Brooklyn Retail Corridors

Technical Memorandum 4: Recommendations and Traffic Analysis

July 2003

City of New York
Michael R. Bloomberg, Mayor

New York City
Department of City Planning
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1. EXECUTIVE SUMMARY

Project Overview

The Brooklyn Retail Corridors project, jointly sponsored by the New York City Departments of City Planning and Transportation, examines traffic and pedestrian congestion and safety issues in four retail corridors in the borough of Brooklyn. Three technical memorandums documenting project milestones were released previously. Recent planning studies and environmental impact statements relevant to the four study areas were reviewed in Technical Memorandum 1. The information gathered was used to better inform this study's data collection effort and recommendations from previous studies were re-examined for relevance under current conditions. Existing conditions were analyzed in Technical Memorandum 2 and included information on land use, zoning, transit, demographics, employment trends, journey-to-work, accidents, signal timing, on- and off-street parking, and the streetscape. A traffic and pedestrian impact analysis was performed based on problems and opportunities identified in Technical Memorandum 3. The results of the analysis helped shape solutions for better management of the traffic and pedestrian networks. This technical memorandum, Technical Memorandum 4, recommends strategies for managing the many challenges that each study area faces on a daily basis. Recommendations for each study area are summarized in Table 1.

Study Area Boundaries

Bay Ridge:	85th and 86th Streets from 4th Avenue to Fort Hamilton Parkway
Brighton Beach:	Brighton Beach Avenue from Ocean Parkway to Coney Island Avenue
Bushwick:	Knickerbocker Avenue from Dekalb Avenue to Menahan Street
Flatlands:	Kings Plaza Shopping Center at Flatbush Avenue and Avenue U

Figure 1

Locations of Study Areas

(Within Brooklyn Community Districts)

TABLE 1

BROOKLYN RETAIL CORRIDORS

RECOMMENDATIONS

RECOMMENDATIONS		BAY RIDGE			BRIGHTON BEACH					BUSHWICK			FLATLANDS	
		86th at 4th Avenue	86th at 5th Avenue	86th Street Corridor	Beachwalk	Brighton Beach Ave. (Ocean Pkwy & Brighton 1st)	Brighton Beach Ave. at Ocean Parkway	Brighton Beach Ave. at Coney Island Avenue	Brighton Beach Avenue Corridor	Knickerbocker Avenue at Myrtle Avenue	Knickerbocker Avenue Corridor	Knickerbocker at Himrod	Flatbush Avenue at Avenue U	Flatbush Avenue Corridor
Pedestrian Improvements	Leading Pedestrian Interval (LPI)	*	*											
	Pedestrian Signage											*		
	Pedestrian Refuge Island									*				
	Install High Visibility Crosswalks	*											*	
	Pedestrian Separator					*		*					*	
	Neckdowns				*			*						
	Clear Corner Zones Enforcement								*					
	Extend Sidewalk									*				
	Repair/Upgrade Island									*				
	New/Upgrade Object Markers						*							
	Relocate Fire Hydrant										*			
	Restripe Pavement Markings					*			*		*		*	
	Off Street-Transit Center													*
	Early Implementation Plan	*	*	*										*
Design Improvements	Pedestrian Amenities			*	*				*		*		*	*
	New/Improved Lighting			*	*						*			
	"BB" Lighting								*	*	*			
	Urban Design				*		*							

** Traffic Control Device

Continued on next page

TABLE 1 *(Continued)*
BROOKLYN RETAIL CORRIDORS
RECOMMENDATIONS

RECOMMENDATIONS		BAY RIDGE			BRIGHTON BEACH					BUSHWICK			FLATLANDS	
		86th at 4th Avenue	86th at 5th Avenue	86th Street Corridor	Beachwalk	Brighton Beach Ave. (Ocean Pkwy & Brighton 1st)	Brighton Beach Ave. at Ocean Parkway	Brighton Beach Ave. at Coney Island Avenue	Brighton Beach Avenue Corridor	Knickerbocker Avenue at Myrtle Avenue	Knickerbocker Avenue Corridor	Knickerbocker at Himrod	Flatbush Avenue at Avenue U	Flatbush Avenue Corridor
Vehicular Improvements	Enforce Parking										*		*	*
	Off-Street Parking								*					
	Congestion Pricing								*		*			
	Muni-Meters		*	*					*		*			
	Re-Route Buses			*										
	Relocate Bus Stop												*	
	Redesign Bus Turn-Around													*
	Taxi Loading/ Unloading Points									*				
	Adjust Signal Timing	*	*				*	*		*			*	
	Directional Signage		*											*
	Install Stop Bar												*	
	Discounted Parking		*											
	Pedestrian TCD's **						*							
	Channelization							*		*				
	Traffic Calming/Gateway Treatment									*				
	Elevated Structure Improvements						*							

** Traffic Control Device

Figure 2
Bay Ridge Study Area
86th Street from Fourth Avenue to Ft. Hamilton Parkway

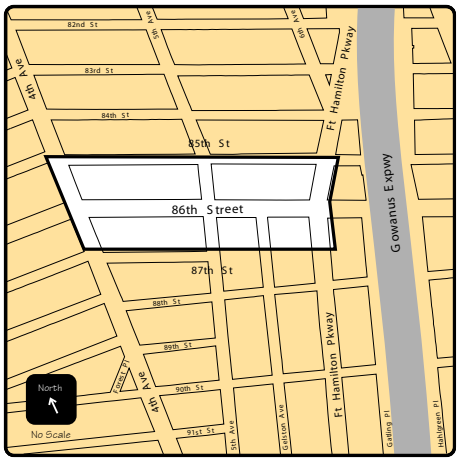
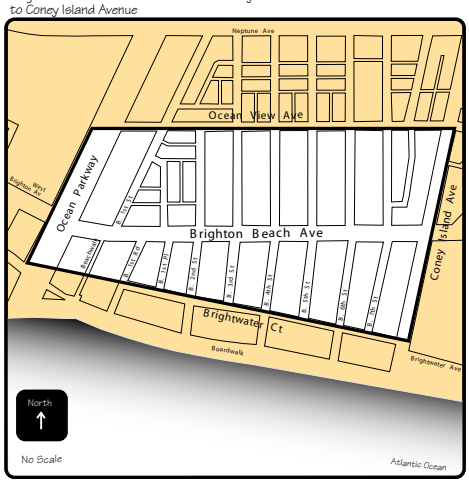


Figure 3
Brighton Beach Study Area
Brighton Beach Avenue from Ocean Parkway to Coney Island Avenue



Bay Ridge Study Area

The Bay Ridge retail corridor area recommendations include signal timing adjustments, the installation of pedestrian amenities such as lighting, high-visibility crosswalks, two hour muni-meters, discounted parking, and enforcement of existing parking regulations. The signal timing changes include establishing a leading pedestrian interval that has the potential for improving operating conditions at two intersections. By replacing existing standard parking meters with muni-meters, it is expected that the availability of on-street parking may increase. Additionally, the re-routing of two bus lines is also recommended to potentially relieve some pedestrian and traffic congestion in the corridor.

Brighton Beach Study Area

The Brighton Beach study area traffic network will experience additional vehicle trips as a result of growth in the area. Recent development in this area has resulted in 850 new dwelling units with 1,200 accesory parking spaces and almost 1,200 new parking spaces serving the new minor league baseball stadium. Recommendations include creating a welcoming pedestrian space with new lighting, paving, signage and other pedestrian amenities for Beachwalk, a street that is presently used by pedestrians to access the boardwalk and beach at Coney Island. Other recommendations include congestion pricing parking strategies, signal timing changes, improvements to the elevated subway structure, the installation of muni-meters, creation of a pedestrian refuge island and separator at a high accident intersection, restriping pavement markings, and the installation of neckdowns that can shorten crossing distances for pedestrians.

Figure 4
Bushwick Study Area
Knickerbocker Avenue from
Dekalb Avenue to Menahan Street

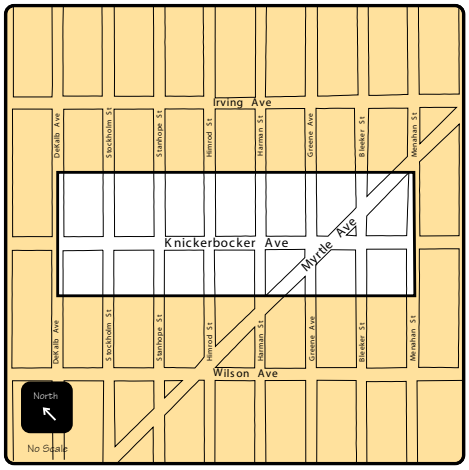
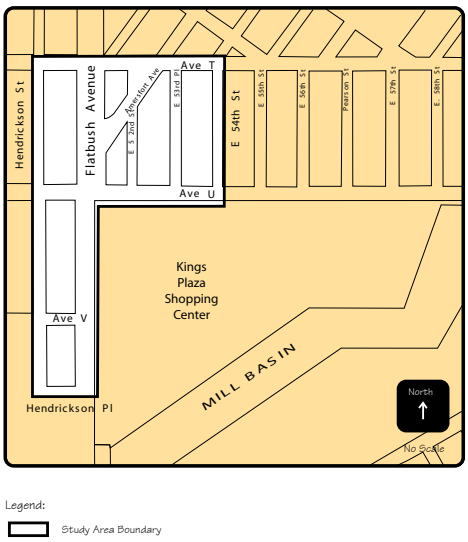


Figure 5
Flatlands Study Area
Kings Plaza Shopping Center
Avenue U and Flatbush Avenue



Bushwick Study Area

While new development is not expected to impact the Bushwick study area, recommendations include a sidewalk extension designed to improve traffic operations and an upgrade of an existing channelization island at an intersection with irregular geometry. Various traffic calming/gateway treatments designed to not only distinguish the retail corridor, but improve its overall operation are also recommended.

Flatlands Study Area

In the Flatlands study area, at the intersection of Flatbush Avenue and Avenue U, the Kings Plaza expansion project includes 241,000 square feet of retail space and a new 770-space accessory parking facility that is expected to bring new vehicle trips to the already busy intersection. Recommendations include signal timing changes, lane re-channelization, bus stop relocation designed to prevent midblock crossings at this high accident location, and the redesign of the bus turnaround area adjacent to the Kings Plaza Shopping Center. This redesign is expected to improve the intersection's overall operation. The designation of commuter van pick-up and drop-off points is also recommended. Additionally, traffic and pedestrian safety issues were examined by the Office of the President of the Borough of Brooklyn. *The Pedestrian/Traffic Safety Mitigation Project*, funded through a grant from the Governor's Traffic Safety Committee, resulted in recommendations that augment those cited in this report.

2. LEVEL OF SERVICE METHODOLOGY

The operation of both signalized intersections and unsignalized intersections in the Bay Ridge, Brighton Beach, Bushwick, and Flatlands study areas was analyzed using the accepted Highway Capacity Manual (HCM) methodology for vehicles and pedestrians. This method evaluates the operation of an intersection by determining average delay time per vehicle, and pedestrian space per minute, and assigning a level of service (LOS) from A to F. This evaluation is then used to develop recommendations to improve the performance of the intersection.

2.a. Vehicles

The operating characteristics of signalized intersections are evaluated by analyzing their capacity and performance. The capacity of the intersection represents the maximum number of vehicles that may be processed in an hour. The volume-to-capacity (v/c) ratio determines the level of service: a v/c ratio greater than 0.85 indicates traffic congestion; conversely, a v/c ratio of 0.60 or lower indicates smooth traffic flow.

The HCM divides an intersection approach into lane groups consisting of all movements that occur during each signal phase. These lane groups are then analyzed to determine the specific vehicular capacity and level of service. The average length of time that a vehicle is stopped, or delay time, determines a lane group's level of service, based on: the capacity of a lane group, the amount of green time allocated to a lane group, and the length of the signal cycle. Short delay time results in acceptable levels of service (LOS A-C), while longer delay time will result in marginal to unacceptable levels of service (LOS D-F). (In New York City, mid-LOS D represents acceptable traffic conditions.) Table 2 describes in further detail the characteristics of each level of service category.

TABLE 2:
Vehicular Level of Service Definitions (for Signalized Intersections)

LOS A	This level of service occurs when progression is extremely favorable and most vehicles arrive during the green phase and do not stop at all. Short cycle lengths may also contribute to low delay.		
	Delay per vehicle:	Less than 5 seconds per vehicle	HCM 3rd ed.
		Less than 10 seconds per vehicle	HCM 2000 ed.
LOS B	This level generally occurs with good progression, short cycle lengths, or both. More vehicles stop than with LOS A, causing higher levels of average delay.		
	Delay per vehicle:	Greater than 5 but less than 15	HCM 3rd ed.
		Greater than 10 but less than 20	HCM 2000 ed.
LOS C	These higher delays may result from fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant, though many still pass through the intersection without stopping.		
	Delay per vehicle:	Greater than 15 but less than 25	HCM 3rd ed.
		Greater than 20 but less than 35	HCM 2000 ed.
LOS D	Describes operations when the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high v/c ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.		
	Delay per vehicle:	Greater than 25 but less than 40	HCM 3rd ed.
		Greater than 35 but less than 55	HCM 2000 ed.
LOS E	This level is considered by many agencies to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high v/c ratios. Individual cycle failures are frequent.		
	Delay per vehicle:	Greater than 40 but less than 60	HCM 3rd ed.
		Greater than 55 but less than 80	HCM 2000 ed.
LOS F	This level, considered to be unacceptable to most drivers, often occurs with oversaturation, that is, when arrival flow rates exceed the capacity of the intersection. It may also occur at high v/c ratios below 1.0 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing causes to such delay levels.		
	Delay per vehicle:	Greater than 60 seconds per vehicle	HCM 3rd ed.
		Greater than 80 seconds per vehicle	HCM 2000 ed.

Source: Highway Capacity Manual, Special Report 209, Third Edition: Transportation Research Board, National Research Council, Washington, D.C., 1994.
Highway Capacity Manual, Transportation Research Board, National Research Council, Washington, D.C., 2000.

2.b. Pedestrians

The pedestrian level of service analysis assesses pedestrian flow and conditions of sidewalks, crosswalks, and intersection corners. The sidewalk analysis determines LOS for both the average and ”platoon“ flow rate. Pedestrian levels of service are measured as the pedestrian flow rate per foot of width per minute (PFM) and indicate how freely pedestrians move in a particular space, and how comfortable they are in that space. The corner and crosswalk analyses both involve pedestrian flow rates, effective street corner/crosswalk areas, and pedestrian signal timings. Level of service is measured by square feet of space per pedestrian per minute. Table 3 defines level of service attributes and Table 4 describes the pedestrian density-comfort relationship.

TABLE 3:
Pedestrian Level of Service Definitions

LOS A	130 or more square feet per pedestrian
LOS B	40 - 130 square feet
LOS C	24 - 40 square feet
LOS D	15 - 24 square feet
LOS E	6 - 15 square feet
LOS F	less than 6 square feet

TABLE 4:
Pedestrian Density-Comfort Relationship

LOS A	Unrestricted	2 PFM or less
LOS B	Slightly restricted	3 - 7 PFM
LOS C	Restricted but fluid	8 - 10 PFM
LOS D	Restricted; necessary to continuously alter walking stride and direction	11 - 15 PFM
LOS E	Severely restricted	16 - 25 PFM
LOS F	Forward progress only by shuffling; no reverse movement possible	Greater than 25 PFM

Source: Highway Capacity Manual, Special Report 209, Third Edition: Transportation Research Board, National Research Council, Washington, D.C., 1994.

3. 2000 EXISTING, 2004 FUTURE NO-BUILD, AND FUTURE BUILD CONDITIONS

For both the traffic and pedestrian analyses, existing, no-build, and build conditions are examined. Existing conditions identify present operating conditions. The no-build condition adds to existing traffic conditions, trips that result from a background traffic growth factor, and any vehicular or pedestrian trips that are generated by nearby major projects that are likely to be in place by the proposed action's build year. The build condition represents projected future conditions with this study's recommended actions in place and fully operational.

3.a. 2000 Existing Conditions

A traffic and transportation consultant, J. Rap & Associates, was retained to collect existing traffic, pedestrian, parking, and accident data for this project. Each intersection was surveyed for either two or three weekdays, and two Saturdays. Traffic volumes, turning movements, and vehicle classification counts were conducted during the peak morning, midday, and evening hours. Automatic Traffic Recorders (ATRs) were also installed to collect 24-hour traffic counts for one full week at nine locations. The existing condition traffic volume was plotted and subsequently balanced to present the existing network. All traffic signal timing, cycle lengths, and phasing plans were provided by the New York City Department of Transportation (NYCDOT).

3.b. 2004 Future No-Build Conditions

Estimating 2004 future no-build conditions consists of several steps. For each study area, 2004 future no-build peak traffic conditions were determined using a standard background traffic growth rate of one (1) percent per year as per the City Environmental Quality Review (CEQR) Technical Manual for areas of Brooklyn other than Downtown. Added to the background traffic growth are any vehicular and/or pedestrian trips related to future planned or proposed development that would likely impact the study area traffic network. Project-generated trips are determined by:

Trip Generation Rates - the number of daily and peak hour volume trips generated by a project, based on its use and size;

Modal Split - percentage of all generated trips occurring by auto, taxi, subway, bus, walk, or other modes (based on US Census journey-to-work data and vehicle occupancy rates). These trips are then assigned to a balanced street network;

Trip Assignment - the routing of trips by mode to specific streets, highways, parking facilities, subway lines, bus routes, and sidewalks en route from their origin and destination;

Balancing the 2004 Future No-Build Baseline Traffic Network - the preparation of traffic volume maps for the AM, midday, PM, and weekend peak periods. Vehicle-to-capacity ratios and delays, as determined by a level of service analysis, are then used to assess the future no-build conditions in comparison to existing conditions.

3.c. 2004 Future Build Conditions

The 2004 future build conditions analysis determines the projected future conditions with the recommended improvements in place and fully operational.

4. ACCIDENT ANALYSIS

Data on all accidents occurring between January 1996 and December 1998 at selected intersections within each study area was analyzed. All data was obtained from the New York State Department of Motor Vehicles (NYSDMV) accident database, which summarizes information from local New York City Police Department (NYPD) accident reports.

The data includes both ”reportable“ and ”non-reportable“ accidents. The NYSDMV designates motor vehicle accidents as reportable if they result in more than $1,000 in physical damage, or if there is an injury or fatality. Accidents resulting in less than $1,000 in damage and no injuries are designated non-reportable, although police reports are still often filed.

Table 5 illustrates the total number of both reportable and non-reportable accidents for each intersection analyzed for the years 1996 through 1998. Table 6 illustrates accidents by accident type.

Additionally, collision diagrams were prepared to graphically represent all accidents occurring at a particular intersection over a period of three years. Each collision was shown by an arrow that represented the type of accident as well as the direction that all vehicles were traveling when the accident occurred. Each arrow was placed on the drawing as close as possible to the actual location where the accident happened. These diagrams were useful in helping to identify the contributing causes of accidents. Analysis of the accident data and collision diagrams resulted in recommending appropriate intersection improvements.

TABLE 5:

Reportable and Non-Reportable Accidents

Location	1996		1997		1998	
	Ped/ Bike	Rep./ Non-Rep.	Ped/ Bike	Rep./ Non-Rep.	Ped/ Bike	Rep./ Non-Rep.
86th/4th	5/0	19/43	3/0	9/26	5/0	22/39
86th/5th	1/0	5/30	0/1	5/22	4/1	29/26
Ocean Pkwy	4/1	13/24	0/0	15/21	2/1	9/15
Coney Is. Ave	1/0	20/22	4/0	16/20	2/0	10/29
Knick/Mrytle	1/0	3/2	1/1	11/7	3/2	6/7
Knick/Himrod	0/0	3/3	0/1	16*/13	1/1	11*/13
Flatbush/U	8/0	57/71	5/0	46/54	6/2	44/46

Three-Year Totals

Location	Ped/Bike	Rep./Non-Rep.
86th/4th	13/0	50/108
86th/5th	5/2	39/78
Ocean Pkwy	6/2	37/60
Coney Is. Ave	7/0	46/71
Knick/Mrytle	5/3	20/16
Knick/Himrod	1/2	30/29
Flatbush/U	19/2	147/171

*12 of 16 accidents in 1997, and 7 of 11 accidents in 1998, were due to a fixed object. Data for the first 6-months of 1999 would indicate that whatever problem that existed has been corrected and therefore these years should be treated as anomalies.

TABLE 6: Reportable Accident Summary by Accident Type

	U-Turn			Pedestrian			Bicycle			Left-Turn			Right-Turn			Rear-End			Sideswipe			Common/ Other Angle			Head-On			Other			Totals
	'96	'97	'98	'96	'97	'98	'96	'97	'98	'96	'97	'98	'96	'97	'98	'96	'97	'98	'96	'97	'98	'96	'97	'98	'96	'97	'98	'96	'97	'98	
86th / 4th	0	0	1	5	3	5	0	0	0	4	3	1	1	0	0	3	1	8	4	1	0	2	1	4	0	0	2	0	0	1	
													0	0	0																
86th/ 5th Ave.	0	0	0	1	0	4	0	1	1	0	0	2	1	2	0	1	2	7	0	1	3	2	0	7	0	0	1	0	0	1	
													0	0	2																
Subtotals	0	0	1	6	3	9	0	1	1	4	3	3	2	2	2	4	3	15	4	2	3	4	1	11	0	0	3	0	0	2	
*		1			18			2			10			6			22			9			16			3			2		89
Brighton Beach/Ocean Parkway	0	1	0	4	0	2	0	0	1	5	6	2	2	3	1	0	2	0	1	0	0	1	0	2	0	0	0	0	0	0	
													0	3	1																
Brighton Beach/Coney Island Ave	0	0	2	1	4	2	1	0	0	1	1	0	0	2	0	7	2	1	5	2	3	5	5	1	0	0	0	0	0	0	
													0	0	1																
Subtotals	0	1	2	5	4	4	1	0	1	6	7	2	2	8	3	7	4	1	6	2	3	6	5	3	0	0	0	0	0	0	
*		3			13			2			15			13			12			11			14			0			0		83
Knickerbocker/ Myrtle	0	0	0	1	1	3	0	1	2	0	2	0	0	1	0	0	0	0	2	4	0	0	1	0	0	0	0	0	1	0	
													0	0	1																
Knickerbocker/ Himrod	0	0	0	0	0	1	0	1	1	0	0	0	2	1	1	0	2	1	0	0	0	0	0	0	0	0	0	1	12**	7**	
													0	0	0																
Subtotals	0	0	0	1	1	4	0	2	3	0	2	0	2	2	2	0	2	1	2	4	0	0	1	0	0	0	0	1	13	7	
		0			6			5			2			6			3			6			1			0			21		50
Flatbush/ Avenue U	0	0	0	8	5	6	0	0	2	3	7	13	3	4	0	19	12	14	2	0	1	22	18	5	0	0	0	0	0	2	
													0	0	1																
Subtotals *		0			19			2			23			8			45			3			45			0			2		147
Total																															369

*Some subtotals are based upon the numbers for each statistic from all three years. They are not mutually exclusive to columns labeled "'97".

**Fixed object

5. LEVEL OF SERVICE/ACCIDENT ANALYSIS AND RECOMMENDATIONS

86th Street and 4th Avenue

86th Street and 5th Avenue

5.a. BAY RIDGE

A traffic and pedestrian level of service (LOS) analysis was conducted at two signalized intersections, 86th Street at 4th and 5th Avenues. Figures 1 and 2 show existing and future balanced traffic volumes for the AM, midday, PM, and weekend peak periods. Table 7 illustrates severity of accidents by time of day. Table 8 details existing and future levels of service and delays for both intersections. Recommended actions for this study area are shown in Drawing 1.

Peak Hour

Traffic

Based upon the peak period traffic counts, the morning peak hour is 8:00-9:00 AM, the midday period is 12:30-1:30 PM, the evening period is 5:00-6:00 PM, and the weekend period is 12:30-1:30 PM.

Pedestrian

Based upon the peak period traffic counts, the morning peak hour is 8:00-9:00 AM, the midday period is 1:00-2:00 PM, the evening period is 5:00-6:00 PM, and the weekend period is 1:00-2:00 PM.

2000 EXISTING CONDITIONS

86th Street at 4th Avenue

Traffic

Overall, the intersection operates at an acceptable LOS C for the AM and PM peak periods, and LOS B during the midday and weekend periods, with delays ranging from 13.6 to 19.1 seconds per vehicle. All lane groups for each peak period operate at LOS D or better, with delays ranging from 9.0 to 34.6 seconds per vehicle.

Pedestrian

Sidewalks operate at LOS A for the average flow rate, and LOS B for the platoon condition, during each peak period. All crosswalks operate at LOS C or better, and all corners operate at LOS A, for all peak periods.

86th Street at 5th Avenue

Traffic

Overall, the intersection operates at an acceptable LOS B for all peak periods, with delays ranging from 10.4 to 12.4 seconds per vehicle. Each lane group operates at LOS C or better, with delays ranging from 7.7 to 21.5 seconds per vehicle.

Pedestrian

Sidewalks operate at LOS A for the average flow rate of each walkway, and LOS B for the platoon condition, during each peak period. Crosswalks operate at LOS C or better, and corners operate at LOS A, for all peak periods.

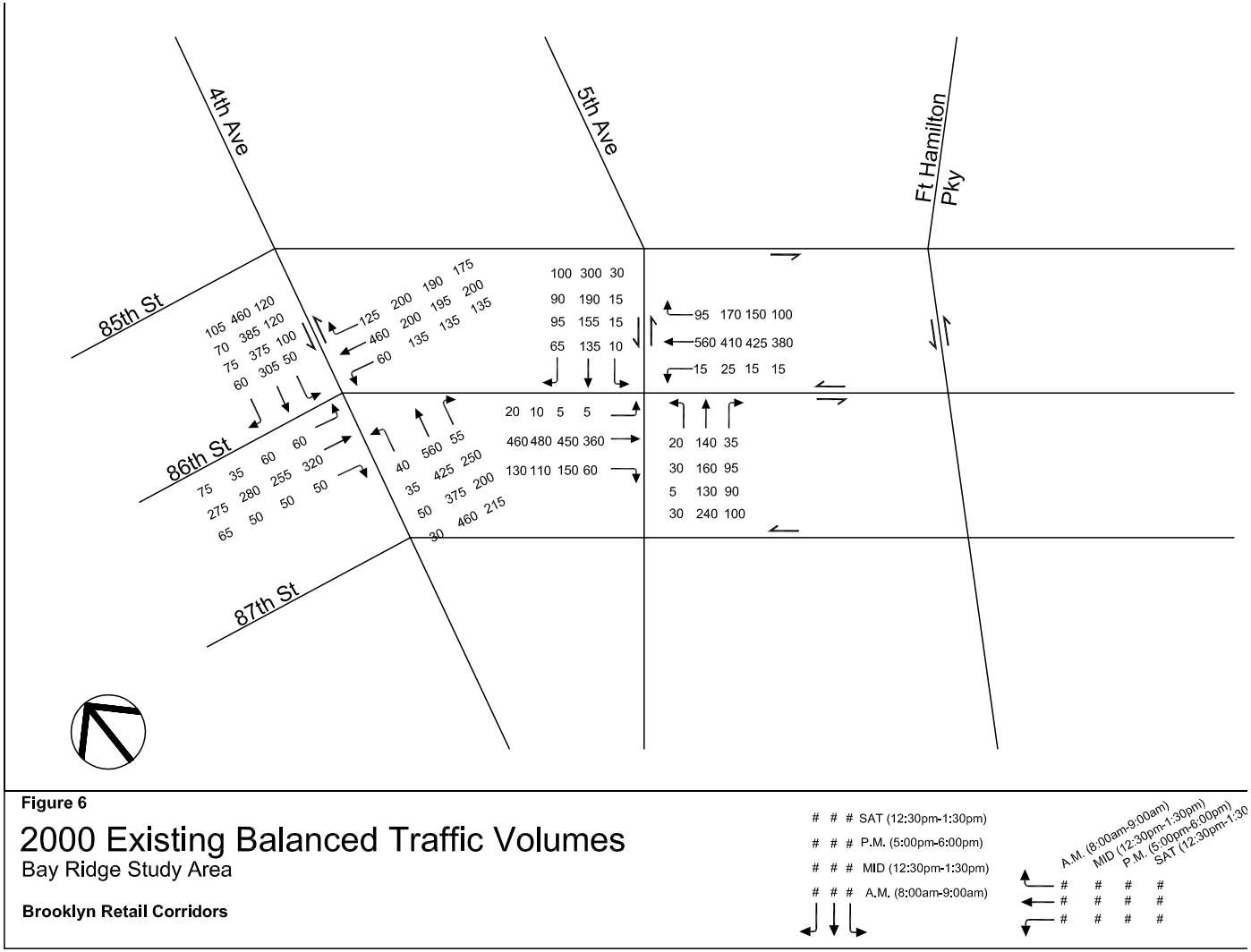


Figure 6

2000 Existing Balanced Traffic Volumes

Bay Ridge Study Area

Brooklyn Retail Corridors

2004 FUTURE NO-BUILD CONDITIONS

The future development scenario identifies one project in the Bay Ridge study area. The reconstruction of 5th Avenue, involves a new concrete base, asphalt wearing course, sidewalks, sewers, water mains, catch basins, traffic signals, streetlights, lane striping and street furniture. This project is not expected to generate new trips, and therefore does not have an impact on the study area traffic network.

86th Street at 4th Avenue

Traffic

Overall, the intersection would continue to operate at LOS C during the AM and PM peak periods, and LOS B during the midday and weekend periods, with slightly increased delays, ranging from 14.5 to 19.9 seconds per vehicle. Each lane group would operate at LOS D or better, with a slight increase in delay; overall delays range from 9.2 to 38.0 seconds per vehicle.

Pedestrian

The level of service for sidewalks, crosswalks, and corners would remain the same for all peak periods.

86th Street at 5th Avenue

Traffic

Overall, the intersection would continue to operate at LOS B for all peak periods, with a very slight increase in delay; delays overall range from 10.4 to 12.5 seconds per vehicle. All lane groups would operate at LOS C or better, with delays ranging from 7.7 to 21.6 seconds per vehicle.

Pedestrian

The analysis indicates no change in level of service for sidewalks, crosswalks, and corners for all peak periods.

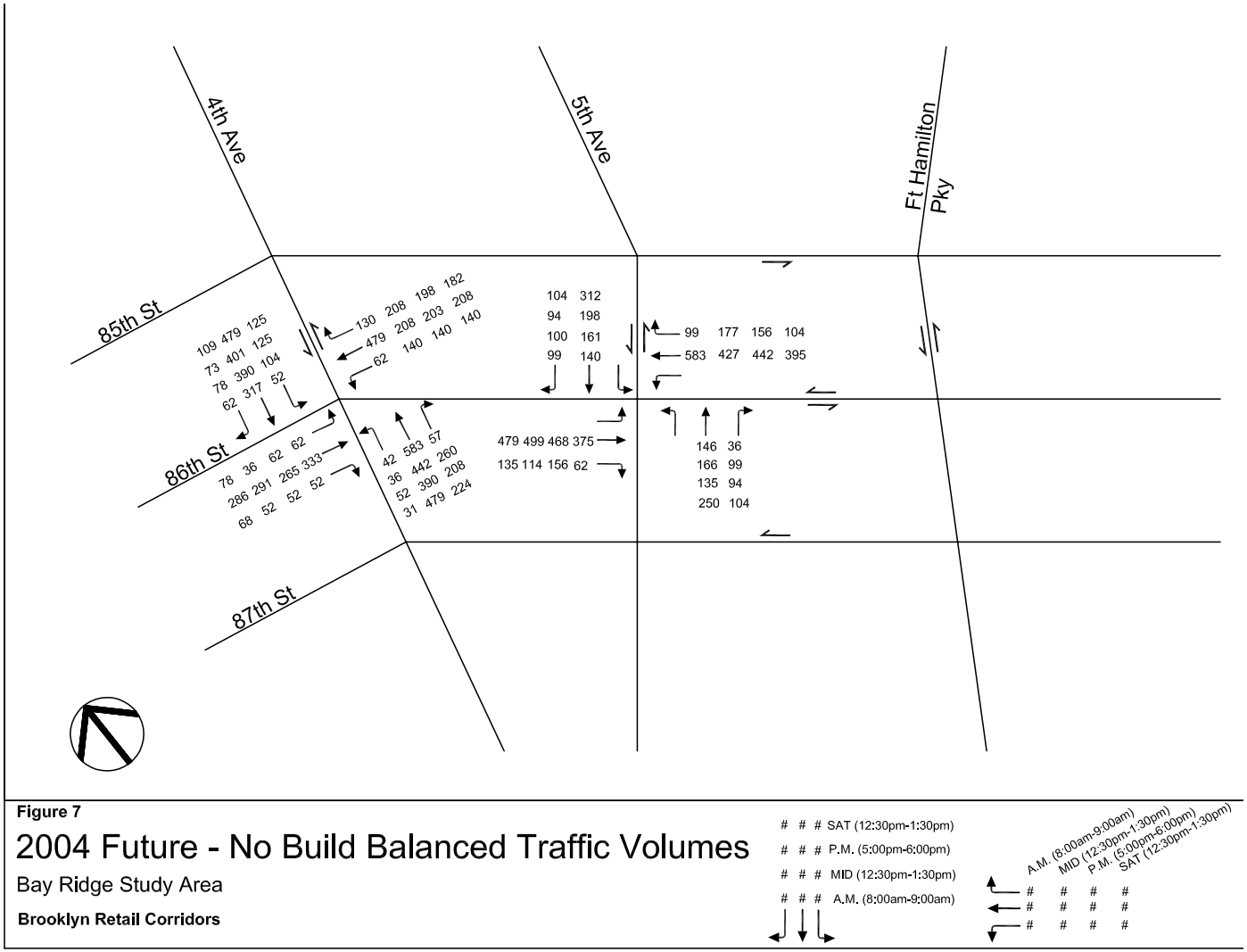


Figure 7

2004 Future - No Build Balanced Traffic Volumes

Bay Ridge Study Area

Brooklyn Retail Corridors

ACCIDENT SUMMARY

Several factors, including signal timing, crossing pedestrians, pavement markings, and turning volumes could be attributed to the types of accidents that occur at these intersections. With the implementation of the following recommendations, including signal timing adjustments and pavement markings, the occurrence of these types of accidents could potentially be reduced.

86th Street at 4th Avenue

Between 1996 and 1998, there were 50 reportable and 108 non-reportable accidents, none fatal, at this intersection. The three most common types of reportable accidents involved pedestrians (26 percent), rear-end collisions (24 percent), and left-turning vehicles (16 percent). Sixty-four percent of reportable accidents occurred during the day. While the number of accidents in 1997 decreased from 1996, they increased again in 1998.

86th Street at 5th Avenue

For the three-year analysis period, 39 reportable and 78 non-reportable accidents occurred at this location. There were no fatalities. Of the three most common types of accidents, 26 percent were rear-end collisions, 23 percent were other-angle common-direction collisions, and 13 percent involved pedestrians and right angle turns. Almost all (87 percent) of the reportable accidents occurred during the day. The number of accidents increased from five (5) in 1996 to 29 in 1998.

Table 7:Accident Analysis
86th Street at 4th and 5th Avenues

1996	4th Avenue			5th Avenue		
	DAY	NIGHT	TOTAL	DAY	NIGHT	TOTAL
FATALITY	0	0	0	0	0	0
INJURY	5	5	10	1	0	1
DAMAGE ONLY	7	2	9	4	0	4
TOTAL	12	7	19	5	0	5

1997	4th Avenue			5th Avenue		
	DAY	NIGHT	TOTAL	DAY	NIGHT	TOTAL
FATALITY	0	0	0	0	0	0
INJURY	3	1	4	1	1	2
DAMAGE ONLY	4	1	5	3	0	3
TOTAL	7	2	9	4	1	5

1998	4th Avenue			5th Avenue		
	DAY	NIGHT	TOTAL	DAY	NIGHT	TOTAL
FATALITY	0	0	0	0	0	0
INJURY	10	4	14	18	3	21
DAMAGE ONLY	3	5	8	7	1	8
TOTAL	13	9	22	25	4	29

RECOMMENDATIONS AND 2004 FUTURE BUILD CONDITIONS

The reconstruction of Fifth Avenue led NYCDOT to institute an Early Implementation Plan to incorporate and complement DCP's recommendations that address the relief of traffic and pedestrian congestion as discussed in Technical Memorandum 3. Certain recommendations as noted below were discussed with and implemented by NYCDOT prior to the completion of this technical memorandum.

PEDESTRIAN-VEHICULAR CONFLICT AND VEHICULAR CONGESTION

86th Street at 4th Avenue

Between 1996 and 1998 there were 50 accidents at this intersection: 13 involved pedestrians, 12 were rear-end collisions, and eight were left-turn collisions.

RECOMMENDATION:

Establish a Leading Pedestrian Interval (LPI). Decrease the north and southbound green time by three (3) seconds (from 70 to 67 seconds in the AM, and from 73 to 70 seconds in the PM) and increase the north and southbound all-red by three (3) seconds (from five [5] to eight [8] seconds). This would increase the time pedestrians have to cross the intersection, while minimizing the potential for pedestrian-vehicular conflict. With this timing adjustment, the intersection in the AM peak would continue to operate at the no-build condition, LOS C, with 20.0 seconds of delay per vehicle. In the PM peak, the intersection would continue to operate at the no-build condition LOS C. Overall, the intersection would experience a very slight increase in delay. Lane group delay also would increase slightly.

Since there is substantial conflict between vehicle and pedestrian movements at this location, it is further recommended that the number of high-visibility crosswalks be increased from one to all four approaches. This entails marking two crosswalks on 4th Avenue, and one on the west side of 86th Street. This should not only increase visibility, but clearly delineate the proper path for pedestrians to safely negotiate the intersection.

86th Street at 4th Avenue

Vehicles turning right from westbound 86th Street to northbound 4th Avenue are blocked by cars parked at meters, as well as double-parked cars at or near the corner.

RECOMMENDATION:

Under the Early Implementation Plan, a right-turn lane was created by removing the first three parking meters on the north side of 86th Street at 4th Avenue.

86th Street at 5th Avenue

Pedestrians using the crosswalk on 86th Street block vehicles making right turns from 5th Avenue, causing traffic spillbacks along 5th Avenue.

RECOMMENDATION:

Increase the time pedestrians have to safely cross the intersection, and minimize conflict with oncoming vehicular traffic**,** by establishing a LPI. Decrease the east and westbound green time by three (3) seconds (from 69 to 66 seconds in the AM and PM, and from 44 to 41 seconds in the Midday and weekend) and increase the east and westbound all-red by three (3) seconds (from six [6] to nine [9] seconds). With this adjustment, the intersection would continue to operate at the no-build condition LOS B during all peak periods.

Bay Ridge Municipal Parking Garage

85th Street at 5th Avenue

Vehicles turning left from southbound 5th Avenue to eastbound 85th Street are blocked by traffic spillbacks created by vehicles trying to enter the municipal garage.

RECOMMENDATION:

Under the Early Implementation Plan, parking meters were removed on the north side of 85th Street between 5th Avenue and Fort Hamilton Parkway. Signage with ”No Standing 7am - 7pm including Sunday“ regulations was installed. Additionally, the existing ”No Standing

Anytime“ regulations on the south side provides ample storage to assist in managing the spillback. This action is expected to alleviate some of the congestion and spillback caused by vehicles entering the garage.

PEDESTRIAN AMENITIES/LIGHTING

86th Street Corridor

86th Street lacks adequate pedestrian amenities, such as benches, additional trees, and waste receptacles. The limited amount of street lighting may divert pedestrian business from the area after dark.

RECOMMENDATION:

Install standard NYCDOT street light fixtures along 86th Street from 4th Avenue to Fort Hamilton Parkway to supplement existing lighting. Specific locations, and the number of fixtures, should be determined by NYCDOT's Street Lighting Division. Pedestrian amenities, including benches and standard Department of Sanitation waste receptacles, should be installed at specific locations. The number and placement of all receptacles and scheduling of additional collection services, if needed, would be determined by the Department of Sanitation. Any and all pedestrian amenities installed as a result of these recommendations should be consistent with the NYC Department of Design and Construction's (DDC) reconstruction of 5th Avenue.

ON-STREET PARKING

The most commonly-cited problem in the study area is that demand for on-street parking exceeds capacity. The resulting double parking on 86th Street contributes to congestion.

RECOMMENDATION:

In response to the area's parking shortages identified in Technical Memorandum 3 of this project, two hour muni-meters were installed along 86th Street from 4th Avenue to Garrison Avenue under the Early Implementation Plan. This strategy increased parking capacity by 25 percent, or 20+ spaces.

UTILIZATION OF THE BAY RIDGE MUNICIPAL PARKING GARAGE

85th Street and 5th Avenue

The garage provides 205 parking spaces, but it is perceived as underutilized, despite the limited availability of parking elsewhere in the study area. Community representatives indicate that drivers avoid the facility due to poor lighting and narrow passageways.

RECOMMENDATION:

Many motorists prefer to park in front of their work place rather than walk to the garage. Under the Early Implementation Plan, monthly parking rates that amount to discounted parking fees were instituted to encourage area residents and employees to park off-street. Most of the users at this facility are transient and do not park long term. The current average occupancy is 73 percent, with weekend occupancy significantly higher at 82 percent. The NYC Department of Transportation has reached out to area residents as well as the business community to further encourage usage of the garage. This facility has been surveyed to address lighting conditions and has been deemed adequate for both security and vehicle operation. In addition, the NYC DOT has contracted a management company to operate this site and any deficiencies are addressed at monthly meetings with the contractor.

Directional Signage

86th Street at 5th Avenue

Signs directing vehicles to the municipal garage are inadequate in terms of quantity, location, and visibility. Motorists bound for the garage are directed by signs on eastbound 86th Street to turn left onto 5th Avenue, although left-turns (except by buses) are prohibited between the hours of 8 AM and 10 PM.

RECOMMENDATION:

Four additional directional signs were installed under the Early Implementation Plan to supplement the 29 signs currently located within, or in close proximity to, the study area. All signs are installed on major streets within a half-mile radius of the facility. Each sign has been determined to be adequately visible to motorists. Signage that incorrectly permitted left turns was removed as recommended.

BUS ROUTES SERVING THE RETAIL CORRIDOR

86th Street Corridor

It is generally perceived by area residents that the current routes of the B64, S53, and S79 bus lines contribute to congestion along 86th Street.

RECOMMENDATION:

DCP and NYCDOT should jointly endorse Community Board 10's Traffic and Transportation Committee proposal to re-route the B-64 bus to terminate at Shore Road, making a left-turn and traveling south on 5th Avenue (at 86th Street), to 87th Street, west on 87th Street to 4th Avenue, and then east onto 86th Street. Additionally, restore 95th Street and 4th Avenue as the terminus of the S-53 bus.

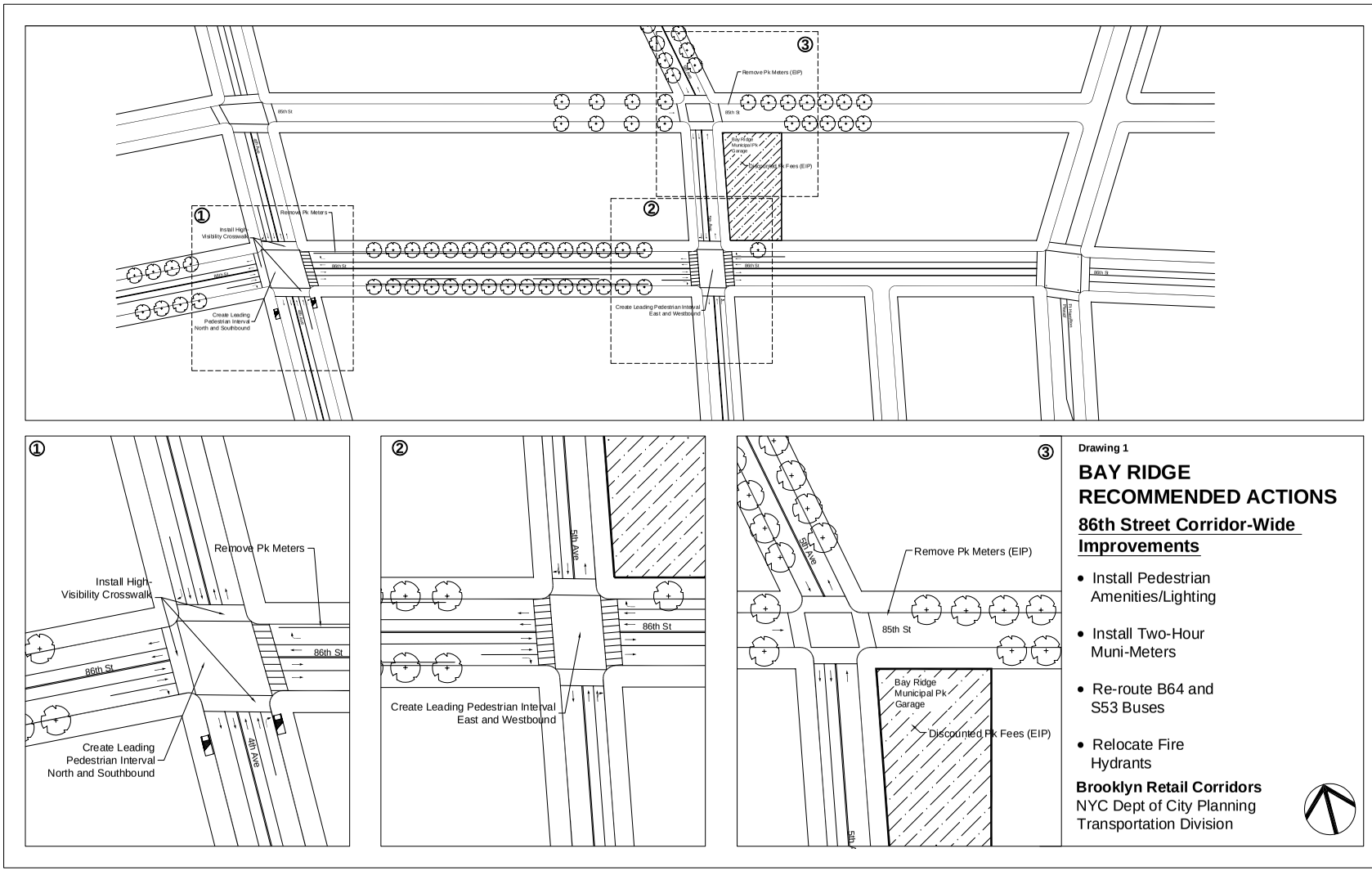
TABLE 8
Bay Ridge: Comparison of LOS and Delay for Existing, No-Build, and Build Conditions

AM PEAK PERIOD													
INTERSECTION	**2000 Existing**				**2004 No-Build**				**2004 Build**				**Delay**
Approach	Mvm't	V/C	Delay	LOS	Mvm't	V/C	Delay	LOS	Mvm't	V/C	Delay	LOS	**Change**
86th Street @ 4th Avenue													
Eastbound	LTR	0.688	27.4	D	LTR	0.733	28.8	D	LTR	0.733	28.8	D	0.0
Westbound	LTR	0.773	29.3	D	LTR	0.817	31.1	D	LTR	0.817	31.1	D	0.0
Northbound	LTR	0.412	9.8	B	LTR	0.432	10.0	B	LTR	0.433	10.0	B	0.0
Southbound	LTR	0.324	9.1	B	LTR	0.343	9.2	B	LTR	0.344	9.3	B	-0.1
Intersection			**19.1**	**C**			**19.9**	**C**			**20.0**	**C**	-0.1
86th Street @ 5th Avenue													
Eastbound	T	0.223	8.4	B	T	0.233	8.5	B	T	0.233	8.5	B	0.0
	R	0.088	7.7	B	R	0.091	7.7	B	R	0.091	7.7	B	0.0
Westbound	T	0.294	8.9	B	T	0.307	9.0	B	T	0.307	9.0	B	0.0
	R	0.152	8.0	B	R	0.158	8.1	B	R	0.158	8.1	B	0.0
Northbound	TR	0.184	20.6	C	TR	0.185	20.6	C	TR	0.185	20.6	C	0.0
Southbound	TR	0.215	20.8	C	TR	0.225	20.9	C	TR	0.225	20.9	C	0.0
Intersection			**11.7**	**B**			**11.8**	**B**			**11.8**	**B**	0.0

MIDDAY PEAK PERIOD													
INTERSECTION	**2000 Existing**				**2004 No-Build**				**2004 Build**				**Delay**
Approach	Mvm't	V/C	Delay	LOS	Mvm't	V/C	Delay	LOS	Mvm't	V/C	Delay	LOS	**Change**
86th Street @ 5th Avenue													
Eastbound	T	0.296	9.3	B	T	0.307	9.3	B	T	0.307	9.3	B	0.0
	R	0.260	9.1	B	R	0.270	9.2	B	R	0.270	9.2	B	0.0
Westbound	T	0.256	9.0	B	T	0.650	9.1	B	T	0.650	9.1	B	0.0
	R	0.313	9.4	B	R	0.325	9.5	B	R	0.325	9.5	B	0.0
Northbound	TR	0.231	13.1	B	TR	0.241	13.2	B	TR	0.241	13.2	B	0.0
Southbound	TR	0.228	13.1	B	TR	0.237	13.2	B	TR	0.237	13.2	B	0.0
Intersection			**10.4**	**B**			**10.4**	**B**			**10.4**	**B**	0.0

PM PEAK PERIOD													
INTERSECTION	**2000 Existing**				**2004 No-Build**				**2004 Build**				**Delay**
Approach	Mvm't	V/C	Delay	LOS	Mvm't	V/C	Delay	LOS	Mvm't	V/C	Delay	LOS	**Change**
86th Street @ 4th Avenue													
Eastbound	LTR	0.477	24.9	C	LTR	0.504	25.3	D	LTR	0.504	25.3	D	0.0
Westbound	LTR	0.834	34.6	D	LTR	0.879	38.0	D	LTR	0.879	38.0	D	0.0
Northbound	LTR	0.443	9.0	B	LTR	0.469	9.2	B	LTR	0.470	9.3	B	-0.1
Southbound	LTR	0.494	9.5	B	LTR	0.528	9.9	B	LTR	0.530	9.9	B	0.0
Intersection			**18.3**	**C**			**19.4**	**C**			**19.4**	**C**	0.0
86th Street @ 5th Avenue													
Eastbound	T	0.274	8.8	B	T	0.850	8.8	B	T	0.850	8.8	B	0.0
	R	0.166	8.1	B	R	0.172	8.2	B	R	0.172	8.2	B	0.0
Westbound	T	0.219	8.4	B	T	0.228	8.5	B	T	0.228	8.5	B	0.0
	R	0.240	8.6	B	R	0.249	8.6	B	R	0.249	8.6	B	0.0
Northbound	TR	0.238	21.0	C	TR	0.302	21.1	C	TR	0.302	21.1	C	0.0
Southbound	TR	0.291	21.5	C	TR	0.307	21.6	C	TR	0.307	21.6	C	0.0
Intersection			**12.4**	**B**			**12.5**	**B**			**12.5**	**B**	0.0

SATURDAY PEAK PERIOD													
INTERSECTION	**2000 Existing**				**2004 No-Build**				**2004 Build**				**Delay**
Approach	Mvm't	V/C	Delay	LOS	Mvm't	V/C	Delay	LOS	Mvm't	V/C	Delay	LOS	**Change**
86th Street @ 5th Avenue													
Eastbound	T	0.293	9.2	B	T	0.305	9.3	B	T	0.305	9.3	B	0.0
	R	0.211	8.8	B	R	0.219	8.9	B	R	0.219	8.9	B	0.0
Westbound	T	0.226	8.9	B	T	0.235	8.9	B	T	0.235	8.9	B	0.0
	R	0.176	8.6	B	R	0.182	8.7	B	R	0.182	8.7	B	0.0
Northbound	TR	0.288	13.5	B	TR	0.300	13.6	B	TR	0.300	13.6	B	0.0
Southbound	TR	0.341	13.9	B	TR	0.354	14.0	B	TR	0.354	14.0	B	0.0
Intersection			**10.9**	**B**			**11.0**	**B**			**11.0**	**B**	0.0


①
②
③
Remove Pk Meters
Install High-Visibility Crosswalk
86th St
Create Leading Pedestrian Interval North and Southbound
4th Ave
Create Leading Pedestrian Interval East and Westbound
5th Ave
Remove Pk Meters (EIP)
85th St
Bay Ridge Municipal Pk Garage
Discounted Pk Fees (EIP)
Drawing 1
BAY RIDGE
RECOMMENDED ACTIONS
86th Street Corridor-Wide Improvements
• Install Pedestrian Amenities/Lighting
• Install Two-Hour Muni-Meters
• Re-route B64 and S53 Buses
• Relocate Fire Hydrants
Brooklyn Retail Corridors
NYC Dept of City Planning
Transportation Division

Brighton Beach Ave. at Ocean Parkway

Brighton Beach Ave. at Coney Island Ave.

Brighton Beach Ave. at Vrighton 5th St.

Brighton Beach Ave. at Vrighton 1st St.

5.b. BRIGHTON BEACH

A traffic and pedestrian LOS analysis was conducted at three signalized intersections, Brighton Beach Avenue at Ocean Parkway, at Coney Island Avenue, and at Brighton 5th Street, and one unsignalized intersection, Brighton Beach Avenue at Brighton 1st Street. Figures 3 and 4 show existing and future balanced traffic volumes for the AM, midday, PM, and weekend peak periods. Figures 5 and 6 represent incremental trips generated by future development as discussed in the future no-build conditions section. Table 9 illustrates the severity of accidents for a three-year period by time of day for each occurrence. Table 10 compares LOS and delay for existing, no-build, and build conditions. Recommended actions for this study area are shown in Drawing 2.

Peak Hour

Traffic

Based upon the peak period traffic counts, the weekday morning peak hour is 8:00-9:00 AM; the midday period is 12:30-1:30 PM, the evening period is 4:30-5:30 PM, and the weekend period is 1:30-2:30 PM.

Pedestrian

Based upon the peak period traffic counts, the weekday morning peak hour is 8:00-9:00 AM; the midday period is 12:30-1:30 PM; the evening period is 5:00-6:00 PM; and the weekend period is 1:00-2:00 PM.

2000 EXISTING CONDITIONS

Brighton Beach Avenue at Ocean Parkway

Traffic

Overall, the intersection operates at LOS C for all peak periods, with delays ranging from 28.6 to 34.9 seconds per vehicle. All lane groups operate at LOS D or better with 14.6 to 54.4 seconds of delay per vehicle.

Pedestrian

All sidewalks, crosswalks, and corners operate at LOS B or better for the AM, midday, PM, and weekend peak periods.

Brighton Beach Avenue at Coney Island Avenue

Traffic

Overall, during the AM and midday peak periods the intersection operates at LOS C, and at LOS D during the PM and the weekend period, with delays ranging from 32.2 to 38.3 seconds per vehicle. All lane groups operate at LOS D or better, with delays ranging from 23.6 to 44.3 seconds per vehicle, except the eastbound left turn, which operates at LOS E during the midday, PM and weekend peak periods with delays ranging from 63.1 to 73.7 seconds per vehicle.

Pedestrian

Sidewalks operate at LOS A for the maximum surge during all peak periods. Crosswalks operate at LOS C or better, and corners operate at LOS A, for each peak period.

Brighton Beach Avenue at Brighton 5th Street

Traffic

Overall, this intersection operates at LOS B during the AM, PM, and weekend peak periods with delays ranging from 5.5 to 7.5 seconds per vehicle. During the midday period, the intersection operates at LOS C with delays of 19.9 seconds per vehicle. All lane groups operate at LOS C better, with delays ranging from 4.0 to 23.2 seconds per vehicle.

Pedestrian

All sidewalks, crosswalks, and corners operate at LOS B or better for each peak period.

Brighton Beach Avenue at Brighton 1st Street

Traffic

Overall, this unsignalized intersection operates at LOS A during all peak periods, with a range of 3.1 to 4.4 seconds per vehicle of average total delay.

Pedestrian

The sidewalks operate at LOS A for each walkway and LOS B for platoon conditions for each peak period. Crosswalks and corners operate at LOS A.

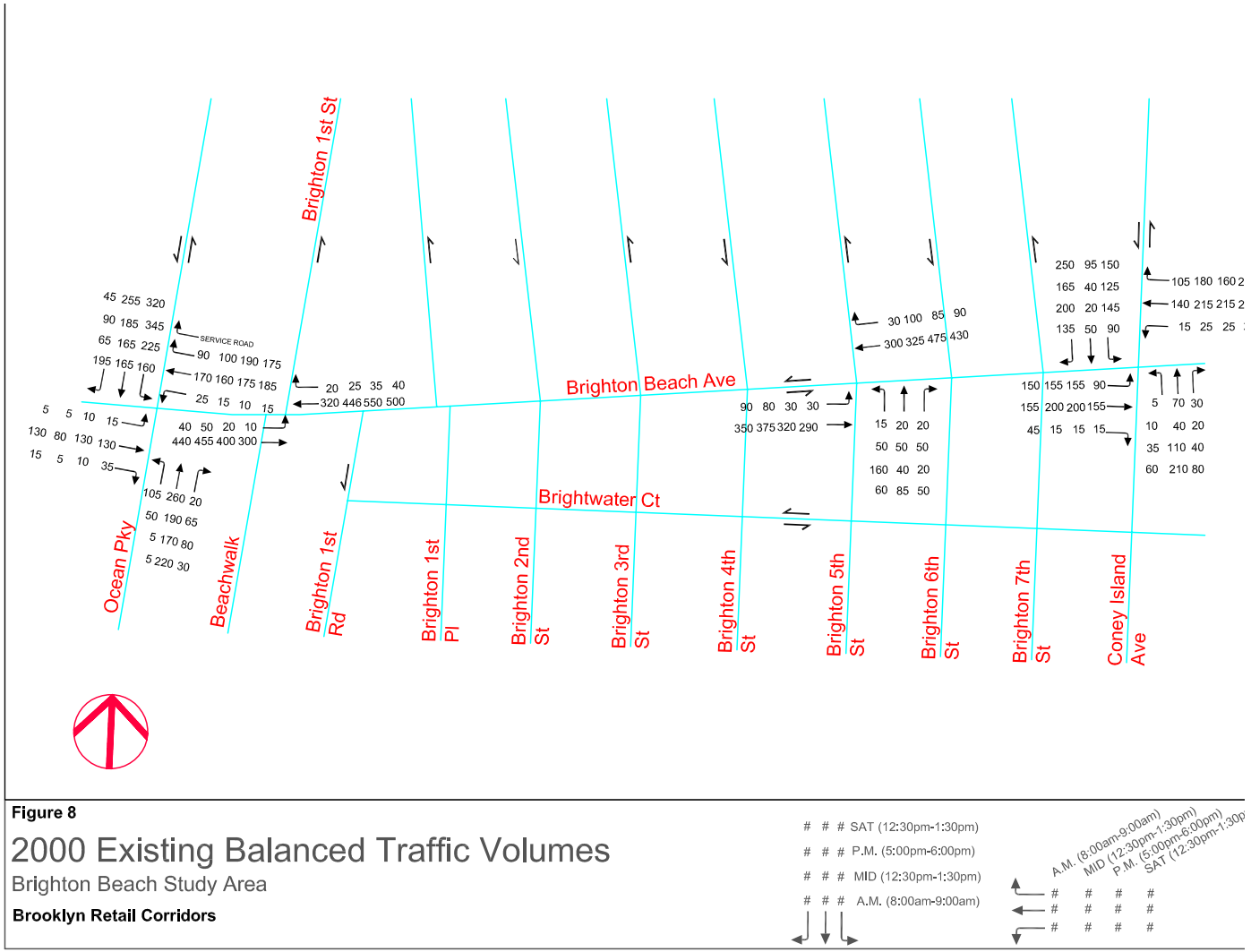


Figure 8

2000 Existing Balanced Traffic Volumes

Brighton Beach Study Area

Brooklyn Retail Corridors

2004 FUTURE NO-BUILD CONDITIONS

The future development scenario identifies seven potential sites within, or near, the study area. Five of the sites are located a considerable distance from the study area, and are not expected to have an impact on the study area traffic network. Their location and access to the Brighton Beach Avenue retail corridor do not warrant analysis under the future 2004 build condition. These sites include a planned Home Depot on Cropsey Avenue; TOPS appliance; Bensonhurst movie theater and retail space; Drier-Offerman Park Driving Range/Miniature Golf; and HPD Partnership homes. Two recent developments have had an impact on the study area traffic network.

The first development, Oceana, is a residential development built along the Coney Island boardwalk that includes 15 seven (7) to 12 story buildings with 850 dwelling units, 1,200 parking spaces, 53,000 square feet of open space, including a public playground and improved access to the boardwalk.

At Ocean Parkway and Brighton Beach Avenue, this development generates 86 additional vehicles during the AM peak period, 38 additional vehicles during the midday peak period, 76 additional vehicles during the PM peak period, and 70 additional vehicles during the weekend peak period.

No additional vehicle trips are projected at Brighton 1st Street and Brighton Beach Avenue.

At Brighton 5th Street and Brighton Beach Avenue, this development generates for the westbound through movement an additional 33 vehicle trips during the AM peak period, 20 additional vehicles during the midday peak perk period, 45 additional vehicles during the PM peak period and 38 additional vehicles during the weekend peak period.

At Coney Island Avenue and Brighton Beach Ave, this development generates 230 additional vehicles during the AM peak period, 130 additional vehicles during the midday peak period, 286 additional vehicles during the weekend peak period, and 179 additional vehicles during the weekend peak period.

The Keyspan Minor League Baseball Stadium in Coney Island, which occupies 948,000 square feet, has 1,158 parking spaces, and 7,500 seats, was projected to generate 305 additional vehicle trips during the PM peak period and 260 additional vehicle trips during the weekend peak period at Brighton Beach Avenue and Ocean Parkway.

Brighton Beach Avenue at Ocean Parkway

Traffic

Overall, the intersection would continue to operate at LOS C during the AM, midday and weekend peak period, and would deteriorate to LOS D during the PM peak period. Overall, delays would slightly increase, ranging from 26.0 to 35.5 seconds of delay per vehicle.

All lane groups would operate at LOS D or better, with the exception of the westbound right-turn movement, which would deteriorate to LOS E during the PM peak period, with 55.7 seconds of delay per vehicle (from 54.4 seconds of delay under existing conditions). During the weekend period it would deteriorate to LOS E with an increase in delay to 56.6 seconds of delay per vehicle from 53.7 seconds of delay per vehicle under existing conditions.

Pedestrian

All sidewalks, crosswalks, and corners would continue to operate at LOS B or better.

Brighton Beach Avenue at Coney Island Avenue

Traffic

Overall, the intersection would continue to operate at LOS C during the AM peak period and at LOS D during the PM and weekend peak periods. During the midday, the intersection would deteriorate to LOS D. Delays range from 33.2 to 50.2seconds per vehicle. All lane groups would operate at LOS D or better, with delays ranging from 24.4 to 47.2 seconds per vehicle, except the eastbound left-turn movement, which would continue to operate at LOS E during the midday period, with 66.9 seconds of delay per vehicle. The eastbound left-turn movement would continue to operate at LOS F, with 82.3 seconds of delay during the PM period. During the weekend period this movement would deteriorate to LOS F with 107.0 seconds of delay per vehicle. The southbound left, through, and right-turn movements would deteriorate to LOS E during the weekend period, with 71.8 seconds of delay per vehicle.

Pedestrian

All sidewalks, crosswalks, and corners would continue to operate at LOS C or better.

Brighton Beach Avenue at Brighton 5th Street

Traffic

Overall, the intersection would continue to operate at LOS B during the AM, PM, and weekend peak periods, with delays ranging from 5.5 to 7.5 seconds of delay per vehicle. During the midday period, the intersection would operate at LOS C, with delays ranging from 4.0 to 24.6 seconds per vehicle.

Pedestrian

Sidewalks, crosswalks, and corners would continue to operate at an acceptable level of service.

Brighton Beach Avenue at Brighton 1st Street

Traffic

Overall, this unsignalized intersection operates at LOS A during all peak periods, with average total delays/vehicle ranging from 3.3 seconds during the AM period to 4.6 seconds during the PM peak.

Pedestrian

Sidewalks, crosswalk, and corner level of service did not change from existing conditions.

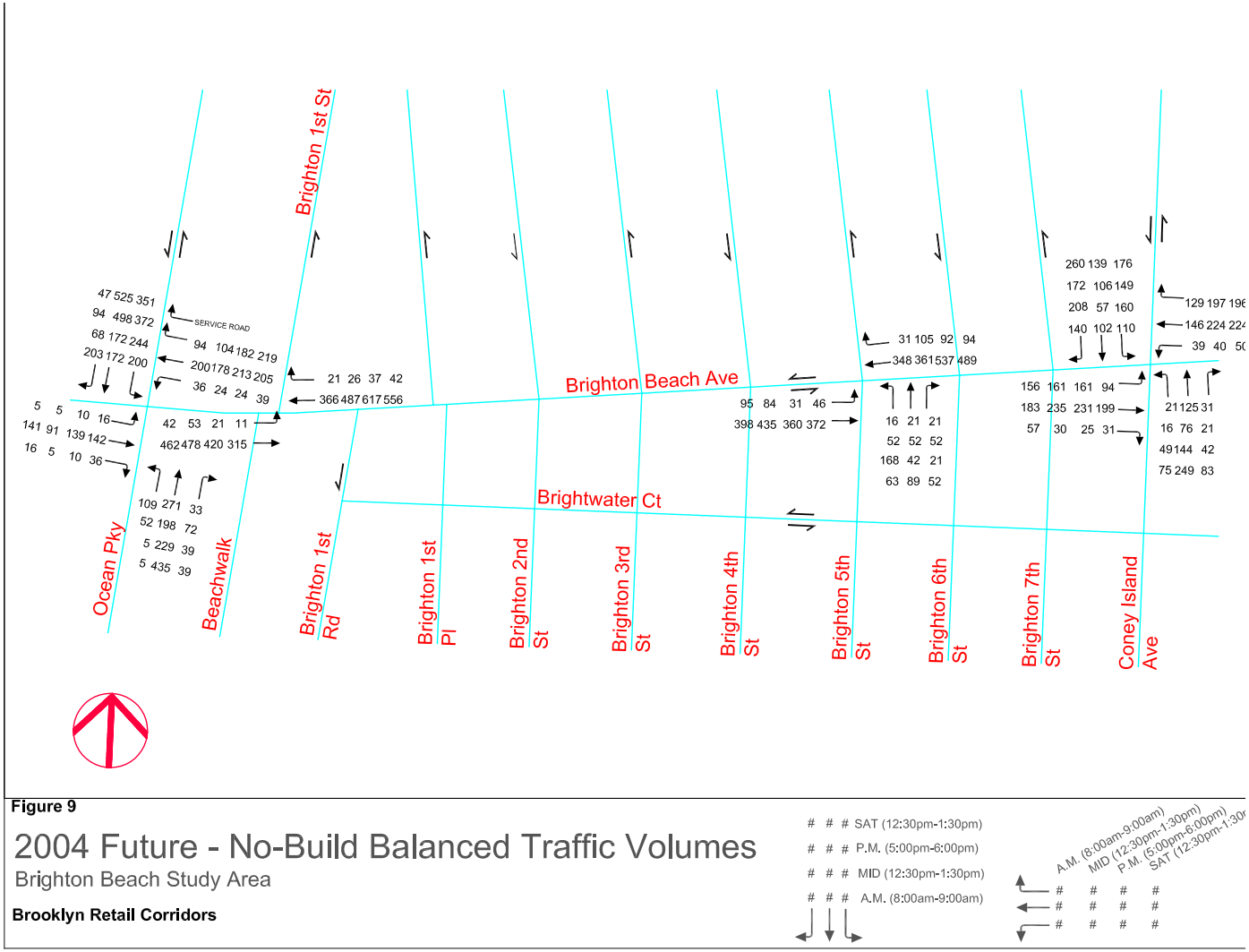


Figure 9

2004 Future - No-Build Balanced Traffic Volumes

Brighton Beach Study Area

Brooklyn Retail Corridors

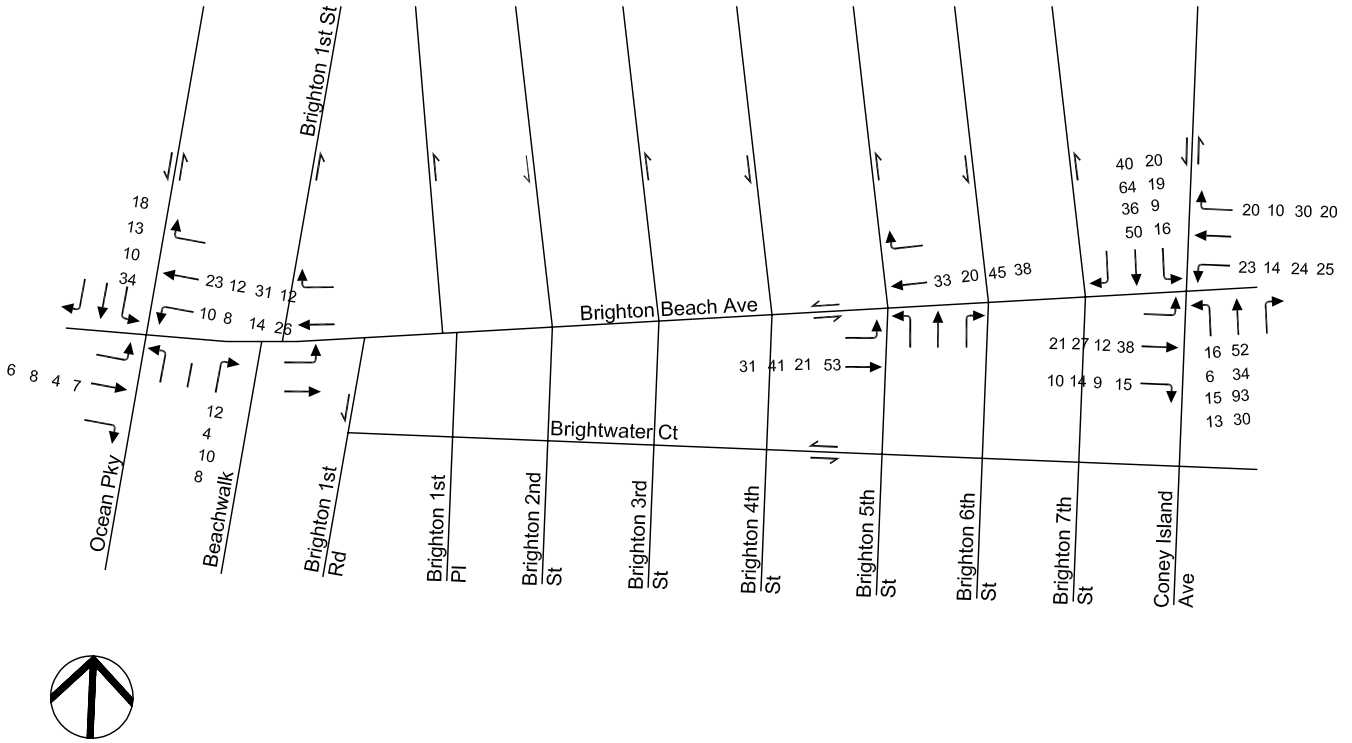


Figure 10

Project Trip Increment (Oceana)

Brighton Beach Study Area

Brooklyn Retail Corridors

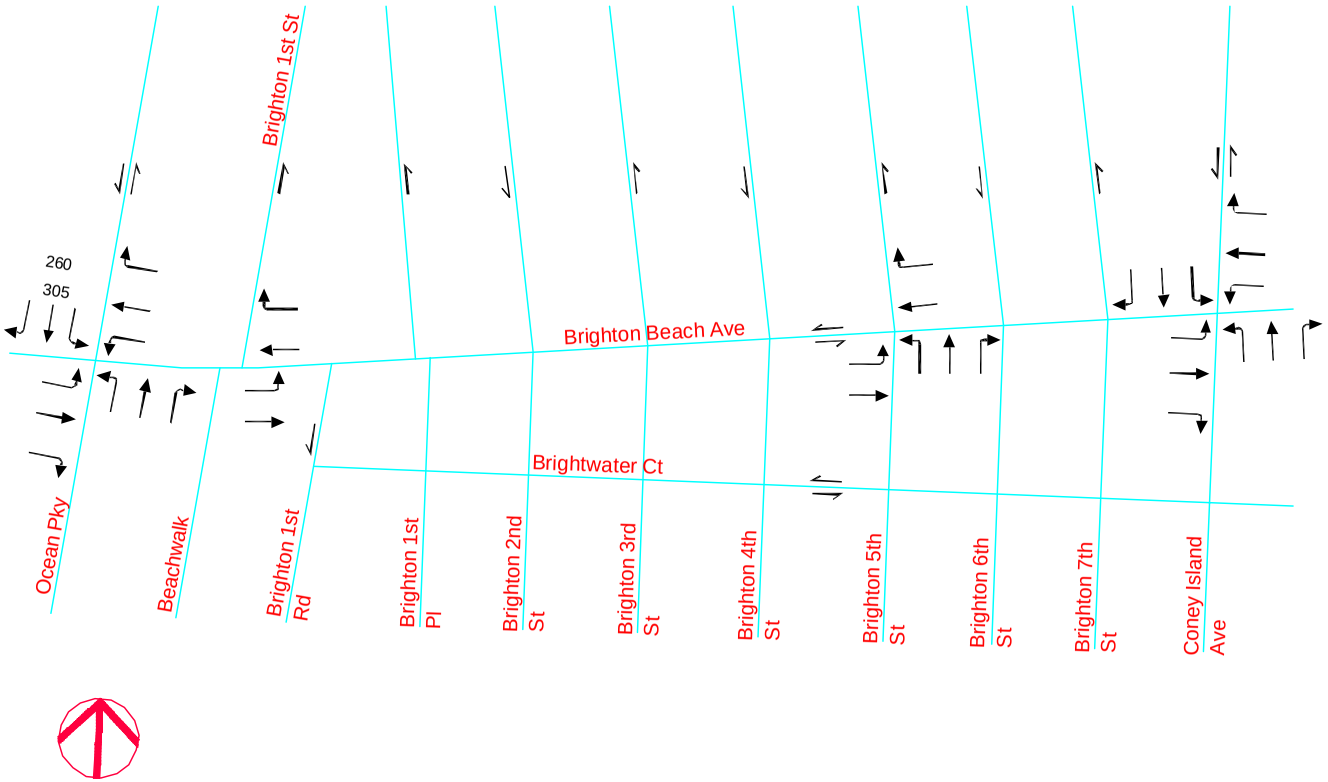


Figure 11

Project Trip Increment (Baseball Stadium)

Brighton Beach Study Area

Brooklyn Retail Corridors

ACCIDENT SUMMARY

The types of accidents occurring at these locations suggest the following contributing factors: restricted sight distances, signal timing, roadway lighting, high traffic volumes, roadway design, excessive speed, and/or pavement markings.

Brighton Beach Avenue at Ocean Parkway

Between 1996 and 1998, there were 37 reportable and 60 non-reportable accidents, and no fatalities, at this location. Of the total number of reportable accidents, 59 percent occurred during the day. Of the three most common types of accidents, 35 percent involved left-turns, 27 percent involved right-angle turns, and 16 percent were pedestrian-related. The number of accidents increased in 1997 from the previous year, then decreased in 1998.

Brighton Beach Avenue at Coney Island Avenue

Between 1996 and 1998, there were 46 reportable and 71 non-reportable accidents, with no fatalities, at this location. Of the total number of reportable accidents, 67 percent occurred during the day. Of the three most common types of accidents, 24 percent were other-angle common-direction collisions, 22 percent were rear-end collisions, and 22 percent were sideswipes. From 1996 to 1998, the number of accidents decreased modestly.

Table 9:Accident Analysis
Brighton Beach Avenue at Ocean Parkway and Coney Island Avenue

1996	Ocean Parkway			Coney Island Avenue		
	DAY	NIGHT	TOTAL	DAY	NIGHT	TOTAL
FATALITY	0	0	0	0	0	0
INJURY	6	1	7	5	2	7
DAMAGE ONLY	3	3	6	10	3	13
TOTAL	9	4	13	15	5	20

1997	Ocean Parkway			Coney Island Avenue		
	DAY	NIGHT	TOTAL	DAY	NIGHT	TOTAL
FATALITY	0	0	0	0	0	0
INJURY	5	2	7	5	4	9
DAMAGE ONLY	3	5	8	3	4	7
TOTAL	8	7	15	8	8	16

1998	Ocean Parkway			Coney Island Avenue		
	DAY	NIGHT	TOTAL	DAY	NIGHT	TOTAL
FATALITY	0	0	0	0	0	0
INJURY	4	4	8	6	1	7
DAMAGE ONLY	1	0	1	2	1	3
TOTAL	5	4	9	8	2	10

RECOMMENDATIONS AND 2004 FUTURE BUILD CONDITIONS

PEDESTRIAN CROSSINGS

Brighton Beach Avenue between Ocean Parkway and Brighton 1st Street

Due to the location of a subway entrance/exit and a bus stop, pedestrians cross the street mid-block to reach retail stores, transit facilities, and the beach. Pedestrians reach the Brighton Beach boardwalk by using Beachwalk, a restricted roadway in poor condition that is poorly lit and lacks pedestrian amenities.

RECOMMENDATION:

Install a pedestrian separator on the Brighton Beach Avenue median between Ocean Parkway and Brighton 1st Street to discourage midblock crossings.

Conduct a warrant analysis to determine the feasibility of installing a traffic control device and crosswalks to provide safe access to Beachwalk from Brighton Beach Avenue.

Install a neckdown on Brighton 1st Street at Brighton Beach Avenue.

Redesign Beachwalk (Drawing 3) as a welcoming pedestrian space that might serve as both a gateway to the beach and as the centerpiece of neighborhood pedestrian improvements:

Repave the length of Beachwalk from Brighton Beach Avenue to the boardwalk stairway with a more attractive material;

Replace grass strips. Remove rusted iron posts, and replace them with two stone or wooden planters to distinguish the entranceway. Install another planter at the south end of the boardwalk stairway;

At the south end of Beachwalk, plant trees on the west side, and plant shrubs on the east side, either to match the shrubs opposite or other beach shrubs;

Install seven new benches and standard trash receptacles along the walkway, four along the east side, two along the west wall, and one by the boardwalk stairs. Promote the installation of local artists' work on Boardwalk's west walls and the wall to the east of the boardwalk stairs. Install pedestrian level lighting. Install directional signage "To the Boardwalk" at the Ocean Parkway station. A maintenance agreement between NYCDOT and an existing organization, such as the Brighton Beach Business Improvement District, would be required prior to the implementation of any such design treatments.

Brighton Beach Avenue at Ocean Parkway

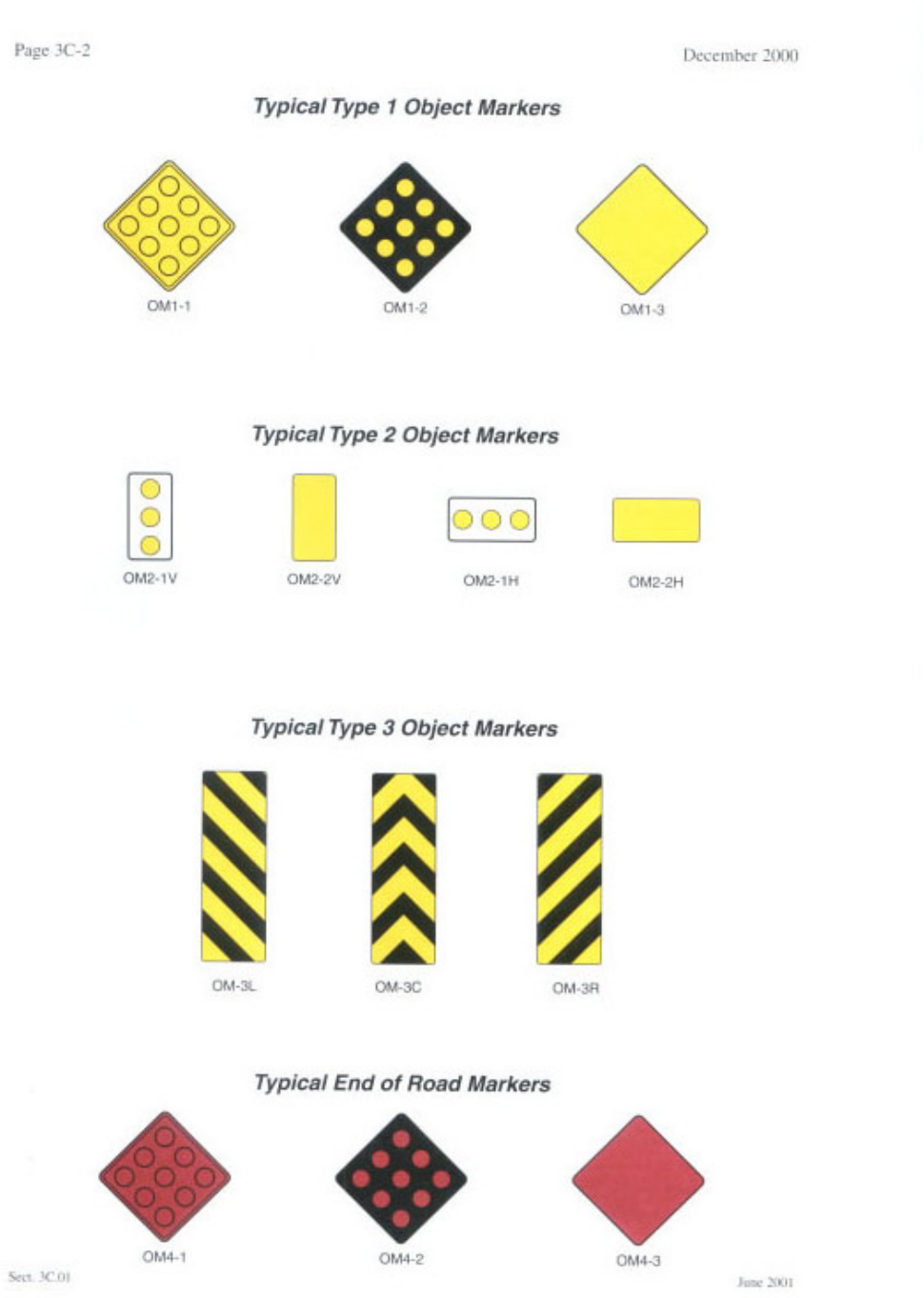
The elevated subway station's concrete supports obstruct sight lines for pedestrians crossing the intersection from north to south, and for drivers turning from wide Ocean Parkway onto the narrow retail corridor of Brighton Beach Avenue.

RECOMMENDATION:

Upgrade or replace existing object markers on the elevated structure's concrete supports that are in disrepair. As stated in the Manual on Uniform Traffic Control Devices (2000 edition), object markers are used to mark obstructions within, or adjacent to, the roadway. Type 1, 2, or 3 object markers are suitable for this location. All three types have reflective elements that may elevate the level of pedestrian safety at night.

Mount properly-angled mirrors at the top of the supports to help both drivers and pedestrians see around corners, and install signs at each leg of the intersection warning drivers of crossing pedestrians. Clean existing light fixtures underneath the structure to better illuminate the roadway, increase nighttime visibility, and improve sight lines.

Request the MTA to repaint the elevated structure's concrete supports as part of their Five-Year Capital Plan. This would provide a more orderly appearance to the intersection and would increase the overall attractiveness of the western gateway to the retail corridor.



Source: Manual on Uniform Traffic Control Devices (2000 edition)

Adjust the signal timing by increasing the westbound green time by three seconds for the PM and weekend peak period. During the PM peak period, the east- and westbound green time would increase from 23 to 26 seconds; during the weekend period, the east and westbound green time would increase from 16 to 19 seconds. The north and southbound green time would decrease by seven seconds and four seconds of a protected southbound left turn phase would be added at the end of the cycle (lagging). During the PM peak period, the north- and southbound green time would decrease from 57 to 50 seconds; during the weekend peak period the north- and southbound green time would decrease from 40 to 33 seconds.

Overall, during the PM peak period, the intersection would continue to operate at LOS D, with a slight increase in lane group delay to 35.8 seconds per vehicle from the No-Build delay of 35.5 seconds. The eastbound left-turn movement would improve to LOS B from the no-build LOS C, with 19.0 seconds of delay per vehicle. The westbound left-turn movement would improve to LOS B with 18.8 seconds of delay per vehicle form the no-build condition of LOS C with 20.5 seconds of delay. Additionally, the westbound right-turn movement would improve to LOS D with 49.3 seconds of delay per vehicle from the no-build condition of LOS E with 55.7 seconds of delay. The westbound through-right movement would continue to operate at LOS D with a decrease in lane group delay to 48.6 from 54.4 seconds of delay from the no-build condition.

During the weekend peak period, the intersection, overall, would continue to operate at LOS C, with 30.7 seconds of delay from the no-build condition of LOS C with 32.0 seconds of delay per vehicle. The eastbound through-right movement would improve to LOS C with 34.6 seconds of delay per vehicle from the no-build condition of LOS D with 39.4 seconds of delay. The westbound through-right movement would continue at LOS D with 43.5 seconds of delay per vehicle from the no-build condition with 46.8 seconds of delay per vehicle. The westbound right-turn movement would improve to LOS D with 43.5 seconds of delay from the no-build condition of LOS E and 56.6 seconds of delay.

EAST-WEST PEDESTRIAN TRAFFIC CONTROL DEVICES

Brighton Beach Avenue at Ocean Parkway

The pedestrian signal for the eastern Ocean Parkway service road is the most prominent and displays "WALK" while the main road signal displays "DON'T WALK." Pedestrians respond to the service road signal and may begin crossing Ocean Parkway unsafely.

RECOMMENDATION:

Improve the visibility of pedestrian signals either by changing their placement or by trimming any trees that may be blocking pedestrians view of them. Install pedestrian signage reminding pedestrians to wait for the green signal before crossing.

INTERSECTION CORNERS

Brighton Beach Avenue

The sidewalks along Brighton Beach Avenue are extremely congested, particularly during the summer months, by beach-goers, local residents, subway riders, sidewalk vendors, fruit stands, and retail displays. Pedestrians crossing Brighton Beach Avenue typically wait in the roadway, rather than on the sidewalk, due to limited space.

RECOMMENDATION:

Increase enforcement of laws governing retail displays on the sidewalk. Implement the Mayor's Executive Order governing "clear corner zones" to relocate newsboxes from street corners and install them at bus stops in order to remove clutter.

PEDESTRIAN AMENITIES/LIGHTING

Brighton Beach Avenue Corridor

Brighton Beach Avenue is very dark at night, creating the perception of an unsafe atmosphere that may discourage shoppers.

RECOMMENDATION:

Install lighting designed for use under elevated structures (”BB“ lighting) along retail streets to provide twice the illumination as standard light fixtures. An alternative is to install a higher wattage light or a metal halide light in the standard fixtures. Install standard Department of Sanitation trash receptacles, their number, placement, and scheduling of additional collection services to be determined by the Department of Sanitation (DOS).

TRUCK LOADING ZONE REGULATIONS

Brighton Beach Avenue

Trucks make deliveries along Brighton Beach Avenue at all times of the day, frequently blocking the flow of traffic by double parking. There are no truck loading time or zone regulations in effect, and some local businesses do not support time restrictions.

RECOMMENDATION:

Monitor/assess the NYCDOT Metered Parking/Congestion Pricing for Commercial Vehicles Pilot Program in Midtown Manhattan to determine its applicability to the Brighton Beach retail corridor.

ON- AND OFF-STREET PARKING FACILITIES

Brighton Beach Avenue Corridor

There is a lack of on-street parking along Brighton Beach Avenue.

RECOMMENDATION:

Replace existing standard parking meters with one or two-hour muni-meters along Brighton Beach Avenue between Ocean Parkway and Coney Island Avenue. The installation of muni-meters would increase the parking supply by up to 25 percent. An alternative to muni-meters would be to stripe white parking space limit markings along the corridor to create a more orderly on-street parking environment.

Create approximately 50 new off-street metered parking spaces on the median beneath the elevated subway tracks on Brighton Beach Avenue between West 3rd and West 6th Streets. Use as a model for developing additional parking spaces at this location two existing locations (West 126th Street and Broadway; Queens Boulevard) where parking underneath elevated structures currently exists. This would generate additional revenue, as well as address the parking shortfall along the retail corridor.

PEDESTRIAN CROSSWALKS

Brighton Beach Avenue Corridor

Pavement markings are faded all along the Brighton Beach corridor, including locations with high volumes of pedestrian activity.

RECOMMENDATION:

Re-stripe faded and/or install pavement markings at Brighton Beach Avenue at Brighton 5th, 6th, and 7th Streets.

HIGH ACCIDENT LOCATION

Brighton Beach Avenue at Coney Island Avenue

Between 1996 and 1998, 46 accidents occurred at this location. Heavy vehicular volumes, considerable pedestrian traffic, and irregular intersection geometry all contribute to the number of accidents, many of which involved rear-end, sideswipe, and other-angle collisions. The vehicular level of service for the eastbound left-turning traffic is poor during the midday, evening, and weekend peak periods.

RECOMMENDATION:

Install pedestrian separators on the Brighton Beach Avenue median to encourage use of the crosswalks and thereby increase pedestrian safety.

Replace the painted channelization markings with a suitably sized and shaped, raised concrete pedestrian refuge and channelization island. This would provide a safe place for pedestrians who cannot cross the roadway within one traffic signal cycle.

Install neckdowns at all four corners of the intersection to decrease crossing distances for pedestrians.

Adjust the signal timing in the PM period by increasing the east and westbound green time by nine (9) seconds (from 34 to 43 seconds), decreasing the north and southbound green time by seven (7) seconds (from 46 to 39 seconds), and decreasing the pedestrian green by two (2) seconds (from 27 to 25 seconds). Although the pedestrian phase would decrease, there would be sufficient time to cross the intersection at a diagonal at a pace of four feet per second. During the PM period, the eastbound left turn would improve to LOS D (43.5 seconds of delay per vehicle) from the no-build condition LOS F (82.3 seconds of delay per vehicle). Overall, the intersection would improve to LOS C with 33.4 seconds of delay per vehicle from the no-build condition of 38.4 seconds.

Movements with failing levels-of-service during the midday and weekend peak periods cannot be mitigated under the existing 90-second signal cycle without negatively impacting pedestrians. Change the signal timing cycle for the midday and weekend peak periods from 90 seconds to 120 seconds to match the signal cycles during the morning and evening peak hours. The east and westbound green time would be 40 seconds with three (3) seconds of yellow and two (2) seconds of all red. The north and southbound green time would be 42 seconds with three (3) seconds of yellow and two (2) seconds of all red. The all-pedestrian phase would have 25 seconds of green time. This change is not expected to affect signal operations at Brighton 1st Street, Brighton 5th Street, or Ocean Parkway or the signal progression along the Brighton Beach Avenue corridor. (The cycle length at Ocean Parkway and Brighton Beach Avenue could also be changed from 90 to 120 seconds during the AM and PM peaks to ensure smooth traffic flow.)

During the midday peak period, the eastbound left turn movement would improve to LOS D with 51.1 seconds of delay from LOS E and 66.9 seconds of delay under the no-build condition. The eastbound through and right-turn movement would drop to LOS D from

LOS C during the no-build, with a slight increase in vehicle delay (to 35.1 seconds to 33.7 seconds) The southbound through, left and right movements would continue to operate at LOS C, with a vehicle delay of 34.1 seconds (a decrease from the no-build condition of 34.8 seconds of delay). All other movements would continue to operate at LOS C with slight increases in delay ranging from 1.4 seconds to 2.6 seconds. Overall, the intersection would continue to operate at LOS D, but with a slight decrease in vehicle delay to 35.3 seconds from 36.0 seconds under the no-build condition.

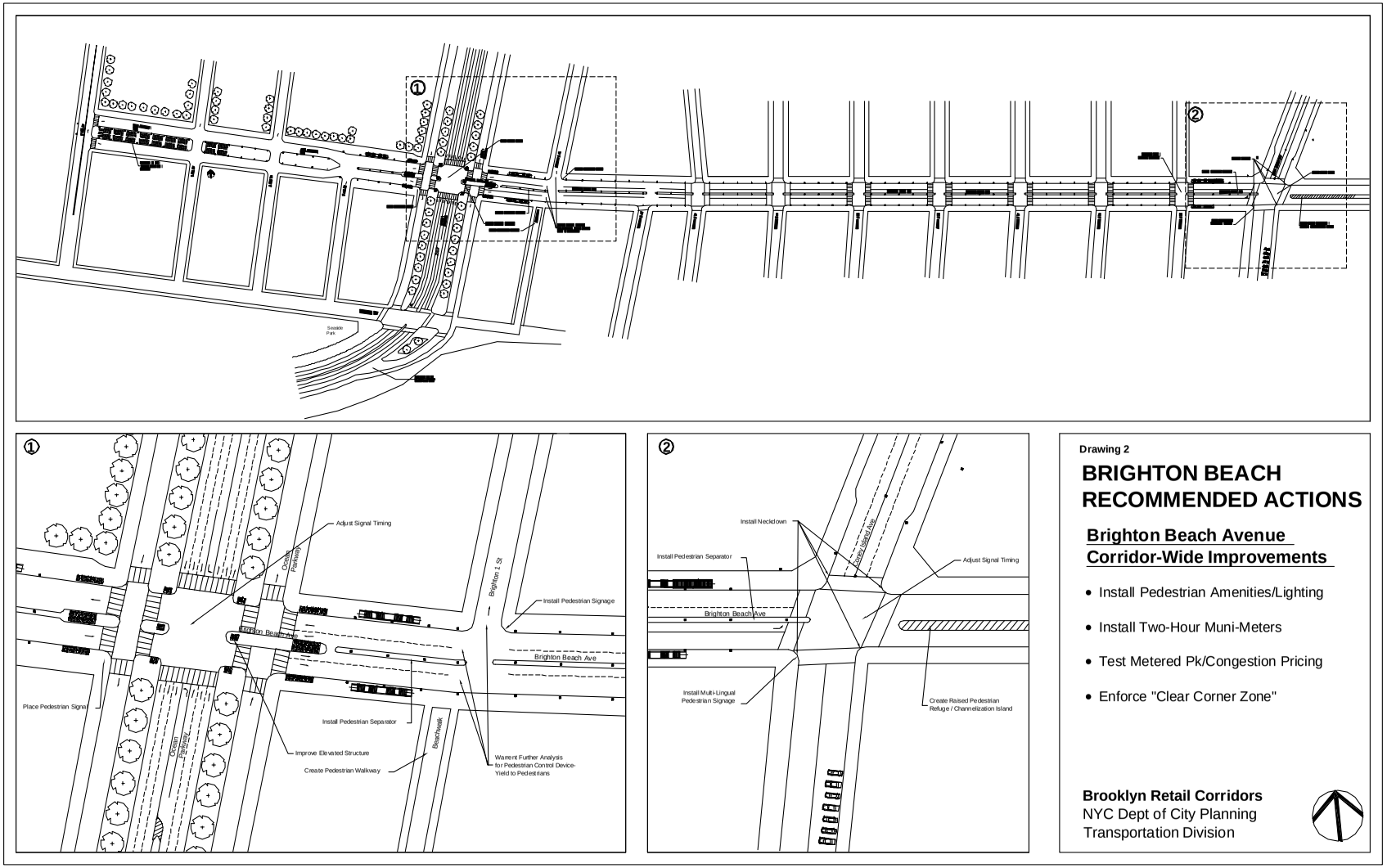
During the weekend peak period, the eastbound left turn movement would improve to LOS E from LOS F under the no-build condition (the vehicle delay would decrease to 64.0 seconds from 107.0 seconds during the no-build condition). The southbound left, through, and right turn movements would improve to LOS D and 44.5 seconds of delay from the no-build conditions of LOS E and 71.8 seconds of delay. The northbound left turn movement would remain at LOS D, with decreased delay from the no-build condition (37.1 seconds from 47.2 seconds during the no-build). All other movement would continue to operate at LOS C with a slight increase in delay ranging from 1.4 seconds to 2.5 seconds. Overall, the intersection would remain at LOS D with a decrease in delay to 39.1 seconds of delay from the no build condition of 50.2 seconds.

TABLE 10
Brighton Beach: Comparison of LOS and Delay for Existing, No-Build, and Build Conditions

MIDDAY PEAK PERIOD													
INTERSECTION	**2000 Existing**				**2004 No-Build**				**2004 Build**				**Delay**
Approach	Mvm't	v/c	Delay	LOS	Mvm't	v/c	Delay	LOS	Mvm't	v/c	Delay	LOS	**Change**
Brighton Beach Ave @ Coney Island Ave													
Eastbound	L	0.78	55.0+	E	L	0.86	66.9	E	L	0.70	51.1	D	15.8
	TR	0.49	31.4	C	TR	0.58	33.7	C	TR	0.47	35.1	D	-1.4
Westbound	L	0.10	25.7	C	L	0.20	27.6	C	L	0.16	30.0	C	-2.4
	TR	0.50	30.0	C	TR	0.53	30.6	C	TR	0.44	33.2	C	-2.6
Northbound	L	0.05	24.9	C	L	0.09	25.7	C	L	0.07	27.1	C	-1.4
	TR	0.07	24.8	C	TR	0.12	25.2	C	TR	0.09	27.0	C	-1.8
Southbound	LTR	0.58	32.2	C	LTR	0.67	34.8	C	LTR	0.53	34.1	C	0.7
Intersection			**33.7**	**C**			**36.0**	**D**			**35.3**	**D**	**0.7**

PM PEAK PERIOD													
INTERSECTION	2000 Existing				2004 No-Build				2004 Build				Delay
Approach	Mvm't	v/c	Delay	LOS	Mvm't	v/c	Delay	LOS	Mvm't	v/c	Delay	LOS	Change
Brighton Beach Ave @ Ocean Parkway													
Eastbound	L	0.01	20.5	C	L	0.01	20.7	C	L	0.01	19.0	B	1.7
	TR	0.25	43.7	D	TR	0.29	44.4	D	TR	0.25	41.3	D	3.1
	R	0.02	40.3	D	R	0.02	40.3	D	R	0.02	37.8	D	2.5
Westbound	L	0.02	20.2	C	L	0.05	20.5	C	L	0.04	18.8	B	1.7
	TR	0.53	50.1	D	TR	0.65	54.4	D	TR	0.57	48.6	D	5.8
	R	0.63	54.4	D	R	0.66	55.7	E	R	0.58	49.3	D	6.4
Northbound	L	0.01	17.2	B	L	0.02	17.3	B	L	0.02	21.3	C	-4.0
	TR	0.14	18.4	B	TR	0.15	18.5	B	TR	0.17	22.8	C	-4.3
Southbound	L	0.79	40.4	D	L	0.88	49.4	D	L	0.84	47.7	D	1.7
	TR	0.15	18.5	B	TR	0.31	20.3	C	TR	0.35	25.1	C	-4.8
Intersection			**34.9**	**C**			**35.5**	**D**			**35.8**	**D**	**-0.3**
Brighton Beach Ave @ Coney Island Ave													
Eastbound	L	0.77	63.1	E	L	0.88	82.3	F	L	0.63	43.5	D	38.8
	TR	0.25	34.5	C	TR	0.31	35.3	D	TR	0.24	28.2	C	7.1
Westbound	L	0.09	32.9	C	L	0.20	35.0-	C	L	0.15	27.7	C	-27.7
	TR	0.45	37.8	D	TR	0.51	38.9	D	TR	0.40	30.6	C	8.3
Northbound	L	0.11	25.1	C	L	0.18	26.5	C	L	0.23	32.4	C	-5.9
	TR	0.13	24.8	C	TR	16.00	25.2	C	TR	0.19	30.2	C	-5.0
Southbound	LTR	0.39	28.7	C	LTR	0.50	30.7	C	LTR	0.59	37.6	D	-6.9
Intersection			**36.0**	**D**			**38.4**	**D**			**33.4**	**C**	**5.0**

SATURDAY PEAK PERIOD													
INTERSECTION	2000 Existing				2004 No-Build				2004 Build				Delay
Approach	Mvm't	v/c	Delay	LOS	Mvm't	v/c	Delay	LOS	Mvm't	v/c	Delay	LOS	Change
Brighton Beach Ave @ Ocean Parkway													
Eastbound	L	0.01	15.0	B	L	0.01	15.1	B	L	0.01	13.4	B	1.7
	TR	0.45	38.5	D	TR	0.48	39.4	D	TR	0.40	34.6	C	4.8
	R	0.09	32.6	C	R	0.09	32.7	C	R	0.08	29.9	C	2.8
Westbound	L	0.03	14.9	B	L	0.08	15.3	B	L	0.07	13.6	B	1.7
	TR	0.62	43.7	D	TR	0.69	46.8	D	TR	0.57	38.7	D	8.1
	R	0.74	53.7	D	R	0.77	56.6	E	R	0.65	43.5	D	13.1
Northbound	L	0.01	14.6	B	L	0.02	14.7	B	L	0.02	19.0	B	-4.3
	TR	0.13	15.5	B	TR	0.14	15.5	B	TR	0.17	20.1	C	-4.6
Southbound	L	0.80	36.5	D	L	0.89	47.1	D	L	0.83	42.6	D	4.5
	TR	0.16	15.7	B	TR	0.29	16.9	B	TR	0.36	22.0	C	-5.1
Intersection			**31.1**	**C**			**32.0**	**C**			**30.7**	**C**	**1.3**
Brighton Beach Ave @ Coney Island Ave													
Eastbound	L	0.88	73.7	E	L	1.01	107.0	F	L	0.80	64.0	E	43.0
	TR	0.46	30.9	C	TR	0.55	33.1	C	TR	0.45	34.7	C	-1.6
Westbound	L	0.08	25.3	C	L	0.21	27.7	C	L	0.17	30.2	C	-2.5
	TR	0.58	31.5	C	TR	0.63	32.6	C	TR	0.51	34.7	C	-2.1
Northbound	L	0.38	33.6	C	L	0.60	47.2	D	L	0.42	37.1	D	10.1
	TR	0.35	27.8	C	TR	0.40	28.4	C	TR	0.31	29.8	C	-1.4
Southbound	LTR	0.84	44.3	D	LTR	1.01	71.8	E	LTR	0.80	44.5	D	27.3
Intersection			**38.3**	**D**			**50.2**	**D**			**39.1**	**D**	**11.1**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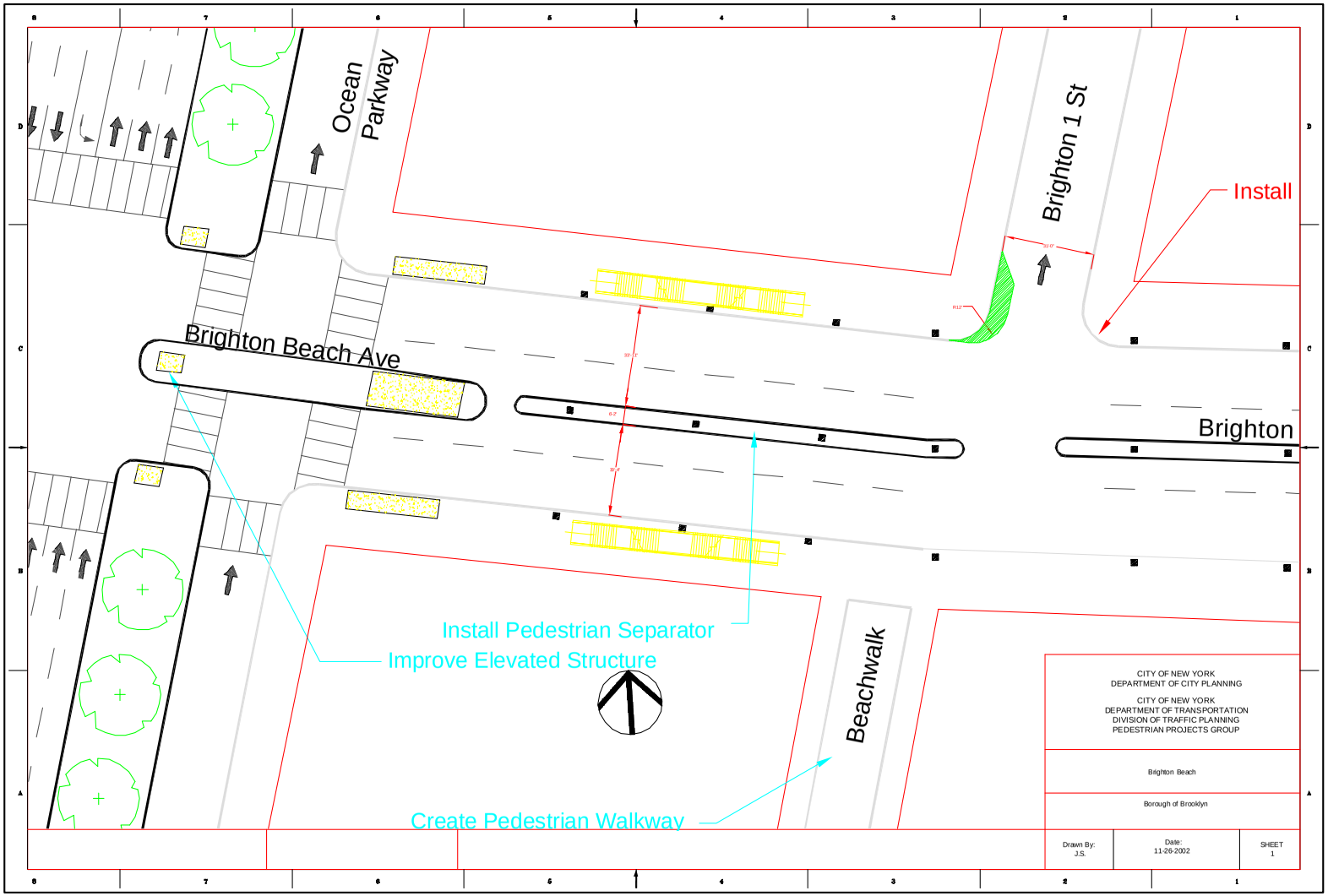
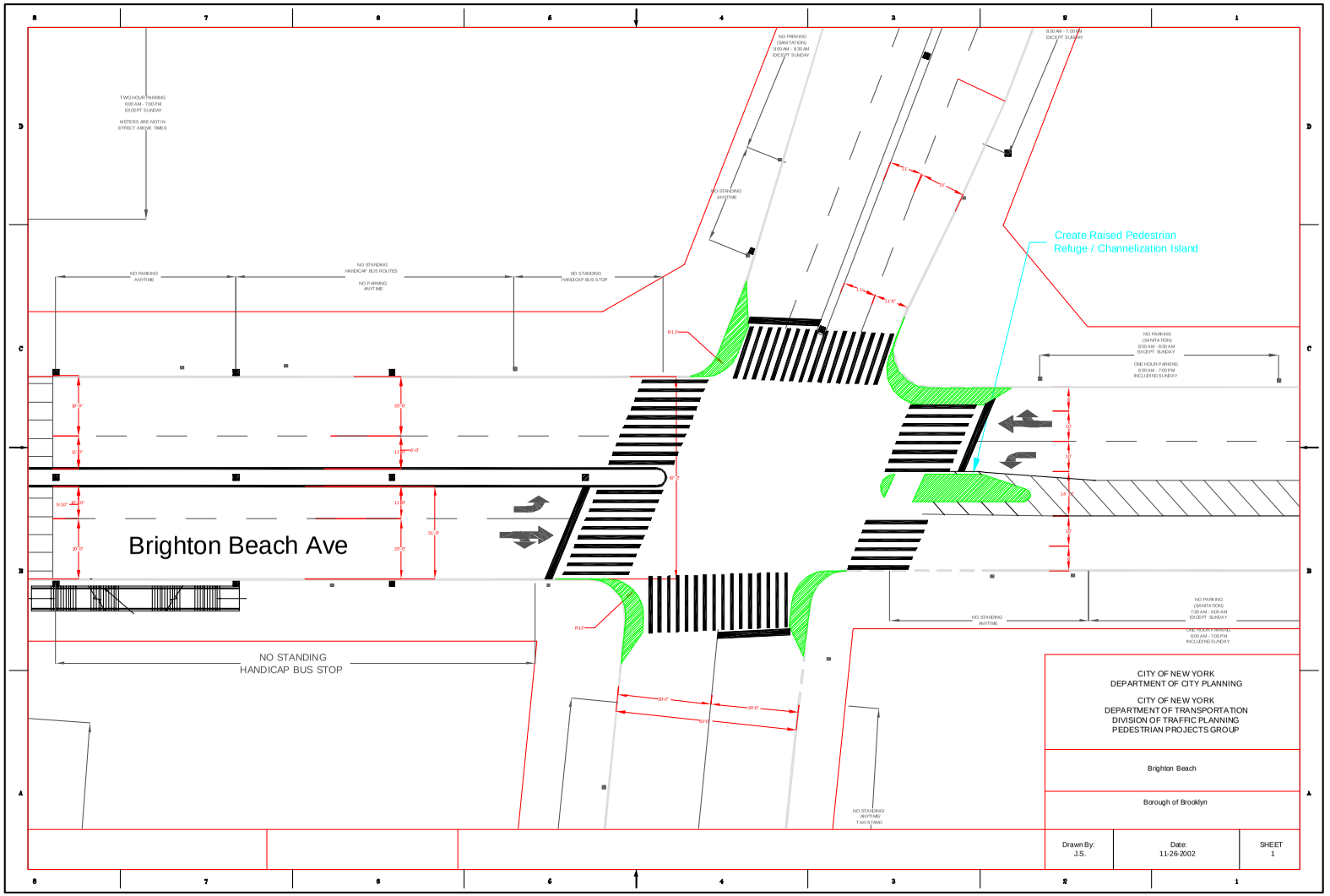
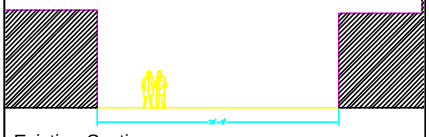
②
Adjust Signal Timing
Ocean Parkway
Brighton 1 St
Install Pedestrian Signage
Brighton Beach Ave
Place Pedestrian Signal
Install Pedestrian Separator
Improve Elevated Structure
Create Pedestrian Walkway
Boardwalk
Warrent Further Analysis for Pedestrian Control Device- Yield to Pedestrians
Install Neckdown
Install Pedestrian Separator
Coney Island Ave
Adjust Signal Timing
Brighton Beach Ave
Install Multi-Lingual Pedestrian Signage
Create Raised Pedestrian Refuge / Channelization Island
Drawing 2
BRIGHTON BEACH
RECOMMENDED ACTIONS
Brighton Beach Avenue
Corridor-Wide Improvements
• Install Pedestrian Amenities/Lighting
• Install Two-Hour Muni-Meters
• Test Metered Pk/Congestion Pricing
• Enforce "Clear Corner Zone"
Brooklyn Retail Corridors
NYC Dept of City Planning
Transportation Division


Ocean Parkway
Brighton 1 St
Install
Brighton Beach Ave
Brighton
Install Pedestrian Separator
Improve Elevated Structure
Beachwalk
Create Pedestrian Walkway
CITY OF NEW YORK
DEPARTMENT OF CITY PLANNING
CITY OF NEW YORK
DEPARTMENT OF TRANSPORTATION
DIVISION OF TRAFFIC PLANNING
PEDESTRIAN PROJECTS GROUP
Brighton Beach
Borough of Brooklyn
Drawn By:
J.S.
Date:
11-26-2002
SHEET
1

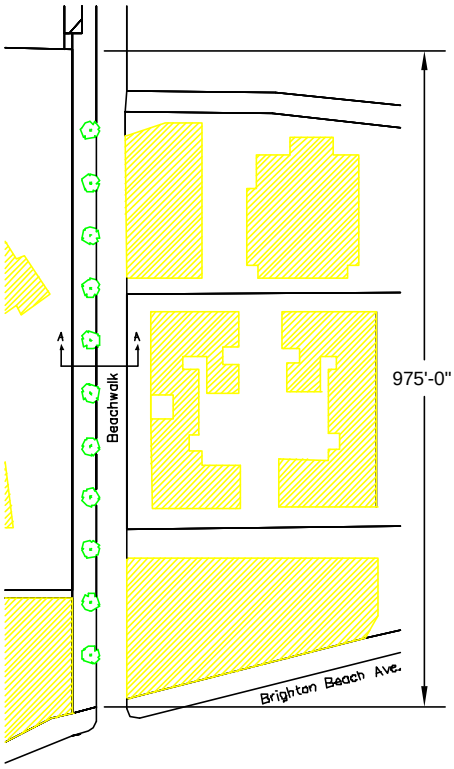

Create Raised Pedestrian
Refuge / Channelization Island
Brighton Beach Ave
NO STANDING
HANDICAP BUS STOP
CITY OF NEW YORK
DEPARTMENT OF CITY PLANNING
CITY OF NEW YORK
DEPARTMENT OF TRANSPORTATION
DIVISION OF TRAFFIC PLANNING
PEDESTRIAN PROJECTS GROUP
Brighton Beach
Borough of Brooklyn
Drawn By:
J.S.
Date:
11-26-2002
SHEET
1

Existing Condition

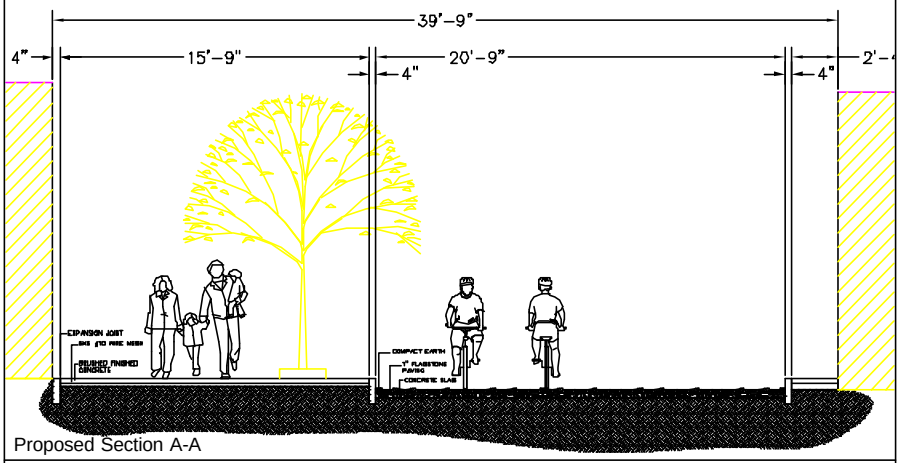
Proposed Condition



Existing Section



Proposed Plan

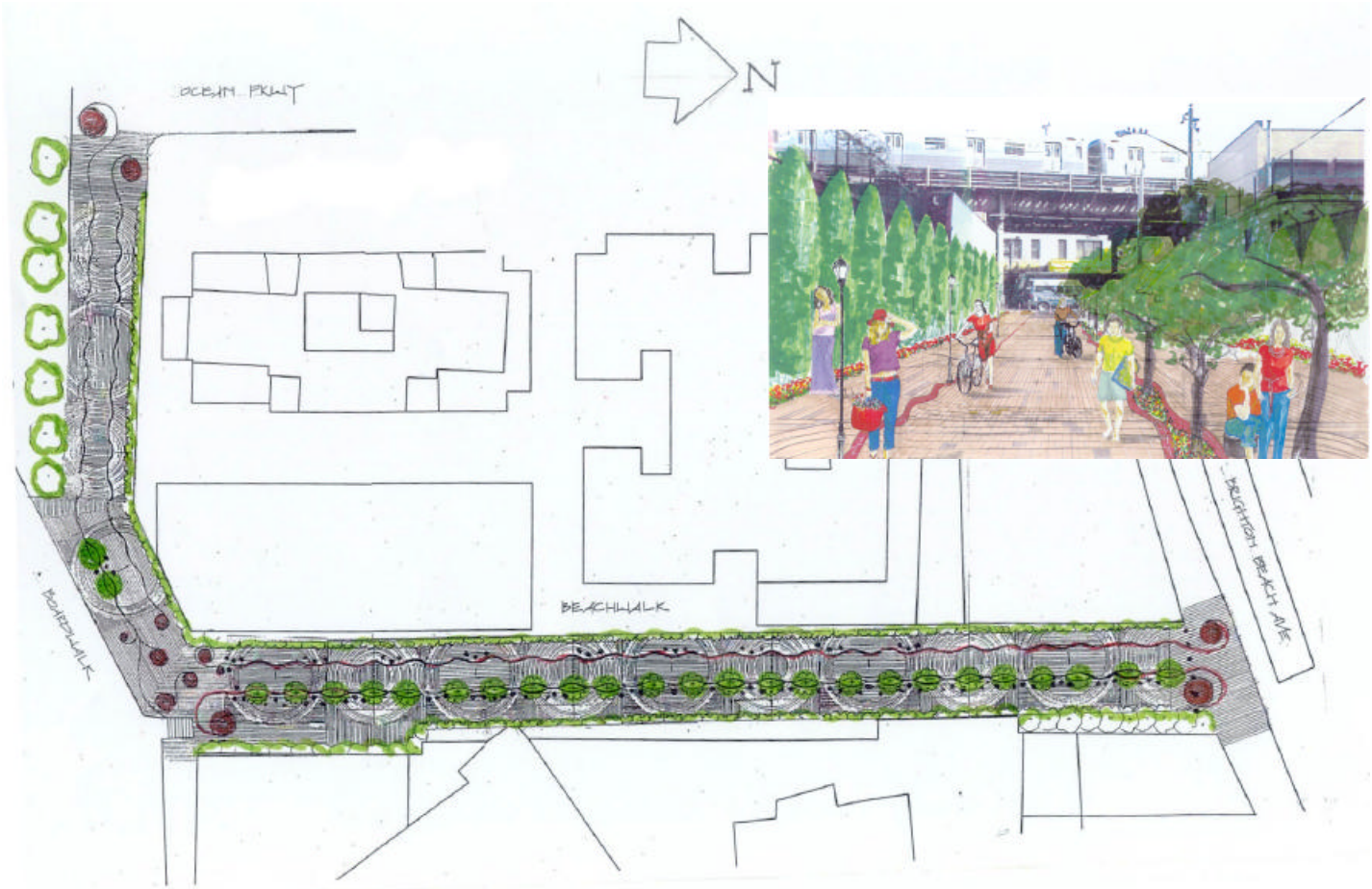


Proposed Section A-A

Drawing 3a

Brighton Beach: Recommended Actions: Beachwalk

Brooklyn Retail Corridors
NYC Dept of City Planning
Transportation Division



Drawing 3b
Brighton Beach:
Recommended Actions: Beachwalk
Alternative Proposed Future Condition

Brooklyn Retail Corridors
New York City
Department of Transportation
Division of Traffic Planning
Pedestrian Projects Group

Knickerbocker Ave. at DeKalb Ave.

Knickerbocker Ave. at Myrtle Ave.

Knickerbocker Ave. at Himrod St.

Knickerbocker Ave. at Menahan St.

5.c. BUSHWICK

A traffic and pedestrian LOS analysis was conducted at two signalized intersections, Knickerbocker Avenue at Dekalb and Myrtle Avenues. Two unsignalized intersections, Knickerbocker Avenue at Himrod and Menahan Streets, were also analyzed. Figures 7 and 8 show the existing and future no-build balanced traffic volumes for the AM, midday, PM, and weekend peak periods. Table 11 illustrates the severity of accidents for a three year period by time of day for each occurrence. Table 12 compares LOS and delay for existing, no-build, and build conditions for both intersections. Recommended actions for this study area are shown in Drawing 4.

Peak Hour

Traffic

Based upon the peak period traffic counts, the morning peak hour is 8:00-9:00 AM, the midday period is 12:30-1:30 PM, the evening period is 4:30-5:30 PM, and the weekend period is 1:00-2:00 PM.

Pedestrian

Based upon the peak period traffic counts, the morning peak hour is 8:00-9:00 AM, the midday period is 12:30-1:30 PM, the evening period is 4:30-5:30 PM, and the weekend period is 1:00-2:00 PM.

2000 EXISTING CONDITIONS

Knickerbocker Avenue at Dekalb Avenue

Traffic

Overall, the intersection operates at acceptable LOS B for all four peak periods, with delays ranging from 8.9 to 9.7 seconds per vehicle. All lane groups operate at LOS B for all peak periods. Delays range from 5.1 to 12.2 seconds per vehicle.

Pedestrian

All sidewalks, crosswalks, and corners operate at LOS B or better for all peak periods.

Knickerbocker Avenue at Myrtle Avenue

Traffic

Overall, the intersection operates during the AM and weekend peak periods at an acceptable LOS C, with 16.3 and 23.4 seconds of delay per vehicle respectively. Each lane group operates at LOS C or better, with delays ranging from 11.0 to 21.6 seconds per vehicle. The exception is the northbound left-through movement during the weekend peak period, which operates at LOS E with 41.1 seconds of delay. During the midday period, the intersection operates at LOS B, with 13.1 seconds of delay per vehicle. Each lane group operates at LOS B or better, with delays ranging from 9.2 to 16.0 seconds of delay per vehicle. During the PM period, the intersection operates at LOS D with 25.6 seconds of delay per vehicle. Lane groups operate at LOS C or better, with delays ranging from 13.8 to 20.7 seconds per vehicle, except for the northbound left-through movement, which operates at LOS E with 48.1 seconds of delay.

Pedestrian

All sidewalks, crosswalks, and corners operate at LOS C or better for all peak periods.

Knickerbocker Avenue at Himrod Street

Traffic

Overall, this unsignalized intersection operates at LOS C during the AM, PM, and weekend peak periods, and LOS B during the midday period. Delays range from 1.6 to 3.0 seconds of delay per vehicle.

Pedestrian

All sidewalks, crosswalks, and corners operate at LOS A for all peak periods.

Knickerbocker Avenue at Menahan Street

Traffic

Overall, this unsignalized intersection operates at LOS B for all peak periods, with delays ranging from 1.4 to 1.7 seconds of delay per vehicle.

Pedestrian

All sidewalks, crosswalks, and corners operate at LOS C or better for all peak periods.

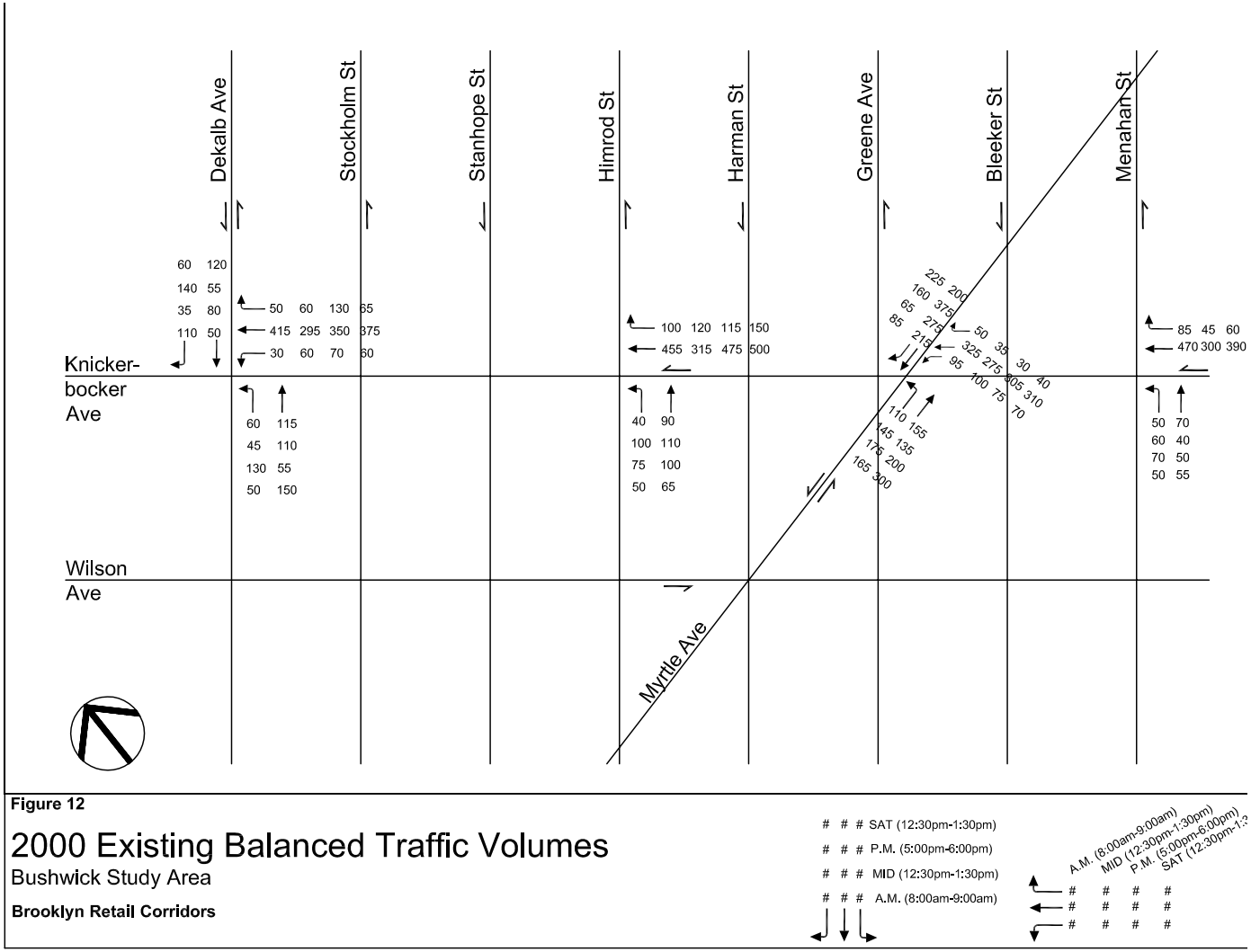


Figure 12

2000 Existing Balanced Traffic Volumes

Bushwick Study Area

Brooklyn Retail Corridors

2004 FUTURE NO-BUILD CONDITIONS

The future development scenario identifies four New York City Department of Housing Preservation and Development (HPD) residential and commercial projects in the vicinity of the Bushwick retail corridor: the Bushwick Central I project, which involves the construction of 104 dwelling units in 52 two-story, two-family homes; Bushwick West, 70 two-story, two-family homes totaling 140 dwelling units; the Ridgewood Bushwick Youth Center, a one- or two-story building of 20,000 square feet; and retail space totaling up to 7,500 square feet. Due to their location and the residential use, these developments are not expected to have an impact on the study area's traffic network and a build analysis is not warranted.

Knickerbocker Avenue at Dekalb Avenue

Traffic

Overall, this intersection would continue to operate at an acceptable LOS B for all peak periods, with a slight increase in delays, ranging from 9.0 to 9.8 seconds of delay per vehicle. All lane groups would experience a very slight increase in delays ranging from 5.1 to 12.4 seconds per vehicle.

Pedestrian

All sidewalks, crosswalks, and corners would continue to operate at acceptable levels for all peak periods.

Knickerbocker Avenue at Myrtle Avenue

Traffic

Overall, this intersection would continue to operate at LOS C during the AM peak period. All lane groups would operate at LOS C or better, and would experience a slight increase in delays, ranging from 11.1 to 21.8 seconds of delay per vehicle. During the midday period, the intersection would continue to operate at LOS B, with a slight increase in delay to 13.8 seconds per vehicle from the no-build condition of 13.1 seconds of delay. All lane groups would continue to operate at LOS C or better, with very slight increases in delay, which would range from 9.4 to 16.1 seconds per vehicle. During the PM and weekend peak periods, the overall intersection would deteriorate to LOS F. All lane groups would operate at LOS C or better, with the exception of the northbound left-through movement for both periods, which would operate at LOS F.

Pedestrian

All sidewalks, crosswalks, and corners would continue to operate at acceptable levels for all peak periods.

Knickerbocker Avenue at Himrod Street

Traffic

Overall, this intersection would continue to operate at LOS C during the AM, PM, and weekend periods, with a slight increase in average total delay, ranging from 11.2 to 13.1 seconds per vehicle. During the midday period, this intersection would continue to operate at LOS B, with a slight increase in average total delay to 9.3 seconds per vehicle.

Pedestrian

All sidewalks, crosswalks, and corners would continue to operate at acceptable levels for all peak periods.

Knickerbocker Avenue at Menahan Street

Traffic

During the AM period, this intersection would deteriorate to LOS C with increased average total delay of 10.2 seconds per vehicle. The midday, PM, and weekend periods would continue to operate at LOS B, with a slight increase in delay; average total delay ranges from 6.6 to 8.5 seconds per vehicle.

Pedestrian

All sidewalks, crosswalks, and corners would continue to operate at acceptable levels for all peak periods.

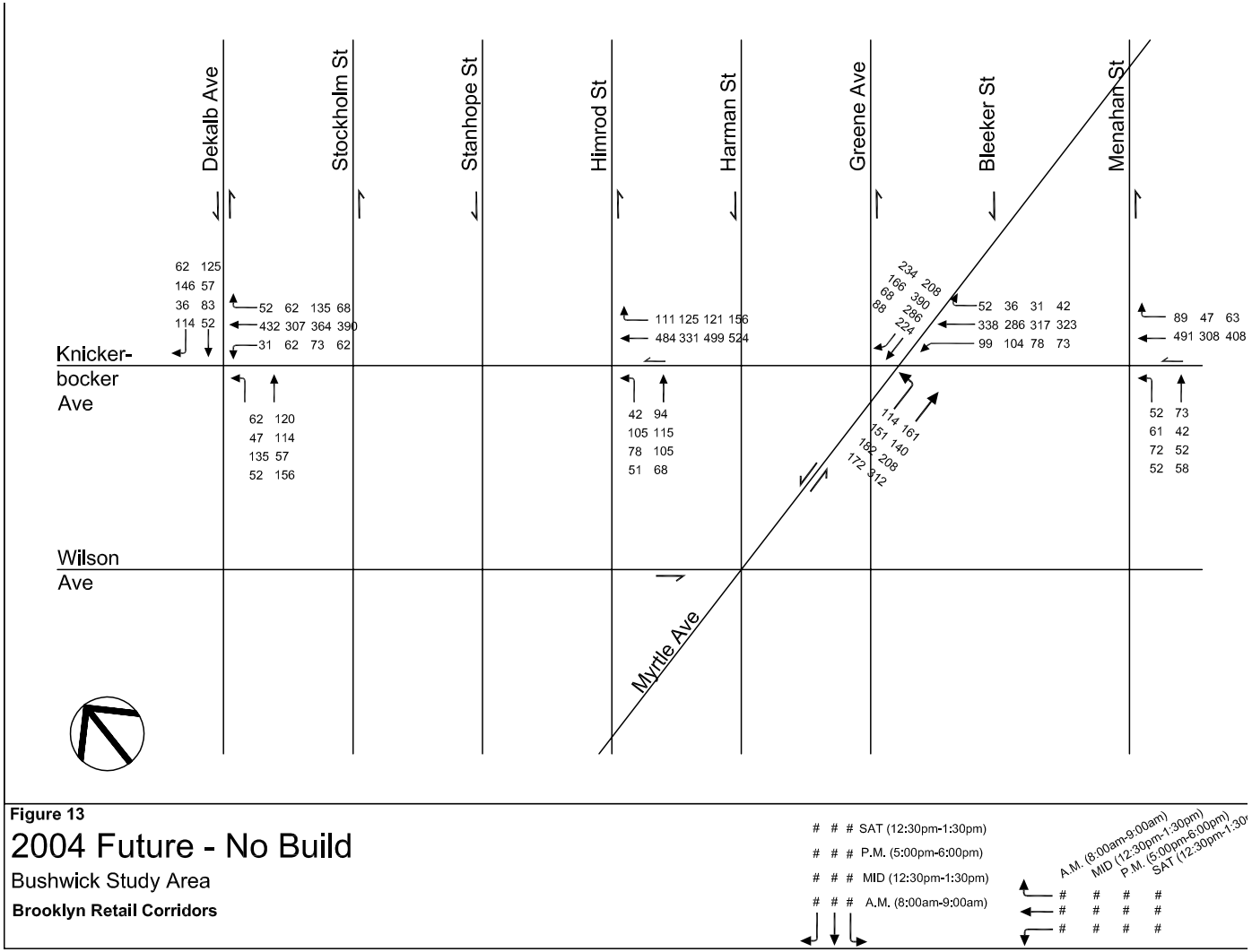


Figure 13

2004 Future - No Build

Bushwick Study Area

Brooklyn Retail Corridors

ACCIDENT SUMMARY

The data suggests that permanent markings, roadway design, channelization, roadway lighting, roadway condition and poor visibility of traffic control devices (i.e. traffic signals, stop signs, directional signs, etc.) may be factors contributing to accidents at these locations.

Knickerbocker Avenue at Myrtle Avenue

Between 1996 and 1998, there were 20 reportable and 16 non-reportable accidents, and no fatalities, at this intersection. Eleven (55 percent) of the reportable accidents occurred at night, and of the three most common accident types, 30 percent were sideswipes, 25 percent involved pedestrians, and 15 percent involved bicyclists. Accidents increased in 1997 from 1996, but decreased again in 1998.

Knickerbocker Avenue at Himrod Street

Between 1996 and 1998, there were 30 reportable and 29 non-reportable accidents, none fatal. Fifty-seven percent of the reportable accidents occurred during the evening. The three most common type of accidents involved collisions with a fixed object (67 percent), right angle turns (13 percent), and rear-end collisions (10 percent). Reportable accidents increased from three (3) to 16 from 1996 to 1997 and then decreased slightly to 11 in 1998. Twelve of the 16 accidents in 1997 and 7 of 11 accidents in 1998 were due to a fixed object. A review of accident data from the first six months of 1999 showed a substantial decrease in accidents once again indicating that the outstanding problem was corrected and the occurrences in 1997 and 1998 were anomalous.

Table 11:Accident Analysis
Knickerbocker Avenue at Myrtle Avenue and Himrod Street

1996	Myrtle Avenue			Himrod Street		
	DAY	NIGHT	TOTAL	DAY	NIGHT	TOTAL
FATALITY	0	0	0	0	0	0
INJURY	1	1	2	1	0	1
DAMAGE ONLY	1	0	1	2	0	2
TOTAL	2	1	3	3	0	3

1997	Myrtle Avenue			Himrod Street		
	DAY	NIGHT	TOTAL	DAY	NIGHT	TOTAL
FATALITY	0	0	0	0	0	0
INJURY	0	3	3	0	3	3
DAMAGE ONLY	4	4	8	7	6	13
TOTAL	4	7	11	7	9	16

1998	Myrtle Avenue			Himrod Street		
	DAY	NIGHT	TOTAL	DAY	NIGHT	TOTAL
FATALITY	0	0	0	0	0	0
INJURY	3	3	6	1	4	5
DAMAGE ONLY	0	0	0	2	4	6
TOTAL	3	3	6	3	8	11

RECOMMENDATIONS AND 2004 FUTURE BUILD CONDITIONS

STREET GEOMETRY/CHANNELIZATION OF VEHICULAR TRAFFIC

Knickerbocker Avenue at Myrtle Avenue

This intersection is configured so that the two westbound travel lanes diverge, passing on either side of the elevated subway's support columns, and then merge into only one lane after the intersection. The reduced capacity of Knickerbocker Avenue causes spill backs into the intersection, thereby restricting traffic flow on Myrtle Avenue. Taxis make left turns from Myrtle Avenue to pick up passengers exiting the subway station, further disrupting westbound traffic flow on Knickerbocker Avenue. Pedestrians on the north-south crosswalk are confused by the intersection geometry and are often caught in the middle of traffic, unsure of its direction. Over three years there were 20 accidents, five involving pedestrians.

RECOMMENDATION:

Adjust signal timing by increasing the north- and southbound green by three (3) seconds (from 67 to 70 seconds in the PM, and 49 to 52 seconds on the weekend) and decreasing the east- and westbound green time by the same (from 43 to 40 seconds in the PM, and 31 to 28 seconds on the weekend).

Create two 10-foot travel lanes, one a designated left-turn lane at the northbound approach, by prohibiting curbside parking on both sides of Myrtle Avenue for 100 feet south of the intersection. Shift the centerline four (4) feet at the northbound approach, thereby narrowing the southbound lane from 16 to 15 feet. For ease of southbound traffic flow, peg-a-track the centerline through the intersection.

With these adjustments, the intersection would improve from LOS F under the no-build condition to LOS C during the PM period and LOS B during the weekend peak period, with 22.7 and 12.6 seconds of delay respectively. All lane groups would operate at LOS C or better, with delays ranging from 6.9 to 22.6 seconds per vehicle,except the PM northbound left-turn movement, which would continue to operate at LOS F with 70.6 seconds of delay.

Implement a program of traffic calming ”gateway“ treatments to increase pedestrian safety and distinguish the commercial area from the surrounding residential streets:

Channelize traffic on Knickerbocker Avenue west of the intersection by creating and marking with arrows: a left-turn-only lane for traffic traveling southbound onto Myrtle Avenue, and a through-only lane for traffic continuing on Knickerbocker Avenue.

Repair/upgrade the existing traffic island to provide pedestrian refuge and better channelize the westbound traffic, thereby eliminating some of the uncertainty pedestrians have when crossing the street. Illuminate the island with reflective material at points of possible danger to pedestrians. Remove current signage (in disrepair) on the support column and install a ”Type 2” object marker - an all yellow reflective panel is recommended - to indicate an obstruction in the roadway.

Extend the sidewalk from the southwest corner of Knickerbocker Avenue to the elevated subway structure’s support column to create a clearly defined location where pedestrians, particularly subway patrons, may safely cross the intersection, while eliminating a dangerous left-turn shortcut through the intersection.

Install at the intersection standard ”BB“ lighting under the elevated subway structure to increase pedestrian safety, and highlight the entrance to the Knickerbocker Avenue retail corridor.

Designate a section of the curb on Myrtle Avenue as a NYCDOT/TLC authorized taxi stand to provide a pick-up and drop-off area for taxis servicing passengers exiting the subway station. Install applicable taxi-stand signage.

INTERSECTION PAVEMENT MARKINGS

Knickerbocker Avenue Corridor

Seven out of nine intersections on Knickerbocker Avenue between Dekalb and Myrtle Avenues are unsignalized. Most of the minor streets are controlled by stop signs that

are sometimes obstructed by vendor merchandise, and many of the pavement markings are either lacking or faded.

RECOMMENDATION:

Re-stripe faded pavement markings along Knickerbocker Avenue at Dekalb Avenue, Stockholm Street, Stanhope Street, and Green Avenue. Install high-visibility crosswalks at Stockholm, Stanhope, Himrod, and Harman streets.

TRAFFIC CONTROL DEVICES/CONGESTION

Knickerbocker Avenue Corridor

Traffic on Stockholm, Stanhope, Himrod, and Harmon streets - minor streets with stop signs - often queues up before there is an available gap in the Knickerbocker Avenue traffic stream, causing pedestrians to weave through vehicular traffic when trying to cross the street. Thirty accidents occurred at the intersection of Knickerbocker Avenue and Himrod Street between 1996 and 1998; 20 involved collisions with fixed objects. Parked trucks and vendor merchandise near sidewalk corners obstruct motorists' view of the stop sign on Himrod Street.

RECOMMENDATION:

Install signage on Himrod Street, in advance of the intersection, warning motorists of the approaching stop sign.

PEDESTRIAN AMENITIES/LIGHTING

Knickerbocker Avenue Corridor

Area residents cite poor lighting at the pedestrian level as contributing to a perception that the environment is unsafe at night.

RECOMMENDATION:

Install standard NYCDOT street light fixtures along Knickerbocker Avenue between Myrtle and Dekalb Avenues to supplement existing lighting. The specific number and location of fixtures should be determined by NYCDOT's Street Lighting Division. Install pedestrian amenities,

including benches and standard DOS waste receptacles, along the Knickerbocker Avenue corridor between Myrtle and Dekalb avenues. The Department of Sanitation shall determine the number and placement of all receptacles.

ON-STREET PARKING

Knickerbocker Avenue Corridor

Metered parking lanes on both sides of Knickerbocker Avenue are insufficient to meet neighborhood demand. Based upon community input, it has been noted that there is inadequate enforcement of parking regulations on weekends, especially illegal double-parking and blocked intersections.

RECOMMENDATION:

Install either muni-meters or parking space limit markings, and relocate fire hydrants from midblock locations to corners, along Knickerbocker Avenue between Myrtle and Dekalb avenues.

Increase enforcement, to the extent possible, during peak periods to eliminate double parking. This item will be referred to the Community Board as an agenda item for the District Service Cabinet.

TRUCK LOADING ZONE REGULATIONS

Knickerbocker Avenue Corridor

There are few truck loading zones in the study area and trucks make deliveries at all times of day, frequently blocking moving traffic.

RECOMMENDATION:

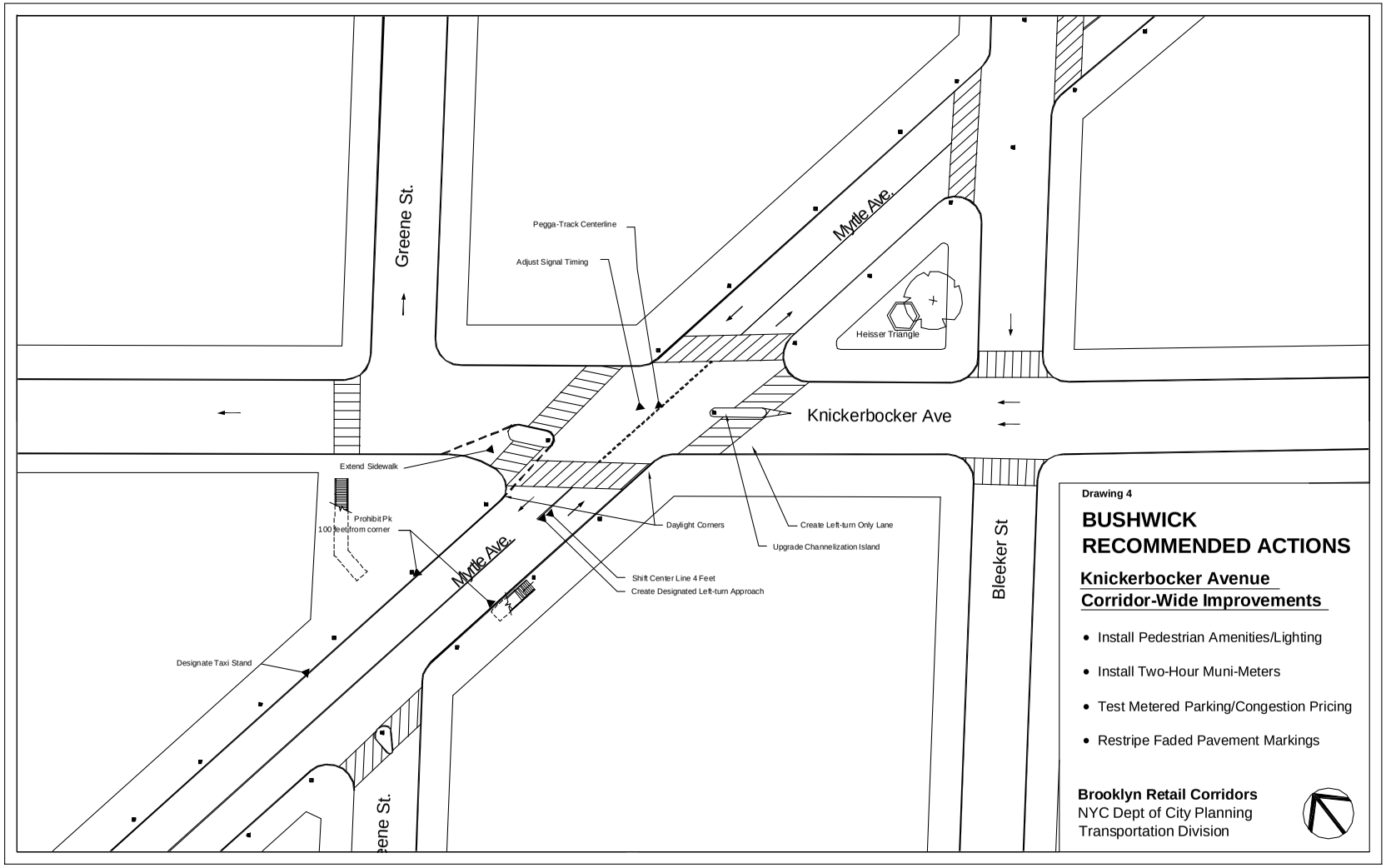
Monitor/assess NYCDOT'sMetered Parking/Congestion Pricing for Commercial Vehicles Pilot Program in Midtown Manhattan for its applicability to Knickerbocker Avenue. Under this program, commercial vehicles during designated periods may only stand on streets by parking in spaces controlled by muni-meters with a graduated hourly rate, thus promoting turnover and off-peak deliveries.

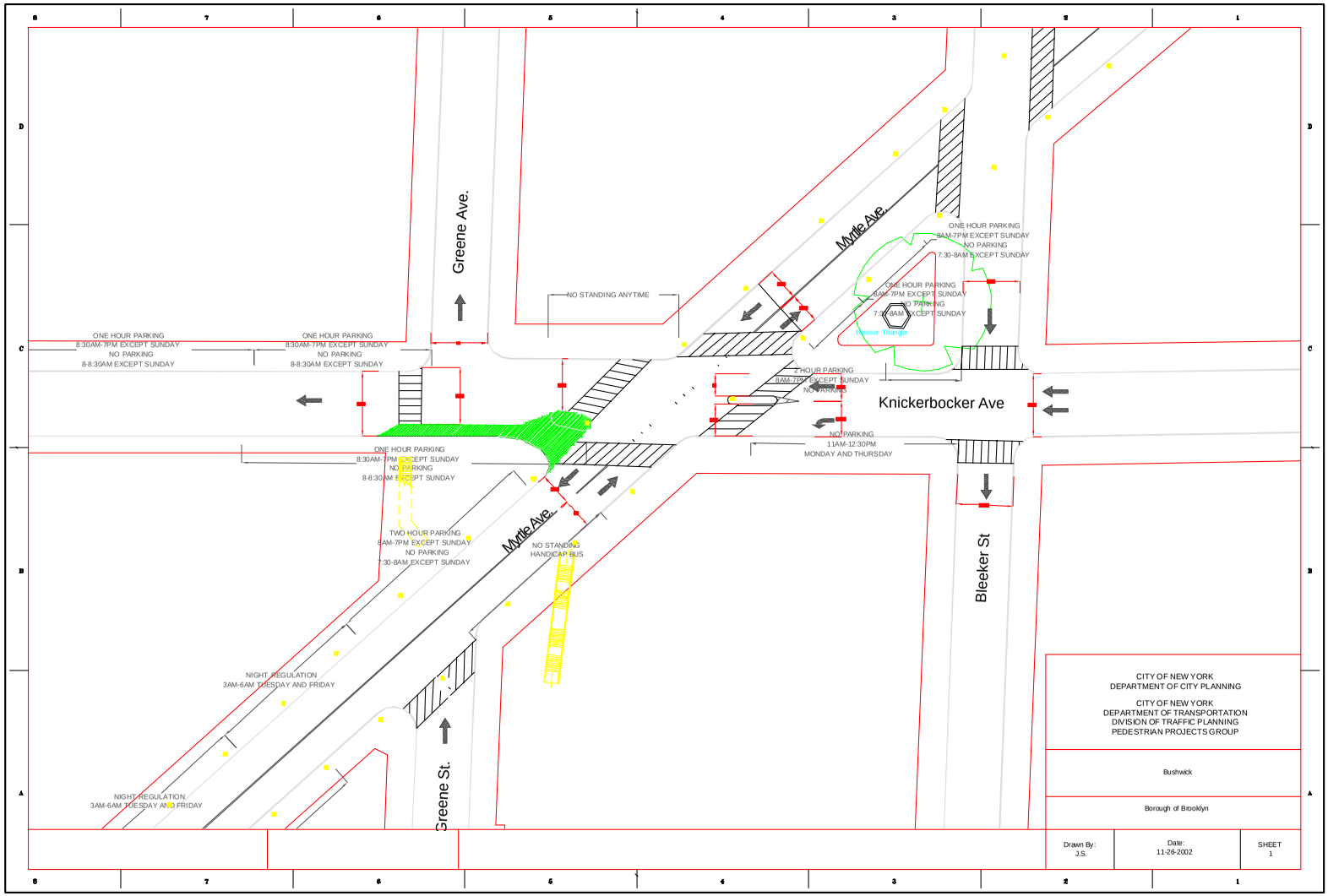
TABLE 12

Bushwick: Comparison of LOS and Delay for Existing, No-Build, and Build Conditions

PM PEAK PERIOD													
INTERSECTION	**2000 Existing**				**2004 No-Build**				**2004 Build**				**Delay**
Approach	Mvm't	V/C	Delay	LOS	Mvm't	V/C	Delay	LOS	Mvm't	V/C	Delay	LOS	**Change**
Knickerbocker Ave @ Mrytle													
Westbound	LTR	0.367	20.7	C	LTR	0.384	20.9	C	LTR	0.407	22.6	C	-1.7
Northbound	LT	0.979	48.1	E	LT	1.571			L	1.007	70.6	F	-70.6
									T	0.187	8.2	B	-8.2
Southbound	TR	0.622	13.8	B	TR	0.647	14.3	B	TR	0.620	12.5	B	1.8
Intersection			**25.6**	**D**				**F**			**22.7**	**C**	-22.7

SATURDAY PEAK PERIOD													
INTERSECTION	**2000 Existing**				**2004 No-Build**				**2004 Build**				**Delay**
Approach	Mvm't	V/C	Delay	LOS	Mvm't	V/C	Delay	LOS	Mvm't	V/C	Delay	LOS	**Change**
Knickerbocker Ave @ Mrytle													0.0
Westbound	LTR	0.384	16.1	C	LTR	0.400	16.2	C	LTR	0.440	18.0	C	-1.8
Northbound	LT	0.982	41.1	E	LT	1.389			L	0.699	14.9	C	-14.9
									T	0.328	6.9	B	-6.9
Southbound	TR	0.643	11.5	B	TR	0.667	12.0	B	TR	0.630	10.0	B	2.0
Intersection			**23.4**	**C**				**F**			**12.6**	**B**	-12.6


Greene St.
Myrtle Ave.
Pegga-Track Centerline
Adjust Signal Timing
Heisser Triangle
Knickerbocker Ave
Extend Sidewalk
Prohibit Pk
100 feet from corner
Myrtle Ave.
Daylight Corners
Create Left-turn Only Lane
Upgrade Channelization Island
Shift Center Line 4 Feet
Create Designated Left-turn Approach
Bleeker St
Designate Taxi Stand
eene St.
Drawing 4
BUSHWICK
RECOMMENDED ACTIONS
Knickerbocker Avenue
Corridor-Wide Improvements
• Install Pedestrian Amenities/Lighting
• Install Two-Hour Muni-Meters
• Test Metered Parking/Congestion Pricing
• Restripe Faded Pavement Markings
Brooklyn Retail Corridors
NYC Dept of City Planning
Transportation Division


Greene Ave.
Myrtle Ave.
NO STANDING ANYTIME
ONE HOUR PARKING
8:30AM-7PM EXCEPT SUNDAY
NO PARKING
8-8:30AM EXCEPT SUNDAY
ONE HOUR PARKING
8AM-7PM EXCEPT SUNDAY
NO PARKING
7:30-8AM EXCEPT SUNDAY
Pelosser Triangle
Knickerbocker Ave
NO PARKING
11AM-12:30PM
MONDAY AND THURSDAY
TWO HOUR PARKING
8AM-7PM EXCEPT SUNDAY
NO PARKING
7:30-8AM EXCEPT SUNDAY
NO STANDING
HANDICAP BUS
Bleeker St
NIGHT REGULATION
3AM-6AM TUESDAY AND FRIDAY
Greene St.
CITY OF NEW YORK
DEPARTMENT OF CITY PLANNING
CITY OF NEW YORK
DEPARTMENT OF TRANSPORTATION
DIVISION OF TRAFFIC PLANNING
PEDESTRIAN PROJECTS GROUP
Bushwick
Borough of Brooklyn
Drawn By:
J.S.
Date:
11-26-2002
SHEET
1

Flatbush Ave. at Ave. U, Eastbound

Flatbush Ave. at Ave. U, Nothbound

Flatbush Ave. at Ave. U, Southbound

Flatbush Ave. at Ave. U, Westbound

5.d. FLATLANDS

A traffic and pedestrian LOS analysis was conducted at one signalized intersection, Flatbush Avenue and Avenue U, in the Flatlands study area. The existing and future no-build balanced traffic volumes for the AM, midday, PM, and weekend peak periods are shown in Figures 9 and 10. Figure 11 shows project trip increments for the Kings Plaza Extension project that is described under the 2004 future no-build conditions discussion. Table 13 illustrates the severity of accidents for a three year period by time of day for each occurrence. Table 14 compares LOS and delay for existing, no-build, and build conditions. Recommended actions for this study area are shown in Drawing 5.

Peak Hour

Traffic

Based upon the peak period traffic counts, the morning peak hour is 8:00-9:00 AM, the midday period is 1:00-2:00 PM, the evening period is 5:00-6:00 PM, and the weekend period is 1:00-2:00 PM.

Pedestrian

Based upon the peak period traffic counts, the morning peak hour is 8:00-9:00 AM, the midday period is 1:00-2:00 PM, the evening period is 5:00-6:00 PM, and the weekend period is 1:00-2:00 PM.

2000 EXISTING CONDITIONS

Flatbush Avenue at Avenue U

Traffic

Overall, this intersection operates at LOS D for the three weekday peak periods and at LOS E for the weekend peak period. Delays range from 37.2 to 55.1 seconds per vehicle. All lane groups operate at acceptable LOS D or better, with delays ranging from 31.1 to 49.2 seconds per vehicle for all periods, except the eastbound and southbound left-turn movements, which operate at LOS F during the weekend peak period with delays of 121.4 and 141.4 seconds per vehicle, respectively.

Pedestrian

All sidewalks, crosswalks, and corners operate at acceptable levels for all peak periods.

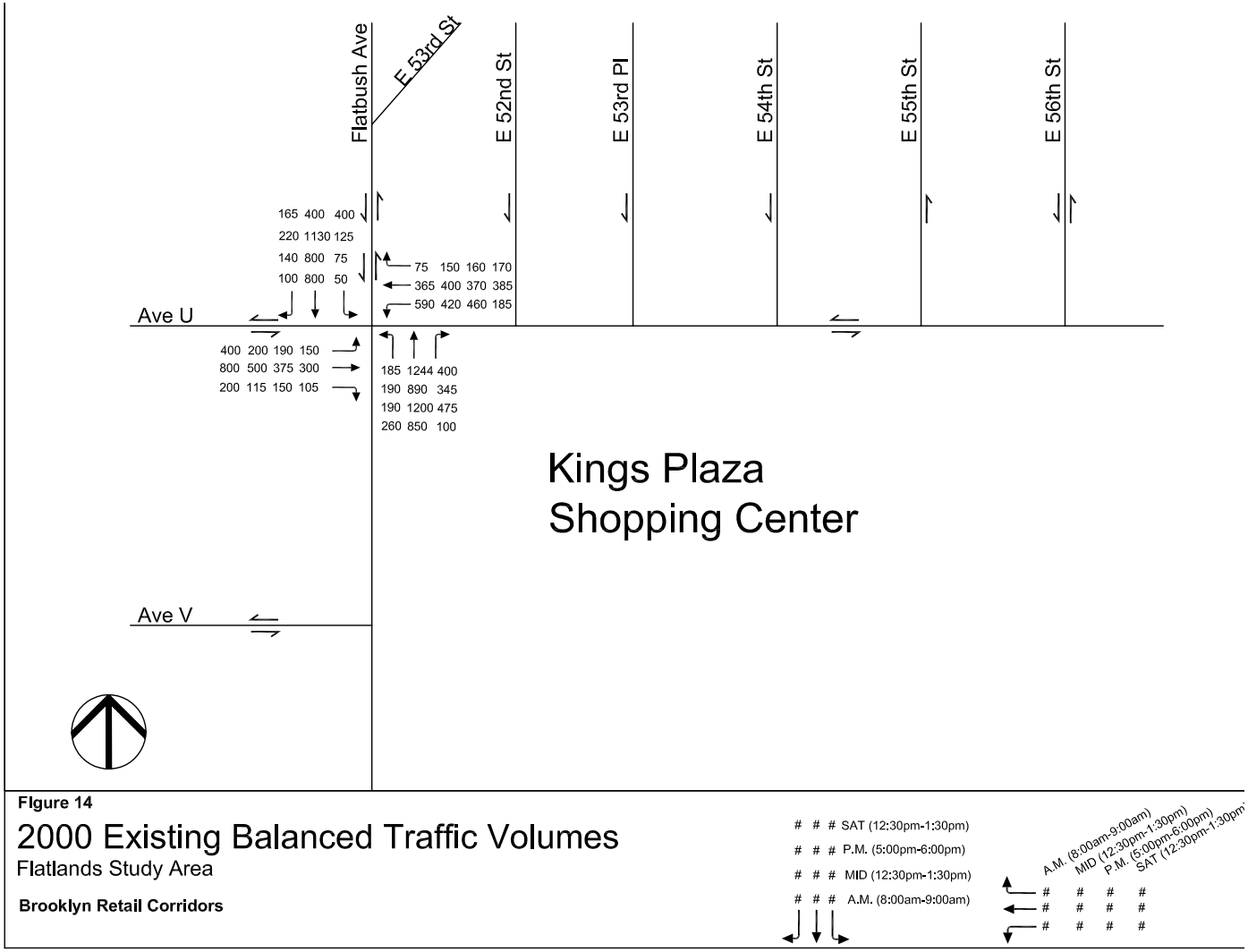


Figure 14

2000 Existing Balanced Traffic Volumes

Flatlands Study Area

Brooklyn Retail Corridors

2004 FUTURE NO-BUILD CONDITIONS

Flatbush Avenue at Avenue U

The future development scenario identified four development proposals for sites within the waterfront block surrounding Mill Basin and bounded by Flatbush Avenue, Avenue U, Mill Avenue, and Strickland Avenue.

Three development projects - an assisted living residential development with 98 units, 34 single-family detached houses, and a mini-storage facility - are not anticipated to have an impact on the study area's traffic network due to their distance from the site. Thus, they have not been analyzed under the future build scenario. The expansion of the Kings Plaza shopping center includes an additional 240,670 square feet of as-of-right retail space, and 770 accessory parking spaces in a structure on the south side of Avenue U at East 56th Street, adjacent to the existing mall. This project is expected to have an impact on the surrounding traffic network of the study area. The traffic it generates was estimated, assigned to the street network, and analyzed. During the AM peak period, the project will generate 30 additional trips; during the midday peak period, 210 vehicle trips will be added; during the PM peak period, 248 vehicle trips will be added; and during the weekend peak period, 347 trips will be added.

Flatbush Avenue at Avenue U

Traffic

Overall, the intersection would continue to operate at LOS D for AM, midday, and PM periods and at LOS E for the weekend peak period. Delays range from 38.2 to 59.3 seconds per vehicle. All lane groups for the AM, midday, and PM peak periods would operate at LOS D or better, with delays ranging from 30.5 to 52.6 seconds of delay per vehicle. The weekend period would operate at LOS D or better, with delays ranging from 32.6 to 49.7 seconds per vehicle, with the exception of the east- and southbound left-turn movements which would operate at LOS F. Delays would range from 113.3 to 186.7 seconds of delay per vehicle respectively.

Pedestrian

All sidewalks, crosswalks, and corners would continue to operate at acceptable levels of service (LOS B or better) for all peak periods.

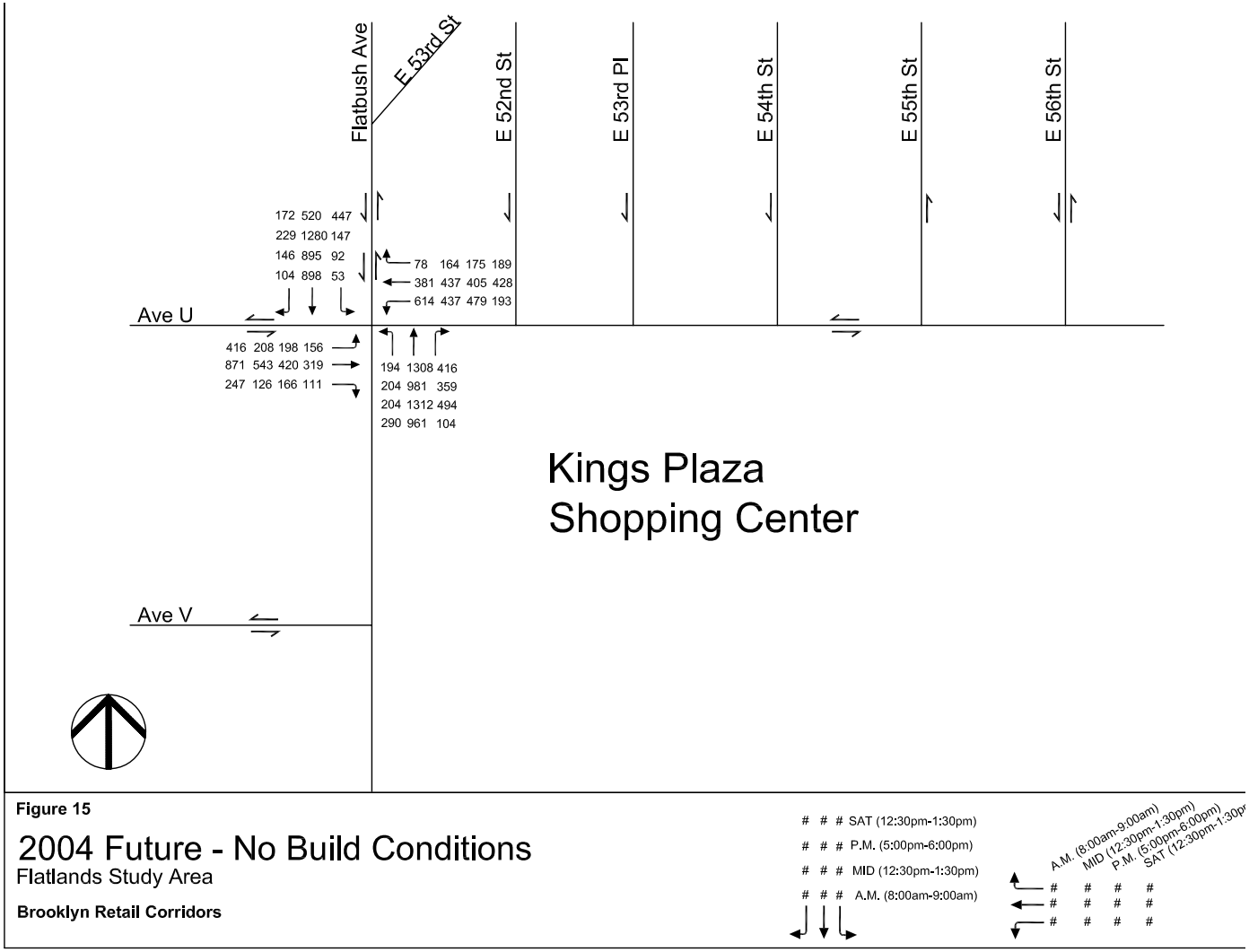


Figure 15

2004 Future - No Build Conditions

Flatlands Study Area

Brooklyn Retail Corridors

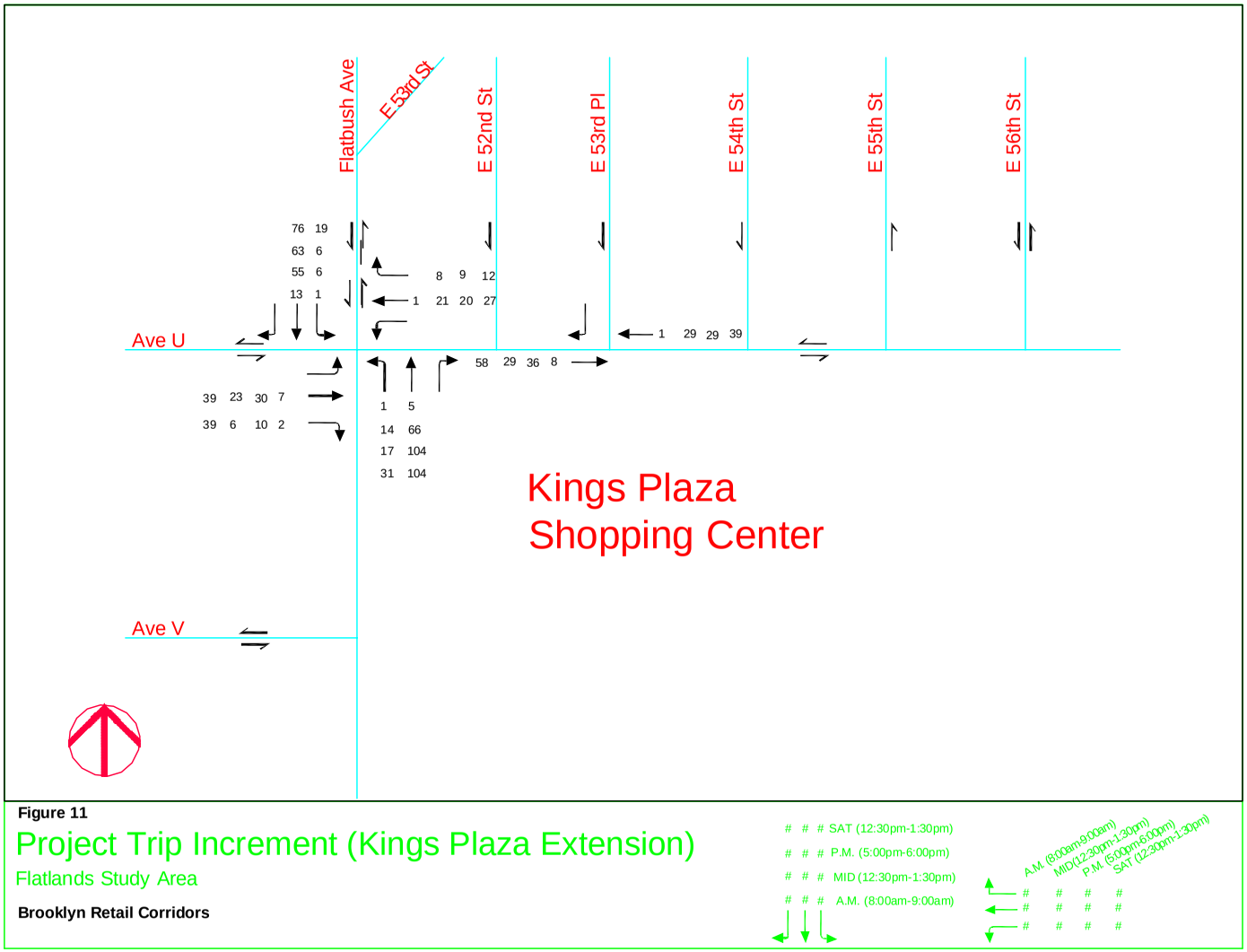


Figure 11

Project Trip Increment (Kings Plaza Extension)

Flatlands Study Area

Brooklyn Retail Corridors

ACCIDENT SUMMARY

Accident data analyzed at this location suggest that large turning volumes, signal timing/phasing, and pedestrian traffic all may be contributing factors to the type of accidents that occur at this intersection.

Flatbush Avenue at Avenue U

Between 1996 and 1998, there were a total of 147 reportable and 171 non-reportable accidents, with no fatalities, at this intersection. Of the four most common types of accidents, 31 percent involved other-angle common- direction collisions, 31 percent were rear-end collisions, 16 percent involved left-turning vehicles, and 13 percent were pedestrian-related. Sixty-two percent of the reportable accidents occurred during the day. The number of accidents decreased from 1996 to 1998.

Table 13:Accident Analysis
Flatbush Avenue at Avenue U

1996	Flatbush Avenue at Avenue U		
	DAY	NIGHT	TOTAL
FATALITY	0	0	0
INJURY	12	4	16
DAMAGE ONLY	26	15	40
TOTAL	38	19	57

1997	Flatbush Avenue at Avenue U		
	DAY	NIGHT	TOTAL
FATALITY	0	0	0
INJURY	4	9	13
DAMAGE ONLY	23	10	33
TOTAL	27	19	46

1998	Flatbush Avenue at Avenue U		
	DAY	NIGHT	TOTAL
FATALITY	0	0	0
INJURY	23	13	36
DAMAGE ONLY	3	5	8
TOTAL	26	18	44

RECOMMENDATIONS AND 2004 FUTURE BUILD CONDITIONS

PEDESTRIAN CROSSINGS

Flatbush Avenue at Avenue U / Flatbush Avenue Crosswalks

At the east-west crosswalks, pedestrians ignore crossing signals and begin crossing whenever there is a break in traffic in order to get to the center median and cross this wide street in one signal cycle.

Avenue U Crosswalks

Pedestrians crossing north-south with the signals often conflict with right-turning vehicles from northbound Flatbush Avenue. The high volume of turning vehicles effectively strand pedestrians on the center median, which is not wide enough to serve as a pedestrian holding area.

RECOMMENDATION:

On Avenue U, augment existing high-visibility crosswalks with the installation of marked stop bars. This should discourage vehicles from encroaching upon the crosswalk and impeding pedestrian traffic.-

Re-stripe the north and southbound Flatbush Avenue approaches from the existing configuration of one exclusive left-turn lane to two exclusive left-turn lanes.

Since this intersection is also a high accident location, it is recommended that the following signal timing adjustment be implemented during the weekend peak period. This adjustment improves the level of service, while addressing safety concerns as well. The following is therefore recommended:

Adjust signal timing during the weekend peak period by decreasing the east- and westbound left turn green time by three (3) seconds (from 13 to 10 seconds) and decreasing the north- and southbound green time by three (3) seconds (from 37 to 34 seconds). The north- and southbound left turn green time increases by six (6) seconds (from 13.0 to 19.0 seconds).

With this adjustment, the intersection would improve from the no-build condition of LOS E (with 59.7 seconds of delay per vehicle) to LOS D with 45.9 seconds of delay per vehicle. All lane groups would operate at LOS D with the exception of the eastbound left-turn movement which would continue to operate at the no-build LOS F but with decreased lane group delay (from 113.3 to 81.9 seconds per vehicle).

Midblock Crossings

Pedestrians cross Flatbush Avenue midblock between Avenue U and Avenue V to directly enter Kings Plaza Shopping Center. Many of these pedestrians are either bus patrons whose bus stop is directly across the street, or patrons of two parking lots located in close proximity to the bus stop.

RECOMMENDATION:

Relocate the bus stop/shelter serving B41 passengers from its present midblock location on Flatbush Avenue, across the street from the Kings Plaza Shopping Center, to the corner of Flatbush Avenue at Avenue U. This is expected to encourage pedestrians to safely cross at the corner. Install a pedestrian separator on Flatbush Avenue between Avenue U and Avenue V to further prevent midblock crossings.

BUS STOP LOCATIONS

Avenue U at Hendrickson Street

Trucks unloading merchandise block access to the bus stop, forcing buses to stop and discharge passengers in the travel lane of Avenue U. This blocks the flow of westbound traffic on Avenue U, sometimes causing spillbacks onto Flatbush Avenue. The trucks obstruct the sight lines of pedestrians, forcing them to step into the street.

RECOMMENDATION:

Relocate the existing B3 bus stop from its current location on the northeast corner of Avenue U and Hendrickson Street, to across the street, in front of the Social Security Administration building at 4123 Avenue U. Enforce existing parking regulations to the extent possible.

PEDESTRIAN AMENITIES

Public Plaza between the Kings Plaza Entrance and Flatbush Avenue Bus Stop

This large area is almost completely barren of pedestrian amenities and lacks even a bus shelter, despite five bus route stops.

RECOMMENDATION:

The Early Implementation Plan redesigns the plaza as an off-street transit center, with bus shelters, signage, and other pedestrian amenities.

DIRECTIONAL SIGNS

Flatbush Avenue

There are no signs directing northbound vehicles on Flatbush Avenue to the mall parking garage.

RECOMMENDATION:

New directional signs for the existing garage and new accessory parking facility at Avenue U and East 56th Street should be installed under NYC DOT's trailblazer signage policy. Trailblazer signs direct motorist to major facilities that generate large numbers of passenger car traffic, are open to the general public, and provide adequate number of public parking spaces. The owners of Kings Plaza Shopping Center may request such signage by submitting all required information. All Trailblazer signs are designed, manufactured and installed by NYC DOT, upon a favorable determination.

PARKING ENFORCEMENT

Avenue U in front of Kings Plaza Shopping Center

Cars illegally park here to load purchases from the mall. This delays eastbound traffic on Avenue U and causes spillbacks that block Flatbush Avenue traffic.

RECOMMENDATION:

Institute a well-publicized ”zero tolerance“ campaign to enforce existing parking regulations. This recommendation is meant to work in tandem with the 770-space accessory parking lot that has been constructed on Avenue U at E. 55th Street. It is expected that this could relieve some of the congestion created by illegally parked vehicles loading purchases from the shopping center.

BUS OPERATIONS

Flatbush Avenue at Avenue V

Two exclusive turn lanes on southbound Flatbush Avenue permit either a left turn into the Kings Plaza Shopping Center parking garage, or a U-turn onto northbound Flatbush Avenue. Buses on five routes - the B2, B9, B44, B46, and B78 - all execute the U-turn to reach the bus layover along the east curb of northbound Flatbush Avenue, approximately 165 feet north of the intersection. This bus movement conflicts with right-turning vehicles exiting the parking garage.

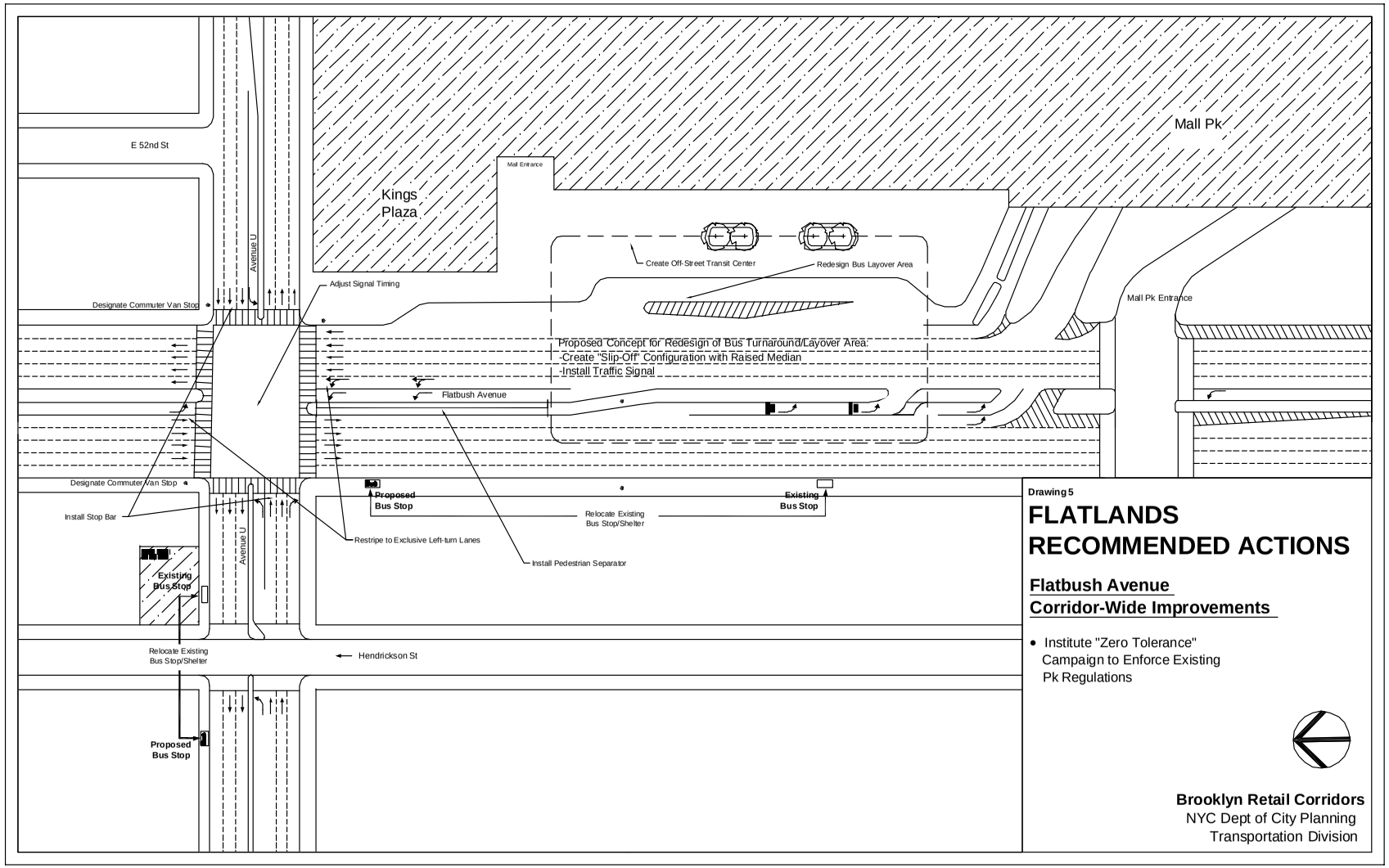
RECOMMENDATION:

As part of NYCDOT’s Early Implementation Plan, the bus turnaround on Flatbush Avenue is to be redesigned as a ”slip-off“ configuration with a raised median aligned with the existing bus layover. The new cut through the existing median would be signalized, thereby controlling bus movements and cars exiting the garage. This is expected to improve bus flow by allowing buses to execute earlier turns and minimize vehicular conflict. The existing painted channelization island separating Flatbush Avenue’s main road from the bus layover would be upgraded to a raised median.

The Office of the President of the Borough of Brooklyn, under a grant by the Governor’s Traffic Safety Committee, also studied this location under the Pedestrian / Traffic Safety Mitigation Project. Additional strategies involving intersection reconfiguration and modification of traffic control devices, enforcement, and education have been recommended to supplement the above.

TABLE 14
Flatlands: Comparison of LOS and Delay for Existing, No-Build, and Build Conditions

SATURDAY PEAK PERIOD													
INTERSECTION	**2000 Existing**				**2004 No-Build**				**2004 Build**				**Delay**
Appr.	Mvm't	v/c	Delay	LOS	Mvm't	v/c	Delay	LOS	Mvm't	v/c	Delay	LOS	**Change**
FLATBUSH AVE @ AVENUE U													
Eastbound	L	1.11	121.4	F	L	1.08	113.3	F	L	0.99	81.9	F	31.4
	T	0.80	45.1	D	T	0.87	49.7	D	T	0.87	49.7	D	0.0
	R	0.53	39.8	D	R	0.59	41.2	D	R	0.67	45.6	D	-4.4
Westbound	L	0.23	34.8	C	L	0.22	36.6	D	L	0.50	42.9	D	-6.3
	TR	0.64	39.7	D	TR	0.64	39.5	D	TR	0.71	42.0	D	-2.5
Northbound	L	0.59	35.1	D	L	0.67	40.9	D	L	0.49	38.0	D	2.9
	TR	0.44	34.4	C	TR	0.45	34.6	C	TR	0.63	40.0	D	-5.4
Southbound	L	1.16	141.4	F	L	1.27	186.7	F	L	0.69	45.5	D	141.2
	TR	0.27	32.3	C	TR	0.30	32.6	C	TR	0.43	36.5	D	-3.9
Intersection			**55.1**	**E**			**59.3**	**E**			**45.9**	**D**	**13.4**


E 52nd St
Avenue U
Kings Plaza
Mall Entrance
Mall Pk
Create Off-Street Transit Center
Redesign Bus Layover Area
Adjust Signal Timing
Designate Commuter Van Stop
Mall Pk Entrance
Proposed Concept for Redesign of Bus Turnaround/Layover Area:
-Create "Slip-Off" Configuration with Raised Median
-Install Traffic Signal
Flatbush Avenue
Designate Commuter Van Stop
Proposed Bus Stop
Existing Bus Stop
Install Stop Bar
Relocate Existing Bus Stop/Shelter
Restripe to Exclusive Left-turn Lanes
Install Pedestrian Separator
Avenue U
Existing Bus Stop
Relocate Existing Bus Stop/Shelter
Hendrickson St
Proposed Bus Stop
Drawing 5
FLATLANDS RECOMMENDED ACTIONS
Flatbush Avenue Corridor-Wide Improvements
• Institute "Zero Tolerance" Campaign to Enforce Existing Pk Regulations
Brooklyn Retail Corridors
NYC Dept of City Planning
Transportation Division

Appendix Drawings

Parking Regulations

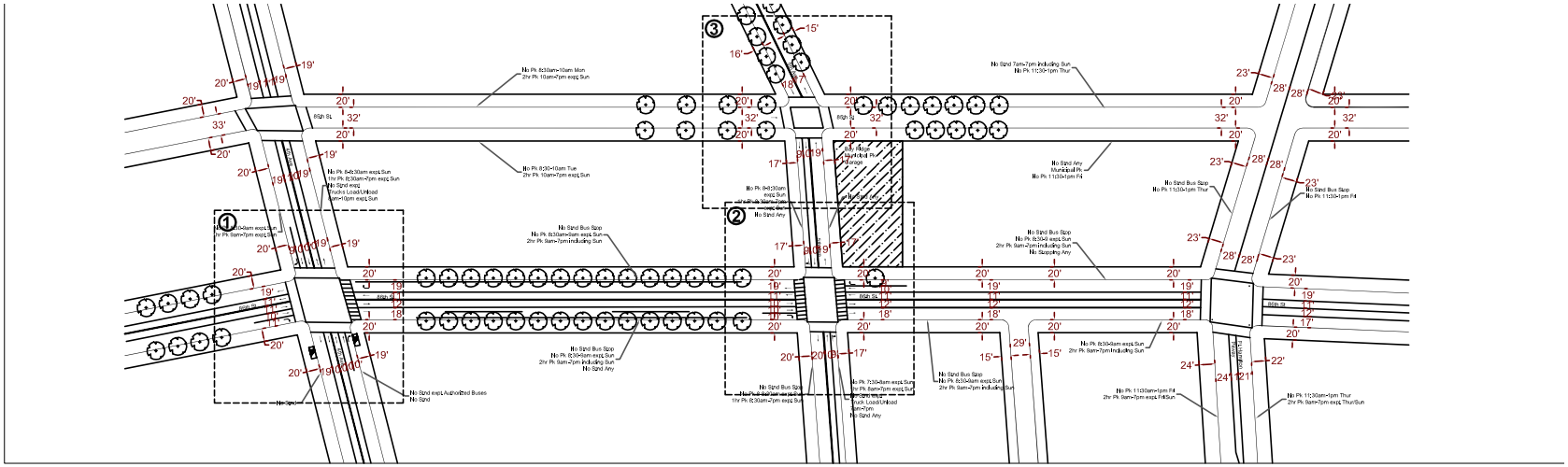
- Bay Ridge
- Brighton Beach
- Bushwick
- Flatlands

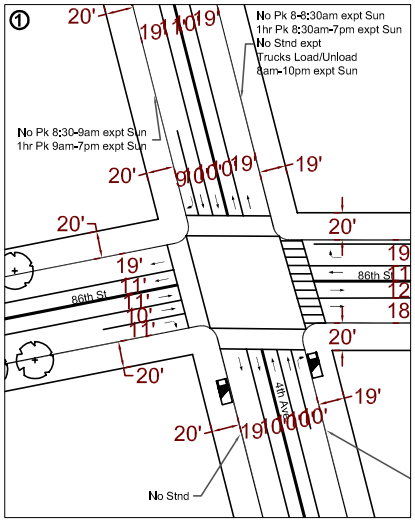
Existing Conditions

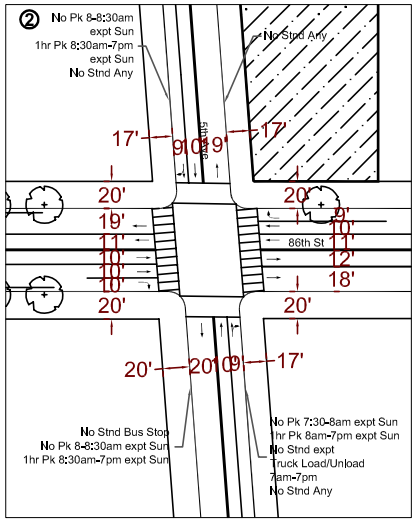
- 86th Street at 5th Avenue
- 86th Street at 4th Avenue
- Brighton Beach Avenue and Ocean Parkway
- Brighton Beach Avenue and Coney Island Avenue
- Knickerbocker Avenue at Myrtle Avenue
- Knickerbocker Avenue at Himrod Street
- Flatbush Avenue and Avenue U

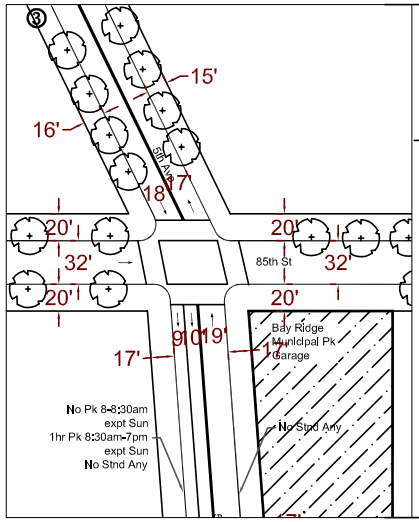
Existing Transit

- 86th Street at 5th Avenue
- 86th Street at 4th Avenue
- Brighton Beach Avenue and Ocean Parkway
- Brighton Beach Avenue and Coney Island Avenue
- Knickerbocker Avenue at Myrtle Avenue
- Flatbush Avenue and Avenue U







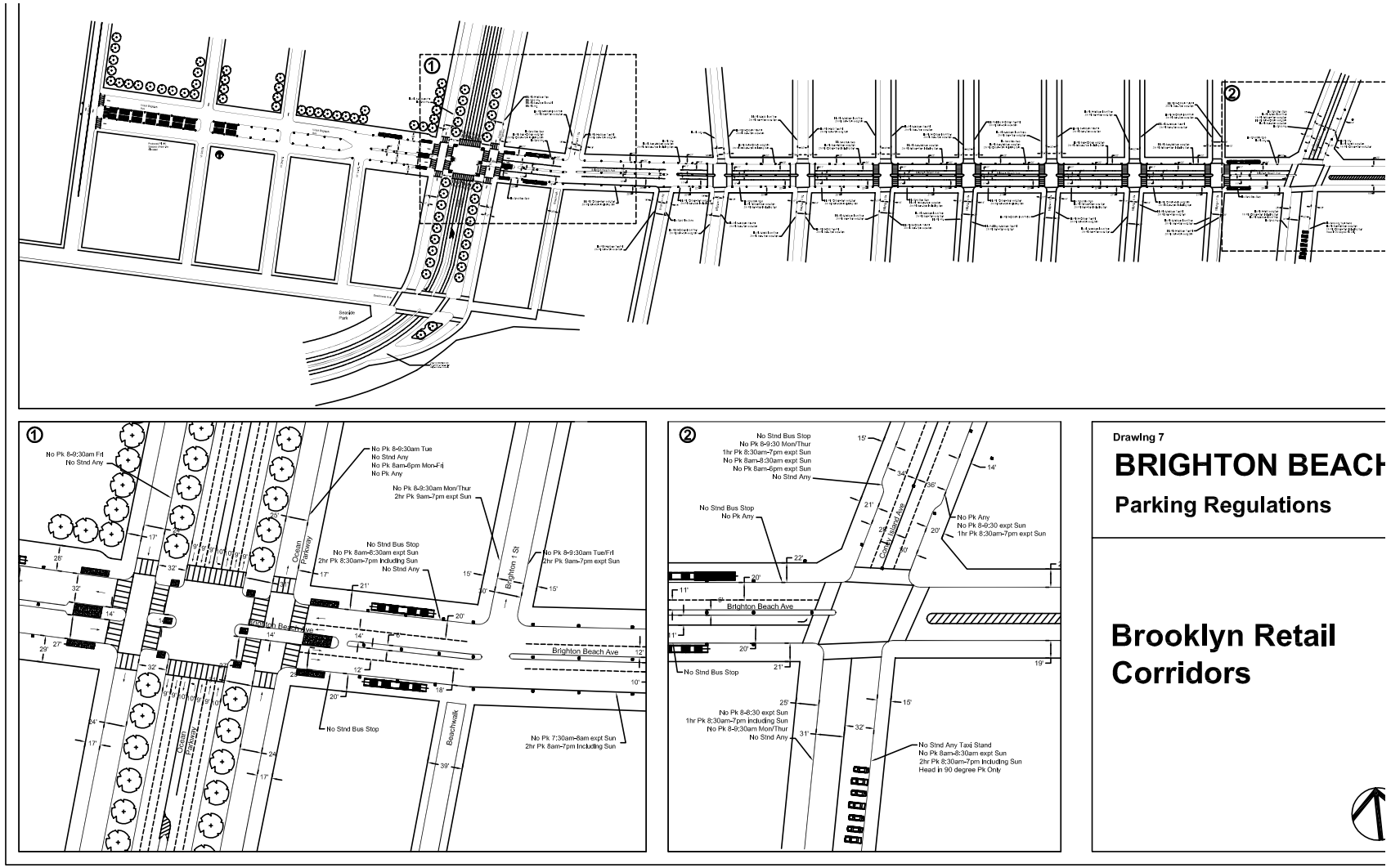


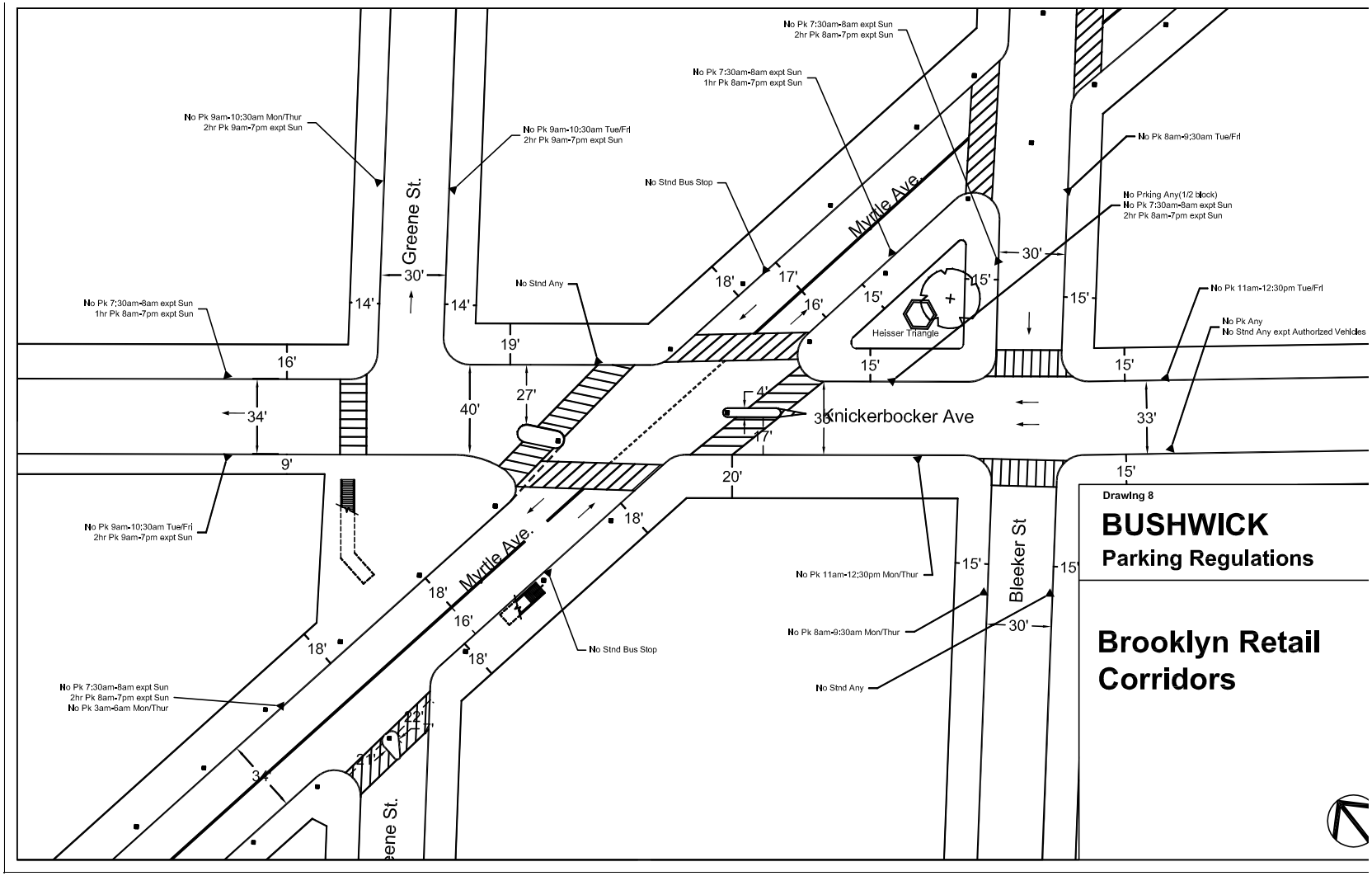
Drawing 6

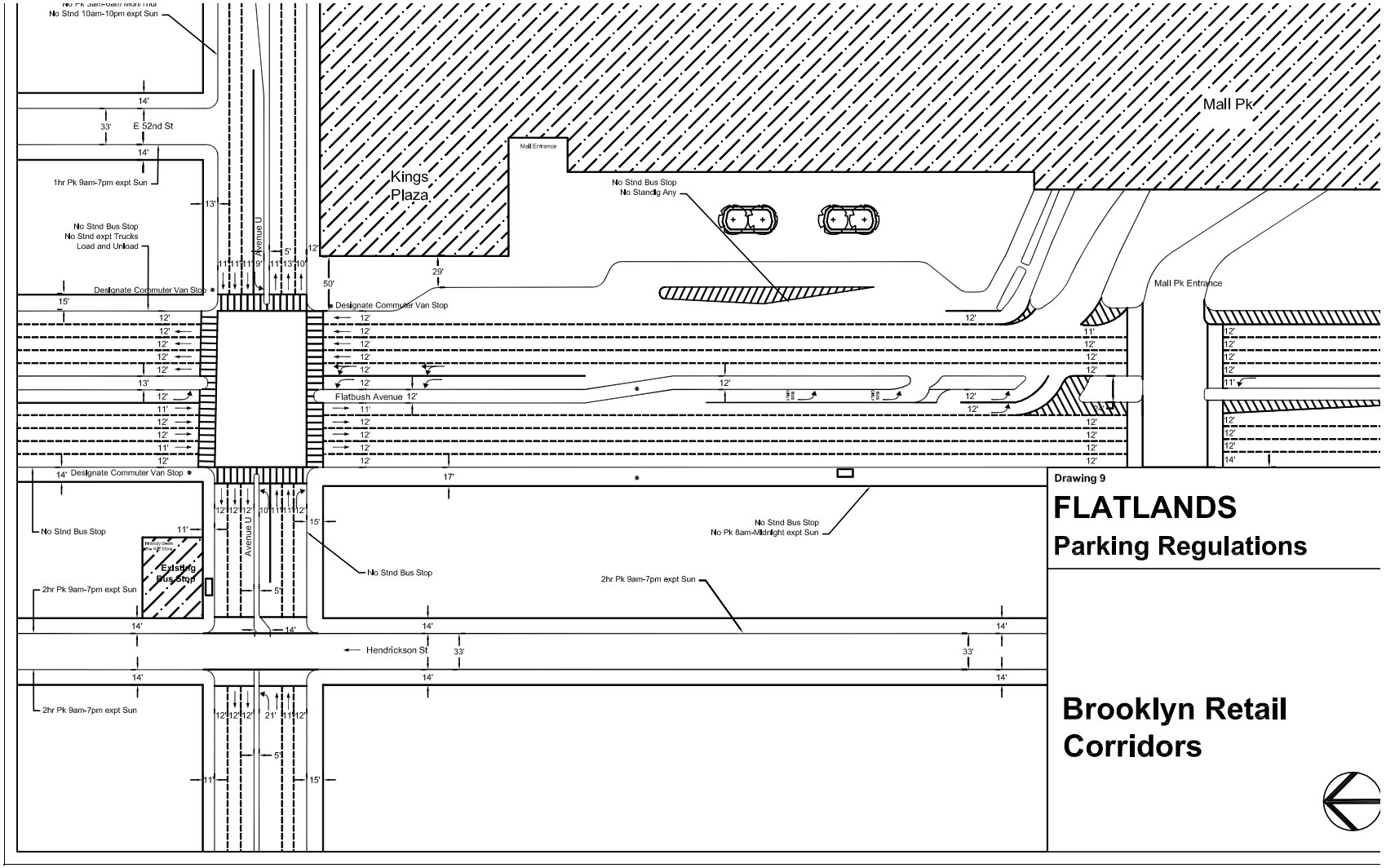
BAY RIDGE

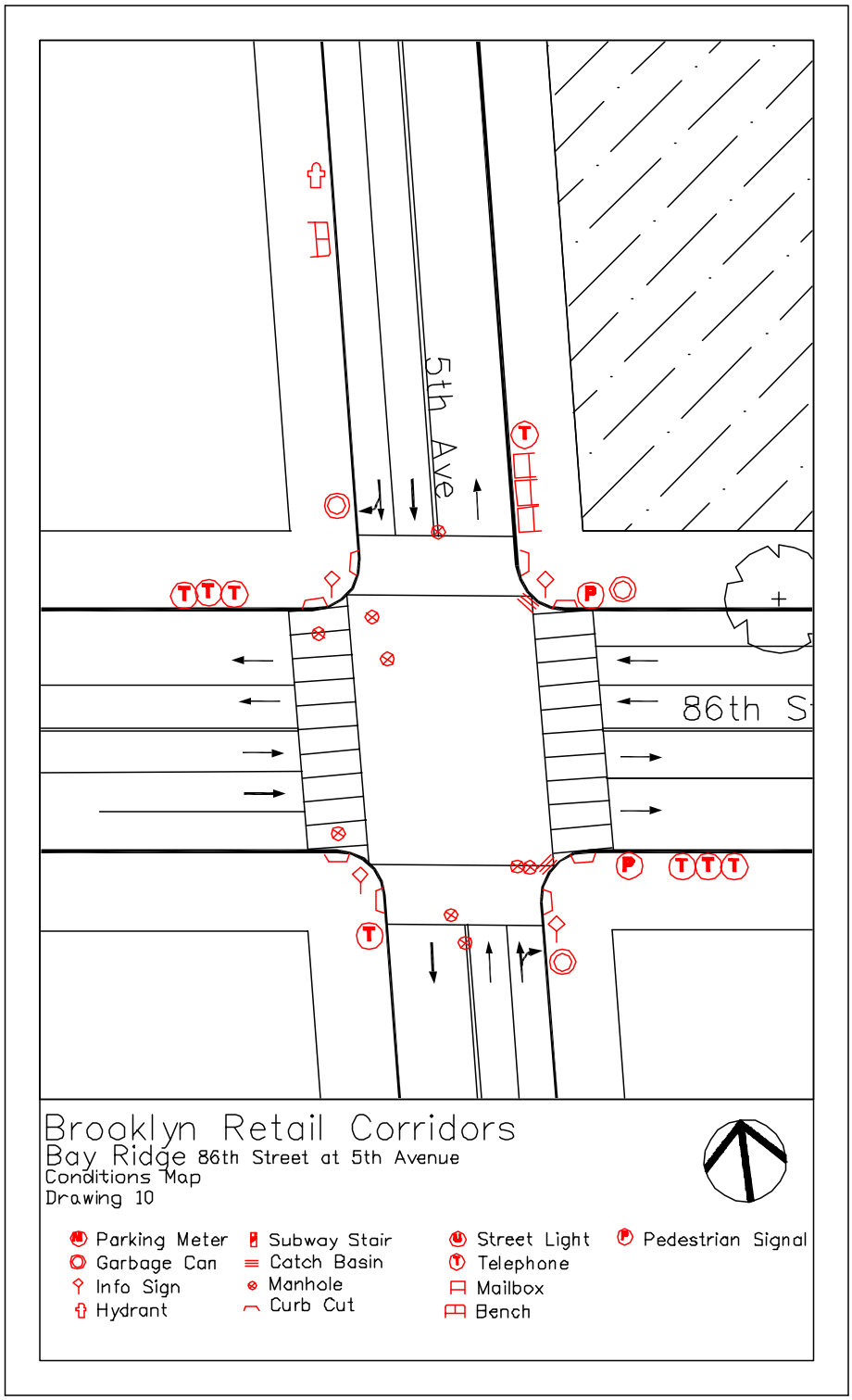
Parking Regulations

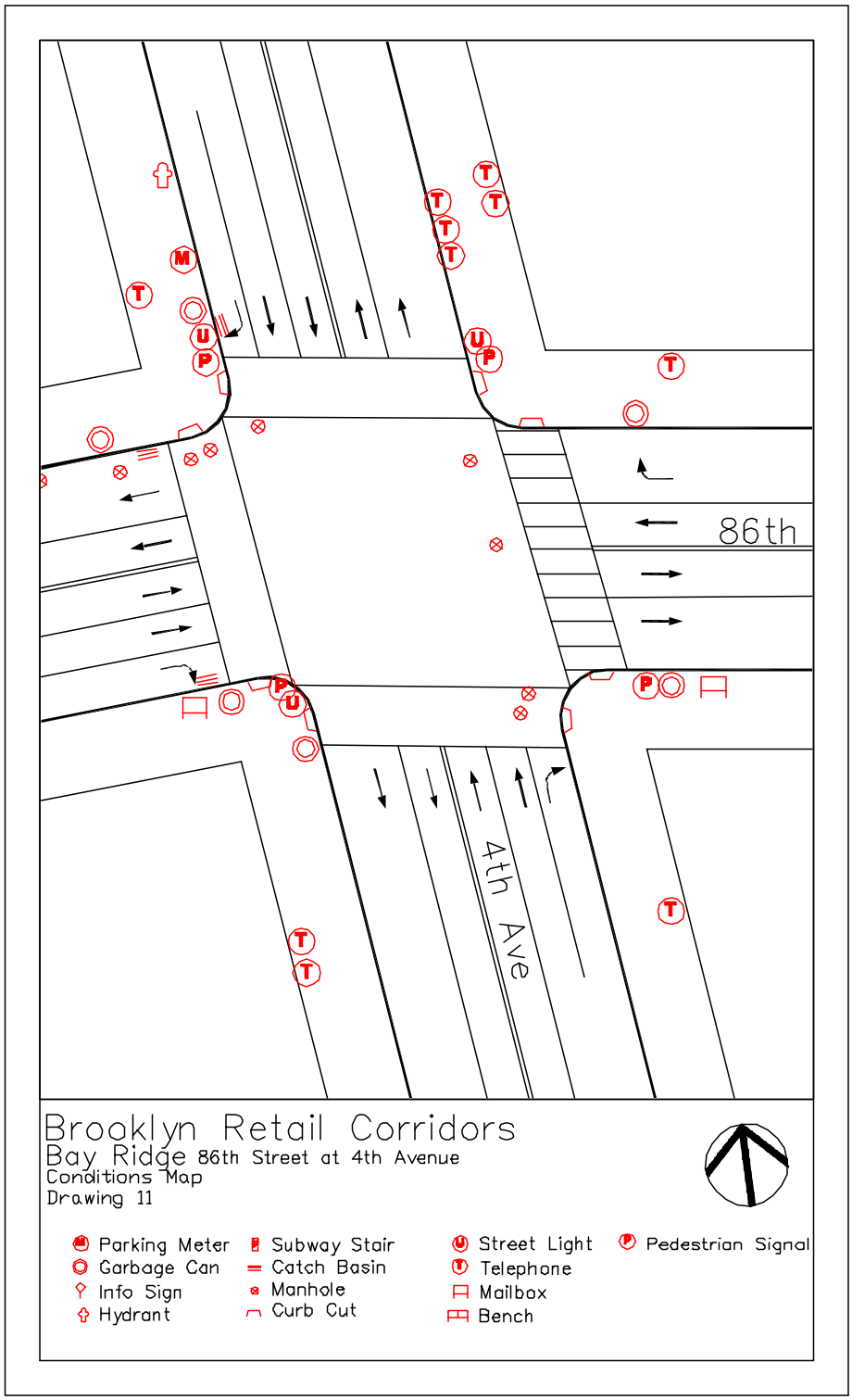
Brooklyn Retail Corridors

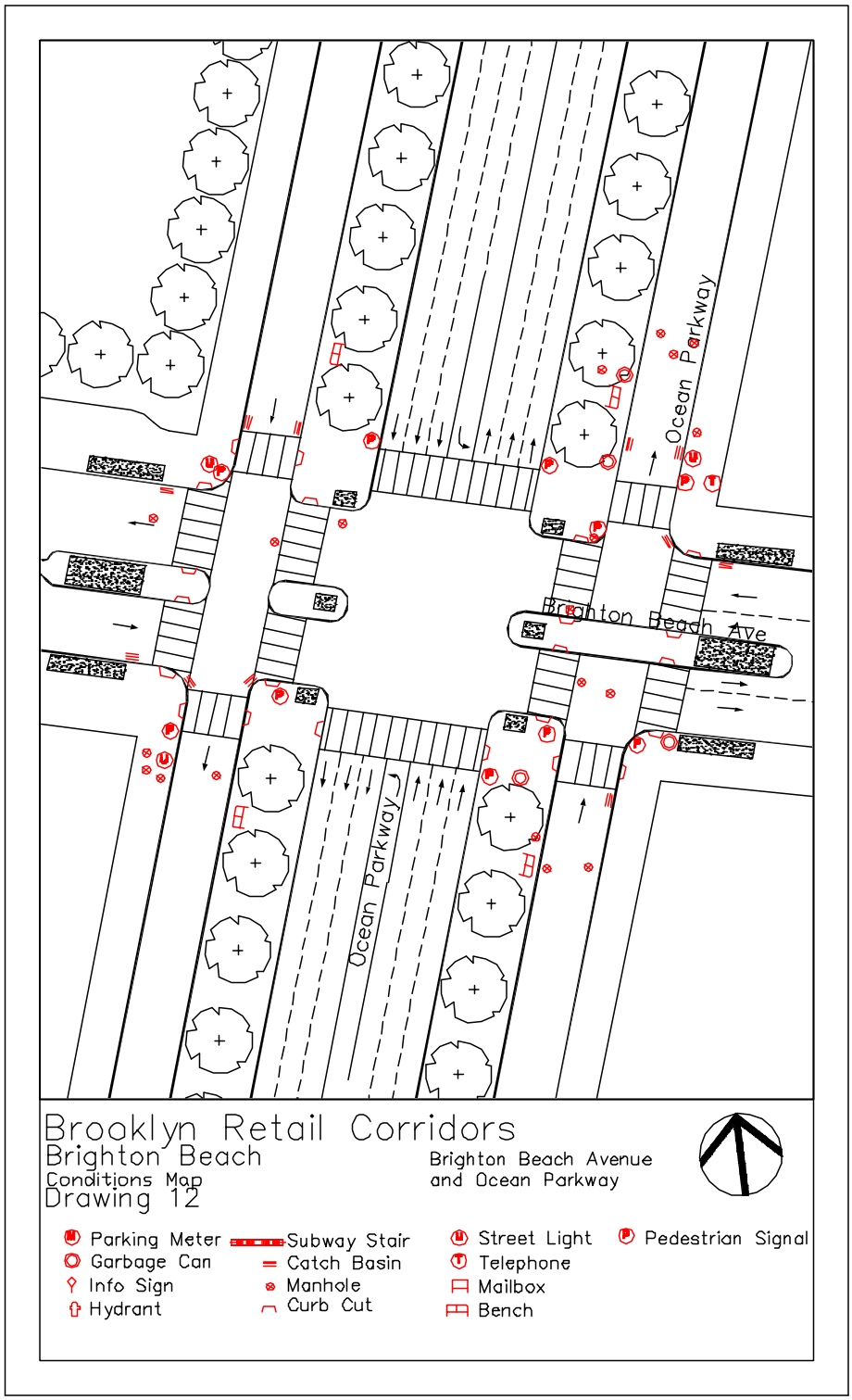

①
②
No Pk 8-9:30am Fri
No Stnd Any
No Pk 8-9:30am Tue
No Stnd Any
No Pk 8am-6pm Mon-Fri
No Pk Any
No Pk 8-9:30am Mon/Thur
2hr Pk 9am-7pm expt Sun
No Stnd Bus Stop
No Pk 8am-8:30am expt Sun
2hr Pk 8:30am-7pm Including Sun
No Stnd Any
No Pk 8-9:30am Tue/Fri
2hr Pk 9am-7pm expt Sun
Ocean Parkway
Brighton 1 St
Brighton Beach Ave
No Stnd Bus Stop
Beachwalk
No Pk 7:30am-8am expt Sun
2hr Pk 8am-7pm Including Sun
No Stnd Bus Stop
No Pk 8-9:30 Mon/Thur
1hr Pk 8:30am-7pm expt Sun
No Pk 8am-8:30am expt Sun
No Pk 8am-6pm expt Sun
No Stnd Any
No Stnd Bus Stop
No Pk Any
Coney Island Ave
No Pk Any
No Pk 8-9:30 expt Sun
1hr Pk 8:30am-7pm expt Sun
Brighton Beach Ave
No Stnd Bus Stop
No Pk 8-8:30 expt Sun
1hr Pk 8:30am-7pm including Sun
No Pk 8-9:30am Mon/Thur
No Stnd Any
No Stnd Any Taxi Stand
No Pk 8am-8:30am expt Sun
2hr Pk 8:30am-7pm Including Sun
Head in 90 degree Pk Only
Drawing 7
BRIGHTON BEACH
Parking Regulations
Brooklyn Retail Corridors

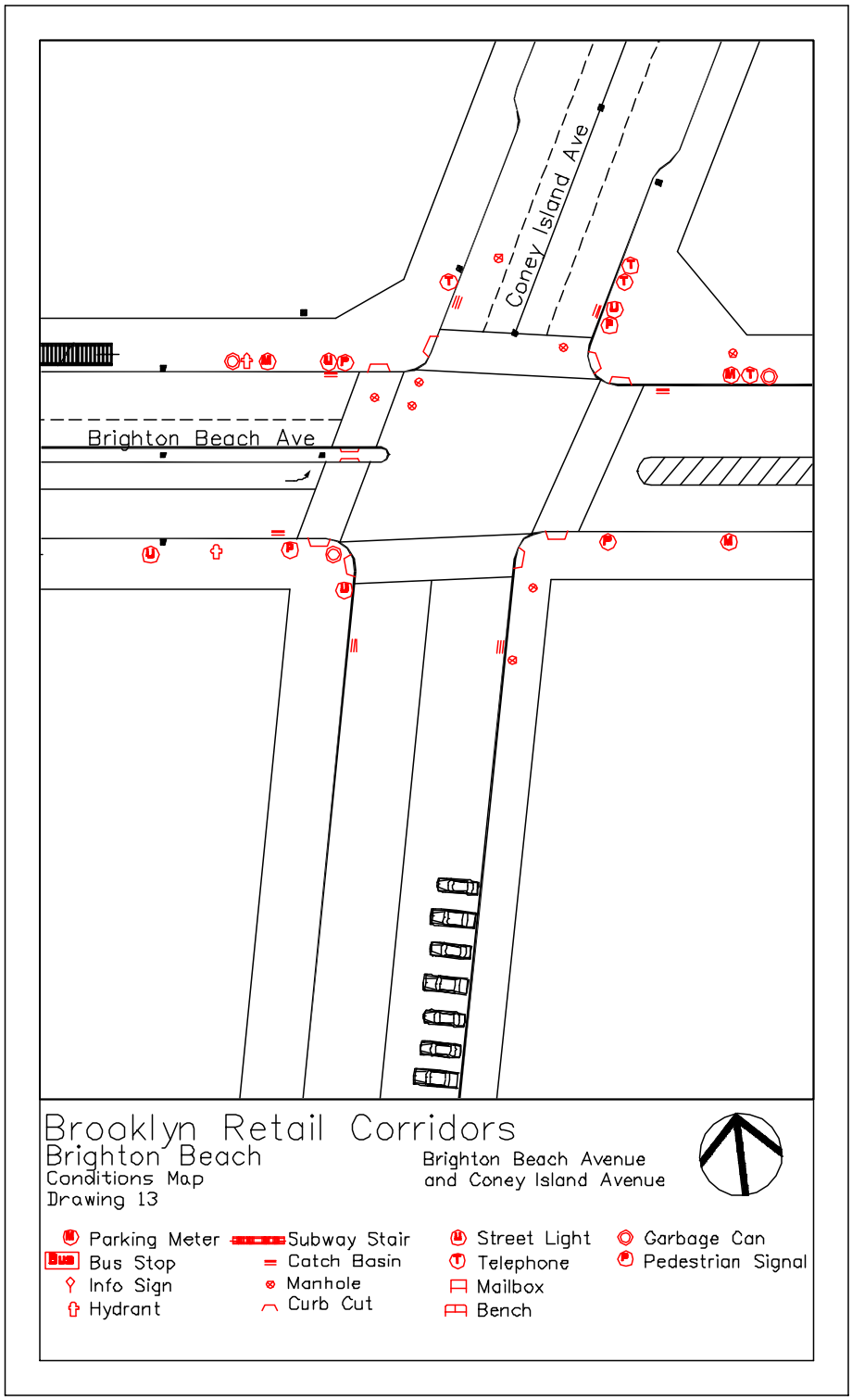

No Pk 7:30am-8am expt Sun
2hr Pk 8am-7pm expt Sun
No Pk 7:30am-8am expt Sun
1hr Pk 8am-7pm expt Sun
No Pk 9am-10:30am Mon/Thur
2hr Pk 9am-7pm expt Sun
No Pk 9am-10:30am Tue/Fri
2hr Pk 9am-7pm expt Sun
No Pk 8am-9:30am Tue/Fri
No Stnd Bus Stop
No Prking Any(1/2 block)
No Pk 7:30am-8am expt Sun
2hr Pk 8am-7pm expt Sun
Greene St.
Myrtle Ave.
No Stnd Any
No Pk 7:30am-8am expt Sun
1hr Pk 8am-7pm expt Sun
No Pk 11am-12:30pm Tue/Fri
No Pk Any
No Stnd Any expt Authorized Vehicles
Heisser Triangle
Knickerbocker Ave
Myrtle Ave.
No Pk 9am-10:30am Tue/Fri
2hr Pk 9am-7pm expt Sun
No Pk 11am-12:30pm Mon/Thur
No Pk 8am-9:30am Mon/Thur
No Stnd Any
No Stnd Bus Stop
Bleeker St
No Pk 7:30am-8am expt Sun
2hr Pk 8am-7pm expt Sun
No Pk 3am-6am Mon/Thur
Drawing 8
BUSHWICK
Parking Regulations
Brooklyn Retail
Corridors

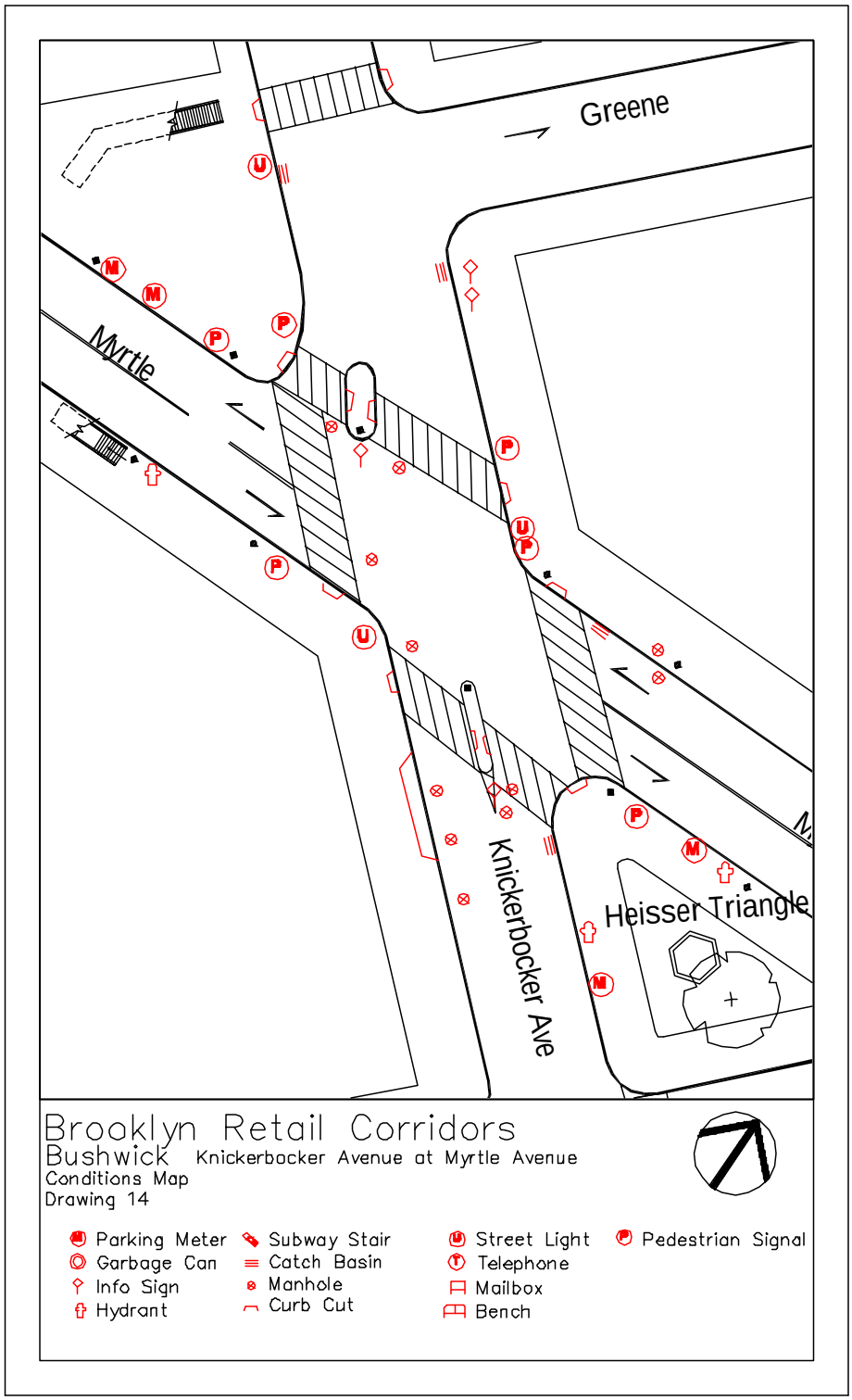

No Stnd 10am-10pm expt Sun
14'
33'
E 52nd St
14'
1hr Pk 9am-7pm expt Sun
13'
No Stnd Bus Stop
No Stnd expt Trucks
Load and Unload
Designate Commuter Van Stop
15'
Avenue U
5'
12'
50'
Kings
Plaza
Mall Entrance
No Stnd Bus Stop
No Standig Any
25'
Designate Commuter Van Stop
Mall Pk
Mall Pk Entrance
Flatbush Avenue
14' Designate Commuter Van Stop
No Stnd Bus Stop
Existing
Bus Stop
2hr Pk 9am-7pm expt Sun
Avenue U
17'
No Stnd Bus Stop
No Pk 8am-Midnight expt Sun
No Stnd Bus Stop
2hr Pk 9am-7pm expt Sun
Hendrickson St
33'
2hr Pk 9am-7pm expt Sun
Drawing 9
FLATLANDS
Parking Regulations
Brooklyn Retail
Corridors

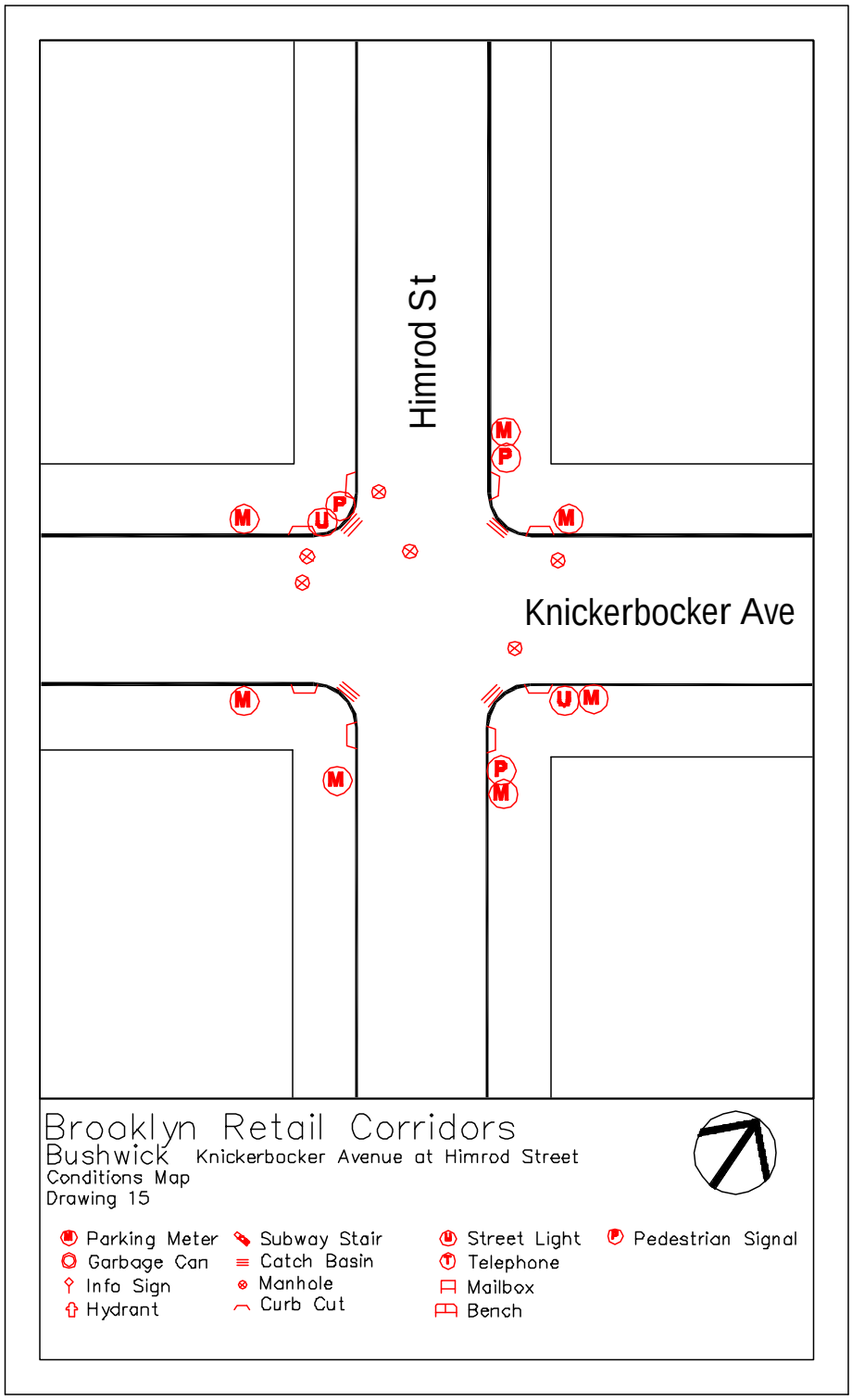

5th Ave
86th S
Brooklyn Retail Corridors
Bay Ridge 86th Street at 5th Avenue
Conditions Map
Drawing 10
Parking Meter
Garbage Can
Info Sign
Hydrant
Subway Stair
Catch Basin
Manhole
Curb Cut
Street Light
Telephone
Mailbox
Bench
Pedestrian Signal

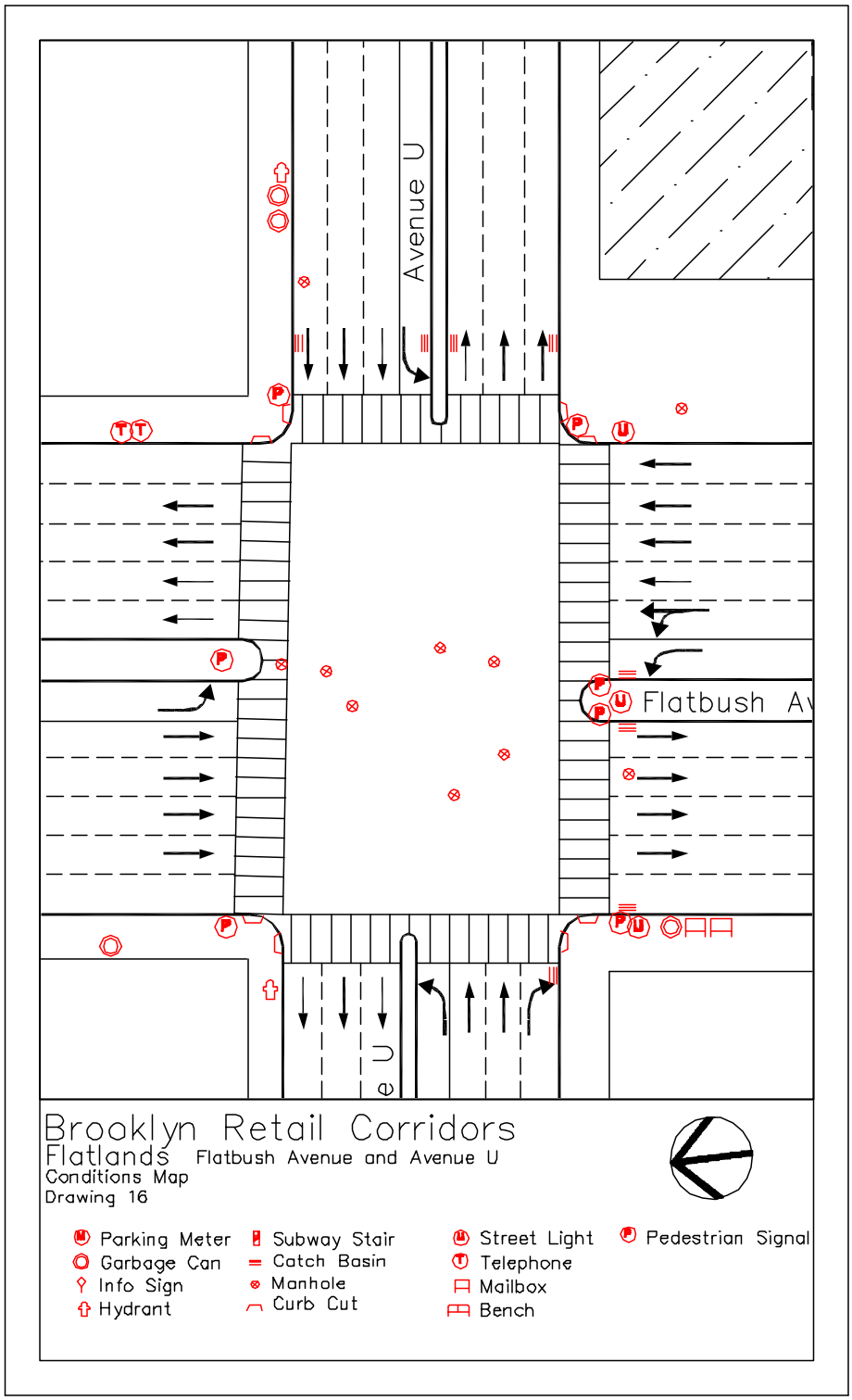

86th
4th Ave
Brooklyn Retail Corridors
Bay Ridge 86th Street at 4th Avenue
Conditions Map
Drawing 11
Parking Meter
Garbage Can
Info Sign
Hydrant
Subway Stair
Catch Basin
Manhole
Curb Cut
Street Light
Telephone
Mailbox
Bench
Pedestrian Signal

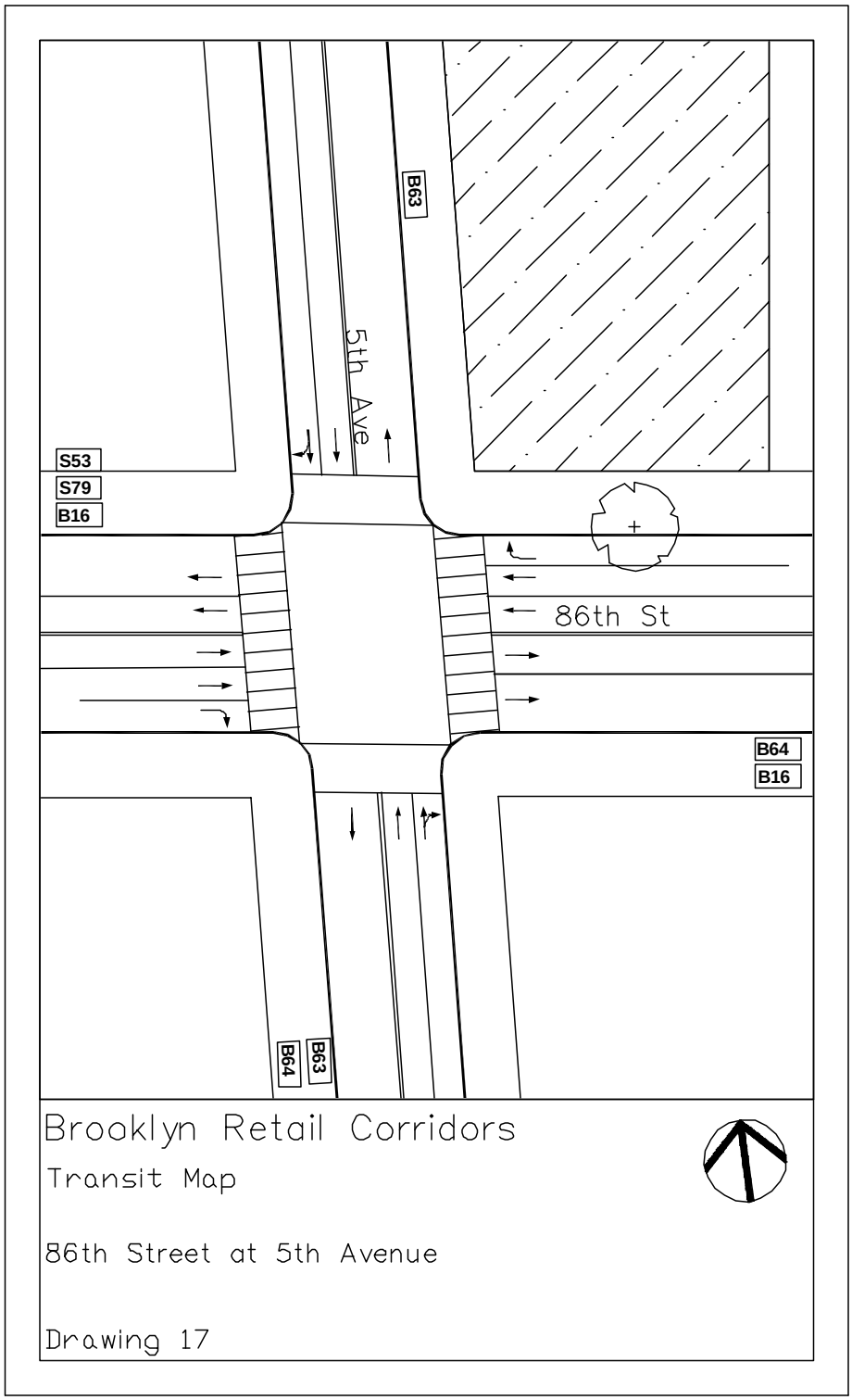

Ocean Parkway
Brighton Beach Ave
Ocean Parkway
Brooklyn Retail Corridors
Brighton Beach
Conditions Map
Drawing 12
Brighton Beach Avenue
and Ocean Parkway
Parking Meter
Garbage Can
Info Sign
Hydrant
Subway Stair
Catch Basin
Manhole
Curb Cut
Street Light
Telephone
Mailbox
Bench
Pedestrian Signal

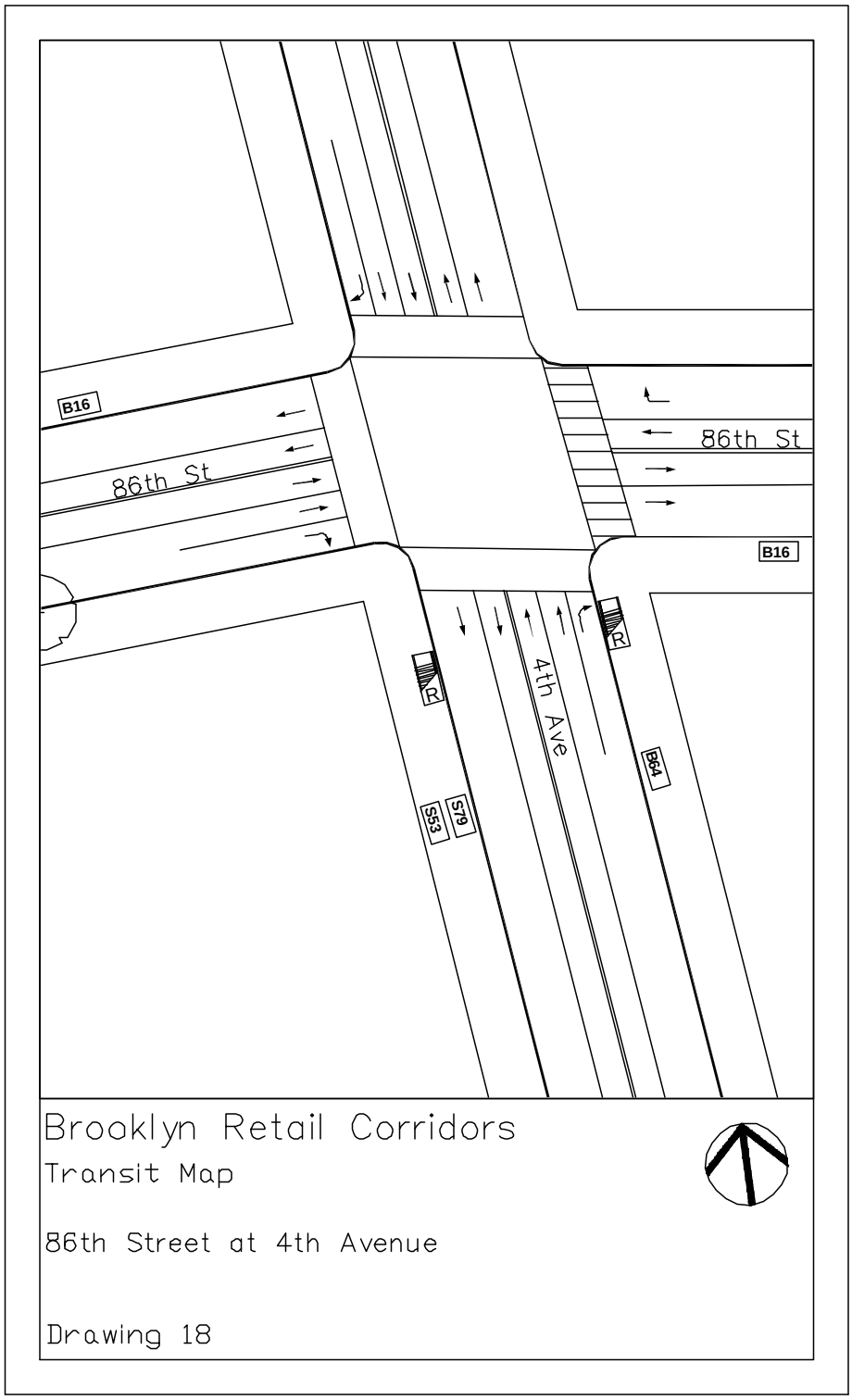

Coney Island Ave
Brighton Beach Ave
Brooklyn Retail Corridors
Brighton Beach
Conditions Map
Drawing 13
Brighton Beach Avenue
and Coney Island Avenue
Parking Meter
Bus Stop
Info Sign
Hydrant
Subway Stair
Catch Basin
Manhole
Curb Cut
Street Light
Telephone
Mailbox
Bench
Garbage Can
Pedestrian Signal

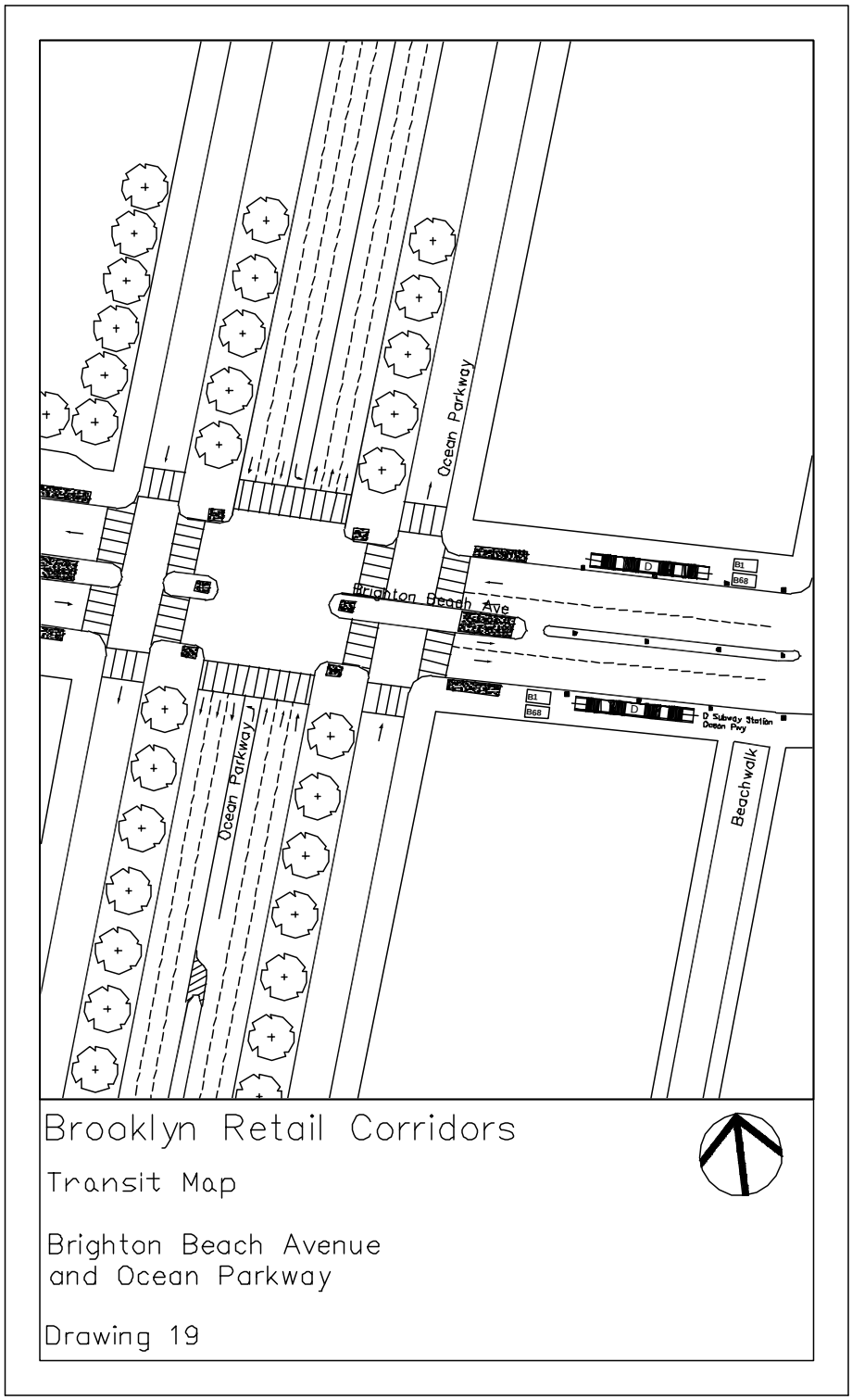

Greene
Myrtle
Knickerbocker Ave
Heisser Triangle
Brooklyn Retail Corridors
Bushwick Knickerbocker Avenue at Myrtle Avenue
Conditions Map
Drawing 14
Parking Meter
Garbage Can
Info Sign
Hydrant
Subway Stair
Catch Basin
Manhole
Curb Cut
Street Light
Telephone
Mailbox
Bench
Pedestrian Signal

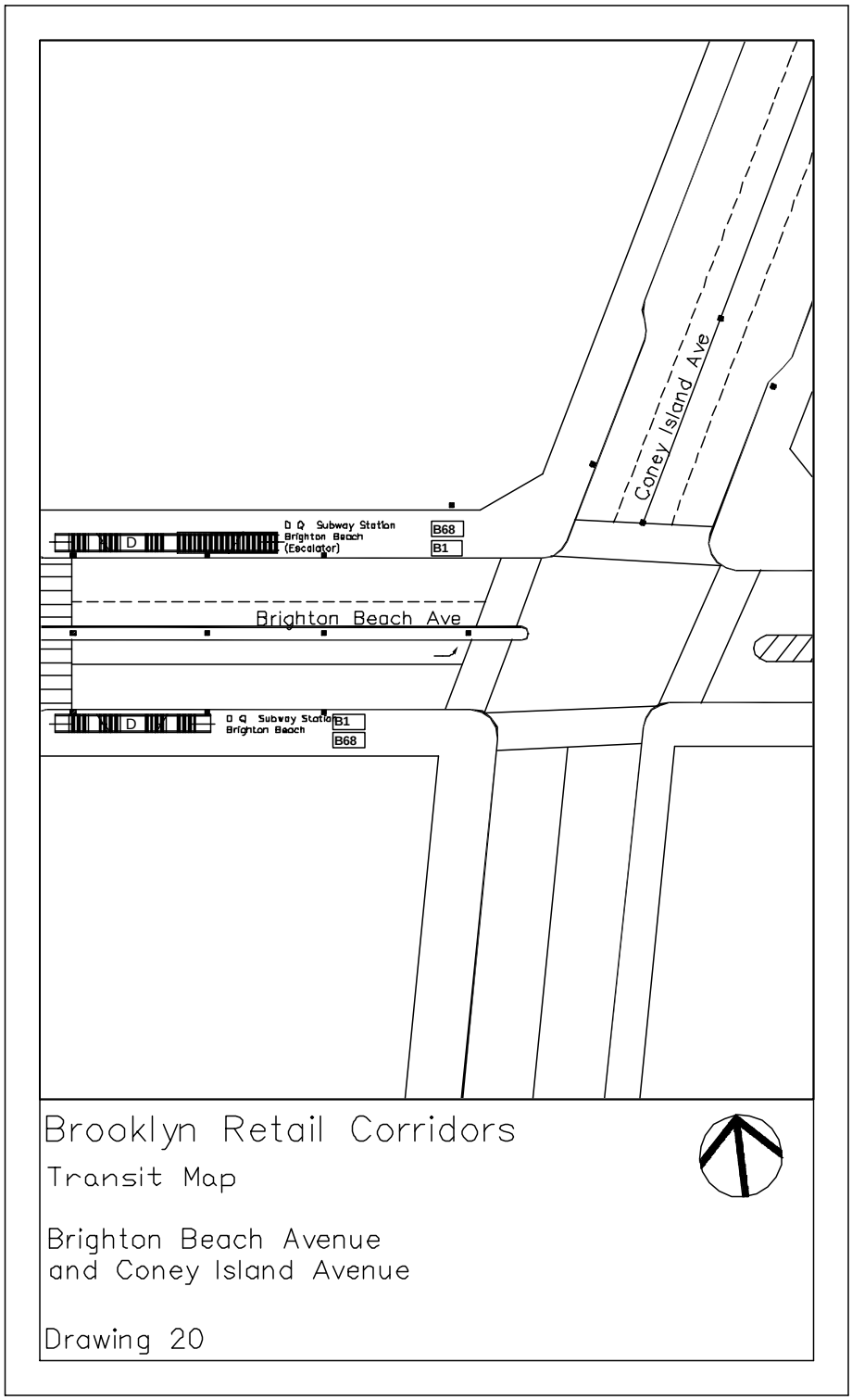

Himrod St
Knickerbocker Ave
Brooklyn Retail Corridors
Bushwick Knickerbocker Avenue at Himrod Street
Conditions Map
Drawing 15
Parking Meter
Garbage Can
Info Sign
Hydrant
Subway Stair
Catch Basin
Manhole
Curb Cut
Street Light
Telephone
Mailbox
Bench
Pedestrian Signal

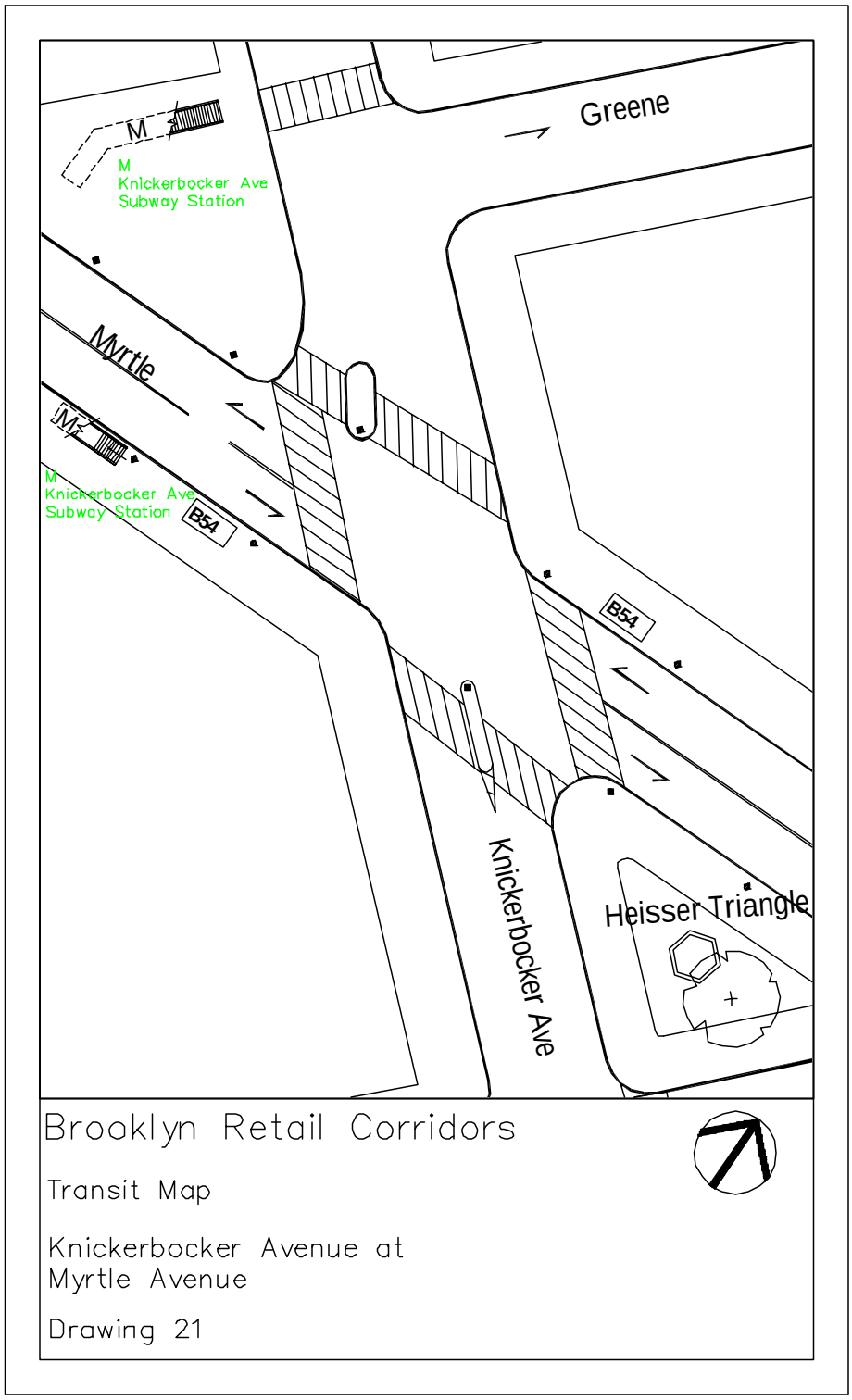

Avenue U
Flatbush Av
Ave U
Brooklyn Retail Corridors
Flatlands Flatbush Avenue and Avenue U
Conditions Map
Drawing 16
Parking Meter
Garbage Can
Info Sign
Hydrant
Subway Stair
Catch Basin
Manhole
Curb Cut
Street Light
Telephone
Mailbox
Bench
Pedestrian Signal

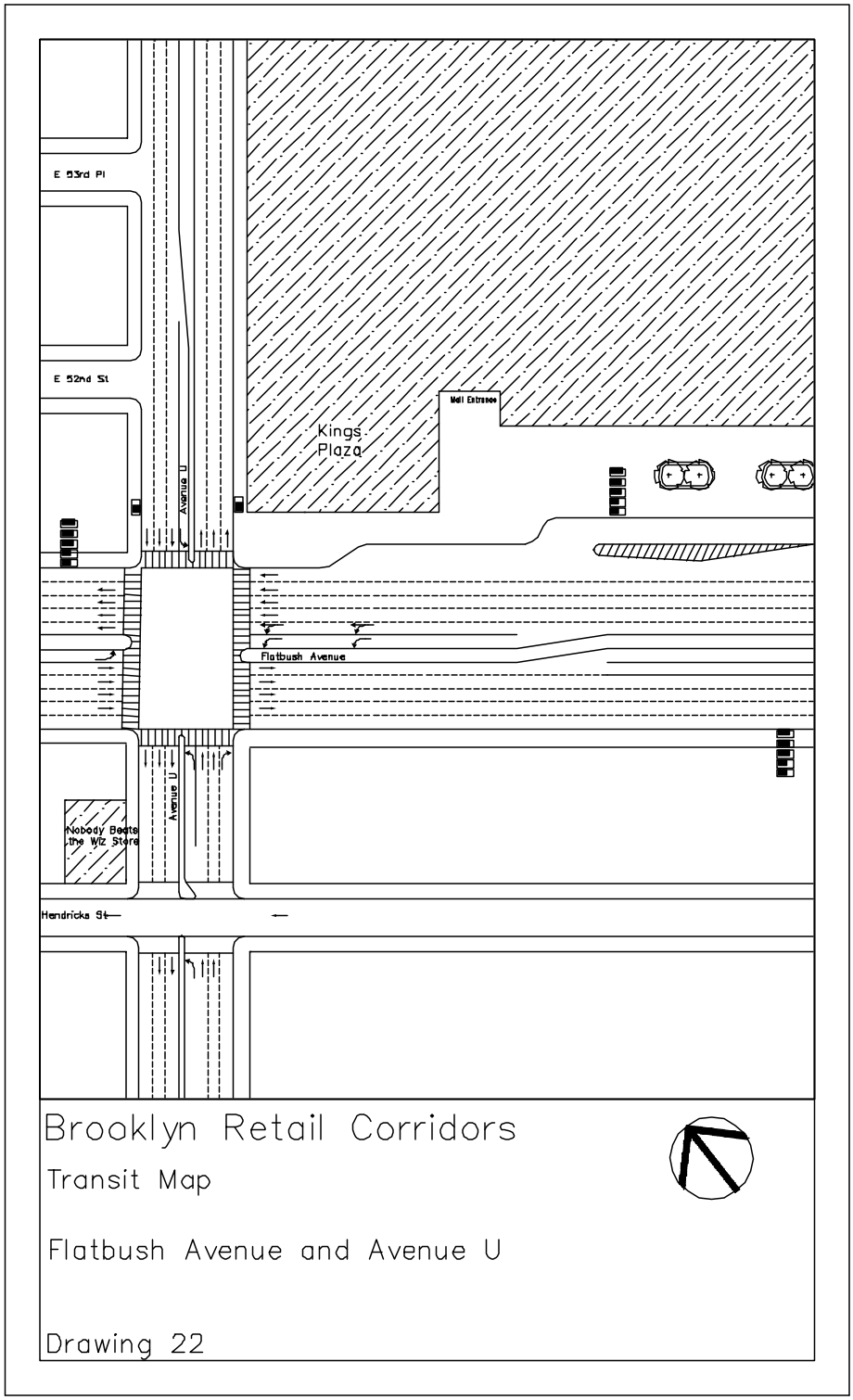

B63
5th Ave
S53
S79
B16
86th St
B64
B16
B64
B63
Brooklyn Retail Corridors
Transit Map
86th Street at 5th Avenue
Drawing 17


B16
86th St
86th St
B16
R
R
4th Ave
B64
S53
S79
Brooklyn Retail Corridors
Transit Map
86th Street at 4th Avenue
Drawing 18


Ocean Parkway
Brighton Beach Ave
B1
B68
D
D Subway Station
Ocean Pwy
Ocean Parkway
Beachwalk
Brooklyn Retail Corridors
Transit Map
Brighton Beach Avenue
and Ocean Parkway
Drawing 19


Coney Island Ave
D Q Subway Station
Brighton Beach
(Escalator)
B68
B1
Brighton Beach Ave
D Q Subway Station
Brighton Beach
B1
B68
Brooklyn Retail Corridors
Transit Map
Brighton Beach Avenue
and Coney Island Avenue
Drawing 20


Greene
M
M
Knickerbocker Ave
Subway Station
Myrtle
M
M
Knickerbocker Ave
Subway Station
B54
B54
Knickerbocker Ave
Heisser Triangle
Brooklyn Retail Corridors
Transit Map
Knickerbocker Avenue at
Myrtle Avenue
Drawing 21


E 53rd Pl
E 52nd St
Avenue U
Mall Entrance
Kings
Plaza
Flatbush Avenue
Avenue U
Nobody Beats
the Wiz Store
Hendricks St
Brooklyn Retail Corridors
Transit Map
Flatbush Avenue and Avenue U
Drawing 22

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