CHAPTER 17: TRAFFIC AND PARKING

17.1 Overview

The proposed Stapleton Waterfront Development project is located in close proximity to, and provides easy access to and from, the St. George Ferry Terminal, the Staten Island Railway (SIR), the Verrazano Narrows Bridge, and the Staten Island Expressway (SIE). Bay and Front Streets serve as key roadways in the vicinity of the Project Area (as defined in Chapter 1, "Project Description"). Local streets such as Thompson, Wave, Prospect, Canal and Water Streets cut across Bay Street and provide additional access to and from the waterfront area. Bay Street traverses a primarily residential area with street-level commercial uses; its existing traffic volumes are generally moderate. The other key streets cited above carry low volumes of traffic.

This chapter addresses the potential traffic and parking impacts of the Proposed Action. The traffic and parking analyses cover a study area encompassing 13 existing intersections and three intersections to be redesigned along Front Street. The chapter starts with an assessment of existing traffic and parking conditions in the traffic study area, and future conditions without the Proposed Action (the 2015 No Build Condition). It then provides a detailed description of the volume of trips expected to be generated by the Proposed Action (2015 Build Condition), and an assessment of future traffic and parking conditions with the Proposed Action in place. These Build year analyses identify the location and extent of significant impacts potentially generated by the Proposed Action. The identification and evaluation of traffic improvements needed to mitigate those impacts is presented in the mitigation section of this chapter and in Chapter 24, "Mitigation." The parking analysis addresses the ability of the Proposed Action to accommodate its parking demands in the Build year.

Of the 16 locations analyzed in the Build Condition for the weekday and Saturday midday peak hours, significant impacts would occur at five intersections during the weekday AM and Saturday midday peak hours, six intersections during the weekday midday peak hour, and eight intersections during the weekday PM peak hour. The evaluation of mitigation measures indicates that 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.

In addition to the analyses presented in this chapter, detailed level of service tables and traffic volume maps are presented in Appendix C.

17.2 Existing Conditions

17.2.1 Roadway Network and Traffic Study Area

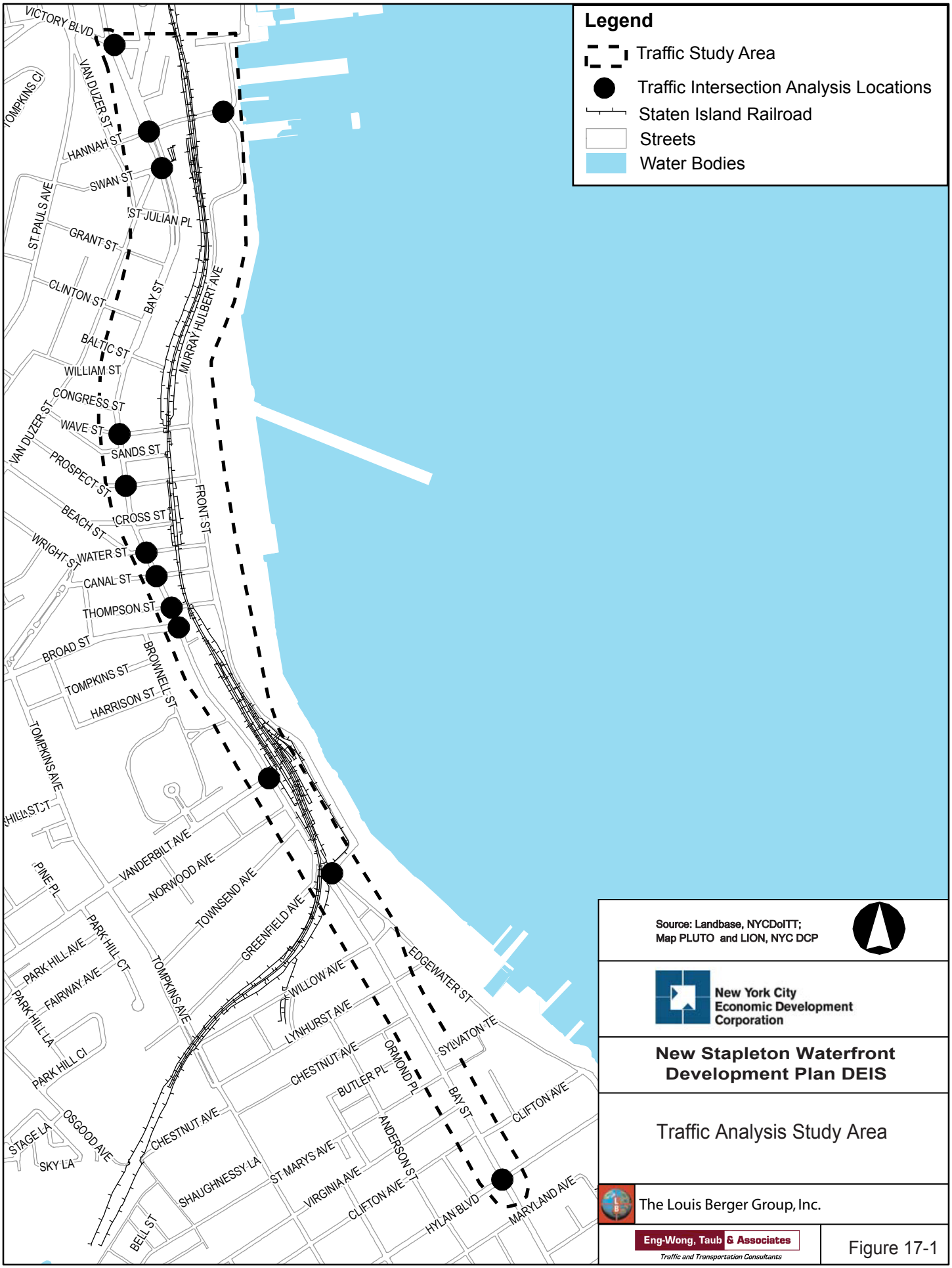
The traffic study area is generally bounded by Victory Boulevard to the north, Hylan Boulevard to the south, Bay Street to the west, and Front Street to the east (see Figure 17-1). The traffic study area includes locations in the immediate vicinity of the Project Area and locations through which generated traffic can be expected. The overall traffic study area consists of 13 existing intersections (eight signalized and five unsignalized intersections) located along Bay and Front Streets; the three intersections being redesigned along Front Street are added in the Build analysis. The specific analysis locations were selected based on observations of traffic patterns in the study area and projected trip patterns to the Project Area.

The primary north-south access streets are Bay Street and Front Street. Bay Street extends north-south inland within the local community, while Front Street bypasses Bay Street along the waterfront. Edgewater Street is a local road that extends along the waterfront farther south of Front Street. Some of the key east-west routes include Hylan and Victory Boulevards, Swan/Van Duzer and Broad Streets, and Vanderbilt Avenue. All the routes mentioned above, except Swan/Van Duzer Street, are two-directional. A number of other streets such as Broad/Thomson, Wave, Prospect, Canal and Water/Beach Streets lead directly to the Project Area. Following is a discussion of some of the key roadways in the study area vicinity:

Bay Street is a key north-south arterial that extends between the Staten Island Ferry Terminal to the north and School Road (in the vicinity of the Verrazano Narrows Bridge) to the south. Within the study area, Bay Street consists of one to two travel lanes in each direction with on-street parking available at times on both sides. It continues parallel to the SIR leading up to St. George and has bus service along its length in both directions. The majority of vehicles that access the waterfront travel along or across Bay Street at some point along their route.

Front Street is an important north-south roadway that intersects with Bay and Edgewater Streets at its southern end and with Hannah Street at the northern end. Front Street is generally characterized by one wide travel lane in each direction. There are currently no bus routes along Front Street. Direct access to the Project Area would be from Front Street.

Edgewater Street is a north-south roadway that extends along the waterfront from Hylan Boulevard to Front Street. Edgewater Street consists of one lane in each direction and is predominantly used by local and commuting traffic as an alternative to Bay Street to bypass the traffic signals and heavier traffic volumes along Bay Street.



Source: Landbase, NYCDoITT; Map PLUTO and LION, NYC DCP

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New Stapleton Waterfront Development Plan DEIS

Traffic Analysis Study Area

The Louis Berger Group, Inc.

Eng-Wong, Taub & Associates
Traffic and Transportation Consultants

Figure 17-1

Victory Boulevard is a major east-west arterial that delineates the northern limit of the study area. It provides local and regional access for Staten Island residents. It extends from Bay Street and connects with the SIE and State Route 440 on the western end of Staten Island. Victory Boulevard consists of two lanes in each direction in the vicinity of the study area.

Hylan Boulevard is a key east-west corridor in this region that defines the southern boundary of the study area and serves as an important link between the SIE and Bay Street. Like Victory Boulevard, Hylan Boulevard also provides local and regional access for Staten Island residents, and extends across the southern parts of Staten Island.

The following 13 existing intersections were analyzed for the weekday AM, midday, PM and Saturday midday peak hours:

1. Bay Street and Victory Boulevard
2. Bay Street and Hannah Street
3. Bay Street and Swan Street/Van Duzer Street
4. Bay Street and Wave Street
5. Bay Street and Prospect Street
6. Bay Street and Water Street
7. Bay Street and Canal Street
8. Bay Street and Thompson Street
9. Bay Street and Broad Street
10. Bay Street and Vanderbilt Avenue
11. Bay Street and Edgewater Street/Front Street
12. Bay Street and Hylan Boulevard
13. Front Street and Hannah Street

17.2.2 Existing Traffic Volumes

Traffic counts for typical weekday conditions were conducted in March 2005 for 13 locations, including manual intersection counts and 24-hour Automatic Traffic Recorder (ATR) machine counts. At the request of the New York City Department of Transportation (NYCDOT), counts were also conducted on a Saturday in mid-November 2005 to determine its midday conditions. These volumes were used along with observations of actual traffic conditions to determine levels of service (LOS) using the *2000 Highway Capacity Manual (HCM 2000)* procedures. All 13 locations were analyzed for weekday AM, midday, PM, and Saturday midday peak hours.

The traffic data analysis identified the following peak hours: 8-9 AM; 12:30-1:30 PM; 4:30-5:30 PM; and 11:45 AM-12:45 PM on Saturday. Overall, traffic flow is moderate along the key commuter routes during the weekday AM and PM peak hours, and the more local streets carry much lower volumes. Traffic volumes along the key commuter routes and local streets are generally lower during the weekday midday and Saturday midday peak hours compared to the weekday AM and PM peak hours. Detailed traffic

volume maps and level of service details for each of the intersections are provided in Appendix C.

Typical weekday and Saturday peak hour vehicular volumes along Bay Street between Hannah and Edgewater Streets vary from approximately 350 to 500 vehicles per hour (vph) in the northbound direction and approximately 450 to 650 vph in the southbound direction. Along Front Street, the volumes range from approximately 200 to 300 vph in each direction during the peak hours. Most of this volume is traffic that uses Front Street as an alternative to the more heavily traveled Bay Street. Edgewater Street between Front Street and Hylan Boulevard experiences approximately 150 to 250 vph in both directions during all peak hours analyzed. Along the east/west approaches, volumes range from approximately 150 to 400 vph on Victory Boulevard; approximately 60 to 160 vph on Van Duzer Street; approximately 10 to 40 vph on Wave and Prospect Streets; approximately 110 to 280 vph on Water and Canal Streets; and approximately 70 to 370 on Broad Street and Vanderbilt Avenue. These are generally considered low traffic volumes.

17.2.3 Existing Traffic Levels of Service

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

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

- LOS F describes operations with delays in excess of 80.0 seconds per vehicle. This is considered to be unacceptable to most drivers. This condition often occurs with oversaturation, i.e., when arrival flow rates exceed the capacity of the intersection. It may also occur at high v/c ratios with cycle failures. Poor progression and long cycle lengths may also be contribute to such delays. Often, vehicles do not pass through the intersection in one signal cycle.

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

Although the majority of analyzed intersections are signalized, some are not. For these unsignalized intersections, delay is defined as the total elapsed time from when a vehicle stops at the end of the queue until the vehicle departs from the stop line: LOS A describes operations with very low delay, i.e., 10.0 seconds or less per vehicle; LOS B describes operations with delays in the range of 10.1 to 15.0 seconds; LOS C has delays in the range of 15.1 to 25.0 seconds; LOS D, 25.1 to 35.0 seconds per vehicle; and LOS E, 35.1 to 50.0 seconds per vehicle. LOS F describes operation with delays in excess of 50.0 seconds per vehicle, which is considered unacceptable to most drivers. This condition exists when there are insufficient gaps of suitable size to allow side street traffic to cross safely through a major vehicular traffic stream.

Table 17-1 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.

- In the weekday AM peak hour, none of the signalized intersections analyzed are operating at overall unacceptable LOS E or F and only one intersection is operating at 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). Two 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 40 total traffic movements analyzed are operating at LOS E.
- In the weekday midday peak hour, none of the signalized intersections operate at overall LOS E or F, while one is at overall LOS D. None of the traffic movements are operating at LOS E.
- In the weekday PM peak hour, none of the signalized intersections operate at overall LOS E or F, while one is at overall LOS D. Three traffic movements are operating at LOS E.
- In the Saturday midday peak hour, all of the signalized intersections are operating at overall LOS C or better. None of the traffic movements are operating at LOS E.
- Each of the five unsignalized intersections analyzed operates at acceptable levels of service during all the traffic analysis hours.

Table 17-1
Intersection Levels of Service Summary
2005 Existing Condition

Signalized Intersections	AM	MD	PM	Saturday MD
Overall LOS A/B	4	5	4	6
Overall LOS C	3	2	3	2
Overall LOS D	1	1	1	0
Overall LOS E/F	0	0	0	0
Number of Movements at LOS E or F	2	0	3	0
Unsignalized Intersections	**AM**	**MD**	**PM**	**Saturday MD**
Overall LOS A/B	5	3	2	5
Overall LOS C	0	2	3	0
Overall LOS D	0	0	0	0
Overall LOS E/F	0	0	0	0
Number of Movements at LOS E or F	0	0	0	0

Overall existing levels of service by intersection are also presented in Figures 17-2 through 17-5. A more detailed presentation of traffic volumes and levels of service is provided below. Details of the level of service analyses for each traffic movement at the intersections analyzed are presented in Table 17-22 located at the end of this chapter..

Signalized Intersections

Along the Bay Street corridor, all eight signalized intersections analyzed operate at acceptable overall LOS D or better during the weekday and Saturday peak hours, with the exception of one intersection (Bay and Edgewater/Front Streets) that operates at marginally unacceptable overall LOS D during the weekday PM peak hour. Three intersections have individual movements that operate at LOS E, including the following:

- At the intersection of Bay Street and Victory Boulevard, the northbound de facto left-turn[1] movement of Bay Street operates at LOS E during the weekday PM peak hour. Also, the eastbound de facto left-turn movement of Victory Boulevard operates at LOS E during the weekday AM and PM peak hours.
- At the intersection of Bay and Edgewater/Front Streets, the westbound left-through movement of Front Street operates at LOS E during the weekday PM peak hour.
- At the intersection of Bay Street and Hylan Boulevard, westbound Hylan Boulevard operates at LOS E during the AM peak hour.

[1] The *2000 Highway Capacity Manual* defines a *de facto left-turn* as a shared left and through lane that has so many left turn movements that it essentially acts as an exclusive left-turn lane. The threshold for reaching this condition is if the computed proportion of left turns in the shared lane equals 1.0 (i.e., 100 percent).

Legend
LOS A or B
LOS C
LOS D
LOS E or F
Unsignalized Intersection
Note: Overall Intersection LOS is Shown
VICTORY BLVD
VAN DUZER ST
TOMPKINS CI
HANNAH ST
SWAN ST
ST JULIAN PL
ST PAULS AVE
GRANT ST
CLINTON ST
BAY ST
MURRAY HULBERT AVE
BALTIC ST
WILLIAM ST
CONGRESS ST
WAVE ST
SANDS ST
PROSPECT ST
FRONT ST
BEACH ST
CROSS ST
WRIGHT ST
WATER ST
CANAL ST
BROAD ST
TOMPKINS ST
HARRISON ST
BROWNELL ST
TOMPKINS AVE
VANDERBILT AVE
NORWOOD AVE
TOWNSEND AVE
GREENFIELD AVE
PINE PL
PARK HILL AVE
PARK HILL CT
FAIRWAY AVE
PARK HILL LA
PARK HILL CI
WILLOW AVE
LYNHURST AVE
EDGEWATER ST
SYLVATON TE
CHESTNUT AVE
BUTLER PL
ORMOND PL
BAY ST
CLIFTON AVE
STAGE LA
OSGOOD AVE
SKY LA
SHAUGHNESSY LA
ST MARYS AVE
VIRGINIA AVE
ANDERSON ST
HYLAN BLVD
MARYLAND AVE
Source: Landbase, NYCDoITT; Map PLUTO and LION, NYC DCP
New York City Economic Development Corporation
New Stapleton Waterfront Development Plan DEIS
Existing Weekday AM Peak Hour Traffic Levels of Service
The Louis Berger Group, Inc.
Eng-Wong, Taub & Associates
Traffic and Transportation Consultants
Figure 17-2

Source: Landbase, NYCDoITT; Map PLUTO and LION, NYC DCP

New York City Economic Development Corporation

New Stapleton Waterfront Development Plan DEIS

Existing Weekday Midday Peak Traffic Levels of Service

The Louis Berger Group, Inc.

Eng-Wong, Taub & Associates
Traffic and Transportation Consultants

Figure 17-3

Source: Landbase, NYCDoITT; Map PLUTO and LION, NYC DCP

New York City Economic Development Corporation

New Stapleton Waterfront Development Plan DEIS

Existing Weekday PM Peak Traffic Levels of Service

The Louis Berger Group, Inc.

Eng-Wong, Taub & Associates
Traffic and Transportation Consultants

Figure 17-4

Source: Landbase, NYCDoITT; Map PLUTO and LION, NYC DCP

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New Stapleton Waterfront Development Plan DEIS

Existing Saturday Midday Peak Traffic Levels of Service

The Louis Berger Group, Inc.

Eng-Wong, Taub & Associates
Traffic and Transportation Consultants

Figure 17-5

Unsignalized Intersections
All five unsignalized intersections analyzed operate at overall LOS C or better during each of the four peak hours.

17.2.4 Parking

A detailed parking inventory of the areas surrounding the Project Area was conducted in March 2005. Information related to on- and off-street parking lots and spaces within a radius of one-half mile around the Project Area were obtained as part of the inventory. Collected information included capacities and occupancies of parking lots during the weekday peak periods of 6:30-9:30 AM, 11:30 AM-2:30 PM, and 4-7 PM.

There are four public parking lots in the study area with a total capacity of 404 spaces. An inventory of these parking lots is provided in Table 17-2 and shown on Figure 17-6.

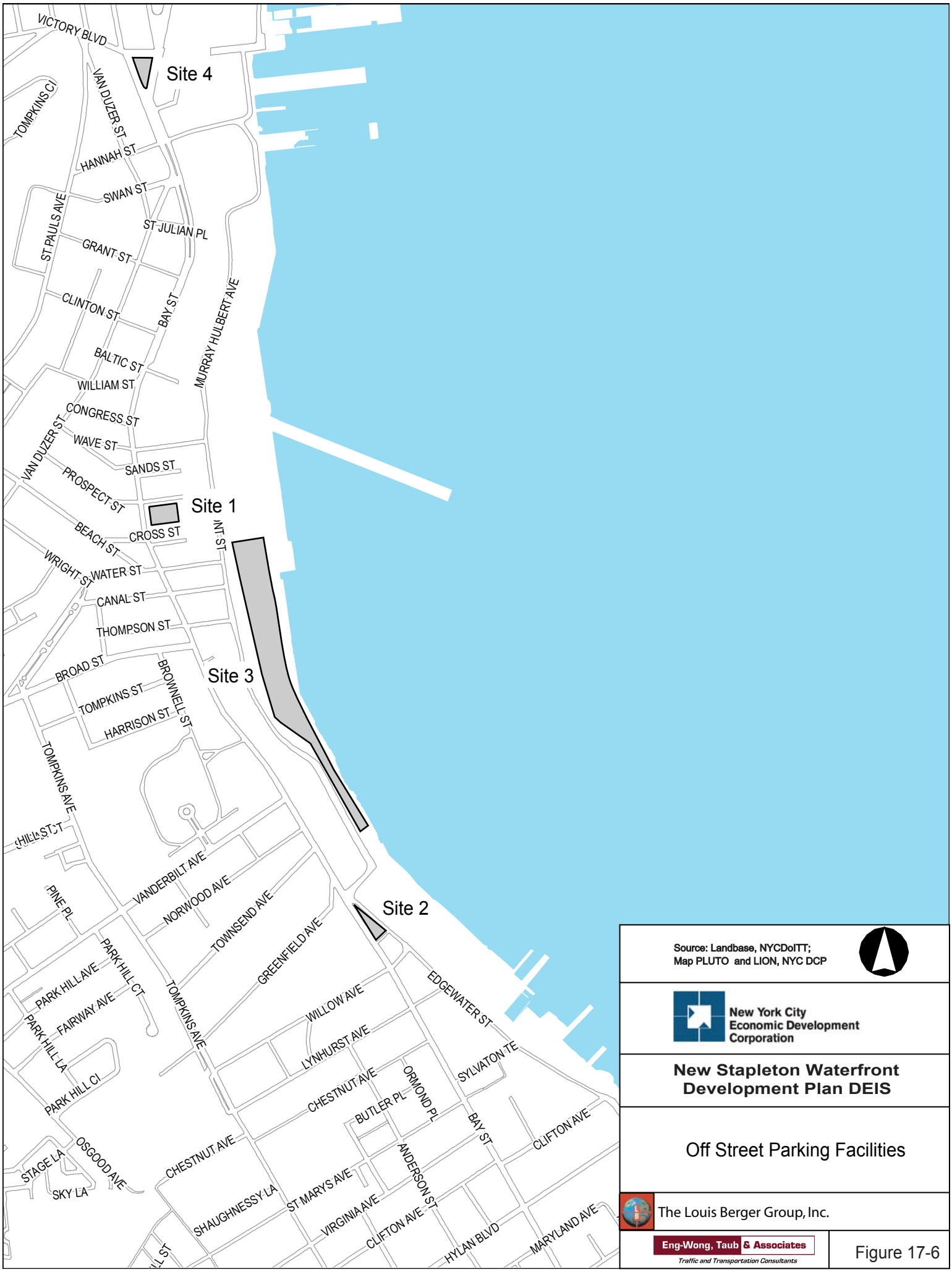
In general, off-street parking is available in the vicinity of the Project Area. The small triangular lot located between Bay, Edgewater and Camden Streets is the only lot that operates at capacity by 9:30 AM and remains fully occupied through late afternoon/early evening. The lot located between Victory Boulevard and Central Avenue has a maximum occupancy of approximately 81 percent during the midday peak period, with occupancy decreasing during the PM peak period. Both remaining lots have maximum occupancies under 25 percent during the entire day. Overall, the four off-street parking facilities are 23 percent full by 9:30 AM, 32 percent full at 12:30 PM, and 16 percent full at 5 PM.

Table 17-2
Parking Utilization for Public Parking Lots
2005 Existing Condition

Facility ID#	Lot Description/Location	Total Capacity	Percent Occupied		
			AM	Midday	PM
1	Municipal Lot between Prospect and Cross Streets	128	2	6	2
2	Lot between Bay/Camden/Edgewater Streets	45	100+	100+	69
3	Open Space between Front Street and the waterfront.	200	16	23	7
4	Lot between Victory Boulevard and Central Avenue	31	32	81	71
	TOTAL	**404**	**23**	**32**	**16**

Note: Facility ID numbers indicated in this Table correspond to those shown in Figure 16-6.

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.



Source: Landbase, NYCDoITT;
Map PLUTO and LION, NYC DCP

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Off Street Parking Facilities

The Louis Berger Group, Inc.

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Traffic and Transportation Consultants

Figure 17-6

Table 17-3 presents an overview of capacity and occupancy of on-street parking in the study area. As shown in the table, the peak occupancy is approximately 70 percent occurring during the midday peak period.

Table 17-3
Summary of On-Street Parking Inventory
2005 Existing Condition

Weekday Peak Period	No. of Spaces Vacant	No. of Spaces Legally Available	Percent Occupancy
6:30 - 9:30 AM	1,051	2,766	62
11:30 AM - 2:30 PM	830	2,766	70
4:00 – 7:00 PM	1,134	2,766	59

17.3 No Build Condition

This section establishes the baseline (the No Build) Condition against which potential impacts of the Proposed Action can be compared. Future year traffic conditions were analyzed for the year 2015. Future No Build traffic volumes were established by applying a background traffic growth rate of one percent per year in accordance with the *City Environmental Quality Review (CEQR) Technical Manual* guidelines and discussions with NYCDOT. Trips expected to be generated by buildout of expected developments were added to the one percent background growth rate to develop future No Build traffic volumes

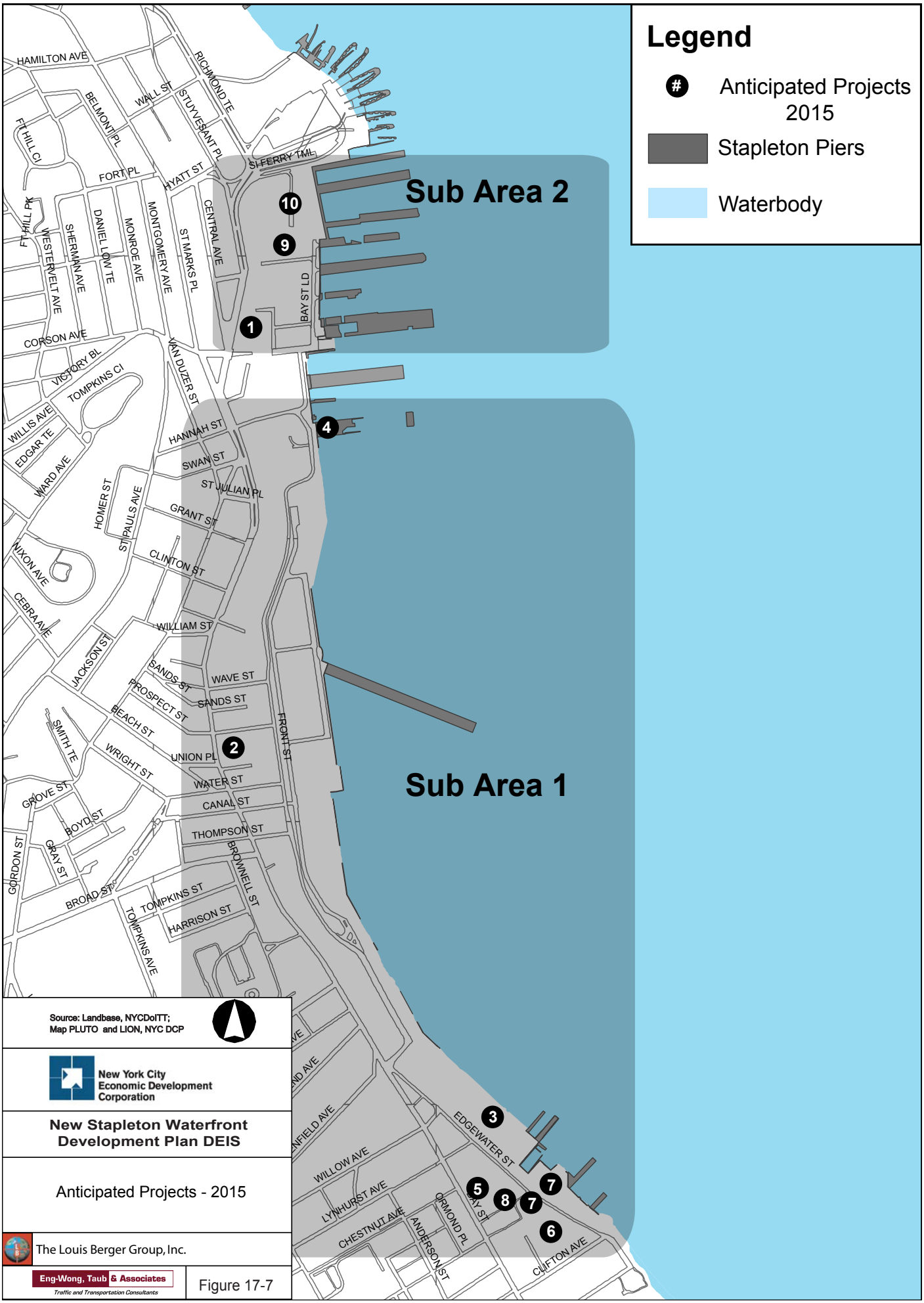
17.3.1 Background Traffic Generation and Assignments

The extent of commercial and residential buildout for the No Build Condition was determined based on information obtained from the New York City Department of City Planning (NYCDCP), the New York City Department of Housing, Preservation, and Development (HPD), the Staten Island Borough President's office, and the New York City Economic Development Corporation. Ten developments were identified, as noted in Table 17-4 and shown in Figure 17-7. The sites were grouped into two areas based on their proximity to transit facilities. Sub Area 1 encompasses all the sites south of Victory Boulevard, while sites located to the north of Victory Boulevard lie within Sub Area 2.

Table 17-4
Approved Developments
No Build Condition

Sub Area 1			
Site #	**Site Description**	**Projected Use**	**Size**
2	Municipal/Citibank Lots	Residential	160 DU
		Local Retail	14,200 sf
		Parking	114 spaces
3	Former MTA Site	Office	94,500 sf
		Local Retail	19,677 sf
		Parking	314 spaces
4	Pier 7 Site	Pier 7	80,700 sf
		Parking	27 spaces
5	1071 Bay Street	Local Retail	10,500 sf
6	Reynolds Shipyard Expansion	Industrial	12,600 sf
7	191 Edgewater Street	Residential	102 DU
		Parking	88 spaces
8	Sylvaton Terrace Mixed-use Development	Residential	40 DU
		Office	40,000 sf
		Parking	109 spaces
Sub Area 2			
Site #	**Site Description**	**Projected Use**	**Size**
1	The Point	Residential	58 DU
		Local Retail	15,000 sf
9	The Pearl	Residential	100 DU
10	The Lighthouse Site	Residential	200 DU
		Local Retail	20,000 sf
		Museum/Cultural	20,000 sf
		Parking	225 spaces

Note: Site numbers shown in the Table correspond to Figure 17-7.


Legend
Anticipated Projects 2015
Stapleton Piers
Waterbody
Sub Area 2
Sub Area 1
HAMILTON AVE
RICHMOND TE
WALL ST
STUYVESANT PL
BELMONT PL
FT HILL CI
FORT PL
HYATT ST
S FERRY TML
FT HILL PK
WESTERVELT AVE
SHERMAN AVE
DANIEL LOW TE
MONROE AVE
MONTGOMERY AVE
ST MARKS PL
CENTRAL AVE
BAY ST LD
CORSON AVE
VICTORY BL
TOMPKINS CI
VAN DUZER ST
WILLIS AVE
EDGAR TE
WARD AVE
HANNAH ST
SWAN ST
ST JULIAN PL
HOMER ST
ST PAULS AVE
GRANT ST
NIXON AVE
CLINTON ST
CEBRA AVE
WILLIAM ST
JACKSON ST
SANDS ST
WAVE ST
PROSPECT ST
BEACH ST
SMITH TE
WRIGHT ST
UNION PL
FRONT ST
WATER ST
GROVE ST
CANAL ST
BOYD ST
THOMPSON ST
GORDON ST
GRAY ST
BROWNELL ST
BROAD ST
TOMPKINS ST
HARRISON ST
TOMPKINS AVE
EDGEWATER ST
WILLOW AVE
LYNHURST AVE
CHESTNUT AVE
ORMOND PL
ANDERSON ST
CLIFTON AVE
1
2
3
4
5
6
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8
9
10
Source: Landbase, NYCDoITT; Map PLUTO and LION, NYC DCP
New York City Economic Development Corporation
New Stapleton Waterfront Development Plan DEIS
Anticipated Projects - 2015
The Louis Berger Group, Inc.
Eng-Wong, Taub & Associates
Traffic and Transportation Consultants
Figure 17-7

Trip generation, modal split, and vehicle occupancy rates for the expected No Build developments were derived from studies conducted for comparable developments and other EISs such as the *Long Island City (LIC) Rezoning FEIS (2001)* (a recent outer borough EIS with a residential component), *ABC West End Avenue Properties FEIS (1993), Special West Chelsea FEIS (2004),* the *2000 Census Transportation Planning Package (CTPP),* standard professional references, and reasonable planning assumptions. For each of the land use categories envisioned under the No Build Condition, sources with similar geographic and/or user characteristics were used to the extent possible. A summary of the travel demand characteristics for weekday and Saturday conditions is shown in Tables 17-5 and 17-6, respectively.

Office (Sites 3 and 8)

A weekday daily trip generation rate of 18.0 person trips per 1,000 square feet was used based on the *CEQR Technical Manual*. The modal split for office trips was based on the *2000 CTPP* "(At Place of Work) Mode of Commute to Work." Data from the *US 2000 Census* tracts 0003, 0015, 0021, 0027, and 0040 were used to represent the Stapleton study area. The modal split used for the weekday AM and PM peak hours was 61.4 percent by auto, 0.5 percent by taxi, 14.0 percent by bus, 19.3 percent by SIR, and 4.8 percent by walking. The weekday midday peak hour modal split was adjusted to 56.4 percent by auto, 0.5 percent by taxi, 3.6 percent by bus, 8.5 percent by SIR, and 31 percent by walking, to reflect a high percentage of lunchtime walking trips (the 1.7 percent ferry use in the data was allocated between bus and SIR modes).

The temporal distribution used was 11.8 percent for weekday AM, 15.0 percent for weekday midday, and 13.7 percent for weekday PM peak hours. The temporal distribution was based on the *CEQR Technical Manual*. The auto vehicle occupancy rate (1.10 persons per auto) was obtained from the *2000 CTPP* for Stapleton area census tracts. The taxi vehicle occupancy rate (1.40 persons per taxi) and the directional splits (i.e., inbound or outbound trip) were all based on the *LIC Rezoning FEIS*, which are typical rates used by several other sources. The directional splits used, expressed as the inbound (in) percentage, were 93 percent "in" for AM, 46 percent "in" for midday, and 3 percent "in" for PM.

A weekday delivery trip rate of 0.20 truck trips per 1,000 square feet and temporal distributions of 9.7 percent for AM, 7.8 percent for midday, and 5.1 percent for PM were based on Wilbur Smith and Associates' *Urban Truck Road Systems and Travel Restrictions* and *Motor Trucks in the Metropolis*, which are the standard sources used for EISs in New York City.

A Saturday trip generation rate of 3.9 person trips per 1,000 square feet was used based on the weekday rate and *ITE Trip Generation Manual* weekday to Saturday ratio for multi-tenant office use. Temporal distribution, modal split, vehicle and taxi occupancy rates, directional splits, and truck rates were all assumed to be similar to weekday midday.

Table 17-5
Weekday Travel Demand Characteristics: Sub Area 1
No Build Condition

	Office 134,500 sf	Residential 202 DU	Pier (Storage Space) 80,700 sf	Local Retail 44,377 sf	Industrial 12,600 sf
Person Trip Generation Rate	18.0[2]	8.1[2]	4.4[3]	205.0[2]	11.5[7]
	per 1,000 SF	*per DU*	*per 1,000 SF*	*per 1,000 SF*	*per 1,000 SF*
Temporal Distribution					
AM Peak	11.8%[2]	9.1%[2]	13.0%[7]	1.0%[2]	13.0%[7]
Midday Peak	15.0%[2]	4.7%[2]	10.0%[7]	12.0%[2]	10.0%[7]
PM Peak	13.7%[2]	10.7%[2]	14.0%[7]	9.6%[2]	14.0%[7]
Linked Trip Credit	0.0%	0.0%	0.0%	25.0%	0.0%
Modal Split (Weekday AM)					
Auto	61.4%[1]	52.0%[1]	69.0%[10]	9.0%[6]	69.0%[10]
Taxi	0.5%[1]	0.5%[1]	0.5%[10]	2.0%[6]	0.5%[10]
Bus	14.0%[1]	29.1%[1]	11.0%[10]	7.0%[6]	11.0%[10]
SIR	19.3%[1]	8.4%[1]	16.0%[10]	7.0%[6]	16.0%[10]
Walk	4.8%[1]	10.0%[1]	3.5%[10]	75.0%[6]	3.5%[10]
Modal Split (Weekday Midday)					
Auto	56.4%[1]	37.0%[1]	56.4%[10]	9.0%[6]	56.4%[10]
Taxi	0.5%[1]	0.5%[1]	0.5%[10]	2.0%[6]	0.5%[10]
Bus	3.6%[1]	29.1%[1]	3.6%[10]	7.0%[6]	3.6%[10]
SIR	8.5%[1]	8.4%[1]	8.5%[10]	7.0%[6]	8.5%[10]
Walk	31.0%[1]	25.0%[1]	31.0%[10]	75.0%[6]	31.0%[10]
Modal Split (Weekday PM)					
Auto	61.4%[1]	52.0%[1]	69.0%[10]	9.0%[6]	69.0%[10]
Taxi	0.5%[1]	0.5%[1]	0.5%[10]	2.0%[6]	0.5%[10]
Bus	14.0%[1]	29.1%[1]	11.0%[10]	7.0%[6]	11.0%[10]
SIR	19.3%[1]	8.4%[1]	16.0%[10]	7.0%[6]	16.0%[10]
Walk	4.8%[1]	10.0%[1]	3.5%[10]	75.0%[6]	3.5%[10]
Vehicle Occupancy (Weekday)					
Auto	1.10[1]	1.13[1]	1.10[9]	1.65[6]	1.10[9]
Taxi	1.40[6]	1.40[6]	1.40[9]	1.40[6]	1.40[9]
Directional Split (Ins)					
AM Peak	93.0%[6]	16.0%[6]	88.0%[7]	50.0%	88.0%[7]
Midday Peak	46.0%[6]	59.0%[6]	50.0%[7]	50.0%	50.0%[7]
PM Peak	3.0%[6]	75.0%[6]	12.0%[7]	50.0%	12.0%[7]
Truck Trip Generation	0.20[5]	0.06[6]	0.52[7]	0.35[8]	0.52[7]
	per 1,000 SF	*per DU*	*per 1,000 SF*	*per 1,000 SF*	*per 1,000 SF*
Truck Temporal Distribution					
AM Peak	9.7%[4]	9.7%[4]	14.0%[7]	9.7%[4]	14.0%[7]
Midday Peak	7.8%[4]	7.8%[4]	8.6%[7]	7.8%[4]	8.6%[7]
PM Peak	5.1%[4]	5.1%[4]	1.0%[7]	5.1%[4]	1.0%[7]
Truck Trip Directional Split (Ins)					
AM Peak	50.0%	50.0%	50.0%	50.0%	50.0%
Midday Peak	50.0%	50.0%	50.0%	50.0%	50.0%
PM Peak	50.0%	50.0%	50.0%	50.0%	50.0%

Trip Generation References

1. 2000 Census Transportation Planning Package (CTPP)
2. CEQR Technical Manual
3. ITE Trip Generation Manual, 7th Edition
4. Motor Trucks in the Metropolis, 1969, Wilbur Smith and Associates
5. Urban Truck Road Systems and Travel Restrictions, Wilbur Smith and Associates, 1975
6. Long Island City Rezoning FEIS, 2001
7. Special West Chelsea FEIS, 2004
8. ABC West End Avenue Properties FEIS, 1993
9. Assumed similar to Office use
10. Assumed same as Office with slight modifications to Auto/Transit.

Table 17-5 (continued)
Weekday Travel Demand Characteristics: Sub Area 2
No Build Condition

	Residential ***The Lighthouse Site*** **200 DU**	**Residential** ***The Pearl*** **100 DU**	**Residential** ***The Point*** **58 DU**	**Local Retail** **35,000 sf**	**Museum /Cultural** ***The Lighthouse Site*** **20,000 sf**
Person Trip Generation Rate	8.1[2]	8.1[2]	8.1[2]	205.0[2]	27.4[3]
	per DU	*per DU*	*per DU*	*per 1,000 SF*	*per 1,000 SF*
Temporal Distribution					
AM Peak	9.1%[2]	9.1%[2]	9.1%[2]	1.0%[2]	0.0%[3]
Midday Peak	4.7%[2]	4.7%[2]	4.7%[2]	12.0%[2]	9.4%[3]
PM Peak	10.7%[2]	10.7%[2]	10.7%[2]	9.6%[2]	14.4%[3]
Linked Trip Credit	0.0%	0.0%	0.0%	25.0%	
Modal Split (Weekday AM)					
Auto	26.0%[1]	26.0%[1]	26.0%[1]	9.0%[6]	26.0%[10]
Taxi	0.5%[1]	0.5%[1]	0.5%[1]	2.0%[6]	0.5%[10]
Bus	19.1%[1]	17.1%[1]	25.1%[1]	7.0%[6]	19.1%[10]
SIR	13.4%[1]	15.4%[1]	15.4%[1]	7.0%[6]	13.4%[10]
Walk	41.0%[1]	10.0%[1]	33.0%[1]	75.0%[6]	41.0%[10]
Modal Split (Weekday Midday)					
Auto	26.0%[1]	26.0%[1]	26.0%[1]	9.0%[6]	26.0%[10]
Taxi	0.5%[1]	0.5%[1]	0.5%[1]	2.0%[6]	0.5%[10]
Bus	19.1%[1]	17.1%[1]	25.1%[1]	7.0%[6]	19.1%[10]
SIR	13.4%[1]	15.4%[1]	15.4%[1]	7.0%[6]	13.4%[10]
Walk	41.0%[1]	10.0%[1]	33.0%[1]	75.0%[6]	41.0%[10]
Modal Split (Weekday PM)					
Auto	26.0%[1]	0.5%[1]	26.0%[1]	9.0%[6]	26.0%[10]
Taxi	0.5%[1]	25.1%[1]	0.5%[1]	2.0%[6]	0.5%[10]
Bus	19.1%[1]	15.4%[1]	25.1%[1]	7.0%[6]	19.1%[10]
SIR	13.4%[1]	33.0%[1]	15.4%[1]	7.0%[6]	13.4%[10]
Walk	41.0%[1]	10.0%[1]	33.0%[1]	75.0%[6]	41.0%[10]
Vehicle Occupancy (Weekday)					
Auto	1.13[1]	1.13[1]	1.13[1]	1.65[6]	2.34[3]
Taxi	1.40[6]	1.40[6]	1.40[6]	1.40[6]	1.90[3]
Directional Split (Ins)					
AM Peak	16.0%[6]	16.0%[6]	16.0%[6]	50.0%	0.0%[3]
Midday Peak	59.0%[6]	59.0%[6]	59.0%[6]	50.0%	53.1%[3]
PM Peak	75.0%[6]	75.0%[6]	75.0%[6]	50.0%	54.4%[3]
Truck Trip Generation	0.06[6]	0.06[6]	0.06[6]	0.35[8]	0.05[3]
	per DU	*per DU*	*per DU*	*per 1,000 SF*	*per DU*
Truck Temporal Distribution					
AM Peak	9.7%[4]	9.7%[4]	9.7%[4]	9.7%[4]	9.7%[4]
Midday Peak	7.8%[4]	7.8%[4]	7.8%[4]	7.8%[4]	7.8%[4]
PM Peak	5.1%[4]	5.1%[4]	5.1%[4]	5.1%[4]	5.1%[4]
Truck Trip Directional Split (Ins)					
AM Peak	50.0%	50.0%	50.0%	50.0%	50.0%
Midday Peak	50.0%	50.0%	50.0%	50.0%	50.0%
PM Peak	50.0%	50.0%	50.0%	50.0%	50.0%

Trip Generation References

1. 2000 Census Transportation Planning Package (CTPP), modified to reflect expected site specific activity.
2. CEQR Technical Manual
3. MoMA Expansion FEIS, 2000.
4. Motor Trucks in the Metropolis, 1969, Wilbur Smith and Associates
5. Urban Truck Road Systems and Travel Restrictions, Wilbur Smith and Associates, 1975
6. Long Island City Rezoning FEIS, 2001
7. Special West Chelsea FEIS, 2004
8. ABC West End Avenue Properties FEIS, 1993
9. Assumed similar to Office use
10. Assumed similar to The Lighthouse Residential use

Table 17-6
Saturday Travel Demand Characteristics: Sub Area 1
No Build Condition

	Office 134,500 sf	Residential 202 DU	Pier (Storage Space) 80,700 sf	Local Retail 44,377 sf	Industrial 12,600 sf
Person Trip Generation Rate	3.9[1]	8.6[1]	3.9[6]	237.8[4]	11.5[2]
	per 1,000 SF	*per DU*	*per 1,000 SF*	*per 1,000 SF*	*per 1,000 SF*
Temporal Distribution					
Midday Peak	15.0%[2]	10.7%[3]	10.0%[2]	12.0%[2]	10.0%[2]
Linked Trip Credit	0.0%	0.0%	0.0%	25.0%	0.0%
Modal Split (Weekday Midday)					
Auto	56.4%[2]	37.0%[2]	56.4%[2]	9.0%[2]	56.4%[2]
Taxi	0.5%[2]	0.5%[2]	0.5%[2]	2.0%[2]	0.5%[2]
Bus	3.6%[2]	29.1%[2]	3.6%[2]	7.0%[2]	3.6%[2]
SIR	8.5%[2]	8.4%[2]	8.5%[2]	7.0%[2]	8.5%[2]
Walk	31.0%[2]	25.0%[2]	31.0%[2]	75.0%2	31.0%[2]
Vehicle Occupancy (Weekday)					
Auto	1.10[2]	1.13[2]	1.10[2]	1.65[2]	1.10[2]
Taxi	1.40[2]	1.40[2]	1.40[2]	1.40[2]	1.40[2]
Directional Split (Ins)					
Midday Peak	46.0%[2]	59.0%[2]	50.0%[2]	50.0%	50.0%[2]
Truck Trip Generation	0.20[2]	0.06[2]	0.52[2]	0.35[5]	0.52[2]
	per 1,000 SF	*per DU*	*per 1,000 SF*	*per 1,000 SF*	*per 1,000 SF*
Truck Temporal Distribution					
Midday Peak	7.8%[2]	7.8%[2]	8.6%[2]	7.8%[7]	8.6%[2]
Truck Trip Directional Split (Ins)					
Midday Peak	50.0%	50.0%	50.0%	50.0%	50.0%

Trip Generation References

1. Adjusted based on ITE Trip Generation of weekday versus Saturday
2. Assumed similar to Weekday midday
3. Assumed similar to Weekday PM
4. Silvercup West DEIS, 2006
5. ABC West End Avenue Properties FEIS, March 1993
6. Assumed similar to Office Saturday
7. Motor Trucks in the Metropolis, 1969, Wilbur Smith & Associates

Table 17-6 (continued)
Saturday Travel Demand Characteristics: Sub Area 2
No Build Condition

	Residential *The Lighthouse Site* 200 DU	Residential *The Pearl* 100 DU	Residential *The Point* 58 DU	Local Retail 35,000 sf	Museum /Cultural *The Lighthouse Site* 20,000 sf
Person Trip Generation Rate	8.6[1]	8.6[1]	8.6[1]	237.8[4]	20.5[7]
	per DU	*per DU*	*per DU*	*per 1,000 SF*	*per 1,000 SF*
Temporal Distribution					
Midday Peak	10.7%[3]	10.7%[3]	10.7%[3]	12.0%[2]	16.8%[7]
Linked Trip Credit	0.0%	0.0%	0.0%	25.0%	
Modal Split (Weekday Midday)					
Auto	26.0%[2]	26.0%[2]	26.0%[2]	9.0%[2]	26.0%[2]
Taxi	0.5%[2]	0.5%[2]	0.5%[2]	2.0%[2]	0.5%[2]
Bus	19.1%[2]	17.1%[2]	25.1%[2]	7.0%[2]	19.1%[2]
SIR	13.4%[2]	15.4%[2]	15.4%[2]	7.0%[2]	13.4%[2]
Walk	41.0%[2]	10.0%[2]	33.0%[2]	75.0%[2]	41.0%[2]
Vehicle Occupancy (Weekday)					
Auto	1.13[2]	1.13[2]	1.13[2]	1.65[2]	2.34[7]
Taxi	1.40[2]	1.40[2]	1.40[2]	1.40[2]	1.90[7]
Directional Split (Ins)					
Midday Peak	59.0%[2]	59.0%[2]	59.0%[2]	50.0%	53.1%[2]
Truck Trip Generation	0.06[2]	0.06[2]	0.06[2]	0.35[5]	0.05[3]
	per DU	*per DU*	*per DU*	*per 1,000 SF*	*per 1,000 SF*
Truck Temporal Distribution					
Midday Peak	7.8%[2]	7.8%[2]	7.8%[2]	7.8%[6]	7.8%[3]
Truck Trip Directional Split (Ins)					
Midday Peak	50.0%	50.0%	50.0%	50.0%	50.0%

Trip Generation References

1. Adjusted based on ITE Trip Generation of weekday versus Saturday
2. Assumed similar to Weekday midday
3. Assumed similar to Weekday PM
4. Silvercup West DEIS, 2006
5. ABC West End Avenue Properties FEIS, March 1993
6. Motor Trucks in the Metropolis, 1969, Wilbur Smith & Associates
7. MoMA Expansion FEIS, 2000

Residential (Sites 1, 2, 7, 8, 9, and 10)

The weekday trip generation rate of 8.1 person trips per dwelling unit and temporal distribution (9.1, 4.7, and 10.7 percents for AM, midday, and PM, respectively) were based on the *CEQR Technical Manual.* Residential modal split was based on the *2000 CTPP* "(Residents) Mode of Commute to Work." Data from the *U.S. 2000 Census* tracts 0003, 0015, 0021, 0027, and 0040 were used to represent the Stapleton study area. The modal split used for residential space was 52 percent by auto, 0.5 percent by taxi, 29.1 percent by bus, 8.4 percent by SIR, and 10 percent by walking, and was applied to the AM and PM peak hours (the 15.2 percent ferry use in the data was allocated between bus and SIR modes). The midday modal split used generally reflects that of the AM and PM peaks, although slight modifications were made to better represent the midday activity, namely, an increase in the walk share (from 10 percent to 25 percent) and a decrease in the auto share (from 52 percent to 37 percent). These percentages have been applied to residential development sites in Sub Area 1 (Sites 2, 7, and 8).

In the case of Sub Area 2 (Sites 7, 9, and 10), residential modal splits vary based on their geographic location and proximity to different modes of transport (the Staten Island Ferry in particular). In general, Sub Area 2 modal splits include a lower auto share than Sub Area 1 and higher transit and walk shares (includes walk-to-transit). Aside from modal split, all other residential travel demand characteristics for Sub Area 1 and Sub Area 2 would be identical.

Auto occupancy (1.13 persons per vehicle) was also derived from the *2000 CTPP*, while a taxi occupancy rate (1.40 for taxi) was based on the *LIC Rezoning FEIS*. Residential directional splits were also obtained from the *LIC Rezoning FEIS*.

The directional splits or "ins" that were used (16 percent, 59 percent, 75 percent "in" for the weekday AM, midday, and PM peak hours, respectively) are also similar to most residential uses in the *ITE Trip Generation Manual*. A weekday delivery trip generation rate of 0.06 truck-trips per dwelling unit was based on the *LIC Rezoning FEIS*, with a weekday temporal distribution of 9.7 percent in the AM peak hour, 7.8 percent in the midday peak hour, and 5.1 percent in the PM peak hour deliveries based on *Motor Trucks in the Metropolis* by Wilbur Smith and Associates.

A trip generation rate of 8.6 person-trips per dwelling unit was used for the Saturday trip generation analysis. This was determined by taking the ratio of Saturday versus weekday analysis rates from *ITE Trip Generation Manual* and applying it to the weekday rate. A temporal distribution of 10.7 percent was assumed based on the weekday PM peak hour to be conservative.

Saturday residential modal split, vehicle and taxi occupancy rates, directional splits, and truck rates were assumed to be similar to weekday midday.

<u>Pier/Storage Space (Site 4)</u>
A pier space of approximately 80,700 square feet will be reconstructed to accommodate DOT and FDNY uses which are currently located on a temporary basis at the Homeport Site. The weekday trip generation rate used for the pier was 171.52 vehicular trips per berth as cited in the *ITE Trip Generation Manual* for Waterport/Marine Terminal. This trip rate was converted to equivalent person trips per 1,000 square feet by first using the *CEQR Technical Manual's* assumptions for converting to person trips, and then dividing the 80,700 gross square footage of space by the trips to get 4.4 person trips per 1,000 square feet. The temporal distributions of 13 percent of all trips occurring in the AM peak hour, 10 percent in the midday peak hour, and 14 percent occurring during the PM peak hour were obtained from the *Special West Chelsea FEIS (2004)*.

The vehicle occupancy rates of 1.10 persons per auto and 1.40 persons per taxi, as well as the directional splits, were assumed similar to the office land use and were also derived from the *Special West Chelsea FEIS*. The proportion of Manufacturing/Storage modal shares to the office modal shares from the *Special West Chelsea FEIS* was applied to the Pier modal shares for Stapleton and resulted in 69 percent by auto, 0.5 percent by taxi, 11 percent by bus, 16 percent by SIR, and 3.5 percent by walking. A delivery trip

generation rate of 0.52 truck trips per 1,000 square feet and temporal distribution were based on the truck trip generation rate and temporal distribution for the Manufacturing/Storage land use in the *Special West Chelsea FEIS*.

The Saturday trip generation rate was assumed to be similar to the office Saturday trip rate, while the temporal distribution, modal split, vehicle occupancy, directional split, and truck delivery trip generation rate were assumed similar to the weekday midday peak hour.

Local Retail (Sites 1, 2, 3, 5, and 10)

The trip generation rate used for street-level retail space was 205 person trips per 1,000 square feet as cited in the *CEQR Technical Manual* and as used in the *LIC Rezoning FEIS*. This trip generation rate is conservative since the development is neither in Midtown Manhattan nor situated along retail corridors akin to those in Midtown Manhattan. The temporal distributions of one percent of all trips occurring in the AM peak hour, 12 percent in the midday peak hour, and 9.6 percent occurring during the PM peak hour were also obtained from the *CEQR Technical Manual*. Since much of the local retail is expected to be located within different complexes and buildings throughout the study area, the midday percentage of daily trips was slightly decreased to better represent temporal distributions of the other uses in the development.

The vehicle occupancy rates of 1.65 persons per auto and 1.40 persons per taxi, as well as the directional splits, were also derived from the *LIC Rezoning FEIS*. The modal splits for local retail of nine percent by auto, two percent by taxi, seven percent by bus, seven percent by subway, and 75 percent by walking, were based on rates from the *LIC Rezoning FEIS* with some slight modifications; the auto share increased (by seven percent) and subway and bus shares decreased (by three percent each) since a lower transit share would be expected in Stapleton. Taxi shares were also slightly decreased (by one percent) due to a lower usage in Stapleton. A delivery trip generation rate of 0.35 truck-trips per 1,000 square feet was based on the *ABC West End Avenue Properties FEIS* as a source for local retail truck deliveries. The delivery temporal distribution percentages were assumed to be similar to office use.

For Saturday, a trip generation rate of 237.8 was obtained from the *Silvercup West DEIS (2006)* as a source for Saturday trip analyses. Temporal distribution, modal split, vehicle occupancy, and directional split were all assumed to be similar to weekday midday. A delivery trip generation rate of 0.35 truck trips per 1,000 square feet was based on the *ABC West End Avenue Properties FEIS*. The delivery temporal distribution percentages were assumed to be similar to weekday midday.

Industrial (Site 6)

Reynolds Shipping Corporation, an existing shipping materials repairs and storage facility, is planning to expand its facility by 12,600 square feet. The trip generation rate used for industrial space was 11.5 person trips per 1,000 square feet which was obtained from the *Special West Chelsea FEIS*. The temporal distributions of 13 percent of all trips occurring in the AM peak hour, 10 percent in the midday peak hour, and 14 percent

occurring during the PM peak hour were also obtained from the *Special West Chelsea FEIS*.

In order to obtain an industrial use modal split, the proportion of manufacturing/storage modal shares to the office modal shares from the *Special West Chelsea FEIS* was applied to the industrial modal shares for Stapleton, resulting in a split of 69 percent by auto, 0.5 percent by taxi, 11 percent by bus, 16 percent by SIR, and 3.5 percent by walking. A delivery trip generation rate of 0.52 truck trips per 1,000 square feet and temporal distribution were based on the truck trip generation rate and temporal distribution for the manufacturing/storage land use in the *Special West Chelsea FEIS.*

Directional splits (88 percent, 50 percent, and 12 percent "ins" for weekday AM, midday, and PM peak periods, respectively), truck trip rates (0.52 per 1,000 square feet) and truck temporal distribution were all also obtained from the *Special West Chelsea FEIS.*

For Saturday midday, the rates and percentages were assumed to be similar to weekday midday since activity at this site is a seven day a week operation and is not expected to change in the future.

Museum /Cultural Space (Site 10)

The daily trip generation rate used was 27.4 person trips per 1,000 square feet and the temporal distribution percentages used were 9.4 percent for the weekday midday peak hour and 14.4 percent for the weekday PM peak hour, based on rates used in the *Museum of Modern Art (MoMA) Expansion FEIS*. The use of these rates is conservatively high, since MoMA has far more activity because it is located in Manhattan. In general, museum use is not open during the morning, so there is no weekday AM peak hour projection. In addition, vehicle occupancy rates of 2.34 persons per auto and 1.90 persons per taxi and the directional distribution of trips (53.1 percent "ins" for midday and 54.4 percent "ins" for PM) were also based on the *MoMA Expansion FEIS*. It was assumed that the modal split of trips would be similar to that of the site's (the Lighthouse site) residential component, which was 26 percent by auto, 0.5 percent by taxi, 19.1 percent by bus, 13.4 percent by subway, and 41 percent by walking ("walking" includes walking to/from the Staten Island Ferry).

A delivery trip generation rate of 0.05 truck trips per 1,000 square feet was based on the *MoMA Expansion FEIS*. The temporal distribution of the delivery trips was based on Wilbur Smith and Associates' *Motor Trucks in the Metropolis.*

The trip generation rate of 20.5 person trips per 1,000 square feet used for the weekend trip generation analysis is similar to the rate used in the *MoMA Expansion FEIS*. The weekend modal split was assumed to be similar to weekday midday. Weekend vehicle occupancy rates of 2.34 persons per auto and 1.9 persons per taxi, were based on the *MoMA Expansion FEIS*. The directional split for the weekend midday hour was 39.2 percent "in", and the weekend temporal distribution used was 16.8 percent "in," which is the rate used in the *MoMA Expansion FEIS*.

The total volume of vehicle trips that would be generated by each of the ten background developments is shown in Tables 17-7 through 17-10. These tables indicate that approximately 400 vehicle trips would be generated in the weekday AM peak hour, approximately 470 vehicle trips would be generated during the weekday midday peak hour, and approximately 540 vehicle trips would be generated during the weekday PM peak hour. Approximately 400 vehicle trips would be generated in the Saturday midday peak hour.

A detailed discussion of the total volume of person trips that would be generated by each of the three background developments is provided in Chapter 18, "Transit and Pedestrians."

Table 17-7
Vehicular Trip Generation: Weekday AM Peak Hour
No Build Condition

Site No.	Development Sites	Trips In	Trips Out	Total Trips
1	Residential, Local Retail	3	10	13
2	Residential, Local Retail	10	47	57
3	Office, Local Retail	108	12	120
4	Pier (storage space)	28	7	35
5	Local Retail	1	1	2
6	Industrial	11	2	13
7	Residential	6	30	36
8	Residential, Office	47	16	63
9	Residential	3	15	18
10	Residential, Local Retail	8	31	39
	Total	**225**	**171**	**396**

Table 17-8
Vehicular Trip Generation: Weekday Midday Peak Hour
No Build Condition

Site No.	Development Sites	Trips In	Trips Out	Total Trips
1	Residential, Local Retail	15	14	29
2	Residential, Local Retail	32	28	60
3	Office, Local Retail	89	100	189
4	Pier (storage space)	11	11	22
5	Local Retail	8	8	16
6	Industrial	4	4	8
7	Residential	8	6	14
8	Residential, Office	29	33	62
9	Residential	6	4	10
10	Residential, Local Retail	30	27	57
	Total	**232**	**235**	**467**

Table 17-9
Vehicular Trip Generation: Weekday PM Peak Hour
No Build Condition

Site No.	Development Sites	Trips In	Trips Out	Total Trips
1	Residential, Local Retail	18	12	30
2	Residential, Local Retail	57	25	82
3	Office, Local Retail	17	140	157
4	Pier (storage space)	4	28	32
5	Local Retail	7	7	14
6	Industrial	2	11	13
7	Residential	31	11	42
8	Residential, Office	14	58	72
9	Residential	15	5	20
10	Residential, Local Retail	48	28	76
	Total	**213**	**325**	**538**

Table 17-10
Vehicular Trip Generation: Saturday Midday Peak Hour
No Build Condition

Site No.	Development Sites	Trips In	Trips Out	Total Trips
1	Residential, Local Retail	21	19	40
2	Residential, Local Retail	42	33	75
3	Office, Local Retail	32	34	66
4	Pier (storage space)	10	10	20
5	Local Retail	9	9	18
6	Industrial	4	4	8
7	Residential	19	13	32
8	Residential, Office	13	12	25
9	Residential	13	9	22
10	Residential, Local Retail	48	41	89
	Total	**211**	**184**	**395**

The No Build project-generated trips were assigned to the roadway network and, together with the background traffic growth, provide the future No Build traffic volume baseline. The *2000 CTPP* provided information on journey-to-work origin-destination (O-D) distributions for office and residential land uses. Trips expected to originate from outside Staten Island such as New Jersey, Long Island, Manhattan and upstate New York, would likely access the No Build development sites via the SIE leading to Hylan Boulevard and then to Bay Street. Trips expected to originate from within Staten Island would also access the sites via east-west routes such as Richmond Terrace, Victory Boulevard, Broad Street, and Vanderbilt Avenue eventually leading to Bay Street from both directions. Local traffic would also use Swan/Van Duzer, Prospect, Water, and Canal Streets. Vehicles would also use Edgewater and Front Streets as alternative routes to Bay Street. The No Build developments would result in the following volume increments to the roadway network:

Along Front Street, volume increments would be approximately 35 to 70 vph during the weekday and Saturday peak hours. Bay Street would experience volume increments of approximately 70 to 140 vph during the weekday and Saturday peak hours, Swan/Van Duzer, Prospect, Water, and Canal Streets would experience volume increments of approximately 5 to 10 vph, whereas the increments along Hylan Boulevard would be approximately 40 to 60 vph. Along Victory Boulevard, volume increments would be approximately 25 to 50 vph during the peak hours.

Detailed 2015 No Build traffic increment and volume maps are provided in Appendix C of this DEIS.

17.3.2 Levels of Service

Based on the projected increases in volumes noted above, future No Build levels of service were determined. Detailed intersection capacity analyses by movements for each location are presented in Table 17-22 located at the end of this chapter. Figures 17-8 through 17-11 depict overall intersection levels of service for the weekday AM, midday, PM and Saturday midday peak hours respectively. An overview of the findings is summarized in Table 17-11.

- In the weekday AM peak hour, three of eight signalized intersections analyzed would operate at overall unacceptable LOS E. 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 40 total signalized traffic movements analyzed would operate at LOS E or F conditions.
- In the weekday midday peak hour, one signalized intersection would operate at overall LOS E, while two intersections would operate at overall LOS D. Five traffic movements would operate at LOS E or F.
- In the weekday PM peak hour, two signalized intersections would operate at overall LOS E, while two intersections would operate at overall LOS D. Thirteen traffic movements would operate at LOS E or F.
- In the Saturday midday peak hour, all eight signalized intersections would operate at overall LOS C or better.
- Each of the five unsignalized intersections analyzed would operate at LOS D or better during all the traffic analysis hours, except one intersection that would operate at unacceptable LOS F during the weekday PM peak hour.

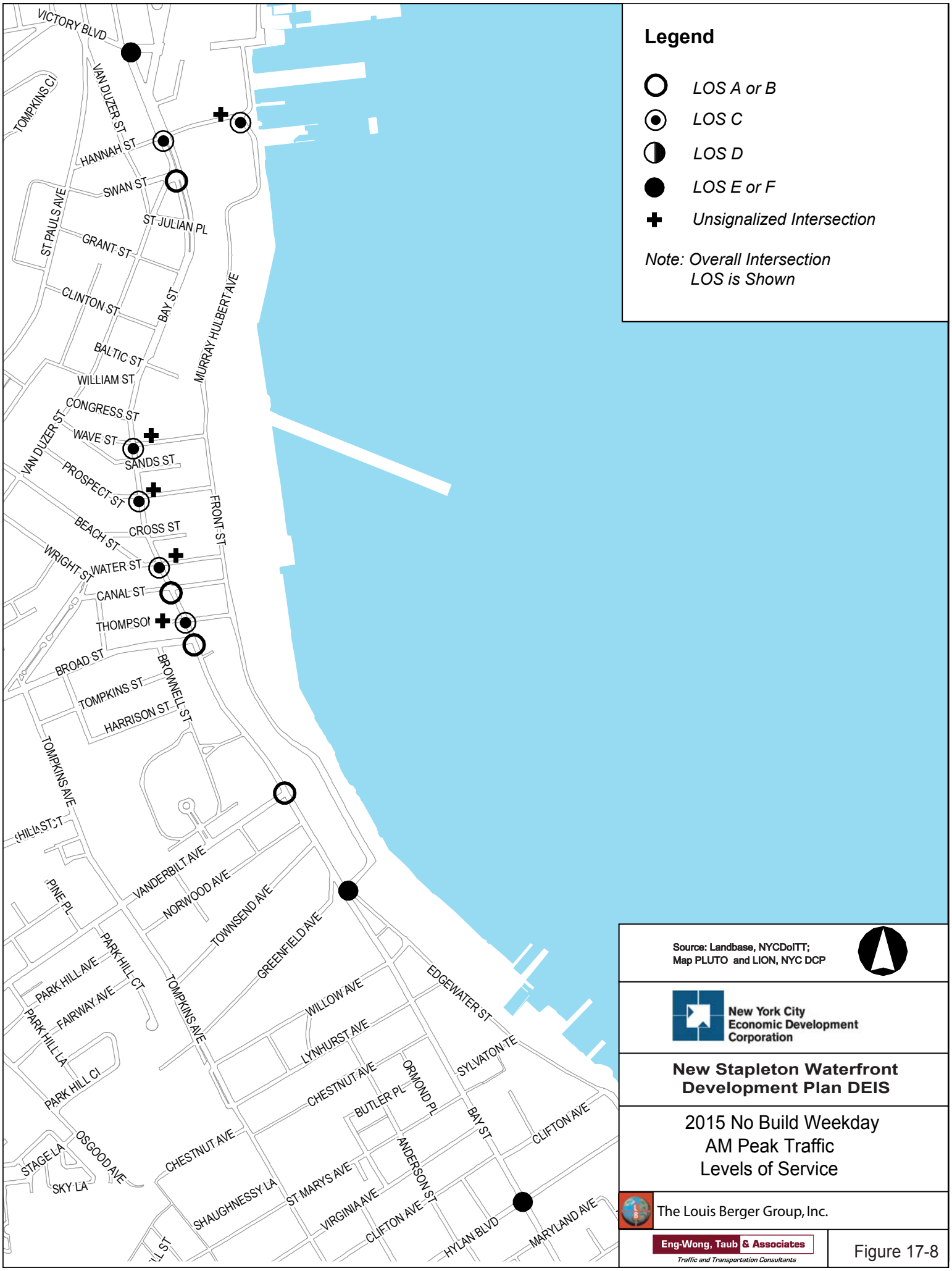

Legend
LOS A or B
LOS C
LOS D
LOS E or F
Unsignalized Intersection
Note: Overall Intersection LOS is Shown
VICTORY BLVD
VAN DUZER ST
TOMPKINS CI
HANNAH ST
SWAN ST
ST JULIAN PL
ST PAULS AVE
GRANT ST
CLINTON ST
BAY ST
MURRAY HULBERT AVE
BALTIC ST
WILLIAM ST
CONGRESS ST
WAVE ST
SANDS ST
PROSPECT ST
FRONT ST
CROSS ST
BEACH ST
WRIGHT ST
WATER ST
CANAL ST
THOMPSON
BROAD ST
TOMPKINS ST
HARRISON ST
BROWNELL ST
TOMPKINS AVE
VANDERBILT AVE
NORWOOD AVE
TOWNSEND AVE
GREENFIELD AVE
PINE PL
PARK HILL AVE
PARK HILL CT
FAIRWAY AVE
PARK HILL LA
PARK HILL CI
WILLOW AVE
LYNHURST AVE
CHESTNUT AVE
BUTLER PL
ORMOND PL
EDGEWATER ST
SYLVATON TE
BAY ST
CLIFTON AVE
OSGOOD AVE
STAGE LA
SKY LA
SHAUGHNESSY LA
ST MARYS AVE
VIRGINIA AVE
ANDERSON ST
HYLAN BLVD
MARYLAND AVE
Source: Landbase, NYCDoITT; Map PLUTO and LION, NYC DCP
New York City Economic Development Corporation
New Stapleton Waterfront Development Plan DEIS
2015 No Build Weekday AM Peak Traffic Levels of Service
The Louis Berger Group, Inc.
Eng-Wong, Taub & Associates
Traffic and Transportation Consultants

Figure 17-8

Legend
LOS A or B
LOS C
LOS D
LOS E or F
Unsignalized Intersection
Note: Overall Intersection LOS is Shown
VICTORY BLVD
VAN DUZER ST
TOMPKINS CI
HANNAH ST
SWAN ST
ST JULIAN PL
ST PAUL S AVE
GRANT ST
CLINTON ST
BAY ST
MURRAY HULBERT AVE
BALTIC ST
WILLIAM ST
CONGRESS ST
WAVE ST
SANDS ST
PROSPECT ST
FRONT ST
CROSS ST
BEACH ST
WRIGHT ST
WATER ST
CANAL ST
THOMPSON
BROAD ST
TOMPKINS ST
HARRISON ST
BROWNELL ST
TOMPKINS AVE
VANDERBILT AVE
NORWOOD AVE
TOWNSEND AVE
GREENFIELD AVE
PINE PL
PARK HILL AVE
PARK HILL CT
FAIRWAY AVE
PARK HILL LA
PARK HILL CI
WILLOW AVE
LYNHURST AVE
CHESTNUT AVE
BUTLER PL
ORMOND PL
EDGEWATER ST
SYLVATON TE
BAY ST
CLIFTON AVE
ANDERSON ST
OSGOOD AVE
STAGE LA
SKY LA
SHAUGHNESSY LA
ST MARYS AVE
VIRGINIA AVE
HYLAN BLVD
MARYLAND AVE
Source: Landbase, NYCDoITT; Map PLUTO and LION, NYC DCP
New York City Economic Development Corporation
New Stapleton Waterfront Development Plan DEIS
2015 No Build Weekday Midday Peak Traffic Levels of Service
The Louis Berger Group, Inc.
Eng-Wong, Taub & Associates
Traffic and Transportation Consultants
Figure 17-9

Legend
LOS A or B
LOS C
LOS D
LOS E or F
Unsignalized Intersection
Note: Overall Intersection LOS is Shown
VICTORY BLVD
VAN DUZER ST
TOMPKINS CI
HANNAH ST
SWAN ST
ST JULIAN PL
ST PAUL S AVE
GRANT ST
CLINTON ST
BAY ST
MURRAY HULBERT AVE
BALTIC ST
WILLIAM ST
CONGRESS ST
WAVE ST
SANDS ST
PROSPECT ST
FRONT ST
CROSS ST
BEACH ST
WRIGHT ST
WATER ST
CANAL ST
THOMPSON
BROAD ST
TOMPKINS ST
HARRISON ST
BROWNELL ST
TOMPKINS AVE
VANDERBILT AVE
NORWOOD AVE
PINE PL
TOWNSEND AVE
GREENFIELD AVE
PARK HILL AVE
PARK HILL CT
FAIRWAY AVE
PARK HILL LA
PARK HILL CI
WILLOW AVE
EDGEWATER ST
LYNHURST AVE
SYLVATON TE
CHESTNUT AVE
ORMOND PL
BUTLER PL
BAY ST
CLIFTON AVE
OSGOOD AVE
STAGE LA
SKY LA
ANDERSON ST
ST MARYS AVE
SHAUGHNESSY LA
VIRGINIA AVE
HYLAN BLVD
MARYLAND AVE
Source: Landbase, NYCDoITT; Map PLUTO and LION, NYC DCP
New York City Economic Development Corporation
New Stapleton Waterfront Development Plan DEIS
2015 No Build Weekday PM Peak Traffic Levels of Service
The Louis Berger Group, Inc.
Eng-Wong, Taub & Associates
Traffic and Transportation Consultants
Figure 17-10

Source: Landbase, NYCDoITT; Map PLUTO and LION, NYC DCP

New York City Economic Development Corporation

New Stapleton Waterfront Development Plan DEIS

2015 No Build Saturday Midday Peak Traffic Levels of Service

The Louis Berger Group, Inc.

Eng-Wong, Taub & Associates
Traffic and Transportation Consultants

Figure 17-11

Table 17-11
Traffic Levels of Service Summary
2005 Existing vs. 2015 No Build

Signalized Intersections	Existing				No Build			
	AM	MD	PM	Saturday MD	AM	MD	PM	Saturday MD
Overall LOS A/B	4	5	4	6	4	3	2	5
Overall LOS C	3	2	3	2	1	2	2	3
Overall LOS D	1	1	1	0	0	2	2	0
Overall LOS E/F	0	0	0	0	3	1	2	0
Number of Movements at LOS E or F	2	0	3	0	9	5	13	0
Unsignalized Intersections	**AM**	**MD**	**PM**	**Saturday MD**	**AM**	**MD**	**PM**	**Saturday MD**
Overall LOS A/B	5	3	2	5	0	1	0	0
Overall LOS C	0	2	3	0	5	1	3	5
Overall LOS D	0	0	0	0	0	3	1	0
Overall LOS E/F	0	0	0	0	0	0	1	0
Number of Movements at LOS E or F	0	0	0	0	1	3	2	0

A more detailed presentation of levels of service is provided below.

Signalized Intersections

Along the Bay Street corridor, three, one, and two intersections would deteriorate from overall LOS C or D to LOS E during the weekday AM, midday, and PM peak hours, respectively. During the Saturday midday peak hour, all intersections analyzed would operate at LOS C or better. Individual movements that deteriorate to LOS E or F during the No Build Condition are provided below:

- At the intersection of Bay Street and Victory Boulevard, approaches that deteriorate to LOS E or F would include: the de facto left-turn movement of eastbound Victory Boulevard (from LOS E to LOS E or F during the weekday AM and PM peak hours); northbound Bay Street (from LOS C to LOS F during the weekday AM peak hour and to a de facto left-turn movement at LOS F during the weekday midday peak hour); the de facto left-turn movement of this approach (from LOS E to LOS F during the weekday PM peak hour); the northbound Bay Street through-right movement (from LOS C to LOS F) during the weekday PM peak hour; and the southbound right turn movement of Bay Street (from LOS C to LOS E in the weekday PM peak hour).
- At Bay Street/Hannah Street, westbound Hannah Street would deteriorate from LOS D to LOS E during the weekday AM and PM peak hours. Southbound left turns from

Bay Street would deteriorate from LOS C to LOS F in the weekday AM and midday peak hours, and from unacceptable LOS D to LOS F in the weekday PM peak hour.

- At the intersection of Bay Street and Edgewater/Front Streets, the westbound left-through movement of Front Street would deteriorate from unacceptable LOS D/E to LOS F during the weekday AM and PM peak hours. The northbound left-through movement of Edgewater Street would deteriorate from LOS D to LOS F in the weekday PM peak hour; the right turn movement would deteriorate from unacceptable LOS D to LOS E and F during the weekday AM and PM peak hours, respectively. Northbound Bay Street would deteriorate from LOS D to LOS E in the weekday midday and PM peak hours, while southbound Bay Street would deteriorate from LOS C to LOS E during the weekday AM peak period.
- At the intersection of Bay Street/Hylan Boulevard, eastbound Hylan Boulevard would deteriorate from LOS D to LOS E during the weekday AM and PM peak hours, and to LOS F during weekday midday peak hour. Westbound Hylan Boulevard would deteriorate from LOS E to LOS F during the weekday AM peak hour, and from LOS D to LOS F and LOS E during the weekday midday and PM peak hours, respectively. Northbound Bay Street would deteriorate from LOS C to LOS F in the weekday PM peak hour.

Unsignalized Intersections

All five unsignalized intersections analyzed would operate at overall LOS D or better during all the peak hours analyzed, except one intersection that would deteriorate to LOS F during the weekday PM peak hour; the intersection of Bay Street and Water Street, would operate at LOS F during the weekday PM peak hour. At this intersection, westbound Water Street would deteriorate from LOS C to LOS E during the weekday AM peak hour, and from LOS C or D to LOS F during the weekday midday and PM peak hours.

Two other unsignalized intersections would have one traffic movement at unacceptable LOS E or F. At the intersection of Bay Street and Wave Street, westbound Wave Street would deteriorate from LOS C to LOS E during the weekday midday peak hour. At the intersection of Bay Street and Prospect Street, eastbound Prospect Street would deteriorate from LOS C to LOS F during the weekday midday and PM peak hours.

17.3.3 Parking

Future parking occupancies for the No Build Condition were projected from existing parking occupancies using an annual growth rate of one percent. In the No Build Condition, one of the four existing off-street parking facilities (the Municipal Lot between Prospect and Cross Streets) would be included within one of the new No Build development sites. The remaining three off-street parking facilities would stay. Also, additional parking would be provided as part of all ten No Build development sites.

Table 17-12 provides projected occupancies of the three off-street parking facilities that would remain. The triangular lot located between Bay, Edgewater and Camden Streets would continue to be at capacity by 9 AM and would remain fully occupied through late

afternoon/early evening. Occupancy would decrease during the late PM peak period. The open space between Front Street and the waterfront would have a maximum parking occupancy of 25 percent during the entire day. The lot located between Victory Boulevard and Central Avenue would have a maximum occupancy of approximately 90 percent during the midday peak period.

Overall, the three off-street parking facilities would be 36 percent full during the AM peak period, 49 percent full during the midday peak period, and 27 percent full by the PM peak period.

Table 17-12
Projected Weekday Parking Occupancies for Public Parking Lots
No Build Condition

Facility ID#	Lot Description/Location	Total Capacity	Percent Occupied		
			AM Peak Hour	Midday Peak Hour	PM Peak Hour
1	Municipal Lot between Prospect and Cross Streets	{This parking lot would be included as part of the No Build development program; see Table 17-13}			
2	Lot between Bay/Camden/Edgewater Streets	45	100+	100+	76
3	Open Space between Front Street and the waterfront.	200	18	25	8
4	Lot between Victory Boulevard and Central Avenue	31	35	89	78
	TOTAL	**276**	**36**	**49**	**27**

Table 17-14 provides on-street parking projections and indicates that parking shortfalls are not expected in the No Build Condition. Peak occupancy would be approximately 80 percent occurring during the midday peak period. On-street parking occupancies would experience a modest increase in the No Build Condition as compared to the Existing Condition. Parking occupancy would increase from 62 to 69 percent during the weekday AM peak hour, 70 to 78 percent during the weekday midday peak hour and 59 to 66 percent during the weekday PM peak hour. There would be sufficient on-street space to accommodate any excess parking needs for the No Build development sites.

Table 17-13
Projected On-Street Parking Summary
No Build Condition

Weekday Peak Period	No. of Spaces Vacant	No. of Spaces Legally Available	Percent Occupancy
6:30 - 9:30 AM	858	2,766	69
11:30 AM - 2:30 PM	609	2,766	78
4 - 7 PM	941	2,766	66

17.4 Build Condition

This section presents an analysis of future traffic and parking conditions with the proposed development in place in 2015. It includes a determination of the volume of vehicular trips generated, their distribution within the study area street network, the analysis of future traffic levels of service, and identification of potential significant traffic impacts.

17.4.1 Trip Generation and Traffic Assignments

Trip generation, modal split, and vehicle occupancy rates for the Proposed Action were derived from studies conducted for comparable developments and EISs such as the *Long Island City (LIC) Rezoning FEIS (2001)*, *ABC West End Avenue Properties FEIS (1993)*, *Special West Chelsea FEIS (2004)*, standard professional references such as the *2000 Census Transportation Planning Package (CTPP)*, *ITE Trip Generation Manual*, and reasonable planning assumptions. For each of the land use categories envisioned under the Build Condition, sources with similar geographic and/or user characteristics were used to the extent possible. The overall development scenario consists of approximately 75,000 square feet of office space (multi-tenant); 75,000 square feet of sports complex space; 638 residential units; 18,000 square feet of restaurant space; a 1,000 seat catering hall; 83,700 square feet of local retail space; and 12 acres of open space. The trip generation analysis was performed for the weekday AM, midday, and PM peak hours, and the Saturday midday peak hour. A summary of trip generation factors used for weekday and Saturday analysis conditions is provided in Tables 17-14 and 17-15. Figure 17-12 shows the layout of the anticipated development program resulting from the Proposed Action.

<u>Residential</u>

The anticipated residential development resulting from the Proposed Action would be three- to five-story multifamily condominiums or rental apartments. The weekday trip generation rate of 8.1 person trips per dwelling unit and temporal distribution (9.1, 4.7, and 10.7 percents for AM, midday, and PM, respectively) were based on the *CEQR Technical Manual*.

Table 17-14
Weekday Travel Demand Characteristics
Build Condition

	Residential 667,500 SF 638 DU	Office 75,000 SF	Sports Complex 75,000 SF	Restaurant 18,000 SF	Open Space 12 acres	Local Retail 83,700 SF
Person Trip Gen Rate	8.1[2]	18.0[2]	30.0[9]	173.0[2]	61.0[9]	205.0[2]
	per DU	per 1,000 SF	per 1,000 SF	per 1,000 SF	per acre	per 1,000 SF
Temporal Distribution						
AM Peak	9.1%[2]	11.8%[2]	3.9%[9]	1.0%[2]	6.0%[9]	1.0%[2]
Midday Peak	4.7%[2]	15.0%[2]	6.5%[9]	17.7%[2]	15.0%[12]	12.0%[10]
PM Peak	10.7%[2]	13.7%[2]	9.1%[9]	7.7%[2]	10.0%[9]	9.6%[2]
Linked Trip Credit	0.0%	0.0%	0.0%	0.0%	30.0%	25.0%
Modal Split (Weekday AM)						
Auto	52.0%[1]	61.4%[1]	68.2%[7]	80.0%[7]	15.0%[11]	9.0%[5]
Taxi	0.5%[1]	0.5%[1]	2.0%[7]	2.0%[7]	0.0%[11]	2.0%[5]
Bus	29.1%[1]	14.0%[1]	12.5%[7]	6.0%[7]	2.5%[11]	7.0%[5]
SIR	8.4%[1]	19.3%[1]	8.3%[7]	4.0%[7]	2.5%[11]	7.0%[5]
Walk	10.0%[1]	4.8%[1]	9.0%[7]	8.0%[7]	80.0%[11]	75.0%[5]
Modal Split (Weekday midday)						
Auto	37.0%[1]	56.4%[1]	68.2%[7]	80.0%[7]	15.0%[11]	9.0%[5]
Taxi	0.5%[1]	0.5%[1]	2.0%[7]	2.0%[7]	0.0%[11]	2.0%[5]
Bus	29.1%[1]	3.6%[1]	12.5%[7]	6.0%[7]	2.5%[11]	7.0%[5]
SIR	8.4%[1]	8.5%[1]	8.3%[7]	4.0%[7]	2.5%[11]	7.0%[5]
Walk	25.0%[1]	31.0%[1]	9.0%[7]	8.0%[7]	80.0%[11]	75.0%[5]
Modal Split (Weekday PM)						
Auto	52.0%[1]	61.4%[1]	68.2%[7]	80.0%[7]	15.0%[11]	9.0%[5]
Taxi	0.5%[1]	0.5%[1]	2.0%[7]	2.0%[7]	0.0%[11]	2.0%[5]
Bus	29.1%[1]	14.0%[1]	12.5%[7]	6.0%[7]	2.5%[11]	7.0%[5]
SIR	8.4%[1]	19.3%[1]	8.3%[7]	4.0%[7]	2.5%[11]	7.0%[5]
Walk	10.0%[1]	4.8%[1]	9.0%[7]	8.0%[7]	80.0%[11]	75.0%[5]
Vehicle Occupancy (Weekday)						
Auto	1.13[1]	1.10[1]	2.00[7]	2.00[7]	2.80[9]	1.65[5]
Taxi	1.40[5]	1.40[5]	2.00[7]	2.00[7]	1.40[9]	1.40[5]
Directional Split (Ins)						
AM Peak	16.0%[5]	93.0%[5]	41.0%[9]	82.0%[8]	80.0%[9]	50.0%
Midday Peak	59.0%[5]	46.0%[5]	50.0%[9]	50.0%[8]	65.0%[13]	50.0%
PM Peak	75.0%[5]	3.0%[5]	75.0%[9]	67.0%[8]	45.0%[9]	50.0%
Truck Trip Gen	0.06[5]	0.20[4]	0.04[9]	0.79[8]	-	0.35[6]
	per DU	per 1,000 SF	per 1,000 SF	per 1,000 SF	-	per 1,000 SF
Truck Temporal Distribution						
AM Peak	9.7%[3]	9.7%[3]	9.7%[3]	9.7%[3]	-	9.7%[3]
Midday Peak	7.8%[3]	7.8%[3]	7.8%[3]	7.8%[3]	-	7.8%[3]
PM Peak	5.1%[3]	5.1%[3]	5.1%[3]	5.1%[3]	-	5.1%[3]
Truck Trip Directional Split (Ins)						
AM Peak	50.0%	50.0%	50.0%	50.0%	-	50.0%
Midday Peak	50.0%	50.0%	50.0%	50.0%	-	50.0%
PM Peak	50.0%	50.0%	50.0%	50.0%	-	50.0%

Trip Generation References

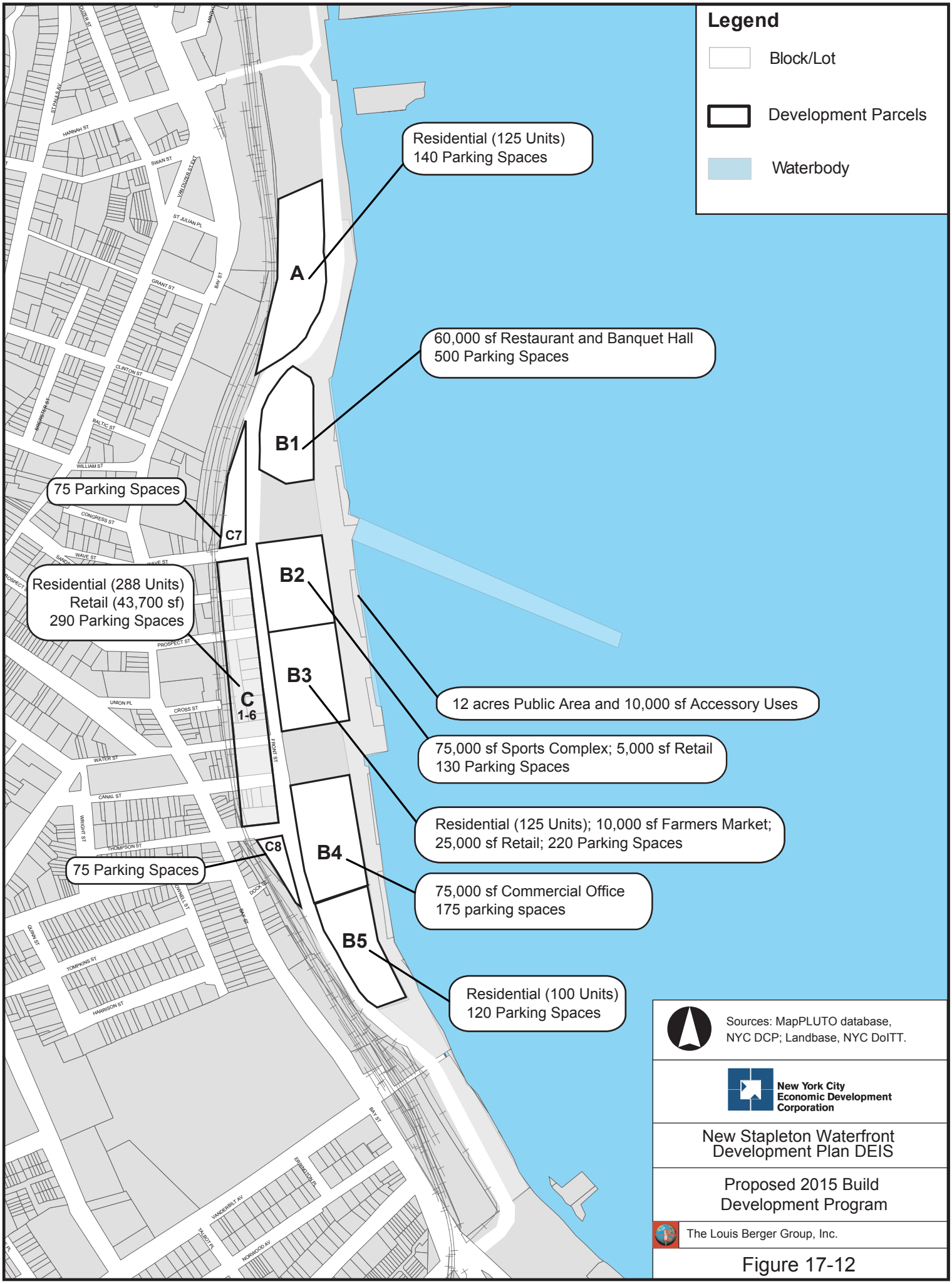
1. 2000 Census Transportation Planning Package (CTPP)
2. CEQR Technical Manual
3. Motor Trucks in the Metropolis, 1969, Wilbur Smith and Associates
4. Urban Truck Road Systems and Travel Restrictions, Wilbur Smith and Associates, 1975
5. Long Island City Rezoning FEIS, 2001
6. ABC West End Avenue Properties FEIS, March 1993
7. East River Plaza EIS (2001) - Destination Retail
8. ITE Trip Generation Manual (Quality Restaurant)
9. Chelsea Piers FEIS, 1993
10. CEQR Technical Manual – Modified as explained in text
11. Chelsea Piers FEIS, 1993 - Slightly modified to reflect Stapleton conditions.
12. Assumed the average of Saturday midday and weekday PM
13. Assume similar to Saturday midday

Table 17-15
Saturday Travel Demand Characteristics
Build Condition

	Residential 638,000 SF 638 DU	Office 75,000 SF	Sports Complex 75,000 SF	Restaurant 18,000 SF	Open Space 12 acres	Local Retail 83,700 SF
Person Trip Gen Rate	8.6[7]	3.9[7]	30.0[6]	181.0[7]	61.0[6]	237.8[2]
	per DU	per 1,000 SF	per 1,000 SF	per 1,000 SF	per acre	per 1,000 SF
Temporal Distribution						
Saturday Midday Peak	10.7%[4]	15.0%[3]	9.8[6]	12.7%[8]	20.0%[6]	12.0%[3]
Linked Trip Credit	0.0%	0.0%	0.0%	0.0%	30.0%	25.0%
Modal Split (Weekday midday)						
Auto	37.0%[3]	56.4%[3]	68.2%[3]	80.0%[3]	15.0%[9]	9.0%[3]
Taxi	0.5%[3]	0.5%[3]	2.0%[3]	2.0%[3]	0.0%[9]	2.0%[3]
Bus	29.1%[3]	3.6%[3]	12.5%[3]	6.0%[3]	2.5%[9]	7.0%[3]
SIR	8.4%[3]	8.5%[3]	8.3%[3]	4.0%[3]	2.5%[9]	7.0%[3]
Walk	25.0%[3]	31.0%[3]	9.0%[3]	8.0%[3]	80.0%[9]	75.0%[3]
Vehicle Occupancy (Weekday)						
Auto	1.13[3]	1.10[3]	2.00[3]	2.00[3]	2.80[6]	1.65[3]
Taxi	1.40[3]	1.40[3]	2.00[3]	2.00[3]	1.40[6]	1.40[3]
Directional Split (Ins)						
Saturday Midday Peak	59.0%[3]	46.0%[3]	62.0%[6]	50.0%[3]	65.0%[6]	50.0%[3]
Truck Trip Gen	0.06[3]	0.20[3]	0.04[6]	0.79[3]	-	0.35[5]
	per DU	per 1,000 SF	per 1,000 SF	per 1,000 SF	-	per 1,000 SF
Truck Temporal Distribution						
Saturday Midday Peak	7.8%[3]	7.8%[3]	0.0%[6]	7.8%[3]	-	7.8%[1]
Truck Trip Directional Split (Ins)						
Saturday Midday Peak	50.0%	50.0%	50.0%	50.0%	-	50.0%

Trip Generation References
1. Motor Trucks in the Metropolis, 1969, Wilbur Smith and Associates
2. Silvercup West DEIS, 2006
3. Assumed similar to Weekday midday
4. Assumed similar to Weekday PM
5. ABC West End Avenue Properties FEIS, March 1993
6. Chelsea Piers FEIS, 1993
7. Adjusted based on ITE Trip Generation ration of weekday vs. Saturday.
8. Adjusted Weekday – CEQR.
9. Chelsea Piers FEIS, 1993 - Slightly modified to reflect Stapleton conditions.

Residential modal split was based on the *2000 CTPP* "(Residents) Mode of Commute to Work." Data from the *U.S. 2000 Census* tracts 0003, 0015, 0021, 0027, and 0040 were used to represent the Stapleton study area. The weekday modal split used for residential space was 52.0 percent by auto, 0.5 percent by taxi, 29.1 percent by bus, 8.4 percent by SIR, and 10 percent by walking, and was applied to the AM and PM peak hours (the 15.2 percent ferry use in the data was allocated between bus and SIR modes). The midday modal split used generally reflects that of the AM and PM peaks, although slight modifications were made to better represent the midday activity, namely, an increase in the walk share (from 10 percent to 25 percent) and a decrease in the auto share (from 52 percent to 37 percent). Auto occupancy (1.13 persons per vehicle) was also derived from the *2000 CTPP*, while a taxi occupancy rate (1.40 for taxi) was based on the *LIC Rezoning FEIS*. Residential directional splits were also obtained from the *LIC Rezoning FEIS*.



Sources: MapPLUTO database, NYC DCP; Landbase, NYC DoITT.

New York City Economic Development Corporation

New Stapleton Waterfront Development Plan DEIS

Proposed 2015 Build Development Program

The Louis Berger Group, Inc.

Figure 17-12

The directional splits or "ins" that were used (16 percent, 59 percent, 75 percent "in" for the AM, midday, and PM peak hours, respectively) are also similar to most residential uses in the *ITE Trip Generation Manual*.

A weekday delivery trip generation rate of 0.06 truck trips per dwelling unit was based on the *LIC Rezoning FEIS*, with a weekday temporal distribution of 9.7 percent in the AM peak hour, 7.8 percent in the midday peak hour, and 5.1 percent in the PM peak hour deliveries based on *Motor Trucks in the Metropolis* by Wilbur Smith and Associates.

A trip generation rate of 8.6 person trips per dwelling unit was used for the Saturday trip generation analysis. This rate was determined by taking the ratio of Saturday versus weekday analysis rates from *ITE Trip Generation Manual* and applying it to the weekday rate. A temporal distribution of 10.7 percent was assumed based on the weekday PM peak hour; the most conservative of the three weekday peak hours.

Saturday residential modal split, vehicle and taxi occupancy rates, directional splits, and truck rates were assumed to be similar to weekday midday.

Office (Multi-tenant)

A weekday daily trip generation rate of 18.0 person trips per 1,000 square feet was used based on the *CEQR Technical Manual*. The modal split for office trips was based on the *2000 CTPP* "(At Place of Work) Mode of Commute to Work." Data from the *U.S. 2000 Census* tracts 0003, 0015, 0021, 0027, and 0040 were used to represent the Stapleton study area. The modal split used for the weekday AM and PM peak hours was 61.4 percent by auto, 0.5 percent by taxi, 14.0 percent by bus, 19.3 percent by SIR, and 4.8 percent by walking. The weekday midday peak hour modal split was adjusted to 56.4 percent by auto, 0.5 percent by taxi, 3.6 percent by bus, 8.5 percent by SIR, and 31 percent by walking, to reflect a high percentage of lunchtime walking trips (the 1.7 percent ferry use in the data was allocated between bus and SIR modes).

The temporal distribution used was 11.8 percent for AM, 15.0 percent for midday, and 13.7 percent for PM. The temporal distribution was based on the *CEQR Technical Manual*. The auto vehicle occupancy rate (1.10 persons per auto) was obtained from the *2000 CTPP* for Stapleton Area census tracts. The taxi vehicle occupancy rate (1.40 rate persons per taxi) and the directional splits (i.e., inbound or outbound trip) were all based on the *LIC Rezoning FEIS*. The directional splits used, expressed as the inbound (in) percentage, were 93 percent "in" for AM, 46 percent "in" for midday, and 3 percent "in" for PM.

A weekday delivery trip rate of 0.20 truck trips per 1,000 square feet and temporal distributions of 9.7 percent for AM, 7.8 percent for midday, and 5.1 percent for PM were based on Wilbur Smith and Associates' *Urban Truck Road Systems and Travel Restrictions* and *Motor Trucks in the Metropolis*, respectively, which is the standard source used for EIS's in New York City.

A Saturday trip generation rate of 3.9 person trips per 1,000 square feet was used based on the weekday rate and *ITE Trip Generation Manual* weekday to Saturday ratio for multi-tenant office use. Saturday temporal distribution, modal split, vehicle and taxi occupancy rates, directional splits, and truck rates were all assumed to be similar to weekday midday.

Sports Complex & Restaurant

The Proposed Action includes two uses, Sports Complex and Restaurant, for which trip generation and modal split information are more complicated to determine. The *East River Plaza EIS*, which studied the impact of a large destination retail development just off the FDR Drive in East Harlem, was used because its modal split has a relatively high auto share reflecting the condition in Stapleton. There is greater access to rail transit in Stapleton than in East Harlem; however, the two areas are similar enough that *East River EIS* can serve as a conservative yet comparable source. For each of the two uses, taxi shares have been slightly decreased (by 1.2 percent) to reflect lower taxi usage in Stapleton. The *Chelsea Piers FEIS* was also used to determine assumptions for the sports complex use.

Sports Complex

For sports complex space, the *Chelsea Piers FEIS* track and gym facility trip generation rate (30.0 person-trips per 1,000 square feet), temporal distribution, and directional splits were used. *Chelsea Piers FEIS'* modal splits were not used as they represent Manhattan's high transit share and low auto share and therefore would not be appropriate to use for Stapleton. The temporal distribution (3.9, 6.5, and 9.1 percents for AM, midday, and PM, respectively) and directional splits (41, 50, and 75 percent "ins" for AM, midday, and PM, respectively) were both based primarily on *Chelsea Piers FEIS*. The Chelsea Piers study only analyzed AM and PM peaks hours for the weekday scenario so midday peak hour numbers were assumed to be approximately the midpoint between AM and PM.

Auto and taxi occupancies (2.0) and modal splits were based on the *East River Plaza EIS*. The modal splits for the weekday peak hours was 68.2 percent by auto, 2.0 percent by taxi, 12.5 percent by bus, 8.3 percent by subway, and 9 percent by walking.

A weekday delivery trip generation rate of 0.04 truck trips per 1,000 square feet was also based on the *Chelsea Piers FEIS* track and gym facility use and a temporal distribution of 9.7 percent in the AM peak hour, 7.8 percent in the midday peak hour, and 5.1 percent in the PM peak hour was based on *Motor Trucks in the Metropolis* by Wilbur Smith and Associates.

A Saturday trip generation rate of 30.0 person trips per 1,000 square feet was used from the Saturday trip generation rate used for the *Chelsea Piers FEIS* track and gym facility. Saturday midday temporal distribution (9.8 percent), directional split (62.0 percent "ins"), and truck trip figures were also obtained from *Chelsea Piers FEIS*. Auto and taxi occupancies (2.0) and modal split were based on the *Chelsea Piers FEIS* and assumed similar to weekday midday.

Restaurant
For the restaurant space, a trip generation rate of 173 person trips per 1,000 square feet was used based on the *CEQR Technical Manual*. The 'Quality Restaurant' use listed in the *ITE Trip Generation Manual* provided an almost identical rate of 171 person trips (using the CEQR vehicle trips to person trips conversion guidelines of assuming 95% auto share and a 2.0 auto occupancy). The temporal distribution (1, 17.7, and 7.7 percents for AM, midday, and PM, respectively) was also based on the *CEQR Technical Manual*.

Auto and taxi occupancies (2.0) and modal split were based on the *East River Plaza EIS*. Based on discussions with NYCDCP, modifications were made to the weekday peak hour modal splits to more accurately reflect the travel patterns of the demographic most likely to patronize a high end restaurant. The auto share was increased (from 68.2 percent to 80 percent), the taxi share remained 2.0 percent, and the bus, subway, and walking share all decreased (12.5 percent by bus, 8.3 percent by subway, and nine percent by walking were revised to be six percent, four percent, and eight percent, respectively).

Directional splits (82, 50, and 67 percent "ins" for AM, midday, and PM peak hours, respectively) were based on the *ITE Trip Generation Manual's* 'Quality Restaurant' use. ITE only provides information for the AM and PM periods, so for the midday period a 50/50 split was assumed. A delivery trip generation rate of 0.79 truck-trips per 1,000 square feet was also based on the *ITE Trip Generation Manual's* 'quality restaurant' use, while a temporal distribution of 9.7 percent in the AM peak hour, 7.8 percent in the midday peak hour, and 5.1 percent in the PM peak hour deliveries was based on *Motor Trucks in the Metropolis* by Wilbur Smith and Associates.

A Saturday trip generation rate of 181.0 person trips per 1,000 square feet was used based on the weekday rate and *ITE Trip Generation Manual* weekday to Saturday ratio for a 'Quality Restaurant' use. Temporal distribution (12.7 percent) was assumed by averaging CEQR weekday midday and weekday PM percentages. Saturday restaurant modal split, vehicle and taxi occupancy rates, directional split, and truck rates were all assumed to be similar to weekday midday.

Open Space
The open space component consists of three primary areas in addition to a waterfront esplanade that stretches along the length of the project area. The north-most open space area (between parcels B1 and B2) is expected to be developed into an open plaza type space with landscaping and a possible playground area. Further south, near parcel B3 and the farmer's market area, a sheltered structure for street vendors is envisioned. To the north of parcel B5, an area known as "The Cove" is expected to have a beachfront atmosphere and possibly feature a kayak rental facility. Farther south (south of Vanderbilt Avenue) there would be additional open space where fishing activity is expected. The continuous waterfront esplanade would allow biking and jogging and would be accessible from each of the primary open spaces areas.

Several studies were researched in order to obtain trip generation and modal split information for the open space use. This review concluded that the open space component of the *Chelsea Piers FEIS (1993)* was comparable to that of the Proposed Action. In addition to the various recreational and commercial uses that comprise the development, the Chelsea Piers study generated trips to the development site for a public open space use which was defined as two and a half acres of park/and or recreational space. The rate of use of Stapleton's open spaces is assumed to be similar to that of the Chelsea Piers project. In addition to their similarity of use, these two projects also share a contextual feature; both projects integrate private recreational facilities with public open spaces.

For the open space land use, a trip generation rate of 61 person trips per acre was assumed based on the *Chelsea Piers FEIS*. Temporal distributions and directional splits for weekday AM, PM, and Saturday midday peak periods were obtained from Chelsea Piers while weekday midday rates were determined by averaging the weekday PM and Saturday midday peak hour values. Modal splits for open space use were based on Chelsea Piers but have been slightly modified (transit share decreased from ten percent to five percent) to reflect expected activity in Stapleton. It is expected that there would be a linked trip credit ranging between 25 and 50 percent. To be reasonably conservative, a 30 percent linked trip credit was assumed. Auto and taxi occupancy were also obtained from Chelsea Piers. Directional splits for weekday AM and PM peak hours, and the Saturday midday peak hour, were obtained from Chelsea Piers, while those for the weekday midday peak hour were assumed to be similar to the Saturday midday peak hour.

Local Retail

The Proposed Action would include a variety of retail development throughout the Project Area. Of the 83,700 square feet of total local retail space, it is assumed that 43,700 square feet would be built on the west side of Front Street while 30,000 square feet and an additional 10,000 square foot farmers market would be built on the Homeport Site. The trip generation rate used for street-level retail was 205 person trips per 1,000 square feet as cited in the *CEQR Technical Manual* and as used in the *LIC Rezoning FEIS*. This trip rate is conservative since the development is not in Midtown Manhattan or situated along retail corridors akin to those in Midtown Manhattan.

The temporal distributions of 1.0 percent of all trips occurring in the AM peak hour and 9.6 percent occurring during the PM peak hour were obtained from the *CEQR Technical Manual*. The CEQR Manual provides a 21.6 percent midday peak hour temporal distribution rate; however, this would be misrepresentative of the local retail being proposed in Stapleton and would not be consistent with peaking characteristics that would be typical or expected of the land use for the area. A temporal distribution of 21.6 percent would result in very sharp peaking during the midday peak hour and almost makes this hour worse than the PM peak hour, which is not realistic. Also, the proposed development would include a variety of retail uses much of which is expected to be located within different complexes and buildings throughout the Project Area. Hence, a

flatter temporal distribution would be expected between the midday and PM peak periods.

As a non-Manhattan reference for local retail land use, the *Long Island City Rezoning FEIS* was reviewed. This study used a temporal distribution rate of 8.7 percent in the midday peak hour and eight percent in the PM peak hour for local retail, which would likely be closer to a more realistic representation of what is expected to happen in the Stapleton study area. The *ITE Trip Generation Manual* was also consulted; it provides a temporal distribution for its Shopping Center use and has much flatter peaks than does the *CEQR Technical Manual*. The assumption that ITE's flat peaks are reflective of Stapleton's retail conditions is supported by the *Bricktown Center EIS*, a retail development study in the Charleston area of Staten Island, which uses the Shopping Center temporal distribution rates from the *ITE Trip Generation Manual*. Based on all the information gathered, a midday peak hour temporal distribution rate of 12 percent was deemed most appropriate for this scenario.

The vehicle occupancy rates of 1.65 persons per auto and 1.40 persons per taxi, as well as the directional splits, were also derived from the *LIC Rezoning FEIS*. The modal splits for local retail of nine percent by auto, two percent by taxi, seven percent by bus, seven percent by subway, and 75 percent by walking, was based on rates from the *LIC Rezoning FEIS* with some slight modifications; the auto share increased (by seven percent) and subway and bus shares decreased (by three percent each) since a lower transit share would be expected in Stapleton. Taxi shares were also slightly decreased (by one percent) due to a lower usage in Stapleton.

A delivery trip generation rate of 0.35 truck trips per 1,000 square feet was based on the *ABC West End Avenue Properties FEIS*. The delivery temporal distribution percentages were assumed to be similar to office use.

A Saturday trip generation rate of 237.8 was obtained from *Silvercup West DEIS (2006)*. Saturday temporal distribution, modal split, vehicle occupancy, and directional split were all assumed to be similar to weekday midday. A delivery trip generation rate of 0.35 truck trips per 1,000 square feet was based on the *ABC West End Avenue Properties FEIS*. The delivery temporal distribution percentages were assumed to be similar to weekday midday.

<u>Catering Hall</u>

Trip generation estimates for the proposed 1,000 seat catering hall were based on a survey of a similar catering hall, the Terrace on the Park facility located in Corona, Queens, conducted in November 2004 by Eng-Wong, Taub & Associates. The modal splits of 92 percent by auto, six percent by taxi, one percent by limousine, and one percent by walking, and vehicle occupancy rate of 1.5 persons per auto were used for all time periods based on the Terrace on the Park survey. Even though Stapleton is accessible to transit (while Terrace on the Park is not), in order to be conservative Terrace on the Park's zero transit share assumption was used. The peak hour ins and outs for the catering hall were a function of the traffic volumes during the peak hour, the number of seats for the catering hall (1,000 seats) and the peak occupancy factor.

Telephone surveys conducted with six similar catering hall facilities indicated a tendency for catering halls to operate at approximately 25 percent of capacity on a typical weekday at midday, 50 percent of capacity on a weekday evening and 75 percent of capacity on a typical Saturday at midday. Applying these percentages to the Terrace on the Park proportions yielded vehicular trips for weekday midday, weekday evening, and Saturday midday peak hours (these are not included in Tables 17-14 and 17-15 since they do not conform to the format of these tables).

Total Trip Generation and Traffic Assignments

The total volume of vehicle trips that would be generated by the Proposed Action is shown in Tables 17-16 through 17-19. These tables indicate that approximately 375, 655, and 735 vehicle trips would be generated in the weekday AM, midday and PM peak hours, respectively. About 765 vehicle trips would be generated in the Saturday midday peak hour.

A detailed discussion of the total volume of person trips that would be generated by each of the Proposed Action is provided in Chapter 18, "Transit and Pedestrians."

Table 17-16
Vehicle Trips Generated by the Proposed Action: Weekday AM Peak Hour
Build Condition

Parcel	Land Uses	Autos		Taxis		Trucks		Total	
		In	Out	In	Out	In	Out	In	Out
A	Residential	7	36	0	0	0	0	7	36
B1	Restaurant, Catering Hall	10	2	0	0	1	1	11	3
B2	Sports Complex, Local Retail	12	18	1	1	0	0	13	19
B3	Residential, Specialty Retail	8	37	1	1	1	1	10	39
B4	Office	83	6	1	1	1	1	85	8
B5	Residential	5	28	0	0	0	0	5	28
C	Residential, Retail	17	84	2	2	2	2	21	88
	Open Space[2]	1	1	0	0	0	0	1	1
`TOTAL		**143**	**212**	**5**	**5**	**5**	**5**	**153**	**222**

[2] The Open Space component is not part of any one Site since it is expected to be spread out throughout the entire Homeport Site.

Table 17-17
Vehicle Trips Generated by the Proposed Action: Weekday Midday Peak Hour Build Condition

Parcel	Land Uses	Autos		Taxis		Trucks		Total	
		In	Out	In	Out	In	Out	In	Out
A	Residential	9	6	0	0	0	0	9	6
B1	Restaurant, Catering Hall	148	113	8	7	2	2	158	122
B2	Sports Complex, Local Retail	27	27	3	3	0	0	30	30
B3	Residential, Specialty Retail	27	24	9	9	1	1	37	34
B4	Office	48	56	1	1	1	1	50	58
B5	Residential	7	5	0	0	0	0	7	5
C	Residential, Retail	43	37	12	12	1	1	56	50
	Open Space[2]	3	1	0	0	0	0	3	1
TOTAL		**312**	**269**	**33**	**32**	**5**	**5**	**350**	**306**

Table 17-18
Vehicle Trips Generated by the Proposed Action: Weekday PM Peak Hour Build Condition

Parcel	Land Uses	Autos		Taxis		Trucks		Total	
		In	Out	In	Out	In	Out	In	Out
A	Residential	37	12	0	0	0	0	37	12
B1	Restaurant, Catering Hall	140	37	6	5	1	1	147	43
B2	Sports Complex, Local Retail	54	19	3	3	0	0	57	22
B3	Residential, Specialty Retail	51	27	8	8	1	1	60	36
B4	Office	3	100	1	1	0	0	4	101
B5	Residential	30	10	0	0	0	0	30	10
C	Residential, Retail	104	46	10	10	1	1	115	57
	Open Space[2]	1	2	0	0	0	0	1	2
TOTAL		**420**	**253**	**28**	**27**	**3**	**3**	**451**	**283**

Table 17-19
Vehicle Trips Generated by the Proposed Action: Saturday Midday Peak Hour Build Condition

Parcel	Land Uses	Autos		Taxis		Trucks		Total	
		In	Out	In	Out	In	Out	In	Out
A	Residential	22	15	0	0	0	0	22	15
B1	Restaurant, Catering Hall	196	90	10	9	1	1	207	100
B2	Sports Complex, Local Retail	50	31	4	4	0	0	54	35
B3	Residential, Specialty Retail	43	36	11	11	1	1	55	48
B4	Office	10	12	0	0	1	1	11	13
B5	Residential	18	12	0	0	0	0	18	12
C	Residential, Retail	77	61	14	14	1	1	92	76
	Open Space[1]	4	2	0	0	0	0	4	2
TOTAL		**420**	**259**	**39**	**38**	**4**	**4**	**463**	**301**

Project-generated trips were assigned to the roadway network leading to and from the study area to determine the traffic increases through study area intersections. These traffic assignments followed a similar set of assumptions to those used in the analysis of No Build Condition and are provided in Figures 17-13 through 17-16. Also, due to the proposed development and traffic calming measures on Front Street, it was assumed that the majority of the northbound volume previously using it as a bypass would be diverted onto Bay Street.

Vehicles would primarily use Front Street to access the Project Area. Due to the proposed development, approximately 45-165 vph would be turning into Front Street from Bay and Edgewater Streets to access the Project Area. Swan/Van Duzer, Prospect, Water, and Canal Streets would experience volume increments of approximately 5-15 vph, whereas the increment along Bay Street at the south end of the study area (near Hylan Boulevard) would range from approximately 55-120 vph. Along Bay Street at the north end of the study area (near Victory Boulevard), volume increments would range from approximately 80-135 vph during peak hours.

17.4.2 Design Improvements

To accommodate the Proposed Action, Front Street would be entirely redesigned and rebuilt to include traffic calming measures, proper signage, speed control, and other streetscape improvements. Front Street would be restriped to accommodate two 11-foot wide travel lanes with sidewalks, bike lanes, and parking on both sides of the street.

The intersection of Bay Street and Edgewater/Front Streets would be redesigned. Design measures during all the peak hours would involve:

1. Eliminating the northbound left turn and through movements from Edgewater Street to Bay Street by creating a traffic island that would only allow right turns from Edgewater Street to Front Street;
2. Prohibiting parking northbound (along the east curb of Bay Street) to provide one 11-foot wide through lane and one 11-foot wide though-right lane;
3. Re-striping Bay Street to provide two 10-foot wide receiving lanes in the northbound direction;
4. Re-striping westbound Front Street to provide one 11-foot wide left turn lane for traffic turning left onto Edgewater Street and one 11-foot wide left-right lane for traffic turning onto Bay Street, with additional signage along westbound Front Street to direct traffic traveling in the left lane to Edgewater Street and traffic traveling in the right lane to Bay Street; and
5. Signal timing modifications to provide a two-phase signal by eliminating the phase for Edgewater Street and permitting the right turning movement during the westbound phase.

Source: Landbase, NYCDoITT;
Map PLUTO and LION, NYC DCP

New York City
Economic Development
Corporation

New Stapleton Waterfront Development Plan DEIS

2015 Build Weekday
AM Trip Assignments
(Percentages)

The Louis Berger Group, Inc.

Eng-Wong, Taub & Associates
Traffic and Transportation Consultants

Figure 17-13

Source: Landbase, NYCDoITT;
Map PLUTO and LION, NYC DCP

New York City
Economic Development
Corporation

New Stapleton Waterfront Development Plan DEIS

2015 Build Weekday
Midday Trip Assignments
(Percentages)

The Louis Berger Group, Inc.

Eng-Wong, Taub & Associates
Traffic and Transportation Consultants

Figure 17-14

30 %
8 %
VAN DUZER ST
TOMPKINS CI
HANNAH ST
3 %
3 %
JULIAN PL
ST PAULS AVE
GRANT ST
CLINTON ST
BAY ST
MURRAY HULBERT AVE
BALTIC ST
WILLIAM ST
CONGRESS ST
WAVE ST
VAN DUZER ST
2 %
FRONT ST
BEACH ST
2 %
2 %
CANAL ST
2 %
THOMPSON
BROAD ST
8 %
BROWNELL ST
HARRISON ST
TOMPKINS AVE
8 %
VANDERBILT AVE
NORWOOD AVE
PINE PL
TOWNSEND AVE
GREENFIELD AVE
PARK HILL AVE
PARK HILL CT
FAIRWAY AVE
PARK HILL LA
PARK HILL CI
TOMPKINS AVE
WILLOW AVE
EDGEWATER ST
LYNHURST AVE
SYLVATON TE
CHESTNUT AVE
ORMOND PL
BUTLER PL
BAY ST
CLIFTON AVE
OSGOOD AVE
STAGE LA
SKY LA
CHESTNUT AVE
ANDERSON ST
ST MARYS AVE
SHAUGHNESSY LA
VIRGINIA AVE
CLIFTON AVE
39%
MARYLAND AVE
Source: Landbase, NYCDoITT;
Map PLUTO and LION, NYC DCP
New York City
Economic Development
Corporation
New Stapleton Waterfront
Development Plan DEIS
2015 Build Weekday
PM Trip Assignments
(Percentages)
The Louis Berger Group, Inc.
Eng-Wong, Taub & Associates
Traffic and Transportation Consultants
Figure 17-15

Source: Landbase, NYCDoITT;
Map PLUTO and LION, NYC DCP

New York City
Economic Development
Corporation

New Stapleton Waterfront Development Plan DEIS

2015 Build Saturday
Midday Trip Assignments
(Percentages)

The Louis Berger Group, Inc.

Eng-Wong, Taub & Associates
Traffic and Transportation Consultants

Figure 17-16

Three additional locations along Front Street were analyzed as part of the 2015 Build Condition:

- Front Street and Wave Street
- Front Street and Prospect Street
- Front Street and Canal Street.

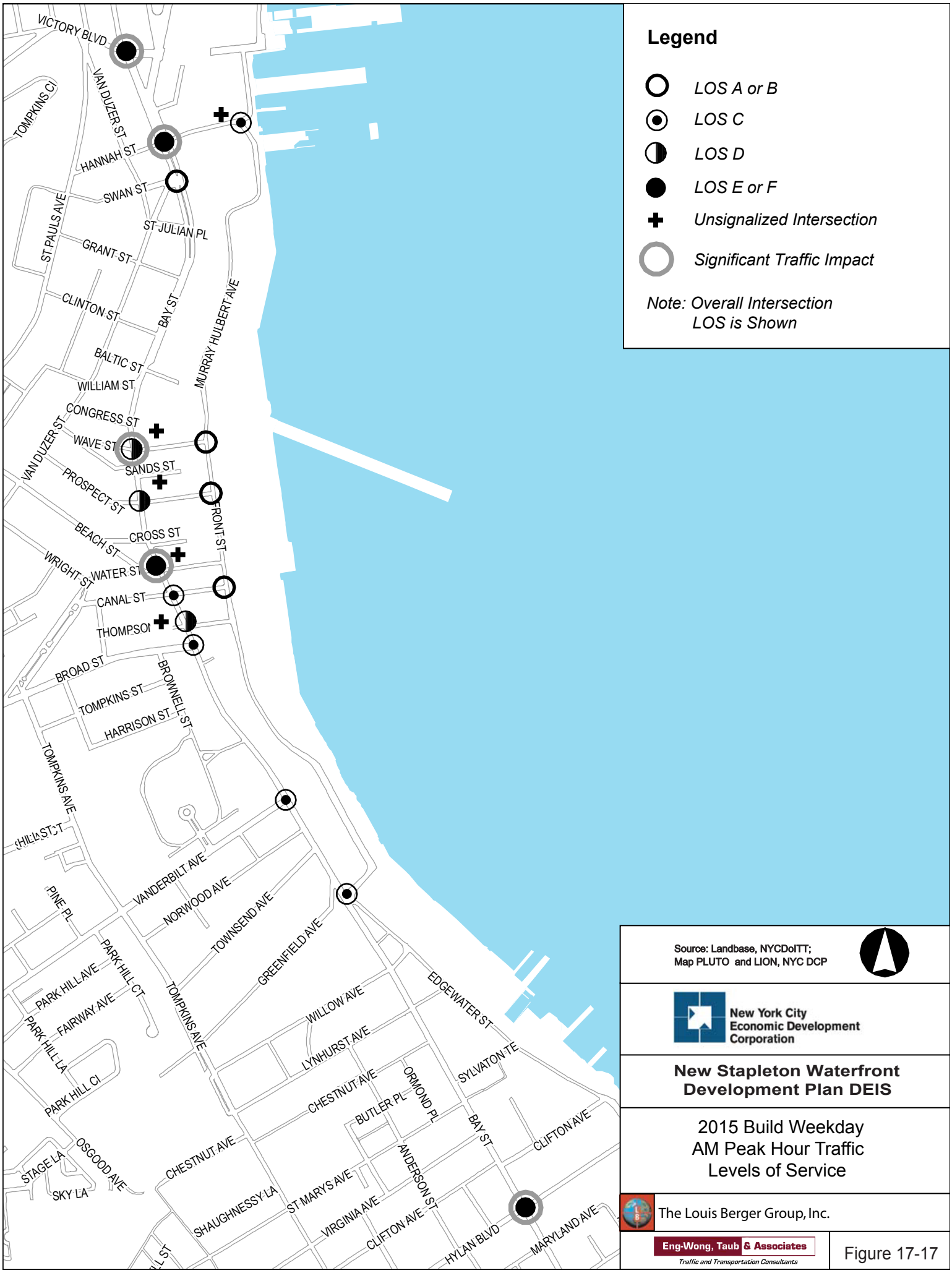
The three intersections listed above were not analyzed for Existing and No Build Conditions since traffic volumes on the side streets are minimal and these intersections were not deemed critical for traffic analysis. However, since the character of Front Street would be modified in the Build Condition, the three intersections were added to the Build analysis. Vehicular traffic would utilize these streets to access and egress the Project Area. Design measures would include installing a traffic signal at all three intersections. A preliminary signal warrant analysis indicated that the pedestrian volume warrant would be satisfied at all three intersections.

17.4.3 Levels of Service

The assessment of potential significant traffic impacts generated by the Proposed Action is based on significant impact criteria defined in the *CEQR Technical Manual*. A significant traffic impact is defined for No Build LOS A, B, or C conditions that deteriorate to unacceptable LOS D, E, or F in the Build Condition. For No Build LOS A, B, or C conditions that deteriorate to LOS D, mitigation to mid-LOS D (45.0 seconds of delay for signalized intersections and 30.0 seconds of delay for unsignalized intersections) is required.

For a No Build LOS D, an increase of Build delay by five 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 four-second increase in Build delay; for a No Build LOS F, a three-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 one second is considered significant, unless the proposed action would generate fewer than five vehicles through that intersection in the peak hour (signalized intersections) and fewer than five passenger-car-equivalents (PCEs) in the peak along the critical approach (unsignalized intersections). In addition, for a minor street of an unsignalized intersection to generate a significant impact, 90 PCEs must be identified in the Build Condition in any peak hour.

Based on the projected increases in traffic volumes described previously, Build Condition levels of service were determined. Final Build Condition volume maps are presented in Appendix C and detailed intersection capacity analyses are provided in Table 17-22 located at the end of this chapter. Figures 17-17 through 17-20 depict levels of service at analyzed intersections for the weekday AM, midday, PM and Saturday midday peak hours.



Source: Landbase, NYCDoITT; Map PLUTO and LION, NYC DCP

New York City Economic Development Corporation

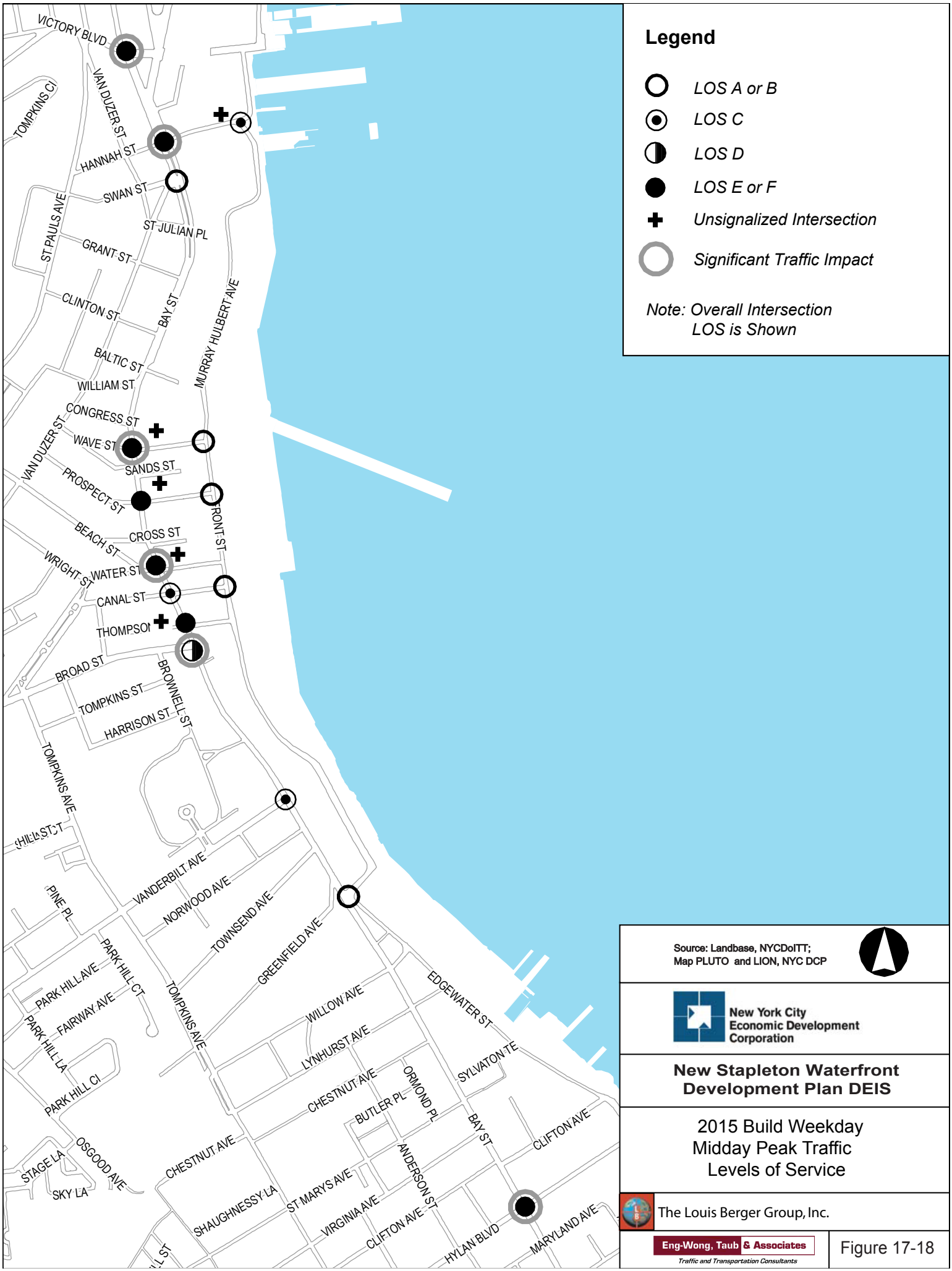
New Stapleton Waterfront Development Plan DEIS

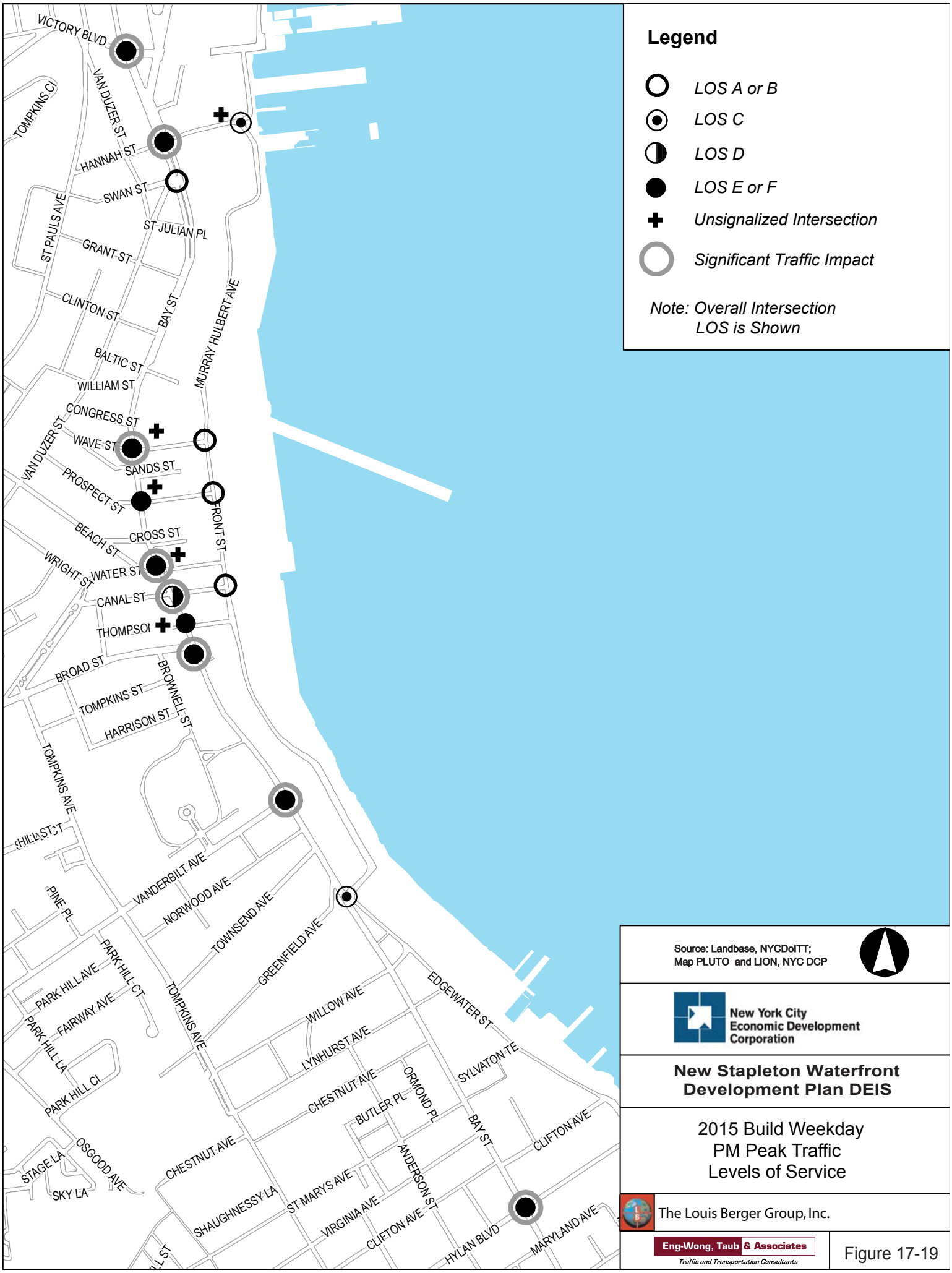
2015 Build Weekday AM Peak Hour Traffic Levels of Service

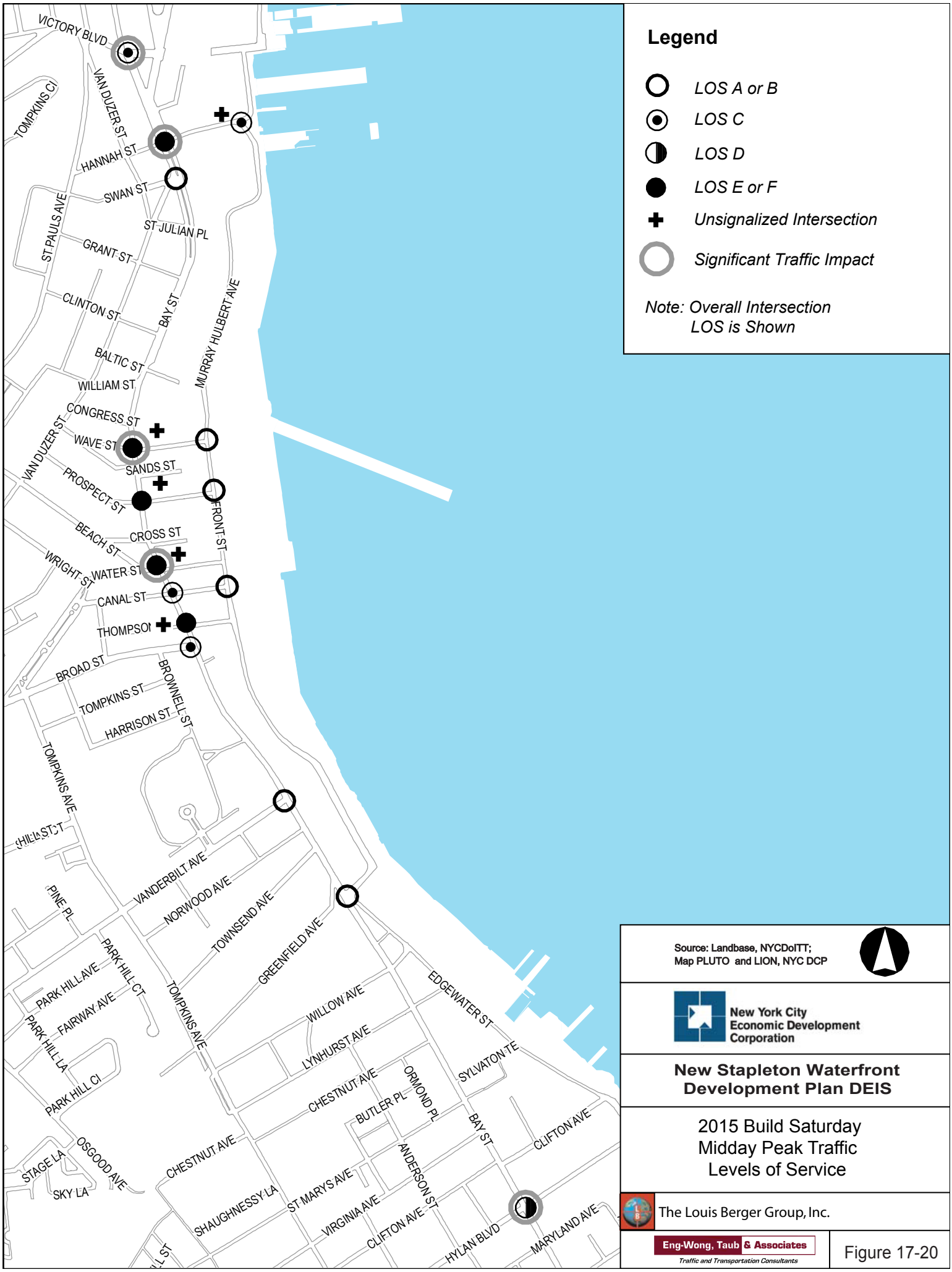
The Louis Berger Group, Inc.

Eng-Wong, Taub & Associates
Traffic and Transportation Consultants

Figure 17-17


Legend
LOS A or B
LOS C
LOS D
LOS E or F
Unsignalized Intersection
Significant Traffic Impact
Note: Overall Intersection LOS is Shown
VICTORY BLVD
VAN DUZER ST
TOMPKINS CI
HANNAH ST
SWAN ST
ST JULIAN PL
ST PAULS AVE
GRANT ST
CLINTON ST
BAY ST
MURRAY HULBERT AVE
BALTIC ST
WILLIAM ST
CONGRESS ST
WAVE ST
SANDS ST
PROSPECT ST
FRONT ST
BEACH ST
CROSS ST
WRIGHT ST
WATER ST
CANAL ST
THOMPSON
BROAD ST
TOMPKINS ST
HARRISON ST
BROWNELL ST
TOMPKINS AVE
CHILLA ST
VANDERBILT AVE
NORWOOD AVE
PINE PL
TOWNSEND AVE
GREENFIELD AVE
PARK HILL AVE
PARK HILL CT
FAIRWAY AVE
PARK HILL LA
PARK HILL CI
WILLOW AVE
EDGEWATER ST
LYNHURST AVE
SYLVATON TE
CHESTNUT AVE
ORMOND PL
BUTLER PL
BAY ST
CLIFTON AVE
OSGOOD AVE
STAGE LA
SKY LA
ANDERSON ST
ST MARYS AVE
SHAUGHNESSY LA
VIRGINIA AVE
CLIFTON AVE
HYLAN BLVD
MARYLAND AVE
Source: Landbase, NYCDoITT; Map PLUTO and LION, NYC DCP
New York City Economic Development Corporation
New Stapleton Waterfront Development Plan DEIS
2015 Build Weekday Midday Peak Traffic Levels of Service
The Louis Berger Group, Inc.
Eng-Wong, Taub & Associates
Traffic and Transportation Consultants
Figure 17-18


Legend
LOS A or B
LOS C
LOS D
LOS E or F
Unsignalized Intersection
Significant Traffic Impact
Note: Overall Intersection LOS is Shown
VICTORY BLVD
VAN DUZER ST
TOMPKINS CI
HANNAH ST
SWAN ST
ST JULIAN PL
ST PAULS AVE
GRANT ST
CLINTON ST
BAY ST
MURRAY HULBERT AVE
BALTIC ST
WILLIAM ST
CONGRESS ST
WAVE ST
SANDS ST
PROSPECT ST
FRONT ST
CROSS ST
BEACH ST
WATER ST
WRIGHT ST
CANAL ST
THOMPSON
BROAD ST
TOMPKINS ST
HARRISON ST
BROWNELL ST
TOMPKINS AVE
VANDERBILT AVE
NORWOOD AVE
PINE PL
TOWNSEND AVE
GREENFIELD AVE
PARK HILL AVE
PARK HILL CT
FAIRWAY AVE
PARK HILL LA
PARK HILL CI
WILLOW AVE
EDGEWATER ST
LYNHURST AVE
SYLVATON TE
CHESTNUT AVE
BUTLER PL
ORMOND PL
BAY ST
CLIFTON AVE
OSGOOD AVE
STAGE LA
SKY LA
ANDERSON ST
ST MARYS AVE
SHAUGHNESSY LA
VIRGINIA AVE
CLIFTON AVE
HYLAN BLVD
MARYLAND AVE
Source: Landbase, NYCDoITT; Map PLUTO and LION, NYC DCP
New York City Economic Development Corporation
New Stapleton Waterfront Development Plan DEIS
2015 Build Weekday PM Peak Traffic Levels of Service
The Louis Berger Group, Inc.
Eng-Wong, Taub & Associates
Traffic and Transportation Consultants
Figure 17-19


Legend
LOS A or B
LOS C
LOS D
LOS E or F
Unsignalized Intersection
Significant Traffic Impact
Note: Overall Intersection LOS is Shown
VICTORY BLVD
VAN DUZER ST
TOMPKINS CI
HANNAH ST
SWAN ST
ST JULIAN PL
ST PAULS AVE
GRANT ST
CLINTON ST
BAY ST
MURRAY HULBERT AVE
BALTIC ST
WILLIAM ST
CONGRESS ST
WAVE ST
SANDS ST
PROSPECT ST
FRONT ST
CROSS ST
BEACH ST
WATER ST
WRIGHT ST
CANAL ST
BROAD ST
TOMPKINS ST
HARRISON ST
BROWNELL ST
TOMPKINS AVE
VANDERBILT AVE
NORWOOD AVE
TOWNSEND AVE
GREENFIELD AVE
PINE PL
PARK HILL AVE
PARK HILL CT
FAIRWAY AVE
PARK HILL LA
PARK HILL CI
WILLOW AVE
LYNHURST AVE
EDGEWATER ST
SYLVATON TE
CHESTNUT AVE
BUTLER PL
ORMOND PL
BAY ST
CLIFTON AVE
OSGOOD AVE
STAGE LA
SKY LA
SHAUGHNESSY LA
ST MARYS AVE
VIRGINIA AVE
ANDERSON ST
HYLAN BLVD
MARYLAND AVE
Source: Landbase, NYCDoITT; Map PLUTO and LION, NYC DCP
New York City Economic Development Corporation
New Stapleton Waterfront Development Plan DEIS
2015 Build Saturday Midday Peak Traffic Levels of Service
The Louis Berger Group, Inc.
Eng-Wong, Taub & Associates
Traffic and Transportation Consultants
Figure 17-20

Due to the proposed roadway improvements described earlier, intersections along Front Street would have improved levels of service in the Build Condition as compared to the No Build Condition. An overview of the projected levels of service and significant impacts is summarized in Table 17-20 and described below:

- In the weekday AM peak hour, three signalized intersections would operate at overall LOS E or F in the Build Condition. Two of these three new locations with LOS E/F conditions were at intersections operating at LOS E/F in the No Build Condition as well. There would be no overall LOS D conditions in the weekday AM peak hour. Six 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 50 total traffic movements analyzed are expected to be at LOS E or F conditions as compared to nine traffic movements in the No Build, i.e., a decrease of three traffic movements. Three intersections would be significantly impacted.
- In the weekday midday peak hour, three signalized intersections would operate at overall LOS E or F in the Build Condition as opposed to one in the No Build Condition. Six traffic movements would operate at LOS E or F in the Build Condition as opposed to five traffic movements in the No Build Condition. Four intersections would be significantly impacted.
- In the weekday PM peak hour, five signalized intersections would operate at overall LOS E or F in the Build Condition as opposed to two in the No Build Condition. Twelve traffic movements would operate at LOS E or F in the Build Condition as opposed to thirteen traffic movements in the No Build Condition. Six intersections would be significantly impacted.
- In the Saturday midday peak hour, one signalized intersection would operate at overall LOS F, and one would operate at overall LOS D. Four traffic movements would operate at LOS E or F as opposed to none in the No Build Condition. Three intersections would be significantly impacted.
- Four of the five unsignalized intersections analyzed would operate at overall LOS E or F during three of the four peak hours analyzed as opposed to one in the No Build Condition. Significant impacts would occur at the same two intersections during all four peak hours analyzed.

As discussed later in this chapter, each of these significant traffic impacts can be mitigated by standard traffic capacity improvements.

A more detailed presentation of levels of service and significant impacts is provided below.

Table 17-20
Traffic Level of Service Summary
2015 No Build vs. Build Condition

Signalized Intersections	No Build				Build			
	AM	MD	PM	Saturday MD	AM	MD	PM	Saturday MD
Overall LOS A/B	4	3	2	5	4	5	4	6
Overall LOS C	1	2	2	3	4	2	1	3
Overall LOS D	0	2	2	0	0	1	1	1
Overall LOS E/F	3	1	2	0	3	3	5	1
Number of Movements at LOS E or F	9	5	13	0	6	6	12	4
Number of Significant Impacts	-	-	-	-	3	4	6	3
Unsignalized Intersections	**AM**	**MD**	**PM**	**Saturday MD**	**AM**	**MD**	**PM**	**Saturday MD**
Overall LOS A/B	0	1	0	0	0	0	0	0
Overall LOS C	5	1	3	5	1	1	1	1
Overall LOS D	0	3	1	0	3	0	0	0
Overall LOS E/F	0	0	1	0	1	4	4	4
Number of Movements at LOS E or F	1	3	2	0	3	4	4	4
Number of Significant Impacts	-	-	-	-	2	2	2	2

Signalized Intersections

Along the Bay Street corridor, five of the eight intersections analyzed would operate at overall LOS E or F during at least one of the four peak hours analyzed. Significant impacts would occur at three intersections during the weekday AM and Saturday midday peak hours, at four intersections during the weekday midday peak hour, and at six intersections during the weekday PM peak hour. Detailed mitigation measures for significantly impacted locations are discussed later in this chapter. All significant impacts can be mitigated by standard traffic engineering improvements such as the installation of traffic signals, lane re-striping, signal phasing and timing changes, parking regulation modifications, and other measures.

- At the intersection of Bay Street and Victory Boulevard, northbound Bay Street (during the weekday AM peak hour) and the de facto left-turn movement of this approach (during the weekday midday and PM peak hours) would continue to operate at LOS F. The northbound through-right movement (during the weekday midday, PM and Saturday midday peak hours) and the de facto left-turn during Saturday

midday would deteriorate to LOS E or F conditions. They would be significantly impacted during all four peak analysis hours.

- At the intersection of Bay Street and Hannah Street, the southbound Bay Street left turns would continue to operate at LOS F during the weekday peak hours and deteriorate to LOS F during the Saturday midday peak hour. It would be significantly impacted during all peak hours analyzed.
- At the intersections of Bay Street with Canal Street, Broad Street, and Vanderbilt Avenue, the northbound approach of Bay Street at these intersections would deteriorate to LOS F during the weekday PM peak hour and would be significantly impacted. Also, northbound Bay Street at its intersection with Broad Street would deteriorate to LOS E during the weekday midday peak hour and would be significantly impacted.
- At the intersection of Bay Street and Hylan Boulevard, eastbound and westbound Hylan Boulevard would operate at unacceptable LOS D, E or F and would be significantly impacted during all peak hours analyzed. Also, northbound Bay Street would operate at LOS E and F during the weekday AM and PM peak hours, respectively, and would have significant impacts.

Each of these significant impacts can be mitigated by standard traffic capacity improvements.

Unsignalized Intersections

Four of the five unsignalized intersections analyzed would operate at overall LOS E or F during at least one of the four peak hours. Significant impacts would occur at two intersections during all peak hours analyzed, including the following:

- At the intersection of Bay Street and Wave Street, westbound Wave Street would operate at LOS E during the weekday AM peak hour and at LOS F during the weekday midday, PM and Saturday midday peak hours. This approach would be significantly impacted during all peak hours analyzed.
- At the intersection of Bay Street and Prospect Street, eastbound Prospect Street would operate at LOS E during the weekday AM peak hour and at LOS F during the weekday midday, PM and Saturday midday peak hours. Although this approach would experience significant delays, it would not be significantly impacted since the minor street volume is below the minimum criteria (less than 90 PCEs) defined for a significant impact for unsignalized intersections.
- At the intersection of Bay Street and Water Street, westbound Water Street would operate at LOS F during all the peak hours analyzed and would be significantly impacted.
- At the intersection of Bay Street and Thompson Street, westbound Thompson Street would operate at LOS E during the weekday and Saturday midday peak hours, and at LOS F during the weekday PM peak hour. Although this approach would experience significant delays, it would not be significantly impacted since the minor street

volume is below the minimum criteria (less than 90 PCEs) defined for a significant impact for unsignalized intersections.

17.4.3 Parking

A parking accumulation analysis was performed for each of the proposed Build development sites based on the expected project-generated trips. References for the hourly distributions and in/out percentages used in the analysis for their similar land uses included the *ITE Trip Generation Manual*, the *ITE Parking Generation Manual*, the *No. 7 Subway Extension - Hudson Yards Rezoning and Development Program FEIS (2004)*, and the *Silvercup West DEIS (2005)*.

Parcel A would include 140 accessory parking spaces allocated for the residential units. Parcel B1 is expected to accommodate 500 spaces for the restaurant and banquet hall space while parcel B2 would include 130 spaces for the sports complex and ground floor retail. Additional parking (approximately 75 spaces) would be available at parcel C7 on the west side of Front Street across from parcel B2 and is expected to serve any overflow of vehicles destined for parcel B2. Parcel B3 would accommodate 140 spaces for the residential units and 80 spaces for the farmer's market. Parcels B4 and B5 are expected to include 225 and 120 spaces for the commercial office space and residential units, respectively. Parcels C1-6 would accommodate 290 spaces for the privately developed residential units and local retail, and 75 spaces would be allocated to parcel C8, just south of parcels C1-6, for any excess parking needs of parcel B4. Results of this analysis are presented in Table 17-21.

Table 17-21
Development Program Weekday Parking Accumulation Summary
Build Condition

Parcel	Spaces Available	Percent Occupied		
		AM Peak Hour	Midday Peak Hour	PM Peak Hour
A	140	88	51	85
B1	500	2	31	42
B2	130	15	2	62
B3	220	56	34	55
B4	225	41	82	46
B5	120	82	49	80
C7	75	0	0	0
C8	75	0	0	0
C1-C6	290	97	55	94
Total	**1,775**	**42**	**40**	**56**

Note: Site numbers indicated in this Table correspond to those shown in Figure 17-12.

The estimates presented in Table 17-21 represent the maximum hourly parking occupancies during each peak period (6-9 AM, 11 AM–2 PM, 4-7 PM). For example,

Parcel A's AM peak hour is from 6-7 AM, while Parcel B1's AM peak hour is from 7-8 AM.

Table 17-21 indicates that there would be sufficient parking supply to meet the expected demand for all of the development sites. Also, at least 300 on-street parking spaces would be provided along Front Street between Edgewater and Hannah Streets. Based on the overall total of 2,075 on- and off-street parking spaces, the peak occupancies would be approximately 36 percent during the weekday AM, 34 percent during the midday peak hours, and approximately 48 percent during the weekday PM peak hour. Approximately 100 additional on-street parking spaces would also be provided along the private road that would extend from Water Street to the north of Wave Street and would loop around parcels B2 and B3.

17.5 Traffic Mitigation

17.5.1 Traffic Capacity and Operational Improvements

This section identifies traffic capacity and operational improvements that would be needed as mitigation measures at significantly impacted locations. The detailed evaluation of mitigation measures indicated that all significant impacts could be fully mitigated by standard traffic engineering improvements such as the installation of traffic signals, signal phasing and timing modifications, parking prohibitions, and lane re-striping. These measures represent the standard range of traffic capacity improvements that have been proposed and implemented for numerous projects in the City. Mitigation measures would involve installing traffic signals at three unsignalized intersections along Bay Street. A preliminary signal warrant analysis indicated that vehicular and/or pedestrian warrants would be satisfied at all three intersections. As noted earlier in this chapter, of the 16 locations analyzed, five intersections would be significantly impacted during the weekday AM and Saturday midday peak hours, six during the weekday midday peak hour, and eight during the weekday PM peak hour.

Mitigation measures for each location are described below, with additional detail provided in Table 17-22 located at the end of this chapter.

<u>Signalized Intersections</u>
Along the Bay Street corridor, four of the eight signalized intersections analyzed would be significantly impacted during at least one peak hour. All significantly impacted locations could be mitigated using standard traffic engineering measures.

Bay Street and Victory Boulevard: Mitigation measures during all peak hours analyzed would involve: 1) prohibiting parking northbound (one space would be lost along the east curb of Bay Street) and shifting the centerline of this approach one foot to the west to provide one 10-foot wide left turn lane and one 13-foot wide through lane; 2) re-striping southbound Bay Street to provide one 16-foot wide right turn lane, one 11-foot wide left-through lane and one 11-foot wide through lane; and 3) shifting the centerline of eastbound Victory Boulevard three feet to the north to provide one 14-foot wide left turn lane and one 10-foot wide through-right lane. Mitigation measures during the weekday

and Saturday midday peak hours would also involve signal timing modifications to provide a northbound lag phase.

Bay Street and Hannah Street: Mitigation measures needed during all four peak hours would include: 1) signal timing modifications to provide a southbound lead phase; 2) shifting the centerline of southbound Bay Street three feet to the east to provide two 14-foot wide left turn lanes, two 10-foot wide through lanes, one 10.5-foot wide right turn lane, and reducing the northbound receiving lane widths from 11 feet and 25 feet to 10 feet and 23 feet, respectively; and 3) shifting the centerline of westbound Hannah Street four feet to the north to provide one 11-foot wide westbound lane and two 10-foot wide eastbound receiving lanes.

Bay Street and Canal Street: Mitigation measures needed during the weekday PM peak hour include: 1) signal timing modifications; and 2) shifting the centerline of northbound Bay Street three feet to the west to provide one 16-foot wide northbound through-right lane and two 10-foot wide southbound receiving lanes. These measures would remain in place during all periods since they include re-striping lanes.

Bay Street and Broad Street: Mitigation measures needed during the midday and PM peak hours would include: 1) signal timing modifications; and 2) shifting the centerline of northbound Bay Street one foot to the west to provide one 16-foot wide northbound left-through lane and one 20-foot wide southbound receiving lane. These measures would remain in place during all periods since they include re-striping lanes.

Bay Street and Vanderbilt Avenue: Mitigation measures during the weekday PM peak hour would include: 1) prohibiting parking eastbound (along the south curb of Vanderbilt Avenue) and re-striping this approach to provide one 11-foot wide left turn lane and one 10-foot wide right turn lane; 2) shifting the centerline of northbound Bay Street six feet to the west to provide one 13-foot wide left-through lane and one 12-foot wide through lane; 3) shifting the centerline of southbound Bay Street three feet to the west to provide one 10-foot wide right turn lane, one 10-foot wide through lane, and two 11-foot wide northbound receiving lanes; and 4) signal timing modifications. The two centerline shifts can be accommodated with a smooth transition. These measures are needed to mitigate only PM peak hour impacts but would remain in place during all periods since they include re-striping lanes.

Bay Street and Hylan Boulevard: Mitigation measures during all four peak hours would involve: 1) prohibiting parking eastbound (along the south curb of Hylan Boulevard) and shifting the centerline of this approach 1.5 feet to the north to provide one 10.5-foot wide left turn lane and one 10.5-foot wide through-right lane; 2) re-striping the westbound receiving lane of Hylan Boulevard to 18 feet wide from its existing 19.5 foot width; and 3) signal timing modifications to eliminate the eastbound lead phase and allocating this time to other movements.

Unsignalized Intersections
Significant impacts would occur at two intersections during all peak hours analyzed. All significantly impacted locations could be mitigated using standard traffic engineering measures. Mitigation measures would involve signalization of the intersections of Bay Street with Wave, Water and Prospect Streets. A preliminary signal warrant analysis indicates that warrants are satisfied at these intersections.

Bay Street and Wave Street: Mitigation measures would include installing a traffic signal. A preliminary signal warrant analysis indicates that the peak hour warrant is satisfied at this intersection.

Bay Street and Water Street: Mitigation measures would include installing a traffic signal. A preliminary signal warrant analysis indicates that the peak hour warrant is satisfied at this intersection. During all peak hours analyzed, mitigation measures would also involve: 1) prohibiting parking southbound (along the west curb of Bay Street) to provide a 15-foot wide through-right lane; 2) shifting the centerline of northbound Bay Street nine feet to the west to provide one 10-foot wide left-through lane, one 10-foot wide through lane, and one 14-foot wide receiving lane in the southbound direction; and 3) shifting the centerline of southbound Bay Street eight feet to the west to provide two 10-foot wide receiving lanes in the northbound direction and one 15-foot wide through-right lane in the southbound direction.

Bay and Prospect Street: The pedestrian analysis presented in Chapter 18, "Transit and Pedestrians," indicates that significant pedestrian impacts would occur at this intersection. Mitigation measures presented in Chapter 18 indicate that these significant pedestrian impacts would be mitigated by installing a traffic signal. A preliminary signal warrant analysis indicates that the pedestrian volume warrant is satisfied at this intersection.

Each of the traffic engineering improvements described above would require approval of the NYCDOT. These improvements fall within the range of typical measures employed by NYCDOT in improving traffic conditions in all parts of the City.

17.5.2 Parking Prohibitions

The implementation of parking prohibitions to help mitigate significant traffic impacts would result in a loss of curbside parking spaces at the following locations:

- Northbound Bay Street (east curb) approaching Edgewater/Front Streets -- nine spaces, all peak hours analyzed.
- Southbound Bay Street (west curb) approaching Water Street -- seven spaces, all peak hours analyzed.
- Eastbound Vanderbilt Avenue (south curb) approaching Bay Street – three spaces, all peak hours analyzed.
- Eastbound Hylan Boulevard (south curb) approaching Bay Street – four spaces, all peak hours.

- Northbound Bay Street (east curb) approaching Victory Boulevard – one space, all peak hours analyzed.

Overall, 24 curb spaces would be lost within the overall study area corridor during all peak hours analyzed. Lost delivery spaces for trucks along Bay Street could be made up on the side streets if necessary.

17.5 Conclusion

Of the 16 locations analyzed in the Build Condition for the weekday and Saturday midday peak hours, significant impacts would occur at five intersections during the weekday AM and Saturday midday peak hours, six intersections during the weekday midday peak hour, and eight intersections during the weekday PM peak hour. The evaluation of mitigation measures indicates that 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 restriping. The analysis of parking conditions indicates that sufficient parking would be provided to accommodate the Proposed Action's expected parking demands, and that the Proposed Action would not result in any significant adverse parking impacts.

TABLE 17-22

LEVELS OF SERVICE

(see following pages)

TABLE 17-22
STAPLETON / HOMEPORT REDEVELOPMENT PROJECT
EXISTING TRAFFIC LEVELS OF SERVICE

INTERSECTION & APPROACH		Weekday AM (8:00 AM - 9:00 AM)				Weekday Midday (12:30 PM - 1:30 PM)				Weekday PM (4:30 PM - 5:30 PM)				Saturday MD (11:45 PM - 12:45 PM)			
		Mvt.	V/C	Control Delay	LOS	Mvt.	V/C	Control Delay	LOS	Mvt.	V/C	Control Delay	LOS	Mvt.	V/C	Control Delay	LOS
SIGNALIZED INTERSECTIONS																	
Bay Street and Victory Boulevard																	
Victory Boulevard	EB	DefL	0.90	67.0	E	DefL	0.68	38.5	D	DefL	0.75	56.3	E	DefL	0.59	31.8	C
		TR	0.11	30.3	C	TR	0.06	20.1	C	TR	0.13	30.9	C	TR	0.10	20.7	C
	WB	LTR	0.17	31.6	C	LTR	0.06	20.1	C	LTR	0.14	30.8	C	LTR	0.04	19.9	B
Bay Street	NB	-	-	-	-	-	-	-	-	DefL	0.90	59.9	E	-	-	-	-
		LTR	0.87	30.7	C	LTR	0.88	31.0	C	TR	0.79	26.8	C	LTR	0.66	18.6	B
	SB	LT	0.44	13.4	B	LT	0.47	13.6	B	LT	0.53	14.7	B	LT	0.38	12.5	B
		R	0.37	14.3	B	R	0.39	14.3	B	R	0.79	33.7	C	R	0.31	12.5	B
Overall Intersection		-	**0.88**	**29.0**	**C**	-	**0.80**	**22.9**	**C**	-	**0.85**	**27.9**	**C**	-	**0.63**	**17.3**	**B**
Bay Street and Hannah Street																	
Hannah Street	EB	LTR	0.49	39.1	D	LTR	0.16	21.2	C	LTR	0.32	43.5	D	LTR	0.17	25.7	C
	WB	LTR	0.66	42.7	D	LTR	0.53	27.1	C	LTR	0.66	52.5	D	LTR	0.47	25.7	C
Bay Street	NB	LTR	0.41	13.0	B	LTR	0.37	12.3	B	LTR	0.35	12.3	B	LTR	0.26	11.7	B
	SB	L	0.72	28.5	C	L	0.69	26.6	C	L	0.93	50.7	D	L	0.41	16.5	B
		T	0.21	10.8	B	T	0.29	11.4	B	T	0.28	11.3	B	T	0.23	11.4	B
		R	0.10	10.1	B	R	0.18	10.9	B	R	0.24	11.4	B	R	0.12	10.8	B
Overall Intersection		-	**0.70**	**20.8**	**C**	-	**0.63**	**16.0**	**B**	-	**0.84**	**25.4**	**C**	-	**0.43**	**15.0**	**B**
Bay Street and Van Duzer Street/Swan Street																	
Van Duzer Street	EB	L	0.23	32.0	C	L	0.17	21.1	C	L	0.16	30.8	C	L	0.09	20.3	C
		LR	0.24	32.4	C	LR	0.16	21.2	C	LR	0.14	30.5	C	LR	0.04	19.8	B
Bay Street	NB	LT	0.39	12.8	B	LT	0.32	11.8	B	LT	0.30	11.7	B	LT	0.25	11.2	B
	SB	TR	0.36	12.3	B	TR	0.40	12.7	B	TR	0.36	12.3	B	TR	0.37	12.2	B
Overall Intersection		-	**0.34**	**15.3**	**B**	-	**0.31**	**13.4**	**B**	-	**0.29**	**14.1**	**B**	-	**0.26**	**12.4**	**B**
Bay Street and Canal Street																	
Canal Street	EB	LTR	0.30	33.3	C	LTR	0.58	29.1	C	LTR	0.40	35.4	D	LTR	0.44	26.6	C
	WB	LR	0.07	29.8	C	LR	0.08	20.2	C	LR	0.15	31.0	C	LR	0.08	20.3	C
Bay Street	NB	TR	0.49	14.8	B	TR	0.53	15.2	B	TR	0.52	15.3	B	TR	0.42	13.4	B
	SB	LT	0.35	12.3	B	LT	0.35	12.1	B	LT	0.36	12.3	B	LT	0.32	11.8	B
Overall Intersection		-	**0.43**	**15.7**	**B**	-	**0.55**	**16.8**	**B**	-	**0.48**	**16.9**	**B**	-	**0.43**	**15.1**	**B**
Bay Street and Broad Street																	
Broad Street	EB	LR	0.32	33.5	C	LR	0.26	22.3	C	LR	0.23	31.9	C	LR	0.18	21.2	C
Bay Street	NB	LT	0.47	14.3	B	LT	0.52	15.0	B	LT	0.53	15.6	B	LT	0.42	13.4	B
	SB	T	0.54	15.8	B	T	0.59	16.6	B	T	0.55	15.9	B	T	0.56	15.8	B
		R	0.12	10.3	B	R	0.17	10.7	B	R	0.14	10.4	B	R	0.13	10.4	B
Overall Intersection		-	**0.46**	**16.9**	**B**	-	**0.46**	**16.0**	**B**	-	**0.44**	**16.7**	**B**	-	**0.41**	**14.9**	**B**
Bay Street and Vanderbilt Avenue																	
Vanderbilt Avenue	EB	LR	0.45	38.4	D	LR	0.40	26.4	C	LR	0.40	36.8	D	LR	0.29	22.9	C
Bay Street	NB	DefL	0.47	16.4	B	-	-	-	-	-	-	-	-	-	-	-	-
		T	0.40	13.5	B	LT	0.49	14.2	B	LT	0.70	20.7	C	LT	0.30	11.8	B
	SB	T	0.41	13.6	B	T	0.48	14.5	B	T	0.41	13.4	B	T	0.42	13.4	B
		R	0.27	11.7	B	R	0.20	11.0	B	R	0.23	11.3	B	R	0.16	10.6	B
Overall Intersection		-	**0.46**	**16.8**	**B**	-	**0.46**	**15.5**	**B**	-	**0.60**	**19.0**	**B**	-	**0.37**	**13.8**	**B**

Bay Street and Edgewater St / Front St																	
Front Street	WB	LT	0.74	51.3	D	LT	0.62	37.1	D	LT	0.83	57.5	E	LT	0.42	31.6	C
		R	0.07	34.1	C	R	0.08	26.7	C	R	0.04	33.5	C	R	0.00	25.7	C
Edgewater Street	NB	LT	0.25	41.7	D	LT	0.22	31.7	C	LT	0.41	44.7	D	LT	0.18	29.4	C
		R	0.62	52.5	D	R	0.45	36.9	D	R	0.67	55.0	D	R	0.31	31.4	C
Bay Street	NB	TR	0.55	28.9	C	TR	0.90	45.0	D	TR	0.88	46.3	D	TR	0.64	27.1	C
	SB	LT	0.69	34.8	C	LT	0.79	33.0	C	LT	0.69	34.0	C	LT	0.56	24.4	C
Overall Intersection		-	**0.68**	**37.8**	**D**	-	**0.71**	**38.1**	**D**	-	**0.81**	**45.5**	**D**	-	**0.49**	**27.3**	**C**
Bay Street and Hylan Boulevard																	
Hylan Boulevard	EB	LTR	0.81	41.4	D	LTR	0.89	46.2	D	LTR	0.83	45.7	D	LTR	0.68	30.3	C
	WB	LTR	0.89	71.9	E	LTR	0.70	43.6	D	LTR	0.57	44.0	D	LTR	0.47	33.3	C
Bay Street	NB	LTR	0.77	30.1	C	LTR	0.60	19.6	B	LTR	0.84	34.6	C	LTR	0.54	18.4	B
	SB	T	0.58	23.6	C	T	0.51	17.9	B	T	0.61	24.1	C	T	0.55	18.6	B
		R	0.16	8.2	A	R	0.17	6.8	A	R	0.19	8.4	A	R	0.17	6.8	A
Overall Intersection		-	**0.83**	**34.8**	**C**	-	**0.72**	**26.6**	**C**	-	**0.82**	**32.4**	**C**	-	**0.60**	**20.8**	**C**
UNSIGNALIZED INTERSECTIONS																	
Front Street and Hannah Street																	
Hannah Street	WB	LT	0.03	8.0	A	LT	0.02	7.7	A	LT	0.02	8.1	A	LT	0.06	8.0	A
Front Street	NB	LR	0.46	14.3	B	LR	0.39	12.4	B	LR	0.49	14.6	B	LR	0.40	13.7	B
Overall Intersection		-	-	**13.6**	**B**	-	-	**12.0**	**B**	-	-	**14.1**	**B**	-	-	**12.4**	**B**
Bay Street and Wave Street																	
Wave Street	WB	LTR	0.16	17.2	C	LTR	0.37	20.1	C	LTR	0.24	18.0	C	LTR	0.19	16.1	C
Bay Street	NB	LTR	0.01	8.9	A	LTR	0.03	9.6	A	LTR	0.02	9.2	A	LTR	0.00	9.1	A
	SB	LTR	0.04	8.3	A	LTR	0.06	8.6	A	LTR	0.05	8.5	A	LTR	0.05	9.0	A
Overall Intersection		-	-	**12.9**	**B**	-	-	**15.6**	**C**	-	-	**13.8**	**B**	-	-	**13.4**	**B**
Bay Street and Prospect Street																	
Prospect Street	EB	LTR	0.14	17.7	C	LTR	0.23	23.3	C	LTR	0.19	18.6	C	LTR	0.14	16.5	C
Bay Street	SB	LT	0.03	8.7	A	LT	0.05	9.0	A	LT	0.03	8.9	A	LT	0.02	9.1	A
Overall Intersection		-	-	**14.2**	**B**	-	-	**16.7**	**C**	-	-	**15.4**	**C**	-	-	**14.8**	**B**
Bay Street and Water Street																	
Water Street	WB	LTR	0.12	22.4	C	LTR	0.24	21.2	C	LTR	0.27	26.1	D	LTR	0.17	14.7	B
Bay Street	NB	LT	0.08	8.7	A	LT	0.26	11.3	B	LT	0.17	10.2	B	LT	0.09	9.8	A
Overall Intersection		-	-	**14.2**	**B**	-	-	**13.9**	**B**	-	-	**15.1**	**C**	-	-	**12.3**	**B**
Bay Street and Thompson Street																	
Thompson Street	WB	LTR	0.13	14.8	B	LTR	0.10	14.6	B	LTR	0.18	16.0	C	LTR	0.11	13.6	B
Bay Street	NB	LT	0.01	8.8	A	LT	0.02	9.2	A	LT	0.01	9.3	A	LT	0.01	9.3	A
Overall Intersection		-	-	**14.1**	**B**	-	-	**13.2**	**B**	-	-	**15.1**	**C**	-	-	**13.1**	**B**

Notes

(1): Control delay is measured in seconds per vehicle.

(2): Level of service (LOS) for signalized intersections is based upon average control delay per vehicle (sec/veh) for each lane group as listed in the 2000 Highway Capacity Manual -- TRB.

(3): Level of service (LOS) for unsignalized intersections is based upon control delay per vehicle (sec/veh) for each minor-approach as listed in the 2000 Highway Capacity Manual -- TRB.

(4): Overall intersection V/C ratio is the critical lane groups' V/C ratio, not the weighted average of all the movements.

TABLE 17-22 (continued)
STAPLETON / HOMEPORT REDEVELOPMENT PROJECT
NO BUILD 2015 TRAFFIC LEVELS OF SERVICE

INTERSECTION & APPROACH		Weekday AM (8:00 AM - 9:00 AM)				Weekday Midday (12:30 PM - 1:30 PM)				Weekday PM (4:30 PM - 5:30 PM)				Saturday MD (11:45 PM - 12:45 PM)			
		Mvt.	V/C	Control Delay	LOS	Mvt.	V/C	Control Delay	LOS	Mvt.	V/C	Control Delay	LOS	Mvt.	V/C	Control Delay	LOS
SIGNALIZED INTERSECTIONS																	
Bay Street and Victory Boulevard																	
Victory Boulevard	EB	DefL	1.01	90.9	F	DefL	0.81	50.7	D	DefL	0.92	79.9	E	DefL	0.74	39.8	D
		TR	0.12	30.5	C	TR	0.06	20.1	C	TR	0.14	31.1	C	TR	0.11	20.8	C
	WB	LTR	0.18	31.8	C	LTR	0.07	20.3	C	LTR	0.15	31.1	C	LTR	0.04	19.9	B
Bay Street	NB	-	-	-	-	DefL	1.17	120.0+	F*	DefL	1.12	120.0+	F*	-	-	-	-
		LTR	1.16	109.1	F	TR	0.96	46.3	D	TR	1.06	76.3	E	LTR	0.88	31.2	C
	SB	LT	0.55	15.1	B	LT	0.57	15.1	B	LT	0.62	16.4	B	LT	0.47	13.5	B
		R	0.45	16.1	B	R	0.49	16.3	B	R	0.98	67.9	E	R	0.38	13.7	B
Overall Intersection		-	**1.11**	**62.5**	**E**	-	**1.03**	**40.7**	**D**	-	**1.05**	**54.1**	**D**	-	**0.82**	**23.4**	**C**
Bay Street and Hannah Street																	
Hannah Street	EB	LTR	0.65	47.8	D	LTR	0.18	21.5	C	LTR	0.46	48.4	D	LTR	0.19	26.1	C
	WB	LTR	0.86	56.0	E	LTR	0.67	30.9	C	LTR	0.91	73.7	E	LTR	0.62	29.7	C
Bay Street	NB	LTR	0.48	14.0	B	LTR	0.44	13.1	B	LTR	0.45	13.5	B	LTR	0.31	12.2	B
	SB	L	1.10	104.2	F	L	1.09	104.0	F	L	1.12	105.6	F	L	0.64	25.3	C
		T	0.26	11.2	B	T	0.35	12.0	B	T	0.33	11.8	B	T	0.27	11.7	B
		R	0.12	10.2	B	R	0.21	11.1	B	R	0.26	11.7	B	R	0.14	10.9	B
Overall Intersection		-	**1.02**	**34.4**	**C**	-	**0.93**	**26.1**	**C**	-	**1.05**	**38.7**	**D**	-	**0.63**	**17.1**	**B**
Bay Street and Van Duzer Street/Swan Street																	
Van Duzer Street	EB	L	0.25	32.4	C	L	0.19	21.4	C	L	0.18	31.1	C	L	0.10	20.4	C
		LR	0.30	33.5	C	LR	0.24	22.5	C	LR	0.19	31.4	C	LR	0.06	19.9	B
Bay Street	NB	LT	0.49	14.4	B	LT	0.43	13.1	B	LT	0.47	13.9	B	LT	0.31	11.8	B
	SB	TR	0.44	13.3	B	TR	0.49	13.7	B	TR	0.42	13.0	B	TR	0.44	13.0	B
Overall Intersection		-	**0.43**	**16.4**	**B**	-	**0.39**	**14.4**	**B**	-	**0.37**	**15.4**	**B**	-	**0.31**	**13.1**	**B**
Bay Street and Canal Street																	
Canal Street	EB	LTR	0.36	34.5	C	LTR	0.66	32.0	C	LTR	0.45	36.5	D	LTR	0.50	28.1	C
	WB	LR	0.11	30.5	C	LR	0.09	20.4	C	LR	0.18	31.5	C	LR	0.10	20.6	C
Bay Street	NB	TR	0.58	16.6	B	TR	0.66	18.3	B	TR	0.71	20.1	C	TR	0.54	15.4	B
	SB	LT	0.44	13.3	B	LT	0.42	12.9	B	LT	0.42	13.0	B	LT	0.39	12.5	B
Overall Intersection		-	**0.50**	**17.1**	**B**	-	**0.66**	**18.7**	**B**	-	**0.62**	**19.2**	**B**	-	**0.53**	**16.2**	**B**
Bay Street and Broad Street																	
Broad Street	EB	LR	0.41	35.6	D	LR	0.33	23.4	C	LR	0.29	32.9	C	LR	0.24	22.0	C
Bay Street	NB	LT	0.57	16.3	B	LT	0.77	22.6	C	LT	0.90	34.5	C	LT	0.58	16.0	B
	SB	T	0.68	19.5	B	T	0.73	20.5	C	T	0.65	18.3	B	T	0.68	18.8	B
		R	0.14	10.5	B	R	0.19	11.0	B	R	0.16	10.6	B	R	0.15	10.5	B
Overall Intersection		-	**0.59**	**19.6**	**B**	-	**0.60**	**20.8**	**C**	-	**0.69**	**25.9**	**C**	-	**0.51**	**17.3**	**B**
Bay Street and Vanderbilt Avenue																	
Vanderbilt Avenue	EB	LR	0.58	42.7	D	LR	0.51	29.1	C	LR	0.50	39.3	D	LR	0.37	24.1	C
Bay Street	NB	DefL	0.65	23.4	C	LT	0.70	18.8	B	LT	0.97	47.8	D	LT	0.42	13.2	B
		T	0.48	14.7	B	-	-	-	-	-	-	-	-	-	-	-	-
	SB	T	0.56	16.4	B	T	0.62	17.2	B	T	0.49	14.7	B	T	0.52	15.0	B
		R	0.31	12.2	B	R	0.23	11.3	B	R	0.26	11.7	B	R	0.19	10.9	B
Overall Intersection		-	**0.63**	**19.7**	**B**	-	**0.63**	**18.8**	**B**	-	**0.82**	**32.2**	**C**	-	**0.46**	**15.1**	**B**

Bay Street and Edgewater St / Front St																	
Front Street	WB	LT	0.99	84.0	F	LT	0.81	47.5	D	LT	1.01	89.5	F	LT	0.54	34.5	C
		R	0.08	34.3	C	R	0.09	26.9	C	R	0.04	33.6	C	R	0.00	25.7	C
Edgewater Street	NB	LT	0.44	46.3	D	LT	0.59	40.1	D	LT	0.98	90.2	F	LT	0.37	32.4	C
		R	0.76	61.3	E	R	0.67	45.3	D	R	1.11	120.0+	F*	R	0.43	33.6	C
Bay Street	NB	TR	0.62	30.5	C	TR	1.03	71.8	E	TR	1.03	76.2	E	TR	0.76	31.8	C
	SB	LT	0.98	66.0	E	LT	0.97	54.4	D	LT	0.83	41.5	D	LT	0.69	27.9	C
Overall Intersection		-	**0.93**	**55.4**	**E**	-	**0.88**	**56.1**	**E**	-	**1.04**	**78.4**	**E**	-	**0.61**	**31.1**	**C**
Bay Street and Hylan Boulevard																	
Hylan Boulevard	EB	LTR	0.95	59.7	E	LTR	1.04	82.6	F	LTR	0.99	73.5	E	LTR	0.84	42.1	D
	WB	LTR	1.18	120.0+	F*	LTR	0.99	83.1	F	LTR	0.81	56.4	E	LTR	0.65	39.4	D
Bay Street	NB	LTR	0.97	53.0	D	LTR	0.72	23.0	C	LTR	1.07	80.3	F	LTR	0.67	21.6	C
	SB	T	0.67	26.3	C	T	0.58	19.3	B	T	0.69	26.6	C	T	0.63	20.4	C
		R	0.20	8.5	A	R	0.20	7.0	A	R	0.22	8.7	A	R	0.20	7.1	A
Overall Intersection		-	**1.04**	**59.7**	**E**	-	**0.87**	**41.6**	**D**	-	**1.03**	**56.3**	**E**	-	**0.74**	**25.2**	**C**
UNSIGNALIZED INTERSECTIONS																	
Front Street and Hannah Street																	
Hannah Street	WB	LT	0.04	8.3	A	LT	0.03	7.9	A	LT	0.03	8.4	A	LT	0.08	8.3	A
Front Street	NB	LR	0.63	19.5	C	LR	0.54	15.3	C	LR	0.74	24.0	C	LR	0.58	18.7	C
Overall Intersection		-	-	**18.3**	**C**	-	-	**14.7**	**B**	-	-	**23.0**	**C**	-	-	**16.6**	**C**
Bay Street and Wave Street																	
Wave Street	WB	LTR	0.23	21.8	C	LTR	0.61	38.5	E	LTR	0.41	30.5	D	LTR	0.28	21.4	C
Bay Street	NB	LTR	0.01	9.4	A	LTR	0.04	10.9	B	LTR	0.03	10.2	B	LTR	0.01	10.0	B
	SB	LTR	0.05	8.5	A	LTR	0.08	9.3	A	LTR	0.07	9.3	A	LTR	0.06	9.8	A
Overall Intersection		-	-	**15.5**	**C**	-	-	**27.2**	**D**	-	-	**21.2**	**C**	-	-	**17.0**	**C**
Bay Street and Prospect Street																	
Prospect Street	EB	LTR	0.25	25.5	D	LTR	0.51	53.9	F	LTR	0.53	53.6	F	LTR	0.31	29.1	D
Bay Street	SB	LT	0.04	9.3	A	LT	0.11	11.0	B	LT	0.12	10.9	B	LT	0.06	11.0	B
Overall Intersection		-	-	**19.1**	**C**	-	-	**32.5**	**D**	-	-	**32.1**	**D**	-	-	**22.3**	**C**
Bay Street and Water Street																	
Water Street	WB	LTR	0.35	40.5	E	LTR	0.63	65.5	F	LTR	0.92	120.0+	F*	LTR	0.33	21.6	C
Bay Street	NB	LT	0.10	9.2	A	LT	0.35	13.5	B	LT	0.23	11.4	B	LT	0.11	10.6	B
Overall Intersection		-	-	**20.2**	**C**	-	-	**28.0**	**D**	-	-	**59.2**	**F**	-	-	**16.8**	**C**
Bay Street and Thompson Street																	
Thompson Street	WB	LTR	0.20	18.5	C	LTR	0.17	18.9	C	LTR	0.31	23.2	C	LTR	0.18	17.5	C
Bay Street	NB	LT	0.01	9.4	A	LT	0.03	10.1	B	LT	0.02	10.1	B	LT	0.01	9.9	A
Overall Intersection		-	-	**17.4**	**C**	-	-	**16.7**	**C**	-	-	**21.6**	**C**	-	-	**16.8**	**C**

Notes
(1): Control delay is measured in seconds per vehicle.
(2): Level of service (LOS) for signalized intersections is based upon average control delay per vehicle (sec/veh) for each lane group as listed in the 2000 Highway Capacity Manual -- TRB.
(3): Level of service (LOS) for unsignalized intersections is based upon control delay per vehicle (sec/veh) for each minor-approach as listed in the 2000 Highway Capacity Manual -- TRB.
(4): Overall intersection V/C ratio is the critical lane groups' V/C ratio, not the weighted average of all the movements.

TABLE 17-22 (continued)
STAPLETON / HOMEPORT REDEVELOPMENT PROJECT
BUILD 2015 TRAFFIC LEVELS OF SERVICE

INTERSECTION & APPROACH		Weekday AM (8:00 AM - 9:00 AM)				Weekday Midday (12:30 PM - 1:30 PM)				Weekday PM (4:30 PM - 5:30 PM)				Saturday MD (11:45 PM - 12:45 PM)			
		Mvt.	V/C	Control Delay	LOS	Mvt.	V/C	Control Delay	LOS	Mvt.	V/C	Control Delay	LOS	Mvt.	V/C	Control Delay	LOS
SIGNALIZED INTERSECTIONS																	
Bay Street and Victory Boulevard																	
Victory Boulevard	EB	DefL	1.01	90.9	F	DefL	0.81	50.7	D	DefL	0.92	79.9	E	DefL	0.74	39.8	D
		TR	0.12	30.5	C	TR	0.06	20.1	C	TR	0.14	31.1	C	TR	0.11	20.8	C
	WB	LTR	0.18	31.8	C	LTR	0.07	20.3	C	LTR	0.15	31.1	C	LTR	0.04	19.9	B
Bay Street	NB	-	-	-	-	DefL	1.20+	120.0+	F*	DefL	1.20+	120.0+	F*	DefL	0.97	74.0	E
		LTR	1.20+	120.0+	F*	TR	1.11	88.9	F	TR	1.20	120.0+	F*	TR	1.00	57.4	E
	SB	LT	0.58	15.7	B	LT	0.64	16.5	B	LT	0.70	18.3	B	LT	0.55	14.8	B
		R	0.45	16.1	B	R	0.49	16.3	B	R	0.98	67.9	E	R	0.38	13.7	B
Overall Intersection		**-**	**1.20+**	**88.2**	**F**	**-**	**1.20+**	**73.4**	**E**	**-**	**1.13**	**72.7**	**E**	**-**	**0.90**	**35.0**	**C**
Bay Street and Hannah Street																	
Hannah Street	EB	LTR	0.56	41.9	D	LTR	0.18	21.5	C	LTR	0.39	45.7	D	LTR	0.19	26.1	C
	WB	LTR	0.73	45.9	D	LTR	0.70	32.2	C	LTR	0.78	59.1	E	LTR	0.45	25.4	C
Bay Street	NB	LTR	0.58	15.6	B	LTR	0.52	14.2	B	LTR	0.56	15.3	B	LTR	0.43	13.5	B
	SB	L	1.20+	120.0+	F*	L	1.20+	120.0+	F*	L	1.20+	120.0+	F*	L	1.20+	120.0+	F*
		T	0.26	11.2	B	T	0.36	12.0	B	T	0.34	11.9	B	T	0.28	11.8	B
		R	0.12	10.2	B	R	0.21	11.1	B	R	0.26	11.7	B	R	0.14	10.9	B
Overall Intersection		**-**	**1.20+**	**70.2**	**E**	**-**	**1.20+**	**103.9**	**F**	**-**	**1.20+**	**91.7**	**F**	**-**	**1.20+**	**94.6**	**F**
Bay Street and Van Duzer Street/Swan Street																	
Van Duzer Street	EB	L	0.26	32.5	C	L	0.20	21.5	C	L	0.19	31.2	C	L	0.11	20.5	C
		LR	0.31	33.8	C	LR	0.33	24.1	C	LR	0.27	32.7	C	LR	0.08	20.1	C
Bay Street	NB	LT	0.67	18.2	B	LT	0.57	15.3	B	LT	0.69	18.8	B	LT	0.46	13.4	B
	SB	TR	0.44	13.3	B	TR	0.50	13.8	B	TR	0.43	13.2	B	TR	0.45	13.2	B
Overall Intersection		**-**	**0.55**	**18.0**	**B**	**-**	**0.48**	**15.5**	**B**	**-**	**0.55**	**17.9**	**B**	**-**	**0.32**	**13.8**	**B**
Bay Street and Canal Street																	
Canal Street	EB	LTR	0.37	34.9	C	LTR	0.80	41.7	D	LTR	0.55	39.8	D	LTR	0.62	32.4	C
	WB	LR	0.20	32.3	C	LR	0.16	21.4	C	LR	0.24	32.8	C	LR	0.19	22.0	C
Bay Street	NB	TR	0.77	22.9	C	TR	0.89	30.1	C	TR	1.10	84.0	F	TR	0.89	30.0	C
	SB	LT	0.46	13.6	B	LT	0.45	13.3	B	LT	0.45	13.4	B	LT	0.44	13.1	B
Overall Intersection		**-**	**0.64**	**20.1**	**C**	**-**	**0.85**	**25.4**	**C**	**-**	**0.92**	**53.0**	**D**	**-**	**0.79**	**23.6**	**C**
Bay Street and Broad Street																	
Broad Street	EB	LR	0.47	36.8	D	LR	0.39	24.5	C	LR	0.37	34.4	C	LR	0.32	23.2	C
Bay Street	NB	LT	0.73	21.1	C	LT	1.02	56.1	E	LT	1.20+	120.0+	F*	LT	0.87	27.9	C
	SB	T	0.72	20.9	C	T	0.77	22.3	C	T	0.68	19.4	B	T	0.74	20.8	C
		R	0.17	10.7	B	R	0.24	11.4	B	R	0.20	11.0	B	R	0.19	11.0	B
Overall Intersection		**-**	**0.64**	**22.1**	**C**	**-**	**0.77**	**36.2**	**D**	**-**	**0.95**	**78.6**	**E**	**-**	**0.66**	**23.5**	**C**
Bay Street and Vanderbilt Avenue																	
Vanderbilt Avenue	EB	LR	0.62	44.2	D	LR	0.59	31.3	C	LR	0.61	42.8	D	LR	0.46	25.9	C
Bay Street	NB	DefL	0.72	28.5	C	LT	0.86	26.9	C	LT	1.20+	120.0+	F*	LT	0.61	16.2	B
		T	0.64	18.5	B	-	-	-	-	-	-	-	-	-	-	-	-
	SB	T	0.58	16.9	B	T	0.62	17.3	B	T	0.50	14.9	B	T	0.53	15.2	B
		R	0.33	12.5	B	R	0.27	11.8	B	R	0.30	12.1	B	R	0.23	11.4	B
Overall Intersection		**-**	**0.69**	**21.1**	**C**	**-**	**0.76**	**23.0**	**C**	**-**	**1.04**	**80.2**	**F**	**-**	**0.55**	**16.7**	**B**
Bay Street and Edgewater St / Front St																	
Front Street	WB	L	0.53	38.0	D	L	0.40	24.5	C	L	0.50	37.2	D	L	0.25	22.2	C
		TR	0.58	40.5	D	TR	0.46	25.8	C	TR	0.65	42.5	D	TR	0.33	23.5	C
Edgewater Street	NB	R	0.38	32.1	C	R	0.38	24.1	C	R	0.69	40.8	D	R	0.28	23.3	C
Bay Street	NB	TR	0.46	13.6	B	TR	0.50	13.9	B	TR	0.61	16.1	B	TR	0.40	12.6	B
	SB	LT	0.62	17.6	B	LT	0.65	17.5	B	LT	0.57	16.0	B	LT	0.51	14.5	B
Overall Intersection		**-**	**0.61**	**22.6**	**C**	**-**	**0.56**	**18.4**	**B**	**-**	**0.64**	**24.4**	**C**	**-**	**0.44**	**16.2**	**B**

Bay Street and Hylan Boulevard																	
Hylan Boulevard	EB	LTR	1.02	81.8	F	LTR	1.15	120.0+	F*	LTR	1.13	120.0+	F*	LTR	1.03	83.3	F
	WB	LTR	1.20+	120.0+	F*	LTR	1.18	120.0+	F*	LTR	0.90	66.3	E	LTR	0.84	53.5	D
Bay Street	NB	LTR	1.06	78.9	E	LTR	0.83	28.3	C	LTR	1.20+	120.0+	F*	LTR	0.84	29.9	C
	SB	T	0.72	28.2	C	T	0.64	20.7	C	T	0.74	28.7	C	T	0.69	22.1	C
		R	0.22	8.7	A	R	0.22	7.2	A	R	0.24	8.9	A	R	0.23	7.2	A
Overall Intersection		**-**	**1.14**	**84.9**	**F**	**-**	**0.99**	**60.6**	**E**	**-**	**1.20+**	**94.7**	**F**	**-**	**0.93**	**37.5**	**D**
Front Street and Wave Street																	
Wave Street	EB	LR	0.13	20.8	C	LR	0.24	22.2	C	LR	0.22	21.9	C	LR	0.20	21.8	C
Front Street	NB	LT	0.33	12.4	B	LT	0.68	20.1	C	LT	0.62	17.7	B	LT	0.28	11.7	B
	SB	TR	0.50	14.6	B	TR	0.44	13.7	B	TR	0.50	14.6	B	TR	0.39	13.1	B
Overall Intersection		**-**	**0.36**	**14.4**	**B**		**0.51**	**17.6**	**B**		**0.47**	**16.8**	**B**		**0.32**	**13.7**	**B**
Front Street and Prospect Street																	
Prospect Street	EB	LTR	0.20	21.5	C	LTR	0.22	21.9	C	LTR	0.26	22.3	C	LTR	0.23	22.0	C
	WB	LR	0.12	20.7	C	LR	0.15	21.2	C	LR	0.13	20.9	C	LR	0.20	21.8	C
Front Street	NB	TR	0.27	11.8	B	TR	0.50	14.9	B	TR	0.55	15.8	B	TR	0.26	11.7	B
	SB	LT	0.60	16.9	B	LT	0.57	16.3	B	LT	0.64	18.3	B	LT	0.46	14.3	B
Overall Intersection		**-**	**0.44**	**16.5**	**B**	**-**	**0.43**	**16.6**	**B**	**-**	**0.49**	**17.9**	**B**	**-**	**0.37**	**15.5**	**B**
Front Street and Canal Street																	
Canal Street	EB	LR	0.26	22.5	C	LR	0.30	23.1	C	LR	0.23	22.0	C	LR	0.27	22.6	C
Front Street	NB	LT	0.19	10.8	B	LT	0.43	13.6	B	LT	0.53	15.2	B	LT	0.19	10.9	B
	SB	TR	0.61	16.8	B	TR	0.52	15.1	B	TR	0.54	15.4	B	TR	0.41	13.4	B
Overall Intersection		**-**	**0.47**	**16.4**	**B**		**0.44**	**15.6**	**B**		**0.42**	**16.0**	**B**		**0.36**	**14.5**	**B**
UNSIGNALIZED INTERSECTIONS																	
Front Street and Hannah Street																	
Hannah Street	WB	LT	0.04	8.5	A	LT	0.03	8.3	A	LT	0.03	9.1	A	LT	0.10	9.6	A
Front Street	NB	LR	0.52	16.8	C	LR	0.62	18.4	C	LR	0.67	23.9	C	LR	0.49	19.1	C
Overall Intersection		**-**	**-**	**15.8**	**C**	**-**	**-**	**17.7**	**C**	**-**	**-**	**22.7**	**C**	**-**	**-**	**16.5**	**C**
Bay Street and Wave Street																	
Wave Street	WB	LTR	0.59	49.5	E	LTR	1.20+	120.0+	F*	LTR	1.20+	120.0+	F*	LTR	1.13	120.0+	F*
Bay Street	NB	LTR	0.01	9.7	A	LTR	0.07	14.6	B	LTR	0.04	12.4	B	LTR	0.01	12.6	B
	SB	LTR	0.06	9.2	A	LTR	0.14	12.2	B	LTR	0.12	12.0	B	LTR	0.12	13.7	B
Overall Intersection		**-**	**-**	**34.9**	**D**	**-**	**-**	**120.0+**	**F***	**-**	**-**	**120.0+**	**F***	**-**	**-**	**120.0+**	**F***
Bay Street and Prospect Street																	
Prospect Street	EB	LTR	0.40	42.1	E	LTR	1.20+	120.0+	F*	LTR	1.20+	120.0+	F*	LTR	0.87	120.0+	F
Bay Street	SB	LT	0.06	10.4	B	LT	0.19	15.7	C	LT	0.21	15.7	C	LT	0.12	15.9	C
Overall Intersection		**-**	**-**	**29.5**	**D**	**-**	**-**	**120.0+**	**F***	**-**	**-**	**120.0+**	**F***	**-**	**-**	**93.4**	**F**
Bay Street and Water Street																	
Water Street	WB	LTR	1.03	120.0+	F*	LTR	1.20+	120.0+	F*	LTR	1.20+	120.0+	F*	LTR	1.00	109.0	F
Bay Street	NB	LT	0.11	9.3	A	LT	0.40	15.4	C	LT	0.26	12.4	B	LT	0.13	11.6	B
Overall Intersection		**-**	**-**	**91.6**	**F**	**-**	**-**	**120.0+**	**F***	**-**	**-**	**120.0+**	**F***	**-**	**-**	**81.2**	**F**
Bay Street and Thompson Street																	
Thompson Street	WB	LTR	0.39	27.9	D	LTR	0.56	49.0	E	LTR	0.92	110.9	F	LTR	0.51	43.0	E
Bay Street	NB	LT	0.01	9.7	A	LT	0.03	10.9	B	LT	0.02	10.8	B	LT	0.01	11.1	B
Overall Intersection		**-**	**-**	**26.4**	**D**	**-**	**-**	**43.0**	**E**	**-**	**-**	**103.1**	**F**	**-**	**-**	**40.8**	**E**

Notes
(1): Control delay is measured in seconds per vehicle.
(2): Level of service (LOS) for signalized intersections is based upon average control delay per vehicle (sec/veh) for each lane group as listed in the 2000 Highway Capacity Manual -- TRB.
(3): Level of service (LOS) for unsignalized intersections is based upon control delay per vehicle (sec/veh) for each minor-approach as listed in the 2000 Highway Capacity Manual -- TRB.
(4): Overall intersection V/C ratio is the critical lane groups' V/C ratio, not the weighted average of all the movements.

TABLE 17-22 (continued)
STAPLETON / HOMEPORT WATERFRONT REDEVELOPMENT STUDY
COMPARISON OF AM 2015 NO BUILD AND AM 2015 BUILD LEVELS OF SERVICE AND MITIGATION

INTERSECTION & APPROACH		2015 No Build Condition Mvt.	V/C	Control Delay	LOS	2015 Build Conditions Mvt.	V/C	Control Delay	LOS	Mitigated Condition Mvt.	V/C	Control Delay	LOS	Mitigation Measures
SIGNALIZED INTERSECTIONS														
Bay Street and Victory Boulevard														- Enforce parking regulation along the east side of the NB approach up to 120 ft. from the intersection.
Victory Boulevard	EB	DefL	1.01	90.9	F	DefL	1.01	90.9	F	L	0.91	67.1	E	
		TR	0.12	30.5	C	TR	0.12	30.5	C	TR	0.12	30.5	C	- Shift NB approach centerline 1 ft. to the west to provide one 10 ft. wide left-turn lane and one 13 ft. wide through lane.
	WB	LTR	0.18	31.8	C	LTR	0.18	31.8	C	LTR	0.18	31.9	C	
Bay Street	NB	LTR	1.16	109.1	F	LTR	1.20+	120.0+	F*	L	0.80	45.5	D	- Restripe SB approach to provide one 16 ft. wide right turn lane, one 11 ft. wide through lane and one 11 ft. wide left-through lane.
		-	-	-	-	-	-	-	-	TR	1.09	82.4	F	
	SB	LT	0.55	15.1	B	LT	0.58	15.7	B	LT	0.61	16.3	B	
		R	0.45	16.1	B	R	0.45	16.1	B	R	0.42	15.1	B	- Shift EB approach centerline 3 ft. to the north to provide one 14 ft. wide left turn lane and one 10 ft. wide through-right lane.
Overall Intersection		**-**	**1.11**	**62.5**	**E**	**-**	**1.20+**	**88.2**	**F**	**-**	**1.03**	**47.6**	**D**	
Bay Street and Hannah Street														- Shift SB approach centerline 3 ft. to the east to provide two 14 ft. wide left turn lanes, two 10 ft. wide through lanes, one 10.5 ft. wide right turn lane, and reduce the NB receiving lanes from 11 ft. and 25 ft. wide to 10 ft. and 23 ft. wide.
Hannah Street	EB	LTR	0.65	47.8	D	LTR	0.56	41.9	D	LTR	0.56	41.9	D	
	WB	LTR	0.86	56.0	E	LTR	0.73	45.9	D	LTR	0.83	54.6	D	
Bay Street	NB	LTR	0.48	14.0	B	LTR	0.58	15.6	B	LTR	0.81	35.6	D	
	SB	L	1.10	104.2	F	L	1.20+	120.0+	F*	L	0.84	66.6	E	- Shift WB centerline 4 ft. to the north to provide one 11 ft. wide approach lane and two 10 ft. wide EB receiving lanes.
		T	0.26	11.2	B	T	0.26	11.2	B	T	0.39	12.7	B	
		R	0.12	10.2	B	R	0.12	10.2	B	R	0.13	10.3	B	- Modify signal timing (Add a SB lead phase of 16s green, 3s yellow, 2s red by reducing NB/SB phase by 21 s and prohibiting the SB left movement during the NB/SB phase.)
Overall Intersection		**-**	**1.02**	**34.4**	**C**	**-**	**1.20+**	**70.2**	**E**	**-**	**0.82**	**36.2**	**D**	
Bay Street and Van Duzer Street/Swan Street														- Mitigation not required.
Van Duzer Street	EB	L	0.25	32.4	C	L	0.26	32.5	C					
		LR	0.30	33.5	C	LR	0.31	33.8	C					
Bay Street	NB	LT	0.49	14.4	B	LT	0.67	18.2	B					
	SB	TR	0.44	13.3	B	TR	0.44	13.3	B					
Overall Intersection		**-**	**0.43**	**16.4**	**B**	**-**	**0.55**	**18.0**	**B**					
Bay Street and Canal Street														- Shift NB approach centerline 3 ft. to the west to provide one 16 ft. wide NB through-right lane and two 10 ft. wide SB receiving lanes.
Canal Street	EB	LTR	0.36	34.5	C	LTR	0.37	34.9	C	LTR	0.37	34.9	C	
	WB	LR	0.11	30.5	C	LR	0.20	32.3	C	LR	0.2	32.3	C	
Bay Street	NB	TR	0.58	16.6	B	TR	0.77	22.9	C	TR	0.7	19.7	B	[Measures reflect operational improvements needed for PM peak period, otherwise mitigation not needeed.]
	SB	LT	0.44	13.3	B	LT	0.46	13.6	B	LT	0.46	13.6	B	
Overall Intersection		**-**	**0.50**	**17.1**	**B**	**-**	**0.64**	**20.1**	**C**	**-**	**0.59**	**18.7**	**B**	

Bay Street and Broad Street														- Shift NB approach centerline 1 ft. to the west to provide
Broad Street	EB	LR	0.41	35.6	D	LR	0.47	36.8	D	LR	0.47	36.8	D	one 16 ft. wide NB left-through lane and one 20 ft. wide SB
Bay Street	NB	LT	0.57	16.3	B	LT	0.73	21.1	C	LT	0.71	20.2	C	receiving lane.
	SB	T	0.68	19.5	B	T	0.72	20.9	C	T	0.72	20.9	C	[Measures reflect operational improvements needed
		R	0.14	10.5	B	R	0.17	10.7	B	R	0.17	10.7	B	for other peak periods, otherwise mitigation not neededed.]
Overall Intersection		**-**	**0.59**	**19.6**	**B**	**-**	**0.64**	**22.1**	**C**	**-**	**0.64**	**21.7**	**C**	
Bay Street and Vanderbilt Avenue														- Prohibit parking on the south side of the EB approach
Vanderbilt Avenue	EB	LR	0.58	42.7	D	LR	0.62	44.2	D	L	0.28	32.8	C	up to 120 ft. from the intersection to provide one 11 ft
		-	-	-	-	-	-	-	-	R	0.29	33.6	C	wide left turn lane and one 10 ft. wide right turn lane.
Bay Street	NB	DefL	0.65	23.4	C	DefL	0.72	28.5	C	DefL	0.63	22.7	C	- Shift NB centerline 6 ft. to the west and restripe NB
		T	0.48	14.7	B	T	0.64	18.5	B	T	0.59	16.8	B	approach to one 13 ft. wide left-through lane and one 12 ft.
	SB	T	0.56	16.4	B	T	0.58	16.9	B	T	0.61	17.5	B	wide through lane.
		R	0.31	12.2	B	R	0.33	12.5	B	R	0.36	13.0	B	- Shift SB centerline 3 ft. to the west to restripe SB
														approach to one 10 ft. wide right turn lane, one 10 ft. wide
Overall Intersection		**-**	**0.63**	**19.7**	**B**	**-**	**0.69**	**21.1**	**C**	**0.76**	**0.52**	**19.2**	**B**	through lane, and two 11 ft. wide NB receiving lanes.
														[Measures reflect operational improvements needed
														for PM peak period, otherwise mitigation not neededed.]
Bay Street and Edgewater St / Front St														- Mitigation not required.
Front Street	WB	LT	0.99	84.0	F	L	0.53	38.0	D					
		R	0.08	34.3	C	TR	0.58	40.5	D					
Edgewater Street	NB	LT	0.44	46.3	D	-	-	-	-					
		R	0.76	61.3	E	R	0.38	32.1	C					
Bay Street	NB	TR	0.62	30.5	C	TR	0.46	13.6	B					
	SB	LT	0.98	66.0	E	LT	0.62	17.6	B					
Overall Intersection		**-**	**0.93**	**55.4**	**E**	**-**	**0.61**	**22.6**	**C**					
Bay Street and Hylan Boulevard														- Prohibit parking along the south side of the EB approach
Hylan Boulevard	EB	LTR	0.95	59.7	E	LTR	1.02	81.8	F	L	0.70	41.8	D	up to 120 ft. from the intersection.
		-	-	-	-	-	-	-	-	TR	0.39	26.3	C	- Shift EB centerline 1.5 ft. to the north to provide one 10.5 ft.
	WB	LTR	1.18	120.0+	F*	LTR	1.20+	120.0+	F*	LTR	0.87	51.1	D	wide left turn lane, one 10.5 ft. wide through-right lane, and
Bay Street	NB	LTR	0.97	53.0	D	LTR	1.06	78.9	E	LTR	0.97	50.8	D	one 18 ft. wide WB receiving lane.
	SB	T	0.67	26.3	C	T	0.72	28.2	C	T	0.69	25.0	C	- Modify signal timing (eliminate EB lead phase, add 15s to
		R	0.20	8.5	A	R	0.22	8.7	A	R	0.27	16.2	B	EB/WB phase and 3s to NB/SB phase.)
Overall Intersection		**-**	**1.04**	**59.7**	**E**	**-**	**1.14**	**84.9**	**F**	**-**	**0.93**	**38.9**	**D**	
Front Street and Wave Street														- Mitigation not required.
Wave Street	EB	-	-	-	-	LR	0.13	20.8	C					
Front Street	NB	-	-	-	-	LT	0.33	12.4	B					
	SB	-	-	-	-	TR	0.50	14.6	B					
Overall Intersection		-	-	-	-	-	**0.36**	**14.4**	**B**					
Front Street and Prospect Street														- Mitigation not required.
Prospect Street	EB	-	-	-	-	LTR	0.20	21.5	C					
	WB	-	-	-	-	LR	0.12	20.7	C					
Front Street	NB	-	-	-	-	TR	0.27	11.8	B					
	SB	-	-	-	-	LT	0.60	16.9	B					
Overall Intersection		-	-	-	-	-	**0.44**	**16.5**	**B**					

Front Street and Canal Street														- Mitigation not required.
Canal Street	EB	-	-	-	-	LR	0.26	22.5	C					
Front Street	NB	-	-	-	-	LT	0.19	10.8	B					
	SB	-	-	-	-	TR	0.61	16.8	B					
Overall Intersection		-	-	-	-	-	**0.47**	**16.4**	**B**					

UNSIGNALIZED INTERSECTIONS

Front Street and Hannah Street														- Mitigation not required.
Hannah Street	WB	LT	0.04	8.3	A	LT	0.04	8.5	A					
Front Street	NB	LR	0.63	19.5	C	LR	0.52	16.8	C					
Overall Intersection		-	-	**18.3**	**C**	-	-	**15.8**	**C**					
Bay Street and Wave Street														- Install traffic signal
Wave Street	WB	LTR	0.23	21.8	C	LTR	0.59	49.5	E	LTR	0.25	33.2	C	[Signal warrant conditions met.]
Bay Street	NB	LTR	0.01	9.4	A	LTR	0.01	9.7	A	LTR	0.58	15.8	B	EB/WB 36 s green, 3 s yellow, 2 s red.
	SB	LTR	0.05	8.5	A	LTR	0.06	9.2	A	LTR	0.96	44.1	D	NB/SB 74 s green, 3 s yellow, 2 s red.
Overall Intersection		-	-	**15.5**	**C**	-	-	**34.9**	**D**	-	**0.73**	**31.7**	**C**	
Bay Street and Prospect Street														- Install traffic signal
Prospect Street	EB	LTR	0.25	25.5	D	LTR	0.40	42.1	E	LTR	0.18	31.5	C	[Signal warrant conditions met.]
Bay Street	NB	-	-	-	-	-	-	-	-	TR	0.69	19.2	B	EB/WB 37 s green, 3 s yellow, 2 s red.
	SB	LT	0.04	9.3	A	LT	0.06	10.4	B	LT	0.45	13.5	B	NB/SB 73 s green, 3 s yellow, 2 s red.
Overall Intersection		-	-	**19.1**	**C**	-	-	**29.5**	**D**	-	**0.52**	**16.8**	**B**	[Measures reflect improvements required to mitigated significant pedestrian impacts.] [Not impacted since there are less than 90 PCE's]
Bay Street and Water Street														- Install traffic signal
Water Street	WB	LTR	0.35	40.5	E	LTR	1.03	120.0+	F*	LTR	0.38	35.4	D	[Signal warrant conditions met.]
Bay Street	NB	LT	0.10	9.2	A	LT	0.11	9.3	A	LT	0.56	15.4	B	WB 37 s green, 3 s yellow, 2 s red.
	SB	-	-	-	-	-	-	-	-	TR	0.79	22.8	C	NB/SB 73 s green, 3 s yellow, 2 s red.
Overall Intersection		-	-	**20.2**	**C**	-	-	**91.6**	**F**	-	**0.65**	**20.5**	**C**	- Shift NB centerline 9 ft to the west to provide one 10 ft. wide left-through lane, one 10 ft. wide through lane, and one 14 ft. wide SB receiving lane. - Shift SB centerline 8 ft. to the west to provide one 15 ft. wide through-right lane and two 10 ft. wide NB receiving lanes. - Prohibit parking along west side of SB approach 120 ft. from the intersection at all times.
Bay Street and Thompson Street														- Mitigation not required.
Thompson Street	WB	LTR	0.20	18.5	C	LTR	0.39	27.9	D					[Not impacted since there are less than 90 PCE's]
Bay Street	NB	LT	0.01	9.4	A	LT	0.01	9.7	A					
	SB	-	-	-	-	-	-	-	-					
Overall Intersection		-	-	**17.4**	**C**	-	-	**26.4**	**D**					

Notes

(1): Control delay is measured in seconds per vehicle.

(2): Level of service (LOS) for signalized intersections is based upon average control delay per vehicle (sec/veh) for each lane group as listed in the 2000 Highway Capacity Manual -- TRB.

(3): Level of service (LOS) for unsignalized intersections is based upon control delay per vehicle (sec/veh) for each minor-approach as listed in the 2000 Highway Capacity Manual -- TRB.

(4): Overall intersection V/C ratio is the critical lane groups' V/C ratio, not the weighted average of all the movements.

(5): Significantly impacted turning movements and overall intersections are highlighted

TABLE 17-22 (continued)
STAPLETON / HOMEPORT WATERFRONT REDEVELOPMENT STUDY
COMPARISON OF MD 2015 NO BUILD AND MD 2015 BUILD LEVELS OF SERVICE AND MITIGATION

INTERSECTION & APPROACH		2015 No Build Condition Mvt.	V/C	Control Delay	LOS	2015 Build Conditions Mvt.	V/C	Control Delay	LOS	Mitigated Condition Mvt.	V/C	Control Delay	LOS	Mitigation Measures
SIGNALIZED INTERSECTIONS														
Bay Street and Victory Boulevard														- Prohibit parking along the east side of the NB approach up to 120 ft. from the intersection.
Victory Boulevard	EB	DefL	0.81	50.7	D	DefL	0.81	50.7	D	L	0.76	44.9	D	- Shift NB approach centerline 1 ft. to the west to provide one 10 ft. wide left turn lane and one 13 ft. wide through lane.
		TR	0.06	20.1	C	TR	0.06	20.1	C	TR	0.07	20.8	C	- Restripe SB approach to provide one 16 ft. wide right turn lane, one 11 ft. wide through lane and one 11 ft. wide left-through lane.
	WB	LTR	0.07	20.3	C	LTR	0.07	20.3	C	LTR	0.08	21.0	C	- Shift EB approach centerline 3 ft. to the north to provide one 14 ft. wide left turn lane and one 10 ft. wide through-right lane.
Bay Street	NB	DefL	1.17	120.0+	F*	DefL	1.20+	120.0+	F*	L	0.97	78.5	E	- Modify signal timing (Add a NB lag phase of 8s green, 3s yellow, 2s red by reducing NB/SB phase by 12s and EB/WB phase by 1s.)
		TR	0.96	46.3	D	TR	1.11	88.9	F	TR	0.89	30.9	C	
	SB	LT	0.57	15.1	B	LT	0.64	16.5	B	LT	0.90	36.0	D	
		R	0.49	16.3	B	R	0.49	16.3	B	R	0.47	15.3	B	
Overall Intersection		**-**	**1.03**	**40.7**	**D**	**-**	**1.20+**	**73.4**	**E**	**-**	**0.84**	**37.7**	**D**	
Bay Street and Hannah Street														- Shift SB approach centerline 3 ft. to the east to provide two 14 ft. wide left turn lanes, two 10 ft. wide through lanes, one 10.5 ft. wide right turn lane, and reduce the NB receiving lanes from 11 ft. and 25 ft. wide to 10 ft. and 23 ft. wide.
Hannah Street	EB	LTR	0.18	21.5	C	LTR	0.18	21.5	C	LTR	0.18	21.5	C	- Shift WB centerline 4 ft. to the north to provide one 11 ft. wide approach lane and two 10 ft. wide EB receiving lanes.
	WB	LTR	0.67	30.9	C	LTR	0.70	32.2	C	LTR	0.80	38.5	D	- Modify signal timing (Add a SB lead phase of 15s green, 3s yellow, 2s red by reducing NB/SB phase by 20 s and prohibiting the SB left movement during the NB/SB phase.)
Bay Street	NB	LTR	0.44	13.1	B	LTR	0.52	14.2	B	LTR	0.76	32.8	C	
	SB	L	1.09	104.0	F	L	1.20+	120.0+	F*	L	0.83	49.8	D	
		T	0.35	12.0	B	T	0.36	12.0	B	T	0.50	14.0	B	
		R	0.21	11.1	B	R	0.21	11.1	B	R	0.23	11.4	B	
Overall Intersection		**-**	**0.93**	**26.1**	**C**	**-**	**1.20+**	**103.9**	**F**	**-**	**0.79**	**29.3**	**C**	
Bay Street and Van Duzer Street/Swan Street														- Mitigation not required.
Van Duzer Street	EB	L	0.19	21.4	C	L	0.20	21.5	C					
		LR	0.24	22.5	C	LR	0.33	24.1	C					
Bay Street	NB	LT	0.43	13.1	B	LT	0.57	15.3	B					
	SB	TR	0.49	13.7	B	TR	0.50	13.8	B					
Overall Intersection		**-**	**0.39**	**14.4**	**B**	**-**	**0.48**	**15.5**	**B**					
Bay Street and Canal Street														- Shift NB approach centerline 3 ft. to the west to provide one 16 ft. wide NB through-right lane and two 10 ft. wide SB receiving lanes.
Canal Street	EB	LTR	0.66	32.0	C	LTR	0.80	41.7	D	LTR	0.80	41.7	D	[Measures reflect operational improvements needed for PM peak period, otherwise mitigation not neededed.]
	WB	LR	0.09	20.4	C	LR	0.16	21.4	C	LR	0.16	21.4	C	
Bay Street	NB	TR	0.66	18.3	B	TR	0.89	30.1	C	TR	0.81	23.4	C	
	SB	LT	0.42	12.9	B	LT	0.45	13.3	B	LT	0.45	13.3	B	
Overall Intersection		**-**	**0.66**	**18.7**	**B**	**-**	**0.85**	**25.4**	**C**	**-**	**0.80**	**22.6**	**C**	

Bay Street and Broad Street														- Modify signal timing (shift 1 s from EB/WB phase to NB/SB phase.)
Broad Street	EB	LR	0.33	23.4	C	LR	0.39	24.5	C	LR	0.41	25.4	C	
Bay Street	NB	LT	0.77	22.6	C	LT	1.02	56.1	E	LT	0.95	38.6	D	- Shift NB approach centerline 1 ft. to the west to provide one 16 ft. wide NB left-through lane and one 20 ft. wide SB receiving lane.
	SB	T	0.73	20.5	C	T	0.77	22.3	C	T	0.76	21.0	C	
		R	0.19	11.0	B	R	0.24	11.4	B	R	0.23	10.9	B	
Overall Intersection		-	**0.60**	**20.8**	**C**	-	**0.77**	**36.2**	**D**	-	**0.74**	**28.1**	**C**	
Bay Street and Vanderbilt Avenue														- Prohibit parking on the south side of the EB approach up to 120 ft. from the intersection to provide one 11 ft wide left lane and one 10 ft. wide right lane.
Vanderbilt Avenue	EB	LR	0.51	29.1	C	LR	0.59	31.3	C	L	0.26	22.4	C	
		-	-	-	-	-	-	-	-	R	0.27	22.9	C	
Bay Street	NB	LT	0.70	18.8	B	LT	0.86	26.9	C	LT	0.78	21.3	C	- Shift NB centerline 6 ft. to the west and restripe NB approach to one 13 ft. wide left-through lane and one 12 ft. wide through lane.
	SB	T	0.62	17.2	B	T	0.62	17.3	B	T	0.65	18.0	B	
		R	0.23	11.3	B	R	0.27	11.8	B	R	0.29	12.0	B	
Overall Intersection		-	**0.63**	**18.8**	**B**	-	**0.76**	**23.0**	**C**	-	**0.58**	**19.5**	**B**	- Shift SB centerline 3 ft. to the west to restripe SB approach to one 10 ft. wide right turn lane, one 10 ft. wide through lane, and two 11 ft. wide NB receiving lanes. [Measures reflect operational improvements needed for PM peak period, otherwise mitigation not neededed.]
Bay Street and Edgewater St / Front St														- Mitigation not required.
Front Street	WB	LT	0.81	47.5	D	L	0.40	24.5	C					
		R	0.09	26.9	C	TR	0.46	25.8	C					
Edgewater Street	NB	LT	0.59	40.1	D	-	-	-	-					
		R	0.67	45.3	D	R	0.38	24.1	C					
Bay Street	NB	TR	1.03	71.8	E	TR	0.50	13.9	B					
	SB	LT	0.97	54.4	D	LT	0.65	17.5	B					
Overall Intersection		-	**0.88**	**56.1**	**E**	-	**0.56**	**18.4**	**B**					
Bay Street and Hylan Boulevard														- Prohibit parking along the south side of the EB approach up to 120 ft. from the intersection.
Hylan Boulevard	EB	LTR	1.04	82.6	F	LTR	1.15	120.0+	F*	L	0.74	39.3	D	
		-	-	-	-	-	-	-	-	TR	0.42	23.7	C	- Shift EB centerline 1.5 ft. to the north to provide one 10.5 ft. wide left turn lane, one 10.5 ft. wide through-right lane, and one 18 ft. wide WB receiving lane.
	WB	LTR	0.99	83.1	F	LTR	1.18	120.0+	F*	LTR	0.81	41.5	D	
Bay Street	NB	LTR	0.72	23.0	C	LTR	0.83	28.3	C	LTR	0.73	20.0	C	
	SB	T	0.58	19.3	B	T	0.64	20.7	C	T	0.57	16.1	B	- Modify signal timing (eliminate EB lead phase, add 9s to EB/WB phase and 5s to NB/SB phase.)
		R	0.20	7.0	A	R	0.22	7.2	A	R	0.26	11.6	B	
Overall Intersection		-	**0.87**	**41.6**	**D**	-	**0.99**	**60.6**	**E**	-	**0.76**	**23.9**	**C**	
Front Street and Wave Street														- Mitigation not required.
Wave Street	EB	-	-	-	-	LR	0.24	22.2	C					
Front Street	NB	-	-	-	-	LT	0.68	20.1	C					
	SB	-	-	-	-	TR	0.44	13.7	B					
Overall Inter		-	-	-	-	-	**0.51**	**17.6**	**B**					
Front Street and Prospect Street														- Mitigation not required.
Prospect Street	EB	-	-	-	-	LTR	0.22	21.9	C					
	WB	-	-	-	-	LR	0.15	21.2	C					
	NB	-	-	-	-	TR	0.50	14.9	B					
Front Street	SB	-	-	-	-	LT	0.57	16.3	B					
Overall Intersection		-	-	-	-	-	**0.43**	**16.6**	**B**					

Front Street and Canal Street														- Mitigation not required.
Canal Street	EB	-	-	-	-	LR	0.30	23.1	C					
Front Street	NB	-	-	-	-	LT	0.43	13.6	B					
	SB	-	-	-	-	TR	0.52	15.1	B					
Overall Intersection		-	-	-	-	-	**0.44**	**15.6**	**B**					

UNSIGNALIZED INTERSECTIONS

Front Street and Hannah Street														- Mitigation not required.
Hannah Street	WB	LT	0.03	7.9	A	LT	0.03	8.3	A					
Front Street	NB	LR	0.54	15.3	C	LR	0.62	18.4	C					
Overall Intersection		-	-	**14.7**	**B**	-	-	**17.7**	**C**					
Bay Street and Wave Street														- Install traffic signal
Wave Street	WB	LTR	0.61	38.5	E	LTR	1.20+	120.0+	F*	LTR	0.67	44.4	D	[Signal warrant conditions met.]
Bay Street	NB	LTR	0.04	10.9	B	LTR	0.07	14.6	B	LTR	0.63	11.0	B	EB/WB 20 s green, 3 s yellow, 2 s red.
	SB	LTR	0.08	9.3	A	LTR	0.14	12.2	B	LTR	0.98	40.6	D	NB/SB 60 s green, 3 s yellow, 2 s red.
Overall Intersection		-	-	**27.2**	**D**	-	-	**120.0+**	**F***	-	**0.90**	**28.8**	**C**	
Bay Street and Prospect Street														- Install traffic signal
Prospect Street	EB	LTR	0.51	53.9	F	LTR	1.20+	120.0+	F*	LTR	0.23	22.4	C	[Signal warrant conditions met.]
Bay Street	NB	-	-	-	-	-	-	-	-	TR	0.90	30.2	C	EB/WB 31 s green, 3 s yellow, 2 s red.
	SB	LT	0.11	11.0	B	LT	0.19	15.7	C	LT	0.64	16.4	B	NB/SB 49 s green, 3 s yellow, 2 s red.
														[Measures reflect improvements required to mitigated
Overall Intersection		-	-	**32.5**	**D**	-	-	**120.0+**	**F***	-	**0.64**	**23.2**	**C**	significant pedestrian impacts.]
														[Not impacted since there are less than 90 PCE's]
Bay Street and Water Street														- Install traffic signal
Water Street	WB	LTR	0.63	65.5	F	LTR	1.20+	120.0+	F*	LTR	0.54	40.5	D	[Signal warrant conditions met.]
Bay Street	NB	LT	0.35	13.5	B	LT	0.40	15.4	C	DefL	0.87	41.1	D	WB 19 s green, 3 s yellow, 2 s red.
		-	-	-	-	-	-	-	-	T	0.68	11.8	B	NB/SB 61 s green, 3 s yellow, 2 s red.
	SB	-	-	-	-	-	-	-	-	TR	0.75	13.4	B	- Shift NB centerline 9 ft to the west to provide one 10 ft. wide
														left-through lane, one 10 ft. wide through lane, and one 14 ft.
Overall Intersection		-	-	**28.0**	**D**	-	-	**120.0+**	**F***	-	**0.79**	**17.3**	**B**	wide SB receiving lane.
														- Shift SB centerline 8 ft. to the west to provide one 15 ft.
														wide through-right lane and two 10 ft. wide NB receiving
														lanes.
														- Prohibit parking along west side of SB approach 120 ft.
														from the intersection at all times.
Bay Street and Thompson Street														- Mitigation not required.
Thompson Street	WB	LTR	0.17	18.9	C	LTR	0.56	49.0	E					[Not impacted since there are less than 90 PCE's]
Bay Street	NB	LT	0.03	10.1	B	LT	0.03	10.9	B					
	SB	-	-	-	-	-	-	-	-					
Overall Intersection		-	-	**16.7**	**C**	-	-	**43.0**	**E**					

Notes

(1): Control delay is measured in seconds per vehicle.

(2): Level of service (LOS) for signalized intersections is based upon average control delay per vehicle (sec/veh) for each lane group as listed in the 2000 Highway Capacity Manual -- TRB.

(3): Level of service (LOS) for unsignalized intersections is based upon control delay per vehicle (sec/veh) for each minor-approach as listed in the 2000 Highway Capacity Manual -- TRB.

(4): Overall intersection V/C ratio is the critical lane groups' V/C ratio, not the weighted average of all the movements.

(5): Significantly impacted turning movements and overall intersections are highlighted

TABLE 17-22 (continued)
STAPLETON / HOMEPORT WATERFRONT REDEVELOPMENT STUDY
COMPARISON OF PM 2015 NO BUILD AND PM 2015 BUILD LEVELS OF SERVICE AND MITIGATION

		2015 No Build Condition				2015 Build Conditions				Mitigated Condition				
INTERSECTION & APPROACH		**Mvt.**	**V/C**	**Control Delay**	**LOS**	**Mvt.**	**V/C**	**Control Delay**	**LOS**	**Mvt.**	**V/C**	**Control Delay**	**LOS**	**Mitigation Measures**
SIGNALIZED INTERSECTIONS														
Bay Street and Victory Boulevard														- Prohibit parking along the east side of the NB approach
Victory Boulevard	EB	DefL	0.92	79.9	E	DefL	0.92	79.9	E	L	0.83	63.6	E	up to 120 ft. from the intersection.
		TR	0.14	31.1	C	TR	0.14	31.1	C	TR	0.14	31.1	C	- Shift NB approach centerline 1 ft. to the west to provide
	WB	LTR	0.15	31.1	C	LTR	0.15	31.1	C	LTR	0.15	31.1	C	a 10 ft. wide left turn lane and a 13 ft. wide through lane.
Bay Street	NB	DefL	1.12	120.0+	F*	DefL	1.20+	120.0+	F*	L	0.33	12.5	B	- Restripe SB approach to provide a 16 ft. wide right turn
		TR	1.06	76.3	E	TR	1.20	120.0+	F*	TR	0.98	49.3	D	lane, one 11 ft. wide through lane and one 11 ft. wide left-
	SB	LT	0.62	16.4	B	LT	0.70	18.3	B	LT	0.74	19.6	B	through lane.
		R	0.98	67.9	E	R	0.98	67.9	E	R	0.91	49.2	D	- Shift EB approach centerline 3 ft. to the north to provide
														one 14 ft. wide left turn lane and one 10 ft. wide through-right
Overall Intersection		**-**	**1.05**	**54.1**	**D**	**-**	**1.13**	**72.7**	**E**	**-**	**0.93**	**34.1**	**C**	lane.
Bay Street and Hannah Street														- Shift SB approach centerline 3 ft. to the east to provide two
Hannah Street	EB	LTR	0.46	48.4	D	LTR	0.39	45.7	D	LTR	0.39	45.7	D	14 ft. wide left turn lanes, two 10 ft. wide through lanes, one
	WB	LTR	0.91	73.7	E	LTR	0.78	59.1	E	LTR	0.88	71.3	E	10.5 ft. wide right turn lane, and reduce the NB receiving
Bay Street	NB	LTR	0.45	13.5	B	LTR	0.56	15.3	B	LTR	0.88	43.3	D	lanes from 11 ft. and 25 ft. wide to 10 ft. and 23 ft. wide.
	SB	L	1.12	105.6	F	L	1.20+	120.0+	F*	L	1.01	87.7	F	- Shift WB centerline 4 ft. to the north to provide one 11 ft.
		T	0.33	11.8	B	T	0.34	11.9	B	T	0.50	14.1	B	wide approach lane and two 10 ft. wide EB receiving lanes.
		R	0.26	11.7	B	R	0.26	11.7	B	R	0.29	12.0	B	- Modify signal timing (Add a SB lead phase of 23s green,
														3s yellow, 2s red by reducing NB/SB phase by 28 s
Overall Intersection		**-**	**1.05**	**38.7**	**D**	**-**	**1.20+**	**91.7**	**F**	**-**	**0.90**	**44.9**	**D**	and prohibiting the SB left movement during the NB/SB
														phase.)
Bay Street and Van Duzer Street/Swan Street														- Mitigation not required.
Van Duzer Street	EB	L	0.18	31.1	C	L	0.19	31.2	C					
		LR	0.19	31.4	C	LR	0.27	32.7	C					
Bay Street	NB	LT	0.47	13.9	B	LT	0.69	18.8	B					
	SB	TR	0.42	13.0	B	TR	0.43	13.2	B					
Overall Intersection		**-**	**0.37**	**15.4**	**B**	**-**	**0.55**	**17.9**	**B**					
Bay Street and Canal Street														- Modify signal timing (shift 3 s from EB/WB phase to
Canal Street	EB	LTR	0.45	36.5	D	LTR	0.55	39.8	D	LTR	0.61	44.4	D	NB/SB phase.)
	WB	LR	0.18	31.5	C	LR	0.24	32.8	C	LR	0.27	35.6	D	- Shift NB approach centerline 3 ft. to the west to provide
Bay Street	NB	TR	0.71	20.1	C	TR	1.10	84.0	F	TR	0.97	39.2	D	one 16 ft. wide NB through-right lane and two 10 ft. wide SB
	SB	LT	0.42	13.0	B	LT	0.45	13.4	B	LT	0.43	11.8	B	receiving lanes.
Overall Intersection		**-**	**0.62**	**19.2**	**B**	**-**	**0.92**	**53.0**	**D**	**-**	**0.85**	**29.8**	**C**	

Bay Street and Broad Street														- Modify signal timing (shift 4 s from EB/WB phase to NB/SB phase.)
Broad Street	EB	LR	0.29	32.9	C	LR	0.37	34.4	C	LR	0.49	44.1	D	
Bay Street	NB	LT	0.90	34.5	C	LT	1.20+	120.0+	F*	LT	0.97	39.2	D	- Shift NB approach centerline 1 ft. to the west to provide one 16 ft. wide NB left-through lane and one 20 ft. wide SB receiving lane.
	SB	T	0.65	18.3	B	T	0.68	19.4	B	T	0.61	12.6	B	
		R	0.16	10.6	B	R	0.20	11.0	B	R	0.17	7.2	A	
Overall Intersection		**-**	**0.69**	**25.9**	**C**	**-**	**0.95**	**78.6**	**E**	**-**	**0.85**	**27.8**	**C**	
Bay Street and Vanderbilt Avenue														- Prohibit parking on the south side of the EB approach up to 120 ft. from the intersection to provide one 11 ft wide left turn lane and one 10 ft. wide right turn lane.
Vanderbilt Avenue	EB	LR	0.50	39.3	D	LR	0.61	42.8	D	L	0.48	43.8	D	
	-	-	-	-	-	-	-	-	-	R	0.26	39.5	D	
Bay Street	NB	LT	0.97	47.8	D	LT	1.20+	120.0+	F*	LT	1.00	45.4	D	- Shift NB centerline 6 ft. to the west and restripe NB approach to one 13 ft. wide left-through lane and one 12 ft. wide through lane.
	SB	T	0.49	14.7	B	T	0.50	14.9	B	T	0.46	10.1	B	
		R	0.26	11.7	B	R	0.30	12.1	B	R	0.29	8.2	A	
Overall Intersection		**-**	**0.82**	**32.2**	**C**	**-**	**1.04**	**80.2**	**F**	**-**	**0.86**	**31.1**	**C**	- Shift SB centerline 3 ft. to the west to restripe SB approach to one 10 ft. wide right turn lane, one 10 ft. wide through lane, and two 11 ft. wide NB receiving lanes. - Modify signal timing (Shift 9 s from EB phase to NB/SB phase.)
Bay Street and Edgewater St / Front St														- Mitigation not required.
Front Street	WB	LT	1.01	89.5	F	L	0.5	37.2	D					
		R	0.04	33.6	C	TR	0.65	42.5	D					
Edgewater Street	NB	LT	0.98	90.2	F	-	-	-	-					
		R	1.11	120.0+	F*	R	0.69	40.8	D					
Bay Street	NB	TR	1.03	76.2	E	TR	0.61	16.1	B					
	SB	LT	0.83	41.5	D	LT	0.57	16.0	B					
Overall Intersection		**-**	**1.04**	**78.4**	**E**	**-**	**0.64**	**24.4**	**C**					
Bay Street and Hylan Boulevard														- Prohibit parking along the south side of the EB approach up to 120 ft. from the intersection.
Hylan Boulevard	EB	LTR	0.99	73.5	E	LTR	1.13	120.0+	F*	L	0.82	61.0	E	
	-	-	-	-	-	-	-	-	-	TR	0.55	38.9	D	- Shift EB centerline 1.5 ft. to the north to provide one 10.5 ft. wide left turn lane, one 10.5 ft. wide through-right lane, and one 18 ft. wide WB receiving lane.
	WB	LTR	0.81	56.4	E	LTR	0.90	66.3	E	LTR	0.75	46.1	D	
Bay Street	NB	LTR	1.07	80.3	F	LTR	1.20+	120.0+	F*	LTR	0.90	32.1	C	
	SB	T	0.69	26.6	C	T	0.74	28.7	C	T	0.62	17.4	B	- Modify signal timing (eliminate EB lead phase, add 6s to EB/WB phase and 12s to NB/SB phase.)
		R	0.22	8.7	A	R	0.24	8.9	A	R	0.25	11.6	B	
Overall Intersection		**-**	**1.03**	**56.3**	**E**	**-**	**1.20+**	**94.7**	**F**	**-**	**0.87**	**31.8**	**C**	
Front Street and Wave Street														- Mitigation not required.
Wave Street	EB	-	-	-	-	LR	0.22	21.9	C					
Front Street	NB	-	-	-	-	LT	0.62	17.7	B					
	SB	-	-	-	-	TR	0.50	14.6	B					
Overall Intersection		-	-	-	-	-	**0.47**	**16.8**	**B**					
Front Street and Prospect Street		-	-	-	-									- Mitigation not required.
Prospect Street	EB	-	-	-	-	LTR	0.26	22.3	C					
	WB	-	-	-	-	LR	0.13	20.9	C					
Front Street	NB	-	-	-	-	TR	0.55	15.8	B					
	SB					LT	0.64	18.3	B					
		-	-	-	-									
Overall Intersection						-	**0.49**	**17.9**	**B**					

Front Street and Canal Street														- Mitigation not required.
Canal Street	EB	-	-	-	-	LR	0.23	22.0	C					
Front Street	NB	-	-	-	-	LT	0.53	15.2	B					
	SB	-	-	-	-	TR	0.54	15.4	B					
Overall Intersection		-				-	**0.42**	**16.0**	**B**					

UNSIGNALIZED INTERSECTIONS

Front Street and Hannah Street														- Mitigation not required.
Hannah Street	WB	LT	0.03	8.4	A	LT	0.03	9.1	A					
Front Street	NB	LR	0.74	24.0	C	LR	0.67	23.9	C					
Overall Intersection		-	-	**23.0**	**C**	-	-	**22.7**	**C**					
Bay Street and Wave Street														- Install traffic signal
Wave Street	WB	LTR	0.41	30.5	D	LTR	1.20+	120.0+	F*	LTR	0.37	35.6	D	[Signal warrant conditions met.]
Bay Street	NB	LTR	0.03	10.2	B	LTR	0.04	12.4	B	LTR	0.76	22.0	C	EB/WB 37 s green, 3 s yellow, 2 s red.
	SB	LTR	0.07	9.3	A	LTR	0.12	12.0	B	LTR	0.92	34.7	C	NB/SB 73 s green, 3 s yellow, 2 s red.
Overall Intersection		-	-	**21.2**	**C**	-	-	**120.0+**	**F***	-	**0.73**	**29.1**	**C**	
Bay Street and Prospect Street														- Install traffic signal
Prospect Street	EB	LTR	0.53	53.6	F	LTR	1.20+	120.0+	F*	LTR	0.28	33.5	C	[Signal warrant conditions met.]
Bay Street	NB	-	-	-	-	-	-	-	-	TR	0.84	26.4	C	EB/WB 37 s green, 3 s yellow, 2 s red.
	SB	LT	0.12	10.9	B	LT	0.21	15.7	C	LT	0.55	15.1	B	NB/SB 73 s green, 3 s yellow, 2 s red.
														[Measures reflect improvements required to mitigated
Overall Intersection		-	-	**32.1**	**D**	-	-	**120.0+**	**F***	-	**0.65**	**21.6**	**C**	significant pedestrian impacts.]
														[Not impacted since there are less than 90 PCE's]
Bay Street and Water Street														- Install traffic signal
Water Street	WB	LTR	0.92	120.0+	F*	LTR	1.20+	120.0+	F*	LTR	0.40	36.3	D	[Signal warrant conditions met.]
Bay Street	NB	LT	0.23	11.4	B	LT	0.26	12.4	B	L	0.72	19.4	B	WB 37 s green, 3 s yellow, 2 s red.
	SB	-	-	-	-	-	-	-	-	T	0.71	19.8	B	NB/SB 73 s green, 3 s yellow, 2 s red.
														- Shift NB centerline 9 ft to the west to provide one 10 ft.
Overall Intersection		-	-	**59.2**	**F**	-	-	**120.0+**	**F***	-	**0.61**	**20.7**	**C**	wide left-through lane, one 10 ft. wide through lane, and one 14 ft. wide SB receiving lane.
														- Shift SB centerline 8 ft. to the west to provide one 15 ft. wide through-right lane and two 10 ft. wide NB receiving lanes.
														- Prohibit parking along west side of SB approach 120 ft. from the intersection at all times.
Bay Street and Thompson Street														- Mitigation not required.
Thompson Street	WB	LTR	0.31	23.2	C	LTR	0.92	110.9	F					[Not impacted since there are less than 90 PCE's]
Bay Street	NB	LT	0.02	10.1	B	LT	0.02	10.8	B					
	SB	-	-	-	-	-	-	-	-					
Overall Intersection		-	-	**21.6**	**C**	-	-	**103.1**	**F**					

Notes

(1): Control delay is measured in seconds per vehicle.

(2): Level of service (LOS) for signalized intersections is based upon average control delay per vehicle (sec/veh) for each lane group as listed in the 2000 Highway Capacity Manual -- TRB.

(3): Level of service (LOS) for unsignalized intersections is based upon control delay per vehicle (sec/veh) for each minor-approach as listed in the 2000 Highway Capacity Manual -- TRB.

(4): Overall intersection V/C ratio is the critical lane groups' V/C ratio, not the weighted average of all the movements.

(5): Significantly impacted turning movements and overall intersections are highlighted

TABLE 17-22 (continued)
STAPLETON / HOMEPORT WATERFRONT REDEVELOPMENT STUDY
COMPARISON OF SATURDAY MD 2015 NO BUILD AND SATURDAY MD 2015 BUILD LEVELS OF SERVICE AND MITIGATION

		2015 No Build Condition				2015 Build Condition				Mitigated Condition				
INTERSECTION & APPROACH		**Mvt.**	**V/C**	**Control Delay**	**LOS**	**Mvt.**	**V/C**	**Control Delay**	**LOS**	**Mvt.**	**V/C**	**Control Delay**	**LOS**	**Mitigation Measures**
SIGNALIZED INTERSECTIONS														
Bay Street and Victory Boulevard														- Prohibit parking along the east side of the NB approach up to 120 ft. from the intersection.
Victory Boulevard	EB	DefL	0.74	39.8	D	DefL	0.74	39.8	D	L	0.69	36.7	D	- Shift NB approach centerline 1 ft. to the west to provide one 10 ft. wide left turn lane and one 13 ft. wide through lane.
		TR	0.11	20.8	C	TR	0.11	20.8	C	TR	0.12	21.6	C	- Restripe SB approach to provide one 16 ft. wide right turn lane, one 11 ft. wide through lane and one 11 ft. wide left-through lane.
	WB	LTR	0.04	19.9	B	LTR	0.04	19.9	B	LTR	0.05	20.6	C	- Shift EB approach centerline 3 ft. to the north to provide one 14 ft. wide left turn lane and one 10 ft. wide through-right lane.
Bay Street	NB	-	-	-	-	DefL	0.97	74.0	E	L	0.66	36.5	D	- Modify signal timing (add a NB lag phase of 8s green, 3s yellow, 2s red by reducing NB/SB phase by 12s and EB/WB phase by 1s.)
		LTR	0.88	31.2	C	TR	1.00	57.4	E	TR	0.92	37.6	D	
	SB	LT	0.47	13.5	B	LT	0.55	14.8	B	LT	0.79	29.0	C	
		R	0.38	13.7	B	R	0.38	13.7	B	R	0.37	12.9	B	
Overall Intersection		**-**	**0.82**	**23.4**	**C**	**-**	**0.90**	**35.0**	**C**	**-**	**0.84**	**31.1**	**C**	
Bay Street and Hannah Street														- Shift SB approach centerline 3 ft. to the east to provide two 14 ft. wide left turn lanes, two 10 ft. wide through lanes, one 10.5 ft. wide right turn lane, and reduce the NB receiving lanes from 11 ft. and 25 ft. wide to 10 ft. and 23 ft. wide.
Hannah Street	EB	LTR	0.19	26.1	C	LTR	0.19	26.1	C	LTR	0.22	30.6	C	- Shift WB centerline 4 ft. to the north to provide one 11 ft. wide approach lane and two 10 ft. wide EB receiving lanes.
	WB	LTR	0.62	29.7	C	LTR	0.45	25.4	C	LTR	0.59	32.5	C	- Modify signal timing (Add a SB lead phase of 21s green, 3s yellow, 2s red by reducing NB/SB phase by 22 s and EB/WB phase by 4s, and prohibiting the SB left movement during the NB/SB phase.)
Bay Street	NB	LTR	0.31	12.2	B	LTR	0.43	13.5	B	LTR	0.80	37.0	D	
	SB	L	0.64	25.3	C	L	1.20+	120.0+	F*	L	0.67	37.8	D	
		T	0.27	11.7	B	T	0.28	11.8	B	T	0.38	10.9	B	
		R	0.14	10.9	B	R	0.14	10.9	B	R	0.14	9.1	A	
Overall Intersection		**-**	**0.63**	**17.1**	**B**	**-**	**1.20+**	**94.6**	**F**	**-**	**0.69**	**27.2**	**C**	
Bay Street and Van Duzer Street/Swan Street														- Mitigation not required.
Van Duzer Street	EB	L	0.10	20.4	C	L	0.11	20.5	C					
		LR	0.06	19.9	B	LR	0.08	20.1	C					
Bay Street	NB	LT	0.31	11.8	B	LT	0.46	13.4	B					
	SB	TR	0.44	13.0	B	TR	0.45	13.2	B					
Overall Intersection		**-**	**0.31**	**13.1**	**B**	**-**	**0.32**	**13.8**	**B**					
Bay Street and Canal Street														- Shift NB approach centerline 3 ft. to the west to provide one 16 ft. wide NB through-right lane and two 10 ft. wide SB receiving lanes.
Canal Street	EB	LTR	0.50	28.1	C	LTR	0.62	32.4	C	LTR	0.62	32.4	C	[Measures reflect operational improvements needed for PM peak period, otherwise mitigation not neededed.]
	WB	LR	0.10	20.6	C	LR	0.19	22.0	C	LR	0.19	22.0	C	
Bay Street	NB	TR	0.54	15.4	B	TR	0.89	30.0	C	TR	0.81	23.4	C	
	SB	LT	0.39	12.5	B	LT	0.44	13.1	B	LT	0.44	13.1	B	
Overall Intersection		**-**	**0.53**	**16.2**	**B**	**-**	**0.79**	**23.6**	**C**	**-**	**0.74**	**20.6**	**C**	

Bay Street and Broad Street														- Shift NB approach centerline 1 ft. to the west to provide one 16 ft. wide NB left-through lane and one 20 ft. wide SB receiving lane. [Measures reflect operational improvements needed for other peak periods, otherwise mitigation not needeed.]
Broad Street	EB	LR	0.24	22.0	C	LR	0.32	23.2	C	LR	0.32	23.2	C	
Bay Street	NB	LT	0.58	16.0	B	LT	0.87	27.9	C	LT	0.85	25.7	C	
	SB	T	0.68	18.8	B	T	0.74	20.8	C	T	0.74	20.8	C	
		R	0.15	10.5	B	R	0.19	11.0	B	R	0.19	11.0	B	
Overall Intersection		-	**0.51**	**17.3**	**B**	-	**0.66**	**23.5**	**C**	-	**0.64**	**22.5**	**C**	
Bay Street and Vanderbilt Avenue														- Prohibit parking on the south side of the EB approach up to 120 ft. from the intersection to provide one 11 ft wide left turn lane and one 10 ft. wide right turn lane. - Shift NB centerline 6 ft. to the west and restripe NB approach to one 13 ft. wide left-through lane and one 12 ft. wide through lane. - Shift SB centerline 3 ft. to the west to restripe SB approach to one 10 ft. wide right lane, one 10 ft. wide through lane, and two 11 ft. wide NB receiving lanes. [Measures reflect operational improvements needed for PM peak period, otherwise mitigation not needeed.]
Vanderbilt Avenue	EB	LR	0.37	24.1	C	LR	0.46	25.9	C	L	0.26	22.4	C	
		-	-	-	-	-	-	-	-	R	0.18	21.5	C	
Bay Street	NB	LT	0.42	13.2	B	LT	0.61	16.2	B	LT	0.55	14.9	B	
	SB	T	0.52	15.0	B	T	0.53	15.2	B	T	0.55	15.6	B	
		R	0.19	10.9	B	R	0.23	11.4	B	R	0.25	11.6	B	
Overall Intersection		-	**0.46**	**15.1**	**B**	-	**0.55**	**16.7**	**B**	-	**0.44**	**15.7**	**B**	
Bay Street and Edgewater St / Front St														- Mitigation not required.
Front Street	WB	LT	0.54	34.5	C	L	0.25	22.2	C					
		R	0.00	25.7	C	TR	0.33	23.5	C					
Edgewater Street	NB	LT	0.37	32.4	C	-	-	-	-					
		R	0.43	33.6	C	R	0.28	23.3	C					
Bay Street	NB	TR	0.76	31.8	C	TR	0.40	12.6	B					
	SB	LT	0.69	27.9	C	LT	0.51	14.5	B					
Overall Intersection		-	**0.61**	**31.1**	**C**	-	**0.44**	**16.2**	**B**					
Bay Street and Hylan Boulevard														- Prohibit parking along the south side of the EB approach up to 120 ft. from the intersection. - Shift EB centerline 1.5 ft. to the north to provide one 10.5 ft. wide left turn lane, one 10.5 ft. wide through-right lane, and one 18 ft. wide WB receiving lane. - Modify signal timing (eliminate EB lead phase, add 9s to EB/WB phase and 5s to NB/SB phase.)
Hylan Boulevard	EB	LTR	0.84	42.1	D	LTR	1.03	83.3	F	L	0.61	32.8	C	
	-	-	-	-	-	-	-	-	-	TR	0.40	24.2	C	
	WB	LTR	0.65	39.4	D	LTR	0.84	53.5	D	LTR	0.57	27.5	C	
Bay Street	NB	LTR	0.67	21.6	C	LTR	0.84	29.9	C	LTR	0.71	19.3	B	
	SB	T	0.63	20.4	C	T	0.69	22.1	C	T	0.62	17.0	B	
		R	0.20	7.1	A	R	0.23	7.2	A	R	0.27	11.8	B	
Overall Intersection		-	**0.74**	**25.2**	**C**	-	**0.93**	**37.5**	**D**	-	**0.67**	**20.6**	**C**	
Front Street and Wave Street														- Mitigation not required.
Wave Street	EB	-	-	-	-	LR	0.20	21.8	C					
Front Street	NB	-	-	-	-	LT	0.28	11.7	B					
	SB	-	-	-	-	TR	0.39	13.1	B					
Overall Intersection		-	-	-	-	-	**0.32**	**13.7**	**B**					
Front Street and Prospect Street														- Mitigation not required.
Prospect Street	EB	-	-	-	-	LTR	0.23	22.0	C					
	WB	-	-	-	-	LR	0.20	21.8	C					
Front Street	NB	-	-	-	-	TR	0.26	11.7	B					
	SB	-	-	-	-	LT	0.46	14.3	B					
Overall Intersection		-	-	-	-	-	**0.37**	**15.5**	**B**					

Front Street and Canal Street														- Mitigation not required.
Canal Street	EB	-	-	-	-	LR	0.27	22.6	C					
Front Street	NB	-	-	-	-	LT	0.19	10.9	B					
	SB	-	-	-	-	TR	0.41	13.4	B					
Overall Intersection		-	-	-	-	-	**0.36**	**14.5**	**B**					

UNSIGNALIZED INTERSECTIONS

Front Street and Hannah Street														- Mitigation not required.
Hannah Street	WB	LT	0.08	8.3	A	LT	0.10	9.6	A					
Front Street	NB	LR	0.58	18.7	C	LR	0.49	19.1	C					
Overall Intersection		-	-	**16.6**	**C**	-	-	**16.5**	**C**					
Bay Street and Wave Street														- Install traffic signal
Wave Street	WB	LTR	0.28	21.4	C	LTR	1.13	120.0+	F*	LTR	0.30	24.0	C	[Signal warrant conditions met.]
Bay Street	NB	LTR	0.01	10.0	B	LTR	0.01	12.6	B	LTR	0.71	18.7	B	EB/WB 30 s green, 3 s yellow, 2 s red.
	SB	LTR	0.06	9.8	A	LTR	0.12	13.7	B	LTR	0.95	41.4	D	NB/SB 50 s green, 3 s yellow, 2 s red.
Overall Intersection		-	-	**17.0**	**C**	-	-	**120.0+**	**F***	-	**0.71**	**29.5**	**C**	
Bay Street and Prospect Street														- Install traffic signal
Prospect Street	EB	LTR	0.31	29.1	D	LTR	0.87	120.0+	F	LTR	0.23	22.4	C	[Signal warrant conditions met.]
Bay Street	NB	-	-	-	-	-	-	-	-	TR	0.91	31.7	C	EB/WB 31 s green, 3 s yellow, 2 s red.
	SB	LT	0.06	11.0	B	LT	0.12	15.9	C	LT	0.54	14.5	B	NB/SB 49 s green, 3 s yellow, 2 s red.
														[Measures reflect improvements required to mitigated
Overall Intersection		-	-	**22.3**	**C**	-	-	**93.4**	**F**	-	**0.64**	**23.4**	**C**	significant pedestrian impacts.]
Bay Street and Water Street														- Install traffic signal
Water Street	WB	LTR	0.33	21.6	C	LTR	1.00	109.0	F	LTR	0.54	29.2	C	[Signal warrant conditions met.]
Bay Street	NB	LT	0.11	10.6	B	LT	0.13	11.6	B	L	0.62	16.0	B	WB 31 s green, 3 s yellow, 2 s red.
	SB	-	-	-	-	-	-	-	-	T	0.77	21.5	C	NB/SB 49 s green, 3 s yellow, 2 s red.
														- Shift NB centerline 9 ft to the west to provide one 10 ft. wide
Overall Intersection		-	-	**16.8**	**C**	-	-	**81.2**	**F**	-	**0.68**	**19.8**	**B**	left-through lane, one 10 ft. wide through lane, and one 14 ft. wide SB receiving lane.
														- Shift SB centerline 8 ft. to the west to provide one 15 ft. wide through-right lane and two 10 ft. wide NB receiving lanes.
														- Prohibit parking along west side of SB approach 120 ft. from the intersection at all times.
Bay Street and Thompson Street														- Mitigation not required.
Thompson Street	WB	LTR	0.18	17.5	C	LTR	0.51	43.0	E					
Bay Street	NB	LT	0.01	9.9	A	LT	0.01	11.1	B					
	SB	-	-	-	-	-	-	-	-					
Overall Intersection		-	-	**16.8**	**C**	-	-	**40.8**	**E**					

Notes

(1): Control delay is measured in seconds per vehicle.

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(3): Level of service (LOS) for unsignalized intersections is based upon control delay per vehicle (sec/veh) for each minor-approach as listed in the 2000 Highway Capacity Manual -- TRB.

(4): Overall intersection V/C ratio is the critical lane groups' V/C ratio, not the weighted average of all the movements.

(5): Significantly impacted turning movements and overall intersections are highlighted