Chapter 16: Traffic and Parking

A. INTRODUCTION

This chapter addresses the potential traffic and parking impacts of the Proposed Project. The approach routes to the Project Site traverse intersections along Erskine Street, Gateway Drive, Flatlands Avenue, Pennsylvania Avenue, Fountain Avenue and Linden Boulevard, and the Shore Parkway's Erskine Street interchange immediately south of the Project Site. Therefore, the traffic and parking analyses cover a large study area encompassing 37 existing intersections and nine new intersections created for access to, from, and within the Project Site. Due to the large size of the study area, it is divided into primary and secondary study areas. The primary study area encompasses 27 existing intersections and nine new intersections constructed for site accessibility, all within approximately ½ mile of the Project Site. The secondary study area consists of 10 intersections outside the primary study area extending to approximately two miles from the Project Site. Key segments of the Shore Parkway have also been studied.

The analyses begin with an assessment of existing traffic and parking conditions in the study area, and proceed to an analysis of conditions in the future without the Proposed Action—the future No Build condition. No Build conditions are analyzed for weekday and Saturday peak hour conditions for two future analysis years—2011 and 2013. The No Build analysis considers the proposed implementation of the 1996 Fresh Creek Urban Renewal Plan (FCURP) as well as background growth and traffic generated from four other approved soft-site developments.

The next step in the analyses considers the amount of vehicular traffic expected to be generated by the Proposed Project in each of the Build years, and an assessment of future traffic and parking conditions with the Proposed Action in place in 2011 (interim analysis year) and 2013 (final Build year). Like the No Build conditions, the Build conditions analyze roadway conditions on weekdays and Saturday. These Build year analyses identify the location and extent of significant impacts potentially generated by the Proposed Project, and identify and evaluate traffic improvements that may be needed to mitigate those impacts. The parking analysis addresses the ability of the Proposed Project to accommodate the parking demands in each Build year.

Of the 46 locations analyzed in the 2011 Build condition for the weekday peak hours, significant impacts would occur at 10 intersections during the weekday AM peak hour, 10 intersections during the weekday midday peak hour, 12 intersections during the weekday PM peak hour, 14 intersections during the Saturday midday peak hour, and 16 intersections during the Saturday PM peak hour. In the 2013 Build condition, significant impacts would occur at 12 intersections during the weekday AM peak hour, 10 intersections during the weekday midday peak hour, 14 intersections during the weekday PM peak hour, 15 intersections during the Saturday midday peak hours, and 19 intersections during the Saturday PM peak hour. Approximately half of the impacted intersections are in the secondary study area. These intersections are heavily trafficked and experience high delays in the existing baseline conditions, and would be significantly impacted in the Build conditions, even though most of the project-generated traffic would not

use these intersections. The evaluation of mitigation measures in Chapter 22, "Mitigation," indicates that most, but not all, significant impacts would be fully mitigated by standard traffic engineering improvements such as the installation of traffic signals, signal timing and phasing modifications, parking prohibitions, and lane re-striping.

The results of the highway analysis indicate that for the 2011 Build condition, the eastbound segment of the Shore Parkway after the Erskine Street on-ramp merge would be significantly impacted in the weekday PM peak hour. During the Saturday PM peak hour, three sections of the Shore Parkway—the eastbound segment before the off-ramp diverge, the eastbound segment after the on-ramp merge, and the westbound segment before the off-ramp diverge—would be significantly impacted. In comparing the 2011 No Build condition to the 2011 Build condition, the reduction in speeds for significantly impacted segments would range from 0.5 to 2.8 mph which would generally not be noticeable to motorists. For the 2013 Build condition, two segments along the eastbound Shore Parkway would be significantly impacted during the weekday PM peak hour. During the Saturday PM peak hour, all sections except the westbound Shore Parkway between the on-ramp and off-ramp would be impacted. A comparison between the 2013 No Build and 2013 Build conditions reveals that the reduction in speeds for significantly impacted segments would range from 0.9 to 3.7 mph or less for all analyzed segments, which would generally not be noticeable to motorists.

The parking analyses indicate that the amount of parking to be provided would be sufficient to accommodate the Proposed Project's parking needs.

B. METHODOLOGY

The assessment of the Proposed Action's potential impacts on vehicular traffic and parking was prepared consistent with methodologies set forth in the *City Environmental Quality Review (CEQR) Technical Manual* (Mayor's Office of Environmental Coordination, 2001) and the *Highway Capacity Manual* (*HCM 2000*; Transportation Research Board, 2000). The traffic and parking study areas, assessment methodologies, and evaluation criteria are described in the analysis sections that follow.

C. EXISTING CONDITIONS

TRAFFIC

ROADWAY NETWORK

The primary traffic study area is generally bounded by Linden Boulevard on the north, the Shore Parkway on the south, Pennsylvania Avenue on the west, and Fountain Avenue on the east (see Figure 16-1a). Key north-south streets include Erskine Street, Pennsylvania Avenue and Fountain Avenue, and important east-west routes include the Shore Parkway, Gateway Drive, Flatlands Avenue, and Linden Boulevard. The primary traffic study area includes locations in the immediate vicinity of the Project Site and key intersections through which generated traffic volumes can be expected to be significant. It includes the Erskine Street interchange on the Shore Parkway in addition to major intersections along Erskine Street, Gateway Drive, Fountain Avenue, Pennsylvania Avenue, Flatlands Avenue, and Linden Boulevard. The secondary study area includes ten intersections along Pennsylvania Avenue, Linden Boulevard, Flatlands Avenue, and Fountain Avenue at key intersections further from the Project Site such as Kings Highway, Remsen Avenue, Rockaway Parkway, and Rockaway Avenue to the west of the

Primary Traffic Study Area

GATEWAY ESTATES II

Figure 16-1a

Project Site, Atlantic Avenue and Liberty Avenue to the north, and 79th Street to the east (see Figure 16-1b). The entire traffic study area consists of 37 existing intersections (26 signalized and 11 unsignalized intersections); nine new intersections would be created within the Project Site as part of the Proposed Project, and are added in the future conditions analyses. The specific analysis locations were selected based on observations of traffic patterns in the study area and projected trip patterns to the Project Site. They represent the key locations along the major approach and departure routes—along heavily trafficked routes, high volume intersections, intersections near the Project Site, and other locations that could potentially be significantly impacted. Following is a discussion of some of the key roadways in the study area vicinity.

- The Shore Parkway is a six-lane, limited access highway with three lanes in each direction. Traveling along the southern edges of Brooklyn and Queens, it extends from the Gowanus Expressway in Sunset Park, Brooklyn to the Cross Island/Southern State Parkway interchange at the Queens/Nassau County border. The Shore Parkway provides excellent regional access to the Project Site via the Erskine Street interchange.
- Erskine Street travels in the north-south direction and provides direct access to the Project Site for vehicles traveling on the Shore Parkway and Fountain Avenue. It also provides access to the parking lot and truck delivery areas of the existing Gateway Center shopping center, i.e., the existing Gateway Center. Erskine Street is characterized by one to three lanes of traffic in each direction with left turn lanes at key intersections.
- Gateway Drive is a perimeter access road connecting several entrance/exits of the existing Gateway Center to the local street network and the Shore Parkway. The roadway carries one to two lanes of traffic in each direction with center medians along certain sections. It extends from Flatlands Avenue where it is oriented in the north-south direction and wraps around the shopping complex where it eventually becomes oriented in the east-west direction and travels parallel to the Shore Parkway. Gateway Drive intersects with Erskine Street just north of the Shore Parkway, and terminates at Fountain Avenue further east.
- Fountain Avenue is a north-south roadway that extends between Atlantic Avenue to the north and Seaview Avenue to the south. Within the primary study area, Fountain Avenue provides access from Flatlands Avenue to the existing Gateway Center via Vandalia and Erskine Streets. To the south of Flatlands Avenue, Fountain Avenue is characterized by two lanes of traffic in each direction with a center median. In the section between Flatlands Avenue and Linden Boulevard, Fountain Avenue experiences heavy truck activity during the day due to the presence of light industrial-type facilities. In the vicinity of Atlantic Avenue, Fountain Avenue turns into a one-lane, one-way southbound local road with low traffic volumes. On-street curb parking is present in each direction along sections of Fountain Avenue between Flatlands Avenue and Atlantic Avenue.
- Flatlands Avenue is a key east-west arterial in the southeast portion of Brooklyn between Flatbush Avenue and Fountain Avenue. It traverses the Flatlands, Canarsie, and Spring Creek neighborhoods and spans the northern border of the Project Site. Within the entire study area, Flatlands Avenue is characterized by two travel lanes in each direction along with on-street parking and left turn lanes. In the primary study area, this roadway has concrete center medians and wide lanes. The lanes become narrower in the secondary study area without a center median to separate opposing traffic. Flatlands Avenue is a New York City Department of Transportation (DOT) designated truck route.
- Pennsylvania Avenue is an important north-south arterial between the Interborough Parkway to the north and the Shore Parkway to the south. It is characterized by three travel lanes in

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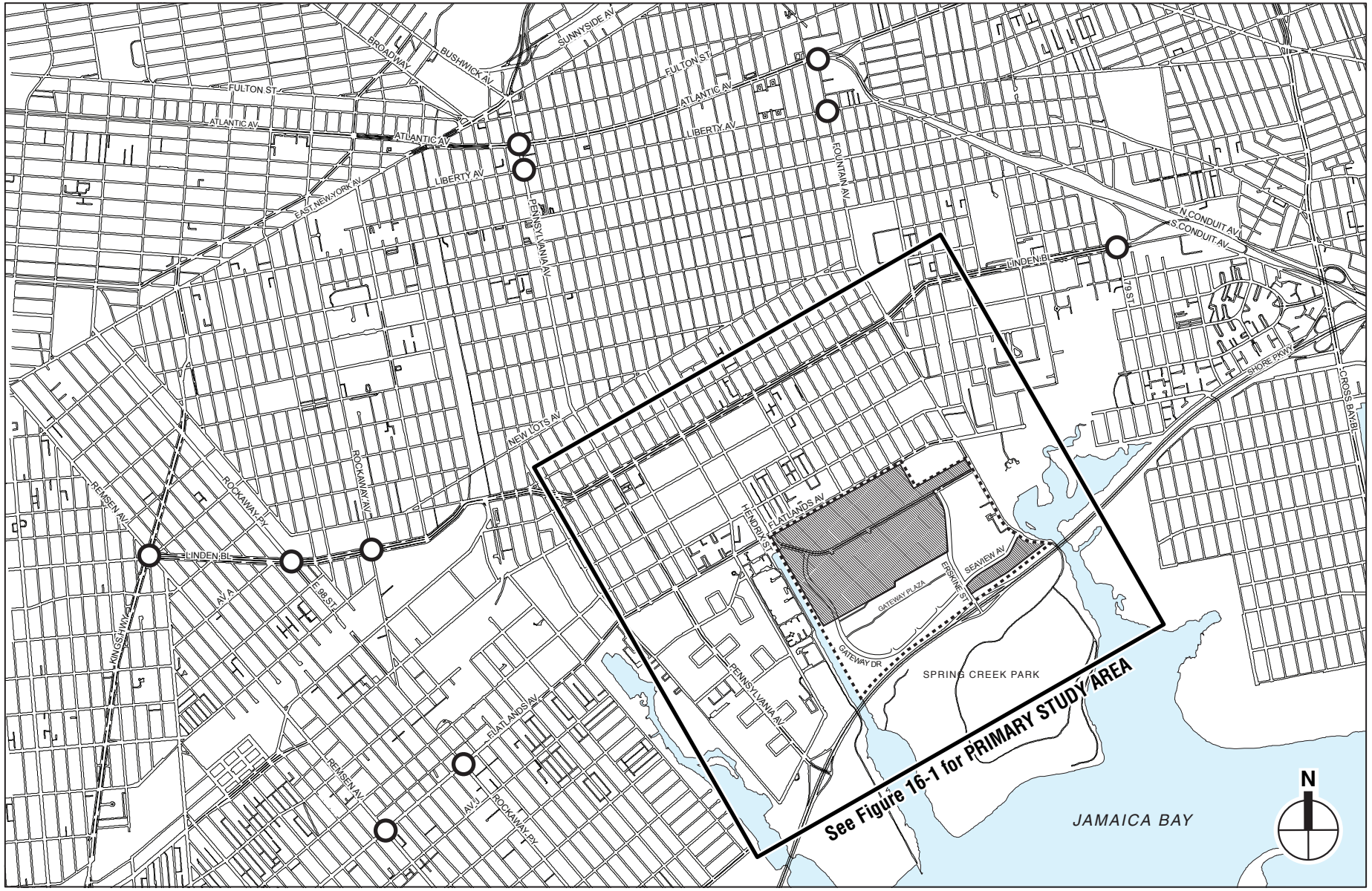

Project Site

Fresh Creek Urban Renewal Area Boundary

Secondary Traffic Study Area Analysis Location

GATEWAY ESTATES II

Secondary Traffic Study Area

Figure 16-1b

each direction with a wide center median within the primary study area. In the secondary study area, the width of the road is reduced. Curbside parking and left turn lanes are present along sections of the roadway. Pennsylvania Avenue is a DOT designated truck route.

- Linden Boulevard is a major east-west arterial that travels parallel to and north of Flatlands Avenue in the vicinity of the Project Site. It extends from Flatbush Avenue to the west to Conduit Avenue (Nassau Expressway/NYS Route 27) to the east. Within the primary and secondary study areas, Linden Boulevard has three travel lanes and a one lane service road in each direction with curbside parking present along the service road. Left turn lanes are present at key intersections. Linden Boulevard is a DOT designated truck route.

The following is a description of important roadways within the secondary study area.

- Rockaway Parkway is an important arterial that travels east of and parallel to Remsen Avenue from East New York Avenue to the Shore Parkway. Brookdale Hospital is located along Rockaway Parkway just north of Linden Boulevard, thus ambulances frequently travel through this area. Left turn lanes are provided at major intersections, and curbside parking is prevalent in many sections of the roadway.
- Rockaway Avenue is a two-way roadway that travels in the north-south direction. It extends from Broadway, just north of Atlantic Avenue, to where it merges with Rockaway Parkway. Although this street is typically a one-lane roadway in each direction, it functions as two lanes in each direction at some key intersections. On-street curbside parking is prevalent along this corridor.
- Remsen Avenue extends northwest to southeast with two lanes in each direction. It serves cross streets between East New York Avenue/Utica Avenue and Seaview Avenue. Remsen Avenue has left turn lanes and wide striped medians at key intersections. It is characterized by sections of on-street curb parking in both directions.
- Atlantic Avenue is a major east-west corridor that connects Brooklyn Heights at the Brooklyn-Queens Expressway (I-278) and Jamaica at the Van Wyck Expressway (I-678). For the majority of the roadway, the LIRR travels under Atlantic Avenue. Within the secondary study area, it can be characterized by three lanes in each direction and wide medians. Atlantic Avenue is a major commuter corridor for travel from Queens and Long Island to Downtown Brooklyn and Manhattan via the Brooklyn and/or Manhattan Bridges.
- Liberty Avenue is a two-lane east-west roadway that extends from Jamaica/East New York Avenue in Broadway Junction, Brooklyn to Farmers Boulevard in the Saint Albans section of Queens. Within the secondary traffic study area, Liberty Avenue travels parallel to and south of Atlantic Avenue and experiences lesser volumes than Atlantic Avenue. Curbside parking is available in both directions.

The traffic study area includes 37 existing intersections, which were analyzed for the weekday AM, midday, PM and Saturday midday and PM peak hours, as follows:

- Erskine Street and eastbound Shore Parkway on/off ramps
- Erskine Street and westbound Shore Parkway on/off ramps
- Erskine Street and Gateway Drive
- Erskine Street and Gateway Plaza
- Gateway Drive and Driveway to Olive Garden
- Gateway Drive and Driveway to Red Lobster

- Gateway Drive and Driveway to Boulder Creek
- Gateway Drive and Gateway Plaza
- Fountain Avenue and Vandalia Avenue
- Fountain Avenue and Flatlands Avenue
- Fountain Avenue and Old Mill Road (unsignalized)
- Fountain Avenue and Cozine Avenue (unsignalized)
- Fountain Avenue and Wortman Avenue (unsignalized)
- Fountain Avenue and Stanley Avenue
- Fountain Avenue and Liberty Avenue (unsignalized)
- Fountain Avenue and Atlantic Avenue (unsignalized)
- Flatlands Avenue and Atkins Avenue (unsignalized)
- Flatlands Avenue and Essex Street (unsignalized)
- Flatlands Avenue and Linwood Street (unsignalized)
- Flatlands Avenue and Elton Street (unsignalized)
- Flatlands Avenue and Jerome Street (unsignalized)
- Flatlands Avenue and Schenck Avenue/Vandalia Avenue
- Flatlands Avenue and Van Siclen Avenue
- Flatlands Avenue and Pennsylvania Avenue
- Flatlands Avenue and Rockaway Parkway
- Flatlands Avenue and Remsen Avenue
- Linden Boulevard and 79th Street
- Linden Boulevard and Euclid Avenue
- Linden Boulevard/Loring Avenue and Fountain Avenue
- Linden Boulevard and Atkins Avenue
- Linden Boulevard and Elton Street (unsignalized)
- Linden Boulevard and Pennsylvania Avenue
- Linden Boulevard and Rockaway Avenue
- Linden Boulevard and Rockaway Parkway
- Linden Boulevard and Remsen Avenue and Kings Highway
- Pennsylvania Avenue and Liberty Avenue
- Pennsylvania Avenue and Atlantic Avenue

Highway analysis locations include the mainline segments of the Shore Parkway approaching and leaving the Erskine Street interchange area, and merge, diverge and weaving areas at the on- and off-ramps at the interchange.

TRAFFIC VOLUMES

Traffic counts for typical weekday and weekend conditions were conducted in November 2006 for the primary study area and in June 2007 for the secondary study area, including manual

intersection counts and 24-hour Automatic Traffic Recorder (ATR) machine counts. These volumes were used along with observations of actual traffic conditions to determine the levels of service.

The determination of peak hours indicated the following peak traffic analysis periods: 8:00 AM to 9:00 AM, 12:45 PM to 1:45 PM, and 4:45 PM to 5:45 PM for typical weekday conditions; and 1:00 PM to 2:00 PM for the Saturday midday peak hour. As per NYCDOT's request, a late afternoon/early evening Saturday (PM) peak hour (4:00 PM to 5:00 PM) was analyzed between the Draft and the Final EIS. A comparison of the ATR counts for the Saturday midday and PM peak periods indicated that the Saturday PM peak hour volumes were approximately nine percent higher. Based on discussions with NYCDOT, the existing Saturday PM peak hour volumes were estimated by increasing the Saturday midday peak hour volumes by nine percent. Traffic volumes along some of the local and commuter routes within the study area are provided in Table 16-1. Overall, the key commuter routes are heavily traveled but many sections of the local street network carry much lower volumes and have substantial amounts of unused capacity. Detailed traffic volume maps and detailed level of service summary tables are provided in Appendix E, "Traffic Technical Appendix," at the end of this Final Environmental Impact Statement (FEIS).

Table 16-1
2006 Existing Traffic Volumes

Roadway Section	Weekday			Saturday	
	AM	Midday	PM	Midday	PM
Eastbound Atlantic Avenue between Pennsylvania and New Jersey Avenues	953	1,079	1,776	1,221	1,347
Westbound Atlantic Avenue between Pennsylvania and New Jersey Avenues	1,307	915	969	1,010	1,003
Northbound Kings Highway between 59th Street and Linden Boulevard	1,383	896	1,207	1,055	1,061
Southbound Kings Highway between 59th Street and Linden Boulevard	1,000	757	1,261	985	1,041
Eastbound Linden Boulevard between Remsen Avenue and 91st Street	820	823	975	800	808
Westbound Linden Boulevard between Remsen Avenue and 91st Street	1,397	800	873	815	925
Eastbound Linden Boulevard between Pennsylvania and New Jersey Avenues	1,374	1,357	1,942	1,617	1,783
Westbound Linden Boulevard between Pennsylvania and New Jersey Avenues	2,235	1,269	1,613	1,374	1,555
Eastbound Linden Boulevard between Logan Street and Fountain Avenue	1,166	1,175	1,784	1,316	1,416
Westbound Linden Boulevard between Logan Street and Fountain Avenue	2,496	1,247	1,508	1,393	1,604
Northbound Pennsylvania Avenue between Cozine and Flatlands Avenues	1,345	935	952	1,008	1,062
Southbound Pennsylvania Avenue between Cozine and Flatlands Avenues	745	904	1,289	1,010	1,205
Northbound Fountain Avenue between Wortman and Cozine Avenues	355	331	389	355	326
Southbound Fountain Avenue between Wortman and Cozine Avenues	302	321	436	382	379
Eastbound Flatlands Avenue between Vermont Street and Van Siclen Avenue	495	628	724	755	803
Westbound Flatlands Avenue between Vermont Street and Van Siclen Avenue	542	598	715	662	771
Eastbound Flatlands Avenue between Jerome and Elton Streets	345	318	369	474	281
Westbound Flatlands Avenue between Jerome and Elton Streets	377	292	385	347	254
Northbound Gateway Drive between Flatlands Avenue and Gateway Plaza	168	448	494	603	805
Southbound Gateway Drive between Flatlands Avenue and Gateway Plaza	168	465	547	775	820
Northbound Erskine Street between Vandalia Avenue and Gateway Plaza	94	147	174	207	247
Southbound Erskine Street between Vandalia Avenue and Gateway Plaza	72	135	152	210	206
Northbound Erskine Street between Gateway Drive and Westbound Shore Parkway Exit Ramp	496	769	616	952	982
Southbound Erskine Street between Gateway Drive and Westbound Shore Parkway Exit Ramp	305	722	917	877	1,124
TOTAL (sample locations)	**19,940**	**17,331**	**22,067**	**20,203**	**21,808**

It can be seen from the sample locations listed in Table 16-1 that the weekday PM peak hour experiences the highest traffic volumes. The weekday PM peak hour volumes are approximately 10 percent higher than the weekday AM and Saturday midday peak hour volumes, 21 percent higher than the weekday midday peak hour volumes, and one percent higher than the Saturday PM peak hour volumes.

INTERSECTION LEVEL OF SERVICE ANALYSIS

Analyses of traffic conditions in urban areas are based on critical conditions at intersections and are defined in terms of level of service (LOS). According to the *HCM 2000* that was used for these analyses, level of service at signalized intersections is defined in terms of a vehicle's total stopped delay 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 greater than 10 seconds to less than or equal to 20 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 greater than 20 seconds to less than or equal to 35 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 greater than 35 seconds to less than or equal to 55 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 in this range greater than 45 seconds are considered marginally unacceptable; delays of 45 seconds or less are considered marginally acceptable.
- LOS E describes operations with delays in the range of greater than 55 seconds to less than or equal to 80 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 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 be contribute to such delays. Often, vehicles do not pass through the intersection in one signal cycle.

LOS 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 the unsignalized intersections analyzed, 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 greater than 10 seconds to less than or equal to 15 seconds; LOS C has delays in the range of greater than 15 seconds to less than or equal to 25

seconds; LOS D, greater than 25 seconds to less than or equal to 35 seconds per vehicle; and LOS E, greater than 35 seconds to less than or equal to 50 seconds per vehicle, which is considered to be the limit of acceptable delay. LOS F describes operation with delays in excess of 50 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.

Table 16-2 provides an overview of the levels of service that characterize the traffic study area during the peak hours. A summary description is also provided below:

Table 16-2
2006 Existing Intersection Level of Service Summary

Level of Service	Weekday			Saturday	
	AM	Midday	PM	Midday	PM
Signalized Intersections					
Overall Intersection LOS A/B	12	12	10	11	11
Overall Intersection LOS C	8	10	9	11	9
Overall Intersection LOS D*	3	3	5	1	2
Overall Intersection LOS E/F	3	1	2	3	4
Number of Movements at LOS E or F	29	21	33	29	41
Unsignalized Intersections					
Overall Intersection LOS A/B	11	11	11	11	11
Overall Intersection LOS C	0	0	0	0	0
Overall Intersection LOS D*	0	0	0	0	0
Overall Intersection LOS E/F	0	0	0	0	0
Number of Movements at LOS E or F	0	0	0	0	1

Note:
* Table 16-2 shows intersections that operate at acceptable and unacceptable levels of service. Only intersections that operate at unacceptable levels of service are discussed in detail in the text below.

- In the weekday AM peak hour, three of the 26 signalized intersections analyzed are operating at overall LOS E or F and one intersection is operating at overall unacceptable LOS D (two of the three intersections shown in Table 16-2 are within the "acceptable" delays of LOS D). "Overall" LOS E or F means that serious congestion exists—either one specific traffic movement has severe delays, or two or more of the specific traffic movements at the intersection are at LOS E or F with very significant delays (the overall intersection level of service is a weighted average of all of the individual traffic movements). Twenty-nine specific traffic movements (e.g., left turns from one street to another, through traffic on one street passing through the intersection, etc.) out of approximately 200 total traffic movements analyzed are at LOS E or F conditions.
- In the weekday midday peak hour, one signalized intersection is operating at overall LOS E or F, and one is operating at overall unacceptable LOS D (two of the three intersections shown in Table 14-2 are within the "acceptable" delays of LOS D). Twenty-one individual traffic movements are at LOS E or F.
- In the weekday PM peak hour, two signalized intersections operate at overall LOS E or F, and one is at overall unacceptable LOS D (four of the five intersections shown in Table 14-2 are within the "acceptable" delays of LOS D). Thirty-three traffic movements operate at LOS E or F.
- In the Saturday midday peak hour, three signalized intersections operate at overall LOS E or F, and one is at overall unacceptable LOS D. Twenty-nine traffic movements operate at LOS E or F.
- In the Saturday PM peak hour, four signalized intersections operate at overall LOS E or F, and two are at overall acceptable LOS D. Forty-one traffic movements operate at LOS E or F.

- Each of the 11 unsignalized intersections analyzed operate at acceptable levels of service during all five traffic analysis hours.

Overall existing levels of service are presented in Figures 16-2a through 16-6b. Table 16-3 shows the details of the individual traffic movements that operate at an unacceptable level of service during at least one peak hour. A description of the level of service by corridor is provided below.

Table 16-3
2006 Existing Traffic Movements at Unacceptable Levels of Service

Intersection	Approach and Movement		Weekday									Saturday					
			AM			Midday			PM			Midday			PM		
			D*	E	F	D*	E	F	D*	E	F	D*	E	F	D*	E	F
Signalized																	
Erskine Street & Gateway Drive	WB	L							●								
Gateway Drive & Gateway Plaza	SB	L										●				●	
	WB	LR													●		
Flatlands Avenue & Schenck Avenue/ Vandalia Avenue	NB	L								●			●				●
Flatlands Avenue & Van Siclen Avenue	WB	L							●								
Flatlands Avenue & Pennsylvania Avenue	NB	L	●							●			●				●
	EB	L				●			●				●				●
		T													●		
	WB	L											●			●	
Flatlands Avenue & Rockaway Parkway	SB	LTR	●						●				●			●	
	EB	L														●	
		TR											●			●	
	WB	L													●		
		TR										●				●	
Flatlands Avenue & Remsen Avenue	SB	L													●		
	WB	TR														●	
Linden Boulevard & Euclid Avenue	SB	LTR	●														
Linden Boulevard & Fountain Avenue & Loring Avenue	NB[1]	LTR		●			●		●			●				●	
	SB[1]	DefL			●	●					●			●			●
		TR		●		●					●			●			●
	NB[2]	LTR		●			●			●		●				●	
	WB[3]	L		●													
		T		●													
	WB[4]	TR	●														
Linden Boulevard & Atkins Avenue	SB	LTR	●														
Linden Boulevard & Pennsylvania Avenue	NB	L			●			●			●			●			●
		T											●			●	
	SB	L									●			●			●
		TR	●				●			●			●			●	
	EB[3]	L			●			●			●		●			●	
		T								●		●				●	
	WB[3]	L			●			●		●			●				●
		T		●						●			●			●	
	EB[4]	T	●														
	WB[4]	TR	●														
Linden Boulevard & Rockaway Avenue	NB	LT			●			●			●			●			●
		R							●								
	SB	LT			●			●			●			●			●
		R	●					●			●						
	EB[3]	L		●			●			●					●		
	WB[3]	L			●			●			●			●			●

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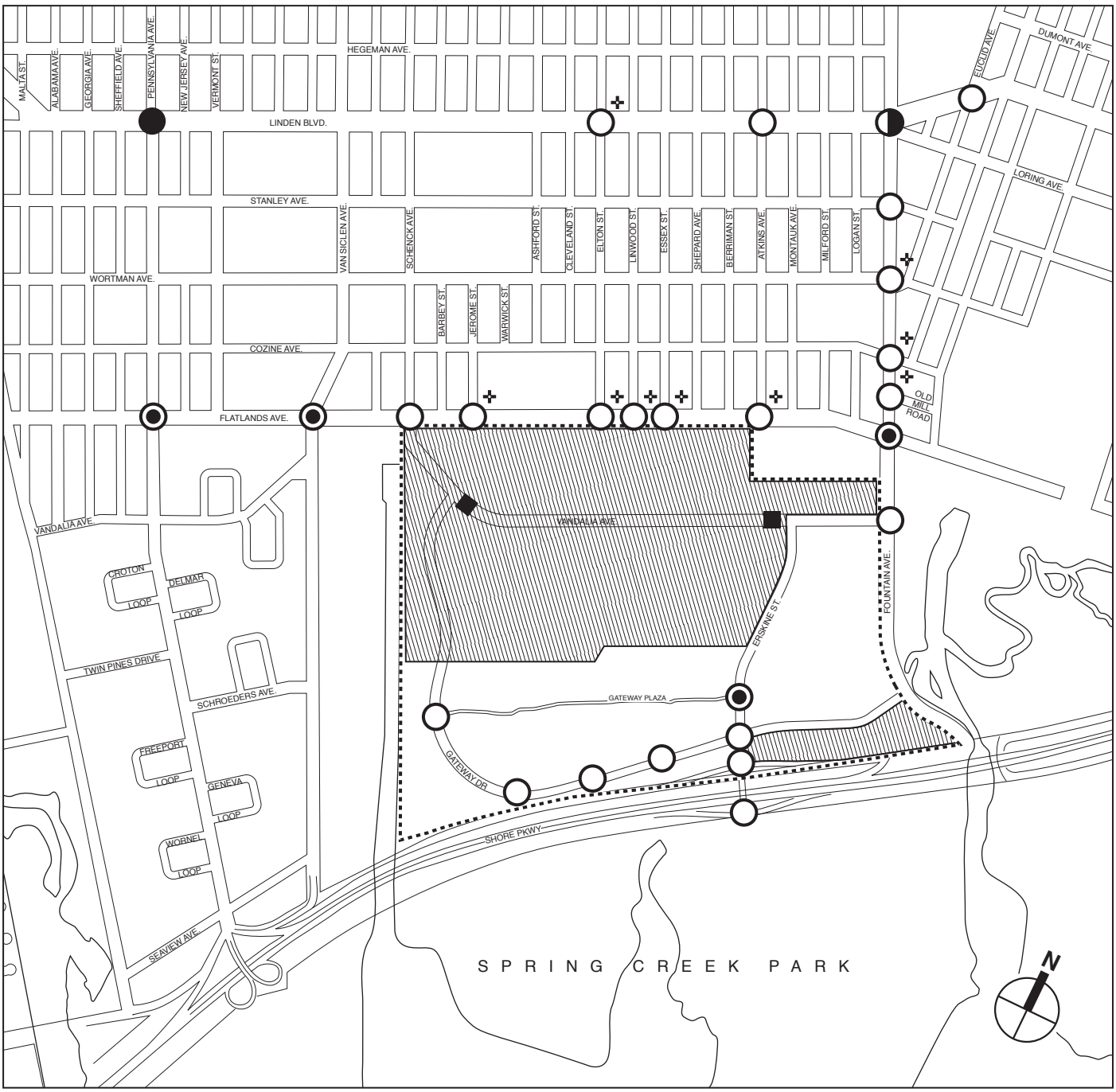

0 1000 2000 FEET

SCALE

Project Site

Fresh Creek Urban Renewal Area Boundary

Roadway Closed

LOS A or B

LOS C

LOS D

LOS E or F

Unsignalized Intersection

NOTE: *Overall intersection LOS is shown*

Existing Weekday
AM Peak Hour Traffic Level of Service
Primary Study Area

Figure 16-2a

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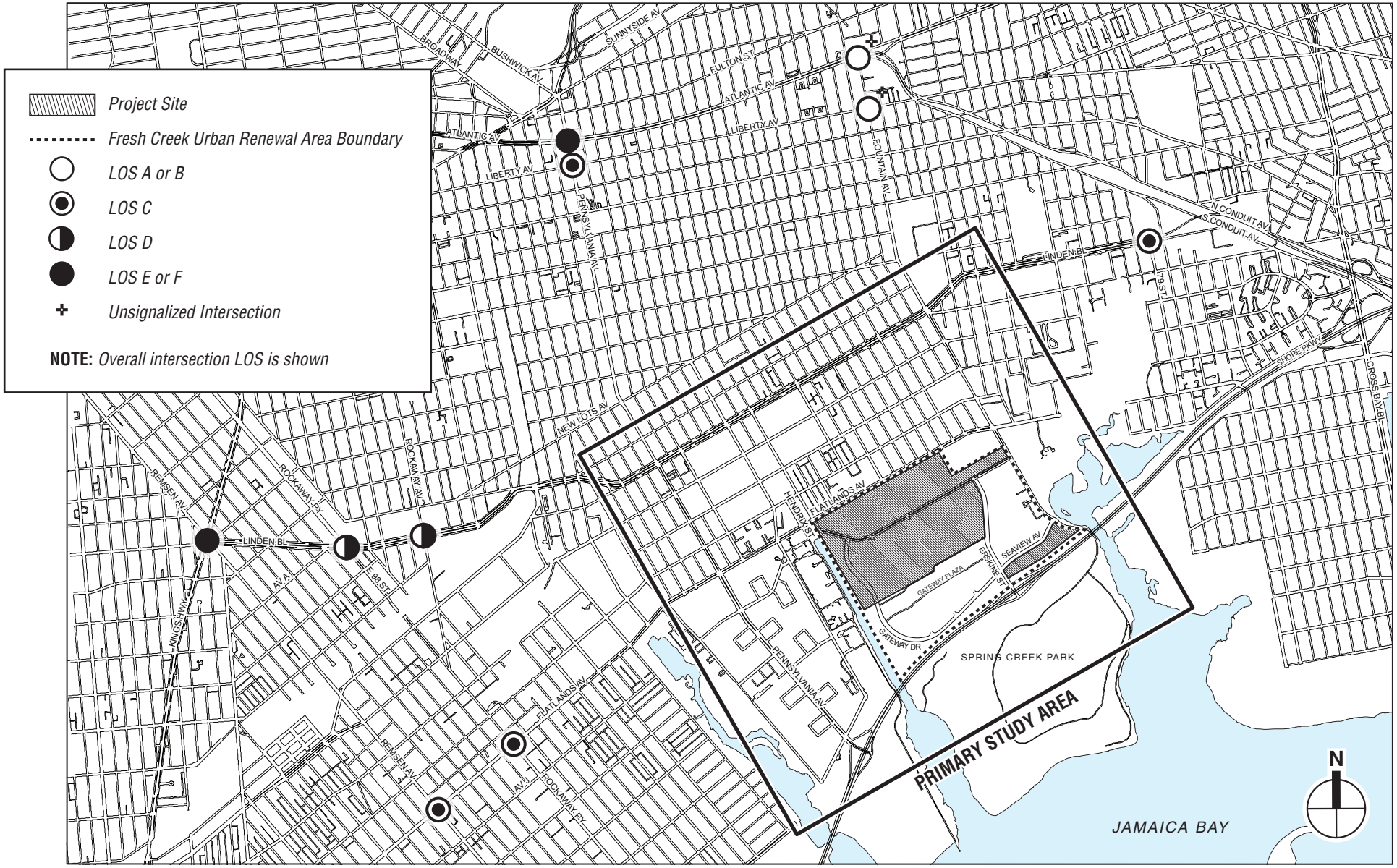

Existing Weekday
AM Peak Hour Traffic Level of Service
Secondary Study Area

Figure 16-2b

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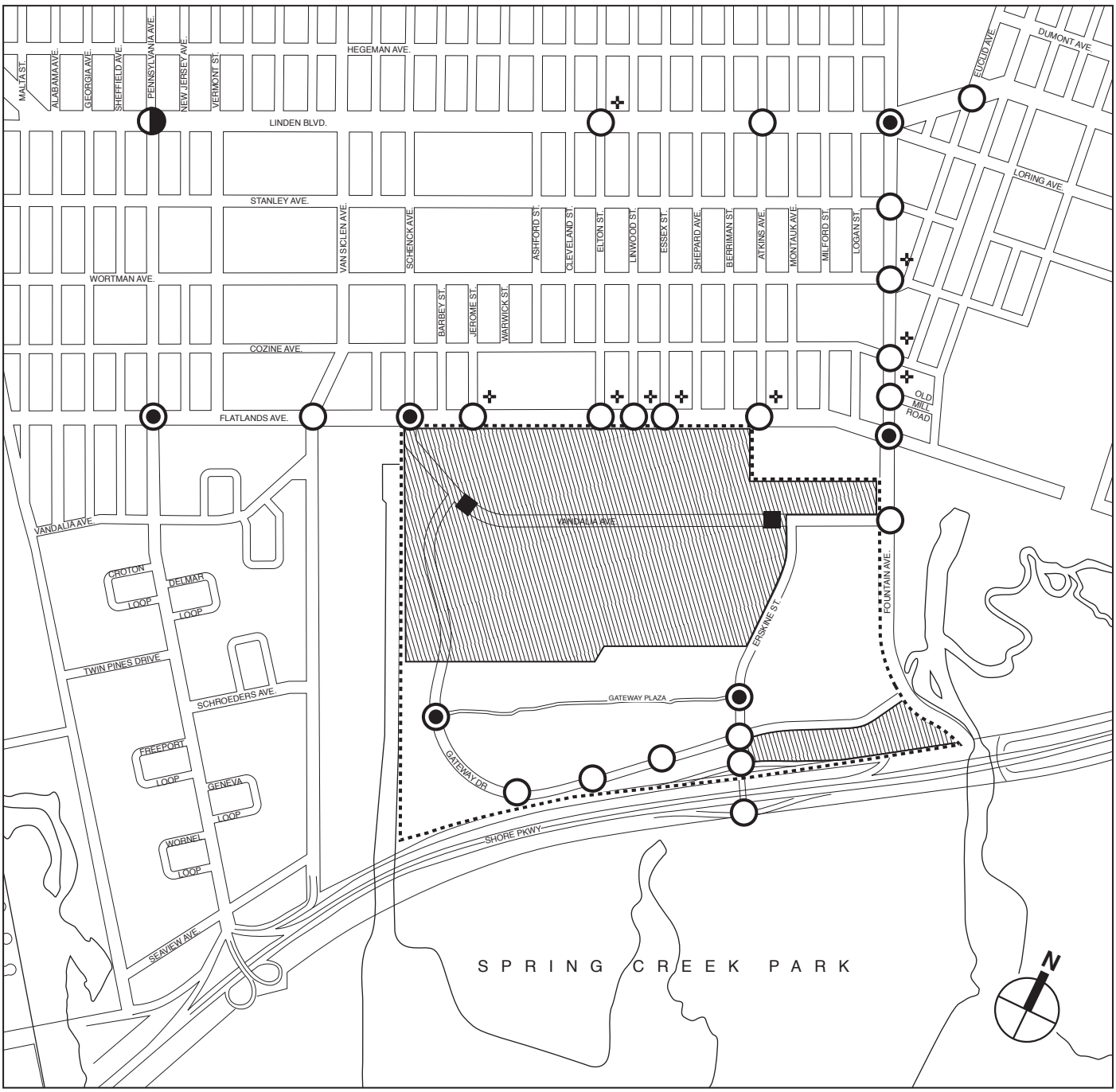


Project Site

Fresh Creek Urban Renewal Area Boundary

Roadway Closed

LOS A or B

LOS C

LOS D

LOS E or F

Unsignalized Intersection

0 1000 2000 FEET

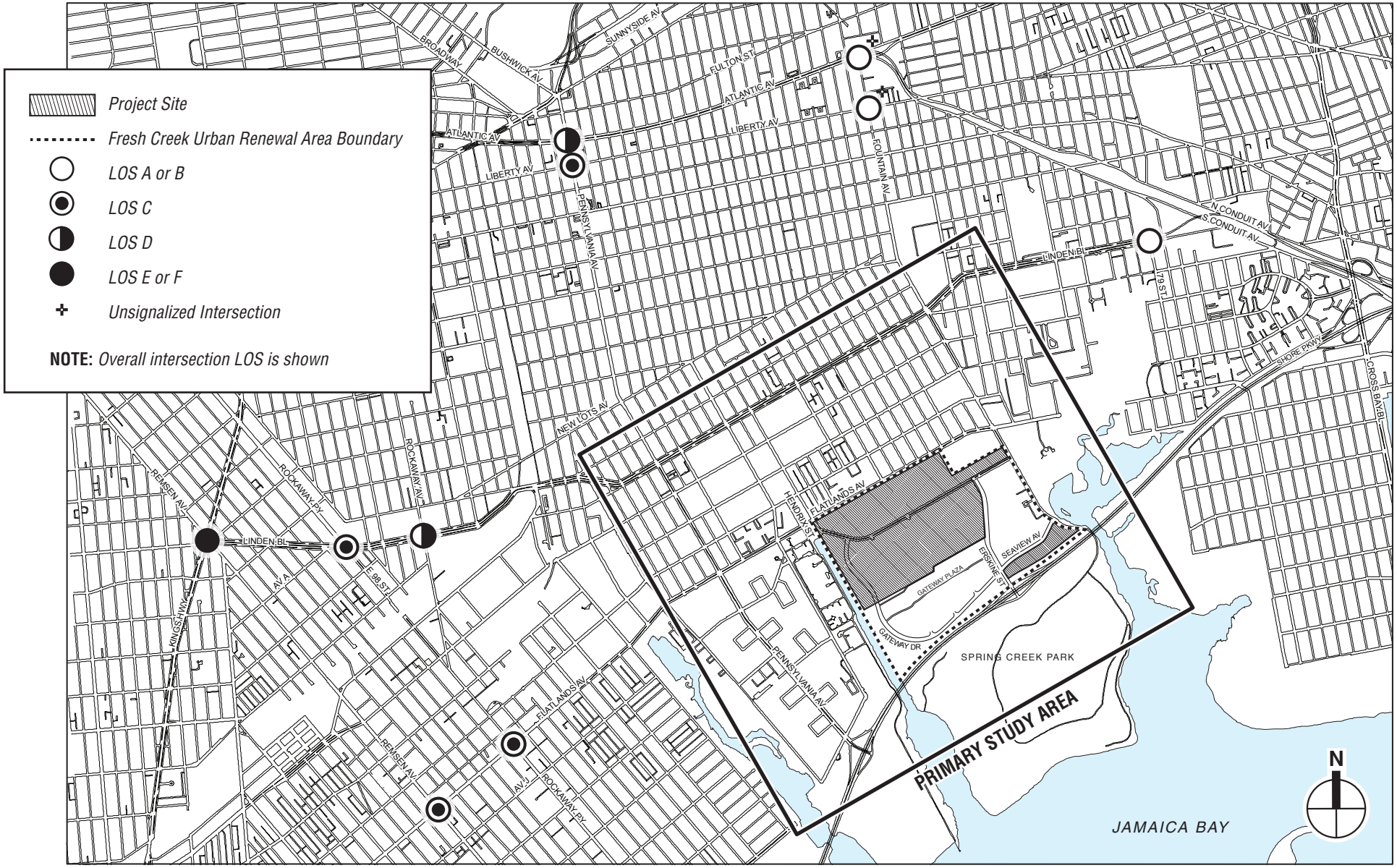
SCALE

NOTE: *Overall intersection LOS is shown*

Existing Weekday
Midday Peak Hour Traffic Level of Service
Primary Study Area

Figure 16-3a

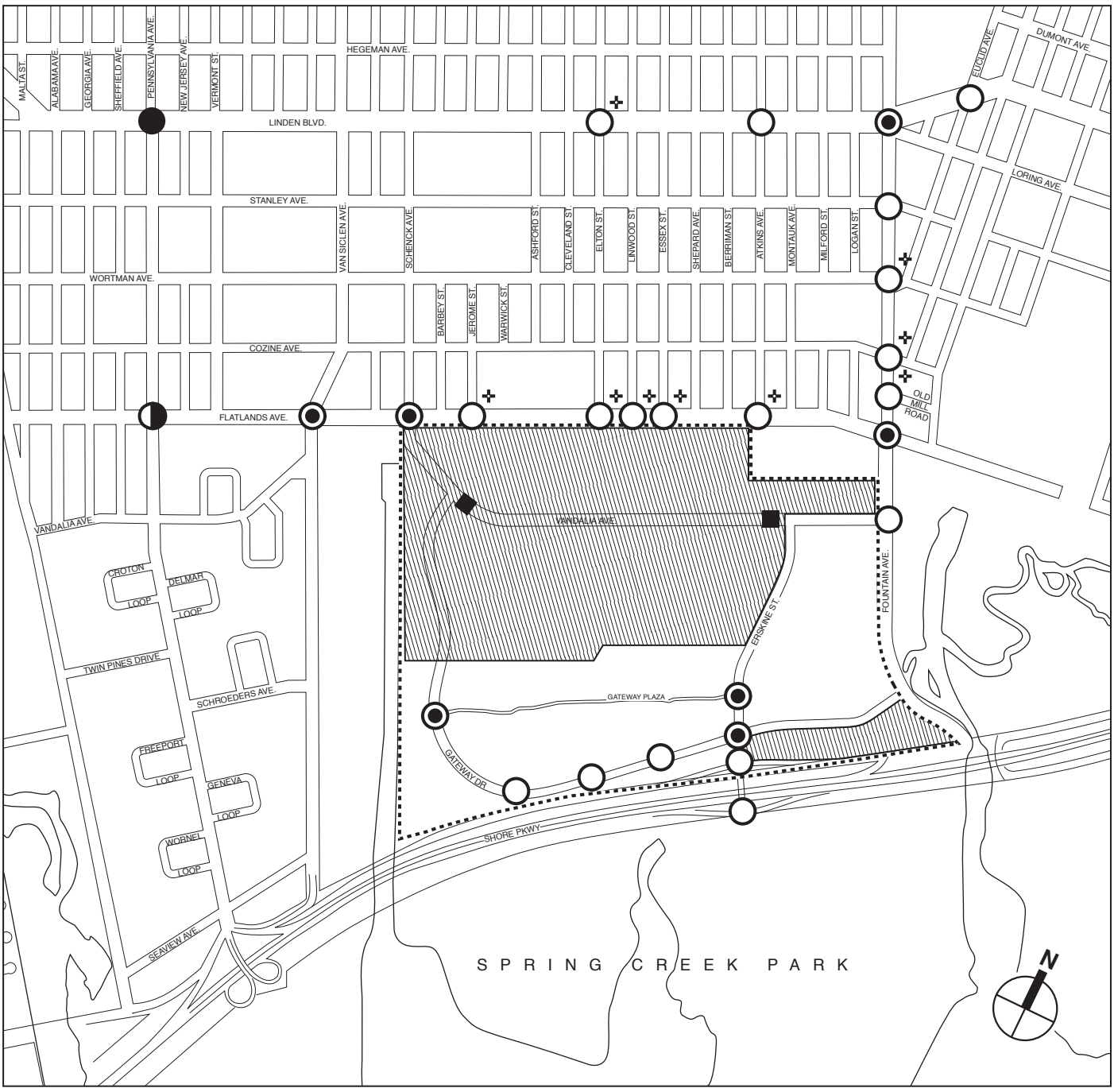
1.16.08



Existing Weekday
Midday Peak Hour Traffic Level of Service
Secondary Study Area

Figure 16-3b

1.16.08



0 1000 2000 FEET

SCALE

Project Site

Fresh Creek Urban Renewal Area Boundary

Roadway Closed

LOS A or B

LOS C

LOS D

LOS E or F

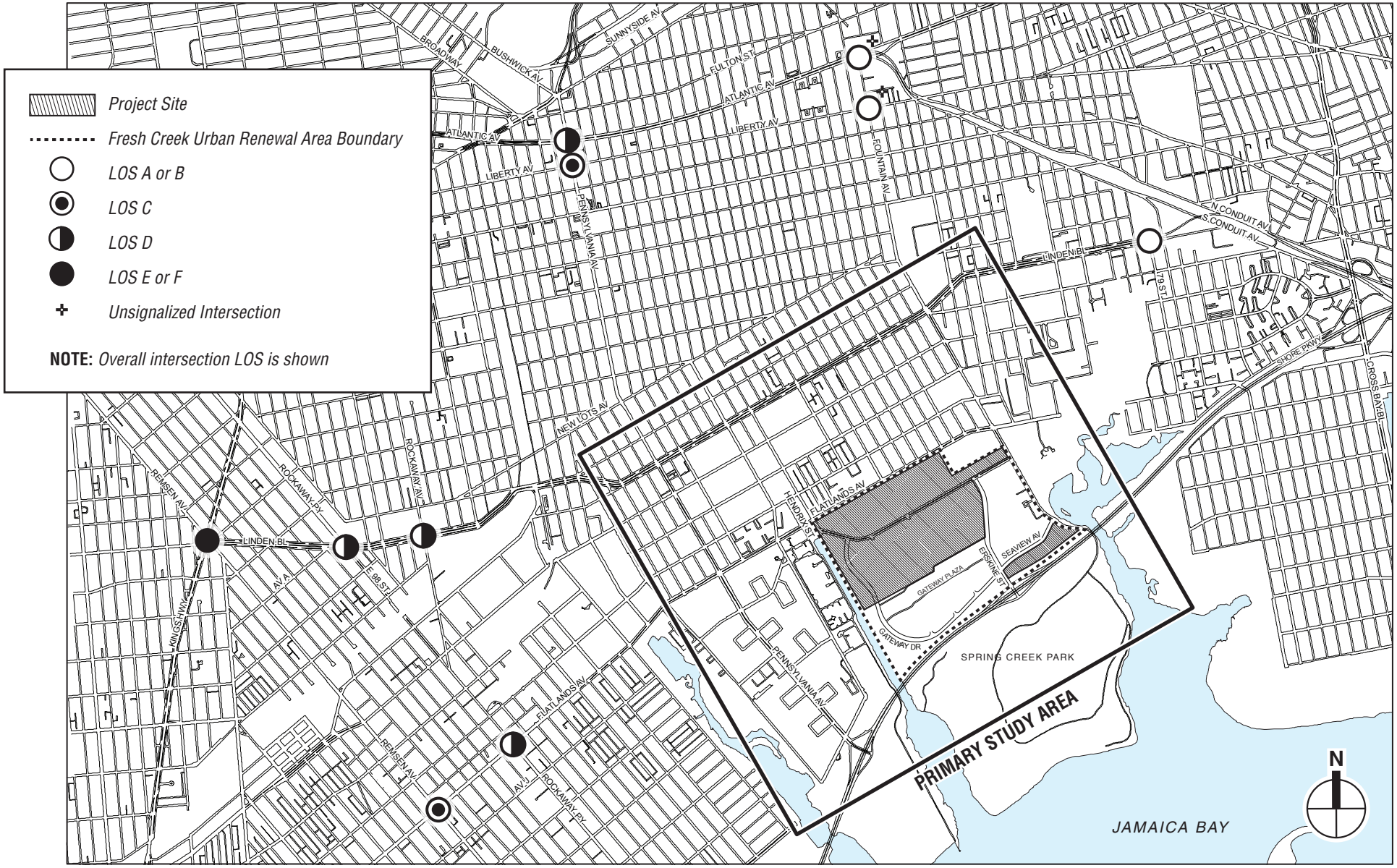
Unsignalized Intersection

NOTE: *Overall intersection LOS is shown*

Existing Weekday
PM Peak Hour Traffic Level of Service
Primary Study Area

Figure 16-4a

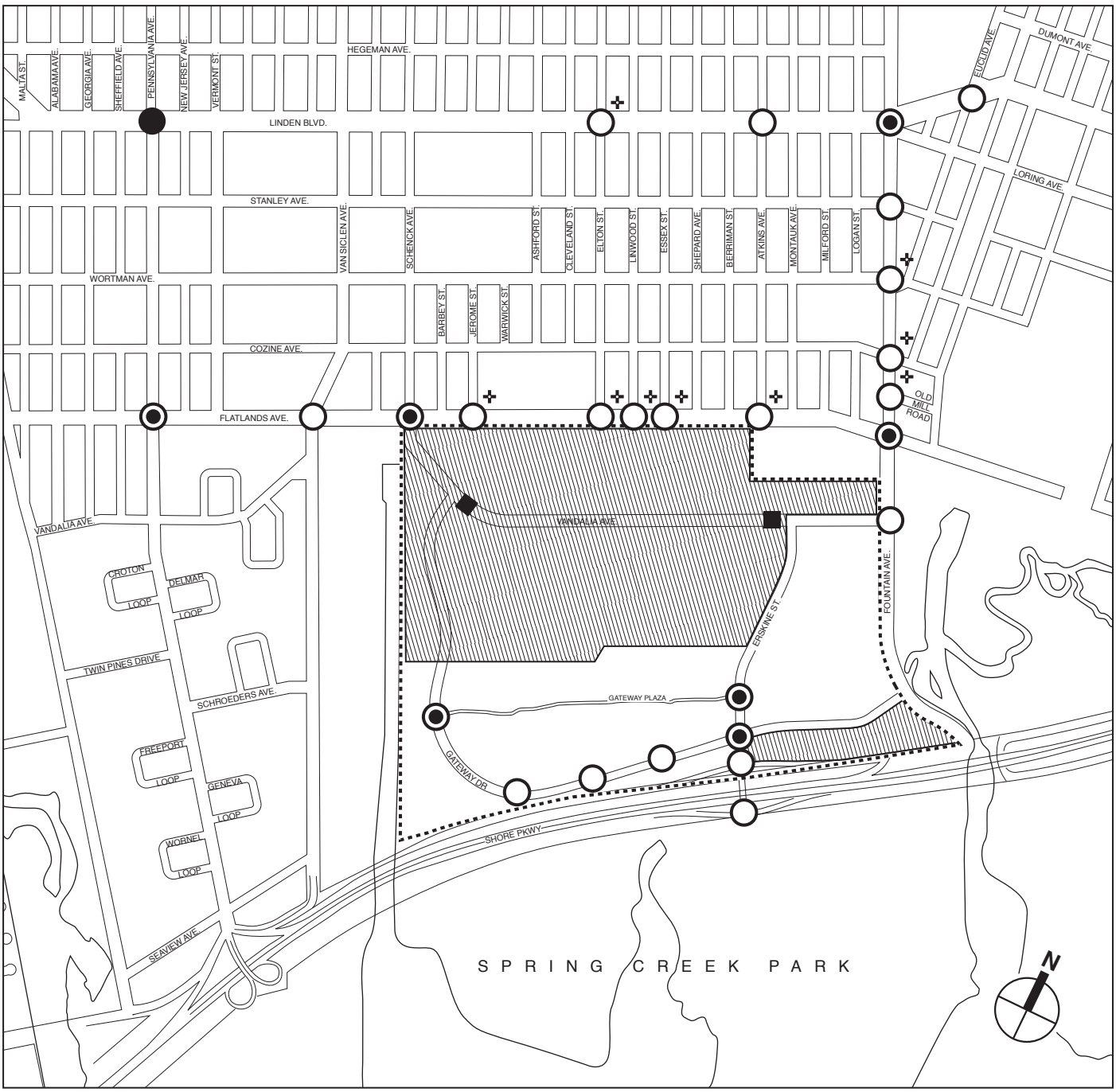
1.16.08



Existing Weekday
PM Peak Hour Traffic Level of Service
Secondary Study Area

Figure 16-4b

1.16.08



0 1000 2000 FEET

SCALE

Project Site

Fresh Creek Urban Renewal Area Boundary

Roadway Closed

LOS A or B

LOS C

LOS D

LOS E or F

Unsignalized Intersection

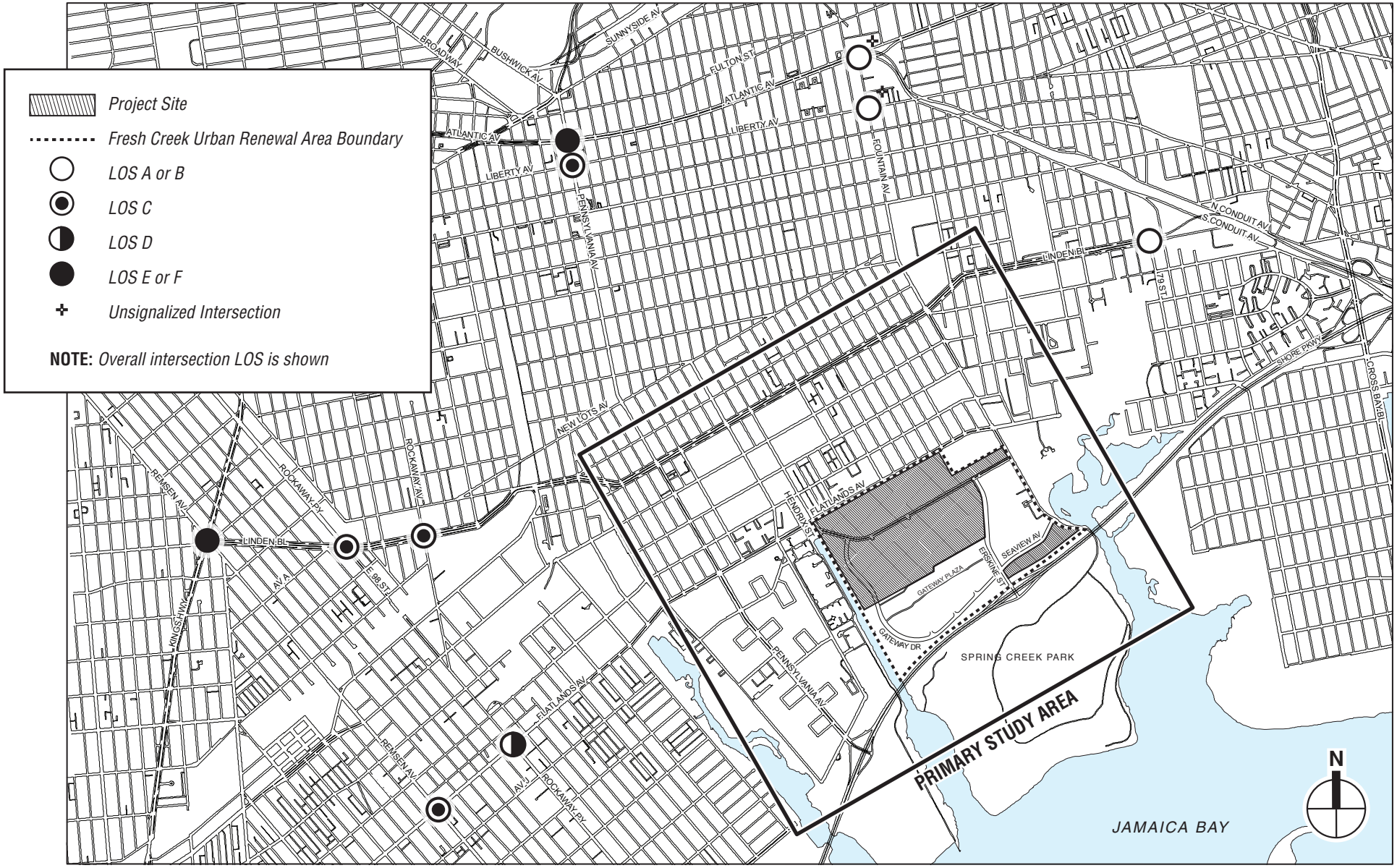
NOTE: *Overall intersection LOS is shown*

Existing Saturday
Midday Peak Hour Traffic Level of Service
Primary Study Area

Figure 16-5a

GATEWAY ESTATES II

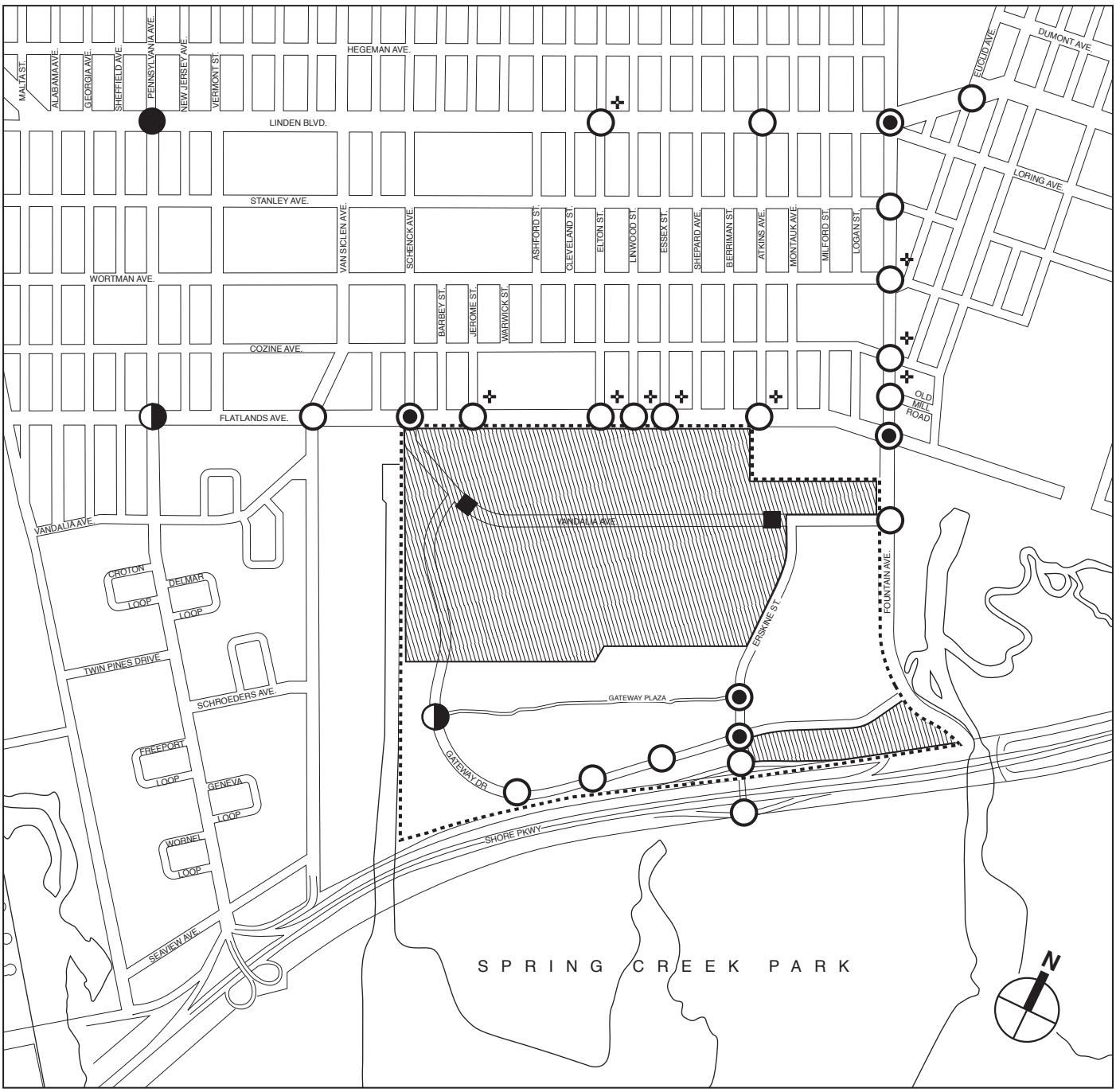
1.16.08



Existing Saturday
Midday Peak Hour Traffic Level of Service
Secondary Study Area

Figure 16-5b

12.2.08



0 1000 2000 FEET

SCALE

Project Site

Fresh Creek Urban Renewal Area Boundary

Roadway Closed

LOS A or B

LOS C

LOS D

LOS E or F

Unsignalized Intersection

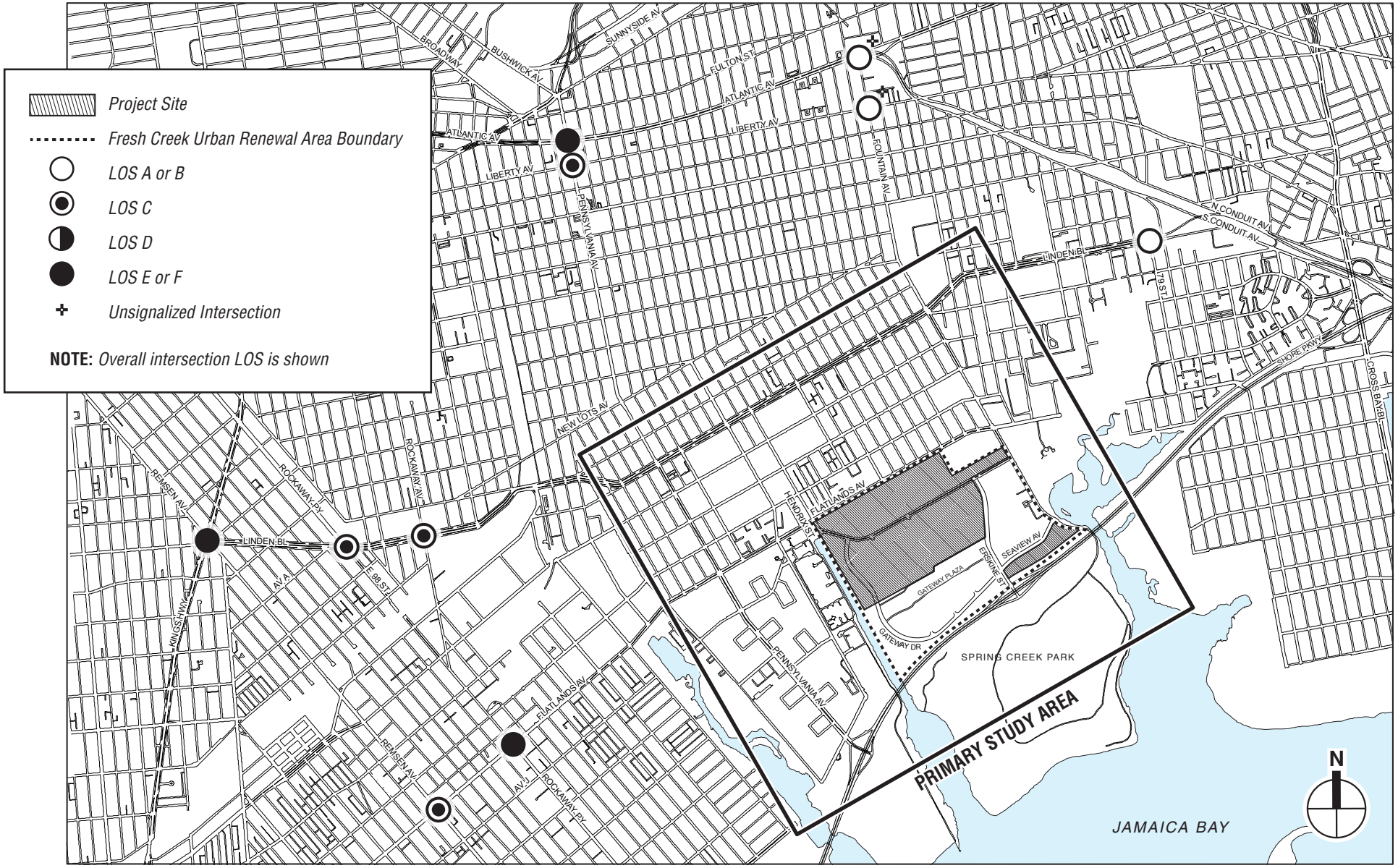
NOTE: *Overall intersection LOS is shown*

Existing Saturday
PM Peak Hour Traffic Level of Service
Primary Study Area

Figure 16-6a

GATEWAY ESTATES II

12.2.08



Existing Saturday
PM Peak Hour Traffic Level of Service
Secondary Study Area
Figure 16-6b

Table 16-3 (cont'd)
2006 Existing Traffic Movements at Unacceptable Levels of Service

Intersection	Approach and Movement		Weekday									Saturday					
			AM			Midday			PM			Midday			PM		
			D*	E	F	D*	E	F	D*	E	F	D*	E	F	D*	E	F
Signalized (continued)																	
Linden Boulevard & Rockaway Parkway	NB	LTR			●				●								
	SB	L			●			●			●		●				●
		TR	●								●						
	EB[3]	L			●		●				●	●				●	
	WB[3]	L			●		●			●							
Linden Boulevard & Kings Highway & Remsen Avenue	NB[5]	T		●			●			●			●				●
	SB[5]	T			●	●					●		●				●
	NB[6]	TR		●		●				●					●		
	SB[6]	TR	●							●		●			●		
	EB[7]	DefL			●			●			●		●			●	
		TR			●		●				●			●			●
	WB[7]	TR			●			●		●				●			●
	EB[3]	TR	●				●			●			●				●
	WB[3]	LT[7]		●			●			●			●			●	
		R	●							●							
Pennsylvania Avenue & Liberty Avenue	EB	LTR				●			●								
	WB	LTR	●						●			●				●	
Pennsylvania Avenue & Atlantic Avenue	NB	L		●			●		●				●				●
		TR		●									●			●	
	SB	L							●			●				●	
		TR		●					●			●				●	
	EB	TR								●			●			●	
	WB	TR		●					●							●	
Unsignalized																	
Fountain Avenue & Wortman Avenue	EB	LT							●							●	

Notes:
L = Left turn movement; T = Through movement; R = Right turn movement; DefL = De facto left turn movement
* Unacceptable LOS D (above 45 seconds per vehicle for signalized intersections, above 30 for unsignalized intersections)
[1] Fountain Avenue
[2] Loring Avenue
[3] Linden Boulevard Mainline
[4] Linden Boulevard Service Road
[5] Kings Highway Mainline
[6] Kings Highway Service Road
[7] Remsen Avenue
[8] In the weekday PM peak hour, the westbound approach operates with a de facto left turn lane and a separate through lane.

Erskine Street

Levels of service along Erskine Street are clearly acceptable with analysis locations operating at overall LOS C or better. All movements at intersections analyzed along Erskine Street operate at acceptable levels of service except left turns from westbound Gateway Drive onto Erskine Street which operate at unacceptable LOS D during the weekday PM peak hour.

Gateway Drive

All intersections analyzed along Gateway Drive operate at overall acceptable LOS D or better during all five peak hours. Left turns from southbound Gateway Drive onto Gateway Plaza operate at unacceptable LOS D and E during the Saturday midday and PM peak hours, respectively. Also, westbound Gateway Plaza operates at unacceptable LOS D during the Saturday PM peak hour at its intersection with Gateway Drive. The intersection of Gateway

Drive and Erskine Street has a movement that operates at an unacceptable level of service, and this intersection is described as part of the Erskine Street corridor.

Fountain Avenue

All signalized and unsignalized intersections analyzed along Fountain Avenue operate at overall LOS C or better, except for the intersection of Fountain Avenue and Linden Boulevard which is discussed as part of the Linden Boulevard corridor. All individual movements at intersections analyzed along Fountain Avenue, excluding the movements at the intersection of Fountain Avenue and Linden Boulevard, also operate at acceptable levels of service. The only exceptions are the left turn and through movements from eastbound Wortman Avenue at its intersection with Fountain Avenue, which operate at unacceptable LOS D during the weekday PM peak hour and LOS E during the Saturday PM peak hour.

Flatlands Avenue

Along the Flatlands Avenue corridor, all signalized intersections analyzed operate at acceptable overall levels of service except the intersection of Flatlands Avenue and Rockaway Parkway, which operates at unacceptable overall LOS D during the Saturday midday peak hour and at overall LOS E during the Saturday PM peak hour. Four signalized intersections analyzed along Flatlands Avenue have individual movements operating at LOS E or F, including the following:

- At the intersection of Flatlands Avenue and Schenck/Vandalia Avenue, left turns from northbound Vandalia Avenue operate at LOS E during the weekday PM and Saturday midday peak hours, and at LOS F during the Saturday PM peak hour.
- At the intersection of Flatlands and Pennsylvania Avenues, left turns from northbound Pennsylvania Avenue operate at LOS E in the weekday PM and Saturday midday peak hours, and at LOS F during the Saturday PM peak hour. Left turns from westbound Flatlands Avenue onto Pennsylvania Avenue operate at LOS E during the Saturday midday and PM peak hours. Left turns from eastbound Flatlands Avenue at LOS E and F during the Saturday midday and PM peak hours, respectively.
- At the intersection of Flatlands Avenue and Rockaway Parkway, the southbound approach of Rockaway Parkway, and the eastbound right turn and through movements of Flatlands Avenue operate at LOS E during the Saturday midday and PM peak hours. Also, the eastbound left turn, and the westbound through and right turn movements of Flatlands Avenue operate at LOS E during the Saturday PM peak hour.
- At the intersection of Flatlands Avenue and Remsen Avenue, the westbound through and right turn movements of Flatlands Avenue operate at LOS E during the Saturday PM peak hour.

All five unsignalized intersections analyzed along the Flatlands Avenue corridor operate at overall LOS A or B during the weekday AM, midday, PM, Saturday midday, and Saturday PM peak hours.

Linden Boulevard

On Linden Boulevard, three of the eight signalized analysis locations operate at unacceptable overall LOS D or LOS E during at least one of the five analysis periods. Linden Boulevard, Fountain Avenue and Loring Avenue operate at unacceptable overall LOS D during the weekday AM peak hour. Linden Boulevard and Pennsylvania Avenue operates at overall unacceptable LOS D during the weekday midday peak hour, and overall LOS E during the weekday AM, PM, Saturday midday, and Saturday PM peak hours. The intersection of Linden Boulevard, Kings

Highway, and Remsen Avenue operates at overall LOS E during all five analysis periods. Five intersections have individual movements operating at LOS E or F, as follows:

- At the intersection of Linden Boulevard, Fountain Avenue and Loring Avenue, northbound Fountain Avenue operates at LOS E during the weekday AM, midday and the Saturday PM peak hours. The de facto left turn movement from southbound Fountain Avenue operates at LOS F during the weekday AM, PM, Saturday midday, and Saturday PM peak hours. Also, the through and right turn movements operate at LOS E during the weekday AM peak hour, and at LOS F during the weekday PM, Saturday midday, and Saturday PM peak hours. The westbound Linden Boulevard mainline operates at LOS E during the weekday AM peak hour. Northbound Loring Avenue operates at LOS E during the weekday peak hours and the Saturday PM peak hour.
- At the intersection of Linden Boulevard and Pennsylvania Avenue, left turns from northbound Pennsylvania Avenue operate at LOS F during all peak hours analyzed while the through movement operates at LOS E during the Saturday midday and PM peak hours. Along southbound Pennsylvania Avenue, the left turn movement operates at LOS F during the weekday PM, Saturday midday, and Saturday PM peak hours, while the right turn and through movements from southbound Pennsylvania Avenue operate at LOS E during the weekday midday, PM, Saturday midday, and Saturday PM peak hours. Along the eastbound Linden Boulevard mainline, left turns operate at LOS F in the weekday AM, midday, and PM peak hours, and at LOS E during the Saturday midday and PM peak hours, and the through movement operates at LOS E during the weekday and Saturday PM peak hours. Along the westbound Linden Boulevard mainline, left turns operate at LOS F in the weekday AM, midday, and the Saturday PM peak hours, and at LOS E during the weekday PM and Saturday midday peak hours. Westbound through traffic operates at LOS E during the weekday AM, PM, Saturday midday, and Saturday PM peak hours.
- At the intersection of Linden Boulevard and Rockaway Avenue, the northbound and southbound left turn and through movements along Rockaway Avenue operate at LOS F during all peak hours analyzed. The southbound right turn movement operates at LOS F during the weekday midday and PM peak hours. Left turns from the eastbound Linden Boulevard mainline operate at LOS E during the three weekday peak analysis hours, while left turns from the westbound mainline operate at LOS F during all five peak hours analyzed.
- At the intersection of Linden Boulevard and Rockaway Parkway, northbound Rockaway Parkway operates at LOS F during the weekday AM peak hour. Left turns from southbound Rockaway Parkway operate at LOS F during the weekday AM, midday, PM, and Saturday PM peak hours, and at LOS E in the Saturday midday peak hour. The southbound through and right turn movements operate at LOS F during the weekday PM peak hour. Left turns from the eastbound Linden Boulevard mainline operate at LOS F in the weekday AM and PM peak hours, and at LOS E in the weekday midday and Saturday PM peak hours. Left turns from the westbound mainline operate at LOS F during the weekday AM peak hour, and at LOS E during the weekday midday and PM peak hours.
- The traffic movements of the six-legged intersection of Linden Boulevard, Kings Highway, and Remsen Avenue operate at LOS E or F during at least one peak hour, except for the stop-controlled, right turn from westbound Linden Boulevard to Kings Highway. The northbound Kings Highway mainline operates at LOS E during all three weekday peak hours and the Saturday midday peak hour, and at the LOS F during the Saturday PM peak hour. The southbound Kings Highway mainline operates at LOS F during the weekday AM, PM, and Saturday PM peak hours, and at LOS E during the Saturday midday peak. The

northbound Kings Highway service road operates at LOS E during the weekday AM and PM peaks, while the southbound service road operates at LOS E only during the weekday PM peak. Eastbound and westbound Remsen Avenue operate at LOS E or F during all five peak hours. Eastbound Linden Boulevard operates at LOS E during the weekday midday, PM, and Saturday midday peak hours, and at LOS F during the Saturday PM peak hour; the left turn and through movements from the westbound Linden Boulevard mainline operate at LOS E during all five peak analysis hours, and the right turn to southbound Remsen Avenue operates at LOS E during the weekday PM peak hour.

The unsignalized intersection of Linden Boulevard and Elton Street operates at overall LOS A during all peak hours analyzed.

Pennsylvania Avenue

The intersection of Pennsylvania Avenue and Atlantic Avenue operates at overall LOS E during the weekday AM, Saturday midday, and Saturday PM peak hours, and at unacceptable LOS D during the weekday PM peak hour. All movements along northbound Pennsylvania Avenue operate at LOS E during the weekday AM and Saturday midday peak hours. Northbound left turns also operate at LOS E and F during the weekday midday and Saturday PM peak hours, respectively. The northbound through and right turn movements, and the southbound left turns from Pennsylvania Avenue operate at LOS E during the Saturday PM peak hour. Through traffic and right turns from southbound Pennsylvania Avenue and westbound Atlantic Avenue operate at LOS E during the weekday AM and Saturday PM peak hours. The through and right turn movements from eastbound Atlantic Avenue operate at LOS E during the weekday PM, Saturday midday, and Saturday PM peak hours. The through and right turn movements from westbound Atlantic Avenue operate at LOS E during the weekday AM and Saturday PM peak hours.

The intersection of Pennsylvania Avenue and Liberty Avenue operates at acceptable overall levels of service with all movements operating at LOS D or better during all five peak hours analyzed except the Liberty Avenue westbound approach which operates at LOS E during the Saturday PM peak hour.

The intersections of Pennsylvania Avenue with Flatlands Avenue and with Linden Boulevard are discussed as part of the Flatlands Avenue and Linden Boulevard corridors, respectively.

HIGHWAY ANALYSIS

The Shore Parkway was analyzed because of its importance to regional travel and proximity to the Project Site, using the CORSIM simulation model. The analysis included six key mainline segments along the eastbound and westbound Shore Parkway within the influence of the on-ramp merges and off-ramp diverges approaching and leaving the Erskine Street interchange.

Simulation tools such as CORSIM are typically used for highway analysis since highway analyses performed using HCS do not accurately model highway characteristics for many New York City highways. The CORSIM model reports the density in passenger cars per mile per lane (pc/mi/ln) and an average speed for the highway section being analyzed but does not readily report the level of service. Levels of service are necessary to assess potential impacts of the proposed development program on the highway as per CEQR Technical Manual guidelines. For highway analysis, the 2000 HCM defines level of service thresholds for merge and diverge areas using density in pc/mi/ln. These thresholds have been applied to the results of the CORSIM model. The level of service threshold for each density range is as follows:

- LOS A describes operations with very low densities (i.e., less than or equal to 10 pc/mi/ln) and high free flow speeds.
- LOS B describes operations with fairly low densities (i.e., greater than 10 to 20 pc/mi/ln) and moderate to high free flow speeds.
- LOS C describes operations with moderate densities (i.e., greater than 20 to 28 pc/mi/ln) and moderate free flow speeds.
- LOS D describes operations with moderate to high densities (i.e., greater than 28 to 35 pc/mi/ln) and moderate to low free flow speeds. A mid-LOS D density of 31.5 pc/mi/ln is considered the high range of acceptable density. Densities greater than 31.5 pc/mi/ln are unacceptable but are commonplace on highways in New York City.
- LOS E describes operations with high densities (i.e., greater than 35 pc/mi/ln) and low free flow speeds. 45 pc/mi/ln is considered the maximum density for sustained flows at capacity on a typical freeway. Queuing can begin at densities higher than this.
- LOS F describes operations with very high densities and very low free flow speeds. Queuing is common within LOS F, which leads to failure conditions and congestion.

Table 16-4 provides traffic volumes along the Shore Parkway mainline and for the Erskine Street on- and off-ramps. Volumes along the eastbound and westbound Shore Parkway approaching the Erskine Street interchange range from 4,700 to 5,000 vph during the weekday AM and PM peak hours, about 3,600 to 3,850 vph during the weekday midday peak hour, approximately 4,600 to 4,750 vph during the Saturday midday peak hour, and approximately 5,000 to 5,200 vph during the Saturday PM peak hour. Peak hour volumes along the Erskine Street off-ramps from the eastbound and westbound Shore Parkway range from approximately 270 to 550 vph, while peak hour volumes along the Erskine Street on-ramps to the eastbound and westbound Shore Parkway range from approximately 150 to 500 vph.

Table 16-4
2006 Existing Traffic Volumes on the Shore Parkway

Roadway Section	Weekday			Saturday	
	AM	Midday	PM	Midday	PM
Eastbound Shore Parkway west of the Erskine Street Interchange	4,703	3,836	4,906	4,753	5,181
Westbound Shore Parkway east of the Erskine Street Interchange	5,011	3,596	5,011	4,573	4,985
Off-ramp from eastbound Shore Parkway to Erskine Street	270	408	270	495	540
On-ramp to eastbound Shore Parkway from Erskine Street	144	342	515	469	511
Off-ramp from westbound Shore Parkway to Erskine Street	300	407	376	512	558
On-ramp to westbound Shore Parkway from Erskine Street	169	402	392	438	477

Table 16-5 presents existing levels of service, speeds and densities for the Shore Parkway near the Erskine Street interchange. Field-measured speeds were collected by driving along sections of the eastbound and westbound Shore Parkway during each peak hour. These speeds are comparable to the calibrated CORSIM results as shown in Table 16-5. The mainline segments within the influence of the merge and diverge areas analyzed typically operate at LOS C or D during the weekday AM peak hour, LOS B or C during the weekday midday peak hour, LOS D or E during the weekday PM peak hour, and LOS C, D, E, or F during the Saturday midday and PM peak hours. Vehicles typically travel at moderate speeds of approximately 50-55 mph during the weekday AM and midday peak hours; 40-50 mph or higher during the weekday PM peak hour which is the busiest hour; and generally around 45-55 mph during the Saturday midday and PM peak hours except for the eastbound Parkway segment east of the Erskine Street on-ramp which operates at about 35 mph.

Maximum queues of 5 to 7 cars were observed to occur during all peak hours analyzed along the off-ramps from the eastbound and westbound Shore Parkway to Erskine Street.

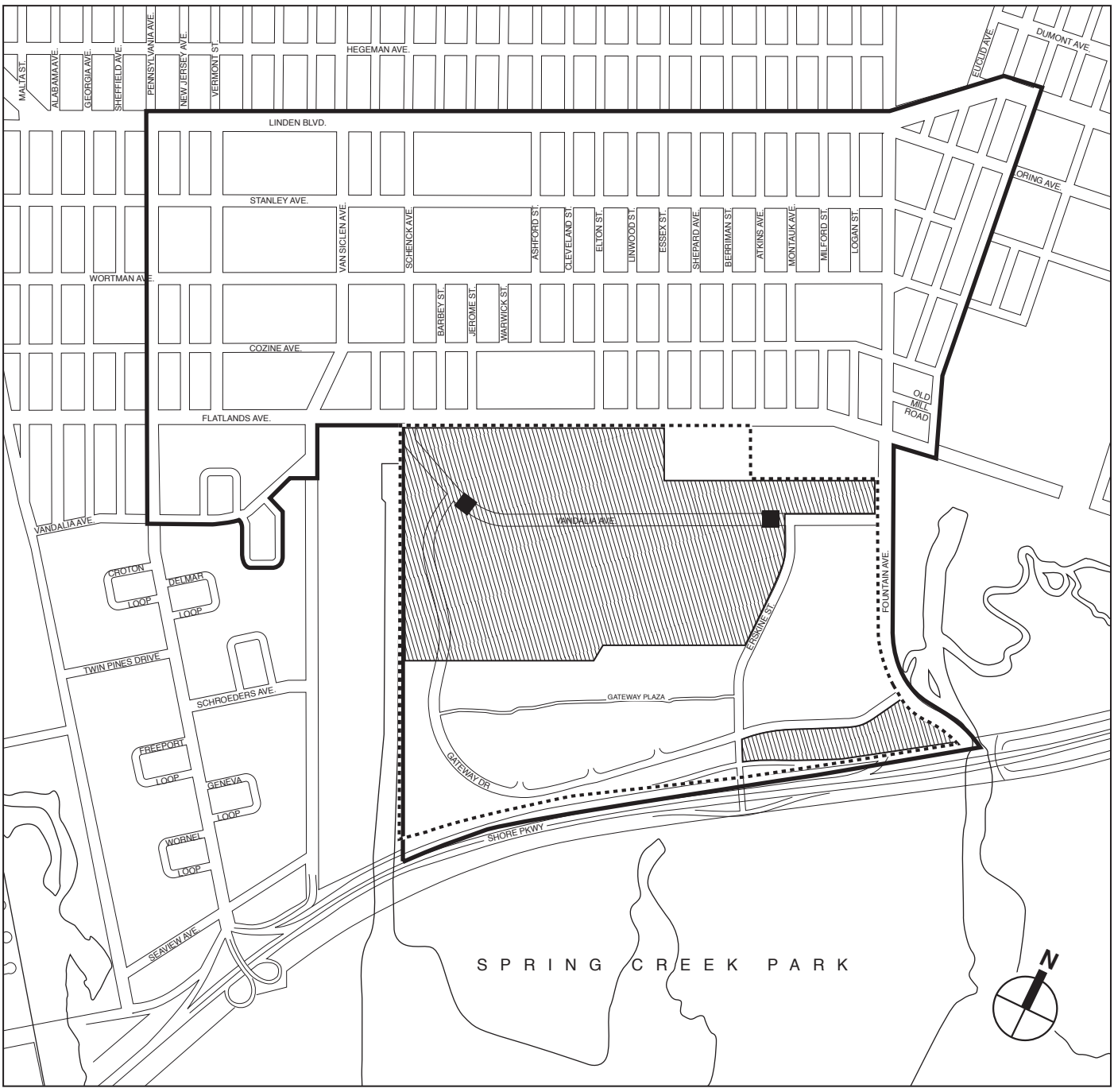
Table 16-5
2006 Existing Conditions on the Shore Parkway

Analysis Location	Field-Measured Speed* (MPH)	CORSIM Measured Speed (mph)	Density (pc/mi/ln)	LOS
Weekday AM				
Eastbound before the Erskine Street Off-Ramp	50	49.3	31.8	D
Eastbound between the Erskine Street Off-Ramp and On-Ramp	55	54.1	27.2	C
Eastbound after the Erskine Street On-Ramp	55	54.2	26.7	C
Westbound before the Erskine Street Off-Ramp	55	54.5	30.6	D
Westbound between the Erskine Street Off-Ramp and On-Ramp	55	53.9	29.2	D
Westbound after the Erskine Street On-Ramp	55	53.7	28.7	D
Weekday Midday				
Eastbound before the Erskine Street Off-Ramp	55	55.7	23.0	C
Eastbound between the Erskine Street Off-Ramp and On-Ramp	55	55.3	20.6	C
Eastbound after the Erskine Street On-Ramp	55	54.4	21.9	C
Westbound before the Erskine Street Off-Ramp	55	55.5	21.5	C
Westbound between the Erskine Street Off-Ramp and On-Ramp	55	55.2	19.1	B
Westbound after the Erskine Street On-Ramp	55	54.8	20.7	C
Weekday PM				
Eastbound before the Erskine Street Off-Ramp	55	54.8	29.8	D
Eastbound between the Erskine Street Off-Ramp and On-Ramp	46	44.1	37.6	E
Eastbound after the Erskine Street On-Ramp	40	38.6	44.2	E
Westbound before the Erskine Street Off-Ramp	53	51.5	32.4	D
Westbound between the Erskine Street Off-Ramp and On-Ramp	50	50.8	30.6	D
Westbound after the Erskine Street On-Ramp	50	50.6	31.7	D
Saturday Midday				
Eastbound before the Erskine Street Off-Ramp	48	47.2	33.6	D
Eastbound between the Erskine Street Off-Ramp and On-Ramp	45	45.1	33.1	D
Eastbound after the Erskine Street On-Ramp	37	35.8	41.8	E
Westbound before the Erskine Street Off-Ramp	55	54.5	27.9	C
Westbound between the Erskine Street Off-Ramp and On-Ramp	55	54.0	25.0	C
Westbound after the Erskine Street On-Ramp	55	53.8	26.5	C
Saturday PM				
Eastbound before the Erskine Street Off-Ramp	45	46.8	36.9	E
Eastbound between the Erskine Street Off-Ramp and On-Ramp	45	43.8	37.9	E
Eastbound after the Erskine Street On-Ramp	35	35.4	46.2	F
Westbound before the Erskine Street Off-Ramp	55	54.1	30.7	D
Westbound between the Erskine Street Off-Ramp and On-Ramp	55	53.5	27.5	C
Westbound after the Erskine Street On-Ramp	55	53.3	29.1	D

Notes:
pc/mi/ln = passenger cars per mile per lane
* Field speeds were measured by driving the route during the peak hour.

PARKING

A detailed parking inventory of the areas surrounding the Project Site was performed in November 2006. Information related to on- and off-street parking lots and spaces within a half-mile radius of the Project Site was obtained as part of the inventory (Figure 16-7). Collected information included capacities and occupancies of on-street parking during the weekday peak periods of 7:00 AM to 10:00 AM, 11:00 AM to 2:00 PM, and 4:00 PM to 7:00 PM, and the Saturday peak period of 11:00 AM to 2:00 PM. The only off-street parking facility within the study area is the parking lot for Gateway Center, which has a capacity of 2,685 spaces.



Existing Parking Study Area

Figure 16-7

Capacities and occupancies of this parking lot were obtained during the weekday from 8:00 AM to 8:00 PM and on Saturday from 11:00 AM to 6:00 PM. The hourly inventory for this lot is shown in Table 16-6. The occupancy remains consistent throughout the weekday and is about 47 percent during the weekday midday peak period and 40 percent during the weekday PM peak period. The highest activity occurs during the Saturday midday peak period when the occupancy is at 72 percent.

Table 16-6
2006 Existing Off-Street Parking at the Existing Gateway Center

Time Period	Approximate Legal Capacity	Number of Spaces Occupied	Percent Occupied
Weekday			
8AM – 9AM	2,685	394	15
9AM – 10AM	2,685	632	24
10AM – 11AM	2,685	889	33
11AM – 12PM	2,685	1,106	41
12PM – 1PM	2,685	1,252	47
1PM – 2PM	2,685	1,266	47
2PM – 3PM	2,685	1,207	45
3PM – 4PM	2,685	1,057	39
4PM – 5PM	2,685	1,042	39
5PM – 6PM	2,685	1,067	40
6PM – 7PM	2,685	1,160	43
7PM – 8PM	2,685	1,141	42
Saturday			
11AM – 12PM	2,685	1,291	48
12PM – 1PM	2,685	1,515	56
1PM – 2PM	2,685	1,726	64
2PM – 3PM	2,685	1,920	72
3PM – 4PM	2,685	1,944	72
4PM – 5PM	2,685	1,885	70
5PM – 6PM	2,685	1,742	65

A parking inventory was conducted to determine the number of legal on-street parking spaces available for each block in the study area and the occupancy percentage of each. Table 16-7 presents an overview of capacity and occupancy of on-street parking in the study area. Peak occupancy of 64 percent of on-street spaces occurs during the weekday AM peak period. The occupancy remains consistent through the weekday midday and gradually drops to 53 percent during the weekday PM peak period. The on-street parking occupancy during the Saturday midday peak period is 51 percent, which increases to 56 percent during the Saturday PM peak hour.

Table 16-7
2006 Existing On-Street Parking Summary

Peak Period	Approximate Legal Capacity	Number of Spaces Occupied	Percent Occupied
Weekday 7-10 AM	5,940	3,785	64
Weekday 11-2 PM	5,906	3,676	62
Weekday 4-7 PM	6,126	3,256	53
Saturday 11-2 PM	6,142	3,132	51
Saturday 4-7 PM[1]	6,142	3,414[1]	56

Note: 1 – Number of Occupied Spaces calculated by increasing the Saturday midday occupancy by nine percent

D. 2011 THE FUTURE WITHOUT THE PROPOSED ACTION

TRAFFIC

This section establishes the baseline (No Build) condition against which potential impacts of the 2011 Proposed Action can be compared. No Build traffic volumes for the 2011 analysis year were established by applying a background traffic growth rate of one percent per year (in accordance with the 2001 *CEQR Technical Manual*) and then adding vehicular volumes expected to be generated by approved elements of the 1996 Plan and soft site developments within a half-mile radius of the Project Site. Anticipated roadway plans from the 1996 Plan were also included in the 2011 No Build condition.

ROADWAY NETWORK

The street network within the primary study area would be modified by 2011 according to the 1996 Plan (see Figure 16-8). New streets and intersections would be created within the Project Site to provide access to the residential uses, local retail, school and community facilities such as the day care, and allow for convenient mobility within the site. Street directions for the new roadway network are assumed to be as shown in the figure. At the same time, certain existing intersections would be modified to accommodate the new street network.

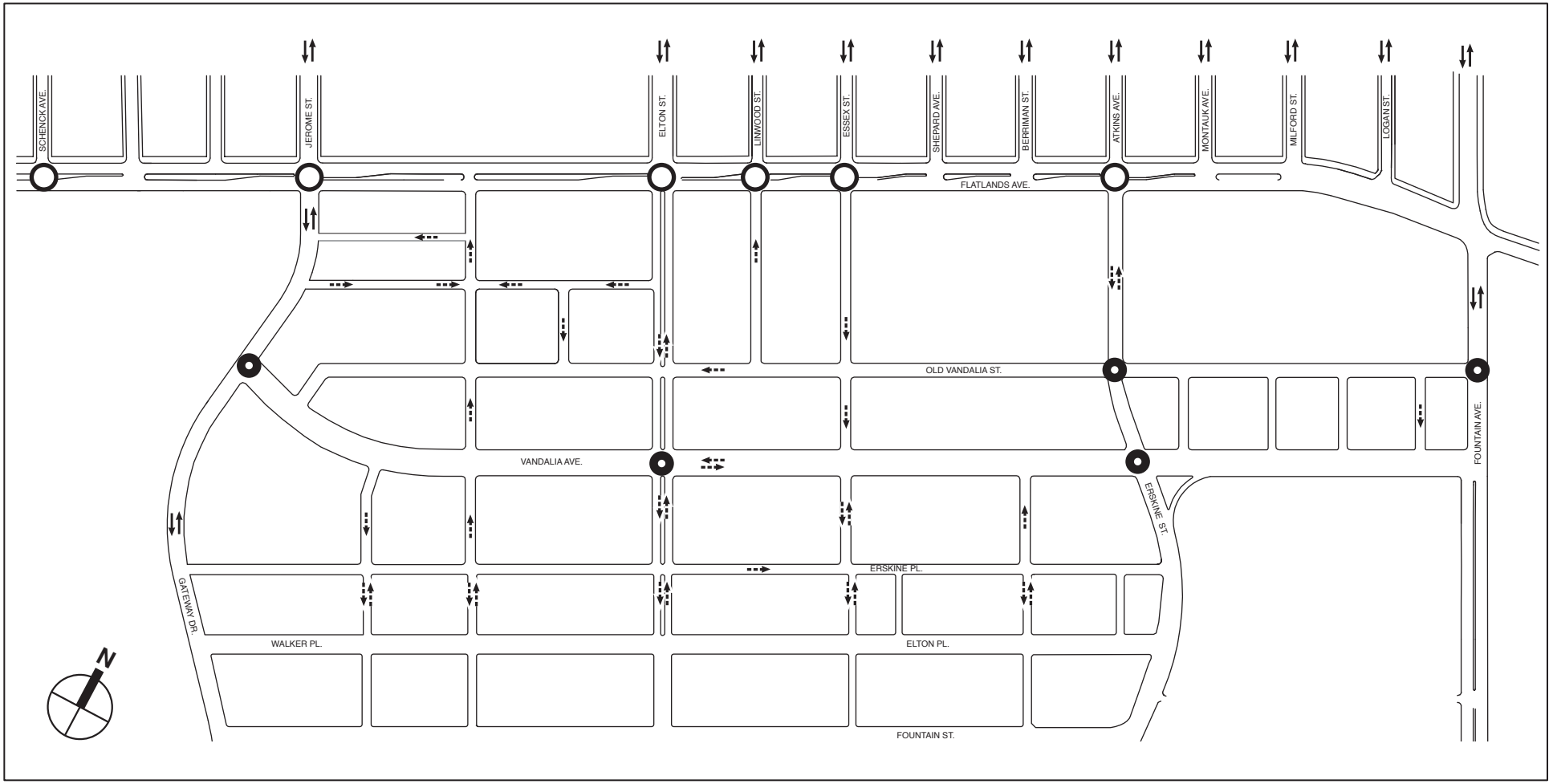
Modified Intersections

As part of the new roadway network, six intersections analyzed along Flatlands Avenue would undergo geometric changes. These intersections include:

- Flatlands Avenue and Atkins Avenue;
- Flatlands Avenue and Essex Street;
- Flatlands Avenue and Linwood Street;
- Flatlands Avenue and Elton Street;
- Flatlands Avenue and Jerome Street; and
- Flatlands Avenue and Schenck Avenue.

The above intersections, except for the intersection of Flatlands Avenue and Schenck Avenue, currently operate as three-legged unsignalized intersections with approaches in the eastbound, westbound, and southbound directions. The southbound approach at these five intersections is the "minor" roadway. It is typically characterized by one effective moving lane for left and right turns onto Flatlands Avenue, and one receiving lane for turns from Flatlands Avenue. On-street curb parking is prevalent along both sides of the southbound approach. The new roadway network would result in the addition of a fourth leg—the northbound approach or southbound receiving lanes—at all five intersections due to the extensions of Erskine Street, Essex Street, Linwood Street, Elton Street, and Gateway Drive south of Flatlands Avenue. The geometry and lane configurations of this new roadway segment would differ at each intersection.

All geometric modifications along Flatlands Avenue would occur as described in the 1996 Plan. Assumptions were made with regard to lane configurations and lane widths at specific intersections within the new roadway network (unless stated otherwise) while curb-to-curb street widths were obtained from the 1996 Plan.



NOT TO SCALE

- *Existing Street Direction*
- *Proposed Street Direction*
- *Modified Intersection*
- *New Intersection*

GATEWAY ESTATES II

Future No Build Roadway Network

Figure 16-8

The intersection of Flatlands Avenue and Schneck Avenue is presently signalized and would remain signalized for all future conditions. A detailed signal warrant analysis performed for the remaining five intersections indicated that in the 2011 No Build condition:

- At the intersection of Flatlands Avenue and Jerome Street, the peak hour warrant would be satisfied, and this intersection is assumed to be signalized.
- At the intersections of Flatlands Avenue with Atkins Avenue, Essex Street, Linwood Street, and Elton Street, the peak hour warrant would not be satisfied. Hence these intersections are assumed to remain unsignalized.

A description of the proposed modifications to each existing intersection is provided below. It should be noted that in the section between Fountain Avenue and Pennsylvania Avenue, eastbound and westbound Flatlands Avenue typically operate with one left turn lane, one through lane, and one through and right turn lane. A raised center median is prevalent along Flatlands Avenue and on-street parking is present along certain sections of the roadway.

Flatlands Avenue and Atkins Avenue. The new northbound approach would consist of one moving lane for northbound traffic and one southbound receiving lane. Left turns from westbound Flatlands Avenue and right turns from eastbound Flatlands Avenue onto southbound Atkins Avenue would be permitted. A left turn lane would be provided along westbound Flatlands Avenue by reducing the width of the center median. On-street curb parking would be permitted on both sides of the newly provided northbound Atkins Avenue approach.

Flatlands Avenue and Essex Street. The extension of Essex Street south of Flatlands Avenue would be one-way in the southbound direction. The southbound approach north of Flatlands Avenue would remain a two-way street. Turns onto southbound Essex Street from Flatlands Avenue would be permitted from the right-most lane in the eastbound direction and by adding a left turn lane to the westbound approach within the existing median. Parking on both sides of the new receiving lane would be allowed.

Flatlands Avenue and Linwood Avenue. The extension of Linwood Avenue south of Flatlands Avenue would be a 30-foot-wide, one-way northbound street with parking allowed on both sides of the roadway. No geometric modifications would occur along the other approaches.

Flatlands Avenue and Elton Street. The extension of Elton Street south of Flatlands Avenue would consist of a 22-foot-wide northbound approach, a 12-foot-wide raised center median, and a 22-foot-wide roadway on the southbound (i.e., receiving) side, with parking available on both sides of Elton Street.

Flatlands Avenue and Jerome Street. As part of the new roadway network, Gateway Drive, which currently connects to Flatlands Avenue via Vandalia Avenue at the intersection of Schenck Avenue, would connect to Flatlands Avenue at the intersection of Jerome Street as the fourth leg (new northbound approach) of this intersection. The new northbound approach (Gateway Drive) would consist of two exclusive left turn lanes, one shared through and right turn lane, and two receiving lanes. The southbound approach would continue to consist of one approach lane from which all movements would occur and one receiving lane.

Flatlands Avenue and Schenck Avenue. At the intersection of Flatlands Avenue and Schenck Avenue, the existing northbound approach is the extension of Vandalia Avenue. In the future No Build condition, Vandalia Avenue would terminate at Gateway Drive while Gateway Drive would terminate at the intersection of Flatlands Avenue and Jerome Street. This would result in the elimination of the northbound approach at the intersection of Flatlands Avenue and Schenck

Avenue, and this intersection would operate as a three-legged intersection. No geometric changes would occur along the eastbound, westbound, and southbound approaches of the intersection.

In addition to these changes, the 2011 No Build traffic analysis also includes proposed changes along Fountain Avenue due to implementation of five foot wide bike lanes along Fountain Avenue (in both directions) as part of the NYC Bike Master Plan (Fountain Avenue would be striped for Class II bike lanes between Cozine Avenue and Linden Boulevard).[1] As part of the Bike Master Plan, the bike lanes would continue further east along Loring Avenue and west along Cozine Avenue. These changes are expected to affect the following four intersections:

- Fountain Avenue and Cozine Avenue
- Fountain Avenue and Wortman Avenue
- Fountain Avenue and Stanley Avenue
- Linden Boulevard and Fountain Avenue and Loring Avenue

Proposed New Intersections

According to the 1996 Plan, new streets and intersections would also be created as part of the new roadway network and are analyzed as part of the future conditions. These include:

- Erskine Street and Egan Street (formerly Old Vandalia Street);
- Erskine Street and Vandalia Avenue;
- Vandalia Avenue and Gateway Drive;
- Vandalia Avenue and Elton Street; and
- Fountain Avenue and Egan Street (formerly Old Vandalia Street).

Erskine Street and Egan Street (formerly Old Vandalia Street). Erskine Street would be extended to connect with Flatlands Avenue at its intersection with Atkins Avenue as part of the new roadway network. Egan Street would typically be a 30-foot-wide one-way westbound street with one moving lane primarily expected to serve the residential and school uses. The intersection of Erskine Street and Egan Street would be a four-legged unsignalized intersection with stop controls along Egan Street. At this intersection, northbound Erskine Street would have one 23-foot-wide approach lane and one 22-foot-wide while southbound Erskine Street would have one 22-foot-wide approach lane and one 23-foot-wide receiving lane. Parking would be allowed on both sides of all approaches.

Erskine Street and Vandalia Avenue. Sections of Vandalia Avenue which are now closed would be opened for year 2011 No Build conditions and Vandalia Avenue would extend in the east-west direction from Fountain Avenue to Gateway Drive. It would consist of two 12-foot-wide approach lanes and two 11-foot-wide receiving lanes in each direction with an additional 8 feet on both sides of the street for on-street curbside parking. The extension of Erskine Street would

[1] Class I Bikeway: Provides a completely separated right-of-way designated for the exclusive use of bicycles. Class II Bikeway: Provides a travel lane designated for the exclusive use of bicycles. Class III Bikeway: Provides a route designated by signs or permanent markings and shared with pedestrians or motorists.

also intersect Vandalia Avenue. The northbound approach of the intersection would consist of one exclusive left turn lane and one through lane with two receiving lanes on the southbound side. The southbound approach would consist of one shared left-through-right lane with one northbound receiving lane. Along Erskine Street, on-street parking would be allowed on both sides of the southbound approach; however, parking would be prohibited along both sides of the northbound approach. A preliminary warrant analysis performed for this intersection indicated that the peak hour warrant would not be satisfied and the intersection is assumed to be unsignalized for the 2011 No Build condition. Vehicles turning right from northbound Erskine Street would have a separate 15-foot-wide channelized right turn lane which would be unsignalized for all future conditions.

Vandalia Avenue and Gateway Drive. Under future No Build conditions, Vandalia Avenue would terminate at Gateway Drive. The westbound approach of Vandalia Avenue would consist of one left turn lane, one right turn lane, and a wide raised median. Curbside parking would be prevalent on both sides of this approach. Both the northbound and southbound approaches of Gateway Drive would have two 12-foot-wide approach lanes and there would be two 10.5-foot-wide lanes on the receiving side of the intersection. On-street parking is assumed to be prohibited along Gateway Drive. A preliminary signal warrant analysis indicates that the peak hour warrant would not be satisfied in the 2011 No Build condition so it is assumed that this intersection would be unsignalized for this condition.

Vandalia Avenue and Elton Street. The extension of Elton Street would be a gateway to the Project Site and would be characterized by street level retail and curbside parking. Northbound and southbound Elton Street are assumed to consist of one 14-foot-wide approaching lane and one 14-foot-wide receiving lane with an additional 8 feet on both sides of the street for on-street curbside parking. The eastbound and westbound approaches of Vandalia Avenue are assumed to consist of two 11-foot-wide approach lanes and two 11-foot-wide receiving lanes in each direction also with an additional 8 feet on both sides of the street for parking. It would consist of All four approaches at this intersection would have raised medians. A preliminary signal warrant analysis indicates that a warrant would be not satisfied in the 2011 No Build condition so it is assumed that this intersection would be unsignalized for this condition.

Fountain Avenue and Egan Street (formerly Old Vandalia Street). Egan Street would terminate at Fountain Avenue and the intersection of Fountain Avenue and Egan Street would be an unsignalized three-legged intersection. Egan Street would be a one-way westbound street with one receiving lane and parking on both sides. At this intersection, the northbound approach of Fountain Avenue would consist of a 13-foot-wide shared left turn and through lane, a 22-foot-wide through curbside lane (which could also accommodate parking), a 6-foot-wide raised median, and two southbound receiving lanes. The southbound approach would consist of a 13-foot-wide through lane, a 22-foot-wide shared through and right turn lane (which could also accommodate parking), a 6-foot-wide median, and two northbound receiving lanes. Turns onto Egan Street would be allowed from both the northbound and southbound approaches.

TRAVEL DEMAND ESTIMATES AND GENERATED VOLUMES

By 2011, 378 residential units would be constructed on the Project Site. These units were approved as part of the full 1996 Plan which would include:

- 2,385 residential units
- Approximately 655,000 square feet of retail comprising 15,000 sf of neighborhood-oriented retail, and a 640,000-square-foot shopping center with 2,685 accessory parking spaces

(Note: the shopping center was built and has been operating since 2002 and its traffic is included in existing conditions)

- 30,000 sf of community facility space, an elementary school, an intermediate school, and a 4,000 sf day care center
- Approximately 10,000 sf of professional office space
- 45.2 acres of new and improved open space, including a 42.1 acre perimeter park and 3.1 acres of interior parks. (Note: To date 9.7 acres have already been developed; 35.5 acres would be developed by 2013.)
- New and improved infrastructure to support the 1996 Plan, including water mains, sewage disposal, drainage, new streets, and the Shore Parkway interchange at Erskine Street which has already been constructed and is in operation.

In addition to the elements of the 1996 Plan that would be built on the Project Site by 2011, development is anticipated at four sites located beyond the Project Site which would generate traffic volume through the study area. These sites were identified through discussions with the New York City Department of Housing Preservation and Development (HPD), the New York City Department of City Planning (DCP), and newspaper and internet research. Three residential developments and one destination retail center were identified as planned developments in the Spring Creek area expected to be completed by the year 2011. No additional developments are expected to be completed by 2013. The location and land use of the four identified developments are as follows:

- 830 Fountain Avenue, 232,810 sf of destination retail and accessory parking;
- Wortman Avenue HPD Site, 180 residential units;
- Hegeman Avenue HPD Site (McClancy Place/ACORN), 69 residential units; and
- Lincoln Avenue HPD Site, 30 residential units.

The location of each development and its proximity to the Project Site is shown in Figure 16-9.

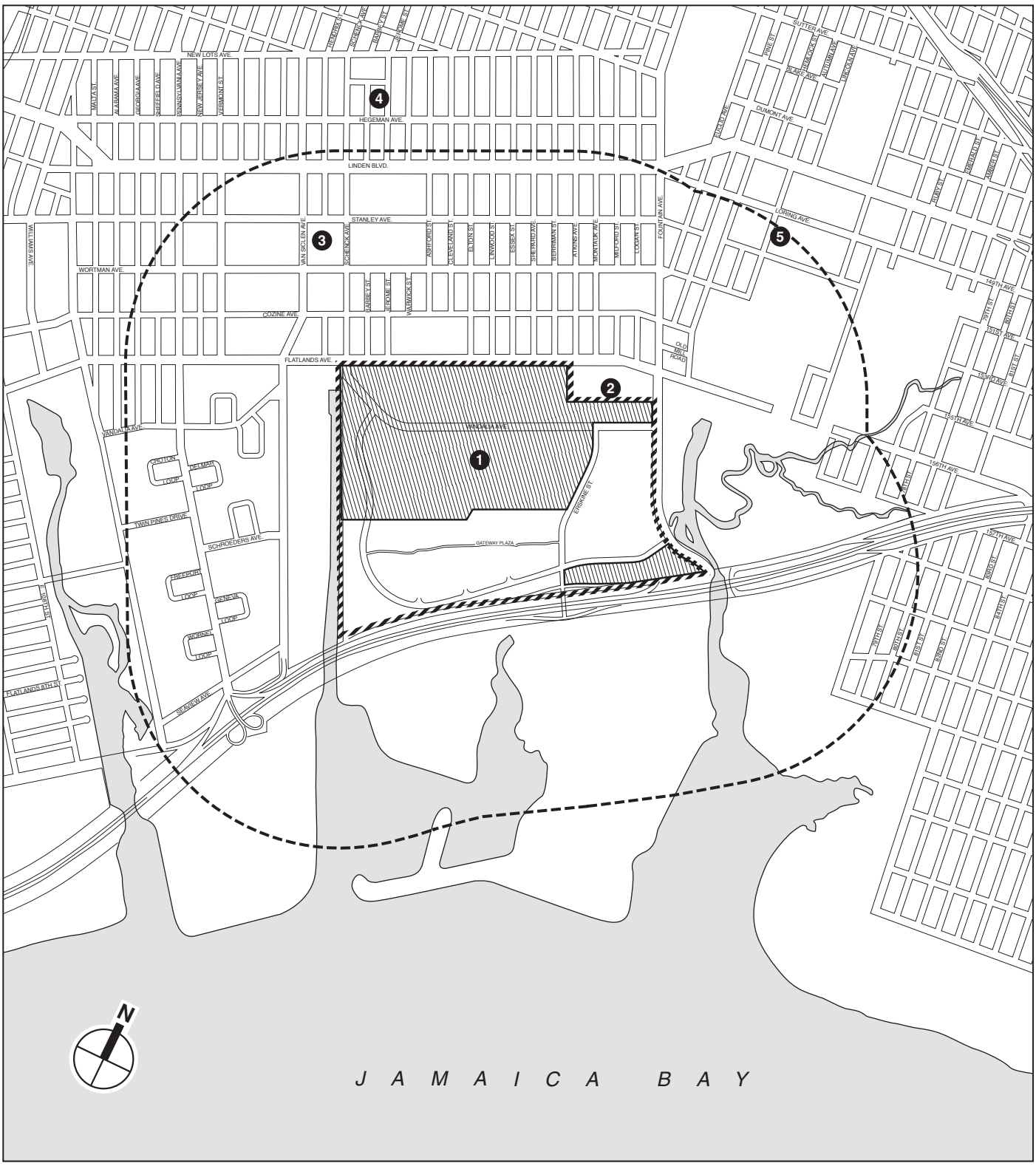
Trip Generation

Travel demand analyses were prepared for the 1996 Plan elements and other off-site developments that would occur in the 2011 No Build condition. Table 16-8 presents the travel demand factors, which are further described below.

- Residential: The trip generation analysis for the residential component used the *1996 Gateway Estates Final Environmental Impact Statement (1996 FEIS)* rate of 12.5 daily trips per 1,000 sf for weekday and Saturday analyses. Modal splits (48 percent by auto, 3 percent by taxi, 30 percent by subway, 13 percent by bus and 6 percent by walking) and vehicle occupancy rates of 1.15 persons per auto or taxi for all analysis periods are from Census 2000 journey-to-work data (U.S. Department of Commerce: Bureau of the Census, 2000) for nearby Census tracts. Data was obtained from Brooklyn Census tracts 1058, 1078, 1100, 1102, 1106, 1110, 1112, 1114, 1214, 1220, and Queens Census tract 62. These tracts have highway access and transit characteristics similar to the Project Site.

  The weekday residential temporal distribution (9.1 percent, 4.7 percent, and 10.7 percent in the AM, midday, and PM peak hours, respectively) and directional splits (expressed as the inbound percentage of 15 percent "in" for the AM peak, 50 percent "in" for the midday peak, and 70 percent "in" for the PM peak) were obtained from the *Greenpoint-Williamsburg Rezoning FEIS* (2005) as was the weekday daily delivery trip generation rate

12.2.08



Project Site

Fresh Creek Urban Renewal Area Boundary

1/2-Mile Perimeter from the Project Site

1. *1996 Plan and Modified Plan Project Site (FCURA)*
2. *830 Fountain Avenue*
3. *Wortman Avenue HPD Site*
4. *McClancy Place (HPD/ACORN)*
5. *Lincoln Avenue HPD Site*

0 1000 2000 FEET

SCALE

No Build Background Developments

GATEWAY ESTATES II

Figure 16-9

of 0.06 trips per dwelling unit. The temporal distribution for weekday delivery trips of 6 percent, 7 percent, and 10 percent in the AM, midday, and PM peak hours, respectively, was obtained from *Curbside Pickup and Delivery Operations and Arterial Traffic Impacts* (U.S. Department of Transportation Federal Highway Administration, 1981).

For the Saturday peak hours, trip generation, modal split, and vehicle occupancy rates were similar to weekdays. Temporal distribution (8.2 percent and 7.2 percent for the Saturday midday and PM peak hours, respectively) and directional split (50 percent "in") were obtained from The *Jamaica Plan DEIS* (2007). The *Atlantic Yards Arena and Redevelopment Project FEIS* (2006) is the source for the Saturday delivery trip rate (0.01 trips per dwelling unit) and delivery temporal distribution (9 percent and 2 percent for the Saturday midday and PM peak hours, respectively).

- Destination Retail: The travel demand factors used to estimate the trips associated with destination retail are the same for the off-site development projects and the development of the Proposed Action.

  The trip generation analysis for destination retail was developed from recent surveys at the existing Gateway Center. Driveway surveys were conducted for weekday and Saturday conditions in November 2006. These surveys recorded 15-minute counts of entering and exiting vehicle traffic (autos, taxis, and trucks) and foot traffic (walk/bike only, walk/bus, walk/bus/subway). The results of the survey were used to determine travel demand rates for destination retail space.

  Results from the surveys provided weekday peak hour trip generation rates of 1.55 person trips per 1,000 square feet (AM peak hour), 5.03 person trips per 1,000 square feet (midday peak hour), and 4.89 person trips per 1,000 square feet (PM peak hour). A weekday modal split of 95.1 percent by auto, 1.5 percent by taxi, 1.2 percent each for subway-to-bus and bus only, and 1 percent by walking was identified. Auto and taxi vehicle occupancies averaged 1.40 and 1.64, respectively. Weekday directional splits were also obtained from the survey. Weekday delivery trip generation (0.35 daily trips per 1,000 square feet) and temporal distribution rates (13 percent, 9 percent, and 0 percent during the AM, midday, and PM peak hours, respectively) were obtained from the 1996 FEIS.

  For the Saturday peak hours, a rate of 8.19 person trips per 1,000 square feet (Saturday midday peak hour) and 11.38 person trips per 1,000 square feet (Saturday PM peak hour) were determined from the survey. The modal split surveyed for the Saturday peak hours was 93.5 percent by auto, 3.5 percent by taxi, and 3 percent made by walk or transit. Auto and taxi vehicle occupancies averaged 1.72 and 1.75, respectively. Saturday directional splits were also obtained from the survey. For Saturday peak hour deliveries, the *Atlantic Yards Arena and Redevelopment Project FEIS* served as the source for trip generation (0.02 daily delivery trips per 1,000 square feet) and temporal distribution rates (11 percent and 2 percent during the Saturday midday and PM peak hours, respectively).

  It is assumed that a percentage of future trips to the proposed destination retail center at 830 Fountain Avenue would be made by people already shopping at the existing Gateway Center. Therefore, a 25 percent trip linkage was applied in accordance with typical CEQR procedures.

Table 16-8
2011 No Build Travel Demand Factors

	Residential	Destination Retail
Weekday		
Person Trip Generation Rate	12.5[1] per DU	1.55 - AM[5] 5.03 - Midday[5] 4.89 - PM[5] per 1,000 SF
Temporal Distribution		
AM Peak	9.1%[2]	NA[5]
Midday Peak	4.7%[2]	NA[5]
PM Peak	10.7%[2]	NA[5]
Linked Trip Credit	0.0%	25.0%
Modal Split		
Auto	48.0%[3]	95.1%[5]
Taxi	3.0%[3]	1.5%[5]
Subway/Bus	30.0%[3]	1.2%[5]
Bus Only	13.0%[3]	1.2%[5]
Walk Only	6.0%[3]	1.0%[5]
Vehicle Occupancy		
Auto	1.15[3]	1.40[5]
Taxi	1.15[3]	1.65[5]
Directional Split (Ins)		
AM Peak	15.0%[2]	62.5%[5]
Midday Peak	50.0%[2]	53.6%[5]
PM Peak	70.0%[2]	51.8%[5]
Truck Trip Generation Rate	0.06[2] per DU	0.35[1] per 1,000 SF
Truck Temporal Distribution		
AM Peak	6.0%[4]	13.0%[1]
Midday Peak	7.0%[4]	9.0%[1]
PM Peak	10.0%[4]	0.0%[1]
Truck Trip Directional Split (Ins)		
AM Peak	50.0%	50.0%
Midday Peak	50.0%	50.0%
PM Peak	50.0%	50.0%
Saturday		
Person Trip Gen Rate	12.5[1]	8.19 – Midday[6] 11.38 – PM[6]
	per DU	per 1,000 SF
Temporal Distribution		
Saturday Midday Peak	8.2%[2]	NA[6]
Saturday PM Peak	7.2%[2]	NA[6]
Linked Trip Credit	0.0%	25.0%
Modal Split (Saturday)		
Auto	48.0%[3]	93.5%[6]
Taxi	3.0%[3]	3.5%[6]
Subway/Bus	30.0%[3]	1.0%[6]
Bus Only	13.0%[3]	1.0%[6]
Walk Only	6.0%[3]	1.0%[6]
Vehicle Occupancy		
Auto	1.15[3]	1.72[6]
Taxi	1.15[3]	1.75[6]
Directional Split (Ins)		
Saturday Midday Peak	50.0%[2]	53.6%[6]
Saturday PM Peak	50.0%[2]	47.5%[6]
Truck Trip Gen Rate	0.01[4]	0.02[4]
	per DU	per 1,000 SF
Truck Temporal Distribution		
Saturday Midday Peak	9.0%[4]	11.0%[4]
Saturday PM Peak	2.0%[2]	2.0%[6]
Truck Trip Directional Split (Ins)		
Saturday Midday Peak	50.0%	50.0%
Saturday PM Peak	50.0%[2]	50.0%[6]

Notes:
1. *Gateway Estates FEIS* (1996)
2. The *Jamaica Plan DEIS* (2007)
3. *Census 2000* (U.S. Department of Commerce: Bureau of the Census, 2000)
4. *Atlantic Yards: Arena and Redevelopment Project FEIS* (2006)
5. *Urban Space for Pedestrians*, Pushkarev and Zupan, 1973
6. Surveys conducted by AKRF, Inc. at Gateway Center (November 2006) Note: temporal distribution not included (for destination retail) since rates are specific to individual peak hours.

Sources: Trip Generation References

Generated Traffic Volumes

As shown in Table 16-9, these developments would generate 540 vehicles per hour (vph), 797 vph, 977 vph, 1,115 vph and 1,408 vph in the weekday AM, midday, PM, Saturday midday, and Saturday PM peak hours, respectively.

Table 16-9
2011 No Build Vehicular Trip Generation

Site	Weekday AM			Weekday Midday			Weekday PM			Saturday Midday			Saturday PM		
	In	Out	Sum	In	Out	Sum	In	Out	Sum	In	Out	Sum	In	Out	Sum
830 Fountain Avenue	128	82	210	333	290	623	306	286	592	437	382	819	543	597	1,140
HPD – Unknown Sponsor	18	78	96	26	26	52	75	35	110	43	43	86	37	37	74
HPD – Lincoln Avenue	3	13	16	3	3	6	12	6	18	6	6	12	6	6	12
HPD – McClancy Place/ACORN	7	30	37	10	10	20	29	13	42	16	16	32	14	14	28
Gateway Site – 1996 Plan	28	153	181	48	48	96	150	65	215	83	83	166	77	77	154
Total	**184**	**356**	**540**	**420**	**377**	**797**	**572**	**405**	**977**	**585**	**530**	**1,115**	677	731	1,408

Trip Assignment

Vehicle trips generated by the 1996 Plan and other off-site developments were assigned to the roadway network. The following describes the vehicular traffic (auto, taxi and truck) assignments by land use and travel mode.

- Residential Auto Trips: Data obtained from the 2000 Census were used for the distribution of these trips. Journey-to-work by auto data from the surrounding neighborhood census tracts (Brooklyn Census Tracts 1058, 1070, 1078, 1100, 1106, 1110, 1112, 1214, and 1220) were used to determine residential commuting patterns. Table 16-10 provides origin-destination information from the 2000 Census.

Table 16-10
Projected Trip Distribution for Residential Auto Trips

Origin / Destination	Percent
Brooklyn	59%
Queens	17%
Manhattan	15%
Long Island	4%
Bronx/Westchester	2%
New Jersey	2%
Staten Island	1%
Total	**100%**

Source: Census Transportation Planning Package (CTPP) 2000 Journey-to-Work data (Brooklyn Census Tracts 1058, 1070, 1078, 1100, 1106, 1110, 1112, 1214, and 1220)

For residential trip destinations within Brooklyn, distributions were determined based on census tract level O-D data. Of the 59 percent of residential trips with destinations in Brooklyn, approximately 21 percent were assigned to westbound Linden Boulevard, 13 percent were expected to use the westbound Shore Parkway, 12 percent were assigned to northbound Pennsylvania Avenue, 6 percent would travel east on Flatlands Avenue, and 1 percent were assigned to northbound Fountain Avenue. Also, 6 percent of Brooklyn-bound trips would travel to nearby destinations using other local streets.

For residential trips with destinations outside of Brooklyn, several routes would be used. Of trips destined to Manhattan (totaling 15 percent), 9 percent were assigned to the westbound

Shore Parkway and 6 percent to the Van Wyck Expressway via the eastbound Shore Parkway. For Queens-bound trips (a total of 17 percent), 10 percent would travel along the eastbound Shore Parkway, 5 percent would use Fountain Avenue, and 2 percent would travel on Conduit Avenue via eastbound Linden Boulevard. Of the trips destined for Long Island (4 percent total), 3 percent are expected to use the eastbound Shore Parkway, while 1 percent would travel along Conduit Avenue via eastbound Linden Boulevard. All New Jersey and Staten Island-bound trips (2 percent and 1 percent, respectively) were assigned to the westbound Shore Parkway, while all Bronx and Westchester trips (2 percent) were assigned to the Van Wyck Expressway via the eastbound Shore Parkway.

- Destination Retail Auto Trips: Destination retail auto trips were assigned based on traffic count and survey data collected at the existing Gateway Center. Auto trips from the Bronx, Westchester and portions of Manhattan, Long Island, and Queens (totaling 25 percent) were assigned to the westbound Shore Parkway. Destination retail trips from Staten Island, New Jersey, portions of southern and western Brooklyn, and parts of Manhattan (amounting to 20 percent) were assigned to the site along the eastbound Shore Parkway. It is expected that trips from central Brooklyn and Downtown Brooklyn (13 percent) would primarily travel to the site along eastbound Linden Boulevard. Trips from parts of southern and northeastern Brooklyn (10 percent each) were assigned to Flatlands and Pennsylvania Avenues, respectively. Trips generated from neighborhoods north (5 percent) and west (5 percent) of the site, and nearby parts of Queens, were assigned to westbound Linden Boulevard and Fountain Avenue, respectively

  Destination retail auto trips generated by the immediate surrounding neighborhoods (10 percent) were assigned to local streets including Vermont, Jerome, and Elton Streets and Van Siclen, Schenck, and Atkins Avenues. Two percent were assigned from Starrett City along Pennsylvania and Vandalia Avenues. Reverse trips were generally assigned to the routes on which they arrived.
- Taxi Trips: Taxi pick-up and drop-off trips for all land uses were distributed mostly to local streets that serve the surrounding neighborhood (20 percent to Atkins Avenue which is one of the main streets to cross Linden Boulevard, 5-15 percent each to Schenck, Van Siclen, and Elton Avenues), and arterials such as Linden Boulevard (10 percent eastbound, 4 percent westbound), Flatlands, Pennsylvania, and Fountain Avenues (10, 13, and 8 percent, respectively), which serve neighborhoods further into Brooklyn and Queens. A small amount of taxi trips (10 percent total) can be expected to arrive at the site from longer distances and would access the site from the Shore Parkway.
- Truck Trips: Deliveries to the site were assigned along DOT designated truck routes. Truck trips from points west (35 percent) were assigned to eastbound Linden Boulevard. Trips from the east and southwest (25 percent each) were assigned to westbound Linden Boulevard and eastbound Flatlands Avenue. Delivery trips originating from the north (15 percent) would use Pennsylvania Avenue.

The trips generated by the No Build developments together with the annual background growth provide the No Build traffic volume baseline. Detailed 2011 No Build traffic volume maps are provided in Appendix E, "Traffic Technical Appendix."

INTERSECTION LEVEL OF SERVICE ANALYSIS

Based on the projected increases in traffic volumes and the physical changes to the roadway network as previously discussed, expected No Build levels of service were determined for 2011.

Table 16-11 provides an overview of the levels of service that would be expected to characterize the traffic study area during the peak hours. In all, the primary and secondary study areas are comprised of 27 signalized and 15 unsignalized intersections. A summary description is also provided below:

Table 16-11
2011 No Build Intersection Level of Service Summary

Level of Service	Weekday			Saturday	
	AM	Midday	PM	Midday	PM
Signalized Intersections					
Overall Intersection LOS A/B	13	12	11	11	9
Overall Intersection LOS C	4	9	8	7	6
Overall Intersection LOS D*	6	3	5	4	5
Overall Intersection LOS E/F	4	3	3	5	7
Number of Movements at LOS E or F	35	23	43	40	49
Unsignalized Intersections					
Overall Intersection LOS A/B	15	15	15	15	13
Overall Intersection LOS C	0	0	0	0	2
Overall Intersection LOS D*	0	0	0	0	0
Overall Intersection LOS E/F	0	0	0	0	0
Number of Movements at LOS E or F	0	0	3	5	8

Notes:
* This table shows intersections that operate at acceptable and unacceptable levels of service. Only intersections that operate at unacceptable levels of service are discussed in detail.
This table includes the 37 intersections analyzed for existing conditions and the 5 newly constructed intersections under No Build conditions.

- In the weekday AM peak hour, four of the 27 signalized intersections analyzed would operate at overall LOS E or F, and two intersections would operate at overall unacceptable LOS D (four of the six intersections shown in Table 16-11 would be within the "acceptable" delays of LOS D). Thirty-five specific traffic movements out of approximately 180 total signalized traffic movements analyzed would function at LOS E or F conditions.
- In the weekday midday peak hour, three signalized intersections would operate at overall LOS E or F, and no signalized intersections would operate at overall unacceptable LOS D (both intersections shown in Table 16-11 would be within the "acceptable" delays of LOS D). Twenty-three traffic movements would operate at LOS E or F.
- In the weekday PM peak hour, three signalized intersections would operate at overall LOS E or F, and two intersections would operate at overall unacceptable LOS D (three of the five intersections shown in Table 16-11 would be within the "acceptable" delays of LOS D). Forty-three traffic movements would operate at LOS E or F during the weekday PM peak hour.
- In the Saturday midday peak hour, five signalized intersections would operate at overall LOS E or F, and two intersections would operate at overall unacceptable LOS D (two intersections would operate within the "acceptable" delays of LOS D during the Saturday midday peak hour). Forty traffic movements would operate at LOS E or F during the Saturday midday peak hour.
- In the Saturday PM peak hour, seven signalized intersections would operate at overall LOS E or F, and four intersections would operate at overall unacceptable LOS D (one of the five intersections shown in Table 16-11 would operate within the "acceptable" delays of LOS D). Forty-nine traffic movements would operate at LOS E or F during the Saturday PM peak hour.
- Each of the 15 unsignalized intersections analyzed would operate at acceptable levels of service during all five peak hours analyzed. None of the approximately 50 total unsignalized traffic movements would operate at LOS E or F in the weekday AM and midday peak hours.

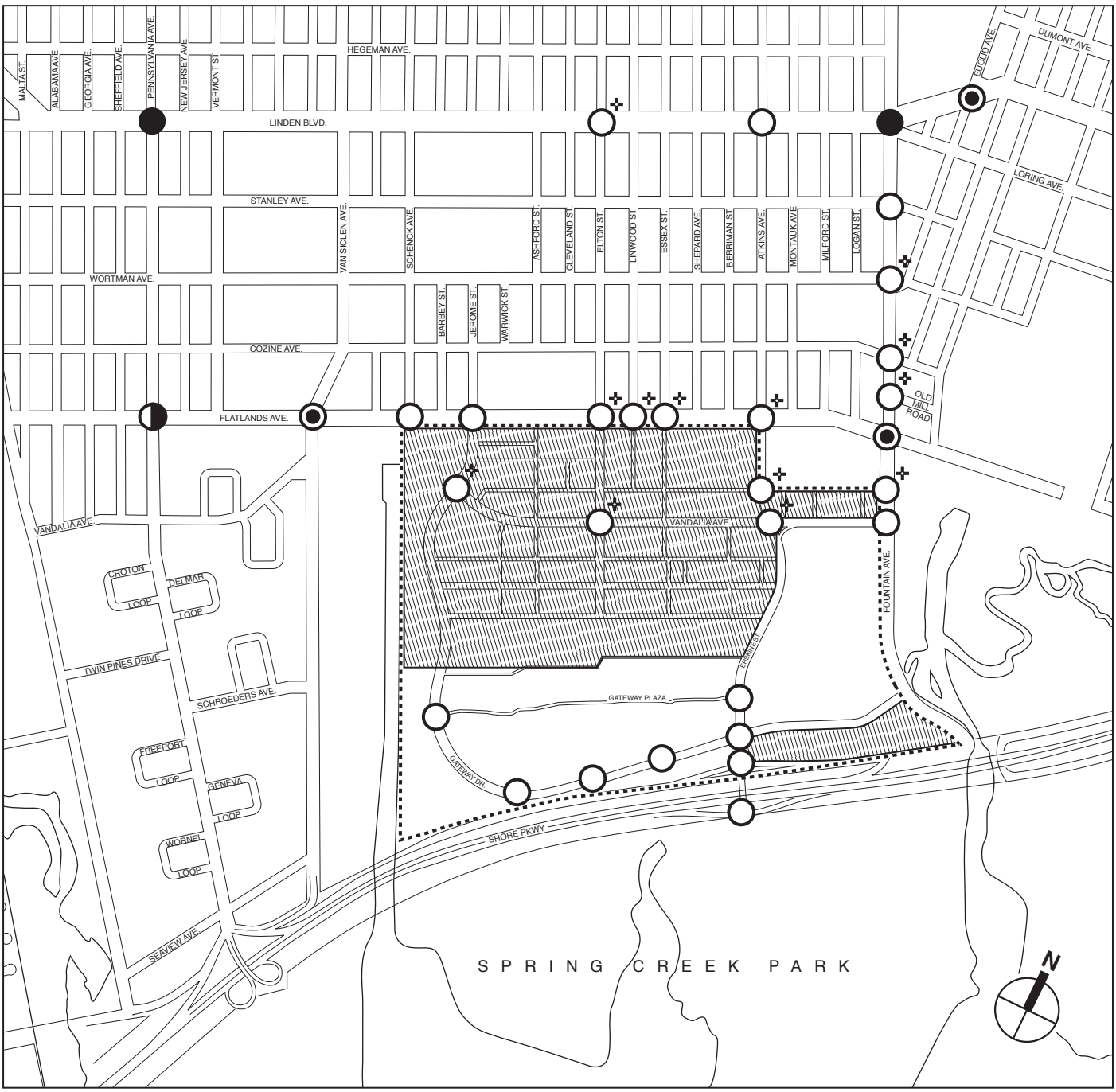
Three, five, and eight of the 50 total unsignalized traffic movements would operate at LOS E or F, and five would operate at LOS E or F during the weekday PM, Saturday midday and Saturday PM peak hours, respectively.

Overall projected levels of service for the 2011 No Build condition are also presented in Figures 16-10a through 16-14b. Table 16-12 shows the details of the individual traffic movements that would operate at an unacceptable level of service during at least one peak hour. A description of intersections and traffic movements that would operate at overall LOS E or F is provided below.

Table 16-12
2011 No Build Traffic Movements at Unacceptable Levels of Service

Signalized Intersection	Approach and Movement		Weekday									Saturday					
			AM			Midday			PM			Midday			PM		
			D*	E	F	D*	E	F	D*	E	F	D*	E	F	D*	E	F
Erskine Street & Gateway Drive	WB	L								●					●		
Gateway Drive & Gateway Plaza	SB	L							●				●				●
	WB	LR														●	
Fountain Avenue & Flatlands Avenue	SB	LTR										●				●	
Flatlands Avenue & Jerome Street	EB	TR											●				●
	WB	L													●		
Flatlands Avenue & Schenck Avenue/ Vandalia Avenue	SB	LR													●		
	EB	L													●		
	WB	TR												●			●
Flatlands Avenue & Van Siclen Avenue	SB	LTR	●						●								
	WB	L								●							
Flatlands Avenue & Pennsylvania Avenue	NB	L	●							●				●			●
	SB	L	●			●			●						●		
	EB	L					●			●				●			●
		T											●				●
	WB	L											●				●
		T													●		
Flatlands Avenue & Rockaway Parkway	SB	LTR	●			●				●				●			●
	EB	L										●				●	
		TR								●				●			●
	WB	L											●			●	
		TR							●					●			●
Flatlands Avenue & Remsen Avenue	SB	L										●				●	
	EB	TR							●								
	WB	TR										●					●
Linden Boulevard & 79th Street	NB	L	●														
Linden Boulevard & Euclid Avenue	SB	LTR	●														
Linden Boulevard & Fountain Avenue & Loring Avenue	NB[1]	LTR			●			●		●				●			●
	SB[1]	DefL			●	●					●			●			●
		TR			●		●				●			●			●
	WB[3]	L			●				●								
		T			●												
	NB[2]	LTR			●		●			●			●			●	
	WB[8]	TR		●													
Linden Boulevard & Atkins Avenue	SB	LTR	●														
Linden Boulevard & Pennsylvania Avenue	NB	L			●			●			●			●			●
		T	●											●			●
	SB	L									●			●			●
		TR		●				●			●			●			●
	EB[3]	L			●			●			●		●				●
		T									●		●				●
	WB[3]	L			●			●		●				●			●
		T			●					●				●			●
	EB[8]	T	●						●								
	WB[8]	TR		●													
Linden Boulevard & Rockaway Avenue	NB	LT			●			●			●			●			●
		R							●								
	SB	LT			●			●			●			●			●
		R	●					●			●						
	EB[3]	L		●			●			●					●		
	WB[3]	L			●			●			●			●			●

12.2.08



0 1000 2000 FEET

SCALE

Project Site

Fresh Creek Urban Renewal Area Boundary

LOS A or B

LOS C

LOS D

LOS E or F

Unsignalized Intersection

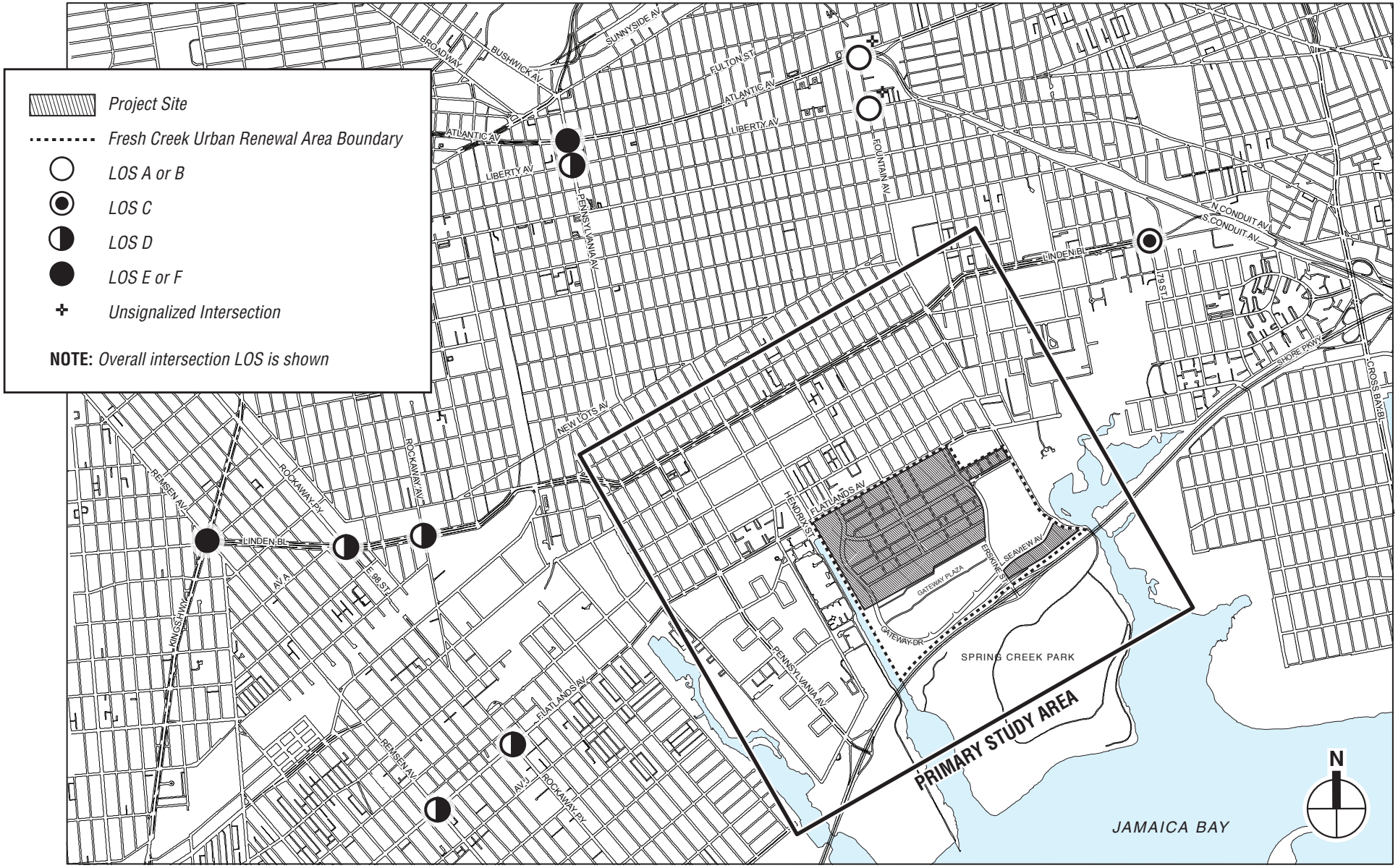
NOTE: *Overall intersection LOS is shown*

2011 No Build Weekday
AM Peak Hour Traffic Level of Service
Primary Study Area

GATEWAY ESTATES II

Figure 16-10a

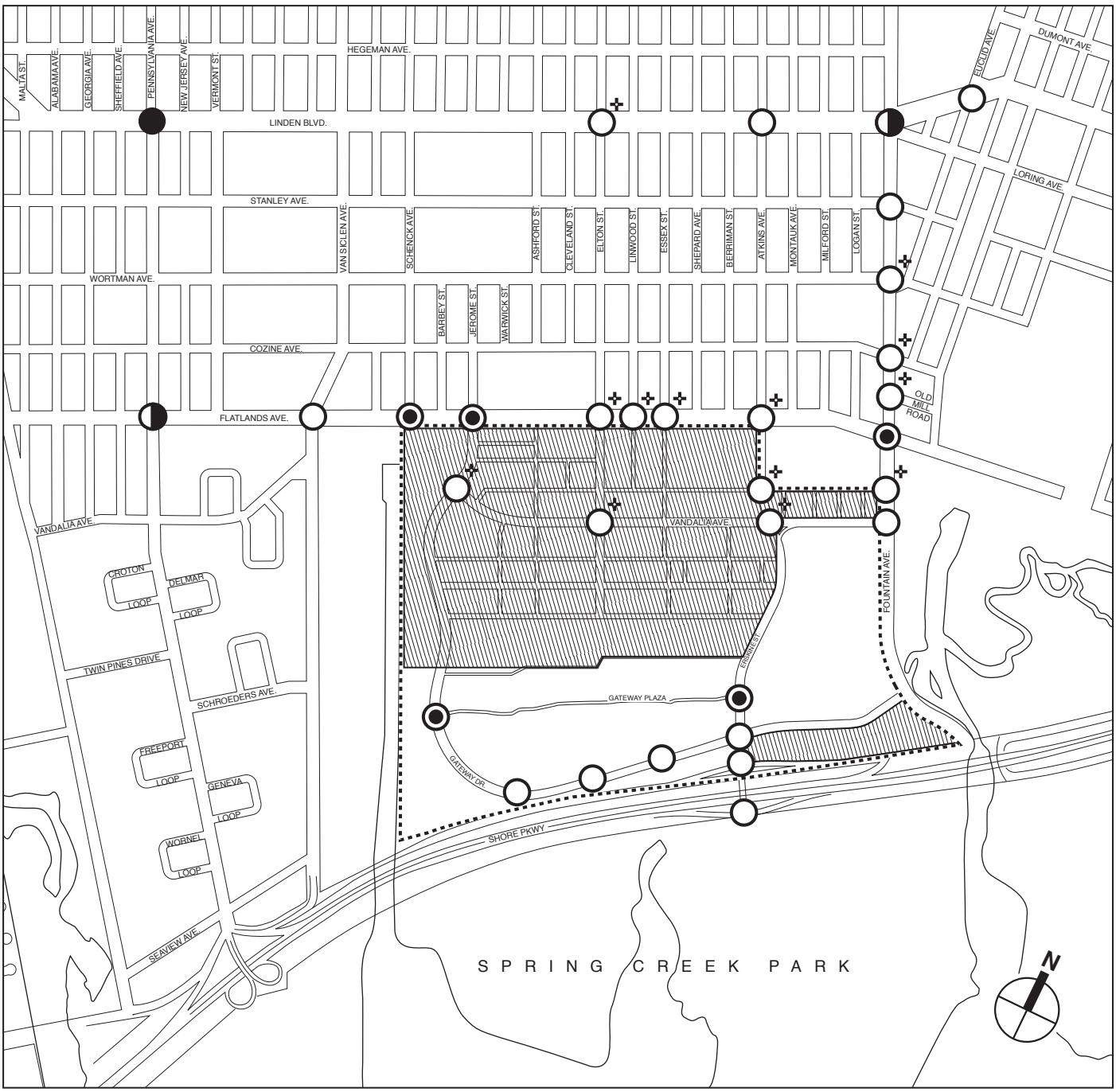
12.2.08



2011 No Build Weekday
AM Peak Hour Traffic Level of Service
Secondary Study Area

Figure 16-10b

12.2.08



0 1000 2000 FEET

SCALE

Project Site

Fresh Creek Urban Renewal Area Boundary

LOS A or B

LOS C

LOS D

LOS E or F

Unsignalized Intersection

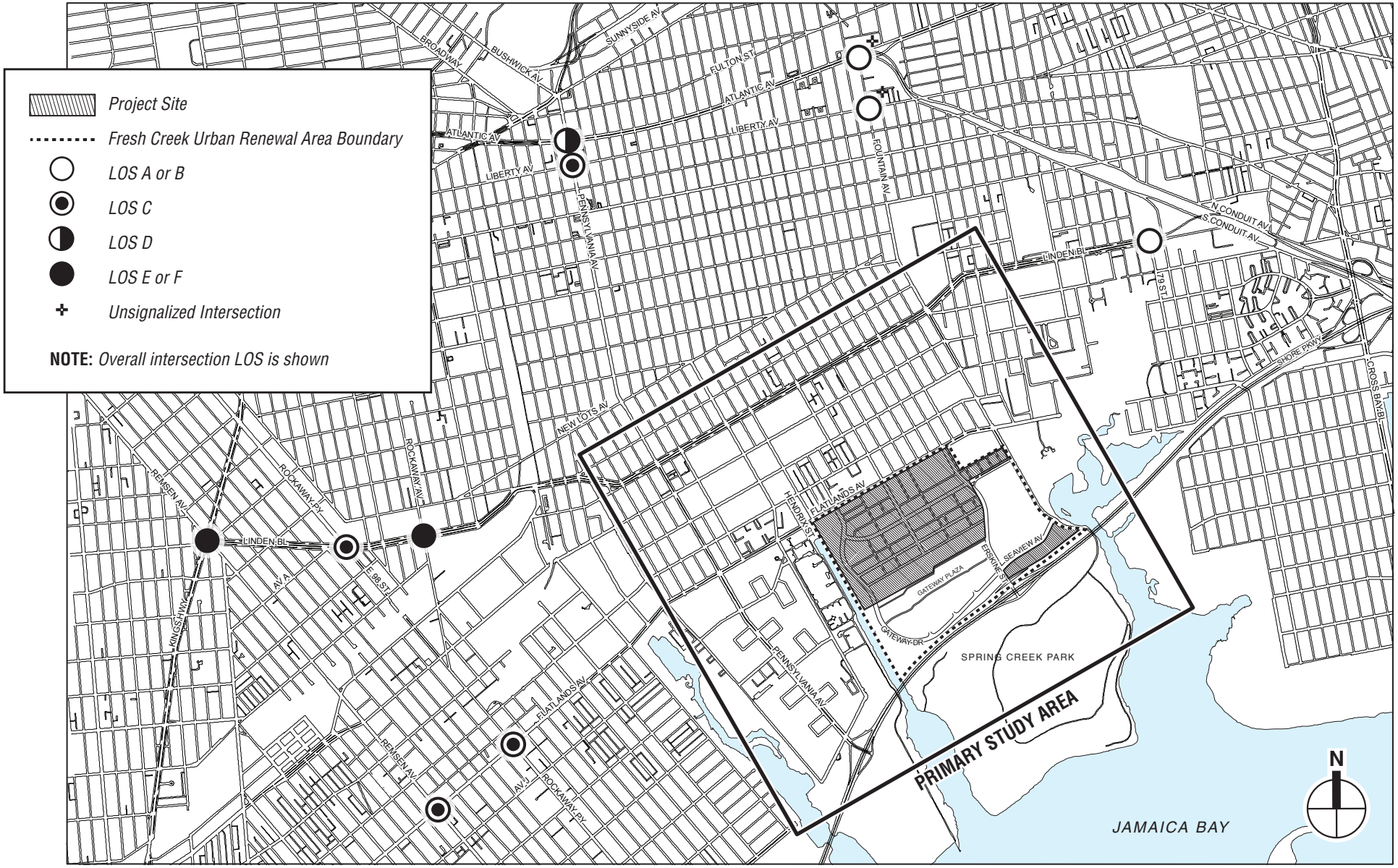
NOTE: *Overall intersection LOS is shown*

2011 No Build Weekday
Midday Peak Hour Traffic Level of Service
Primary Study Area

GATEWAY ESTATES II

Figure 16-11a

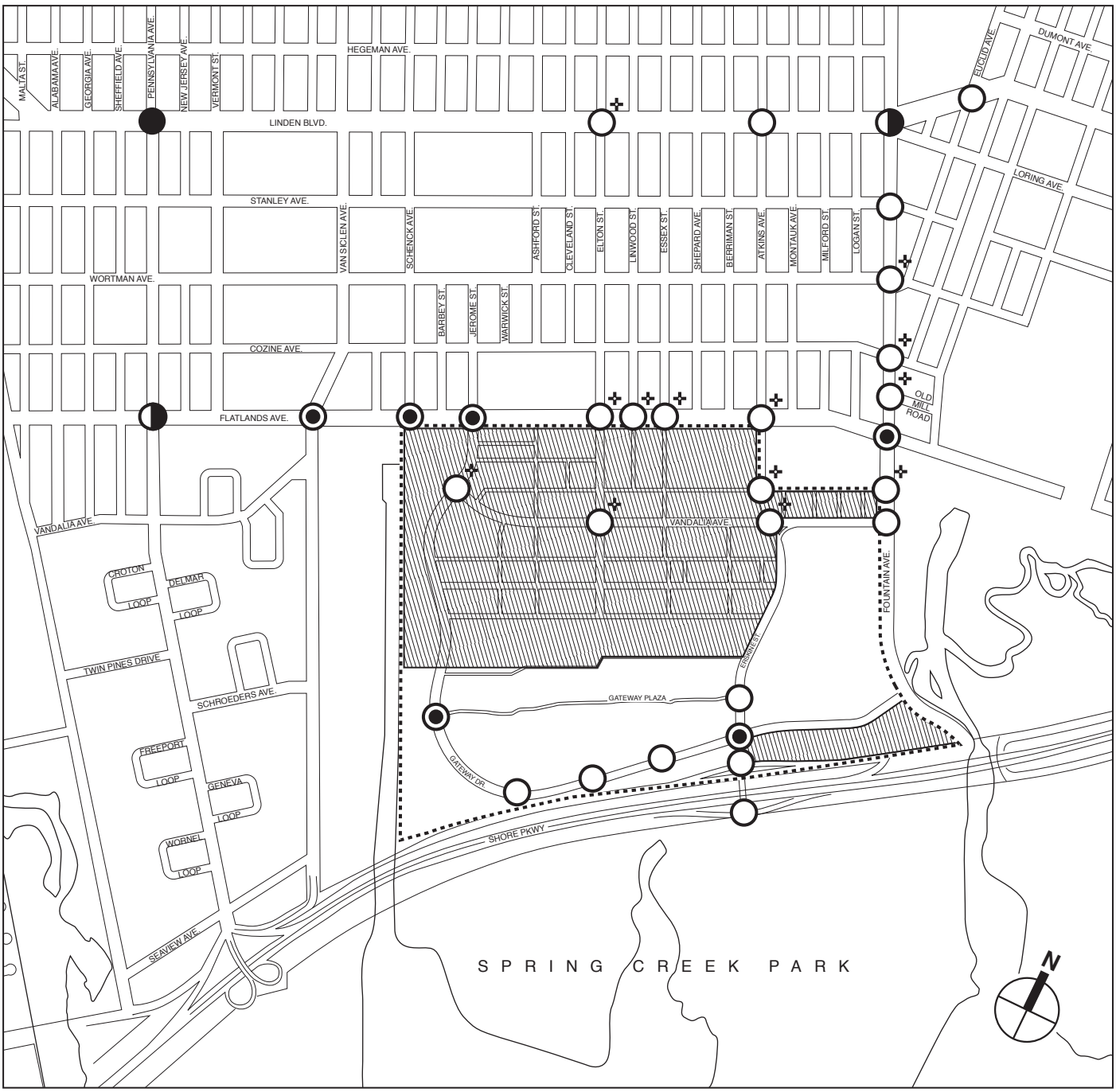
12.2.08



2011 No Build Weekday
Midday Peak Hour Traffic Level of Service
Secondary Study Area

Figure 16-11b

12.2.08



0 1000 2000 FEET

SCALE

Project Site

Fresh Creek Urban Renewal Area Boundary

LOS A or B

LOS C

LOS D

LOS E or F

Unsignalized Intersection

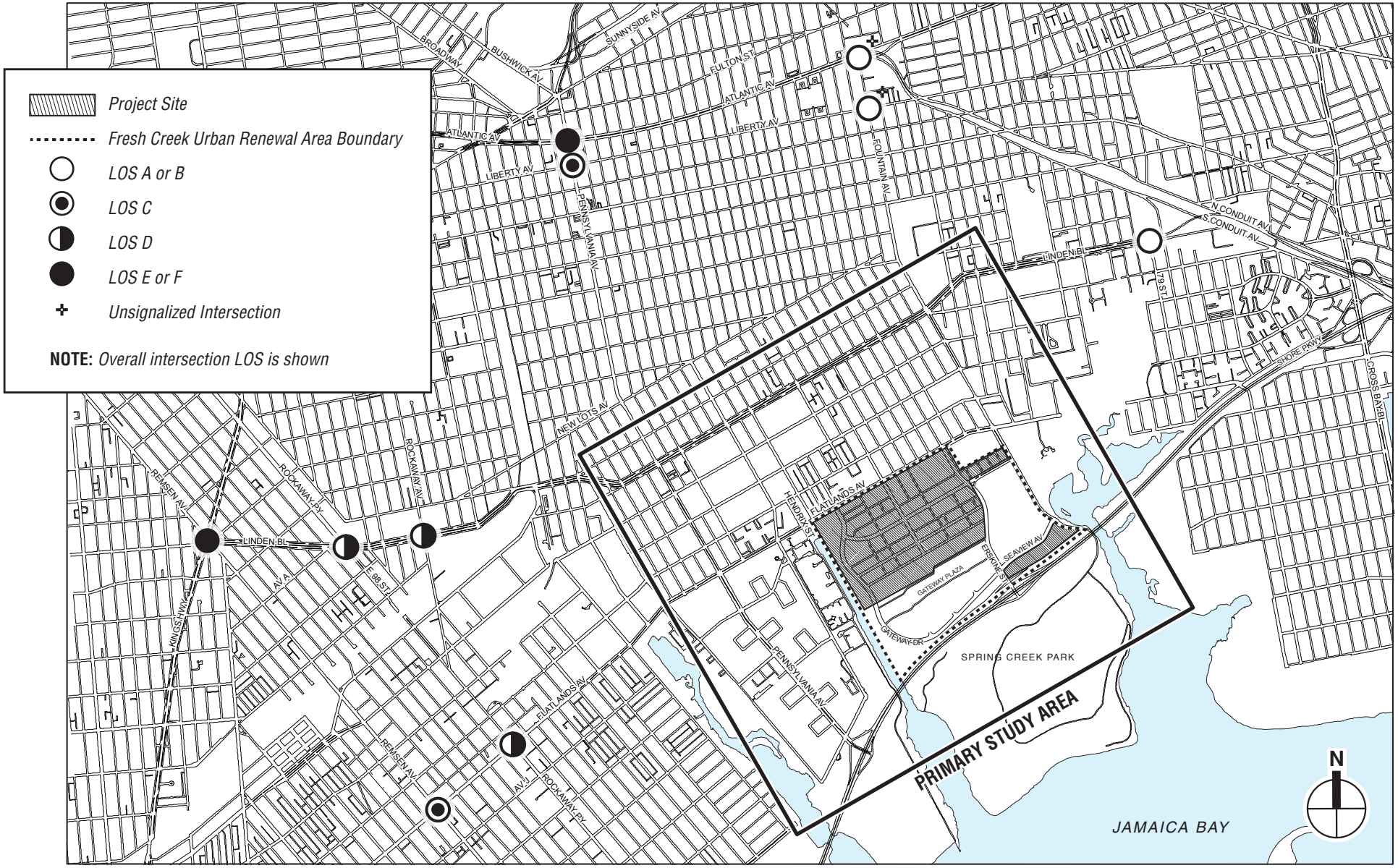
NOTE: *Overall intersection LOS is shown*

2011 No Build Weekday
PM Peak Hour Traffic Level of Service
Primary Study Area

GATEWAY ESTATES II

Figure 16-12a

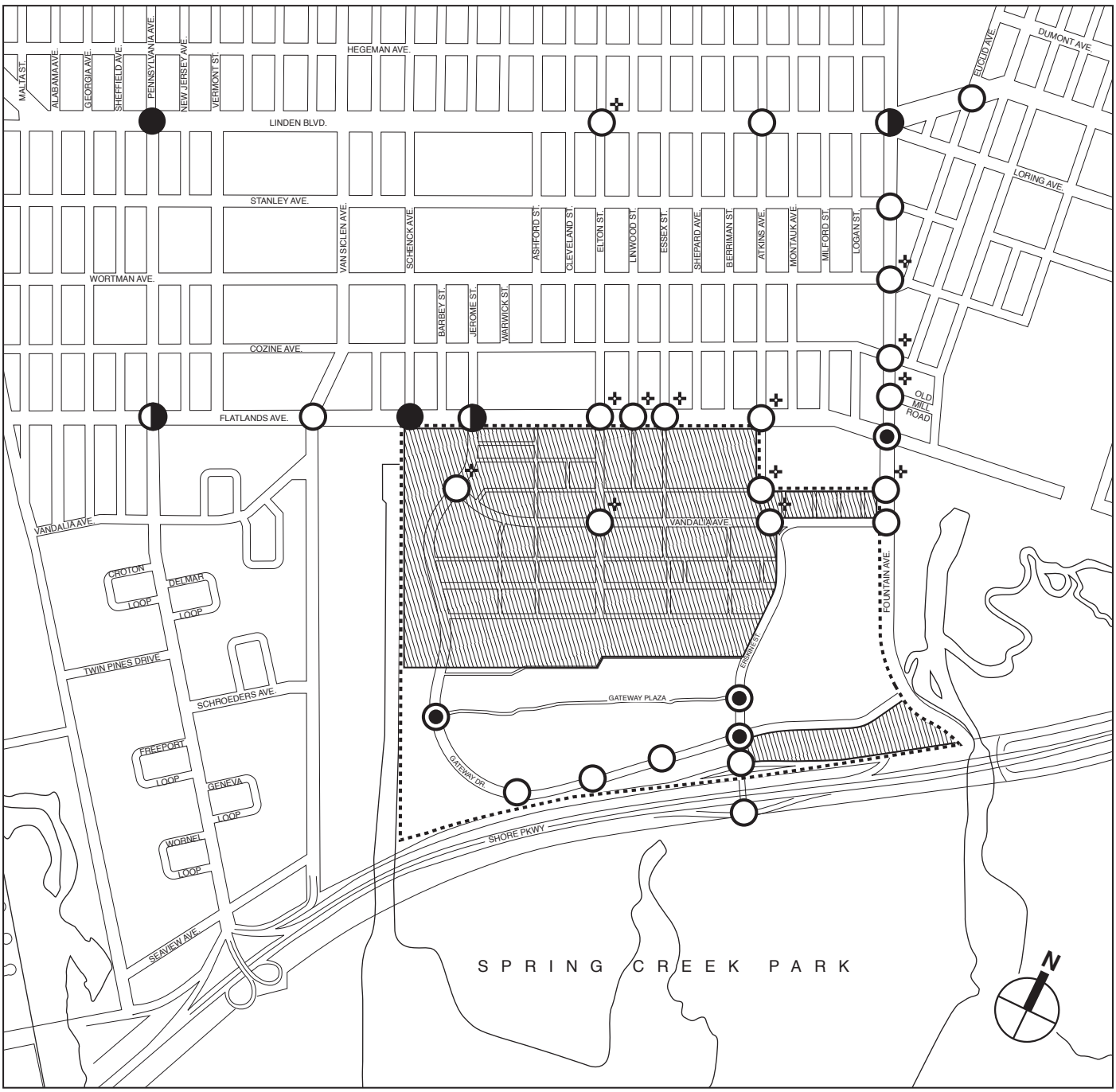
12.2.08



2011 No Build Weekday
PM Peak Hour Traffic Level of Service
Secondary Study Area

Figure 16-12b

12.2.08



0 1000 2000 FEET

SCALE

Project Site

Fresh Creek Urban Renewal Area Boundary

LOS A or B

LOS C

LOS D

LOS E or F

Unsignalized Intersection

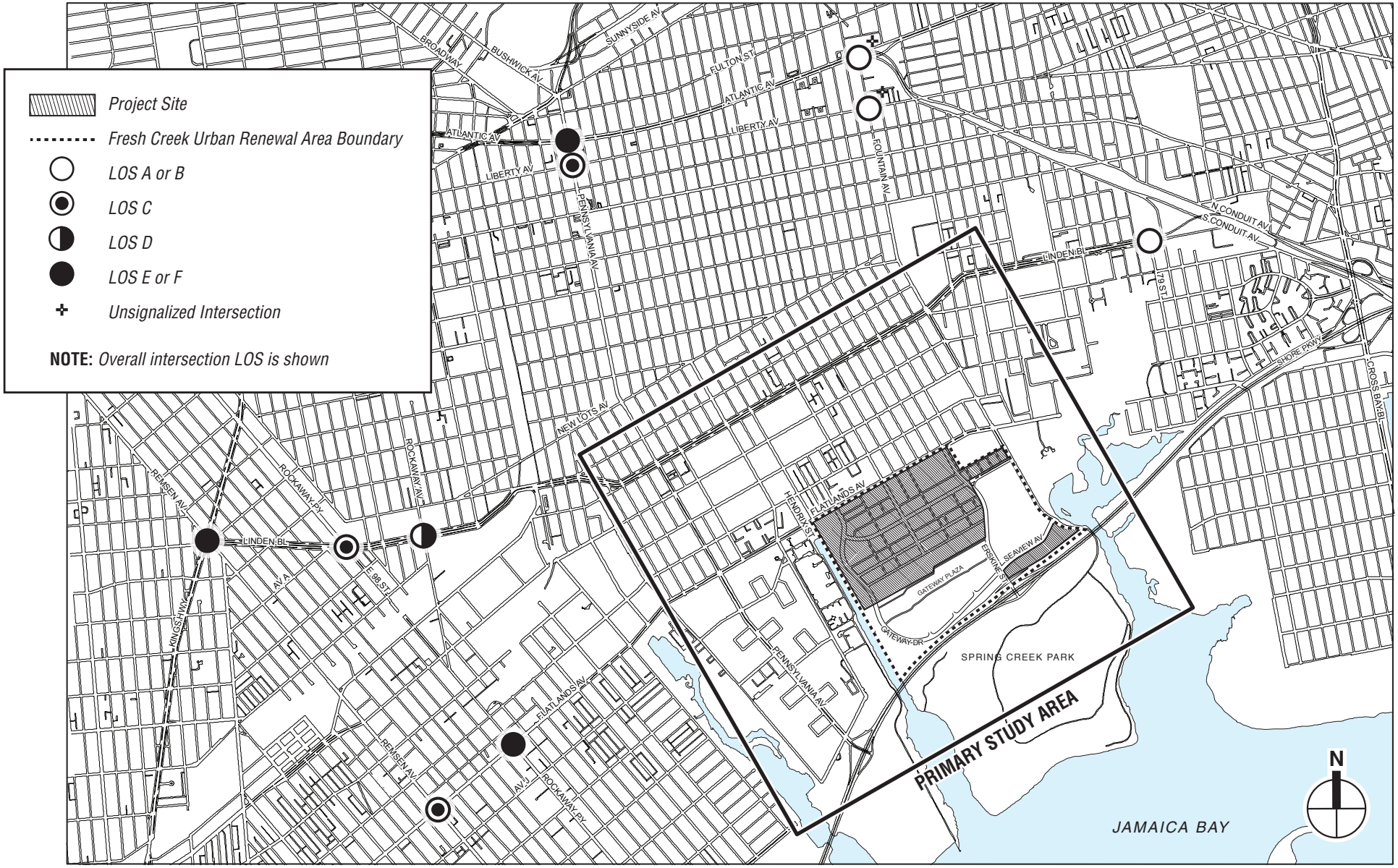
NOTE: *Overall intersection LOS is shown*

2011 No Build Saturday
Midday Peak Hour Traffic Level of Service
Primary Study Area

GATEWAY ESTATES II

Figure 16-13a

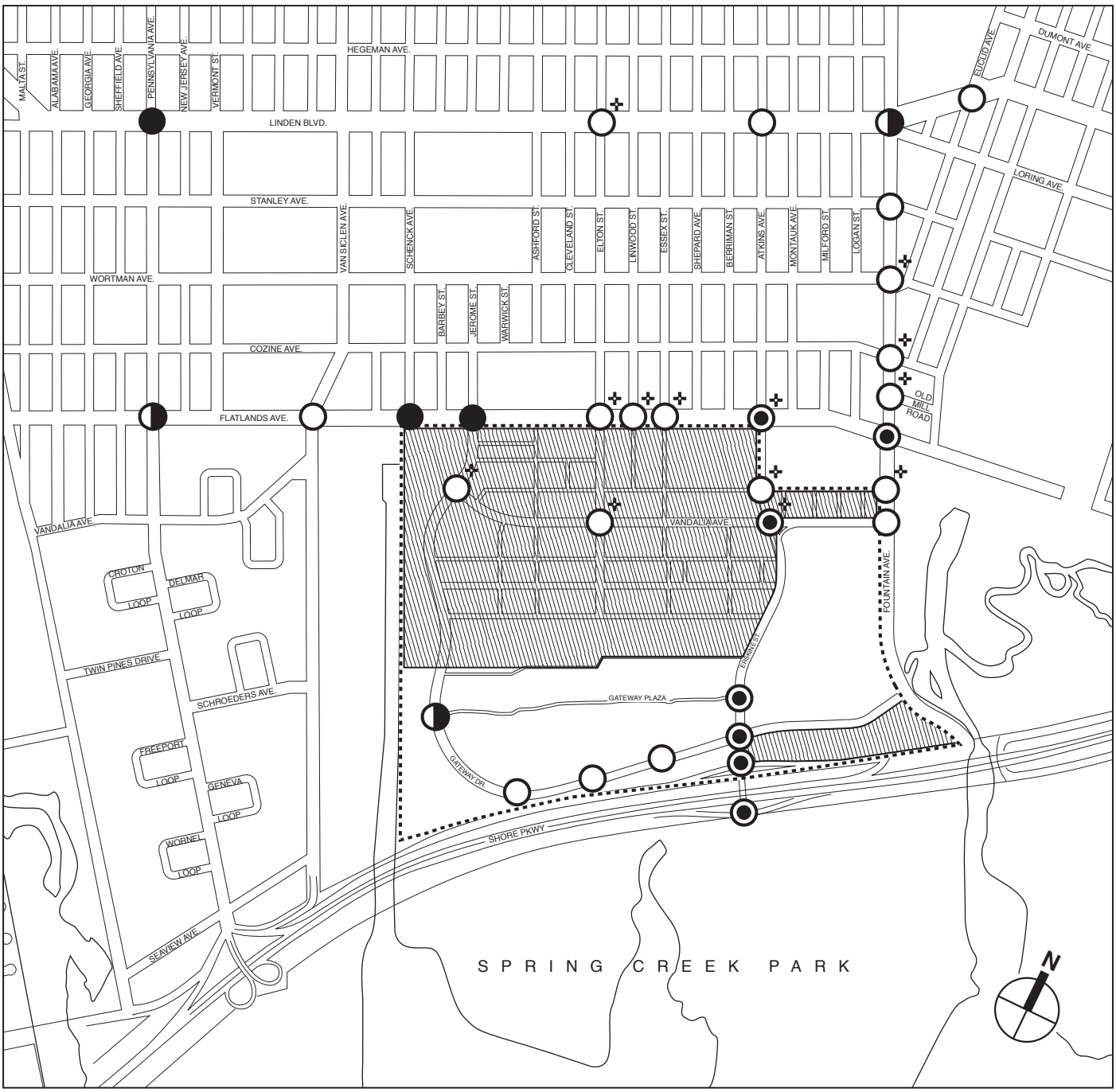
12.2.08



2011 No Build Saturday
Midday Peak Hour Traffic Level of Service
Secondary Study Area

Figure 16-13b

12.2.08



0 1000 2000 FEET

SCALE

Project Site

Fresh Creek Urban Renewal Area Boundary

LOS A or B

LOS C

LOS D

LOS E or F

Unsignalized Intersection

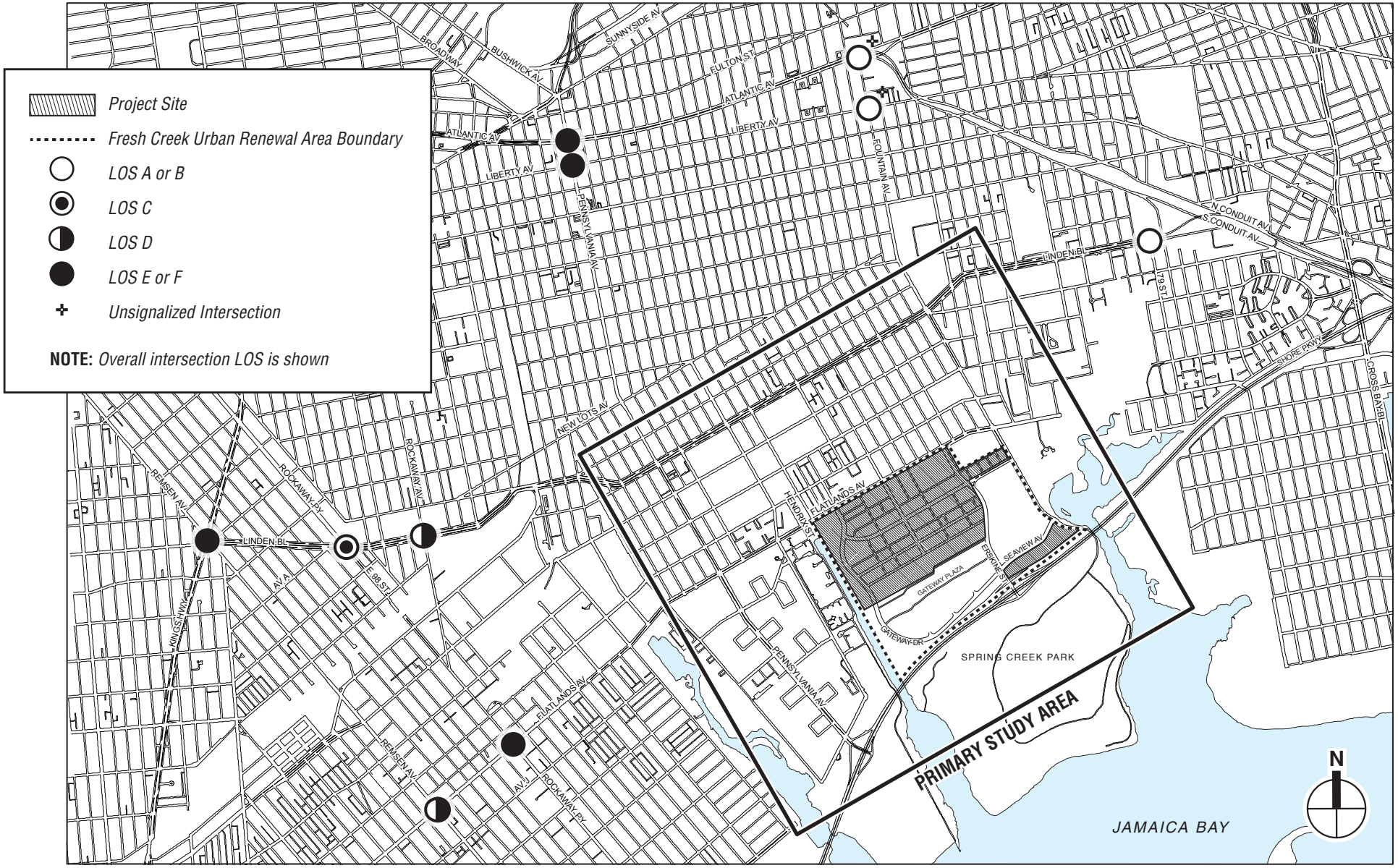
NOTE: *Overall intersection LOS is shown*

2011 No Build Saturday
PM Peak Hour Traffic Level of Service
Primary Study Area

GATEWAY ESTATES II

Figure 16-14a

12.3.08



2011 No Build Saturday
PM Peak Hour Traffic Level of Service
Secondary Study Area

Figure 16-14b

Table 16-12 (cont'd)
2011 No Build Traffic Movements at Unacceptable Levels of Service

Signalized Intersection	Approach and Movement		Weekday AM D*	Weekday AM E	Weekday AM F	Weekday Midday D*	Weekday Midday E	Weekday Midday F	Weekday PM D*	Weekday PM E	Weekday PM F	Saturday Midday D*	Saturday Midday E	Saturday Midday F	Saturday PM D*	Saturday PM E	Saturday PM F
Linden Boulevard & Rockaway Parkway	NB	LTR			●					●					●		
	SB	L			●			●			●			●			●
		TR	●								●						
	EB[3]	L			●		●				●		●			●	
	WB[3]	L			●		●			●							
Linden Boulevard & Kings Highway & Remsen Avenue	NB[4]	T			●		●				●			●			●
	SB[4]	T			●	●					●			●			●
	NB[5]	TR			●	●				●		●			●		
	SB[5]	TR	●								●	●			●		
	EB[6]	DefL			●			●			●		●			●	
		TR			●			●			●			●			●
	WB[6]	TR			●			●			●			●			●
	EB[3]	TR		●			●				●			●			●
	WB[3]	LT[7]			●			●		●				●			●
										●							
		R	●							●							
Pennsylvania Avenue & Liberty Avenue	NB	LTR		●												●	
	SB	TR										●					●
	EB	LTR				●			●								
	WB	LTR		●		●				●		●				●	
Pennsylvania Avenue & Atlantic Avenue	NB	L			●			●		●				●			●
		TR		●		●								●			●
	SB	L								●			●				●
		TR			●					●			●				●
	EB	TR									●			●			●
	WB	TR			●				●			●					●

Unsignalized Intersection	Approach and Movement		Weekday AM D*	Weekday AM E	Weekday AM F	Weekday Midday D*	Weekday Midday E	Weekday Midday F	Weekday PM D*	Weekday PM E	Weekday PM F	Saturday Midday D*	Saturday Midday E	Saturday Midday F	Saturday PM D*	Saturday PM E	Saturday PM F
Erskine Street & Vandalia Avenue	WB	LT											●				●
Vandalia Avenue & Gateway Drive	WB	L											●			●	
Fountain Avenue & Wortman Avenue	EB	LT								●			●				●
	WB	LTR								●						●	
Fountain Avenue & Liberty Avenue	SB	LTR														●	
Flatlands Avenue & Atkins Avenue	NB	LTR								●				●			●
	SB	LTR															●
Flatlands Avenue & Elton Street	NB	LTR	●						●				●				●
	SB	LTR													●		

Notes:
L = Left turn movement ;T = Through movement; R = Right turn movement; DefL = De facto left turn movement
* Unacceptable LOS D (above 45 seconds per vehicle for signalized intersections, above 30 for unsignalized intersections)
[1] Fountain Avenue
[2] Loring Avenue
[3] Linden Boulevard Mainline
[4] Kings Highway Mainline
[5] Kings Highway Service Road
[6] Remsen Avenue
[7] In the weekday PM peak hour, the westbound approach operates with a de facto left turn lane and a separate through lane.
[8] Linden Boulevard Service Road

Erskine Street

Levels of service along Erskine Street would be acceptable with all intersections analyzed operating at overall LOS C or better for all peak hours. All movements at intersections analyzed along Erskine Street would operate at acceptable levels of service, with two exceptions. The signalized westbound left turn from Gateway Drive onto Erskine Street would operate at LOS E during the weekday PM peak hour, and the unsignalized westbound through and left turn

movements at the intersection of Vandalia Avenue and Erskine Street would operate at LOS E and F during the Saturday midday and PM peak hours, respectively.

Gateway Drive

All intersections analyzed along Gateway Drive would operate at overall LOS C or better during all peak analysis hours with the exception of Gateway Drive and Gateway Plaza, which would operate at unacceptable overall LOS D during the Saturday PM peak hour. Left turns from southbound Gateway Drive onto Gateway Plaza would operate at LOS E and F during the Saturday midday and PM peak hours, respectively. Also, the westbound approach of Gateway Plaza would operate at LOS E during the Saturday PM peak hour. The intersection of Gateway Drive and Erskine Street has a movement that would also operate at an unacceptable level of service, and is described as part of the Erskine Street corridor.

Vandalia Avenue

The two unsignalized intersections analyzed along this corridor would operate at acceptable overall levels of service for all five peak analysis hours. The westbound left turn from Vandalia Avenue onto Gateway Drive would function at LOS E for the Saturday midday and PM peak hours.

The intersections of Vandalia Avenue and Erskine Street, and Vandalia Avenue and Fountain Avenue are described as part of the Erskine Street and Fountain Street corridors, respectively.

Fountain Avenue

With the exception of the intersection of Fountain Avenue and Linden Boulevard which is described as part of the Linden Boulevard corridor, all signalized intersections analyzed along Fountain Avenue would operate at overall LOS C or better. No specific traffic movements would operate at LOS E or F with the exception of southbound Fountain Avenue at its intersection with Flatlands Avenue, which would operate at LOS E during the Saturday PM peak hour.

All five unsignalized intersections analyzed along Fountain Avenue would operate at overall LOS B or better during all five peak hours. At the intersection of Fountain Avenue and Wortman Avenue, eastbound left turns and through traffic would operate at LOS E during the weekday PM and Saturday midday peak hours, and at LOS F during the Saturday PM peak hour. The westbound approach would operate at LOS E during the weekday and Saturday PM peak hours. At the intersection of Fountain Avenue and Liberty Avenue, southbound Fountain Avenue would operate at LOS E during the Saturday PM peak hour.

Flatlands Avenue

Along the Flatlands Avenue corridor, two and three signalized intersections would operate at overall LOS E or F during the Saturday midday and PM peak hours, respectively. Six signalized intersections analyzed along Flatlands Avenue have individual movements operating at LOS E or F, including the following:

- At the intersection of Flatlands Avenue and Jerome Street, the through and right turn movements of eastbound Flatlands Avenue would operate at LOS E and F during the Saturday midday and PM peak hours, respectively.
- At the intersection of Flatlands Avenue and Schenck Avenue, westbound Flatlands Avenue would operate at LOS F during the Saturday midday and PM peak hours.

- At the intersection of Flatlands Avenue and Van Siclen Avenue, left turns from westbound Flatlands Avenue onto Van Siclen Avenue would operate at LOS E during the weekday PM peak hour.
- At the intersection of Flatlands Avenue and Pennsylvania Avenue, left turns from northbound Pennsylvania Avenue and from eastbound Flatlands Avenue would operate at LOS E or F during the weekday PM, Saturday midday, and Saturday PM peak hours. Left turns from eastbound Flatlands Avenue would operate at LOS E during the weekday midday peak hour. Eastbound through movements and westbound left turns would operate at LOS E and F during the Saturday midday and PM peak hours, respectively.
- At the intersection of Flatlands Avenue and Rockaway Parkway, the southbound approach of Rockaway Parkway, and the through traffic and right turns from eastbound Flatlands Avenue would operate at LOS E during the weekday PM peak hour, and at LOS F during the Saturday midday and PM peak hours. The left turns from eastbound Flatlands Avenue would operate at LOS E during the Saturday PM peak hour. Also, the westbound approach of Flatlands Avenue would operate at LOS E and F during the Saturday midday and PM peak hours.
- At the intersection of Flatlands Avenue and Remsen Avenue, southbound left turns from Remsen Avenue, and the westbound right turn and through movements from Flatlands Avenue would operate at LOS E and F, respectively, during the Saturday PM peak hour.

All four unsignalized intersections analyzed along Flatlands Avenue would operate at acceptable overall LOS C or better during all five peak hours analyzed. However, the northbound approach of the intersection of Flatlands Avenue and Atkins Avenue would operate at LOS E or F during the weekday PM, Saturday midday, and Saturday PM peak hours. The southbound approach at the same intersection would operate at LOS F during the Saturday PM peak hour. Also, northbound Elton Street at its intersection with Flatlands Avenue would also operate at LOS E and F during the Saturday midday and PM peak hours, respectively.

Linden Boulevard

Along Linden Boulevard, two of the eight signalized intersections analyzed, Linden Boulevard and Pennsylvania Avenue, and the six-legged intersection of Linden Boulevard, Kings Highway, and Remsen Avenue, would operate at overall LOS E or F during all five peak analysis hours. Also, the intersection of Linden Boulevard, Fountain Avenue, and Loring Avenue, and the intersection of Linden Boulevard and Rockaway Avenue would operate at overall LOS E during the weekday AM and midday peak hours, respectively. Five intersections have individual movements operating at LOS E or F, including the following:

- At the intersection of Linden Boulevard, Fountain Avenue, and Loring Avenue, northbound and southbound Fountain Avenue, and northbound Loring Avenue would operate at unacceptable LOS D, E or F during all five peak hours analyzed. During the weekday AM peak hour, the left turn and through movements of the westbound Linden Boulevard mainline would operate at LOS F, and the through movement and right turns of the westbound Linden Boulevard service road would operate at LOS E.
- At the intersection of Linden Boulevard and Pennsylvania Avenue, northbound Pennsylvania Avenue left turns onto Linden Boulevard would operate at LOS F during all peak hours analyzed. Also, the northbound through movement would operate at LOS F during the Saturday midday and PM peak hours. Left turns from southbound Pennsylvania Avenue would operate at LOS F during the weekday PM, Saturday midday, and Saturday PM peak hours. Also, the southbound through and right turn movements would operate at LOS E during the weekday

AM peak hour and at LOS F during the weekday midday, PM, Saturday midday, and Saturday PM peak hours. Along the eastbound Linden Boulevard mainline, left turns would operate at LOS E or F during all peak analysis hours, and the through movement would operate at LOS E or F during the weekday PM, Saturday midday, and Saturday PM peak hours. Along the westbound Linden Boulevard mainline, left turns would operate at LOS F during the weekday AM, midday, Saturday midday, and Saturday PM peak hours, and at LOS E during the weekday PM peak hour. The westbound through movement would operate at LOS F during the weekday AM, Saturday midday, and Saturday PM peak hours, and at LOS E during the weekday PM peak hour. The through and right turn movements of the westbound Linden Boulevard service road would operate at LOS E during the weekday AM peak hour.

- At the intersection of Linden Boulevard and Rockaway Avenue, the left turn and through movements of northbound and southbound Rockaway Avenue would operate at LOS F during all peak hours analyzed. Southbound right turns would also operate at LOS F during the weekday midday and PM peak hours. Left turns from the eastbound Linden Boulevard mainline would operate at LOS E during the weekday AM, midday and PM peak analysis hours, while westbound mainline left turns would operate at LOS F during all five peak hours analyzed.
- At the intersection of Linden Boulevard and Rockaway Parkway, northbound Rockaway Parkway would operate at LOS F and E during the weekday AM and PM peak hours, respectively. Left turns from southbound Rockaway Parkway would operate at LOS F during all peak hours analyzed. Southbound through traffic and right turns would operate at LOS F during the weekday PM peak hour. Left turns from eastbound Linden Boulevard mainline would operate at LOS E or F during all five peak hours, while left turns from the westbound mainline would operate at LOS F during the weekday AM peak hour, and LOS E during the weekday midday and PM peak hours.
- All individual traffic movements of the six-legged intersection of Linden Boulevard, Kings Highway, and Remsen Avenue would continue to operate at LOS E or F during at least one peak hour, except for the stop-controlled right turn from westbound Linden Boulevard onto Kings Highway. The northbound Kings Highway mainline would operate at LOS E or F during all five peak hours while the southbound Kings Highway mainline would operate at LOS F during the weekday AM, PM, Saturday midday, and Saturday PM peak hours. The northbound Kings Highway service road would operate at LOS F and E during the weekday AM and PM peak hours, respectively, while the southbound service road would operate at LOS F during the weekday PM peak hour. Eastbound and westbound Remsen Avenue would operate at LOS E or F during all five peak hours analyzed. Eastbound Linden Boulevard would operate at LOS E or F during all peak hours. The left turn and through movements of the westbound Linden Boulevard mainline would also operate at LOS E or F during all five peak analysis hours, and right turns would operate at LOS E during the weekday PM peak hour.

The unsignalized intersection of Linden Boulevard and Elton Street would operate at overall LOS A during all peak hours analyzed.

Pennsylvania Avenue

Along the Pennsylvania Avenue corridor, the intersection of Pennsylvania Avenue and Liberty Avenue would operate at overall LOS E during the Saturday PM peak hour. Also, the intersection of Pennsylvania Avenue and Atlantic Avenue would operate at overall LOS E during the weekday AM, PM, and Saturday midday peak hours, and at LOS F during Saturday PM peak hour. Both intersections would have individual movements that would operate at LOS E or F, including the following:

- At the intersection of Pennsylvania Avenue and Liberty Avenue, northbound Pennsylvania Avenue would operate at LOS E during the weekday AM and Saturday PM peak hours. The southbound right turn and through movements would operate at LOS F during the Saturday PM peak hour. Also, westbound Liberty Avenue would operate at LOS E during the weekday AM, PM, and Saturday PM peak hours.
- At the intersection of Pennsylvania Avenue and Atlantic Avenue, left turns from northbound Pennsylvania Avenue would operate at LOS F during the weekday AM, midday, Saturday midday, and Saturday PM peak hours, and at LOS E during the weekday PM peak hour. The northbound through and right turn movements would operate at LOS E during the weekday AM, and at LOS F during the Saturday midday and PM peak hours. The southbound left turns from Pennsylvania Avenue would operate at LOS E or F during the weekday PM, Saturday midday, and Saturday PM peak hours. The southbound through and right turn movements would operate at LOS F during the weekday AM and Saturday PM peak hours, and at LOS E during the weekday PM and Saturday midday peak hours. All movements along westbound Atlantic Avenue would operate at LOS F during the weekday AM and Saturday PM peak hours. The through and right turn movements of eastbound Atlantic Avenue would operate at LOS F during the weekday PM, Saturday midday, and Saturday PM peak hours.

The intersections of Pennsylvania Avenue with Flatlands Avenue and with Linden Boulevard are discussed as part of the Flatlands Avenue and Linden Boulevard corridors, respectively.

HIGHWAY ANALYSIS

The Shore Parkway would experience moderate volume increases due to increased background traffic accessing the Parkway via the Erskine Street interchange. Projected volume increases along the Shore Parkway and the Erskine Street interchange on and off-ramps would range from approximately 280 to 390 vph during the weekday and weekend peak hours for the 2011 No Build condition.

Table 16-13 provides 2011 No Build levels of service, speeds and densities for the Shore Parkway near the Erskine Street interchange. The mainline highway sections within the influence of merge and diverge areas analyzed would operate at LOS D and C during the weekday AM and midday peak hours, respectively. Sections of the eastbound Shore Parkway between the Erskine Street off-ramp and on-ramp, and past the on-ramp would operate at LOS E and F, respectively, during the weekday PM, Saturday midday, and Saturday PM peak hours. Also, the eastbound section of the Shore Parkway prior to the Erskine Street off-ramp would operate at LOS E during the Saturday midday and PM peak hours. During the weekday PM peak hour, the westbound Shore Parkway would deteriorate to LOS E in the section prior to the Erskine Street off-ramp. Although the densities along the various segments of the Shore Parkway would increase, speeds would not be significantly affected.

PARKING

As described in the existing conditions analysis, the only off-street parking facility within the study area is the parking lot for the existing Gateway Center that has a capacity of 2,685 spaces. 2011 No Build parking occupancies for this facility were determined by applying a background traffic growth rate of one percent per year to the existing parking occupancies. Table 16-14 provides the expected weekday and Saturday occupancies in year 2011.

Table 16-13
2011 No Build Conditions on the Shore Parkway

Analysis Location	Speed (mph)	Density (pc/mi/ln)	LOS
Weekday AM			
Eastbound before the Erskine Street Off-Ramp	49.0	33.9	D
Eastbound between the Erskine Street Off-Ramp and On-Ramp	53.4	29.1	D
Eastbound after the Erskine Street On-Ramp	53.4	29.1	D
Westbound before the Erskine Street Off-Ramp	54.1	32.7	D
Westbound between the Erskine Street Off-Ramp and On-Ramp	53.3	30.9	D
Westbound after the Erskine Street On-Ramp	53.2	31.0	D
Weekday Midday			
Eastbound before the Erskine Street Off-Ramp	55.2	24.8	C
Eastbound between the Erskine Street Off-Ramp and On-Ramp	55.0	22.0	C
Eastbound after the Erskine Street On-Ramp	53.9	24.1	C
Westbound before the Erskine Street Off-Ramp	55.0	23.5	C
Westbound between the Erskine Street Off-Ramp and On-Ramp	54.9	20.3	C
Westbound after the Erskine Street On-Ramp	54.5	22.2	C
Weekday PM			
Eastbound before the Erskine Street Off-Ramp	54.2	32.5	D
Eastbound between the Erskine Street Off-Ramp and On-Ramp	42.5	42.5	E
Eastbound after the Erskine Street On-Ramp	38.1	48.5	F
Westbound before the Erskine Street Off-Ramp	50.9	35.3	E
Westbound between the Erskine Street Off-Ramp and On-Ramp	50.3	32.1	D
Westbound after the Erskine Street On-Ramp	50.1	33.9	D
Saturday Midday			
Eastbound before the Erskine Street Off-Ramp	46.6	36.6	E
Eastbound between the Erskine Street Off-Ramp and On-Ramp	44.4	35.7	E
Eastbound after the Erskine Street On-Ramp	35.5	45.5	F
Westbound before the Erskine Street Off-Ramp	53.9	30.5	D
Westbound between the Erskine Street Off-Ramp and On-Ramp	53.6	26.4	C
Westbound after the Erskine Street On-Ramp	53.3	28.7	D
Saturday PM			
Eastbound before the Erskine Street Off-Ramp	46.3	40.2	E
Eastbound between the Erskine Street Off-Ramp and On-Ramp	42.5	42.1	E
Eastbound after the Erskine Street On-Ramp	35.0	50.7	F
Westbound before the Erskine Street Off-Ramp	53.5	33.6	D
Westbound between the Erskine Street Off-Ramp and On-Ramp	52.7	29.6	D
Westbound after the Erskine Street On-Ramp	52.4	32.3	D

Note: pc/mi/ln = passenger cars per mile per lane

Table 16-14 indicates that 15 percent occupancy would occur during the weekday AM peak hour. The occupancy would remain fairly consistent throughout the day and would be about 49 percent during the weekday midday peak period and approximately 42 percent during the weekday PM peak hour. The highest activity would occur during the Saturday midday peak period when the occupancy would be 76 percent.

The background growth rate of one percent was also applied to on-street parking occupancies. Table 16-15 summarizes the projected on-street parking occupancies of the existing roadway network for the 2011 No Build condition. Peak occupancy of about 67 percent of on-street spaces would occur during the weekday AM peak period. The occupancy would remain consistent through the weekday midday and decrease to about 56 percent during the weekday PM peak period. The on-street parking occupancy during the Saturday midday and PM peak periods would be approximately 54 and 58 percent, respectively.

Table 16-14
2011 No Build Off-Street Parking at Gateway Center Phase I

Time Period	Capacity	Number of Spaces Occupied	Percent Occupied
Weekday			
8AM – 9AM	2,685	413	15
9AM – 10AM	2,685	663	25
10AM – 11AM	2,685	932	35
11AM – 12PM	2,685	1,161	43
12PM – 1PM	2,685	1,314	49
1PM – 2PM	2,685	1,329	49
2PM – 3PM	2,685	1,268	47
3PM – 4PM	2,685	1,110	41
4PM – 5PM	2,685	1,093	41
5PM – 6PM	2,685	1,119	42
6PM – 7PM	2,685	1,218	45
7PM – 8PM	2,685	1,198	45
Saturday			
11AM – 12PM	2,685	1,356	51
12PM – 1PM	2,685	1,590	59
1PM – 2PM	2,685	1,811	67
2PM – 3PM	2,685	2,014	75
3PM – 4PM	2,685	2,040	76
4PM – 5PM	2,685	1,979	74
5PM – 6PM	2,685	1,829	68

Table 16-15
2011 No Build On-Street Parking Summary (Existing Roadway Network)

Peak Period	Approximate Legal Capacity	Number of Spaces Occupied	Percent Occupied
Weekday 7-10 AM	5,940	3,978	67
Weekday 11-2 PM	5,906	3,863	65
Weekday 4-7 PM	6,126	3,422	56
Saturday 11-2 PM	6,142	3,291	54
Saturday 4-7 PM	6,142	3,588	58

Also, the new roadway network within the Project Site is expected to provide approximately 960 new on-street parking spaces. These spaces would serve the uses that would be in place by year 2011. The 378 residential units expected to be completed by 2011 would provide approximately 150 parking spaces. This, along with the new on-street spaces, would ensure that adequate parking is provided for the residential land use as, according to 2000 Census data for Brooklyn Community District 5, the average vehicle ownership per household is 0.51.

E. 2011 PROBABLE IMPACTS OF THE PROPOSED ACTION

TRAFFIC

By 2011, the Proposed Action would result in a total of 1,027 residential units, including the 378 units already under construction; a 630,000-square-foot shopping center (Gateway Center Phase II), and 68,000 square feet of local retail along Flatlands Avenue and Elton Avenue. This section presents the analysis of future traffic and parking conditions with the Proposed Project in place, i.e., the future Build condition. It includes a discussion of the volume of vehicle trips expected to be generated under Build conditions, their distribution within the study area roadway network,

analysis of future traffic levels of service, and the identification of significant impacts per *CEQR Technical Manual* guidelines. Mitigation measures are discussed in Chapter 22, "Mitigation."

ROADWAY NETWORK

Under the Proposed Action, the future roadway network would be constructed similarly to that which was previously described in Section D, "2011 the Future without the Proposed Action." The deviations from the 2011 No Build roadway network are discussed below.

Modified Intersections

A detailed signal warrant analysis indicates that a warrant would be satisfied in the 2011 Build condition for the following modified intersections:

- Flatlands Avenue and Atkins Avenue
- Flatlands Avenue and Elton Street
- Flatlands Avenue and Jerome Street

The intersections of Flatlands Avenue and Essex Street, and Flatlands Avenue and Linwood Street would remain unsignalized in the 2011 Build condition.

Flatlands Avenue and Jerome Street. As previously described in Section D, "2011 the Future without the Proposed Action," Gateway Drive would terminate at the intersection of Flatlands Avenue and Jerome Street, and Schenck Avenue would terminate at Flatlands Avenue. This would result in the elimination of the northbound approach of Schenck Avenue at its intersection with Flatlands Avenue, and this intersection would operate as a three-legged intersection. Thus, the main existing access point to the Project Site along Flatlands Avenue would be shifted from Schenck Avenue to Jerome Street.

Due to this change, northbound traffic that previously traveled through the intersection of Flatlands Avenue and Schenck Avenue would have to turn left from Jerome Street and travel west along Flatlands Avenue, and then turn right from Flatlands Avenue onto Schenck Avenue. Geometric and operational changes would be required at the intersection of Flatlands and Jerome Street to accommodate the shift in volumes. Similarly, vehicles traveling south to access the site would have to use Jerome Street instead of Schenck Avenue.

In the 2011 Build condition, eastbound Flatlands Avenue would have one 10-foot-wide exclusive left turn lane, two 10-foot-wide through lanes, and one 12-foot-wide exclusive right turn lane. Parking would be prohibited along this approach. Westbound Flatlands Avenue is assumed to have one 10-foot-wide exclusive left turn lane, one 12-foot-wide through lane, and one 20-foot-wide shared through and right turn lane with curbside parking. Both eastbound and westbound approaches would have two 12-foot-wide receiving lanes with room for an additional 8 feet for on-street curbside parking. Northbound Jerome Street is assumed to operate with two 10-foot-wide exclusive left turn lanes, one 10-foot-wide shared through and right turn lane, and two 10-foot-wide receiving lanes. Curbside parking would be prohibited along this approach. In order for the intersection of Flatlands Avenue and Jerome Street to accommodate the heavy shift in traffic, further modifications would be needed -- Jerome Street would need to be converted to a one-way northbound street north of Flatlands Avenue. The width of the existing roadway is 50 feet, allowing for two northbound 17-foot-wide receiving lanes with an additional 8 feet for curbside parking on both sides of the street.

Flatlands Avenue and Schenck Avenue. Similar to the intersection of Flatlands Avenue and Jerome Avenue, this intersection would require geometric and operational changes to efficiently accommodate the shift in volume. In the 2011 Build condition, eastbound Flatlands Avenue is assumed to consist of three through lanes (two 10-foot-wide and one 12-foot-wide) and three receiving lanes (two 10-foot-wide and one 12-foot-wide). The westbound approach would consist of two 10-foot-wide through lanes and one 12-foot-wide exclusive right turn lane. Eastbound left turns are assumed to be prohibited. Southbound Schenck Avenue is assumed to operate with one 12-foot-wide exclusive left turn lane, one 11-foot-wide lane for left and right turns, and one 12-foot-wide receiving lane with room for an additional 8 feet on both sides of the street for on-street curbside parking.

New Intersections

A detailed signal warrant analysis indicates that a warrant would be satisfied in the 2011 Build condition for the intersection of Erskine Street and Vandalia Avenue. The intersections of Erskine Street and Egan Street, Vandalia Avenue and Gateway Drive, Vandalia Avenue and Elton Street, and Fountain Avenue and Egan Street would remain unsignalized.

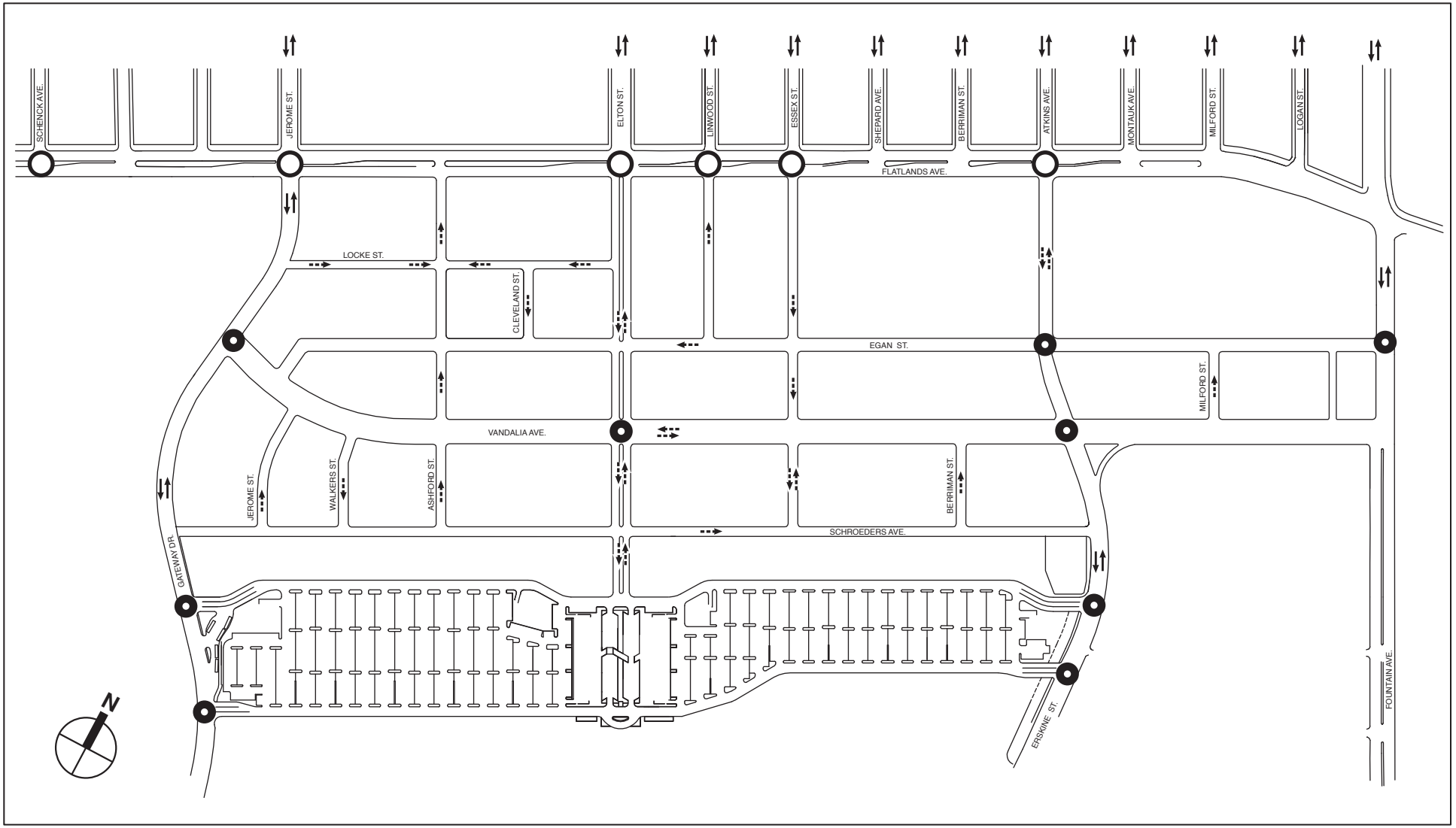
Vandalia Avenue and Gateway Drive. Westbound left turns from Vandalia Avenue are assumed to be prohibited to maintain acceptable intersection operation, as the intersection would remain unsignalized. The westbound approach is assumed have one 19-foot-wide exclusive right turn lane and a 22-foot-wide raised median.

In addition, a new parking lot would be constructed to accommodate the proposed expansion of the shopping center. Four additional new intersections would be created to provide access to and from the new parking lot, two along Erskine Street and two along Gateway Drive. These intersections would be located between Gateway Plaza and Vandalia Avenue. The two northern intersections would provide access to the rear of the parking lot and the two southern intersections would provide access to the front end of the parking lot. The four new intersections are identified in Figure 16-15.

Erskine Street and Northeast Parking Lot Entrance/Exit. This intersection would provide access to the rear of the new Gateway Estates parking lot from Erskine Street. It would be a three-legged unsignalized intersection with the parking lot exit being stop-controlled. The parking lot exit is assumed to consist of one 15-foot-wide exclusive left turn lane, one 15-foot-wide exclusive right turn lane, and one 14-foot-wide receiving (inbound) lane. The northbound Erskine Street approach is assumed to operate with one 10-foot-wide exclusive left turn lane and two 11-foot-wide through lanes, with two 11-foot-wide southbound receiving lanes. Southbound Erskine Street would operate with one through lane, one wide shared through and right turn lane, two receiving lanes, and a 6-foot-wide median. All lanes along southbound Erskine Street would be 12 feet wide.

Erskine Street and Southeast Parking Lot Entrance/Exit. This intersection would provide access to the front of the new parking lot. It is expected to be signalized since a detailed warrant analysis performed for this intersection indicates that the peak hour warrant would be satisfied in the 2011 Build condition. The lane configurations and geometry at this intersection are assumed to be identical to the intersection of Erskine Street and the Northeast Parking Lot Entrance/Exit described above except that the receiving lane within the parking lot would be 15 feet wide.

Gateway Drive and Northwest Parking Lot Entrance/Exit. This intersection would be a three-legged intersection and would provide access to the rear of the new Gateway Estates parking lot from Gateway Drive. It is expected to be signalized since a detailed warrant analysis performed at this intersection indicates that the peak hour warrant would be satisfied for the 2011 Build condition. The parking lot entrance/exit would consist of one 15-foot-wide exclusive left turn lane and one 15-foot-wide exclusive right turn lane, and it would have one 15-foot-wide



NOT TO SCALE

→ *Existing Street Direction*

⇢ *Proposed Street Direction*

○ *Modified Intersection*

● *New Intersection*

GATEWAY ESTATES II

Future Build Roadway Network

Figure 16-15

receiving lane within the parking lot. Northbound Gateway Drive is assumed to operate with one through lane, one shared through and right turn lane, and would have two receiving lanes southbound. Southbound Gateway Drive is assumed to operate with one shared through and left turn lane, one through lane, and two receiving lanes. All lanes along northbound and southbound Gateway Drive would be 11 feet wide.

Gateway Drive and Southwest Parking Lot Entrance/Exit. This intersection would provide access to the front of the new parking lot from Gateway Drive. It is expected to be signalized since a detailed warrant analysis performed for this intersection indicates that the peak hour warrant would be satisfied in the 2011 Build condition. The lane configurations and geometry at this intersection are assumed to be identical to the intersection of Gateway Drive and the Northeast Parking Lot Entrance/Exit described above.

TRAVEL DEMAND ESTIMATES AND GENERATED VOLUMES

By 2011, a total of 1,027 residential dwelling units, 630,000 square feet of destination retail space, and 84,000 square feet of local retail space would be developed.

Trip Generation

A travel demand analysis was prepared to estimate the volume of trips associated with elements of the Proposed Action to be developed by 2011. Table 16-16 shows the travel demand factors for the residential, destination retail, and local retail uses. These factors are further described below.

- Residential: Trips associated with the residential component were estimated using the rates described in Section D, "2011 The Future without the Proposed Action."
- Destination Retail: The travel demand factors used to estimate the trips associated with the Proposed Project's destination retail component are the same as those used for the destination retail of the off-site development projects, as previously discussed in Section D, "2011 The Future without the Proposed Action."
- Local Retail: For local retail space, the weekday daily trip rate of 205 trips per 1,000 square feet originates from *Urban Space for Pedestrians*. Weekday modal split (15 percent by auto, 5 percent by bus, and 80 percent by walking) and directional distribution (63 percent "in" during the AM peak hour, 55 percent "in" during the midday peak hour, and 47 percent "in" during the PM peak hour) comes from the 1996 FEIS. A weekday temporal distribution of 2.3, 7.9, and 10.7 percent during the AM, midday, and PM peak hours, respectively was obtained from the *Greenpoint-Williamsburg Rezoning FEIS*. Vehicle occupancies (1.40 persons per auto and 1.64 persons per taxi) were assumed to be similar to the destination retail rates derived from the survey at the existing Gateway Center.

  Weekday delivery trip generation (0.35 daily trips per dwelling unit) and temporal distribution rates (6, 11, and 0 percent during the AM, midday, and PM peak hours, respectively) come from the *Greenpoint-Williamsburg Rezoning FEIS*.

Table 16-16
2011 Build Travel Demand Factors

	Residential	Destination Retail	Local Retail
Weekday			
Person Trip Generation Rate	12.5[1] per DU	1.55 - AM[5] 5.03 - Midday[5] 4.89 - PM[5] per 1,000 SF	205[4] per 1,000 SF
Temporal Distribution			
AM Peak	9.1%[2]	NA[5]	2.3%[1]
Midday Peak	4.7%[2]	NA[5]	7.9%[1]
PM Peak	10.7%[2]	NA[5]	10.7%[1]
Linked Trip Credit	0.0%	25.0%	25.0%
Modal Split			
Auto	48.0%[3]	95.1%[5]	15.0%[1]
Taxi	3.0%[3]	1.5%[5]	0.0%[1]
Subway/Bus	30.0%[3]	1.2%[5]	0.0%[1]
Bus Only	13.0%[3]	1.2%[5]	5.0%[1]
Walk Only	6.0%[3]	1.0%[5]	80.0%[1]
Vehicle Occupancy			
Auto	1.15[3]	1.40[5]	1.40[5]
Taxi	1.15[3]	1.65[5]	1.65[5]
Directional Split (Ins)			
AM Peak	15.0%[2]	62.5%[5]	63.0%[1]
Midday Peak	50.0%[2]	53.6%[5]	55.0%[1]
PM Peak	70.0%[2]	51.8%[5]	47.0%[1]
Truck Trip Generation Rate	0.06[2] per DU	0.35[1] per 1,000 SF	0.35[1] per 1,000 SF
Truck Temporal Distribution			
AM Peak	6.0%[4]	13.0%[1]	6.0%[1]
Midday Peak	7.0%[4]	9.0%[1]	11.0%[1]
PM Peak	10.0%[4]	0.0%[1]	0.0%[1]
Truck Trip Directional Split (Ins)			
AM Peak	50.0%	50.0%	50.0%
Midday Peak	50.0%	50.0%	50.0%
PM Peak	50.0%	50.0%	50.0%
Saturday			
Person Trip Generation Rate	12.5[1]	8.19 – Midday[6] 11.38 – PM[6]	488[5]
	per DU	per 1,000 SF	per 1,000 SF
Temporal Distribution			
Saturday Midday Peak	8.2%[2]	NA[6]	9.7%[1]
Saturday PM Peak	7.2%[2]	NA[6]	9.7%[1]
Linked Trip Credit	0.0%	25.0%	25.0%
Modal Split (Saturday)			
Auto	48.0%[3]	93.5%[6]	15.0%[1]
Taxi	3.0%[3]	3.5%[6]	0.0%[1]
Subway/Bus	30.0%[3]	1.0%[6]	0.0%[1]
Bus Only	13.0%[3]	1.0%[6]	5.0%[1]
Walk Only	6.0%[3]	1.0%[6]	80.0%[1]
Vehicle Occupancy			
Auto	1.15[3]	1.72[6]	1.72[6]
Taxi	1.15[3]	1.75[6]	1.75[6]
Directional Split (Ins)			
Saturday Midday Peak	50.0%[2]	53.6%[6]	50.0%[1]
Saturday PM Peak	50.0%[2]	47.5%[6]	50.0%[1]
Truck Trip Gen Rate	0.01[4] per DU	0.02[4] per 1,000 SF	0.02[4] per 1,000 SF
Truck Temporal Distribution			
Saturday Midday Peak	9.0%[4]	11.0%[4]	11.0%[4]
Saturday PM Peak	2.0%[4]	2.0%[4]	2.0%[4]
Truck Trip Directional Split (Ins)			
Saturday Midday Peak	50.0%	50.0%	50.0%
Saturday PM Peak	50.0%	50.0%	50.0%

Notes:
1. *Gateway Estates FEIS* (1996)
2. The *Jamaica Plan DEIS* (2007)
3. *Census 2000* (U.S. Department of Commerce: Bureau of the Census, 2000)
4. *Atlantic Yards: Arena and Redevelopment Project FEIS* (2006)
5. *Urban Space for Pedestrians*, Pushkarev and Zupan, 1973
6. Surveys conducted by AKRF, Inc. at Gateway Center (November 2006) Note: temporal distribution not included (for destination retail) since rates are specific to individual peak hours.

A Saturday rate of 488 daily trips per 1,000 square feet was obtained from *Urban Space for Pedestrians*. Modal and directional splits were assumed to be similar to weekday rates. The temporal distribution percentage for the Saturday midday and PM peak hours was obtained from the 1996 FEIS. Vehicle occupancy rates (1.72 persons per auto and 1.75 persons per taxi) were derived from Saturday data from the Gateway Estates shopping center survey. Saturday delivery trip generation (0.02 daily trips per dwelling unit) and temporal distribution (11 percent and 2 percent during Saturday midday and PM peak hours, respectively) were obtained from the *Atlantic Yards Arena and Redevelopment Project FEIS*. A 25 percent trip linkage was applied during all weekday and Saturday peak hours in accordance with the 2001 *CEQR Technical Manual* procedures.

Generated Traffic Volumes

As shown in Table 16-17, these elements of the Proposed Project to be built by 2011 would generate 1,152 vph, 2,086 vph, 2,379 vph, 2,971 vph, and 3,771 vph during the weekday AM, midday, PM, Saturday midday, and Saturday PM peak hours, respectively.

Table 16-17
2011 Build Conditions: Vehicular Trip Generation

Site	Weekday AM			Weekday Midday			Weekday PM			Saturday Midday			Saturday PM		
	In	Out	Sum	In	Out	Sum	In	Out	Sum	In	Out	Sum	In	Out	Sum
Auto/Truck:															
Residential	77	419	496	130	130	260	408	178	586	225	225	450	194	194	388
Destination Retail	340	216	556	886	769	1,655	813	756	1,569	1,128	977	2,105	1,388	1,535	2,923
Local Retail	22	14	36	63	52	115	69	79	148	130	130	260	130	130	260
Taxis (All Uses)	32	32	64	28	28	64	38	38	76	78	78	156	100	100	200
Total	**471**	**681**	**1,152**	**1,107**	**979**	**2,086**	**1,328**	**1,051**	**2,379**	**1,561**	**1,410**	**2,971**	**1,812**	**1,959**	**3,771**

Subsequent to preparation of the travel demand analysis for this FEIS, the development program was modified slightly. The travel demand analysis was based on a program of 84,000 square feet of local retail use. However, as described in Chapter 1, 'Project Description," the proposed program is now expected to include 68,000 square feet of local retail use, but the other proposed uses in the 2011 build year analysis were not changed. As per discussions with NYCDOT, the traffic and parking analyses were based on the original development program since this would be slightly more conservative.

Trip Assignment

Vehicle trips generated by the Proposed Project were assigned to the roadway network as follows:

- Residential Auto Trips: The assignment patterns for residential auto trips are described in Section D, "2011 The Future without the Proposed Action."
- Destination Retail Auto Trips: The assignment patterns for trips associated with destination retail are described in Section D, "2011 The Future without the Proposed Action." The patterns for the destination retail component of the Proposed Action are the same as those used for the destination retail of the off-site development projects.
- Local Retail Auto Trips: Local retail uses are typically comprised of neighborhood "mom and pop" stores (i.e., florists, cleaners, drug store, video rental etc.). Hence, most local retail trips would be generated from the immediate neighborhood. Approximately 50 percent of the trips were assigned from residential parcels within the proposed development site, while

50 percent were assigned from surrounding residential sections north of Flatlands Avenue and the adjacent Starrett City.

- Taxis: The assignment of taxi trips is described in Section D, "2011 The Future without the Proposed Action."
- Trucks: The assignment of delivery trips is described in Section D, "2011 The Future without the Proposed Action."

The 2011 Build year traffic volumes were developed by adding the project-generated volumes to the 2011 No Build volumes. The 2011 Build volume maps are presented in Appendix E, "Traffic Technical Appendix."

INTERSECTION LEVEL OF SERVICE ANALYSIS

The 2011 Build level of service analyses have been compared to the 2011 No Build condition to assess potential significant traffic impacts of the Proposed Project. The assessment of potential significant traffic impacts of the Proposed Project is based on significant impact criteria defined in the *CEQR Technical Manual*. For No Build LOS A, B, or C conditions that deteriorate to unacceptable LOS D, E, or F in the future Build condition, a significant traffic impact is defined. For future No Build LOS A, B, or C conditions that deteriorate to unacceptable LOS D, mitigation to mid-LOS D (45.0 seconds of delay for signalized intersections and 30.0 seconds of delay for unsignalized intersections) is required.

For a No Build LOS D, an increase of Build delay by 5 or more seconds 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 Build delay is significant. However, if a No Build LOS F condition already has delays in excess of 120 seconds, an increase in Build delay of more than 1 second is considered significant, unless the proposed action would generate fewer than 5 vehicles through that intersection in the peak hour (signalized intersections) and fewer than 5 passenger-car-equivalents (PCEs) in the peak 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.

Table 16-18 provides an overview of the levels of service and significant adverse impacts that would characterize the traffic study area during the peak hours, and detailed intersection capacity analyses are presented in Appendix E, "Traffic Technical Appendix." A summary description is also provided below.

- In the weekday AM peak hour, four signalized intersections would operate at overall LOS E or F, and four signalized intersections would operate at overall unacceptable LOS D (two of the six intersections shown in Table 16-18 would be within the "acceptable" delays of LOS D) in the Build condition. Thirty-seven signalized traffic movements out of a total of approximately 214 traffic movements would operate at LOS E or F conditions, and 10 signalized intersections would have movements that would be significantly impacted, five of which are located in the primary study area.
- In the weekday midday peak hour, five signalized intersections would operate at overall LOS E or F in the Build condition, and one would operate at unacceptable LOS D (three of the four intersections shown in Table 16-18 would be within the "acceptable" delays of LOS D). Twenty-eight signalized traffic movements would operate at LOS E or F conditions, and 10 signalized intersections would have movements that would be significantly impacted, five of which are located in the primary study area.

Table 16-18
2011 No Build and Build Intersection Level of Service Summary

Level of Service	2011 No Build					2011 Build				
	Weekday			Saturday		Weekday			Saturday	
	AM	Midday	PM	Midday	PM	AM	Midday	PM	Midday	PM
Signalized Intersections (27 Total in No Build and 33 Total in Build)										
Overall Intersection LOS A/B	13	12	11	11	9	18	16	15	11	9
Overall Intersection LOS C	4	9	8	7	6	5	8	6	10	8
Overall Intersection LOS D*	6	3	5	4	5	6	4	6	5	3
Overall Intersection LOS E/F	4	3	3	5	7	4	5	6	7	13
Number of Signalized Intersection Movements at LOS E or F (of approximately 181 total in No Build and 214 total in Build)	35	23	43	40	49	37	28	53	49	59
Number of Signalized Intersections with Significant Impacts	—	—	—	—	—	10	10	11	13	15
Unsignalized Intersections (15 Total in No Build and 13 Total in Build)										
Overall Intersection LOS A/B	15	15	15	15	13	13	13	12	12	11
Overall Intersection LOS C	0	0	0	0	2	0	0	1	1	2
Overall Intersection LOS D*	0	0	0	0	0	0	0	0	0	0
Overall Intersection LOS E/F	0	0	0	0	0	0	0	0	0	0
Number of Unsignalized Intersection Movements at LOS E or F (of approximately 50 total in No Build and 31 total in Build)	0	0	3	5	8	1	0	2	2	5
Number of Unsignalized Intersections with Significant Impacts	—	—	—	—	—	0	0	1	1	1

Notes:
* This table shows intersections that operate at acceptable and unacceptable levels of service. Only intersections that operate at unacceptable levels of service are discussed in detail.
Three intersections analyzed as unsignalized in the 2011 No Build condition would be signalized in the Build condition. Three new signalized intersections and one new unsignalized intersection were added to the 2011 Build analysis.

- In the weekday PM peak hour, six signalized intersections would operate at overall LOS E or F and two signalized intersections would operate at overall unacceptable LOS D (four of the six intersections shown in Table 16-18 would be within the "acceptable" delays of LOS D) in the Build condition. Fifty-three traffic movements would operate at LOS E or F conditions, and 11 signalized intersections would have movements that would be significantly impacted, five of which are located in the primary study area.
- In the Saturday midday peak hour, seven signalized intersections would operate at overall LOS E or F in the Build condition, and two would operate at overall unacceptable LOS D (three of the five intersections shown in Table 16-18 would be within the "acceptable" delays of LOS D). Forty-nine traffic movements would operate at LOS E or F conditions, and 13 intersections would have movements that would be significantly impacted, six of which are located in the primary study area.
- In the Saturday PM peak hour, thirteen signalized intersections would operate at overall LOS E or F in the Build condition, and one would operate at overall unacceptable LOS D (two of the three intersections shown in Table 16-18 would be within the "acceptable" delays of LOS D). Fifty-nine traffic movements would operate at LOS E or F conditions, and 15 intersections would have movements that would be significantly impacted, eight of which are located in the primary study area.
- All unsignalized intersections would operate at overall LOS C or better for all peak hours. In the weekday AM and midday peak hours, one intersection would have movements that would be significantly impacted. In the weekday PM, Saturday midday, and Saturday PM peak hours, two intersections would have movements that would be significantly impacted.

Overall projected levels of service for the 2011 Build condition are presented in Figures 16-16a through 16-20b, and detailed mitigation measures for significantly impacted locations are discussed in Chapter 22, "Mitigation." Table 16-19 provides the details of individual traffic

12.30.08

0 1000 2000 FEET

SCALE

Project Site

Fresh Creek Urban Renewal Area Boundary

LOS A or B

LOS C

LOS D

LOS E or F

Unsignalized Intersection

Significant Impacts

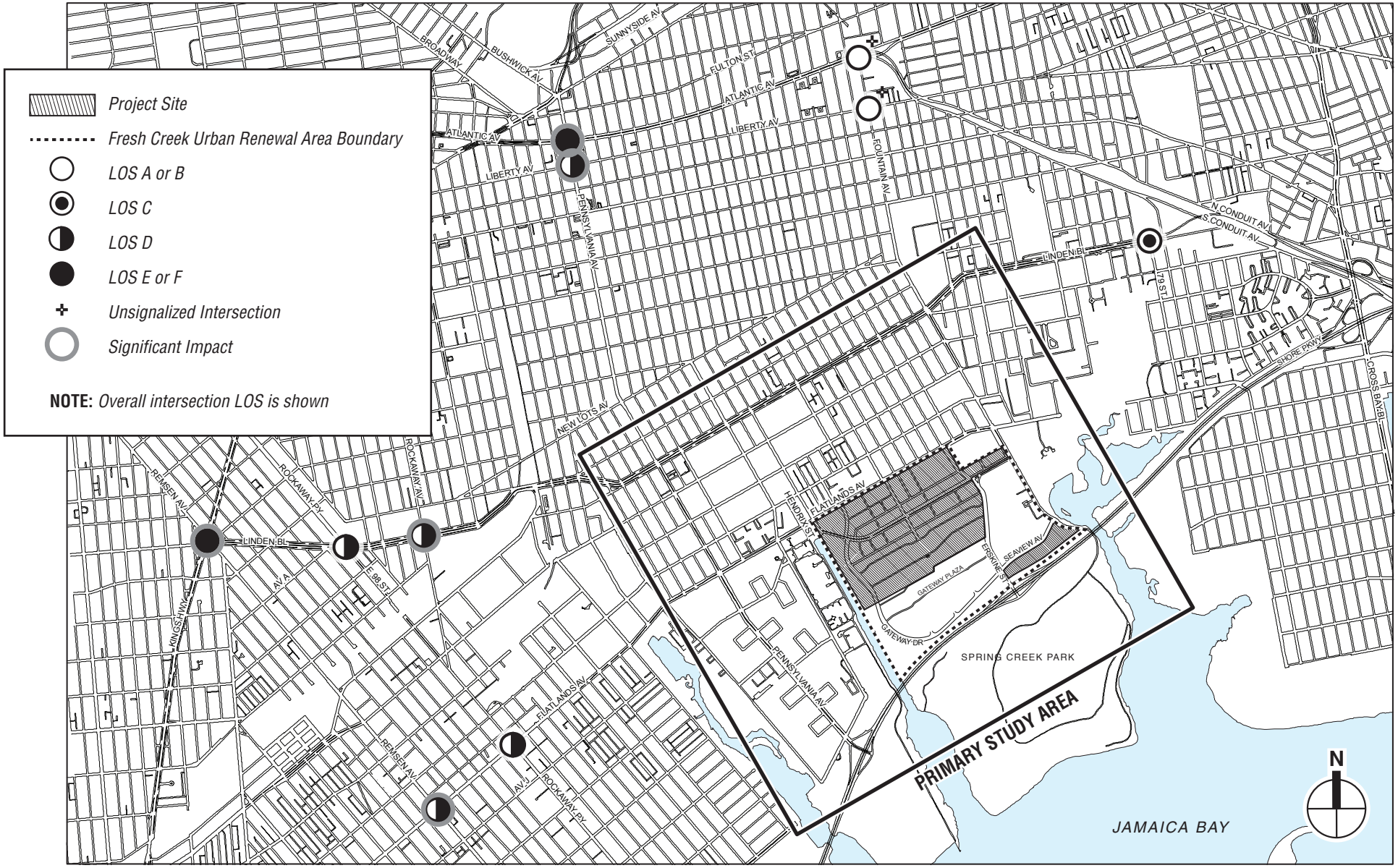
NOTE: *Overall intersection LOS is shown*

2011 Build Weekday
AM Peak Hour Traffic Level of Service
Primary Study Area

GATEWAY ESTATES II

Figure 16-16a

12.30.08



2011 Build Weekday
AM Peak Hour Traffic Level of Service
Secondary Study Area

Figure 16-16b

12.30.08

0 1000 2000 FEET

SCALE

Project Site

Fresh Creek Urban Renewal Area Boundary

LOS A or B

LOS C

LOS D

LOS E or F

Unsignalized Intersection

Significant Impacts

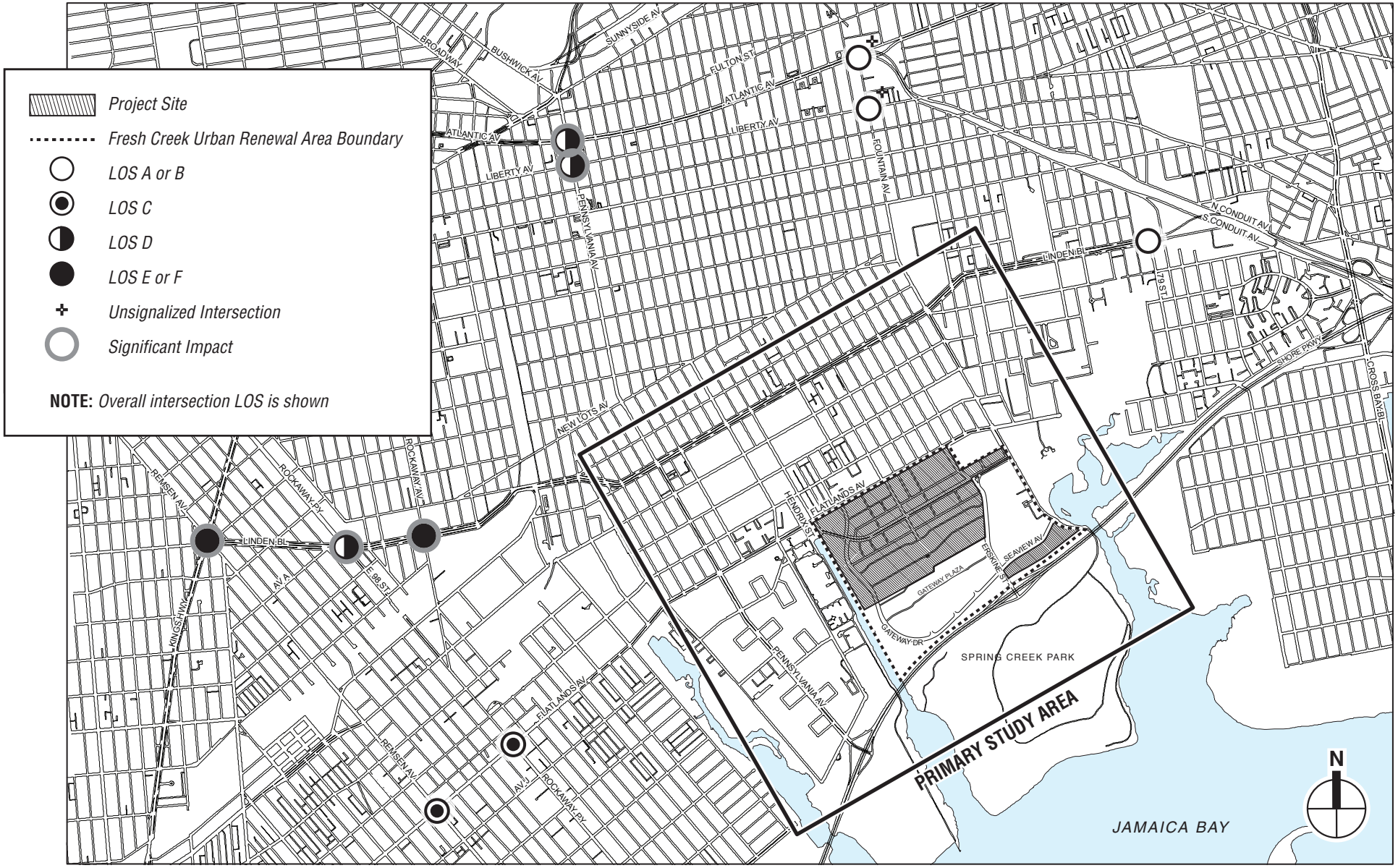
NOTE: *Overall intersection LOS is shown*

2011 Build Weekday
Midday Peak Hour Traffic Level of Service
Primary Study Area

GATEWAY ESTATES II

Figure 16-17a

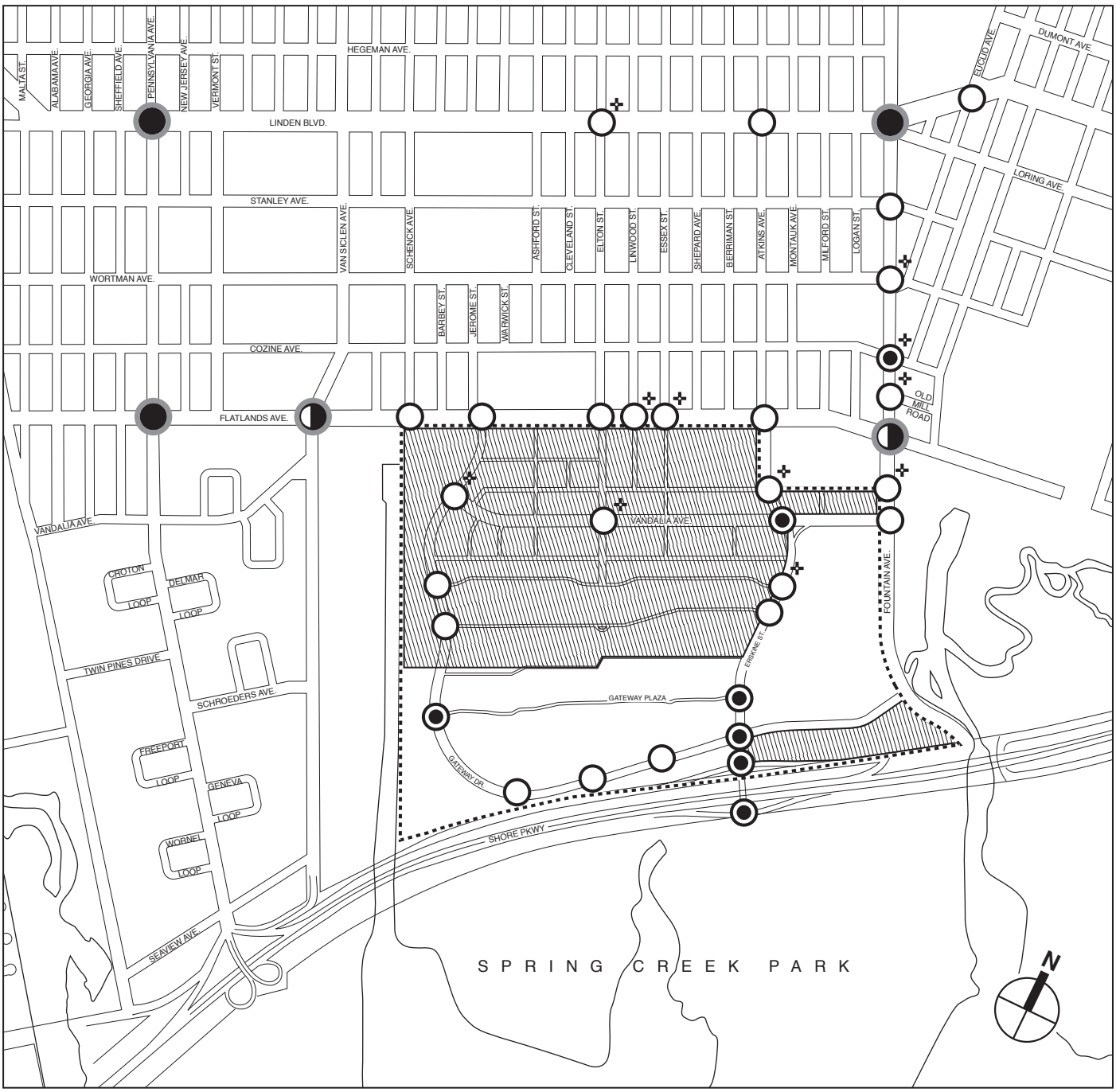
12.2.08



2011 Build Weekday
Midday Peak Hour Traffic Level of Service
Secondary Study Area

Figure 16-17b

12.30.08



0 1000 2000 FEET

SCALE

Project Site

Fresh Creek Urban Renewal Area Boundary

LOS A or B

LOS C

LOS D

LOS E or F

Unsignalized Intersection

Significant Impacts

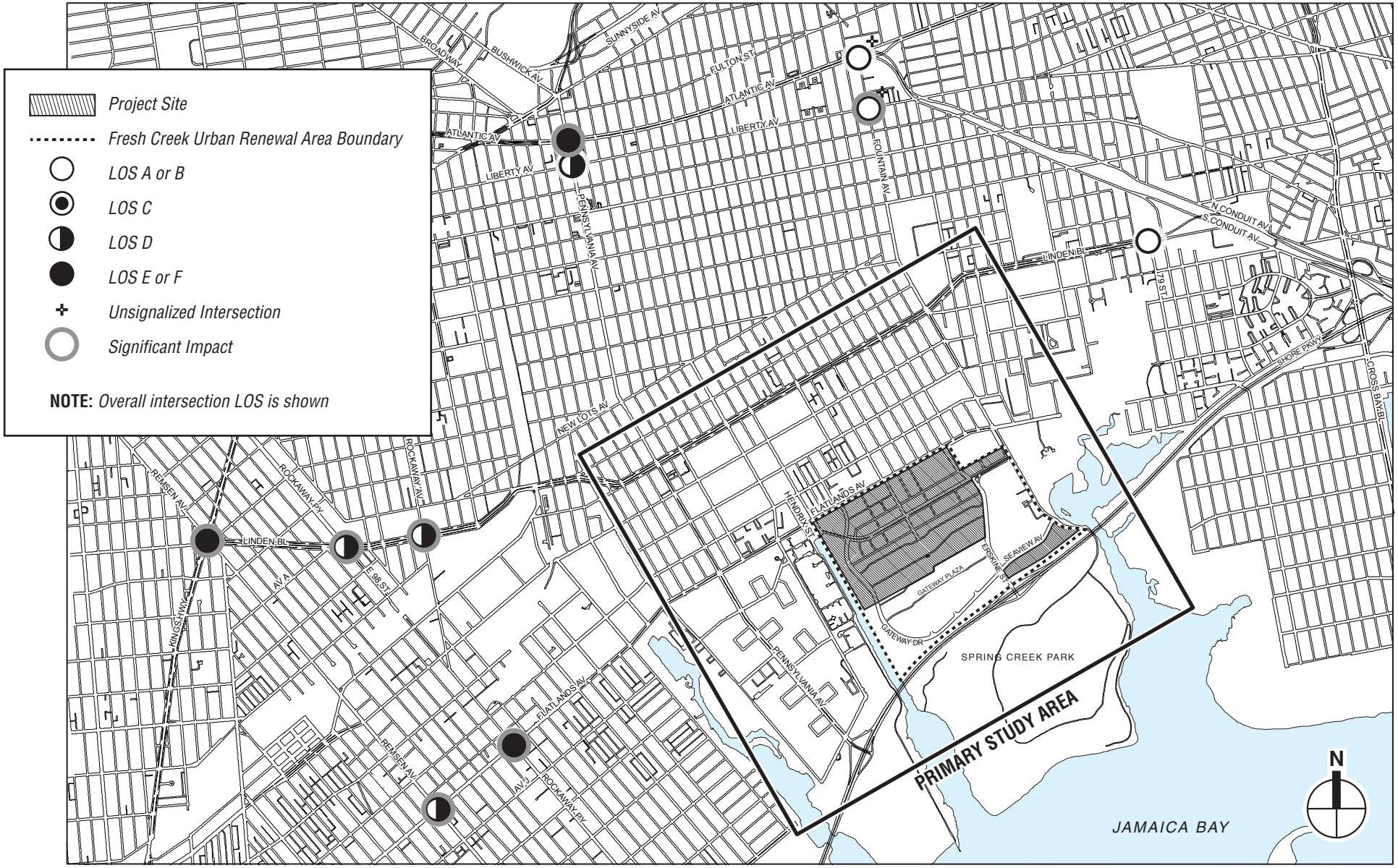
NOTE: *Overall intersection LOS is shown*

2011 Build Weekday
PM Peak Hour Traffic Level of Service
Primary Study Area

GATEWAY ESTATES II

Figure 16-18a

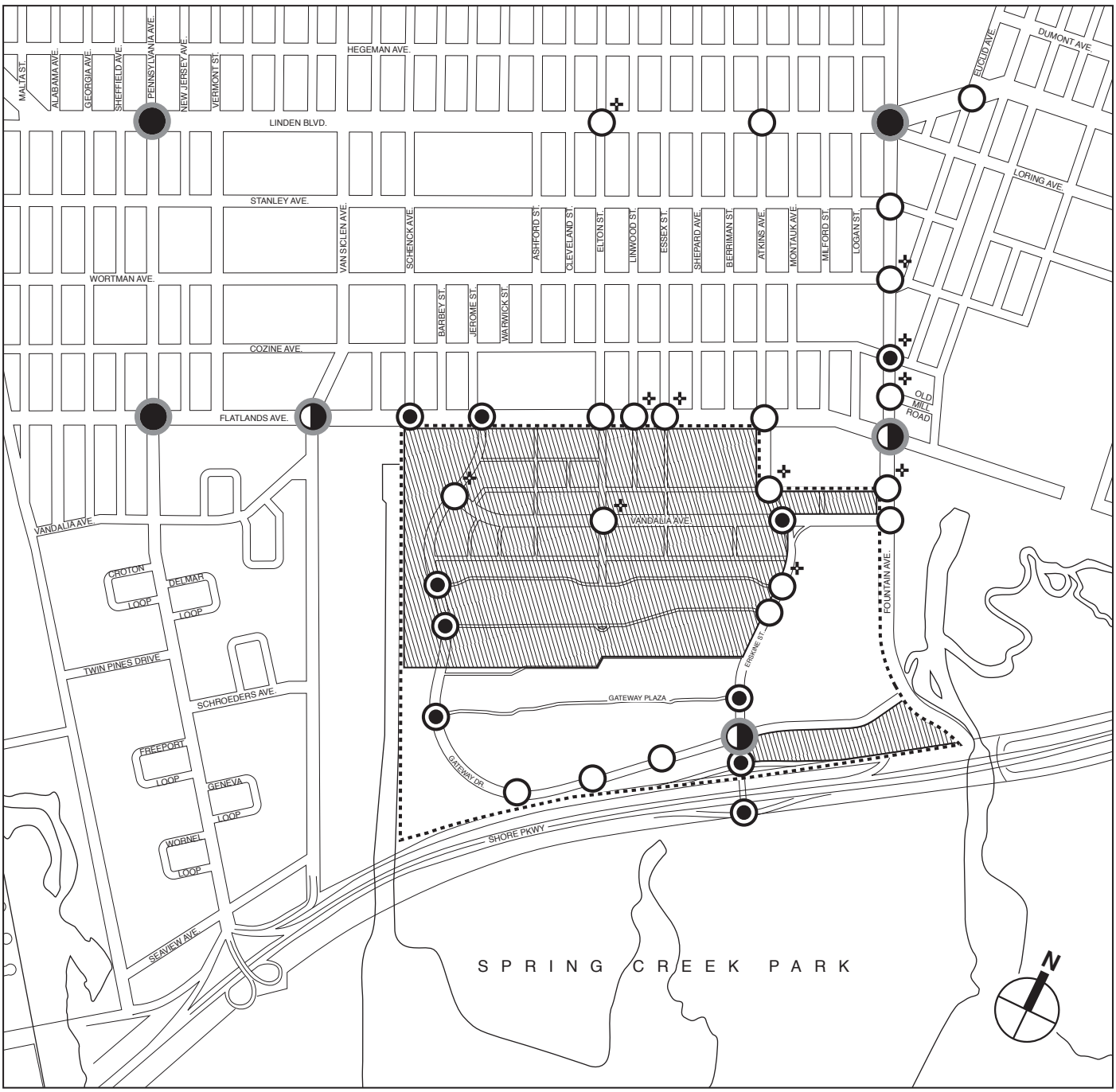
12.2.08



2011 Build Weekday
PM Peak Hour Traffic Level of Service
Secondary Study Area

Figure 16-18b

12.30.08



0 1000 2000 FEET

SCALE

Project Site

Fresh Creek Urban Renewal Area Boundary

LOS A or B

LOS C

LOS D

LOS E or F

Unsignalized Intersection

Significant Impacts

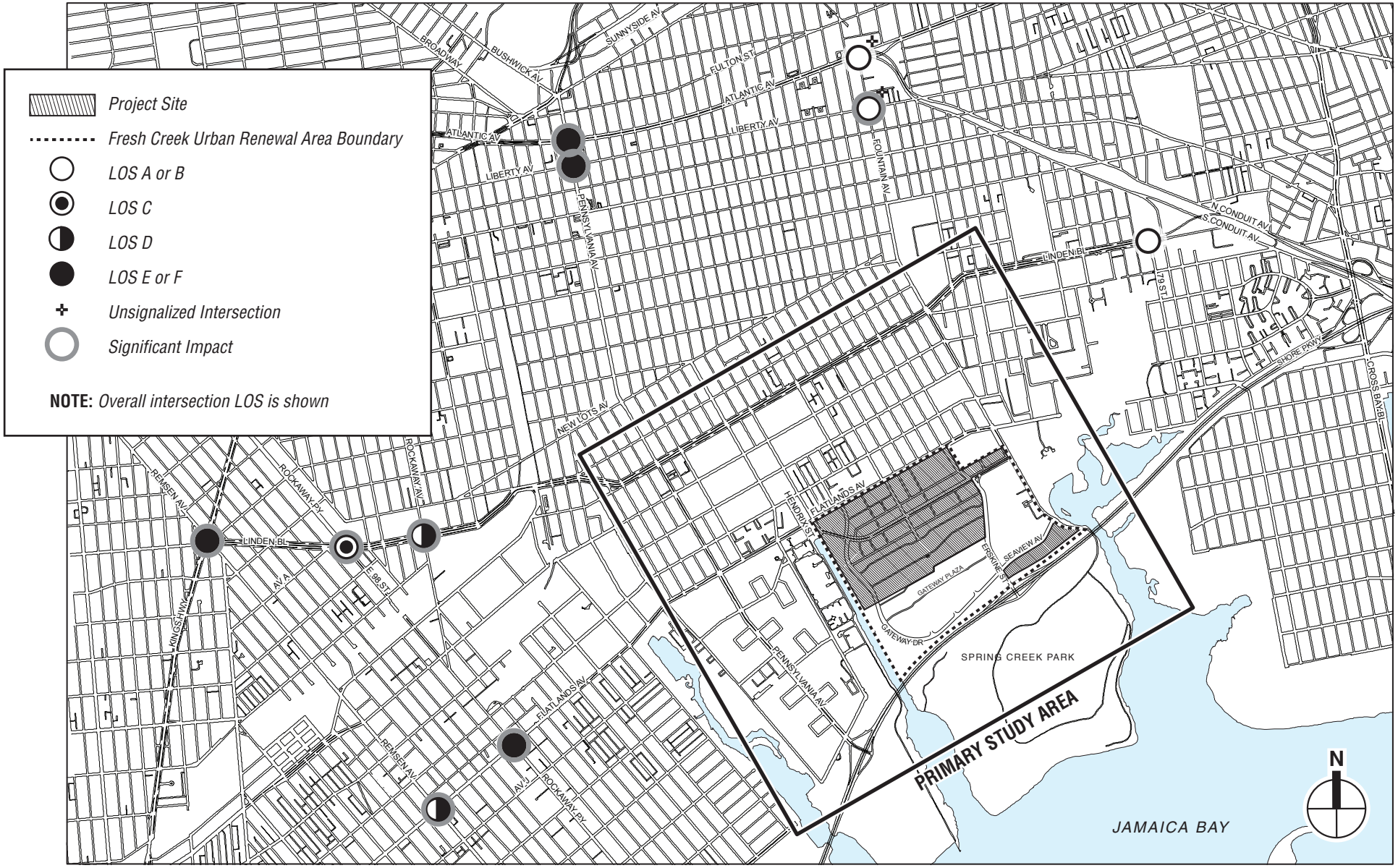
NOTE: *Overall intersection LOS is shown*

2011 Build Saturday
Midday Peak Hour Traffic Level of Service
Primary Study Area

GATEWAY ESTATES II

Figure 16-19a

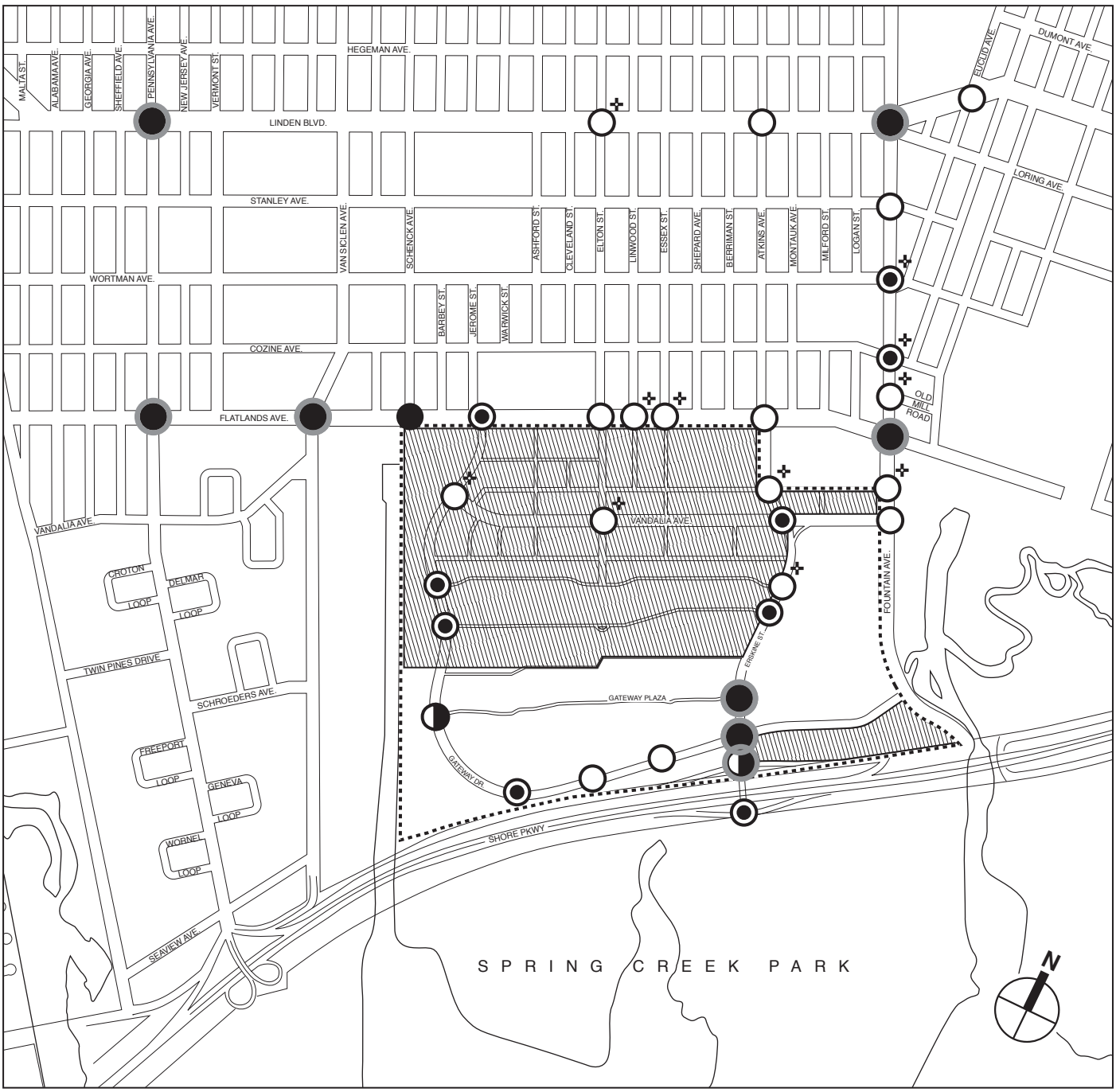
12.2.08



2011 Build Saturday
Midday Peak Hour Traffic Level of Service
Secondary Study Area

Figure 16-19b

12.30.08



0 1000 2000 FEET

SCALE

Project Site

Fresh Creek Urban Renewal Area Boundary

LOS A or B

LOS C

LOS D

LOS E or F

Unsignalized Intersection

Significant Impacts

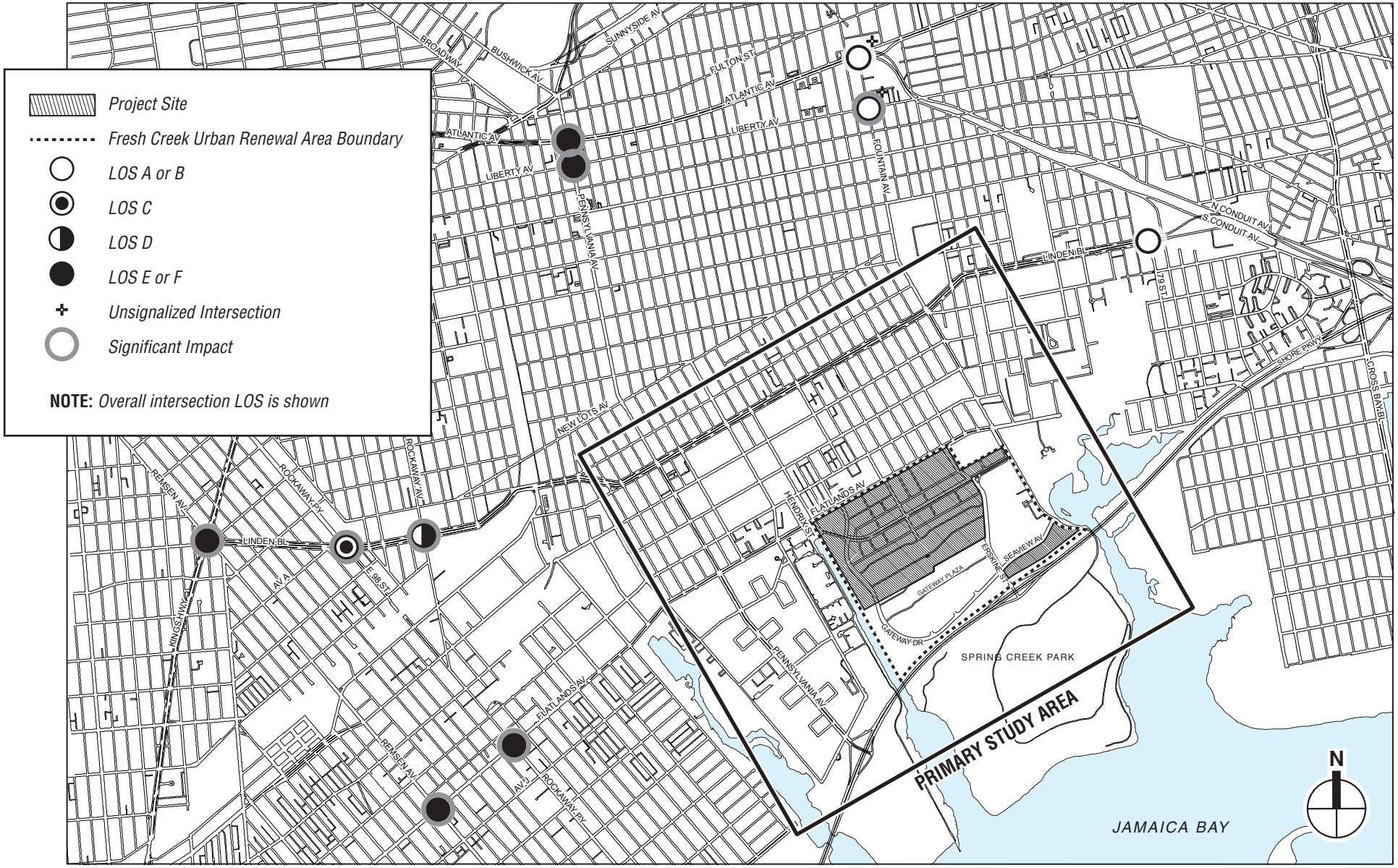
NOTE: *Overall intersection LOS is shown*

2011 Build Saturday
PM Peak Hour Traffic Level of Service
Primary Study Area

GATEWAY ESTATES II

Figure 16-20a

12.2.08



2011 Build Saturday
PM Peak Hour Traffic Level of Service
Secondary Study Area

Figure 16-20b

movements that would operate at unacceptable levels of service during at least one peak hour and indicates if these movements would be significantly impacted. Many of the significantly impacted locations are at highly trafficked intersections in the secondary study area where the project does not add a lot of new traffic. Approximately half of the significantly impacted intersections are located in the primary study area, through which most of the generated traffic travels. A description of significant impacts by corridor is provided below. It should be noted that at the intersections providing access to the new proposed parking lot, some of the movements exiting the parking lot experience unacceptable levels of service; however, these movements are not considered significant impacts under CEQR because they are not a part of the city street network.

Table 16-19

2011 Build Traffic Movements at Unacceptable Levels of Service

Signalized Intersection	Approach and Movement		Weekday												Saturday							
			AM				Midday				PM				Midday				PM			
			D*	E	F	SI**	D*	E	F	SI**	D*	E	F	SI**	D*	E	F	SI**	D*	E	F	SI**
Erskine Street & Belt Parkway WB	WB	R																	●			●
Erskine Street & Gateway Drive	SB	T															●	●			●	●
	WB	L										●							●			
Erskine Street & Gateway Plaza	SB	TR																			●	●
Gateway Drive & Gateway Plaza	SB	L									●					●					●	
	WB	LR																		●		
Gateway Drive & Parking Lot SW Corner	WB	L																	●			
Fountain Avenue & Flatlands Avenue	NB	LTR					●			●		●		●						●		●
	SB	LTR						●		●							●	●			●	●
	EB	DefL	●			●																
Flatlands Avenue & Schenck Avenue	WB	T													●						●	
Flatlands Avenue & Van Siclen Avenue	SB	LTR		●		●			●	●			●	●		●		●			●	●
	EB	L															●	●			●	●
		L							●	●		●		●			●	●			●	●
	WB	TR																	●			●
Flatlands Avenue & Pennsylvania Avenue	NB	L	●									●					●				●	
	SB	L			●	●			●	●			●	●			●	●			●	●
	EB	L							●	●			●	●			●	●			●	
		T									●			●			●	●			●	●
	WB	L									●			●			●	●			●	●
		T					●			●	●				●			●			●	●
		R										●		●			●	●			●	●
Flatlands Avenue & Rockaway Parkway	SB	LTR	●				●					●		●			●	●			●	●
	EB	L										●		●	●					●		
		TR											●	●			●	●			●	●
	WB	L									●			●			●	●			●	●
		TR										●		●			●	●			●	●
Flatlands Avenue & Remsen Avenue	SB	L										●		●		●		●			●	●
	EB	TR										●		●								
	WB	TR	●			●					●			●		●		●			●	●
Linden Boulevard & 79th Street	NB	L	●																			
Linden Boulevard & Euclid Avenue	SB	LTR	●																			
Linden Boulevard & Fountain Avenue & Loring Avenue	NB[1]	LTR			●	●			●	●			●	●			●	●			●	●
	SB[1]	DefL			●		●						●				●				●	
		TR			●	●			●	●			●	●			●	●			●	●
	WB[3]	L			●	●		●		●			●	●			●	●			●	●
		T			●																	
	NB[2]	LTR			●			●				●				●				●		
	WB[8]	TR		●																		

Table 16-19 (cont'd)
2011 Build Traffic Movements at Unacceptable Levels of Service

Signalized Intersection	Approach and Movement		Weekday AM D*	AM E	AM F	AM SI**	Weekday Midday D*	Midday E	Midday F	Midday SI**	Weekday PM D*	PM E	PM F	PM SI**	Saturday Midday D*	Midday E	Midday F	Midday SI**	Saturday PM D*	PM E	PM F	PM SI**
Linden Boulevard & Atkins Avenue	SB	LTR	●																			
Linden Boulevard & Pennsylvania Avenue	NB	L			●	●			●	●			●	●			●	●			●	●
		T	●			●											●	●			●	●
	SB	L	●										●	●			●	●			●	●
		TR		●		●			●	●			●	●			●	●			●	●
	EB[3]	L			●				●				●			●					●	
		T					●						●	●		●					●	
	WB[3]	L			●				●			●					●				●	
		T			●	●	●						●	●			●	●			●	●
	EB[8]	T	●								●			●						●		●
		R																	●			●
	WB[8]	TR		●																		
Linden Boulevard & Rockaway Avenue	NB	LT			●				●				●				●				●	
		R					●					●		●					●			●
	SB	LT			●	●			●	●			●	●			●	●			●	●
		R	●						●				●									
	EB[3]	L		●				●				●							●			
	WB[3]	L			●	●			●	●			●	●			●	●			●	●
Linden Boulevard & Rockaway Parkway	NB	LTR			●							●							●			
	SB	L			●				●	●			●	●			●	●			●	●
		TR	●										●									
	EB[3]	L			●			●					●			●				●		
	WB[3]	L			●			●				●										
Linden Boulevard & Kings Highway & Remsen Avenue	NB[4]	T			●			●					●				●				●	
	SB[4]	T			●		●						●				●				●	
	NB[5]	TR			●		●					●		●	●				●			
	SB[5]	TR	●										●		●				●			
		DefL			●	●			●				●	●		●				●		
	EB[6]	TR			●				●				●				●				●	
	WB[6]	TR			●				●				●				●				●	
	EB[3]	TR		●		●			●	●			●	●			●	●			●	●
		LT[7]			●	●			●	●		●	●	●			●	●			●	●
	WB[3]	R	●									●										
Pennsylvania Avenue & Liberty Avenue	NB	LTR		●		●									●			●			●	●
	SB	TR					●			●							●	●			●	●
	EB	LTR					●				●											
	WB	LTR		●			●					●			●					●		
Pennsylvania Avenue & Atlantic Avenue	NB	L			●	●			●	●			●	●			●	●			●	●
		TR			●	●	●			●	●						●	●			●	●
	SB	L											●	●		●				●		
		TR			●	●							●	●			●	●			●	●
	EB	TR					●			●			●	●			●	●			●	●
	WB	TR			●						●				●						●	

Table 16-19 (cont'd)
2011 Build Traffic Movements at Unacceptable Levels of Service

Unsignalized Intersection	Approach and Movement		Weekday AM D*	AM E	AM F	AM SI**	Weekday Midday D*	Midday E	Midday F	Midday SI**	Weekday PM D*	PM E	PM F	PM SI**	Saturday Midday D*	Midday E	Midday F	Midday SI**	Saturday PM D*	PM E	PM F	PM SI**
Erskine Street & Parking Lot NE Corner	EB	L															●				●	
Fountain Avenue & Wortman Avenue	EB	LT	●				●						●				●				●	
		TR									●				●						●	
	WB	LTR		●									●				●				●	
Fountain Avenue & Liberty Avenue	SB	LTR	●								●			●	●			●			●	●

Notes:
* Unacceptable LOS D (above 45 seconds per vehicle for signalized intersections, above 30 for unsignalized intersections)
** Movement is significantly impacted (indicated by "SI")
L = Left turn movement; T = Through movement; R = Right turn movement; DefL = De facto left turn movement
[1] Fountain Avenue
[2] Loring Avenue
[3] Linden Boulevard Mainline
[4] Kings Highway Mainline
[5] Kings Highway Service Road
[6] Remsen Avenue
[7] In the weekday PM peak hour, the westbound approach operates with a de facto left turn lane and a separate through lane.
[8] Linden Boulevard Service Road

Erskine Street

Three intersections along the Erskine Street corridor would have movements that would be significantly impacted.

- At the intersection of Erskine Street and the Belt Parkway westbound ramps, westbound right turning traffic would be significantly impacted in the Saturday PM peak hour.
- At the intersection of Erskine Street and Gateway Drive, southbound through traffic would be significantly impacted in the Saturday midday and PM peak hours.
- At the intersection of Erskine Street and Gateway Plaza, the southbound approach of Erskine Street would be significantly impacted in the Saturday PM peak hour.

Gateway Drive

With the exception of the intersection of Gateway Drive and Erskine Street, which is described as part of the Erskine Street corridor, no intersections would be significantly impacted along the Gateway Drive corridor.

Vandalia Avenue

No intersections along the Vandalia Avenue corridor would be significantly impacted.

Fountain Avenue

Excluding the intersection of Fountain Avenue and Linden Boulevard, which is described as part of the Linden Boulevard corridor, the intersection of Fountain Avenue and Flatlands Avenue is the only signalized intersection that would be significantly impacted. Northbound Fountain Avenue would be significantly impacted in the weekday midday, PM, and Saturday PM peak hours. Southbound Fountain Avenue would be significantly impacted during the weekday midday, Saturday midday, and Saturday PM peak hours. Eastbound de facto left turns would be significantly impacted in the weekday AM peak hour.

The intersection of Fountain Avenue and Liberty Avenue is the only unsignalized intersection that would be significantly impacted. The southbound approach would be significantly impacted during the weekday PM, Saturday midday, and Saturday PM peak hours.

Flatlands Avenue

Along the Flatlands Avenue corridor, five signalized intersections would be significantly impacted, including the following:

- At the intersection of Flatlands Avenue and Van Siclen Avenue, southbound Van Siclen Avenue would be significantly impacted during all five peak hours. The eastbound left turns from Flatlands Avenue would be significantly impacted in the Saturday midday and PM peak hours. The westbound left turns would be significantly impacted in all peak hours except the weekday AM peak hour. Also, the westbound right turn and through movements would be significantly impacted during the Saturday PM peak hour.
- At the intersection of Flatlands Avenue and Pennsylvania Avenue, southbound left turns from Pennsylvania Avenue would be significantly impacted during all five peak hours. Eastbound left turns from Flatlands Avenue would be significantly impacted in the weekday midday, PM and Saturday midday peak hours. During the weekday PM, Saturday midday, and Saturday PM peak hours, significant impacts along Flatlands Avenue would occur for westbound right turn movements. Eastbound through traffic would be significantly impacted during the weekday PM, Saturday midday, and Saturday PM peak hours. In the weekday PM, Saturday midday, and Saturday PM peak hours, westbound left turns from Flatlands Avenue would be significantly impacted; westbound through traffic would be significantly impacted during the weekday midday, Saturday midday, and Saturday PM peak hours.
- At the intersection of Flatlands Avenue and Rockaway Parkway, eastbound left turns from Flatlands Avenue would be significantly impacted during the weekday PM peak hour. In the weekday PM, Saturday midday, and Saturday PM peak hours, all movements along southbound Rockaway Avenue and westbound Flatlands Avenue, and the through and right turn movements from eastbound Flatlands Avenue would be significantly impacted.
- At the intersection of Flatlands Avenue and Remsen Avenue, southbound left turns from Remsen Avenue would be significantly impacted during the weekday PM, Saturday midday, and Saturday PM peak hours. The through and right turn movements along eastbound Flatlands Avenue would be significantly impacted during the weekday PM peak hour. During the weekday AM, PM, Saturday midday, and Saturday PM peak hours, the through and right turn movements along westbound Flatlands Avenue would be significantly impacted.
- The intersection of Flatlands Avenue and Fountain Avenue would be significantly impacted and is described as part of the Fountain Avenue corridor.

Linden Boulevard

Five intersections along the Linden Boulevard corridor would be significantly impacted, including the following:

- At the intersection of Linden Boulevard with Fountain Avenue and Loring Avenue, northbound Fountain Avenue, the through and right turn movements along southbound Fountain Avenue, and left turns from the westbound Linden Boulevard mainline would be significantly impacted for all peak hours analyzed.
- At the intersection of Linden Boulevard and Pennsylvania Avenue, northbound left turns from Pennsylvania Avenue, and the through and right turn movements from southbound

Pennsylvania Avenue, would be significantly impacted for all five peak analysis hours. Northbound through traffic would be significantly impacted during the weekday AM, Saturday midday, and Saturday PM peak hours. Southbound left turns would be significantly impacted in the weekday PM, Saturday midday, and Saturday PM peak hours. The through movement on the eastbound Linden Boulevard mainline would be significantly impacted in the weekday PM peak hour. Through traffic along the westbound Linden Boulevard mainline would be significantly impacted during the weekday AM, PM, Saturday midday, and Saturday PM peak hours. The through movement on the eastbound Linden Boulevard service road would be significantly impacted during the weekday and Saturday PM peak hours. Right turns from the same approach would be significantly impacted in the Saturday PM peak hour.

- At the intersection of Linden Boulevard and Rockaway Avenue, the southbound left turn and through movements along Rockaway Avenue, and left turns from the westbound Linden Boulevard mainline would be significantly impacted during all peak analysis hours. Northbound right turns from Rockaway Avenue would be significantly impacted in the weekday and Saturday PM peak hours.
- At the intersection of Linden Boulevard and Rockaway Parkway, southbound left turns would be significantly impacted during all peak hours analyzed except the weekday AM peak hour.
- At the six-legged intersection of Linden Boulevard, Kings Highway and Remsen Avenue, the through and right turn movements on the northbound Kings Highway service road would be significantly impacted in the weekday PM peak hour. The de facto left turn movement from eastbound Remsen Avenue to Linden Boulevard would be significantly impacted during the weekday AM and PM peak hours. The eastbound through traffic along the Linden Boulevard mainline and right turns from this approach onto Remsen Avenue would be significantly impacted for all peak hours. In the weekday AM, midday, Saturday midday, and Saturday PM peak hours, the left turn and through movements of the westbound Linden Boulevard mainline would be significantly impacted. In the weekday PM peak hour, the westbound through movement along the Linden Boulevard mainline would be significantly impacted.

Pennsylvania Avenue

All intersections analyzed along the Pennsylvania Avenue corridor would be significantly impacted, including the following:

- At the intersection of Pennsylvania Avenue and Liberty Avenue, northbound Pennsylvania Avenue would be significantly impacted during the weekday AM, Saturday midday, and Saturday PM peak hours. The through and right turn movements from southbound Pennsylvania Avenue would be significantly impacted during the weekday midday, Saturday midday, and Saturday PM peak hours.
- At the intersection of Pennsylvania Avenue and Atlantic Avenue, northbound left turns would be significantly impacted during all five peak hours, and southbound left turns would be significantly impacted in the weekday PM peak hour. The northbound through and right turn movements would be significantly impacted during the weekday AM, midday, Saturday midday, and Saturday PM peak hours. The southbound through and right turn movements would be significantly impacted in the weekday AM, PM, Saturday midday, and Saturday PM peak hours. The eastbound through and right turn movements would be significantly impacted in the weekday midday, PM, Saturday midday, and Saturday PM peak hours.

The intersections of Pennsylvania Avenue and Flatlands Avenue, and Pennsylvania Avenue and Linden Boulevard would both have significant impacts and are discussed as part of the Flatlands Avenue and Linden Boulevard corridors, respectively.

HIGHWAY ANALYSIS

In the 2011 Build condition, the Shore Parkway would experience volume increases due to the background growth in traffic and volumes expected to be generated by the No Build developments, which were both described in Section D, "2011 The Future without the Proposed Action," as well as the traffic generated by the development of the Proposed Project. The development of the Proposed Project would increase traffic on the Shore Parkway and the Erskine Street interchange on and off-ramps by approximately 75 to 415 vph during the weekday and weekend peak hours for the 2011 Build condition. These volumes were added to the 2011 No Build volumes to establish the 2011 Build volumes.

Table 16-20 provides a comparison of the 2011 No Build and Build levels of service, speeds and densities for the Shore Parkway near the Erskine Street interchange. For the 2011 Build conditions, the different mainline highway sections within the influence of the merge and diverge areas analyzed would operate at LOS D and C during the weekday AM and midday peak hours, respectively. Sections of the eastbound Shore Parkway between the Erskine Street off-ramp and on-ramp, and past the on-ramp would operate at LOS E and F, respectively, during the weekday PM and Saturday midday peak hours. Also, the eastbound section of the Shore Parkway prior to the Erskine Street off-ramp would operate at LOS E during the Saturday midday peak hour. During the weekday PM peak hour, the westbound Shore Parkway would operate at LOS E in the sections before and after the Erskine Street interchange.

According to CEQR procedures, highway or ramp sections being analyzed—including mainline capacity sections, weaving areas, and ramp junctions—should not deteriorate more than one-half of a level of service between No Build and Build conditions when the No Build level of service is in the D, E, or F range. Additional criteria that have been used in other certified EISs follow:

- For No Build LOS D to Build LOS D: Since the starting value of LOS D is 28.1 pc/mi/ln and the highest value of LOS D is 35 pc/mi/ln, one half of the difference between these two is 3.5 pc/mi/ln. Hence, an increase in the projected density of 4 pc/mi/ln or more as a result of traffic volume added between the No Build and Build conditions is considered a significant impact.
- For No Build LOS D to Build LOS E: Since the value of mid-LOS D is 31.5 pc/mi/ln and the starting value of LOS E is 35.1 pc/mi/ln, one half of the difference between these two is 1.75 pc/mi/ln. Therefore, an increase in the projected density of 2 pc/mi/ln or more between No Build and Build is considered a significant impact.
- For No Build LOS E to Build LOS E: Since the value of mid-LOS E is 40 pc/mi/ln and the highest value of LOS E is 45 pc/mi/ln, one half of the difference between these two is 2.5 pc/mi/ln. Therefore, an increase in the projected density of 3 pc/mi/ln or more between No Build and Build is considered a significant impact.
- For No Build LOS E to Build LOS F and No Build LOS F to Build LOS F: The same criteria as No Build LOS E to Build LOS E applies.

Table 16-20
2011 No Build and Build Conditions on the Shore Parkway

Analysis Location	2011 No Build Speed (mph)	2011 No Build Density (pc/mi/ln)	2011 No Build LOS	2011 Build Speed (mph)	2011 Build Density (pc/mi/ln)	2011 Build LOS
Weekday AM						
Eastbound before Erskine Street Off-Ramp Diverge	49.0	33.9	D	48.9	34.5	D
Eastbound between Erskine Street Off-Ramp Diverge and On-Ramp Merge	53.4	29.1	D	53.5	29.0	D
Eastbound after Erskine Street On-Ramp Merge	53.4	29.1	D	53.5	29.6	D
Westbound before Erskine Street Off-Ramp Diverge	54.1	32.7	D	54.1	33.3	D
Westbound between Erskine Street Off-Ramp Diverge and On-Ramp Merge	53.3	30.9	D	53.1	31.3	D
Westbound after Erskine Street On-Ramp Merge	53.2	31.0	D	52.8	32.1	D
Weekday Midday						
Eastbound before Erskine Street Off-Ramp Diverge	55.2	24.8	C	54.9	26.2	C
Eastbound between Erskine Street Off-Ramp Diverge and On-Ramp Merge	55.0	22.0	C	54.9	22.0	C
Eastbound after Erskine Street On-Ramp Merge	53.9	24.1	C	53.6	25.4	C
Westbound before Erskine Street Off-Ramp Diverge	55.0	23.5	C	54.1	25.1	C
Westbound between Erskine Street Off-Ramp Diverge and On-Ramp Merge	54.9	20.3	C	54.6	20.5	C
Westbound after Erskine Street On-Ramp Merge	54.5	22.2	C	54.1	23.5	C
Weekday PM						
Eastbound before Erskine Street Off-Ramp Diverge	54.2	32.5	D	53.8	34.1	D
Eastbound between Erskine Street Off-Ramp Diverge and On-Ramp Merge	42.5	42.5	E	41.7	44.8	E
Eastbound after Erskine Street On-Ramp Merge	38.1	48.5	F	37.6	51.6	F*
Westbound before Erskine Street Off-Ramp Diverge	50.9	35.3	E	50.4	37.5	E
Westbound between Erskine Street Off-Ramp Diverge and On-Ramp Merge	50.3	32.1	D	50.0	32.7	D
Westbound after Erskine Street On-Ramp Merge	50.1	33.9	D	49.5	35.7	E
Saturday Midday						
Eastbound before Erskine Street Off-Ramp Diverge	46.6	36.6	E	46.1	38.9	E
Eastbound between Erskine Street Off-Ramp Diverge and On-Ramp Merge	44.4	35.7	E	44.5	35.5	E
Eastbound after Erskine Street On-Ramp Merge	35.5	45.5	F	35.2	48.4	F
Westbound before Erskine Street Off-Ramp Diverge	53.9	30.5	D	52.8	33.2	D
Westbound between Erskine Street Off-Ramp Diverge and On-Ramp Merge	53.6	26.4	C	53.5	26.6	C
Westbound after Erskine Street On-Ramp Merge	53.3	28.7	D	52.9	30.4	D
Saturday PM						
Eastbound before Erskine Street Off-Ramp Diverge	46.3	40.2	E	44.7	44.0	E*
Eastbound between Erskine Street Off-Ramp Diverge and On-Ramp Merge	42.5	42.1	E	41.8	43.2	E
Eastbound after Erskine Street On-Ramp Merge	35.0	50.7	F	34.4	55.4	F*
Westbound before Erskine Street Off-Ramp Diverge	53.5	33.6	D	50.7	38.0	E*
Westbound between Erskine Street Off-Ramp Diverge and On-Ramp Merge	52.7	29.6	D	52.4	29.5	D
Westbound after Erskine Street On-Ramp Merge	52.4	32.3	D	51.7	34.6	D

Notes:
* Denotes significant impact
pc/mi/ln = passenger cars per mile per lane

A comparison of the 2011 No Build and Build conditions indicates that levels of service would generally remain similar. The maximum reduction in speed would be 2.8 mph within the westbound section before the Erskine Street off-ramp, which would occur during the Saturday PM peak hour. The maximum increase in density would be 4.7 pc/mi/ln at the eastbound section after the Erskine Street on-ramp, which would occur during the Saturday PM peak hour. The only differences in levels of service between the 2011 No Build and 2011 Build conditions would occur along the westbound Shore Parkway sections after the Erskine Street on-ramp merge (during the weekday PM peak hour) and before the Erskine Street off-ramp diverge (during the Saturday PM peak hour). These segments would deteriorate from LOS D to E. None of the Shore Parkway sections would be significantly impacted during the weekday AM, midday, and Saturday midday peak hours.

One Shore Parkway segment would be significantly impacted during the weekday PM peak hour and three segments would be significantly impacted in the Saturday PM peak hour. Although these sections would be significantly impacted, the reduction in speeds would range from 0.5 mph to 2.8 mph, which would generally not be noticeable to motorists.

PARKING

The 2011 Build parking occupancies for the existing parking lot would remain the same as in the 2011 No Build condition, as shown previously in Table 16-14. A second parking lot with a capacity of approximately 2,067 spaces would be provided for the Gateway Center Phase II as part of the proposed development of the Proposed Project. The total amount of available off-street parking would amount to approximately 4,752 spaces to accommodate the existing shopping center and the proposed expansion. Construction of the shopping center expansion and new parking lot would be completed by the 2011 Build year. Table 16-21 presents the expected weekday and Saturday parking accumulations and percent occupancies for the new parking lot in the 2011 Build condition. As shown in Table 16-21, the parking lot for the new shopping center would have 13 percent occupancy during the weekday AM peak hour. The occupancy would remain consistent throughout the day and would reach about 49 percent during the weekday midday peak period and approximately 45 percent during the weekday 5-6 PM peak hour (and 48 percent at 6-7 PM). The highest activity would occur during the Saturday midday peak when the occupancy of the new lot would be 68 percent.

When the existing and proposed parking lots are considered cumulatively, the peak weekday occupancy would be 49 percent. The peak Saturday occupancy would be 72 percent.

In addition to the shopping center expansion, local retail and residential units would be constructed by 2011 as part of the Proposed Action. As discussed in the No Build conditions section, the highest occupancy for on-street parking of the existing roadway network would be 67 percent during the weekday AM peak period. Also, the 1,027 residential units would provide approximately 500 parking spaces. This, along with the new roadway network which would provide an additional 960 to 1,000 on-street parking spaces would accommodate the parking needs of the local retail and residential units, also as previously discussed in the No Build conditions section.

Table 16-21
2011 Build Parking Accumulation for Gateway Center[1]

Time Period	Gateway Center Phase I		Gateway Center Phase II				Total	
	Occupied Spaces	Percent Occupied	Vehicles In	Vehicles Out	Occupied Spaces	Percent Occupied	Occupied Spaces	Percent Occupied
Weekday								
Before 8AM	197	7	N/A	N/A	139	7	336	7
8AM – 9AM	413	15	311	187	263	13	677	14
9AM – 10AM	663	25	521	346	438	21	1104	23
10AM – 11AM	932	35	697	506	629	30	1565	33
11AM – 12PM	1,161	43	776	615	790	38	1954	41
12PM – 1PM	1,314	49	875	767	898	43	2216	47
1PM – 2PM	1,329	49	898	779	1017	49	2350	49
2PM – 3PM	1,268	47	673	810	880	43	2151	45
3PM – 4PM	1,110	41	753	737	896	43	2009	42
4PM – 5PM	1,093	41	735	764	867	42	1972	41
5PM – 6PM	1,119	42	813	756	924	45	2159	45
6PM – 7PM	1,218	45	898	830	992	48	2235	47
7PM – 8PM	1,198	45	747	877	862	42	2085	44
Saturday								
Before 11AM	1,113	41	N/A	N/A	783	38	1,896	40
11AM – 12PM	1,356	51	1063	895	951	46	2,307	49
12PM – 1PM	1,590	59	1206	1040	1117	54	2,707	57
1PM – 2PM	1,811	67	1127	976	1268	61	3,079	65
2PM – 3PM	2,014	75	1408	1265	1411	68	3,425	72
3PM – 4PM	2,040	76	1427	1407	1394	67	3,434	72
4PM – 5PM	1,979	74	1257	1310	1297	63	3,276	69
5PM – 6PM	1,829	68	1240	1236	1223	59	3,052	64

Notes:
The existing Gateway Center parking lot has 2,685 spaces and the proposed expansion would provide 2,067 spaces. In total, Phases I and II would have 4,752 spaces.
[1] Indicates existing and proposed expansion.

F. 2013 THE FUTURE WITHOUT THE PROPOSED ACTION

TRAFFIC

This section establishes the baseline (No Build) condition against which potential impacts of the 2013 Proposed Action can be compared. No Build traffic volumes for the 2013 analysis year were established by applying a background traffic growth rate of one percent per year (in accordance with the 2001 *CEQR Technical Manual*) and then adding vehicular volumes expected to be generated by approved elements of the 1996 Plan and soft site developments within a half-mile radius of the Project Site. Anticipated roadway plans and traffic mitigation measures from the 1996 Plan were also included in the 2013 No Build condition.

ROADWAY NETWORK

The roadway network for the 2013 No Build condition is similar to the roadway network described in Section D, "2011 the Future without the Proposed Action," except for a few modifications that are discussed below.

As previously described in Section D, "2011 the Future without the Proposed Action," five new intersections would be created and six existing intersections would be modified as part of the

future roadway network for the 2011 No Build condition. A detailed signal warrant analysis indicated that a warrant would be satisfied for the 2013 No Build condition at five of these intersections including the following:

- Flatlands Avenue and Atkins Avenue
- Flatlands Avenue and Elton Street
- Flatlands Avenue and Jerome Street
- Erskine Street and Vandalia Avenue
- Vandalia Avenue and Gateway Drive

The above intersections are assumed to be signalized in the 2013 No Build condition. The intersection of Flatlands Avenue and Schenk Avenue is signalized in the existing condition and would continue to remain signalized. The other five modified or new intersections are assumed to remain unsignalized.

The 2013 No Build condition reflects completion of the 1996 Plan, and as such it incorporates mitigation measures that were proposed and approved as part of the *1996 FEIS*. These measures included geometric modifications and signal timing changes at six intersections, which were used as the baseline conditions for the 2013 No Build analysis, as detailed below. At some intersections, the mitigation measures of the 1996 Plan worsened the effectiveness of the existing signal operation by eliminating an existing phase. In these cases, the mitigation measures were not incorporated as part of the 2013 No Build analysis. The descriptions below summarize all proposed measures and explain which measures were used as part of the analysis.

Flatlands Avenue and Pennsylvania Avenue

Most of the mitigation measures proposed as part of the 1996 Plan were already implemented at the time of the data collection effort for the existing conditions within this DEIS. The proposed mitigation measures from the 1996 Plan included installing "No Standing Anytime" regulations along the eastbound and westbound approaches of Flatlands Avenue for 100 feet from the intersection, and striping the curb lanes of these approaches as exclusive right turn lanes. These lanes presently operate as exclusive right turn lanes and the eastbound approach is currently striped as such; however, restriping the lanes in the westbound approach is necessary to ensure that the lanes are clearly identified as exclusive right turn lanes. The existing conditions analysis accounted for the "No Standing Anytime" regulations. The 1996 Plan also proposed modifying the signal phasing plan to a three phase cycle at this intersection; however the existing signal timing plan consists of four phases. This four phase cycle allows the intersection to operate at a better level of service and was maintained in the 2013 No Build analysis.

Linden Boulevard, Loring Avenue and Fountain Avenue

As part of the 1996 Plan mitigation measures, Loring Avenue would be converted to a one-way eastbound street for one block. For the 2013 No Build analysis, westbound vehicles traveling along Loring Avenue were diverted through the intersections of Fountain Avenue and Stanley Avenue, and Linden Boulevard and Euclid Avenue. Turns onto westbound Loring Avenue would still be permitted. The signal phasing and timing would change; the signal phasing for westbound Loring Avenue would be modified to a shortened lag phase for westbound Linden Boulevard.

Linden Boulevard and Atkins Avenue

The signal timing at this intersection would be modified to provide additional green time to northbound and southbound Atkins Avenue. No geometric changes would occur.

Linden Boulevard and Pennsylvania Avenue

The mitigation measures for this intersection would include changes to the signal phasing and timing plan. A four phase cycle would be provided. It would provide a lead phase for exclusive left turns from eastbound and westbound Linden Boulevard, a lead phase for northbound Pennsylvania Avenue, and right turns from eastbound Linden Boulevard. The 1996 Plan also proposed widening the southbound approach by reducing the sidewalk width by 5 feet, re-striping the southbound approach to provide three 10-foot lanes, and re-striping the northbound approach to provide one left turn lane, two through lanes, and one right turn lane. These are the existing lane configurations and have been accounted for in the existing conditions analysis.

Pennsylvania Avenue and Liberty Avenue

Mitigation measures at this intersection would include prohibiting southbound left turns. In the 2013 No Build analysis, it was assumed that vehicles would make this movement from Atlantic Avenue. "No Standing Anytime" regulations would be installed along eastbound and westbound Liberty Avenue and both approaches would be striped for exclusive left turn lanes and one through/right turn lane. The signal timing plan would also be modified to provide additional green time along northbound and southbound Pennsylvania Avenue.

Pennsylvania Avenue and Atlantic Avenue

Westbound Atlantic Avenue would be restriped as four lanes with one exclusive left turn lane, two through lanes, and one through/right turn lane. "No Standing Anytime" regulations would be installed along this approach and on the receiving side. Northbound Pennsylvania Avenue would also be re-striped to four lanes, one exclusive left turn lane, two through lanes, and one exclusive right turn lane. The signal timing and phasing plan would be modified; the lag phase along eastbound Atlantic Avenue would be changed to a lead phase. The 1996 Plan recommended reducing the width of the center median from 10 feet to 4 feet, and the south sidewalk along the eastbound approach from 13 feet to 10 feet, and re-striping this approach to provide one left turn lane, two through lanes, and one 19-foot-wide curb lane. These mitigation measures were already implemented and accounted for in the existing conditions analysis, except that the eastbound approach is presently striped as two left turn lanes, one through lane, and one shared through/right turn lane. Re-striping the second left turn lane back to a through lane would result in significantly increased delays for the left turn movement along this approach; therefore this mitigation measure was not included as part of the 2013 No Build analysis.

TRAVEL DEMAND ESTIMATES AND GENERATED VOLUMES

Completion of the 1996 Plan would result in 2,007 new residential units, 15,000 square feet of local retail space, 10,000 square feet of professional office space, a grade school, an intermediate school, a day care facility, 30,000 square feet of other community facility space, and 27.8 acres new public parkland on the Project Site over and above the planned development described for the 2011 No Build condition.

Trip Generation

Travel demand analyses were prepared for the 1996 Plan elements (residential, local retail, office, grade school and intermediate school, community/public facilities, and open space) and other off-site development (residential and destination retail) that would be developed in the 2013 No Build condition. Table 16-22 presents the travel demand factors, which are described below.

- Residential: The rates used for residential use are described in Section D, "2011 the Future without the Proposed Action."
- Destination Retail: The rates used for destination retail are described in Section D, "2011 the Future without the Proposed Action."
- Local Retail: The rates used for local retail are described in Section E, "2011 Probable Impacts of the Proposed Action."
- Office: For office space, a weekday office trip generation rate of 18 person trips per 1,000 square feet was used based on the 2001 *CEQR Technical Manual*. The modal split (65 percent by auto, 2 percent by taxi, 10 percent by subway, 3 percent by bus, and 10 percent by walking) and vehicle occupancy (1.13 persons for auto and taxi) for all analysis periods was developed from Census 2000 reverse journey-to-work data, for the same Brooklyn and Queens census tracts used for the residential use. Due to the low density nature of the area, it was assumed that there would be no change in mode split for midday trips.

  A weekday temporal distribution of 11.8 percent, 14.5 percent, and 13.7 percent during the AM, midday and PM peak hours, respectively, and weekday directional splits of 96 percent "in", 39 percent "in", and 5 percent "in" (AM, midday, PM) were obtained from the *Atlantic Yards Arena and Redevelopment Project FEIS*. A weekday daily delivery trip generation rate (0.16 trips per 1,000 square feet) and temporal distribution (7 percent during the AM and midday peak hours, and 3 percent during the PM peak hour) were also obtained from the *Atlantic Yards Arena and Redevelopment Project FEIS.*

  Saturday trip generation rates (5.38 trips per 1,000 square feet) were taken from the 1996 FEIS. Temporal distribution (15 percent during the Saturday midday and PM peak hours) and directional split (60 percent "in" during the Saturday midday and PM peak hours) rates were obtained from the *Atlantic Yards Arena and Redevelopment Project FEIS*. Modal split and vehicle occupancy rates were assumed to be similar to weekday. A Saturday delivery trip generation rate (0.01 daily trips per 1,000 square feet) and temporal distribution (11 percent and 3 percent during the Saturday midday and PM peak hours, respectively) were obtained from the *Atlantic Yards Arena and Redevelopment Project FEIS*.

Table 16-22
2013 No Build Travel Demand Factors (Weekday)

	Residential	Destination Retail	Local Retail	Office	Grade School	Intermediate School	Day Care	Community Facility	Open Space
Person Trip Generation Rate	12.5[1] per DU	1.55 - AM[5] 5.03 - Midday[5] 4.89 - PM[5] per 1,000 SF	205[4] per 1,000 SF	18.0[7] per 1,000 SF	2.18[1] per seat	2.18[1] per seat	138[9] per 1,000 SF	40[1] per 1,000 SF	139[1] per 1,000 SF
Temporal Distribution									
AM Peak	9.1%[2]	NA[5]	2.3%[1]	11.8%[8]	43.2%[1]	44.0%[1]	16.0%[9]	5.0%[1]	7.0%[2]
Midday Peak	4.7%[2]	NA[5]	7.9%[1]	14.5%[8]	2.0%[1]	2.0%[1]	5.0%[9]	10.0%[1]	17.0%[2]
PM Peak	10.7%[2]	NA[5]	10.7%[1]	13.7%[8]	0.0%[1]	0.0%[1]	19.0%[9]	10.0%[1]	14.0%[2]
Linked Trip Credit	0.0%	25.0%	25.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Modal Split									
Auto	48.0%[3]	95.1%[5]	15.0%[1]	65.0%[3]	19.1%[1]	22.3%[1]	48.0%[10]	4.0%[1]	12.0%[1]
Taxi	3.0%[3]	1.5%[5]	0.0%[1]	2.0%[3]	0.0%[1]	0.0%[1]	3.0%[10]	7.0%[1]	0.0%[1]
Subway/Bus	30.0%[3]	1.2%[5]	0.0%[1]	10.0%[3]	2.5%[1]	5.0%[1]	30.0%[10]	0.0%[1]	5.0%[1]
Bus Only	13.0%[3]	1.2%[5]	5.0%[1]	13.0%[3]	25.9%[1]	27.7%[1]	13.0%[10]	14.0%[1]	5.0%[1]
Walk Only	6.0%[3]	1.0%[5]	80.0%[1]	10.0%[3]	52.5%[1]	45.0%[1]	6.0%[10]	75.0%[1]	78.0%[1]
Vehicle Occupancy									
Auto	1.15[3]	1.40[5]	1.40[5]	1.13[3]	1.30[1]	1.30[1]	2.00[11]	2.00[1]	2.80[1]
Taxi	1.15[3]	1.65[5]	1.65[5]	1.13[3]	0.00[1]	0.00[1]	2.00[11]	2.00[1]	2.00[1]
Directional Split (Ins)									
AM Peak	15.0%[2]	62.5%[5]	63.0%[1]	96.0%[8]	64.0%[1]	100.0%[1]	53.0%[9]	70.0%[1]	80.0%[1]
Midday Peak	50.0%[2]	53.6%[5]	55.0%[1]	39.0%[8]	50.0%[1]	50.0%[1]	50.0%[9]	50.0%[1]	55.0%[1]
PM Peak	70.0%[2]	51.8%[5]	47.0%[1]	5.0%[8]	0.0%[1]	0.0%[1]	47.0%[9]	50.0%[1]	45.0%[1]
Truck Trip Generation Rate	0.06[2] per DU	0.35[1] per 1,000 SF	0.35[1] per 1,000 SF	0.16[8] per 1,000 SF	0.02[1] per seat	0.02[1] per seat	0.07[9] per 1,000 SF	0.02[1] per 1,000 SF	- -
Truck Temporal Distribution									
AM Peak	6.0%[4]	13.0%[1]	6.0%[1]	7.0%[8]	17.0%[6]	17.0%[6]	9.7%[9]	6.0%[1]	-
Midday Peak	7.0%[4]	9.0%[1]	11.0%[1]	7.0%[8]	2.0%[6]	2.0%[6]	7.8%[9]	11.0%[1]	-
PM Peak	10.0%[4]	0.0%[1]	0.0%[1]	3.0%[8]	0.0%[6]	0.0%[6]	5.1%[9]	1.0%[9]	-
Truck Trip Directional Split (Ins)									
AM Peak	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	-
Midday Peak	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	-
PM Peak	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	-

Notes:
1. *Gateway Estates FEIS* (1996)
2. *Greenpoint-Williamsburg Rezoning FEIS* (2005)
3. *Census 2000* (U.S. Department of Commerce: Bureau of the Census, 2000)
4. *Urban Space for Pedestrians*, Pushkarev and Zupan, 1973
5. Surveys conducted by AKRF, Inc. at Gateway Center (November 2006). Note: temporal distribution not included (for destination retail) since rates are specific to individual peak hours.
6. *Curbside Pickup and Delivery Operations and Arterial Traffic Impacts*, U.S. Department of Transportation/Federal Highway Administration (1981)
7. *New York City Environmental Quality Review (CEQR) Technical Manual* (2001)
8. *Atlantic Yards: Arena and Redevelopment Project FEIS* (2006)
9. *7 Subway Extension—Hudson Yards Rezoning and Development Program FGEIS* (2004)
10. Assumed similar to Residential
11. Project team assumption

Table 16-22 (cont'd)
2013 No Build Travel Demand Factors (Saturday)

	Residential	Destination Retail	Local Retail	Office	Grade School	Intermediate School	Day Care	Community Facility	Open Space
Person Trip Generation Rate	12.5[1] per DU	8.19 – Midday[6] 11.38 – PM[6] per 1,000 SF	488[5] per 1,000 SF	5.38[1] per 1,000 SF	- -	- -	- -	15[1] per 1,000 SF	158[1] per 1,000 SF
Temporal Distribution									
Saturday Midday Peak	8.2%[2]	NA[6]	9.7%[1]	15.0%[4]	-	-	-	13.3.0%[1]	20.0%[1]
Saturday PM Peak	7.2%[2]	NA[6]	9.7%[1]	15.0%[4]	-	-	-	13.3.0%[1]	20.0%[1]
Linked Trip Credit	0.0%	25.0%	25.0%	0.0%	-	-	-	0.0%	0.0%
Modal Split (Saturday)									
Auto	48.0%[3]	93.5%[6]	15.0%[1]	65.0%[3]	-	-	-	4.0%[1]	12.0%[1]
Taxi	3.0%[3]	3.5%[6]	0.0%[1]	2.0%[3]	-	-	-	7.0%[1]	0.0%[1]
Subway/Bus	30.0%[3]	1.0%[6]	0.0%[1]	10.0%[3]	-	-	-	0.0%[1]	5.0%[1]
Bus Only	13.0%[3]	1.0%[6]	5.0%[1]	13.0%[3]	-	-	-	14.0%[1]	5.0%[1]
Walk Only	6.0%[3]	1.0%[6]	80.0%[1]	10.0%[3]	-	-	-	75.0%[1]	78.0%[1]
Vehicle Occupancy									
Auto	1.15[3]	1.72[6]	1.72[6]	1.13[3]	-	-	-	2.00[1]	2.80[1]
Taxi	1.15[3]	1.75[6]	1.75[6]	1.13[3]	-	-	-	2.00[1]	2.00[1]
Directional Split (Ins)									
Saturday Midday Peak	50.0%[2]	53.6%[6]	50.0%[1]	60.0%[4]	-	-	-	50.0%[1]	55.0%[1]
Saturday PM Peak	50.0%[2]	47.5%[6]	50.0%[1]	60.0%[4]	-	-	-	50.0%[1]	45.0%[1]
Truck Trip Generation Rate	0.01[4] per DU	0.02[4] per 1,000 SF	0.02[4] per 1,000 SF	0.01[4] per 1,000 SF	- -	- -	- -	0.01[7] per 1,000 SF	- -
Truck Temporal Distribution									
Saturday Midday Peak	9.0%[4]	11.0%[4]	11.0%[4]	11.0%[4]	-	-	-	1.0%[7]	-
Saturday PM Peak	2.0%[4]	2.0%[4]	2.0%[4]	3.0%[4]	-	-	-	1.0%[7]	-
Truck Trip Directional Split (Ins)									
Saturday Midday Peak	50.0%	50.0%	50.0%	50.0%	-	-	-	50.0%	-
Saturday PM Peak	50.0%	50.0%	50.0%	50.0%	-	-	-	50.0%	-

Notes:
1. *Gateway Estates FEIS* (1996)
2. The *Jamaica Plan DEIS* (2007)
3. *Census 2000* (U.S. Department of Commerce: Bureau of the Census, 2000)
4. *Atlantic Yards: Arena and Redevelopment Project FEIS* (2006)
5. *Urban Space for Pedestrians*, Pushkarev and Zupan, 1973
6. Surveys conducted by AKRF, Inc. at Gateway Center (November 2006) Note: temporal distribution not included (for destination retail) since rates are specific to individual peak hours.
7. *7 Subway Extension—Hudson Yards Rezoning and Development Program FGEIS* (2004)

- Grade School: All rates for the grade school use were obtained from the grade school component of the 1996 FEIS. For grade school space, a weekday daily trip generation rate of 2.18 trips per seat was used. A modal split of 19.1 percent by auto (parental pick-up/drop-off trips), 2.5 percent by subway, 25.9 by school bus, and 52.5 percent by walking was applied. The vehicle occupancy rate used was 1.30 persons per auto. A temporal distribution with 43.2 percent and 2 percent during the weekday AM and midday peak hours, respectively, was used, and a directional distribution (100 percent and 50 percent "in" during weekday AM and midday peak hours, respectively) was also used. PM peak hour trips are not expected.

  A weekday delivery trip generation rate 0.02 trips per 1,000 sf was used. The temporal distribution for delivery trips (17 percent and 2 percent during the weekday AM and midday peak hours) comes from the 1996 FEIS and *Curbside Pickup and Delivery Operations and Arterial Traffic Impacts*.

  The grade school would generate trips during the AM peak commuter hour; however, students and staff typically depart before the PM peak commuter hour. Therefore, the trip generation analysis reflects no student or staff trips in the PM peak hour. Students and staff remain on campus for the duration of the school day; therefore trips during the midday peak hour are negligible. Based on the analysis presented in the 1996 FEIS, there would be no student, teacher, visitor, or delivery trips on Saturday.

- Intermediate School: The weekday daily trip generation rate (2.18 trips per seat), modal split (22.3 percent by auto by parent pick-ups/drop-offs, 5 percent by subway, 27.7 percent by school bus, and 45 percent by walking), and vehicle occupancy (1.3 persons per auto) were obtained from the 1996 FEIS. A temporal distribution of 44 percent during the weekday AM peak hour and 2 percent during the midday peak hour, and directional splits of 100 percent "in" during the weekday AM peak hour and 50 percent "in" during the midday peak hour also are from the 1996 FEIS.

  A weekday delivery trip generation rate 0.02 trips per 1,000 sf was used. The temporal distribution for delivery trips (17 percent and 2 percent during the weekday AM and midday peak hours, respectively) comes from the 1996 FEIS and *Curbside Pickup and Delivery Operations and Arterial Traffic Impacts*.

  Similar to the grade school, the intermediate school would generate trips during the AM peak commuter hour, but students and staff typically depart before the PM peak commuter hour. Therefore, the trip generation analysis reflects no student or staff trips in the PM peak hour. Students and staff remain on campus for the duration of the school day; therefore trips during the midday peak hour are negligible. Based on the analysis presented in the previous 1996 FEIS, there would be no student, teacher, visitor, or delivery trips on Saturday.

- Day Care: For the day care component, a weekday daily trip generation rate of 138 trips per 1,000 square feet was used from the *No. 7 Subway Extension—Hudson Yards Rezoning and Development Program FGEIS* (2004). Similar to the residential use, the day care modal split was derived from Census 2000 Journey to Work data. Vehicle occupancy rates (2 persons per auto and per taxi) are based on the assumption that on average each vehicle would have one guardian and one child for day care-trips. Weekday peak hour temporal distributions of 16, 5, and 19 percents (AM, midday, PM), and directional splits (53, 50, and 47 percents "in" during the weekday AM, midday, and PM peak hours, respectively) also come from the *No. 7 Subway Extension—Hudson Yards Rezoning and Development Program FGEIS*.

Weekday delivery trip generation rate (0.07 trips per 1,000 square feet) and temporal distribution data (9.6 percent, 11 percent, and 1 percent during the AM, midday, and PM peak hours) was obtained from the *No. 7 Subway Extension—Hudson Yards Rezoning and Development Program FGEIS*. The day care is not expected to generate Saturday trips.

- Community Facility: The 1996 FEIS was the source for the weekday and Saturday trip rate (40 and 15 daily person trips per 1,000 square feet for weekday and Saturday, respectively), modal split (4 percent auto, 7 percent taxi, 14 percent bus, and 75 percent walking), vehicle occupancy (2 persons per auto/taxi), temporal distribution (5 percent, 10 percent, 10 percent, 13.3 percent, and 13.3 percent during the weekday AM, midday, PM, Saturday midday, and Saturday PM peak hours, respectively) and directional split (70 percent, 50 percent, 30 percent, 50 percent, and 50 percent "in" in the weekday AM, midday, PM, Saturday midday, and Saturday PM peak hours, respectively).

  For weekday and Saturday delivery trips, trip generation rates (0.2 daily trips per 1,000 square feet on a weekday and 0.01 daily trips per 1,000 square feet on a Saturday) were also obtained from the 1996 FEIS. The weekday AM and midday peak hour temporal distributions for delivery trips (6 percent and 11 percent) came from the 1996 FEIS while the PM, Saturday midday, and Saturday PM distributions (1 percent each) were obtained from the *No. 7 Subway Extension—Hudson Yards Rezoning and Development Program FGEIS*.

- Open Space: For the open space component, weekday trip generation rate (139 daily trips per acre), modal split (12 percent by auto, 5 percent by subway, 5 percent by bus, and 78 percent by walking), and vehicle occupancy (2.8 persons per auto and 2 persons per taxi) came from the 1996 FEIS. Weekday temporal distributions of 7 percent during the AM peak hour, 17 percent during the midday peak hour, and 14 percent during the PM peak hour were obtained from the *Greenpoint-Williamsburg Rezoning FEIS*. Directional splits (80 percent, 55 percent, and 45 percent "in" during the AM, midday, and PM peak hours, respectively) came from the 1996 FEIS. The open space is not expected to generate delivery trips.

  All Saturday trip generation data were obtained from the *Greenpoint-Williamsburg Rezoning FEIS*. A trip generation rate of 158 daily person trips per acre was used. For the Saturday midday and PM peak hours, a temporal distribution of 20 percent and directional split of 55 percent (Saturday midday peak) and 45 percent (Saturday PM peak) "in" was used. Modal split and vehicle occupancy assumptions are similar to weekdays.

Generated Traffic Volumes

The trips associated with completion of the 1996 Plan in 2013 were considered cumulatively with the elements of the 1996 Plan to be completed by 2011 as well as other off-site developments that were described above. As shown in Table 16-23, the completed 1996 Plan with all anticipated background developments would generate a total of 2,445 vph, 1,462 vph, 2,335 vph, 2,186 vph, and 2,335 vph during the weekday AM, midday, PM, Saturday midday, and Saturday PM peak hours, respectively. In addition, the 2013 No Build traffic network accounts for background growth of one percent per year consistent with the *CEQR Technical Manual*.

Trip Assignment

Vehicle trips generated by the 1996 Plan and other No Build developments were assigned to the roadway network. The following describes the vehicular traffic (auto, taxi and truck) assignments by use.

Table 16-23
2013 No Build Vehicular Trip Generation

Site	Weekday AM			Weekday Midday			Weekday PM			Saturday Midday			Saturday PM		
	In	Out	Sum	In	Out	Sum	In	Out	Sum	In	Out	Sum	In	Out	Sum
830 Fountain Avenue	128	82	210	333	290	623	306	286	592	437	382	819	543	597	1,140
HPD – Unknown Sponsor	18	78	96	26	26	52	75	35	110	43	43	86	37	37	74
HPD – Lincoln Avenue	3	13	16	3	3	6	12	6	18	6	6	12	6	6	12
HPD – McClancy Place/ACORN	7	30	37	10	10	20	29	13	42	16	16	32	14	14	28
Gateway Site – 1996 Plan*	698	1,388	2,086	381	380	761	1,043	530	1,573	621	616	1,237	539	542	1,081
Total	**854**	**1,591**	**2,445**	**753**	**709**	**1,462**	**1,465**	**870**	**2,335**	**1,123**	**1,063**	**2,186**	**1,139**	**1,196**	**2,335**

Note: * Includes residential, office, local retail, grade school, intermediate school, day care, community facility, and parkland.

- Residential Auto Trips: The assignment patterns for residential auto trips are described in Section D, "2011 the Future without the Proposed Action."
- Destination Retail Auto Trips: The assignment patterns for trips associated with destination retail are described in Section D, "2011 the Future without the Proposed Action."
- Local Retail Auto Trips: The assignment patterns for local retail auto trips are described in Section E, "2011 Probable Impacts of the Proposed Action."
- Office Auto Trips: The assignment patterns for office trips were based on Census 2000 reverse journey-to-work data (see "Grade/Intermediate School Faculty" below).
- Grade/Intermediate School Student Auto Trips: AM peak hour student auto trips were assigned from local streets and arterials serving the surrounding neighborhoods. Student-related weekday AM peak hour "in" trips were assigned to the school sites as follows: 20 percent each on eastbound Linden Boulevard and eastbound Flatlands Avenue; 15 percent along southbound Pennsylvania Avenue; 10 percent along Ashford Street (via Essex Street south of Linden Boulevard); 10 percent on Atkins Avenue; 9 percent on Fountain Avenue; 8 percent along eastbound Shore Parkway; 5 percent on northbound Pennsylvania Avenue (coming from Starrett City); 2 percent on the westbound Shore Parkway; and, 1 percent along westbound Linden Boulevard. Student-related auto trips would primarily be parental drop-offs. These trips would likely be destined to places of work; therefore, student-related weekday AM peak hour "out" trips (or drop-off return trips) were assigned according to morning commuter patterns (weekday AM peak hour residential "out" trip assignments).
- Grade/Intermediate School Faculty Auto Trips: Faculty weekday AM peak hour trips were assigned according to Census 2000 reverse journey-to-work data (traveling to a workplace within the study area) from other census tracts. Table 16-24 provides the basis of faculty origins and destinations based on the Census data.

Table 16-24
Projected Trip Distribution for Faculty Auto Trips

Origin / Destination	Percent
Brooklyn	42%
Queens	23%
Long Island	17%
Staten Island	10%
Bronx/Westchester	7%
Manhattan	1%
Total	100%

Note: The above distribution of origins and destinations was also used for the assignment of office trips.
Sources: Census Transportation Planning Package (CTPP), 2000 Journey-to-Work data (Brooklyn Census Tracts 1058, 1070, 1078, 1100, 1106, 1110, 1112, 1214, and 1220)

- Day Care Facility Auto Trips: The day care center is expected to primarily serve residents of the proposed residential development and adjacent neighborhoods. Of the weekday AM peak hour "in" trips generated to the day care site, 50 percent were assumed to originate from within the residential portion of the Project Site and 50 percent from adjacent neighborhoods. Of the auto trips generated to the day care site from outside the Project Site, approximately 5 percent were assigned from Starrett City along Pennsylvania and Vandalia Avenues, 4 percent each were assigned to eastbound Linden Boulevard, southbound Pennsylvania Avenue, and southbound Fountain Avenue. Approximately 1 percent was assigned to westbound Linden Boulevard, and 32 percent would access the site using local streets north of the Project Site. Day care auto trips would primarily be parental drop-offs, and therefore "out" trips during the weekday AM peak hour were assumed to be destined to places of work. Similar to school drop-offs, weekday AM peak hour day care generated "out" trips were assigned according to morning commuter patterns (weekday AM peak hour residential "out" trip assignments). These assignments were reversed for weekday PM peak hour day care auto trip assignments.
- Community Facility and Open Space Auto Trips: These land uses are local traffic generators, therefore community facility and park-related auto trips were assigned to the site similarly to local retail distribution assumptions.
- Taxis: The assignment of taxi trips is described in Section D, "2011 the Future without the Proposed Action."
- Trucks: The assignment of delivery trips is described in Section D, "2011 the Future without the Proposed Action."

Vehicle trips generated by the No Build developments together with the annual background growth provide the No Build traffic volume baseline. Detailed 2013 No Build traffic volume maps are provided in Appendix E, "Traffic Technical Appendix."

INTERSECTION LEVEL OF SERVICE ANALYSIS

Based on the projected increases in traffic volumes and the physical changes to the roadway network, No Build levels of service were determined for 2013. Table 16-25 provides an overview of the levels of service that are expected to characterize the traffic study area during the peak hours. In all, the primary and secondary study areas are comprised of 31 signalized and 11 unsignalized intersections. A summary description is also provided below:

- In the weekday AM peak hour, six of the 31 signalized intersections analyzed would operate at overall LOS E or F, and two intersections would operate at overall unacceptable LOS D (four of the six intersections shown in Table 16-25 would be within the "acceptable" delays of LOS D). Forty of approximately 200 analyzed specific traffic movements would operate at LOS E or F.
- In the weekday midday peak hour, three signalized intersections would operate at overall LOS E or F, and one intersection would operate at overall unacceptable LOS D (two of the three intersections shown in Table 16-25 would be within the "acceptable" delays of LOS D). Twenty-three traffic movements would operate at LOS E or F.
- During the weekday PM peak hour, six signalized intersections would operate at overall LOS E or F, and three would operate at overall unacceptable LOS D (one of the four intersections shown in Table 16-25 would be within the "acceptable" delays of LOS D). Forty-eight individual traffic movements would be operating at LOS E or F.

- For the Saturday midday peak hour, seven signalized intersections would be at LOS E or F, and none would operate at overall unacceptable LOS D. Thirty-nine traffic movements would operate at LOS E or F.
- For the Saturday PM peak hour, seven signalized intersections would be at LOS E or F, and three would operate at overall unacceptable LOS D (one of the four intersections shown in Table 16-25 would be within the "acceptable" delays of LOS D). Forty-seven traffic movements would operate at LOS E or F.

Table 16-25
2013 No Build Condition Intersection Level of Service Summary

Level of Service	Weekday			Saturday	
	AM	Midday	PM	Midday	PM
Signalized Intersections					
Overall Intersection LOS A/B	12	14	12	11	11
Overall Intersection LOS C	7	11	9	9	9
Overall Intersection LOS D*	6	3	4	4	4
Overall Intersection LOS E/F	6	3	6	7	7
Number of Signalized Intersection Movements at LOS E or F	40	23	48	39	47
Unsignalized Intersections					
Overall Intersection LOS A/B	10	11	10	11	11
Overall Intersection LOS C	0	0	1	0	0
Overall Intersection LOS D*	0	0	0	0	0
Overall Intersection LOS E/F	1	0	0	0	0
Number of Unsignalized Intersection Movements at LOS E or F	6	0	3	2	4

Notes:
* This table shows intersections that operate at acceptable and unacceptable levels of service. Only intersections that operate at unacceptable levels of service are discussed in detail.
This table includes the 37 intersections analyzed for existing conditions and the 5 newly constructed intersections under No Build conditions.

In the weekday AM peak hour, one unsignalized intersection would operate at overall LOS E or F. During all other peak hours, all unsignalized intersections would operate at overall LOS C or better. Six unsignalized traffic movements would operate at LOS E or F in the weekday AM peak hour, none in the weekday midday peak hour, three in the weekday PM peak hour, two in the Saturday midday peak hour, and four in the Saturday PM peak hour.

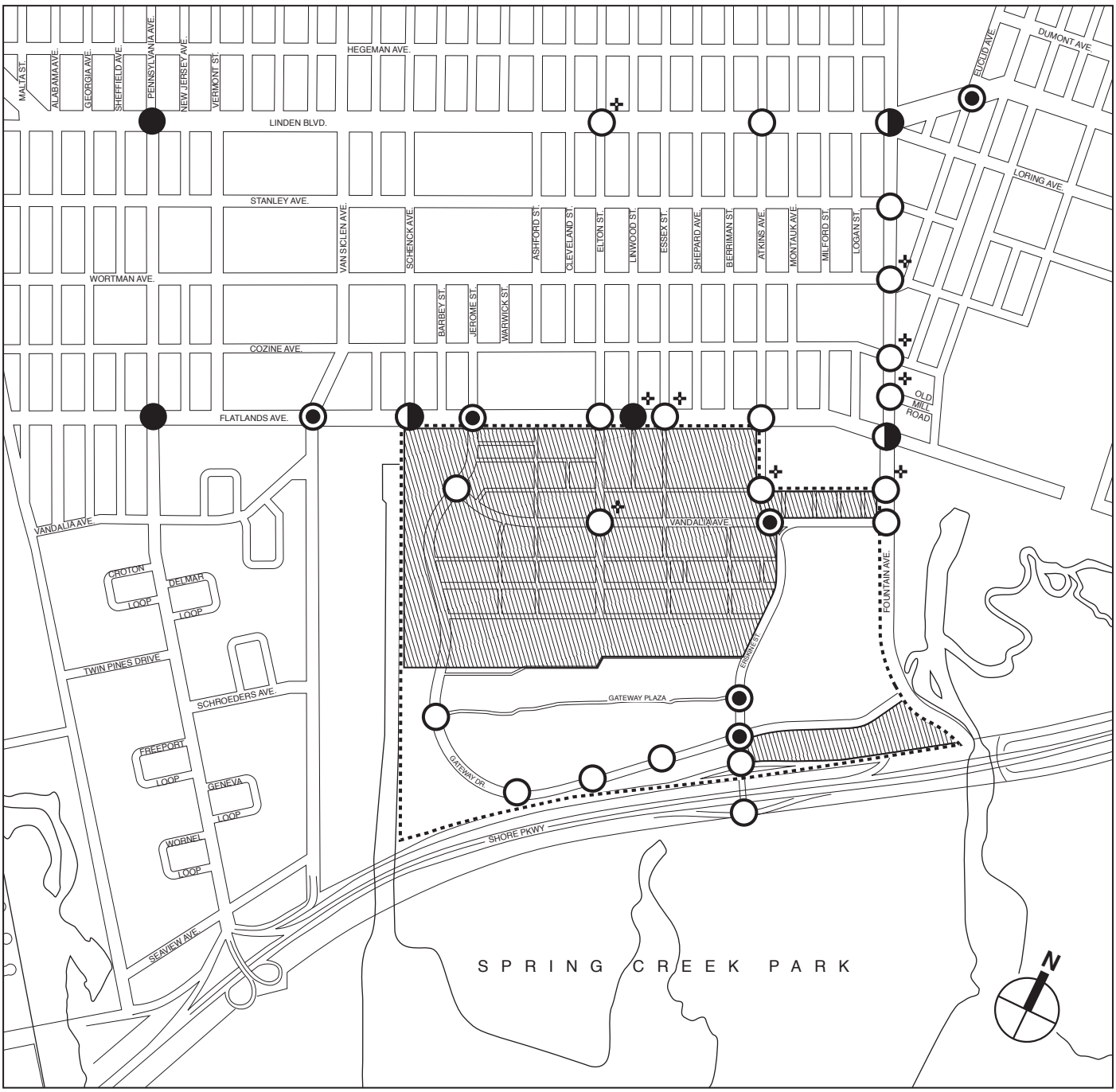
Overall projected levels of service for the 2013 No Build condition are also presented in Figures 16-21a through 16-25b. Table 16-26 shows the details of the individual traffic movements that would operate at an unacceptable level of service during at least one peak hour, and whether or not these movements would be significantly impacted. A description of traffic levels of service by corridor is also provided below.

Erskine Street

Levels of service along Erskine Street would be acceptable with all intersections analyzed operating at overall LOS C or better for all peak hours. All movements at intersections analyzed along Erskine Street would operate at acceptable levels of service except the following:

- At the intersection of Erskine Street and Gateway Drive, southbound through traffic would operate at LOS E during the weekday AM and Saturday PM peak hours. Westbound left turns from Gateway Drive onto Erskine Street would all operate at LOS E during the weekday PM peak hour.

12.8.08



0 1000 2000 FEET

SCALE

Project Site

Fresh Creek Urban Renewal Area Boundary

LOS A or B

LOS C

LOS D

LOS E or F

Unsignalized Intersection

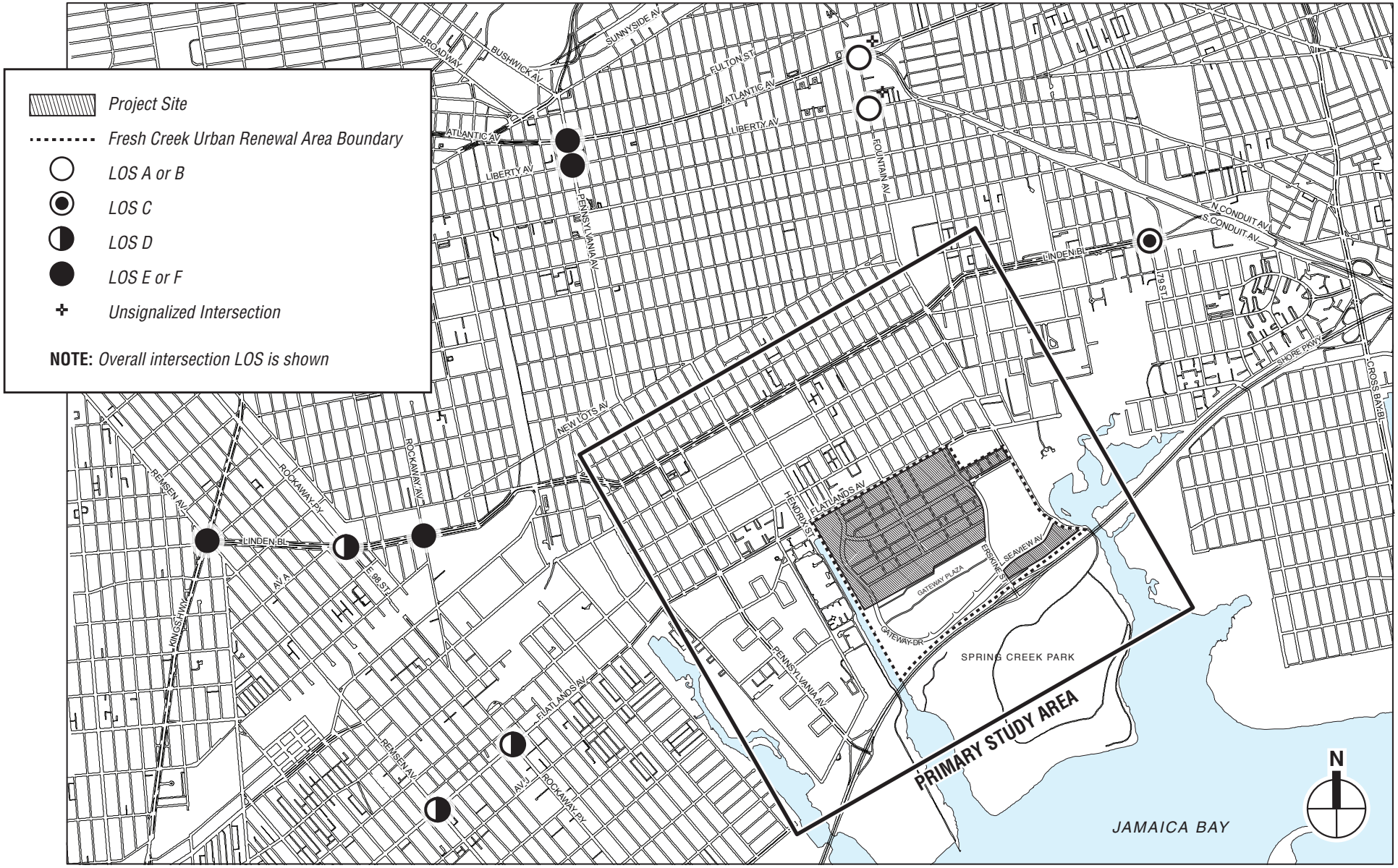
NOTE: *Overall intersection LOS is shown*

2013 No Build Weekday
AM Peak Hour Traffic Level of Service
Primary Study Area

GATEWAY ESTATES II

Figure 16-21a

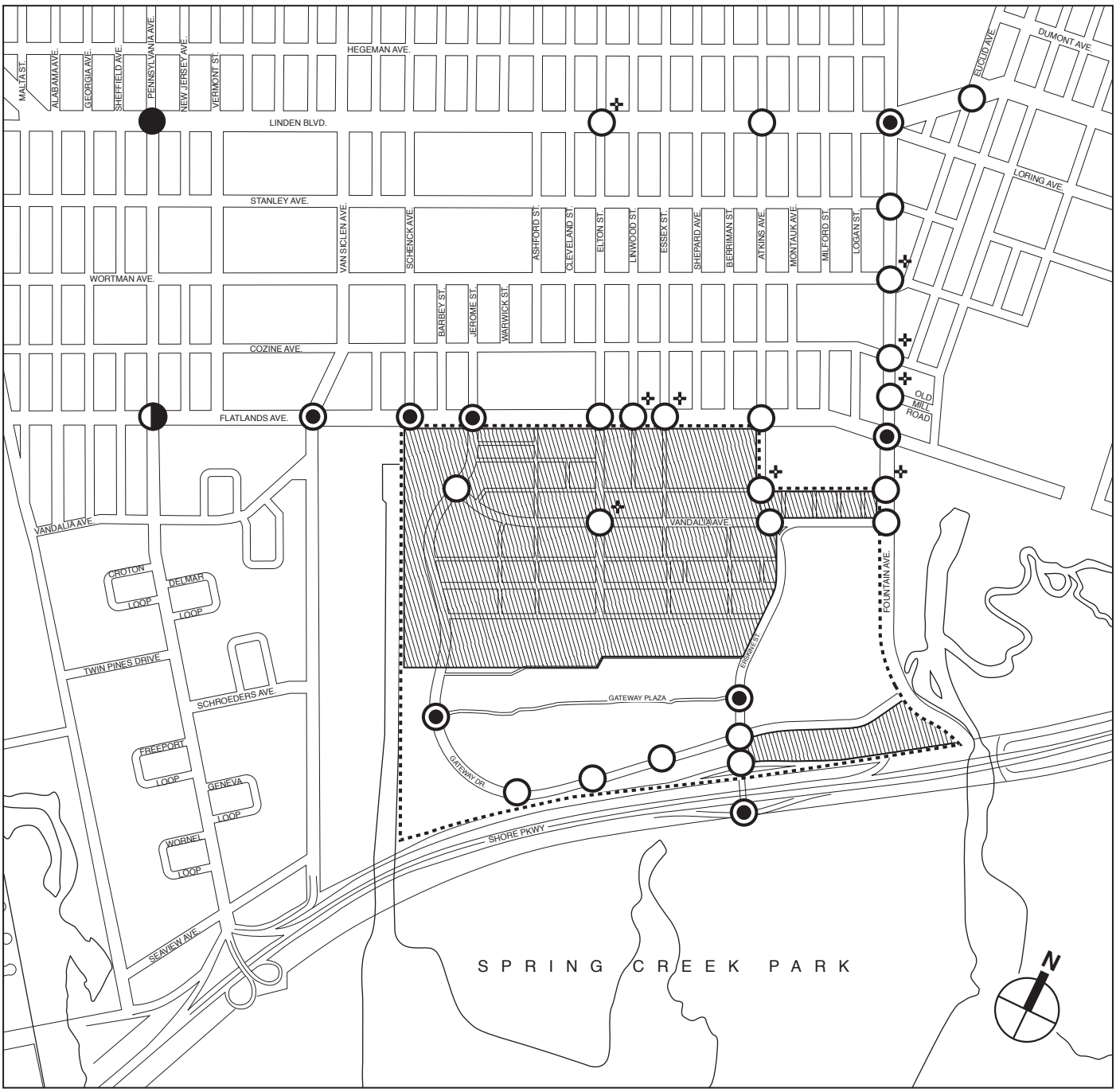
12.2.08



2013 No Build Weekday
AM Peak Hour Traffic Level of Service
Secondary Study Area

Figure 16-21b

12.8.08



0 1000 2000 FEET

SCALE

Project Site

Fresh Creek Urban Renewal Area Boundary

LOS A or B

LOS C

LOS D

LOS E or F

Unsignalized Intersection

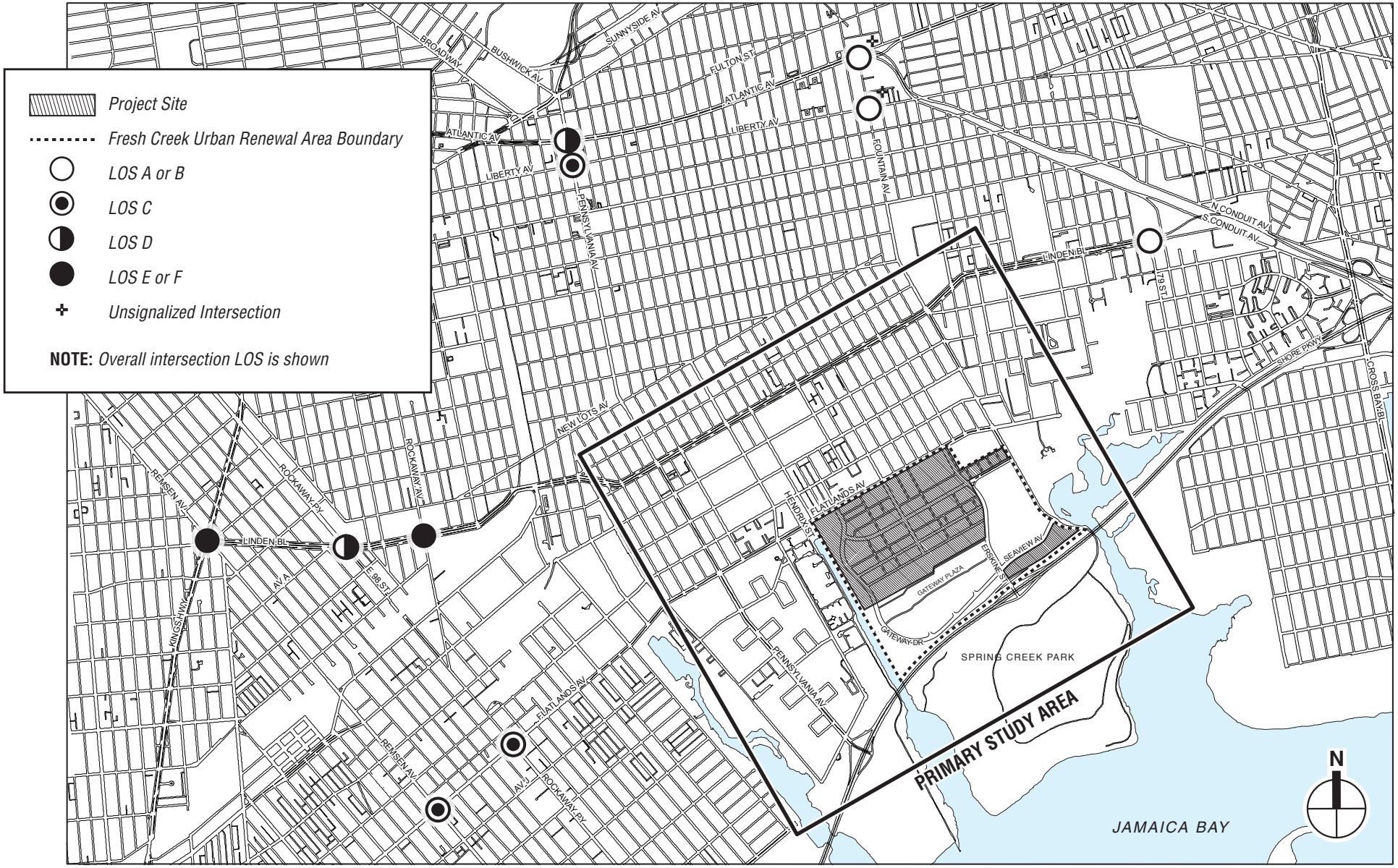
NOTE: *Overall intersection LOS is shown*

2013 No Build Weekday
Midday Peak Hour Traffic Level of Service
Primary Study Area

GATEWAY ESTATES II

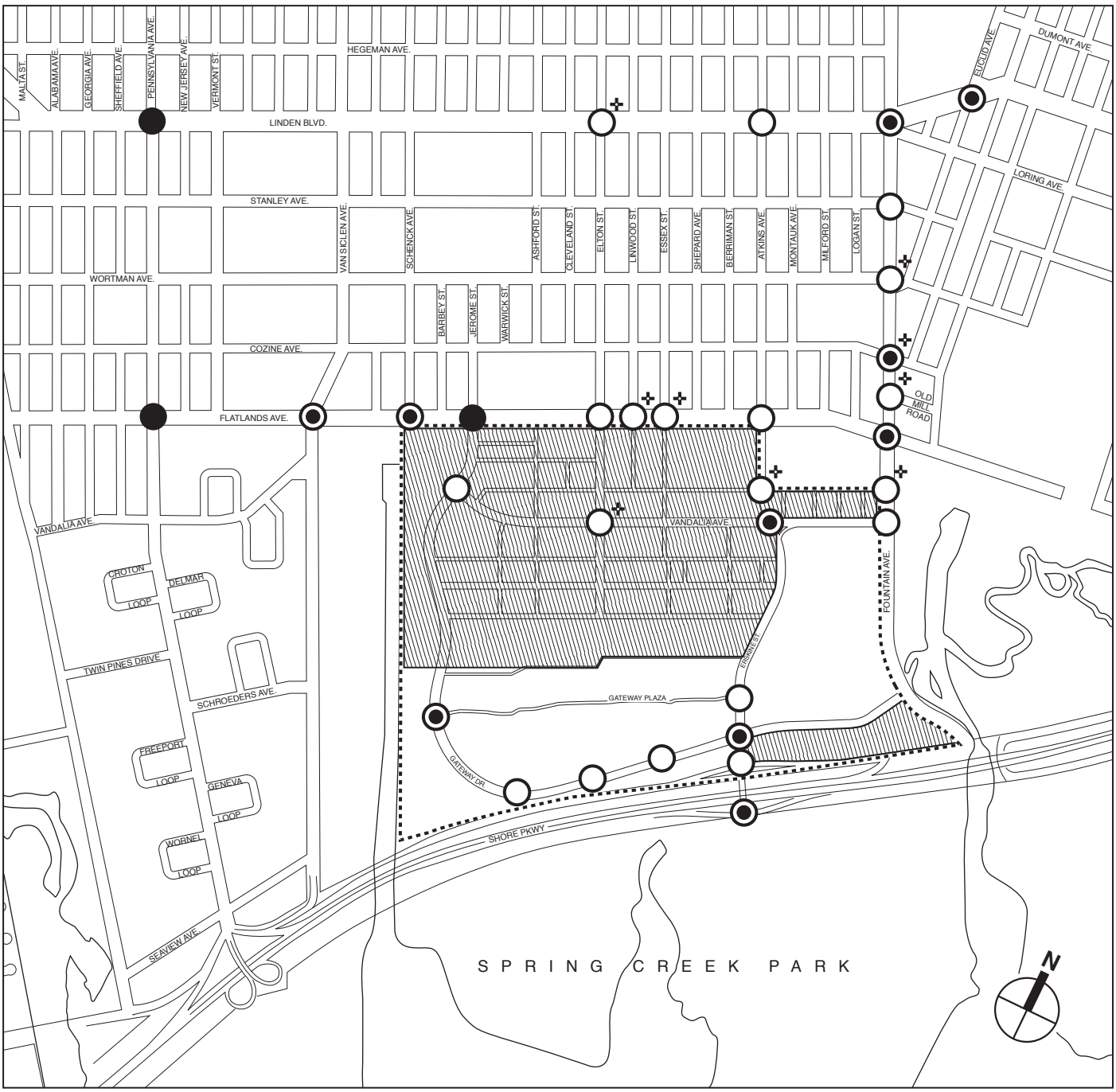
Figure 16-22a

12.2.08



2013 No Build Weekday
Midday Peak Hour Traffic Level of Service
Secondary Study Area

Figure 16-22b



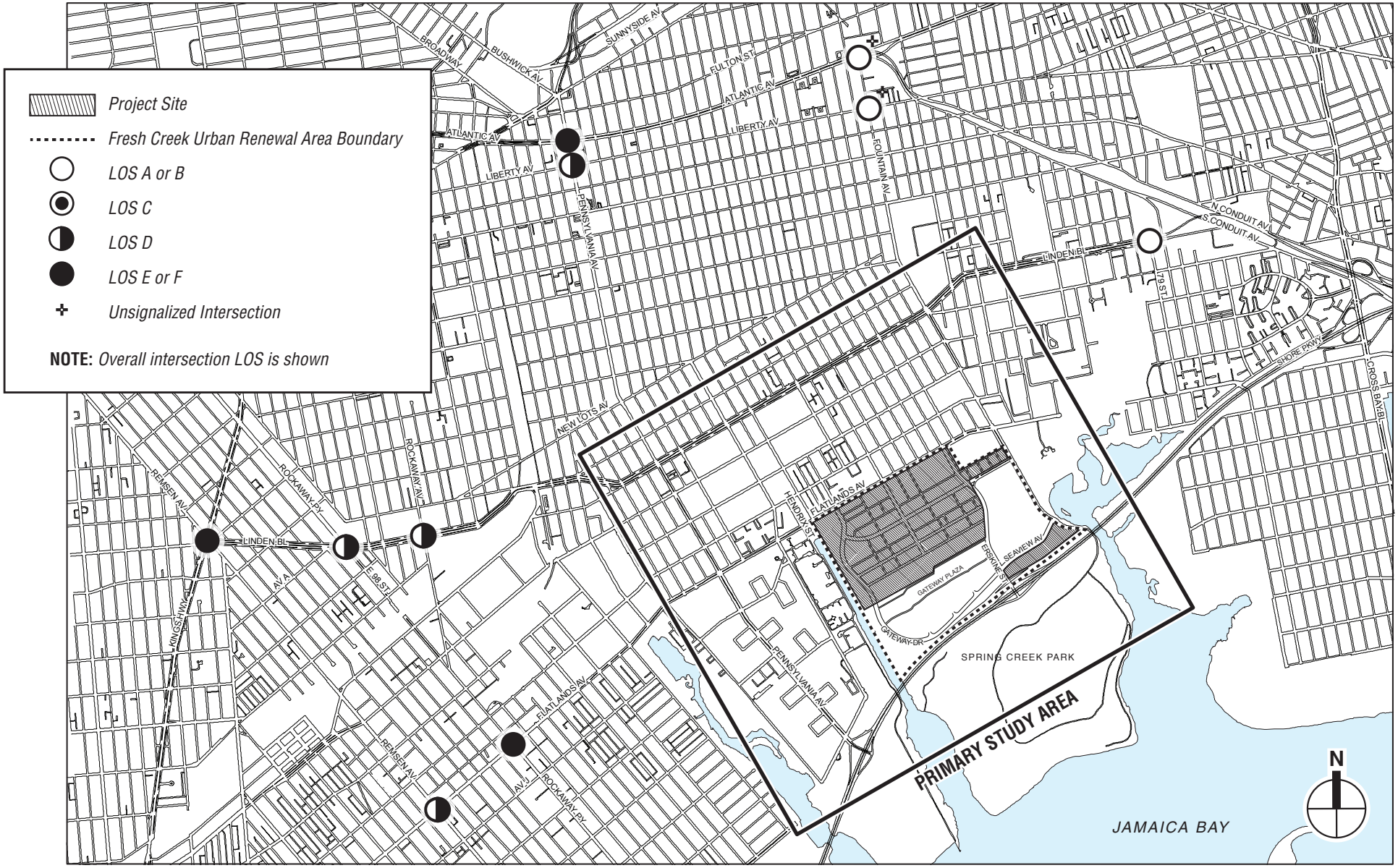
NOTE: *Overall intersection LOS is shown*

2013 No Build Weekday
PM Peak Hour Traffic Level of Service
Primary Study Area

GATEWAY ESTATES II

Figure 16-23a

12.2.08

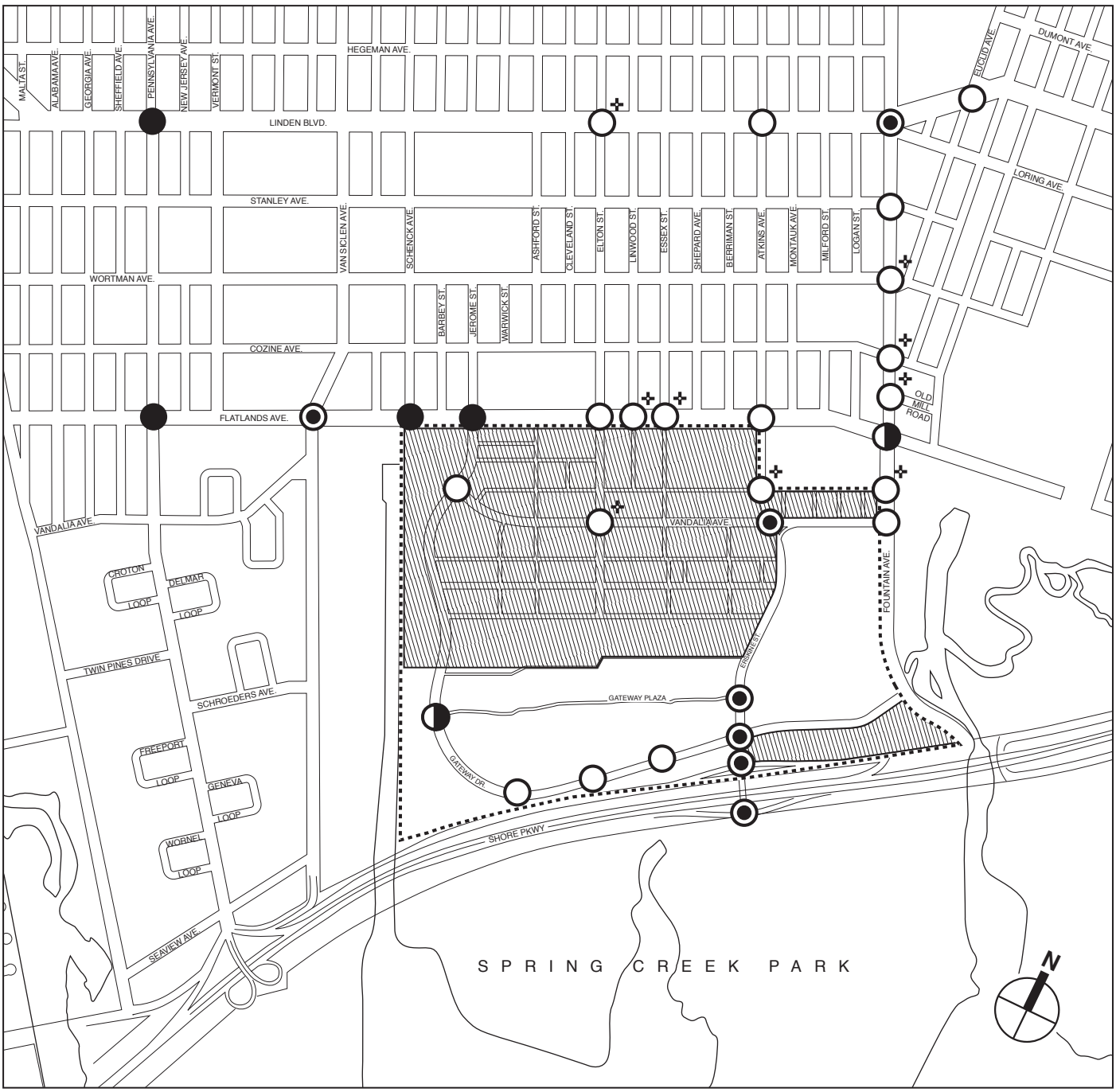


2013 No Build Weekday
PM Peak Hour Traffic Level of Service
Secondary Study Area

Figure 16-23b

GATEWAY ESTATES II

12.8.08



0 1000 2000 FEET

SCALE

Project Site

Fresh Creek Urban Renewal Area Boundary

LOS A or B

LOS C

LOS D

LOS E or F

Unsignalized Intersection

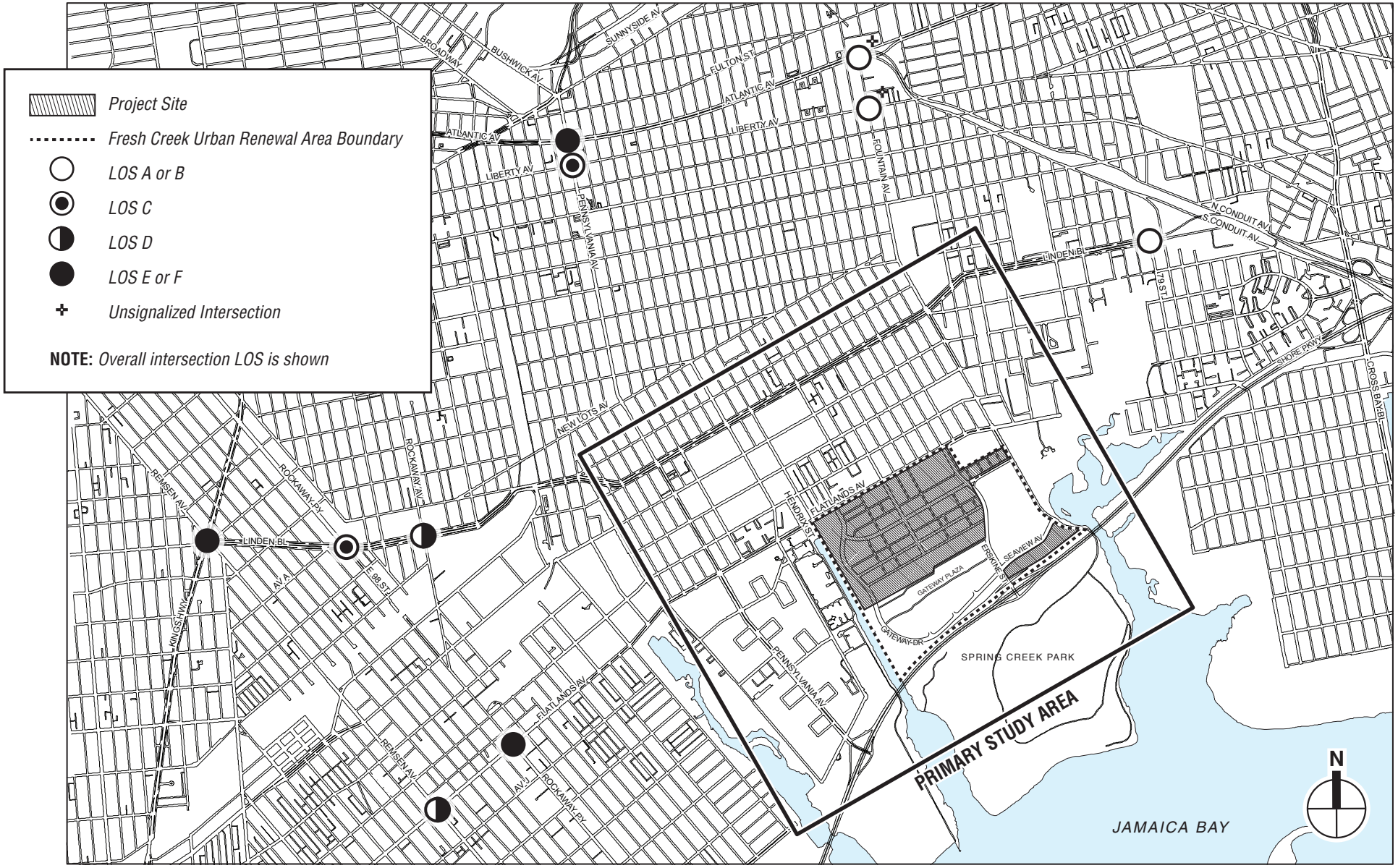
NOTE: *Overall intersection LOS is shown*

2013 No Build Saturday
Midday Peak Hour Traffic Level of Service
Primary Study Area

GATEWAY ESTATES II

Figure 16-24a

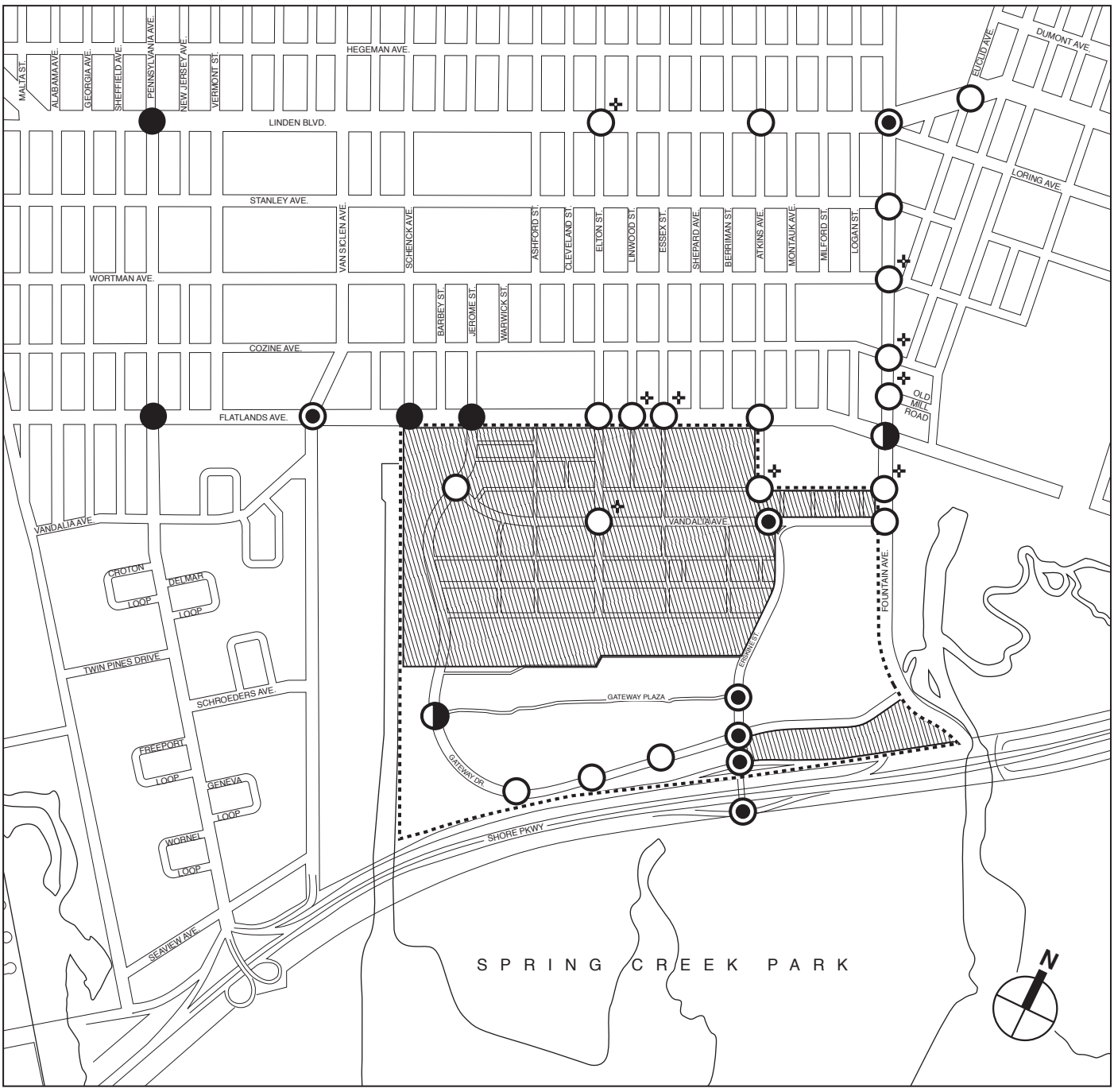
12.2.08



2013 No Build Saturday
Midday Peak Hour Traffic Level of Service
Secondary Study Area

Figure 16-24b

12.8.08



Project Site

Fresh Creek Urban Renewal Area Boundary

LOS A or B

LOS C

LOS D

LOS E or F

Unsignalized Intersection

0 1000 2000 FEET

SCALE

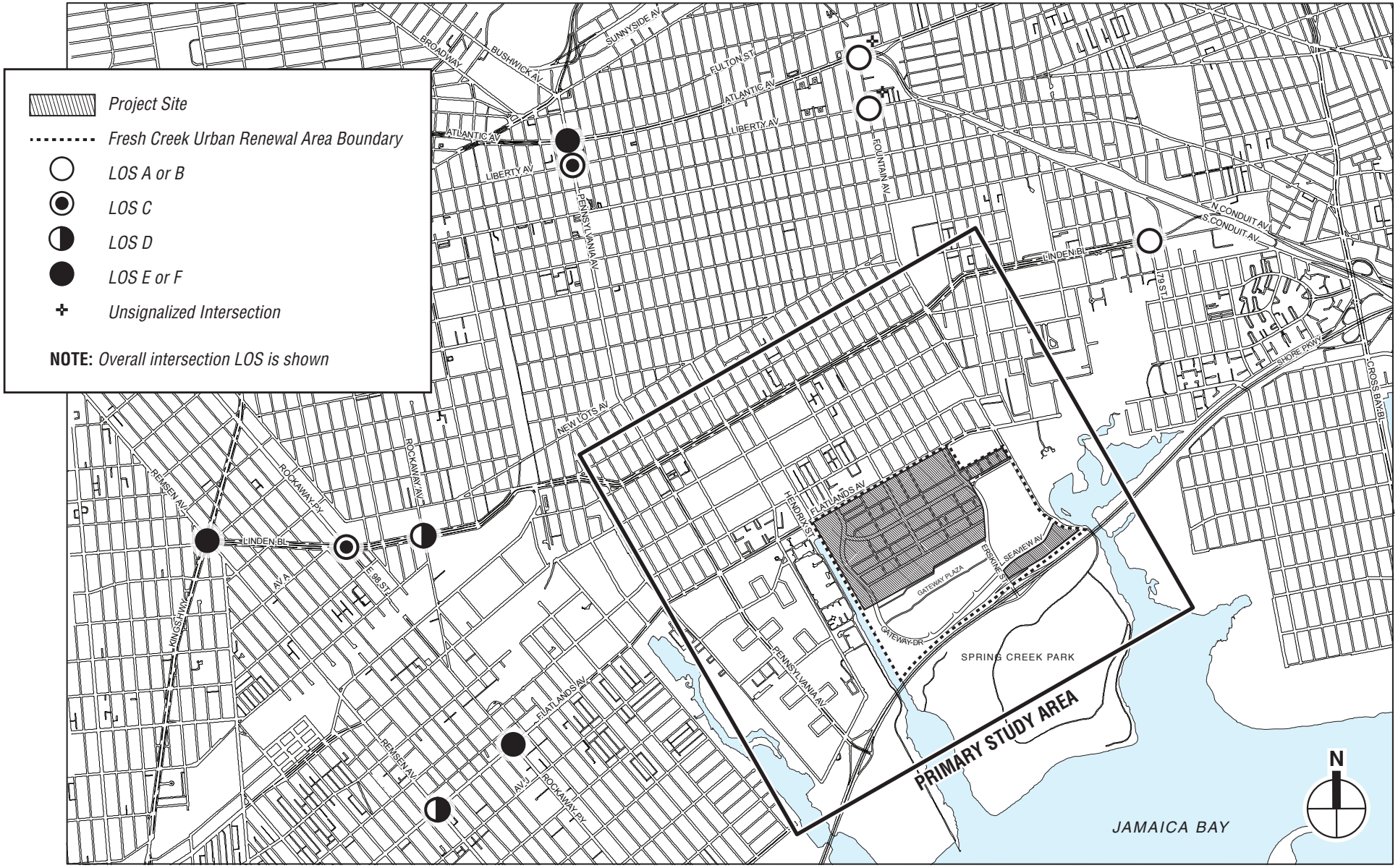
NOTE: *Overall intersection LOS is shown*

2013 No Build Saturday
PM Peak Hour Traffic Level of Service
Primary Study Area

GATEWAY ESTATES II

Figure 16-25a

12.2.08



2013 No Build Saturday
PM Peak Hour Traffic Level of Service
Secondary Study Area

GATEWAY ESTATES II

Figure 16-25b

Table 16-26
2013 No Build Traffic Movements at Unacceptable Levels of Service

Signalized Intersection	Approach and Movement		Weekday									Saturday					
			AM			Midday			PM			Midday			PM		
			D*	E	F	D*	E	F	D*	E	F	D*	E	F	D*	E	F
Erskine Street & Gateway Drive	SB	T		●												●	
	WB	L								●					●		
Gateway Drive & Gateway Plaza	SB	L				●			●				●				●
	WB	LR										●				●	
Fountain Avenue & Flatlands Avenue	NB	LTR							●								
	SB	LTR				●							●				●
	EB	DefL			●												
Flatlands Avenue & Jerome Street	NB	L												●			●
	EB	TR									●			●			●
	WB	L													●		
Flatlands Avenue & Schenck Avenue/ Vandalia Avenue	SB	LR														●	
	EB	L													●		
	WB	TR		●										●			●
Flatlands Avenue & Van Siclen Avenue	SB	LTR		●							●				●		
	EB	L		●													
	WB	L		●						●			●				●
Flatlands Avenue & Pennsylvania Avenue	NB	L	●							●				●			●
	SB	L			●			●			●			●			●
	EB	L					●			●				●			●
		T							●				●				●
	WB	L							●					●			●
		T													●		
		R			●							●				●	
Flatlands Avenue & Rockaway Parkway	SB	LTR	●			●				●				●			●
	EB	L							●			●				●	
		TR								●				●			●
	WB	L							●				●				●
		TR								●				●			●
Flatlands Avenue & Remsen Avenue	SB	L								●			●			●	
	EB	TR								●							
	WB	TR		●					●				●				●
Linden Boulevard & 79th Street	NB	L	●														
Linden Boulevard & Euclid Avenue	NB	LTR			●			●			●						
	SB	LTR	●														
Linden Boulevard & Fountain Avenue & Loring Avenue	NB[1]	LTR			●				●				●				●
	SB[1]	DefL	●						●								
		TR	●							●			●		●		
	EB[3]	L			●						●		●				●
Linden Boulevard & Pennsylvania Avenue	NB	L			●			●			●			●			●
	SB	L			●		●			●				●			●
		TR			●			●			●			●			●
	EB	L		●		●			●						●		
		T									●	●				●	
	WB	L	●			●						●				●	
		T			●					●		●				●	
	EB[8]	T	●														
	WB[8]	TR		●													
Linden Boulevard & Rockaway Avenue	NB	LT			●			●			●			●			●
		R	●			●				●					●		
	SB	LT			●			●			●			●			●
		R	●					●			●				●		
	EB[3]	L		●			●			●					●		
	WB[3]	L			●			●			●			●			●
		T		●													

Table 16-26 (cont'd)
2013 No Build Traffic Movements at Unacceptable Levels of Service

Signalized Intersection	Approach and Movement		Weekday AM D*	AM E	AM F	Midday D*	Midday E	Midday F	PM D*	PM E	PM F	Saturday Midday D*	Midday E	Midday F	PM D*	PM E	PM F
Linden Boulevard & Rockaway Parkway	NB	LTR			●					●					●		
	SB	L			●			●			●			●			●
		TR	●								●						
	EB[3]	L			●		●				●		●			●	
	WB[3]	L			●		●			●							
Linden Boulevard & Kings Highway & Remsen Avenue	NB[4]	T			●		●				●			●			●
	SB[4]	T			●	●					●			●			●
	NB[5]	TR			●	●					●	●			●		
	SB[5]	TR	●								●	●			●		
	EB[6]	DefL			●			●			●		●			●	
		TR			●			●			●			●			●
	WB[6]	TR			●			●			●			●			●
	EB[3]	TR		●				●			●			●			●
	WB[3]	LT[7]			●			●		●				●			●
											●						
		R		●						●							
Pennsylvania Avenue & Liberty Avenue	NB	LTR			●												
	SB	TR							●								
	EB	LTR	●				●			●		●				●	
	WB	LTR		●		●					●		●				●
Pennsylvania Avenue & Atlantic Avenue	NB	L			●			●			●			●			●
	SB	L	●				●				●			●			●
		TR									●	●			●		
	EB	TR		●		●					●			●			●
	WB	TR	●														

Unsignalized Intersection	Approach and Movement		Weekday AM D*	AM E	AM F	Midday D*	Midday E	Midday F	PM D*	PM E	PM F	Saturday Midday D*	Midday E	Midday F	PM D*	PM E	PM F
Fountain Avenue & Wortman Avenue	EB	LT		●							●			●			●
	WB	LTR			●						●		●				●
Fountain Avenue & Liberty Avenue	SB	LTR		●						●		●				●	
Flatlands Avenue & Essex Street	SB	LTR			●											●	
Flatlands Avenue & Linwood Street	NB	LTR			●				●			●			●		
	SB	LR			●												

Notes:
L = Left turn movement ;T = Through movement; R = Right turn movement; DefL = De facto left turn movement
* Unacceptable LOS D (above 45 seconds per vehicle for signalized intersections, above 30 for unsignalized intersections)
[1] Fountain Avenue
[2] Loring Avenue
[3] Linden Boulevard Mainline
[4] Kings Highway Mainline
[5] Kings Highway Service Road
[6] Remsen Avenue
[7] In the weekday PM peak hour, the westbound approach operates with a de facto left turn lane and a separate through lane.
[8] Linden Boulevard Service Road

Gateway Drive

- All intersections analyzed along Gateway Drive would operate at overall LOS D or better during all five peak hours. Left turns from southbound Gateway Drive onto Gateway Plaza would operate at LOS E and F during the Saturday midday and Saturday PM peak hours, respectively. Also, left and right turns from westbound Gateway Plaza would operate at LOS E during the Saturday PM peak hour. The intersection of Gateway Drive and Erskine Street

has two traffic movements that would also operate at an unacceptable level of service, and is described as part of the Erskine Street corridor above.

Vandalia Avenue

One of the two intersections analyzed along this corridor, Vandalia Avenue and Gateway Drive would be signalized in the 2013 No Build condition. A detailed warrant analysis indicated that the peak hour warrant would be satisfied at this intersection. The intersection of Vandalia Avenue and Elton street would remain unsignalized. The two intersections would operate at overall LOS B during all peak hours analyzed. All individual traffic movements would operate at LOS C or better.

The intersections of Vandalia Avenue and Erskine Street, and Vandalia Avenue and Fountain Avenue, are described as part of the Erskine Street and Fountain Street corridors, respectively.

Fountain Avenue

Along the Fountain Avenue corridor, none of the intersections would operate at overall LOS E or F during any of the peak hours analyzed. The intersection of Fountain Avenue and Flatlands Avenue would operate at an overall unacceptable LOS D during the weekday AM peak hour. De facto left turns from eastbound Flatlands Avenue onto Fountain Avenue would operate at LOS F during the weekday AM peak hour. Also, southbound Fountain Avenue would operate at LOS E and F during the Saturday midday and PM peak hours, respectively. The intersection of Fountain Avenue and Linden Boulevard has movements that would operate at LOS E or F, and this intersection is described as part of the Linden Boulevard corridor.

All six unsignalized intersections analyzed along Fountain Avenue would operate at overall LOS C or better. At the intersection of Fountain Avenue and Wortman Avenue, eastbound through traffic and left turns would operate at LOS E or F during the weekday AM, PM, Saturday midday, and Saturday PM peak hours. Westbound Wortman Avenue would operate at LOS F during the weekday AM, PM, and Saturday PM peak hours, and at LOS E during the Saturday midday peak hour. At the intersection of Fountain Avenue and Liberty Avenue, southbound Fountain Avenue would operate at LOS E during the weekday AM, PM, and Saturday PM peak hours.

Flatlands Avenue

Along the Flatlands Avenue corridor, four signalized intersections would operate at overall LOS E or F during at least one peak hour. Seven signalized intersections analyzed along Flatlands Avenue would have individual movements operating at LOS E or F, including the following:

- At the intersection of Flatlands Avenue and Jerome Street, through and right turn movements from eastbound Flatlands Avenue would operate at LOS F during the weekday PM, Saturday midday, and Saturday PM peak hours. The northbound left turns from Jerome Street also operate at LOS F during the Saturday midday and PM peak hours.
- At the intersection of Flatlands Avenue and Schenck Avenue, westbound Flatlands Avenue would operate at LOS E or F during the weekday AM, Saturday midday, and Saturday PM peak hours, respectively. Southbound Schenck Avenue would operate at LOS E during the Saturday PM peak hour.
- At the intersection of Flatlands Avenue and Van Siclen Avenue, southbound Van Siclen Avenue would operate at LOS E and F in the weekday AM and PM peak hours, respectively. Left turns from eastbound Flatlands Avenue onto Van Siclen Avenue would operate at LOS E during the weekday AM peak hour, and the left turns from westbound

Flatlands Avenue onto Van Siclen Avenue would operate at LOS E during the weekday AM, PM, and Saturday midday peak hours and at LOS F during the Saturday PM peak hour.

- At the intersection of Flatlands Avenue and Pennsylvania Avenue, left turns from northbound and southbound Pennsylvania Avenue, and eastbound Flatlands Avenue would operate at LOS E or F during the weekday PM, Saturday midday, and Saturday PM peak hours. Left turns from southbound Pennsylvania Avenue would also operate at LOS F during the weekday AM and midday peak hours, and left turns from eastbound Flatlands Avenue onto Pennsylvania Avenue would operate at LOS E during the weekday midday peak hour. Eastbound through traffic along Flatlands Avenue would operate at LOS E and F during the Saturday midday and PM peak hours, respectively. Westbound right turns from Flatlands Avenue would operate at LOS F and E during the weekday AM and Saturday PM peak hours, respectively. Left turns from westbound Flatlands Avenue would operate at LOS F during the Saturday midday and PM peak hours.
- At the intersection of Flatlands Avenue and Rockaway Parkway, southbound Rockaway Parkway, and the through and right turn movements along Flatlands Avenue would operate at LOS E or F during the weekday PM, Saturday midday, and Saturday PM peak hours. Left turns from westbound Flatlands Avenue onto Rockaway Parkway would operate at LOS E and F during the Saturday midday and PM peak hours, respectively.
- At the intersection of Flatlands Avenue and Remsen Avenue, left turns from southbound Remsen Avenue onto Flatlands Avenue would operate at LOS E during the weekday PM, Saturday midday, and Saturday PM peak hours. The through and right turn movements from eastbound Flatlands Avenue would operate at LOS E during the weekday PM peak hour. Along westbound Flatlands Avenue, these movements would operate at LOS E during the weekday AM and Saturday midday peak hours, and at LOS F during the Saturday PM peak hour.
- The intersection of Flatlands Avenue and Fountain Avenue has movements that would operate at unacceptable levels of service and is described as part of the Fountain Avenue corridor.

Both unsignalized intersections analyzed along the Flatlands Avenue corridor would have individual movements that would operate at LOS E or F, including the following:

- At the intersection of Flatlands Avenue and Essex Street, southbound Essex Street would operate at LOS F and LOS E during the weekday AM and Saturday PM peak hours, respectively.
- The intersection of Flatlands Avenue and Linwood Street would operate at overall LOS F during the weekday AM peak hour, and at LOS A for the other peak hours. In the AM peak hour, the northbound and southbound approaches of Linwood Street would operate at LOS F.

Linden Boulevard

Along Linden Boulevard, two of the eight signalized intersections analyzed, Linden Boulevard and Pennsylvania Avenue, and the six-legged intersection of Linden Boulevard, Kings Highway, and Remsen Avenue, would operate at overall LOS F during all five peak analysis hours. Also, the intersection of Linden Boulevard and Rockaway Avenue would operate at overall LOS E during the weekday AM and midday peak hours. Six intersections have individual movements operating at LOS E or F, including the following:

- At the intersection of Linden Boulevard and Euclid Avenue, the northbound Euclid Avenue approach would operate at LOS F during all the weekday peak analysis hours.
- At the intersection of Linden Boulevard, Fountain Avenue and Loring Avenue, northbound Fountain Avenue would operate at LOS E or F during the weekday AM, Saturday midday, and Saturday PM peak hours. Through traffic and right turns from southbound Fountain Avenue

would operate at LOS E during the weekday PM and Saturday midday peak hours. Left turns from the eastbound Linden Boulevard mainline would operate at LOS F during the weekday AM, PM, and Saturday PM peak hours, and at LOS E during the Saturday midday peak hour.

- At the intersection of Linden Boulevard and Pennsylvania Avenue, left turns from northbound Pennsylvania Avenue, and the through and right turn movements from southbound Pennsylvania Avenue, would operate at LOS F during all peak hours analyzed. Left turns from southbound Pennsylvania Avenue would operate at LOS F during the weekday AM, Saturday midday, and Saturday PM peak hours, and at LOS E during the weekday midday and PM peak hours. Left turns from the eastbound and westbound Linden Boulevard mainline would operate at LOS E during the weekday AM and Saturday PM peak hours, respectively, and eastbound through traffic would operate at LOS F and E during the weekday and Saturday PM peak hours, respectively. Westbound through traffic along the Linden Boulevard mainline would operate at LOS F during the weekday AM peak hour, and at LOS E during the weekday and Saturday PM peak hours. Through traffic and right turns from the westbound Linden Boulevard service road would operate at LOS E during the weekday AM peak hour.
- At the intersection of Linden Boulevard and Rockaway Avenue, left turns and through traffic along northbound and southbound Rockaway Avenue, and left turns from the westbound Linden Boulevard mainline would operate at LOS F during all peak hours analyzed. Northbound right turns would operate at LOS E during the weekday PM peak hour, and southbound right turns would operate at LOS F during the weekday midday and PM peak hours. Left turns from the eastbound Linden Boulevard mainline would operate at LOS E during the weekday AM, midday and PM peak analysis hours. Westbound through traffic along the Linden Boulevard mainline would operate at LOS E during the weekday AM peak hour.
- At the intersection of Linden Boulevard and Rockaway Parkway, northbound Rockaway Parkway would operate at LOS F and E during the weekday AM and PM peak hours, respectively. Left turns from southbound Rockaway Parkway would operate at LOS F during all peak hours analyzed. Southbound through and right turn movements would operate at LOS F in the weekday PM peak hour. Left turns from eastbound Linden Boulevard mainline would operate at LOS E or F during all five peak hours, while left turns from the westbound mainline would operate at LOS E or F during the weekday peak hours.
- All individual traffic movements of the six-legged intersection of Linden Boulevard, Kings Highway, and Remsen Avenue would continue to operate at LOS E or F during at least one peak hour, except for the stop-controlled right turn from westbound Linden Boulevard onto Kings Highway. The northbound Kings Highway mainline would operate at LOS E or F during all five peak hours. The southbound Kings Highway mainline would operate at LOS F during the weekday AM, PM, Saturday midday, and Saturday PM peak hours. The northbound Kings Highway service road would operate at LOS F during the weekday AM and PM peak hours, while the southbound service road would operate at LOS F during the weekday PM peak hour. Eastbound and westbound Remsen Avenue would operate at LOS E or F during all five peak hours analyzed. Eastbound Linden Boulevard would operate at LOS E or F during all peak hours. The left turn and through movements of the westbound Linden Boulevard mainline would also operate at LOS E or F during all five peak analysis hours, and right turns would operate at LOS E during the weekday AM and PM peak hours.
- The unsignalized intersection of Linden Boulevard and Elton Street would operate at overall LOS A during all peak hours analyzed.

Pennsylvania Avenue

All intersections analyzed along the Pennsylvania Avenue corridor would operate at overall LOS E during at least one peak hour, and would have individual movements that would operate at LOS E or F, including the following:

- At the intersection of Pennsylvania Avenue and Liberty Avenue, northbound Pennsylvania Avenue would operate at LOS F during the weekday AM peak hour. Eastbound Liberty Avenue would operate at LOS E in the weekday midday, PM, and Saturday PM peak hours. Westbound Liberty Avenue would operate at LOS E in the weekday AM and Saturday midday peak hours, and at LOS F during the weekday and Saturday PM peak hours.
- At the intersection of Pennsylvania Avenue and Atlantic Avenue, left turns from northbound and southbound Pennsylvania Avenue onto Atlantic Avenue would operate at LOS E or F during the weekday midday, PM, Saturday midday, and Saturday PM peak hours. Northbound left turns would also operate at LOS F during the weekday AM peak hour. Through traffic and right turns from southbound Pennsylvania Avenue would operate at LOS F during the weekday PM peak hour. The through and right turn movements from eastbound Atlantic Avenue would operate at LOS E during the weekday AM peak hour, and at LOS F during the weekday PM, Saturday midday, and Saturday PM peak hours.

The intersections of Pennsylvania Avenue with Flatlands Avenue and with Linden Boulevard are discussed as part of the Flatlands Avenue and Linden Boulevard corridors, respectively.

HIGHWAY ANALYSIS

Projected volume increases due to increased background traffic along the Shore Parkway and the Erskine Street interchange on and off-ramps would range from approximately 400 to 730 vph during the weekday and weekend peak hours for the 2013 No Build conditions. Table 16-27 provides 2013 No Build levels of service, speeds and densities for the Shore Parkway near the Erskine Street interchange.

In the weekday AM and midday peak hours, the different mainline highway sections within the influence of the merge and areas analyzed would operate at LOS D and C, respectively, except the eastbound section of the Shore Parkway prior to the Erskine Street off-ramp, which would operate at LOS E during the AM peak hour. This section of the Shore Parkway would operate at LOS E during the Saturday midday peak hour. Sections of the eastbound Shore Parkway between the Erskine Street off-ramp and on-ramp, and past the on-ramp, would operate at LOS E and F, respectively, during the weekday PM and Saturday midday peak hours. During the weekday PM peak hour, the westbound Shore Parkway would deteriorate to LOS E in the sections prior to the Erskine Street off-ramp and past the Erskine Street on-ramp. Although the densities along the various sections of the Shore Parkway would increase, speeds would not be substantially affected.

In the weekday AM and midday peak hours, the different mainline highway sections within the influence of the merge and areas analyzed would operate at LOS D and C, respectively, except the eastbound section of the Shore Parkway prior to the Erskine Street off-ramp, which would operate at LOS E during the AM peak hour. This section of the Shore Parkway would operate at LOS E during the Saturday midday and PM peak hours. Sections of the eastbound Shore Parkway between the Erskine Street off-ramp and on-ramp, and past the on-ramp, would operate at LOS E or F during the weekday PM, Saturday midday, and Saturday PM peak hours. During the weekday PM peak hour, the westbound Shore Parkway would deteriorate to LOS E in the sections prior to the Erskine Street off-ramp and past the Erskine Street on-ramp. Also, the westbound Shore Parkway section prior to the Erskine Street off-ramp would operate at LOS E

during the Saturday PM peak hour. Although the densities along the various sections of the Shore Parkway would increase, speeds would not be substantially affected.

Table 16-27
2013 No Build Conditions on the Shore Parkway

Analysis Location	Speed (mph)	Density (pc/mi/ln)	LOS
Weekday AM			
Eastbound before the Erskine Street Off-Ramp	48.9	35.3	E
Eastbound between the Erskine Street Off-Ramp and On-Ramp	53.1	29.9	D
Eastbound after the Erskine Street On-Ramp	52.5	31.8	D
Westbound before the Erskine Street Off-Ramp	54.0	33.8	D
Westbound between the Erskine Street Off-Ramp and On-Ramp	51.5	33.1	D
Westbound after the Erskine Street On-Ramp	51.7	34.6	D
Weekday Midday			
Eastbound before the Erskine Street Off-Ramp	55.0	25.9	C
Eastbound between the Erskine Street Off-Ramp and On-Ramp	54.9	22.5	C
Eastbound after the Erskine Street On-Ramp	54.0	24.8	C
Westbound before the Erskine Street Off-Ramp	55.0	24.3	C
Westbound between the Erskine Street Off-Ramp and On-Ramp	54.9	20.4	C
Westbound after the Erskine Street On-Ramp	54.4	22.8	C
Weekday PM			
Eastbound before the Erskine Street Off-Ramp	53.6	34.8	D
Eastbound between the Erskine Street Off-Ramp and On-Ramp	42.5	43.2	E
Eastbound after the Erskine Street On-Ramp	38.0	49.9	F
Westbound before the Erskine Street Off-Ramp	50.5	37.5	E
Westbound between the Erskine Street Off-Ramp and On-Ramp	48.7	34.3	D
Westbound after the Erskine Street On-Ramp	49.3	35.7	E
Saturday Midday			
Eastbound before the Erskine Street Off-Ramp	46.4	38.3	E
Eastbound between the Erskine Street Off-Ramp and On-Ramp	44.2	36.7	E
Eastbound after the Erskine Street On-Ramp	35.3	47.5	F
Westbound before the Erskine Street Off-Ramp	53.5	31.9	D
Westbound between the Erskine Street Off-Ramp and On-Ramp	53.4	27.2	C
Westbound after the Erskine Street On-Ramp	53.0	30.2	D
Saturday PM			
Eastbound before the Erskine Street Off-Ramp	45.8	42.1	E
Eastbound between the Erskine Street Off-Ramp and On-Ramp	41.3	45.2	F
Eastbound after the Erskine Street On-Ramp	34.7	52.9	F
Westbound before the Erskine Street Off-Ramp	52.8	35.2	E
Westbound between the Erskine Street Off-Ramp and On-Ramp	52.5	30.2	D
Westbound after the Erskine Street On-Ramp	51.9	33.7	D

Note: pc/mi/ln = passenger cars per mile per lane

PARKING

Similar to the 2011 No Build condition, the demand for on- and off-street parking was determined by applying a background growth rate of one percent per year for the 2013 No Build condition. The existing Gateway Center parking lot with a capacity of 2,685 spaces would be the only off-street parking facility within the study area for the 2013 No Build condition. Table 16-28 provides the expected weekday and Saturday occupancies in year 2013.

Table 16-28 indicates that 16 percent occupancy would occur during the weekday AM peak hour. Occupancy would remain fairly consistent throughout the day and would be about 51 percent during the weekday midday peak period and 42 percent during the weekday 5-6 PM peak hour (and 46 percent at 6-7 PM). The highest activity would occur during the Saturday midday/PM peak period when the occupancy would be approximately 77 percent.

The background growth rate of one percent was also applied to on-street parking occupancies. Table 16-29 summarizes the projected on-street parking occupancies of the existing roadway network for the 2013 No Build condition. Peak occupancy of about 68 percent of on-street spaces would occur during the weekday AM peak period. The occupancy would remain consistent through the weekday midday and decrease to about 57 percent during the weekday PM peak period. The on-street parking occupancy during the Saturday midday and PM peak periods would be approximately 55 and 60 percent, respectively.

Table 16-28
2013 No Build Off-Street Parking at Gateway Center Phase I

Time Period	Capacity	Number of Spaces Occupied	Percent Occupied
Weekday			
8AM – 9AM	2,685	423	16
9AM – 10AM	2,685	677	25
10AM – 11AM	2,685	951	35
11AM – 12PM	2,685	1,184	44
12PM – 1PM	2,685	1,341	50
1PM – 2PM	2,685	1,356	51
2PM – 3PM	2,685	1,291	48
3PM – 4PM	2,685	1,123	42
4PM – 5PM	2,685	1,114	41
5PM – 6PM	2,685	1,140	42
6PM – 7PM	2,685	1,239	46
7PM – 8PM	2,685	1,218	45
Saturday			
11AM – 12PM	2,685	1,381	51
12PM – 1PM	2,685	1,620	60
1PM – 2PM	2,685	1,846	69
2PM – 3PM	2,685	2,052	76
3PM – 4PM	2,685	2,077	77
4PM – 5PM	2,685	2,014	75
5PM – 6PM	2,685	1,860	69

Table 16-29
2013 No Build On-Street Parking Summary (Existing Roadway Network)

Peak Period	Approximate Legal Capacity	Number of Spaces Occupied	Percent Occupied
Weekday 7-10 AM	5,940	4,058	68
Weekday 11-2 PM	5,906	3,941	67
Weekday 4-7 PM	6,126	3,491	57
Saturday 11-2 PM	6,142	3,358	55
Saturday 4-7 PM	6,142	3,661	60

The new street layout would not change between years 2011 and 2013. Hence, similar to the 2011 No Build conditions, the new roadway network within the Project Site is expected to provide approximately 960 new on-street parking spaces. These spaces would primarily serve the residential uses, office, local retail, school, community facility and the day care facility. The 2,385 residential units expected to be completed by 2013 would provide approximately 1,140 off-street parking spaces. This, along with the new on-street spaces, would ensure that adequate parking is provided for residential land use as according to 2000 Census data for Brooklyn Community District 5, the average vehicle ownership per household is 0.51. On-street parking should be sufficient for the local retail, as these trips are usually short in length and do not cause substantial

accumulation. The office space, community facilities, and open space would not generate a substantial amount of parking accumulation. In the AM peak hour alone, the office space accumulation would be 11 vehicles, the grade school and intermediate school would account for a total of 81 accumulated trips, the day care facility would have an accumulation of 2 trips, community facilities do not generate any accumulated trips during the peak analysis hours, and parkland generates at most 7 accumulated trips in the weekday AM peak hour. This total, for the morning peak hour, would be 101 parked vehicles accumulated in the morning peak hour. So even over the course of the full day, the 960 on-street parking spaces can be expected to fully accommodate all of the parking needs for these land uses in the 2013 No Build condition.

G. 2013 PROBABLE IMPACTS OF THE PROPOSED ACTION

TRAFFIC

By 2013, the Proposed Project would be completed and would include the following elements:

- 2,385 residential units, including 1,027 units that would be completed by 2011;
- 630,000 square feet of destination retail space, which would be completed by 2011;
- 68,000 square feet of local retail space, which would be completed by 2011;
- A 1,650 seat high school;
- A 16,000 square foot of day care;
- 30,000 square feet of community and public facility space; and
- 36.5 acres of parkland and open space.

This section presents the analysis of future traffic and parking conditions with the full build-out of the Proposed Project. It includes a discussion of the volume of vehicle trips expected to be generated under Build conditions, their distribution within the study area roadway network, analysis of future traffic levels of service, and the identification of significant impacts per *CEQR Technical Manual* guidelines. Mitigation measures are discussed in Chapter 22, "Mitigation."

ROADWAY NETWORK

The 2013 Build condition roadway network includes all of the intersections and intersection controls described in Section E, "2011 Probable Impacts of the Proposed Action" (six modified intersections and nine new intersections). All modified intersections would satisfy a signal warrant and would be signalized in the 2013 Build condition. The following five new intersections would satisfy a signal warrant and would be signalized in the 2013 Build condition:

- Erskine Street and Vandalia Avenue
- Vandalia Avenue and Gateway Drive
- Erskine Street and the Southeast Parking Lot Entrance/Exit
- Gateway Drive and the Northwest Parking Lot Entrance/Exit
- Gateway Drive and the Southwest Parking Lot Entrance/Exit

The other four new intersections would remain unsignalized in the 2013 Build condition.

Vandalia Avenue and Gateway Drive. In the 2013 Build condition, westbound left turns from Vandalia Avenue would be permitted as they would no longer considerably affect intersection

operation. The westbound approach would be assumed to operate with one 11-foot-wide exclusive left turn lane, one 11-foot-wide exclusive right turn lane with room for an additional 8 feet for on-street curbside parking, and a 12-foot-wide raised center median.

TRAVEL DEMAND ESTIMATES AND GENERATED VOLUMES

Trip Generation

Travel demand analyses were prepared for the Proposed Action elements (residential, destination and local retail, high school, day care, community/public facilities, and open space) to be completed in the 2013 Build condition. Table 16-30 shows the travel demand factors, which are further described below.

- Residential: The rates used for residential use are described in Section D, "2011 the Future without the Proposed Action."
- Destination Retail: The rates used for destination retail are described in Section D, "2011 the Future without the Proposed Action."
- Local Retail: The rates used for local retail are described in Section E, "2011 Probable Impacts of the Proposed Action."
- High School: The weekday daily trip generation rate (1.8 trips per seat), modal splits (35 percent by auto, 10 percent by subway, 40 percent by bus, and 15 percent by walking), vehicle occupancies (1.5 persons per vehicle for autos and taxis), and the weekday AM temporal distribution (45 percent) and directional split (100 percent "in") for student trips come from the *Sunset Park High School FEIS* (2005). The midday temporal distribution (2 percent) and directional split (50 percent "in") was assumed to be the same as the intermediate and elementary schools in the 1996 FEIS, while the PM peak hour temporal and directional distributions (8.2 percent and 0 percent "in") were derived from rates presented in *Institute for Transportation (ITE) Trip Generation, 7th Edition* (2003).

  The weekday daily trip generation rate (1.99 trips per staff, assuming a faculty of approximately 70 persons), modal splits (95 percent by auto and 5 percent by bus), vehicle occupancies (1.2 persons per vehicle for autos and taxis), and the weekday AM temporal distribution (45 percent) and directional split (100 percent "in") for student trips come from the *Sunset Park High School Facility FEIS*, while the PM peak hour temporal and directional distributions (8.2 percent and 0 percent "in") were derived from rates presented in *ITE Trip Generation, 7th Edition*. It was assumed that no faculty trips would be generated during the weekday midday peak hour.

  The weekend trip generation rates (0.6 daily trips per seat), temporal distribution (18 percent) during the Saturday midday and PM peak hours, and directional distribution (64 and 36 percent "in" during the Saturday midday and PM peak hours, respectively) were derived from rates presented in *ITE Trip Generation, 7th Edition*. Saturday modal splits and vehicle occupancies were assumed to be similar to weekday. No delivery trips are expected to be generated to the high school during weekends.

  The weekend trip generation rates (0.7 daily trips per staff), temporal distribution (18 percent) during the Saturday midday and PM peak hours, and directional distribution (64 and 36 percent "in" during the Saturday midday and PM peak hours, respectively) were derived from rates presented in *ITE Trip Generation, 7th Edition*. Saturday modal splits and vehicle occupancies were assumed to be similar to weekday.

Table 16-30
2013 Build Travel Demand Factors (Weekday)

	Residential	Destination Retail	Local Retail	High School		Day Care	Community Facility	Open Space
				Students	Faculty			
Person Trip Generation Rate	12.5[1] per DU	1.55 - AM[5] 5.03 - Midday[5] 4.89 - PM[5] per 1,000 SF	205[4] per 1,000 SF	1.8[6] per seat	1.99[6] per staff	138[10] per 1,000 SF	40[1] per 1,000 SF	139[1] per 1,000 SF
Temporal Distribution								
AM Peak	9.1%[2]	NA[5]	2.3%[1]	45.0%[6]	45.0%[6]	16.0%[10]	5.0%[1]	7.0%[2]
Midday Peak	4.7%[2]	NA[5]	7.9%[1]	2.0%[1]	0.0%[9]	5.0%[10]	10.0%[1]	17.0%[2]
PM Peak	10.7%[2]	NA[5]	10.7%[1]	8.2%[7]	8.2%[1]	19.0%[10]	10.0%[1]	14.0%[2]
Linked Trip Credit	0.0%	25.0%	25.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Modal Split								
Auto	48.0%[3]	95.1%[5]	15.0%[1]	35.0%[6]	95.0%[6]	48.0%[11]	4.0%[1]	12.0%[1]
Taxi	3.0%[3]	1.5%[5]	0.0%[1]	0.0%[6]	0.0%[6]	3.0%[11]	7.0%[1]	0.0%[1]
Subway/Bus	30.0%[3]	1.2%[5]	0.0%[1]	10.0%[6]	0.0%[6]	30.0%[11]	0.0%[1]	5.0%[1]
Bus Only	13.0%[3]	1.2%[5]	5.0%[1]	40.0%[6]	5.0%[6]	13.0%[11]	14.0%[1]	5.0%[1]
Walk Only	6.0%[3]	1.0%[5]	80.0%[1]	15.0%[6]	0.0%[6]	6.0%[11]	75.0%[1]	78.0%[1]
Vehicle Occupancy								
Auto	1.15[3]	1.40[5]	1.40[5]	1.50[6]	1.20[6]	2.00[9]	2.00[1]	2.80[1]
Taxi	1.15[3]	1.65[5]	1.65[5]	1.50[6]	1.20[6]	2.00[9]	2.00[1]	2.00[1]
Directional Split (Ins)								
AM Peak	15.0%[2]	62.5%[5]	63.0%[1]	100.0%[6]	100.0%[6]	53.0%[10]	70.0%[1]	80.0%[1]
Midday Peak	50.0%[2]	53.6%[5]	55.0%[1]	2.0%[1]	0.0%[1]	50.0%[10]	50.0%[1]	55.0%[1]
PM Peak	70.0%[2]	51.8%[5]	47.0%[1]	0.0%[7]	0.0%[1]	47.0%[10]	50.0%[1]	45.0%[1]
Truck Trip Generation Rate	0.06[2] per DU	0.35[1] per 1,000 SF	0.35[1] per 1,000 SF	0.064[1] per seat		0.07[10] per 1,000 SF	0.02[1] per 1,000 SF	- -
Truck Temporal Distribution								
AM Peak	6.0%[4]	13.0%[1]	6.0%[1]	9.7%[8]		9.7%[10]	6.0%[1]	-
Midday Peak	7.0%[4]	9.0%[1]	11.0%[1]	7.8%[8]		7.8%[10]	11.0%[1]	-
PM Peak	10.0%[4]	0.0%[1]	0.0%[1]	5.1%[8]		5.1%[10]	1.0%[9]	-
Truck Trip Directional Split (Ins)								
AM Peak	50.0%	50.0%	50.0%	50.0%		50.0%	50.0%	-
Midday Peak	50.0%	50.0%	50.0%	50.0%		50.0%	50.0%	-
PM Peak	50.0%	50.0%	50.0%	50.0%		50.0%	50.0%	-

Notes:
1. *Gateway Estates FEIS* (1996)
2. *Greenpoint-Williamsburg Rezoning FEIS* (2005)
3. *Census 2000* (U.S. Department of Commerce: Bureau of the Census, 2000)
4. *Urban Space for Pedestrians*, Pushkarev and Zupan, 1973
5. Surveys conducted by AKRF, Inc. at Gateway Center (November 2006). Note: temporal distribution not included (for destination retail) since rates are specific to individual peak hours.
6. *Sunset Park High School Facility FEIS* (2005) – modal split slightly adjusted to reflect local conditions
7. *Trip Generation, 7th Edition* (Institute of Transportation Engineers, 2003)
8. *Curbside Pickup and Delivery Operations and Arterial Traffic Impacts*, U.S. Department of Transportation/Federal Highway Administration (1981)
9. Project team assumption
10. *No. 7 Subway Extension—Hudson Yards Rezoning and Development Program FGEIS* (2004)
11. Assumed similar to Residential

Table 16-30 (cont'd)
2013 Build Travel Demand Factors (Saturday)

	Residential	Destination Retail	Local Retail	High School		Day Care	Community Facility	Open Space
				Students	Faculty			
Person Trip Gen Rate	12.5[1] per DU	8.19 – Midday[6] 11.38 – PM[6] per 1,000 SF	488[5] per 1,000 SF	0.6[7] per seat	0.7[7] per staff		15[1] per 1,000 SF	158[1] per 1,000 SF
Temporal Distribution								
Saturday Midday Peak	8.2%[2]	NA[6]	9.7%[1]	18.0%[7]	18.0%[7]		13.3.0%[1]	20.0%[1]
Saturday PM Peak	7.2%[2]	NA[6]	9.7%[1]	18.0%[7]	18.0%[7]		13.3.0%[1]	20.0%[1]
Linked Trip Credit	0.0%	25.0%	25.0%	0.0%	0.0%		0.0%	0.0%
Modal Split (Saturday Midday)								
Auto	48.0%[3]	93.5%[6]	15.0%[1]	35.0%[8]	95.0%[8]	-	4.0%[1]	12.0%[1]
Taxi	3.0%[3]	3.5%[6]	0.0%[1]	0.0%[8]	0.0%[8]	-	7.0%[1]	0.0%[1]
Subway/Bus	30.0%[3]	1.0%[6]	0.0%[1]	10.0%[8]	0.0%[8]	-	0.0%[1]	5.0%[1]
Bus Only	13.0%[3]	1.0%[6]	5.0%[1]	40.0%[8]	5.0%[8]	-	14.0%[1]	5.0%[1]
Walk Only	6.0%[3]	1.0%[6]	80.0%[1]	15.0%[8]	0.0%[8]	-	75.0%[1]	78.0%[1]
Vehicle Occupancy								
Auto	1.15[3]	1.72[6]	1.72[6]	1.50[8]	1.20[8]	-	2.00[1]	2.80[1]
Taxi	1.15[3]	1.75[6]	1.75[6]	1.50[8]	1.20[8]	-	2.00[1]	2.00[1]
Directional Split (Ins)								
Saturday Midday Peak	50.0%[2]	53.6%[6]	50.0%[1]	64.0%[7]	64.0%[7]	-	50.0%[1]	55.0%[1]
Saturday PM Peak	50.0%[2]	47.5%[6]	50.0%[1]	36.0%[7]	36.0%[7]	-	50.0%[1]	45.0%[1]
Truck Trip Gen Rate	0.01[4] per DU	0.02[4] per 1,000 SF	0.02[4] per 1,000 SF	-		- -	- per 1,000 SF	-
Truck Temporal Distribution								
Saturday Midday Peak	9.0%[4]	11.0%[4]	11.0%[4]	-		-	1.0%[7]	-
Saturday PM Peak	2.0%[4]	2.0%[4]	2.0%[4]	-		-	1.0%[7]	-
Truck Trip Directional Split (Ins)								
Saturday Midday Peak	50.0%	50.0%	50.0%	-		-	50.0%	-
Saturday PM Peak	50.0%	50.0%	50.0%	-		-	50.0%	-

Notes:
1. *Gateway Estates FEIS* (1996)
2. *The Jamaica Plan DEIS* (2007)
3. *Census 2000* (U.S. Department of Commerce: Bureau of the Census, 2000)
4. *Atlantic Yards: Arena and Redevelopment Project FEIS* (2006)
5. *Urban Space for Pedestrians*, Pushkarev and Zupan, 1973
6. Surveys conducted by AKRF, Inc. at Gateway Center (November 2006) Note: temporal distribution not included (for destination retail) since rates are specific to individual peak hours
7. *Trip Generation, 7th Edition* (Institute of Transportation Engineers, 2003)
8. Assumed similar to weekday
9. *No. 7 Subway Extension—Hudson Yards Rezoning and Development Program FGEIS* (2004)

For overall high school delivery trips, the residential delivery trip generation rate (0.064 trips per seat) was obtained from the *Gateway Estates FEIS*. The temporal distribution used for delivery trips (9.7 percent, 7.8 percent and 5.1 percent during the weekday AM, midday, and PM peak hours, respectively) is from *Curbside Pickup and Delivery Operations and Arterial Traffic Impacts*. The high school is not expected to generate Saturday delivery trips.

- Day Care: The rates used for the day care are described in Section F, "2013 the Future without the Proposed Action."
- Community/Public Facility: The rates used for the community/public facilities are described in Section F, "2013 the Future without the Proposed Action."
- Open Space: The rates used for the new public open space are described in Section F, "2013 the Future without the Proposed Action."

Generated Traffic Volumes

As shown in Table 16-31, the completed Proposed Project would generate a total of 2,684 vph, 2,542 vph, 3,424 vph, 3,727 vph, and 4,441 vph during the weekday AM, midday, PM, Saturday midday, and Saturday PM peak hours, respectively.

Table 16-31
2013 Build Vehicular Trip Generation

Site	Weekday AM			Weekday Midday			Weekday PM			Saturday Midday			Saturday PM		
	In	Out	Sum	In	Out	Sum	In	Out	Sum	In	Out	Sum	In	Out	Sum
Auto/Truck															
Residential	179	972	1,151	302	302	604	946	413	1,359	523	523	1,046	451	451	902
Destination Retail	340	216	556	886	769	1,655	813	756	1,569	1,128	977	2,105	1,388	1,535	2,923
Local Retail	22	14	36	63	52	115	69	79	148	130	130	260	130	130	260
High School	440	322	762	18	18	36	62	84	146	39	23	62	23	39	62
Community/Public Facility	12	10	22	4	4	8	12	14	26	1	1	2	1	1	2
Day Care	1	1	2	2	2	4	1	2	3	1	1	2	17	21	38
Parkland/Open space	9	2	11	15	13	28	10	13	23	21	17	38	1	1	2
Taxis (All Uses)	72	72	144	46	46	92	75	75	150	106	106	212	126	126	252
Total	1,075	1,609	2,684	1,336	1,206	2,542	1,988	1,436	3,424	1,949	1,778	3,727	2,137	2,304	4,441

Subsequent to preparation of the travel demand analysis for this DEIS, the development program was modified slightly. The travel demand analysis was based on a program of 86,000 square feet of local retail use, 4,000 square feet of day care, and 27.8 acres of new open space. However, as described in Chapter 1, 'Project Description," the proposed program is now expected to include 68,000 square feet of local retail use, 16,000 square feet of day care, and 36.5 acres of new open space, but the other proposed uses were not changed. As per discussions with NYCDOT, the traffic and parking analyses were based on the original development program since this would be more conservative.

Trip Assignment

Vehicle trips generated by the Proposed Project were assigned to the roadway network, as follows:

- Residential Auto Trips: The assignment patterns for residential auto trips are the same as for the 1996 Plan and are described in Section D, "2011 the Future without the Proposed Action."

- Destination Retail Auto Trips: The assignment patterns for destination retail auto trips are described in Section D, "2011 the Future without the Proposed Action."
- Local Retail Auto Trips: The assignment patterns for local retail auto trips are described in Section E, "2011 Probable Impacts of the Proposed Action."
- High School Students Auto Trips: The assignment of high school student trips is the same as for the grade school and intermediate school components of the 1996 Plan and is described in Section F, "2013 the Future without the Proposed Action."
- High School Faculty Auto Trips: The assignment of high school faculty trips is the same as for the grade school and intermediate school components of the 1996 Plan and is described in Section F, "2013 the Future without the Proposed Action."
- Day Care Facility Auto Trips: The assignment of day care trips is the same as for the 1996 Plan and is described in Section F, "2013 the Future without the Proposed Action."
- Community Facility and Open Space Auto Trips: The assignment of community facility and open space trips is the same as for the 1996 Plan and is described in Section F, "2013 the Future without the Proposed Action."
- Taxis: The assignment of taxi trips is the same as for the 1996 Plan and is described in Section D, "2011 the Future without the Proposed Action."
- Trucks: The assignment of truck trips is the same as for the 1996 Plan and is described in Section D, "2011 the Future without the Proposed Action."

The 2013 Build year traffic volumes were developed by adding the project-generated volumes to the 2013 No Build volumes. The 2013 Build volume maps are presented in Appendix E, "Traffic Technical Appendix."

INTERSECTION LEVEL OF SERVICE ANALYSIS

The 2013 Build level of service analyses have been compared to 2013 No Build conditions to assess the potential significant traffic impacts of the Proposed Action, based on criteria defined in the *CEQR Technical Manual* (see Section E, "2011 Probable Impacts of the Proposed Action"). Table 16-32 provides an overview of the levels of service and significant adverse impacts that would be expected to characterize the traffic study area during the peak hours, and detailed intersection capacity analyses are presented in Appendix E, "Traffic Technical Appendix." A summary description is also provided below.

- In the weekday AM peak hour, eight signalized intersections would operate at overall LOS E or F, and two signalized intersections would operate at overall unacceptable LOS D (three of the five intersections shown in Table 16-32 would be within the "acceptable" delays of LOS D) in the Build condition. Forty-eight signalized traffic movements out of a total of approximately 230 traffic movements would operate at LOS E or F conditions, and 12 signalized intersections would have movements that would be significantly impacted, seven of which are located in the primary study area.
- In the weekday midday peak hour, six signalized intersections would operate at overall LOS E or F in the Build condition, and two would operate at overall unacceptable LOS D (three of the five intersections shown in Table 16-32 would be within the "acceptable" delays of LOS D). Thirty-two signalized traffic movements would operate at LOS E or F conditions, and 10 signalized intersections would have movements that would be significantly impacted, five of which are located in the primary study area.

Table 16-32
2013 No Build and Build Intersection Level of Service Summary

Level of Service	2013 No Build					2013 Build				
	Weekday			Saturday		Weekday			Saturday	
	AM	Midday	PM	Midday	PM	AM	Midday	PM	Midday	PM
Signalized Intersections (31 Total in No Build and 37 Total in Build)										
Overall Intersection LOS A/B	12	14	12	11	11	17	18	18	14	11
Overall Intersection LOS C	7	11	9	9	9	7	8	7	9	6
Overall Intersection LOS D*	6	3	4	4	4	5	5	5	5	7
Overall Intersection LOS E/F	6	3	6	7	7	8	6	7	9	13
Number of Signalized Intersection Movements at LOS E or F (of approximately 200 total in No Build and 230 total in Build)	40	23	48	39	47	48	32	61	54	67
Number of Signalized Intersections with Significant Impacts	—	—	—	—	—	12	10	13	14	18
Unsignalized Intersections (11 Total in No Build and 9 Total in Build)										
Overall Intersection LOS A/B	10	11	10	11	11	9	9	7	8	6
Overall Intersection LOS C	0	0	1	0	0	0	0	2	1	2
Overall Intersection LOS D*	0	0	0	0	0	0	0	0	0	1
Overall Intersection LOS E/F	1	0	0	0	0	0	0	0	0	0
Number of Unsignalized Intersection Movements at LOS E or F (of approximately 34 total in No Build and 28 total in Build)	6	0	3	2	4	3	1	4	4	4
Number of Unsignalized Intersections with Significant Impacts	—	—	—	—	—	0	0	1	1	1

Notes:
* This table shows intersections that operate at acceptable and unacceptable levels of service. Only intersections that operate at unacceptable levels of service are discussed in detail.
Three intersections analyzed as unsignalized in the 2013 No Build condition would be signalized in the Build condition. Three new signalized intersections and one new unsignalized intersection were added to the 2013 Build analysis.

- In the weekday PM peak hour, seven signalized intersections would operate at overall LOS E or F, and four signalized intersections would operate at overall unacceptable LOS D (one of the five intersections shown in Table 16-32 would be within the "acceptable" delays of LOS D). Sixty-one signalized traffic movements would operate at LOS E or F conditions and 13 signalized intersections would have movements that would be significantly impacted, six of which are located in the primary study area.
- In the Saturday midday peak hour, nine signalized intersections would operate at overall LOS E or F in the Build condition, and four would operate at overall unacceptable LOS D (one of the five intersections shown in Table 16-32 would be within the "acceptable" delays of LOS D). Fifty-four traffic movements would operate at LOS E or F conditions, and 14 intersections would have movements that would be significantly impacted, seven of which are located in the primary study area.
- In the Saturday PM peak hour, 13 signalized intersections would operate at overall LOS E or F in the Build condition, and two would operate at overall unacceptable LOS D (five of the seven intersections shown in Table 16-32 would be within the "acceptable" delays of LOS D). Sixty-seven traffic movements would operate at LOS E or F conditions, and 18 intersections would have movements that would be significantly impacted, 11 of which are located in the primary study area.
- All unsignalized intersections would operate at overall LOS C or better during all five peak hours analyzed except the intersection of Fountain Avenue and Wortman Avenue that would

operate at LOS D in the Saturday PM peak hour. One intersection would have a movement that would be significantly impacted in the weekday PM, Saturday midday, and Saturday PM peak hours.

Overall projected levels of service for the 2013 Build condition are also presented in Figures 16-26a through 16-30b, and detailed mitigation measures for significantly impacted locations are discussed in Chapter 22, "Mitigation." Table 16-33 provides the details of individual traffic movements that would operate at unacceptable levels of service during at least one peak hour and indicates if these movements would be significantly impacted. A description of significant impacts by corridor is provided below.

Table 16-33
2013 Build Traffic Movements at Unacceptable Levels of Service

Signalized Intersection	Approach and Movement		Weekday												Saturday							
			AM				Midday				PM				Midday				PM			
			D*	E	F	SI**	D*	E	F	SI**	D*	E	F	SI**	D*	E	F	SI**	D*	E	F	SI**
Erksine Street & Belt Parkway Eastbound Ramps	EB	L																		●		●
Erksine Street & Belt Parkway Westbound Ramps	WB	R																		●		●
Erksine Street & Gateway Drive	SB	T			●	●						●		●			●	●			●	●
	WB	L										●							●			
Erskine Street & Gateway Plaza	SB	TR														●		●			●	●
Gateway Drive & Driveway to Boulder Creek	EB	LT																		●		●
Gateway Drive & Gateway Plaza	SB	L					●				●					●					●	
	WB	LR													●					●		
Gateway Drive & Parking Lot SW Corner	WB	L																	●			
Fountain Avenue & Flatlands Avenue	NB	LTR					●			●		●		●						●		●
	SB	LTR							●	●							●	●			●	●
	EB	DefL			●	●	●			●					●			●		●		●
Flatlands Avenue & Jerome Street	NB	L																		●		
	EB	L																	●			●
Flatlands Avenue & Schenk Street	WB	T															●				●	
Flatlands Avenue & Van Siclen Avenue	SB	LTR			●	●			●	●			●	●		●		●			●	●
	EB	L			●	●											●	●			●	●
		TR																	●			●
	WB	L			●	●			●	●		●		●			●	●			●	●
		TR																			●	●
Flatlands Avenue & Pennsylvania Avenue	NB	L	●									●					●				●	
	SB	L			●	●			●	●			●	●			●	●			●	●
	EB	L							●	●			●	●			●				●	●
		T										●		●			●	●			●	●
	WB	L									●			●			●	●			●	●
		T					●			●	●			●		●		●			●	●
		R			●	●		●		●			●	●			●	●			●	●
Flatlands Avenue & Rockaway Parkway	NB	TR	●																			
	SB	LTR	●				●						●	●			●	●			●	●
	EB	L										●		●	●					●		
		TR											●	●			●	●			●	●
	WB	L		●		●						●		●			●	●			●	●
		TR	●									●		●			●	●			●	●

12.30.08

Project Site

Fresh Creek Urban Renewal Area Boundary

LOS A or B

LOS C

LOS D

LOS E or F

Unsignalized Intersection

Significant Impacts

0 1000 2000 FEET

SCALE

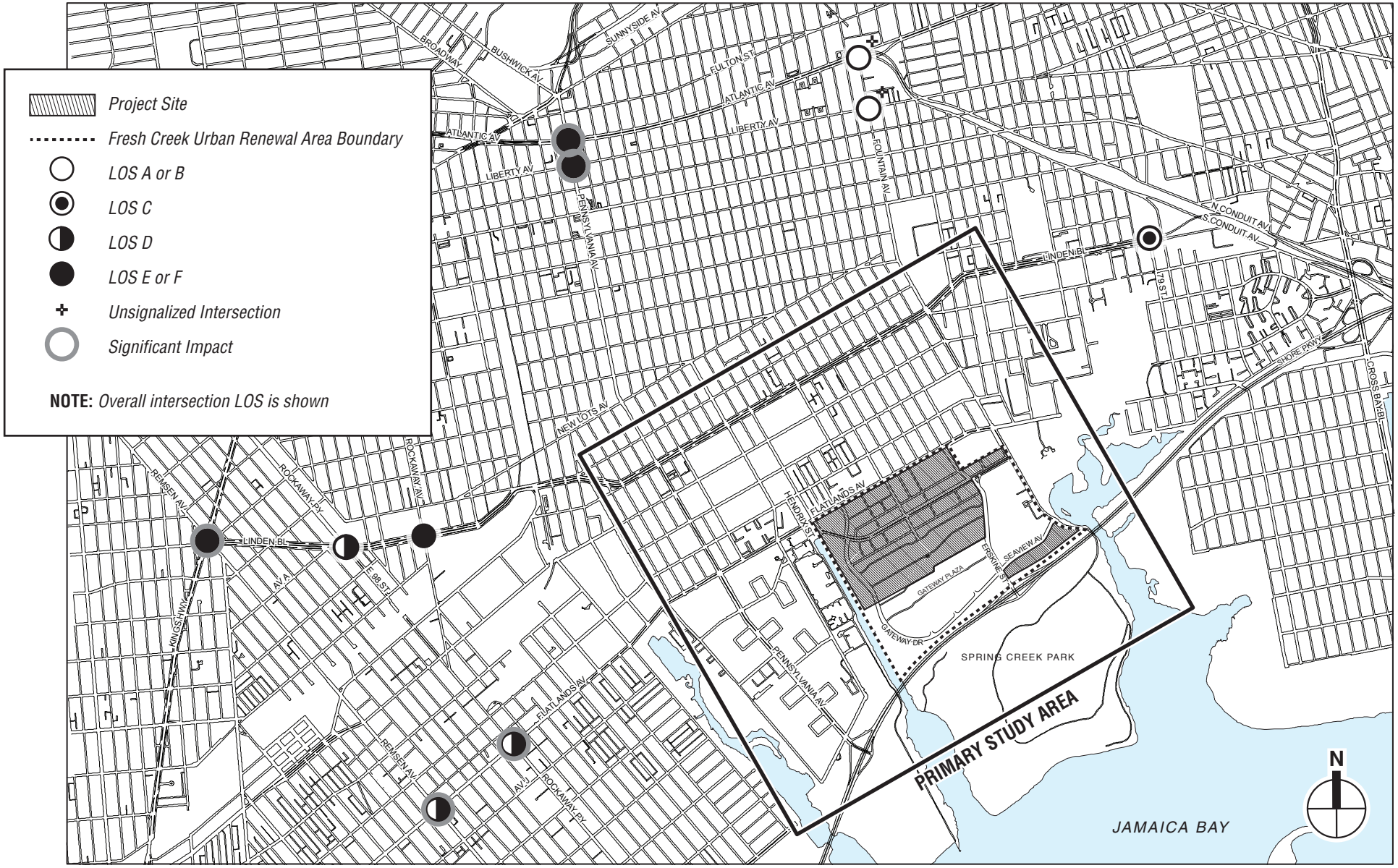
NOTE: *Overall intersection LOS is shown*

2013 Build Weekday
AM Peak Hour Traffic Level of Service
Primary Study Area

GATEWAY ESTATES II

Figure 16-26a

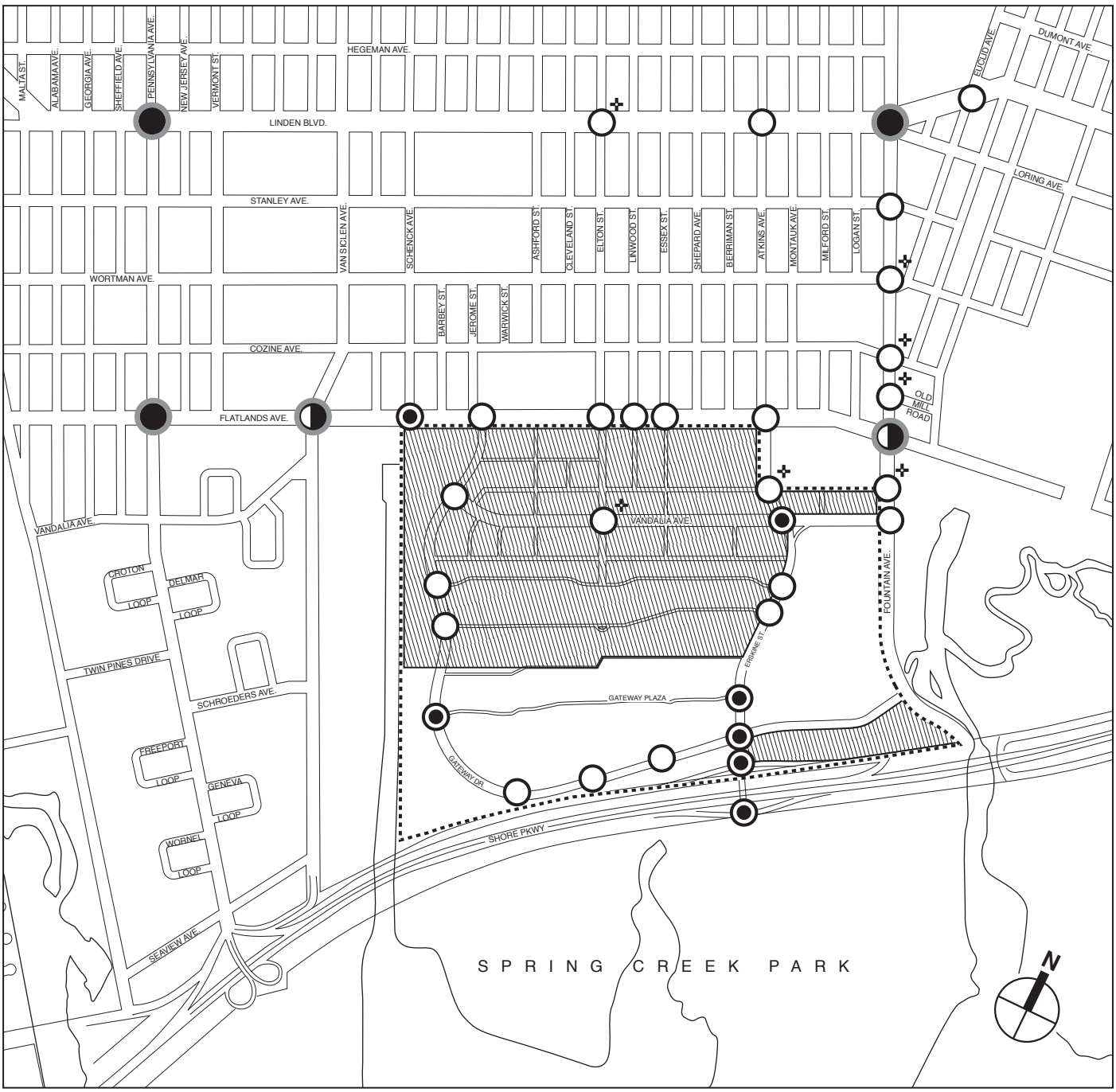
12.30.08



2013 Build Weekday
AM Peak Hour Traffic Level of Service
Secondary Study Area

Figure 16-26b

12.30.08



0 1000 2000 FEET

SCALE

Project Site

Fresh Creek Urban Renewal Area Boundary

LOS A or B

LOS C

LOS D

LOS E or F

Unsignalized Intersection

Significant Impacts

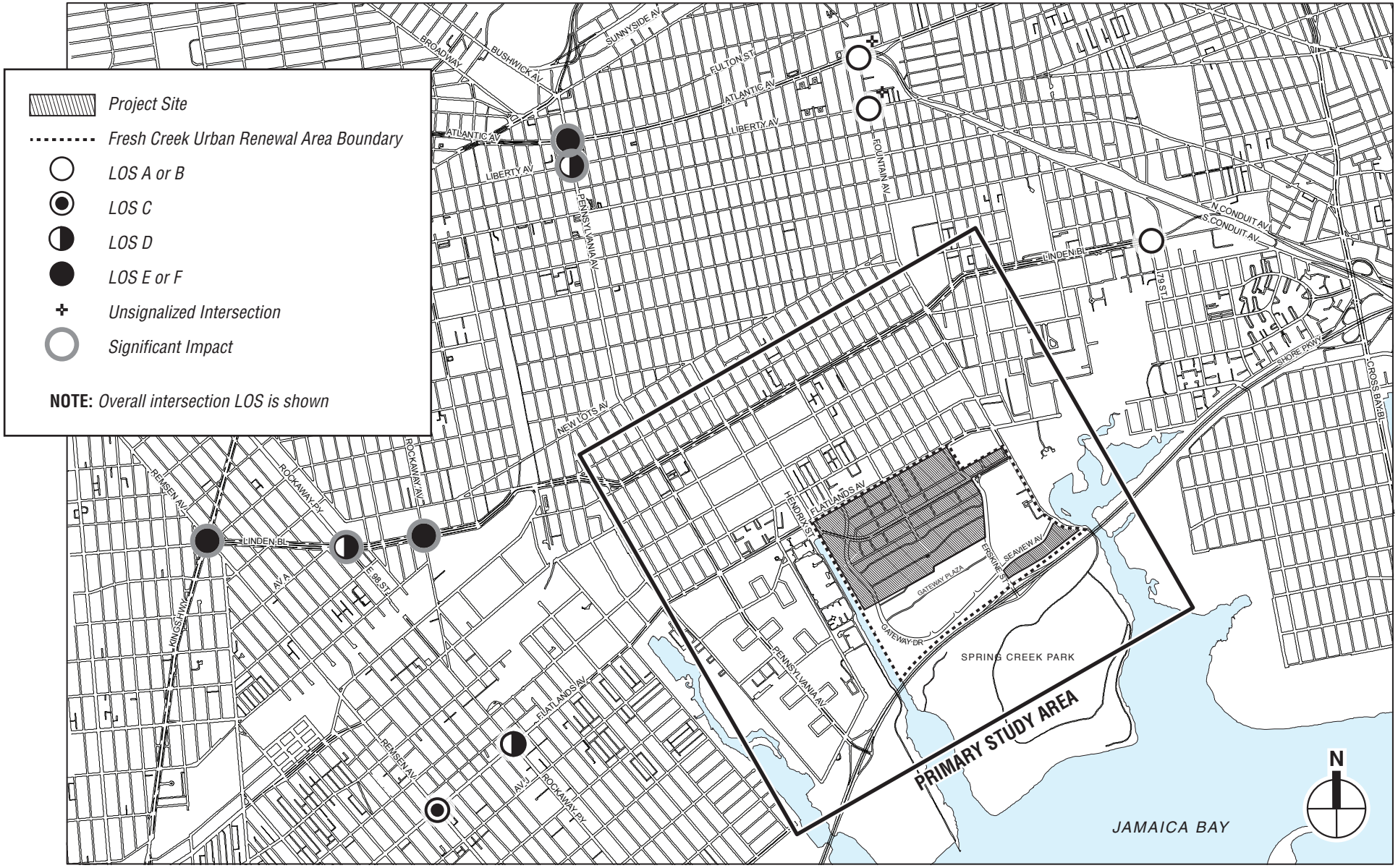
NOTE: *Overall intersection LOS is shown*

2013 Build Weekday
Midday Peak Hour Traffic Level of Service
Primary Study Area

GATEWAY ESTATES II

Figure 16-27a

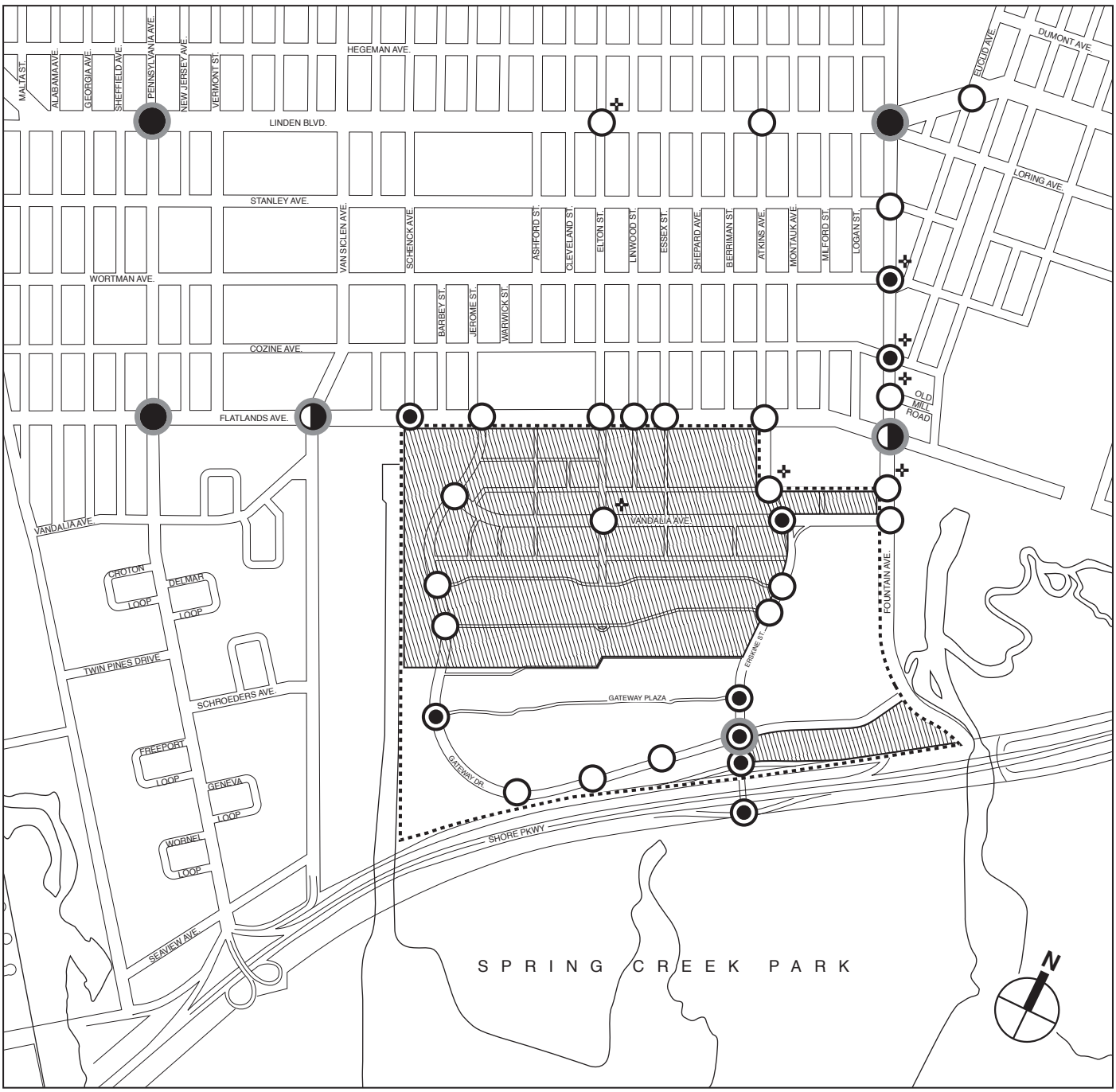
12.2.08



2013 Build Weekday
Midday Peak Hour Traffic Level of Service
Secondary Study Area

Figure 16-27b

12.30.08



0 1000 2000 FEET

SCALE

Project Site

Fresh Creek Urban Renewal Area Boundary

LOS A or B

LOS C

LOS D

LOS E or F

Unsignalized Intersection

Significant Impacts

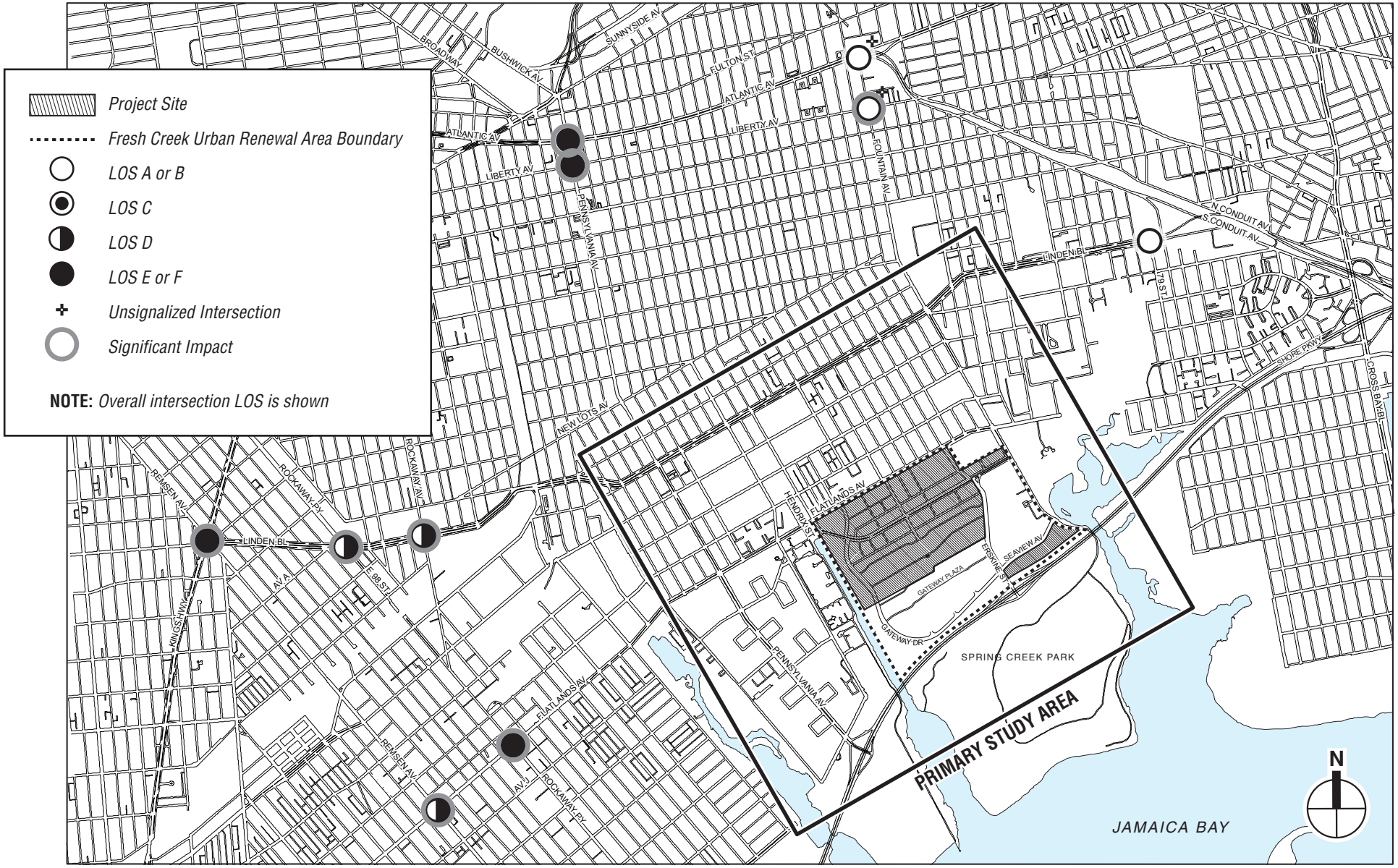
NOTE: *Overall intersection LOS is shown*

2013 Build Weekday
PM Peak Hour Traffic Level of Service
Primary Study Area

GATEWAY ESTATES II

Figure 16-28a

12.2.08

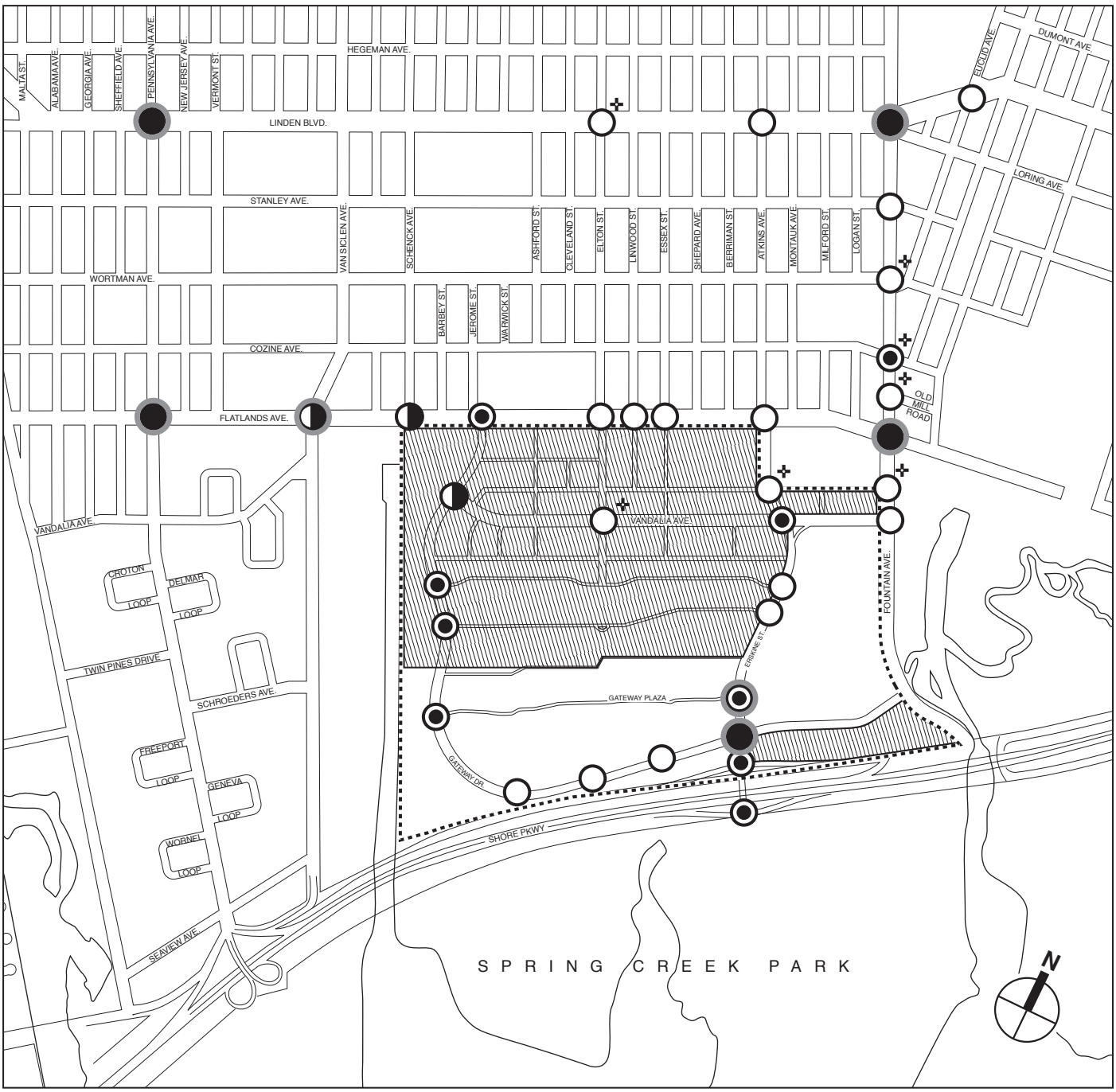


2013 Build Weekday
PM Peak Hour Traffic Level of Service
Secondary Study Area

Figure 16-28b

GATEWAY ESTATES II

12.30.08



0 1000 2000 FEET

SCALE

Project Site

Fresh Creek Urban Renewal Area Boundary

LOS A or B

LOS C

LOS D

LOS E or F

Unsignalized Intersection

Significant Impacts

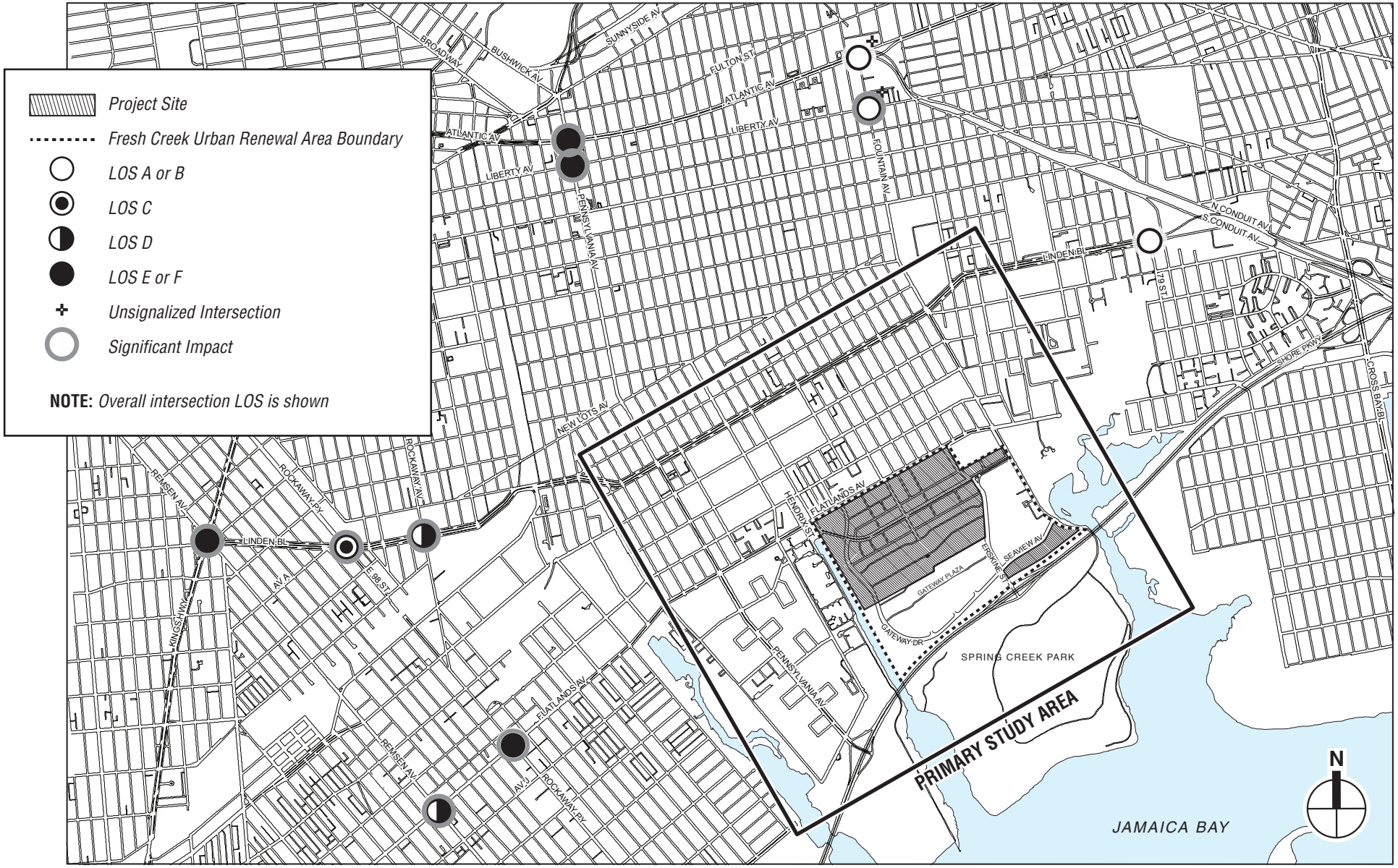
NOTE: *Overall intersection LOS is shown*

2013 Build Saturday
Midday Peak Hour Traffic Level of Service
Primary Study Area

GATEWAY ESTATES II

Figure 16-29a

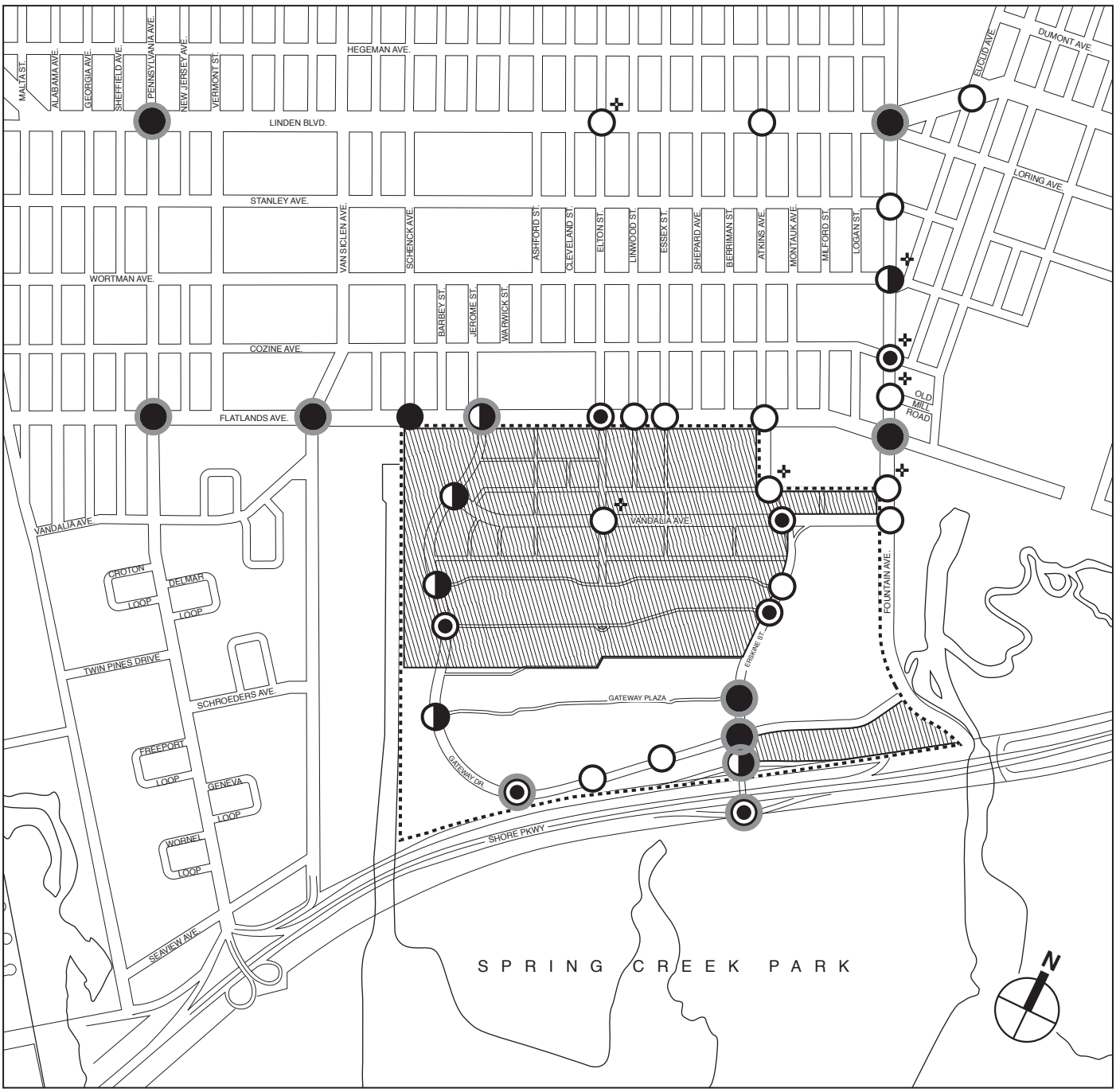
12.2.08



2013 Build Saturday
Midday Peak Hour Traffic Level of Service
Secondary Study Area

GATEWAY ESTATES II

Figure 16-29b



0 1000 2000 FEET

SCALE

Project Site

Fresh Creek Urban Renewal Area Boundary

LOS A or B

LOS C

LOS D

LOS E or F

Unsignalized Intersection

Significant Impacts

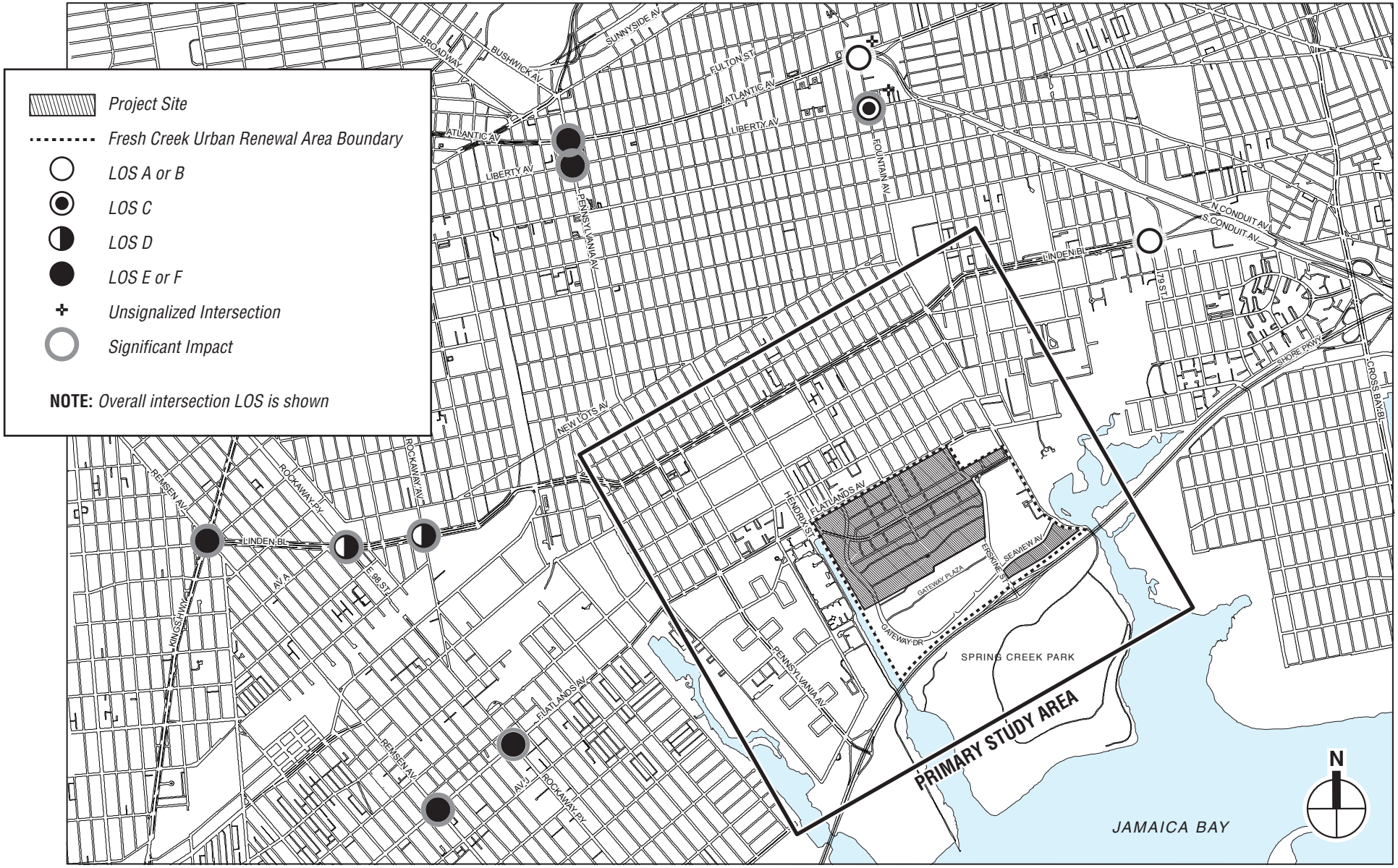
NOTE: *Overall intersection LOS is shown*

2013 Build Saturday
PM Peak Hour Traffic Level of Service
Primary Study Area

GATEWAY ESTATES II

Figure 16-30a

12.30.08



2013 Build Saturday
PM Peak Hour Traffic Level of Service
Secondary Study Area

GATEWAY ESTATES II

Figure 16-30b

Table 16-33 (cont'd)
2013 Build Traffic Movements at Unacceptable Levels of Service

Signalized Intersection	Approach and Movement		Weekday AM D*	AM E	AM F	AM SI**	Weekday Midday D*	Midday E	Midday F	Midday SI**	Weekday PM D*	PM E	PM F	PM SI**	Saturday Midday D*	Midday E	Midday F	Midday SI**	Saturday PM D*	PM E	PM F	PM SI**
Flatlands Avenue & Remsen Avenue	NB	TR	●																			
	SB	L											●	●		●		●			●	●
	EB	TR	●			●						●		●								
	WB	TR		●		●						●		●			●	●			●	●
Linden Boulevard & 79th Street	NB	L	●																			
Linden Boulevard & Euclid Avenue	SB	LTR	●																			
Linden Boulevard & Fountain Avenue & Loring Avenue	NB[1]	LTR			●	●			●	●			●	●			●	●			●	●
	SB[1]	DefL			●	●	●			●			●	●			●	●			●	●
		TR			●	●			●	●			●	●			●	●			●	●
	WB[3]	L			●	●			●	●			●	●			●	●			●	●
		T			●	●																
	WB[8]	TR		●		●																
	NB[2]	LTR			●[9]			●[9]				●[9]				●[9]					●[9]	
Linden Boulevard & Atkins Avenue	SB	LTR		●		●																
Linden Boulevard & Pennsylvania Avenue	NB	L			●				●	●			●				●				●	
		T			●	●					●			●			●	●			●	●
	SB	L	●										●	●			●	●			●	●
		TR			●				●				●				●	●			●	●
	EB[3]	L			●	●			●	●			●	●		●		●			●	●
		T					●						●	●			●	●			●	●
	WB[3]	L			●	●			●	●			●	●			●	●			●	●
		T			●	●	●			●			●	●			●	●			●	●
	EB[8]	T	●			●					●			●	●			●		●		●
		R											●	●	●			●		●		●
	WB[8]	TR			●	●																
Linden Boulevard & Rockaway Avenue	NB	LT			●				●				●				●				●	
		R	●				●			●		●		●	●			●		●		●
	SB	LT			●				●	●			●	●			●	●			●	●
		R	●						●				●						●			
	EB[3]	L		●				●				●							●			
	WB[3]	L			●				●	●			●	●			●	●			●	●
		T		●																		
Linden Boulevard & Rockaway Parkway	NB	LTR			●							●							●			
	SB	L			●				●	●			●	●			●	●			●	●
		TR	●										●									
	EB[3]	L			●			●					●			●				●		
	WB[3]	L			●			●				●										
Linden Boulevard & Kings Highway & Remsen Avenue	NB[4]	T			●			●					●				●				●	
	SB[4]	T			●		●						●				●				●	
	NB[5]	TR			●		●						●	●	●				●			
	SB[5]	TR	●										●		●				●			
	EB[6]	DefL			●				●				●			●				●		
		TR			●				●				●				●				●	
	WB[6]	TR			●				●				●				●				●	
	EB[3]	TR		●		●			●	●			●	●			●	●			●	●
		LT[7]			●	●			●	●			●	●			●	●			●	●
	WB[3]												●	●								
		R		●									●									
Pennsylvania Avenue & Liberty Avenue	NB	LTR			●	●					●			●			●	●			●	●
	SB	TR						●		●		●		●			●	●			●	●
	EB	LTR					●					●										
	WB	LTR		●			●					●			●					●		

Table 16-33 (cont'd)
2013 Build Traffic Movements at Unacceptable Levels of Service

Signalized Intersection	Approach and Movement		Weekday AM D*	AM E	AM F	AM SI**	Weekday Midday D*	Midday E	Midday F	Midday SI**	Weekday PM D*	PM E	PM F	PM SI**	Saturday Midday D*	Midday E	Midday F	Midday SI**	Saturday PM D*	PM E	PM F	PM SI**
Pennsylvania Avenue & Atlantic Avenue	NB	L			●				●	●			●				●				●	
		TR			●	●		●		●	●			●			●	●			●	●
	SB	L											●			●					●	
		TR			●	●							●	●			●	●			●	●
	EB	TR						●		●			●	●			●	●			●	●
	WB	TR			●	●						●		●		●		●			●	●
Unsignalized Intersection	**Approach and Movement**		**Weekday AM D***	**AM E**	**AM F**	**AM SI****	**Weekday Midday D***	**Midday E**	**Midday F**	**Midday SI****	**Weekday PM D***	**PM E**	**PM F**	**PM SI****	**Saturday Midday D***	**Midday E**	**Midday F**	**Midday SI****	**Saturday PM D***	**PM E**	**PM F**	**PM SI****
Fountain Avenue & Wortman Avenue	EB	LT			●			●					●				●				●	
		TR										●				●					●	
	WB	LTR			●								●				●				●	
Fountain Avenue & Liberty Avenue	SB	LTR		●								●		●		●		●			●	●

Notes:
L = Left turn movement; T = Through movement; R = Right turn movement; DefL = De facto left turn movement
* Unacceptable LOS D (above 45 seconds per vehicle for signalized intersections, above 30 for unsignalized intersections)
** Movement is significantly impacted (indicated by "SI")
[1] Fountain Avenue
[2] Loring Avenue
[3] Linden Boulevard Mainline
[4] Kings Highway Mainline
[5] Kings Highway Service Road
[6] Remsen Avenue
[7] In the weekday PM peak hour, the westbound approach operates with a de facto left turn and a separate thru lane.
[8] Linden Boulevard Service Road
[9] In the 2013 No Build condition, Loring Avenue would be converted into a one-way southbound street at the intersection with Linden Boulevard and Fountain Avenue. In the 2013 Build condition, Loring Avenue would be a two-way street.

Erskine Street

Four signalized intersections along the Erskine Street corridor would have movements that would be significantly impacted including the following:

- At the intersection of Erskine Street and the Belt Parkway Eastbound Ramps, eastbound left turns would be significantly impacted during the Saturday PM peak hour.
- At the intersection of Erskine Street and the Belt Parkway Westbound Ramps, westbound right turns would be significantly impacted during the Saturday PM peak hour.
- At the intersection of Erskine Street and Gateway Drive, southbound through traffic would be significantly impacted during the weekday AM, PM, Saturday midday, and Saturday PM peak hours.
- At the intersection of Erskine Street and Gateway Plaza, southbound through traffic and right turns from Erskine Street would be significantly impacted during the Saturday midday and PM peak hours.

Gateway Drive

The eastbound approach of Gateway Drive at its intersection with the driveway to Boulder Creek would be significantly impacted during the Saturday PM peak hour. No other intersection along Gateway Drive would be significantly impacted with the exception of the intersection of Gateway Drive and Erskine Street, which is described as part of the Erskine Street corridor above.

Vandalia Avenue

No intersections along the Vandalia Avenue corridor would be significantly impacted.

Fountain Avenue

Excluding the intersection of Fountain Avenue and Linden Boulevard, which is described as part of the Linden Boulevard corridor, the intersection of Fountain Avenue and Flatlands Avenue is the only signalized intersection that would be significantly impacted. Northbound Fountain Avenue would be significantly impacted in the weekday midday, PM, and Saturday PM peak hours. Southbound Fountain Avenue would be significantly impacted during the weekday midday, Saturday midday, and Saturday PM peak hours. De facto left turns from the eastbound Linden Boulevard mainline would be significantly impacted during the weekday AM, midday, Saturday midday, and Saturday PM peak hours.

One unsignalized intersection along the Fountain Avenue corridor -- Fountain Avenue and Liberty Avenue -- would be significantly impacted. At this intersection, southbound Fountain Avenue would be significantly impacted during the weekday PM, Saturday midday, and Saturday PM peak hours.

Flatlands Avenue

Along the Flatlands Avenue corridor, six signalized intersections would be significantly impacted including the following:

- At the intersection of Flatlands Avenue and Jerome Street, eastbound left turns would be significantly impacted during the Saturday PM peak hour.
- At the intersection of Flatlands Avenue and Van Siclen Avenue, southbound Van Siclen Avenue would be significantly impacted during all five peak analysis hours. Eastbound left turns from Flatlands Avenue would be significantly impacted during the weekday AM, Saturday midday, and Saturday PM peak hours. Westbound left turns from Flatlands Avenue would be significantly impacted during all five peak hours. The through and right turn movements along eastbound and westbound Flatlands Avenue would be significantly impacted during the Saturday PM peak hour.
- At the intersection of Flatlands and Pennsylvania Avenues, southbound left turns from Pennsylvania Avenue and westbound right turns from Flatlands Avenue would be significantly impacted during all five peak hours. Along Flatlands Avenue, the eastbound left turns would be significantly impacted in the weekday midday, PM, and Saturday PM peak hours; the eastbound through and westbound left turn movements would be significantly impacted during the weekday PM, Saturday midday, and Saturday PM peak hours. Westbound through traffic would be significantly impacted in the weekday midday, PM, Saturday midday, and Saturday PM peak hours.
- At the intersection of Flatlands Avenue and Rockaway Parkway, southbound Rockaway Parkway would be significantly impacted during the weekday PM, Saturday midday, and Saturday PM peak hours. Eastbound left turns from Flatlands Avenue would be significantly impacted in the weekday PM peak hour. Westbound left turns from Flatlands Avenue would be significantly impacted in the weekday AM, PM, Saturday midday, and Saturday PM peak hours. The through and right turn movements along eastbound and westbound Flatlands Avenue would be significantly impacted during the weekday PM, Saturday midday, and Saturday PM peak hours.

- At the intersection of Flatlands Avenue and Remsen Avenue, southbound left turns from Remsen Avenue would be significantly impacted during the weekday PM, Saturday midday, and Saturday PM peak hours. The through and right turn movements along eastbound Flatlands Avenue would be significantly impacted during the weekday AM and PM peak hours. During the weekday AM, PM, Saturday midday, and Saturday PM peak hours, the through and right turn movements along the westbound approach would be significantly impacted.
- The intersection of Flatlands Avenue and Fountain Avenue would be significantly impacted and is described as part of the Fountain Avenue corridor.

Linden Boulevard

Six intersections along the Linden Boulevard corridor would be significantly impacted, including the following:

- At the intersection of Linden Boulevard with Fountain Avenue and Loring Avenue, all movements along northbound and southbound Fountain and Loring Avenue would be significantly impacted during all peak hours analyzed. Westbound left turns from the Linden Boulevard mainline would be significantly impacted in the weekday AM, midday, PM, Saturday midday, and Saturday PM peak hours. The through and right turn movements along the westbound Linden Boulevard mainline and service road would be significantly impacted during the weekday AM peak hour.
- At the intersection of Linden Boulevard and Atkins Avenue, southbound Atkins Avenue would be significantly impacted during the weekday AM peak hour.
- At the intersection of Linden Boulevard and Pennsylvania Avenue, northbound left turns from Pennsylvania Avenue would be significantly impacted during the weekday midday peak hour. The northbound through movement would be significantly impacted in the weekday AM, PM, Saturday midday, and Saturday PM peak hours. Southbound left turns from Pennsylvania Avenue would be significantly impacted in the weekday PM, Saturday midday, and Saturday PM peak hours. The southbound through and right turn movements from Pennsylvania Avenue would be significantly impacted during the Saturday peak hours. Along the Linden Boulevard mainline, eastbound and westbound left turns, and the westbound through movement would be significantly impacted during all peak hours analyzed. The eastbound Linden Boulevard mainline through movement, and right turn movement along the eastbound Linden Boulevard service road would be significantly impacted during the weekday PM, Saturday midday, and Saturday PM peak hours. The through movement along the eastbound Linden Boulevard service road would be significantly impacted during the weekday AM, PM, Saturday midday, and Saturday PM peak hours. The westbound through and right turn movements along the Linden Boulevard service road would be significantly impacted during the weekday AM peak hour.
- At the intersection of Linden Boulevard and Rockaway Avenue, the southbound left turn and through movements of Rockaway Avenue, and the left turns from the westbound Linden Boulevard mainline would be significantly impacted during all peak analysis hours except the weekday AM peak hour. Right turns from northbound Rockaway Avenue would be significantly impacted during the weekday midday, PM, Saturday midday, and Saturday PM peak hours.

- At the intersection of Linden Boulevard and Rockaway Parkway, southbound left turns from Rockaway Parkway would be significantly impacted during all peak analysis hours except the weekday AM peak hour.
- At the six-legged intersection of Linden Boulevard, Kings Highway and Remsen Avenue, the through and right turn movements along the northbound Kings Highway service road would be significantly impacted in the weekday PM peak hour. The eastbound through movement and right turns and westbound left turns and through movements along the Linden Boulevard mainline would be significantly impacted for all five peak hours analyzed.

Pennsylvania Avenue

All intersections analyzed along the Pennsylvania Avenue corridor would be significantly impacted, including the following:

- At the intersection of Pennsylvania Avenue and Liberty Avenue, northbound Pennsylvania Avenue would be significantly impacted during the weekday AM, PM, Saturday midday, and Saturday PM peak hours. The through and right turn movements of southbound Pennsylvania Avenue would be significantly impacted during the weekday midday, PM, Saturday midday, and Saturday PM peak hour.
- At the intersection of Pennsylvania Avenue and Atlantic Avenue, northbound left turns from Pennsylvania Avenue would be significantly impacted in the weekday midday peak hour. The northbound through and right turn movements would be significantly impacted for all five peak hours analyzed. The through and right turn movements of southbound Pennsylvania Avenue would be significantly impacted during the weekday AM, PM, Saturday midday, and Saturday PM peak hours. The through and right turn movements of eastbound Atlantic Avenue would be significantly impacted during the weekday midday, PM, Saturday midday, and Saturday PM peak hours. The through and right turn movements of westbound Atlantic Avenue would have significant impacts in the weekday AM, PM, Saturday midday, and Saturday PM peak hours.

The intersections of Pennsylvania Avenue and Flatlands Avenue, and Pennsylvania Avenue and Linden Boulevard would both have significant impacts and are discussed as part of the Flatlands Avenue and Linden Boulevard corridors, respectively.

HIGHWAY ANALYSIS

In the 2013 Build condition, the Shore Parkway would experience volume increases due to the background growth, No Build developments, and traffic generated by the development of the Proposed Project. The Proposed Action would result in increasing traffic on the Shore Parkway and Erskine Street interchange on and off-ramps by approximately 35 to 390 vph during the peak hours for the 2013 Build condition. These volumes were added to the 2013 No Build volumes to establish the 2013 Build volumes.

Table 16-34 provides a comparison of the 2013 No Build and Build levels of service, speeds and densities for the Shore Parkway near the Erskine Street interchange. The sections within the influence of the merge and diverge areas analyzed would operate at LOS D or E during the weekday AM peak hour, and at LOS C during the weekday midday peak hour.

Table 16-34
2013 No Build and Build Conditions on the Shore Parkway

Analysis Location	2013 No Build			2013 Build		
	Speed (mph)	Density (pc/mi/ln)	LOS	Speed (mph)	Density (pc/mi/ln)	LOS
Weekday AM						
Eastbound before Erskine Street Off-Ramp Diverge	48.9	35.3	E	48.7	35.9	E
Eastbound between Erskine Street Off-Ramp Diverge and On-Ramp Merge	53.1	29.9	D	52.9	30.2	D
Eastbound after Erskine Street On-Ramp Merge	52.5	31.8	D	52.1	32.3	D
Westbound before Erskine Street Off-Ramp Diverge	54.0	33.8	D	53.5	34.8	D
Westbound between Erskine Street Off-Ramp Diverge and On-Ramp Merge	51.5	33.1	D	52.0	32.3	D
Westbound after Erskine Street On-Ramp Merge	51.7	34.6	D	51.5	34.6	D
Weekday Midday						
Eastbound before Erskine Street Off-Ramp Diverge	55.0	25.9	C	54.7	27.0	C
Eastbound between Erskine Street Off-Ramp Diverge and On-Ramp Merge	54.9	22.5	C	54.9	22.4	C
Eastbound after Erskine Street On-Ramp Merge	54.0	24.8	C	53.6	26.0	C
Westbound before Erskine Street Off-Ramp Diverge	55.0	24.3	C	54.3	25.9	C
Westbound between Erskine Street Off-Ramp Diverge and On-Ramp Merge	54.9	20.4	C	54.4	21.0	C
Westbound after Erskine Street On-Ramp Merge	54.4	22.8	C	53.8	24.5	C
Weekday PM						
Eastbound before Erskine Street Off-Ramp Diverge	53.6	34.8	D	52.3	36.8	E*
Eastbound between Erskine Street Off-Ramp Diverge and On-Ramp Merge	42.5	43.2	E	41.1	46.3	F*
Eastbound after Erskine Street On-Ramp Merge	38.0	49.9	F	37.6	52.6	F
Westbound before Erskine Street Off-Ramp Diverge	50.5	37.5	E	49.1	39.9	E
Westbound between Erskine Street Off-Ramp Diverge and On-Ramp Merge	48.7	34.3	D	47.6	35.2	E
Westbound after Erskine Street On-Ramp Merge	49.3	35.7	E	48.8	37.2	E
Saturday Midday						
Eastbound before Erskine Street Off-Ramp Diverge	46.4	38.3	E	45.5	40.7	E
Eastbound between Erskine Street Off-Ramp Diverge and On-Ramp Merge	44.2	36.7	E	44.0	36.8	E
Eastbound after Erskine Street On-Ramp Merge	35.3	47.5	F	35.0	50.0	F
Westbound before Erskine Street Off-Ramp Diverge	53.5	31.9	D	52.0	34.7	D
Westbound between Erskine Street Off-Ramp Diverge and On-Ramp Merge	53.4	27.2	C	53.2	27.4	C
Westbound after Erskine Street On-Ramp Merge	53.0	30.2	D	52.5	31.8	D
Saturday PM						
Eastbound before Erskine Street Off-Ramp Diverge	45.8	42.1	E	43.9	46.1	F*
Eastbound between Erskine Street Off-Ramp Diverge and On-Ramp Merge	41.3	45.2	F	38.4	50.0	F*
Eastbound after Erskine Street On-Ramp Merge	34.7	52.9	F	33.8	58.5	F*
Westbound before Erskine Street Off-Ramp Diverge	52.8	35.2	E	49.1	40.3	E*
Westbound between Erskine Street Off-Ramp Diverge and On-Ramp Merge	52.5	30.2	D	52.1	30.5	D
Westbound after Erskine Street On-Ramp Merge	51.9	33.7	D	50.8	36.3	E*

Notes:
* Denotes significant impact
pc/mi/ln = passenger cars per mile per lane

During the weekday PM peak hour, the analyzed sections would operate at LOS E or F. In the Saturday midday peak hour, the eastbound sections would operate at LOS E or F and the westbound sections would operate at LOS C or D. In the Saturday PM peak hour, the eastbound sections would operate at LOS F and the westbound sections would operate at LOS D or E.

None of the Shore Parkway sections would be significantly impacted during the weekday AM and midday peak hours. A comparison of the 2013 No Build and Build conditions indicates that the maximum reduction in speed from the No Build to the Build condition would be 3.7 mph and would occur within the westbound section before the Erskine Street off-ramp in the Saturday PM peak hour. The largest increase in density would be 5.6 pc/mi/ln, which would occur within the eastbound section after the on-ramp in the Saturday PM peak hour.

The eastbound sections before the Erskine Street off-ramp, and between the on-ramp and off-ramp, and the westbound section between the interchange ramps would all deteriorate from LOS D to LOS F in the 2013 Build condition.

During the weekday PM peak hour, two Shore Parkway segments would be significantly impacted. These impacts would occur on the eastbound Shore Parkway section before the Erskine Street off-ramp, and the section between the Erskine Street off-ramp and on-ramp. During the Saturday PM peak hour, all sections except the westbound Shore Parkway between the on-ramp and off-ramp would be significantly impacted. In general, the reduction in speeds would range from 0.9 mph to 3.7 mph, which would generally not be noticeable to motorists.

PARKING

Table 16-35 provides the expected weekday and Saturday occupancies for the Gateway Center Phase I and II parking lots in the 2013 Build condition. Overall, the parking lots would have a maximum weekday accumulation of 49 percent from 1 PM to 2 PM; on Saturdays, the maximum accumulation would be 73 percent from 3 to 4 PM. Thus, the combined existing and new parking lots would have adequate capacity to meet projected demands.

Completion of the proposed development of the Proposed Project would result in the construction of 2,385 residential units, a high school, community and public facilities and open space. As mentioned in the No Build conditions section, these residential units would provide approximately 1,140 off-street parking spaces. This, along with the new on-street spaces, would ensure that adequate parking is provided for residential land use as according to 2000 Census data for Brooklyn Community District 5, the average vehicle ownership per household is 0.51.

Available on-street parking should suffice for the local retail, as these trips do not cause substantial parking accumulation. The high school would at most generate an accumulation of 118 vehicles in the weekday AM peak hour, the day care facility accumulations would be 2 vehicles, community facilities do not generate any accumulated trips during the peak analysis hours, and parkland generates at most 7 accumulated trips in the weekday AM peak hour. Therefore, in the AM peak hour alone, a total of 127 parked vehicles would be expected, and even over the course of the full day, the 1,015 on-street parking spaces would be expected to fully accommodate all of the parking needs for these land uses in the 2013 Build condition.

Table 16-35
2013 Build Parking Accumulation for Gateway Center[1]

Time Period	Gateway Center Phase I		Gateway Center Phase II		Total	
	Occupied Spaces	Percent Occupied	Occupied Spaces	Percent Occupied	Occupied Spaces	Percent Occupied
Weekday						
Before 8AM	201	7	139	7	340	7
8AM – 9AM	423	16	263	13	686	14
9AM – 10AM	677	25	438	21	1115	23
10AM – 11AM	951	35	629	30	1580	33
11AM – 12PM	1,184	44	790	38	1974	42
12PM – 1PM	1,341	50	898	43	2239	47
1PM – 2PM	1,356	51	1017	49	2373	50
2PM – 3PM	1,291	48	880	43	2171	46
3PM – 4PM	1,123	42	896	43	2019	42
4PM – 5PM	1,114	41	867	42	1981	42
5PM – 6PM	1,140	42	924	45	2064	43
6PM – 7PM	1,239	46	992	48	2231	47
7PM – 8PM	1,218	45	862	42	2080	44
Saturday						
Before 11AM	1,134	42	783	38	1917	40
11AM – 12PM	1,381	51	951	46	2332	49
12PM – 1PM	1,620	60	1117	54	2737	58
1PM – 2PM	1,846	69	1268	61	3114	66
2PM – 3PM	2,052	76	1411	68	3463	73
3PM – 4PM	2,077	77	1407	68	3484	73
4PM – 5PM	2,014	75	1310	63	3324	70
5PM – 6PM	1,860	69	1236	60	3096	65

Note: The existing Gateway Center parking lot has 2,685 spaces and the proposed expansion would provide 2,067 spaces. In total, Phases I and II would have 4,752 spaces.
[1] Indicates existing and proposed expansion.

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