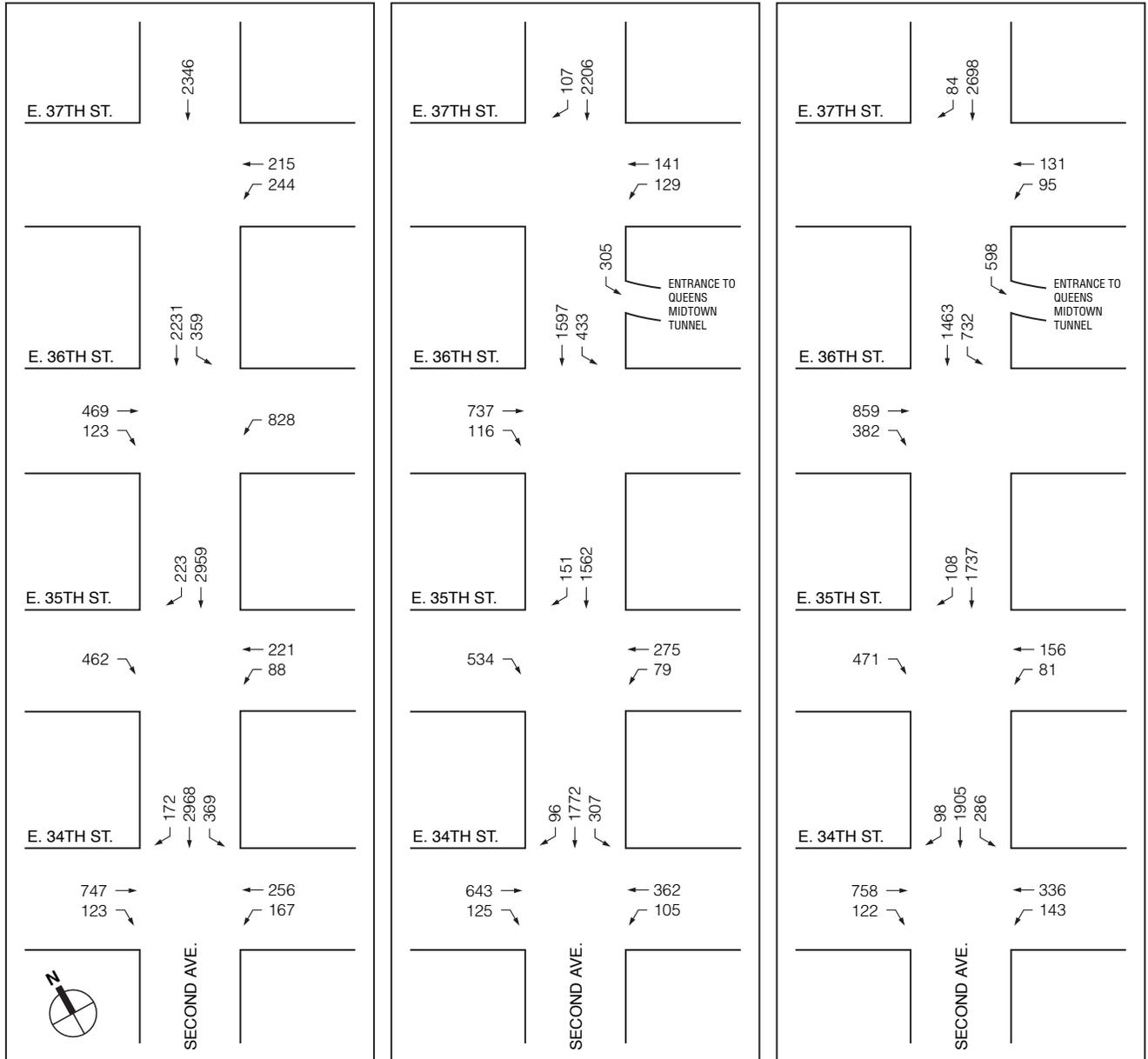
NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION  
 PROPOSED SHAFT 33B TO CITY WATER TUNNEL NO. 3  
 STAGE 2-MANHATTAN LEG  
 WATER MAIN ONLY ALTERNATIVE  
 2004 EXISTING TRAFFIC VOLUMES  
 WATER MAIN ALTERNATIVE

FIGURE 9.2-2

**AM PEAK HOUR**

**MIDDAY PEAK HOUR**

**PM PEAK HOUR**



NOT TO SCALE



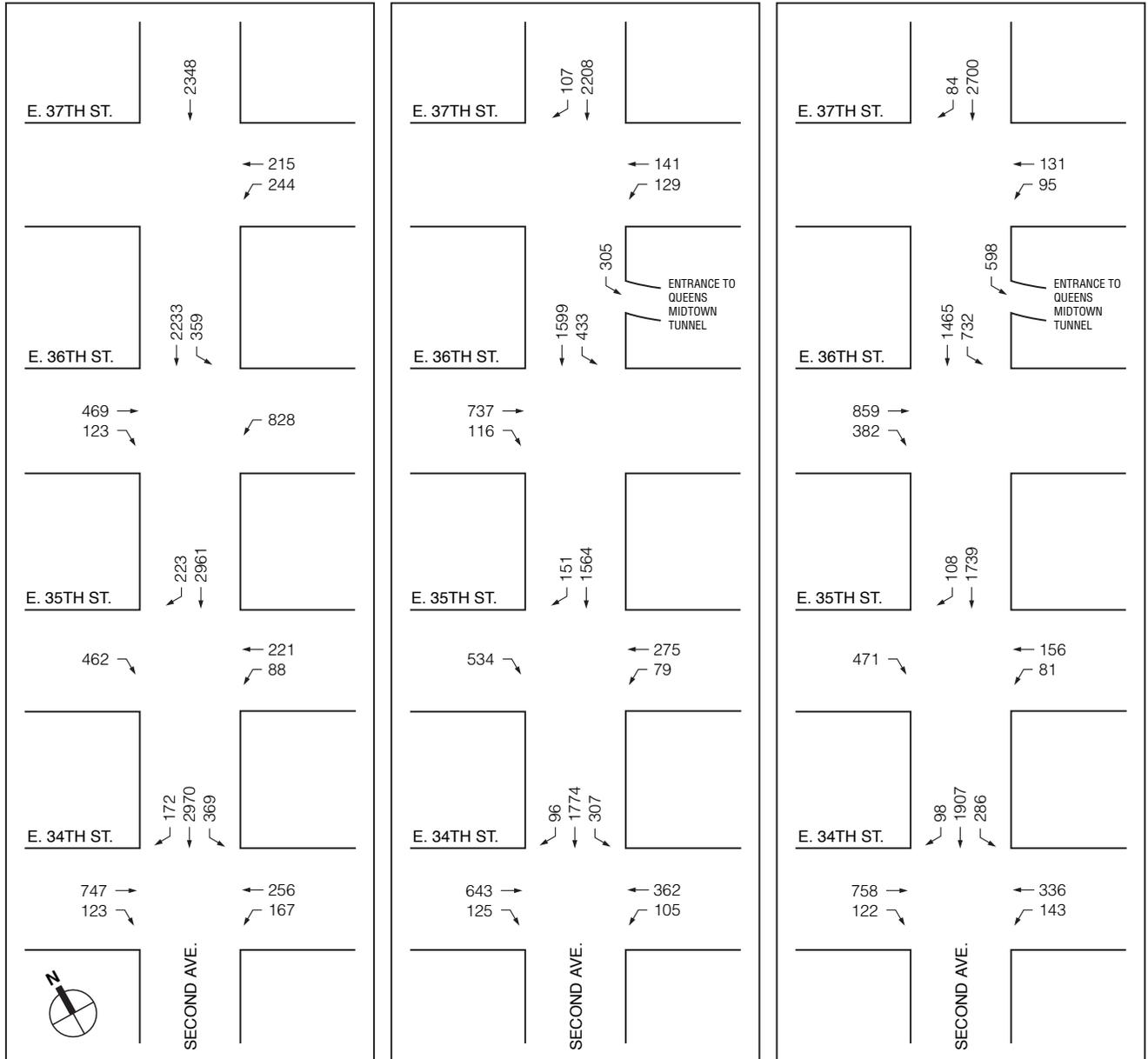
NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION  
 PROPOSED SHAFT 33B TO CITY WATER TUNNEL NO. 3  
 STAGE 2-MANHATTAN LEG  
 WATER MAIN ONLY ALTERNATIVE  
 2008 NO BUILD TRAFFIC VOLUMES  
 WATER MAIN ALTERNATIVE

FIGURE 9.2-3

**AM PEAK HOUR**

**MIDDAY PEAK HOUR**

**PM PEAK HOUR**



NOT TO SCALE



NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION  
 PROPOSED SHAFT 33B TO CITY WATER TUNNEL NO. 3  
 STAGE 2-MANHATTAN LEG  
 WATER MAIN ONLY ALTERNATIVE  
**2008 BUILD TRAFFIC VOLUMES**  
 WATER MAIN ALTERNATIVE

FIGURE 9.2-4

The substantial increases in delay at the southbound approaches of Second Avenue upstream from (north of) the Queen-Midtown Tunnel entrance at E. 36<sup>th</sup> Street would severely impact the overall traffic flow along the Second Avenue corridor for numerous blocks during the AM and midday peak periods. Since no potential adverse traffic impacts were projected for the PM peak hour, more favorable conditions are anticipated.

*Conclusions of Traffic Impact Assessment*

The extent of potential adverse traffic impacts during construction along most of Water Main Only route are expected to be similar to or less than those described for the First Avenue Route for the Shaft Sites. In addition, severe traffic impacts during construction were predicted near the Queens-Midtown Tunnel. It is expected that these adverse traffic impacts would occur along the remainder of the Water Main Only route. Based on the analysis results presented above and in Section 5.9, it can be concluded that construction of the Water Main Only Alternative would result in extensive traffic impacts between E. 35<sup>th</sup> and E. 77<sup>th</sup> Streets as construction progressed along the potential route. These impacts represent a reduction in capacity at First and Second Avenue intersections that could also result in spillbacks along the corridors. Capacity reduction on the avenues would increase delays along the corridors and adversely impact a number of intersections in one or more peak hours. Since these adverse impacts would be expected to persist along and adjacent to key traffic corridors on the Water Main Only route for much of the entire five-seven year construction period, this alternative would result in significant adverse impacts.

**CHAPTER 9**  
**WATER MAIN ONLY ALTERNATIVE**

**Table 9.2-1**  
**2008 Build and No Build Conditions Comparison – Water Main Only Alternative Study Area**

Analysis Intersection	AM Peak Hour								Midday Peak Hour								PM Peak Hour							
	No Build Conditions				Build Conditions				No Build Conditions				Build Conditions				No Build Conditions				Build Conditions			
	Lane Group	V/C Ratio	Delay (sec)	LOS	Lane Group	V/C Ratio	Delay (sec)	LOS	Lane Group	V/C Ratio	Delay (sec)	LOS	Lane Group	V/C Ratio	Delay (sec)	LOS	Lane Group	V/C Ratio	Delay (sec)	LOS	Lane Group	V/C Ratio	Delay (sec)	LOS
<b>E. 34<sup>th</sup> Street (E-W) Second Avenue (SB)</b>	EB-TR	0.88	41.8	D	EB-TR	0.88	41.8	D	EB-T	0.88	44.3	D	EB-T	0.88	44.3	D	EB-TR	0.89	42.7	D	EB-TR	0.89	42.7	D
	WB-L	0.65	42.9	D	WB-L	0.65	42.9	D	EB-R	0.56	37.2	D	EB-R	0.56	37.2	D	WB-L	0.56	38.6	D	WB-L	0.56	38.6	D
	WB-T	0.22	17.0	B	WB-T	0.22	17.0	B	WB-L	0.41	32.4	C	WB-L	0.41	32.4	C	WB-T	0.30	17.8	B	WB-T	0.30	17.8	B
	SB-L	0.80	30.1	C	SB-L	0.80	30.1	C	WB-T	0.32	18.0	B	WB-T	0.32	18.0	B	SB-L	0.62	20.7	C	SB-L	0.62	20.7	C
	SB-LT	1.02	40.0	D	SB-LT	1.02	40.2	D	SB-L	0.80	31.4	C	SB-L	0.80	31.4	C	SB-LT	0.65	16.1	B	SB-LT	0.65	16.1	B
	SB-R	0.36	14.6	B	SB-R	0.36	14.6	B	SB-LT	0.61	15.4	B	SB-LT	0.61	15.5	B	SB-LT	0.65	16.1	B	SB-LT	0.65	16.1	B
<b>E. 35<sup>th</sup> Street (E-W) Second Avenue (SB)</b>	EB-R	0.69	28.5	C	EB-R	0.69	28.5	C	SB-R	0.20	12.4	B	SB-R	0.20	12.4	B	EB-R	0.70	29.0	C	EB-R	0.70	29.0	C
	WB-LT	0.32	20.0	B	WB-LT	0.32	20.0	B	EB-R	0.80	33.6	C	EB-R	0.80	33.6	C	WB-LT	0.25	19.2	B	WB-LT	0.25	19.2	B
	SB-T	0.79	15.9	B	SB-TR	1.04	45.3	D *	WB-LT	0.35	20.4	C	WB-LT	0.35	20.4	C	SB-T	0.46	11.6	B	SB-TR	0.60	13.2	B
	SB-R	0.43	13.5	B	SB-TR	0.58	13.0	B	SB-TR	0.94	26.9	C	SB-TR	0.94	26.9	C	SB-R	0.21	10.5	B	SB-R	0.21	10.5	B
<b>E. 36<sup>th</sup> Street (E-W) Second Avenue (SB)</b>	EB-TR	0.73	37.8	D	EB-TR	0.73	37.8	D	EB-TR	0.43	20.8	C	EB-TR	0.43	20.8	C	EB-TR	0.67	24.5	C	EB-TR	0.67	24.5	C
	WB-L	0.95	51.9	D	WB-L	0.95	51.9	D	SB-L	0.43	12.3	B	SB-L	0.42	12.0	B	WB-L	0.95	51.9	D	WB-L	0.95	51.9	D
	SB-L	0.99	75.1	E	SB-L	0.92	58.3	E	SB-L	0.43	12.3	B	SB-L	0.42	12.0	B	SB-L	0.67	16.0	B	SB-L	0.65	15.4	B
	SB-LT	1.01	49.1	D	SB-LT	1.24	142.7	F *	SB-T	0.65	14.0	B	SB-T	1.26	138.7	F *	SB-T	0.60	13.3	B	SB-T	0.78	17.3	B
<b>E. 37<sup>th</sup> Street (WB) Second Avenue (SB)</b>	WB-LT	0.29	22.0	C	WB-LT	0.29	22.0	C	WB-LT	0.21	21.2	C	WB-LT	0.21	21.2	C	WB-LT	0.20	21.1	C	WB-LT	0.20	21.1	C
	SB-T	0.57	10.0	A	SB-T	0.69	11.4	B	SB-TR	0.72	11.9	B	SB-TR	1.21	113.6	F *	SB-T	0.66	10.9	B	SB-TR	0.82	14.0	B

**Notes:** EB-Eastbound, WB-Westbound, NB-Northbound, SB-Southbound; L-Left, T-Through, R-Right, DfL-Analysis considers a Defacto Left Lane on this approach.  
 Defacto left lane: As per HCM 2000, page 16-135, when the proportion of left turns in the left-hand lane group is 1.0, this left-hand lane should be analyzed as an exclusive left-turn lane (a de facto left-turn lane), since occupied entirely by left-turning vehicles.  
 V/C Ratio - Volume to Capacity Ratio, SEC/VEH - Seconds per vehicle; LOS - Level of service  
 \* Denotes impacted locations  
 Analysis is based on the 2000 *Highway Capacity Manual Methodology* (HCS 2000).  
 Similar lane restriping to the First Avenue Route construction was assumed on Second Avenue. Hence, Build delay levels may be lower than those projected for the No Build conditions for certain lane groups.

### *Parking Analysis*

The construction of the Water Main Only Alternative along First and Second Avenues would temporarily eliminate a maximum of 10 curbside spaces on each avenue block depending on the parking regulations and the number of available spaces on each block. For cross-town streets, approximately 25 spaces would be displaced at any one time since construction would be conducted in up to 200-foot segments. These curbside spaces would be eliminated due to the construction of the water mains for periods of between 12 and 20 weeks depending on the sequencing and construction progress of each segment.

### **Transit and Pedestrians**

As described in Section 5.10, “Transit and Pedestrians” for water main connections to the preferred Shaft Site, the construction along the reasonable worst-case First Avenue Route would require temporary disruption of the bus-only lane and relocation of existing bus stops along First Avenue. Since these conditions are typical of construction activities in New York City and would not be considered to result in potential significant adverse impacts to transit service, similar conclusions could be drawn for the construction of the Water Main Only route. While it affects a substantially larger area, the construction would be staged, such that the effects on bus lanes and bus stops would be limited to a few blocks at a time. For the Study Area addressed above for traffic and parking, the bus-only lane on the west side of Second Avenue and a few bus stops would be affected during construction.

With regard to pedestrian conditions, the analysis conducted for the reasonable worst-case First Avenue route encompassed both roadway construction only and disturbance along adjacent sidewalks. It is expected that the same conclusions could be drawn for construction along the Water Main Only route, in that no potential significant adverse impacts to pedestrians would result from the construction of the water mains.

### **Air Quality**

Construction of the Water Main Only Alternative is expected to result in similar emissions to those analyzed in detail for the reasonable worst-case route from the preferred Shaft Site (see Section 5.11). Therefore, no potential significant adverse air quality impacts from the construction of the Water Main Only Alternative are expected.

### **Noise**

As described in Section 5.12, “Noise,” for water main connections to the preferred Shaft Site, construction would result in potential noise impacts along the corridors where such work construction work would occur. The extent of these noise impacts during construction along most of Water Main Only Alternative route would be similar to those described in Section 5.12, except they would occur over the entire area affected by the construction of this alternative (see affected areas above under Land Use and Community Facilities, Zoning, and Public Policy).

Based on the analysis results presented in Section 5.12, it can be concluded that construction of the Water Main Only Alternative would result in extensive noise impacts between E. 35<sup>th</sup> and E. 77<sup>th</sup> Streets as construction progressed along the route. NYCDEP would work with NYCDDC, who would be responsible for the water main construction work, to implement measures to minimize noise impacts for this Alternative. These measures could include use of newer equipment, mufflers and silencers, housings or enclosures for noise producing equipment, possible prohibition of the use of air or gasoline driven saws and similar equipment, and implementation of a noise monitoring program.

While the Water Main Only Alternative would involve a five-seven year construction period, the work would occur segment by segment and would not impact receptors along any given block for an extended period. Due to the short-term duration those potential adverse noise impacts could occur, no significant adverse noise impacts would be expected with this alternative.

### **Vibration**

The construction techniques used for construction of the Water Main Only Alternative would be the same as those described in Chapter 5, “Water Main Connections,” Section 5.1, “Project Description.” Construction would result in varying degrees of ground-borne vibration, depending on the stage of construction, the equipment and construction methods employed, and the distance from the construction to vibration-sensitive receptors.

Use of compactors, jackhammers and heavy trucks are typical activities that occur throughout the City. On any given block, construction would generally last 12 weeks for the street segment and another 10 weeks for each intersection. Much of the vibration-causing construction equipment such as soil compactors and jackhammers, among others, would be used on an intermittent basis during this construction period. These activities would be short-term and temporary in nature. Therefore, no potential significant adverse vibration impacts would be anticipated to occur from the Water Main Only Alternative construction.

### **Hazardous Materials**

During construction of the Water Main Only Alternative, soils would be excavated along the route. Environmental testing would be conducted prior to construction of the Water Main Only Alternative to determine the specific potential for soil and groundwater contamination along the water main route. It is likely that some subsurface soils may contain contaminants resulting from a number of sources including deposition and infiltration, contamination from off-site sources, and from historic fill material commonly used throughout the City of New York. Therefore, it is expected that preventative measures, described in Section 5.14, would need to be implemented during construction of the Water Main Only Alternative to minimize exposure to potentially contaminated soils and groundwater during construction. With implementation of such measures, there would be no potential significant adverse hazardous materials impacts from construction of the Water Main Only Alternative.

## **Public Health**

Based on the air quality assessment of the construction of the water main connections to the preferred Shaft Site (See Section 5.11), the construction of the Water Main Only Alternative would also not result in any new predicted exceedances of air quality standards and the predicted neighborhood average incremental concentration of PM<sub>2.5</sub> would be less than the applicable interim guideline concentration. Additionally, any increased emission levels produced during the construction activity would be transient and short-term as the work along the water main progresses. Therefore, potential PM<sub>2.5</sub> emissions from mobile and stationary sources related to the construction of the Water Main Only Alternative are not anticipated to result in an adverse impact on public health. To the extent that it can be determined from the changes in air quality resulting from the construction of the water mains, no significant increases of asthma incidences in the community would be expected for this alternative. In addition, the potential impacts from noise, traffic and hazardous materials are also not expected to result in an adverse impact on public health. Therefore, the construction of the Water Main Only Alternative is not expected to result in a significant adverse impact on public health.

## **Mitigation Measures**

### *Traffic*

If the Water Main Only Alternative is selected, it is expected that as part of an overall effort to further attenuate conditions for traffic flow at critical locations, NYCDOT Office of Construction Mitigation and Coordination (OCMC) will require more aggressive measures that will be identified in the Maintenance and Protection of Traffic (MPT), that were not analyzed as part of this EIS for the water main connection routes for the Shaft Sites. In Section 5.16, conceptual traffic management strategies, beyond conventional mitigation measures, were also explored to evaluate the full set of options in mitigating traffic impacts during the construction of the water main connections to the preferred Shaft Site. Even with such traffic mitigation and management strategies in place for the Water Main Only Alternative, the significant adverse traffic impacts during construction would still be expected throughout the five to seven year construction period.

## **Unavoidable Adverse Impacts**

The construction of the Water Main Only Alternative would result in extensive traffic impacts between E. 35<sup>th</sup> and E. 77<sup>th</sup> Streets as construction progressed along the potential route. These significant adverse traffic impacts would be unavoidable.

