

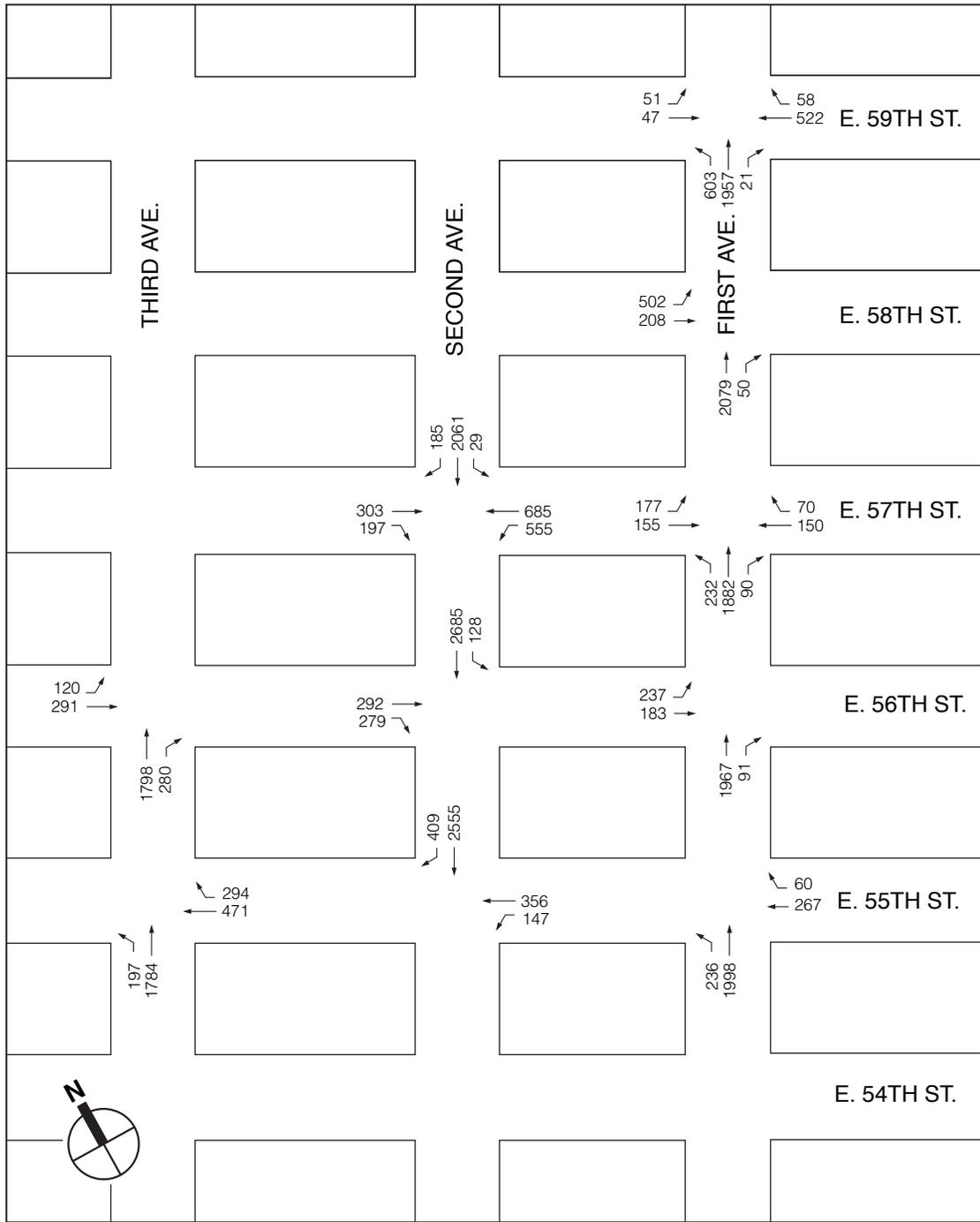
5.9 TRAFFIC AND PARKING

5.9.1 Introduction

This Section analyzes the conceptual construction scenarios that could occur when the water mains are connected from the proposed Shaft 33B to the existing trunk main water distribution system. The methodology utilized to prepare traffic and parking analyses is described in Section 3.9, “Traffic and Parking,” of Chapter 3, “Impact Methodologies.”

As discussed in Section 5.1, “Project Description,” NYCDEP water supply objectives for a large part of Manhattan involve connecting Shaft 33B to an existing trunk main located on Third Avenue, ideally between E. 55th and E. 56th Streets but as far north as E. 61st Street. As there are many potential water main connection routes, a reasonable worst-case route and two additional representative routes were considered to address the transportation-related issues that could occur with the construction of the water main connections along these routes. The actual construction would be undertaken by New York City Department of Design and Construction (NYCDDC) in coordination with New York City Department of Transportation (NYCDOT) Office of Construction Mitigation and Coordination (OCMC). The traffic and parking impact assessment presented in this EIS considers the weekday AM, midday, and PM peak periods. Although double shifts, night work, and weekend work could also occur, traffic volumes during these time periods are comparatively lower than those assessed for the typical weekday peak periods. Hence, the findings presented for the selected analysis time periods reflect the reasonable worst-case traffic conditions in the Study Area. Where temporary construction-related traffic impacts are identified, conceptual mitigation measures were explored and are presented in Section 5.16, “Mitigation Measures.”

The First Avenue route, which was developed to represent the reasonable worst-case scenario for impact assessment, contemplates two mains constructed along the east side of First Avenue between E. 55th and E. 59th Streets, and assumes that the east-west sections of the connection route would be constructed along E. 55th and E. 56th Streets. The Sutton Place route, which was analyzed as one of the two additional representative routes, would involve the construction of two mains from the preferred Shaft Site along E. 59th Street to Sutton Place, down to E. 55th and E. 56th Streets, then across to Third Avenue. The other additional representative route, the E. 59th Street/E. 61st Street route considers connecting one main directly westward along E. 59th Street to Third Avenue and the other main up along First Avenue to E. 61st Street, then across to Third Avenue. These conceptual water main connection routes are illustrated in Figures 5.1-1, 5.1-2, and 5.1-3, and detailed further below. For the reasonable worst-case First Avenue route, four construction options were explored. While these options could possibly be implemented as part of the two additional representative routes as well, they are described only for the First Avenue route.

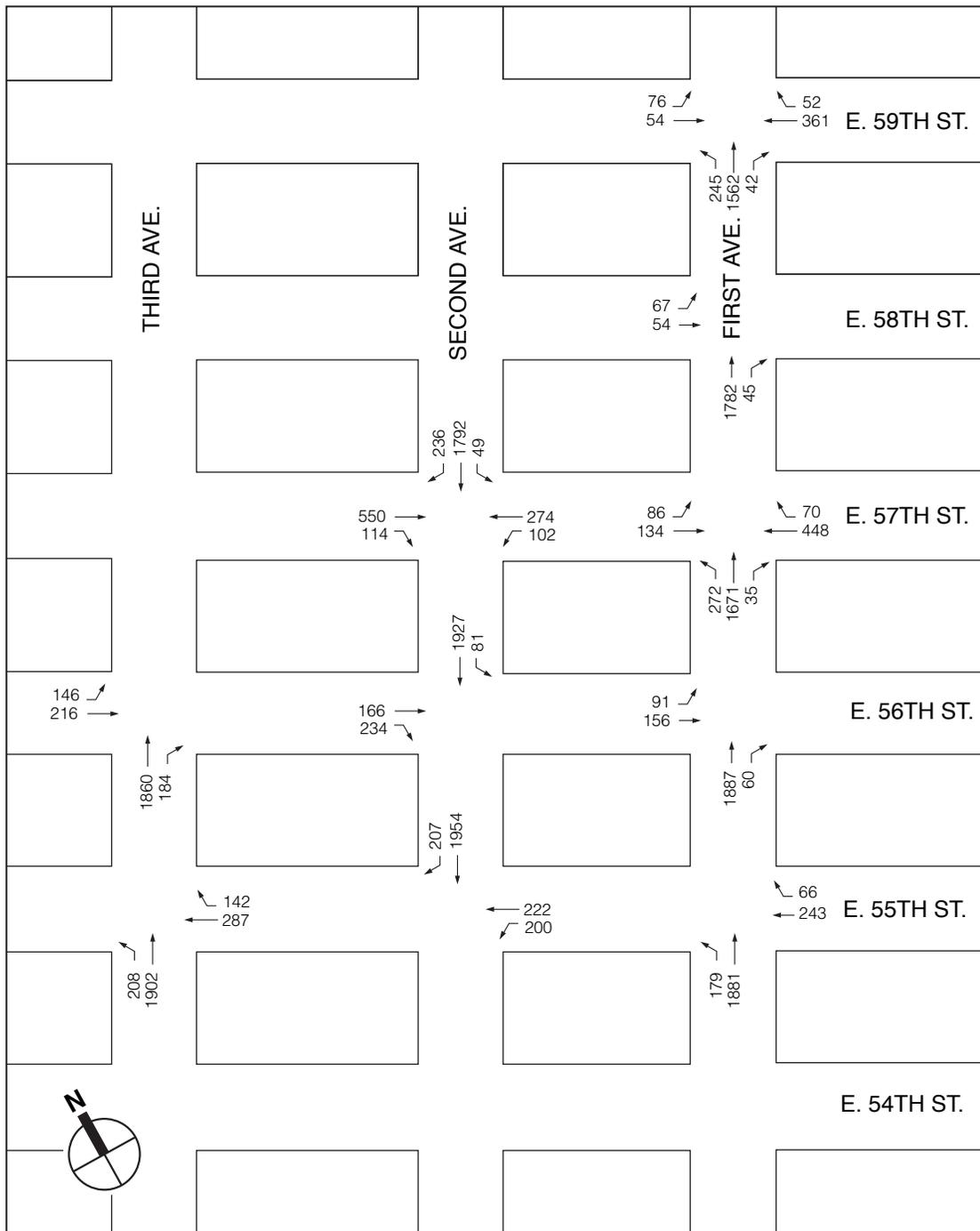


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 PROPOSED SHAFT 33B TO CITY WATER TUNNEL NO. 3
 STAGE 2-MANHATTAN LEG
 WATER MAIN CONNECTIONS
 2004 EXISTING TRAFFIC VOLUME NETWORK
 WATER MAIN STUDY AREA - FIRST AVENUE ROUTE
 AM PEAK HOUR

FIGURE 5.9-1

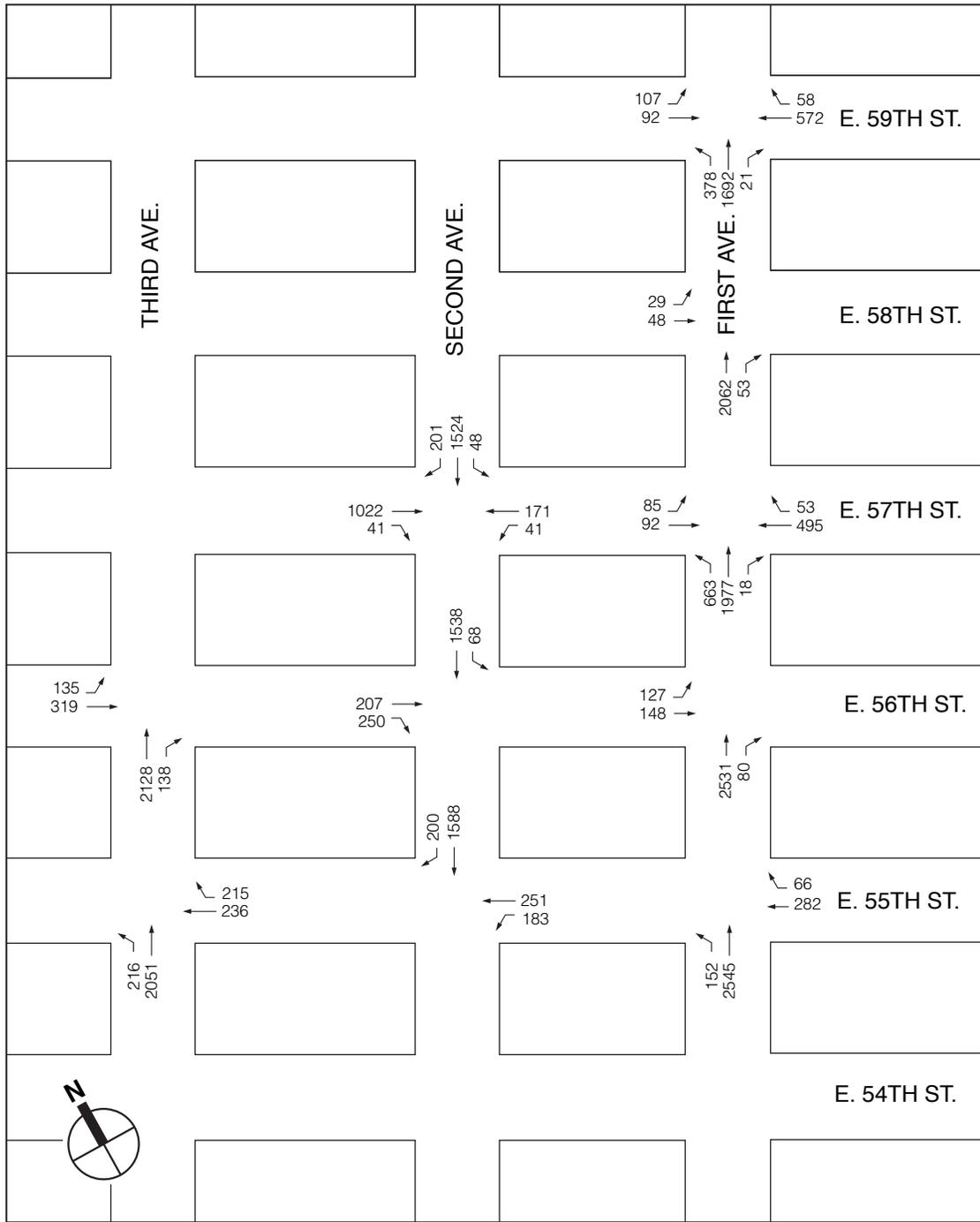


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 WATER MAIN CONNECTIONS
 2004 EXISTING TRAFFIC VOLUME NETWORK
 WATER MAIN STUDY AREA - FIRST AVENUE ROUTE
 MIDDAY PEAK HOUR

FIGURE 5.9-2



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 WATER MAIN CONNECTIONS
 2004 EXISTING TRAFFIC VOLUME NETWORK
 WATER MAIN STUDY AREA - FIRST AVENUE ROUTE
 PM PEAK HOUR

FIGURE 5.9-3

First Avenue Route

The Base Scenario of the First Avenue route represents the reasonable worst-case condition for evaluating potential traffic and parking impacts. As detailed in Section 5.1, it would occur in segments over an approximately 41-month¹ period. The construction of both water mains would take place concurrently along the east side of First Avenue between E. 55th and E. 56th Streets and not involve any taking of sidewalk space. Along E. 55th and E. 56th streets between First and Third Avenues, a nominal amount of the north sidewalk (2 feet from the north curb) would be taken to maintain the optimum use of the traffic lanes. The other three construction options for the First Avenue route are as follows.

- Scenario A—same as the Base Scenario, except part of the east sidewalk would also be taken for construction.
- Scenario B—two mains constructed one at a time, with less roadway closure requirements than Scenario A during the construction of the first main and the same roadway closure requirements as Scenario A during the construction of the second main.
- Scenario C—one main constructed on First Avenue and one main constructed on Sutton Place, with the same roadway closure requirements as the first stage of Scenario B plus construction along Sutton Place.

Sutton Place Route

The Sutton Place route would require a construction period of approximately 51 months and involve constructing two mains along Sutton Place (similar to the Base Scenario for the First Avenue route but assumed to occur on the west side of the street). Along E. 55th and E. 56th Streets, the connections for this route would also require traversing the respective segments from Sutton Place to First Avenue. In addition, extending the two mains from the preferred Shaft Site to Sutton Place would require construction along the south side of E. 59th Street between First Avenue and Sutton Place² and temporarily converting this roadway segment from two-way to one-way westbound operations.

E. 59th Street/E. 61st Street Route

The E. 59th Street/E. 61st Street route would require a construction period of approximately 31 months and involve constructing one main along the south side of E. 59th Street from First Avenue to Third Avenue and connecting it to the existing trunk main between E. 59th and E. 60th Streets. The other main would travel up the west side of First Avenue to E. 61st Street, proceed west along the center of E. 61st Street to Third Avenue, and then connect to the existing trunk main between E. 60th and E. 61st Streets. As detailed in Section 5.9.4, “Future Conditions With

¹ This 41-month duration assumes no water main construction would occur during “black-out dates,” which are typically imposed by NYCDOT in this area of Manhattan. The black-out dates include the period between Thanksgiving and the New Year. During this period, roadways would be restored.

² Sutton Place ends at E. 59th Street and continues northward as York Avenue.

the Project,” this connection route would require careful coordination, particularly if the alternate site configuration is chosen for the preferred Shaft Site, and would require the use of approximately 6 feet of sidewalk space for about half of the E. 59th Street block between First and Second Avenues.

Detailed assessments of the First Avenue route Base Scenario, the Sutton Place route, and the E. 59th Street/E. 61st Street route were conducted to identify the range of potential impacts associated with these representative water main connection routes. The other construction options (Scenarios A, B, and C), which could be undertaken in a similar fashion but may require different construction durations, are described qualitatively and, where appropriate, analyzed quantitatively in the context of the First Avenue route. The associated construction issues and analysis results for these construction scenarios are presented below in Section 5.9.4, “Water Main Connection Construction Options.” Section 3.9, “Traffic and Parking Methodology,” defines the traffic Study Area and the analysis methodology that was used to assess potential traffic impacts.

5.9.2 Existing Conditions

First Avenue Route Base Scenario

Study Area Roadways and Traffic Volumes

As described in Section 3.9.2, the traffic Study Area consists of ten intersections: First Avenue intersections with E. 55th to E. 59th Streets; Second Avenue intersections with E. 55th to E. 57th Streets; and Third Avenue intersections with E. 55th and E. 56th Streets. Figures 5.9-1, 5.9-2, and 5.9-3 show the traffic volumes at these intersections during the weekday AM (8:00 to 9:00 a.m.), midday (12:00 to 1:00 p.m.), and PM (5:00 to 6:00 p.m.) peak analysis hours³. Three of these intersections (First Avenue and E. 57th, E. 58th, and E. 59th Streets) were also part of the Shaft 33B traffic Study Area. Descriptions of the affected roadways and peak hour traffic volumes, beyond those discussed in Section 4.9.2 for the preferred Shaft Site analysis (including Queensboro Bridge, First Avenue, Second Avenue, E. 57th Street, E. 58th Street, E. 59th Street, and E. 60th Street), are presented below.

Third Avenue

Third Avenue is a 70-foot wide northbound roadway. In the AM and midday peak hours, there are typically five lanes available to serve the northbound traffic, plus a parking lane on the west side and a permanent bus lane on the east side. In the PM peak hour, there are six traffic lanes available and parking is not permitted on either side. Third Avenue at E. 56th Street carries 2,100,

³ These analysis hours were selected to reflect conditions during the morning (7:00 to 10:00 a.m.), midday (noon to 2:00 p.m.), and evening (4:00 to 7:00 p.m.) time periods and to characterize traffic conditions during construction for different parts of the day (i.e., peak construction period – 7:00 to 11:00 a.m. and 3:00 to 7:00 p.m.; off-peak construction period – 11:00 a.m. to 3:00 p.m.).

2,050, and 2,250 vehicles per hour (vph) during the AM, midday, and PM peak hours, respectively. Along Third Avenue, the adjacent land uses consist of primarily commercial offices, with ground floor retail and some residential buildings.

E. 55th Street

E. 55th Street is a westbound local cross-town street with a roadway width of approximately 34 feet. The street accommodates a bicycle lane on the south side of the street, and commercial parking/standing is permitted along parts of both sides of the street. E. 55th Street at Second Avenue carries moderate traffic volumes of approximately 500 vph, 400 vph, and 450 vph in the AM, midday, and PM peak hours, respectively. A layover for the M57 bus route is located on E. 55th Street east of First Avenue and a general bus layover lane is located east of Third Avenue. Adjacent land uses between Second and Third Avenues are primarily commercial and institutional, including the United States Post Office. These uses are frequented by truck activity and some have active loading docks. Between First and Second Avenues, adjacent buildings are mostly residential with ground floor retail. Entrances to two garages, as well as the pedestrian entrance to the Church of Saint John's the Evangelist, are located on the north side of E. 55th Street between First and Second Avenues.

E. 56th Street

E. 56th Street is an eastbound local cross-town street with a roadway width of approximately 34 feet. Truck loading and unloading activity occurs on both sides of the street during daytime hours. E. 56th Street at First Avenue carries peak traffic volumes of approximately 400 vph, 250 vph, and 300 vph in the AM, midday, and PM peak hours, respectively. The land uses on E. 56th Street are residential, institutional, and commercial. Some of the notable establishments on E. 56th Street include the Art and Design High School at Second Avenue, the Cathedral High School at First Avenue, the Telephone Building located east of Third Avenue, and Verizon also located east of Third Avenue. Between First and Third Avenues, there are also three parking garages.

Traffic Operations Analysis

Existing capacity and level-of-service (LOS) analysis results for the First Avenue intersections with E. 57th, E. 58th, and E. 59th Streets are shown in Table 4.9-1 and discussed in Section 4.9.2. Results for the other seven Study Area intersections are presented in Table 5.9-1 and discussed below. Those intersection approaches that operate at mid-LOS D (delay in excess of 45 seconds) or worse, or have a high volume-to-capacity (v/c) ratio (generally 0.90 and above), are considered congested.

CHAPTER 5: WATER MAIN CONNECTIONS
5.9 TRAFFIC AND PARKING

Table 5.9-1
2004 Existing Conditions – First Avenue Route Water Main Connection Study Area

Analysis Intersection	AM Peak Hour				Midday Peak Hour				PM Peak Hour			
	Lane Group	V/C Ratio	Delay (sec)	LOS	Lane Group	V/C Ratio	Delay (sec)	LOS	Lane Group	V/C Ratio	Delay (sec)	LOS
E. 56 th Street (EB) First Avenue (NB)	EB-LT NB-TR	0.93 0.71	53.9 14.8	D B	EB-LT NB-TR	0.61 0.62	31.1 10.7	C B	EB-LT NB-T NB-R	0.61 0.65 0.24	27.8 13.6 11.5	C B B
E. 55 th Street (WB) First Avenue (NB)	WB-T WB-R NB-LT	0.73 0.21 0.73	37.1 22.4 12.2	D C B	WB-T WB-R NB-LT	0.63 0.23 0.68	31.9 22.8 11.4	C C B	WB-T WB-R NB-L NB-LT	0.75 0.23 0.39 0.73	38.7 22.8 11.6 12.1	D C B B
E. 57 th Street (E-W) Second Avenue (SB)	EB-TR WB-DfL WB-T SB-L SB-TR	1.03 1.03 1.01 0.14 1.01	84.1 72.8 61.0 18.2 45.7	F E E B D	EB-TR WB-DfL WB-T SB-LTR	1.04 0.51 0.49 0.87	79.1 28.6 23.1 24.4	E C C C	EB-TR WB-DfL WB-T SB-L SB-TR	0.98 0.20 0.30 0.12 0.62	55.8 20.7 19.7 13.7 18.0	E C B B B
E. 56 th Street (EB) Second Avenue (SB)	EB-T EB-R SB-LT	0.69 0.98 0.65	33.6 75.4 10.7	C E B	EB-T EB-R SB-LT	0.41 0.82 0.58	25.5 48.2 10.1	C D B	EB-T EB-R SB-LT	0.49 0.87 0.46	27.0 55.5 9.0	C E A
E. 55 th Street (WB) Second Avenue (SB)	WB-LT SB-T SB-R	0.65 0.64 0.75	28.9 10.6 19.9	C B B	WB-LT SB-TR	0.50 0.70	25.4 11.6	C B	WB-LT SB-T SB-R	0.51 0.49 0.37	25.5 9.3 9.9	C A A
E. 56 th Street (EB) Third Avenue (NB)	EB-LT NB-T NB-R	0.80 0.63 1.05	36.2 13.6 85.8	D B F	EB-LT NB-T NB-R	0.67 0.71 0.89	26.0 18.8 56.4	C B E	EB-LT NB-T NB-R	0.89 0.58 0.57	44.5 12.8 20.9	D B C
E. 55 th Street (WB) Third Avenue (NB)	WB-TR NB-LT	0.94 0.66	46.3 12.5	D B	WB-TR NB-LT	0.75 0.84	29.1 22.2	C C	WB-TR NB-LT	0.56 0.61	25.4 11.7	C B
Notes:	<p>Analysis results for the First Avenue intersections with E. 57th, E. 58th, and E. 59th Street are presented with the Shaft Study Area analysis results.</p> <p>EB-Eastbound, WB-Westbound, NB-Northbound, SB-Southbound</p> <p>L-Left, T-Through, R-Right, DfL-Analysis considers a Defacto Left Lane on this approach.</p> <p>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.</p> <p>V/C Ratio - Volume to Capacity Ratio, SEC/VEH - Seconds per vehicle</p> <p>LOS - Level of service</p> <p>* Denotes Congested Intersections (marginally unacceptable mid-LOS D, LOS E, LOS F, or V/C > 0.90)</p> <p>Analysis is based on the 2000 <i>Highway Capacity Manual Methodology</i> (HCS 2000).</p>											

AM Peak Hour

- First Avenue and E. 56th Street – The eastbound approach operates at LOS D with a v/c ratio of 0.93 and an average delay of 53.9 seconds per vehicle (spv).
- Second Avenue and E. 57th Street – The eastbound approach operates at LOS F with a v/c ratio of 1.03 and an average delay of 84.1 spv. Westbound, the de facto left turn operates at LOS E with a v/c ratio of 1.03 and an average delay of 72.8 spv while the through movement operates at LOS E with a v/c ratio of 1.01 and an average delay of 61.0 spv. The southbound through-right movement operates at LOS D with a v/c ratio of 1.01 and an average delay of 45.7 spv.
- Second Avenue and E. 56th Street – The eastbound right-turn movement operates at LOS E with a v/c ratio of 0.98 and an average delay of 75.4 spv.
- Third Avenue and E. 56th Street – The northbound right-turn movement operates at LOS F with a v/c ratio of 1.05 and an average delay of 85.8 spv.
- Third Avenue and E. 55th Street – The westbound approach operates at LOS D with a v/c ratio of 0.94 and an average delay of 46.3 spv.

Midday Peak Hour

- Second Avenue and E. 57th Street – The eastbound approach operates at LOS E with a v/c ratio of 1.04 and an average delay of 79.1 spv.
- Second Avenue and E. 56th Street – The eastbound right-turn movement operates at LOS D with a v/c ratio of 0.82 and an average delay of 48.2 spv.
- Third Avenue and E. 56th Street – The northbound right-turn movement operates at LOS E with a v/c ratio of 0.89 and an average delay of 56.4 spv.

PM Peak Hour

- Second Avenue and E. 57th Street – The eastbound approach operates at LOS E with a v/c ratio of 0.98 and an average delay of 55.8 spv.
- Second Avenue and E. 56th Street – The eastbound right-turn movement operates at LOS E with a v/c ratio of 0.87 and an average delay of 55.5 spv.

Parking Analysis

The Study Area is generally well-served with private commercial garages that accommodate parking demand from area residents and day-time visits from office and other uses. On-street parking during the day is typically limited to short durations, with many curbsides restricted for commercial loading/unloading activities. As shown in Figures 5.9-4 and 5.9-5, parking lanes along First Avenue are restricted in the Study Area to no standing from 7:00 a.m. to 7:00 p.m. on the east side and to 8:00 p.m. on the west side to accommodate traffic, a bus lane or truck loading/unloading activity. On Second Avenue between E. 55th and E. 57th Streets commercial vehicle parking is permitted on the east side in the midday and PM peak hours, with no standing

restrictions from 7:00 to 10:00 a.m. On the west side, truck commercial vehicle parking is permitted only in the midday period with no standing restrictions from 7:00 to 10:00 a.m. and from 4:00 to 7:00 p.m. to accommodate a dedicated bus lane. On Third Avenue, commercial vehicle parking is permitted on the west side of the roadway in the AM and midday peak periods with no standing restrictions from 4:00 to 7:00 p.m. On the east side of Third Avenue, parking is not permitted in any peak hour to accommodate a bus lane. Metered commercial parking and truck loading is allowed on the south side of E. 55th Street between First and Third Avenues, and on the north side between First and Second Avenues. On E. 56th Street between First and Second Avenues, regulations permit truck loading on both sides of the street near the corners with the mid-block sections reserved for special vehicle parking. Metered commercial parking is permitted on the north side of the street between Second and Third Avenues with no standing between 7:00 a.m. and 7:00 p.m. on the south side of the street.

Safety Analysis

As previously noted in Section 4.9.2, there are five high-pedestrian-accident locations identified from the review of accident data obtained for the three-year period between January 1999 and December 2001. Four of these locations are within the First Avenue route water main connections Study Area. Along First Avenue, both the E. 57th and E. 59th Street intersections had 5 pedestrian-related accidents in 1999. At Second Avenue and E. 57th Street, 9 pedestrian-related accidents occurred in 2001, and at Third Avenue and E. 55th Street, 5 pedestrian-related accidents occurred in 2000.

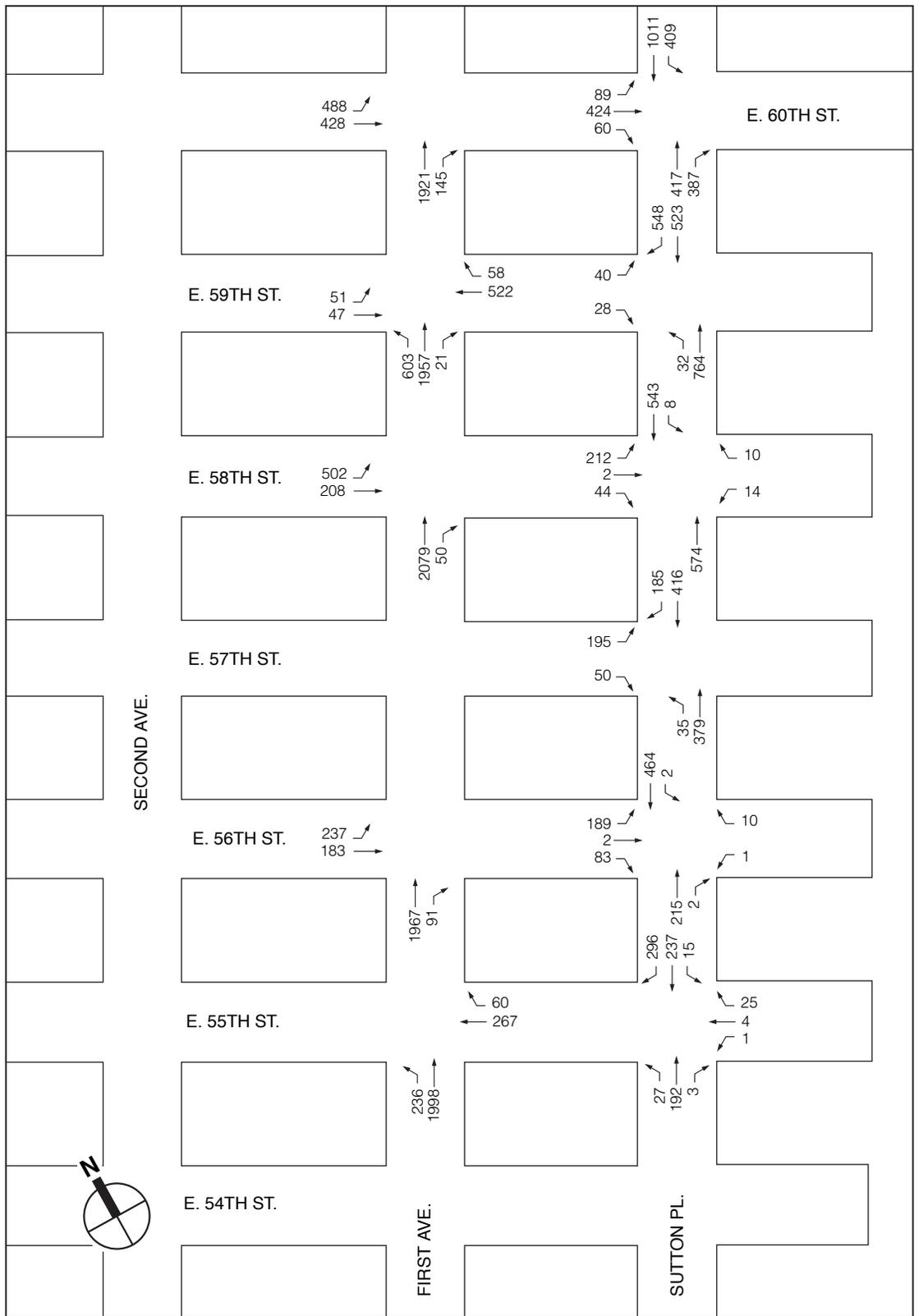
Sutton Place Route

Study Area Roadways and Traffic Volumes

The traffic Study Area for the Sutton Place route is essentially an extension of the First Avenue route analysis locations, consisting of eleven intersections: First Avenue intersections with E. 55th, E. 56th, E. 58th, E. 59th, and E. 60th Streets; and Sutton Place/York Avenue intersections with E. 55th to E. 60th Streets. To address the likely traffic diversion resulting from the conversion of E. 59th Street between First Avenue and Sutton Place/York Avenue to one-way westbound operations during the initial water main connection to Sutton Place, the E. 60th Street intersections at First and York Avenues were added. Other intersections along First Avenue were analyzed as well to depict different future conditions at these intersections under the Sutton Place route water main connections. The AM, midday, and PM peak hour traffic volumes are illustrated in Figures 5.9-4, 5.9-5, and 5.9-6, respectively. Descriptions of the affected roadways and peak hour traffic volumes, beyond those discussed earlier for the preferred Shaft Site and the First Avenue route for water main connections, are presented below.

E. 59th Street between First Avenue and Sutton Place/York Avenue

Two-way traffic is currently accommodated along E. 59th Street between First Avenue and Sutton Place/York Avenue. The roadway segment is approximately 35 feet in width and serves primarily southbound York Avenue traffic accessing the Queensboro Bridge's south outer roadway. Curbside activities are permitted only on the south side of the street. Peak hour traffic

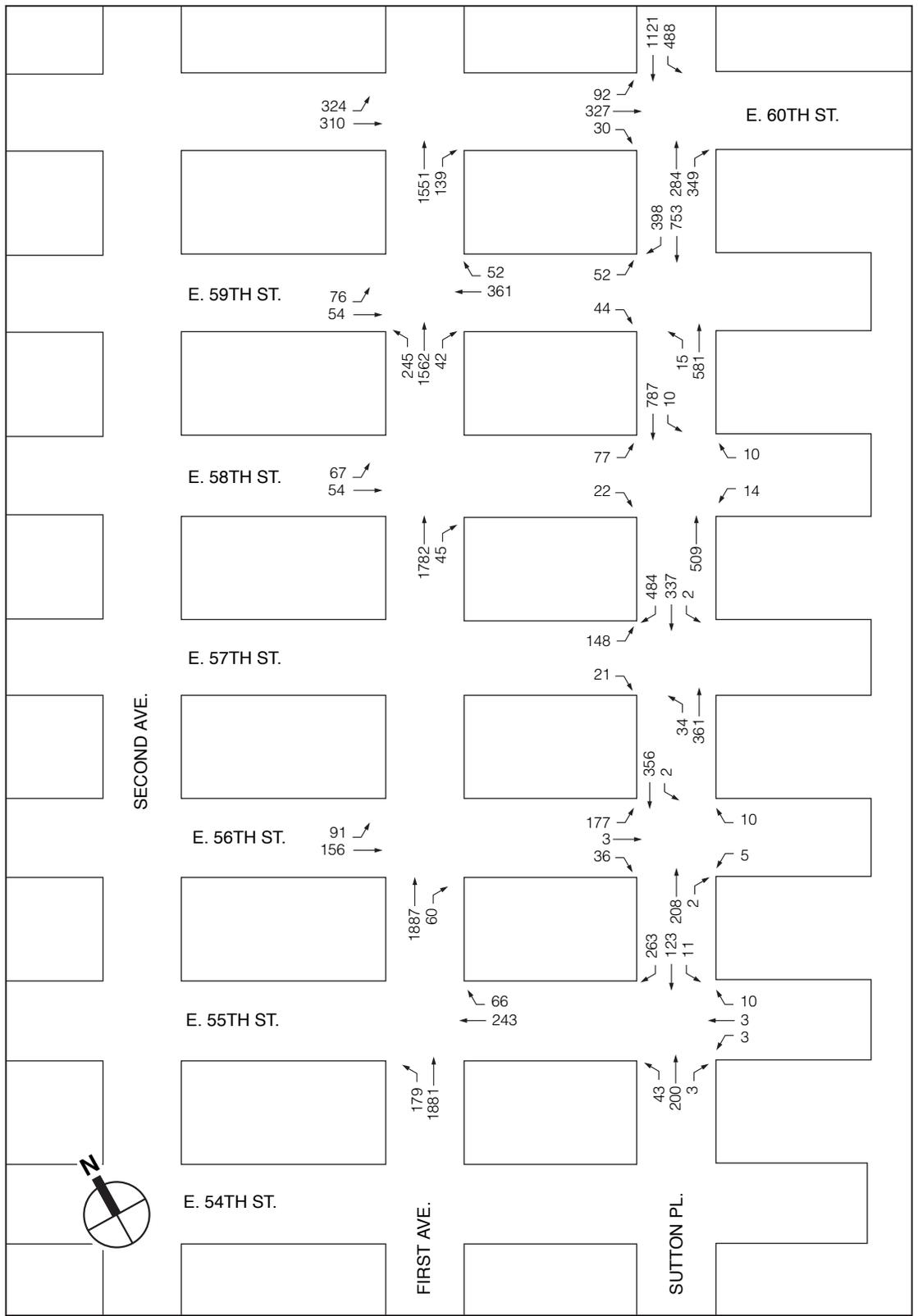


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 AM PEAK HOUR

FIGURE 5.9-4

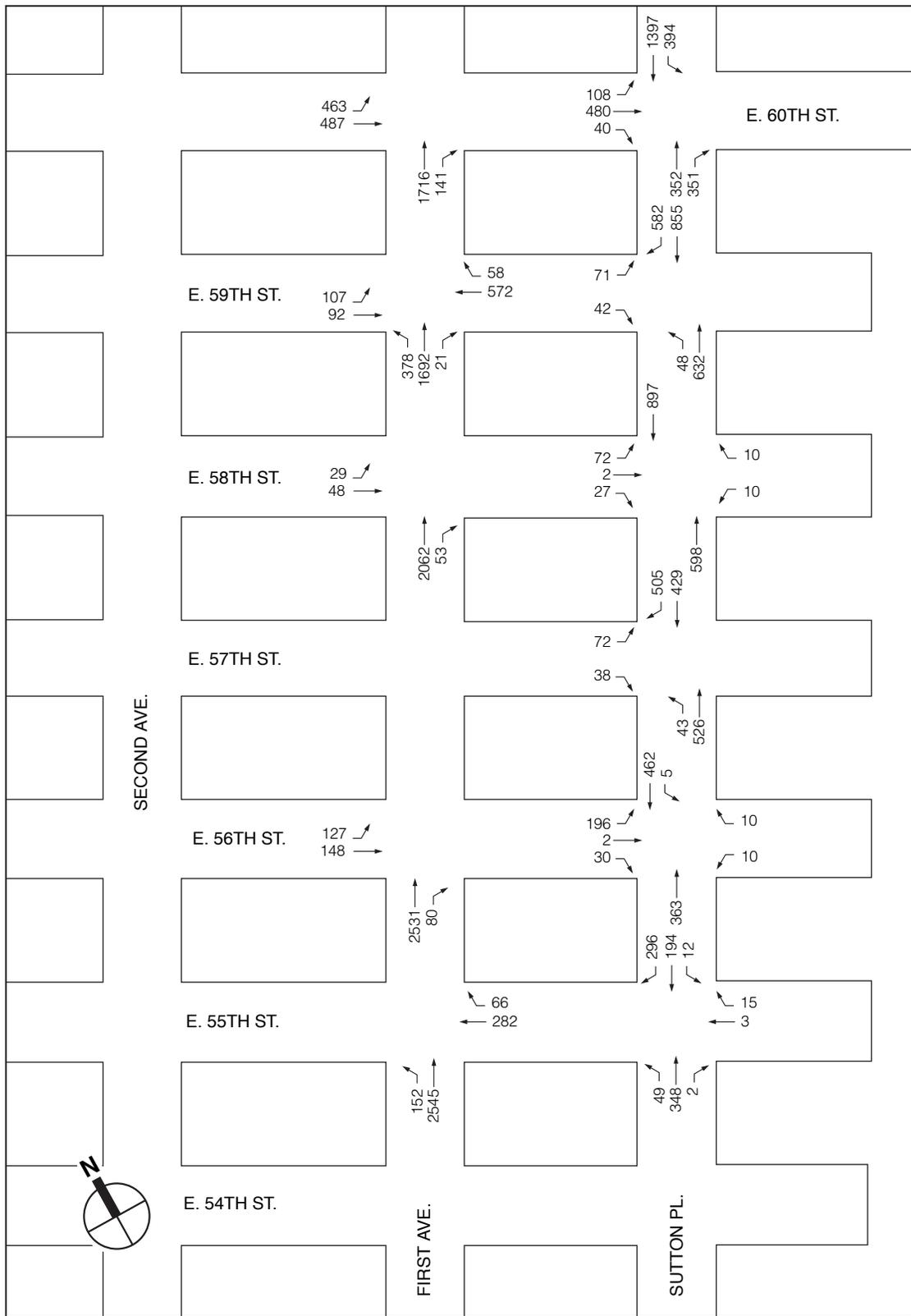


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 WATER MAIN STUDY AREA - SUTTON PLACE ROUTE
 MIDDAY PEAK HOUR

FIGURE 5.9-5



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 WATER MAIN STUDY AREA - SUTTON PLACE ROUTE
 PM PEAK HOUR

FIGURE 5.9-6

volumes are approximately 580 vph, 420 vph, and 630 vph westbound and 70 vph, 100 vph, and 115 vph eastbound during the AM, midday, and PM peak hours, respectively.

Sutton Place/York Avenue

York Avenue is a two-way north-south roadway that becomes Sutton Place south of E. 59th Street. Sutton Place continues to be two-ways until E. 54th Street, where it becomes one-way southbound, terminating at E. 53rd Street. Sutton Place/York Avenue has a roadway width of approximately 60 feet with two travel lanes available in each direction and parking on both sides. At E. 59th Street, the southbound curb lane is used for bus layover, and parking is not permitted between E. 59th and E. 60th Streets. Due to the current rehabilitation of the FDR Drive, the analysis presented in this section considers traffic patterns currently observed on Sutton Place/York Avenue, which include a temporary entrance to northbound FDR Drive at E. 60th Street (formerly at E. 62nd Street). Sutton Place/York Avenue carries two-way traffic volumes of approximately 1,350 vph, 1,400 vph, and 1,600 vph in the AM, midday, and PM peak hours, respectively, between E. 58th and E. 59th Streets.

Traffic Operations Analysis

Existing capacity analysis results for the First Avenue intersections are shown in Tables 4.9-1 and 5.9-1. Results for the six Sutton Place/York Avenue intersections are presented in Table 5.9-2 and discussed below. Those intersection approaches that operate at mid-LOS D (delay in excess of 45 seconds) or worse, or have a high v/c ratio (generally 0.90 and above), are considered congested.

Midday Peak Hour

- York Avenue and E. 59th Street – The southbound approach operates at LOS C with a v/c ratio of 0.90 and an average delay of 25.2 spv.

PM Peak Hour

- York Avenue and E. 60th Street – The southbound through movement operates at LOS C with a v/c ratio of 0.93 and an average delay of 28.8 spv.
- York Avenue and E. 59th Street – The southbound approach operates at LOS E with a v/c ratio of 1.05 and an average delay of 56.4 spv.

Parking Analysis

Several private commercial garages are situated east of First Avenue to accommodate residential demand in the area. On-street parking is also more readily available daytime since less commercial vehicle deliveries occur east of First Avenue and there is less of a need to reserve curbside spaces for short-duration activities. However, to accommodate diplomatic personnel needs, several of the area's curbsides are reserved for authorized or consulate vehicle parking only.

CHAPTER 5: WATER MAIN CONNECTIONS
5.9 TRAFFIC AND PARKING

Table 5.9-2
2004 Existing Conditions – Sutton Place Route Water Main Connection Study Area

Analysis Intersection	AM Peak Hour				Midday Peak Hour				PM Peak Hour			
	Lane Group	V/C Ratio	Delay (sec)	LOS	Lane Group	V/C Ratio	Delay (sec)	LOS	Lane Group	V/C Ratio	Delay (sec)	LOS
E. 60 th Street (EB) York Avenue (N-S)	EB-L	0.19	29.4	C	EB-L	0.20	22.4	C	EB-L	0.21	26.3	C
	EB-TR	0.51	34.0	C	EB-TR	0.37	23.9	C	EB-TR	0.48	30.0	C
	NB-TR	0.71	38.0	D	NB-TR	0.56	27.0	C	NB-TR	0.71	42.9	D
	NB-R	0.54	36.4	D	NB-R	0.50	28.7	C	NB-R	0.57	42.9	D
	SB-L	0.47	18.4	B	SB-L	0.62	18.3	B	SB-L	0.48	21.9	C
	SB-T	0.61	11.5	B	SB-T	0.74	13.3	B	SB-T	0.93	28.8	C *
E. 59 th Street (E-W) York Avenue (N-S)	EB-LTR	0.23	28.6	C	EB-LTR	0.32	30.7	C	EB-LTR	0.39	32.5	C
	WB-TR	0.00	24.7	C	WB-TR	0.00	24.7	C	WB-TR	0.00	24.7	C
	NB-TR	0.62	14.0	B	NB-TR	0.44	11.3	B	NB-LTR	0.68	16.0	B
	SB-LTR	0.84	21.3	C	SB-LTR	0.90	25.2	C *	SB-LTR	1.05	56.4	E *
E. 58 th Street (EB) Sutton Place (N-S)	EB-LTR	0.63	38.9	D	EB-LTR	0.24	28.4	C	EB-LTR	0.25	28.5	C
	WB-LR	0.06	25.5	C	WB-LR	0.06	25.5	C	WB-LR	0.05	25.4	C
	NB-TR	0.36	10.3	B	NB-TR	0.32	10.0	A	NB-TR	0.37	10.5	B
	SB-LT	0.37	10.4	B	SB-LT	0.55	12.8	B	SB-LT	0.58	13.0	B
E. 57 th Street (E-W) Sutton Place (N-S)	EB-DfL	0.48	33.7	C	EB-DfL	0.44	33.3	C	EB-DfL	0.21	28.1	C
	EB-TR	0.13	26.6	C	EB-TR	0.06	25.5	C	EB-TR	0.10	26.1	C
	WB-TR	0.00	24.7	C	WB-TR	0.00	24.7	C	WB-TR	0.00	24.7	C
	NB-TR	0.33	10.2	B	NB-TR	0.33	10.2	B	NB-LTR	0.48	12.0	B
	SB-LTR	0.44	11.3	B	SB-LTR	0.73	17.2	B	SB-LTR	0.77	18.0	B
E. 56 th Street (EB) Sutton Place (N-S)	EB-LTR	0.64	38.9	D	EB-LTR	0.53	35.1	D	EB-LTR	0.56	36.1	D
	WB-LR	0.03	25.2	C	WB-LR	0.04	25.3	C	WB-LR	0.06	25.6	C
	NB-TR	0.15	8.7	A	NB-TR	0.14	8.6	A	NB-TR	0.25	9.4	A
	SB-LT	0.33	10.2	B	SB-LT	0.27	9.6	A	SB-LT	0.34	10.3	B
E. 55 th Street (WB) Sutton Place (N-S)	WB-TR	0.08	25.8	C	WB-TR	0.04	25.3	C	WB-TR	0.05	25.4	C
	NB-TR	0.18	8.9	A	NB-TR	0.21	9.2	A	NB-LTR	0.33	10.3	B
	SB-LTR	0.45	11.5	B	SB-LTR	0.35	10.5	B	SB-LTR	0.43	11.3	B
Notes:	<p>Analysis results for the First Avenue intersections are presented with the Shaft Study Area and First Avenue route water main connection Study Area analysis results.</p> <p>EB-Eastbound, WB-Westbound, NB-Northbound, SB-Southbound</p> <p>L-Left, T-Through, R-Right, DfL-Analysis considers a Defacto Left Lane on this approach.</p> <p>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.</p> <p>V/C Ratio - Volume to Capacity Ratio, SEC/VEH - Seconds per vehicle</p> <p>LOS - Level of service</p> <p>* Denotes Congested Intersections (marginally unacceptable mid-LOS D, LOS E, LOS F, or V/C > 0.90)</p> <p>Analysis is based on the <i>2000 Highway Capacity Manual Methodology</i> (HCS 2000).</p>											

Between E. 59th and E. 60th Streets, parking is not permitted to ensure the availability of travel lanes for FDR Drive and Queensboro Bridge traffic, as well as bus layover. South of E. 59th Street, parking on Sutton Place is generally permitted on both sides for residents and is restricted

at bus stops and during designated street-cleaning hours. Between E. 58th and E. 59th Streets, parking is permitted on the east curb for part of the block except during street-cleaning from 10:00 to 11:30 a.m. on Tuesdays and Fridays. On the west side, parking is not permitted. Between E. 57th and E. 58th Streets, some parking is permitted on the east side for diplomat vehicles only, while on the west side, parking is permitted for part of the block. Between E. 54th and E. 57th Streets, parking is permitted on the east side except during street-cleaning from 10:00 to 11:30 a.m. on Tuesdays and Fridays. On the west side, parking is permitted except during street-cleaning from 10:00 to 11:30 a.m. on Mondays and Thursdays.

Cross-street regulations between First Avenue and Sutton Place generally allow truck loading and unloading except on the north side of E. 59th Street where parking/standing is not permitted at all times to maintain two westbound travel lanes. On E. 58th Street, parking is permitted at all times except during street-cleaning hours. East of Sutton Place, truck loading/unloading is permitted along the curbs within each dead-end street except along E. 58th and E. 59th Streets. The dead-end area on E. 57th Street is gated and manned by security detail to permit access only to authorized vehicles.

Safety Analysis

Based on the information summarized in Section 4.9.2, of the eleven Study Area intersections, only the First Avenue and E. 59th Street intersection meet the high-pedestrian-accident location criteria. In 1999, five pedestrian-related accidents were recorded at this location.

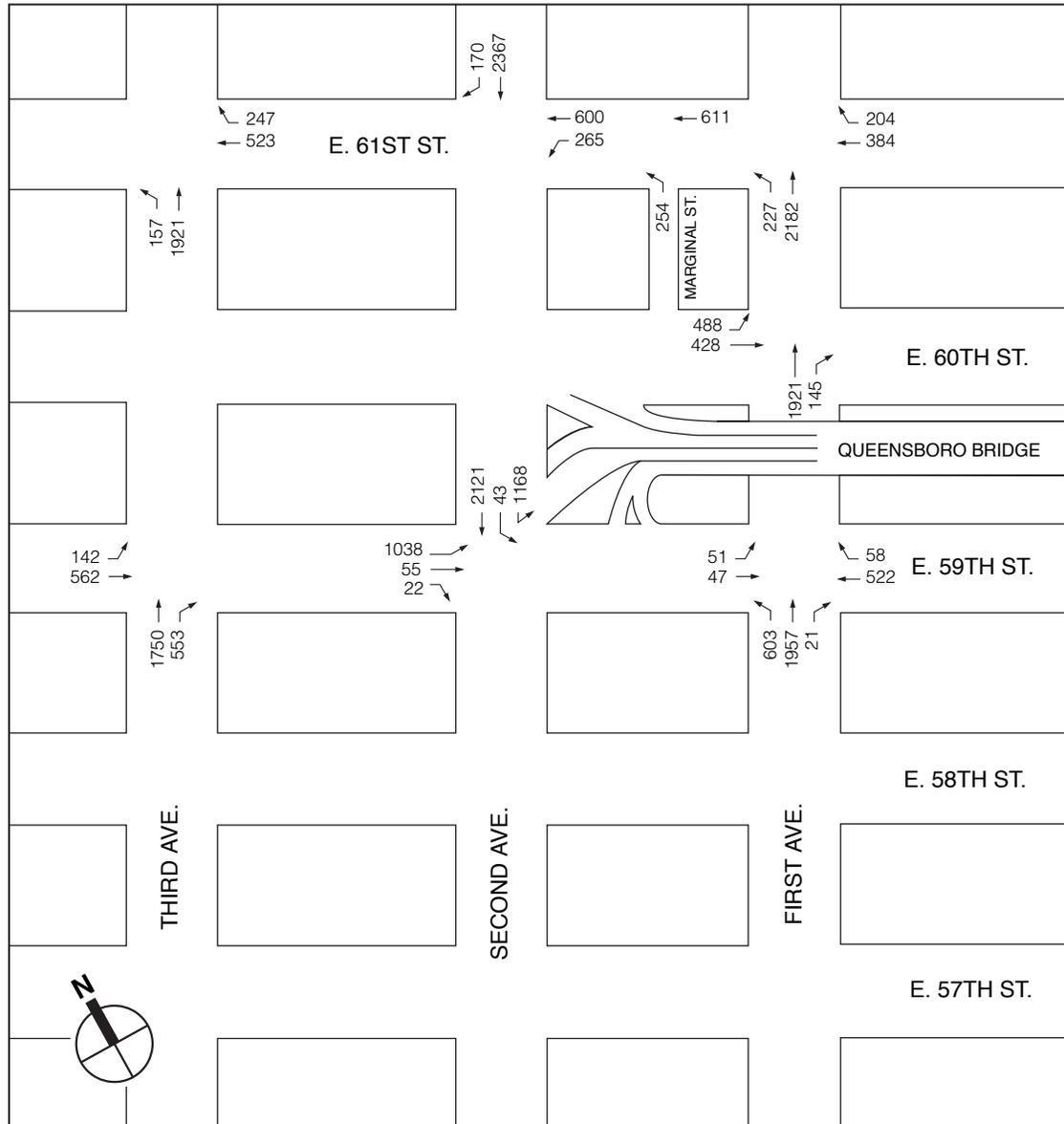
E. 59th Street/E. 61st Street Route

Study Area Roadways and Traffic Volumes

The traffic Study Area for the E. 59th Street/E. 61st Street route includes eight intersections: First Avenue intersections with E. 59th, E. 60th, and E. 61st Streets; Marginal Street intersection with E. 61st Street; Second Avenue intersections with E. 59th and E. 61st Streets; and Third Avenue intersections with E. 59th and E. 61st Streets. The AM, midday, and PM peak hour traffic volumes are illustrated in Figures 5.9-7, 5.9-8, and 5.9-9, respectively. Descriptions of the affected roadways and peak hour traffic volumes, beyond those discussed earlier for the preferred Shaft Site and the First Avenue and Sutton Place routes for water main connections, are presented below.

E. 61st Street

E. 61st Street is a one-way westbound cross street with an average roadway width of 33.5 feet in the Study Area. The FDR Drive northbound exit ramp feeds directly into E. 61st Street at its terminus east of York Avenue. Between First and Second Avenues, curbside activities are permitted on both sides of the street, except during the AM peak period along the north curb. Between Second and Third Avenues, curbside activities are prohibited along both sides of the street during the AM peak period, and permitted only on the south curb for the rest of the day. Within the Study Area, peak hour traffic volumes along E. 61st Street are approximately 800, 700, and 800 vph during the AM, midday, and PM peak hours, respectively.

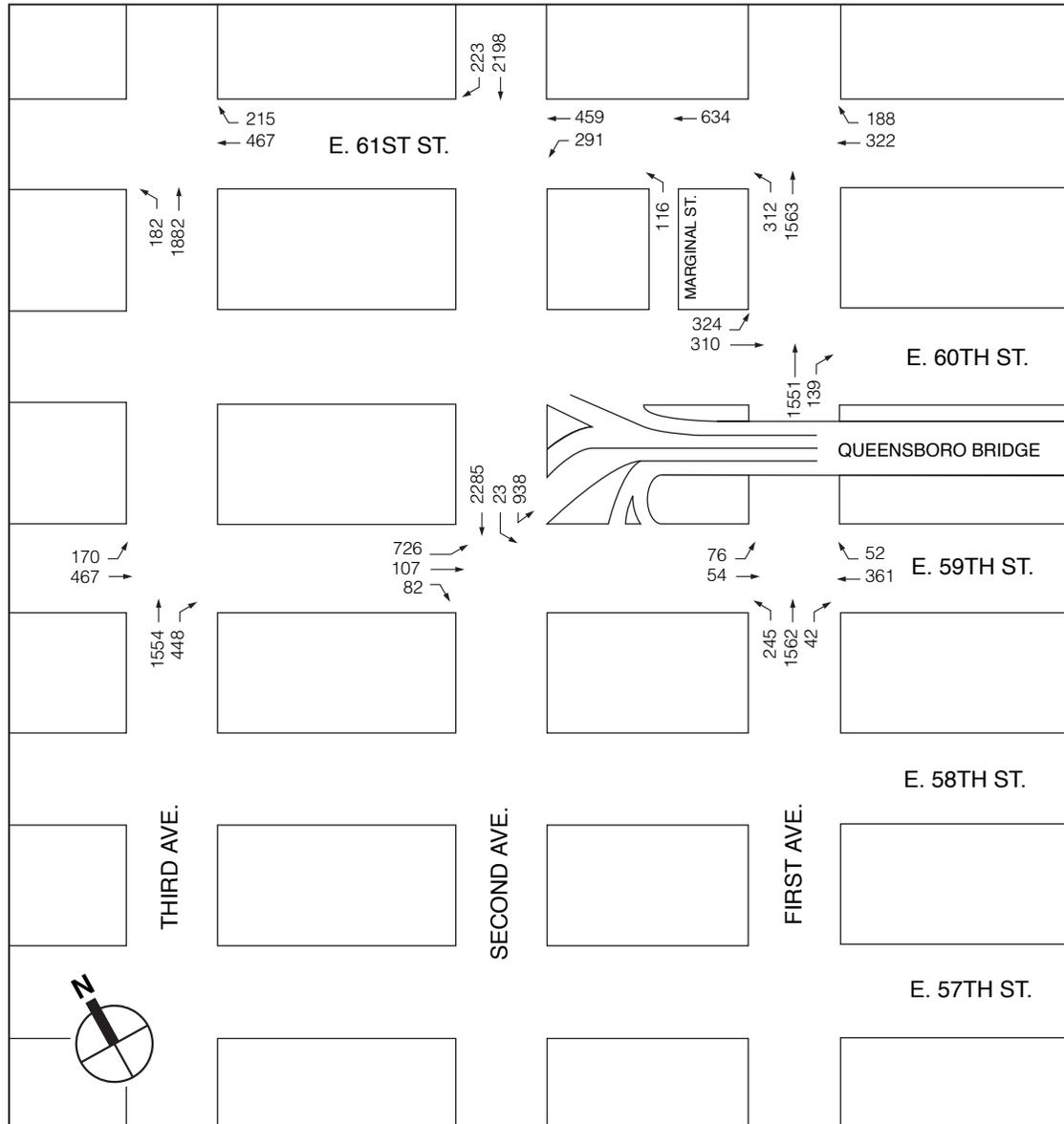


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 WATER MAIN STUDY AREA - E. 59TH STREET / E. 61ST STREET ROUTE
 AM PEAK HOUR

FIGURE 5.9-7

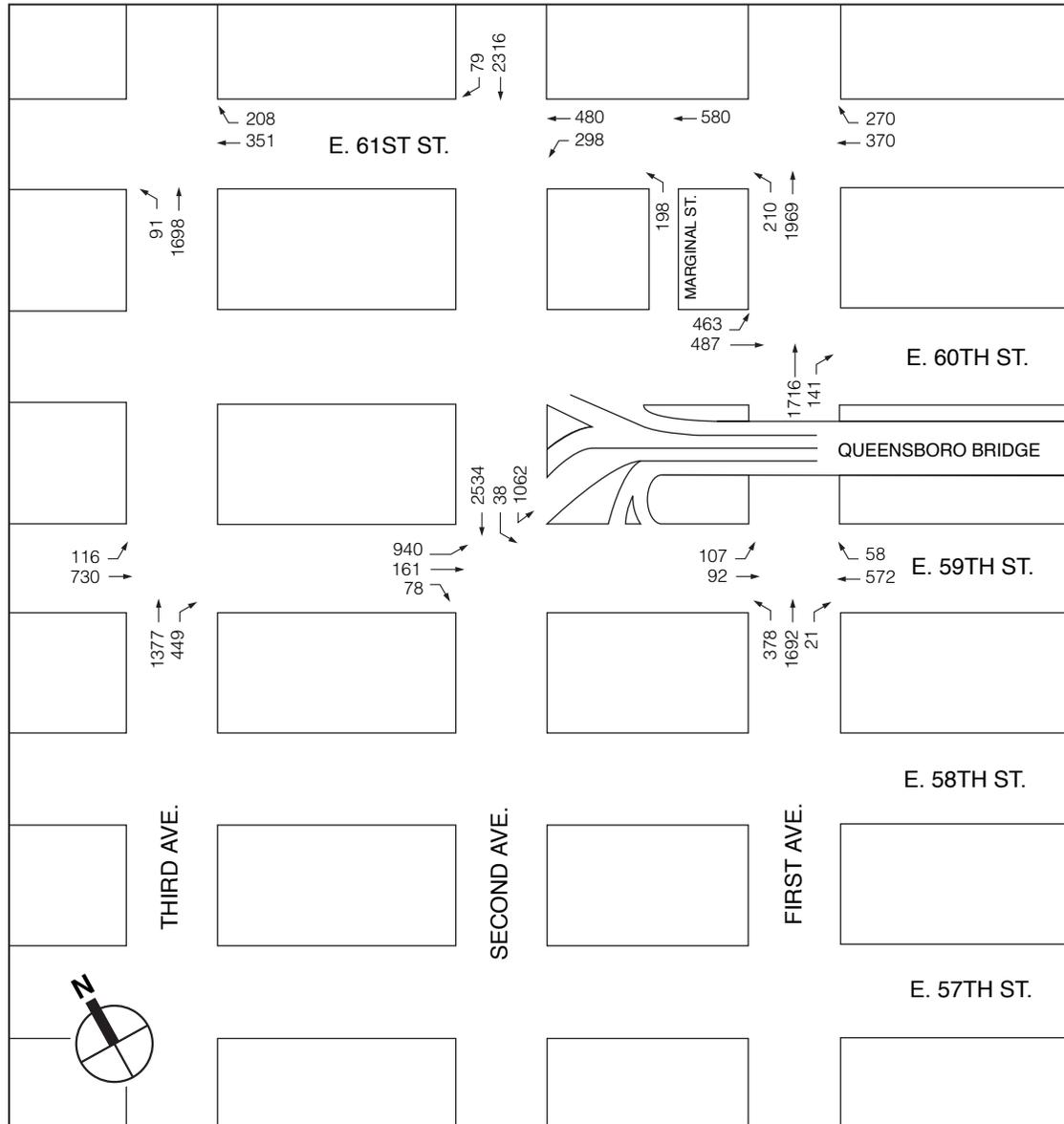


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 MIDDAY PEAK HOUR

FIGURE 5.9-8



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 PM PEAK HOUR

FIGURE 5.9-9

Marginal Street

Marginal Street is a one-way northbound street that serves as single-block connections for the Manhattan-bound Queensboro Bridge to the area's roadway network. The 30-foot roadway begins at E. 60th Street and connects the lower level exit ramp to E. 61st Street. At E. 62nd Street, it meets the landing of the upper level exit ramp and serves as its connection to E. 63rd Street. Between E. 60th and E. 61st Street, Marginal Street provides one travel lane and curb space on both sides for bus layover. Peak hour traffic volumes approaching E. 61st Street are approximately 250, 100, and 200 vph during the AM, midday, and PM peak hours, respectively.

Traffic Operations Analysis

Existing capacity analysis results for the First Avenue intersections with E. 59th and E. 60th Streets and the Second Avenue intersection with E. 59th Street are shown in Table 4.9-1. Results for the other five Study Area intersections are presented in Table 5.9-3 and discussed below. Those intersection approaches that operate at mid-LOS D (delay in excess of 45 seconds) or worse, or have a high v/c ratio (generally 0.90 and above), are considered congested.

AM Peak Hour

- Third Avenue and E. 59th Street – The northbound right-turn movement operates at LOS E with a v/c ratio of 0.89 and an average delay of 59.5 spv.

Midday Peak Hour

- Marginal Street and E. 61st Street – The westbound approach operates at LOS E with a v/c ratio of 1.00 and an average delay of 59.0 spv.
- Second Avenue and E. 61st Street – The southbound approach operates at LOS E with a v/c ratio of 1.05 and an average delay of 56.6 spv.

PM Peak Hour

- Marginal Street and E. 61st Street – The westbound approach operates at LOS D with a v/c ratio of 0.95 and an average delay of 48.9 spv.

CHAPTER 5: WATER MAIN CONNECTIONS
5.9 TRAFFIC AND PARKING

Table 5.9-3
2004 Existing Conditions – E. 59th/E. 61st Street Route Water Main Connection Study Area

Analysis Intersection	AM Peak Hour				Midday Peak Hour				PM Peak Hour			
	Lane Group	V/C Ratio	Delay (sec)	LOS	Lane Group	V/C Ratio	Delay (sec)	LOS	Lane Group	V/C Ratio	Delay (sec)	LOS
E. 61 st Street (WB) First Avenue (NB)	WB-TR	0.61	24.7	C	WB-T	0.53	23.2	C	WB-T	0.68	26.5	C
	NB-LT	0.82	17.4	B	NB-LT	0.66	14.0	B	NB-L	0.39	16.1	B
									NB-T	0.65	13.8	B
E. 61 st Street (WB) Marginal Street (NB)	WB-T	0.49	19.0	B	WB-T	1.00	59.0	E *	WB-T	0.95	48.9	D *
	NB-L	0.40	18.6	B	NB-L	0.18	15.6	B	NB-L	0.30	17.2	B
E. 61 st Street (WB) Second Avenue (SB)	WB-LT	0.49	21.7	C	WB-LT	0.66	25.5	C	WB-LT	0.69	26.3	C
	SB-TR	0.84	22.1	C	SB-TR	1.05	56.6	E *	SB-TR	0.71	18.6	B
E. 61 st Street (WB) Third Avenue (NB)	WB-TR	0.62	24.2	C	WB-TR	0.85	35.3	D	WB-TR	0.83	34.5	C
	NB-LT	0.89	24.9	C	NB-LT	0.75	19.7	B	NB-LT	0.64	17.6	B
E. 59 th Street (EB) Third Avenue (NB)	EB-LT	0.70	23.8	C	EB-LT	0.63	22.1	C	EB-LT	0.57	19.9	B
	NB-TR	0.85	25.8	C	NB-TR	0.67	21.2	C	NB-TR	0.48	18.2	B
	NB-R	0.89	59.5	E *	NB-R	0.70	41.6	D	NB-R	0.68	40.9	D

Notes: Analysis results for the First Avenue intersections with E. 59th and E. 60th Streets and Second Avenue intersection with E. 59th Street are presented with the Shaft Study Area analysis results.
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 Congested Intersections (marginally unacceptable mid-LOS D, LOS E, LOS F, or V/C > 0.90)
Analysis is based on the 2000 *Highway Capacity Manual Methodology* (HCS 2000).

Parking Analysis

Several private commercial garages are situated along E. 59th and E. 61st Streets to accommodate parking demand from area residents and day-time visits from office and other uses. On-street parking during the day is limited to short durations, with curbsides restricted for commercial loading/unloading activities only. Along E. 61st Street between First and Second Avenues, curbside deliveries are permitted on both sides of the street, except during morning hours along the north curb. Between Second and Third Avenues, curbside use along E. 61st Street is available only on the south side of the street. There is no standing permitted along the north curb. Along E. 59th Street between First and Second Avenues, only the eastern portion of the south curb permits daytime deliveries. Between Second and Third Avenues, curbside deliveries are limited to only the middle portion of the block along the north curb to maintain clear street access from Third Avenue and approach to Second Avenue.

Safety Analysis

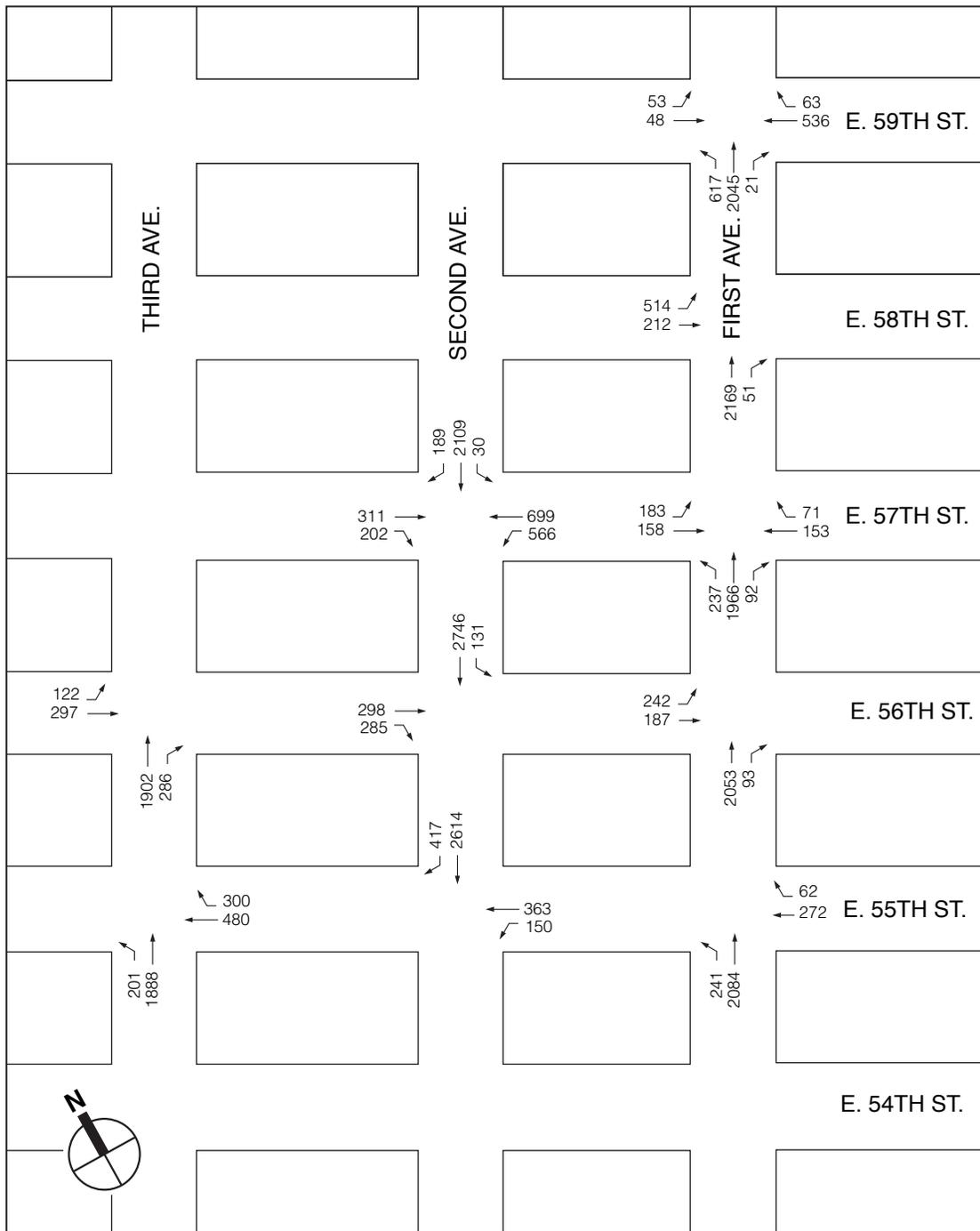
Based on the information summarized in Section 4.9.2, of the eight Study Area intersections, only the First Avenue and E. 59th Street intersection meet the high-pedestrian-accident location criteria. In 1999, 5 pedestrian-related accidents were recorded at this location.

5.9.3 Future Conditions Without the Project

First Avenue Route Base Scenario

Traffic Operations Analysis

Figures 5.9-10, 5.9-11 and 5.9-12 show the projected weekday peak hour traffic volumes at the First Avenue route Study Area intersections for 2008 conditions in the Future Without the Project (No Build conditions), which incorporate a background growth and trips from future developments in the area, as described in Section 3.9.4, “Future Conditions Without the Project Methodology.” Capacity analyses were prepared for each intersection, with conditions at the northern three Study Area intersections on First Avenue depicted in Table 4.9-3 and discussed in Section 4.9.3. Analysis results for the other seven intersections are presented in Table 5.9-4.

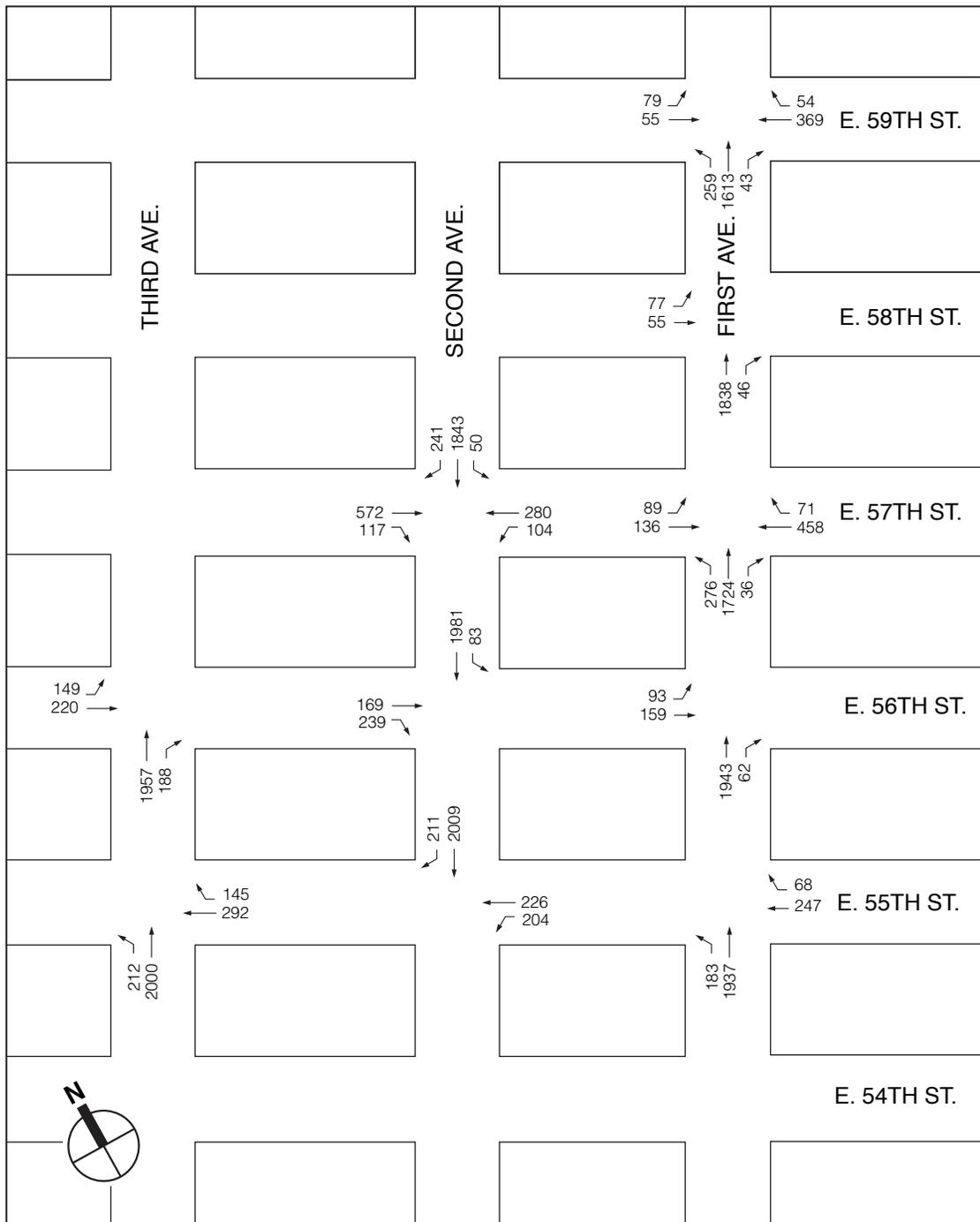


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 AM PEAK HOUR

FIGURE 5.9-10

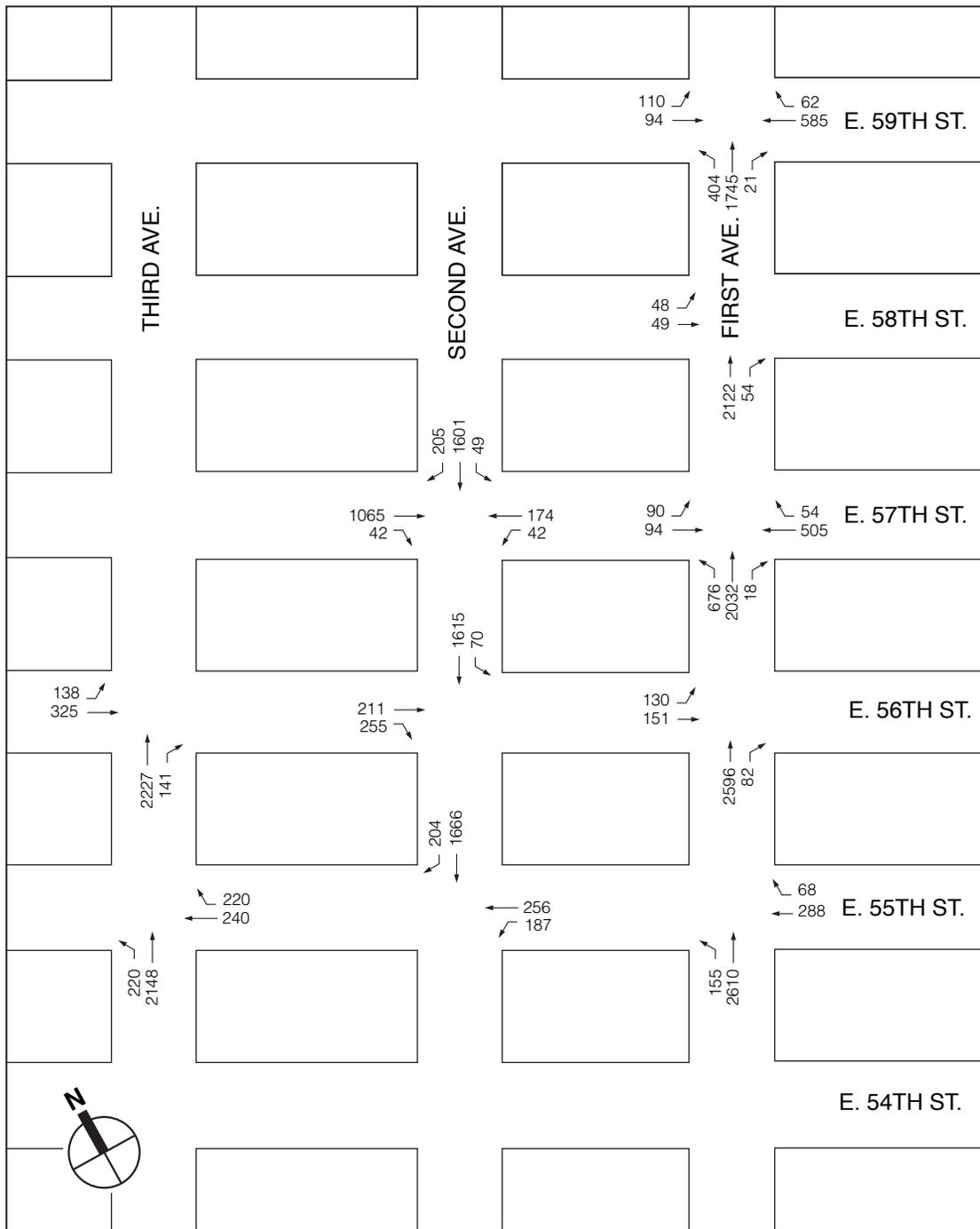


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 MIDDAY PEAK HOUR

FIGURE 5.9-11



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 PM PEAK HOUR

FIGURE 5.9-12

CHAPTER 5: WATER MAIN CONNECTIONS
5.9 TRAFFIC AND PARKING

Table 5.9-4

2008 No Build and 2004 Existing Conditions Comparison – First Avenue Route Water Main Connection Study Area

Analysis Intersection	AM Peak Hour								Midday Peak Hour								PM Peak Hour							
	Existing Conditions				No Build Conditions				Existing Conditions				No Build Conditions				Existing Conditions				No 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
E. 56 th Street (EB) First Avenue (NB)	EB-LT	0.93	53.9	D *	EB-LT	0.95	58.0	E *	EB-LT	0.61	31.1	C	EB-LT	0.63	31.5	C	EB-LT	0.61	27.8	C	EB-LT	0.62	28.3	C
	NB-TR	0.71	14.8	B	NB-TR	0.74	15.4	B	NB-TR	0.62	10.7	B	NB-TR	0.64	10.9	B	NB-T	0.65	13.6	B	NB-T	0.67	13.8	B
E. 55 th Street (WB) First Avenue (NB)	WB-TR	0.73	37.1	D	WB-TR	0.74	37.9	D	WB-TR	0.63	31.9	C	WB-TR	0.64	32.3	C	WB-T	0.75	38.7	D	WB-T	0.77	39.8	D
	WB-R	0.21	22.4	C	WB-R	0.22	22.5	C	WB-R	0.23	22.8	C	WB-R	0.24	22.9	C	WB-R	0.23	22.8	C	WB-R	0.24	22.9	C
	NB-LT	0.73	12.2	B	NB-LT	0.76	12.7	B	NB-LT	0.68	11.4	B	NB-LT	0.70	11.7	B	NB-L	0.39	11.6	B	NB-L	0.40	11.8	B
E. 57 th Street (E-W) Second Avenue (SB)	EB-TR	1.03	84.1	F *	EB-TR	1.06	93.0	F *	EB-TR	1.04	79.1	E *	EB-TR	1.08	91.4	F *	EB-TR	0.98	55.8	E *	EB-TR	1.01	63.3	E *
	WB-DfL	1.03	72.8	E *	WB-DfL	1.05	77.9	E *	WB-DfL	0.51	28.6	C	WB-DfL	0.52	29.1	C	WB-DfL	0.20	20.7	C	WB-DfL	0.20	20.8	C
	WB-T	1.01	61.0	E *	WB-T	1.03	66.8	E *	WB-T	0.49	23.1	C	WB-T	0.50	23.4	C	WB-T	0.30	19.7	B	WB-T	0.30	19.7	B
	SB-L	0.14	18.2	B	SB-L	0.14	18.3	B	SB-LTR	0.87	24.4	C	SB-LTR	0.90	25.7	C *	SB-L	0.12	13.7	B	SB-L	0.13	13.7	B
	SB-TR	1.01	45.7	D *	SB-TR	1.03	52.1	D *					SB-TR	0.62	18.0	B	SB-TR	0.63	18.0	B				
E. 56 th Street (EB) Second Avenue (SB)	EB-T	0.69	33.6	C	EB-T	0.70	34.3	C	EB-T	0.41	25.5	C	EB-T	0.42	25.7	C	EB-T	0.49	27.0	C	EB-T	0.50	27.2	C
	EB-R	0.98	75.4	E *	EB-R	1.00	80.5	F *	EB-R	0.82	48.2	D *	EB-R	0.84	50.5	D *	EB-R	0.87	55.5	E *	EB-R	0.89	58.0	E *
	SB-LT	0.65	10.7	B	SB-LT	0.66	10.9	B	SB-LT	0.58	10.1	B	SB-LT	0.59	10.2	B	SB-LT	0.46	9.0	A	SB-LT	0.48	9.2	A
E. 55 th Street (WB) Second Avenue (SB)	WB-LT	0.65	28.9	C	WB-LT	0.66	29.2	C	WB-LT	0.50	25.4	C	WB-LT	0.51	25.6	C	WB-LT	0.51	25.5	C	WB-LT	0.52	25.7	C
	SB-T	0.64	10.6	B	SB-T	0.65	10.8	B	SB-TR	0.70	11.6	B	SB-TR	0.71	11.9	B	SB-T	0.49	9.3	A	SB-T	0.51	9.5	A
	SB-R	0.75	19.9	B	SB-R	0.77	20.7	C					SB-R	0.37	9.9	A	SB-R	0.38	10.0	B				
E. 56 th Street (EB) Third Avenue (NB)	EB-LT	0.80	36.2	D	EB-LT	0.82	37.5	D	EB-LT	0.67	26.0	C	EB-LT	0.69	26.6	C	EB-LT	0.89	44.5	D	EB-LT	0.90	46.7	D *
	NB-T	0.63	13.6	B	NB-T	0.67	14.2	B	NB-T	0.71	18.8	B	NB-T	0.75	19.5	B	NB-T	0.58	12.8	B	NB-T	0.60	13.1	B
	NB-R	1.05	85.8	F *	NB-R	1.08	92.4	F *	NB-R	0.89	56.4	E *	NB-R	0.90	59.7	E *	NB-R	0.57	20.9	C	NB-R	0.58	21.5	C
E. 55 th Street (WB) Third Avenue (NB)	WB-TR	0.94	46.3	D *	WB-TR	0.96	49.5	D *	WB-TR	0.75	29.1	C	WB-TR	0.76	30.0	C	WB-TR	0.56	25.4	C	WB-TR	0.57	25.6	C
	NB-LT	0.66	12.5	B	NB-LT	0.69	13.0	B	NB-LT	0.84	22.2	C	NB-LT	0.88	23.9	C	NB-LT	0.61	11.7	B	NB-LT	0.63	12.0	B

Notes: Analysis results for the First Avenue intersections with E. 57th, E. 58th, and E. 59th Streets are presented with the Shaft Study Area analysis results.
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 Congested Intersections (marginally unacceptable mid-LOS D, LOS E, LOS F, or V/C > 0.90)
Analysis is based on the 2000 Highway Capacity Manual Methodology (HCS 2000).

Intersections and traffic movements that were identified as congested under existing conditions are expected to deteriorate. Two additional locations would meet the criteria for congestion under 2008 No Build conditions. The southbound approach at Second Avenue and E. 57th Street would operate at LOS C with a v/c ratio of 0.90 and an average delay of 25.7 spv during the midday peak hour and the eastbound approach at Third Avenue and E. 56th Street would operate at LOS D with a v/c ratio of 0.90 and an average delay of 46.7 spv during the PM peak hour.

Parking Analysis

No changes to parking regulations and nominal increases in parking demand are anticipated under the 2008 No Build conditions in the Study Area.

Safety Analysis

With nominal increases in traffic projected, pedestrian safety under the 2008 No Build conditions is anticipated to be similar to existing conditions within the Study Area.

Sutton Place Route

Traffic Operations Analysis

Figures 5.9-13, 5.9-14 and 5.9-15 show the projected weekday peak hour traffic volumes at the Sutton Place route Study Area intersections for 2008 conditions in the No Build conditions, which incorporate a background growth and trips from future developments in the area, as described in Section 3.9.4. Capacity analyses were prepared for each intersection, with conditions at the First Avenue intersections depicted in Tables 4.9-3 and 5.9-4. Analysis results for the other six intersections along Sutton Place are presented in Table 5.9-5. Intersections and traffic movements that were identified as congested under existing conditions are expected to deteriorate.

Parking Analysis

No changes to parking regulations and nominal increases in parking demand are anticipated under the 2008 No Build conditions in the Study Area.

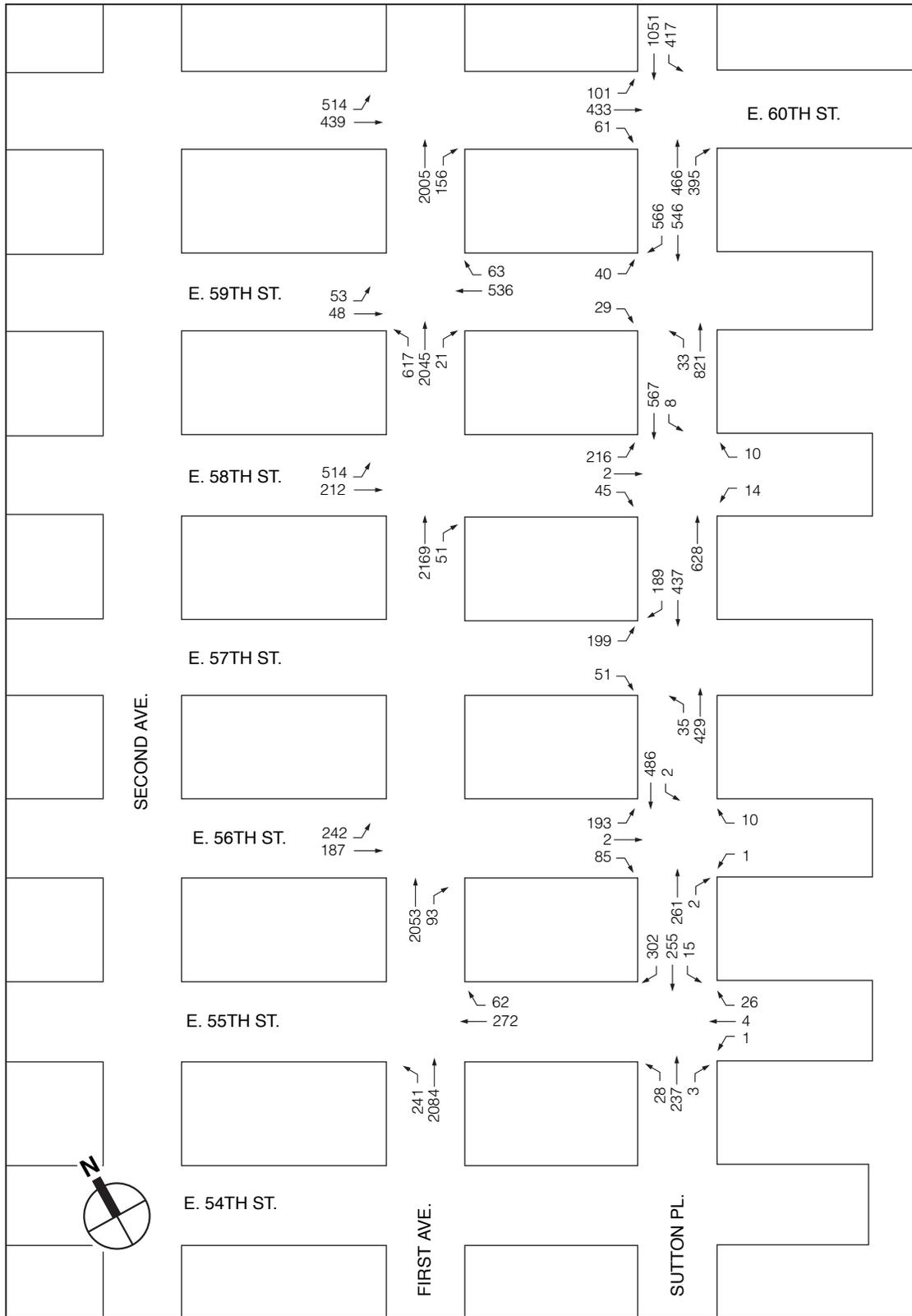
Safety Analysis

With nominal increases in traffic projected, pedestrian safety under the 2008 No Build conditions is anticipated to be similar to existing conditions within the Study Area.

E. 59th Street/E. 61st Street Route

Traffic Operations Analysis

Figures 5.9-16, 5.9-17 and 5.9-18 show the projected weekday peak hour traffic volumes at the E. 59th and E. 61st Street intersections for 2008 conditions in the No Build conditions, which incorporate a background growth and trips from future developments in the area, as described in Section 3.9.4. Capacity analyses were prepared for each intersection, with conditions at the First Avenue intersections with E. 59th and E. 60th Streets and the Second Avenue intersections with E. 59th Street depicted in Tables 4.9-3. Analysis results for the other five intersections are presented in Table 5.9-6.

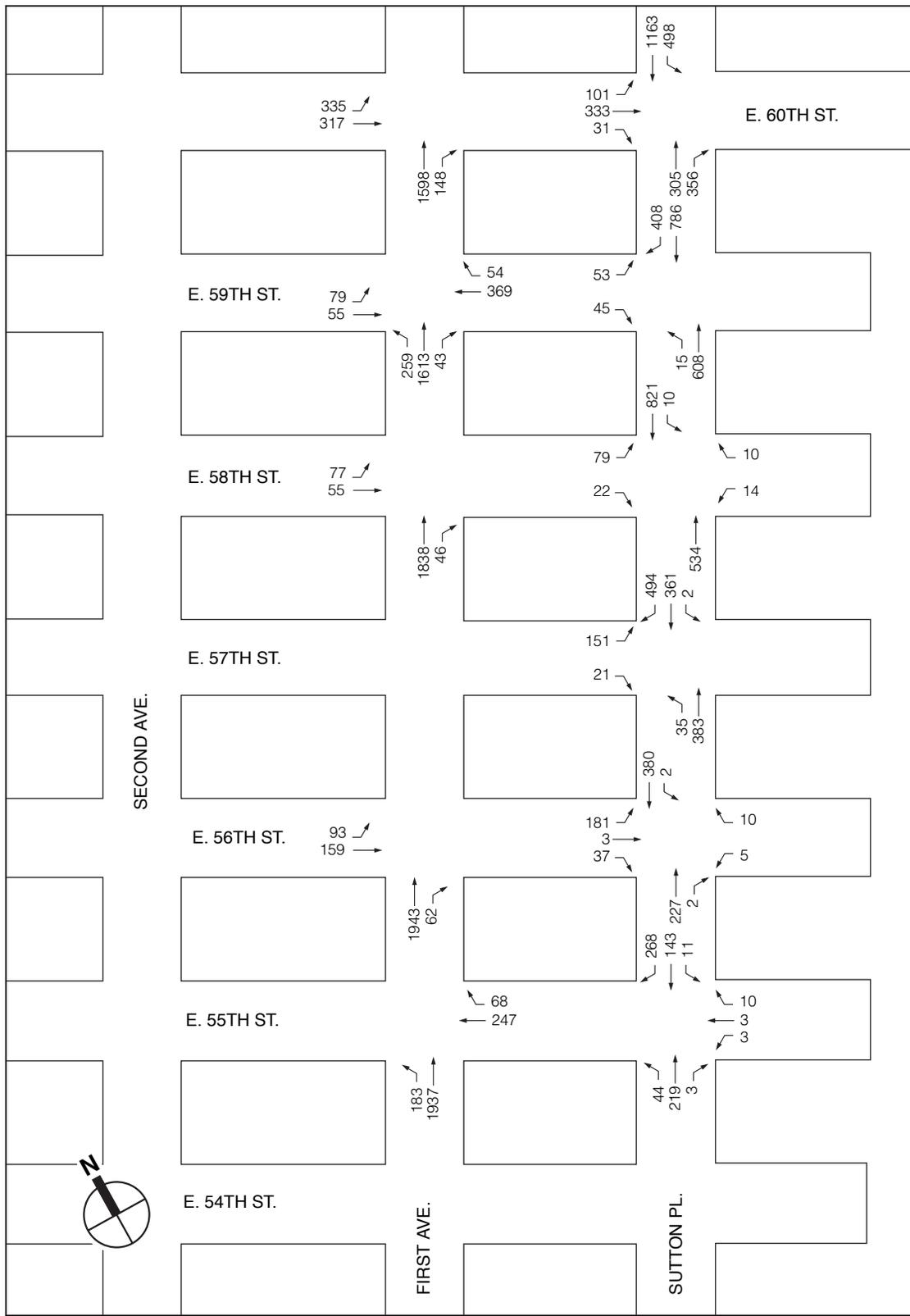


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 AM PEAK HOUR

FIGURE 5.9-13

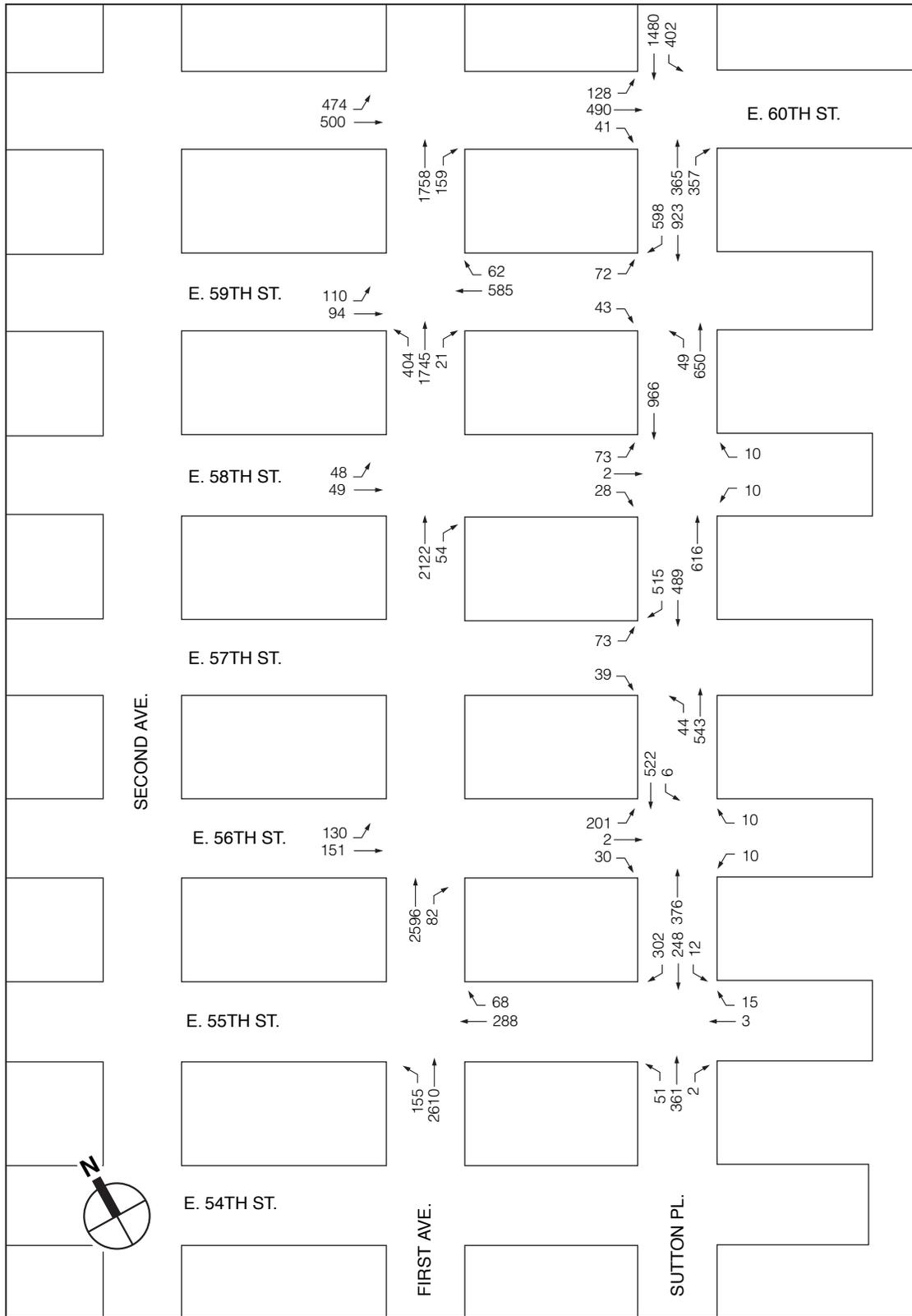


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 WATER MAIN STUDY AREA - SUTTON PLACE ROUTE
 MIDDAY PEAK HOUR

FIGURE 5.9-14

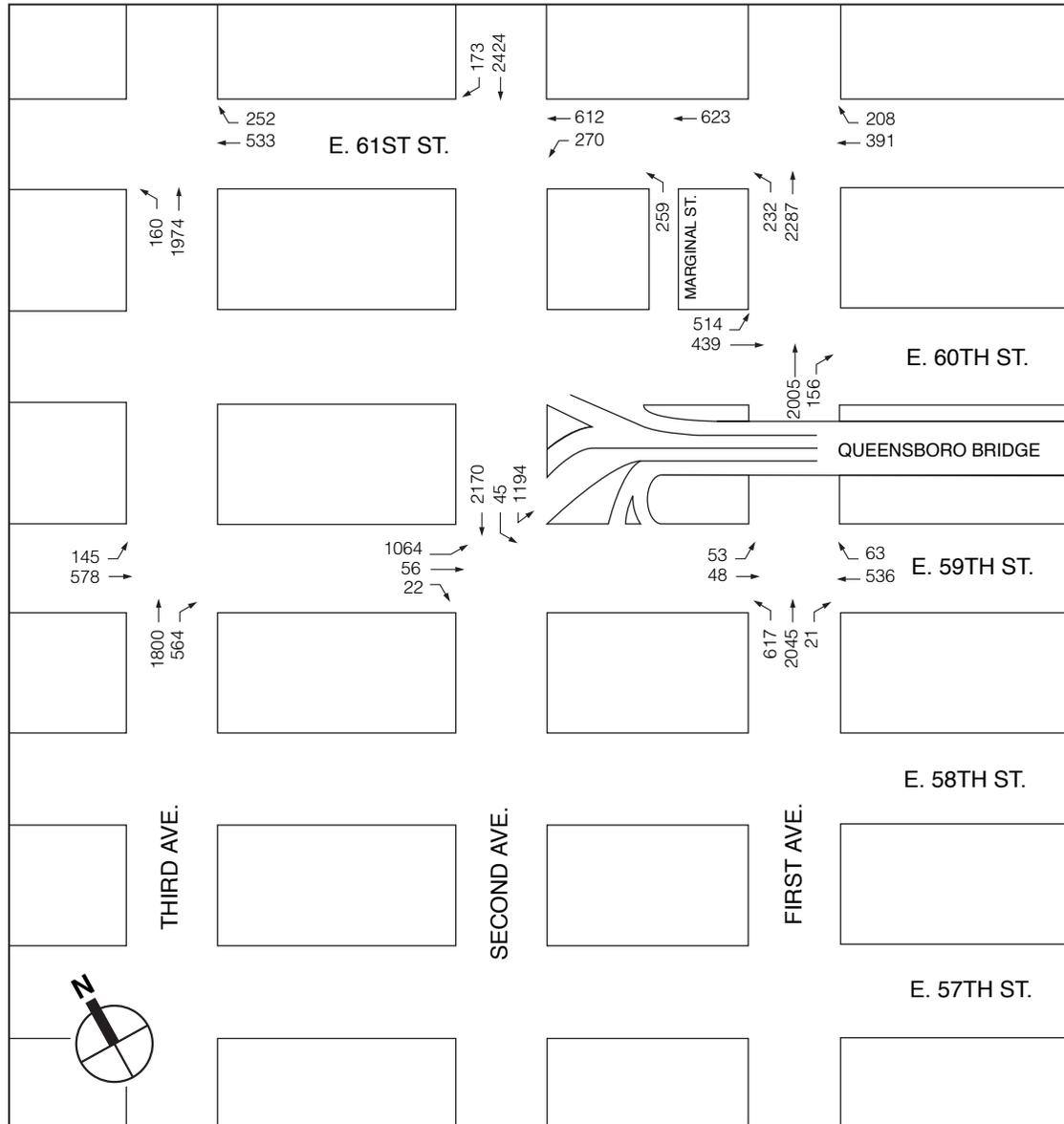


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 PM PEAK HOUR

FIGURE 5.9-15

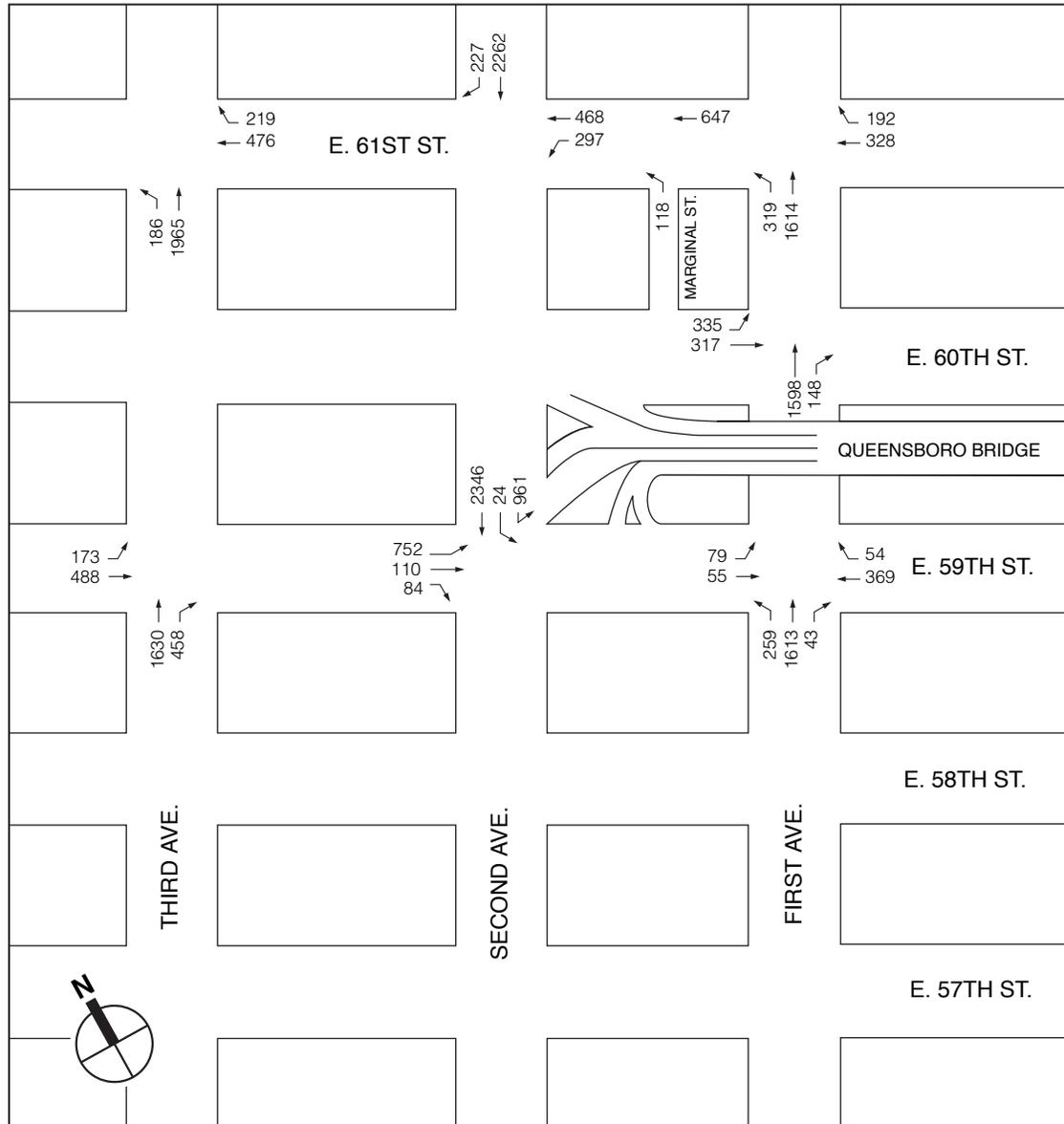


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NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION
 PROPOSED SHAFT 33B TO CITY WATER TUNNEL NO. 3
 STAGE 2-MANHATTAN LEG
 WATER MAIN CONNECTIONS
 2008 NO BUILD TRAFFIC VOLUME NETWORK
 WATER MAIN STUDY AREA - E. 59TH STREET / E. 61ST STREET ROUTE
 AM PEAK HOUR

FIGURE 5.9-16

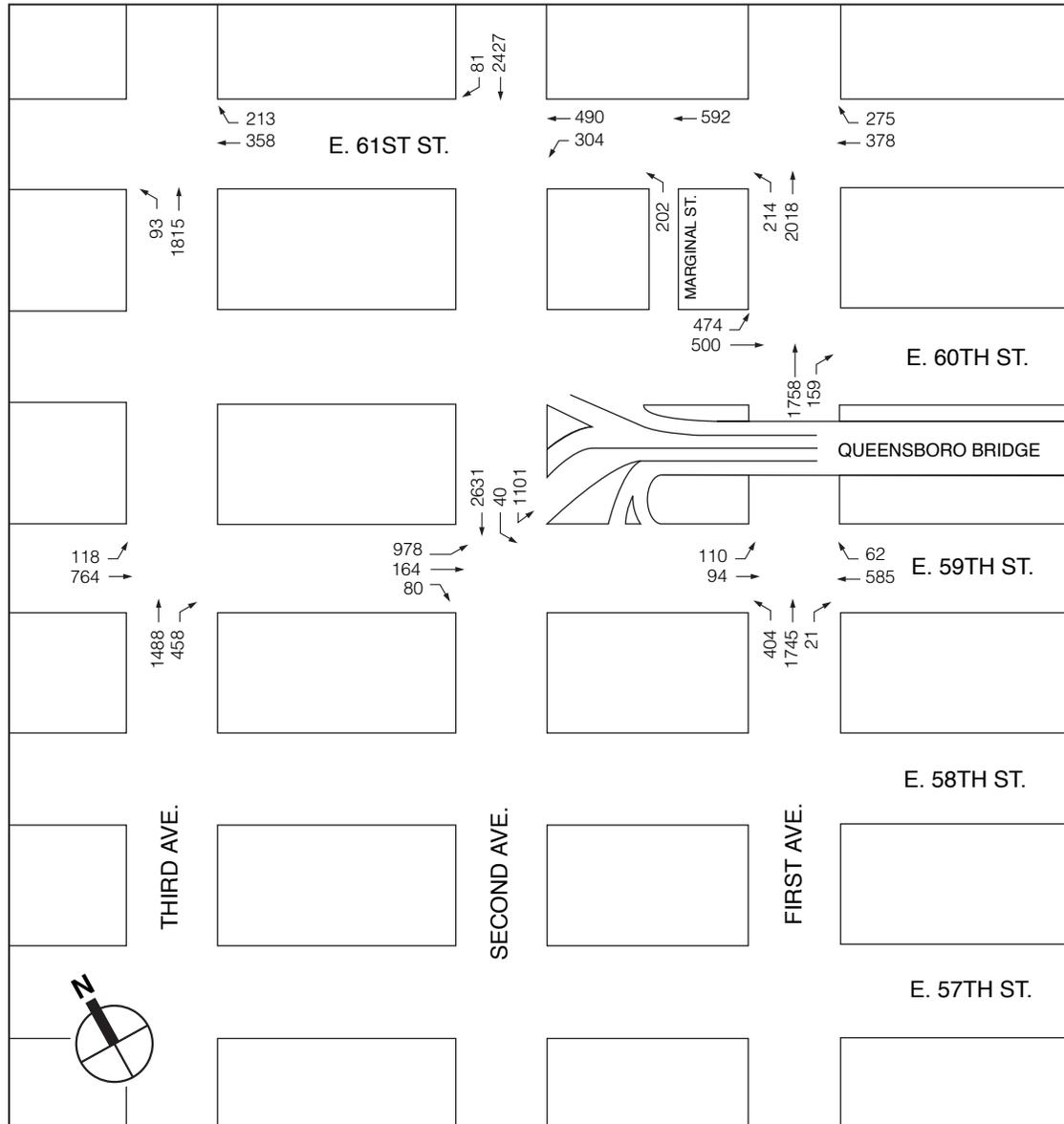


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 WATER MAIN CONNECTIONS
 2008 NO BUILD TRAFFIC VOLUME NETWORK
 WATER MAIN STUDY AREA - E. 59TH STREET / E. 61ST STREET ROUTE
 MIDDAY PEAK HOUR

FIGURE 5.9-17



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 2008 NO BUILD TRAFFIC VOLUME NETWORK
 WATER MAIN STUDY AREA - E. 59TH STREET / E. 61ST STREET ROUTE
 PM PEAK HOUR

FIGURE 5.9-18

CHAPTER 5: WATER MAIN CONNECTIONS
5.9 TRAFFIC AND PARKING

Table 5.9-5

2008 No Build and 2004 Existing Conditions Comparison – Sutton Place Route Water Main Connection Study Area

Analysis Intersection	AM Peak Hour								Midday Peak Hour								PM Peak Hour																																							
	Existing Conditions				No Build Conditions				Existing Conditions				No Build Conditions				Existing Conditions				No 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																																
E. 60 th Street (EB) York Avenue (N-S)	EB-L	0.19	29.4	C	EB-L	0.22	29.8	C	EB-L	0.20	22.4	C	EB-L	0.22	22.6	C	EB-L	0.21	26.3	C	EB-L	0.25	26.9	C	EB-TR	0.51	34.0	C	EB-TR	0.52	34.2	C	EB-TR	0.37	23.9	C	EB-TR	0.38	24.0	C	EB-TR	0.48	30.0	C	EB-TR	0.49	30.2	C								
	NB-TR	0.71	38.0	D	NB-TR	0.76	40.3	D	NB-TR	0.56	27.0	C	NB-TR	0.59	27.6	C	NB-TR	0.71	42.9	D	NB-TR	0.73	43.7	D	NB-R	0.54	36.4	D	NB-R	0.55	36.8	D	NB-R	0.57	42.9	D	NB-R	0.58	43.2	D	NB-R	0.57	42.9	D	NB-R	0.58	43.2	D								
	SB-L	0.47	18.4	B	SB-L	0.47	18.5	B	SB-L	0.62	18.3	B	SB-L	0.63	18.4	B	SB-L	0.48	21.9	C	SB-L	0.49	22.1	C	SB-T	0.61	11.5	B	SB-T	0.63	11.8	B	SB-T	0.74	13.3	B	SB-T	0.77	14.0	B	SB-T	0.93	28.8	C *	SB-T	0.98	38.0	D *								
	SB-T	0.61	11.5	B	SB-T	0.63	11.8	B	SB-T	0.74	13.3	B	SB-T	0.77	14.0	B	SB-T	0.93	28.8	C *	SB-T	0.98	38.0	D *	EB-LTR	0.23	28.6	C	EB-LTR	0.23	28.7	C	EB-LTR	0.32	30.7	C	EB-LTR	0.33	30.9	C	EB-LTR	0.39	32.5	C	EB-LTR	0.40	32.7	C								
	WB-LTR	0.00	24.7	C	WB-LTR	0.00	24.7	C	WB-LTR	0.00	24.7	C	WB-LTR	0.00	24.7	C	WB-LTR	0.00	24.7	C	WB-LTR	0.00	24.7	C																																
	NB-LTR	0.62	14.0	B	NB-LTR	0.67	15.0	B	NB-LTR	0.44	11.3	B	NB-LTR	0.46	11.6	B	NB-LTR	0.68	16.0	B	NB-LTR	0.72	17.6	B	SB-LTR	0.84	21.3	C	SB-LTR	0.87	23.3	C	SB-LTR	0.90	25.2	C *	SB-LTR	0.93	28.4	C *	SB-LTR	1.05	56.4	E *	SB-LTR	1.11	78.0	E *								
E. 58 th Street (EB) Sutton Place (N-S)	EB-LTR	0.63	38.9	D	EB-LTR	0.64	39.4	D	EB-LTR	0.24	28.4	C	EB-LTR	0.25	28.5	C	EB-LTR	0.25	28.5	C	EB-LTR	0.25	28.6	C	WB-LR	0.06	25.5	C	WB-LR	0.06	25.5	C	WB-LR	0.06	25.5	C	WB-LR	0.06	25.5	C	WB-LR	0.05	25.4	C	WB-LR	0.05	25.4	C								
	NB-TR	0.36	10.3	B	NB-TR	0.39	10.7	B	NB-TR	0.32	10.0	A	NB-TR	0.33	10.1	B	NB-TR	0.37	10.5	B	NB-TR	0.39	10.6	B	SB-LT	0.37	10.4	B	SB-LT	0.38	10.6	B	SB-LT	0.55	12.8	B	SB-LT	0.58	13.1	B	SB-LT	0.58	13.0	B	SB-LT	0.62	13.8	B								
	SB-LT	0.37	10.4	B	SB-LT	0.38	10.6	B	SB-LT	0.55	12.8	B	SB-LT	0.58	13.1	B	SB-LT	0.58	13.0	B	SB-LT	0.62	13.8	B	EB-DfL	0.48	33.7	C	EB-DfL	0.49	34.0	C	EB-DfL	0.44	33.3	C	EB-DfL	0.45	33.5	C	EB-DfL	0.21	28.1	C	EB-DfL	0.22	28.2	C								
	EB-DfL	0.48	33.7	C	EB-DfL	0.49	34.0	C	EB-DfL	0.44	33.3	C	EB-DfL	0.45	33.5	C	EB-DfL	0.21	28.1	C	EB-DfL	0.22	28.2	C	EB-TR	0.13	26.6	C	EB-TR	0.14	26.7	C	EB-TR	0.06	25.5	C	EB-TR	0.06	25.5	C	EB-TR	0.10	26.1	C	EB-TR	0.10	26.2	C								
E. 57 th Street (E-W) Sutton Place (N-S)	WB-LTR	0.00	24.7	C	NB-LTR	0.33	10.2	B	NB-LTR	0.37	10.6	B	NB-LTR	0.33	10.2	B	NB-LTR	0.35	10.4	B	NB-LTR	0.48	12.0	B	NB-LTR	0.50	12.3	B	NB-LTR	0.48	12.0	B	NB-LTR	0.50	12.3	B																				
	NB-LTR	0.33	10.2	B	NB-LTR	0.37	10.6	B	NB-LTR	0.33	10.2	B	NB-LTR	0.35	10.4	B	NB-LTR	0.48	12.0	B	NB-LTR	0.50	12.3	B	SB-LTR	0.44	11.3	B	SB-LTR	0.46	11.5	B	SB-LTR	0.73	17.2	B	SB-LTR	0.76	18.1	B	SB-LTR	0.77	18.0	B	SB-LTR	0.81	19.9	B								
	SB-LTR	0.44	11.3	B	SB-LTR	0.46	11.5	B	SB-LTR	0.73	17.2	B	SB-LTR	0.76	18.1	B	SB-LTR	0.77	18.0	B	SB-LTR	0.81	19.9	B	EB-LTR	0.64	38.9	D	EB-LTR	0.65	39.5	D	EB-LTR	0.53	35.1	D	EB-LTR	0.54	35.5	D	EB-LTR	0.56	36.1	D	EB-LTR	0.57	36.6	D								
	EB-LTR	0.64	38.9	D	EB-LTR	0.65	39.5	D	EB-LTR	0.53	35.1	D	EB-LTR	0.54	35.5	D	EB-LTR	0.56	36.1	D	EB-LTR	0.57	36.6	D	WB-LR	0.03	25.2	C	WB-LR	0.03	25.2	C	WB-LR	0.04	25.3	C	WB-LR	0.04	25.3	C	WB-LR	0.06	25.6	C	WB-LR	0.06	25.6	C								
E. 56 th Street (EB) Sutton Place (N-S)	NB-TR	0.15	8.7	A	NB-TR	0.18	8.9	A	NB-TR	0.14	8.6	A	NB-TR	0.15	8.7	A	NB-TR	0.25	9.4	A	NB-TR	0.25	9.5	A	SB-LT	0.33	10.2	B	SB-LT	0.35	10.3	B	SB-LT	0.27	9.6	A	SB-LT	0.28	9.8	A	SB-LT	0.34	10.3	B	SB-LT	0.39	10.7	B								
	SB-LT	0.33	10.2	B	SB-LT	0.35	10.3	B	SB-LT	0.27	9.6	A	SB-LT	0.28	9.8	A	SB-LT	0.34	10.3	B	SB-LT	0.39	10.7	B	WB-LTR	0.08	25.8	C	WB-LTR	0.08	25.9	C	WB-LTR	0.04	25.3	C	WB-LTR	0.04	25.3	C	WB-LTR	0.05	25.4	C	WB-LTR	0.05	25.4	C								
	WB-LTR	0.08	25.8	C	WB-LTR	0.08	25.9	C	WB-LTR	0.04	25.3	C	WB-LTR	0.04	25.3	C	WB-LTR	0.05	25.4	C	WB-LTR	0.05	25.4	C	NB-LTR	0.18	8.9	A	NB-LTR	0.21	9.2	A	NB-LTR	0.21	9.2	A	NB-LTR	0.22	9.3	A	NB-LTR	0.33	10.3	B	NB-LTR	0.35	10.5	B								
	NB-LTR	0.18	8.9	A	NB-LTR	0.21	9.2	A	NB-LTR	0.21	9.2	A	NB-LTR	0.22	9.3	A	NB-LTR	0.33	10.3	B	NB-LTR	0.35	10.5	B	SB-LTR	0.45	11.5	B	SB-LTR	0.46	11.7	B	SB-LTR	0.35	10.5	B	SB-LTR	0.37	10.7	B	SB-LTR	0.43	11.3	B	SB-LTR	0.47	11.8	B								
E. 55 th Street (WB) Sutton Place (N-S)	SB-LTR	0.45	11.5	B	SB-LTR	0.46	11.7	B	SB-LTR	0.35	10.5	B	SB-LTR	0.37	10.7	B	SB-LTR	0.43	11.3	B	SB-LTR	0.47	11.8	B	Notes: Analysis results for the First Avenue intersections are presented with the Shaft Study Area and First Avenue route Water Main Connection Study Area analysis results. 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 Congested Intersections (marginally unacceptable mid-LOS D, LOS E, LOS F, or V/C > 0.90) Analysis is based on the 2000 Highway Capacity Manual Methodology (HCS 2000).																															

CHAPTER 5: WATER MAIN CONNECTIONS
5.9 TRAFFIC AND PARKING

Table 5.9-6

2008 No Build and 2004 Existing Conditions Comparison – E. 59th/E. 61st Street Route Water Main Connection Study Area

Analysis Intersection	AM Peak Hour								Midday Peak Hour								PM Peak Hour																																																							
	Existing Conditions				No Build Conditions				Existing Conditions				No Build Conditions				Existing Conditions				No 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																																																
E. 61 st Street (WB) First Avenue (NB)	WB-TR	0.61	24.7	C	WB-TR	0.62	24.9	C	WB-TR	0.53	23.2	C	WB-TR	0.54	23.4	C	WB-TR	0.68	26.5	C	WB-TR	0.69	26.9	C	NB-L	0.39	16.1	B	NB-L	0.40	16.2	B	NB-T	0.65	13.8	B	NB-T	0.66	14.0	B																																
E. 61 st Street (WB) Marginal Street (NB)	WB-T	0.49	19.0	B	WB-T	0.50	19.1	B	WB-T	1.00	59.0	E *	WB-T	1.02	64.4	E *	WB-T	0.95	48.9	D *	WB-T	0.97	52.7	D *	NB-L	0.30	17.2	B	NB-L	0.31	17.3	B																																								
E. 61 st Street (WB) Second Avenue (SB)	WB-LT	0.49	21.7	C	WB-LT	0.51	22.0	C	WB-LT	0.66	25.5	C	WB-LT	0.68	25.9	C	WB-LT	0.69	26.3	C	WB-LT	0.71	26.7	C	SB-TR	0.84	22.1	C	SB-TR	0.86	22.9	C	SB-TR	1.05	56.6	E *	SB-TR	1.08	67.4	E *	SB-TR	0.71	18.6	B	SB-TR	0.74	19.3	B																								
E. 61 st Street (WB) Third Avenue (NB)	WB-TR	0.62	24.2	C	WB-TR	0.63	24.4	C	WB-TR	0.85	35.3	D	WB-TR	0.87	36.6	D	WB-TR	0.83	34.5	C	WB-TR	0.85	35.9	D	NB-LT	0.89	24.9	C	NB-LT	0.91	26.5	C *	NB-LT	0.75	19.7	B	NB-LT	0.78	20.5	C	NB-LT	0.64	17.6	B	NB-LT	0.68	18.4	B																								
E. 59 th Street (EB) Third Avenue (NB)	EB-LT	0.70	23.8	C	EB-LT	0.72	24.3	C	EB-LT	0.63	22.1	C	EB-LT	0.65	22.6	C	EB-LT	0.57	19.9	B	EB-LT	0.59	20.3	C	NB-TR	0.85	25.8	C	NB-TR	0.87	26.9	C	NB-TR	0.67	21.2	C	NB-TR	0.71	21.8	C	NB-TR	0.48	18.2	B	NB-TR	0.52	18.6	B	NB-R	0.89	59.5	E *	NB-R	0.91	62.3	E *	NB-R	0.70	41.6	D	NB-R	0.71	42.5	D	NB-R	0.68	40.9	D	NB-R	0.70	41.7	D

Notes: Analysis results for the First Avenue intersections with E. 59th and E. 60th Streets and Second Avenue intersection with E. 59th Street are presented with the Shaft Study Area analysis results.

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 Congested Intersections (marginally unacceptable mid-LOS D, LOS E, LOS F, or V/C > 0.90)

Analysis is based on the 2000 *Highway Capacity Manual Methodology* (HCS 2000).

Intersections and traffic movements that were identified as congested under existing conditions are expected to deteriorate. In addition, operating conditions at the northbound approach at Third Avenue and E. 61st Street would reach congested levels, at LOS C with a v/c ratio of 0.91 and an average delay of 26.5 spv during the AM peak hour.

Parking Analysis

No changes to parking regulations and nominal increases in parking demand are anticipated under the 2008 No Build conditions in the Study Area.

Safety Analysis

With nominal increases in traffic projected, pedestrian safety under the 2008 No Build conditions is anticipated to be similar to existing conditions within the Study Area.

5.9.4 Future Conditions With the Project

First Avenue Route Base Scenario

Traffic Operations Analysis

The construction of the water main connections would occur in segments and take 41 months to complete, with most block segments taking 12 weeks each and intersection segments taking 10 weeks each. Segment 1, which would include the construction of the venturi chamber for the preferred Shaft 33B site, is expected to take 20 weeks to complete. The Base Scenario assumes that construction zones would require 16.5-foot wide areas along First Avenue during the AM and PM peak periods and 24.5-foot wide areas in the midday peak period. For purposes of this analysis, it was assumed that First Avenue would be re-stripped to accommodate seven 10-foot lanes and that parking/standing on specific blocks along the roadway's east curb would be temporarily displaced during construction. In addition, the use of the dedicated bus lane along the east curb of First Avenue between 4:00 and 7:00 p.m. would be disrupted during construction. Along E. 55th and E. 56th Streets during all peak periods, an 18.5-foot wide area, incorporating 16.5 feet of roadway space and 2 feet of sidewalk space, would be required during all time periods. To minimize curbside and access disruptions along these cross streets, the construction would occur in segments of approximately 200 feet each. Although construction would only take place on one side of the street, which has been assumed to be the north side for analysis purposes, curbside restrictions across from the construction zone were also assumed (for approximately 280 feet to include 40 feet transition on each end) to maintain travel lane(s). At the intersections, to ensure that traffic flow, particularly during peak hours, would be maintained, it is anticipated that intersection work would be conducted in sections and, where possible, during the evening or late night hours when traffic volumes are lower.

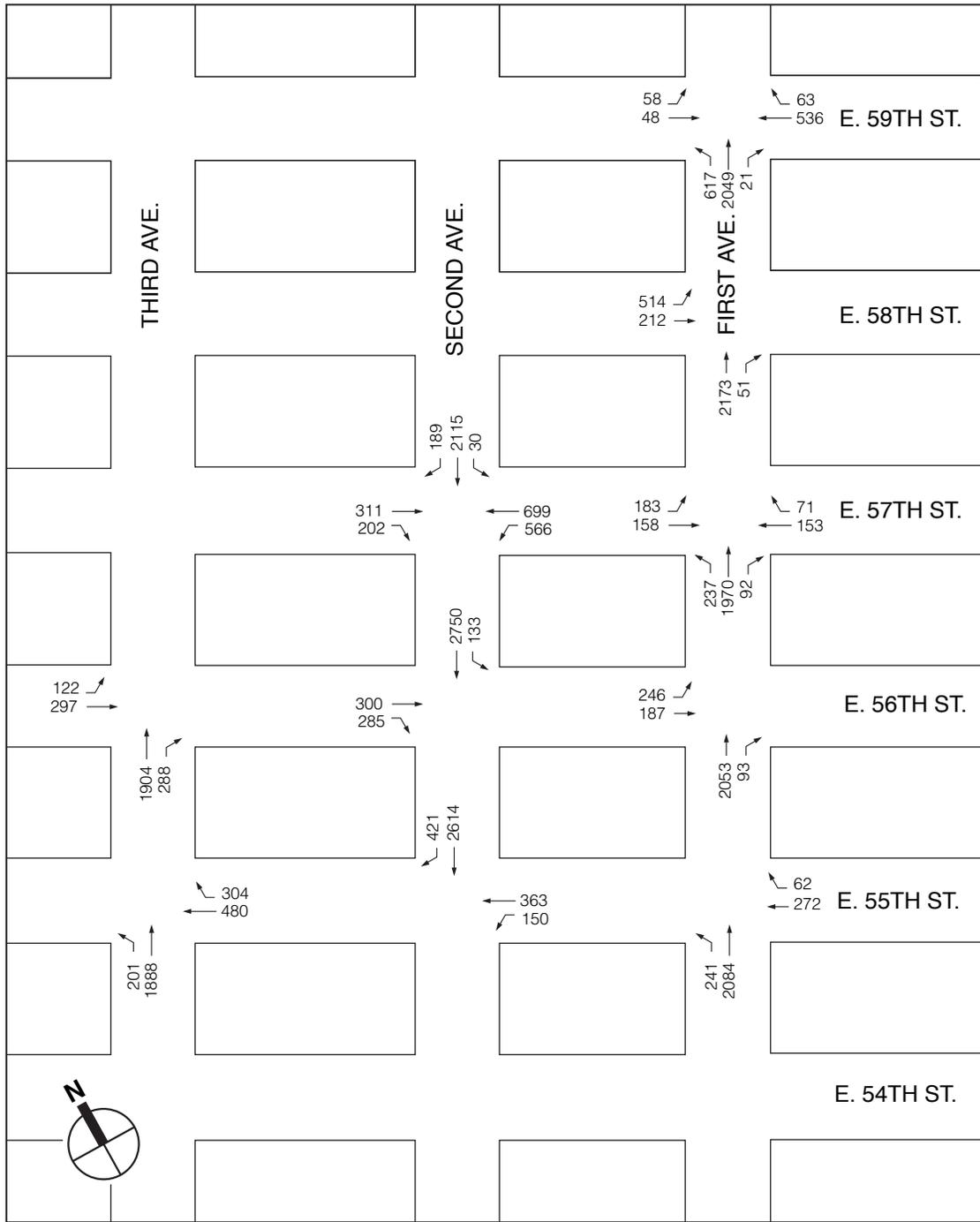
As described in Section [3.9.4](#), traffic generated by the shaft construction (10 truck trips in the AM and midday and 6 truck trips in the PM peak hours), by the water main connections, and by the roadway modifications due to the water main connections, were considered for analysis. To present a worst-case scenario, it was assumed that up to two segments (one on a cross street and one along First Avenue) would be constructed concurrently. A maximum of 8 truck trips (4 in and 4 out) in any peak hour would be generated by the construction of any two segments along the water main route. Trucks are

expected to use the avenues as well as the cross streets to reach their destinations. Since the truck routing for each specific segment of construction would be different, a representative routing, conservatively incorporating 4 additional truck trips (2 in and 2 out) for a total of 12 total truck trips (6 in and 6 out) for the construction of water main connections, was included for analysis. Figures 5.9-19, 5.9-20, and 5.9-21 illustrate the 2008 Study Area traffic volumes.

The specific roadway space requirements for the water main connection construction are detailed below for Segments 1, 3, 5, 7, 9, and 10. The anticipated changes to lane configuration along the First Avenue corridor, as well as along westbound E. 55th Street and eastbound E. 56th Street, are depicted in Figures 5.9-22 through 5.9-31. A qualitative discussion of conditions under intersection construction (Segments 2, 4, 6, 8, 11, and 13) is provided under “Secondary Segment Construction Assessment.”

- Segment 1: The Base Scenario contemplates simultaneous construction on two non-contiguous blocks along First Avenue, between E. 56th and E. 57th Streets and between E. 58th and E. 59th Streets. The construction work zone would reduce the First Avenue roadway from 70 to 53.5 feet in the AM and PM peak periods and to 45.5 feet in the midday peak period. As shown in Figures 5.9-22 to 5.9-24, First Avenue at both E. 57th and E. 59th Streets would operate with four lanes, three lanes, and five lanes in the AM, midday, and PM peak periods, respectively. During the AM and PM peak periods, parking would be maintained on the right curb immediately upstream⁴ of E. 56th and E. 58th Streets while the easternmost traffic lane would be designated for right turns only. During the midday peak period, the three easternmost lanes would consist of a parking lane, an unused or redundant lane (due to channelization and construction blockage), and a right-turn only lane. Northbound through traffic upstream of the construction zones would have to transition westward during all time periods. The bus lane that currently operates on the east curb lane during the PM peak period would be temporarily discontinued for a minimum of four blocks.
- Segment 3: This segment also contemplates simultaneous construction on two non-contiguous blocks along First Avenue, between E. 55th and E. 56th Streets and between E. 57th and E. 58th Streets. The construction work zone would again reduce the First Avenue roadway from 70 to 53.5 feet in the AM and PM peak periods and to 45.5 feet in the midday peak period. Similarly, First Avenue at both E. 56th and E. 58th Streets would operate with four lanes, three lanes, and five lanes in the AM, midday, and PM peak hours, respectively, and the bus lane that currently operates on the east curb lane during the PM peak period would be temporarily discontinued for a minimum of four blocks, as shown in Figures 5.9-25 to 5.9-27. The northbound approach to E. 55th Street would include an east parking/standing lane and traffic on the easternmost traffic lane during the AM and PM peak periods or on the two easternmost traffic lanes during the midday peak period would have to transition westward upstream of the construction zone. At E. 57th Street, similar transitioning for traffic upstream of the construction zone is required. During the AM and midday peak periods, the east curb would be available for loading/unloading activities, while the adjacent lane or lanes

⁴ “Upstream” from a street segment or an intersection refers to the one prior in the direction of travel. So, for northbound First Avenue, E. 58th Street is upstream from E. 59th Street, whereas for southbound Second Avenue, E. 59th Street is upstream from E. 58th Street.

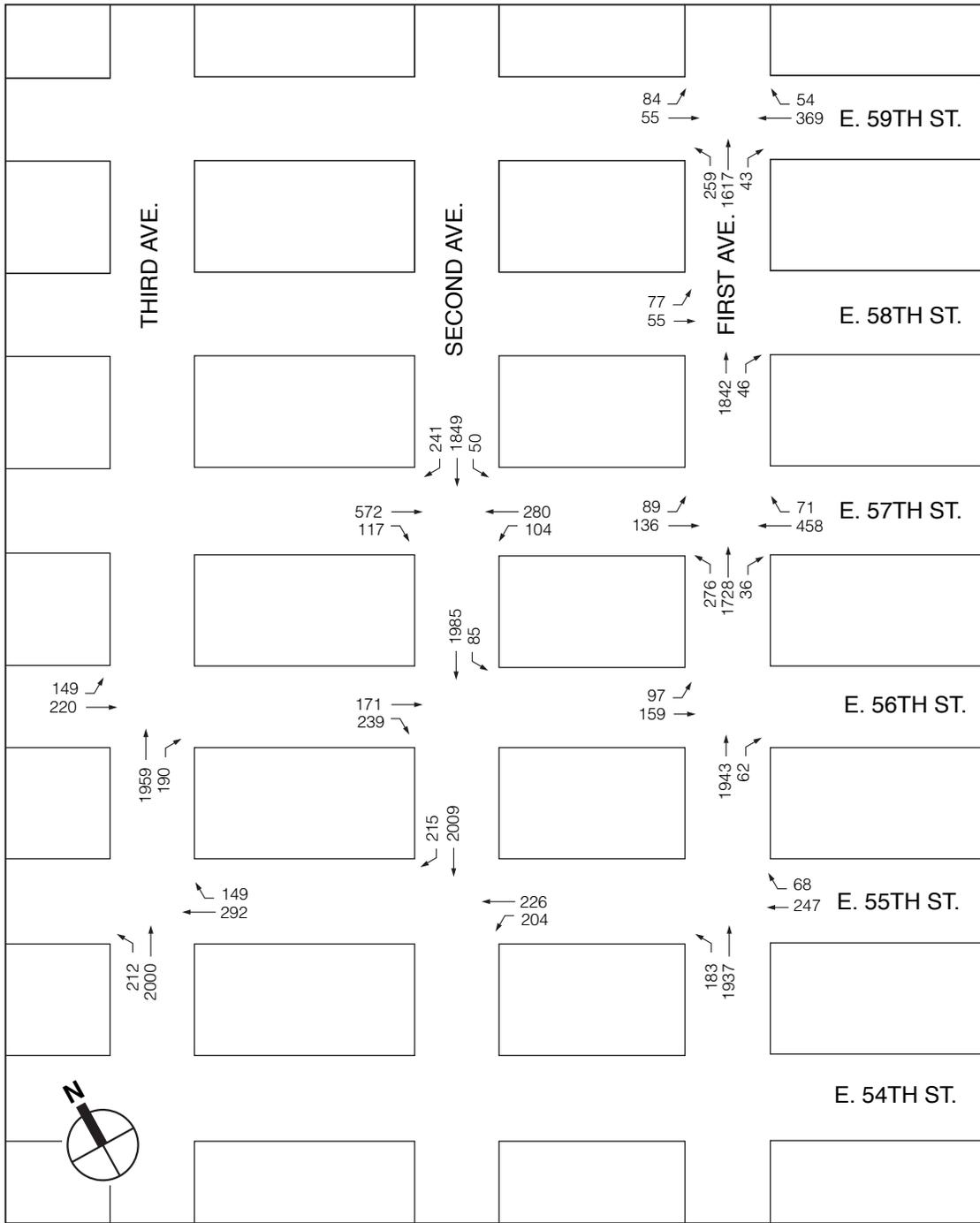


NOT TO SCALE



NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION
 PROPOSED SHAFT 33B TO CITY WATER TUNNEL NO. 3
 STAGE 2-MANHATTAN LEG
 WATER MAIN CONNECTIONS
 2008 BUILD TRAFFIC VOLUME NETWORK
 WATER MAIN STUDY AREA - FIRST AVENUE ROUTE
 AM PEAK HOUR

FIGURE 5.9-19

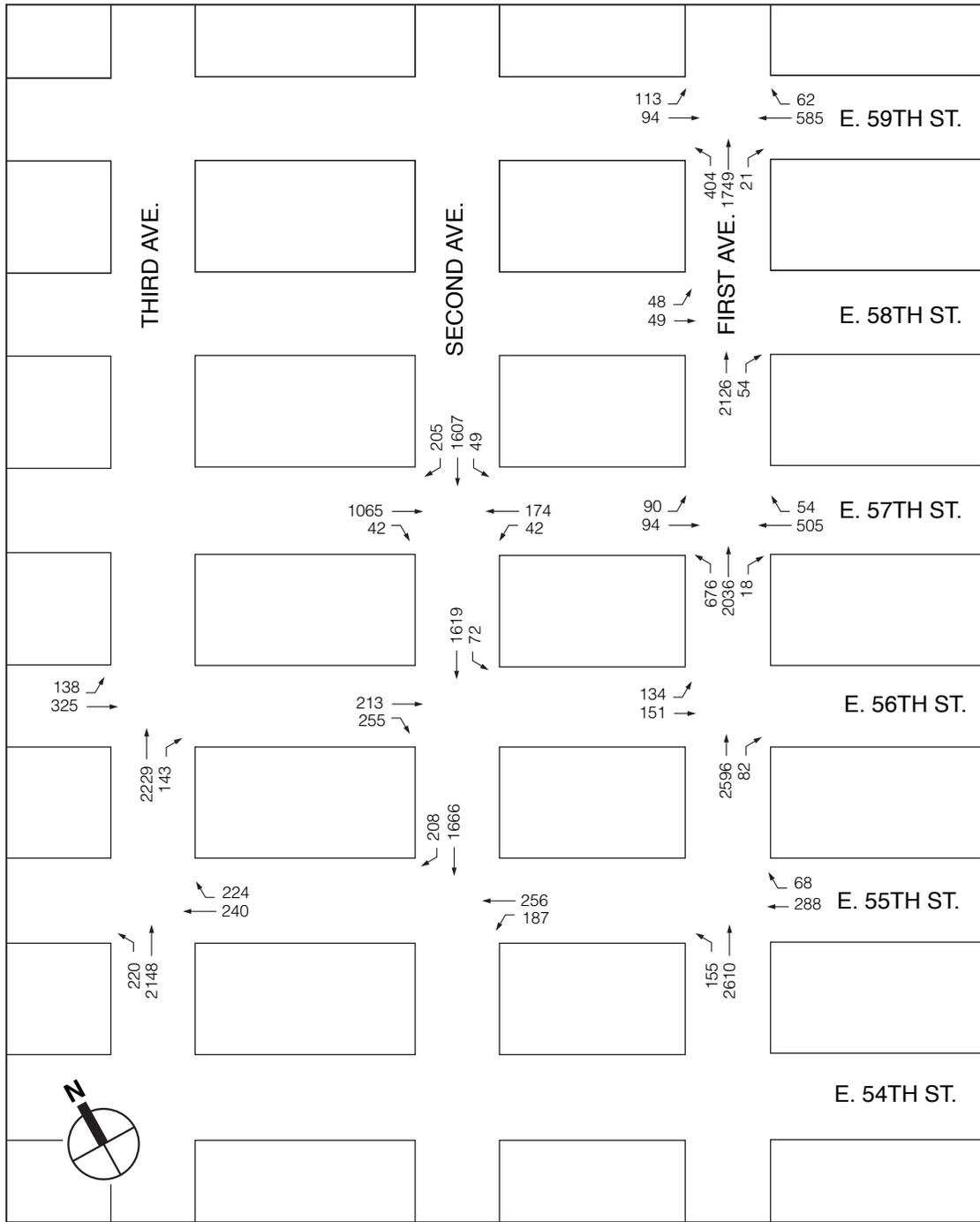


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 2008 BUILD TRAFFIC VOLUME NETWORK
 WATER MAIN STUDY AREA - FIRST AVENUE ROUTE
 MIDDAY PEAK HOUR

FIGURE 5.9-20



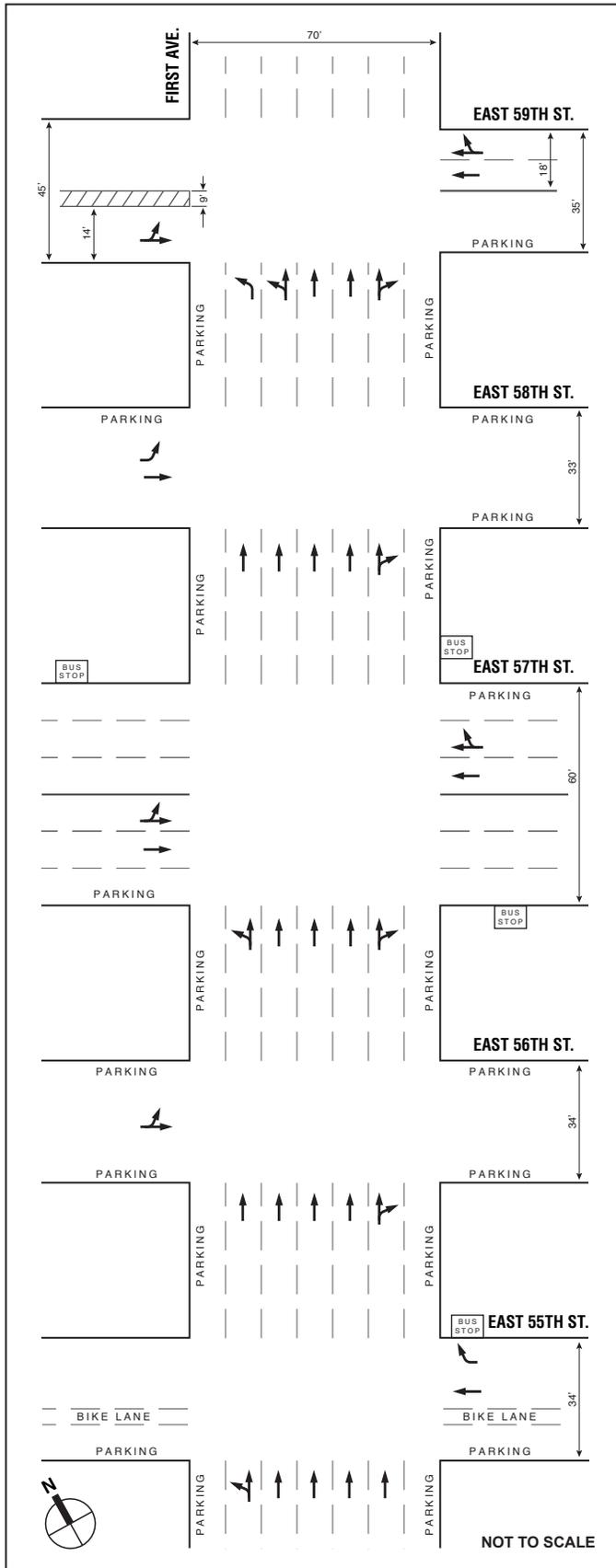
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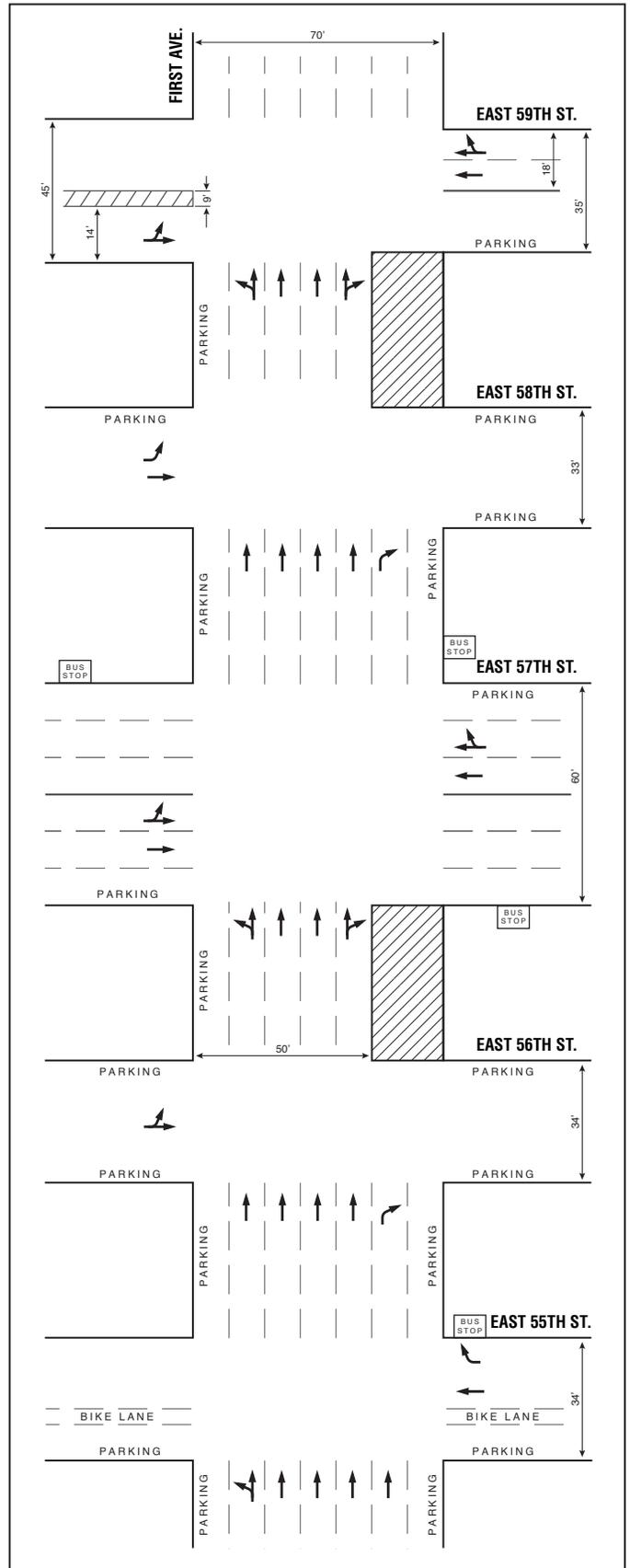
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 2008 BUILD TRAFFIC VOLUME NETWORK
 WATER MAIN STUDY AREA - FIRST AVENUE ROUTE
 PM PEAK HOUR

FIGURE 5.9-21

EXISTING CONFIGURATION



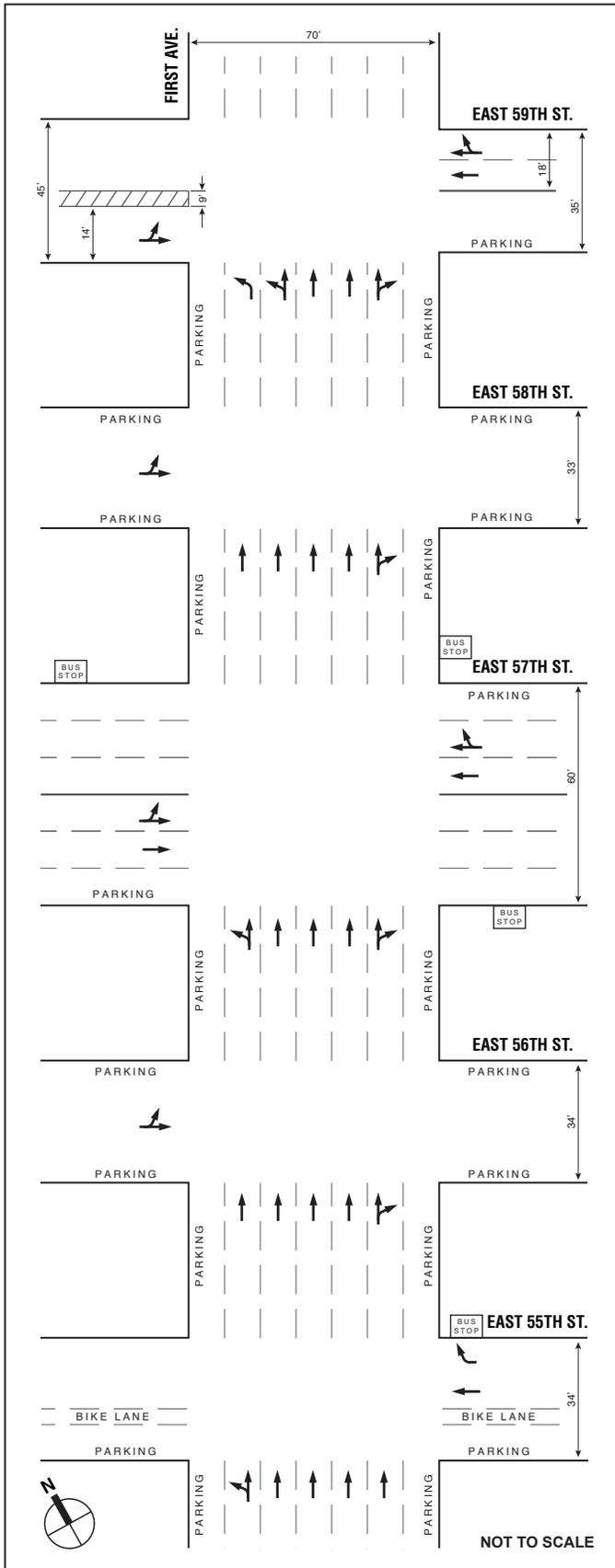
FIRST AVENUE ROUTE CONFIGURATION



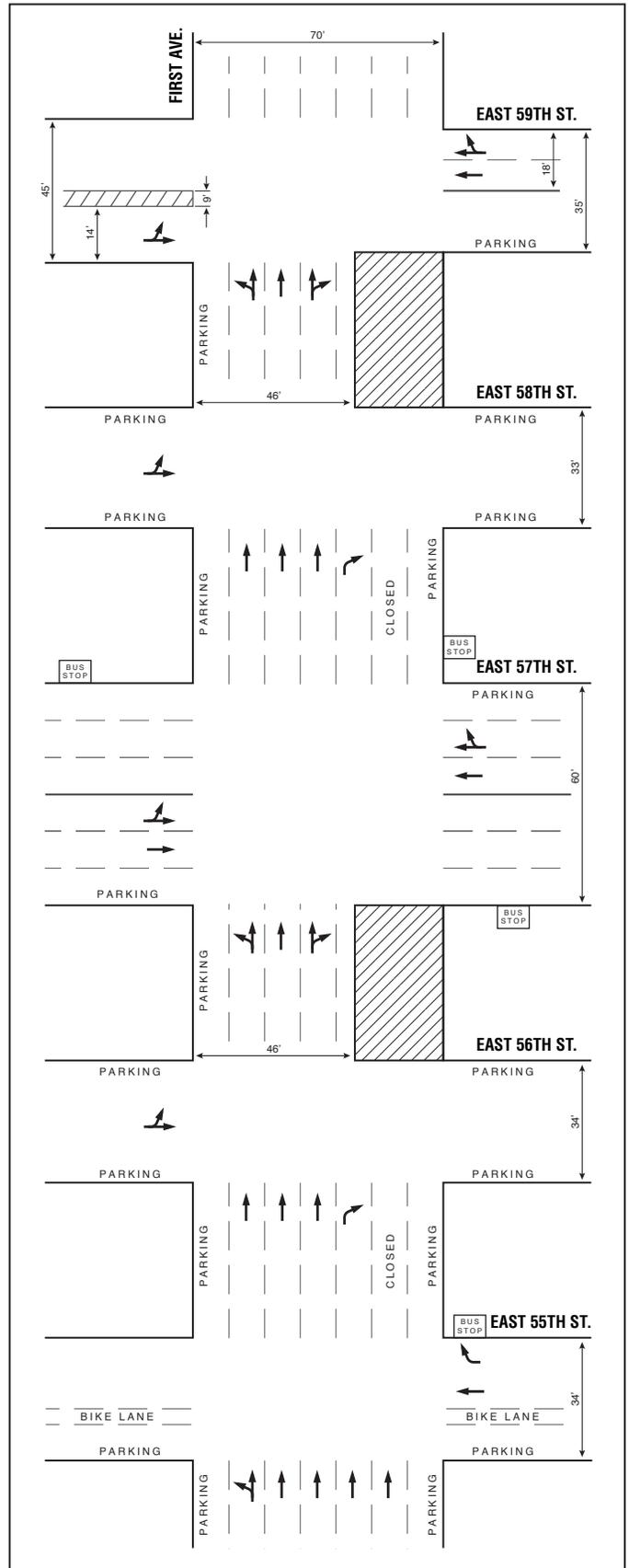
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 PROPOSED SHAFT 33B TO CITY WATER TUNNEL NO. 3
 STAGE 2-MANHATTAN LEG
 WATER MAIN CONNECTIONS
ROADWAY CONFIGURATIONS
FIRST AVENUE ROUTE - SEGMENT 1
AM PEAK HOUR

FIGURE 5.9-22

EXISTING CONFIGURATION



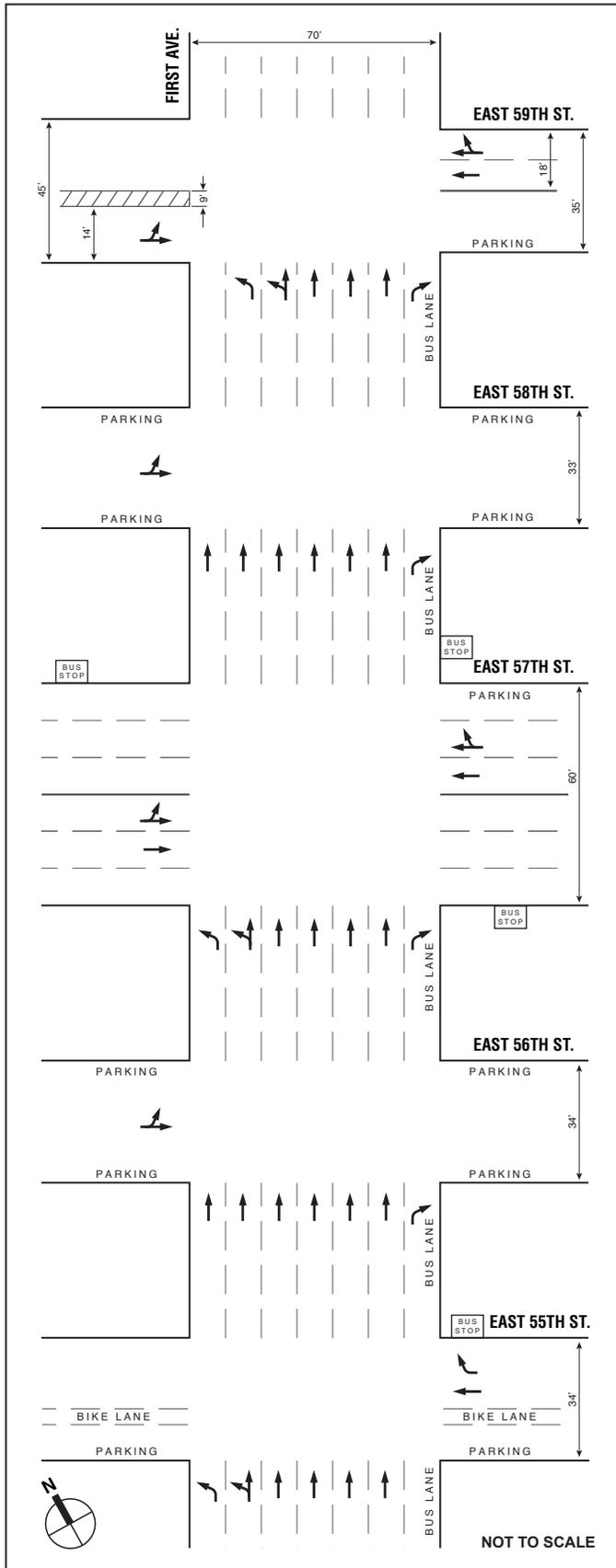
FIRST AVENUE ROUTE CONFIGURATION



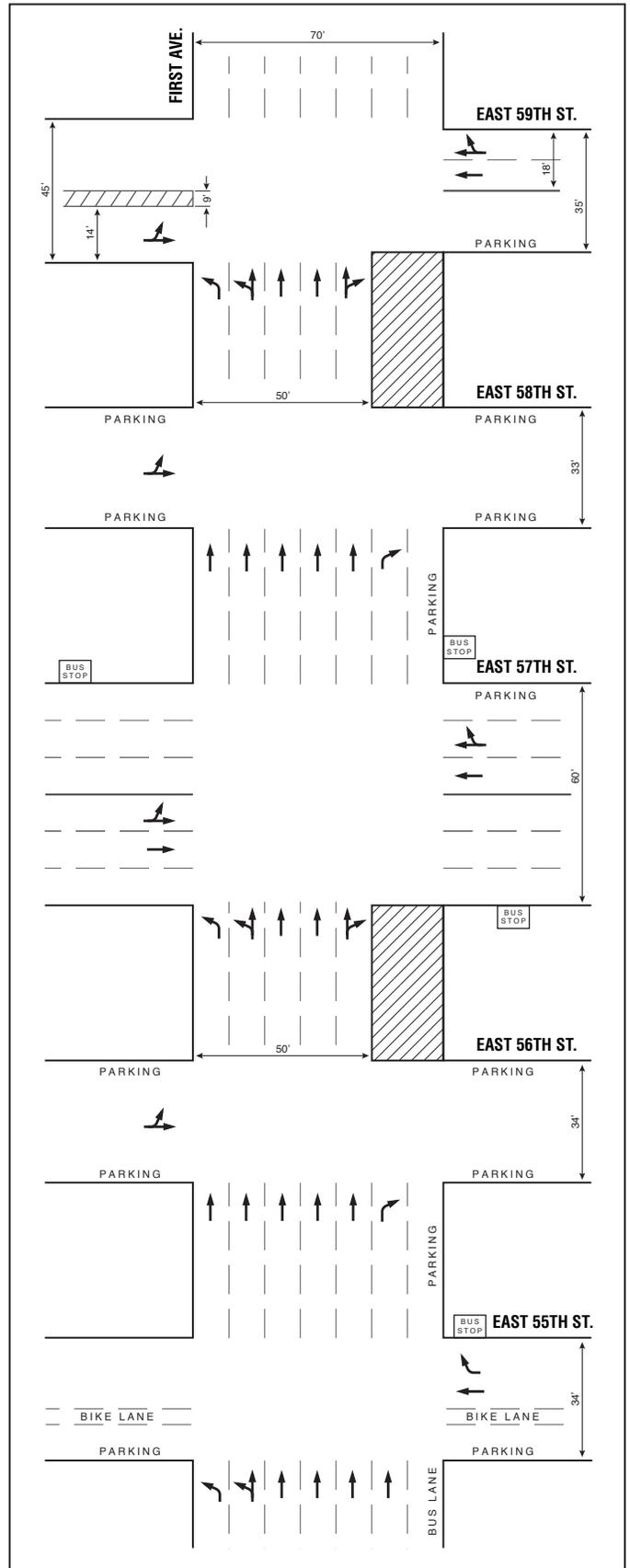
NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION
 PROPOSED SHAFT 33B TO CITY WATER TUNNEL NO. 3
 STAGE 2-MANHATTAN LEG
 WATER MAIN CONNECTIONS
 ROADWAY CONFIGURATIONS
 FIRST AVENUE ROUTE - SEGMENT 1
 MIDDAY PEAK HOUR

FIGURE 5.9-23

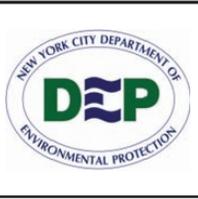
EXISTING CONFIGURATION



FIRST AVENUE ROUTE CONFIGURATION



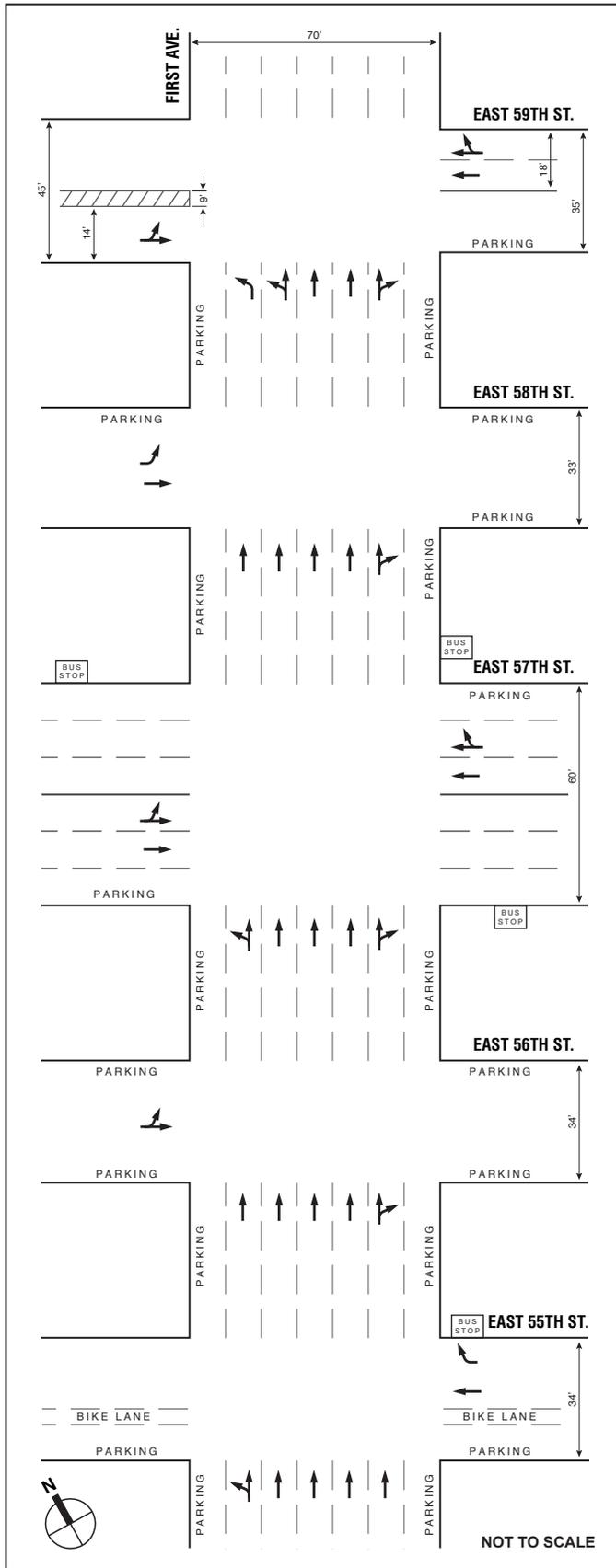
NOT TO SCALE



NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION
 PROPOSED SHAFT 33B TO CITY WATER TUNNEL NO. 3
 STAGE 2-MANHATTAN LEG
 WATER MAIN CONNECTIONS
 ROADWAY CONFIGURATIONS
 FIRST AVENUE ROUTE - SEGMENT 1
 PM PEAK HOUR

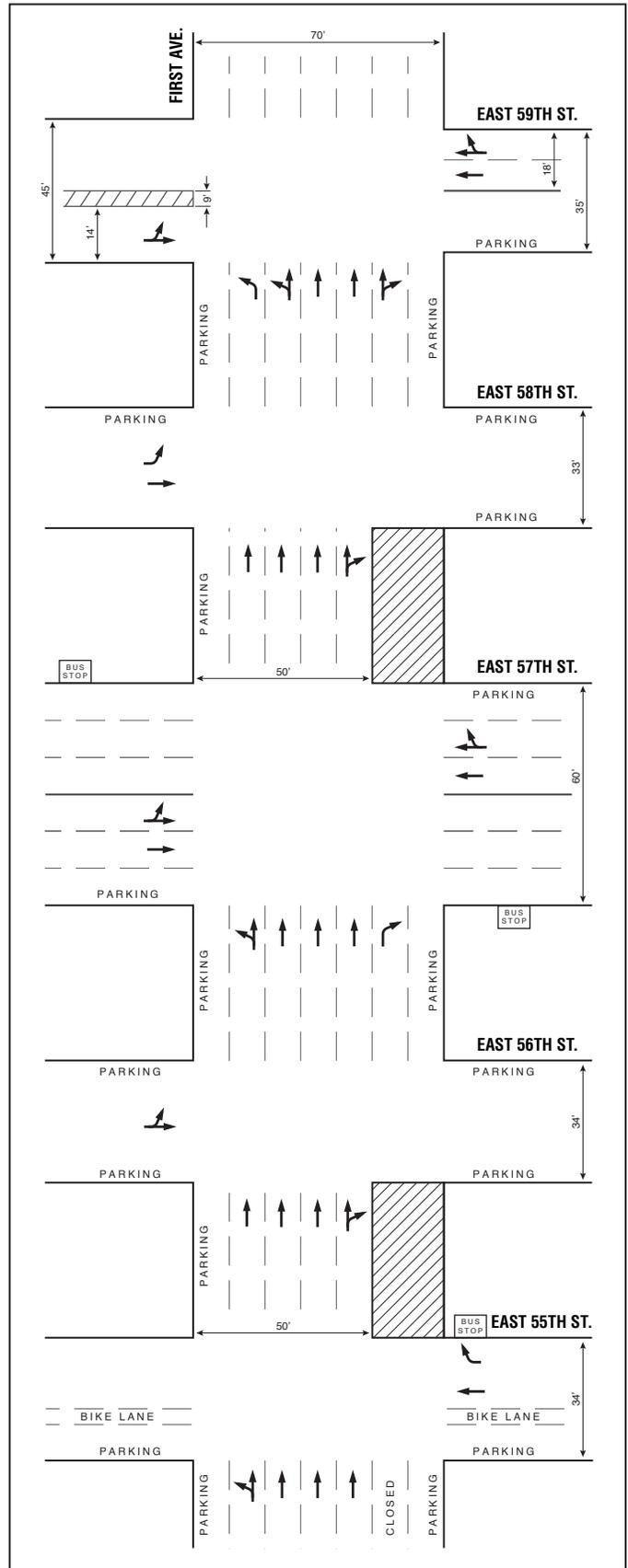
FIGURE 5.9-24

EXISTING CONFIGURATION

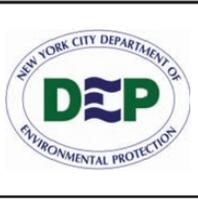


NOT TO SCALE

FIRST AVENUE ROUTE CONFIGURATION



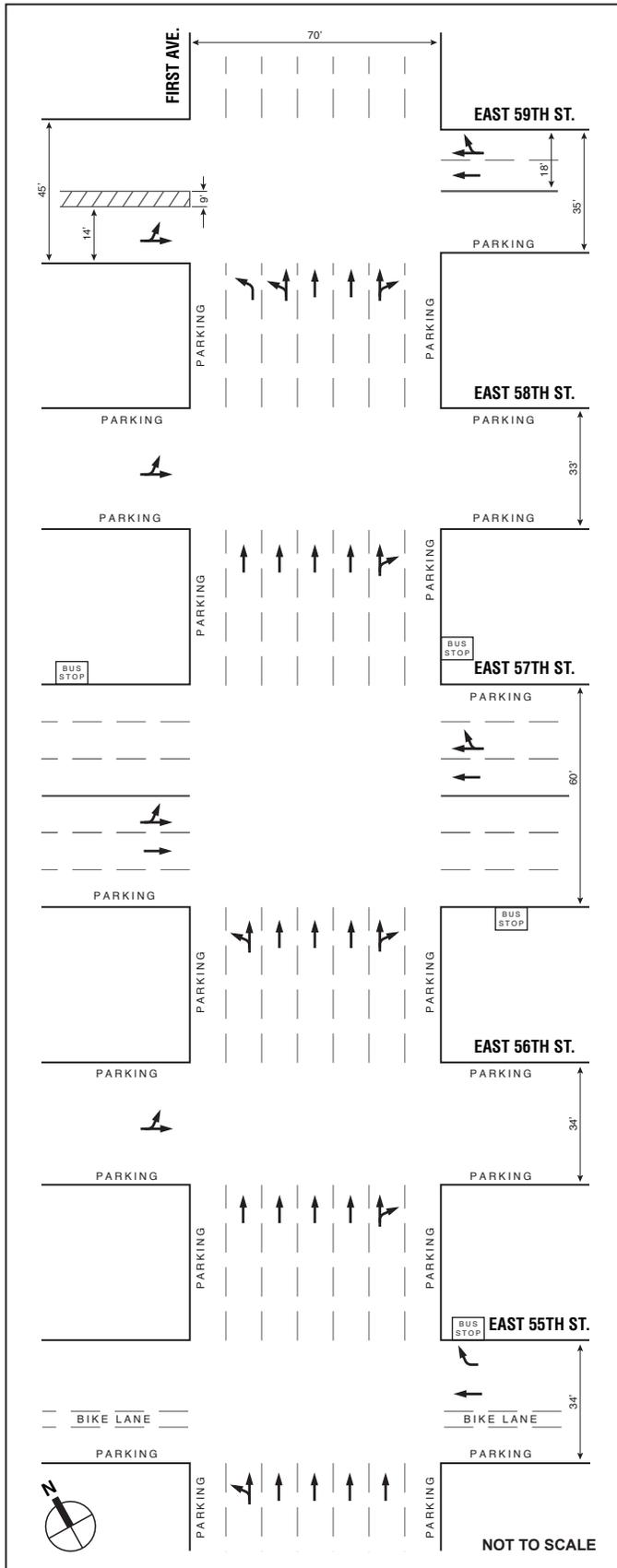
CLOSED



NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION
 PROPOSED SHAFT 33B TO CITY WATER TUNNEL NO. 3
 STAGE 2-MANHATTAN LEG
 WATER MAIN CONNECTIONS
 ROADWAY CONFIGURATIONS
 FIRST AVENUE ROUTE - SEGMENT 3
 AM PEAK HOUR

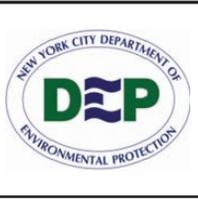
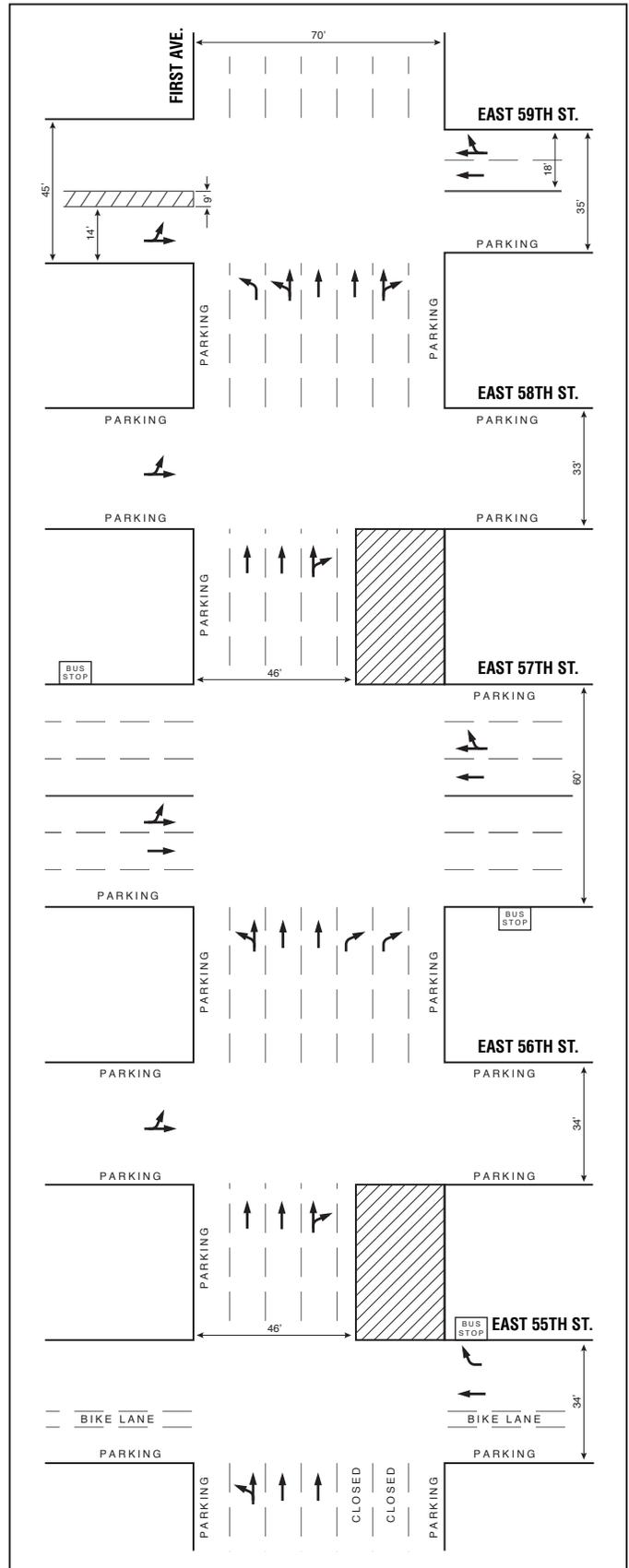
FIGURE 5.9-25

EXISTING CONFIGURATION



NOT TO SCALE

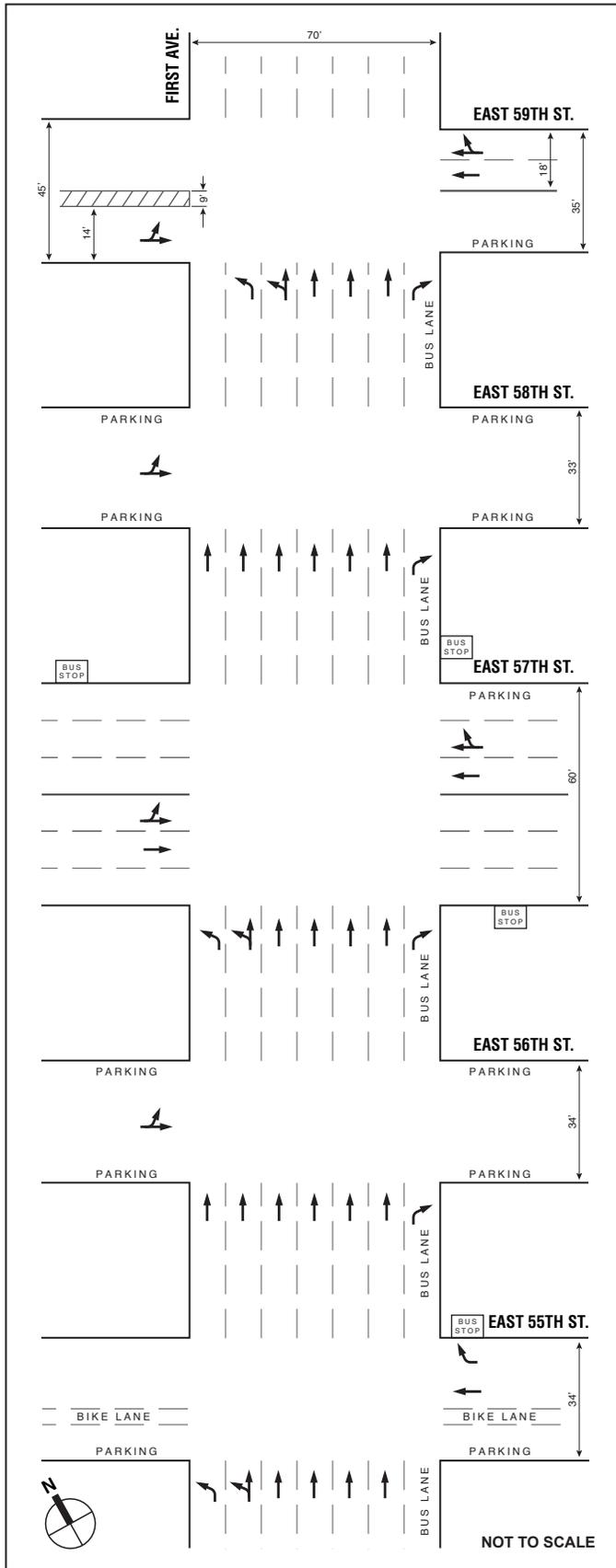
FIRST AVENUE ROUTE CONFIGURATION



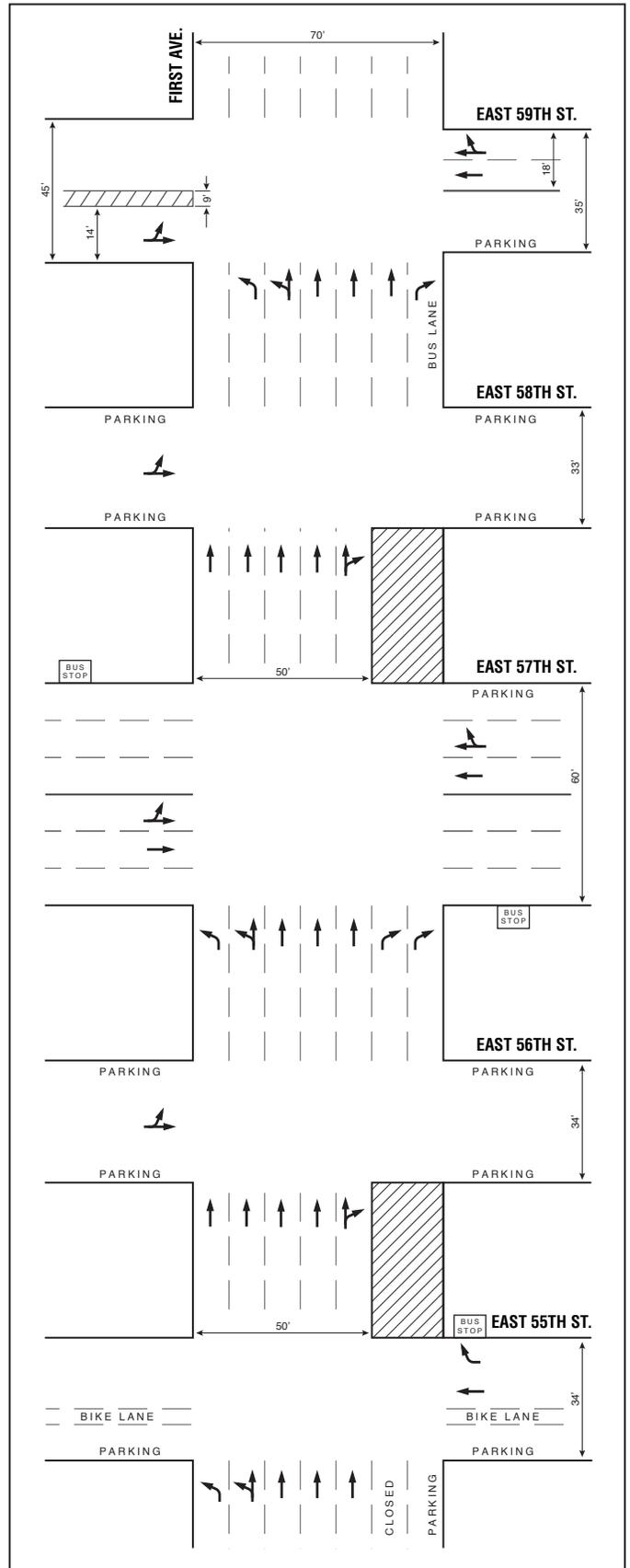
NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION
 PROPOSED SHAFT 33B TO CITY WATER TUNNEL NO. 3
 STAGE 2-MANHATTAN LEG
 WATER MAIN CONNECTIONS
 ROADWAY CONFIGURATIONS
 FIRST AVENUE ROUTE - SEGMENT 3
 MIDDAY PEAK HOUR

FIGURE 5.9-26

EXISTING CONFIGURATION



FIRST AVENUE ROUTE CONFIGURATION



NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION
 PROPOSED SHAFT 33B TO CITY WATER TUNNEL NO. 3
 STAGE 2-MANHATTAN LEG
 WATER MAIN CONNECTIONS
 ROADWAY CONFIGURATIONS
 FIRST AVENUE ROUTE - SEGMENT 3
 PM PEAK HOUR

FIGURE 5.9-27

EXISTING CONFIGURATION

AM PEAK HOUR

FIRST AVENUE ROUTE CONFIGURATION

EXISTING CONFIGURATION

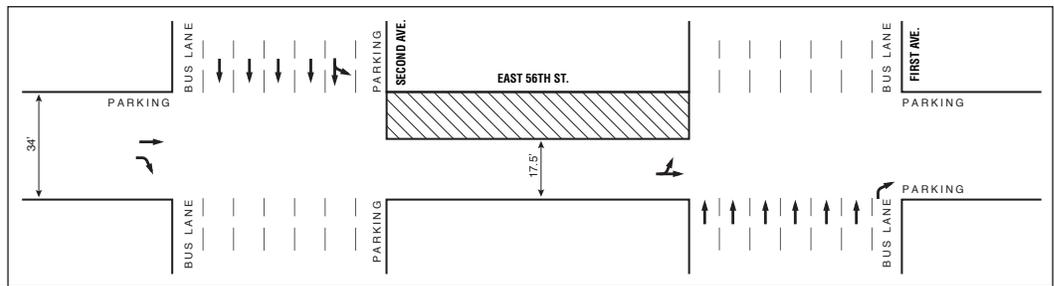
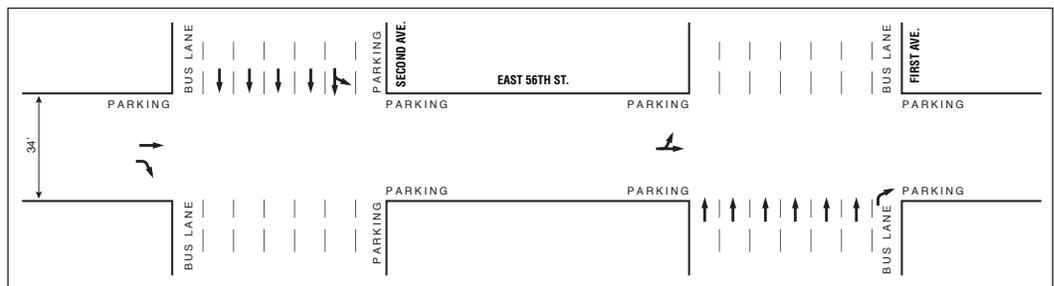
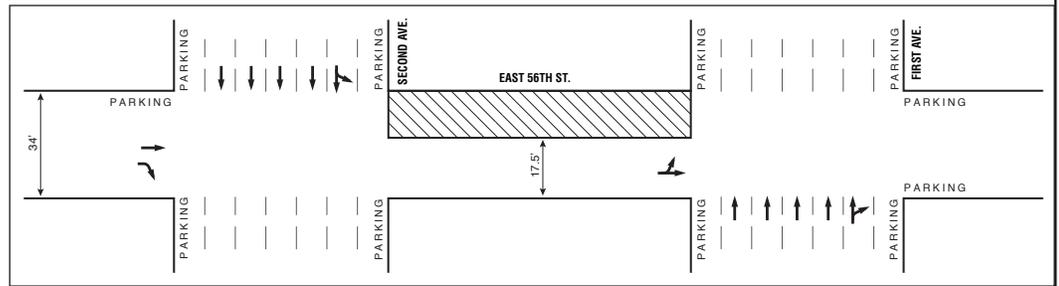
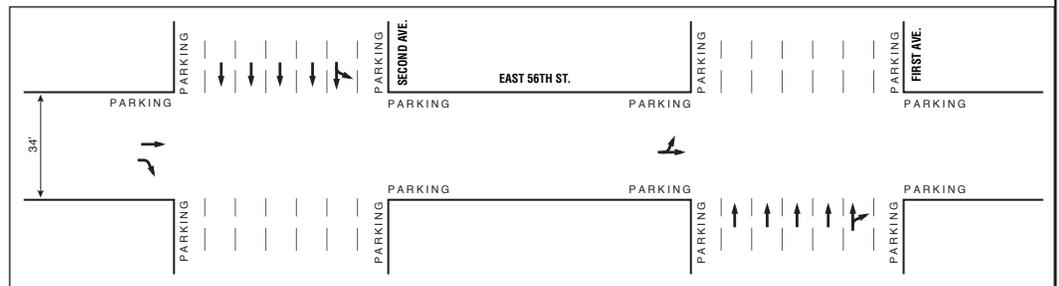
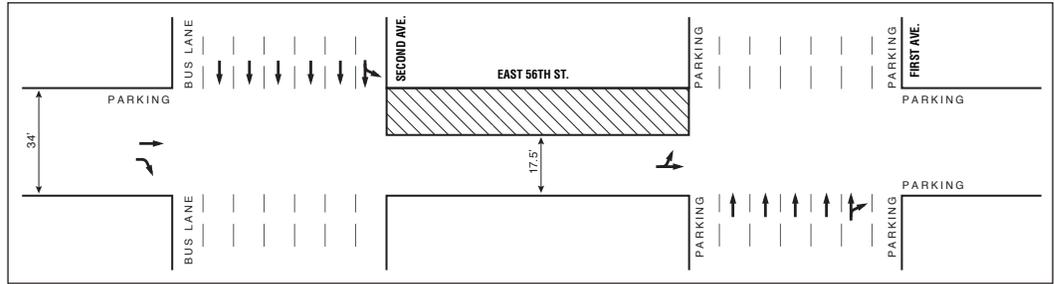
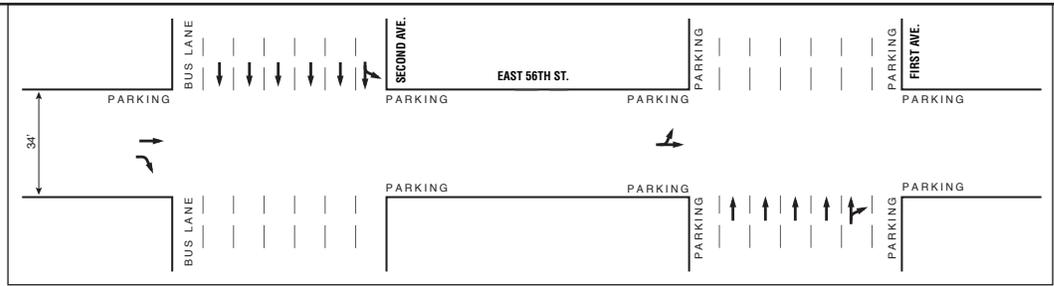
MIDDAY PEAK HOUR

FIRST AVENUE ROUTE CONFIGURATION

EXISTING CONFIGURATION

PM PEAK HOUR

FIRST AVENUE ROUTE CONFIGURATION



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

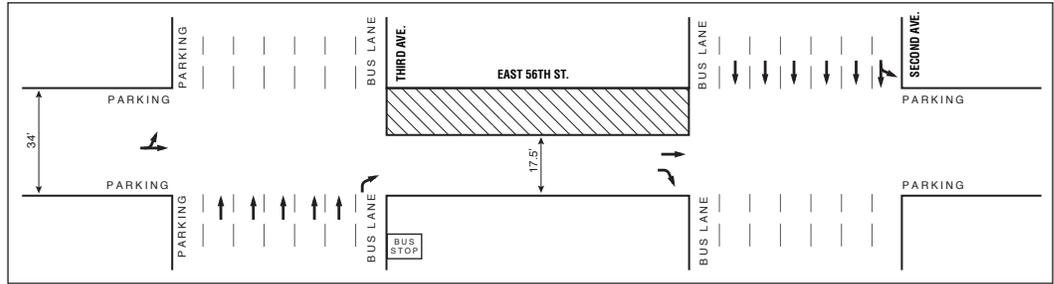
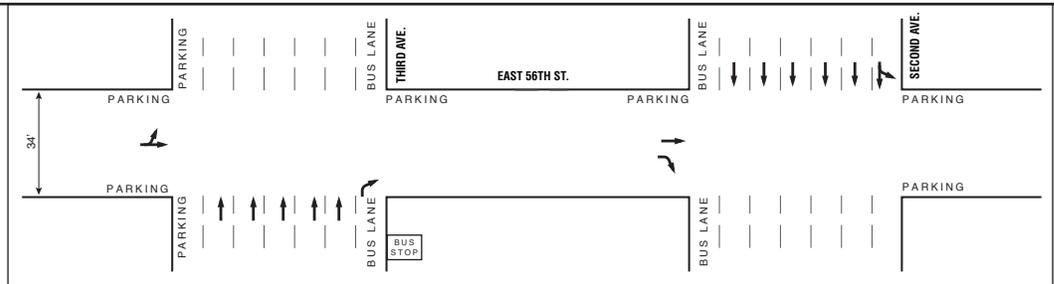
ROADWAY CONFIGURATIONS
FIRST AVENUE ROUTE - SEGMENT 5

FIGURE 5.9-28

EXISTING CONFIGURATION

AM PEAK HOUR

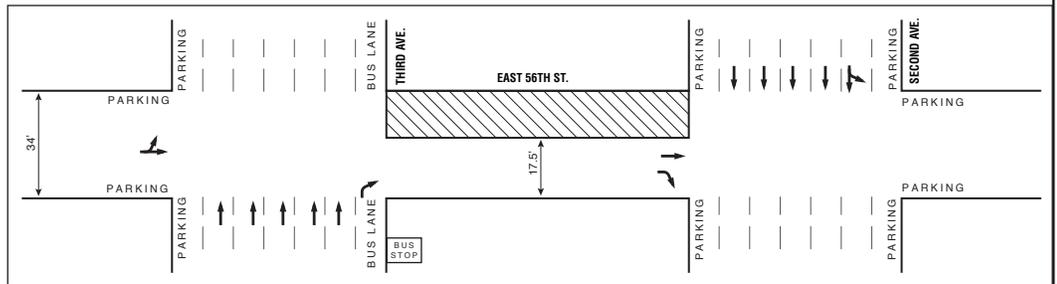
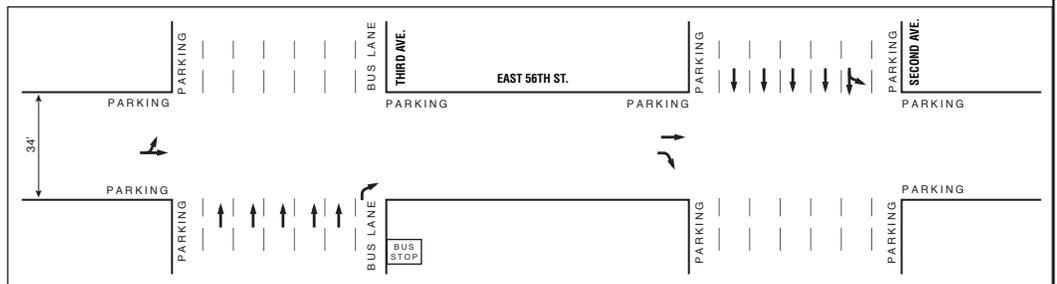
FIRST AVENUE ROUTE CONFIGURATION



EXISTING CONFIGURATION

MIDDAY PEAK HOUR

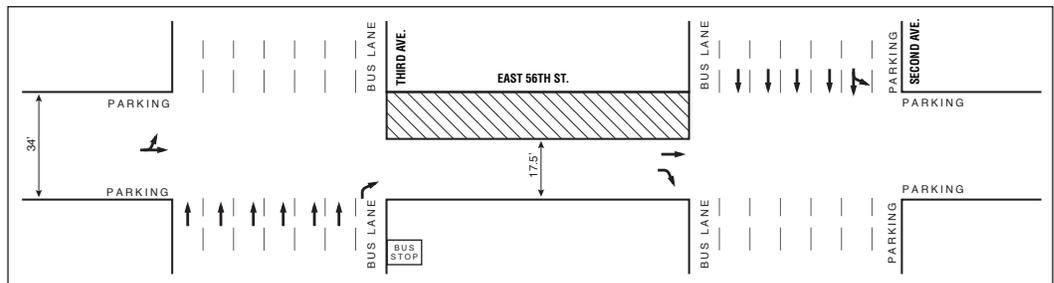
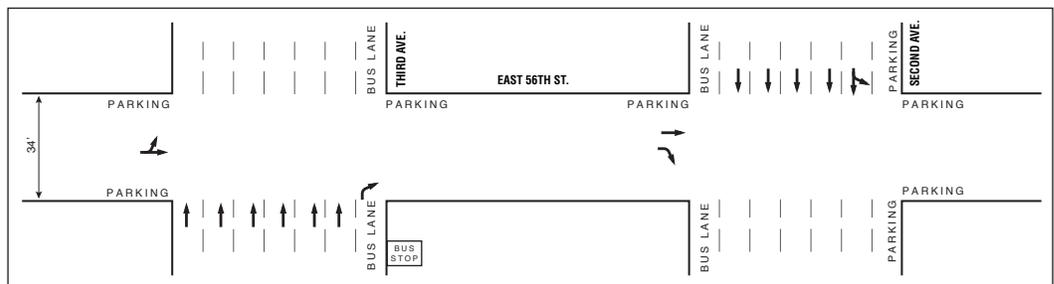
FIRST AVENUE ROUTE CONFIGURATION



EXISTING CONFIGURATION

PM PEAK HOUR

FIRST AVENUE ROUTE CONFIGURATION



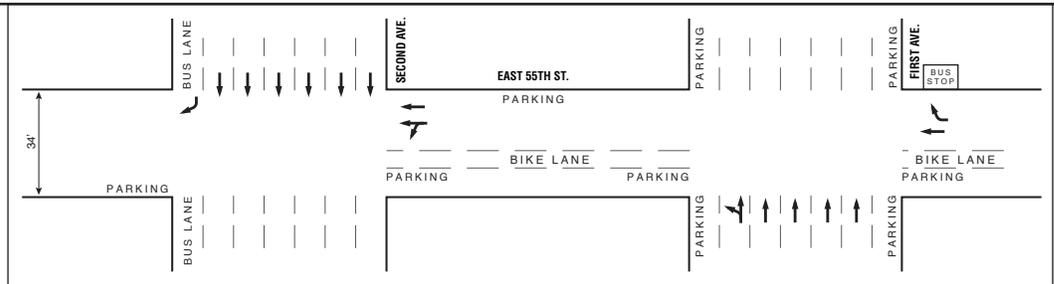
NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION
 PROPOSED SHAFT 33B TO CITY WATER TUNNEL NO. 3
 STAGE 2-MANHATTAN LEG
 WATER MAIN CONNECTIONS

ROADWAY CONFIGURATIONS
 FIRST AVENUE ROUTE - SEGMENT 7

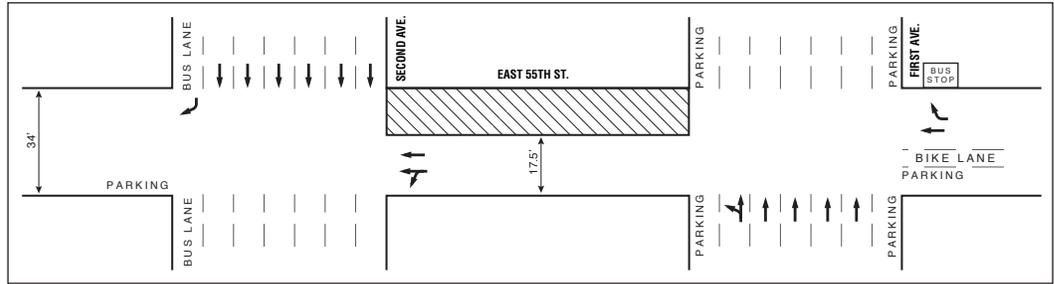
FIGURE 5.9-29

AM PEAK HOUR

EXISTING CONFIGURATION

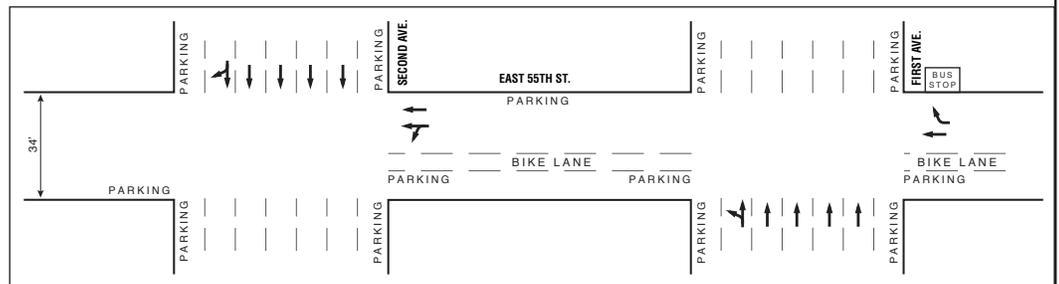


FIRST AVENUE ROUTE CONFIGURATION

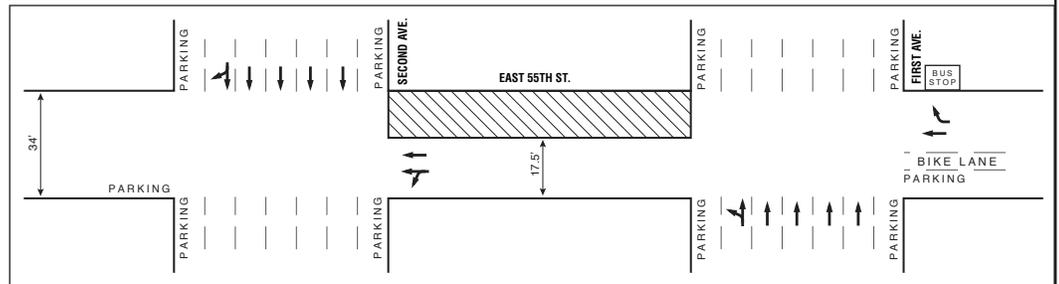


MIDDAY PEAK HOUR

EXISTING CONFIGURATION

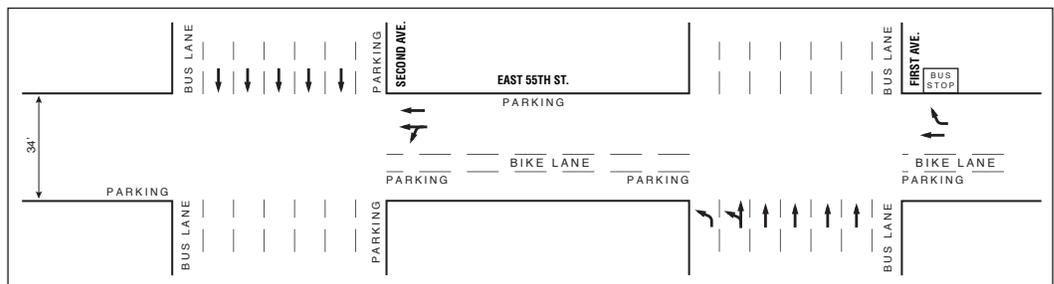


FIRST AVENUE ROUTE CONFIGURATION

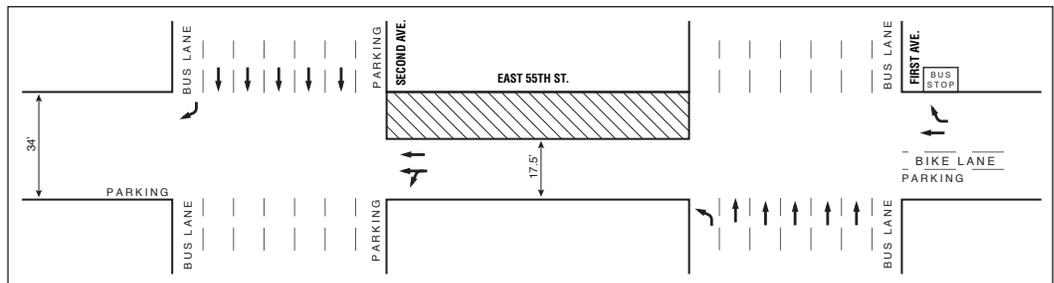


PM PEAK HOUR

EXISTING CONFIGURATION



FIRST AVENUE ROUTE CONFIGURATION



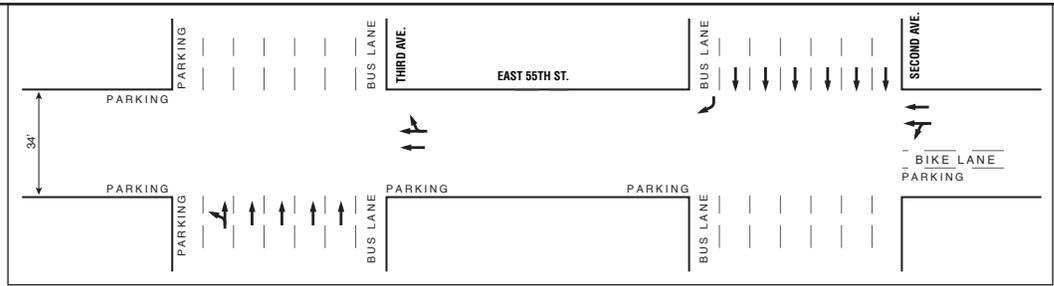
NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION
 PROPOSED SHAFT 33B TO CITY WATER TUNNEL NO. 3
 STAGE 2-MANHATTAN LEG
 WATER MAIN CONNECTIONS

ROADWAY CONFIGURATIONS
 FIRST AVENUE ROUTE - SEGMENT 9

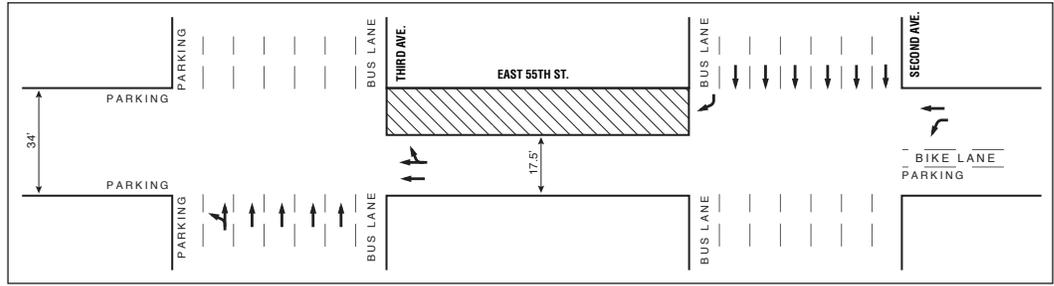
FIGURE 5.9-30

AM PEAK HOUR

EXISTING CONFIGURATION

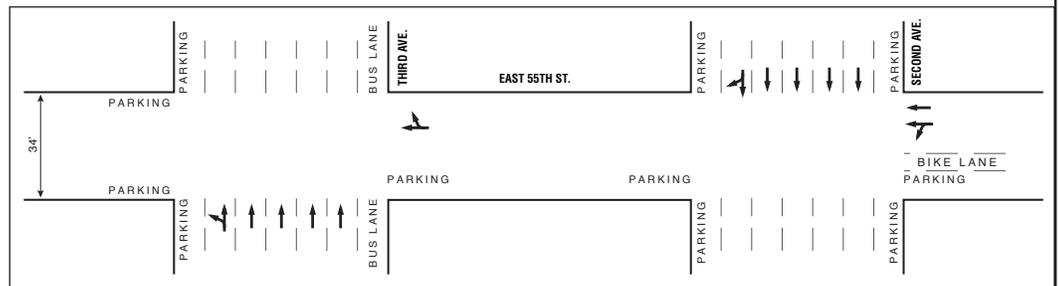


FIRST AVENUE ROUTE CONFIGURATION

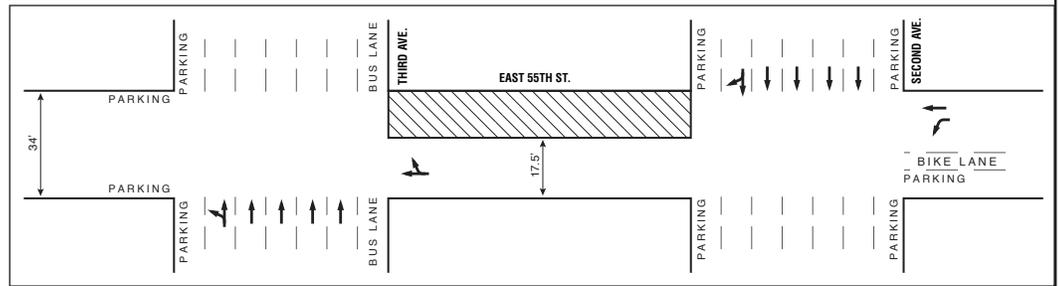


MIDDAY PEAK HOUR

EXISTING CONFIGURATION

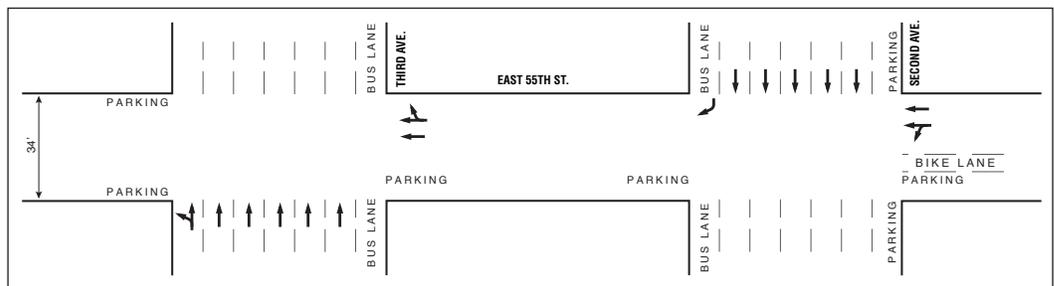


FIRST AVENUE ROUTE CONFIGURATION

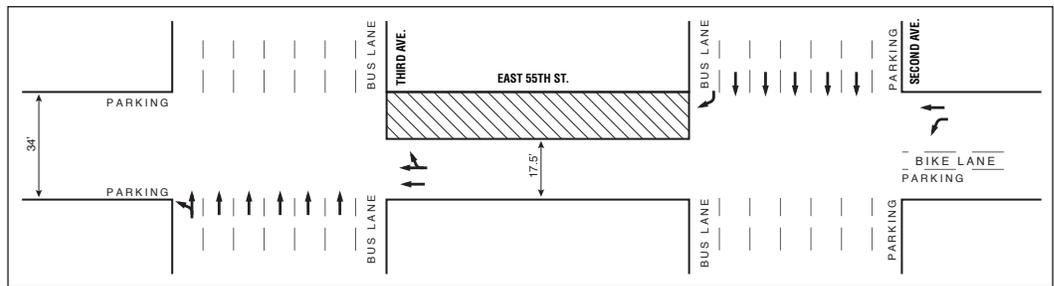


PM PEAK HOUR

EXISTING CONFIGURATION



FIRST AVENUE ROUTE CONFIGURATION



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

ROADWAY CONFIGURATIONS
 FIRST AVENUE ROUTE - SEGMENT 10

FIGURE 5.9-31

obstructed by construction downstream⁵ would be used for right-turn traffic. During the PM peak period, curbside activities would be prohibited and both easternmost lanes would be used for right-turn traffic only.

- Segment 5: Construction for this segment, as illustrated in Figure 5.9-28, would occur along E. 56th Street between First and Second Avenues. The construction would reduce the width of the E. 56th Street roadway from approximately 34 to 17.5 feet in 200-foot segments. Curbside activities would be prohibited across from the construction zone to maintain adequate roadway width for traffic flow.
- Segment 7: Construction for this segment, as illustrated in Figure 5.9-29, would occur along E. 56th Street between Second and Third Avenues. The construction would reduce the width of the E. 56th Street roadway from approximately 34 to 17.5 feet in 200-foot segments. Curbside activities would be prohibited across from the construction zone to maintain adequate roadway width for traffic flow. During the initial period of construction along this segment, the eastbound approach at Second Avenue would continue to operate with two lanes during all peak periods but on narrower lanes.
- Segment 9: Construction for this segment, as illustrated in Figure 5.9-30, would occur along E. 55th Street between First and Second Avenues. The construction would reduce the width of the E. 55th Street roadway from approximately 34 to 17.5 feet in 200-foot segments. Curbside activities would be prohibited across from the construction zone to maintain adequate roadway width for traffic flow. During the latter period of construction along this segment, the westbound approach at Second Avenue would continue to operate with two lanes during all peak periods but on narrower lanes. The bicycle lane striped outside of the existing south curb lane, however, would be temporarily displaced for the duration of this segment's construction.
- Segment 10: Construction for this segment, as illustrated in Figure 5.9-31, would occur along E. 55th Street between Second and Third Avenues. The construction would reduce the width of the E. 55th Street roadway from approximately 34 to 17.5 feet in 200-foot segments. Curbside activities would be prohibited across from the construction zone to maintain adequate roadway width for traffic flow. During the latter period of construction along this segment, the westbound approach at Third Avenue would continue to operate with two lanes during the AM and PM peak periods but on narrower lanes. During the midday peak period, the same one-lane approach is anticipated. Due to the lane shift across Second Avenue, the south travel lane on the upstream approach would likely change in operation from left-through to left-turn only.

Tables 5.9-7, 5.9-8, and 5.9-9 summarize the results of the intersection capacity analyses for the AM, midday, and PM peak hours under the roadway configurations described above for each of the construction segments. The operating levels at each of the affected intersections are described below.

⁵ "Downstream" from a street segment or an intersection refers to the one after in the direction of travel. So, for northbound First Avenue, E. 59th Street is downstream from E. 58th Street, whereas for southbound Second Avenue, E. 58th Street is downstream from E. 59th Street.

CHAPTER 5: WATER MAIN CONNECTIONS
5.9 TRAFFIC AND PARKING

Table 5.9-7
2008 Build and No Build Conditions Comparison
First Avenue route Base Scenario Water Main Connection Study Area Segments 1 & 3

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																								
Construction on First Avenue – Segment 1 Only (between E. 59th and E. 58th and between E. 57th and E. 56th Streets)																																																
E. 59 th Street (E-W) First Avenue (NB)	EB-LT	0.28	18.9	B	EB-LT	0.31	19.5	B	EB-LT	0.44	22.7	C	EB-LT	0.47	23.7	C	EB-LT	0.78	42.3	D	EB-LT	0.81	45.4	D	WB-TR	0.53	21.0	C	WB-TR	0.53	21.0	C	WB-TR	0.38	18.9	B	WB-TR	0.38	18.9	B	WB-TR	0.57	21.8	C	WB-TR	0.57	21.8	C
	NB-L	0.96	48.3	D	NB-L	1.22	121.8	F *	NB-L	0.63	21.7	C	NB-L	0.70	22.6	C	NB-L	0.70	22.6	C	NB-L	0.85	34.6	C	NB-L	0.70	22.6	C	NB-L	0.70	22.6	C	NB-L	0.70	22.6	C	NB-L	0.70	22.6	C								
	NB-LTR	0.99	36.2	D	NB-LTR	1.22	121.8	F *	NB-LTR	0.76	18.7	B	NB-LTR	1.22	123.5	F *	NB-LTR	0.74	18.0	B	NB-LTR	0.76	18.3	B	NB-LTR	0.99	36.2	D	NB-LTR	0.99	36.2	D	NB-LTR	0.76	18.3	B	NB-LTR	0.76	18.3	B								
	NB-R	0.07	11.2	B	NB-R	0.07	11.2	B	NB-R	0.07	11.2	B	NB-R	0.07	11.2	B	NB-R	0.07	11.2	B	NB-R	0.07	11.2	B	NB-R	0.07	11.2	B	NB-R	0.07	11.2	B	NB-R	0.07	11.2	B												
E. 58 th Street (EB) First Avenue (NB)	EB-L	1.04	77.9	E	EB-L	1.04	77.9	E	EB-LT	0.25	19.7	B	EB-LT	0.25	19.7	B	EB-LT	0.19	18.9	B	EB-LT	0.19	18.9	B	EB-T	0.35	21.0	C	EB-T	0.35	21.0	C	NB-TR	0.67	14.2	B	NB-TR	0.67	14.2	B	NB-T	1.10	71.0	E *	NB-T	0.66	13.9	B
	EB-T	0.35	21.0	C	EB-T	0.35	21.0	C	NB-TR	0.67	14.2	B	NB-TR	0.67	14.2	B	NB-T	1.10	71.0	E *	NB-T	1.10	71.0	E *	NB-TR	0.67	14.2	B	NB-TR	0.67	14.2	B	NB-T	0.66	13.9	B												
	NB-TR	0.74	15.2	B	NB-TR	0.74	15.2	B	NB-R	0.11	12.4	B	NB-R	0.11	12.4	B	NB-R	0.09	9.3	A	NB-R	0.09	9.3	A	NB-R	0.11	12.4	B	NB-R	0.11	12.4	B	NB-R	0.11	9.6	A												
	NB-R	0.11	12.4	B	NB-R	0.11	12.4	B	NB-R	0.11	12.4	B	NB-R	0.11	12.4	B	NB-R	0.09	9.3	A	NB-R	0.09	9.3	A	NB-R	0.11	12.4	B	NB-R	0.11	9.6	A																
E. 57 th Street (E-W) First Avenue (NB)	EB-DfL	0.90	67.9	E	EB-DfL	0.90	67.9	E	EB-DfL	0.64	43.1	D	EB-DfL	0.64	43.1	D	EB-DfL	0.69	49.9	D	EB-DfL	0.69	49.9	D	EB-T	0.39	24.3	C	EB-T	0.39	24.3	C	WB-TR	0.33	22.3	C	WB-TR	0.33	22.3	C	WB-TR	0.61	27.0	C	WB-TR	0.65	28.0	C
	EB-T	0.39	24.3	C	EB-T	0.39	24.3	C	WB-TR	0.61	27.0	C	WB-TR	0.61	27.0	C	EB-T	0.20	20.9	C	EB-T	0.20	20.9	C	WB-TR	0.65	28.0	C	WB-TR	0.65	28.0	C																
	WB-TR	0.33	22.3	C	WB-TR	0.33	22.3	C	NB-LTR	1.29	159.4	F *	NB-LTR	0.93	31.8	C	NB-LTR	1.58	287.4	F *	NB-L	1.04	83.5	F	NB-L	1.04	83.5	F	NB-L	0.97	62.2	E																
	NB-LTR	1.03	50.9	D	NB-LTR	1.29	159.4	F *	NB-LTR	0.93	31.8	C	NB-LTR	0.93	31.8	C	NB-LTR	1.58	287.4	F *	NB-L	1.04	83.5	F	NB-L	1.04	83.5	F	NB-L	0.97	62.2	E																
E. 56 th Street (EB) First Avenue (NB)	EB-LT	0.95	58.0	E	EB-LT	0.96	60.2	E	EB-LT	0.63	31.5	C	EB-LT	0.64	32.0	C	EB-LT	0.62	28.3	C	EB-LT	0.63	28.7	C	NB-TR	0.74	15.4	B	NB-TR	0.74	15.4	B	NB-T	1.03	41.8	D	NB-T	1.03	41.8	D	NB-R	0.25	11.6	B	NB-R	0.27	12.0	B
	NB-TR	0.74	15.4	B	NB-TR	0.74	15.4	B	NB-TR	0.64	10.9	B	NB-TR	0.64	10.9	B	NB-T	1.03	41.8	D	NB-T	1.03	41.8	D	NB-R	0.25	11.6	B	NB-R	0.27	12.0	B																
	NB-T	0.86	19.4	B	NB-T	0.86	19.4	B	NB-R	0.35	16.9	B	NB-R	0.22	12.2	B	NB-T	0.67	13.8	B	NB-T	0.67	13.8	B	NB-R	0.25	11.6	B	NB-R	0.27	12.0	B																
	NB-R	0.35	16.9	B	NB-R	0.35	16.9	B	NB-R	0.22	12.2	B	NB-R	0.22	12.2	B	NB-T	0.67	13.8	B	NB-T	0.67	13.8	B	NB-R	0.25	11.6	B	NB-R	0.27	12.0	B																
Construction on First Avenue – Segment 3 Only (between E. 58th and E. 57th and between E. 56th and E. 55th Streets)																																																
E. 58 th Street (EB) First Avenue (NB)	EB-L	1.04	77.9	E	EB-L	1.04	77.9	E	EB-LT	0.25	19.7	B	EB-LT	0.25	19.7	B	EB-LT	0.19	18.9	B	EB-LT	0.19	18.9	B	EB-T	0.35	21.0	C	EB-T	0.35	21.0	C	NB-TR	0.67	14.2	B	NB-TR	0.68	14.2	B								
	EB-T	0.35	21.0	C	EB-T	0.35	21.0	C	NB-TR	0.67	14.2	B	NB-TR	1.13	84.5	F *	NB-TR	1.13	84.5	F *	NB-T	0.55	12.4	B	NB-T	0.55	12.4	B	NB-TR	0.68	14.2	B																
	NB-TR	0.74	15.2	B	NB-TR	0.92	22.8	C	NB-TR	0.67	14.2	B	NB-TR	1.13	84.5	F *	NB-T	0.55	12.4	B	NB-T	0.55	12.4	B	NB-TR	0.68	14.2	B																				
	NB-R	0.09	9.3	A	NB-R	0.09	9.3	A	NB-TR	0.67	14.2	B	NB-TR	1.13	84.5	F *	NB-T	0.55	12.4	B	NB-T	0.55	12.4	B	NB-TR	0.68	14.2	B																				
E. 57 th Street (E-W) First Avenue (NB)	EB-DfL	0.90	67.9	E	EB-DfL	0.90	67.9	E	EB-DfL	0.64	43.1	D	EB-DfL	0.64	43.1	D	EB-DfL	0.69	49.9	D	EB-DfL	0.69	49.9	D	EB-T	0.39	24.3	C	EB-T	0.39	24.3	C	WB-TR	0.33	22.3	C	WB-TR	0.33	22.3	C								
	EB-T	0.39	24.3	C	EB-T	0.39	24.3	C	WB-TR	0.61	27.0	C	WB-TR	0.61	27.0	C	EB-T	0.20	20.9	C	EB-T	0.20	20.9	C	WB-TR	0.65	28.0	C	WB-TR	0.65	28.0	C																
	WB-TR	0.33	22.3	C	WB-TR	0.33	22.3	C	NB-LT	1.54	268.9	F *	NB-LT	0.93	31.8	C	NB-L	1.04	83.5	F	NB-L	1.04	83.5	F	NB-L	0.97	62.2	E																				
	NB-LTR	1.03	50.9	D	NB-LTR	1.21	125.9	F *	NB-LTR	0.93	31.8	C	NB-LTR	0.93	31.8	C	NB-L	1.04	83.5	F	NB-L	1.04	83.5	F	NB-L	0.97	62.2	E																				
E. 56 th Street (EB) First Avenue (NB)	EB-LT	0.95	58.0	E	EB-LT	0.96	60.2	E	EB-LT	0.63	31.5	C	EB-LT	0.64	32.0	C	EB-LT	0.62	28.3	C	EB-LT	0.63	28.7	C	NB-TR	0.74	15.4	B	NB-TR	0.74	15.4	B	NB-T	1.03	41.8	D	NB-T	1.03	41.8	D								
	NB-TR	0.74	15.4	B	NB-TR	0.93	23.7	C	NB-TR	0.64	10.9	B	NB-TR	0.64	10.9	B	NB-T	1.03	41.8	D	NB-T	1.03	41.8	D	NB-R	0.25	11.6	B	NB-R	0.27	12.0	B																
	NB-T	0.86	19.4	B	NB-T	0.86	19.4	B	NB-R	0.35	16.9	B	NB-R	0.22	12.2	B	NB-T	0.67	13.8	B	NB-T	0.67	13.8	B	NB-R	0.25	11.6	B	NB-R	0.27	12.0	B																
	NB-R	0.35	16.9	B	NB-R	0.35	16.9	B	NB-R	0.22	12.2	B	NB-R	0.22	12.2	B	NB-T	0.67	13.8	B	NB-T	0.67	13.8	B	NB-R	0.25	11.6	B	NB-R	0.27	12.0	B																
E. 55 th Street (WB) First Avenue (NB)	WB-T	0.74	37.9	D	WB-T	0.74	37.9	D	WB-T	0.64	32.3	C	WB-T	0.64	32.3	C	WB-T	0.77	39.8	D	WB-T	0.77	39.8	D	WB-R	0.22	22.5	C	WB-R	0.22	22.5	C	NB-LT	0.76	12.7	B	NB-LT	0.76	12.7	B	NB-L	0.40	11.8	B	NB-L	0.37	11.0	B
	WB-R	0.22	22.5	C	WB-R	0.22	22.5	C	WB-R	0.24	22.9	C	WB-R	0.24	22.9	C	WB-T	0.77	39.8	D	WB-T	0.77	39.8	D	WB-R	0.24	22.5	C	WB-R	0.24	22.9	C	NB-L	0.40	11.8	B	NB-L	0.37	11.0	B								
	NB-LT	0.76	12.7	B	NB-LT	0.95	23.1	C	NB-LT	0.70	11.7	B	NB-LT	0.70	11.7	B	NB-LT	1.02	47.0	D	NB-LT	1.27	151.6	F *	NB-LT	0.76	12.7	B	NB-LT	0.76	12.7	B	NB-L	0.40	11.8	B	NB-L	0.37	11.0	B								
	NB-L	0.40	11.8	B	NB-L	0.40	11.8	B	NB-LT	0.70	11.7	B	NB-LT	0.70	11.7	B	NB-LT	1.02	47.0	D	NB-LT	1.27	151.6	F *	NB-LT	0.76	12.7	B	NB-LT	0.76	12.7	B	NB-L	0.40	11.8	B	NB-L	0.37	11.0	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).
Where the same number of travel lanes would be maintained during construction and adjacent parking removed, Build delay levels may be lower than those projected for the No Build conditions.

CHAPTER 5: WATER MAIN CONNECTIONS
5.9 TRAFFIC AND PARKING

Table 5.9-8
2008 Build and No Build Conditions Comparison
First Avenue route Base Scenario Water Main Connection Study Area Segments 5 & 7

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
Construction on E. 56th Street – Segment 5 Only (between First and Second Avenues)																								
E. 56 th Street (EB)	EB-LT	0.95	58.0	E	EB-LT	0.82	37.3	D	EB-LT	0.63	31.5	C	EB-LT	0.51	27.0	C	EB-LT	0.62	28.3	C	EB-LT	0.51	24.0	C
First Avenue (NB)	NB-TR	0.74	15.4	B	NB-TR	0.74	15.4	B	NB-TR	0.64	10.9	B	NB-TR	0.64	10.9	B	NB-T	0.67	13.8	B	NB-T	0.67	13.8	B
																	NB-R	0.25	11.6	B	NB-R	0.25	11.6	B
E. 56 th Street (EB)	EB-T	0.70	34.3	C	EB-T	0.71	34.6	C	EB-T	0.42	25.7	C	EB-T	0.43	25.8	C	EB-T	0.50	27.2	C	EB-T	0.50	27.3	C
Second Avenue (SB)	EB-R	1.00	80.5	F	EB-R	1.00	80.5	F	EB-R	0.84	50.5	D	EB-R	0.84	50.5	D	EB-R	0.89	58.0	E	EB-R	0.89	58.0	E
	SB-LT	0.66	10.9	B	SB-LT	0.66	10.9	B	SB-LT	0.59	10.2	B	SB-LT	0.59	10.3	B	SB-LT	0.48	9.2	A	SB-LT	0.48	9.2	A
Construction on E. 56th Street – Segment 7 Only (between Second and Third Avenues)																								
E. 57 th Street (E-W)	EB-TR	1.06	93.0	F	EB-TR	1.06	93.0	F	EB-TR	1.08	91.4	F	EB-TR	1.08	91.4	F	EB-TR	1.01	63.3	E	EB-TR	1.01	63.3	E
Second Avenue (SB)	WB-DfL	1.05	77.9	E	WB-DfL	1.05	77.9	E	WB-DfL	0.52	29.1	C	WB-DfL	0.52	29.1	C	WB-DfL	0.20	20.8	C	WB-DfL	0.20	20.8	C
	WB-T	1.03	66.8	E	WB-T	1.03	66.8	E	WB-T	0.50	23.4	C	WB-T	0.50	23.4	C	WB-T	0.30	19.7	B	WB-T	0.30	19.7	B
	SB-L	0.14	18.3	B	SB-L	0.14	18.3	B	SBLTR	0.90	25.7	C	SB-LTR	0.90	25.9	C	SB-L	0.13	13.7	B	SB-L	0.13	13.7	B
	SB-TR	1.03	52.1	D	SB-TR	1.03	52.9	D					SB-TR	0.63	18.0	B	SB-TR	0.63	18.0	B	SB-TR	0.63	18.0	B
E. 56 th Street (EB)	EB-T	0.70	34.3	C	EB-T	0.64	31.2	C	EB-T	0.42	25.7	C	EB-T	0.37	24.2	C	EB-T	0.50	27.2	C	EB-T	0.46	26.0	C
Second Avenue (SB)	EB-R	1.00	80.5	F	EB-R	1.07	102.2	F *	EB-R	0.84	50.5	D	EB-R	0.90	60.7	E *	EB-R	0.89	58.0	E	EB-R	0.95	71.8	E *
	SB-LT	0.66	10.9	B	SB-LT	0.66	10.9	B	SB-LT	0.59	10.2	B	SB-LT	0.59	10.3	B	SB-LT	0.48	9.2	A	SB-LT	0.48	9.2	A
E. 56 th Street (EB)	EB-LT	0.82	37.5	D	EB-LT	0.82	37.5	D	EB-LT	0.69	26.6	C	EB-LT	0.69	26.6	C	EB-LT	0.90	46.7	D	EB-LT	0.90	46.7	D
Third Avenue (NB)	NB-T	0.67	14.2	B	NB-T	0.67	14.2	B	NB-T	0.75	19.5	B	NB-T	0.75	19.6	B	NB-T	0.60	13.1	B	NB-T	0.60	13.1	B
	NB-R	1.08	92.4	F	NB-R	1.08	94.7	F	NB-R	0.90	59.7	E	NB-R	0.91	61.5	E	NB-R	0.58	21.5	C	NB-R	0.63	24.9	C
Notes:	EB-Eastbound, WB-Westbound, NB-Northbound, SB-Southbound; L-Left, T-Through, R-Right, DfL-Analysis considers a Defacto Left Lane on this approach. 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 <i>Highway Capacity Manual Methodology</i> (HCS 2000). Where the same number of travel lanes would be maintained during construction and adjacent parking removed, Build delay levels may be lower than those projected for the No Build conditions.																							

CHAPTER 5: WATER MAIN CONNECTIONS
5.9 TRAFFIC AND PARKING

Table 5.9-9
2008 Build and No Build Conditions Comparison
First Avenue route Base Scenario Water Main Connection Study Area Segments 9 & 10

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
Construction on E. 55th Street – Segment 9 Only (between First and Second Avenues)																								
E. 55 th Street (WB) First Avenue (NB)	WB-T	0.74	37.9	D	WB-T	0.74	37.9	D	WB-T	0.64	32.3	C	WB-T	0.64	32.3	C	WB-T	0.77	39.8	D	WB-T	0.77	39.8	D
	WB-R	0.22	22.5	C	WB-R	0.22	22.5	C	WB-R	0.24	22.9	C	WB-R	0.24	22.9	C	WB-R	0.24	22.9	C	WB-R	0.24	22.9	C
	NB-LT	0.76	12.7	B	NB-LT	0.76	12.7	B	NB-LT	0.70	11.7	B	NB-LT	0.70	11.7	B	NB-L	0.40	11.8	B	NB-L	0.46	12.8	B
E. 55 th Street (WB) Second Avenue (SB)	WB-LT	0.66	29.2	C	WB-LT	0.64	28.6	C	WB-LT	0.49	25.1	C	WB-LT	0.49	25.1	C	WB-LT	0.52	25.7	C	WB-LT	0.51	25.4	C
	SB-T	0.65	10.8	B	SB-T	0.65	10.8	B	SB-TR	0.71	11.9	B	SB-TR	0.72	12.0	B	SB-T	0.51	9.5	A	SB-T	0.51	9.5	A
	SB-R	0.77	20.7	C	SB-R	0.78	21.1	C					SB-R	0.38	10.0	B	SB-R	0.38	10.1	B				
Construction on E. 55th Street – Segment 10 Only (between Second and Third Avenues)																								
E. 55 th Street (WB) Second Avenue (SB)	WB-LT	0.66	29.2	C	WB-L	0.48	28.1	C	WB-LT	0.51	25.6	C	WB-L	0.67	35.9	D	WB-LT	0.52	25.7	C	WB-L	0.60	32.1	C
					WB-T	0.78	37.9	D					WB-T	0.48	26.6	C				WB-T	0.55	28.2	C	
					SB-T	0.65	10.8	B	SB-TR	0.71	11.9	B	SB-TR	0.72	12.1	B	SB-T	0.51	9.5	A	SB-T	0.51	9.5	A
					SB-R	0.77	20.7	C	SB-R	0.92	38.8	D				SB-R	0.38	10.0	B	SB-R	0.46	11.7	B	
E. 55 th Street (WB) Third Avenue (NB)	WB-TR	0.96	49.5	D	WB-TR	0.93	45.3	D	WB-TR	0.76	30.0	C	WB-TR	0.65	24.3	C	WB-TR	0.57	25.6	C	WB-TR	0.55	25.1	C
	NB-LT	0.69	13.0	B	NB-LT	0.57	11.3	B	NB-LT	0.88	23.9	C	NB-LT	0.88	23.9	C	NB-LT	0.63	12.0	B	NB-LT	0.63	12.0	B
Notes:	<p>EB-Eastbound, WB-Westbound, NB-Northbound, SB-Southbound; L-Left, T-Through, R-Right, DfL-Analysis considers a Defacto Left Lane on this approach.</p> <p>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.</p> <p>V/C Ratio - Volume to Capacity Ratio, SEC/VEH - Seconds per vehicle; LOS - Level of service</p> <p>* Denotes impacted locations</p> <p>Analysis is based on the 2000 Highway Capacity Manual Methodology (HCS 2000).</p> <p>Where the same number of travel lanes would be maintained during construction and adjacent parking removed, Build delay levels may be lower than those projected for the No Build conditions.</p>																							

- Segment 1 – Construction on First Avenue, E. 56th to E. 57th Street and E. 58th to E. 59th Street: As shown in Table 5.9-7, construction along First Avenue for Segment 1 would result in temporary adverse impacts at E. 59th, E. 58th, and E. 57th Streets in one or more peak periods. At E. 59th Street, the northbound approach would deteriorate in the AM peak hour from LOS D to LOS F, with delays increasing from 36.2 seconds per vehicle (spv) to 121.8 spv, and in the midday peak hour from LOS B to LOS F, with delays increasing from 18.7 spv to 123.5 spv. At E. 58th Street, delays on the northbound-right approach would increase from 14.2 spv (LOS B) to 71.0 spv (LOS E) for through traffic and 12.4 spv (LOS B) for right turns in the midday peak hour.

At E. 57th Street, the northbound approach would be impacted in all three analysis peak periods, with delays increasing from 50.9 spv (LOS D) to 159.4 spv (LOS F) in the AM peak hour, from 31.8 spv (LOS C) to 287.4 spv (LOS F) in the midday peak hour, and from 47.0 spv (LOS D) on the left-through movement and 15.3 spv (LOS B) on the right-turn only movement to 158.0 spv (LOS F) on the combined approach in the PM peak hour. The substantial increases in delay at the northbound approaches of these intersections would severely impact the overall traffic flow along the First Avenue corridor near the Queensboro Bridge.

- Segment 3 – Construction on First Avenue, E. 55th to E. 56th Street and E. 57th to E. 58th Street: For Segment 3, construction-related temporary adverse impacts would result for northbound traffic along First Avenue at E. 58th, E. 57th, E. 56th, and E. 55th Streets. At E. 58th Street, the northbound approach would deteriorate during the midday peak hour from LOS B to LOS F, with delays increasing from 14.2 spv to 84.5 spv. At E. 57th Street, northbound approach delays would increase from 50.9 spv (LOS D) to 125.9 spv (LOS F) for the left-through movement and 23.2 spv (LOS C) for right turns in the AM peak hour. During the midday peak hour, delays at the same approach would increase from 31.8 spv (LOS C) to 268.9 spv (LOS F) and 18.2 spv (LOS B) for the left-through and right-turn movements, respectively. During the PM peak hour, the intersection's northbound left-turn movement would deteriorate from LOS D to LOS F, with delays increasing from 47.0 to 151.6 spv. At E. 56th Street, delays for the northbound approach would increase from 10.9 spv (LOS B) to 60.1 spv (LOS E) in the midday peak hour, while at E. 55th Street the northbound approach delay would increase from 11.7 spv (LOS B) to 107.2 spv (LOS F) during the same time period. The substantial increases in delay at the northbound approaches of these intersections would severely impact the overall traffic flow along the First Avenue corridor near the Queensboro Bridge.
- Segment 5 – Construction on E. 56th Street, First to Second Avenue: No temporary adverse impacts are expected to result from the construction of Segment 5.
- Segment 7 – Construction on E. 56th Street, Second to Third Avenue: For Segment 7, temporary adverse impacts were identified for E. 56th Street at Second Avenue during all peak periods. Delays for the eastbound right-turn movement would increase from 80.5 spv (LOS F) to 102.2 spv (LOS F) during the AM peak hour, from 50.5 spv (LOS D) to 60.7 spv (LOS E) during the midday peak hour, and from 58.0 spv (LOS E) to 71.8 spv (LOS E) during the PM peak hour. These increases in delay represent the worst-case conditions for E. 56th Street traffic and would only occur when the construction takes place at the intersection approach. In addition, these temporary adverse impacts, as shown by the projected increases in delays, are expected to be confined to the block where construction would be taking place and not impact the traffic flow on surrounding streets.

- Segment 9 – Construction on E. 55th Street, First to Second Avenue: No temporary adverse impacts are expected to result from the construction of Segment 9.
- Segment 10 – Construction on E. 55th Street, Second to Third Avenue: No temporary adverse impacts are expected to result from the construction of Segment 10.

Mid-block Traffic Assessment

The construction of the proposed water mains, as described above, have been assumed to create work zones along the east curbs of First Avenue between E. 55th and E. 59th Streets, and along the north curbs of E. 55th and E. 56th Streets between First and Third Avenues. The work zones would vary in width on First Avenue from 16.5 to 24.5 feet and would be 18.5 feet wide along both cross streets.

Along the east side of First Avenue, the work zone would displace curbside parking, truck loading and unloading, and bus stops for 12 to 20 weeks at a time. While the adjoining sidewalks would be maintained throughout construction, loading/unloading activities and curbside pick-ups and drop-offs would be temporarily displaced to adjacent blocks and cross-streets.

Along E. 55th and E. 56th Streets, construction would take place in approximately 200-foot segments and steel plates for mid-block access of the adjacent sidewalks would be provided. Access to parking garages and building driveways would also be maintained. If only one access to a certain driveway exists and restrictions to that driveway would be necessary, affected persons would be notified in advance and the restriction would be as short term as possible. Additional sidewalk connections would be sequenced along each block at locations to be determined during the design/construction process.

Since E. 55th and E. 56th Streets would essentially operate with a wide 17.5-foot lane or two narrow lanes adjacent to the construction zone, passing maneuvers or steering around stopped vehicles could be difficult to negotiate. Therefore, any stopping of commercial traffic or school buses could potentially result in traffic delays and queuing. Along E. 55th Street, conditions could be exacerbated by activities at the U. S. Post Office on the south side of the street. However, since these east-west segments are substantially longer than the First Avenue segments and construction zones would be delineated for portions of each block at a time, sections along E. 55th and E. 56th Streets could be maintained free from construction or partially covered with steel plates to allow for limited curbside deliveries, although it is likely that some of existing curbside activities would be displaced onto adjacent streets or avenues during construction.

Queuing Analysis

Under existing conditions, traffic volumes along First Avenue often approach capacity and some queuing during peak periods was observed. Due to background traffic growth and activities attributed to other nearby developments, this condition is expected to worsen in the Future Without the Project, as peak period queues near the Queensboro Bridge are expected to extend to upstream blocks. As detailed above, construction disruptions, particularly along First Avenue during Segments 1 and 3, were projected to result in increased traffic congestion in the Study Area, assuming that traffic would arrive at each intersection and not be metered by an upstream bottleneck. In reality, queues forming behind a bottleneck would persist for several blocks and conditions projected for intersections downstream from a bottleneck may not be as severe as predicted while those at the upstream intersections would be more congested. A summary of the likely queuing conditions is provided below.

- Segment 1 – Construction on First Avenue, E. 56th to E. 57th Street and E. 58th to E. 59th Street: During the AM peak hour, traffic queues from all four of the First Avenue northbound approaches between E. 56th and E. 59th Streets are expected to extend beyond the respective blocks, with predicted queues ranging from approximately 1.5 to 3.5 blocks long and up to 1.5 blocks longer than those under No Build conditions. Based on the queuing estimates, the bottleneck created at the E. 57th Street intersection is expected to meter traffic flow and form residual queues extending to several other intersections upstream beyond the construction zone. During the midday peak hour, construction activities are expected to result in northbound traffic queues of approximately 2.5 to 5.5 blocks long and up to 4 blocks longer than those projected for the No Build conditions. These comparatively longer queues are primarily a result of the additional lane taken for construction during the midday period. Although traffic volumes along First Avenue would be lower during the midday peak hour, predicted congestion would be the most severe, with queues likely to extend several blocks upstream beyond the construction zone. During the PM peak hour, predicted queues are relatively lower than the other two analysis time periods due to the restriction of curbside activities along the west side of First Avenue, making available an additional northbound travel lane. As a result, traffic queues would be similar to No Build conditions at E. 58th and E. 59th Streets with minimal spillback onto the upstream block. However, at E. 57th Street, the increase in queues over No build conditions is expected to be approximately 1.5-block long to just over 3.5 blocks long. As with the AM and midday peak hours, traffic queues predicted for the PM peak hour would likely extend beyond the construction zone to several upstream blocks.
- Segment 3 – Construction on First Avenue, E. 55th to E. 56th Street and E. 57th to E. 58th Street: Queuing conditions during Segment 3 construction are expected to be similar to those explained above for Segment 1. During the AM peak hour, traffic queues from the intersections within the construction zone are expected to range from approximately 1.5 to 3 blocks long, which are up to 1 block longer than those under No Build conditions. Based on the queuing estimates, the bottleneck created at the E. 57th Street intersection is expected to meter traffic flow and form residual queues extending to several other intersections upstream beyond the construction zone. During the midday peak hour, construction activities are expected to result in northbound traffic queues of approximately 3 to 5 blocks long and up to 3.5 blocks longer than those projected for the No Build conditions. As with Segment 1 construction, these comparatively longer queues are primarily a result of the additional lane taken for construction during the midday period and are likely to extend several blocks upstream beyond the construction zone. During the PM peak hour, predicted queues are relatively lower than the other two analysis time periods due to the restriction of curbside activities currently in place along the west side of First Avenue, making available an additional northbound travel lane. As a result, traffic queues would be similar to No Build conditions at E. 58th Street with minimal spillback onto the upstream block. However, at E. 57th Street, the increase in queues over No build conditions is expected to be approximately 1.5-block long to 3.5 blocks long. As with the AM and midday peak hours, traffic queues predicted for the PM peak hour would likely extend beyond the construction zone to several upstream blocks.
- Segment 5 – Construction on E. 56th Street, First to Second Avenue: Queuing conditions during Segment 5 construction are expected to be similar to those under No Build conditions.
- Segment 7 – Construction on E. 56th Street, Second to Third Avenue: Queuing conditions during Segment 7 construction are expected to be similar to those under No Build conditions.

- Segment 9 – Construction on E. 55th Street, First to Second Avenue: Queuing conditions during Segment 9 construction are expected to be similar to those under No Build conditions.
- Segment 10 – Construction on E. 55th Street, Second to Third Avenue: Queuing conditions during Segment 10 construction are expected to be similar to those under No Build conditions except during the early stages when lane disruptions occur near Second Avenue. During the AM peak hour, the narrower receiving lane along E. 55th Street is anticipated to result in an increase in queues for the southbound right-turn movement from Second Avenue, as predicted queues would likely increase to just over one block long.

The queuing conditions described above are anticipated to result in motorists considering alternate routes to reach their destinations, potentially affecting adjacent available routes (Sutton Place or Third Avenue). However, as discussed earlier, the construction efforts would be conducted in coordination with the NYCDOT OCMC, which requires the preparation of maintenance and protection of traffic (MPT) plans to address potential traffic impacts, such as those resulting from capacity reductions during construction on City streets. The construction of the water main connections would likely not proceed without the implementation of mitigation measures to alleviate congested conditions due to the loss of travel lanes. Mitigation measures that are available to address the anticipated traffic impacts are described in Section 5.16, “Mitigation Measures.” When applied, these measures are expected to address the impacts to water main constructions to some extent by increasing capacity, reducing delays, and alleviating queues to conditions that would be typical of traffic flow under such street surface disruptions.

Parking Analysis

During the construction of the water main connections, curb lanes in each segment would be temporarily occupied by construction work zones. Along First Avenue, construction during Segments 1 and 3 would displace 5 to 10 curbside spaces per block (two blocks under construction at a time during each segment for a total of 10 to 20 displaced spaces for the duration of each segment) for periods of between 12 and 20 weeks. On the east side of First Avenue, use of the curb lane is permitted between E. 55th and E. 56th Streets for loading and unloading from 7:00 a.m. to 4:00 p.m. and up to 10 spaces would be displaced. Between E. 56th and E. 57th Streets, loading and unloading is permitted during the same times, and up to 10 spaces would be displaced as well. Between E. 57th and E. 58th Streets, the parking regulations allow for loading and unloading during the same time period and parking is not permitted on the south end of the block due to a bus stop. Up to 5 spaces plus the bus stop would be displaced. Between E. 58th and E. 59th Streets, loading and unloading is permitted from 7:00 a.m. to 3:00 p.m. and approximately 10 spaces would be displaced. From 3:00 or 4:00 p.m. to 7:00 p.m., curbside activities are prohibited along the east curb of First Avenue to provide for a dedicated bus lane. The water main construction would also temporarily disrupt this afternoon peak period bus operation.

During the construction of Segments 5, 7, 9, and 10, curbside usage on both sides of the cross streets would be temporarily displaced. On E. 55th and E. 56th Streets, each segment of construction would temporarily displace up to 10 curbside spaces through the construction area and up to 15 curbside spaces across from it. While the limits of disruptions would shift, this level of curb space displacement would occur over a maximum period of 12 weeks per block. On E. 56th Street between First and Second Avenues, current parking regulations allow for loading and unloading activities from 8:00 a.m.

to 7:00 p.m. on both sides of the street and a maximum of 45 curbside spaces would be affected during construction. On E. 56th Street between Second and Third Avenues, metered parking for commercial vehicles is permitted from 7:00 a.m. to 7:00 p.m. Approximately 40 curbside spaces would be affected during construction on this segment. On E. 55th Street between First and Second Avenues, parking on the south side of the street is restricted to loading and unloading from 8:00 a.m. to 7:00 p.m. On the north side of the street, parking is permitted mid-block but prohibited on each end of the block. Approximately 35 curbside spaces would be affected during construction on this segment. On E. 55th Street between Second and Third Avenues, metered parking for commercial vehicles is provided on the south side of the street from 10:00 a.m. to 3:00 p.m. On the north side, curbside usage is limited on the mid-block and not permitted at both ends of the block. Approximately 30 curbside spaces would be affected from the water main construction on this block. Both E. 55th Street and E. 56th Streets are used for commercial parking or loading and unloading vehicles during the day and for auto parking overnight. The parking displacement would be short-term and according to CEQR criteria, such a short-term displacement, particularly within the Manhattan Central Business District (CBD), would not constitute a significant adverse impact.

Secondary Segment Construction Assessment

In addition to the primary water main construction efforts and the associated impacts described above, secondary construction would be required to connect the water mains at intersections and along the east side of Third Avenue between E. 55th and E. 56th Streets. The intersection work would be expected to occur during off-peak hours, to the extent possible, by imposing temporary partial closures at each location to ensure minimal disturbance to area traffic. This effort, to be accomplished via closing half of the cross streets at a time while continuing to process traffic, would take approximately 10 weeks to complete for each intersection along the water main connection route. To connect the water mains to the existing trunk main distribution system on Third Avenue between E. 55th and E. 56th Streets, temporary closures along Third Avenue for a single block would be required for approximately 12 weeks. Temporary disruptions and curb lane closures (including loss of bus lane use) would also result. If these efforts are conducted during daytime hours, the likely traffic impacts would be similar to those described for the First Avenue and cross-street construction and similar mitigation measures as those identified in Section 5.16 are expected to be required.

Safety Analysis

As described in Section 5.9.2, "Existing Conditions," four Study Area intersections were identified as high-pedestrian-accident locations, including the First Avenue intersections with E. 57th and E. 59th Streets, Second Avenue and E. 57th Street, and Third Avenue and E. 55th Street. The water main construction would reduce the roadway width of First Avenue at E. 57th and E. 59th Streets. However, all sidewalks and crosswalks would be maintained during construction and pedestrian crossing distances would be reduced, thereby also reducing pedestrian exposure. The number of conflicting turning vehicles would remain the same with or without construction. At Third Avenue and E. 55th Street, similar crossing conditions would result with the east-west connection of the water mains. At all three of these intersections, as well as the Second Avenue intersection with E. 57th Street, the water main construction would not generate appreciable new pedestrian traffic or truck traffic through these high-pedestrian-accident locations.

The one potential safety issue during construction may be the maintenance of proper sight-line for turning traffic (i.e., from First Avenue northbound to E. 57th Street eastbound). It is expected that the contract specifications would require that proper line of sight be maintained to ensure pedestrian safety. Hence, no decrease in pedestrian safety is anticipated with the proposed construction at any of the Study Area's high-pedestrian-accident locations, and water main construction is not expected to result in any potential significant adverse impacts to pedestrian safety.

Impact Assessment Summary

Under the First Avenue route Base Scenario, construction of the water main connections would result in temporary adverse traffic impacts due to lane closures along the First Avenue corridor and along E. 56th Street. No adverse impacts are expected from the construction on E. 55th Street. All intersections on First Avenue would be impacted in one or more peak hours. Traffic impacts at cross streets are anticipated in one or more peak hours on E. 56th Street at Second Avenue. These impacts would occur for Segments 1 through 7, which, according to the current construction schedule, would take place over a period of approximately 100 weeks. For approximately 75 weeks when First Avenue would be under construction, predicted queues would extend several blocks upstream beyond the construction zone. However, the First Avenue route Base Scenario is a conservative and reasonable worst-case scenario the does not include mitigation measures. While it is not likely that water main construction would proceed in the unmitigated manner which it contemplates, the existing congestion and the nature of the curbside usage (short-term parking and commercial loading/unloading) within the First Avenue corridor are likely to make mitigation of these temporary adverse impacts difficult. Many options for typical mitigation measures that are used elsewhere, for example, parking restrictions and the use of detour routes would likely not be entirely successful in addressing these adverse impacts because illegal curbside activities would be expected to block lanes even with parking restrictions in place and other traffic corridors in the general area do not have enough available capacity to absorb traffic that could be diverted from First Avenue. Nevertheless, NYCDDC and NYCDOT would endeavor to address potential traffic disruptions that would result from this construction scenario, if it was to be the one ultimately constructed. Mitigation measures that could be implemented to address the traffic impacts are presented in Section 5.16.

Sutton Place Route

Traffic Operations Analysis

Under this scenario, both mains would be constructed concurrently on Sutton Place. The Sutton Place route would take approximately 51 months to complete and require traversing E. 59th, E. 56th and E. 55th Streets between First Avenue and Sutton Place and involve construction along Sutton Place between E. 55th and E. 59th Streets. West of First Avenue, the water mains would follow the First Avenue route and continue along E. 55th and E. 56th Streets to connect with the trunk mains under Third Avenue. Construction schedule for the Sutton Place route would be similar to the First Avenue route, with most block segments taking 12 weeks each and intersection segments taking 10 weeks each. The initial segment of water main connections, which traverses E. 59th Street from First Avenue to Sutton Place, would include the construction of the venturi chamber for the preferred Shaft Site and take 24 weeks to complete.

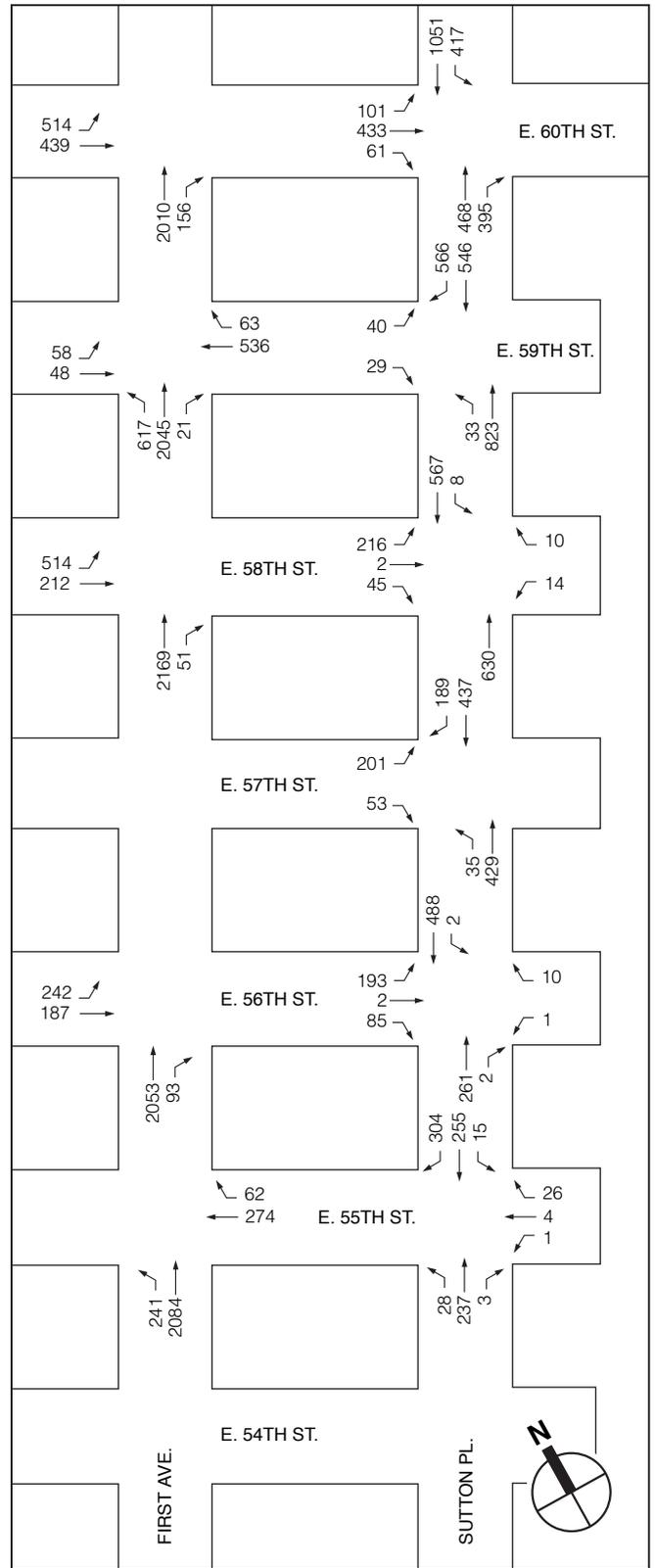
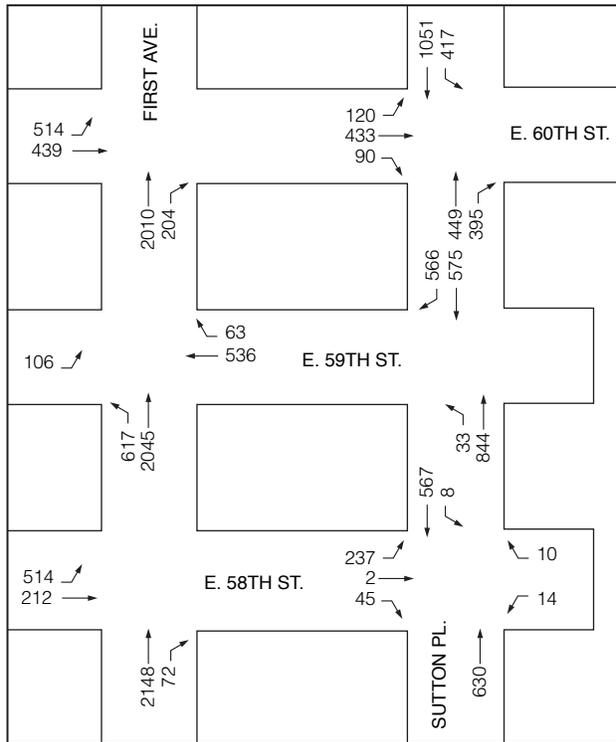
Concurrent construction of two water mains would occupy 16.5 feet of roadway width during the AM and PM peak periods and 24.5 feet during the midday and off-peak periods. For the purposes of this analysis, the construction is assumed to be conducted in a manner similar to the Base Scenario presented for the First Avenue route. The water main connections would begin with an E. 59th Street Segment (south side of the street) between First Avenue and Sutton Place, continue on the west side of Sutton Place in two stages, then across E. 56th and E. 55th Streets on the north side of these streets between Sutton Place and First Avenue. For ease of comparison, the Sutton Place segments are analogously referred to as Segments 1 and 3, whereas the E. 56th Street and E. 55th Street segments are referred to as Segment 5 and Segment 9, respectively.

Between First Avenue and Sutton Place, E. 59th Street currently accommodates two-way traffic on a 35-foot roadway. During construction of the E. 59th Street Segment, it would be converted to one-way westbound operation, with construction zones of approximately 200 feet at a time implemented to minimize curbside and access disruptions. Two feet of sidewalk space would be taken from the north side of the street to enhance the available roadway space during construction. Eastbound access would temporarily be discontinued, with traffic likely diverting to E. 58th and E. 60th Streets. Sutton Place is a two-way roadway of approximately 60 feet wide and carries two travel lanes and one curb lane in each direction. Construction of the water main connections would require the same roadway space as would be required along the First Avenue route under the Base Scenario, with two lanes closed during the AM and PM peak periods and three lanes closed during the midday peak period. Along E. 55th and E. 56th Streets, both predominantly residential in character between First Avenue and Sutton Place and both serve lower traffic volumes than west of First Avenue, a single main would be constructed on each, incorporating an 18.5-foot wide area that is consisted of 16.5 feet of roadway space and 2 feet of sidewalk space. To minimize curbside and access disruptions along all cross streets, the construction would occur in segments of approximately 200 feet each. Although construction would only take place on one side of the street, curbside restrictions across from the construction zone were also assumed (for approximately 280 feet to include 40 feet transition on each end) to maintain travel lane(s). To ensure that traffic flow would be maintained, particularly during peak hours, intersection work would be conducted in sections and, where possible, during the evening or late night hours when traffic volumes are lower.

Projected 2008 Study Area traffic volumes, incorporating the construction truck traffic detailed under the First Avenue route discussions, are presented in Figures 5.9-32, 5.9-33, and 5.9-34 for the AM, midday, and PM peak hours, respectively. These figures also include an illustration of the anticipated traffic diversion during the construction of the E. 59th Street Segment.

The specific roadway space requirements for the water main connection construction are detailed below for the E. 59th Street Segment, as well as Segments 1, 3, 5, and 9. The anticipated changes to lane configuration along the E. 59th Street and the Sutton Place corridor, as well as along westbound E. 55th Street and eastbound E. 56th Street, are depicted in Figures 5.9-35 through 5.9-43.

- E. 59th Street Segment: Construction for this segment, which would occur in approximately 200-foot sections at a time and include taking 2 feet from the north sidewalk for vehicular traffic, would reduce the effective roadway width of E. 59th Street to 20.5 feet during the AM and PM peak hours and to 12.5 feet during midday peak and all non-peak hours. As illustrated in Figure 5.9-35, E. 59th

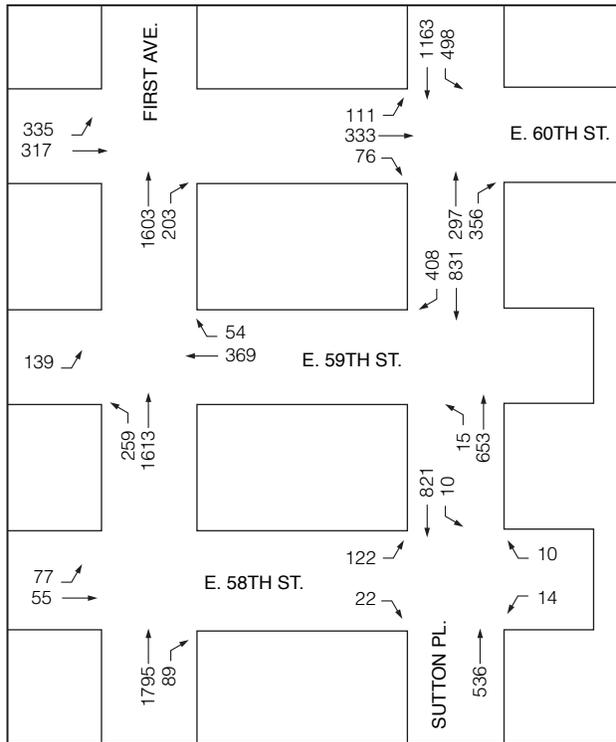


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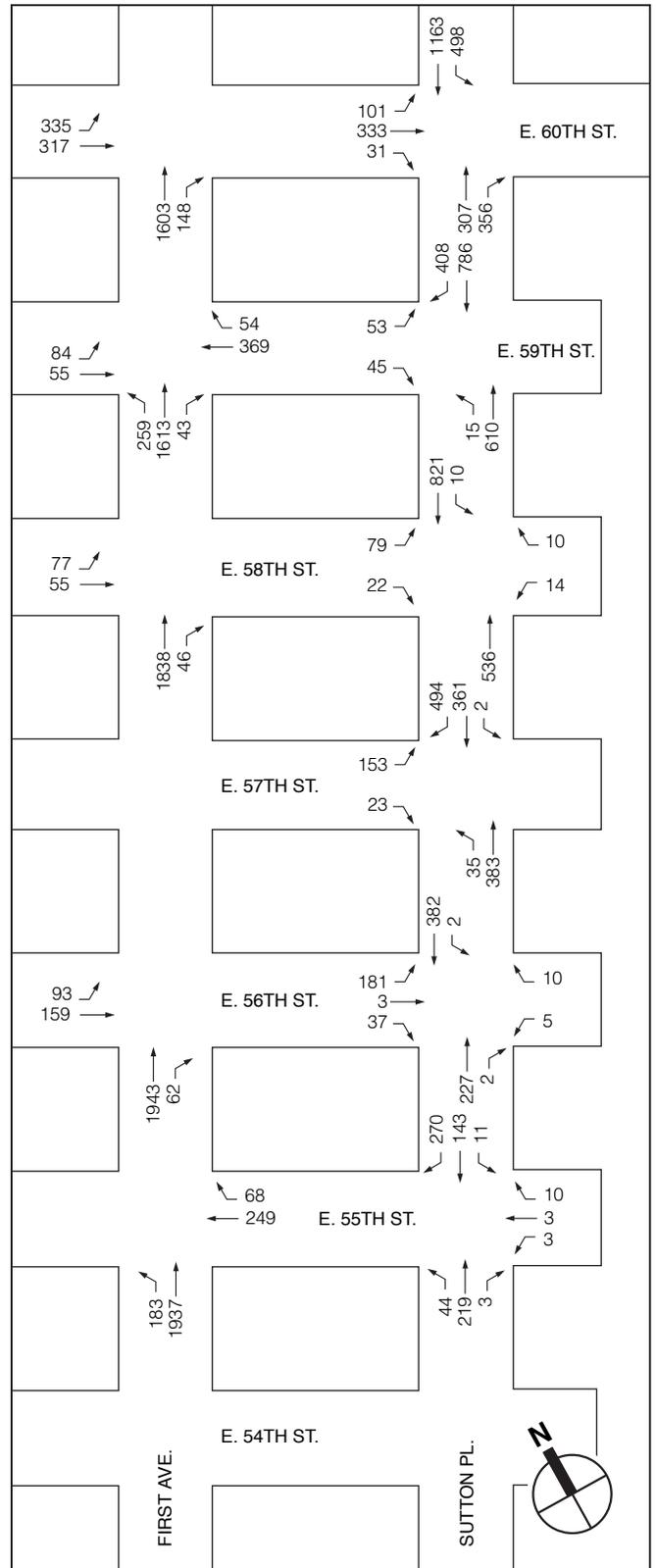


NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION
 PROPOSED SHAFT 33B TO CITY WATER TUNNEL NO. 3
 STAGE 2-MANHATTAN LEG
 WATER MAIN CONNECTIONS
 2008 BUILD TRAFFIC VOLUME NETWORK
 WATER MAIN STUDY AREA - SUTTON PLACE ROUTE
 AM PEAK HOUR

FIGURE 5.9-32



Construction on E. 59th Street

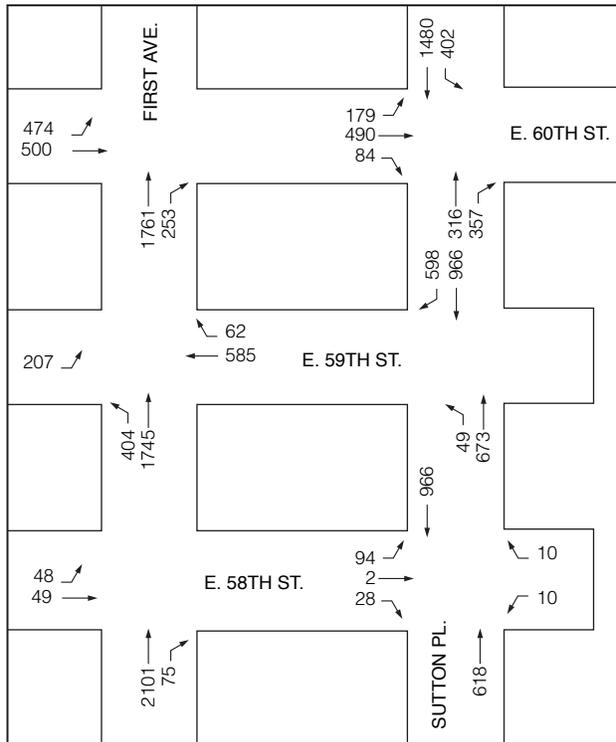


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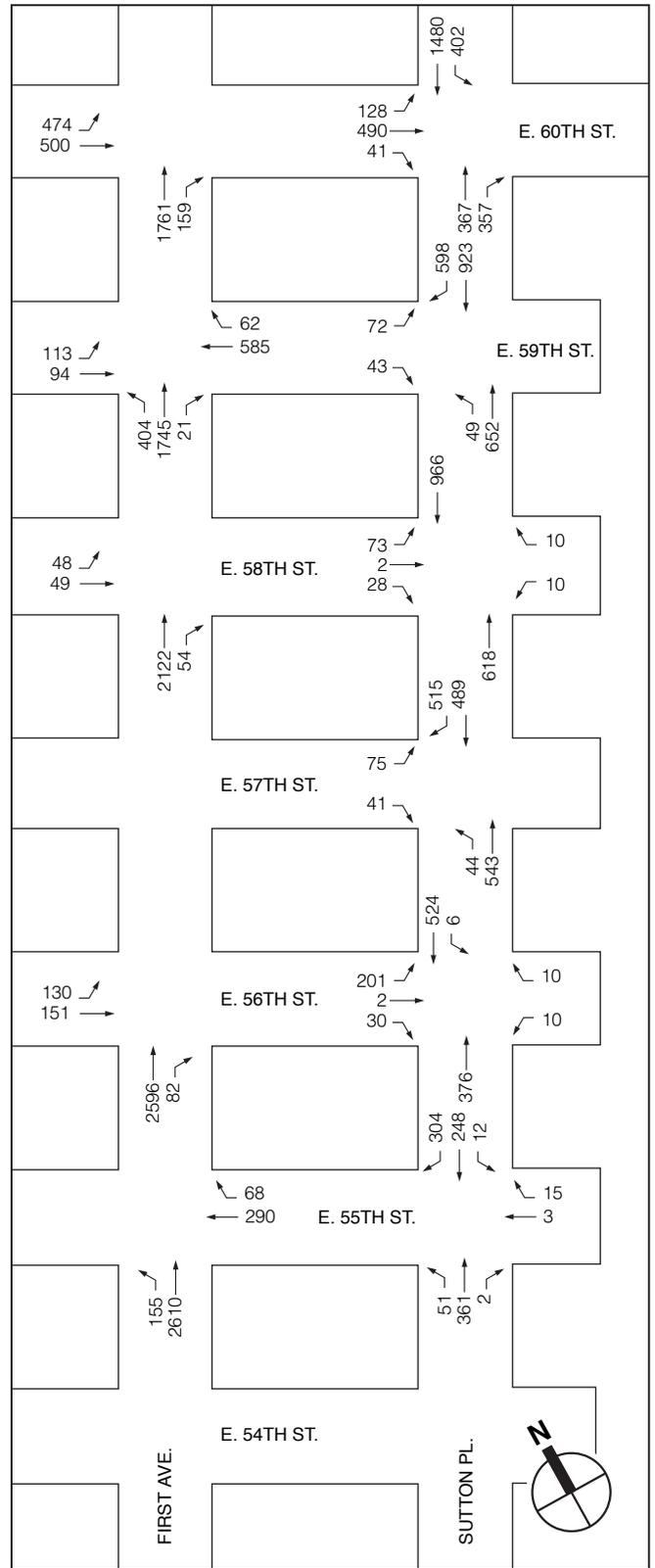


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 STAGE 2-MANHATTAN LEG
 WATER MAIN CONNECTIONS
 2008 BUILD TRAFFIC VOLUME NETWORK
 WATER MAIN STUDY AREA - SUTTON PLACE ROUTE
 MIDDAY PEAK HOUR

FIGURE 5.9-33



Construction on E. 59th Street



NOT TO SCALE

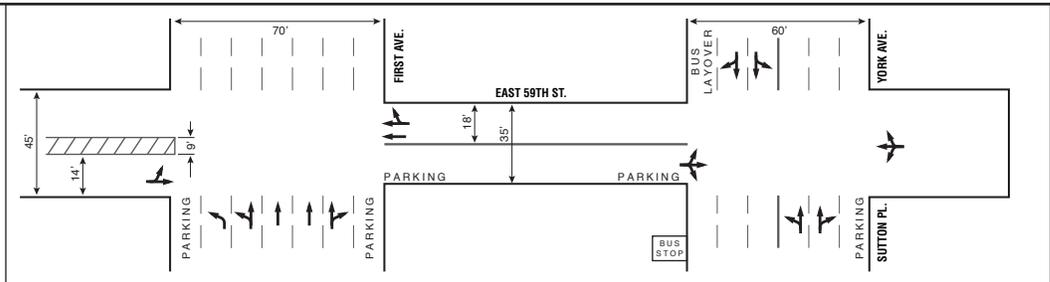


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 STAGE 2-MANHATTAN LEG
 WATER MAIN CONNECTIONS
 2008 BUILD TRAFFIC VOLUME NETWORK
 WATER MAIN STUDY AREA - SUTTON PLACE ROUTE
 PM PEAK HOUR

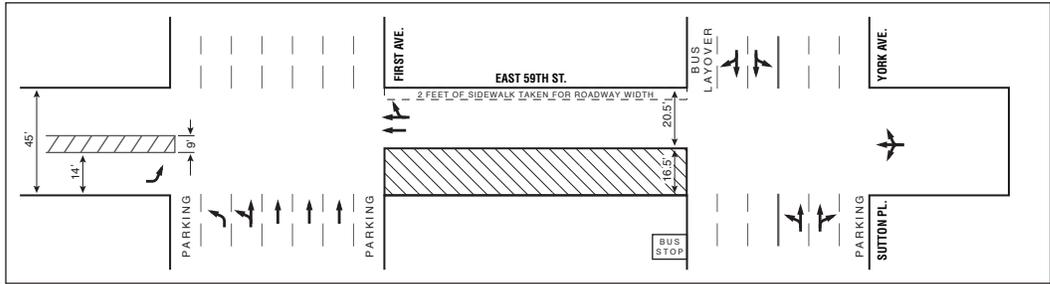
FIGURE 5.9-34

AM PEAK HOUR

EXISTING CONFIGURATION

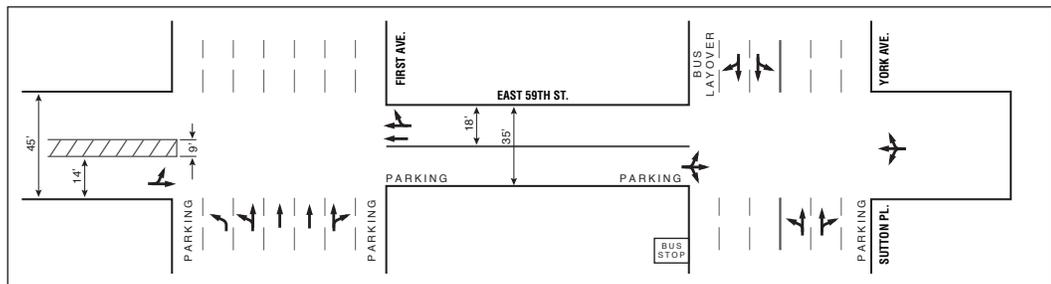


SUTTON PLACE ROUTE CONFIGURATION

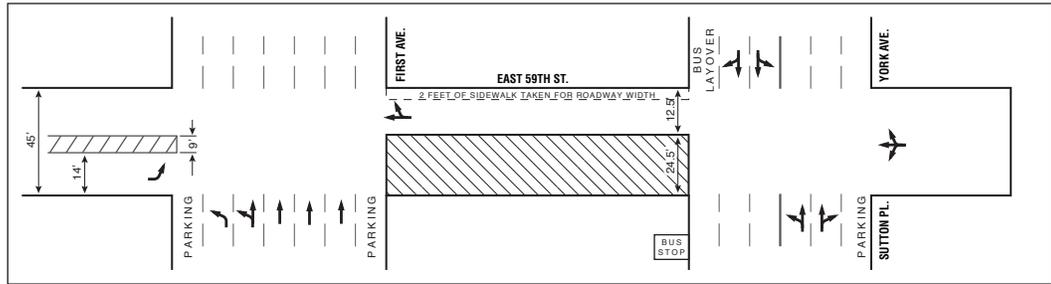


MIDDAY PEAK HOUR

EXISTING CONFIGURATION

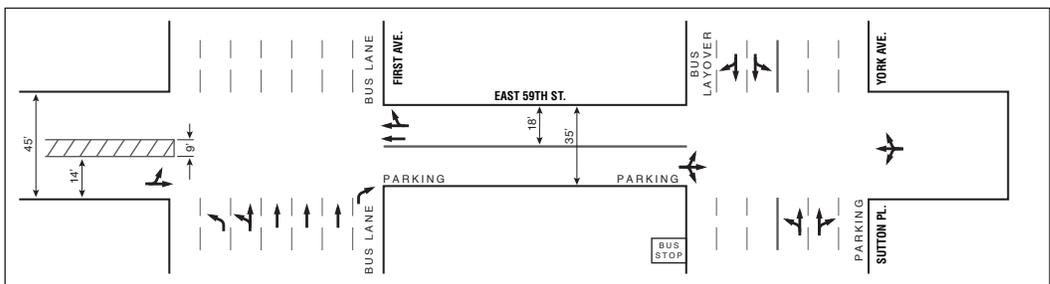


SUTTON PLACE ROUTE CONFIGURATION

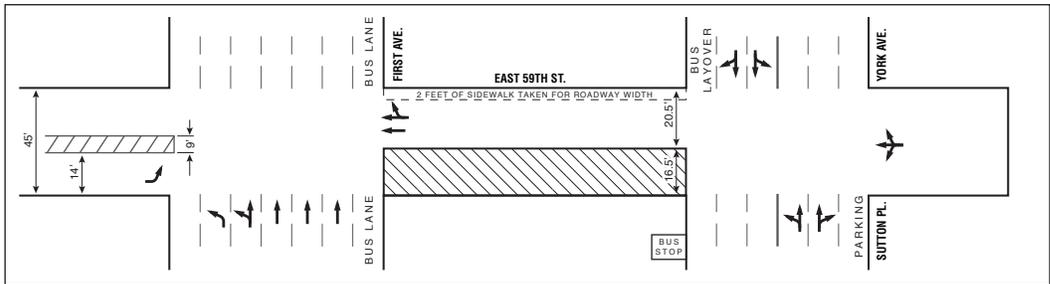


PM PEAK HOUR

EXISTING CONFIGURATION



SUTTON PLACE ROUTE CONFIGURATION

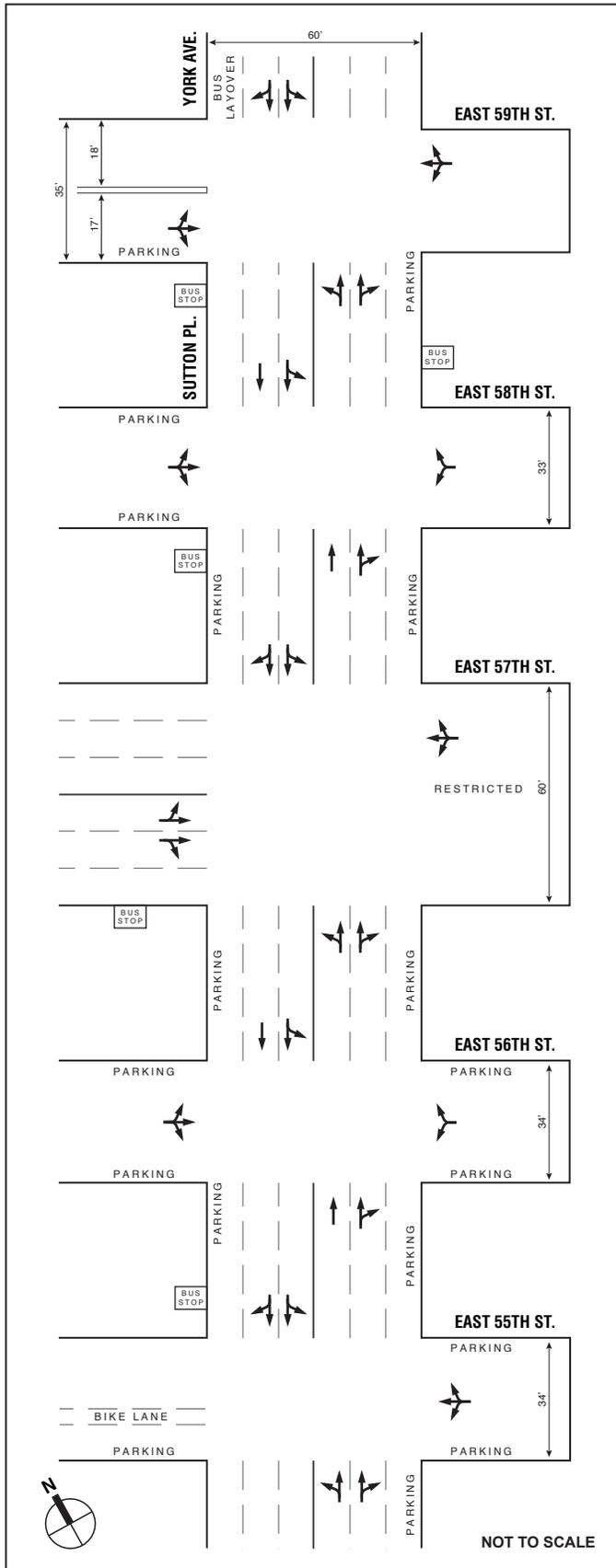


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 STAGE 2-MANHATTAN LEG
 WATER MAIN CONNECTIONS

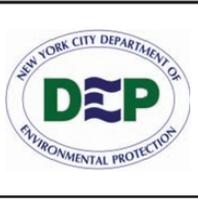
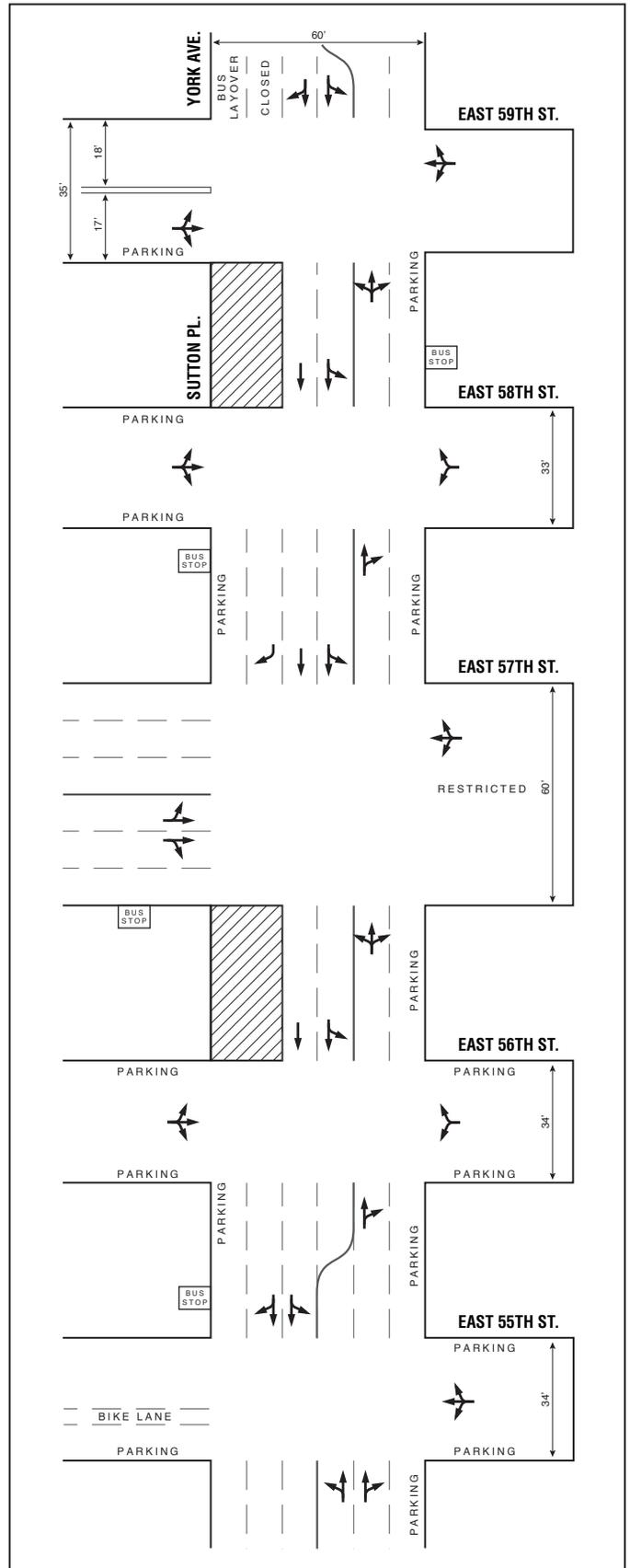
ROADWAY CONFIGURATIONS
 SUTTON PLACE ROUTE - E. 59TH STREET SEGMENT

FIGURE 5.9-35

EXISTING CONFIGURATION



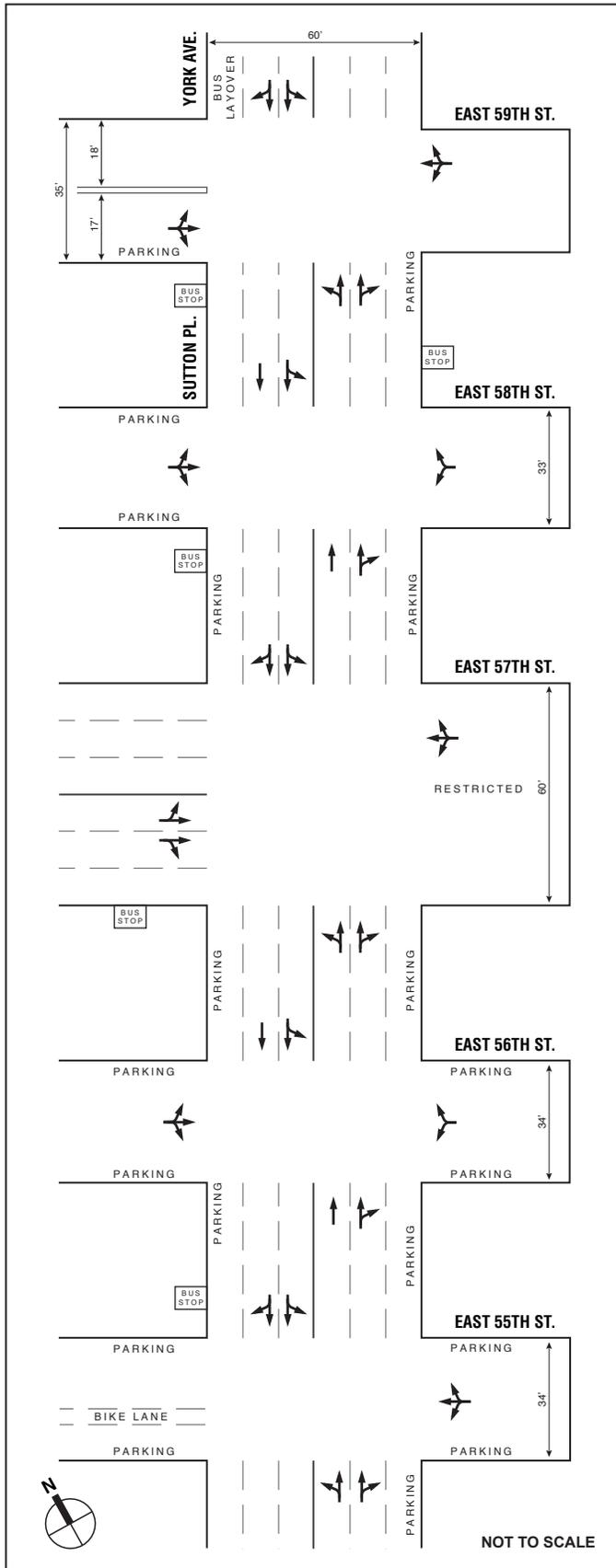
SUTTON PLACE ROUTE CONFIGURATION



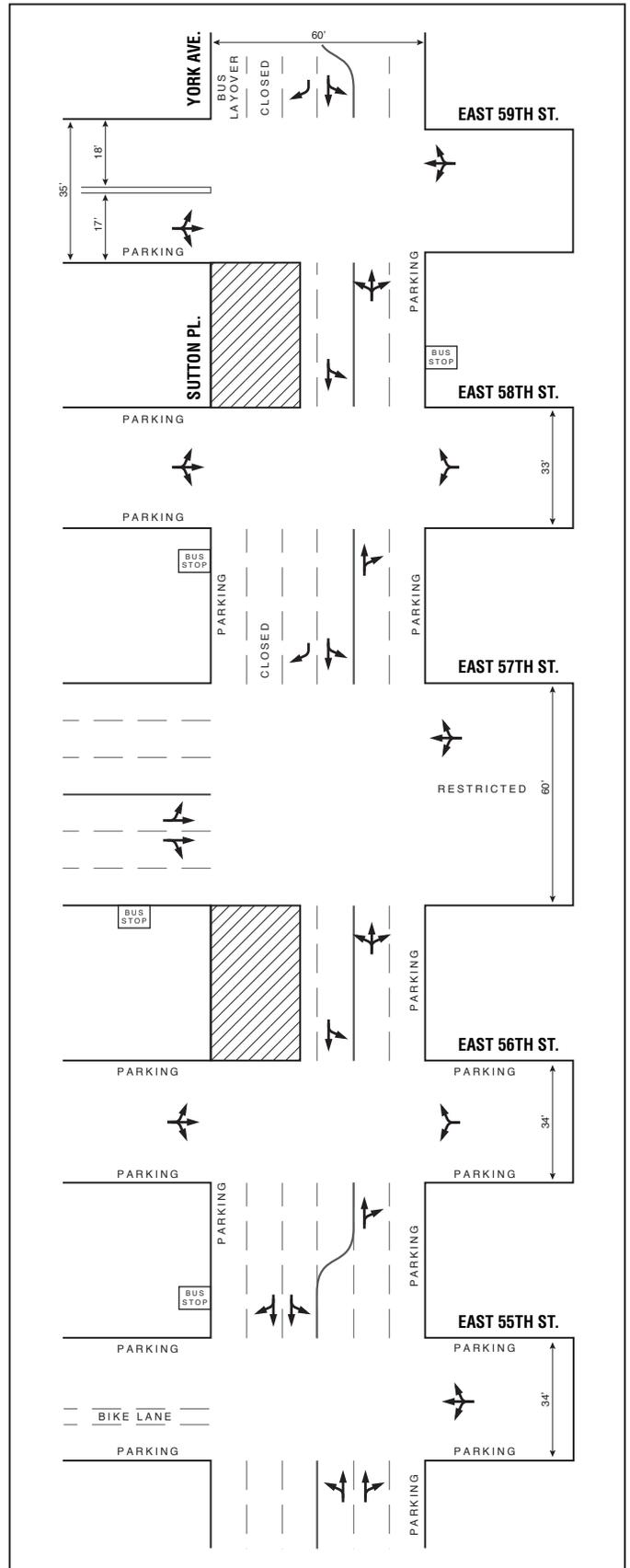
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 PROPOSED SHAFT 33B TO CITY WATER TUNNEL NO. 3
 STAGE 2-MANHATTAN LEG
 WATER MAIN CONNECTIONS
ROADWAY CONFIGURATIONS
 SUTTON PLACE ROUTE - SEGMENT 1
 AM PEAK HOUR

FIGURE 5.9-36

EXISTING CONFIGURATION



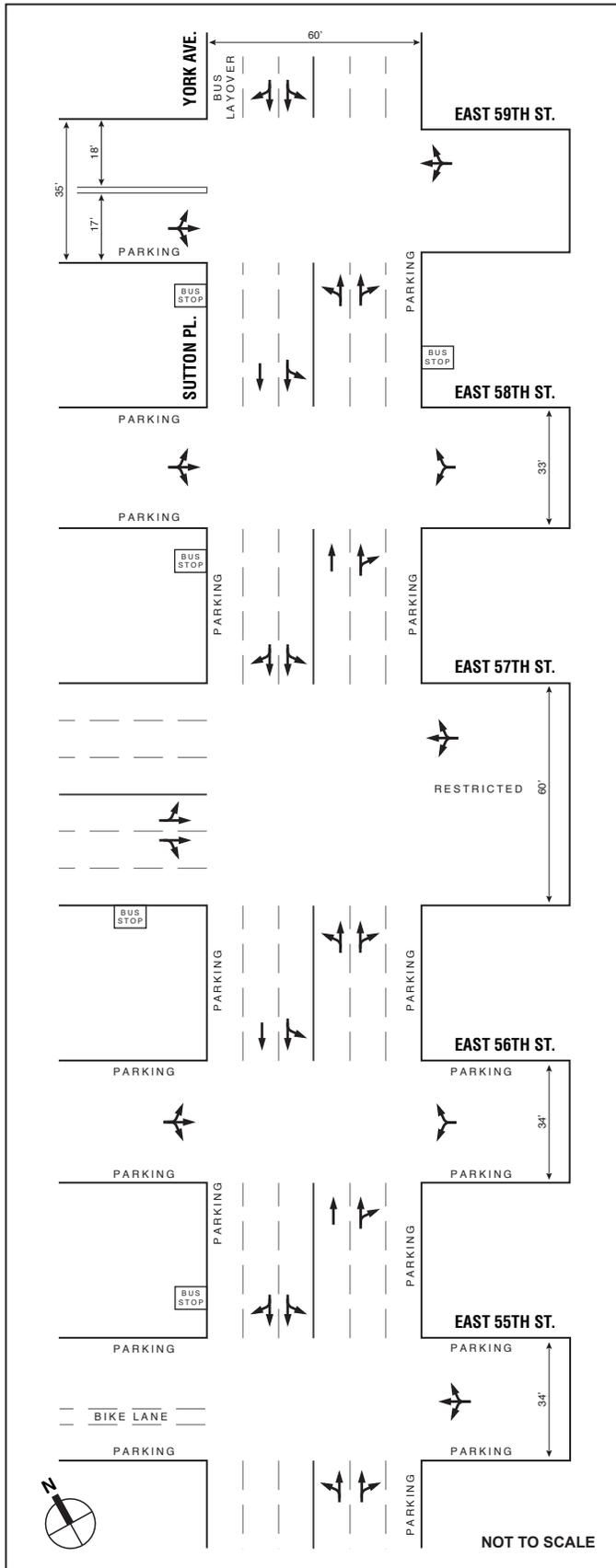
SUTTON PLACE ROUTE CONFIGURATION



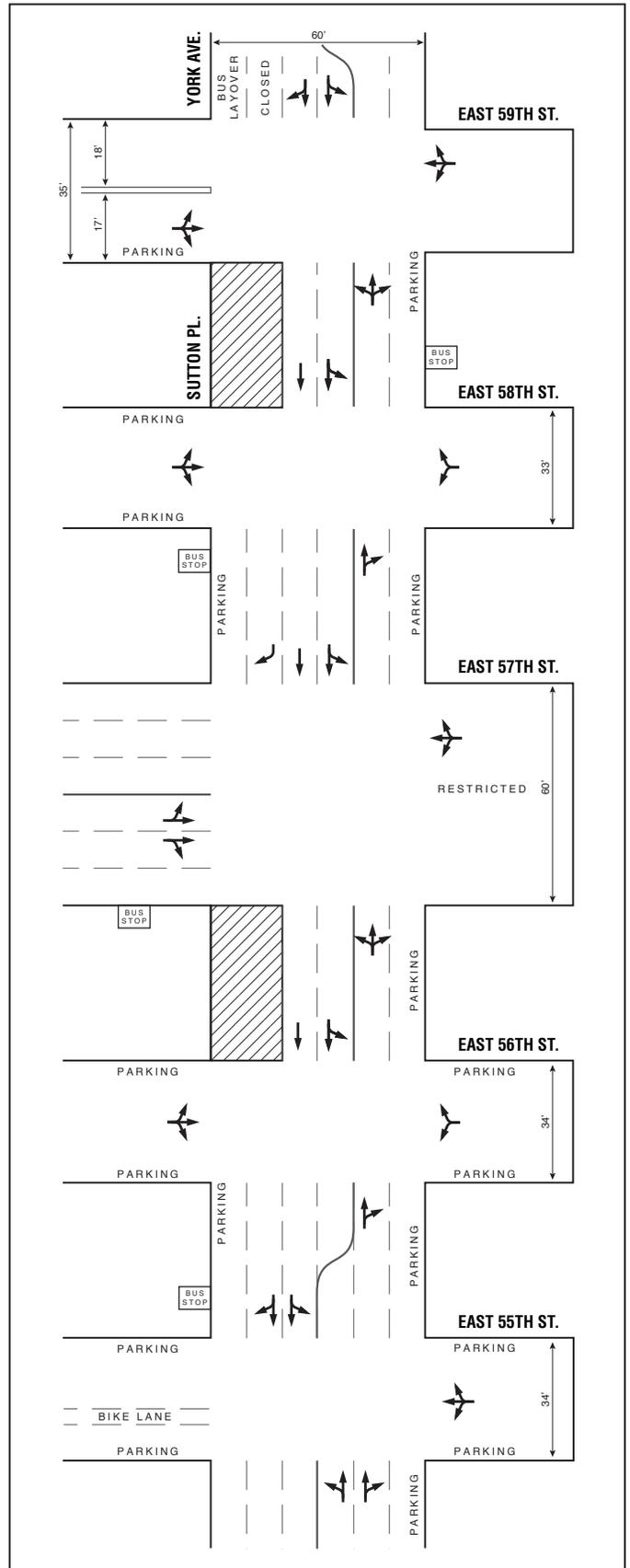
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 PROPOSED SHAFT 33B TO CITY WATER TUNNEL NO. 3
 STAGE 2-MANHATTAN LEG
 WATER MAIN CONNECTIONS
 ROADWAY CONFIGURATIONS
 SUTTON PLACE ROUTE - SEGMENT 1
 MIDDAY PEAK HOUR

FIGURE 5.9-37

EXISTING CONFIGURATION



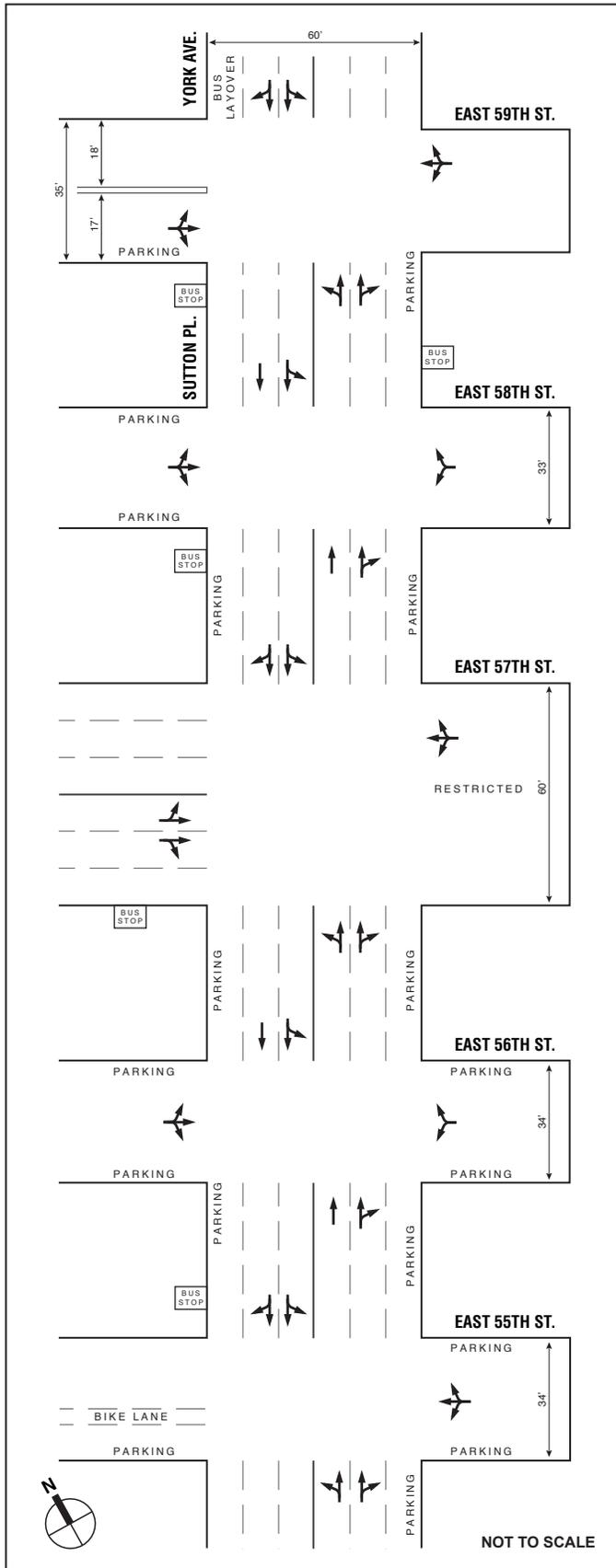
SUTTON PLACE ROUTE CONFIGURATION



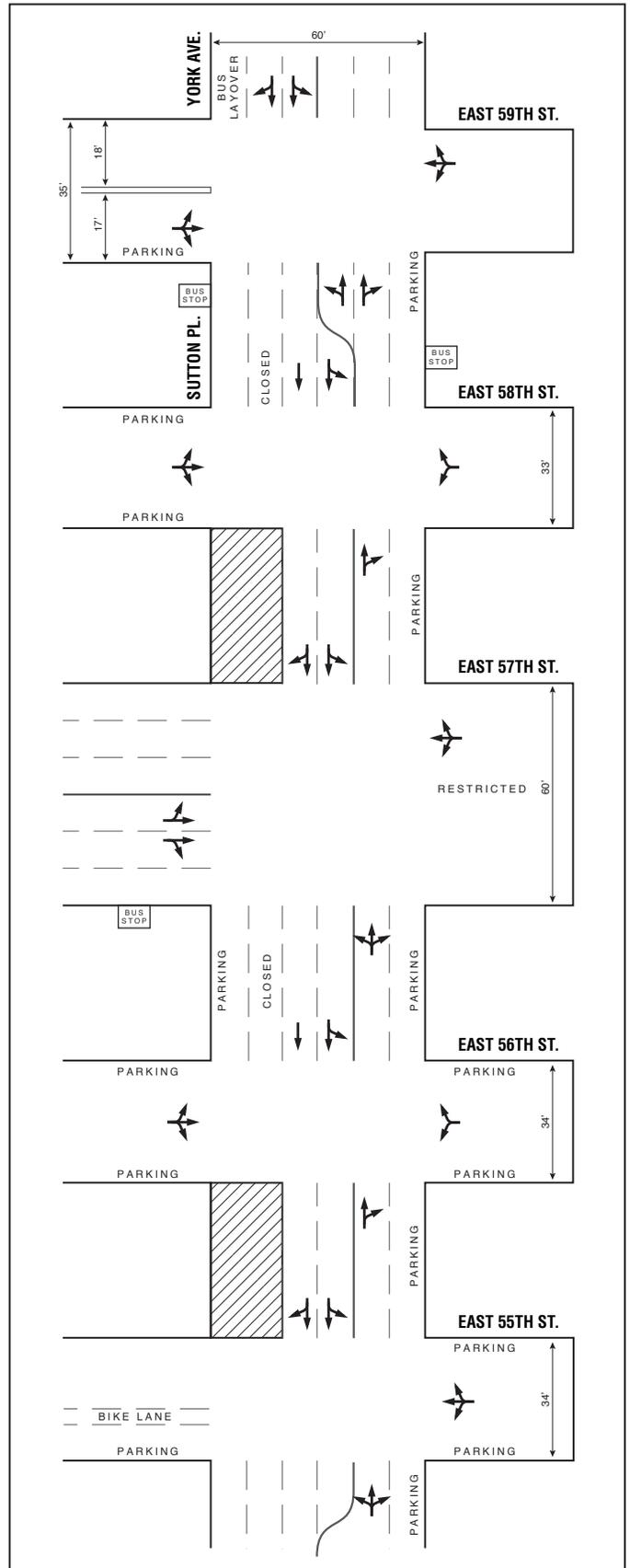
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 PROPOSED SHAFT 33B TO CITY WATER TUNNEL NO. 3
 STAGE 2-MANHATTAN LEG
 WATER MAIN CONNECTIONS
 ROADWAY CONFIGURATIONS
 SUTTON PLACE ROUTE - SEGMENT 1
 PM PEAK HOUR

FIGURE 5.9-38

EXISTING CONFIGURATION



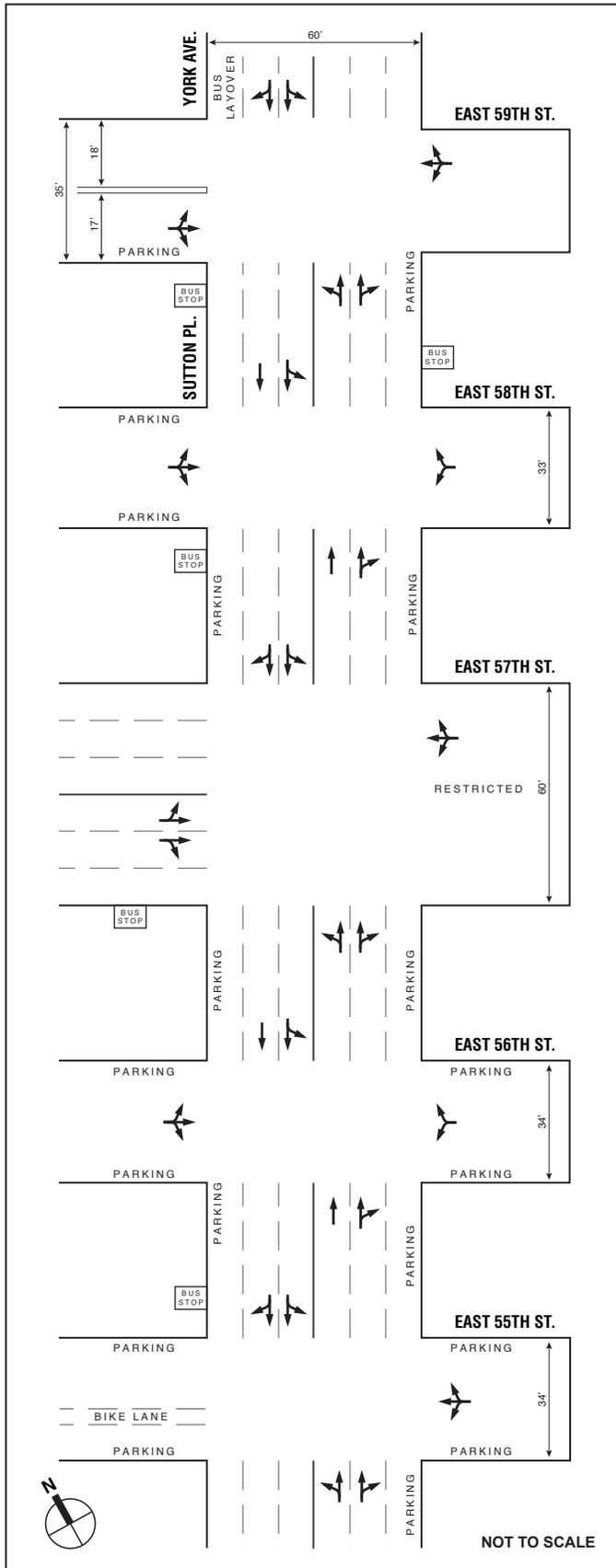
SUTTON PLACE ROUTE CONFIGURATION



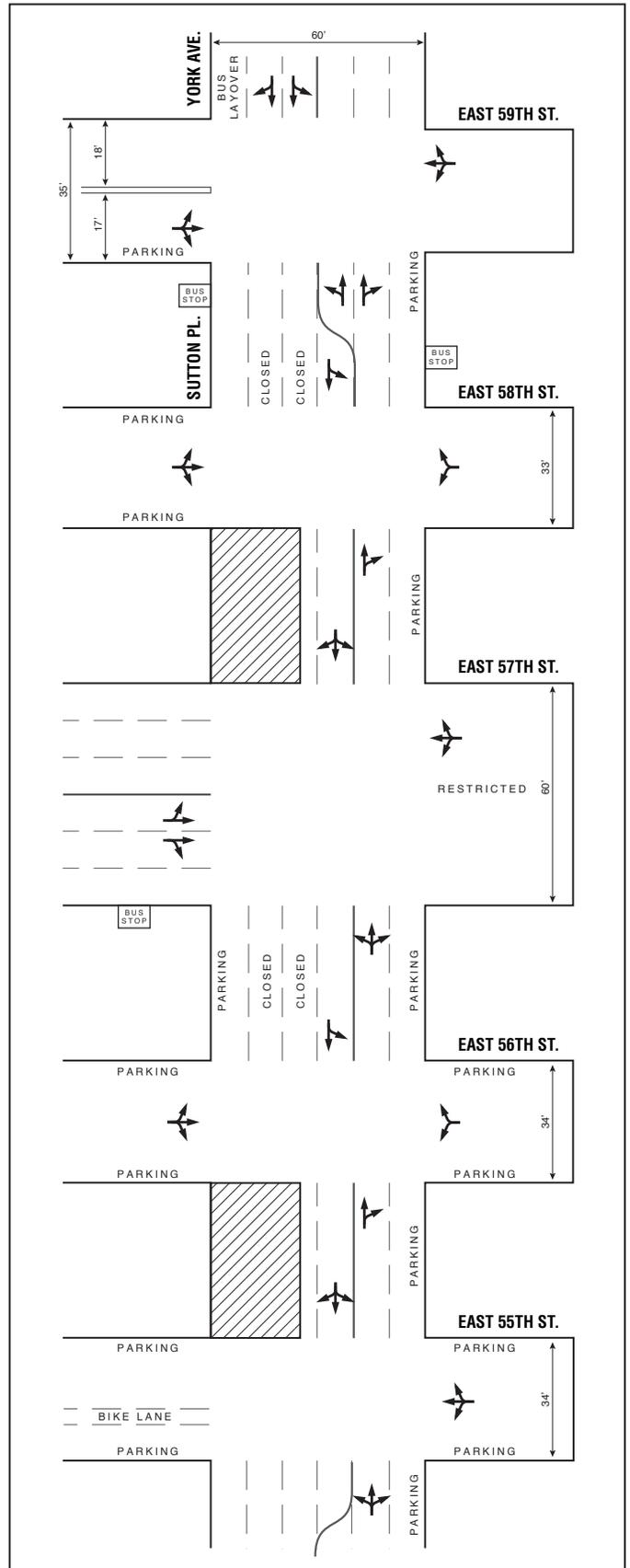
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 PROPOSED SHAFT 33B TO CITY WATER TUNNEL NO. 3
 STAGE 2-MANHATTAN LEG
 WATER MAIN CONNECTIONS
 ROADWAY CONFIGURATIONS
 SUTTON PLACE ROUTE - SEGMENT 3
 AM PEAK HOUR

FIGURE 5.9-39

EXISTING CONFIGURATION



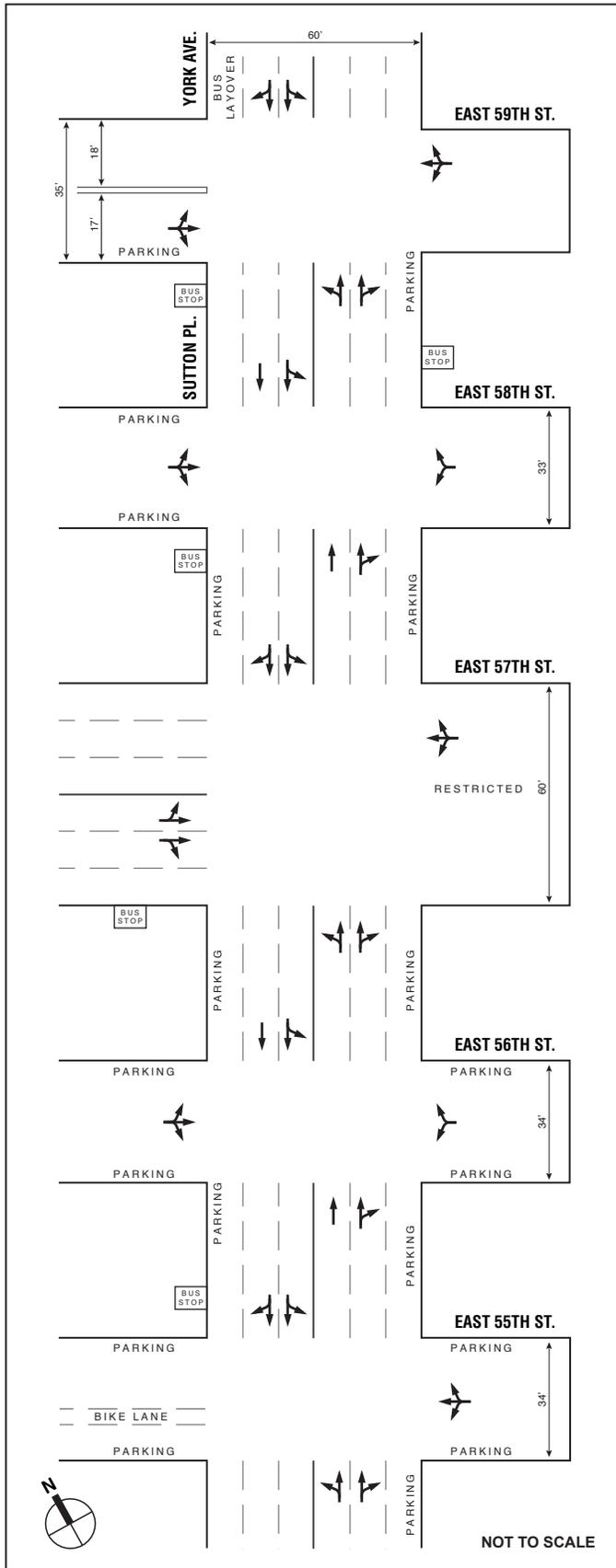
SUTTON PLACE ROUTE CONFIGURATION



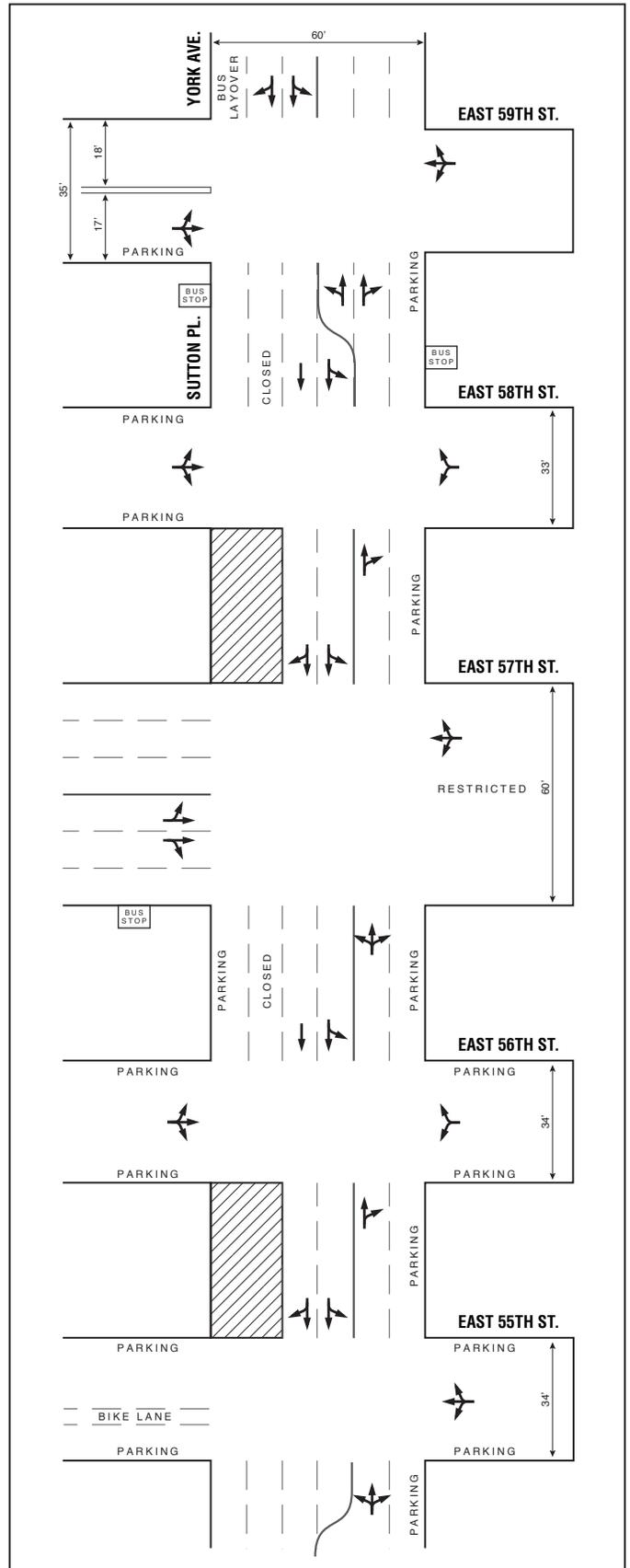
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 PROPOSED SHAFT 33B TO CITY WATER TUNNEL NO. 3
 STAGE 2-MANHATTAN LEG
 WATER MAIN CONNECTIONS
 ROADWAY CONFIGURATIONS
 SUTTON PLACE ROUTE - SEGMENT 3
 MIDDAY PEAK HOUR

FIGURE 5.9-40

EXISTING CONFIGURATION



SUTTON PLACE ROUTE CONFIGURATION

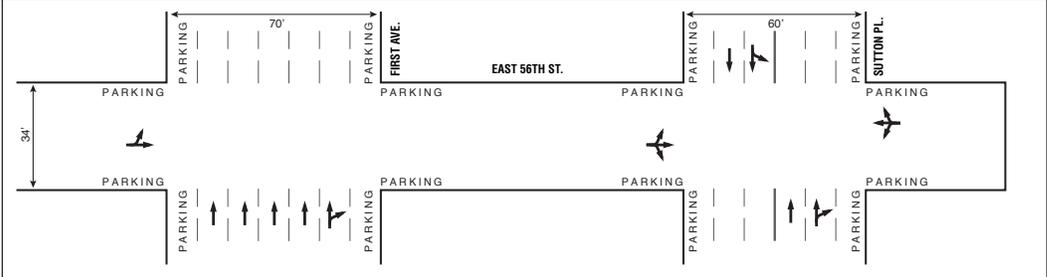


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 PROPOSED SHAFT 33B TO CITY WATER TUNNEL NO. 3
 STAGE 2-MANHATTAN LEG
 WATER MAIN CONNECTIONS
 ROADWAY CONFIGURATIONS
 SUTTON PLACE ROUTE - SEGMENT 3
 PM PEAK HOUR

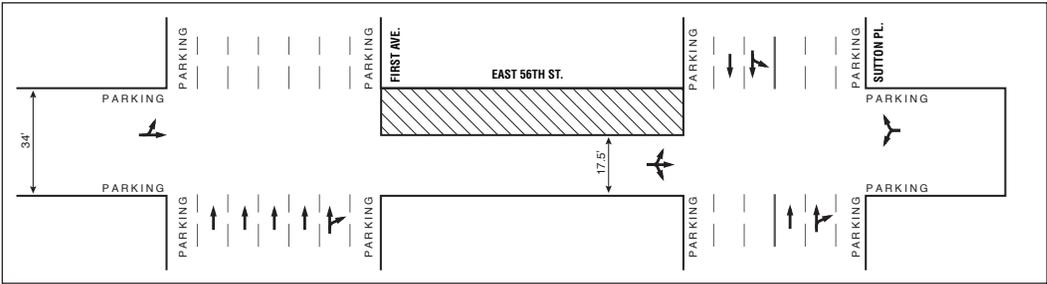
FIGURE 5.9-41

AM PEAK HOUR

EXISTING CONFIGURATION

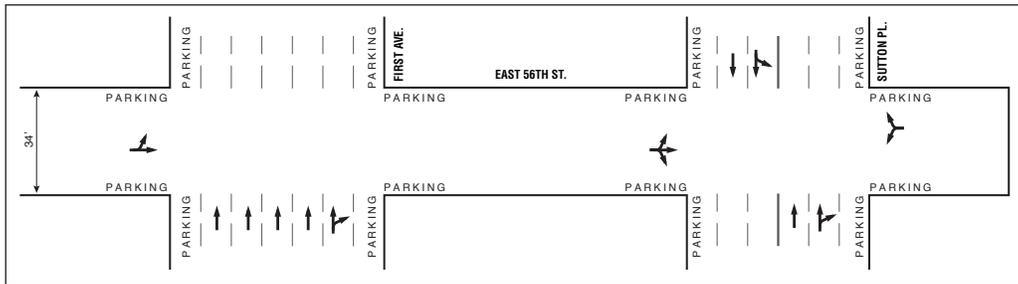


SUTTON PLACE ROUTE CONFIGURATION

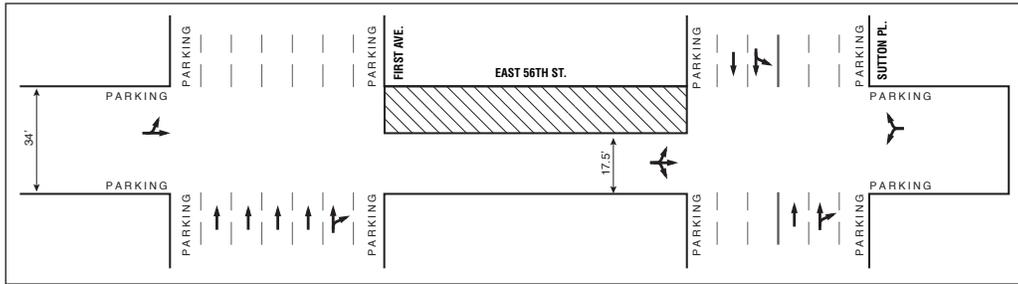


MIDDAY PEAK HOUR

EXISTING CONFIGURATION

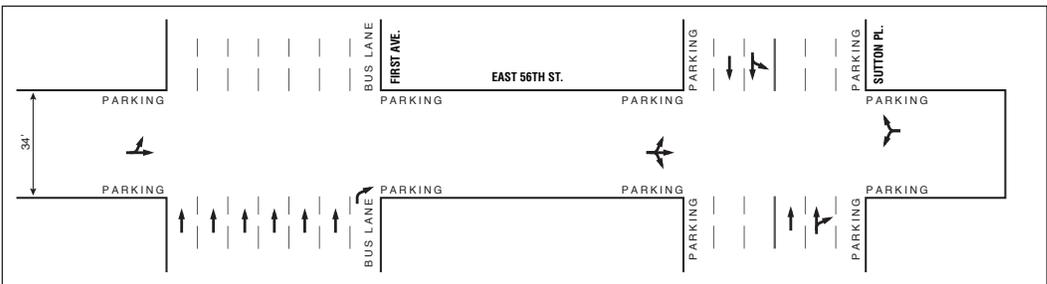


SUTTON PLACE ROUTE CONFIGURATION

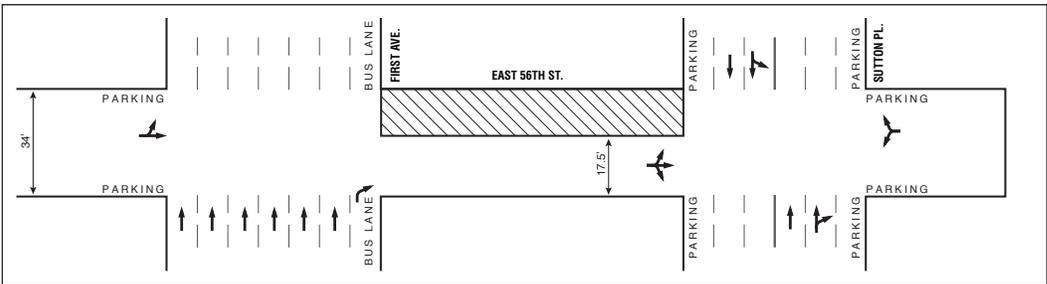


PM PEAK HOUR

EXISTING CONFIGURATION



SUTTON PLACE ROUTE CONFIGURATION



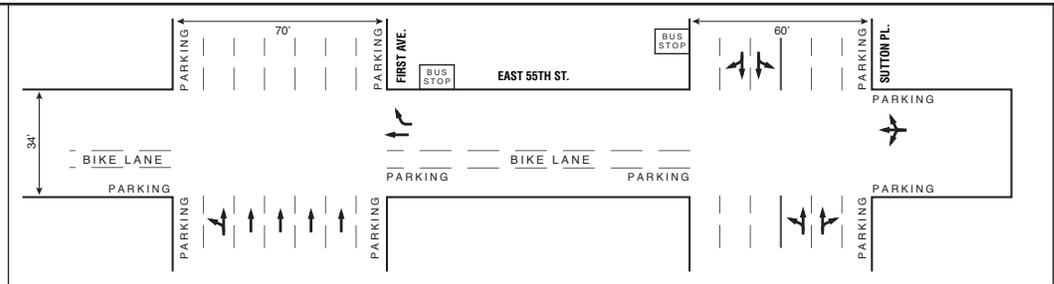
NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION
 PROPOSED SHAFT 33B TO CITY WATER TUNNEL NO. 3
 STAGE 2-MANHATTAN LEG
 WATER MAIN CONNECTIONS

ROADWAY CONFIGURATIONS
 SUTTON PLACE ROUTE - SEGMENT 5

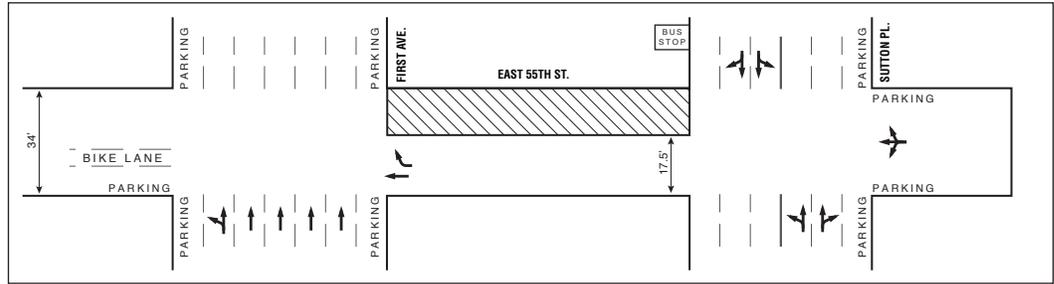
FIGURE 5.9-42

AM PEAK HOUR

EXISTING CONFIGURATION

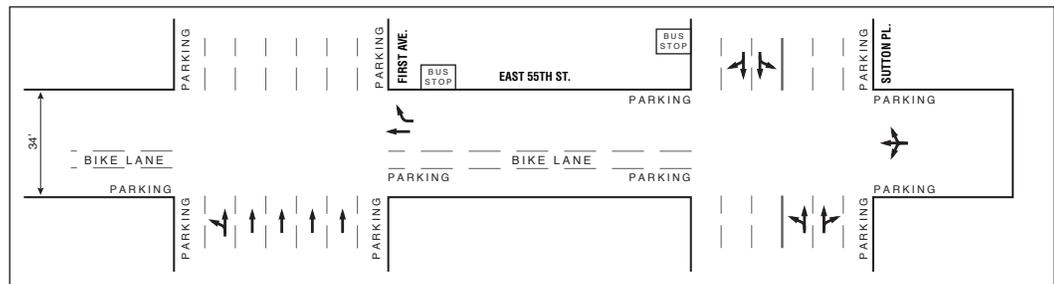


SUTTON PLACE ROUTE CONFIGURATION

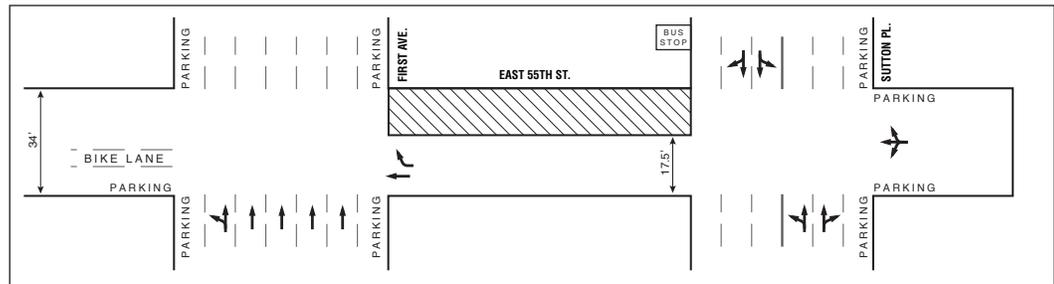


MIDDAY PEAK HOUR

EXISTING CONFIGURATION

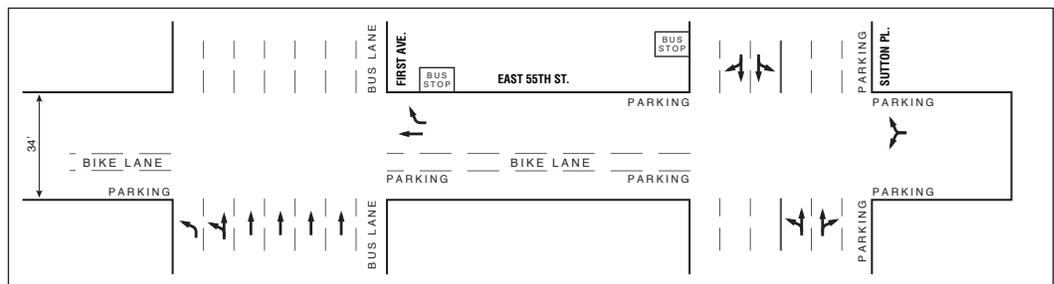


SUTTON PLACE ROUTE CONFIGURATION

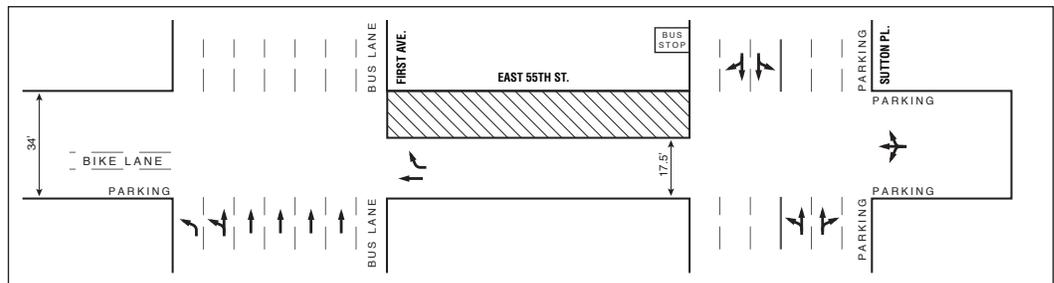


PM PEAK HOUR

EXISTING CONFIGURATION



SUTTON PLACE ROUTE CONFIGURATION



NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION
 PROPOSED SHAFT 33B TO CITY WATER TUNNEL NO. 3
 STAGE 2-MANHATTAN LEG
 WATER MAIN CONNECTIONS
 ROADWAY CONFIGURATIONS
 WATER MAIN STUDY AREA - SUTTON PLACE ROUTE
 SEGMENT 9

FIGURE 5.9-43

Street would be restricted to westbound traffic only, providing two 10-foot wide westbound lanes during the AM and PM peak periods and a single 12.5-foot wide westbound lane at other times.

- Segment 1: This segment contemplates simultaneous construction on two non-contiguous blocks along Sutton Place, between E. 56th and E. 57th Streets and between E. 58th and E. 59th Streets. The construction work zone would reduce the Sutton Place roadway from 60 to 43.5 feet in the AM and PM peak periods and to 35.5 feet in the midday peak period. As shown in Figures 5.9-36 to 5.9-38, Sutton Place at both E. 57th and E. 59th Streets would operate with one northbound and two southbound lanes in the AM and PM peak periods and with a single traffic lane in each direction during the midday peak period. Parking would be maintained on the northbound curb of these segments but prohibited in the southbound lanes. North of E. 59th Street, the bus layover lane would be maintained, but southbound traffic would be required to transition eastward to continue south. Similar lane channelization would occur on the southern end of the construction zone.
- Segment 3: This segment also contemplates simultaneous construction on two non-contiguous blocks along Sutton Place, between E. 55th and E. 56th Streets and between E. 57th and E. 58th Streets. The construction work zone would again reduce the Sutton Place roadway from 60 to 43.5 feet in the AM and PM peak periods and to 35.5 feet in the midday peak period. Similarly, Sutton Place at both E. 56th and E. 58th Streets would operate with one northbound and two southbound lanes in the AM and PM peak periods and with a single traffic lane in each direction during the midday peak period, as shown in Figures 5.9-39 to 5.9-41. North of E. 58th Street, the southbound curbside restrictions would be maintained to accommodate bus traffic, but southbound traffic would be required to transition eastward to continue south. Similar lane channelization would occur on the southern end of the construction zone.
- Segment 5: Construction for this segment, as illustrated in Figure 5.9-42, would occur along E. 56th Street between First Avenue and Sutton Place. The construction would reduce the width of the E. 56th Street roadway from approximately 34 to 17.5 feet in 200-foot segments. Curbside activities would be prohibited across from the construction zone to maintain adequate roadway width for traffic flow. E. 56th Street would operate with a single traffic lane during all peak periods.
- Segment 9: Construction for this segment, as illustrated in Figure 5.9-43, would occur along E. 55th Street between First Avenue and Sutton Place. The construction would reduce the width of the E. 55th Street roadway from approximately 34 to 17.5 feet in 200-foot segments. Curbside activities would be prohibited across from the construction zone to maintain adequate roadway width for traffic flow. During the latter period of construction along this segment, the westbound approach at First Avenue would continue to operate with two lanes during all peak periods but on narrower traffic lanes. The bicycle lane striped outside of the existing south curb lane, however, would be temporarily displaced for the duration of this segment's construction.

Tables 5.9-10, 5.9-11, and 5.9-12 summarize the results of the intersection capacity analyses for the AM, midday, and PM peak hours under the roadway configurations described above for each of the construction segments. The operating levels at each of the affected intersections are described below.

CHAPTER 5: WATER MAIN CONNECTIONS
5.9 TRAFFIC AND PARKING

Table 5.9-10
2008 Build and No Build Conditions Comparison
Sutton Place Route Water Main Connection Study Area E. 59th Street Segment

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																				
Construction on E. 59th Street – E. 59th Street Segment Only (between First Avenue and York Avenue/Sutton Place)																																												
E. 60 th Street (EB) First Avenue (NB)	EB-LT 0.78	32.4	C		EB-LT 0.78	32.4	C		EB-LT 0.53	26.5	C		EB-LT 0.53	26.5	C		EB-LT 0.79	32.8	C		EB-LT 0.79	32.8	C		EB-LT 0.79	32.8	C		EB-LT 0.79	32.8	C		EB-LT 0.79	32.8	C		EB-LT 0.79	32.8	C		EB-LT 0.79	32.8	C	
	NB-T 0.61	13.2	B		NB-T 0.61	13.2	B		NB-T 0.54	12.5	B		NB-T 0.54	12.5	B		NB-T 0.45	11.5	B		NB-T 0.45	11.5	B		NB-T 0.45	11.5	B		NB-T 0.45	11.5	B		NB-T 0.45	11.5	B		NB-T 0.45	11.5	B		NB-T 0.45	11.5	B	
	NB-R 0.25	10.8	B		NB-R 0.33	11.6	B		NB-R 0.27	14.1	B		NB-R 0.36	15.5	B		NB-R 0.27	11.0	B		NB-R 0.42	13.0	B		NB-R 0.42	13.0	B		NB-R 0.42	13.0	B		NB-R 0.42	13.0	B		NB-R 0.42	13.0	B		NB-R 0.42	13.0	B	
E. 59 th Street (E-W) First Avenue (NB)	EB-LT 0.28	18.9	B		EB-L 0.57	30.9	C		EB-LT 0.44	22.7	C		EB-L 0.80	52.7	D *		EB-LT 0.78	42.3	D		EB-LT 1.10	119.6	F *		EB-LT 1.10	119.6	F *		EB-LT 1.10	119.6	F *		EB-LT 1.10	119.6	F *		EB-LT 1.10	119.6	F *		EB-LT 1.10	119.6	F *	
	WB-TR 0.53	21.0	C		WB-TR 0.51	20.6	C		WB-TR 0.38	18.9	B		WB-TR 0.65	25.3	C		WB-TR 0.57	21.8	C		WB-TR 0.55	21.4	C		WB-TR 0.55	21.4	C		WB-TR 0.55	21.4	C		WB-TR 0.55	21.4	C		WB-TR 0.55	21.4	C		WB-TR 0.55	21.4	C	
	NB-L 0.96	48.3	D		NB-L 0.96	48.3	D		NB-L 0.63	21.7	C		NB-L 0.63	21.7	C		NB-L 0.70	22.6	C		NB-L 0.70	22.6	C		NB-L 0.70	22.6	C		NB-L 0.70	22.6	C		NB-L 0.70	22.6	C		NB-L 0.70	22.6	C					
	NB-LTR 0.99	36.2	D		NB-LT 0.98	33.6	C		NB-LTR 0.76	18.7	B		NB-LT 0.73	17.9	B		NB-LT 0.74	18.0	B		NB-LT 0.74	18.0	B		NB-LT 0.74	18.0	B		NB-LT 0.74	18.0	B		NB-LT 0.74	18.0	B		NB-LT 0.74	18.0	B					
																	NB-R 0.07	11.2	B																									
E. 58 th Street (EB) First Avenue (SB)	EB-L 1.04	77.9	E		EB-L 1.04	77.9	E		EB-LT 0.25	19.7	B		EB-LT 0.25	19.7	B		EB-LT 0.19	18.9	B		EB-LT 0.19	18.9	B		EB-LT 0.19	18.9	B		EB-LT 0.19	18.9	B		EB-LT 0.19	18.9	B		EB-LT 0.19	18.9	B					
	EB-T 0.35	21.0	C		EB-T 0.35	21.0	C										NB-T 0.55	12.4	B		NB-T 0.54	12.4	B		NB-T 0.54	12.4	B		NB-T 0.54	12.4	B		NB-T 0.54	12.4	B									
	NB-TR 0.74	15.2	B		NB-TR 0.74	15.3	B		NB-TR 0.67	14.2	B		NB-TR 0.67	14.3	B		NB-R 0.09	9.3	A		NB-R 0.13	9.7	A		NB-R 0.13	9.7	A		NB-R 0.13	9.7	A		NB-R 0.13	9.7	A		NB-R 0.13	9.7	A					
E. 60 th Street (EB) York Avenue (N-S)	EB-L 0.22	29.8	C		EB-L 0.26	30.5	C		EB-L 0.22	22.6	C		EB-L 0.24	22.9	C		EB-L 0.25	26.9	C		EB-L 0.34	28.6	C		EB-L 0.34	28.6	C		EB-L 0.34	28.6	C		EB-L 0.34	28.6	C		EB-L 0.34	28.6	C					
	EB-TR 0.52	34.2	C		EB-TR 0.56	35.1	D		EB-TR 0.38	24.0	C		EB-TR 0.44	24.8	C		EB-TR 0.49	30.2	C		EB-TR 0.54	31.2	C		EB-TR 0.54	31.2	C		EB-TR 0.54	31.2	C		EB-TR 0.54	31.2	C		EB-TR 0.54	31.2	C					
	NB-TR 0.76	40.3	D		NB-TR 0.75	39.5	D		NB-TR 0.59	27.6	C		NB-TR 0.58	27.4	C		NB-TR 0.73	43.7	D		NB-TR 0.67	41.6	D		NB-TR 0.67	41.6	D		NB-TR 0.67	41.6	D		NB-TR 0.67	41.6	D									
	NB-R 0.55	36.8	D		NB-R 0.55	36.8	D		NB-R 0.51	29.1	C		NB-R 0.51	29.1	C		NB-R 0.58	43.2	D		NB-R 0.58	43.2	D		NB-R 0.58	43.2	D		NB-R 0.58	43.2	D		NB-R 0.58	43.2	D									
	SB-L 0.47	18.5	B		SB-L 0.48	18.5	B		SB-L 0.63	18.4	B		SB-L 0.63	18.5	B		SB-L 0.49	22.1	C		SB-L 0.50	22.2	C		SB-L 0.50	22.2	C		SB-L 0.50	22.2	C		SB-L 0.50	22.2	C									
	SB-T 0.63	11.8	B		SB-T 0.63	11.8	B		SB-T 0.77	14.0	B		SB-T 0.77	14.0	B		SB-T 0.98	38.0	D		SB-T 0.98	38.0	D		SB-T 0.98	38.0	D		SB-T 0.98	38.0	D		SB-T 0.98	38.0	D									
E. 59 th Street (E-W) York Avenue (N-S)	EB-LTR 0.23	28.7	C						EB-LTR 0.33	30.9	C						EB-LTR 0.40	32.7	C						EB-LTR 0.40	32.7	C						EB-LTR 0.40	32.7	C									
	WB-LTR 0.00	24.7	C		WB-LTR 0.00	24.7	C		WB-LTR 0.00	24.7	C		WB-LTR 0.00	24.7	C		WB-LTR 0.00	24.7	C		WB-LTR 0.00	24.7	C		WB-LTR 0.00	24.7	C		WB-LTR 0.00	24.7	C		WB-LTR 0.00	24.7	C									
	NB-LTR 0.67	15.0	B		NB-LTR 0.68	15.5	B		NB-LTR 0.46	11.6	B		NB-LTR 0.49	12.0	B		NB-LTR 0.72	17.6	B		NB-LTR 0.76	19.0	B		NB-LTR 0.76	19.0	B		NB-LTR 0.76	19.0	B		NB-LTR 0.76	19.0	B									
	SB-LTR 0.87	23.3	C		SB-LTR 0.89	24.8	C		SBLTR 0.93	28.4	C		SB-LTR 0.96	33.0	C		SB-LTR 1.11	78.0	E		SB-LTR 1.14	89.5	F *		SB-LTR 1.14	89.5	F *		SB-LTR 1.14	89.5	F *		SB-LTR 1.14	89.5	F *									

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).

Where the same number of travel lanes would be maintained during construction and adjacent parking removed, Build delay levels may be lower than those projected for the No Build conditions.

CHAPTER 5: WATER MAIN CONNECTIONS
5.9 TRAFFIC AND PARKING

Table 5.9-11
2008 Build and No Build Conditions Comparison
Sutton Place Route Water Main Connection Study Area Segments 1 & 3

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																																
Construction on Sutton Place – Segment 1 Only (between E. 59th and E. 58th and between E. 57th and E. 56th Streets)																																																								
E. 59 th Street (E-W) York Avenue (N-S)	EB-LTR	0.23	28.7	C	EB-LTR	0.25	29.2	C	EB-LTR	0.33	30.9	C	EB-LTR	0.38	32.5	C	EB-LTR	0.40	32.7	C	EB-LTR	0.43	34.1	C	WB-LTR	0.00	24.7	C	WB-LTR	0.00	24.7	C	WB-LTR	0.00	24.7	C	WB-LTR	0.00	24.7	C	WB-LTR	0.00	24.7	C	WB-LTR	0.00	24.7	C								
	WB-LTR	0.00	24.7	C	WBLTR	0.00	24.7	C	WBLTR	0.00	24.7	C	WBLTR	0.00	24.7	C	WBLTR	0.00	24.7	C	WBLTR	0.00	24.7	C	NB-LTR	0.67	15.0	B	NB-LTR	0.72	17.6	B	NB-LTR	0.72	17.6	B	NB-LTR	0.72	17.6	B	NB-LTR	0.72	17.6	B	NB-LTR	0.72	17.6	B								
	NB-LTR	0.67	15.0	B	NB-LTR	1.26	145.1	F	NB-LTR	0.46	11.6	B	NB-LTR	0.88	28.7	C	NB-LTR	0.88	28.7	C	NB-LTR	1.26	149.6	F	SB-LTR	0.87	23.3	C	SB-LTR	0.87	23.3	C	SB-LTR	0.87	23.3	C	SB-LTR	0.87	23.3	C	SB-LTR	0.87	23.3	C	SB-LTR	0.87	23.3	C	SB-LTR	0.87	23.3	C				
	SB-LTR	0.87	23.3	C	SB-LTR	0.87	23.3	C	SB-LTR	0.93	28.4	C	SB-LTR	0.98	44.5	D	SB-LTR	1.11	78.0	E	SB-LTR	1.11	78.0	E	SB-LTR	1.11	78.0	E	SB-LTR	1.11	78.0	E	SB-LTR	1.11	78.0	E	SB-LTR	1.11	78.0	E	SB-LTR	1.11	78.0	E	SB-LTR	1.11	78.0	E								
E. 58 th Street (E-W) Sutton Place (N-S)	EB-LTR	0.64	39.4	D	EB-LTR	0.72	44.4	D	EB-LTR	0.25	28.5	C	EB-LTR	0.28	29.4	C	EB-LTR	0.25	28.6	C	EB-LTR	0.28	29.2	C	WB-LR	0.06	25.5	C	WB-LR	0.06	25.6	C	WB-LR	0.05	25.4	C	WB-LR	0.05	25.4	C	WB-LR	0.05	25.4	C	WB-LR	0.05	25.4	C	WB-LR	0.05	25.4	C	WB-LR	0.05	25.4	C
	WB-LR	0.06	25.5	C	WB-LR	0.06	25.6	C	WB-LR	0.06	25.5	C	WB-LR	0.07	25.6	C	WB-LR	0.05	25.4	C	WB-LR	0.05	25.4	C	NB-TR	0.39	10.7	B	NB-TR	0.75	19.3	B	NB-TR	0.39	10.6	B	NB-TR	0.39	10.6	B	NB-TR	0.39	10.6	B	NB-TR	0.39	10.6	B	NB-TR	0.39	10.6	B	NB-TR	0.39	10.6	B
	NB-TR	0.39	10.7	B	NB-TR	0.75	19.3	B	NB-TR	0.33	10.1	B	NB-TR	0.64	15.7	B	NB-TR	0.64	15.7	B	NB-TR	0.74	18.7	B	SB-LT	0.38	10.6	B	SB-LT	0.38	10.6	B	SB-LT	0.58	13.1	B	SB-LT	1.05	62.9	E	SB-LT	0.62	13.8	B												
	SB-LT	0.38	10.6	B	SB-LT	0.38	10.6	B	SB-LT	0.58	13.1	B	SB-LT	1.05	62.9	E	SB-LT	0.62	13.8	B	SB-LT	0.62	13.8	B	EB-DfL	0.49	34.0	C	EB-DfL	0.50	34.2	C	EB-DfL	0.45	33.5	C	EB-DfL	0.53	36.8	D	EB-DfL	0.22	28.2	C												
E. 57 th Street (E-W) Sutton Place (N-S)	EB-DfL	0.49	34.0	C	EB-DfL	0.50	34.2	C	EB-DfL	0.45	33.5	C	EB-DfL	0.53	36.8	D	EB-DfL	0.22	28.2	C	EB-DfL	0.22	28.2	C	EB-TR	0.14	26.7	C	EB-TR	0.14	26.8	C	EB-TR	0.10	26.2	C	EB-TR	0.10	26.2	C	EB-TR	0.10	26.2	C	EB-TR	0.10	26.2	C	EB-TR	0.10	26.2	C	EB-TR	0.10	26.2	C
	EB-TR	0.14	26.7	C	EB-TR	0.14	26.8	C	EB-TR	0.06	25.5	C	EB-TR	0.07	25.7	C	EB-TR	0.10	26.2	C	EB-TR	0.10	26.2	C	WB-LTR	0.00	24.7	C	WB-LTR	0.00	24.7	C	WB-LTR	0.00	24.7	C	WB-LTR	0.00	24.7	C	WB-LTR	0.00	24.7	C	WB-LTR	0.00	24.7	C	WB-LTR	0.00	24.7	C				
	WB-LTR	0.00	24.7	C	WB-LTR	0.00	24.7	C	WB-LTR	0.00	24.7	C	WB-LTR	0.00	24.7	C	WB-LTR	0.00	24.7	C	WB-LTR	0.00	24.7	C	NB-LTR	0.37	10.6	B	NB-LTR	0.72	19.3	B	NB-LTR	0.37	10.6	B	NB-LTR	0.37	10.6	B	NB-LTR	0.37	10.6	B	NB-LTR	0.37	10.6	B	NB-LTR	0.37	10.6	B				
	NB-LTR	0.37	10.6	B	NB-LTR	0.72	19.3	B	NB-LTR	0.35	10.4	B	NB-LTR	0.67	17.7	B	NB-LTR	0.50	12.3	B	SB-LTR	0.46	11.5	B	SB-LTR	0.43	11.2	B	SB-LTR	0.76	18.1	B	SB-LTR	1.30	163.0	F	SB-LTR	0.81	19.9	B	SB-LTR	0.77	18.0	B	SB-LTR	0.77	18.0	B								
E. 56 th Street (E-W) Sutton Place (N-S)	EB-LTR	0.65	39.5	D	EB-LTR	0.72	43.4	D	EB-LTR	0.54	35.5	D	EB-LTR	0.62	39.2	D	EB-LTR	0.57	36.6	D	EB-LTR	0.65	40.3	D	WB-LR	0.03	25.2	C	WB-LR	0.04	25.3	C	WB-LR	0.05	25.4	C	WB-LR	0.05	25.4	C	WB-LR	0.05	25.4	C	WB-LR	0.05	25.4	C	WB-LR	0.05	25.4	C				
	WB-LR	0.03	25.2	C	WB-LR	0.04	25.3	C	WB-LR	0.04	25.3	C	WB-LR	0.05	25.4	C	WB-LR	0.05	25.4	C	WB-LR	0.05	25.4	C	NB-TR	0.18	8.9	A	NB-TR	0.37	11.2	B	NB-TR	0.32	10.6	B	NB-TR	0.32	10.6	B	NB-TR	0.32	10.6	B	NB-TR	0.32	10.6	B	NB-TR	0.32	10.6	B				
	NB-TR	0.18	8.9	A	NB-TR	0.37	11.2	B	NB-TR	0.15	8.7	A	NB-TR	0.32	10.6	B	NB-TR	0.25	9.5	A	NB-TR	0.25	9.5	A	SB-LT	0.35	10.3	B	SB-LT	0.32	10.0+	B	SB-LT	0.28	9.8	A	SB-LT	0.48	12.6	B	SB-LT	0.39	10.7	B	SB-LT	0.36	10.4	B	SB-LT	0.36	10.4	B				
	SB-LT	0.35	10.3	B	SB-LT	0.32	10.0+	B	SB-LT	0.28	9.8	A	SB-LT	0.48	12.6	B	SB-LT	0.39	10.7	B	SB-LT	0.36	10.4	B	EB-DfL	0.49	34.0	C	EB-DfL	0.50	34.2	C	EB-DfL	0.45	33.5	C	EB-DfL	0.53	36.8	D	EB-DfL	0.22	28.2	C	EB-DfL	0.22	28.2	C	EB-DfL	0.22	28.2	C				
E. 55 th Street (WB) Sutton Place (N-S)	WB-LTR	0.08	25.9	C	WBLTR	0.09	26.1	C	WBLTR	0.04	25.3	C	WBLTR	0.04	25.3	C	WBLTR	0.05	25.4	C	WBLTR	0.05	25.4	C	NB-LTR	0.21	9.2	A	NB-LTR	0.42	12.1	B	NB-LTR	0.22	9.3	A	NB-LTR	0.43	12.4	B	NB-LTR	0.35	10.4	B												
	NB-LTR	0.21	9.2	A	NB-LTR	0.42	12.1	B	NB-LTR	0.22	9.3	A	NB-LTR	0.43	12.4	B	NB-LTR	0.35	10.4	B	NB-LTR	0.35	10.4	B	SB-LTR	0.46	11.7	B	SB-LTR	0.46	11.6	B	SB-LTR	0.37	10.7	B	SB-LTR	0.67	17.5	B	SB-LTR	0.47	11.8	B	SB-LTR	0.46	11.7	B								
	SB-LTR	0.46	11.7	B	SB-LTR	0.46	11.6	B	SB-LTR	0.37	10.7	B	SB-LTR	0.67	17.5	B	SB-LTR	0.47	11.8	B	SB-LTR	0.46	11.7	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). Where the same number of travel lanes would be maintained during construction and adjacent parking removed, Build delay levels may be lower than those projected for the No Build conditions.																														

CHAPTER 5: WATER MAIN CONNECTIONS
5.9 TRAFFIC AND PARKING

Table 5.9-12
2008 Build and No Build Conditions Comparison
Sutton Place Route Water Main Connection Study Area Segments 5 & 9

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	
Construction on E. 56th Street – Segment 5 Only (between Sutton Place and First Avenue)																									
E. 56 th Street (EB) First Avenue (NB)	EB-LT	0.95	58.0	E	EB-LT	0.95	58.0	E	EB-LT	0.63	31.5	C	EB-LT	0.63	31.5	C	EB-LT	0.62	28.3	C	EB-LT	0.62	28.3	C	
	NB-TR	0.74	15.4	B	NB-TR	0.74	15.4	B	NB-TR	0.64	10.9	B	NB-TR	0.64	10.9	B	NB-T	0.67	13.8	B	NB-T	0.67	13.8	B	
																		NB-R	0.25	11.6	B	NB-R	0.25	11.6	B
E. 56 th Street (E-W) Sutton Place (N-S)	EB-LTR	0.65	39.5	D	EB-LTR	0.55	35.0	C	EB-LTR	0.54	35.5	D	EB-LTR	0.43	31.8	C	EB-LTR	0.57	36.6	D	EB-LTR	0.46	32.4	C	
	WB-LR	0.03	25.2	C	WB-LR	0.03	25.2	C	WB-LR	0.04	25.3	C	WB-LR	0.04	25.3	C	WB-LR	0.06	25.6	C	WB-LR	0.06	25.6	C	
	NB-TR	0.18	8.9	A	NB-TR	0.18	8.9	A	NB-TR	0.15	8.7	A	NB-TR	0.16	8.7	A	NB-TR	0.25	9.5	A	NB-TR	0.25	9.5	A	
	SB-LT	0.35	10.3	B	SB-LT	0.35	10.3	B	SB-LT	0.28	9.8	A	SB-LT	0.29	9.8	A	SB-LT	0.39	10.7	B	SB-LT	0.39	10.7	B	
Construction on E. 55th Street – Segment 9 Only (between Sutton Place and First Avenue)																									
E. 55 th Street (WB) First Avenue (NB)	WB-T	0.74	37.9	D	WB-T	0.61	30.2	C	WB-T	0.64	32.3	C	WB-T	0.55	28.5	C	WB-T	0.77	39.8	D	WB-T	0.64	31.5	C	
	WB-R	0.22	22.5	C	WB-R	0.24	23.2	C	WB-R	0.24	22.9	C	WB-R	0.27	23.7	C	WB-R	0.24	22.9	C	WB-R	0.27	23.7	C	
	NB-LT	0.76	12.7	B	NB-LT	0.76	12.7	B	NB-LT	0.70	11.7	B	NB-LT	0.70	11.7	B	NB-L	0.40	11.8	B	NB-L	0.40	11.8	B	
																		NB-LT	0.75	12.4	B	NB-LT	0.75	12.4	B
Notes:	<p>EB-Eastbound, WB-Westbound, NB-Northbound, SB-Southbound; L-Left, T-Through, R-Right, DiL-Analysis considers a Defacto Left Lane on this approach.</p> <p>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.</p> <p>V/C Ratio - Volume to Capacity Ratio, SEC/VEH - Seconds per vehicle; LOS - Level of service</p> <p>* Denotes impacted locations</p> <p>Analysis is based on the 2000 <i>Highway Capacity Manual Methodology</i> (HCS 2000).</p> <p>Where the same number of travel lanes would be maintained during construction and adjacent parking removed, Build delay levels may be lower than those projected for the No Build conditions.</p>																								

- E. 59th Street Segment: Construction on E. 59th Street, First Avenue to York Avenue/Sutton Place: Construction along E. 59th Street would result in temporary adverse impacts at the E. 59th Street intersections with First Avenue and York Avenue/Sutton Place in one or more peak periods. At First Avenue and E. 59th Street, with all eastbound vehicles required to turn left onto First Avenue, the eastbound approach would deteriorate in the midday peak hour from LOS C to LOS D, with delays increasing from 22.7 spv to 52.7 spv and in the PM peak hour from LOS D to LOS F, with delays increasing from 42.3 spv to 119.6 spv. At York Avenue/Sutton Place and E. 59th Street, the southbound approach would deteriorate from LOS E to LOS F in the PM peak hour, with delays increasing from 78.0 spv to 89.5 spv. This increase in delay represents the worst-case conditions for the York Avenue/Sutton Place intersection with E. 59th Street and would only occur when the construction takes place at the intersection. While delay increases on eastbound E. 59th Street at First Avenue were projected to be substantial during the PM peak hour, the number of vehicles impacted by this condition would be relatively low. Hence, it is expected that minimal disruptions to surrounding traffic flow would result from the projected increases in delay. For the southbound York Avenue approach to E. 59th Street, delay increases are less substantial and minimal disruptions to surrounding traffic flow is anticipated.
- Segment 1: Construction on Sutton Place, E. 56th to E. 57th Street and E. 58th to E. 59th Street: Segment 1 construction along Sutton Place would result in temporary adverse impacts at E. 58th and E. 59th Streets in one or more peak periods. At E. 59th Street, the northbound approach would deteriorate in the AM peak hour from LOS B to LOS F, with delays increasing from 15.0 spv to 145.1 spv and in the PM peak hour from LOS B to LOS F, with delays increasing from 17.6 spv to 149.6 spv. At E. 58th Street, the southbound approach would deteriorate from LOS B to LOS E, with delays increasing from 13.1 spv to 62.9 spv. The substantial increases in delay at the northbound approaches of these intersections would severely impact the overall traffic flow along the Sutton Place corridor south of E. 59th Street.
- Segment 3: Construction on Sutton Place, E. 55th to E. 56th Street and E. 57th to E. 58th Street: Segment 3 construction along Sutton Place would result in temporary adverse impacts at E. 57th and E. 58th Streets in one or more peak periods. At E. 58th Street, the southbound approach would deteriorate from LOS B to LOS E in the midday peak hour, with delays increasing from 13.1 spv to 62.9 spv. At E. 57th Street, the southbound approach in the midday peak hour would deteriorate from LOS B to LOS F, with delays increasing from 18.1 spv to 163.0 spv while the northbound approach in the PM peak hour would deteriorate from LOS B to LOS D, with delays increasing from 12.3 spv to 45.7 spv. The substantial increases in delay at the northbound approaches of these intersections would severely impact the overall traffic flow along the Sutton Place corridor south of E. 57th Street.
- Segment 5 – Construction on E. 56th Street, Sutton Place to First Avenue: No temporary adverse impacts are expected to result from the construction of Segment 5.
- Segment 9 – Construction on E. 55th Street, Sutton Place to First Avenue: No temporary adverse impacts are expected to result from the construction of Segment 9.

Mid-block Traffic and Queuing Assessments

The construction of the proposed water mains, as described above, have been assumed to create work zones along the south curb of E. 59th Street between First Avenue and York Avenue/Sutton Place, the west curbs of Sutton Place between E. 55th and E. 59th Streets, and the north curbs of E. 55th and E. 56th Streets from Sutton Place to First Avenue, where the crosstown portions of the First Avenue route would resume. The work zones would vary in width on E. 59th Street and Sutton Place from 16.5 to 24.5 feet and would be 18.5 feet wide along both cross streets. Curbside conditions during construction would be similar to those depicted for the First Avenue route, with parking and bus stops temporarily displaced along Sutton Place and portions of the cross streets.

Queues would form where congested levels were identified during construction and are likely to be similar but at lower magnitude than those depicted for the First Avenue route. However, since Sutton Place is less of a through or feeder route than First Avenue, potential diversion of traffic away from the construction zone to other parallel routes is less likely. Mitigation measures that are available to address the anticipated traffic impacts are described in Section 5.16, "Mitigation Measures." When applied, these measures are expected to address these impacts by increasing capacity, reducing delays, and alleviating queues to conditions that would be typical of traffic flow under such street surface disruptions.

Parking Analysis

During the construction of the water main connections, curb lanes in each segment would be temporarily occupied by construction work zones. Along E. 59th Street, truck loading and unloading is permitted during daytime hours on the south side of the street for most of the block between First Avenue and York Avenue/Sutton Place. During construction, spanning approximately 200 feet at a time, up to 10 curbside spaces would be temporarily displaced. Along Sutton Place, construction during Segments 1 and 3 would displace 5 to 10 curbside spaces per block (two blocks under construction at a time during each segment for a total of 10 to 20 displaced spaces for the duration of each segment) for 12 weeks each. On the west side of Sutton Place, up to 10 parking spaces per block would be displaced during construction between E. 55th and E. 57th Streets. A bus stop located north of E. 55th Street would need to be relocated as well. Between E. 57th and E. 58th Streets, approximately 5 spaces would be displaced and a bus stop located on the northern end of the block would need to be relocated during construction. Between E. 58th and E. 59th Streets, since parking is currently not permitted, no anticipated loss in parking spaces would occur. However, the existing bus stop on this block would need to be relocated during construction. During the construction of Segments 5 and 9, curbside usage on both sides of the cross streets would be affected. With surface disruptions occurring at approximately 200-foot segments, up to 10 curbside spaces through the construction area and up to 15 curbside spaces across from it would be temporarily displaced, similar to conditions described for the cross-street construction under the First Avenue route. The parking displacement would be short-term and according to CEQR criteria, such a short-term displacement, particularly within the Manhattan CBD, would not constitute a significant adverse impact.

Secondary Segment Construction Assessment

In addition to the primary water main construction efforts and the associated impacts described above, secondary construction would be required to connect the water mains at intersections. This work would

occur during off-peak hours, to the extent possible, by imposing temporary partial closures at each location to ensure minimal disturbance to area traffic. This effort, to be accomplished via closing half of the cross streets at a time while continuing to process traffic, would take approximately 10 weeks to complete for each intersection along the water main connection route. The secondary segment construction for locations west of First Avenue is provided under the discussions for the First Avenue route.

Safety Analysis

As discussed for the First Avenue route, the First Avenue intersection with E. 59th Street was identified as a high-pedestrian-accident location. The construction along the E. 59th Street Segment between First Avenue and York Avenue/Sutton Place would narrow the roadway but would also eliminate one travel direction, thereby reducing potential vehicular-pedestrian conflicts. For other segments along the Sutton Place route, construction staging would be similar to what was described for the First Avenue route. Since the available pedestrian space would not be diminished except for a two-foot width along the north sidewalk of E. 59th Street during this block's construction and there would not be a perceptible increase in vehicular and pedestrian traffic, no decrease in pedestrian safety is anticipated and the proposed construction is not expected to result in any potential significant adverse impacts to pedestrian safety.

Impact Assessment Summary

Under the Sutton Place route, construction of the water main connections would result in temporary adverse traffic impacts at the First Avenue intersection with E. 59th Street and at the Sutton Place intersections with E. 57th, E. 58th, and E. 59th Streets. No adverse impacts are expected from the construction on E. 55th and E. 56th Streets. The total duration of these impacts and those along E. 56th Street under Segment 7 of the First Avenue route would be approximately 115 weeks. Mitigation measures that could be implemented to address the traffic impacts are presented in Section 5.16.

E. 59th Street/E. 61st Street Route

Traffic Operations Analysis

Under this scenario, one main each would be constructed across E. 59th and E. 61st Streets from the preferred Shaft Site to Third Avenue where the two mains would connect to the existing trunk main distribution system. The E. 61st Street main would also involve construction up First Avenue between E. 59th and E. 61st Streets. The E. 59th Street/E. 61st Street route would take approximately 31 months to complete, with most block segments taking 12 weeks each and intersection segments taking 10 weeks each. The first half of the First Avenue connection to E. 61st Street would include the construction of the venturi chamber for the preferred Shaft Site and take 20 weeks to complete. The same 20-week duration would be required for the E. 59th Street segment between First and Second Avenues.

Since the E. 59th Street/E. 61st Street route would involve single-main construction throughout, an 18.5-foot wide area would be required within construction zones at all times. Along First Avenue, one of the mains would be constructed on the west side of the roadway between E. 59th and E. 61st Streets, then continue west to Third Avenue in two stages along the center of E. 61st Street. The second main would be constructed along the south side of E. 59th Street, also in two stages, connecting to the

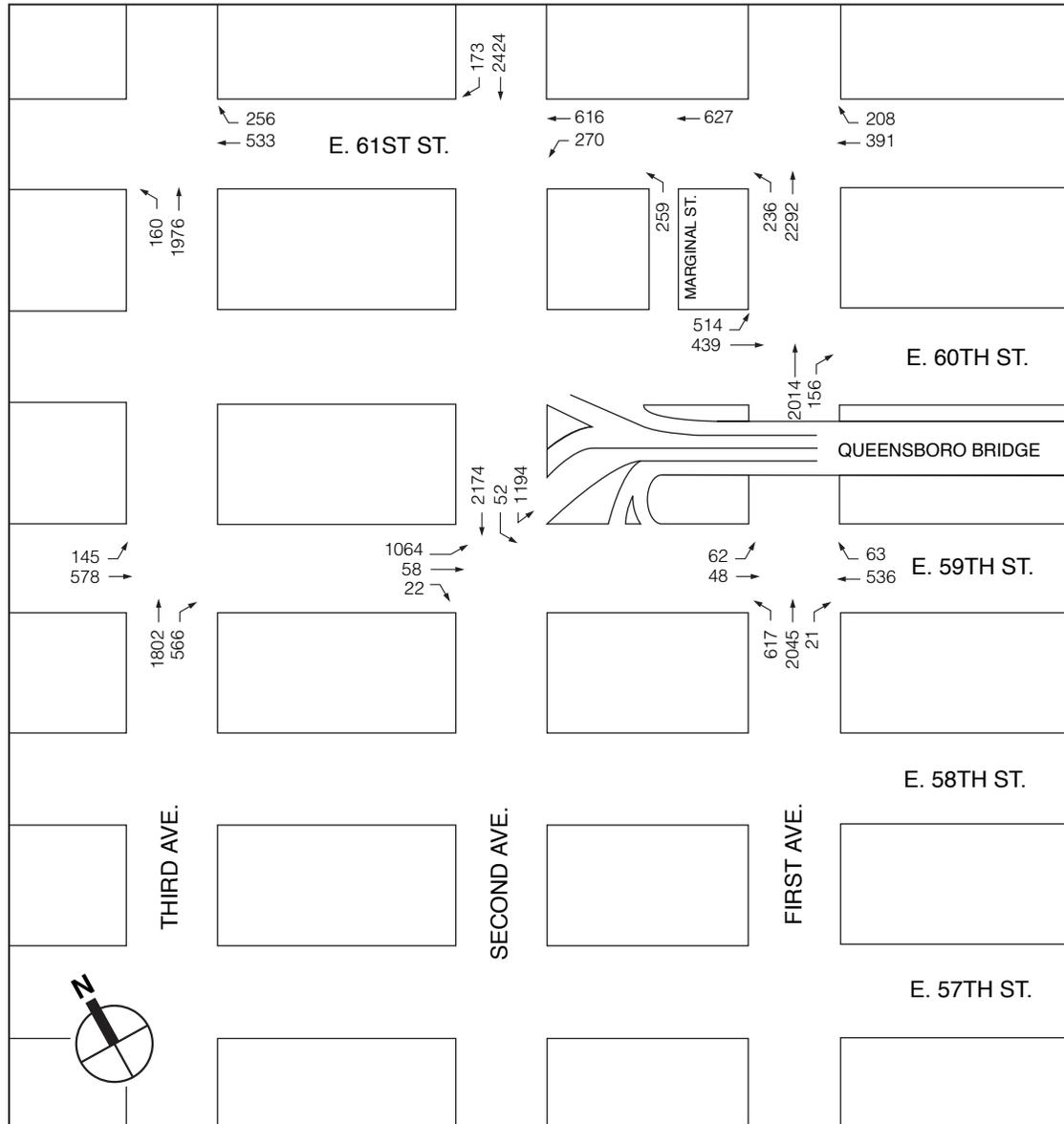
existing trunk main under Third Avenue. For ease of comparison, the First Avenue segment is analogously referred to as Segment 1, while the E. 61st Street and E. 59th Street segments are referred to as Segments 3 and 5 and Segments 6 and 8, respectively.

First Avenue between E. 59th and E. 61st Streets is seven lanes wide, including curb lanes. When construction takes place on Segment 1, the avenue's two western lanes would be closed to traffic during all time periods. E. 61st Street is a one-way westbound street providing access from the northbound FDR Drive to the Upper East Side. It varies in width from approximately 33.5 feet wide at First Avenue to 30 feet wide at Third Avenue. Construction on E. 61st Street would be conducted along the center of the street. By using the area on the south curb for truck staging, a travel lane of 11.5 to 15 feet could be maintained along the north curb through the construction zone, which would be delineated at approximately 200-foot segments, similar to the construction at other cross-town streets under the First Avenue and Sutton Place routes. Along E. 59th Street, construction would occur on the south side of the street. Between First and Second Avenues, 6 feet of the south sidewalk would be taken for approximately half of the block to maintain eastbound traffic flow and the existing level of access from First Avenue and westbound E. 59th Street to the Queensboro Bridge outer roadway. For the other half of the block, the NYCDOT equipment storage area would be used to provide a temporary eastbound roadway to bypass the construction zone. Between Second and Third Avenues, E. 59th Street serves as one of the primary access route to the Queensboro Bridge lower level. Construction of the water mains would reduce this section of E. 59th Street to a single-lane roadway. To minimize curbside and access disruptions, the construction would occur in segments of approximately 200 feet each. Furthermore, intersection work would be conducted in sections and, where possible, during the evening or late night hours when traffic volumes are lower, to ensure that traffic flow would be maintained.

Projected 2008 Study Area traffic volumes, incorporating the construction truck traffic detailed under the First Avenue route discussions, are presented in Figures 5.9-44, 5.9-45, and 5.9-46 for the AM, midday, and PM peak hours, respectively.

The specific roadway space requirements for the water main connections are detailed below for each segment of construction. The anticipated changes to lane configuration along the First Avenue, E. 59th Street and E. 61st Street corridors are depicted in Figures 5.9-47 through 5.9-53.

- **Segment 1:** This segment contemplates construction along two blocks of First Avenue between E. 59th and E. 61st Streets, with construction being staged one block at a time. The 18.5-foot wide construction area would reduce the First Avenue roadway to 5 lanes, with usage varying at different times of the day. The block between E. 59th and E. 60th Streets would operate with four through lanes and one right-turn only lane at all times, with the east curb lane also serving as a bus lane during the PM peak period. The block between E. 60th and E. 61st Streets would operate with one left-through and 3 through lanes during all peak periods. The east curb lane would serve as a parking lane during the AM and midday peak periods and as a bus lane during the PM peak period. Lane configurations along First Avenue during the construction period are illustrated in Figures 5.9-47, 5.9-48 and 5.9-49.
- **Segment 3:** Construction for this segment, as illustrated in Figure 5.9-50, would occur along E. 61st Street between First and Second Avenues. This segment also includes the signalized intersection of E. 61st Street with Marginal Street, which serves primarily as a bus staging area and secondarily as

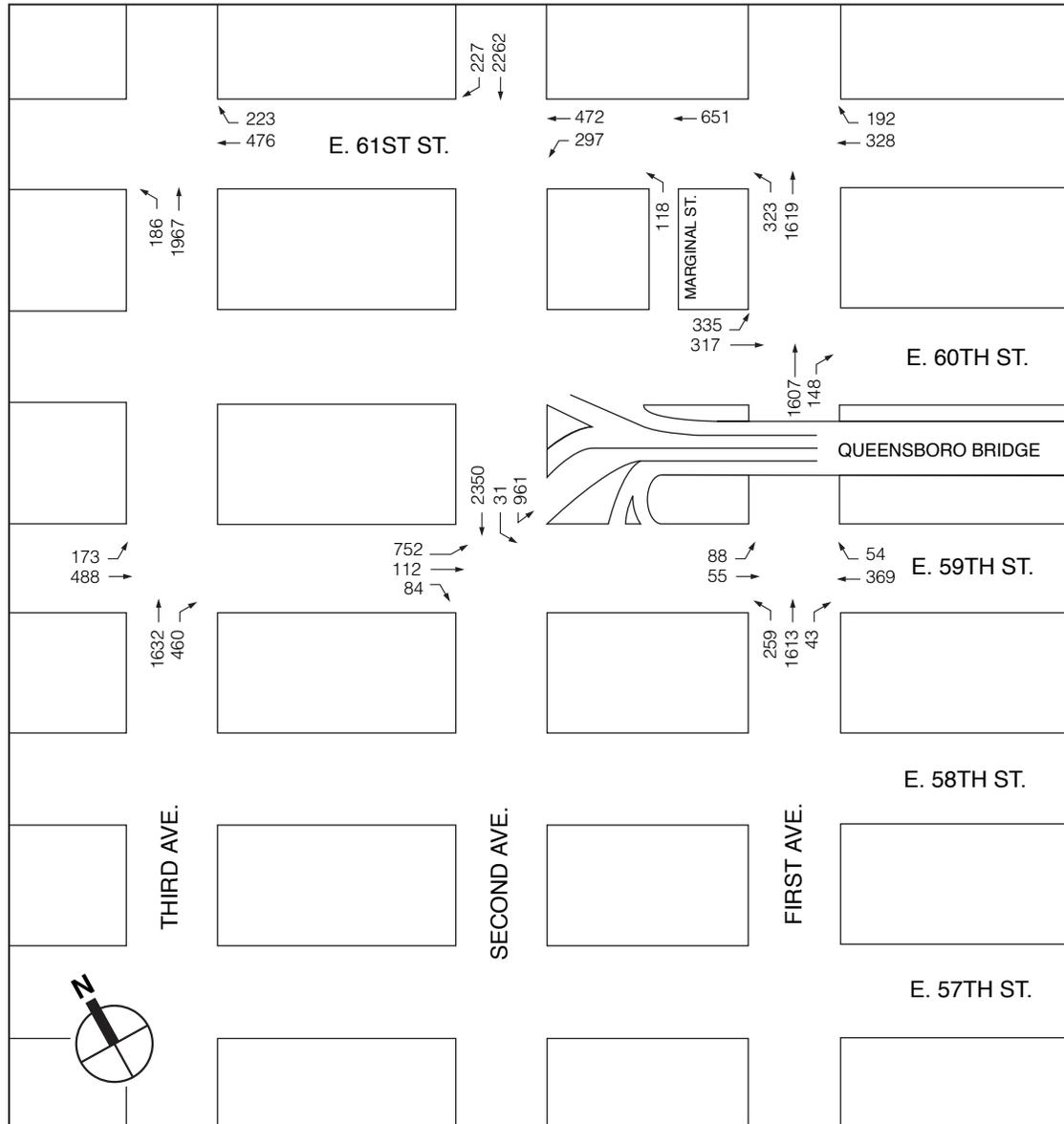


NOT TO SCALE



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 PROPOSED SHAFT 33B TO CITY WATER TUNNEL NO. 3
 STAGE 2-MANHATTAN LEG
 WATER MAIN CONNECTIONS
 2008 BUILD TRAFFIC VOLUME NETWORK
 WATER MAIN STUDY AREA - E. 59TH STREET / E. 61ST STREET ROUTE
 AM PEAK HOUR

FIGURE 5.9-44

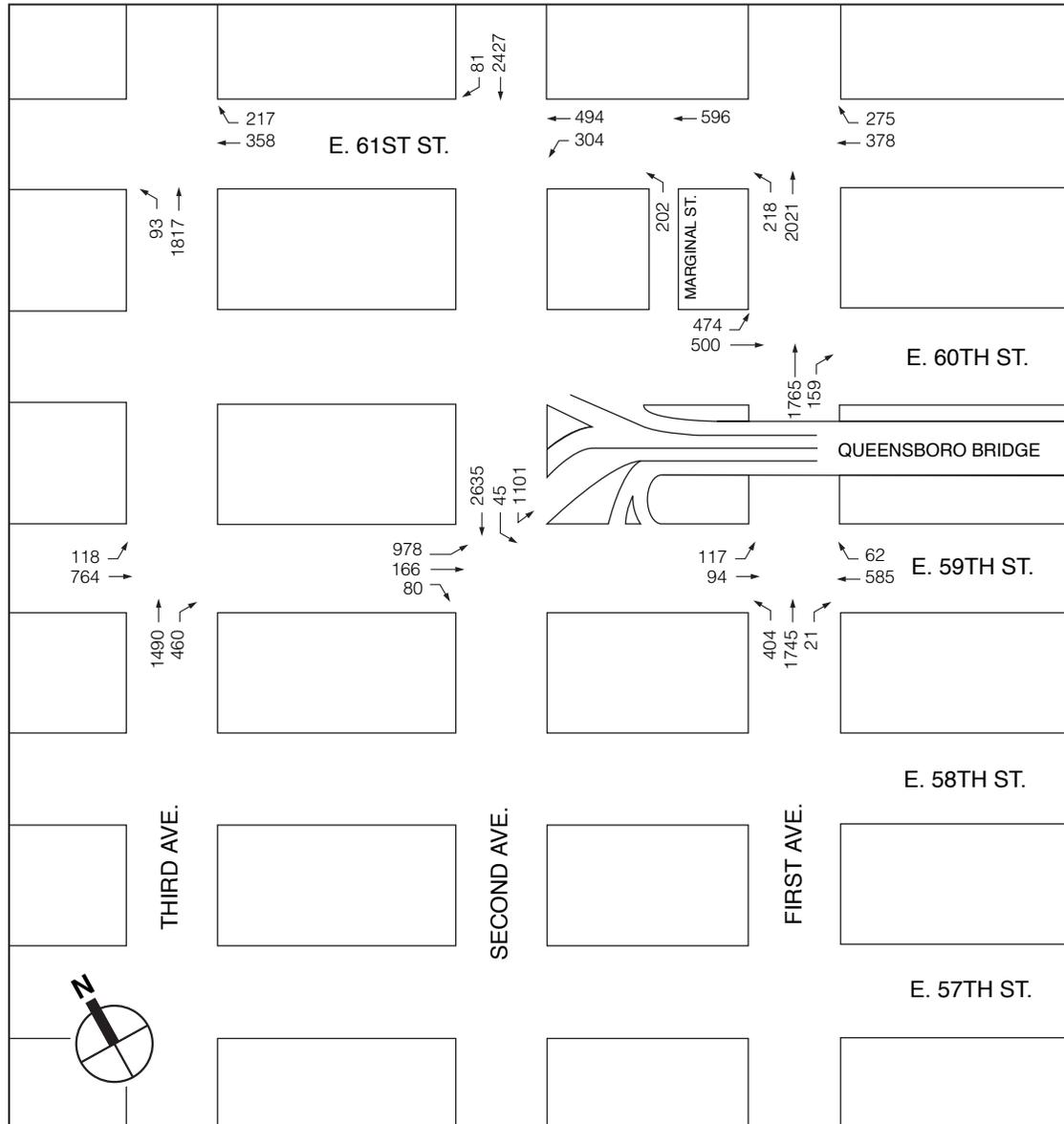


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 WATER MAIN CONNECTIONS
 2008 BUILD TRAFFIC VOLUME NETWORK
 WATER MAIN STUDY AREA - E. 59TH STREET / E. 61ST STREET ROUTE
 MIDDAY PEAK HOUR

FIGURE 5.9-45



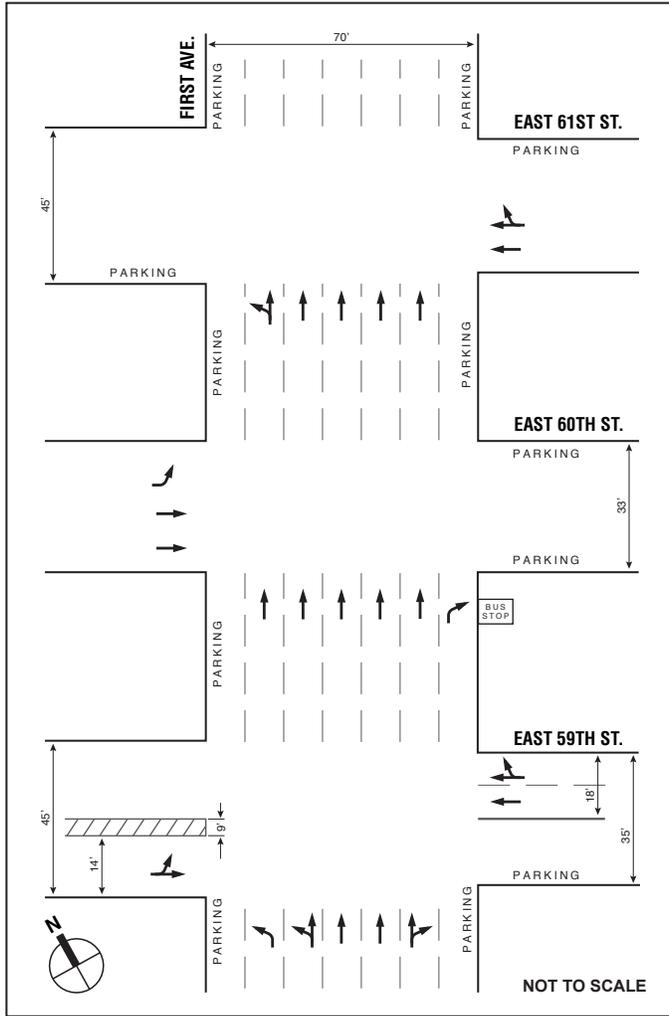
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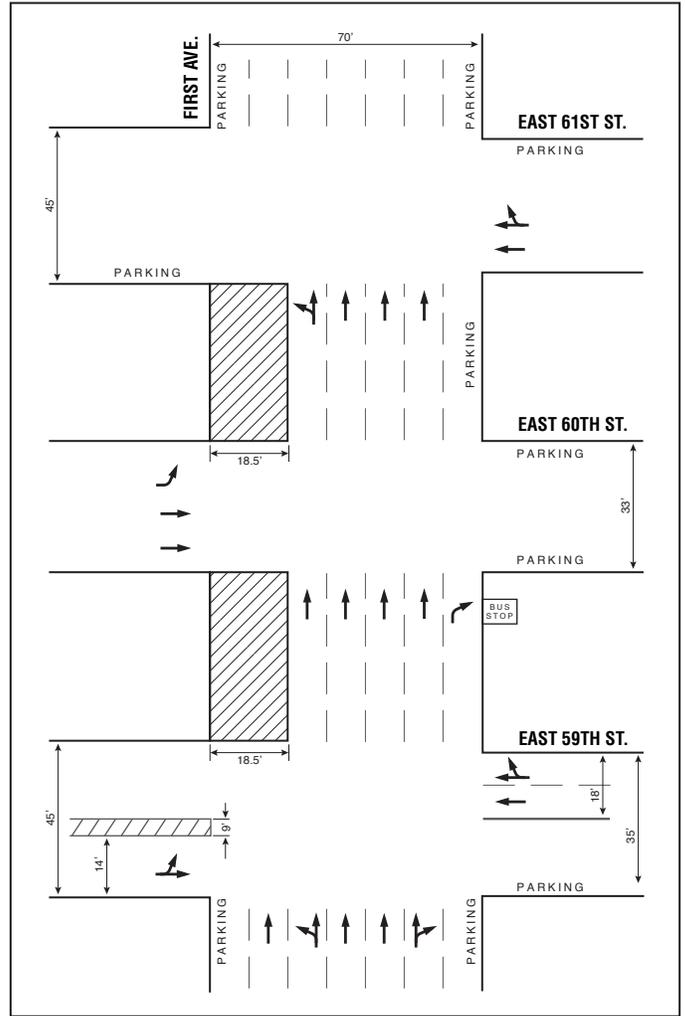
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 WATER MAIN CONNECTIONS
 2008 BUILD TRAFFIC VOLUME NETWORK
 WATER MAIN STUDY AREA - E. 59TH STREET / E. 61ST STREET ROUTE
 PM PEAK HOUR

FIGURE 5.9-46

EXISTING CONFIGURATION



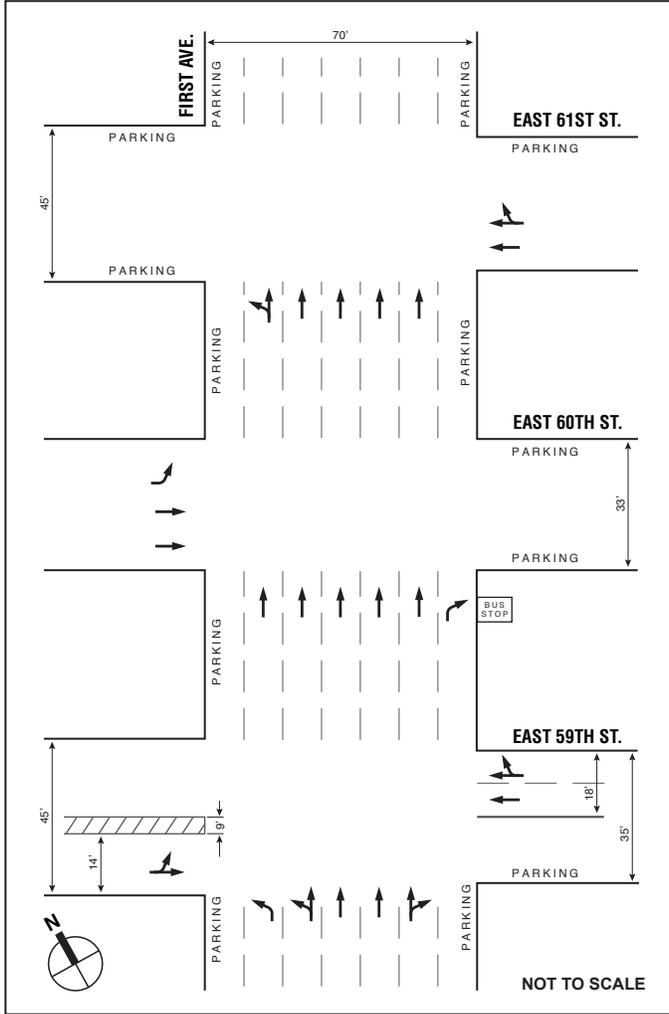
E. 59TH / E. 61ST STREET ROUTE CONFIGURATION



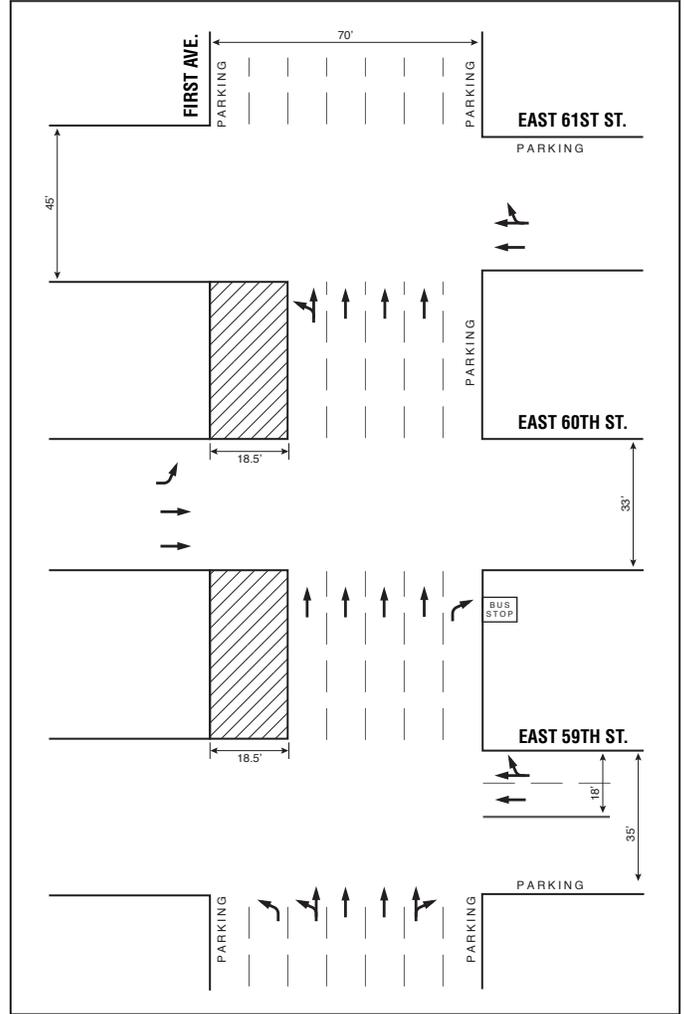
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 WATER MAIN CONNECTIONS
ROADWAY CONFIGURATIONS
 E. 59TH STREET / E. 61ST STREET ROUTE - SEGMENT 1
 AM PEAK HOUR

FIGURE 5.9-47

EXISTING CONFIGURATION



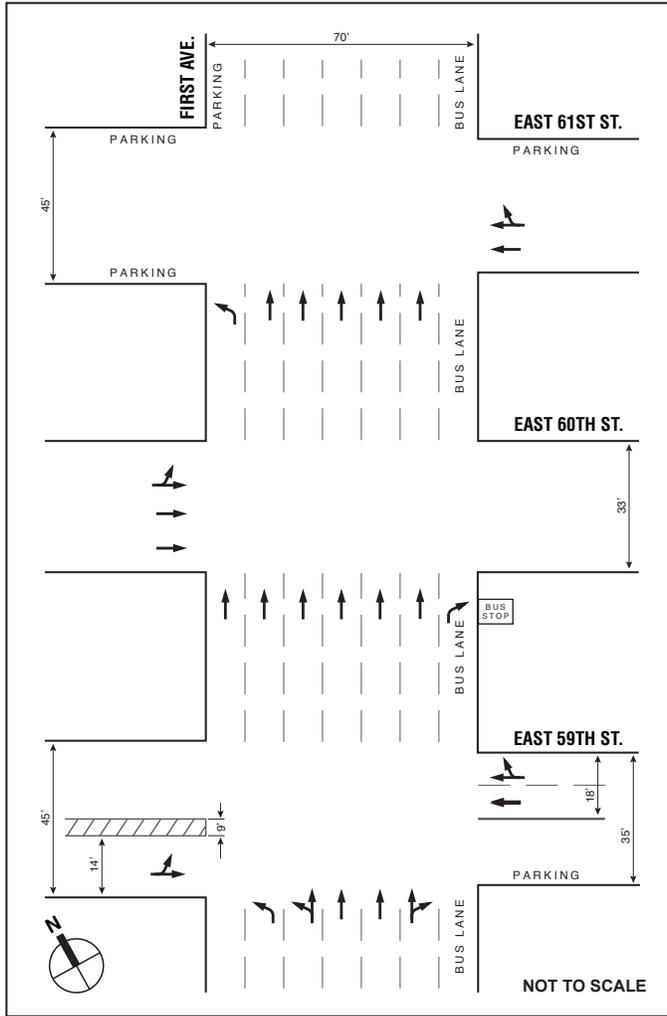
E. 59TH / E. 61ST STREET ROUTE CONFIGURATION



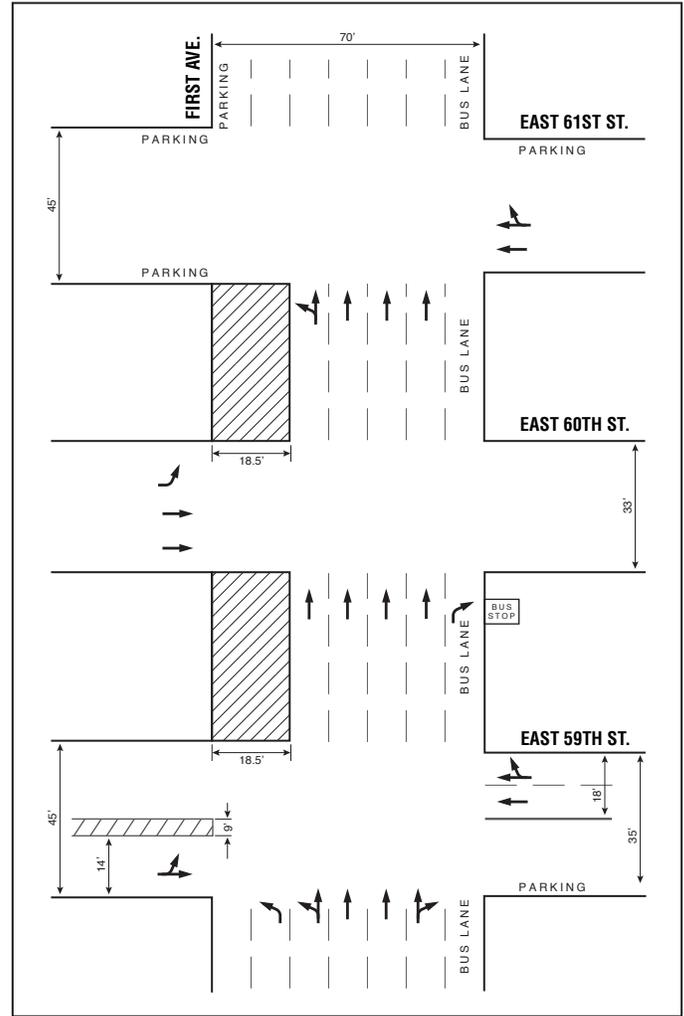
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 STAGE 2-MANHATTAN LEG
 WATER MAIN CONNECTIONS
ROADWAY CONFIGURATIONS
 E. 59TH STREET / E. 61ST STREET ROUTE - SEGMENT 1
 MIDDAY PEAK HOUR

FIGURE 5.9-48

EXISTING CONFIGURATION



E. 59TH / E. 61ST STREET ROUTE CONFIGURATION

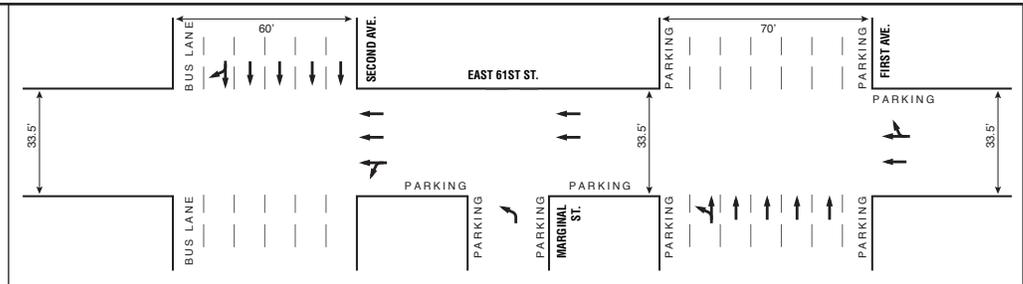


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 STAGE 2-MANHATTAN LEG
 WATER MAIN CONNECTIONS
ROADWAY CONFIGURATIONS
 E. 59TH STREET / E. 61ST STREET ROUTE - SEGMENT 1
 PM PEAK HOUR

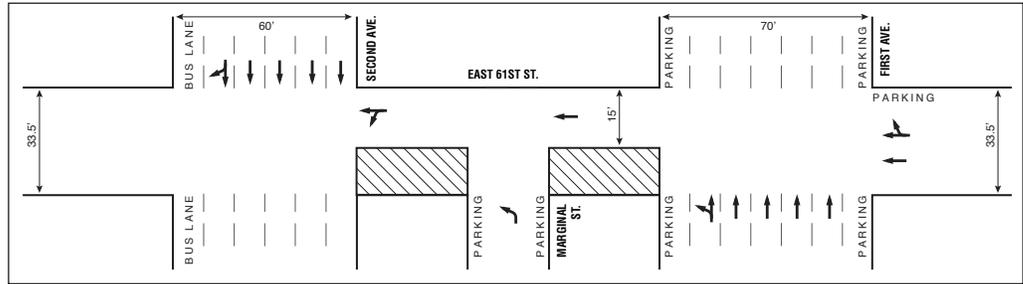
FIGURE 5.9-49

AM PEAK HOUR

EXISTING CONFIGURATION

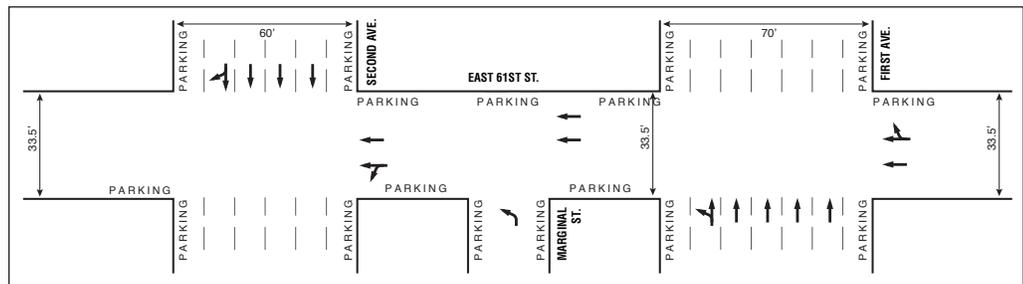


E. 59TH STREET /
E. 61ST STREET ROUTE CONFIGURATION

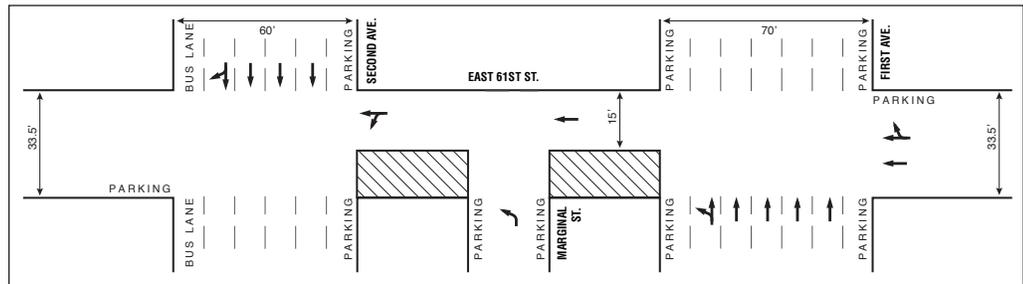


MIDDAY PEAK HOUR

EXISTING CONFIGURATION

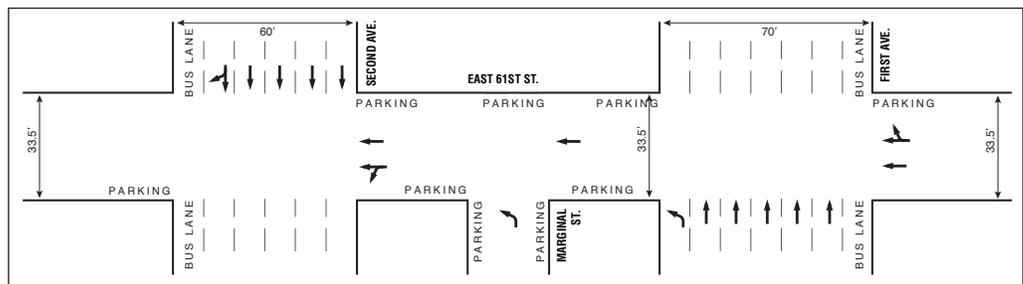


E. 59TH STREET /
E. 61ST STREET ROUTE CONFIGURATION

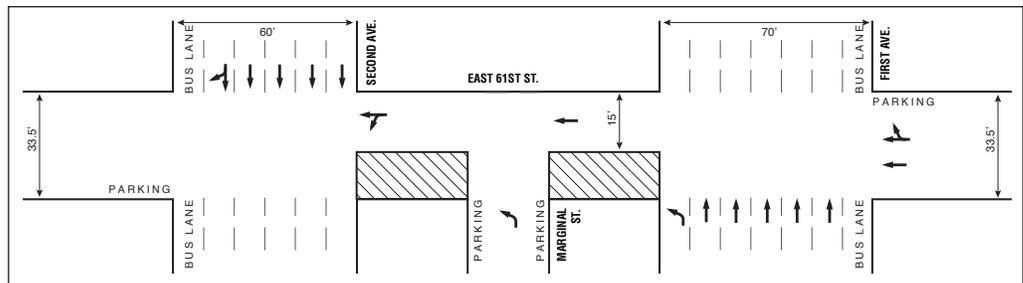


PM PEAK HOUR

EXISTING CONFIGURATION



E. 59TH STREET /
E. 61ST STREET ROUTE CONFIGURATION

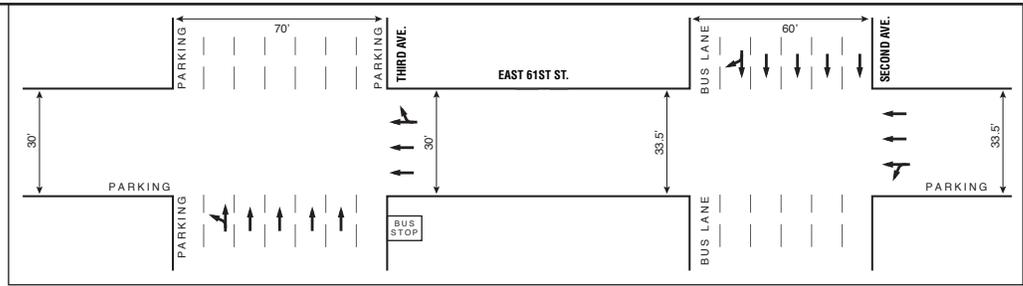


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 STAGE 2-MANHATTAN LEG
 WATER MAIN CONNECTIONS
 ROADWAY CONFIGURATIONS
 E. 59TH STREET / E. 61ST STREET ROUTE - SEGMENT 3

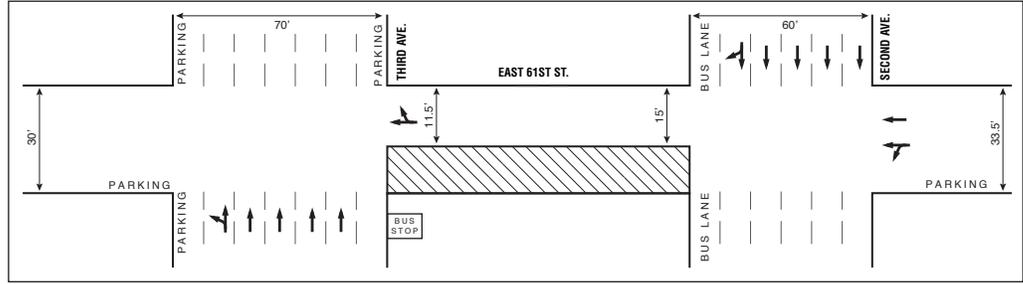
FIGURE 5.9-50

AM PEAK HOUR

EXISTING CONFIGURATION

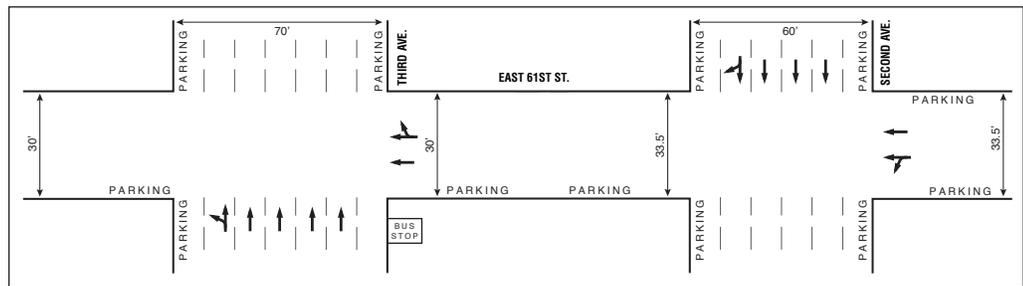


E. 59TH STREET / E. 61ST STREET ROUTE CONFIGURATION

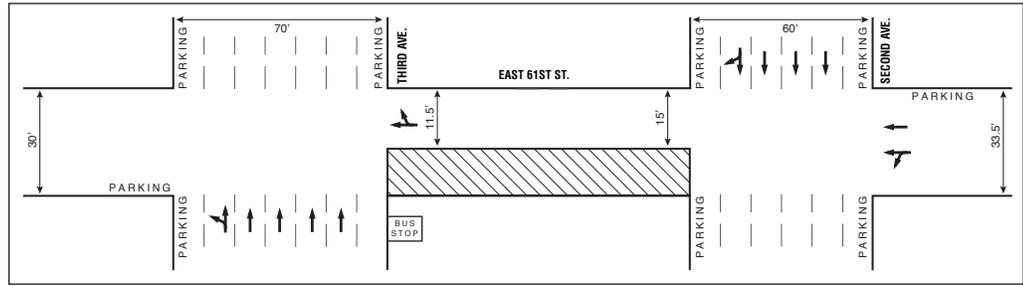


MIDDAY PEAK HOUR

EXISTING CONFIGURATION

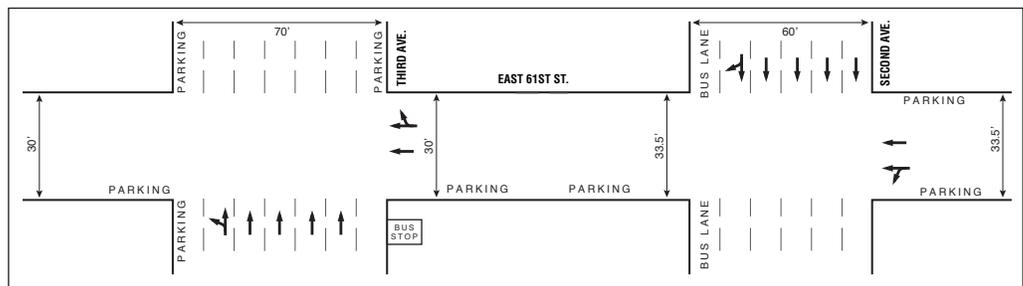


E. 59TH STREET / E. 61ST STREET ROUTE CONFIGURATION

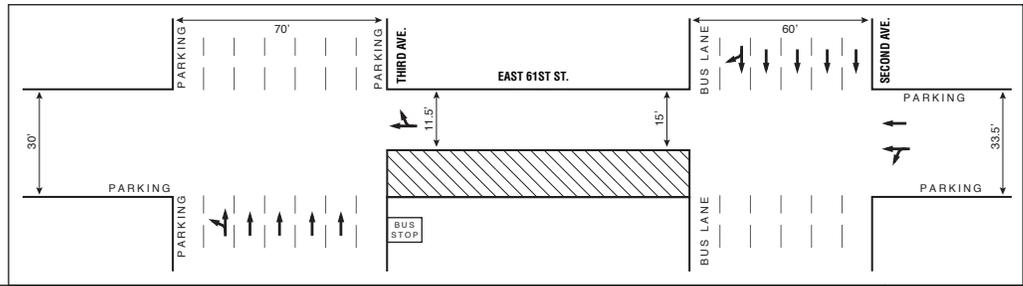


PM PEAK HOUR

EXISTING CONFIGURATION



E. 59TH STREET / E. 61ST STREET ROUTE CONFIGURATION



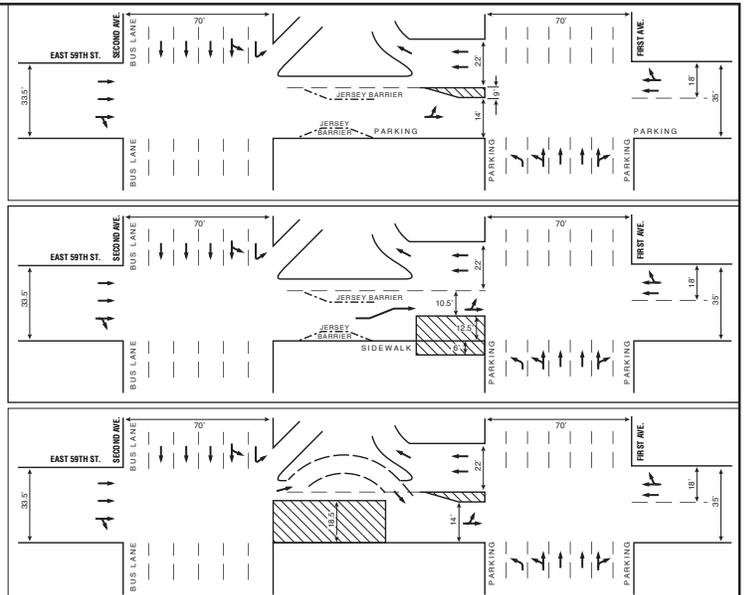
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 STAGE 2-MANHATTAN LEG
 WATER MAIN CONNECTIONS
 ROADWAY CONFIGURATIONS
 E. 59TH STREET / E. 61ST STREET ROUTE - SEGMENT 5

FIGURE 5.9-51

AM PEAK HOUR

**E. 59TH STREET /
E. 61ST STREET ROUTE CONFIGURATION
EASTERN PORTION**

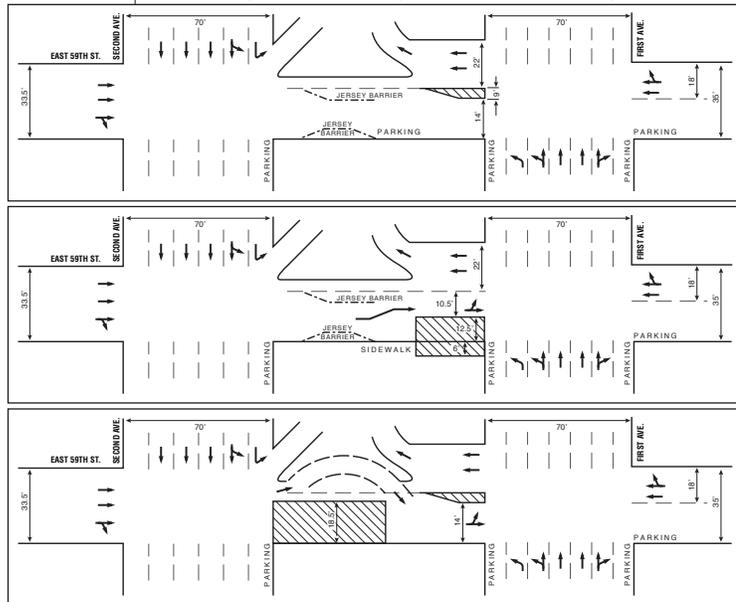
**E. 59TH STREET /
E. 61ST STREET ROUTE CONFIGURATION
WESTERN PORTION**



MIDDAY PEAK HOUR

**E. 59TH STREET /
E. 61ST STREET ROUTE CONFIGURATION
EASTERN PORTION**

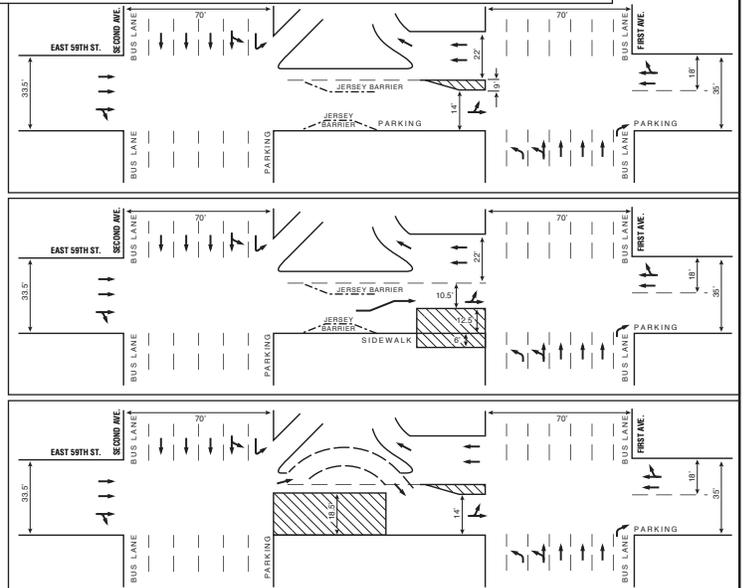
**E. 59TH STREET /
E. 61ST STREET ROUTE CONFIGURATION
WESTERN PORTION**



PM PEAK HOUR

**E. 59TH STREET /
E. 61ST STREET ROUTE CONFIGURATION
EASTERN PORTION**

**E. 59TH STREET /
E. 61ST STREET ROUTE CONFIGURATION
WESTERN PORTION**



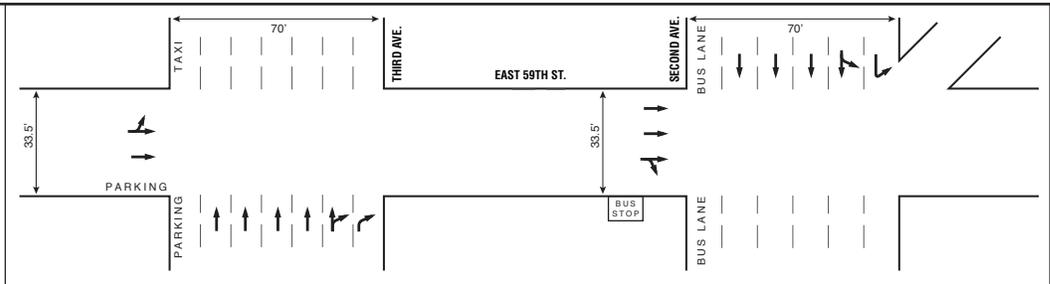
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STAGE 2-MANHATTAN LEG
WATER MAIN CONNECTIONS**

**ROADWAY CONFIGURATIONS
E. 59TH STREET / E. 61ST STREET ROUTE - SEGMENT 6**

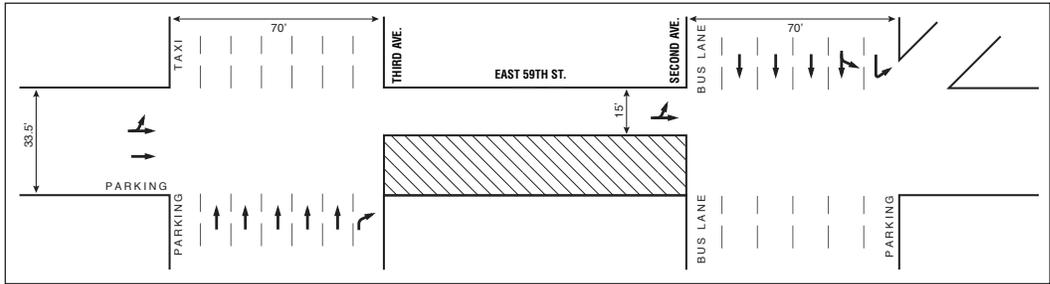
FIGURE 5.9-52

AM PEAK HOUR

EXISTING CONFIGURATION

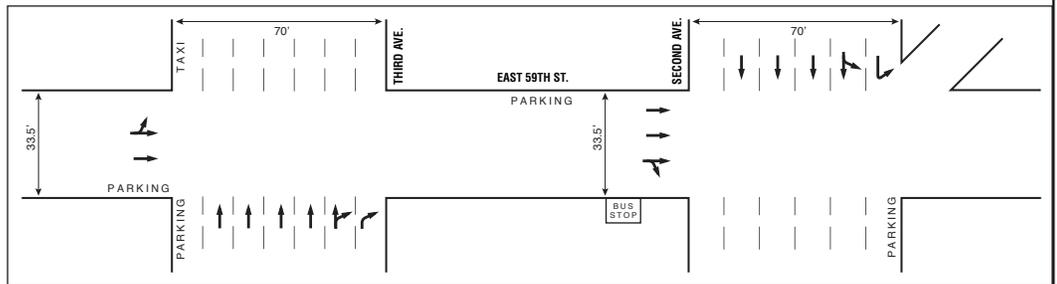


E. 59TH STREET /
E. 61ST STREET ROUTE
CONFIGURATION

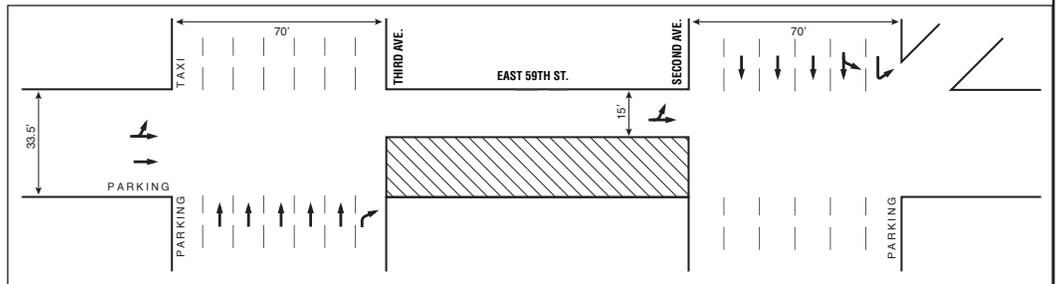


MIDDAY PEAK HOUR

EXISTING CONFIGURATION

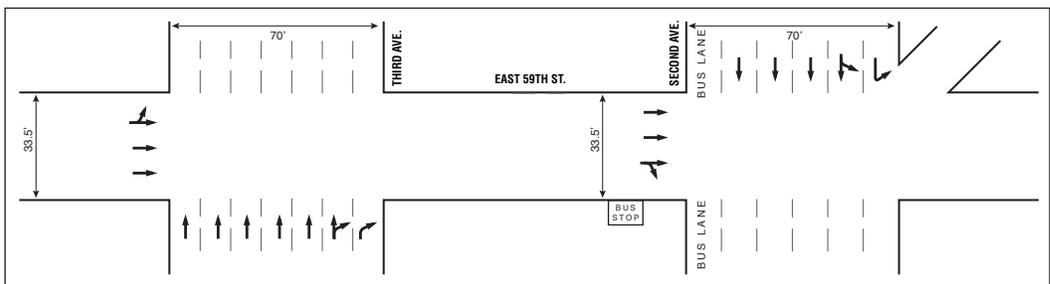


E. 59TH STREET /
E. 61ST STREET ROUTE
CONFIGURATION

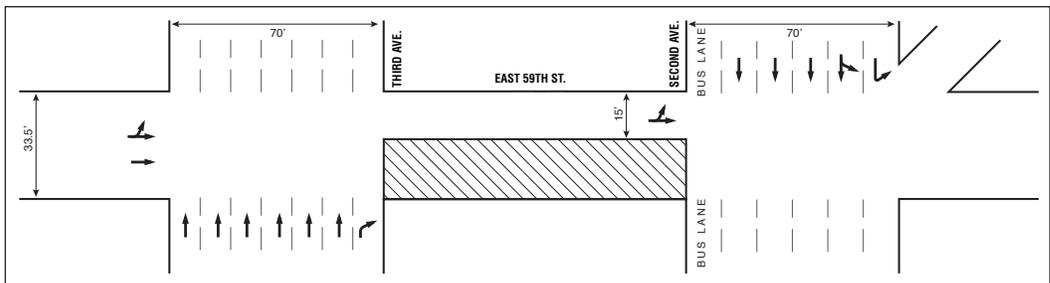


PM PEAK HOUR

EXISTING CONFIGURATION



E. 59TH STREET /
E. 61ST STREET ROUTE
CONFIGURATION



NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION
 PROPOSED SHAFT 33B TO CITY WATER TUNNEL NO. 3
 STAGE 2-MANHATTAN LEG
 WATER MAIN CONNECTIONS
ROADWAY CONFIGURATIONS
 E. 59TH STREET / E. 61ST STREET ROUTE - SEGMENT 8

FIGURE 5.9-53

a minor exit route from the lower level of the Queensboro Bridge. The construction would reduce the width of the E. 61st Street roadway from approximately 33.5 to 15 feet in 200-foot segments. Curbside activities would be prohibited across from the construction zone to maintain adequate roadway width for traffic flow.

- Segment 5: Construction for this segment, as illustrated in Figure 5.9-51, would occur along E. 61st Street between Second and Third Avenues and would reduce the roadway width from approximately 30 to 11.5 feet in 200-foot segments. Curbside activities would be prohibited across from the construction zone to maintain adequate roadway width for traffic flow.
- Segment 6: Construction for this segment, as illustrated in Figure 5.9-52, would occur in 200-foot segments along E. 59th Street between First and Second Avenues. The 45-foot wide roadway in the eastern portion of this block serves two-way traffic, with one 14-foot eastbound lane and two 11-foot westbound lanes that continue onto the access ramp to the Queensboro Bridge outer roadway. A 9-foot striped median provides the separation for the eastbound and westbound roadways. The western portion of this block serves one-way eastbound traffic underneath the southern arch of the Queensboro Bridge overpass. The area underneath the northern arch of the overpass is gated and functions as an enclosed NYCDOT equipment storage area. When construction initiates on the eastern end of the block, 6 feet of the south sidewalk and 12.5 feet of the eastbound roadway would be closed (for approximately 370 feet from the First Avenue intersection). To continue operating eastbound traffic, the 9-foot striped median would be eliminated and combined with the remaining roadway space to form a single 10.5-foot eastbound lane. The eastbound stop bar would be set back to provide an adequate turning radius for the double left-turn lanes from First Avenue. Curbside activities would be prohibited along the south curb at and immediately adjacent to the construction zone. When water main connections shift to the western half of E. 59th Street between First and Second Avenues, construction would take place entirely on the roadway. Because of the locations of the Queensboro Bridge overpass and the inadequate vertical clearance underneath the north side of the southern arch, effectively the entire existing eastbound roadway at this location would not be available. A temporary roadway through the NYCDOT equipment storage area would be provided to maintain eastbound traffic through the construction zone. At this time, the configuration on the eastern half of the block would be restored to existing conditions.
- Segment 8: Construction for this segment, as illustrated in Figure 5.9-53, would occur along E. 59th Street between Second and Third Avenues. The construction would reduce the width of the E. 59th Street roadway from 33.5 to 15 feet in 200-foot segments. Curbside activities would be prohibited across from the construction zone to maintain adequate roadway width for traffic flow.

Tables 5.9-13 and 5.9-14 summarize the results of the intersection capacity analyses for the AM, midday, and PM peak hours under the roadway configurations described above for each of the construction segments. The operating levels at each of the affected intersections are described below.

- Segment 1: Construction on First Avenue, E. 59th to E. 61st Street: Segment 1 construction along First Avenue would result in temporary adverse impacts at E. 59th and E. 61st Streets in one or more peak periods. At E. 61st Street, the northbound approach would deteriorate in the AM peak hour from LOS B to LOS E, with delays increasing from 18.6 spv to 60.9 spv. At E. 59th Street, LOS D delays on the eastbound approach during the PM peak hour would increase from 42.3 spv to 50.7

spv. These delay increases are not expected to substantially worsen the overall traffic flow along First Avenue.

- Segment 3: Construction on E. 61st Street, First to Second Avenue: Segment 3 construction along E. 61st Street would result in temporary adverse impacts at Second Avenue in all analysis time periods. The westbound approach would deteriorate from LOS C to LOS F, with delays increasing from 22.0 spv to 188.9 spv during the AM peak hour, from 25.9 spv to 130.6 spv during the midday peak hour, and from 26.7 spv to 152.9 spv during the PM peak hour. These increases in delay represent the worst-case conditions for E. 61st Street traffic and would only occur when the construction takes place at the intersection approach. Since E. 61st Street is the direct feeder route for exiting northbound FDR Drive traffic, the substantial increases in delay would severely impact traffic flow further upstream.
- Segment 5: Construction on E. 61st Street, Second to Third Avenue: Segment 5 construction along E. 61st Street would result in temporary adverse impacts at Third Avenue in all analysis time periods. The westbound approach would deteriorate in the AM peak hour from LOS C to LOS F, with delays increasing from 24.4 spv to 320.9 spv. During the midday and PM peak hours, the westbound approach would deteriorate from LOS D to LOS F, with delays increasing from 36.6 spv to 241.1 spv and from 35.9 spv to 231.1 spv, respectively. These increases in delay represent the worst-case conditions for E. 61st Street traffic and would only occur when the construction takes place at the intersection approach. Similar to Segment 3, the substantial increases in delay would severely impact traffic flow further upstream.
- Segment 6: Construction on E. 59th Street, First to Second Avenue: Based on the descriptions provided above, this segment actually involves two separate stages of construction. While operating conditions during each stage could vary, the impact assessment considers the worst-case conditions for analysis. The results show that Segment 6 construction along E. 59th Street would result in temporary adverse impacts at First Avenue during the PM peak hour, when the eastbound approach would deteriorate from LOS D to LOS E, with delays increasing from 42.3 spv to 73.0 spv. Because eastbound traffic volumes on this segment would be relatively low, it is expected that minimal disruptions to surrounding traffic flow would result from the projected increases in delay.
- Segment 8: Construction on E. 59th Street, Second to Third Avenue: Segment 8 construction along E. 59th Street would result in temporary adverse impacts at Second and Third Avenues. At Second Avenue, the eastbound approach would deteriorate from LOS E to LOS F in the AM peak hour, with delays increasing from 62.3 spv to 683.2 spv, from LOS D to LOS F in the midday peak hour, with delays increasing from 38.9 spv to 510.9 spv, and remaining at LOS F in the PM peak, with delays increasing from 87.4 spv to 764.0 spv. At Third Avenue, the northbound right turn movement would deteriorate from LOS E to LOS F in the AM peak hour, with delays increasing from 62.3 spv to 413.3 spv, from LOS D to LOS F in the midday peak hour, with delays increasing from 42.5 spv to 243.1 spv, and from LOS D to LOS F in the PM peak hour, with delays increasing from 41.7 spv to 228.9 spv. These increases in delay represent the worst-case conditions for E. 59th Street traffic and would only occur when the construction takes place at the intersection approach. However, since E. 59th Street is the primary feeder to the Queensboro Bridge, the projected delay increases are expected to severely impact the traffic flow in the area, as many motorists may seek alternate routes to access the Queensboro Bridge.

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Table 5.9-13
2008 Build and No Build Conditions Comparison
E. 59th Street/E. 61st Street Route Water Main Connection Study Area Segments 1, 3, & 5

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
Construction on First Avenue – Segment 1 Only (between E. 59th and E. 61st Streets)																								
E. 61 st Street (WB)	WB-TR	0.62	24.9	C	WB-TR	0.62	24.9	C	WB-TR	0.54	23.4	C	WB-TR	0.54	23.4	C	WB-TR	0.69	26.9	C	WB-TR	0.69	26.9	C
First Avenue (NB)	NB-LT	0.86	18.6	B	NB-LT	1.08	60.9	E *	NB-LT	0.68	14.3	B	NB-LT	0.85	19.0	B	NB-L	0.40	16.2	B	NB-LT	0.93	23.9	C
																	NB-T	0.66	14.0	B				
E. 60 th Street (EB)	EB-LT	0.78	32.4	C	EB-LT	0.78	32.4	C	EB-LT	0.53	26.5	C	EB-LT	0.53	26.5	C	EB-LT	0.79	32.8	C	EB-LT	0.79	32.8	C
First Avenue (NB)	NB-T	0.61	13.2	B	NB-T	0.74	15.4	B	NB-T	0.54	12.5	B	NB-T	0.66	14.2	B	NB-T	0.45	11.5	B	NB-T	0.68	14.4	B
																	NB-R	0.27	11.0	B	NB-R	0.27	11.0	B
E. 59 th Street (E-W)	EB-LT	0.28	18.9	B	EB-LT	0.33	20.1	C	EB-LT	0.44	22.7	C	EB-LT	0.50	24.9	C	EB-LT	0.78	42.3	D	EB-LT	0.85	50.7	D *
First Avenue (NB)	WB-TR	0.53	21.0	C	WB-TR	0.53	21.0	C	WB-TR	0.38	18.9	B	WB-TR	0.38	18.9	B	WB-TR	0.57	21.8	C	WB-TR	0.57	21.8	C
																	NB-L	0.70	22.6	C	NB-L	0.70	22.6	C
																	NB-LTR	0.99	36.2	D	NB-LT	0.74	18.0	B
																	NB-R	0.07	11.2	B	NB-R	0.07	11.2	B
Construction on E. 61st – Segment 3 Only (between First and Second Avenues)																								
E. 61 st Street (WB)	WB-TR	0.62	24.9	C	WB-TR	0.62	24.9	C	WB-TR	0.54	23.4	C	WB-TR	0.54	23.4	C	WB-TR	0.69	26.9	C	WB-TR	0.69	26.9	C
First Avenue (NB)	NB-LT	0.86	18.6	B	NB-LT	0.87	18.9	B	NB-LT	0.68	14.3	B	NB-LT	0.68	14.3	B	NB-L	0.40	16.2	B	NB-L	0.41	16.3	B
																	NB-T	0.66	14.0	B	NB-T	0.66	14.0	B
E. 61 st Street (E-W)	WB-T	0.50	19.1	B	WB-T	0.80	29.4	C	WB-T	1.02	64.4	E	WB-T	0.84	32.6	C	WB-T	0.97	52.7	D	WB-T	0.80	30.2	C
Marginal Street (NB)	NB-L	0.40	18.7	B	NB-L	0.41	18.8	B	NB-L	0.18	15.7	B	NB-L	0.18	15.7	B	NB-L	0.31	17.3	B	NB-L	0.31	17.3	B
E. 61 st Street (E-W)	WB-LT	0.51	22.0	C	WB-LT	1.34	188.9	F *	WB-LT	0.68	25.9	C	WB-LT	1.20	130.6	F *	WB-LT	0.71	26.7	C	WB-LT	1.25	152.9	F *
Second Avenue (SB)	SB-TR	0.86	22.9	C	SB-TR	0.86	22.9	C	SB-TR	1.08	67.4	E	SB-TR	1.08	67.4	E	SB-TR	0.74	19.3	B	SB-TR	0.74	19.3	B
Construction on E. 61st Street – Segment 5 Only (between Second and Third Avenues)																								
E. 61 st Street (WB)	WB-LT	0.51	22.0	C	WB-LT	0.76	28.3	C	WB-LT	0.68	25.9	C	WB-LT	0.70	26.6	C	WB-LT	0.71	26.7	C	WB-LT	0.73	27.6	C
Second Avenue (SB)	SB-TR	0.86	22.9	C	SB-TR	0.86	23.0	C	SB-TR	1.08	67.4	E	SB-TR	1.09	69.0	E	SB-TR	0.74	19.3	B	SB-TR	0.74	19.3	B
E. 61 st Street (WB)	WB-TR	0.63	24.4	C	WB-TR	1.63	320.9	F *	WB-TR	0.87	36.6	D	WB-TR	1.45	241.1	F *	WB-TR	0.85	35.9	D	WB-TR	1.43	231.1	F *
Third Avenue (NB)	NB-LT	0.91	26.5	C	NB-LT	0.91	26.6	C	NB-LT	0.78	20.5	C	NB-LT	0.80	21.0	C	NB-LT	0.68	18.4	B	NB-LT	0.68	18.4	B
Notes:	EB-Eastbound, WB-Westbound, NB-Northbound, SB-Southbound; L-Left, T-Through, R-Right, DfL-Analysis considers a Defacto Left Lane on this approach. 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 <i>Highway Capacity Manual Methodology</i> (HCS 2000). Where the same number of travel lanes would be maintained during construction and adjacent parking removed, Build delay levels may be lower than those projected for the No Build conditions.																							

CHAPTER 5: WATER MAIN CONNECTIONS
5.9 TRAFFIC AND PARKING

Table 5.9-14
2008 Build and No Build Conditions Comparison
E. 59th Street/E. 61st Street Route Water Main Connection Study Area Segments 6 & 8

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
Construction on E. 59th Street – Segment 6 Only (between First and Second Avenues)																								
E. 59 th Street (E-W) First Avenue (NB)	EB-LT	0.28	18.9	B	EB-LT	0.38	21.3	C	EB-LT	0.44	22.7	C	EB-LT	0.56	27.9	C	EB-LT	0.78	42.3	D	EB-LT	0.95	73.0	E *
	WB-TR	0.53	21.0	C	WB-TR	0.53	21.0	C	WB-TR	0.38	18.9	B	WB-TR	0.38	18.9	B	WB-TR	0.57	21.8	C	WB-TR	0.57	21.8	C
	NB-L	0.96	48.3	D	NB-L	0.96	48.3	D	NB-L	0.63	21.7	C	NB-L	0.63	21.7	C	NB-L	0.70	22.6	C	NB-L	0.70	22.6	C
	NB-LTR	0.99	36.2	D	NB-LTR	0.99	36.2	D	NB-LTR	0.76	18.7	B	NB-LTR	0.76	18.7	B	NB-LTR	0.74	18.0	B	NB-LTR	0.74	18.0	B
E. 59 th Street (EB) Second Avenue (SB)	EB-TR	1.01	62.3	E	EB-TR	1.02	62.7	E	EB-TR	0.85	38.9	D	EB-TR	0.86	39.0	D	EB-TR	1.09	87.4	F	EB-TR	1.09	88.1	F
	SB-L	0.74	12.2	B	SB-L	0.74	12.3	B	SB-L	0.83	16.3	B	SB-L	0.83	16.6	B	SB-L	0.61	8.8	A	SB-L	0.61	8.8	A
	SB-LT	0.94	15.8	B	SB-LT	0.94	16.0	B	SB-LT	0.89	12.6	B	SB-LT	0.89	12.7	B	SB-LT	0.97	18.7	B	SB-LT	0.97	19.1	B
Construction on E. 59th Street – Segment 8 Only (between Second and Third Avenues)																								
E. 59 th Street (EB) Second Avenue (SB)	EB-TR	1.01	62.3	E	EB-TR	2.43	683.2	F *	EB-TR	0.85	38.9	D	EB-TR	2.05	510.9	F *	EB-TR	1.09	87.4	F	EB-TR	2.61	764.0	F *
	SB-L	0.74	12.2	B	SB-L	0.74	12.3	B	SB-L	0.83	16.3	B	SB-L	0.83	16.6	B	SB-L	0.61	8.8	A	SB-L	0.61	8.8	A
	SB-LT	0.94	15.8	B	SB-LT	0.94	16.0	B	SB-LT	0.89	12.6	B	SB-LT	0.89	12.7	B	SB-LT	0.97	18.7	B	SB-LT	0.97	19.1	B
E. 59 th Street (EB) Third Avenue (NB)	EB-LT	0.72	24.3	C	EB-LT	0.72	24.3	C	EB-LT	0.65	22.6	C	EB-LT	0.65	22.6	C	EB-LT	0.59	20.3	C	EB-LT	0.84	29.4	C
	NB-TR	0.87	26.9	C	NB-T	0.75	22.8	C	NB-TR	0.71	21.8	C	NB-T	0.61	20.1	C	NB-TR	0.52	18.6	B	NB-T	0.44	17.7	B
	NB-R	0.91	62.3	E	NB-R	1.82	413.3	F *	NB-R	0.71	42.5	D	NB-R	1.43	243.1	F *	NB-R	0.70	41.7	D	NB-R	1.40	228.9	F *
<p>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.</p> <p>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.</p> <p>V/C Ratio - Volume to Capacity Ratio, SEC/VEH - Seconds per vehicle; LOS - Level of service</p> <p>* Denotes impacted locations</p> <p>Analysis is based on the 2000 <i>Highway Capacity Manual Methodology</i> (HCS 2000).</p> <p>Where the same number of travel lanes would be maintained during construction and adjacent parking removed, Build delay levels may be lower than those projected for the No Build conditions.</p>																								

Mid-block Traffic and Queuing Assessments

The construction of the proposed water mains, as described above, have been assumed to create work zones along the south curb of E. 59th and E. 61st Streets between First and Third Avenues and the west curb of First Avenue between E. 59th and E. 61st Streets. The work zones would be 18.5 feet wide at all locations. To maintain traffic flow, sidewalk disruptions and delineation of temporary roadways were assumed. Curbside conditions during construction would be similar to those depicted for the other analysis routes.

Queues would form where congested levels were identified during construction, and motorists would consider utilizing alternate routes to reach their destinations, potentially affecting nearby available cross streets, as well as northbound and southbound avenues. However, as discussed earlier, the construction efforts would be conducted in coordination with the NYCDOT OCMC, which requires the preparation of MPT plans to address potential traffic impacts, such as those resulting from capacity reductions during construction on City streets. The construction of the water main connections would likely not proceed without the implementation of mitigation measures to alleviate congested conditions due to the loss of travel lanes. Mitigation measures that are available to address the anticipated traffic impacts are described in Section 5.16, "Mitigation Measures." When applied, these measures are expected to address the impacts from water main construction by increasing capacity, reducing delays, and alleviating queues to conditions that would be typical of traffic flow under such street surface disruptions. In the case of the E. 59th Street/E. 61st Street route, it is likely that a comprehensive traffic management plan involving traffic detours would also be needed for implementation upon construction of certain segments. A discussion of the potential components of this plan is provided in Section 5.16.

Parking Analysis

During the construction of the water main connections, curb lanes in each segment would be temporarily occupied by construction work zones. Along First Avenue, construction during Segment 1 would displace 5 to 10 curbside spaces per block for approximately 20 weeks between E. 59th and E. 60th Streets and 12 weeks between E. 60th and E. 61st Streets. Along E. 61st Street, the displacement of curbside spaces would be similar to other cross-town streets described for the First Avenue and Sutton Place routes, with generally up to 10 spaces on the south side and up to 15 spaces on the north side of the street displaced during each 200-foot segment of construction. Along E. 59th Street, the temporary displacement of parking between First and Second Avenues would only occur on the south side of the street since no parking is currently permitted on the north side. As such, up to 10 spaces would be displaced during each 200-foot segment of construction. Between Second and Third Avenues, only a portion of the north curb is permitted for curbside deliveries. During the construction of this E. 59th Street segment, up to 15 spaces would be displaced during each 200-foot segment of construction.

Secondary Segment Construction Assessment

In addition to the primary water main construction efforts and the associated impacts described above, secondary construction would be required to connect the water mains at intersections. This work would occur during off-peak hours by imposing temporary partial closures at each location to ensure minimal disturbance to area traffic. This effort, to be accomplished via closing half of the cross streets at a time while continuing to process traffic, would take approximately 10 weeks to complete for each intersection along the water main connection route. To connect the water mains to the existing truck main distribution

system on Third Avenue at points north of E. 59th Street and south of E. 61st Street, temporary closures along Third Avenue for partial blocks and relocation of existing bus stops would also be required.

Safety Analysis

As discussed for the First Avenue and Sutton Place routes, the intersection at First Avenue and E. 59th Street was identified as a high-pedestrian-accident location. The water main construction would not result in the loss of any crosswalks at this location and would reduce roadway widths of both First Avenue and E. 59th Street during construction, thereby reducing pedestrian exposure. Since only a small amount of truck and pedestrian traffic would be generated, the change in the number of conflicting turning vehicles would imperceptible. Based on the operational analysis results presented in Section 5.10, “Transit and Pedestrians” for water main connections, the use of the 6-foot sidewalk space for construction along the eastern portion of E. 59th Street between First and Second Avenues is not expected to have an adverse effect on pedestrian circulation. Therefore, no decrease in pedestrian safety is anticipated with the proposed construction and water main construction is not expected to result in any potential significant adverse impacts to pedestrian safety.

Impact Assessment Summary

Under the E. 59th Street/E. 61st Street route, construction of the water main connections would result in temporary adverse traffic impacts at the First Avenue intersections with E. 59th and E. 61st Streets during construction along First Avenue, and at each approach intersection during construction along the respective segments. The duration of these impacts would be just over 120 weeks, which is almost as long as the entire construction period of 31 months. However, the most intense disruptions are anticipated for the construction of Segments 3, 5, and 8, during which noticeable queuing and traffic diversions are anticipated. As described above, a conceptual traffic management plan involving traffic detours is explored in Section 5.16, where other mitigation measures that could be implemented to address the traffic impacts are also presented.

5.9.5 Water Main Connection Construction Options

The potential traffic and parking impacts associated with the three other construction options for the water main connections are described below. These options vary in terms of the specific width of sidewalk and/or traffic lanes that must be closed on the affected north-south corridor for the water main construction zone. Possible options include constructing the water mains concurrently using the sidewalk for a portion of the construction zone to reduce the amount of roadway affected; non-concurrent construction of the water mains; and use of two avenues rather than one for the north-south portion of the water main route. While most of the discussions focus on a qualitative assessment of these construction options in comparison to the Base Scenario, targeted or more comprehensive quantitative analyses were conducted, where appropriate.

Scenario A

Under Scenario A, five feet of the east sidewalk along First Avenue would be utilized to accommodate a portion of the construction work zone, such that no more than two lanes on First Avenue would be disrupted from construction during all time periods. During the AM and PM peak periods, 11.5 feet of roadway would be required, while during the midday peak period, 19.5 feet of roadway would be

CHAPTER 5: WATER MAIN CONNECTIONS
5.9 TRAFFIC AND PARKING

required. Operations during the AM and PM peak periods would be identical to those depicted for the Base Scenario. However, during the midday peak period, an additional travel lane would be available (four instead of three lanes under the Base Scenario). Capacity analysis was conducted to determine the potential traffic impacts under Scenario A during the midday peak hour. Table 5.9-15 presents the results of this analysis and compares them against those determined for the Base Scenario. As shown, noticeable benefits in traffic operations would be realized with Scenario A in the midday peak period. For both Segment 1 and Segment 3 construction, only the northbound approach at E. 57th Street would experience adverse traffic impacts during the midday peak hour, as opposed to three or all four of the analyzed intersections under the Base Scenario. This construction option would require the same length of time to complete as the Base Scenario (41 months). The potential impacts from taking sidewalk space for construction to pedestrian flow are addressed in Section 5.10, "Transit and Pedestrians."

Table 5.9-15
2008 Scenario A Build Conditions, Midday Peak Period –
Water Main Connection Study Area Segments 1 & 3

Analysis Intersection	No Build Conditions				Base Scenario Build Conditions				Scenario A 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
<i>Construction on First Avenue – Segment 1 Only</i>												
E. 59 th Street (E-W) First Avenue (NB)	EB-LT	0.44	22.7	C	EB-LT	0.47	23.7	C	EB-LT	0.47	23.7	C
	WB-TR	0.38	18.9	B	WB-TR	0.38	18.9	B	WB-TR	0.38	18.9	B
	NB-L	0.63	21.7	C								
	NBLTR	0.76	18.7	B	NBLTR	1.22	123.5	F *	NB-LTR	0.90	24.6	C
E. 58 th Street (EB) First Avenue (NB)	EB-LT	0.25	19.7	B	EB-LT	0.25	19.7	B	EB-LT	0.25	19.7	B
	NB-TR	0.67	14.2	B	NB-T	1.10	71.0	E *	NB-T	0.81	17.7	B
					NB-R	0.11	12.4	B	NB-R	0.11	12.4	B
E. 57 th Street (E-W) First Avenue (NB)	EB-DfL	0.64	43.1	D	EB-DfL	0.64	43.1	D	EB-DfL	0.64	43.1	D
	EB-T	0.34	23.4	C	EB-T	0.34	23.4	C	EB-T	0.34	23.4	C
	WB-TR	0.61	27.0	C	WB-TR	0.61	27.0	C	WB-TR	0.61	27.0	C
	NBLTR	0.93	31.8	C	NBLTR	1.58	287.4	F *	NB-LTR	1.17	105.8	F *
E. 56 th Street (EB) First Avenue (NB)	EB-LT	0.63	31.5	C	EB-LT	0.64	32.0	C	EB-LT	0.64	32.0	C
	NB-TR	0.64	10.9	B	NB-T	1.03	41.8	D	NB-T	0.76	13.1	B
					NB-R	0.22	12.2	B	NB-R	0.22	12.2	B
<i>Construction on First Avenue – Segment 3 Only</i>												
E. 58 th Street (EB) First Avenue (NB)	EB-LT	0.25	19.7	B	EB-LT	0.25	19.7	B	EB-LT	0.25	19.7	B
	NB-TR	0.67	14.2	B	NB-TR	1.13	84.5	F *	NB-TR	0.84	18.6	B
E. 57 th Street (E-W) First Avenue (NB)	EB-DfL	0.64	43.1	D	EB-DfL	0.64	43.1	D	EB-DfL	0.64	43.1	D
	EB-T	0.34	23.4	C	EB-T	0.34	23.4	C	EB-T	0.34	23.4	C
	WB-TR	0.61	27.0	C	WB-TR	0.61	27.0	C	WB-TR	0.61	27.0	C
	NBLTR	0.93	31.8	C	NB-LT	1.54	268.9	F *	NB-LT	1.14	92.9	F *
E. 56 th Street (EB) First Avenue (NB)	EB-LT	0.63	31.5	C	EB-LT	0.64	32.0	C	EB-LT	0.64	32.0	C
	NB-TR	0.64	10.9	B	NB-TR	1.08	60.1	E *	NB-TR	0.80	14.1	B
E. 55 th Street (WB) First Avenue (NB)	WB-T	0.64	32.3	C	WB-T	0.64	32.3	C	WB-T	0.64	32.3	C
	WB-R	0.24	22.9	C	WB-R	0.24	22.9	C	WB-R	0.24	22.9	C
	NB-LT	0.70	11.7	B	NB-LT	1.19	107.2	F *	NB-LT	0.88	17.2	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 defacto 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). Where the same number of travel lanes would be maintained during construction and adjacent parking removed, Build delay levels may be lower than those projected for the No Build conditions.											

Scenario B

Under Scenario B, there would be two mains constructed, one at a time, on the east side of First Avenue. This construction scenario would take approximately 20 months longer to complete than the Base Scenario and Scenario A but would utilize less roadway space (10.5 feet) than the Base Scenario and Scenario A during the construction of the first main. However, during the construction of the second main, Scenario B would require similar lane closures (18.5 feet) as Scenario A during all time periods. Since all potential impacts have been addressed as part of the analyses for the Base Scenario and Scenario A, a quantitative analysis of Scenario B was not conducted.

Scenario C

Under Scenario C, both water mains would be constructed concurrently, with one main constructed on First Avenue and one main constructed on Sutton Place. The required roadway space would be the same as the water main construction on the cross streets, where 10.5 feet would be required during the AM and PM peak periods and 18.5 feet would be required during the midday peak period. As with the Sutton Place route depicted above, Scenario C would also require traversing E. 59th Street between First Avenue and Sutton Place, Sutton Place between E. 59th and E. 55th Streets, and E. 55th and E. 56th Streets between First Avenue and Sutton Place.

This construction option, which would take approximately 20 months longer to complete than the Base Scenario and Scenario A, is expected to have similar effects on traffic along First Avenue as Scenario A during the midday peak period and relatively less effects than the Base Scenario, Scenario A, and the latter stages of Scenario B during the AM and PM peak periods. Since the extent of potential impacts was addressed as part of the analyses for the Base Scenario, Scenario A, and the Sutton Place route, a quantitative analysis of Scenario C was not conducted.

5.9.6 Conclusions

While the actual construction of the water main connections would be coordinated with NYCDOT OCMC and may incorporate conventional mitigation and other traffic attenuation measures, the analysis presented above illustrates the reasonable worst-case conditions that could potentially result from the three connection routes analyzed. As explained in the tables above and in Section 3.9, “Traffic and Parking,” in Chapter 3, “Impact Methodologies,” both shaft and water main construction-generated traffic were included in the water main connection analysis presented herein. Other possible connection routes would likely result in similar impacts. Although these impacts would not be permanent because they are construction-related, some measures have been identified to alleviate these construction-related temporary adverse traffic impacts. A description of these measures and an analysis showing their effectiveness of alleviating projected impacts are discussed in Section 5.16, “Mitigation Measures.”

It is expected that as part of an overall effort to further attenuate conditions for traffic flow at critical locations, NYCDOT OCMC will require more aggressive measures that will be identified in the Maintenance and Protection of Traffic (MPT) plan for the project, that were not analyzed as part of this EIS. 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. The temporary adverse traffic impacts predicted for the reasonable worst-case First Avenue route and the two additional representative routes, Sutton Place route and E. 59th/E. 61st Street Route, are described below.

For the First Avenue route, three intersections during Segment 1 construction, four intersections during Segment 3 construction, and one intersection during Segment 7 construction would experience temporary adverse traffic impacts. The resulting increases in projected delays, particularly during Segment 1 and Segment 3 construction, are expected to severely impact the overall traffic flow along First Avenue. With this condition persisting for most of the day, many of the approximately 40,000 daily motorists who travel on First Avenue in the area of the Queensboro Bridge would experience substantial increases in travel time. Based on the current construction schedule, these impacts would occur over a period of about 100 weeks. For approximately the first 75 weeks when First Avenue would be under construction, predicted queues would extend several blocks upstream beyond the Segment 1 and Segment 3 construction zones. No spillbacks beyond the block under construction are anticipated for the construction of Segment 7.

In addition to the potential temporary adverse impacts predicted using standard traffic impact methodology, additional traffic congestion from longer queue lengths and therefore increased travel time along First Avenue and adjacent cross streets could occur, such that queues could potentially extend beyond what the analysis has projected. Queues currently form on First Avenue regularly for varying lengths throughout the day approaching the Queensboro Bridge. Generally, these queues occur during the AM, midday, and PM peak periods, with conditions during the PM peak period being the most congested because commuter demands along First Avenue en route to Queens are typically the highest in the afternoon.

Currently, traffic queues on First Avenue at times extend to the area of the First Avenue tunnel (located between E. 41st and E. 48th Streets). It is possible, with the water main construction, that these queue lengths would grow by up to 5 blocks beyond the queue lengths projected for the No Build conditions, as shown in the queuing analysis results in Section 5.9.3, "Future Conditions With the Project," which are based on the HCS analysis outputs of average queue lengths. During other periods of the day or when peak hour congestion is less pronounced, it is still likely that queue lengths would be notably longer due to the reduction of capacity on First Avenue from the construction of the water main connections. As discussed above, this traffic disruption is expected to have a duration of approximately 75 weeks. Although not likely to be as severe, the effect of increased queues is also expected during the construction of Segment 7 along E. 56th Street, for an additional duration of 20 weeks, for a total of nearly 100 weeks.

Under sustained congestion and queuing, it is possible that traffic upstream from the bottleneck would divert to other travel routes, such as the FDR Drive and other access routes leading to northbound roadways. The effects and anticipated magnitude of such diversions, after incorporating conceptual mitigation and other traffic attenuating measures likely to be employed in the future by the agencies to impacted locations, were evaluated and presented in Section 5.16. With regard to the use of curb lanes for parking or deliveries, up to 20 spaces each would be displaced during the construction of Segment 1 and Segment 3, while up to 25 spaces would be displaced during each 200-section of construction along the crosstown streets.

For the Sutton Place route, two intersections each during the construction of the E. 59th Street Segment, Segment 1, and Segment 3 would experience temporary adverse traffic impacts. The resulting increases in projected delays, particularly during Segment 1 and Segment 3 construction, are expected to severely impact the overall traffic flow along Sutton Place, where average weekday daily traffic levels are approximately 10,000 vehicles northbound and 13,000 vehicles southbound. With congestion persisting for most of the day, many of these motorists would experience substantial increases in travel time. Including the impacts along E. 56th Street under Segment 7 of the First Avenue route, the total duration over which temporary construction impacts would occur is estimated to be about 115 weeks. For approximately the first 70 weeks, when E. 59th Street and Sutton Place would be under construction, predicted queues would extend several blocks along York Avenue/Sutton Place. Since Sutton Place is less of a through or feeder route than First Avenue, potential diversion of traffic away from the construction zone to other parallel routes is less likely. With regard to the use of curb lanes for parking or deliveries, up to 10 spaces would be displaced during the construction of the E. 59th Street Segment, up to 20 spaces each would be displaced during the construction of Segment 1 and Segment 3, and up to 25 spaces would be displaced during each 200-section of construction along the other crosstown streets.

For the E. 59th Street/E. 61st Street route, two intersections each during Segment 1 and Segment 8 construction and one intersection each during Segment 3, Segment 5, and Segment 6 construction would experience temporary adverse traffic impacts. These impacts are expected to occur over a duration of just over 120 weeks, which is nearly the entire 31-month period of construction. For just approximately 50 weeks when E. 61st Street between Marginal Street and Third Avenue and E. 59th Street between Second and Third Avenues would be under construction, predicted queues would extend several blocks upstream beyond the respective construction zones. Because E. 59th Street between Second and Third Avenues is a major access to the Queensboro Bridge and E. 61st Street connects directly with the FDR Drive, disruptions on these roadways could result in areawide traffic diversions and congestion at other nearby locations. Since conventional mitigation measures are not likely to alleviate the projected traffic impacts, conceptual traffic management strategies involving potential detour routes were addressed in Section 5.16. With regard to the use of curb lanes for parking or deliveries, up to 10 spaces would be displaced along each block of First Avenue under Segment 1 construction. The construction of E. 59th Street between First and Second Avenues under Segment 6 would also result in the displacement of up to 10 spaces. For Segments 3 and 5, up to 25 spaces each would be displaced and for Segment 8, up to 15 spaces would be displaced.

Potential mitigation measures and traffic management strategies that could be implemented to alleviate predicted temporary adverse traffic impacts, as well as an analysis of the potential effects of traffic diversions under the First Avenue route water main connections, are discussed in Section 5.16, "Mitigation Measures." Table 5.9-16 provides a representative summary of the maximum durations for which temporary adverse traffic impacts, traffic queuing, and potential traffic diversions could occur under the Build conditions for each of the water main connection routes analyzed. While adverse traffic impacts were identified for all three connection routes, and extensive queuing and potential traffic diversions were identified for substantial portions of the First Avenue and the E. 59th Street/E. 61st Street routes, these conditions would be temporary and not persist beyond the respective construction periods. Therefore, the construction of Shaft 33B and its water main connections at the preferred Shaft Site would not result in potential significant adverse traffic and parking impacts.

