Soundview Areawide Transportation Study

EXISTING AND FUTURE CONDITIONS WITH RECOMMENDATIONS
FINAL REPORT

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Commissioner

A Member of the New York Metropolitan Transportation Council

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Soundview Areawide Transportation Study

Existing and Future Conditions

with Recommendations

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1.0 INTRODUCTION

The Soundview Transportation Study was initiated in response to community (Community Board 9) concerns about traffic circulation and safety issues in the general study area. Recently, the eastern and southern sections of the study area and peninsula have seen growth in population and economic activity that changed the traffic characteristics by increasing automobile and truck traffic on neighborhood streets. The study addresses traffic and safety issues and explores ways to improve circulation, traffic flow, and safety for all road users – motorists, pedestrians, and cyclists.

1.1 Study Area

The study area within the regional setting is shown in Figure 1-1. The general study area is bounded to the east by the Bronx River/Zerega Avenue, to the west by Bronx River Parkway, to the north by East Tremont Avenue and to the south by Westchester Creek/East River/Long Island Sound. The Bruckner Expressway divides the study area into north and south halves, and the Cross Bronx Expressway divides the north half diagonally. Several neighborhoods fall within the study area boundaries, they include: Soundview, Castle Hill Union, Harding Park, Clason Point, Unionport, Bruckner, Parkchester, and West Farms. Figure 1-2 shows the general study area and the three focus areas identified for detailed analysis.

The study area has mixed land uses. It is characterized by high-rise residential buildings (such as Parkchester housing complex), newly constructed two-family homes, commercial facilities (shopping mall, retails, etc.), recreational facilities (YMCA, parks and open spaces – Sound View, Castle Hill, and Pugsley's Creek Park), and industrial uses and transportation facilities (school and NYC Transit bus garages, etc.).

Exhibit 1-1

Study Area within Regional Setting

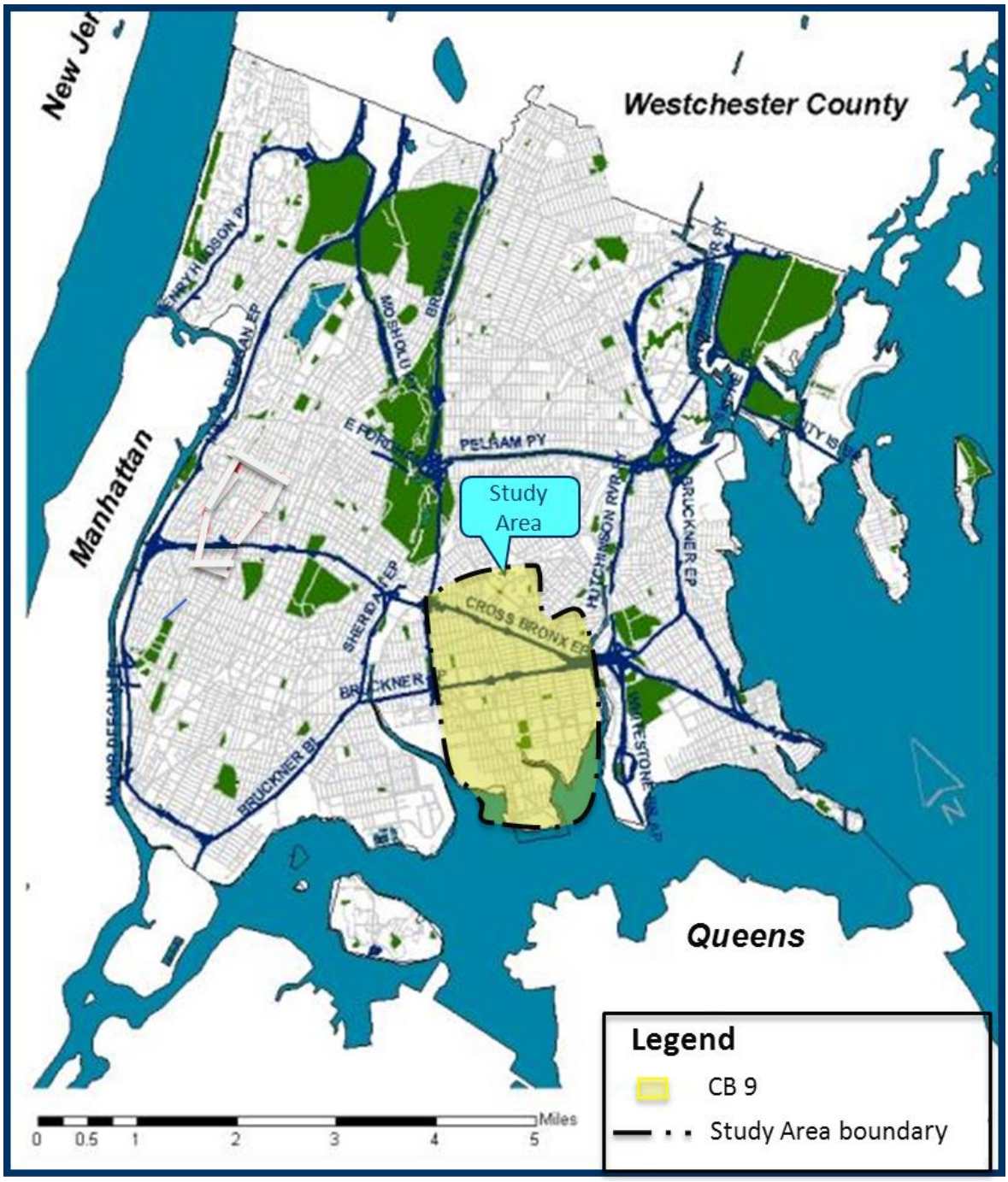
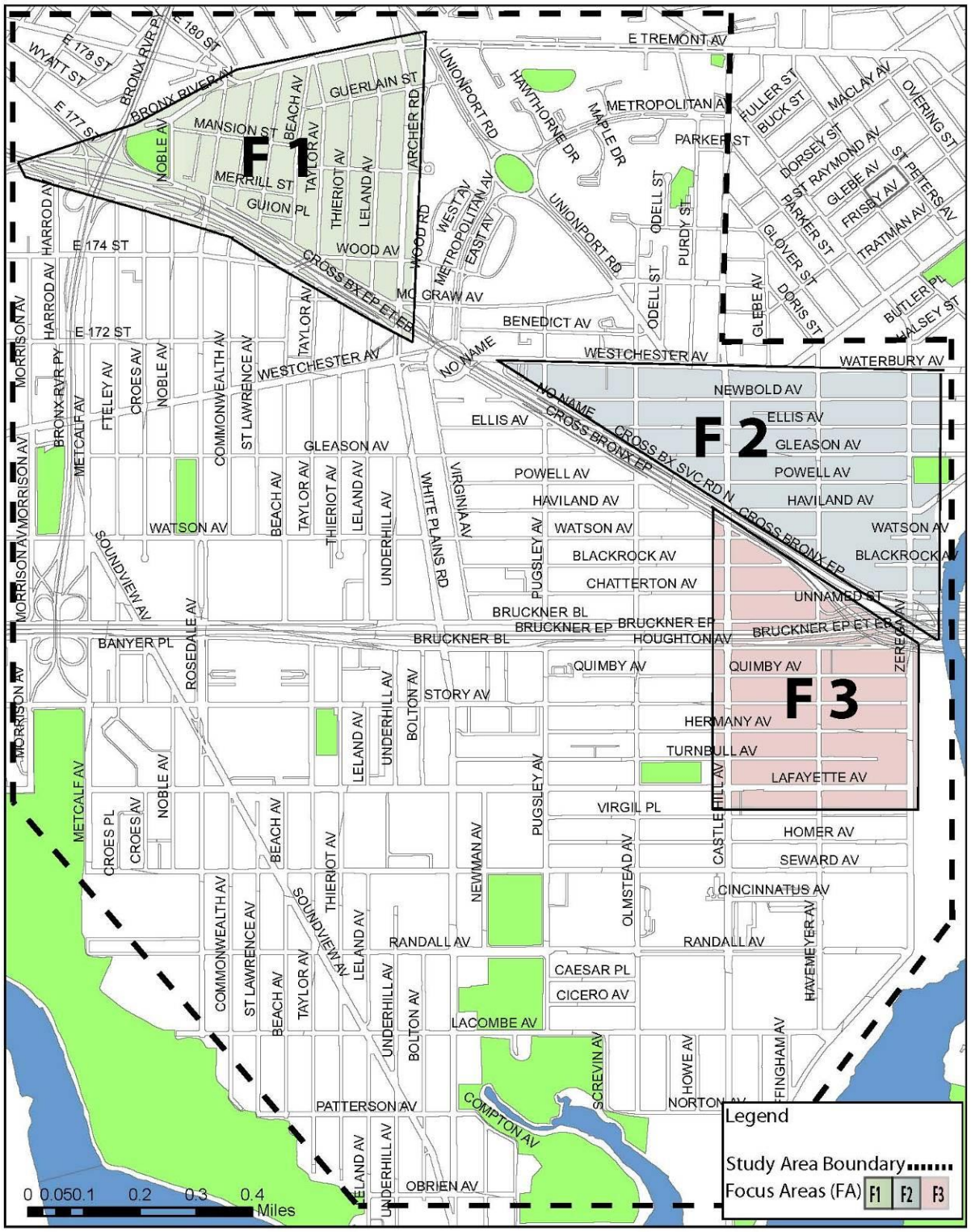


Exhibit 1-2

Study Area Boundaries and Focus Areas



Traffic congestion is concentrated in certain sections of the study area; as a result, the study identified three specific areas for detailed investigation.

The three focus areas are described below as well as the problem(s) identified there by the community board.

Focus Area 1 is situated in the north western section of the study area, north of the Cross Bronx Expressway (CBE) and adjacent to the Bronx River Parkway interchange.

Objectives:

1. Examine traffic circulation and congestion in the vicinity of the interchange, by focusing on the operation of the on and off ramps of the parkway and expressway;
2. Examine the street network within the triangular area between White Plains Road, Cross Bronx Expressway, and East Tremont /Bronx River Avenues to improve accessibility; and,
3. Explore the feasibility and implications of converting Leland Avenue to two-way from the current one-way operation.

Focus Area 2 is situated between Zerega and Westchester/Waterbury Avenues, and Cross Bronx Expressway.

Objectives:

1. Examine vehicular and pedestrian safety issues in this triangular area and explore the feasibility of converting several streets from two-way to one-way operation;
2. Evaluate the possibility of providing new on-street bike lanes; and,
3. Assess congestion in the area especially along Castle Hill Avenue, between Westchester Avenue and Cross Bronx Expressway.

Focus Area 3 is situated in the area bounded by the Cross Bronx Expressway, Lafayette Avenue, Castle Hill Avenue, and Zerega Avenue.

Objectives:

1. Improve vehicular and pedestrian safety by exploring the possibility of converting some streets from two-way to one-way operation; and,
2. Evaluate the possibility to provide new bike lanes.

1.2 Goals of the Study

The goal of the study is to reduce congestion and enhance safety for all street users (motorists, pedestrians, and cyclists) and to facilitate public participation in the planning process.

1.3 Objectives of the Study

The study's main objectives are:

- To assess the existing and future transportation conditions;
- To identify problems and develop solutions to reduce congestion, and improve mobility and safety for all street users; and
- Explore opportunities to provide new bicycle routes.

1.4 Project Organization and Methodology

The study examines the study area's demographics, land use and zoning, vehicular traffic, goods movement, pedestrian and bicycle movements, accident and safety, on- and off-street parking, and public transportation provision to help identify and define problems and develops effective traffic solutions.

The existing conditions were analyzed and short-term improvements developed. Then the projected future conditions analysis and more substantial long-term improvement measures were developed. Throughout the process the community input was sought and obtained.

2.0 ZONING AND LAND USE

2.1 Zoning

The existing zoning and land use in the study area were examined to determine significant trip generation locations. See Figure 2.1 for the existing zoning map. The existing zoning in the focus areas is predominantly residential (R3-2, R5, and R6) with small sections of commercial establishments along East Tremont Avenue (C8-1) and along of Castle Hill Avenue between Waterbury and the Cross Bronx Expressway in Focus Area 2. Areas zoned for manufacturing (M1-1, M1-2, M2-1, M3-1) are located in Focus Areas 2 and 3 along Zerega Avenue and Havemeyer Avenue.

2.2 Land Use

The existing land uses in the study area include residential, commercial, institutional, transportation, and industrial buildings and recreational facilitates. Figure 2-2 shows the existing land use in the study area.

Residential

The predominant land use in the study area is residential comprising mainly of multi-family walk-ups, one, and two-family dwellings with some ground floor commercial.

There are a few high density multi-family buildings scattered throughout the study area. These are mainly along White Plains Road, Castle Hill Avenue, Rosedale Avenue, Cross Bronx Avenue, Havemeyer Avenue, and Archer Street. The pictures below show the types of residential development in the study area.

Residential

Figure 2-1
Zoning in the Study Area (Focus Areas)

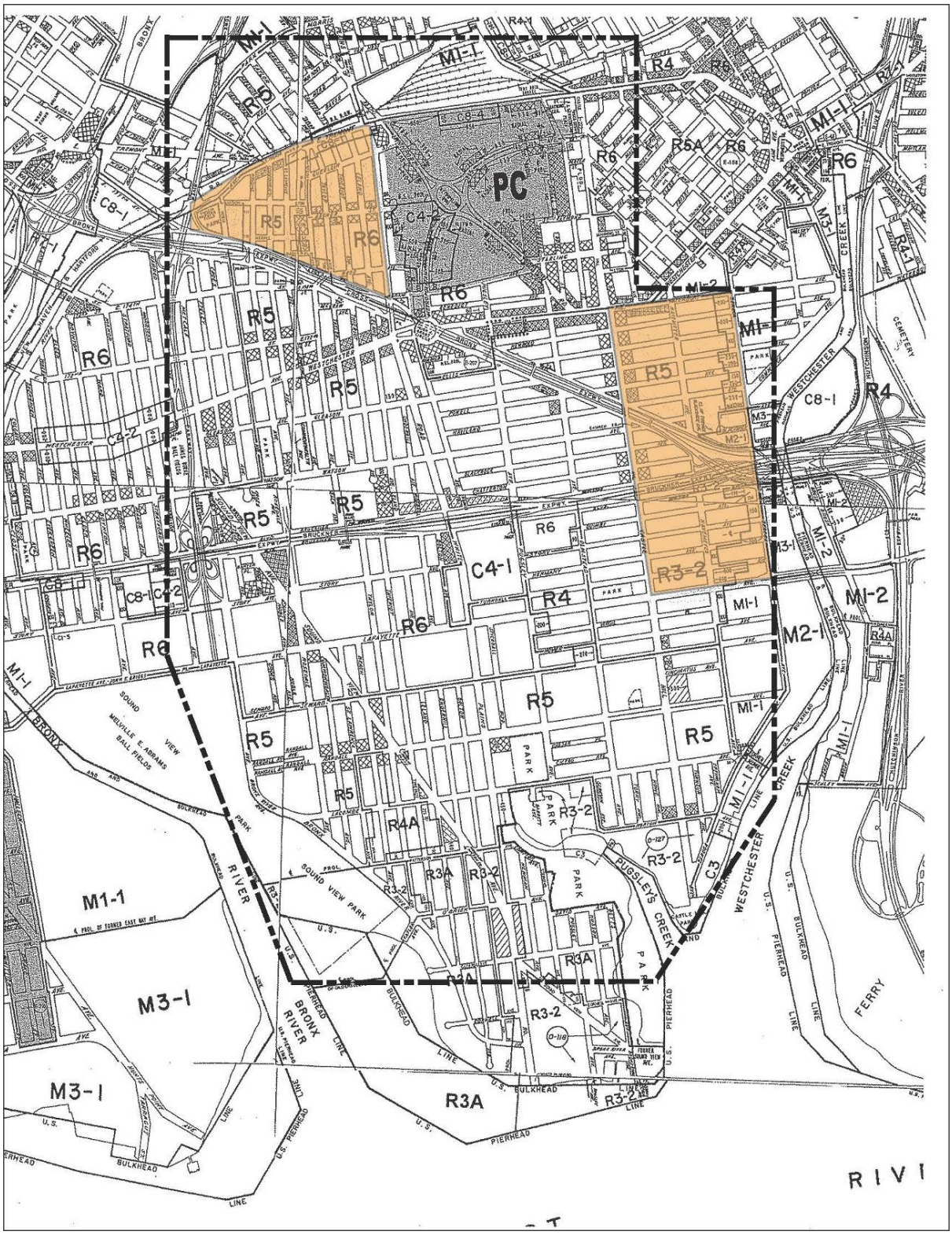
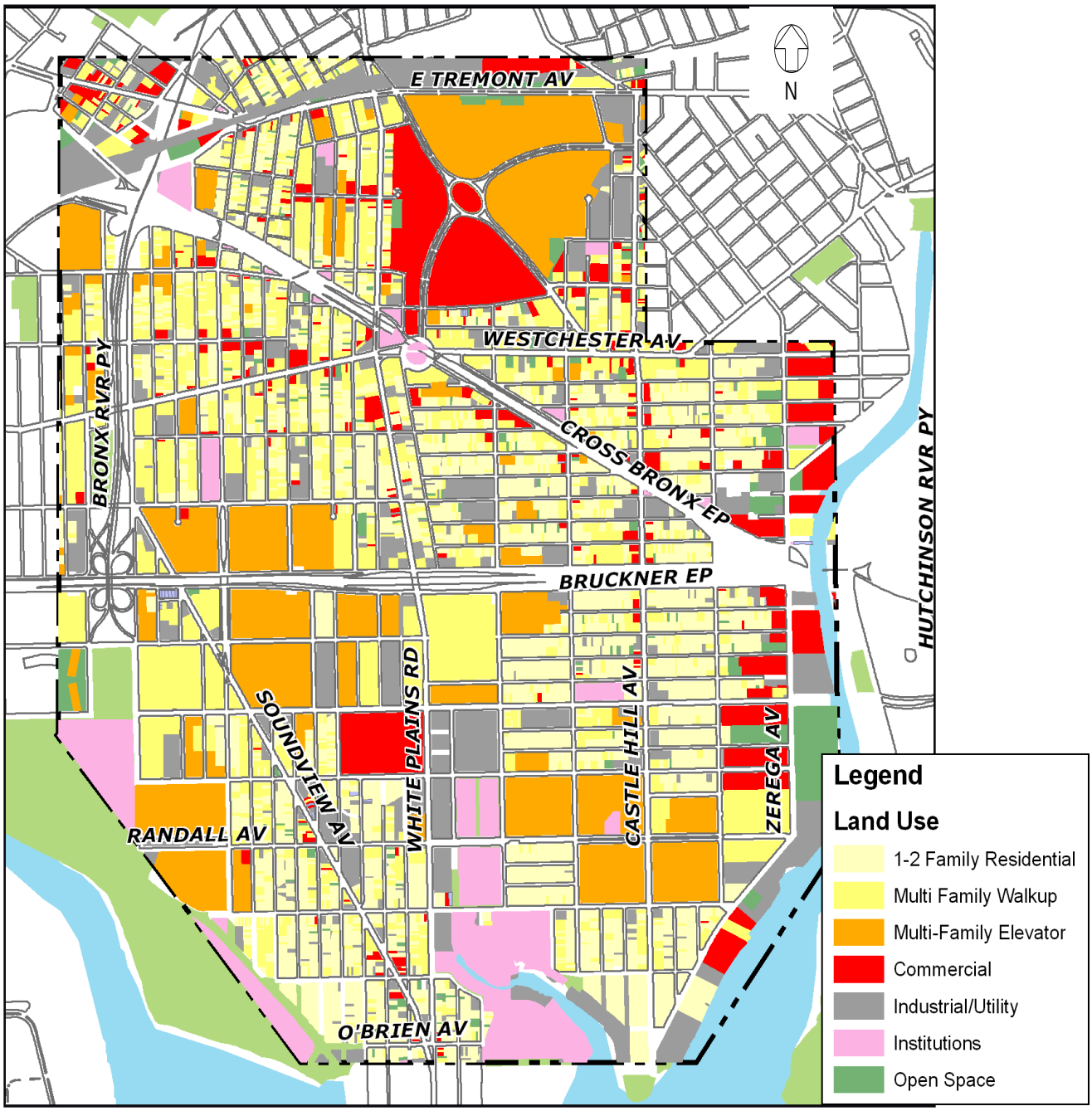
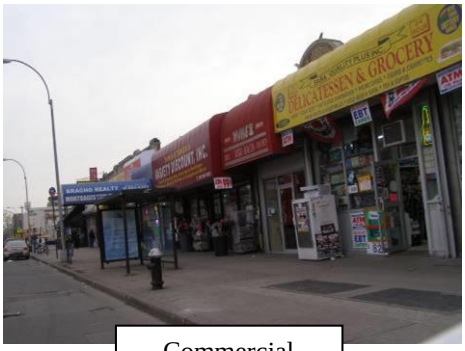


Figure 2-2
Land Use



The majority of the commercial activity is concentrated along Castle Hill Avenue, Archer Road, and White Plains Road. Castle Hill Avenue serves as the main commercial retail center for the focus areas and beyond. The corridor accommodates small groceries stores, supermarkets, discount stores, banks, furniture stores, restaurants, clothing stores, auto parts stores, and dental/medical offices (see pictures).

Commercial

Manufacturing

The manufacturing/industrial activity is located in eastern section of the study area (Focus Areas 2 and 3) along Zerega Avenue and Havemeyer Avenue. The activity is confined mainly to big factories, auto related uses, such as gas station and school bus garages. The two pictures below show some types of the manufacturing in the area.


Manufacturing

Transportation

There are several transportation uses in the vicinity of the three focus areas such as the elevated subway structure with stations and two expressways (Cross Bronx and Bruckner) with their interchanges.

The two pictures below show some types of the transportation land uses in the areas.

Transportation facilities

Community/Institutional Facilities

The community facilities in the general study area include churches, public/private elementary and secondary schools, and a public library.

Recreational Facilities - Parks and Open Space

There are limited recreational facilities in the focus areas, primarily associated with schools or large multifamily complexes. There are no vacant lots in the focus areas. There are several parks and open spaces throughout the general study area including one YMCA facility on the southern tip of the peninsula.

Future Developments

No major developments are planned in the three Focus Areas by the year 2018. However, Home Depot, located at Zarega Avenue and Lafayette Avenue is relocated outside of the study area; as a result this will reduce numbers of daily trips to the area (Focus Area 3) and need for the short-term parking.

The New York City Department of Park and Recreation (DPR) planned to improve the existing recreational facilities at Soundview Park by redesigning the site of approximately 205 acres and adding new park amenities. The improvements would encompass a large portion of the park and would include both active and passive open space resources. Since the planned project is located outside of the three focus areas it will not have significant impact on traffic operations within the focus areas.

3. TRAFFIC AND TRANSPORTATION

3.1 Introduction

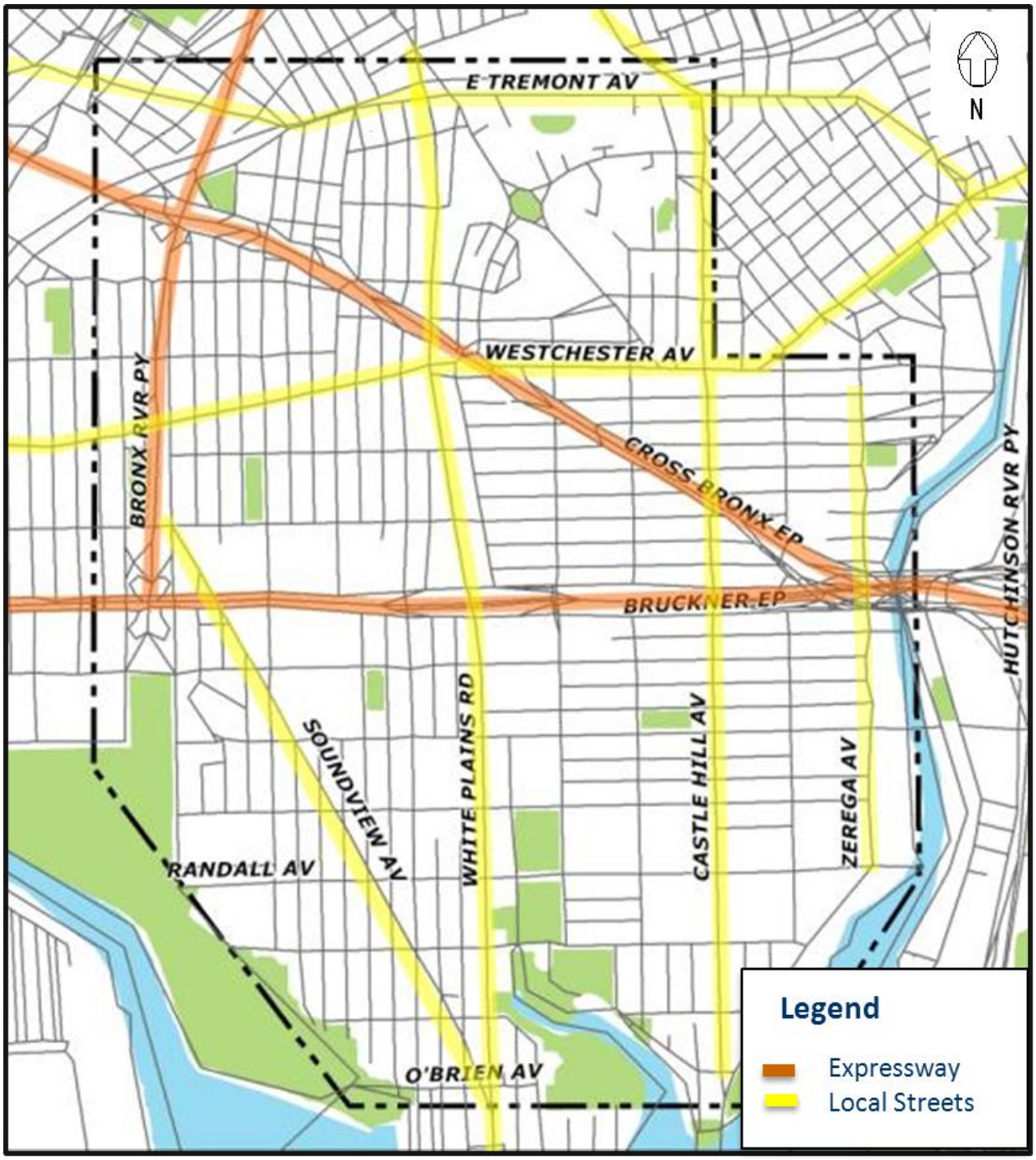
The Soundview peninsula is surrounded by water on all sides except to the north and has three freeways Bronx River Parkway, the Cross Bronx Expressway, and the Bruckner Expressway passing through the area. Other main arterials in the study area are East Tremont Avenue, Westchester Avenue, and Lafayette Avenue - all running east to west and Soundview Avenue, White Plains Road, and Castle Hill Avenue running north to south. The freeways process significant regional through traffic flows and they are generally congested during and beyond the peak hours.

3.2 Street Network

The street network provides adequate vehicular access to the study area. The study area can be accessed via the Bronx River Parkway on the western limit of the study area, the Bruckner Expressway that passes through the center of the study area, and the Cross Bronx Expressway (I-95) that runs diagonally, yet parallel to Bruckner Expressway. The Bronx River Parkway runs north-south from the Bruckner Expressway to Westchester County to the north. The Bruckner Expressway runs east-west in the study area between Bronx River Parkway and Zerega Avenue. There are several major arterials within the study area that process a significant amount of vehicular traffic during the peak periods. They are East Tremont Avenue, White Plains Road, Castle Hill Avenue, and Cross Bronx Expressway North Service Road. Figure 3-1 shows the major arterials in the study focus areas.

East Tremont Avenue is an east/west corridor on the northern boundary of Focus Area 1. Typical cross-section of Tremont Avenue is approximately 70 feet wide and comprises of two moving lanes in each direction and parking on both sides of the street. The entire corridor within the study area is dominated by residential building mixed with few smaller commercial establishments, such as grocery stores and supermarkets.

Figure 3-1
Major Arterials in the Study Area



White Plains Road is a north/south corridor on the eastern boundary of Focus Area 1. Typical cross-section of White Plains Road is approximately 60 feet wide and comprises of two moving lanes in each direction and parking on both sides of the street. It has direct connection to the Cross Bronx Expressway and the Bruckner Expressway. The entire corridor within the study area is dominated in residential uses with very little mixed of commercial stores.

Castle Hill Avenue is another north/south corridor on the eastern section of Focus Areas 2 and 3. Typical cross-section of Castle Hill Avenue is approximately 60 feet wide and comprises of two moving lanes in each direction and parking on both sides of the street. The land uses along the entire corridor within the study area is mostly commercial and residential mixed.

Cross Bronx Expressway North Service Road is a major corridor that traverses the study area (touching all focus areas) and processes a significant amount of traffic. Typical cross-section of Cross Bronx Expressway North Service Road is approximately 30 feet wide with two travel lanes and parking on the right curb.

3.3 Data Collection and Network Volumes

The traffic data collection included Automatic Traffic Recorders (ATR), manual turning movements and classification counts (i.e., auto, bikes, trucks, and buses), and pedestrian counts for one midweek day (Tuesday, Wednesday, or Thursday) during the AM, midday, and PM peak hours; and the Saturday midday peak hour. Truck routes with loading/unloading regulations, bus and subway stops and layovers, travel time runs along major corridors, parking utilization rates (off-street and on-street) along the major arterials, and signal timings for 24 locations were also collected for the traffic analysis.

Automatic Traffic Recorders (ATR) provided traffic count data from Saturday, March 8, 2008 to Monday, March 17, 2008. The ATR machines were placed at fifteen locations for ten days and recorded in 15-minute intervals to collect for a consecutive 24-hour. Figure 3-2 shows the traffic count locations in the study area.

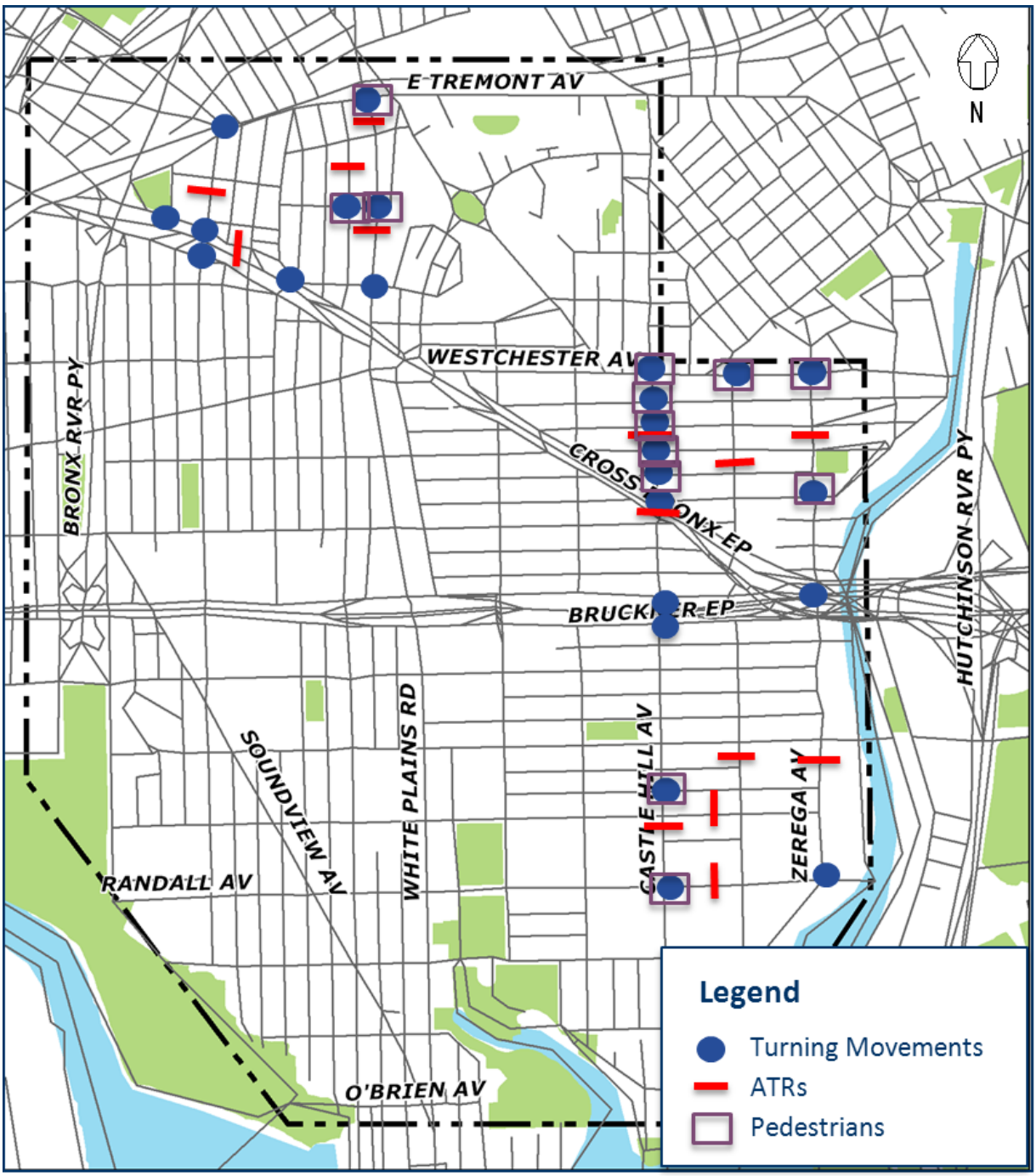
Automatic Traffic Recorders (ATRs) were placed at the following fifteen locations:

1. Zerega Avenue between Story Avenue and Hermany Avenue (NB & SB);
2. Zerega Avenue between Gleason Avenue and Ellis Avenue (NB & SB);
3. Havemeyer Avenue between Story Avenue and Hermany Avenue (NB & SB);
4. Havemeyer Avenue between Gleason Avenue and Ellis Avenue (NB & SB);
5. Castle Hill Avenue between Hermany Avenue and Story Avenue (NB & SB);
6. Castle Hill Avenue between Cross Bronx Expressway Service Roads (NB & SB);
7. Castle Hill Avenue between Gleason Avenue and Ellis Avenue (NB & SB);
8. Hermany Avenue between Castle Hill Avenue & Havemeyer Avenue (EB & WB);
9. Turnbull Avenue between Castle Hill Avenue and Havemeyer Avenue (EB & WB);
10. Cross Bronx Expressway Service Road West of Rosedale Avenue (WB);
11. Leland Avenue between Archer Avenue and Wood Avenue (NB);
12. East Tremont Avenue between Leland Avenue and White Plains Road (EB & WB);
13. White Plains Road between Archer Street and Wood Avenue (NB & SB);
14. Rosedale Avenue between Merrille Street and Mansion Street (NB); and
15. Archer Street between Leland Avenue and White Plains Road (WB).

Manual turning movement with vehicle classification counts were conducted concurrently with the ATR counts for the various peak periods – AM (7:00 to 9:00 AM), midday (Noon to 2:00 PM), PM (4:00 to 6:30 PM), and Saturday midday (Noon to 2:00 PM) at the following intersections:

1. Cross Bronx Expressway North and South Service Roads & Rosedale Avenue;
2. Cross Bronx Expressway South Service Road & Noble Avenue;
3. Cross Bronx Expressway North Service Road & Taylor Avenue;
4. Bronx River Avenue & Rosedale Avenue;
5. White Plains Road & East Tremont Avenue;
6. White Plains Road & Archer Street;
7. White Plains Road & Wood Street;
8. Archer Street & Leland Avenue;
9. Zerega Avenue & Haviland Avenue;
10. Zerega Avenue & Waterbury Avenue;
11. Havemeyer Avenue & Waterbury Avenue;
12. Havemeyer Avenue & Gleason Avenue;
13. Castle Hill Avenue & Cross Bronx Exp. North Service Road/Haviland Avenue;

Figure 3-2
Traffic Count Locations



14. Castle Hill Avenue & Powell Avenue;
15. Castle Hill Avenue & Gleason Avenue;
16. Castle Hill Avenue & Ellis Avenue;
17. Castle Hill Avenue & Newbold Avenue;
18. Castle Hill Avenue & Westchester Avenue;
19. Zerega Avenue & Bruckner Boulevard;
20. Zerega Avenue & Lafayette Avenue;
21. Castle Hill Avenue & Bruckner Boulevard East and Westbound;
22. Castle Hill Avenue & Story Avenue;
23. Castle Hill Avenue & Lafayette Avenue; and
24. Havemeyer Avenue & Hermany Avenue.

Network Volumes

Balanced traffic network volumes for the various peak periods were prepared using the ATRs and the manual turning movement counts. This information was plotted on traffic flow maps for each of the representative peak hours; AM (7:30 - 8:30 AM), midday (1:00 - 2:00 PM), PM (5:00 - 6:00 PM), and Saturday midday (1:00 - 2:00 PM). Figures 3-3 to 3-6 shows the 2008 existing peak hour traffic volumes.

Figure 3-3
2008 Existing Traffic Volumes - AM Peak Hour

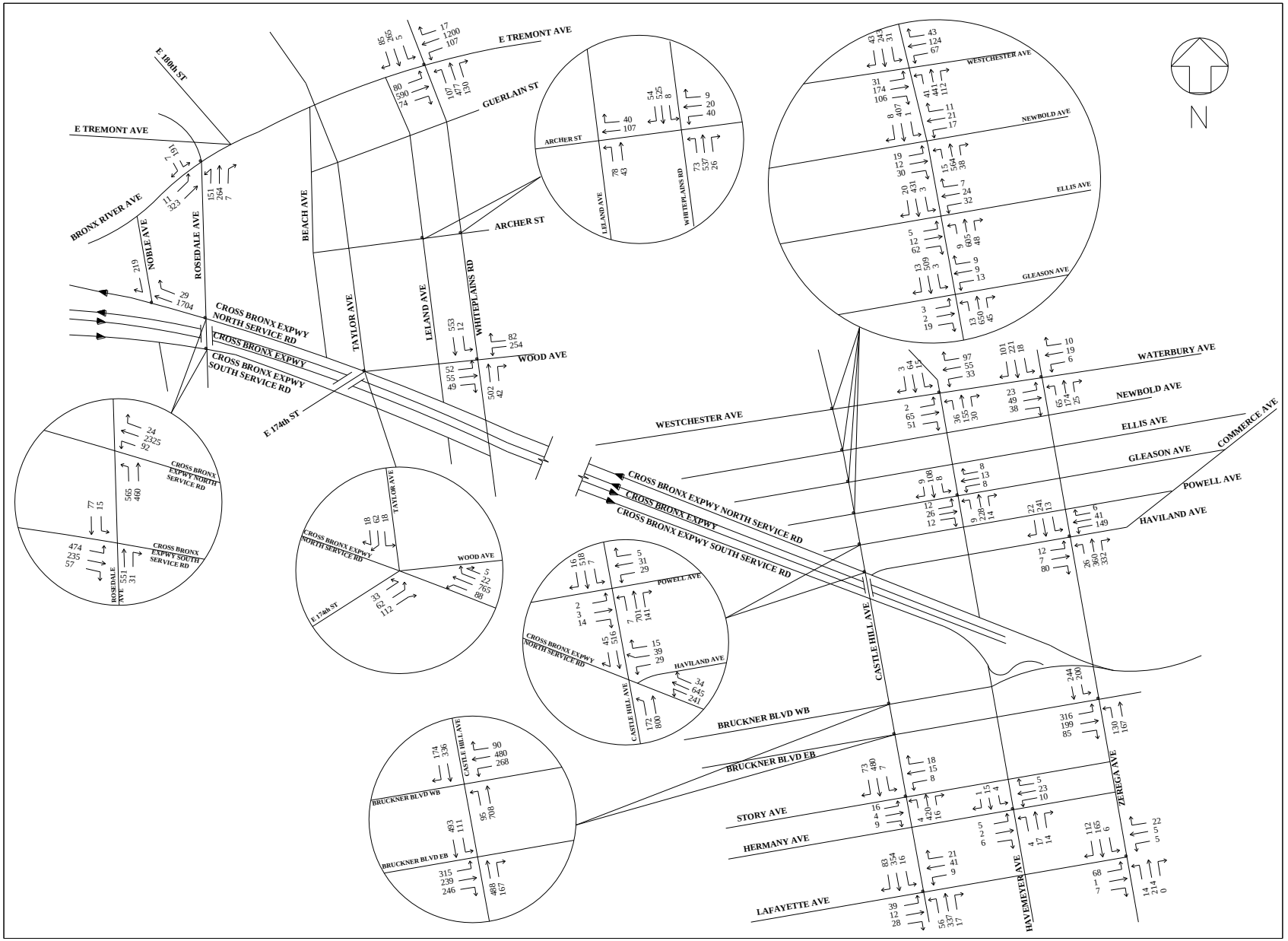


Figure 3-4
2008 Existing Traffic Volumes - Midday Peak Hour

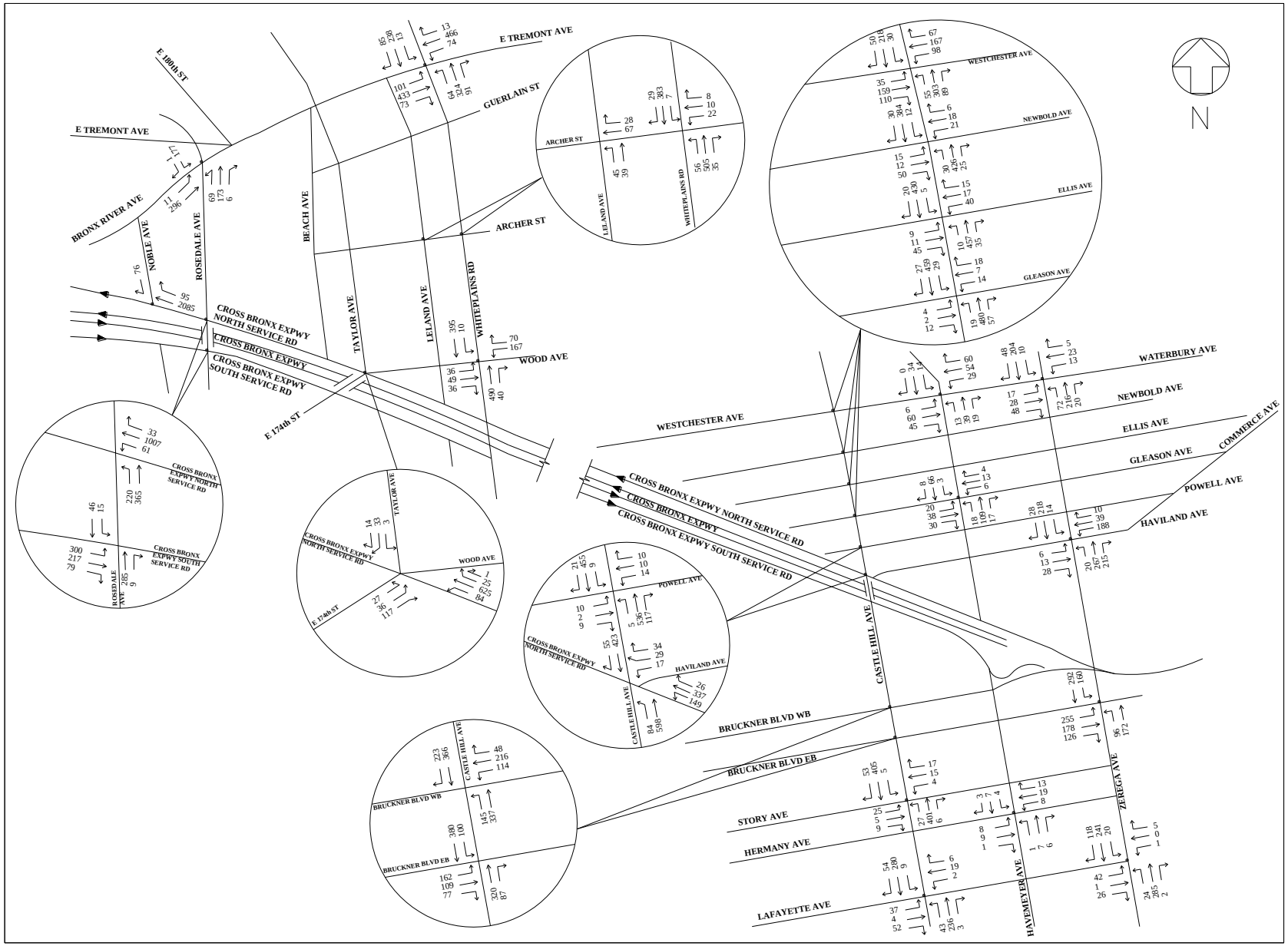


Figure 3-5
2008 Existing Traffic Volumes - PM Peak Hour

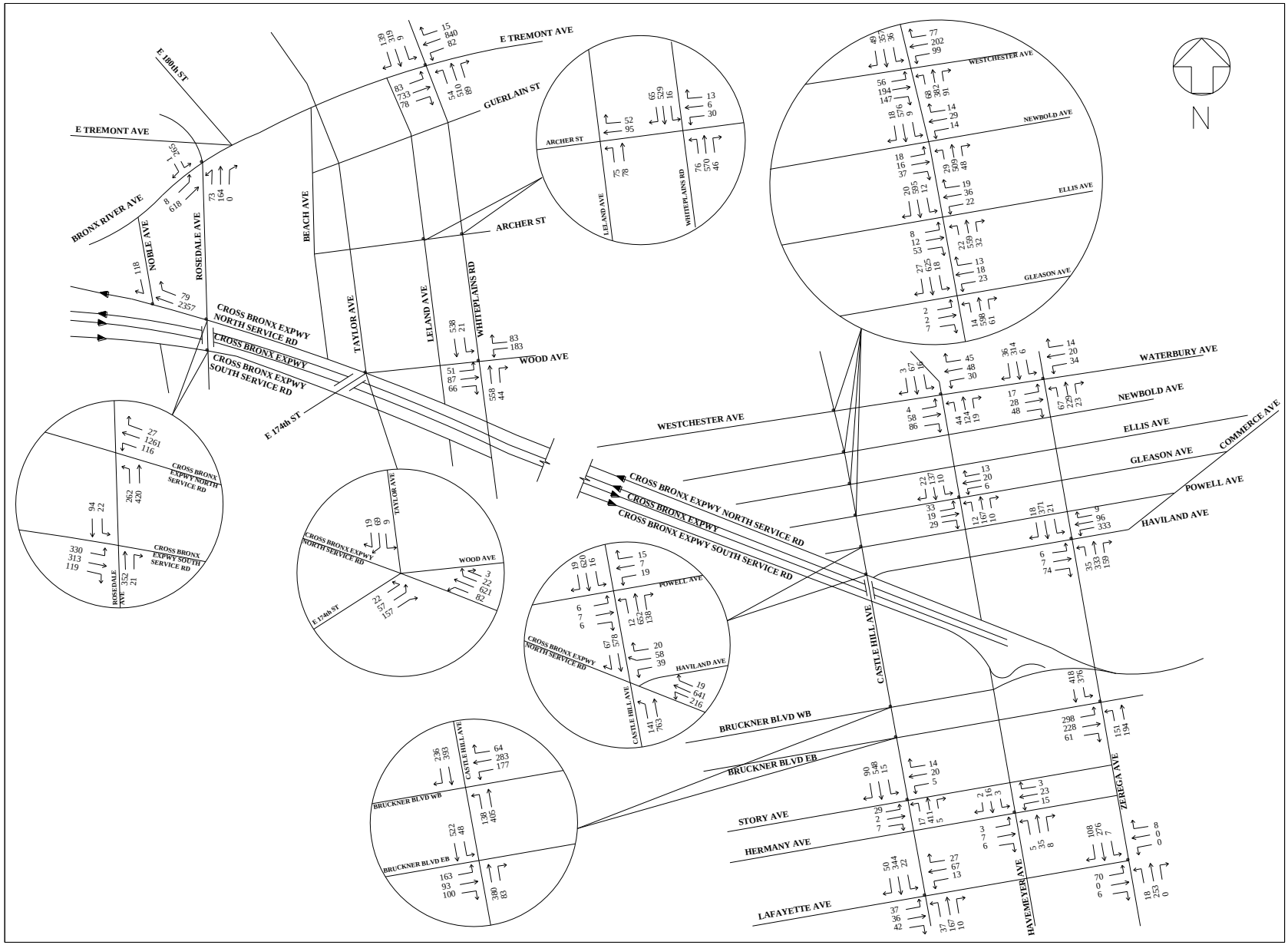
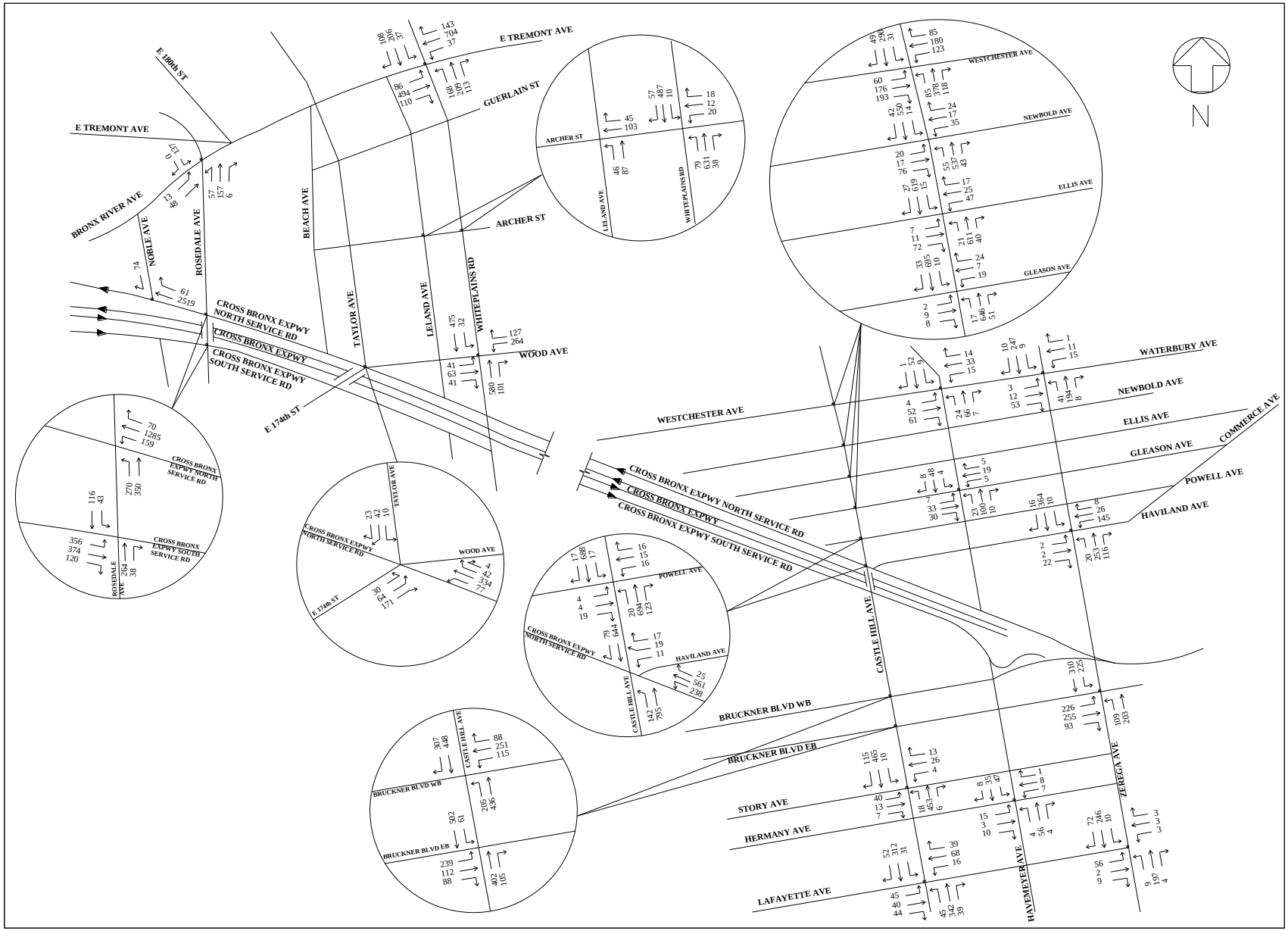


Figure 3-6
2008 Existing Traffic Volumes - Saturday Midday Peak Hour



The data showed that the Cross Bronx Expressway Service Road, just west of Rosedale Avenue, processed the highest number of vehicles during all peak periods, approximately 4,188, 2,412, 2,713, and 2,789 vehicles per hour (vph) during the AM, midday, PM, and Saturday midday peak hours, respectively.

3.4 Capacity and Level of Service (LOS) Analysis

The capacity of the roadways is the maximum rate of flow which may pass through a section of roadway under prevailing traffic, roadway and signalization conditions; it is determined by several factors including turning movements, signal timing, geometric design of the intersection, pedestrian movements, type of vehicle, illegal and/or double parking, grade, roadway conditions, and weather. In determining street capacity within the study area, the 2000 HCM methodology was used.

The traffic flow characteristics are measured in terms of the volume-to-capacity (v/c) ratios and delays. The quality of the flow is expressed in terms of LOS, which is based on an average delay experienced by a vehicle. Delay is a measure of driver discomfort, frustration, fuel consumption, and lost travel time. When the v/c ratio exceeds 1.0, a facility or intersection operates at or over capacity. In this situation severe congestion occurs in traffic with stop-and-start conditions, and extensive vehicle queuing and delays. Volume-to-capacity ratios of less than 0.85 are considered to be reflective of acceptable traffic conditions, with average delays of 45 seconds or less. Table 3- shows level of service criteria as specified in the 2000 HCM Methodology.

Table 3-1
Level of Service Criteria for Signalized Intersections

Level of Service (LOS)	Control Delay Per Vehicle	Description of Traffic Condition
A	**< 10.0**	Describe operations with very low control delay, up to 10 seconds per vehicle. This level of service occurs when progression is extremely favorable and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.
B	**10.1 to 20.0**	Describes operations with control delay greater than 10 and up to 20 sec. per vehicle. 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.
C	**20.1 to 35.0**	Describes operations with control delay greater than 20 and up to 35 sec. per vehicle. 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 at this level, though many still pass through the intersection without stopping.
D	**35.1 to 55.0**	Describes operations with control delay greater than 35 and up to 55 sec. per vehicle. At level D, 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.
E	**55.1 to 80.0**	Describes operations with control delay greater than 55 and up to 80 sec. per vehicle. This level of service 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 occurrences.
F	**> 80**	Describes operations with control delay in excess of 80 sec. per vehicle. 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 factor to such delay levels.

Sources: Highway Capacity Manual 2000
National Research Council, Washington, D.C. 2000.

3.5 Existing Traffic Conditions

Intersections with significant activities and volumes were identified and analyzed for roadway capacity using HCS+ and follows the 2000 Highway Capacity Manual (HCM) methodology. Balanced traffic network for the AM, midday, PM, and Saturday midday peak hours were developed and volume-to-capacity (v/c) ratios, vehicular delay, and level-of-service (LOS) were determined. Table 3-2 shows the LOS Analysis for 2008 Existing Conditions during the AM, midday, PM, and Saturday midday peak hours for the 32 intersections analyzed in the study area.

The analyses show that most intersections operated at an acceptable level of service (LOS) C or better during the AM, Midday, PM, and Saturday midday peak hours. However, some intersections experienced LOS D, E, and F for some or all lane groups during certain peak hours. Figures 3-7 to 3-10 show the overall LOS for all analyzed intersections in the study area.

Intersections with approaches or lane groups with mid LOS D (equal to 45 sec/veh) or worse are listed below:

- Castle Hill Avenue & Cross Bronx Expwy North Service Road/Haviland Avenue;
- Haviland Avenue and Zarega Avenue;
- Havemeyer Avenue & Waterbury Avenue;
- Zerega Avenue & Bruckner Boulevard EB;
- Castle Hill Avenue & Bruckner Boulevard Eastbound;
- Castle Hill Avenue & Bruckner Boulevard Westbound;
- Cross Bronx Expressway North Service Road & Rosedale Avenue;
- Cross Bronx Expressway North Service Road & Taylor Avenue;
- White Plains Road & East Tremont Avenue;
- White Plains Road & Wood Street; and
- Cross Bronx Expressway North Service Road and Noble Avenue.

Table 3-2 (Page 1 of 4)

LOS Analysis for Signalized Intersections

2008 Existing Conditions

Intersection	Approach	Lane Group	AM Peak Hour			MD Peak Hour			PM Peak Hour			SAT MD Peak Hour		
			V/C	Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS
Castle Hill & Gleason Avenues														
	NB	LTR	0.66	17.4	B	0.52	14.7	B	0.57	15.6	B	0.69	18.1	B
	SB	LTR	0.54	15.0	B	0.52	14.9	B	0.63	16.7	B	0.62	16.4	B
	EB	LTR	0.14	21.6	C	0.10	20.9	C	0.07	20.5	C	0.09	20.7	C
	WB	LTR	0.15	21.5	C	0.18	22.0	C	0.22	22.7	C	0.23	23.0	C
	Overall			16.6	B		15.3	B		16.5	B		17.6	B
Castle Hill & Haviland Avenues/CBE N. Service Rd														
	NB	L	0.79	36.5	D	0.40	16.3	B	0.58	22.5	C	0.69	29.2	C
		T	0.64	16.7	B	0.48	14.0	B	0.55	15.0	B	0.61	16.1	B
	SB	TR	0.51	14.5	B	0.46	13.8	B	0.48	14.0	B	0.54	14.9	B
	WB	LTR	1.05	72.5	E	0.83	36.3	D	1.05	70.8	E	0.98	53.1	D
	Overall			38.4	D		21.6	C		37.3	D		29.1	D
Castle Hill & Newbold Avenues														
	NB	LTR	0.59	16.0	B	0.46	14.0	B	0.54	15.1	B	0.62	16.8	B
	SB	LTR	0.38	12.7	B	0.43	13.5	B	0.51	14.5	B	0.58	15.8	B
	EB	LTR	0.33	24.7	C	0.36	25.3	C	0.34	24.9	C	0.48	28.3	C
	WB	LTR	0.21	22.5	C	0.27	23.7	C	0.28	23.5	C	0.33	24.6	C
	Overall			15.9	B		15.5	B		16.1	B		17.9	B
Castle Hill & Powell Avenues														
	NB	LTR	0.81	22.5	C	0.60	16.1	B	0.68	17.8	B	0.73	19.3	B
	SB	LTR	0.54	15.0	B	0.48	14.2	B	0.56	15.3	B	0.60	16.1	B
	EB	LTR	0.12	21.2	C	0.13	21.4	C	0.09	20.7	C	0.11	21.0	C
	WB	LTR	0.32	24.7	C	0.17	21.8	C	0.20	22.4	C	0.21	22.4	C
	Overall			19.9	B		15.7	B		17.0	B		18.1	B
Castle Hill & Westchester Avenues														
	NB	LTR	0.78	27.3	C	0.52	20.3	C	0.65	23.0	C	0.70	24.6	C
	SB	LT	0.39	18.1	B	0.26	16.5	B	0.38	17.9	B	0.34	17.4	B
		R	0.17	16.3	B	0.15	15.9	B	0.17	16.3	B	0.16	15.9	B
	EB	LTR	0.48	19.8	B	0.44	19.1	B	0.55	21.1	C	0.57	21.6	C
	WB	LTR	0.42	19.1	B	0.51	20.5	C	0.62	23.0	C	0.70	27.1	C
	Overall			22.2	C		19.2	B		21.3	C		22.8	C
Haviland & Zerega Avenues														
	NB	LTR	0.91	30.2	C	0.64	16.8	B	0.65	16.8	B	0.42	13.2	B
	SB	LTR	0.38	12.7	B	0.38	12.8	B	0.47	13.7	B	0.40	12.9	B
	EB	LTR	0.36	13.9	B	0.21	12.0	B	0.31	13.1	B	0.11	10.7	B
	WB	LTR	0.74	26.3	C	0.69	22.1	C	1.03	63.4	E	0.42	14.6	B
	Overall			24.2	C		16.7	B		30.6	C		13.2	B

Table 3-2 (Page 2 of 4)

LOS Analysis for Signalized Intersections

2008 Existing Conditions

Intersection	Approach	Lane Group	AM Peak Hour			MD Peak Hour			PM Peak Hour			SAT MD Peak Hour		
			V/C	Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS
Waterbury & Havemeyer Avenues														
	NB	LTR	0.43	10.9	B	0.16	8.1	A	0.32	9.6	A	0.16	8.1	A
	SB	LTR	0.18	8.4	A	0.11	7.7	A	0.18	8.3	A	0.13	7.9	A
	EB	LTR	0.43	19.6	B	0.42	19.4	B	0.49	20.6	C	0.33	17.7	B
	WB	LTR	0.92	51.5	D	0.49	21.3	C	0.42	19.5	B	0.22	16.4	B
	Overall			26.3	C		16.2	B		14.8	B		12.8	B
Waterbury & Zerega Avenues														
	NB	LTR	0.58	13.7	B	0.64	15.1	B	0.57	13.0	B	0.40	9.9	A
	SB	LTR	0.63	13.9	B	0.46	10.8	B	0.49	11.2	B	0.37	9.6	A
	EB	LTR	0.43	18.6	B	0.30	16.8	B	0.30	16.7	B	0.19	15.3	B
	WB	LTR	0.22	15.9	B	0.21	15.6	B	0.26	16.4	B	0.10	14.6	B
	Overall			14.8	B		13.8	B		13.1	B		10.7	B
Castle Hill & Ellis Avenues														
	NB	LTR	0.70	18.4	B	0.45	13.7	B	0.54	15.0	B	0.62	16.6	B
	SB	LTR	0.43	13.5	B	0.42	13.4	B	0.62	16.4	B	0.53	14.7	B
	EB	LTR	0.31	24.1	C	0.28	23.7	C	0.26	23.2	C	0.33	24.6	C
	WB	LTR	0.28	23.8	C	0.29	23.9	C	0.28	23.5	C	0.37	25.7	C
	Overall			17.4	B		15.1	B		16.6	B		17.0	B
Bruckner Blvd EB & Zerega Avenue														
	NB	TR	0.42	23.0	C	0.32	21.4	C	0.33	21.5	C	0.32	21.3	C
	SB	DefL	0.89	60.0	E				1.05	90.2	F	0.71	37.4	D
		T	0.50	25.1	C				0.60	27.5	C	0.43	23.5	C
		LT				0.54	25.5	C						
	EB	LTR	0.75	31.2	C	0.64	27.7	C	0.61	26.8	C	0.54	25.0	C
	Overall			32.0	C		25.6	C		39.9	D		25.7	C
Castle Hill Ave & Bruckner Blvd EB														
	NB	TR	0.75	31.6	C	0.46	23.7	C	0.45	23.3	C	0.43	23.1	C
	SB	LT	0.95	53.7	D	0.72	31.7	C	0.64	27.9	C	0.66	28.6	C
	EB	LTR	0.99	58.3	E	0.41	22.9	C	0.45	23.6	C	0.39	22.3	C
	Overall			48.4	D		26.4	C		25.2	C		24.9	C
Castle Hill Ave & Bruckner Blvd WB														
	NB	L	0.48	53.1	D	0.53	42.6	D	0.50	43.4	D	0.61	43.0	D
		T	0.86	38.8	D	0.64	29.6	C	0.90	50.3	D	0.76	35.2	D
	SB	TR	0.91	57.3	E	0.88	52.6	D	0.95	62.9	E	0.90	53.4	D
	WB	LTR	0.80	33.3	C	0.39	22.4	C	0.51	24.4	C	0.47	23.8	C
	Overall			41.9	D		37.8	D		46.3	D		40.1	D

Table 3.2 (Page 3 of 4)

LOS Analysis for Signalized Intersections

2008 Existing Conditions

Intersection	Approach	Lane Group	AM Peak Hour			MD Peak Hour			PM Peak Hour			SAT MD Peak Hour		
			V/C	Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS
Castle Hill & Lafayette Avenues														
	NB	LTR	0.47	10.7	B	0.33	9.3	A	0.28	8.7	A	0.43	10.2	B
	SB	LTR	0.51	11.0	B	0.32	9.1	A	0.44	10.1	B	0.38	9.6	A
	EB	DefL	0.30	17.7	B									
		LTR				0.21	15.8	B	0.26	16.1	B	0.28	16.4	B
		TR	0.21	16.3	B									
	WB	LTR	0.21	15.8	B	0.08	14.6	B	0.19	15.4	B	0.22	15.8	B
	Overall			12.0	B		10.3	B		11.3	B		11.5	B
Castle Hill & Story Avenues														
	NB	LTR	0.44	10.8	B	0.46	11.0	B	0.46	11.0	B	0.44	10.8	B
	SB	LTR	0.65	13.7	B	0.49	11.4	B	0.73	15.6	B	0.54	12.0	B
	EB	LTR	0.15	15.0	B	0.22	15.9	B	0.15	15.0	B	0.21	15.7	B
	WB	LTR	0.21	15.6	B	0.17	15.2	B	0.19	15.3	B	0.20	15.5	B
	Overall			12.8	B		11.7	B		13.9	B		11.9	B
Lafayette & Zerega Avenues														
	NB	LTR	0.46	11.9	B	0.71	17.0	B	0.39	10.7	B	0.30	9.7	A
	SB	LTR	0.65	15.0	B	0.74	18.2	B	0.59	13.8	B	0.43	11.1	B
	EB	LTR	0.35	17.**9**	B	0.32	17.0	B	0.29	16.5	B	0.22	15.6	B
	WB	LTR	0.13	14.6	B	0.04	13.7	B	0.06	14.0	B	0.08	14.2	B
	Overall			14.3	B		17.5	B		13.1	B		11.3	B
CBE North Sr. Rd & Rosedale Avenue														
	NB	LT	0.81	26.9	C	0.64	21.4	C	0.58	20.1	C	0.63	21.1	C
	WB	LTR	1.05	55.8	E	0.56	18.5	B	0.71	21.1	C	0.73	21.8	C
	Overall			47.1	E		19.7	B		20.8	C		21.6	C
CBE North Sr. Rd & Taylor Ave														
	NB	L	0.40	32.2	C	0.30	30.5	C	0.30	30.3	C	0.34	30.9	C
		LT	0.23	28.2	C	0.28	28.9	C	0.26	28.5	C	0.28	28.8	C
	SB	LR	0.48	35.7	D	0.36	32.5	C	0.49	35.8	D	0.45	35.0	C
	WB	LTR	0.89	39.7	D	0.97	50.8	E	0.82	34.3	C	0.55	26.2	C
	Overall			37.2	D		45.1	D		33.2	C		28.3	C
CBE South Sr. Rd & Rosedale Avenue														
	NB	TR	0.55	20.4	C	0.33	17.3	B	0.33	17.2	B	0.33	17.2	B
	SB	LT	0.11	15.1	B	0.09	14.8	B	0.16	15.5	B	0.22	16.1	B
	EB	LTR	0.72	24.3	C	0.67	23.0	C	0.78	26.3	C	0.78	26.3	C
	Overall			22.1	C		20.7	C		22.7	C		22.7	C

Table 3-2 (Page 4 of 4)

LOS Analysis for Signalized Intersections

2008 Existing Conditions

Intersection	Approach	Lane Group	AM Peak Hour			Midday Peak Hour			PM Peak Hour			SAT MD Peak Hour		
			V/C	Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS
White Plains Road & Archer Street														
	NB	LTR	0.89	27.8	C	0.71	16.5	B	0.81	20.5	C	0.80	19.4	B
	SB	LTR	0.72	16.7	B	0.46	11.9	B	0.71	16.3	B	0.55	13.0	B
	WB	LTR	0.10	12.2	B	0.06	11.9	B	0.07	12.0	B	0.08	12.1	B
	Overall			21.7	C		14.6	B		18.1	B		16.5	B
White Plains Rd & East Tremont Avenue														
	NB	LTR	0.91	51.9	D	0.56	20.8	C	0.86	45.9	D	0.90	52.8	D
	SB	LTR	0.52	32.8	C	0.48	19.7	B	0.73	39.8	D	0.85	53.4	D
	EB	LTR	0.98	51.2	D	0.60	21.2	C	0.99	52.4	D	0.99	52.8	D
	WB	LTR	0.93	36.1	D	0.72	24.0	C	0.66	20.6	C	0.99	51.6	D
	Overall			42.8	D		29.6	C		39.3	D		52.4	D
White Plains Road & Wood Avenue														
	NB	TR	0.55	12.4	B	0.52	11.9	B	0.49	11.3	B	0.98	42.6	D
	SB	LT	0.56	12.4	B	0.40	10.6	B	0.56	12.5	B	0.92	32.9	C
	EB	LTR	0.41	16.8	B	0.36	16.1	B	0.49	18.2	B	0.59	23.5	C
	WB	LR	0.92	45.9	D	0.68	24.8	C	0.74	28.1	C	1.03	71.7	E
	Overall			19.7	B		14.4	B		15.4	B		44.2	D

Table 3-3

LOS Analysis for Unsignalized Intersections

2008 Existing Conditions

Intersection	Approach	Lane Group	AM Peak Hour			MD Peak Hour			PM Peak Hour			Saturday MD Peak Hour		
				Delay	LOS		Delay	LOS		Delay	LOS		Delay	LOS
Leland Ave & Archer Street														
	NB	LT		12.5	B		11.1	B		12.4	B		12.0	B
Rosedale & Bronx River Avenues														
	NB	TR		31.6	D		11.7	B		10.8	B		10.0	B
	SB	L		19.6	C		10.4	B		11.7	B		9.6	A
	EB	LT		28.3	D		9.9	A		10.0	B		9.1	A
Cross Bronx Expwy N. Service Road & Noble Ave														
	SB	R		19.7	C		19.5	C		33.0	D		19.2	C
	NB	LTR		13.9	B		13.3	B		14.8	B		12.1	B
	EB	LTR		7.2	A		7.3	A		7.2	A		7.2	A
	WB	LTR		7.5	A		7.6	A		7.5	A		7.4	A

Figure 3-7
Overall Intersection LOS (AM Peak Hour)

Figure 3-8

Overall Intersection LOS (Midday Peak Hour)

Figure 3-9
Overall Intersection LOS (PM Peak Hour)

Figure 3-10
Overall Intersection LOS (Saturday Midday Peak Hour)

3.6 Future Traffic Conditions

The 2018 future traffic conditions concentrate on capacity analysis of 21 signalized and three unsignalized intersections in the study area using HCS+ and the 2000 Highway Capacity Manual (HCM) methodologies. The existing volumes were projected using a base growth rate of 0.38% for period of ten years by year 2018. Future balanced traffic network was developed for the weekday AM, midday, PM, and Saturday midday peak hours and shown in Figures 3-11 to 3-14. Volume-to-capacity (v/c) ratios, average vehicular delay, and level-of-service (LOS) were determined for the 24 analyzed intersections in the study area. Table 3-3 shows the results of capacity analysis for the future conditions.

The projected analysis reveals that most intersections operated at an acceptable level of service (LOS) C or better during the AM, midday, PM, and Saturday midday peak hours. However, some intersections experienced LOS D, E, and F for one of approaches or all lane groups during selected peak hours. Intersections with approaches or lane groups with mid LOS D (equal or higher than 45 seconds per vehicles) are listed below and shown in Figures 3-15 to 3-18. Intersections with approaches or lane groups with mid LOS D (equal to 45 sec/veh) or worse (LOS E or F) are listed below:

- Cross Bronx Expressway North Service Road & Rosedale Avenue (AM);
- Cross Bronx Expressway South Service Road & Noble Avenue (PM);
- Cross Bronx Expressway North Service Road & Taylor Avenue (midday);
- White Plains Road & East Tremont Avenue (AM, midday, PM, and Saturday midday);
- White Plains Road & Wood Street (AM and Saturday midday);
- Zerega Avenue & Haviland Avenue (PM);
- Havemeyer Avenue & Waterbury Avenue (AM);
- Castle Hill Avenue & Cross Bronx Expressway North Service Road/Haviland Avenue (AM, PM, and Saturday midday);
- Castle Hill Avenue & Bruckner Boulevard Westbound (AM, midday, PM, and Saturday midday);
- Castle Hill Avenue & Bruckner Boulevard Eastbound (AM);
- Zerega Avenue & Bruckner Boulevard Eastbound (AM & PM); and
- Zerega Avenue & Lafayette Avenue.

Figure 3-11
2018 Future Traffic Volumes - AM Peak Hour

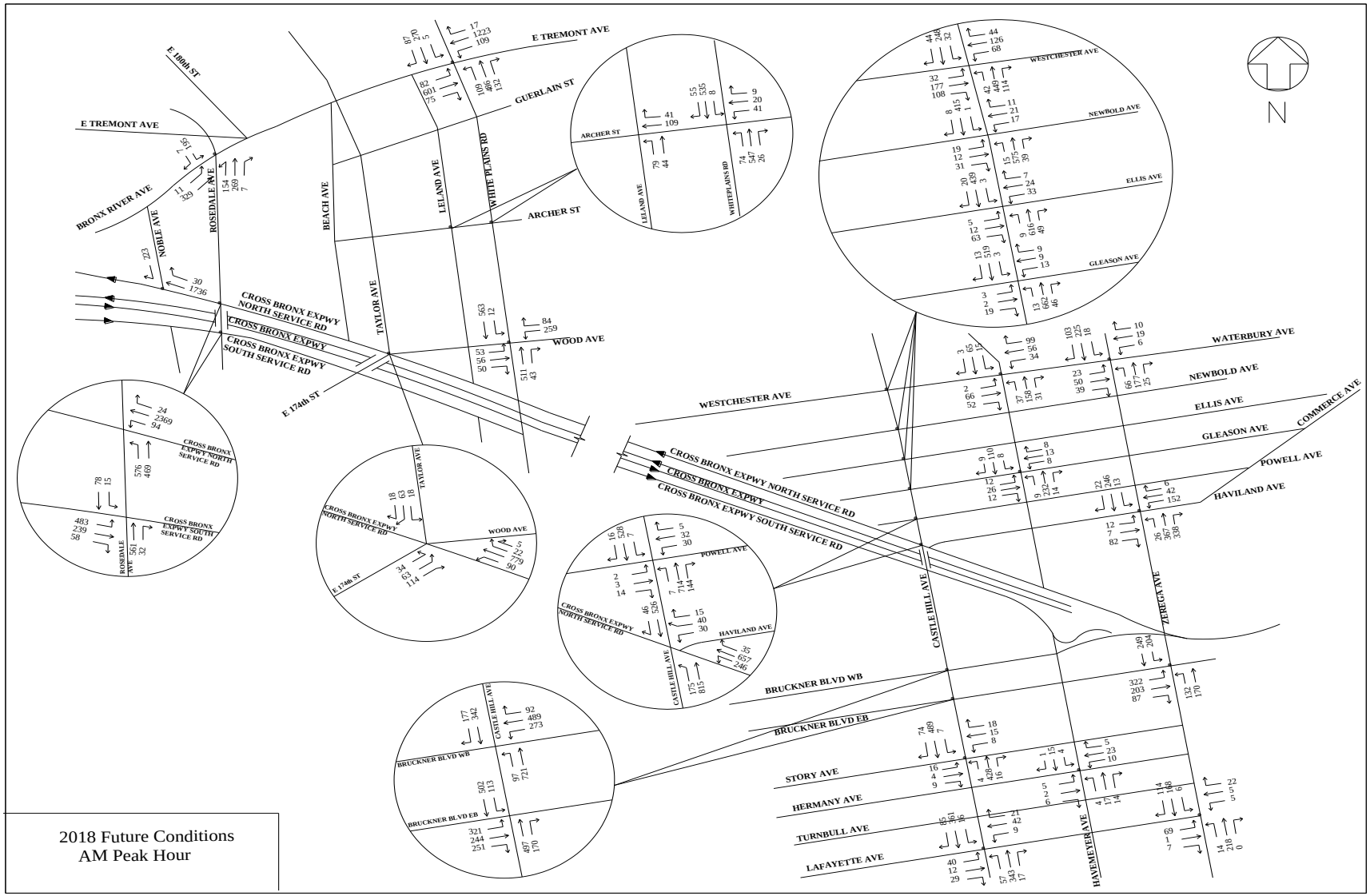


Figure 3-12
2018 Future Traffic Volumes - Midday Peak Hour

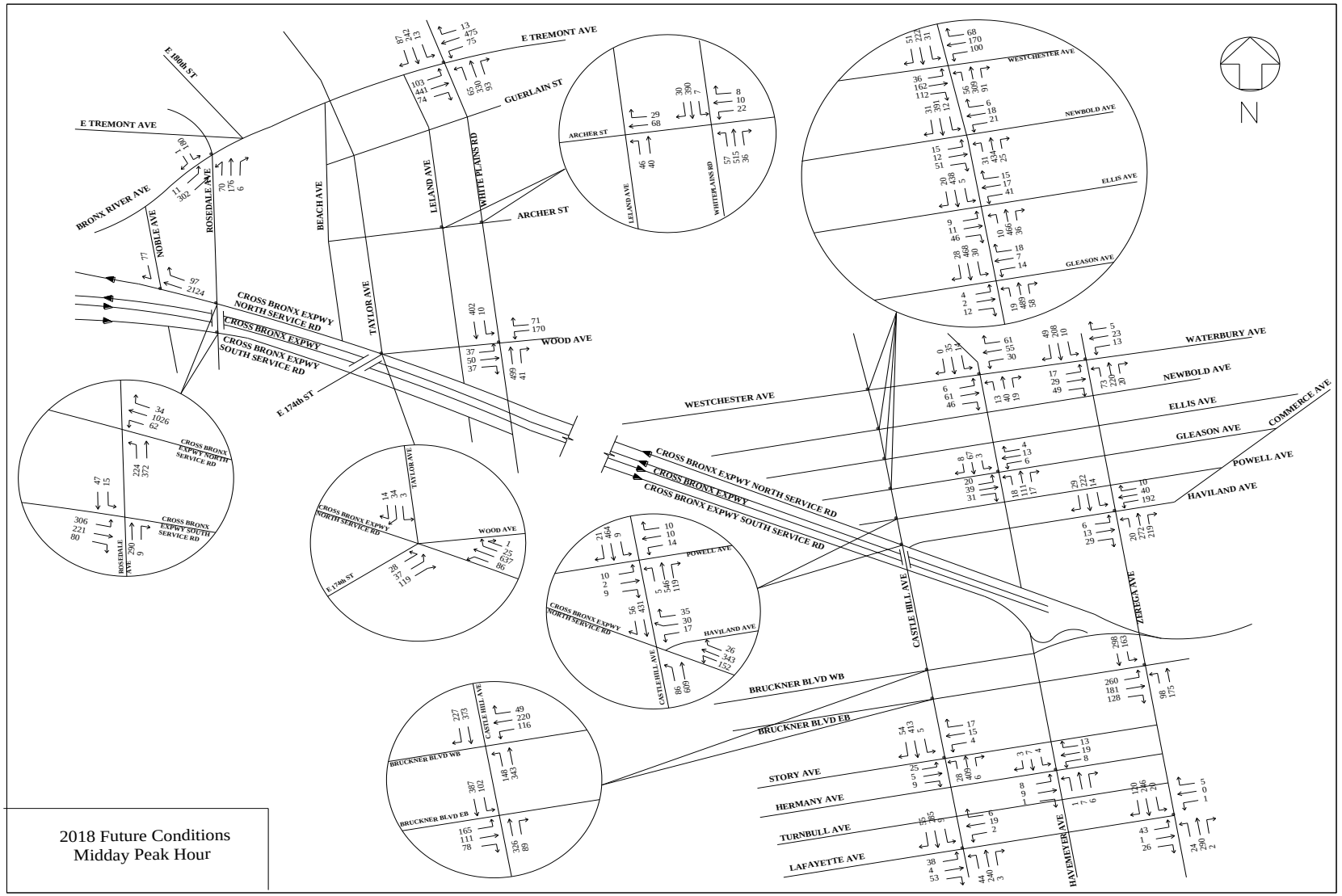


Figure 3-13
2018 Future Traffic Volumes - PM Peak Hour

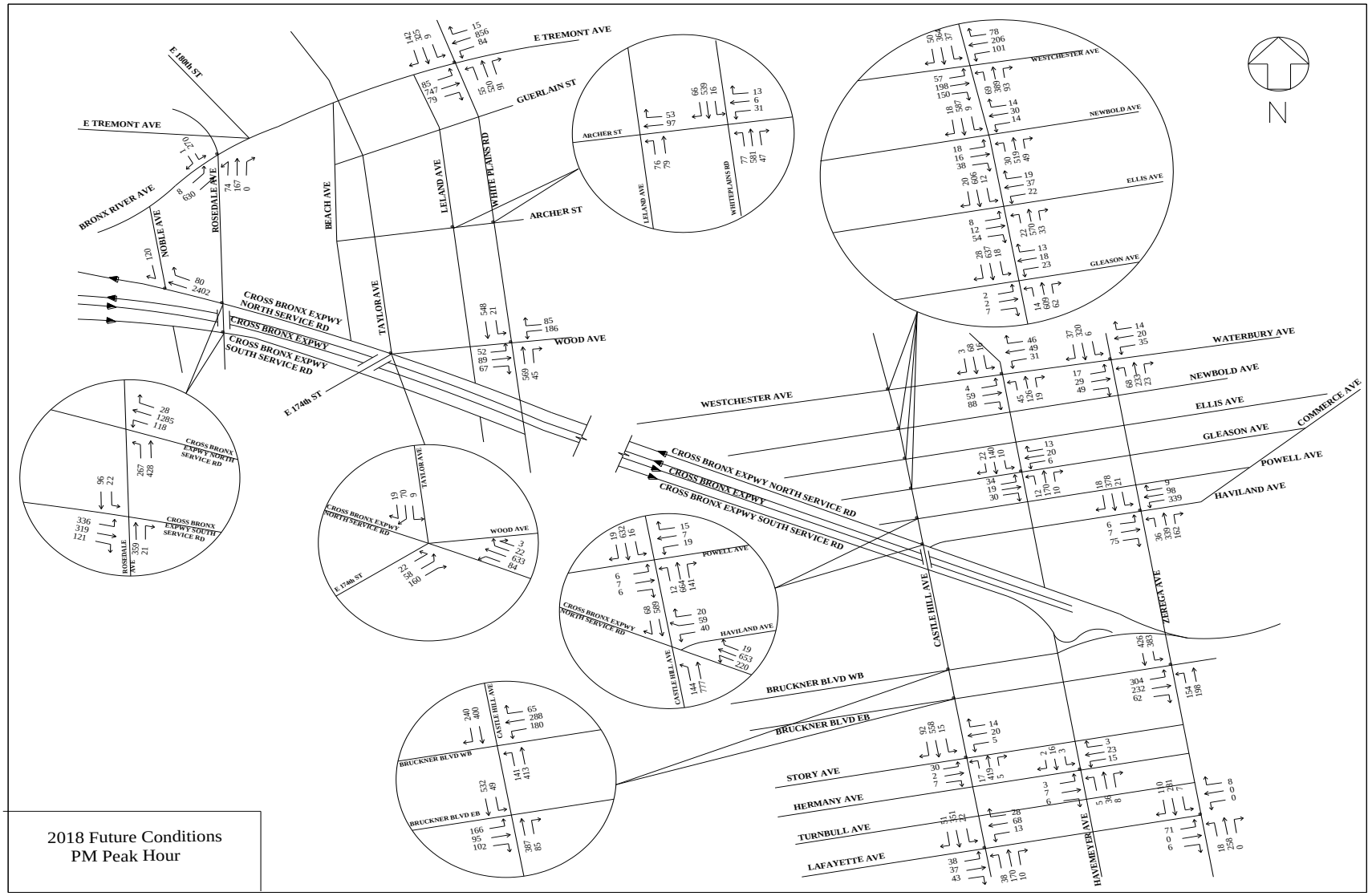


Figure 3-14
2018 Future Traffic Volumes - Saturday Midday Peak Hour

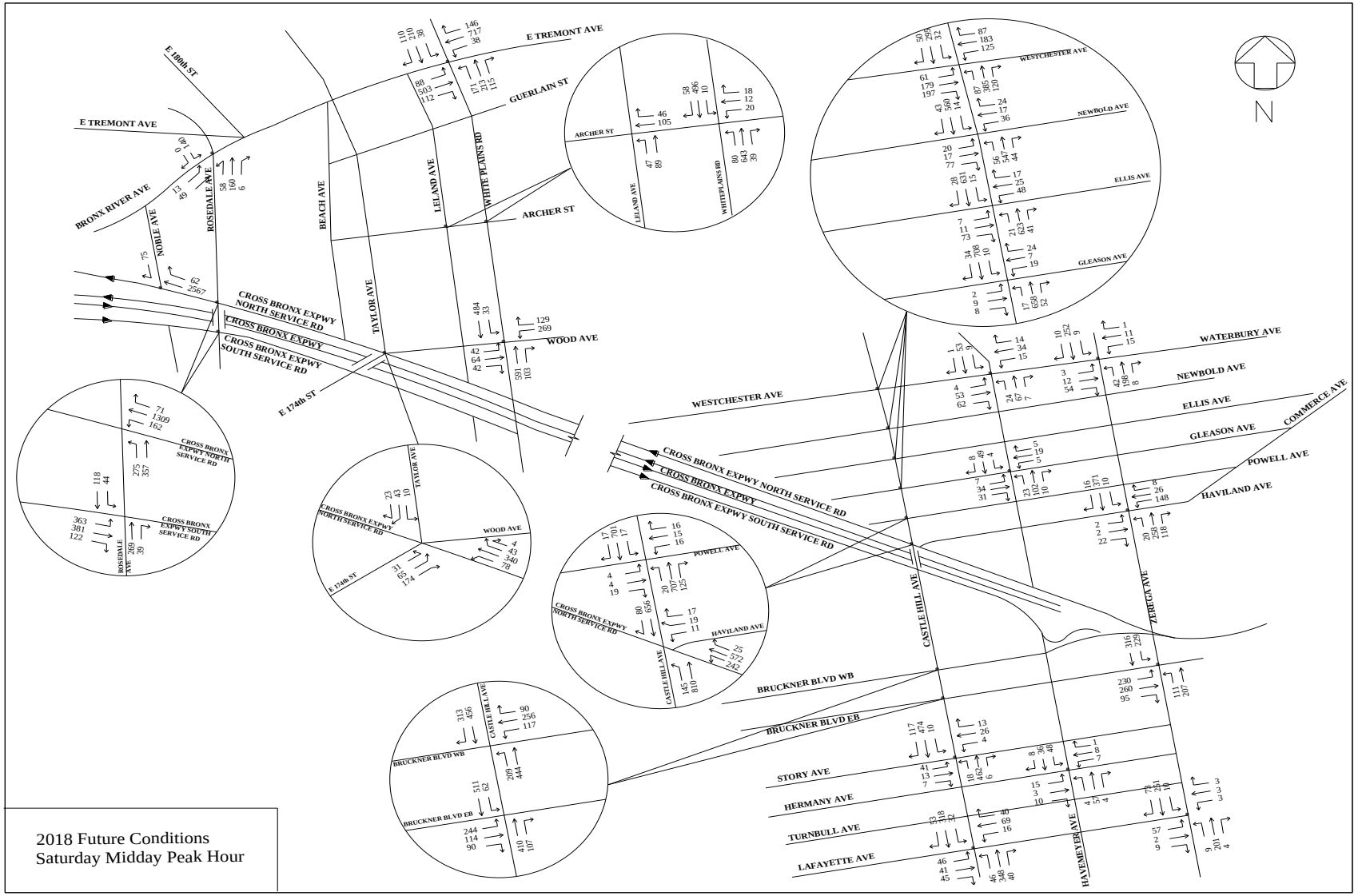


Table 3-4 (Page 1 of 4)
LOS Analysis for Signalized Intersections
2018 Future Conditions

Intersection	Approach	Lane Group	AM Peak Hour			MD Peak Hour			PM Peak Hour			SAT MD Peak Hour		
			V/C	Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS
Castle Hill & Gleason Avenues														
	NB	LTR	0.67	17.7	B	0.52	14.9	B	0.58	15.7	B	0.70	18.4	B
	SB	LTR	0.55	15.2	B	0.54	15.1	B	0.64	17.0	B	0.63	16.6	B
	EB	LTR	0.14	21.6	C	0.10	20.9	C	0.07	20.5	C	0.09	20.7	C
	WB	LTR	0.15	21.5	C	0.18	22.0	C	0.22	22.7	C	0.23	23.0	C
	Overall			16.8	B		15.4	B		16.7	B		17.8	B
Castle Hill & Haviland Avenues/CBE N. Service Rd														
	NB	L	0.82	40.5	D	0.42	16.8	B	0.61	23.6	C	0.72	31.6	C
		T	0.65	16.9	B	0.49	14.2	B	0.56	15.2	B	0.62	16.3	B
	SB	TR	0.52	14.6	B	0.47	13.9	B	0.49	14.1	B	0.55	15.0	B
	WB	LTR	1.08	79.8	E	0.86	38.6	D	1.07	77.0	E	0.99	54.8	D
	Overall			41.6	D		22.6	C		39.9	D		30.0	D
Castle Hill & Newbold Avenues														
	NB	LTR	0.60	16.2	B	0.47	14.1	B	0.55	15.3	B	0.64	17.2	B
	SB	LTR	0.38	12.8	B	0.44	13.7	B	0.52	14.6	B	0.59	16.0	B
	EB	LTR	0.34	24.8	C	0.36	25.3	C	0.34	25.0	C	0.48	28.5	C
	WB	LTR	0.21	22.5	C	0.27	23.7	C	0.28	23.6	C	0.33	24.7	C
	Overall			16.0	B		15.6	B		16.2	B		18.2	B
Castle Hill & Powell Avenues														
	NB	LTR	0.83	23.3	C	0.61	16.4	B	0.69	18.2	B	0.74	19.8	B
	SB	LTR	0.55	15.2	B	0.49	14.4	B	0.57	15.5	B	0.61	16.3	B
	EB	LTR	0.12	21.2	C	0.13	21.4	C	0.09	20.7	C	0.11	21.0	C
	WB	LTR	0.33	24.8	C	0.17	21.8	C	0.20	22.4	C	0.21	22.4	C
	Overall			20.4	C		15.9	B		17.3	B		18.4	B
Castle Hill & Westchester Avenues														
	NB	LTR	0.80	28.3	C	0.53	20.5	C	0.66	23.4	C	0.71	25.2	C
	SB	LT	0.40	18.3	B	0.26	16.5	B	0.39	18.0	B	0.35	17.5	B
		R	0.17	16.3	B	0.15	15.9	B	0.18	16.3	B	0.16	16.0	B
	EB	LTR	0.50	20.0	B	0.45	19.3	B	0.56	21.4	C	0.58	21.8	C
	WB	DefL										0.71	34.9	C
		LTR	0.43	19.3	B	0.52	20.9	C	0.63	23.5	C			
		TR										0.59	23.6	C
	Overall			22.7	C		19.4	B		21.6	C		23.3	C
Haviland & Zerega Avenues														
	NB	LTR	0.93	32.3	C	0.65	17.1	B	0.67	17.2	B	0.43	13.3	B
	SB	LTR	0.38	12.8	B	0.39	12.8	B	0.48	13.8	B	0.41	12.9	B
	EB	LTR	0.37	14.1	B	0.21	12.1	B	0.32	13.2	B	0.11	10.7	B
	WB	LTR	0.76	27.5	C	0.70	22.9	C	1.05	68.0	E	0.43	14.8	B
	Overall			25.5	C		17.0	B		32.1	C		13.3	B

Table 3-4 (Page 2 of 4)
LOS Analysis for Signalized Intersections
2018 Future Conditions

Intersection	Approach	Lane Group	AM Peak Hour			MD Peak Hour			PM Peak Hour			SAT MD Peak Hour		
			V/C	Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS
Waterbury & Havemeyer Avenues														
	NB	LTR	0.43	11.0	B	0.16	8.2	A	0.32	9.6	A	0.17	8.1	A
	SB	LTR	0.18	8.4	A	0.11	7.7	A	0.18	8.3	A	0.13	7.9	A
	EB	LTR	0.44	19.7	B	0.43	19.5	B	0.50	20.8	C	0.34	17.8	B
	WB	LTR	0.94	54.7	D	0.50	21.5	C	0.43	19.7	B	0.22	16.4	B
	Overall			27.5	C		16.3	B		14.9	B		12.8	B
Waterbury & Zerega Avenues														
	NB	LTR	0.59	13.9	B	0.65	15.5	B	0.58	13.2	B	0.40	10.0	A
	SB	LTR	0.64	14.2	B	0.47	10.9	B	0.50	11.3	B	0.38	9.7	A
	EB	LTR	0.43	18.7	B	0.31	16.8	B	0.31	16.8	B	0.19	15.3	B
	WB	LTR	0.22	15.9	B	0.21	15.6	B	0.26	16.4	B	0.10	14.6	B
	Overall			15.0	B		14.0	B		13.2	B		10.7	B
Castle Hill & Ellis Avenues														
	NB	LTR	0.71	18.7	B	0.46	13.9	B	0.55	15.2	B	0.63	16.9	B
	SB	LTR	0.44	13.6	B	0.43	13.5	B	0.63	16.6	B	0.54	14.9	B
	EB	LTR	0.31	24.2	C	0.29	23.8	C	0.26	23.2	C	0.33	24.6	C
	WB	LTR	0.29	23.9	C	0.30	24.1	C	0.28	23.6	C	0.38	25.8	C
	Overall			17.7	B		15.3	B		16.8	B		17.2	B
Bruckner Blvd EB & Zerega Avenue														
	NB	TR	0.42	23.1	C	0.32	21.5	C	0.34	21.6	C	0.32	21.4	C
	SB	DefL	0.91	65.0	E				1.07	95.9	F	0.73	38.8	D
		T				0.55	25.8	C						
		LT	0.51	25.3	C				0.61	27.8	C	0.44	23.7	C
	EB	LTR	0.76	31.8	C	0.65	28.0	C	0.63	27.1	C	0.55	25.2	C
	Overall			33.1	C		25.9	C		41.3	D		26.1	C
Castle Hill Ave & Bruckner Blvd EB														
	NB	TR	0.77	32.3	C	0.47	23.9	C	0.45	23.4	C	0.45	23.3	C
	SB	LT	0.95	54.0	D	0.74	32.6	C	0.65	28.5	C	0.67	29.3	C
	EB	LTR	1.01	63.6	E	0.42	23.0	C	0.46	23.8	C	0.40	22.5	C
	Overall			50.8	D		26.8	C		25.5	C		25.3	C
Castle Hill Ave & Bruckner Blvd WB														
	NB	L	0.49	53.5	D	0.54	43.6	D	0.51	44.5	D	0.63	44.1	D
		T	0.87	40.3	D	0.65	30.1	C	0.92	53.2	D	0.77	36.1	D
	SB	TR	0.93	60.1	E	0.89	54.4	D	0.97	66.8	E	0.90	54.0	D
	WB	LTR	0.82	34.3	C	0.40	22.5	C	0.52	24.7	C	0.48	24.0	C
	Overall			43.5	D		38.8	D		48.6	D		40.7	D

Table 3-4 (Page 3 of 4)
LOS Analysis for Signalized Intersections
2018 Future Conditions

Intersection	Approach	Lane Group	AM Peak Hour			MD Peak Hour			PM Peak Hour			SAT MD Peak Hour		
			V/C	Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS
Castle Hill & Lafayette Avenues														
	NB	LTR	0.48	10.8	B	0.34	9.3	A	0.28	8.8	A	0.44	10.3	B
	SB	LTR	0.52	11.1	B	0.33	9.1	A	0.44	10.2	B	0.39	9.7	A
	EB	DefL	0.31	17.9	B									
		LTR				0.22	15.8	B	0.26	16.2	B	0.29	16.5	B
		TR	0.21	16.3	B									
	WB	LTR	0.21	15.8	B	0.08	14.6	B	0.19	15.5	B	0.22	15.8	B
	Overall			12.2	B		10.4	B		11.3	B		11.6	B
Castle Hill & Story Avenues														
	NB	LTR	0.45	10.9	B	0.47	11.1	B	0.47	11.1	B	0.45	10.9	B
	SB	LTR	0.66	13.9	B	0.50	11.5	B	0.74	16.0	B	0.55	12.1	B
	EB	LTR	0.15	15.0	B	0.22	15.9	B	0.16	15.0	B	0.21	15.7	B
	WB	LTR	0.21	15.6	B	0.17	15.2	B	0.19	15.3	B	0.20	15.5	B
	Overall			12.9	B		11.8	B		14.2	B		12.0	B
Lafayette & Zerega Avenues														
	NB	LTR	0.46	12.0	B	0.72	17.4	B	0.40	10.8	B	0.30	9.8	A
	SB	LTR	0.66	15.3	B	0.76	18.8	B	0.60	14.0	B	0.44	11.2	B
	EB	LTR	0.35	18.1	B	0.32	17.0	B	0.29	16.5	B	0.22	15.6	B
	WB	LTR	0.13	14.6	B	0.04	13.7	B	0.06	14.0	B	0.08	14.2	B
	Overall			14.5	B		17.9	B		13.2	B		11.4	B
CBE North Sr. Rd & Rosedale Avenue														
	NB	LT	0.83	27.7	C	0.65	21.7	C	0.59	20.3	C	0.64	21.3	C
	WB	LTR	1.07	62.9	E	0.57	18.7	B	0.72	21.4	C	0.75	22.1	C
	Overall			52.4	D		19.9	B		21.1	C		21.9	C
CBE North Sr. Rd & Taylor Ave														
	NB	L	0.41	32.3	C	0.31	30.7	C	0.31	30.4	C	0.35	31.1	C
		LT	0.23	28.3	C	0.28	28.9	C	0.26	28.6	C	0.29	28.9	C
	SB	LR	0.49	35.8	D	0.36	32.5	C	0.49	36.0	D	0.46	35.2	D
	WB	LTR	0.91	41.3	D	0.99	54.8	D	0.83	35.2	D	0.56	26.4	C
	Overall			38.3	D		48..1	E		33.8	C		28.4	C
CBE South Sr. Rd & Rosedale Avenue														
	NB	TR	0.56	20.6	C	0.34	17.3	B	0.34	17.3	B	0.33	17.2	B
	SB	LT	0.12	15.1	B	0.09	14.8	B	0.16	15.5	B	0.23	16.2	B
	EB	LTR	0.73	24.7	C	0.68	23.3	C	0.79	27.0	C	0.80	26.9	C
	Overall			22.4	C		20.9	C		23.1	C		23.1	C

Table 3-4 (Page 4 of 4)
LOS Analysis for Signalized Intersections
2018 Future Conditions

Intersection	Approach	Lane Group	AM Peak Hour			Midday Peak Hour			PM Peak Hour			SAT MD Peak Hour		
			V/C	Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS
White Plains Road & Archer Street														
	NB	LTR	0.91	30.4	C	0.72	17.0	B	0.83	21.7	C	0.81	20.2	C
	SB	LTR	0.73	17.0	B	0.46	12.0	B	0.73	16.6	B	0.56	13.2	B
	WB	LTR	0.10	12.2	B	0.06	11.9	B	0.07	12.0	B	0.08	12.1	B
	Overall			23.1	C		14.9	B		18.9	B		17.0	B
White Plains Rd & East Tremont Avenue														
	NB	LTR	0.93	54.2	E	0.57	21.1	C	0.88	48.1	D	0.91	54.8	D
	SB	LTR	0.53	33.0	C	0.49	19.9	B	0.75	40.8	D	0.86	54.6	D
	EB	LTR	0.99	54.6	E	0.98	54.9	D	1.00	54.4	D	1.00	54.4	D
	WB	LTR	0.95	39.2	D	0.62	21.6	C	0.67	21.0	C	1.00	54.6	D
	Overall			45.5	D		30.4	C		40.6	D		54.6	D
White Plains Road & Wood Avenue														
	NB	TR	0.56	12.5	B	0.53	12.0	B	0.50	11.4	B	1.00	47.5	D
	SB	LT	0.57	12.6	B	0.41	10.7	B	0.57	12.6	B	0.93	35.5	D
	EB	LTR	0.42	17.0	B	0.37	16.3	B	0.50	18.4	B	0.60	23.9	C
	WB	LR	0.94	50.7	D	0.69	25.6	C	0.76	29.4	C	1.05	77.2	E
	Overall			20.9	C		14.6	B		15.7	B		48.1	D

Table 3-5
LOS Analysis for Unsignalized Intersections
2018 Future Conditions

Intersection	Approach	Lane Group	AM Peak Hour			MD Peak Hour			PM Peak Hour			Saturday MD Peak Hour		
				Delay	LOS		Delay	LOS		Delay	LOS		Delay	LOS
Leland Ave & Archer Street														
	NB	LT		12.6	B		11.2	B		12.5	B		12.1	B
Rosedale & Bronx River Avenues														
	NB	TR		34.4	D		11.9	B		10.9	B		10.1	B
	SB	L		20.5	C		10.5	B		11.9	B		9.6	A
	EB	LT		30.5	D		10.0	A		10.1	B		9.2	A
Cross Bronx Expwy North Service Road & Noble Ave														
	SB	R		20.0	C		20.3	C		34.7	D		20.4	C
	NB	LTR		14.1	B		13.3	B		14.8	B		12.1	B
	EB	LTR		7.4	A		7.4	A		7.5	A		7.3	A
	WB	LTR		7.6	A		7.8	A		7.6	A		7.6	A

Figure 3-15
2018 Overall Intersection LOS - AM Peak Hour

Figure 3-16

2018 Overall Intersection LOS - Midday Peak Hour

Figure 3-17
2018 Overall Intersection LOS - PM Peak Hour

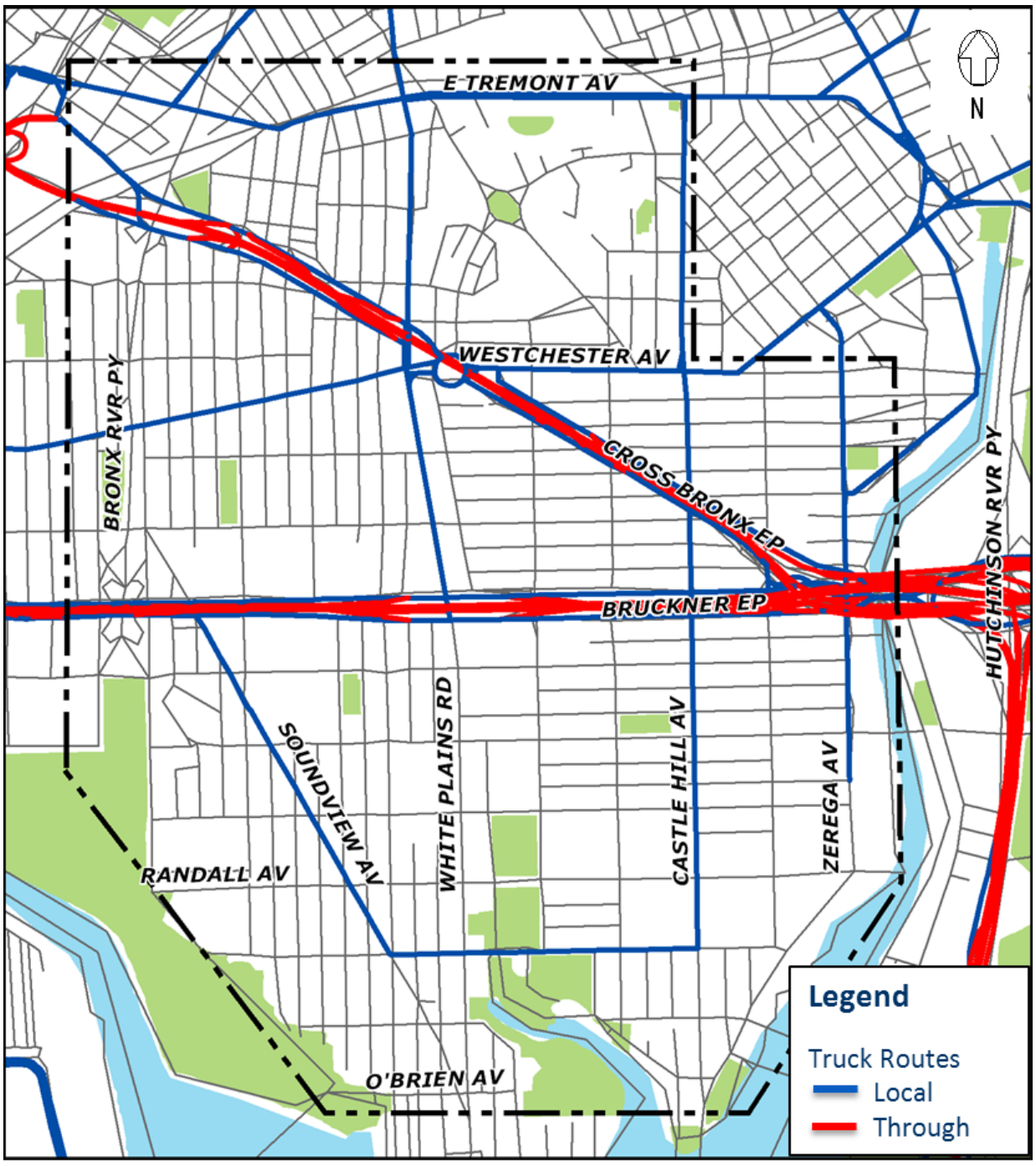
Figure 3-18
2018 Overall Intersection LOS - Saturday Midday Peak Hour

3.7 Goods Movement

Truck Routes in the Study Area

There are two designated through and nine local truck routes in the study area. The Cross Bronx Expressway (I-95) and Bruckner Expressway (I-278) are two of the most congested through truck routes in the city, and provide east-west access in the study area. Designated local truck routes are White Plains Road, Castle Hill Avenue, Soundview Avenue, and Zerega Avenue running north-south in the study area, while East Tremont Avenue, Westchester Avenue, Lacombe Avenue, Bronx Expressway Service Roads, and Bruckner Expressway Service Roads are running east-west. Local truck routes are serving predominantly commercial strips and establishments and also various industrial complexes located along Zerega Avenue. Figure 3-19 shows the local and through truck routes in the study area.

Figure 3-19
Truck Routes in the Study Area



4. PEDESTRIAN ANALYSIS

4.1 Introduction

Pedestrian traffic plays a significant role in the study area due to the presence of the commercial retails, recreational facilities, schools, and churches. Heavy pedestrian volumes in the area generally can be also associated with bus transfer points, bus/subway stops and generally in high density residential areas. The existing conditions pedestrian analysis focused on crosswalks and corners, and general pedestrian flow patterns in the area.

4.2 Data Collection and Pedestrian Network

To assess pedestrian activity in the study area, pedestrian counts were conducted for the AM, midday, PM and Saturday peak hours for 13 locations in the study area. Pedestrian counts were conducted (in 15-minutes intervals) including corner and crosswalk volumes for the same peak periods as for vehicle class and turning movements counts for the following locations:

1. White Plains Road & E. Tremont Road
2. White Plains Road & Archer Street
3. Archer Street & Leland Avenue
4. Zerega Avenue & Haviland Avenue
5. Zerega Avenue & Waterbury Avenue
6. Havemayer Avenue & Waterbury Avenue
7. Castle Hill Avenue & Powell Avenue
8. Castle Hill Avenue & Gleason Avenue
9. Castle Hill Avenue & Ellis Avenue
10. Castle Hill Avenue & Newbold Avenue
11. Castle Hill Avenue & Westchester Avenue
12. Castle Hill Avenue & Story Avenue
13. Castle Hill Avenue & Lafayette Avenue

The corridors with the heaviest pedestrian traffic were Castle Hill Avenue, White Plains Road, Story Avenue, Zerega Avenue and East Tremont Avenue. The crosswalk and corner pedestrian volumes are shown in Table 4-1 and Figures 4-1 and 4-2 show the crosswalk volumes.

Table 4-1
2008 Pedestrian (Crosswalk and Corner) Volumes
Weekday and Saturday Peak Hours

No.	Intersection	AM Peak Hour		Midday Peak Hour		PM Peak Hour		SAT MD Peak Hour	
		XWalk (Ped/Hr)	Corner (Ped/Hr)	XWalk (Ped/Hr)	Corner (Ped/Hr)	XWalk (Ped/Hr)	Corner (Ped/Hr)	XWalk (Ped/Hr)	Corner (Ped/Hr)
1	White Plains Road & E. Tremont Avenue	135	80	123	75	158	82	227	163
2	White Plains Road & Archer Street	538	414	313	269	440	381	671	725
3	Archer Street & Leland Avenue	556	117	292	67	438	125	351	317
4	Zerega Avenue & Haviland Avenue	62	85	102	75	47	61	32	40
5	Zerega Avenue & Waterbury Avenue	157	689	124	812	188	889	34	117
6	Havemayer Avenue & Waterbury Avenue	316	489	211	349	210	284	68	114
7	Castle Hill Avenue & Powell Avenue	722	1007	446	538	776	892	466	968
8	Castle Hill Avenue & Gleason Avenue	709	271	442	150	768	198	564	233
9	Castle Hill Avenue & Ellis Avenue	650	97	572	58	725	94	667	126
10	Castle Hill Avenue & Newbold Avenue	792	857	770	648	1050	869	771	277
11	Castle Hill Avenue & Westchester Avenue	1519	1692	1147	1235	2028	2130	1067	1089
12	Castle Hill Avenue & Story Avenue	185	149	122	232	140	303	103	143
13	Castle Hill Avenue & Lafayette Avenue	163	262	168	172	135	200	128	54

Figure 4-1
Existing Pedestrian Volumes
AM and Midday Peak Hours

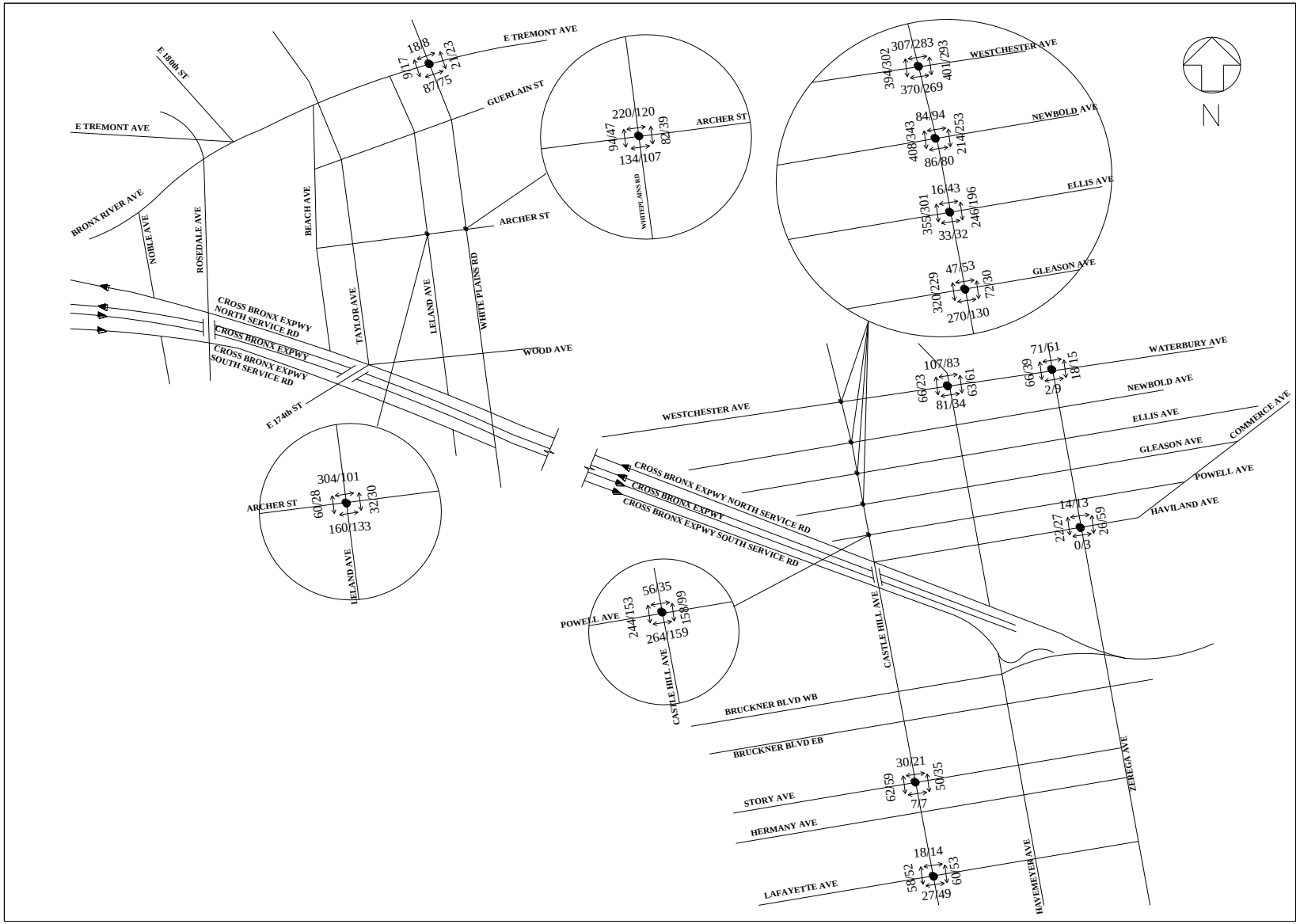
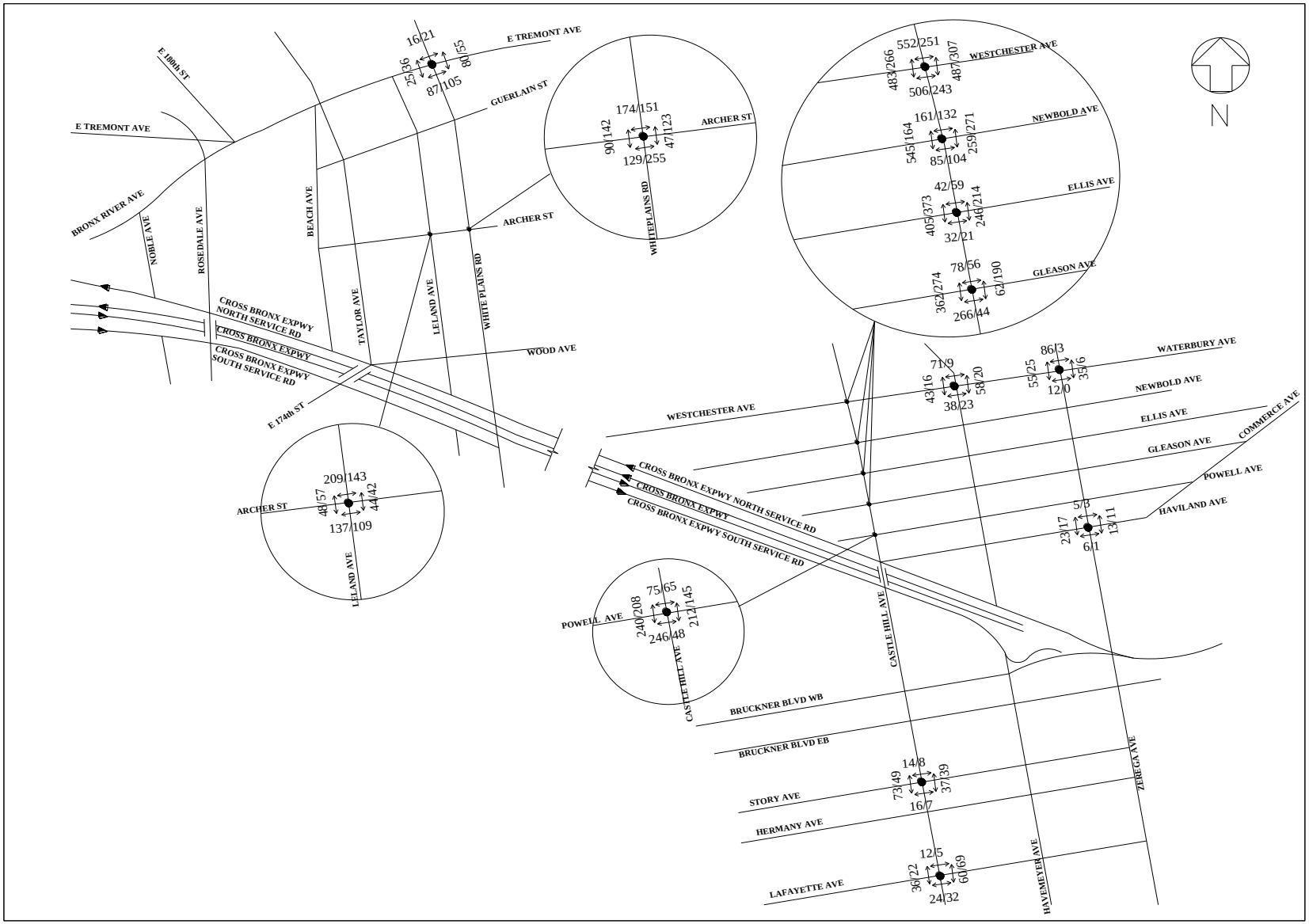


Figure 4-2
Existing Pedestrian Volumes
PM and Saturday Midday Peak Hours



4.3 Level of Service (LOS) Analysis

The pedestrian analyses were performed for corners and crosswalks at the 13 selected locations. Since the PM peak hour was significantly higher than the other weekdays and weekends peaks, only the PM peak hour was selected for detailed analysis. In addition, the Saturday peak hour was analyzed only for those locations with higher volumes.

The pedestrian level of service (LOS) was analyzed using the methodologies of the Highway Capacity Manual Software "HiCAP 2000 – US Customary Unit Version". Pedestrian level of service measures the space that pedestrians have to maneuver in corners, crosswalks, stairwells, and walkways. Table 4.2 shows the level of service criteria for crosswalks and street corners which is measured in terms of square feet of space per pedestrian.

Table 4-2
Pedestrian Level of Service (LOS) Criteria for Crosswalks and Corners

LOS	Space (ft^2/p)	Flow Rate (p/min/ft)	Speed (ft/s)	v/c Ratio
A	>60	< or = 5	>4.25	< or = 0.21
B	>40 - 60	>5 – 7	>4.17 – 4.25	>0.21 – 0.31
C	>24 - 40	>7 – 10	>4.00 – 4.17	>0.31 – 0.44
D	>15 – 24	>10 – 15	>3.75 – 4.00	>0.44 – 0.65
E	>8 - 15	>15 – 23	>2.50 – 3.75	>0.65 – 1.0
F	< or = 8	Variable	< or = 2.50	variable

Crosswalk and Corner Analysis

The analysis of existing conditions for crosswalks and corners showed that all crosswalks and corners in the study area (Focus Areas) operated at acceptable levels of services (LOS A or B). The results of the crosswalk and corner analyses for the selected peak periods (weekday PM and Saturday midday peak hours) are shown in Table 4-3.

Table 4-3 (Page 1 of 2)
2008 Crosswalk and Corner Level of Service (LOS) Analyses
Weekday PM and Saturday Midday Peak Hours

Intersection	PM Peak Hour					
		Crosswalk Space			Corner Space	
	Crosswalk	SF/P	LOS	Corner	SF/P	LOS
White Plains Road & East Tremont Avenue	North	3274.9	A	Northeast	2676.9	A
	East	999.9	A	Southeast	782.6	A
	South	787.8	A	Southwest	821.5	A
	West	906.6	A	Northwest	1296.6	A
White Plains Road & Archer Street	North	209.8	A	Northeast	165.8	A
	East	1144.2	A	Southeast	144.7	A
	South	308.3	A	Southwest	142.7	A
	West	682.8	A	Northwest	149.6	A
Archer Street & Leland Avenue	North	170.8	A	Northeast	369.6	A
	East	832.3	A	Southeast	203.7	A
	South	264.7	A	Southwest	252.7	A
	West	974.6	A	Northwest	425.4	A
Zerega Avenue & Haviland Avenue	North	5102.4	A	Northeast	1269.7	A
	East	1968.4	A	Southeast	1085.3	A
	South	3406.7	A	Southwest	1109.7	A
	West	1392.5	A	Northwest	1153.0	A
Zerega Avenue & Waterbury Avenue	North	302.1	A	Northeast	402.0	A
	East	1719.3	A	Southeast	776.9	A
	South	1429.4	A	Southwest	924.8	A
	West	1028.3	A	Northwest	123.0	A
Havemayer Avenue & Waterbury Avenue	North	231.5	A	Northeast	149.9	A
	East	650.5	A	Southeast	104.1	A
	South	501.0	A	Southwest	187.9	A
	West	785.7	A	Northwest	515.5	A
Castle Hill Avenue & Powell Avenue	North	482.8	A	Northeast	304.5	A
	East	241.6	A	Southeast	247.8	A
	South	170.3	A	Southwest	54.5	B
	West	238.1	A	Northwest	53.4	B
Castle Hill Avenue & Gleason Avenue	North	466.3	A	Northeast	363.3	A
	East	263.6	A	Southeast	332.5	A
	South	486.6	A	Southwest	303.3	A
	West	145.6	A	Northwest	344.7	A
Castle Hill Avenue & Ellis Avenue	North	912.1	A	Northeast	439.4	A
	East	269.9	A	Southeast	332.5	A
	South	1339.7	A	Southwest	366.2	A
	West	172.0	A	Northwest	324.9	A
Castle Hill Avenue & Newbold Avenue	North	225.8	A	Northeast	240.1	A
	East	217.8	A	Southeast	329.4	A
	South	580.6	A	Southwest	149.0	A
	West	135.3	A	Northwest	171.6	A

Table 4-3 (Page 2 of 2)

2008 Crosswalk and Corner Level of Service (LOS) Analyses
Weekday PM and Saturday Midday Peak Hours

Intersection	PM Peak Hour					
		Crosswalk Space			Corner Space	
	Crosswalk	SF/P	LOS	Corner	SF/P	LOS
Castle Hill Avenue & Westchester Avenue	North	123.6	A	Northeast	65.6	A
	East	160.3	A	Southeast	56.0	B
	South	138.3	A	Southwest	110.6	A
	West	165.6	A	Northwest	95.2	A
Castle Hill Avenue & Story Avenue	North	1755.5	A	Northeast	319.2	A
	East	1214.8	A	Southeast	254.8	A
	South	1660.7	A	Southwest	286.3	A
	West	733.2	A	Northwest	522.9	A
Castle Hill Avenue & Lafayette Avenue	North	2481.2	A	Northeast	1295.8	A
	East	907.7	A	Southeast	443.2	A
	South	1092.9	A	Southwest	430.4	A
	West	2393.0	A	Northwest	567.2	A
Intersection	Saturday Midday Peak Hour					
		Crosswalk Space			Corner Space	
	Crosswalk	SF/P	LOS	Corner	SF/P	LOS
White Plains Rd & East Tremont Avenue	North	2737.3	A	Northeast	1911.4	A
	East	712.3	A	Southeast	648.8	A
	South	708.3	A	Southwest	740.6	A
	West	1260.8	A	Northwest	1569.4	A
White Plains Road & Archer Street	North	190.6	A	Northeast	107.8	A
	East	456.3	A	Southeast	63.0	A
	South	154.9	A	Southwest	74.7	A
	West	449.5	A	Northwest	132.1	A

Future Conditions

The analysis of the future conditions added a population growth of 0.38 percent per year for ten years (2018). The analyses of future conditions for the crosswalks and corners revealed that all crosswalks and corners in the three focus areas will operate at acceptable levels of services (LOS A or B) similarly to the existing conditions. The results of the crosswalk and corner analyses for the selected peak periods (weekday PM and Saturday midday peak hours) are shown in Table 4-4.

Table 4-4 (Page 1 of 2)
2018 Crosswalk and Corner Level of Service (LOS) Analyses
Weekday PM and Saturday Midday Peak Hours

Intersection	PM Peak Hour					
		Crosswalk Space			Corner Space	
	Crosswalk	SF/P	LOS	Corner	SF/P	LOS
White Plains Road & East Tremont Avenue	North	3154.2	A	Northeast	2612.2	A
	East	932.6	A	Southeast	776.4	A
	South	765.8	A	Southwest	803.6	A
	West	896.6	A	Northwest	1276.1	A
White Plains Road & Archer Street	North	202.4	A	Northeast	158.2	A
	East	1124.4	A	Southeast	140.1	A
	South	301.5	A	Southwest	138.2	A
	West	662.7	A	Northwest	143.5	A
Archer Street & Leland Avenue	North	160.8	A	Northeast	355.4	A
	East	822.6	A	Southeast	198.6	A
	South	244.5	A	Southwest	244.9	A
	West	964.6	A	Northwest	402.7	A
Zerega Avenue & Haviland Avenue	North	5012.8	A	Northeast	1211.5	A
	East	1948.1	A	Southeast	1032.4	A
	South	3346.4	A	Southwest	1098.8	A
	West	1372.5	A	Northwest	1124.0	A
Zerega Avenue & Waterbury Avenue	North	292.1	A	Northeast	398.2	A
	East	1679.2	A	Southeast	743.4	A
	South	1399.6	A	Southwest	912.5	A
	West	1008.4	A	Northwest	119.2	A
Havemayer Avenue & Waterbury Avenue	North	222.5	A	Northeast	146.3	A
	East	640.6	A	Southeast	101.2	A
	South	489.1	A	Southwest	169.5	A
	West	765.4	A	Northwest	487.8	A
Castle Hill Avenue & Powell Avenue	North	462.9	A	Northeast	277.5	A
	East	231.3	A	Southeast	232.6	A
	South	166.7	A	Southwest	50.3	B
	West	230.1	A	Northwest	51.2	B
Castle Hill Avenue & Gleason Avenue	North	456.2	A	Northeast	332.5	A
	East	254.7	A	Southeast	311.6	A
	South	472.6	A	Southwest	297.4	A
	West	132.8	A	Northwest	333.5	A
Castle Hill Avenue & Ellis Avenue	North	903.4	A	Northeast	422.7	A
	East	260.3	A	Southeast	321.7	A
	South	1321.4	A	Southwest	343.2	A
	West	167.2	A	Northwest	320.6	A
Castle Hill Avenue & Newbold Avenue	North	213.4	A	Northeast	228.3	A
	East	207.6	A	Southeast	311.2	A
	South	555.2	A	Southwest	142.3	A
	West	131.2	A	Northwest	160.6	A

Table 4-4 (Page 2 of 2)

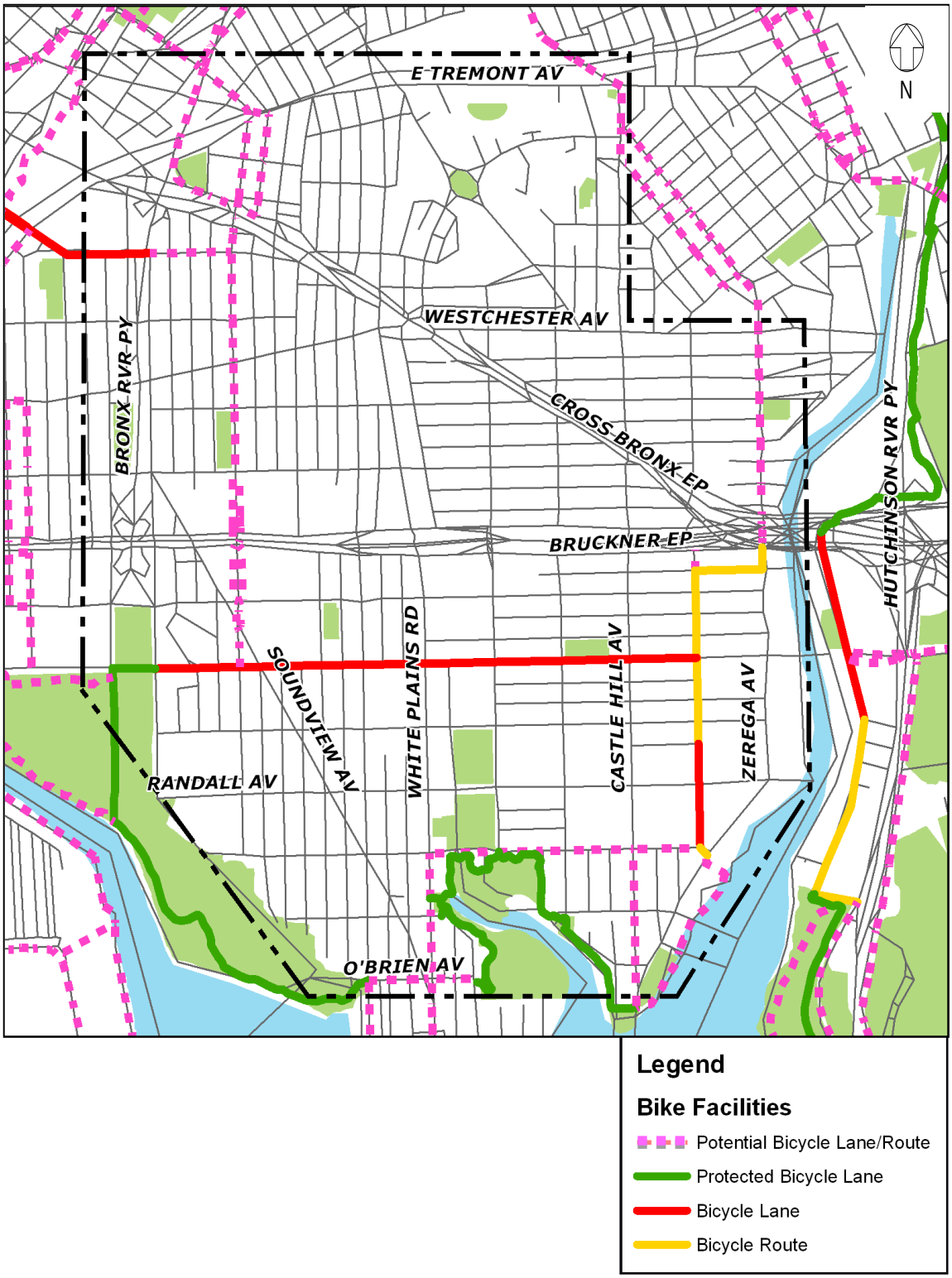
2018 Crosswalk and Corner Level of Service (LOS) Analyses
Weekday PM and Saturday Midday Peak Hours

Intersection	PM Peak Hour					
		Crosswalk Space			Corner Space	
	Crosswalk	SF/P	LOS	Corner	SF/P	LOS
Castle Hill Avenue & Westchester Avenue	North	119.2	A	Northeast	59.8	B
	East	155.4	A	Southeast	54.2	B
	South	132.7	A	Southwest	102.4	A
	West	160.1	A	Northwest	90.9	A
Castle Hill Avenue & Story Avenue	North	1711.3	A	Northeast	312.3	A
	East	1197.2	A	Southeast	246.3	A
	South	1623.5	A	Southwest	281.5	A
	West	714.8	A	Northwest	507.8	A
Castle Hill Avenue & Lafayette Avenue	North	2422.9	A	Northeast	1225.3	A
	East	899.1	A	Southeast	435.2	A
	South	1053.3	A	Southwest	424.9	A
	West	2334.2	A	Northwest	556.5	A
Intersection	Saturday Midday Peak Hour					
		Crosswalk Space			Corner Space	
	Crosswalk	SF/P	LOS	Corner	SF/P	LOS
White Plains Rd & East Tremont Avenue	North	2711.9	A	Northeast	1897.6	A
	East	701.2	A	Southeast	642.4	A
	South	698.8	A	Southwest	728.1	A
	West	1210.1	A	Northwest	1523.6	A
White Plains Road & Archer Street	North	184.2	A	Northeast	102.2	A
	East	444.6	A	Southeast	61.5	A
	South	148.3	A	Southwest	70.5	A
	West	441.5	A	Northwest	125.5	A

4.4 Bicycle Network

There is only one on-street striped bike lane (Class 2, two-way) in the study area. It is located on Lafayette Avenue between Metcalf Street and Havemeyer Avenue. An on-street bike is proposed for Rosedale Avenue between East Tremont Avenue and Lafayette Avenue and another starting at the southern most tip of peninsula on Soundview Avenue then north to Lacombe Street, then along Havemeyer Avenue to Zerega Avenue past East Tremont Avenue. The existing and proposed bicycle routes in the study area are shown in Figure 4-3.

Figure 4-3
Existing and Proposed Bicycle Routes



5. ACCIDENT ANALYSIS

5.1 Introduction

The analysis of accidents and safety is an important component in traffic and transportation planning studies, as transportation related accidents often lead to property damage, bodily injury, and sometimes even death. Providing the safe and efficient movement of people and goods, by all modes, is the New York City Department of Transportation's (NYCDOT) primary goal. The main purpose of this analysis is to identify locations in the study area with a history of vehicular, bicycle, or pedestrian accidents to implement safety improvement measures as appropriate.

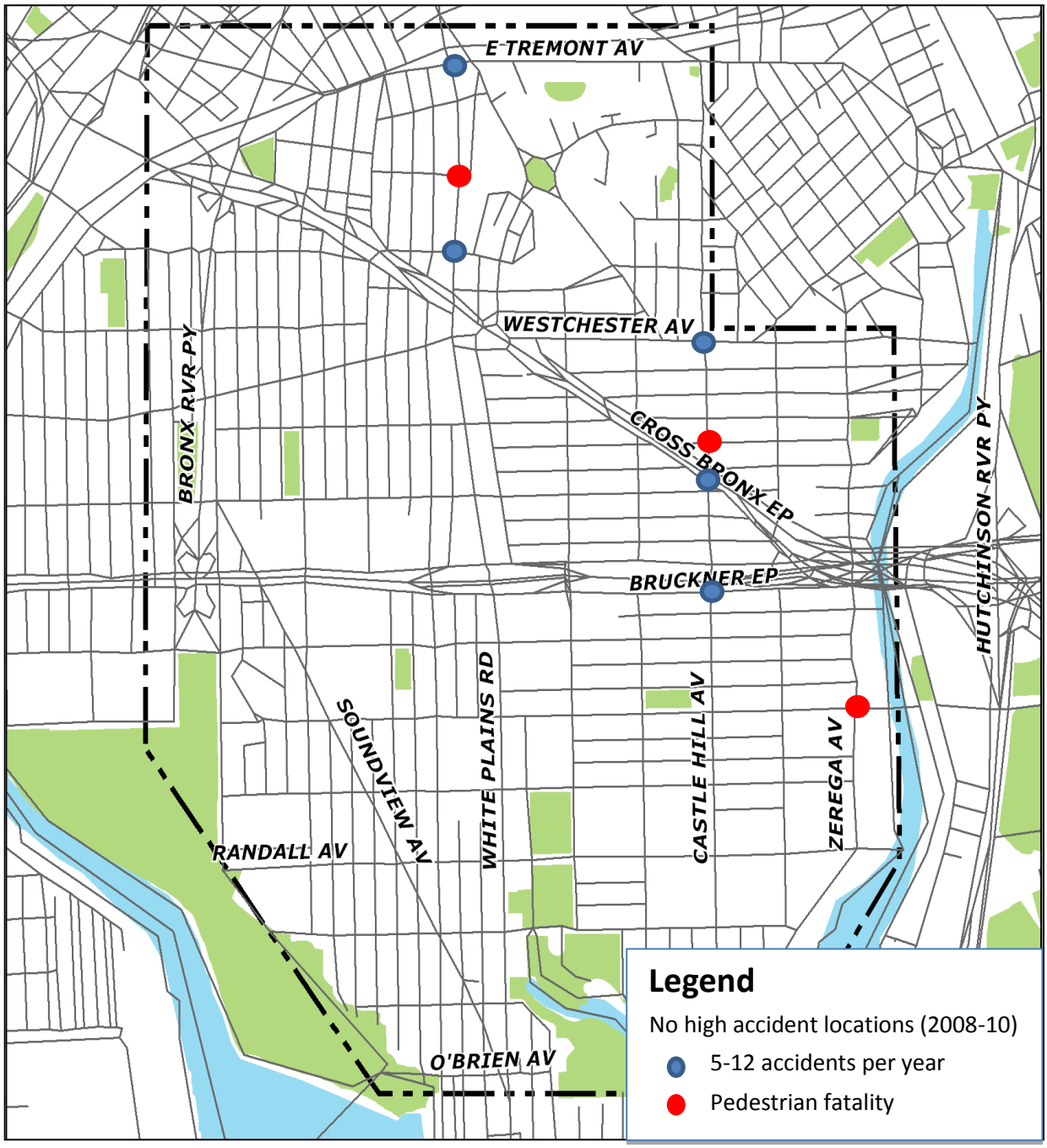
5.2 Accident Analysis

After reviewing all the intersections in the three focus areas for the most recent three years (2008-2010) of accident statistics, only one intersection White Plains Road/Archer Street was identified as a "High Accident Location" for recording five pedestrian accidents in 2009. In addition, five other intersections averaging at least five accidents between 2008 and 2010 are also selected for detailed analysis. Table 1 lists these six locations, and figure 1 shows them on a map.

Table 5-1
Three-Year Accident History in Study Area (2008 – 2010)

	Reportable Accidents					Pedestrian Accidents				
Intersection	**2008**	**2009**	**2010**	**Total**	**Avg.**	**2008**	**2009**	**2010**	**Total**	**Avg.**
Castle Hill Ave/Bruckner Blvd	10	10	8	28	9	2	0	3	5	1
Castle Hill Ave/CBE-IN95SR	2	21	13	36	12	0	2	1	3	1
Castle Hill Ave/Westchester Ave	11	8	5	24	8	3	3	1	7	2
White Plains Rd/Archer St	11	6	7	23	7	3	5	3	11	3
White Plains Rd/E. Tremont Ave	11	14	10	35	11	0	3	2	5	1
White Plains Rd/Wood Ave	4	7	6	17	5	2	3	3	8	2
Total	**49**	**66**	**49**	**163**		**10**	**16**	**13**	**39**	

Figure 5-1
Accident Locations in the Study Area (Focus Areas)



As part of a detailed analysis, number of injuries and their severities are also compiled for the six analyzed locations for the most recent three years (2008-2010). Table 5-2 shows the summary of injuries for the three-year period.

Table 5-2
Summary of Injuries (2008-2010)

Intersection	Injury			3-Year	Injury Type (2008-2010)			
	2008	2009	2010	Total	A	B	C	PDO
Castle Hill Ave/Bruckner Blvd	14	11	9	34	0	1	41	7
Castle Hill Ave/CBE-IN95SR	2	22	17	41	0	4	34	8
Castle Hill Ave/Westchester Ave	10	7	3	20	1	2	17	7
White Plains Rd/Archer St	13	6	9	28	3	4	21	3
White Plains Rd/E. Tremont Ave	24	13	19	56	6	3	47	7
White Plains Rd/Wood Ave	3	8	8	19	1	1	17	3
Total Injury	**66**	**67**	**65**	**198**	**11**	**15**	**177**	**35**

Between 2008 and 2010 there were 198 injuries at six selected locations. The highest numbers of injuries were recorded at the intersection of White Plains Road and East Tremont Avenue where 56 injuries were recorded, and the most type A injuries were also recorded at this intersection.

Accidents involving pedestrians

There were 39 accidents involving pedestrians between 2008 and 2010 on the six selected locations. Highest numbers of accidents involving pedestrians were recorded at the intersection of White Plains Road and Archer Street, where one pedestrian was killed in 2008, and a total of 11 pedestrians injured between years 2008 and 2010, including five pedestrians injured in 2009 alone, making this intersection a “High Accident Location” for that year. Following are the three locations where pedestrians were killed in the study area between 2008 and 2010, as shown in figure 5-1.

1. White Plains Road @ Archer Street (2008)
2. Castle Hill Avenue @ Gleason Avenue (2008)
3. Zerega Avenue @ Lafayette Avenue (2008)

Recommendations:

Recommendations to improve overall safety conditions in the study area (focus areas) are integrated into the traffic improvement measures.

6. PUBLIC TRANSPORTATION

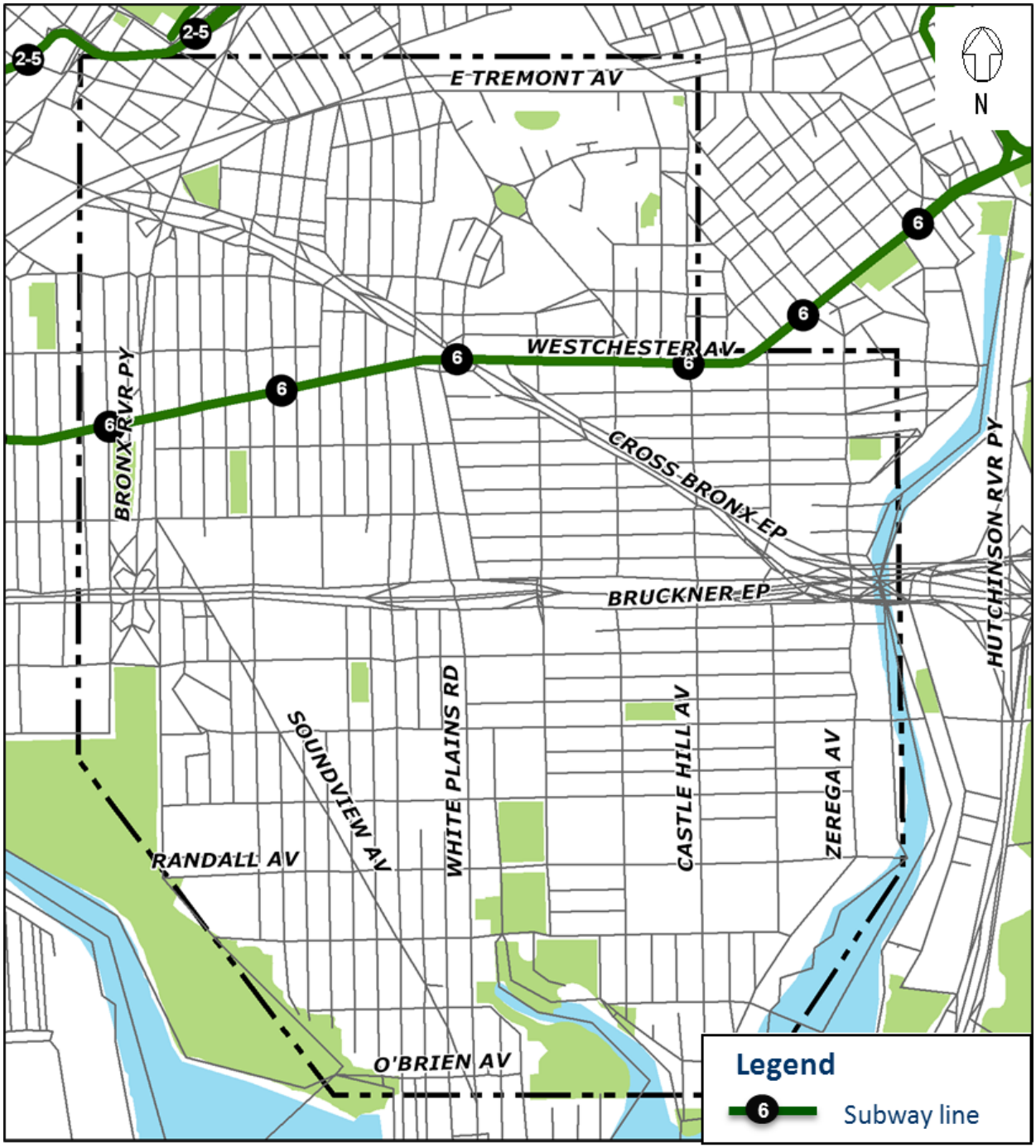
6.1 Introduction

Public transportation plays an important role in the transportation system of the study area. It provides an alternative to private auto use and also helps to reduce traffic congestion. The study area is well served with public transportation having one subway line with two stations and seven bus lines with many stops throughout the study area. The Metropolitan Transportation Authority - New York City Transit (MTA-NYCT) operates subway and bus services within the study area.

6.2 Subway Service

The No. 6 train provides the only subway service in the study area. The train connects the study area to the upper Bronx and Manhattan. The "6" subway line on Westchester Avenue runs local from Brooklyn Bridge/City Hall (Lower Manhattan) to Pelham Bay Park (Bronx) and operates at all times during weekdays and weekends. The train route and stations are shown in Figure 6-1.

Figure 6-1
Subway Lines in the Study Area



6.3 Bus Service

There are seven local bus routes in the study area (focus areas) shown in Figure 6-2. These buses operate on two north-south corridors: White Plains Road (Bx39) and Castle Hill Avenue (Bx5/Bx22) as well as on the four major cross-town streets - East Tremont Avenue (Bx40/Bx42), Cross Bronx Expressway North Service Road (Bx36/Q44), Westchester Avenue (Bx4), and Bruckner Boulevard Service Road (Bx5). Table 6-1 below provides headway information for each route.

Table 6-1
Average Frequency of NYCT Bus Service

	Weekday					Saturday					Sunday				
Route	AM	Noon	PM	Eve	Night	AM	Noon	PM	Eve	Night	AM	Noon	PM	Eve	Night
Bx39	11	12	10	12	ns	12	10	11	12	ns	20	12	12	15	ns
Bx5	7	13	11	9	ns	13	17	15	11	ns	20	17	10	12	ns
Bx22	5	9	6	10	ns	12	10	9	11	ns	12	11	10	12	ns
Bx40	15	17	15	20	60	24	20	20	20	60	20	24	20	24	60
Bx42	13	20	15	20	ns	24	20	20	24	ns	20	20	23	24	ns
Bx36	4	7	5	8	50	8	6	6	8	50	10	7	7	9	50
Bx4	7	9	9	11	ns	10	8	8	10	ns	17	10	10	12	ns
Q44	5	9	8	9	30	8	8	8	9	30	17	8	8	9	30

Notes: Time Periods: AM= 7-9 AM, Noon= 11 AM-1 PM, PM= 4-7 PM, Eve= 7-9 PM and Night= Midnight - 4 AM
NS = no service during time period. Headway in minutes.

Bx4

The Bx4 operates between Westchester Square at East Tremont Avenue/Lane Avenue and Melrose at Westchester Avenue/Bergen Avenue at all times except for overnight service. It provides service along Westchester Avenue in the study area. The frequency of the service varies by direction and peak hours. The headway is ten minutes eastbound and six minutes westbound during the AM peak hour, ten minutes in both directions during the midday peak hour, ten minutes eastbound and fifteen minutes westbound during the PM peak hour, and ten minutes in both directions during the Saturday midday peak hour.

Figure 6-2
Bus Routes in the Study Area

Bx5

The Bx5 operates between Hunts Point at Westchester Avenue/Southern Boulevard and Pelham Bay Park at Bruckner Boulevard Service Road/Westchester Avenue at all times except overnight service. In the study area, it provides service along Bruckner Boulevard and Castle Hill Avenue. The frequency of the service in both directions is five, nine, and eight minutes headway during the AM, midday, and PM peak hours, respectively.. The headway during the Saturday midday peak hour is nine minutes eastbound and eight minutes westbound. Eastbound services extend to Orchard Beach during the summer on weekends only.

Bx22

The Bx22 operates between Castle Hill Park at Zerega Avenue/Castle Hill Avenue and Bedford Park at West 205 Street/Goulden Avenue at all times except there is no overnight service. It provides service along Castle Hill Avenue in the study area. The frequency of the service varies by direction and peak hours. The headway is five minutes northbound and nine minutes southbound during the AM peak hour, eight minutes northbound and ten minutes southbound during the midday peak hour, eight minutes in both directions during the PM peak hour and Saturday midday peak hour.

Bx36

The Bx36 operates between Washington Heights and Soundview at Olmstead Avenue/Randall Avenue at all times except for overnight service. It provides service along Cross Bronx Expressway North Service Road the study area. The frequency of the service varies by peak hours. The headway is five minutes during the AM peak hour, eight minutes during the midday peak hour, seven minutes during the PM peak hour, and eight minutes during the Saturday midday peak hour.

Bx39

The Bx39 operates between Williamsbridge at East Gun Hill Road/White Plains Road and Clasons Point at Cornell Avenue/Soundview Avenue at all times except overnight service. In the study area, it provides service along White Plains Road. The frequency of the service in both directions is ten and fifteen minutes headway during the AM, midday, and PM peak hours and twelve minutes during the Saturday midday peak hour.

Bx40 and Bx42

The Bx40 and Bx42 operate between SUNY Maritime College at Fort Schuyler and Morris Heights at all times except for overnight service. It provides service along East Tremont Avenue and the frequency varies by direction and peak hour. The headway is six minutes eastbound and five minutes westbound during the AM peak hour, ten minutes eastbound and eight minutes westbound during the midday peak hour, seven minutes eastbound and eight minutes westbound during the PM peak hour, and ten minutes in both directions during the Saturday midday peak hour.

Q44

The Q44 (Cross Bronx Expressway Limited) operates between Archer Avenue/Merrick Blvd at Jamaica and the Bronx Zoo at all times and the frequency varies by direction and peak hour.

Future Conditions

It is anticipated that the study area (Focus Areas) will be well served by public transportation in the years to come (by 2018). The quality of service in the area would probably remain at the same level or slightly reduced (due to economic hardship) but in some instances would improve over the period of ten years.

Due to the national economic recession, the NYC Transit 2010 Service Reduction Proposals would modify, limit or reduce number of their services either by temporally suspended lines, shortening spans, or eliminating completely services within the city limits. Due to the recent service reduction proposals, the study area would experience minor changes in transit services.

7.0 RECOMMENDATIONS

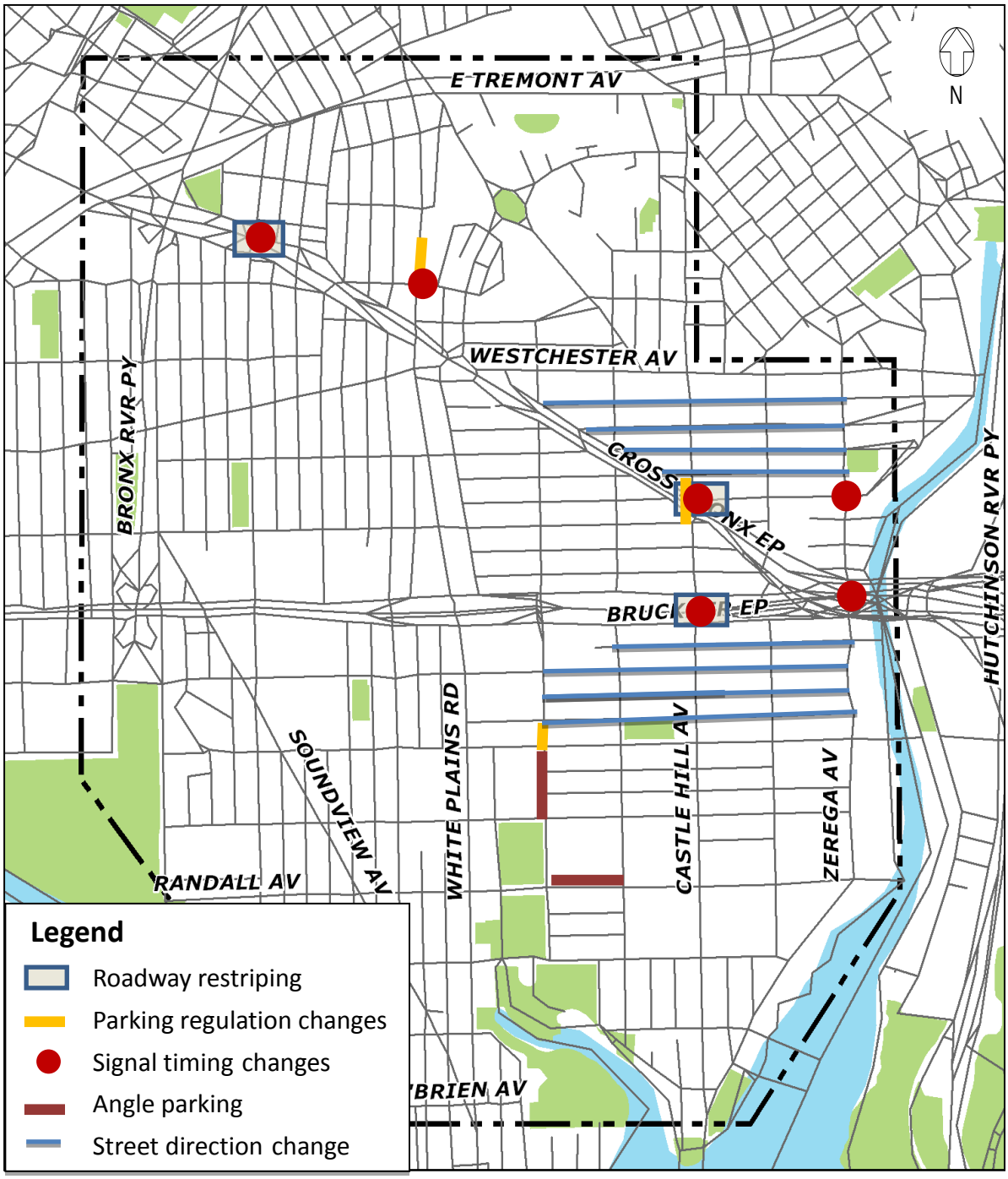
The analyses of the existing and future conditions revealed that there are several locations in the study area that can be improved with respect to traffic circulation, roadway configuration (striping, installing kwick curb, medians, etc.), signal timing modification, installation of angle parking, street directional change, parking regulation change, signs and markings, which will all contribute to improvement of overall safety of vehicular and pedestrian traffic in the study area.

The proposed improvement measures are recommended for the following locations/areas:

1. Eight local streets to be converted from two-way to one-way;
2. Castle Hill Avenue and Bruckner Boulevard (roadway striping, installation of left turn/shared lanes, and signal timing plan modification);
3. Cross Bronx Expressway Service Roads and Castle Hill Avenue/Haviland Avenue (installation of kwick curb and hatching area to separate roadways, prohibition of left/right turns from service road/exit ramp, and parking removal);
4. Cross Bronx Expressway Service Road and Rosedale Avenue (roadway striping, installation of kwick curb and median separation, prohibition of left/right turns from service road/exit ramp);
5. Installation of angled parking on Randall Avenue (between Olmstead/Pugsley and Zerega/Havemeyer Avenues).
6. Proposed signal timing modification for six intersections (Bruckner Blvd/Zarega Avenue, White Plains Road/Wood Avenue, Haviland/Zarega Avenues, Castle Hill Avenue/Bruckner Blvd Service Roads, White Plains Road/Wood Avenue, Cross Bronx Expressway N. Service Road/Rosedale Avenue and Cross Bronx Expressway N. Service Road and Castle Hill/Haviland Avenues).

Figure 7-1 shows locations in the study area recommended for improvements.

Figure 7-1
Locations of Improvement



Proposed Street Directional Changes

The following streets in the study area are recommended for directional change from two-way to one-way.

1. Newbold Avenue EB, between Cross Bronx Expressway Service Road & Zerega Avenue;
2. Ellis Avenue WB, between Zerega Ave & Olmstead Avenue;
3. Gleason Avenue EB, between Cross Bronx Expressway Service Road & Zerega Avenue;
4. Powell Avenue WB, between Zerega Avenue & Cross Bronx Expressway Service Road);
5. Quincy Avenue EB, between Olmstead Avenue & Zerega Avenues);
6. Story Avenue WB, between Zerega & Pugsley Avenues);
7. Hermany Avenue EB, between Pugsley & Zerega Avenues);
8. Turnbull Avenue WB, between Havemeyer and Pugsley Avenues);

Figure 7-2 shows the existing two-way streets in the two focus areas that are recommended for one-way street conversion.

Figure 7-2 Existing Two-way Street Directions

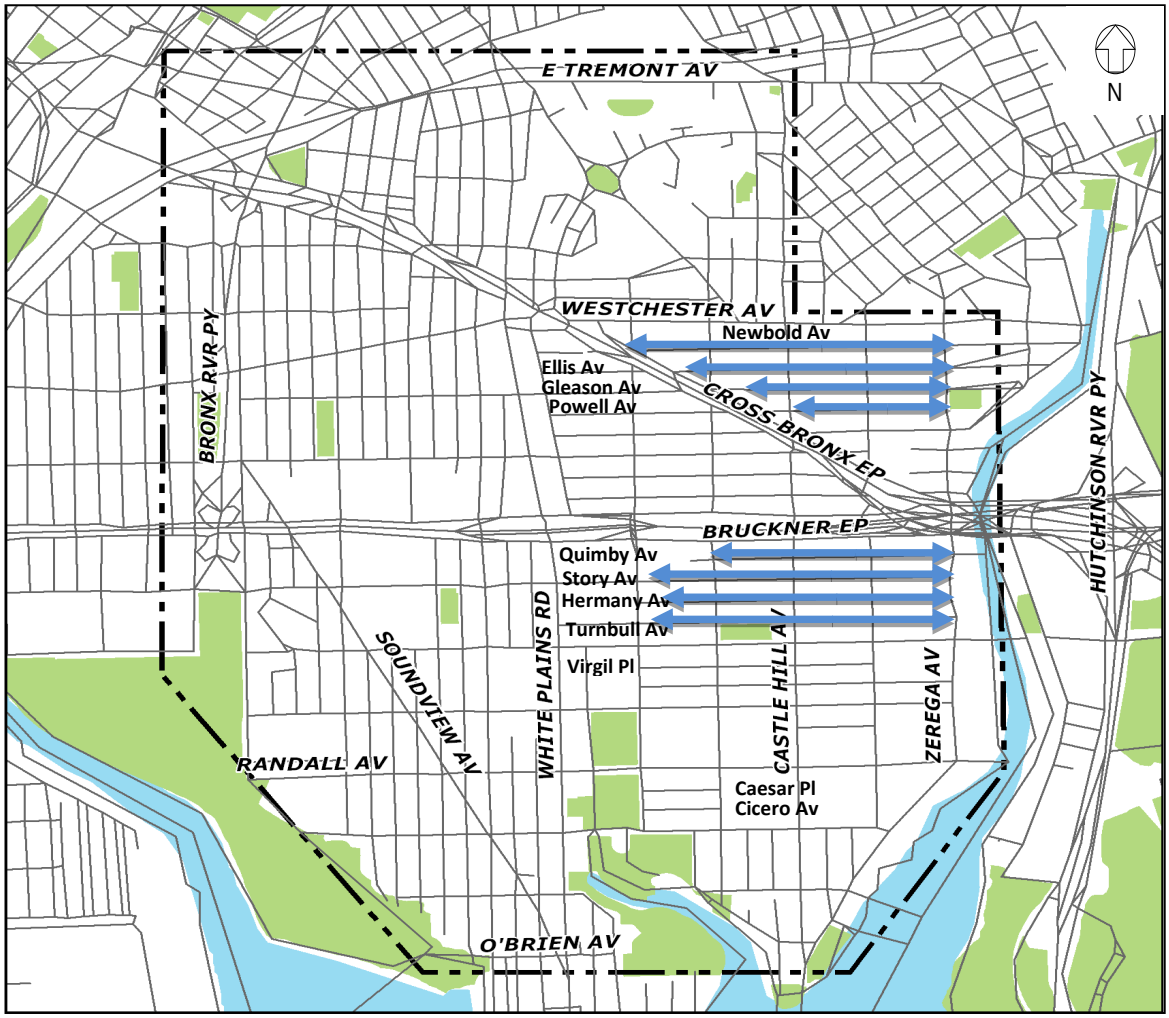
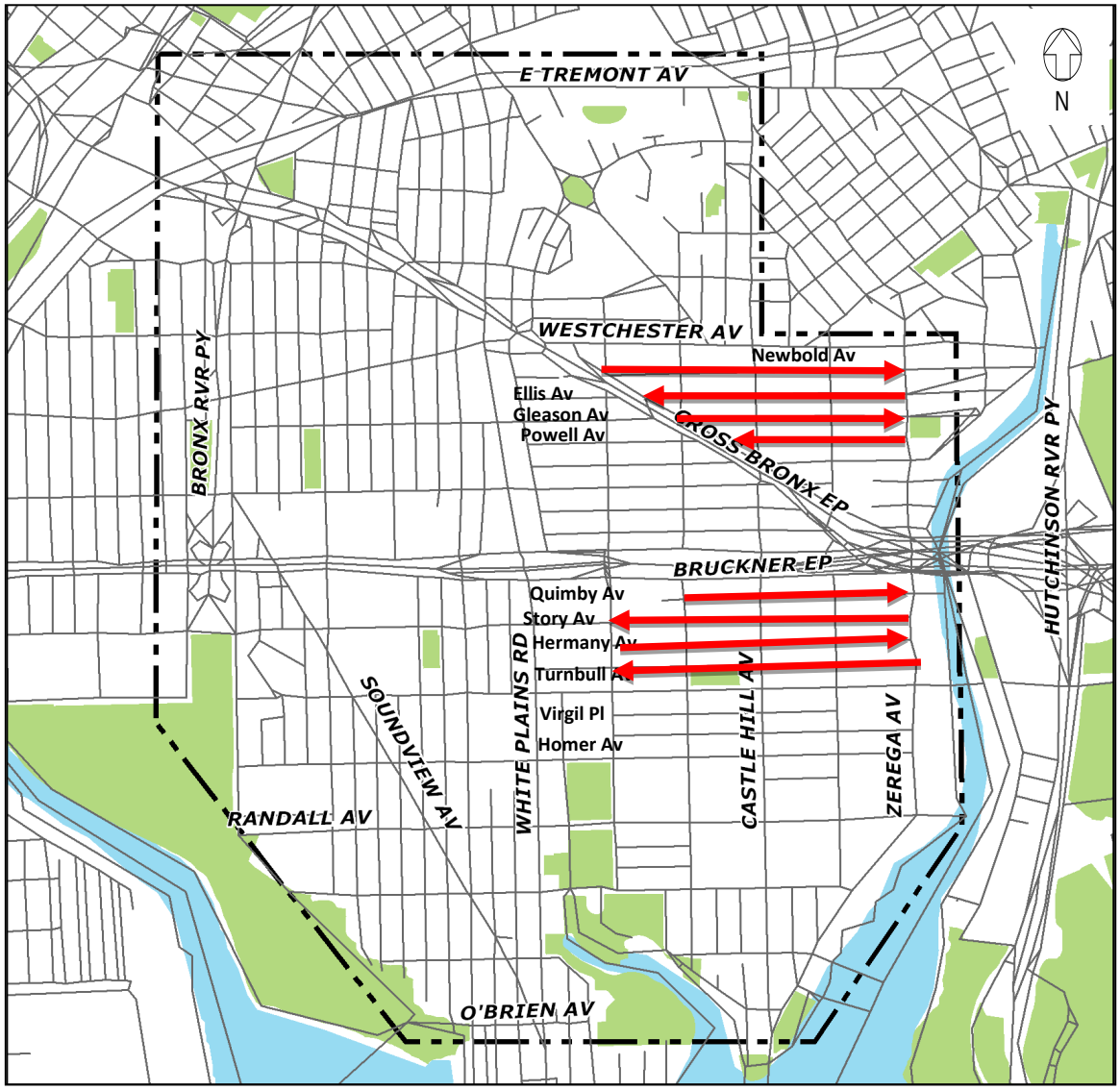


Figure 7-3 shows the proposed one-way street directional changes.

Figure 7-3 Proposed One-way Street Directions



Proposed Roadway and Intersection Improvement

The results of the capacity analysis for 24 locations indicated that several locations have poor levels of service. Roadway restriping and parking removal is recommended for the following intersections:

1. Castle Hill Avenue and Bruckner Boulevard Service Roads
2. CBE WB Service Road & Castle Hill/Haviland Avenues, and
3. CBE WB Service Road & Rosedale Avenue

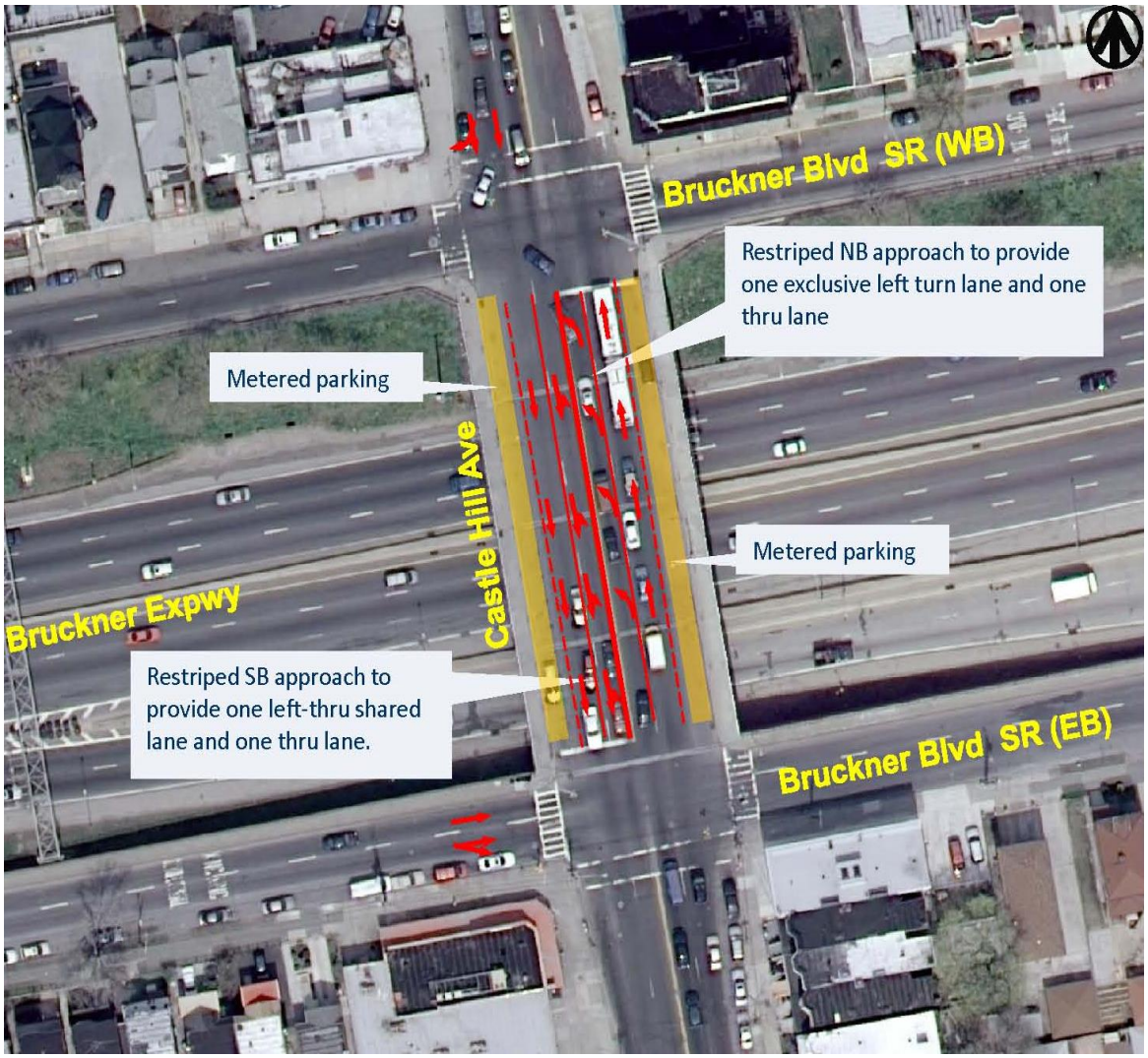
1. Bruckner Boulevard Service Roads and Castle Hill Avenue (implemented)

The levels of service for the existing conditions (2008) revealed LOS F and E during the AM and PM peak hours. In 2010, the DOT restriped the Castle Hill Avenue overpass between Bruckner Boulevard Service Roads and created two moving lanes (11 feet wide) including a left turn lane and one thru lane for the northbound approach, and also one shared left-thru and one thru lane for the southbound approach, while maintaining curbside parking (meters) on both sides. Additionally, the signal timings were modified at these adjacent locations to accommodate the recent roadway geometry changes. As a result of these improvements, the level of service improved to D and delays reduced.

The pictures below show the recently implemented improvements for this intersection.

Bruckner Boulevard Service Roads @ Castle Hill Avenue

Proposed Improvements (implemented)



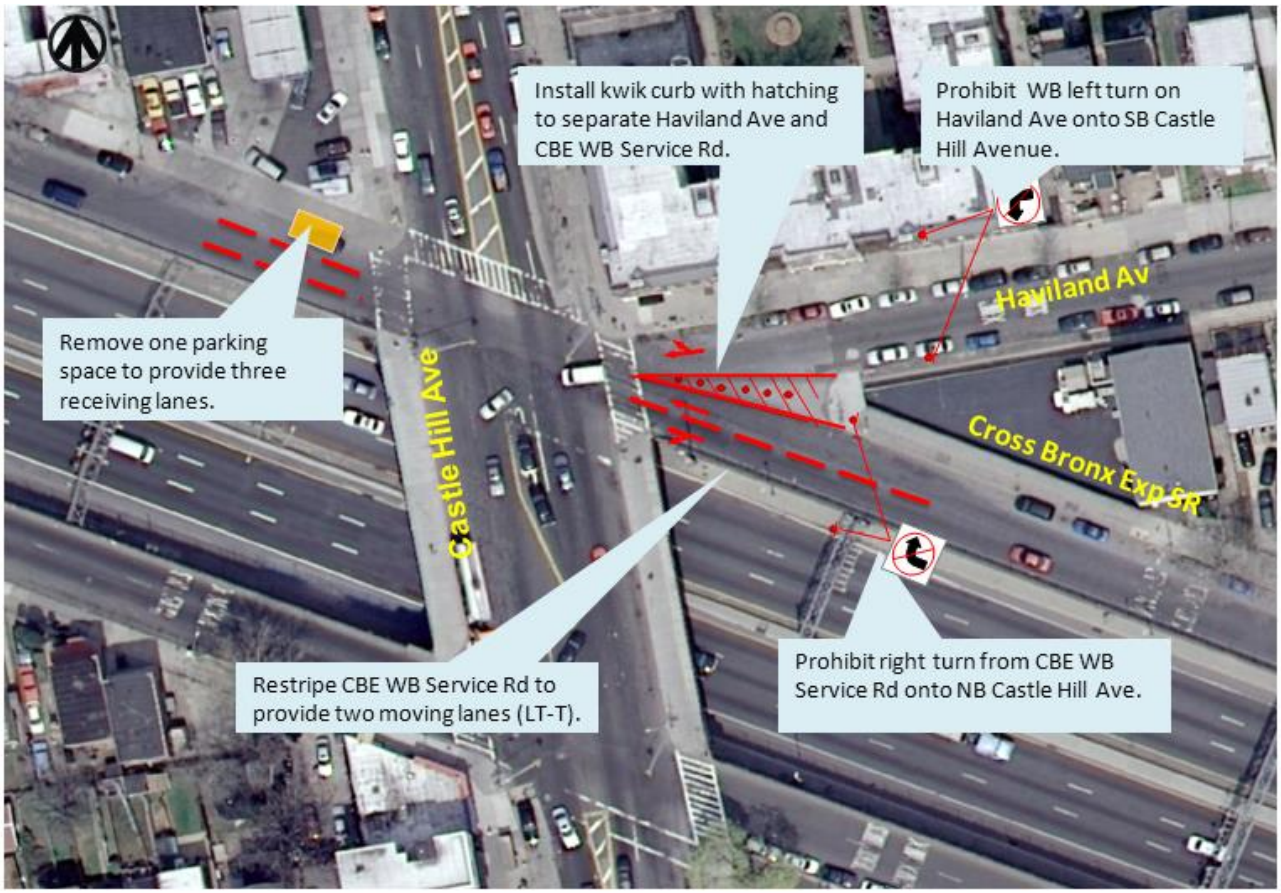
2. Cross Bronx Expressway (CBE) Service Road and Castle Hill/Haviland Avenues

The poor levels of service (E) for the existing and future conditions during the AM, PM and Saturday midday peak hours will be improved to LOS D by:

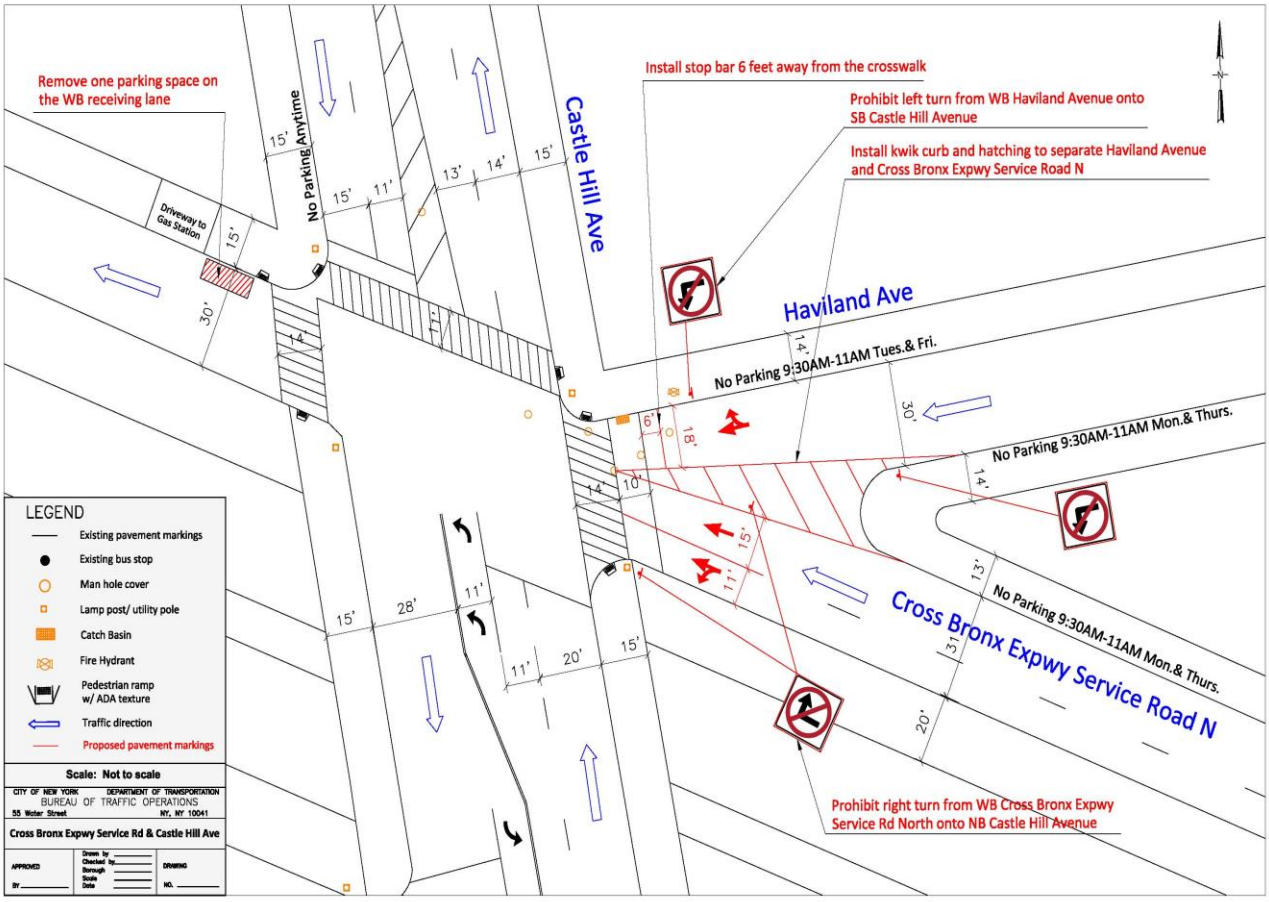
1. Install a kwick curb and hatching area to separate Haviland Avenue from Cross Bronx Expressway westbound service road;
2. Prohibit left turns from Haviland onto Castle Hill Avenue southbound and right turns from Cross Bronx Expressway westbound service road onto Castle Hill Avenue northbound; and
3. Remove one parking space from the north-east curb of Cross Bronx Expressway service road to provide three westbound receiving lanes.

The picture and drawing below show proposed improvements for the intersection.

Cross Bronx Expressway Service Road/Haviland Avenue @ Castle Hill Avenue
Proposed Improvements



Cross Bronx Expressway Service Road/Haviland Avenue @ Castle Hill Avenue
Proposed Improvements

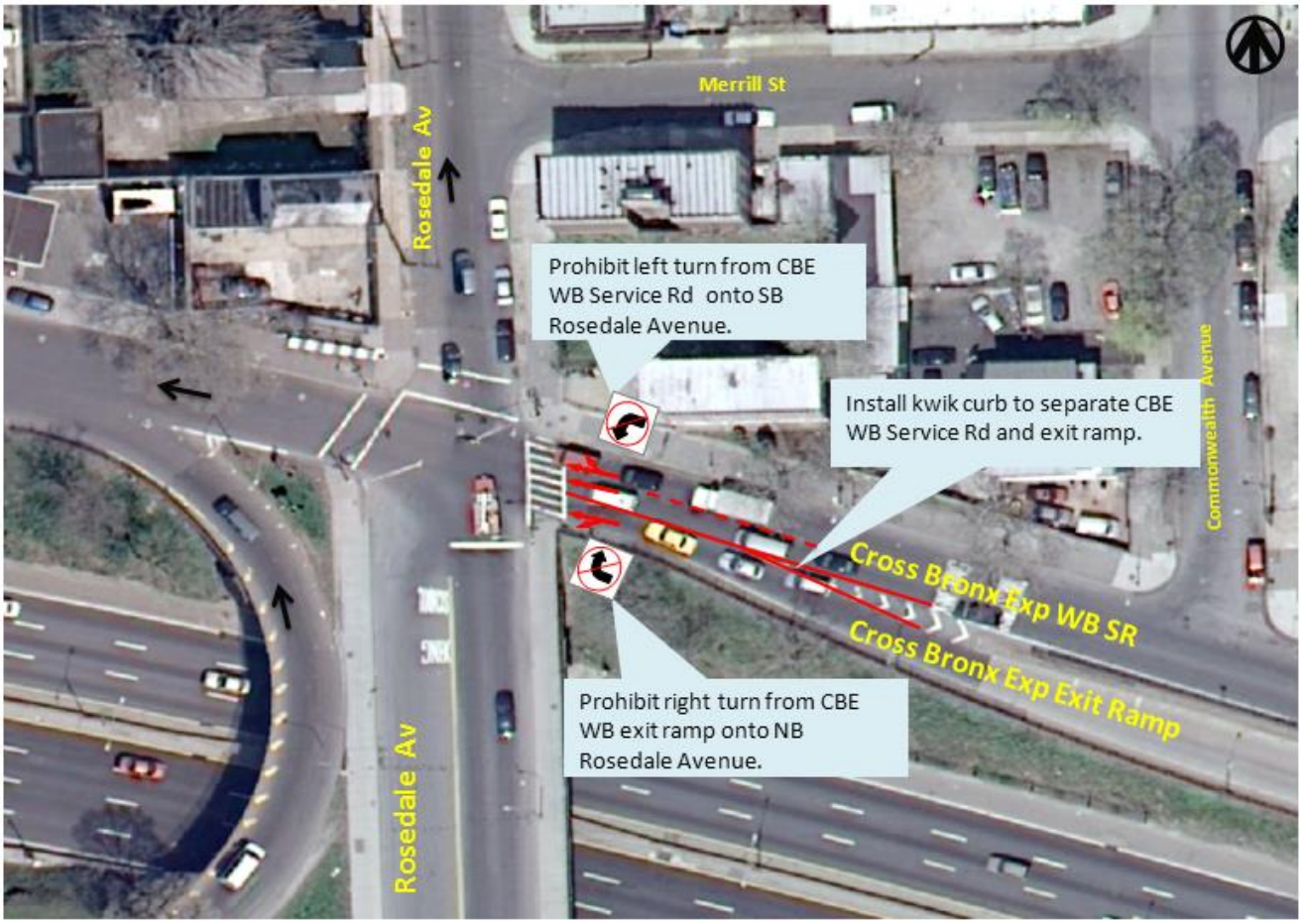


3. Cross Bronx Expressway Service Road and Rosedale Avenue

The levels of service under the existing and future conditions (E during the AM peak) will be improved by:

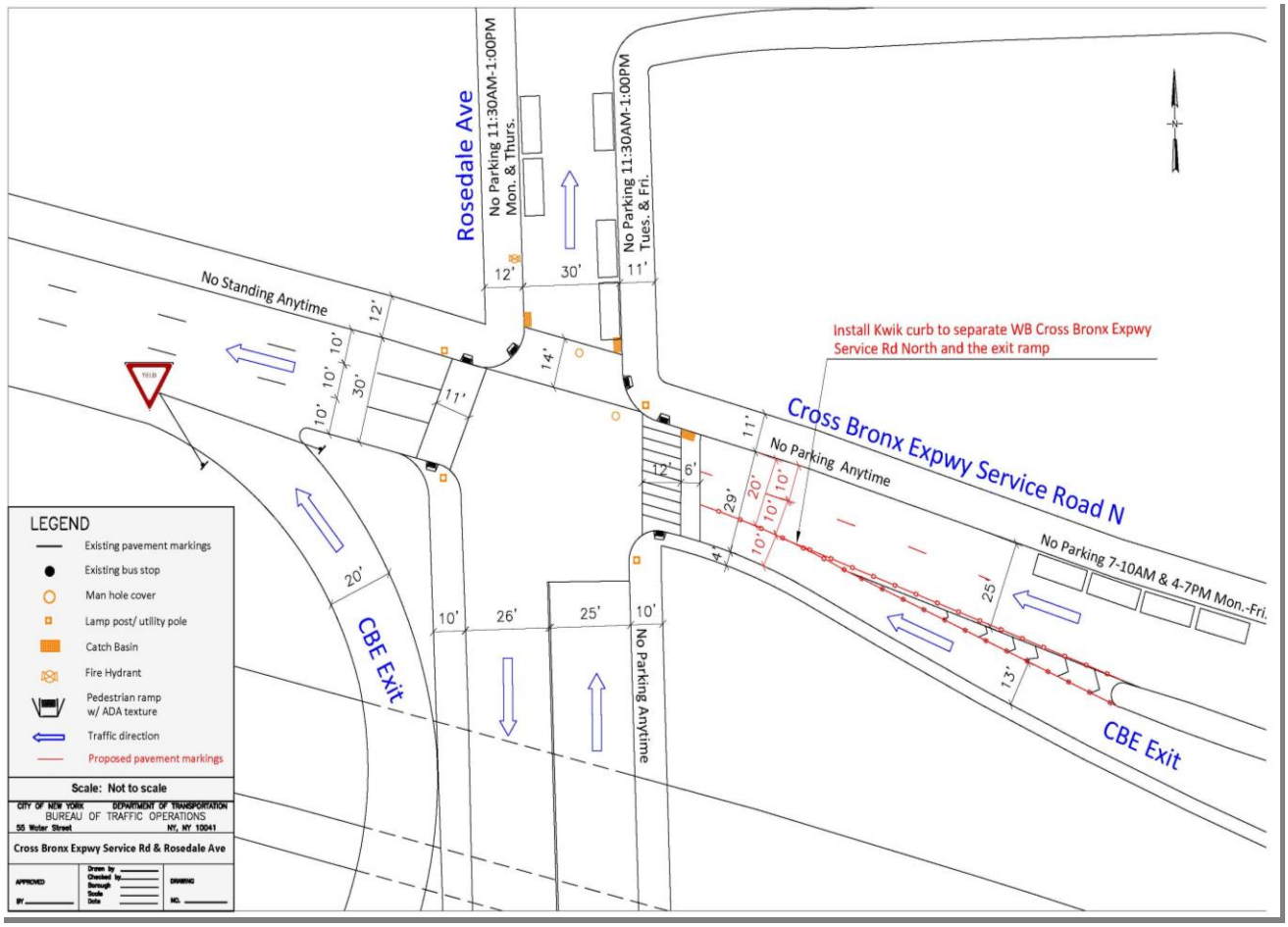
- Install kwick curb to separate roadways from the Cross Bronx Expressway Service Road westbound and the Cross Bronx Expressway exit ramp.
- Restripe CBE westbound Service Road to create two lanes: through and through-right;
- Prohibit left turns from CBE westbound Service Road onto Rosedale Avenue southbound and right turns from exit ramp onto Rosedale Avenue northbound. The pictures below show proposed improvements for this intersection.

Cross Bronx Expressway N. Service Road @ Rosedale Avenue
Proposed Improvements



Cross Bronx Expressway N. Service Road @ Rosedale Avenue

Proposed Improvements



Signal Timing Modifications

In order to improve traffic flow and operations at various locations in the study area, signal timing modifications are recommended for the following intersections:

1. Haviland Avenue and Zerega Avenue;
2. Bruckner Blvd EB and Zerega Avenue;
3. White Plains Road and Wood Avenue;
4. Cross Bronx Expressway N. Service Road and Rosedale Ave;
5. Cross Bronx Expressway and Castle Hill / Haviland Aves; and
6. Castle Hill Avenue and Bruckner Blvd (signal timing plan was recently modified).

1. **Haviland Avenue and Zerega Avenue (PM)**

   During the PM peak hour shift two seconds of green time from the NB/SB phase to the EB/WB phase. The level of service for the PM peak would be D (from E) and delays for the westbound approach reduced to 44 seconds from 63 seconds, respectively.

2. **Bruckner Blvd EB and Zerega Avenue (AM, PM)**

   During the AM and PM peak hours shift three seconds of green time from the EB phase to the NB/SB phase. The levels of service for the AM and PM peaks would be D (from E and F) and delays reduced to 46 and 54 seconds from 60 and 90 seconds, respectively.

3. **White Plains Road and Wood Avenue (SAT)**

   During the Saturday midday peak hour shift three seconds of green time from the NB/SB phase to the EB/WB phase. The level of service for the Saturday midday peak would be D (from E) and delays reduced to 50 seconds from 72 seconds, respectively.

4. **Cross Bronx Expressway North Service Road and Rosedale Avenue (AM)**

   During the AM peak hour shift two seconds of green time from the NB phase to the WB phase. The level of service for the AM peak would be D (from E) and delays reduced to 40 seconds from 56 seconds, respectively.

5. **Cross Bronx Expressway and Castle Hill/Haviland Avenues (AM & PM)**

   During the AM and PM peak hours shift two seconds of green time from the NB/SB phase to the WB phase. The level of service for the AM, PM and Saturday midday peaks would be D (from E) and delays reduced to 50 and 49 seconds from 73 and 71 seconds, respectively.

6. **Bruckner Blvd Service Road and Castle Hill Avenue (implemented)**

   The existing signal timing plan was changed (adding a third phase for left turns) in coordination with the new striping lanes on Castle Hill Avenue between Bruckner Boulevard Service Roads.

Angled Parking Installation

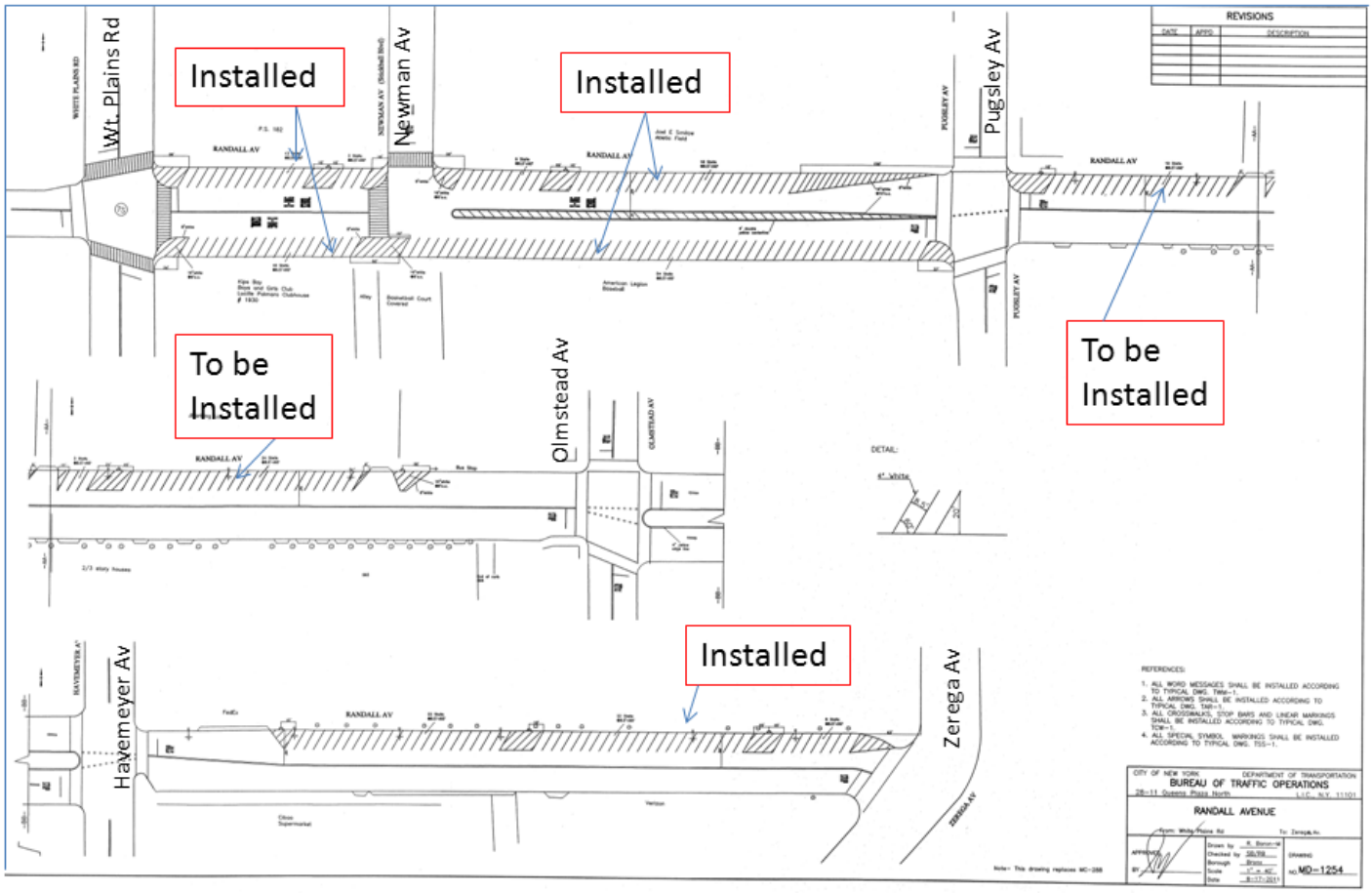
DOT **plan** to install angled parking at the following locations:

- Randall Avenue b/w Olmstead & Pugsley Avenues; and
- White Plains Road b/w Lafayette and Seward Avenues.

Installed angled parking at following locations:

- Randall Avenue b/w Havemeyer and Zerega Avenues (2011); and
- Randall Avenue b/w White Plains Road and Pugsley Avenue.

The drawing below shows proposed sections for installation of angled parking on Randall Avenue and sections were angled parking was recently installed.



The photo below shows the existing angled parking on Randall Avenue between White Plains Road and Pugsley Avenue.

Randall Avenue, looking west (towards White Plains Road)

The photo below shows the angled parking recently installed (2011) on Randall Avenue between Zerega and Havemeyer Avenues.

Randall Avenue, looking west (towards Havemeyer Avenue)

The photos below show Randall Avenue as a wide street where the angled parking will be installed, between Puglsey and Olmstead Avenues.

Randall Avenue, looking east (towards Olmstead Avenue)

Randall Avenue, looking west (towards Pugsley Avenue)

8.0 CONCLUSION

The analyses of the existing and future conditions contained in this report relied on various data sources, analyses, field observations, on-site meetings and discussions. Based on the analyses and community input, a series of recommendations were developed.

Recommendations/improvement measures will improve travel conditions including congestion and safety of all street users. A set of street directional changes from two-way to one-way operation was recommended for implementation shortly.