

**A. INTRODUCTION**

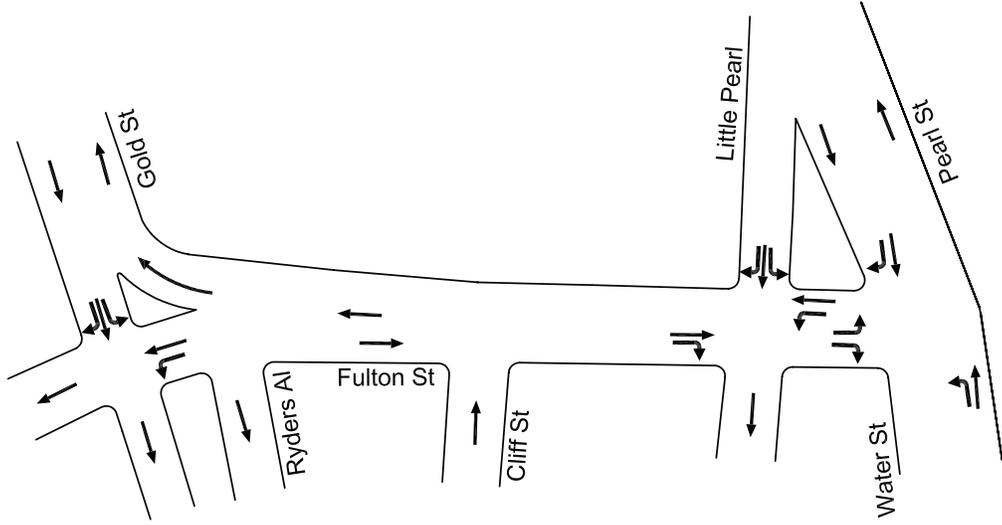
This chapter evaluates traffic conditions along Fulton Street with proposed operational and geometric changes at its intersections with Gold Street, the Pearl Street spur (called “Little Pearl Street” between Pearl and Fulton Streets), and Water Street/Pearl Street (see Figure 2E-1).

- At the intersection of Fulton Street and Gold Street, the Proposed Project would eliminate the existing westbound free-flow right turn, which creates John DeLury Sr. Plaza, a greenspace island within the intersection. With the elimination of the free-flow right turn, the plaza would be integrated into the contiguous pedestrian corridor along the north side of Fulton Street, and right-turn traffic would be reconfigured to align with the westbound Fulton Street approach at the signalized intersection with Gold Street.
- Pedestrianizing the southbound Little Pearl Street approach at the unsignalized intersection with Fulton Street is also part of the Proposed Project to provide one contiguous pedestrian corridor without curb cuts on the north side of Fulton Street from Gold Street to the Water Street/Pearl Street intersection. The proposed pedestrianizing would eliminate all vehicular traffic along Little Pearl Street.
- Southbound traffic currently using Little Pearl Street would instead remain on Pearl Street and turn onto Fulton Street at the signalized intersection with Water Street/Pearl Street.

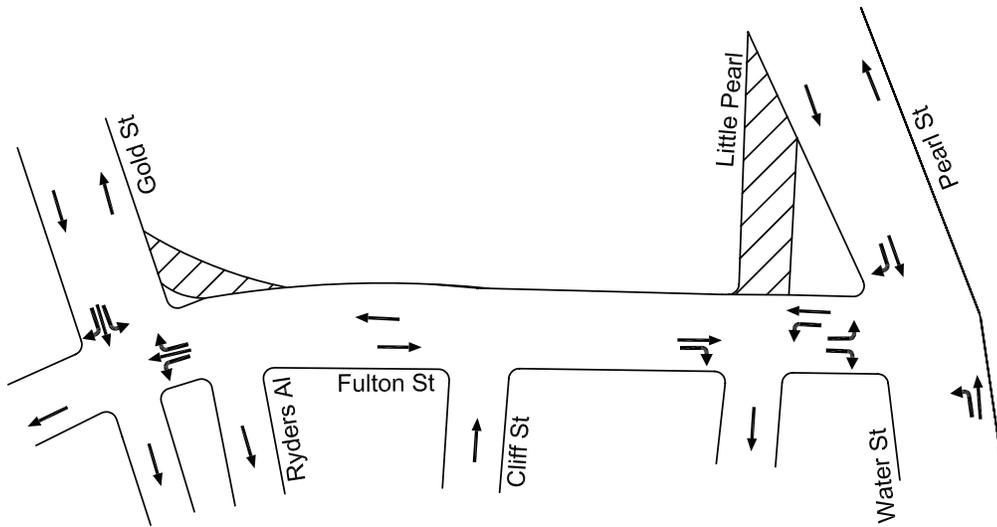
The methodology in this chapter outlines the evaluation process for the Proposed Project along Fulton Street, including a discussion of the current 2007 traffic conditions at the analysis intersections, the development of future traffic volumes and conditions for the 2009 analysis year without and with the Proposed Project, and identification of specific geometric and operational elements required as part of the Proposed Project.

**KEY FINDINGS**

The proposed traffic modifications along Fulton Street at the intersections with Gold Street, Little Pearl Street, and Water Street/Pearl Street would result in localized traffic diversions and necessitate geometric and operational improvements at the signalized intersections of Gold Street and Water Street/Pearl Street to address potential significant adverse traffic impacts. At the intersection of Fulton Street and Gold Street, the elimination of the free-flow right turn and enlargement of John DeLury Sr. Plaza would necessitate the widening and restriping of the southbound and westbound approaches, modifications in the curbside utilization, and retiming the traffic signal. Also, the closure of Little Pearl Street would cause a traffic shift to the intersection of Fulton Street and Water Street/Pearl Street, where geometric improvements, modifications to the curbside utilization, a southbound right turn treatment, and retiming of the traffic signal would be needed.



**EXISTING GEOMETRY AND TURNING MOVEMENTS**



**PROPOSED GEOMETRY AND TURNING MOVEMENTS**

**LEGEND**

 **New Pedestrian Area**

NOT TO SCALE

## **Fulton Corridor Revitalization Program**

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Overall, the Proposed Project, in concert with these traffic improvements, would result in approximately the same or better traffic conditions than those expected for future conditions without the Proposed Project and would not result in any significant adverse traffic impacts. Also, pedestrian level of service analyses show that there would be no significant adverse impacts resulting from the Proposed Project on crosswalks at Fulton Street and Gold Street, and Water Street/Pearl Street.

The analysis of traffic and pedestrian conditions in this chapter follows a series of prescribed steps, which are described in more detail below:

- Description of the existing roadway network for the analysis conditions, including the study locations and peak hours;
- Definition of delay criteria for traffic analysis of signalized and unsignalized intersections;
- Analysis of existing traffic levels of service;
- Determination of the traffic volumes projected for future conditions without the Proposed Project;
- Analysis of projected future traffic levels of service without the Proposed Project;
- Determination of the diversions of future traffic volumes due to the Proposed Project;
- Discussion of geometric and operational design elements associated with the Proposed Project;
- Analysis of projected future traffic levels of service with the Proposed Project;
- Determination of significant adverse traffic impacts;
- Comparison of projected future traffic levels of service without and with the Proposed Project; and
- Comparison of pedestrian conditions without and with the Proposed Project.

## **B. EXISTING CONDITIONS**

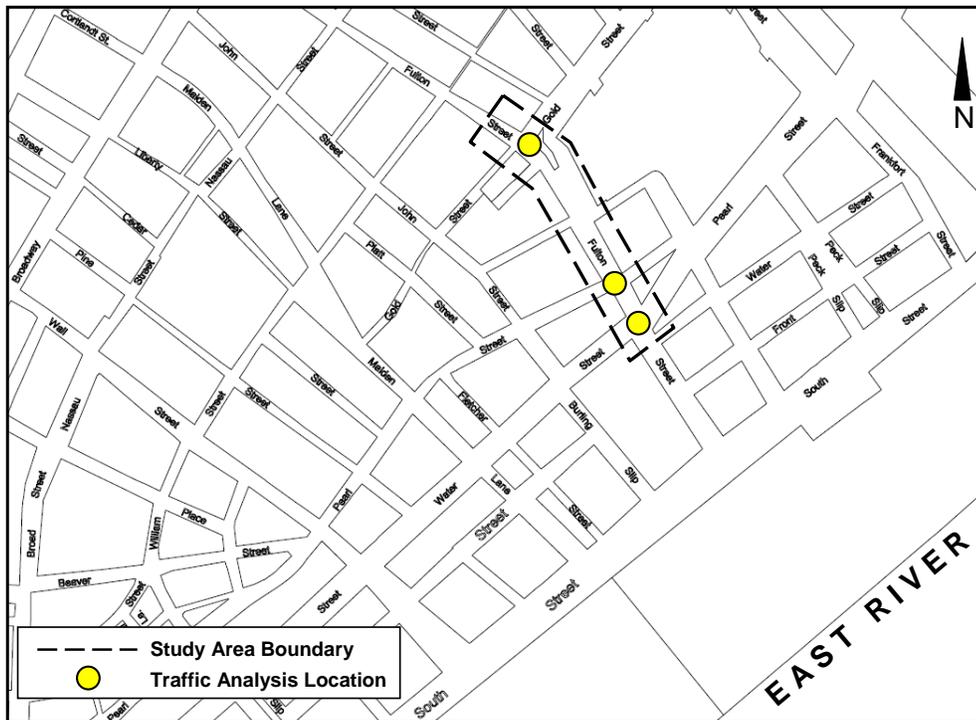
### **ROADWAY NETWORK AND TRAFFIC STUDY AREA**

The traffic study area consists of several closely spaced intersections along Fulton Street near the South Street waterfront (see Figure 2E-2). Two signalized and one unsignalized intersection were analyzed as part of this study. The two signalized intersections are Fulton Street at Gold Street, and Fulton Street at Water Street/Pearl Street. The unsignalized intersection is Fulton Street at the Pearl Street spur (called Little Pearl Street between Pearl and Fulton Streets). The two signalized intersections are at either side of the study area, and the unsignalized intersection lies between them, within approximately 80 feet of the intersection of Fulton Street and Water Street/Pearl Street. Northbound Cliff Street and southbound Ryders Alley, which are both unsignalized, are the only other intersections on Fulton Street between Gold Street and Water Street/Pearl Street. Cliff Street and Ryders Alley operate as “T” intersections with Fulton Street, and were observed to have minor traffic volumes; they would most likely not be significantly impacted by the Proposed Project, and have not been included in these analyses.

Between Gold and Water Streets, two-way Fulton Street is generally oriented from southeast (eastbound) to northwest (westbound) and includes one moving lane in each direction, with parking along the curbs. The westbound moving lane widens approaching the free-flow right turn to Gold Street, where the roadway forks to form John DeLury Sr. Plaza. West of Gold Street, Fulton Street becomes westbound-only with one moving lane and parking on both sides. Eastbound Fulton Street terminates as a vehicular roadway at the intersection with Water Street/Pearl Street, where the roadway becomes a pedestrian-only corridor leading to the South Street waterfront.

On the south leg of the intersection with Fulton Street, Water Street is two-way with two moving lanes in each direction and parking along the curbs. Pearl Street forms the north leg of the intersection, which also has two moving lanes in each direction, with no parking due to a series of bus stops on both sides for New York City Transit (NYCT) and various tour buses.

Figure 2E-2: Traffic Study Area



Little Pearl Street runs southbound with one moving lane from Pearl Street to Fulton Street, a distance of approximately 170 feet, and continues further south to John Street, where it continues as Pearl Street. Little Pearl Street, along with Pearl Street and Fulton Street, forms a large traffic triangle, which includes a playground.

On the west side of the study area, Gold Street is generally oriented in the north-south direction. North of Fulton Street, Gold Street is two-way but is one-way southbound south of the intersection with Fulton Street. The southbound approach to Fulton Street is one moving lane with parking along the west curb.

## **EXISTING TRAFFIC VOLUMES AND LEVELS OF SERVICE**

The analyses begin with an assessment of existing traffic conditions in the study area. The existing conditions are analyzed under normal weekday peak hour roadway conditions, including the 8:15-9:15 AM weekday morning, 12:00-1:00 PM weekday midday, and 5:00-6:00 PM weekday evening.

Analyses of traffic conditions in urban areas are based on critical conditions at intersections and are defined in terms of levels of service. According to the *Highway Capacity Manual 2000* (HCM), which was used for these analyses, levels of service (LOS) at signalized intersections are defined in terms of the average control delay per vehicle at an intersection, as follows:

- LOS A describes operations with very low delays, i.e., 10.0 seconds or less per vehicle. This occurs when signal progression is extremely favorable and most vehicles arrive during the green phase. Most vehicles do not stop at all.
- LOS B describes operations with delays in the range of 10.1 to 20.0 seconds per vehicle. This generally occurs with good progression and/or short cycle lengths. Again, most vehicles do not stop at the intersection.
- LOS C describes operations with delays in the range of 20.1 to 35.0 seconds per vehicle. These higher delays may result from fair progression and/or longer cycle lengths. The number of vehicles stopping is significant at this level, although many still pass through the intersection without stopping.
- LOS D describes operations with delays in the range of 35.1 to 55.0 seconds per vehicle. At LOS D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high volume-to-capacity (v/c) ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Delays of 45.0 seconds or greater are considered marginally unacceptable; delays under 45.0 seconds are considered marginally acceptable.
- LOS E describes operations with delays in the range of 55.1 to 80.0 seconds per vehicle. These high delay values generally indicate poor progression, long cycle lengths, and high v/c ratios.
- LOS F describes operations with delays in excess of 80.0 seconds per vehicle. This is considered to be unacceptable to most drivers. This condition often occurs with oversaturation, i.e., when arrival flow rates exceed the capacity of the intersection. It may also occur at high v/c ratios with cycle failures. Poor progression and long cycle lengths may also contribute to such delays. Often, vehicles do not pass through the intersection in one signal cycle.

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

For unsignalized intersections, delay is defined as the total elapsed time from when a vehicle stops at the end of the queue until the vehicle departs from the stop line: LOS A describes operations with very low delay, i.e., 10.0 seconds or less per vehicle; LOS B describes operations with delays in the range of 10.1 to 15.0 seconds; LOS C has delays in the range of 15.1 to 25.0 seconds; LOS D, 25.1 to 35.0 seconds per vehicle; and LOS E, 35.1 to 50.0 seconds per vehicle, which is considered to be the limit of acceptable delay. LOS F describes operation

with delays in excess of 50.0 seconds per vehicle, which is considered unacceptable to most drivers. This condition exists when there are insufficient gaps of suitable size to allow side street traffic to cross safely through a major vehicular traffic stream.

Figure 2E-3 shows the existing traffic volumes. Between Water Street and Little Pearl, westbound Fulton Street carries approximately 110–170 vehicles per hour (vph) during the three weekday peak hours. Between Little Pearl and Gold Streets, westbound Fulton Street is traveled by about 290–450 vph. The increase in traffic through the intersection with Little Pearl is due to a relatively high right-turn volume from Little Pearl Street—approximately 170–240 vph during the AM, midday, and PM peak periods. Most traffic traveling from Pearl Street to westbound Fulton Street uses Little Pearl Street instead of the southbound right at the signalized intersection at Water Street. Eastbound Fulton Street between Gold Street and Water Street / Pearl Street carries approximately 150–230 vph during the three weekday peak hours.

The free-flow right turn from westbound Fulton Street onto northbound Gold Street is traveled by about 130–210 vph with the highest volume during the AM peak hour. Southbound Gold Street approaching Fulton Street carries approximately 280–360 vph during the analysis periods, with a significant portion of that traffic (170–230 vph) turning left onto eastbound Fulton Street.

Northbound Water Street approaching Fulton Street is traveled by about 740–1,000 vph during the three weekday peak hours, with the highest volume during the PM peak hour. In the opposite direction, Pearl Street carries approximately 310–580 vph to Fulton Street. Adjacent to Pearl Street, Little Pearl Street carries about 230–360 vph to the unsignalized approach at Fulton Street, again, with a significant number of right turns, approximately 170–240 vph during the AM, midday, and PM peak periods.

Table 2E-1 summarizes the existing traffic levels of service. During the AM and PM peak hours, all of the study intersections currently operate at overall LOS B and C, except for the intersection of Fulton Street and Water Street/Pearl Street, which operates at marginally acceptable overall LOS D in the PM period (the “overall” level of service is a weighted average of all of the individual traffic movements). No individual movements operate at LOS E or F during the AM and PM peak hours. During the midday, increased pedestrian flows along Fulton Street cause additional delays for vehicular traffic, especially at the unsignalized southbound Little Pearl Street approach at Fulton Street. Finding acceptable gaps through the pedestrian flow across the approach and the major traffic movements becomes increasingly difficult, causing the approach to operate at unacceptable LOS F. Similarly, high pedestrian volumes in the south crosswalk at the intersection of Fulton and Water Streets results in unacceptable LOS E conditions for the eastbound Fulton Street approach. During the midday peak hour, two intersections, Fulton Street at Gold Street and at Little Pearl Street, operate at marginally acceptable overall LOS D while Fulton Street at Water Street/Pearl Street is at acceptable overall LOS C.



Table 2E-1

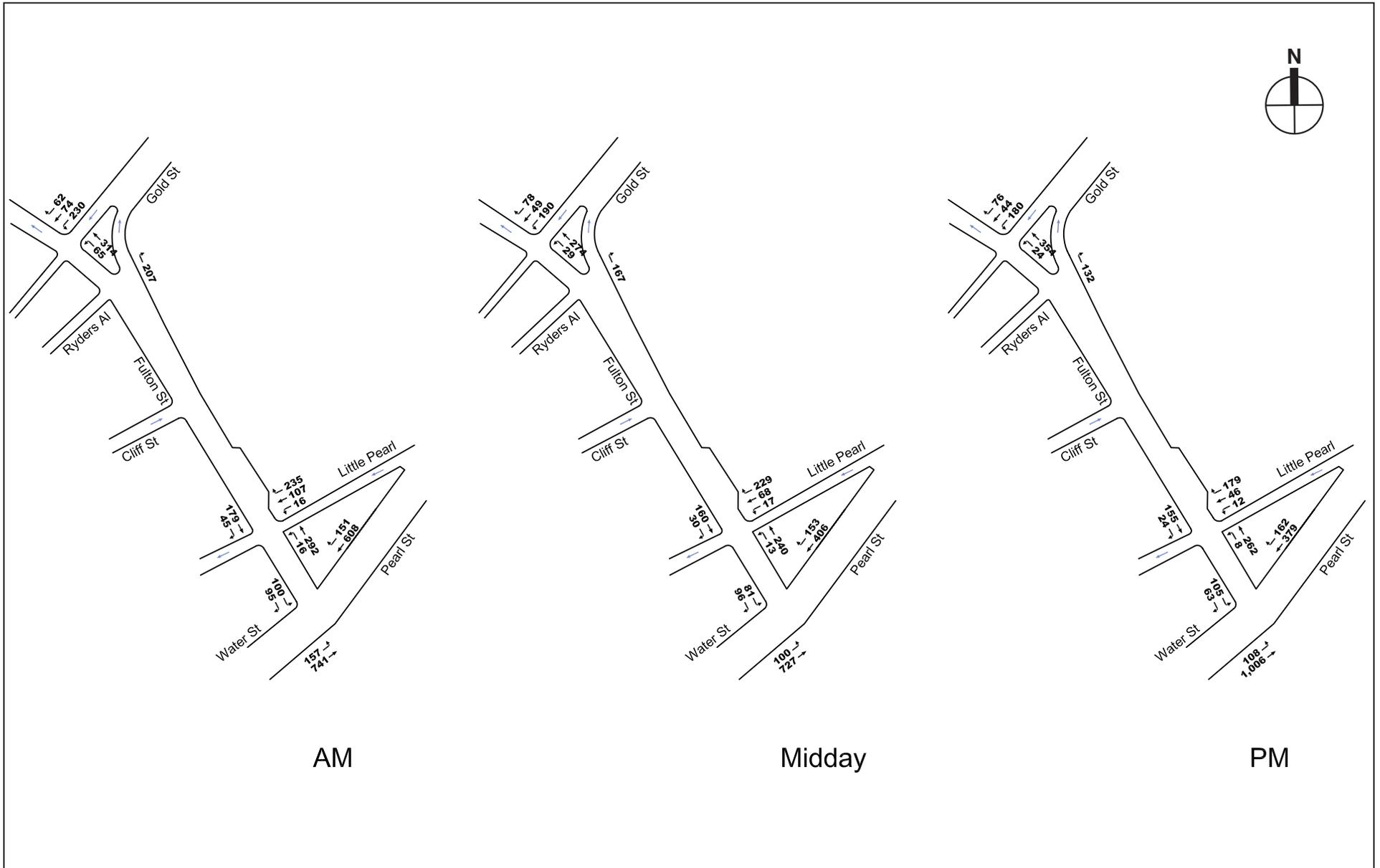
Levels of Service Summary—2007 Existing Conditions

INTERSECTION & APPROACH	AM (8:15 - 9:15 AM)				Midday (12:00 AM - 1:00 PM)				PM (5:00 - 6:00 PM)				
	Mvt.	V/C	Delay	LOS	Mvt.	V/C	Delay	LOS	Mvt.	V/C	Delay	LOS	
<b>FULTON STREET CORRIDOR</b>													
<b>FULTON STREET &amp; WATER STREET / PEARL STREET</b>													
Water Street / Pearl Street	NB	LT	0.92	36.4	D	LT	0.83	27.5	C	LT	0.98	44.6	D
	SB	TR	0.59	14.5	B	TR	0.35	11.3	B	TR	0.37	11.5	B
Fulton Street	EB	LR	0.72	44.4	D	LR	0.86	61.4	E	LR	0.79	52.8	D
<b>Overall Intersection</b>	-	-	<b>0.85</b>	<b>29.1</b>	<b>C</b>	-	<b>0.84</b>	<b>27.7</b>	<b>C</b>	-	<b>0.92</b>	<b>37.6</b>	<b>D</b>
<b>FULTON STREET &amp; PEARL STREET SPUR [Unsignalized]</b>													
Pearl Street Spur	SB	LTR	0.68	22.4	C	LTR	0.95	63.4	F	LTR	0.62	24.5	C
Fulton Street	EB	TR	-	-	-	TR	-	-	-	TR	-	-	-
	WB	LT	0.02	8.1	A	LT	0.02	8.0	A	LT	0.02	8.1	A
<b>Overall Intersection</b>	-	-	<b>12.4</b>	<b>B</b>	-	-	<b>33.1</b>	<b>D</b>	-	-	<b>12.3</b>	<b>B</b>	
<b>FULTON STREET &amp; GOLD STREET</b>													
Gold Street	SB	LTR	0.74	22.8	C	LTR	0.87	35.9	D	LTR	0.84	35.6	D
Fulton Street	WB	LT	0.79	43.5	D	LT	0.68	37.4	D	LT	0.63	32.1	C
<b>Overall Intersection</b>	-	-	<b>0.76</b>	<b>30.1</b>	<b>C</b>	-	<b>0.80</b>	<b>36.4</b>	<b>D</b>	-	<b>0.76</b>	<b>34.1</b>	<b>C</b>
<b>Notes</b>													
(1): Control delay is measured in seconds per vehicle.													
(2): Level of service (LOS) for signalized intersections is based upon average control delay per vehicle (sec/veh) for each lane group as listed in the 2000 Highway Capacity Manual -- TRB.													
(3): Level of service (LOS) for unsignalized intersections is based upon control delay per vehicle (sec/veh) for each minor-approach as listed in the 2000 Highway Capacity Manual -- TRB.													
(4): Overall intersection V/C ratio is the critical lane groups' V/C ratio, not the weighted average of all the movements.													

C. FUTURE CONDITIONS WITHOUT THE PROPOSED PROJECT

Future conditions without the geometric and operational modifications of the Proposed Project (the future No Build conditions) are established in order to provide the baseline against which the impacts of the Proposed Project can be compared and to account for changes in traffic conditions between existing conditions and the future analysis year. Future year conditions were analyzed for 2009. Future No Build traffic volumes were developed by applying a background traffic growth rate of one-half percent per year to the existing 2007 volumes, as stated in the *City Environmental Quality Review (CEQR) Technical Manual*, and by adding the 2009 No Build and Build trip increments from the World Trade Center Memorial and Redevelopment Final Generic Environmental Impact Statement (FGEIS), which included trips along Fulton, Water, and Pearl Streets. Although the development timeline presented in the FGEIS is for the intermediate 2009 Build year, the Freedom Tower, Cultural and Memorial uses, and retail development will most likely be completed later than 2009. Therefore, the inclusion of the FGEIS's intermediate 2009 Build year trips in the 2009 No Build year of this study is more conservative. The 2009 No Build conditions also include mitigation measures—specifically, signal timing modifications for the AM and PM peak hours—certified in the World Trade Center Memorial and Redevelopment FGEIS for the intersection of Fulton Street and Water Street/Pearl Street.

Figure 2E-4 shows the future No Build traffic volumes. Under the 2009 No Build conditions, traffic volumes along westbound Fulton Street are generally expected to increase by approximately 130–150 vph in the AM, midday, and PM peak hours between Water Street and Gold Street compared with existing conditions. Eastbound Fulton Street would gain up to 10 vph during the three peak hours. Northbound Water Street volumes would increase by approximately 100–120 vph during the three peak hours, while southbound Pearl Street is generally be expected to increase by 170–180



AM

Midday

PM

vph during the AM and midday peak hours and by 220–230 vph during the PM peak hour. Gold Street and Little Pearl Street would each gain up to approximately 10 vph during the three peak hours.

Table 2E-2 summarizes the future No Build traffic levels of service. During the three analysis peak hours, both signalized intersections are expected to operate at marginally acceptable overall LOS D or unacceptable overall LOS E or F, while the unsignalized intersection would operate at unacceptable overall LOS E during the midday peak hour but at acceptable overall LOS B or C in the AM and PM peak hours. The intersection of Fulton Street and Gold Street would operate at unacceptable overall LOS E or F due to the significant volume increase on westbound Fulton Street; specifically, the westbound Fulton Street approach at Gold Street would experience LOS F conditions during all peak hours, compared with LOS C or D under the existing conditions. Northbound Water Street would also experience LOS F conditions during the PM peak hour, compared with LOS D under the existing conditions, due to volume increases on the approach as well as the additional southbound traffic on Pearl Street that would conflict with northbound left turns. Eastbound Fulton Street at Water Street/Pearl Street and Little Pearl Street at Fulton Street would continue to operate at LOS E and F, respectively, under the future No Build conditions.

**Table 2E-2  
Levels of Service Summary – 2009 No Build Conditions**

INTERSECTION & APPROACH	AM (8:15 - 9:15 AM)				Midday (12:00 AM - 1:00 PM)				PM (5:00 - 6:00 PM)				
	Mvt.	V/C	Delay	LOS	Mvt.	V/C	Delay	LOS	Mvt.	V/C	Delay	LOS	
<b>FULTON STREET CORRIDOR</b>													
<b>FULTON STREET &amp; WATER STREET / PEARL STREET</b>													
Water Street / Pearl Street	NB	LT	1.02	54.8	D	LT	0.98	47.7	D	LT	1.15	99.2	F
	SB	TR	0.74	14.8	B	TR	0.60	14.8	B	TR	0.68	15.1	B
Fulton Street	EB	LR	0.89	68.1	E	LR	0.88	65.2	E	LR	0.92	74.4	E
<b>Overall Intersection</b>	-	-	<b>0.98</b>	<b>39.4</b>	<b>D</b>	-	<b>0.95</b>	<b>37.8</b>	<b>D</b>	-	<b>1.07</b>	<b>68.5</b>	<b>E</b>
<b>FULTON STREET &amp; PEARL STREET SPUR [Unsignalized]</b>													
Pearl Street Spur	SB	LTR	0.79	32.4	D	LTR	1.08	101.6	F	LTR	0.68	30.1	D
Fulton Street	EB	TR	-	-	-	TR	-	-	-	TR	-	-	-
	WB	LT	0.02	8.2	A	LT	0.02	8.0	A	LT	0.02	8.1	A
<b>Overall Intersection</b>	-	-	-	<b>15.9</b>	<b>C</b>	-	-	<b>43.5</b>	<b>E</b>	-	-	<b>13.2</b>	<b>B</b>
<b>FULTON STREET &amp; GOLD STREET</b>													
Gold Street	SB	LTR	0.75	23.5	C	LTR	0.90	38.9	D	LTR	0.88	39.3	D
Fulton Street	WB	LT	1.23	157.4	F	LT	1.28	177.3	F	LT	1.03	82.2	F
<b>Overall Intersection</b>	-	-	<b>0.94</b>	<b>84.6</b>	<b>F</b>	-	<b>1.04</b>	<b>100.8</b>	<b>F</b>	-	<b>0.93</b>	<b>61.9</b>	<b>E</b>

**D. FUTURE CONDITIONS WITH THE PROPOSED PROJECT**

Future conditions with the geometric and operational modifications of the Proposed Project (the future Build conditions) are presented below and compared with No Build conditions. Build conditions include the elimination of the free-flow right turn from westbound Fulton Street onto Gold Street at John DeLury Sr. Plaza and the diversion of the westbound right turns to the signalized intersection of Fulton Street and Gold Street, the closure of the unsignalized Little Pearl Street approach to Fulton Street and the diversion of the southbound left, through, and right turns to the signalized intersection of Fulton Street and Water Street/Pearl Street, and operational improvements described further below. The proposed geometric improvements would enlarge the pedestrian area on the northeast corner of Fulton Street and Gold Street and eliminate an existing uncontrolled pedestrian crossing on the north side of Fulton Street at Gold Street (the westbound free-flow right turn onto Gold Street). The proposed improvements would

## **Fulton Corridor Revitalization Program**

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also enlarge the pedestrian area on the north side of Fulton Street near Water Street/Pearl Street and eliminate an existing unsignalized crosswalk on the north leg of the Fulton Street intersection with Little Pearl Street. To implement the Proposed Project, traffic diversions and geometric and operational improvements are included as part of the Build conditions.

### **BUILD TRAFFIC DIVERSIONS**

Traffic diversions would be necessary due to the closure of Little Pearl Street. Currently, vehicles predominantly use the street to access westbound Fulton Street from Pearl Street or to access the block of Pearl Street between Fulton Street and John Street. Very few vehicles (under 20 vph) turn onto eastbound Fulton Street, since it immediately returns them to the Water Street/Pearl Street intersection, but may do so because of a wrong turn or in order to access the block between Little Pearl Street and Water Street.

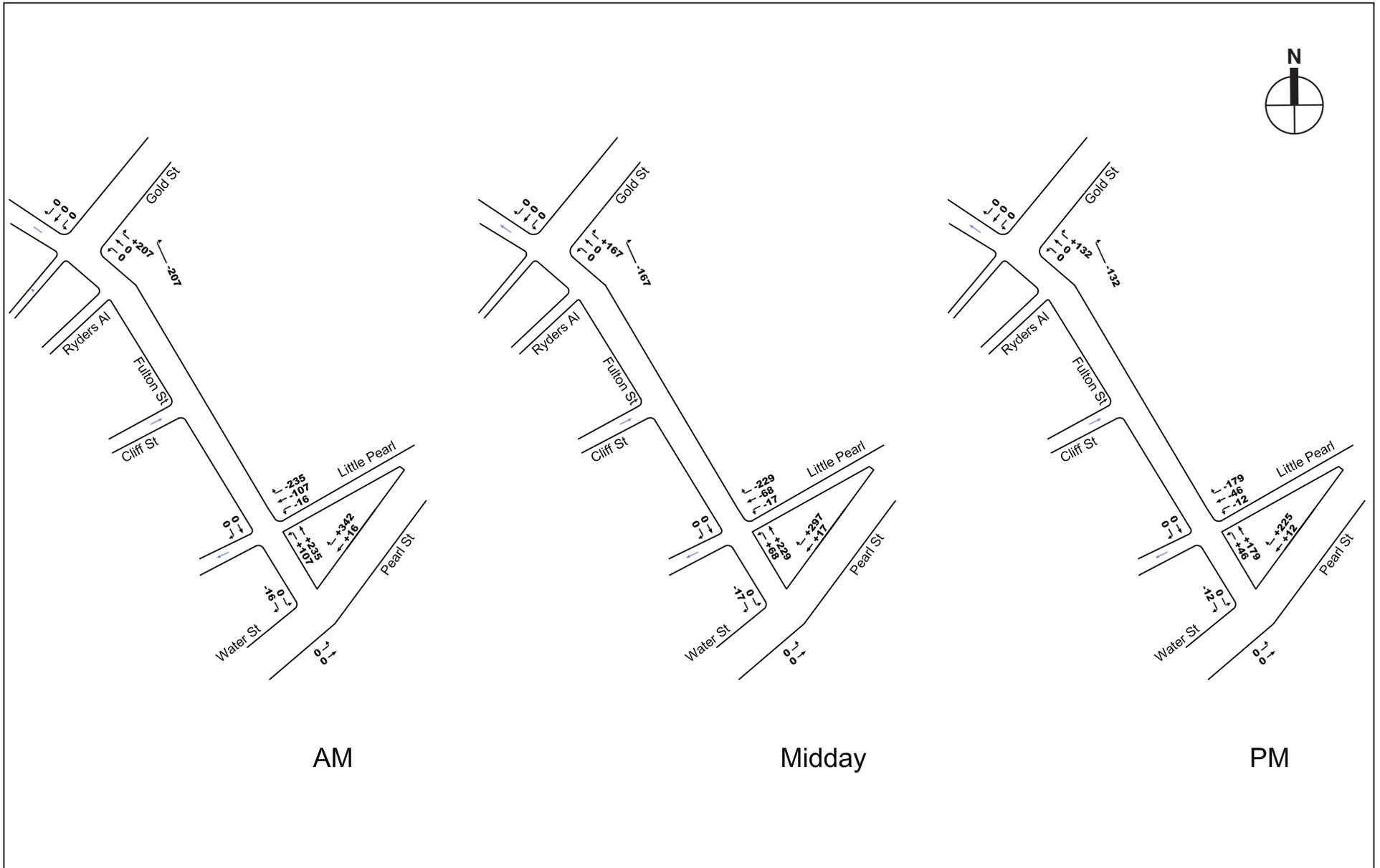
Figure 2E-5 shows the future Build traffic diversions. All vehicular traffic that currently uses Little Pearl Street to turn right or go through Fulton Street would instead continue along southbound Pearl Street to the signalized intersection with Fulton Street and turn right. There, traffic with destinations along westbound Fulton Street and Little Pearl Street south of Fulton Street (vehicles that currently make right turns or through movements, respectively, from Little Pearl Street) would turn right onto Fulton Street, with a portion immediately turning left onto Little Pearl Street and the rest continuing westbound. The remaining traffic diverted from Little Pearl Street—the left turns—would continue southbound through on Pearl Street to Water Street. These cumulative traffic diversions would increase volumes on the southbound Pearl Street approach at Fulton Street by approximately 230–360 vph during the AM, midday, and PM peak hours. There would be an additional 220–350 vph on westbound Fulton Street between the Water Street/Pearl Street intersection and Little Pearl Street, but also a decrease on eastbound Fulton Street traffic by up to 20 vph during the three peak hours. Figure 2E-6 shows the resulting Build volumes due to the diversions.

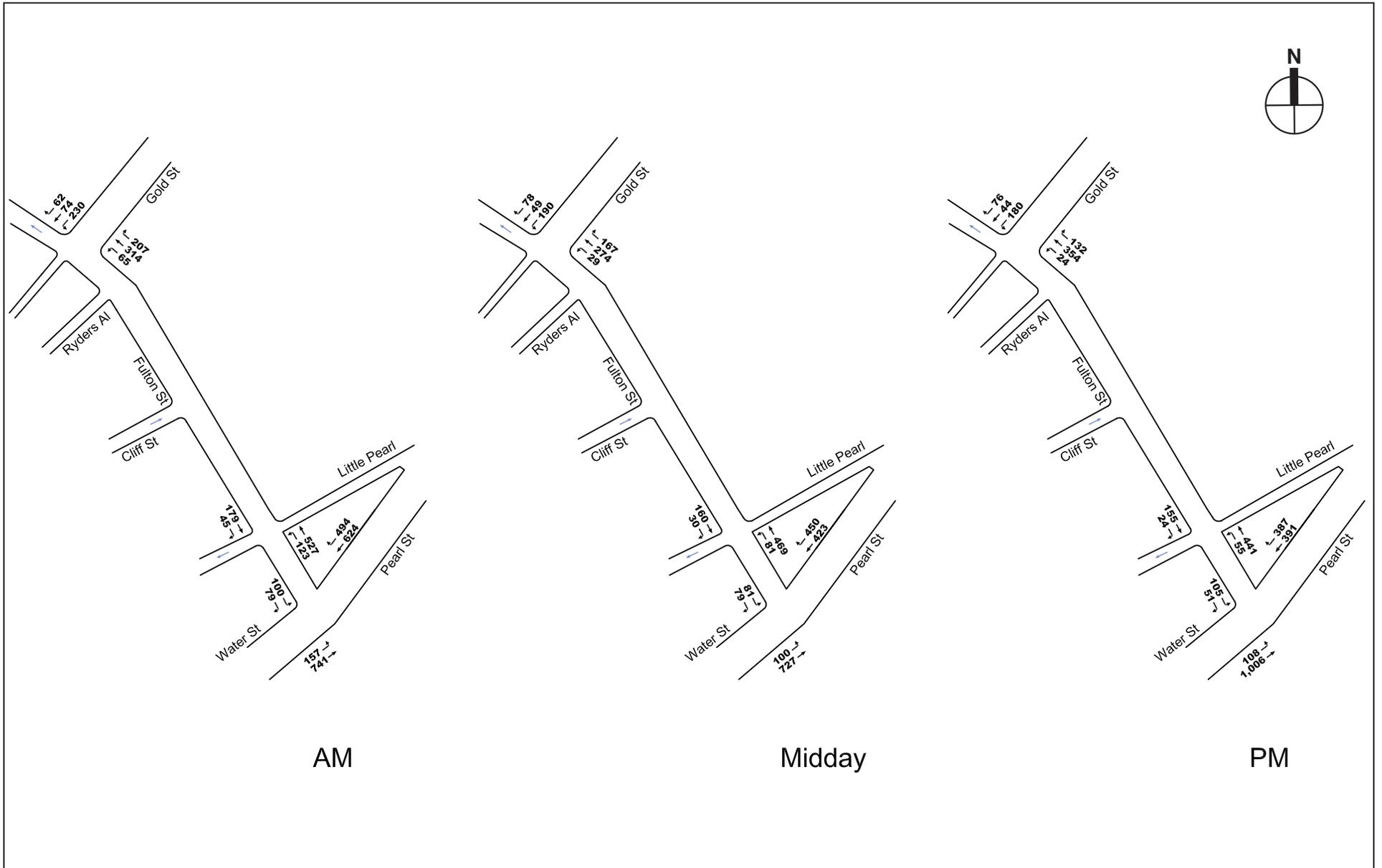
At the intersection of Fulton Street and Gold Street, the vehicular traffic using the free-flow right turn—approximately 130–210 vph during the three peak hours—would be diverted to the signalized westbound Fulton Street approach. In addition to being controlled by the traffic signal, the westbound rights would also have to yield to pedestrians in the north crosswalk and make a slower 90-degree right-turn maneuver.

### **BUILD INTERSECTION DESIGN AND OPERATIONS IMPROVEMENTS**

At Fulton Street and Gold Street, the removal of the free-flow right turn lane and the relocation of John DeLury Sr. Plaza would allow for widening of the Fulton Street and Gold Street approaches to the intersection (see Figure 2E-7). With the proposed 44-foot width for Fulton Street east of Gold Street, the westbound approach would be restriped as one 12-foot shared left-through lane and one 16-foot exclusive right-turn lane, with “No Standing Anytime” regulations along the new north curb within at least 150 feet of the approach stop line; the wide westbound right-turn lane would better facilitate turning maneuvers by trucks. Adjacent to the westbound approach, the receiving lane (going eastbound) would be restriped as one 16-foot lane, maintaining the existing “No Standing Anytime” regulations along the south curb.

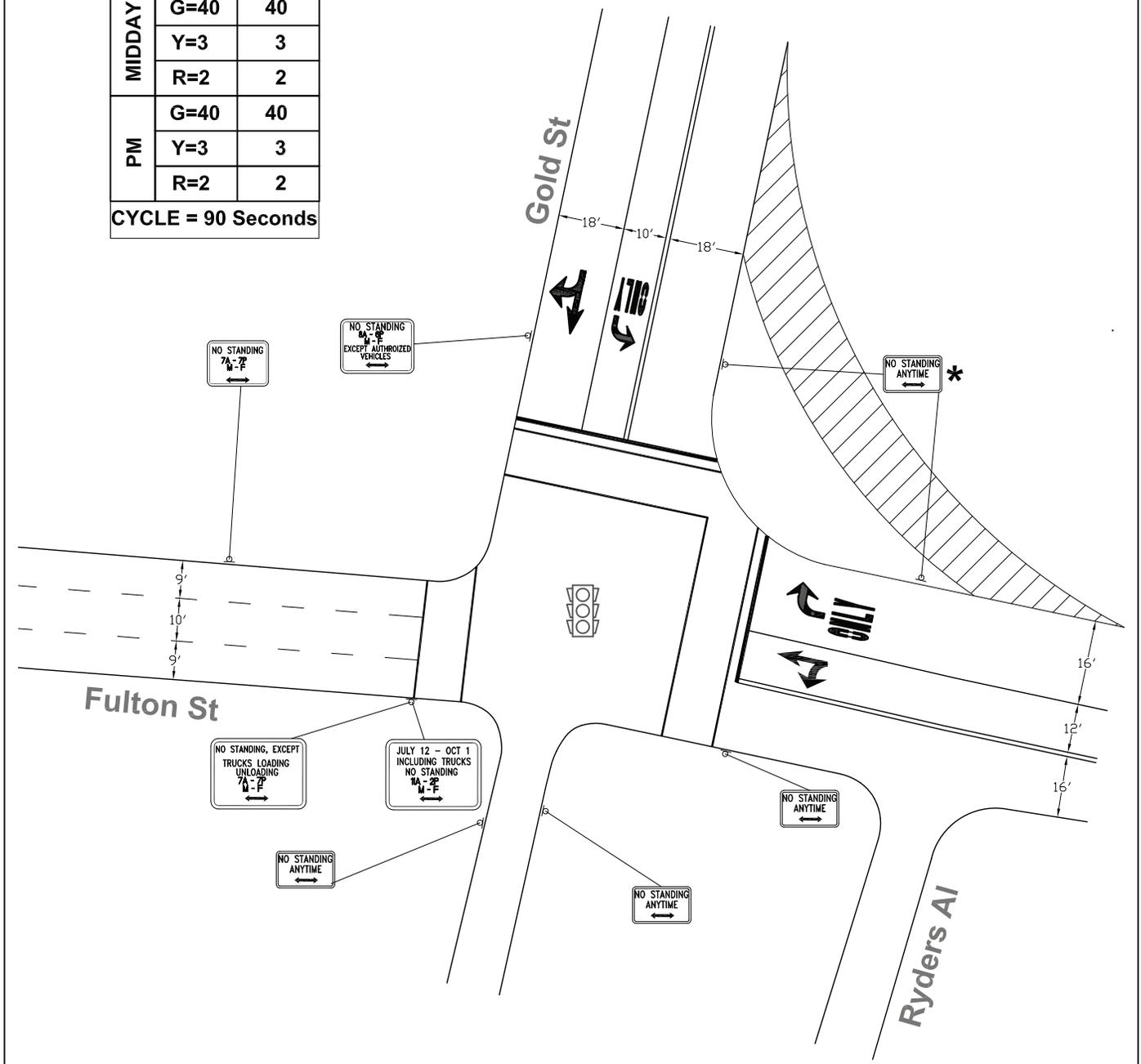
With the proposed 46-foot width of Gold Street north of Fulton Street, the southbound approach would be restriped as one 10-foot exclusive left-turn lane and one 18-foot shared through-right lane, maintaining the existing parking regulations along the west curb. Adjacent to the southbound approach, the receiving lane (going northbound) would be restriped as one wide 18-





### Proposed Signal Timing/Phasing

		
AM	G=40	40
	Y=3	3
	R=2	2
MIDDAY	G=40	40
	Y=3	3
	R=2	2
PM	G=40	40
	Y=3	3
	R=2	2
CYCLE = 90 Seconds		



 New Pedestrian Area

\* Proposed Signage

NOT TO SCALE

Proposed Improvements at  
Fulton Street and Gold Street  
Figure 2E-7

foot lane to accommodate trucks turning from westbound Fulton Street onto northbound Gold Street, with “No Standing Anytime” regulations along the new east curb between Fulton Street and Ann Street. The traffic signal timing would be modified, giving 40 seconds of green time to each approach during the AM, midday, and PM peak hours, while maintaining the current 90-second cycle length. The existing signal controller has a fixed timing plan in the AM, midday, and PM peak hours. It would remain fixed under the proposed modifications, and would not require an equipment upgrade.

At Fulton Street and Gold Street, the proposed geometric configuration shown in Figure 2E-7 was tested for westbound right turns using AutoTurn software. Truck counts conducted during the AM, midday, and PM traffic counts showed that 30-foot or 40-foot single unit trucks and shuttle buses turned from westbound Fulton Street onto northbound Gold Street. To be conservative, two types of 40-foot trucks were tested using AutoTurn. The first vehicle tested was an SU-40 design vehicle, which represents a single unit truck 40 feet long, such as a fire engine or city bus. The second vehicle tested was a WB-40, which represents a 40-foot-long tractor trailer. The recommended lane widths would accommodate the SU-40 or WB-40 design vehicles if the curb on the northeast corner of Fulton Street at Gold Street is constructed at a 35-foot radius. However, the final dimensions of the northeast corner curb radius have not been designed and will be determined by the New York City Department of Transportation/Department of Design and Construction (NYCDOT/DDC); a smaller curb radius will not have a noticeable effect on levels of service at the intersection.

At Fulton Street and Water Street/Pearl Street, the closure of Little Pearl Street would shift traffic to the southbound Pearl Street approach at Fulton Street, necessitating improvements on the southbound and northbound approaches—especially the southbound right turns and northbound left turns. With the proposed 44-foot width of Fulton Street, the westbound receiving lane would be 22 feet wide to accommodate trucks turning from southbound Water Street onto westbound Fulton Street, and the eastbound approach would be restriped as one 11-foot exclusive left-turn lane and one 11-foot exclusive right-turn lane (see Figure 2E-8). However, the curbside taxi stand on the south side of Fulton Street between Pearl Street and Water Street/Pearl Street would need to be moved farther west along Fulton Street to the block between Pearl Street and Cliff Street, where it would use the eastern portion of the block, and an existing truck loading and unloading regulation would be used on the western portion of the block. Approximately two or three truck loading and unloading spaces would be displaced to retain the taxi stand on the south curb of Fulton Street.

On the north leg of the intersection, the Pearl Street centerline would be shifted five feet eastward and the southbound approach restriped as two 10-foot exclusive through lanes and one 12-foot exclusive right-turn lane. To provide for full-time use of the southbound exclusive right-turn lane for right turning traffic only, the bus stop for the M9, M15, X8, and QM1 would be moved to the far side of the intersection<sup>1</sup> where a “No Standing Anytime” regulation exists. The tour bus parking regulation further up the block near Beekman Street would be retained. Also on the north leg of the intersection, to better align with the south leg, the northbound receiving lanes would be restriped as one 10-foot lane and one 18-foot lane.

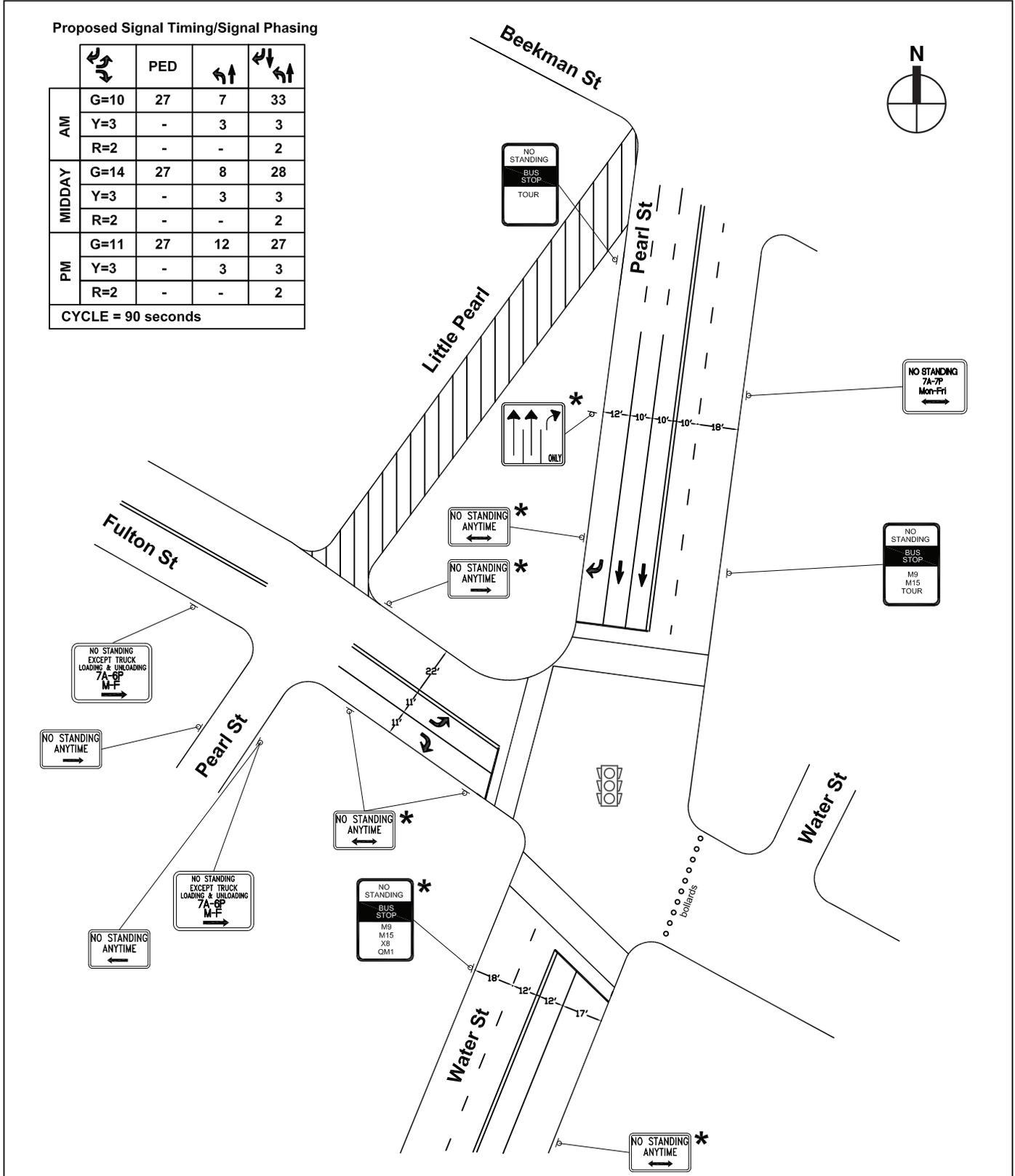
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<sup>1</sup> In a preliminary review of these analyses, NYCDOT suggested moving the bus stop to the far side of the intersection to facilitate southbound right turns by eliminating conflicts between through buses and right-turning vehicles. This is an effective measure that avoids significant impacts on the southbound right-turn movement, but NYCT concurrence will be needed for this modification.

Proposed Signal Timing/Signal Phasing

		PED		
AM	G=10	27	7	33
	Y=3	-	3	3
	R=2	-	-	2
MIDDAY	G=14	27	8	28
	Y=3	-	3	3
	R=2	-	-	2
PM	G=11	27	12	27
	Y=3	-	3	3
	R=2	-	-	2

CYCLE = 90 seconds



New Pedestrian Area

\* Proposed Signage

NOT TO SCALE

Proposed Improvements at  
Fulton Street and Water Street/Pearl Street  
Figure 2E-8

## **Fulton Corridor Revitalization Program**

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On the northbound approach of Water Street at Fulton Street, lane striping modifications would not be necessary. There would continue to be one 18-foot receiving lane and one 12-foot receiving lane adjacent to a 12-foot shared left-turn/through lane and a 17-foot through lane. However, the curbside taxi stand just south of Fulton Street on the east side of Water Street would need to be moved to the south end of the block so that the existing No Standing Anytime parking regulation just south of the taxi stand could be extended to Fulton Street to reduce friction and better facilitate through movements; no existing on-street parking would be displaced to move the taxi stand.

The traffic signal timing would be modified for the AM, midday, and PM peak hours, but would maintain the existing 90-second cycle length. The existing computerized signal controller has a variable timing plan in the AM, midday, and PM peak hours, and can accept different signal timings in different peak hours. The proposed signal timings include adding a 27-second pedestrian-only phase for all crosswalks and eliminating the Lead Pedestrian Interval. It would add a northbound protected lead phase, and add a southbound right turn arrow that operates concurrently with the eastbound phase. The proposed signal timing would be as follows: 10 seconds of green in the AM peak hour (with 14 seconds of green in the midday peak hour and 11 seconds of green in the PM peak hour), 3 seconds of yellow, and 2 seconds of red on the eastbound with southbound right-turn phase; 27 seconds of combined “Walk” and “Don’t Walk” on the pedestrian only phase in the AM, midday, and PM peak hours (split to be determined by NYCDOT); 7 seconds of green (with 8 seconds of green in the midday peak hour and 12 seconds of green in the PM peak hour) and 3 seconds of yellow on the northbound only phase; and 33 seconds of green (with 28 seconds of green in the midday peak hour and 27 seconds of green in the PM peak hour), 3 seconds of yellow, and 2 seconds of red on the northbound and southbound phase.

At Fulton Street and Water Street/Pearl Street, the proposed geometric configuration shown in Figure 2E-8 was tested for southbound right turns using AutoTurn software. Truck observations conducted during the AM, midday, and PM traffic counts showed that, generally, 30-foot or 40-foot single unit trucks and shuttle buses approached southbound Little Pearl Street at Fulton Street to turn right or left, or go through. In addition, one 40-foot tractor trailer was observed making a southbound right turn from Little Pearl Street onto westbound Fulton Street during the midday peak hour. Therefore, two types of 40-foot trucks were tested using AutoTurn. The first vehicle tested was an SU-40 design vehicle, which represents a single unit truck 40 feet long, such as a fire engine or city bus. The second vehicle tested was a WB-40, which represents a 40-foot-long tractor trailer. The recommended lane widths would accommodate the SU-40 or WB-40 design vehicles if the curb on the northwest corner of Fulton Street at Water/Pearl Street is constructed at a 30-foot radius. However, as with the westbound right turn from Fulton Street onto Gold Street, the final dimensions of the northwest corner curb radius at Fulton Street and Water Street/Pearl Street have not been designed and will be determined by NYCDOT/DDC; a smaller curb radius will not have a noticeable effect on levels of service at the intersection.

### **BUILD LEVELS OF SERVICE AND DETERMINATION OF SIGNIFICANT ADVERSE TRAFFIC IMPACTS**

The assessment of potential significant traffic impacts of the Proposed Project is based on significant impact criteria defined in the *CEQR Technical Manual*. No Build LOS A, B, or C conditions that deteriorate to unacceptable LOS D, E, or F in the future Build conditions are considered a significant traffic impact. For future No Build LOS A, B, or C conditions that deteriorate to LOS D, mitigation to mid-LOS D (45.0 seconds of delay for signalized

intersections and 30.0 seconds of delay for unsignalized intersections) needs to be considered to fully mitigate the impact.

For a No Build LOS D, an increase of delay by 5 or more seconds in the Build condition is considered a significant impact if the Build delay meets or exceeds 45.0 seconds. For a No Build LOS E, the threshold is a 4-second increase in Build delay; for a No Build LOS F, a 3-second increase in delay in the Build condition is significant. However, if a No Build LOS F condition already has delays in excess of 120 seconds, an increase in delay of more than 1 second is considered significant, unless the Proposed Project would generate fewer than 5 vehicles through that intersection in the peak hour (signalized intersections) or fewer than 5 passenger-car-equivalents (PCEs) in the peak hour along the critical approach (unsignalized intersections). In addition, for unsignalized intersections, for the minor street to generate a significant impact, 90 PCEs must be identified in the Build condition in any peak hour.

For a roadway improvement project in New York City, a 10-second increase between No Build and Build conditions is customarily used as the threshold to determine significant adverse traffic impacts in an environmental study. The *CEQR Technical Manual* significant impact thresholds are more stringent and intended for development projects that generate a net increase in vehicular traffic volumes in the study area. Although the Proposed Project does not increase the net amount of vehicular traffic volumes in the study area, traffic diversions and geometric and operational modifications associated with the Proposed Project at these congested intersections require a stringent level of service deterioration threshold to retain acceptable levels of service. Therefore, the more conservative *CEQR Technical Manual* thresholds have been used to determine potential significant adverse traffic impacts.

Table 2E-3 summarizes the future Build traffic levels of service. Under Build conditions, the intersection of Fulton Street and Gold Street would operate at marginally acceptable overall LOS D during the AM and midday peak hours, and overall LOS C during the PM peak hour, compared with unacceptable overall LOS F in the AM and midday peak hours and unacceptable LOS E in the PM peak hour under No Build conditions. The westbound Fulton Street shared left-through movement at the intersection is expected to experience LOS E conditions during the AM and midday peak hours and LOS C during the PM peak hour, compared with LOS F under the No Build conditions for all three peak hours. The reconfigured westbound right turn movement would operate at marginally acceptable LOS D during the AM and midday peak hours and acceptable LOS C during the PM peak hour. Although the reconfigured right turn is no longer a free-flow (zero control delay) movement, the projected delays for the new movement under the Build conditions are acceptable during all three analysis periods. Therefore, no significant adverse traffic impacts would occur at Fulton Street and Gold Street.

With the closure of Little Pearl Street at Fulton Street, the elimination of vehicle delays on the southbound approach, especially the high delays experienced during the midday peak hour, would improve the intersection's overall levels of service to acceptable overall LOS A during all three peak hours under Build conditions compared with LOS C in the AM peak hour, LOS E in the midday peak hour, and LOS B in the PM peak hour under No Build conditions.

At Fulton Street and Water Street/Pearl Street, the AM and midday peak hours would operate at marginally acceptable overall LOS D and acceptable overall LOS C, respectively, while the PM peak hour would be at unacceptable overall LOS E under Build conditions, compared with marginally acceptable overall LOS D in the AM and midday peak hours and unacceptable LOS E in the PM peak hour under No Build conditions. The following individual movements would operate at unacceptable LOS E under Build conditions: northbound Water Street during the PM

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peak hour; the eastbound Fulton Street left turn during the AM and PM peak hours; and the eastbound Fulton Street right turn during the AM peak hour. This is compared with individual movements that would operate at unacceptable LOS E or F under No Build conditions: northbound Water Street during the PM peak hour at LOS F; and the eastbound left and right turns during the AM, midday, and PM peak hours at LOS E. Therefore, no significant adverse traffic impacts would occur at Fulton Street and Water Street/Pearl Street.

**Table 2E-3**  
**Levels of Service Summary – 2009 Build Conditions**

INTERSECTION & APPROACH	AM (8:15 - 9:15 AM)				Midday (12:00 AM - 1:00 PM)				PM (5:00 - 6:00 PM)					
	Mvt.	V/C	Delay	LOS	Mvt.	V/C	Delay	LOS	Mvt.	V/C	Delay	LOS		
<b>FULTON STREET CORRIDOR</b>														
<b>FULTON STREET &amp; WATER STREET / PEARL STREET</b>														
Water Street / Pearl Street	NB	LT	1.00	51.1	D	LT	0.91	36.9	D	LT	1.08	76.0	E	
	SB	T	0.86	36.0	D	T	0.60	29.1	C	T	0.75	35.3	D	
Fulton Street		R	0.79	20.8	C		R	0.91	31.7		R	0.95	42.2	D
	EB	L	0.75	67.2	E	L	0.37	38.7	D	L	0.74	60.8	E	
		R	0.65	60.5	E		R	0.61	49.9	D		R	0.39	43.7
	<b>Overall Intersection</b>	-	<b>0.95</b>	<b>40.8</b>	<b>D</b>	-	<b>0.60</b>	<b>34.5</b>	<b>C</b>	-	<b>1.02</b>	<b>58.4</b>	<b>E</b>	
<b>FULTON STREET &amp; PEARL STREET SPUR [Unsignalized]</b>														
Pearl Street Spur	SB	-	-	-	-	-	-	-	-	-	-	-	-	
Fulton Street	EB	TR	-	-	-	TR	-	-	-	TR	-	-	-	
	WB	LT	0.13	8.6	A	LT	0.11	8.3	A	LT	0.11	8.4	A	
	<b>Overall Intersection</b>	-	-	<b>6.2</b>	<b>A</b>	-	-	<b>6.2</b>	<b>A</b>	-	-	<b>6.2</b>	<b>A</b>	
<b>FULTON STREET &amp; GOLD STREET</b>														
Gold Street	SB	L	0.52	21.4	C	L	0.54	22.5	C	L	0.46	20.8	C	
Fulton Street		TR	0.41	19.6	B		TR	0.53	23.7		TR	0.52	24.5	C
	WB	LT	0.96	57.6	E	LT	0.99	68.0	E	LT	0.80	33.6	C	
		R	0.82	43.1	D		R	0.76	38.7	D		R	0.43	21.0
	<b>Overall Intersection</b>	-	<b>0.74</b>	<b>38.7</b>	<b>D</b>	-	<b>0.77</b>	<b>42.3</b>	<b>D</b>	-	<b>0.66</b>	<b>27.1</b>	<b>C</b>	

**BUILD PEDESTRIAN ANALYSES**

Because the pedestrian areas are currently used predominantly by residents and local workers in the neighborhood, and only minor increases in the square feet of pedestrian areas are proposed, it is expected that the expanded John DeLury Sr. Plaza and Fulton Street north curb park space would not generate additional pedestrian trips above the amount of background growth estimated between the existing condition to the future 2009 No Build condition. The existing pedestrian crosswalk volumes were grown by one-half percent per year for the 2009 No Build and Build conditions. With the elimination of the uncontrolled pedestrian crossing of the free-flow right turn from westbound Fulton Street onto Gold Street at John DeLury Sr. Plaza and the elimination of the unsignalized pedestrian crosswalk across Little Pearl Street on the north side of Fulton Street, Build conditions would generally be safer for pedestrians when compared with No Build conditions.

Pedestrian level of service analyses were performed to compare No Build and Build conditions and determine potential significant adverse impacts. According to the *CEQR Technical Manual*, for crosswalks in Midtown, Lower Manhattan, and Downtown Brooklyn, a significant impact may be considered for a deterioration (decrease) of one square foot per pedestrian when No Build conditions are at LOS E or F.

Pedestrian level of service analyses conducted on the north crosswalk at Fulton Street and Gold Street show an improvement under Build conditions when compared with No Build conditions.

On the signalized north crosswalk at Fulton Street and Gold Street, the crossing distance would increase from 22 feet to 46 feet (or slightly more, depending on the curb radius), and between approximately 130 to 210 vehicles per hour making the right turn from westbound Fulton Street onto northbound Gold Street would conflict with pedestrians under Build conditions. To offset these modifications, the pedestrian crossing time would be increased by nine seconds. The pedestrian levels of service on the north crosswalk would improve from LOS B to LOS A in the AM and PM peak hours and LOS C to LOS B in the midday peak hour when comparing No Build with Build conditions.

The east crosswalk at Fulton Street and Gold Street was also analyzed. An increase in the crossing distance from 30 to 44 feet and nine second modification of the signal timing on the signalized east crosswalk would not affect pedestrian levels of service, which would remain at LOS A during the AM, midday, and PM peak hours under Build conditions. Modifications to the crossing distance would not be made to the west and south crosswalks, and it is not likely that significant changes in levels of service would result from signal timing modifications.

Pedestrian level service analyses were conducted on the north, south and west crosswalks at Fulton Street and Water Street/Gold Street. At this intersection, the signal would be modified to include a 27 second pedestrian-only phase. On the north and south crosswalks, the signal timings under Build conditions would reduce the crossing time by four to eight seconds compared with No Build conditions, but would provide 16 additional seconds of pedestrian-only time (compared with the 11 second Lead Pedestrian Interval under No Build conditions). Furthermore, the signal timings under Build conditions would not allow pedestrian-vehicle conflicts to occur, whereas No Build conditions include pedestrian-vehicle conflicts on all three crosswalks during at least part of the signal phase. Therefore, pedestrian safety under Build conditions would improve compared with No Build conditions.

On the signalized north crosswalk at Fulton Street and Water Street/Pearl Street, the crossing distance would remain at 60 feet, but could increase slightly depending on the curb radius. The pedestrian levels of service on the north crosswalk would remain at LOS A in the AM peak hour, deteriorate from LOS B to an acceptable LOS C in the midday peak hour, and remain at LOS B in the PM peak hour when comparing No Build with Build conditions. On the signalized south crosswalk at Fulton Street and Water Street/Pearl Street, there would be no geometric modifications; however, the signal timing modifications would cause the pedestrian levels of service to deteriorate from LOS C to acceptable LOS D in the PM peak hour under Build conditions when compared with No Build conditions. The AM and PM peak hours would remain at LOS B and LOS D, respectively, on the south crosswalk under Build conditions. On the signalized west crosswalk at Fulton Street and Water Street/Pearl Street, the crossing distance would increase from 40 feet to 44 feet, and the signal timing would be modified. However, the levels of service in the AM, midday, and PM peak hours would remain at LOS A on this crosswalk during Build conditions. Therefore, no significant adverse impacts would result from the Proposed Project.

The *CEQR Technical Manual* considers a location to be a high-pedestrian-accident location if five or more pedestrian-related accidents occurred within a 12-month period in the most recent three years. Data on traffic accidents for the intersections in the vicinity of the Proposed Project were compiled from New York State Department of Transportation (NYSDOT) records for the period ending in September 2007. Based on this information, none of the intersections within the study area are high accident locations, and further analysis of pedestrian safety is not required. \*