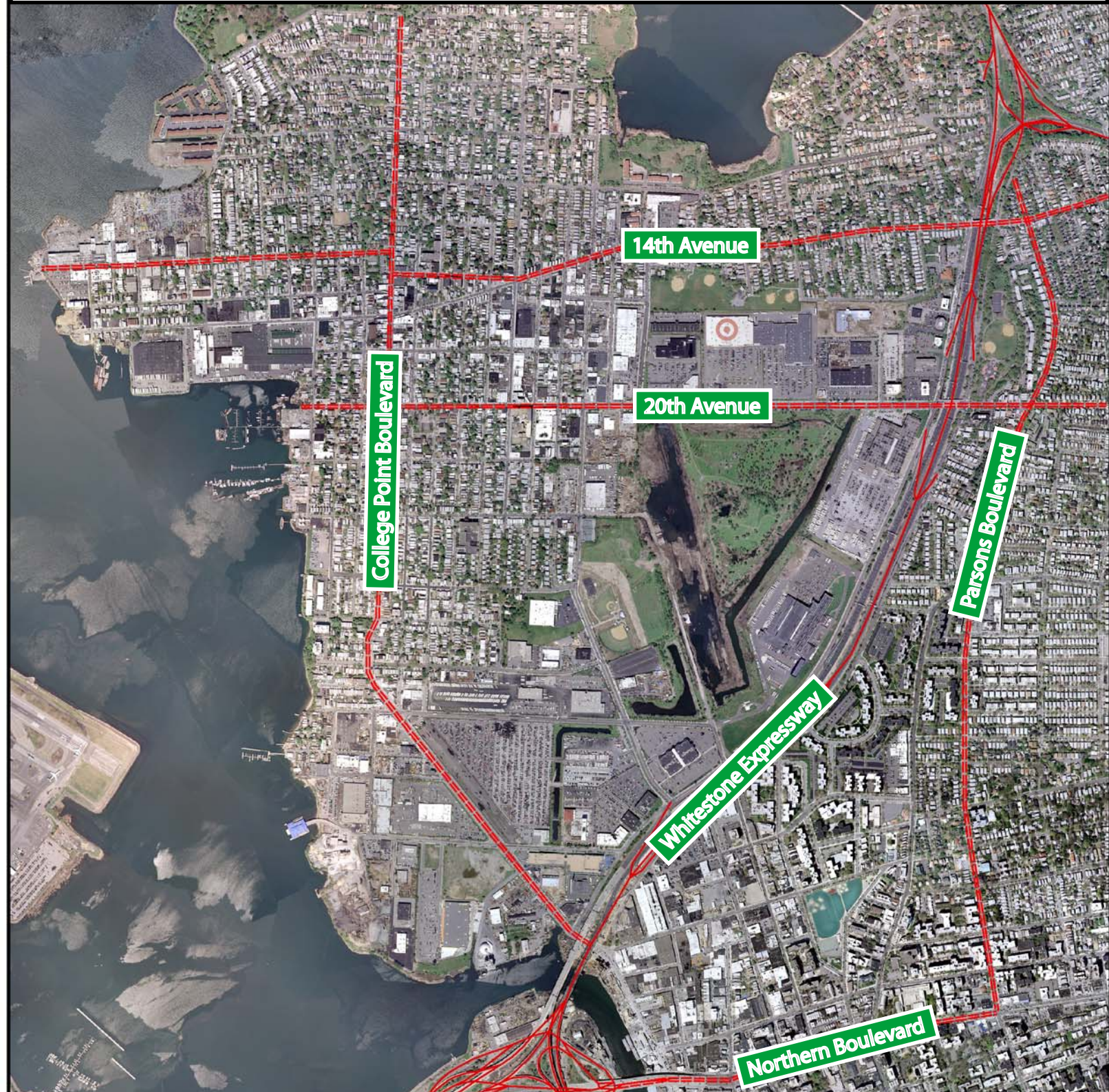


# COLLEGE POINT TRANSPORTATION STUDY

## Draft Final Summary Report

### December 2010



Michael R. Bloomberg  
Mayor



Janette Sadik-Khan  
Commissioner



A Member of the New York  
Metropolitan Transportation Council

**C**OLLEGE **P**OINT  
**T**RAFFIC & **T**RANSPORTATION **S**TUDY  
**D**RAFT **F**INAL **S**UMMARY **R**EPORT

# College Point Transportation Study

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# EXECUTIVE SUMMARY

The College Point Transportation Study was initiated to address the traffic and transportation issues arising from new large scale commercial retail developments on the peninsula. With the increase of vehicular trips from new developments and the existing capacity constraints on the street network, it became necessary to make several improvements – geometric, signal, and parking - to the street network. Some of the major recommended improvements included the widening of Linden Place (at the Whitestone Expressway Service Roads), the widening of 20th Avenue (between Whitestone Expressway and Parsons Boulevard), and the creation of free flow U-turns between the Whitestone Expressway Service Roads at Linden Place, and College Point Boulevard. Major future improvements include the extension of Linden Place from 28th Avenue to 20th Avenue to facilitate circulation and improve the connection between the commercial retail centers located on 28th and 20th Avenues.

The 2010 traffic network includes recommended improvements that have been implemented in the study area over the past five years. The traffic analysis shows that some intersections have one or more failing approaches. These intersections can be improved with signal timing modifications.

The 2014 future traffic conditions were developed by applying a background growth to the 2010 existing traffic volumes along with trips from all known developments. The capacity analysis shows that in 2014 there will be some increase in delay at some intersection approaches. A set of improvement measures are recommended to improve traffic operations and safety for all street users at these locations.

On completion of the Police Academy in 2014 and other network changes such as the extension of Linden Place a post implementation analysis and evaluation will be undertaken.

# INTRODUCTION

The College Point peninsula has been the focus of development since the 1960s. A “Plan for New York City: A Proposal 1969” spoke of the College Point Corporate Park that was proposed to be completely developed by the year 2000. As time went by there were changes to the original plan concept. The changes provided for more commercial retail development and less industrial/manufacturing uses. The area continues to be subjected to planning proposals as circumstances continue to change. For example, the closure of the Flushing Airport, a general aviation facility since 1970, also created new possibilities for developments.

The NYCDOT in its attempt to be proactive in addressing the College Point area's travel and traffic needs has conducted a series of in-depth area-wide traffic studies, as well as location specific traffic analyses to improve traffic operations and safety for all street users (bicyclists, pedestrians, transit and vehicles). DOT also reviewed various EIS(s) and ensured that the appropriate mitigation measures were developed and implemented for proposals that were subjected to the City Environmental Quality Review (CEQR) process. These efforts were, and continue, to address the changing nature of the developments and their associated trip generation and travel characteristics.

In 1999, NYCDOT conducted an extensive area wide analysis on the College Point peninsula. This resulted in the development of a series of short-term improvement measures (most of which have been implemented in recent years) as well as long-term major capital improvement proposals that resulted in several individual projects.

During the late 1990's NYSDOT was involved in the rehabilitation (planning, design and construction) of Whitestone Bridge over the Flushing River. Simultaneously NYCDOT was developing improvement measures for the College Point Transportation Study. Some of the recommendations involved major long term capital improvements. NYCDOT was able to coordinate the major long term capital improvements with the NYSDOT and took advantage of the Whitestone Bridge over the Flushing River Project Construction Contract to implement some of the recommended improvements.

In 2004 NYCDOT conducted another round of traffic analysis. The objectives were to evaluate the 2004 traffic conditions having some of the improvements in place and to develop new short term improvements to relieve any existing traffic congestion generated by the new developments in the area.

This Draft Final Summary report:

- chronicles the planning process;
- document the recommendations and capital improvements that resulted from previous analyses and studies;
- provides an overview of the state of completeness of the various project elements that were recommended and implemented since the study was initiated;
- presents an analysis of the 2010 existing and 2014 future traffic conditions; and
- assess the current level of congestion and generate improvement measures as needed.

# STUDY AREA ANALYSES & RECOMMENDATIONS

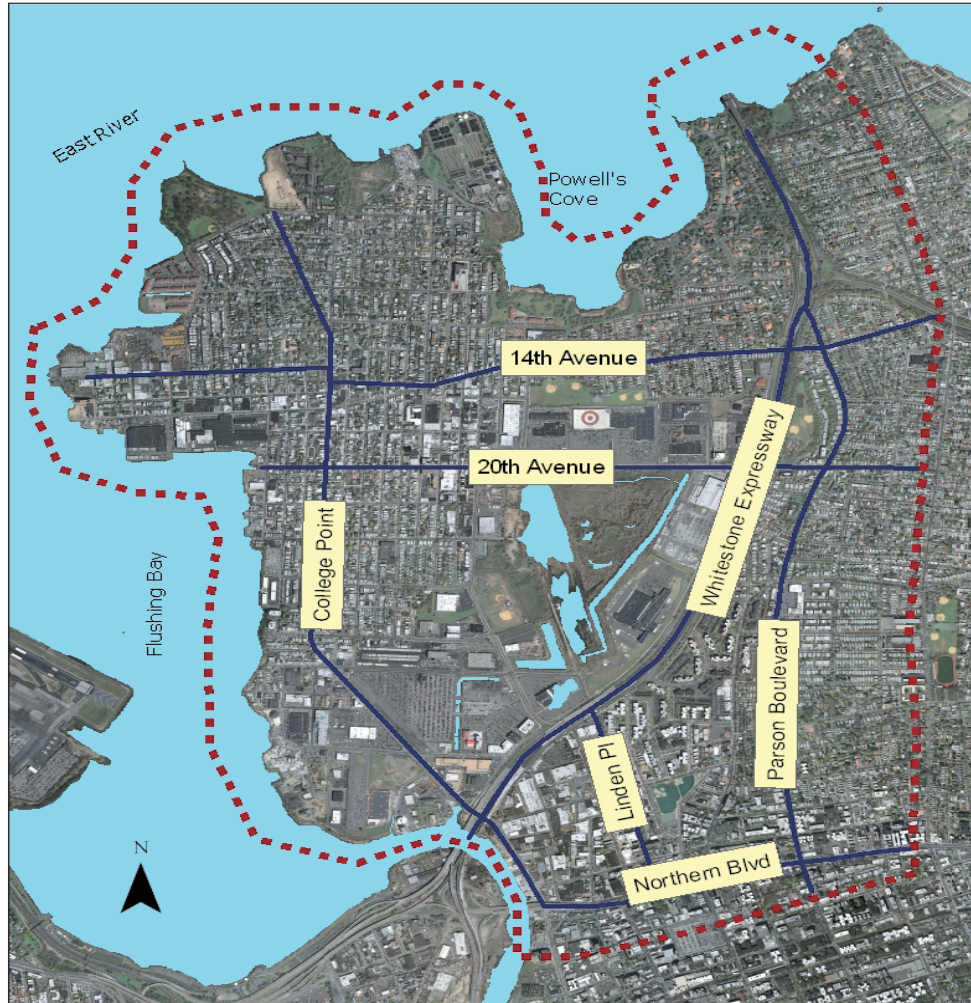
The College Point Traffic and Transportation Study analyzed many issues to develop effective measures to address the area's mobility needs, improve traffic flow and safety as well as relieve congestion. The study area is bounded by the East River on the north, Northern Boulevard on the south, Flushing Bay on the west and Parsons Boulevard on the east, (See Exhibit 1). In 1999 NYC DOT issued a Technical Memorandum which examined issues such as demographics, land use and zoning, traffic, pedestrian flow, accidents/safety, parking and transit. It also recommended a series of short term measures for implementation. By the year 2000 several establishments, including many major commercial retail stores, became operational that added new trips to the street network. Many short term improvement measures were implemented to address the increase in traffic volumes. As a result NYC DOT collected new data and conducted additional analysis in 2004.

Based on the 2004 analysis, long term capital improvement measures and the short term solutions that were intended to provide immediate relief from the congestion as a result of the new developments were recommended. The 2004 analysis also permitted an evaluation of the effectiveness of some of the already implemented measures.



Issues of capacity constraints and congestion in the study area street network were predicted from earlier studies and more recently from field observations. In response, various initiatives to improve traffic circulation were undertaken. Below are the initiatives that were implemented.

Exhibit 1: College Point Study Area



## 2004 ANALYSIS AND IMPROVEMENT MEASURES

The 2004 analysis built upon the 1998 extensive data collection and analysis. The process involved extensive community participation, identification of many improvements alternatives and selection of preferred improvements options. The 2004 analysis revealed bottlenecks in the system, particularly at the entrances and exits to the peninsula, as well as along segments of 20th Avenue and College Point Boulevard.

Based on the analysis the main congested locations in the Study Area traffic network were:

- Linden Place and the Whitestone Expressway Service Roads;
- 20th Avenue and the Whitestone Expressway Service Roads; and
- College Point Boulevard between 14th and 23rd Avenues.

The two most congested access points, the 20th Avenue overpass and the Linden Place underpass, are in the center of the study area. Both locations experienced significant turning movements with heavy demand for left turns.

To effectively address the traffic circulation and congestion problem, measures beyond Transportation System Management (TSM) and Travel Demand Management (TDM) were explored to improve traffic operations as well as safety for all street users. This process resulted in the development and implementation of the following capital improvements:

1. Capacity and Safety Enhancement at Linden Place and Whitestone Expressway Service Roads

a. *Widening Linden Place under the Whitestone Expressway*

Linden Place (under the Whitestone Expressway) was widened from 50 to 56 feet by eliminating the two 5-foot sidewalks and placing 2-foot wide traffic barriers in front of the piers. The widened underpass provides five 11-foot lanes with no sidewalks. Pedestrian walkways were constructed on both sides of Linden Place under the existing viaduct on the inner side of the support columns.

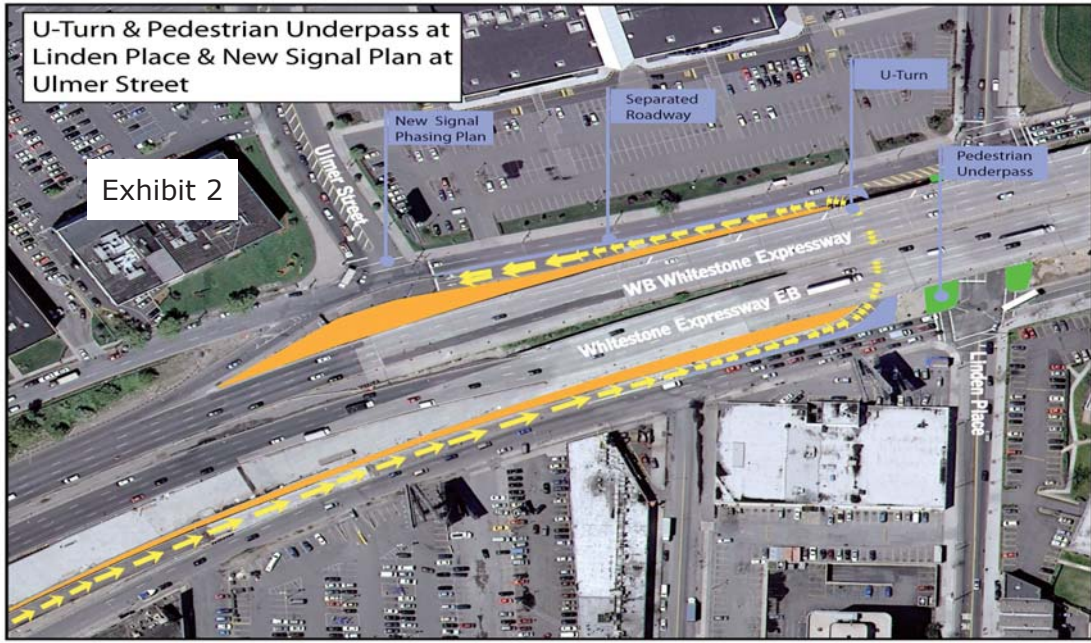


Pedestrian underpass at Linden Place between Whitestone Expressway Service Road



b. *Construction of a Free Flow U-turn from the Whitestone Expressway Northbound Service Road south of Linden Place to the Southbound Service Road.*

The proposal involved the construction of a U-turn roadway south of the Linden Place by opening the Expressway viaduct curtain walls and lowering the roadway embankment for adequate vertical clearance under the viaduct. This allows free flow movement from the northbound onto the southbound service road.



The proposal reduces the number of left turning vehicles having to pass through two signalized locations by approximately 50%, thus improving the overall operation of this location. Exhibit 2 and supporting pictures show the configuration at this location



Linden Place U-Turn Under Whitestone Expressway



U-Turn and Service Roadway at Ulmer Street

## 2. Capacity Enhancement at College Point Boulevard & Whitestone Expressway Service Roads



- a. *Construction of a Free Flow U-turn from Whitestone Expressway Southbound Service Road at College Point Boulevard to the Northbound Service Road*

This measure facilitated traffic traveling southbound on the Whitestone Expressway Service Road making left turns onto the College Point Boulevard and onto the northbound service road.

The free flow U-turn reduced the number of vehicles having to pass through the signalized location in route from the southbound service road to the northbound service road. The following photos and Exhibit 3 show the improvement measure implemented in 2010.

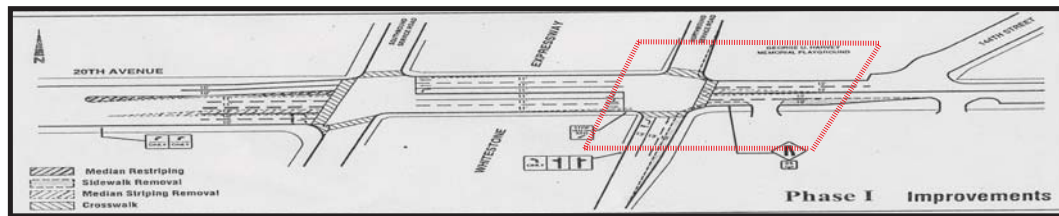
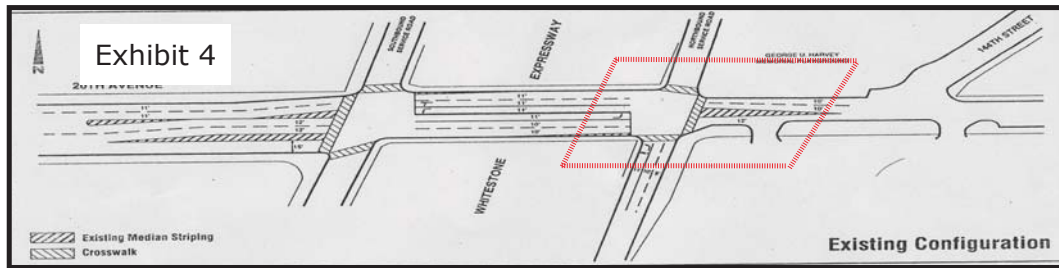


U-Turn under the Whitestone Expressway Bridge



Looking north U-Turn merging with NB → Service Road

### 3. Addressing Bottleneck at 20th Avenue & Whitestone Expressway NB Service Road



- a. *Widen 20th Avenue and Whitestone Expressway NB Service Road Intersection (Exhibit 4)*

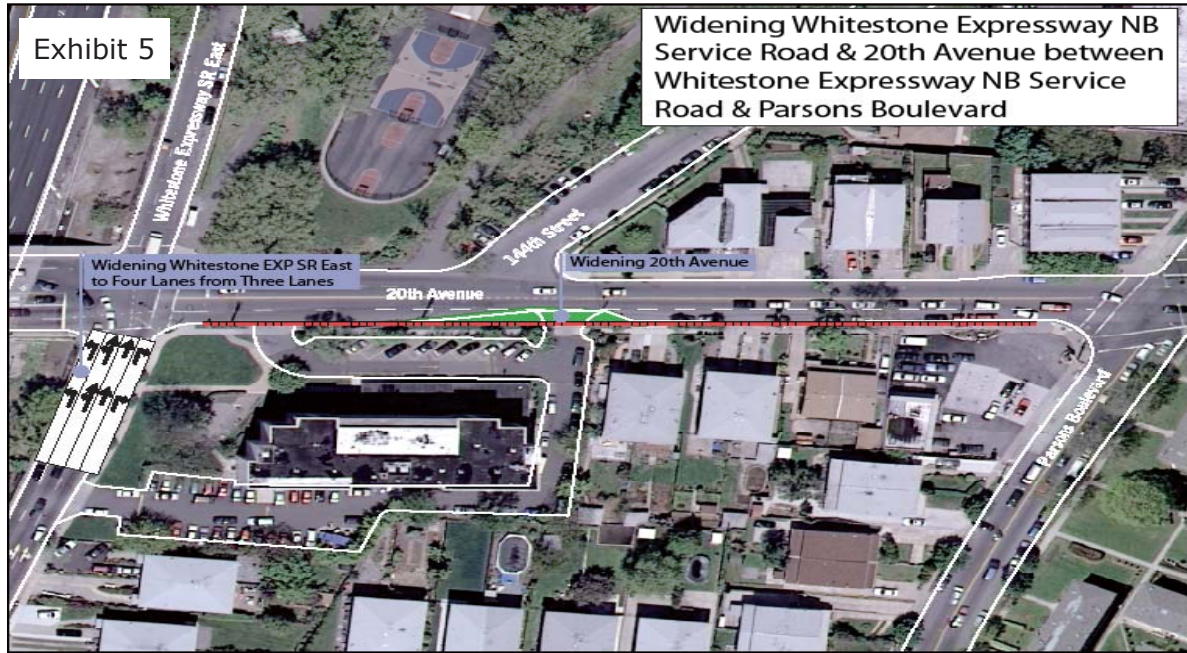
As part of the improvement package associated with new retail developments along 20th Avenue, the College Point Retail Environmental Impact Statement (EIS) identified mitigation measures to improve the operation of the intersection. The main proposal involved widening the northbound approach to accommodate an exclusive right turn lane and widen the eastbound receiving lane.



Whitestone Expressway NB Service Road  
-Looking south ➡

⬅ Whitestone Expressway NB Service Road-Looking north



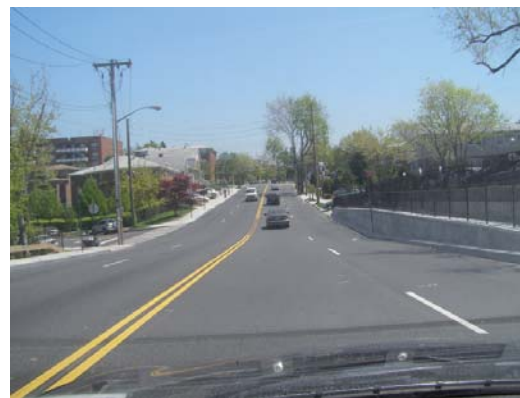


*b. Widening Whitestone Expressway Northbound Service Road and 20th Avenue between the Whitestone Expressway Northbound Service Road and Parsons Boulevard (Exhibit 5)*

To improve the 20th Avenue corridor operations it was recommended that 20th Avenue from the Whitestone Expressway to Parsons Boulevard be widened. Also the widening of the Whitestone Expressway Northbound Service Road from three lanes to four lanes with two exclusive left, one through, and one exclusive right would enhance the operation of the roadway segment. See aerial photo above. This recommendation has already been implemented.



20th Avenue Looking West



20th Avenue-Looking East

#### 4. Extension of Linden Place to 20th Avenue

##### a. *Extension of Linden Place*

To improve circulation and reduce congestion, it is proposed that Linden Place be extended northward to 20th Avenue. The proposed extension is from 28th Avenue to 23rd Avenue in the first phase and from 23rd Avenue to 20th Avenue in the second phase (see photos).



Linden Place looking North

This improvement would result in the redistribution of traffic relieving some of the congestion on 20th Avenue and the Whitestone Expressway. This project is being implemented by the Economic Development Corporation.



Linden Place Looking South



The extension of Linden Place would provide a direct link between the two large commercial retail areas and enhance street network capacity. It is estimated that it would divert approximately 200 vehicles per hour from the congested 20th Avenue and the northbound Whitestone Expressway, thereby significantly improving traffic operations at this location.

The identification and implementation of all the above measures provide a comprehensive improvement plan that will not only improve intersection capacity and operation but would also redistribute traffic, thus relieving congestion throughout the peninsula.

## 2010 ANALYSIS AND IMPROVEMENT MEASURES

The 2010 conditions capacity analysis was undertaken by collecting a limited amount of new traffic count data at 12 locations in the study area. The traffic network was revised to account for all changes since 2006. Appendix A shows the 2010 traffic volumes in the study area for the AM, midday, PM and Saturday peak hours, and the HCS analysis results for the intersections analyzed in Table A-1.

The 2010 analysis revealed that some locations in the study area continue to experience congestion during some peak hours. They are:

- Linden Place and the Whitestone Expressway Southbound Service Road (PM and Saturday MD);
- 20th Avenue and the Whitestone Expressway Northbound Service Road (AM, MD, PM and Saturday MD); and
- 20th Avenue and the Whitestone Expressway Southbound Service Road (AM, MD, PM and Saturday MD).

The following proposed improvement measures would alleviate traffic congestion at the above locations and improve safety of vehiculars, and pedestrian traffic.

***Linden Place @ Whitestone Expressway Southbound Service Road:***

- Signal timing modifications: shift 3 seconds of green time from the westbound only phase to the southbound phase during the PM and SAT MD peak periods.

***20 Avenue @ Whitestone Expressway Northbound Service Road:***

- Signal timing modifications: shift 1 second of green time from the east-westbound phase to the northbound phase during all peak periods.

The intersections of 20th Avenue and Whitestone Expressway Northbound and Southbound Service Roads operate at LOS E or F at some approaches with delays between 60 to 100 seconds where signal timing changes are proposed. The extension of Linden Place from 28th Avenue to 20th Avenue will divert some of the traffic from this location, thereby improving the level of service.

Appendix A: Table A-2 show the results of the HCS analysis with the proposed improvement measures for 2010.

## 2014 ANALYSIS AND IMPROVEMENT MEASURES

The 2014 future traffic conditions were derived from a combination of the new 2010 counts, and 2004 counts projected to 2014 using a background growth rate of 0.5% per year. The traffic network was revised to account for all planned and recommended improvements in the study area. This includes the extension of Linden Place from 28th Avenue to 20th Avenue, and the trips from the proposed Police Academy of approximately 2.4 million gross square feet scheduled for completion by the year 2014. The future traffic network also includes mitigation measures from the Police Academy.

The 2014 capacity analysis reveals that some locations within the study area will continue to experience level of service E or F at some intersection approaches during different peak hours. These intersections and peak hours are listed below:

- College Point Boulevard and 20th Avenue (AM, MD and, SAT MD);
- College Point Boulevard and 31st Avenue (AM and PM);
- Linden Place and Whitestone Expressway Northbound Service Road (PM and SAT MD);
- Linden Place and Whitestone Expressway Southbound Service Road (AM, PM and SAT MD);
- Ulmer Street and Whitestone Expressway Southbound Service Road (AM, PM and SAT MD);
- 14th Avenue and Whitestone Expressway Northbound Service Road (AM); and
- 20th Avenue and Whitestone Expressway North and Southbound Service Roads (AM, MD, PM and SAT MD).

The following improvement measures would improve traffic operation and safety at the above locations for all street users.

**Proposed Improvement Measures:**

*1) College Point Boulevard and 20th Avenue:*

- Signal timing modifications: shift 3 seconds of green time from the NB/SB phase to the EB/WB during the AM and Saturday MD peak hours.

*2) College Point Boulevard and 31st Avenue:*

- Signal timing modifications: shift 7 seconds of green time from the NB/SB phase to the EB/WB during the AM and PM peak hours,
- Restripe WB approach to provide an exclusive right-turn lane and a left-thru lane.

*(Source: Police Academy, EIS 2009)*

*3) Linden Place and Whitestone Expressway Northbound Service Road*

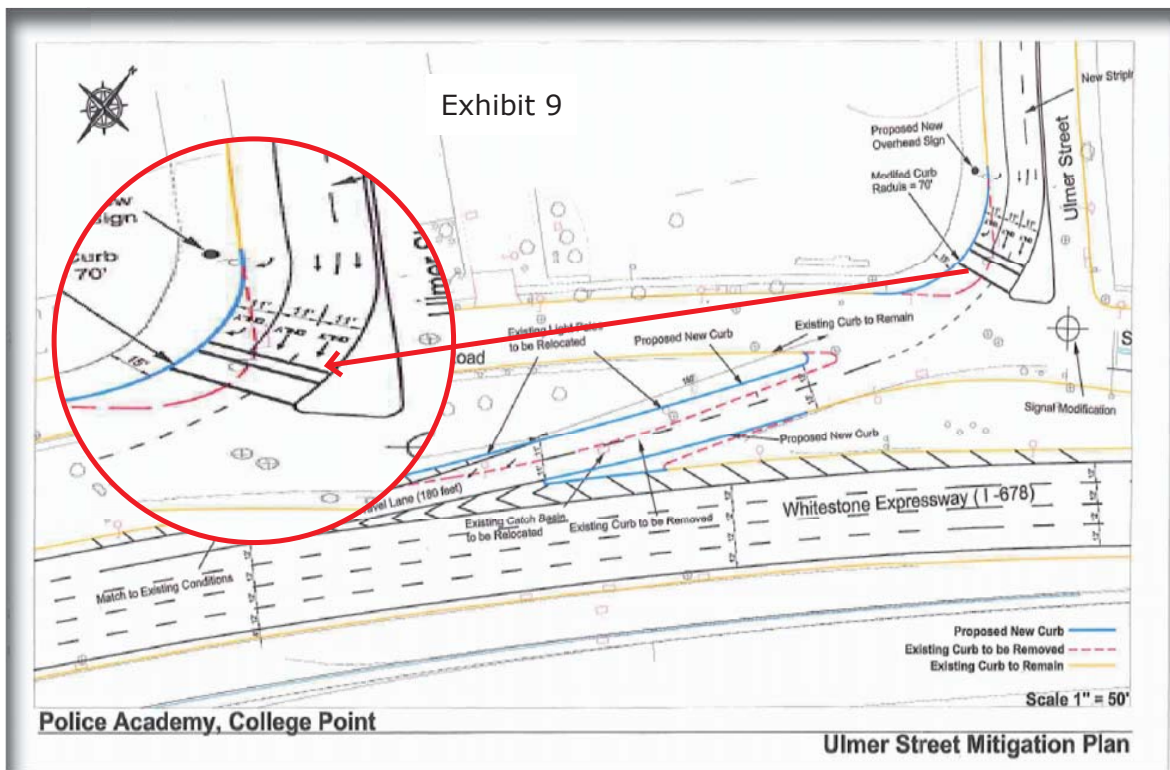
- Signal timing modifications: shift 2 seconds of green time from the NB phase to the EB only phase during the AM peak hour.

*4) Linden Place and Whitestone Expressway Southbound Service Road*

- Signal timing modifications: shift 3 seconds of green time from the EB/WB phase to the SB phase during the AM and PM peak hours, and shift 4 seconds of green time from the WB phase to the SB phase during the Saturday MD peak hour.

5) Ulmer Street and Whitestone Expressway Southbound Service Road/U Turn

- Roadway Reconfiguration/Widening/Pavement Markings: Under 2010 current conditions this intersection does not experience any congestion. However, the proposed Police Academy would generate a significant number of trips. As part of its mitigation measures the EIS recommended the redesign of the intersection to provide an additional southbound lane. The west sidewalk on the southbound approach would be narrowed to provide three moving lanes. The proposed reconfiguration is shown in Exhibit 9 below.
- Signal timing modifications: Shift 2 seconds of green time from the southbound phase to the westbound U-turn phase during the AM peak hour.



source: College Point EIS 2009

6) 14th Avenue and Whitestone Expressway Northbound Service Road

- Signal timing modifications: Shift 2 seconds of green time from the NB phase to the EB/WB phase during the AM peak hour.

7) 20th Avenue and Whitestone Expressway Northbound and Southbound Service Road

- The extension of Linden Place from 20th Avenue to 28th Avenue would provide a direct link between the two main commercial areas, while adding street network capacity, thereby improving the level of service at this location.

Appendix B (exhibits and tables) show the 2014 traffic volume maps, the future HCS analysis and the improvement measures proposed for the analyzed locations in the study area.

# COMPLETED IMPROVEMENT MEASURES

## *The long-term improvement measures that are 100% complete:*

- U-turns at Linden Place and at College Point
- Pedestrian Underpasses
- Widening of Linden Place under Whitestone Expressway.
- Widening of 20th Avenue between Whitestone Expressway and Parsons Boulevard
- Widening of Whitestone Expressway NB Service Road at 20th Avenue
- New Signal timing plan at Ulmer Street/Whitestone Expressway SB Service Road Exit ramp
- Installation of an all-way stop sign at 14th Avenue and 143rd Street

## *The long-term improvement measures not completed:*

- Linden Place Extension Phases I and II

As the 2010 analysis shows, most of the locations in the study area operate at LOS D or better. The completion of the two U-turns, together with the widening of Linden Place, the widening of 20th Avenue between the Whitestone Expressway NB Service Road and Parsons Boulevard increased roadway capacity in a substantial way and improved traffic operation and safety of all street users.

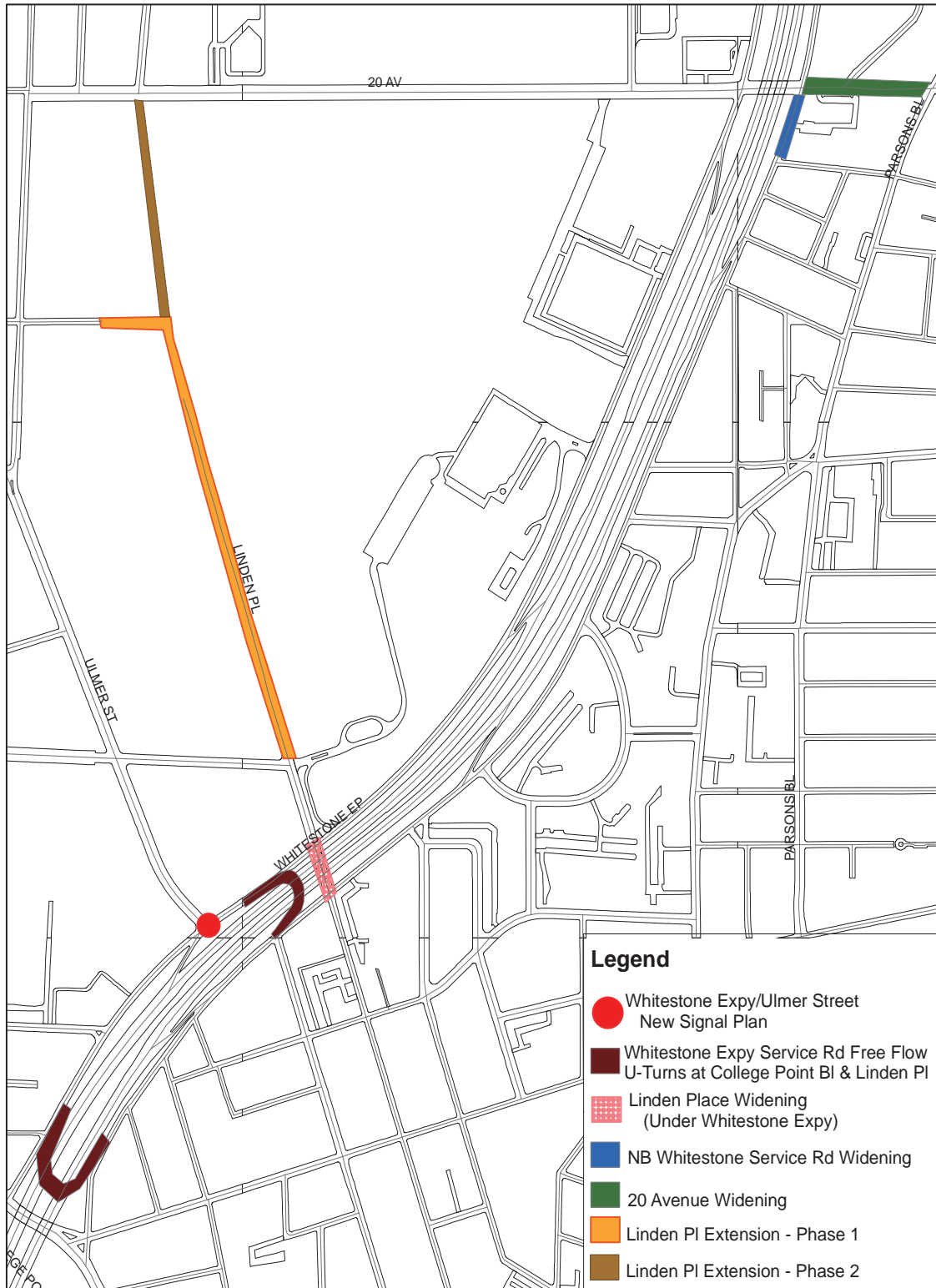
The outstanding long term improvement is the construction of the Linden Place extension from 28th Avenue to 20th Avenue. The extension of Linden Place Phase I design is expected to be completed by the end of the year (2010) and construction is anticipated to take 18 months to 2 years.



Another major proposed development is NYPD Police Academy planned for completion in 2014. This development has generated its own mitigation measures which will be implemented upon its completion. Subsequent to the completion of both Linden Place extension and the Police Academy a re-evaluation of the traffic would be undertaken as post implementation analysis.

Exhibit 10 shows the major improvement locations in the study area.

# Exhibit 10: A Snapshot of All Major Improvements In The College Point Transportation Study Area



# CONCLUSION

The College Point Transportation Study, having examined demographics, land use and zoning, traffic, parking, transit, pedestrian and accident/safety issues recommended a number of immediate, short term and long term improvement measures to reduce congestion, improve circulation and safety for all street users in the study area. Active community involvement contributed positively to the planning, development, and implementation of the recommended improvement measures. The study spanned many years and deviated from the more traditional path, in that major elements were implemented early in the process. The duration of the study allowed for post implementation evaluation of major elements. As NYSDOT rehabilitation of the Whitestone Bridge over the Flushing River was underway with its own design and construction schedule the opportunity to implement some major capital improvements became available. As a result 80% of the recommended improvements are already in place.

**APPENDIX A  
2010 CONDITIONS  
VOLUME MAPS,  
LOS TABLES &  
IMPROVEMENTS**





# Exhibit A-3 2010 PM Peak Hour Volumes

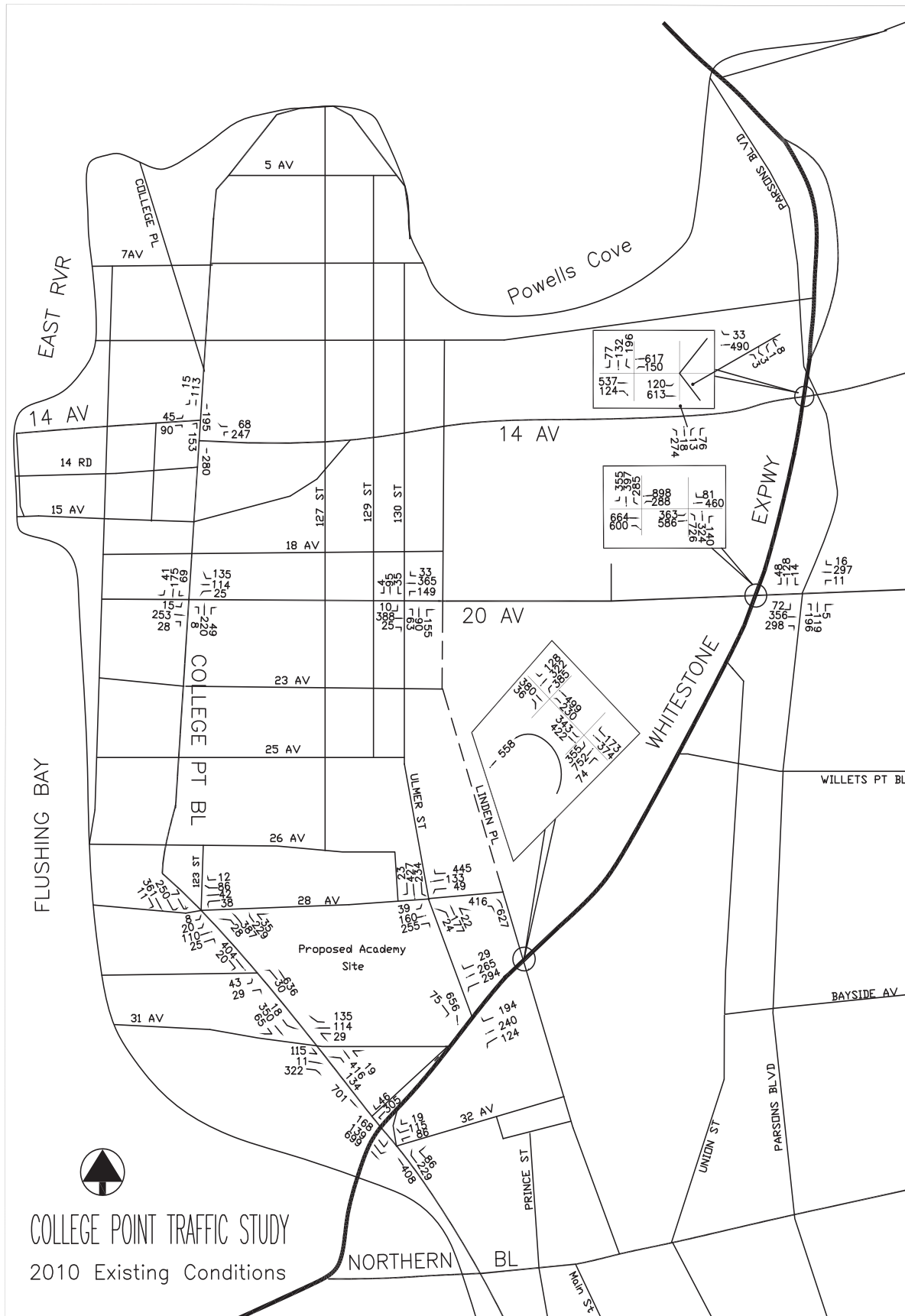






Table A-1

2010 Existing Condition: Traffic Capacity Analysis (Page 1 of 3)

Locations	Lane Group		AM			MID			PM			MID SAT		
			V/C	DELAY	LOS	V/C	DELAY	LOS	V/C	DELAY	LOS	V/C	DELAY	LOS
130th ST @ 20th Ave	NB	LTR	0.47	18.6	B	0.47	18.5	B	0.47	18.5	B	0.40	17.5	B
	SB	LTR	0.37	18.6	B	0.56	23.9	C	0.46	20.7	C	0.42	20.0	B
	EB	LTR	0.68	15.7	B	0.54	12.3	B	0.53	11.9	B	0.41	10.3	B
	WB	L	0.36	11.5	B	0.45	12.6	B	0.39	11.6	B	0.31	10.1	B
		TR	0.72	16.4	B	0.57	13.0	B	0.53	12.2	B	0.52	11.8	B
	Overall		16.5	B		15.3	B		14.4	B		13.4	B	
28th Ave & Ulmer St	NB	LTR	0.17	10.7	B	0.17	10.7	B	0.21	11.0	B	0.15	10.7	B
	SB	LTR	0.83	22.6	C	0.49	13.9	B	0.75	19.2	B	0.84	22.5	C
	EB	LTR	0.50	14.0	B	0.45	13.3	B	0.54	14.5	B	0.46	13.2	B
	WB	LTR	0.60	13.2	B	0.51	11.9	B	0.67	14.3	B	0.68	15.0	B
		Overall		16.8	B		12.7	B		15.6	B		17.3	B
College Point Blvd @ 14th Ave (North leg)	NB	LT	0.54	16.7	B	0.47	15.3	B	0.65	19.7	B	0.70	22.0	C
	SB	TR	0.21	11.1	B	0.21	11.2	B	0.20	11.0	B	0.24	11.5	B
	EB	LR	0.26	22.4	C	0.33	23.7	C	0.31	23.3	C	0.35	24.0	C
		Overall		16.3	B		16.5	B		18.4	B		19.7	B
College Point Blvd @ 14 Ave (South Leg)	NB	LT	0.21	11.2	B	0.24	11.5	B	0.49	15.1	B	0.52	15.9	B
	SB	TR	0.26	11.6	B	0.28	11.9	B	0.32	12.3	B	0.34	12.6	B
	WB	L	0.71	33.8	C	0.39	24.7	C	0.55	28.2	C	0.35	23.9	C
		R	0.32	23.4	C	0.25	22.4	C	0.16	21.2	C	0.18	21.4	C
	Overall		22.8	C		17.2	B		18.7	B		17.0	B	
College Point Blvd @ 20th Avenue	NB	LTR	0.65	19.8	B	0.58	17.6	B	0.49	15.4	B	0.81	28.0	C
	SB	LTR	0.73	25.8	C	0.74	25.7	C	0.64	20.2	C	0.75	26.3	C
	EB	LTR	0.43	25.7	C	0.39	24.9	C	0.81	41.4	D	0.41	25.3	C
	WB	LTR	0.86	47.1	D	0.88	50.2	D	0.71	35.3	D	0.90	54.6	D
		Overall		30.2	C		30.3	C		28.4	C		34.3	C
College Point Blvd @ 31st Street	NB	L	0.35	13.0	B	0.31	10.7	B	0.28	10.7	B	0.21	10.4	B
		T	0.22	8.6	A	0.22	8.5	A	0.23	8.6	A	0.21	8.4	A
	SB	L	0.04	13.8	B	0.05	13.9	B	0.08	14.3	B	0.05	13.9	B
		T	0.33	16.3	B	0.23	15.3	B	0.26	15.5	B	0.31	16.1	B
	EB	LTR	0.52	30.1	C	0.45	28.7	C	0.92	54.6	D	0.26	25.5	C
	WB	LTR	0.48	28.5	C	0.41	27.6	C	0.61	32.2	C	0.19	24.7	C
		Overall		19.1	B		17.6	B		27.2	C		15.3	B
College Point Blvd @ 32th Ave	NB	T	0.48	26.4	C	0.38	24.8	C	0.55	27.6	C	0.38	24.8	C
	SB	L	0.57	23.3	C	0.53	20.0	C	0.78	35.0	C	0.62	23.2	C
		T	0.53	14.6	B	0.41	12.9	B	0.54	14.8	B	0.34	12.2	B
	WB	L	0.13	20.8	C	0.35	23.9	C	0.21	21.8	C	0.24	22.2	C
		Overall		19.7	B		18.7	B		23.0	C		19.3	B

**Table A-1**  
**2010 Existing Condition: Traffic Capacity Analysis (Page 2 of 3)**

Locations	Lane Group		AM			MID			PM			MID SAT		
			V/C	DELAY	LOS	V/C	DELAY	LOS	V/C	DELAY	LOS	V/C	DELAY	LOS
College Point Righth turn @ 32 Ave_Whitestone Expressway	NB	TR	0.27	23.5	C	0.27	23.5	C	0.49	26.8	C	0.45	26.0	C
	EB	LT	0.39	12.6	B	0.45	13.6	B	0.55	15.6	B	0.48	14.1	B
	WB	TR	0.54	28.0	C	0.77	37.3	D	0.53	27.9	C	0.71	34.2	C
	Overall			21.2	C		26.4	C		23.0	C		25.0	C
College Point @ Whitestone Expressway Southbound Service Road	SB	L	0.42	22.1	C	0.56	24.9	C	0.52	23.9	C	0.30	20.1	C
		R	0.08	17.7	B	0.16	18.4	B	0.09	17.7	B	0.06	17.4	B
	EB	T	0.42	14.9	B	0.28	13.4	B	0.44	15.2	B	0.33	13.9	B
	WB	T	0.32	13.9	B	0.29	13.6	B	0.33	14.0	B	0.29	13.6	B
	Overall			15.9	B		16.7	B		16.6	B		14.8	B
Parson Blvd @ 20th Ave	NB	DefL	0.60	30.8	C	0.44	20.5	C	0.51	26.9	C			
		LTR										0.82	30.4	C
		TR	0.33	22.1	C	0.26	16.7	B	0.23	20.5	C			
	SB	LTR	0.31	21.1	C	0.26	16.3	B	0.19	19.6	B	0.41	18.1	B
	EB	LTR	0.73	31.8	C	0.63	22.0	C	0.83	36.1	D	0.86	33.6	C
	WB	LTR	0.57	25.6	C	0.33	17.0	B	0.31	21.1	C	0.52	19.7	B
	Overall			26.9	C		19.2	B		28.5	C		26.5	C
Whitestone Expressway Northbound Service Road @ Linden PL	NB	LT	0.78	29.2	C	0.86	33.3	C	0.95	43.0	D	1.03	58.5	E
		R	0.25	19.8	B	0.12	18.2	B	0.17	18.7	B	0.16	18.5	B
	EB	L	0.72	34.4	C	0.36	18.8	B	0.85	45.7	D	0.76	40.3	D
		T	0.24	13.2	B	0.32	14.0	B	0.29	13.6	B	0.37	14.5	B
	WB	TR	0.66	32.1	C	0.48	28.4	C	0.72	33.9	C	0.85	40.3	D
	Overall			27.6	C		26.2	C		35.7	D		43.4	D
Whitestone Expressway Southbound Service Road @ Linden PL	SB	L	0.80	49.6	D	0.81	44.4	D	1.03	88.9	F	1.05	88.2	F
		TR	0.82	44.8	D	0.55	30.4	C	0.72	39.0	D	0.66	36.6	D
	EB	TR	0.47	28.2	C	0.37	26.7	C	0.55	29.7	C	0.91	46.8	D
	WB	L	0.35	10.3	B	0.38	12.0	B	0.34	11.4	B	0.39	17.0	B
		T	0.49	8.9	A	0.44	10.6	B	0.50	9.1	A	0.40	7.9	A
	Overall			27.9	C		25.1	C		35.4	D		43.0	D
Whitestone Expressway Southbound Service Road @ Ulmer St-SR	SB	T	0.86	40.5	D	0.60	30.8	C	0.81	37.2	D	0.82	38.1	D
	WB	TR	0.79	36.3	D	0.65	31.6	C	0.75	34.6	C	0.95	50.1	D
	Overall			38.6	D		31.2	C		36.0	D		44.4	D
Whitestone Expressway Southbound Service Road @ Ulmer St-UT	SB	T	0.86	40.5	D	0.60	30.8	C	0.81	37.2	D	0.82	38.1	D
	WB	TR	0.80	37.3	D	0.81	38.0	D	0.75	35.1	D	0.75	34.6	C
	Overall			39.0	D		34.6	C		36.3	D		39.0	D

Table A-1  
2010 Existing Condition: Traffic Capacity Analysis (Page 3 of 3)

Locations	Lane Group		AM			MID			PM			MID SAT		
			V/C	DELAY	LOS	V/C	DELAY	LOS	V/C	DELAY	LOS	V/C	DELAY	LOS
Whitestone Expressway Southbound Service Road @ 14th Ave	SB	L	0.54	28.3	C	0.40	25.5	C	0.44	26.1	C	0.37	24.7	C
		TR	0.47	25.1	C	0.24	22.3	C	0.24	22.3	C	0.20	21.9	C
	EB	TR	0.74	30.4	C	0.56	26.0	C	0.64	27.7	C	0.50	25.0	C
	WB	L	0.79	41.5	D	0.50	23.8	C	0.40	23.0	C	0.41	19.7	B
		T	0.63	16.5	B	0.52	14.4	B	0.71	18.9	B	0.61	16.1	B
	Overall		27.2	C		21.9	C		23.4	C		20.9	C	
Whitestone Expressway Northbound Service Road @ 14th Ave	NB	L	0.32	17.4	B	0.32	17.3	B	0.51	20.5	C	0.36	17.9	B
		TR	0.42	18.1	B	0.13	15.0	B	0.17	15.4	B	0.16	15.2	B
	EB	LT	0.95	44.5	D	0.59	20.9	C	0.74	25.5	C	0.51	19.5	B
	WB	TR	0.65	22.0	C	0.42	18.0	B	0.41	17.8	B	0.43	18.2	B
		Overall		28.2	C		18.9	B		21.3	C		18.4	B
Whitestone Expressway Northbound Service Road @ 20th Ave	NB	L	1.05	86.9	F	1.04	74.8	E	1.00	70.2	E	1.05	82.1	F
		LT	0.59	35.7	D	0.22	21.4	C	0.30	27.1	C	0.23	26.1	C
		R	0.15	28.8	C	0.43	25.4	C	0.29	27.5	C	0.30	27.7	C
	EB	L	0.51	38.0	D	0.89	47.6	D	0.86	53.0	D	0.69	45.6	D
		LT	0.24	12.4	B	0.23	11.0	B	0.39	16.6	B	0.34	16.0	B
	WB	TR	0.70	32.6	C	0.50	23.0	C	0.53	32.2	C	0.69	36.3	D
		Overall		44.6	D		40.2	D		40.8	D		45.7	D
Whitestone Expressway Southbound Service Road @ 20th Ave	SB	LTR	0.94	60.2	E	0.80	36.8	D	0.83	50.4	D	0.63	42.1	D
		R	0.92	67.8	E	0.63	34.2	C	0.92	70.5	E	1.04	99.1	F
	EB	T	0.40	38.6	D	0.49	28.6	C	0.54	36.8	D	0.47	35.4	D
		R	0.62	44.5	D	0.92	51.2	D	0.83	49.1	D	0.94	61.3	E
	WB	L	0.97	57.3	E	1.05	78.7	E	0.50	27.3	C	0.68	33.2	C
		T	0.45	16.0	B	0.44	14.2	B	0.55	16.0	B	0.61	17.1	B
	Overall		46.7	D		40.3	D		38.4	D		42.6	D	

Table A-2  
2010 Conditions with Improvements (page 1 of 2)

**AM Peak Hour**

Locations	Lane Group	2010 No Action			2010 With Improvements			Improvement Measures	
		V/C	DELAY	LOS	V/C	DELAY	LOS		
Whitestone Expressway Northbound Service Road @ 20th Ave	NB	L	1.05	86.9	F	1.02	78.5	E	shift 1 sec of green time from the EB/WB phase to the Nothbound phase
		LT	0.59	35.7	D	0.58	34.7	C	
		R	0.15	28.8	C	0.15	28.1	C	
	EB	L	0.51	38.0	D	0.52	39.1	D	
		LT	0.24	12.4	B	0.24	13.0	B	
	WB	TR	0.70	32.6	C	0.72	33.8	C	
		Overall		44.6	D		42.7	D	

**MD Peak Hour**

Locations	Lane Group	2010 No Action			2010 With Improvements			Improvement Measures	
		V/C	DELAY	LOS	V/C	DELAY	LOS		
Whitestone Expressway Northbound Service Road @ 20th Ave	NB	L	1.04	74.8	E	1.01	64.4	E	shift 1 sec of green time from the EB/WB phase to the Nothbound phase
		LT	0.22	21.4	C	0.21	20.6	C	
		R	0.43	25.4	C	0.42	24.4	C	
	EB	L	0.89	47.6	D	0.91	51.7	D	
		LT	0.23	11.0	B	0.24	11.6	B	
	WB	TR	0.50	23.0	C	0.52	23.9	C	
		Overall		40.2	D		38.0	D	

Table A-2  
2010 Conditions with Improvements (page 2 of 2)

**PM Peak Hour**

Locations	Lane Group	2010 No Action			2010 With Improvements			Improvement Measures
		V/C	DELAY	LOS	V/C	DELAY	LOS	
Whitestone Expressway Northbound Service Road @ 20th Ave	NB L	1.00	70.2	E	0.98	63.9	E	shift 1 sec of green time from the EB/WB phase to the Nothbound phase
	LT	0.30	27.1	C	0.29	26.3	C	
	R	0.29	27.5	C	0.28	26.8	C	
	EB L	0.86	53.0	D	0.87	55.3	E	
	LT	0.39	16.6	B	0.39	17.3	B	
	WB TR	0.53	32.2	C	0.54	33.2	C	
Overall			40.8	D		39.7	D	
Whitestone Expressway Southbound Service Road @ Linden PL	SB L	1.03	88.9	F	0.90	55.6	E	shift 3 sec of green time from the WB only phase to the Sothbound phase
	TR	0.72	39.0	D	0.62	33.5	C	
	EB TR	0.55	29.7	C	0.55	29.7	C	
	WB L	0.34	11.4	B	0.37	13.5	B	
	T	0.50	9.1	A	0.53	11.0	B	
	Overall			35.4	D		28.7	

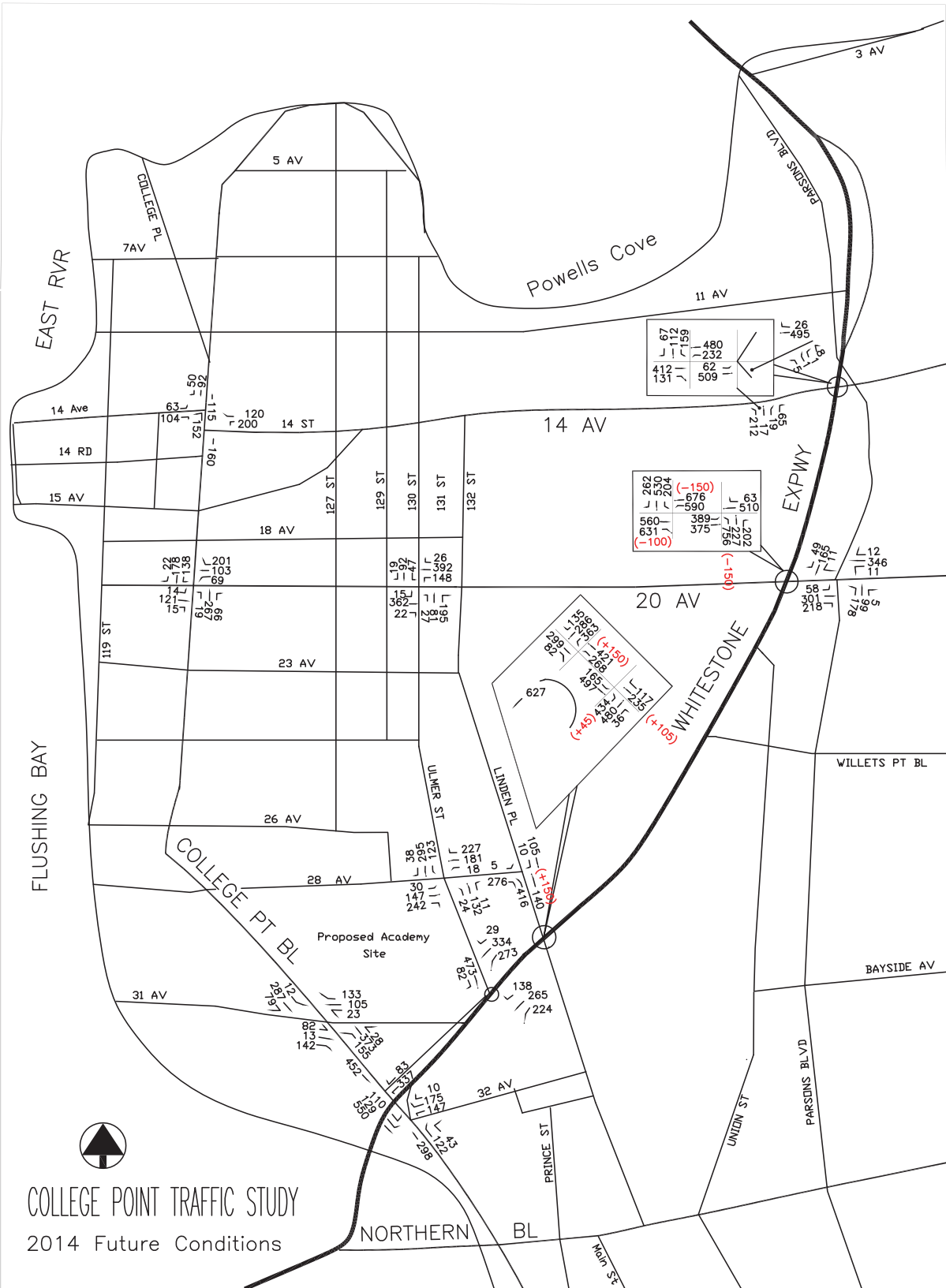
**SAT MD Peak Hour**

Locations	Lane Group	2010 No Action			2010 With Improvements			Improvement Measures
		V/C	DELAY	LOS	V/C	DELAY	LOS	
Whitestone Expressway Northbound Service Road @ 20th Ave	NB L	1.05	82.1	F	1.03	74.6	E	shift 1 sec of green time from the EB/WB phase to the Nothbound phase
	LT	0.23	26.1	C	0.23	25.4	C	
	R	0.30	27.7	C	0.29	27.0	C	
	EB L	0.69	45.6	D	0.70	46.8	D	
	LT	0.34	16.0	B	0.34	16.6	B	
	WB TR	0.69	36.3	D	0.71	37.5	D	
Overall			45.7	D		43.9	D	
Whitestone Expressway Southbound Service Road @ Linden PL	SB L	1.05	88.2	F	0.92	54.4	D	shift 3 sec of green time from the WB only phase to the Sothbound phase
	TR	0.66	36.6	D	0.57	32.0	C	
	EB TR	0.91	46.8	D	0.91	46.8	D	
	WB L	0.39	17.0	B	0.43	19.4	B	
	T	0.40	7.9	A	0.42	9.5	A	
	Overall			43.0	D		35.5	

**APPENDIX B  
2014 CONDITIONS  
VOLUME MAPS,  
LOS TABLES &  
IMPROVEMENTS**



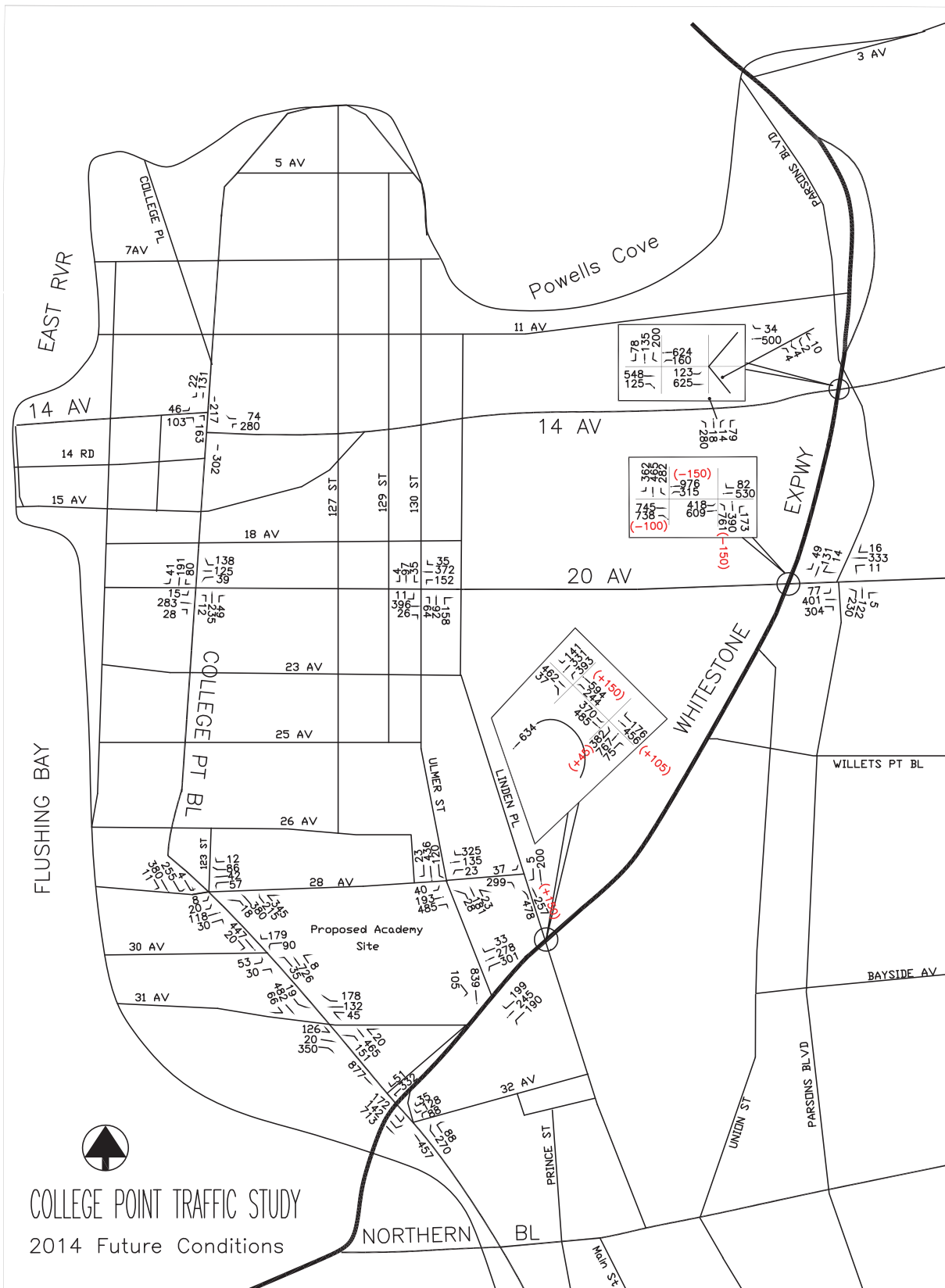
# Exhibit B-2 2014 MD Peak Hour Volumes



(000) Expected changes in traffic volumes due extension of Linden Pl from 28th to 20th Avenue by 2014

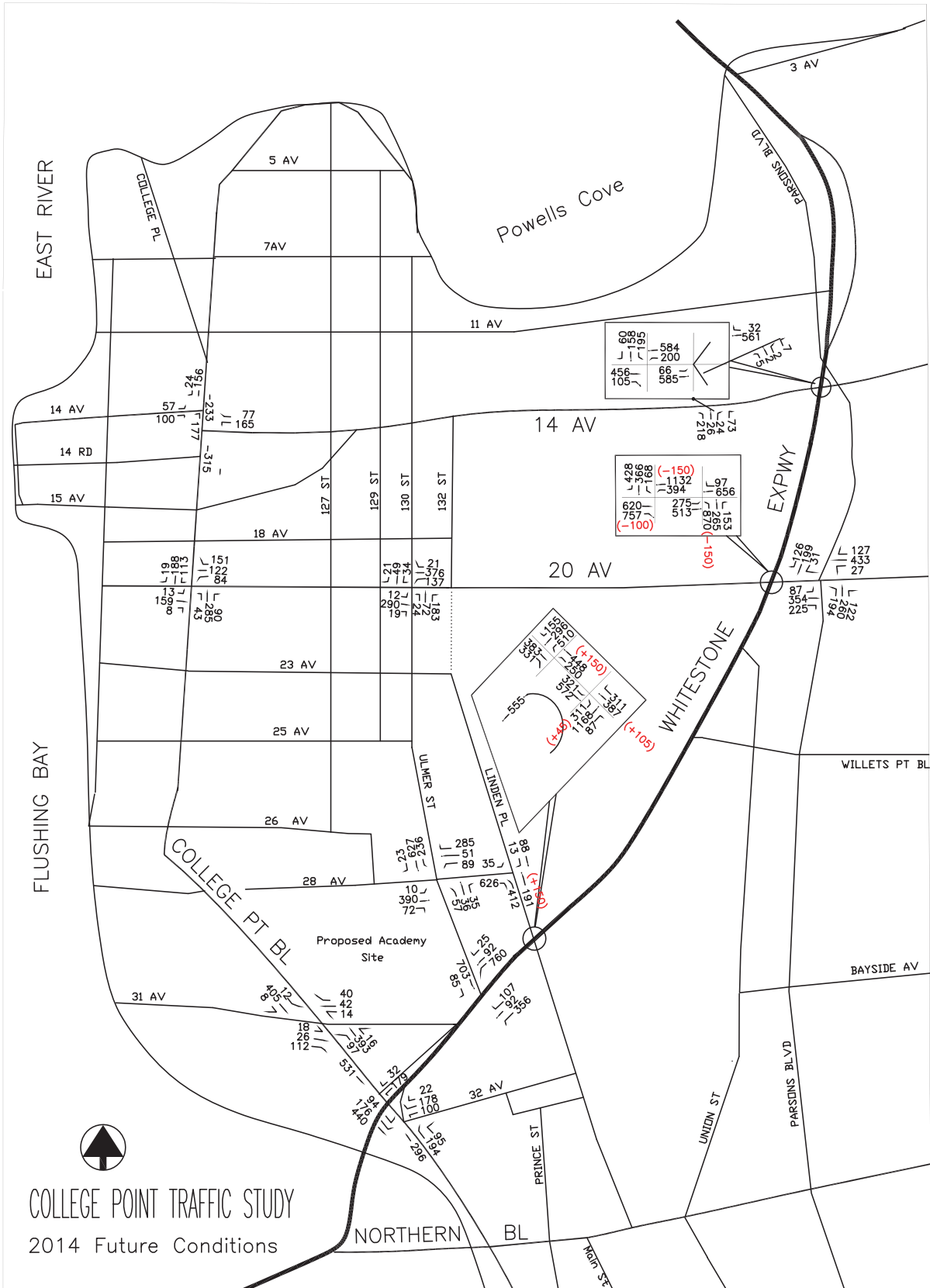


# Exhibit B-3 2014 PM Peak Hour Volumes



(000) Expected changes in traffic volumes due extension of Linden Pl from 28th to 20th Avenue by 2014

# Exhibit B-4 2014 SAT MD Peak Hour Volumes



(000) Expected changes in traffic volumes due extension of Linden Pl from 28th to 20th Avenue by 2014

Table B-1  
2014 Traffic Capacity Analysis (Page 1 of 3)

Locations	Lane Group		AM			MID			PM			MID SAT		
			V/C	DELAY	LOS	V/C	DELAY	LOS	V/C	DELAY	LOS	V/C	DELAY	LOS
130th ST @ 20th Ave	NB	LTR	0.49	18.9	B	0.48	18.7	B	0.48	18.6	B	0.42	17.7	B
	SB	LTR	0.40	19.3	B	0.60	25.0	C	0.47	20.9	C	0.44	20.5	C
	EB	LTR	0.71	16.8	B	0.55	12.6	B	0.54	12.1	B	0.42	10.4	B
	WB	L	0.38	11.9	B	0.47	13.0	B	0.41	11.8	B	0.32	10.2	B
		TR	0.74	16.9	B	0.58	13.3	B	0.53	12.1	B	0.53	12.1	B
	Overall		17.1	B		15.7	B		14.5	B		13.6	B	
28th Ave & Ulmer St	NB	LTR	0.28	11.6	B	0.17	10.7	B	0.21	11.0	B			
	SB	LTR	0.93	31.8	C	0.50	14.0	B	0.58	15.0	B	0.85	23.1	C
	EB	LTR	0.52	14.4	B	0.46	13.4	B	0.81	21.5	C	0.47	13.4	B
	WB	LTR	0.52	12.1	B	0.42	11.1	B	0.51	11.9	B	0.55	12.8	B
		Overall		20.6	C		12.6	B		16.1	B		17.6	B
College Point Blvd @ 14th Ave (North leg)	NB	LT	0.61	18.9	B	0.55	17.1	B	0.74	23.9	C	0.83	30.4	C
	SB	TR	0.22	11.2	B	0.24	11.4	B	0.24	11.5	B	0.28	11.9	B
	EB	LR	0.27	22.6	C	0.38	24.5	C	0.35	23.9	C	0.37	24.3	C
		Overall		17.6	B		17.6	B		20.8	C		24.2	C
College Point Blvd @ 14 Ave (South Leg)	NB	LT	0.24	11.5	B	0.28	12.0	B	0.53	15.9	B	0.56	16.5	B
	SB	TR	0.26	11.6	B	0.31	12.2	B	0.36	12.9	B	0.38	13.1	B
	WB	L	0.74	35.3	D	0.46	26.0	C	0.63	30.4	C	0.38	24.3	C
		R	0.35	23.9	C	0.29	22.9	C	0.18	21.4	C	0.18	21.5	C
		Overall		23.4	C		17.9	B		19.8	B		17.4	B
College Point Blvd @ 20th Avenue	NB	LTR	0.71	22.4	C	0.66	19.9	B	0.53	16.2	B	0.85	32.0	C
	SB	LTR	0.77	28.6	C	0.90	42.4	D	0.71	23.4	C	0.85	35.1	D
	EB	LTR	0.44	25.9	C	0.44	25.9	C	0.89	50.1	D	0.46	26.3	C
	WB	LTR	0.93	57.8	E	1.01	78.1	E	0.84	45.7	D	0.96	65.7	E
		Overall		35.0	D		44.1	D		34.3	C		40.8	D
College Point Blvd @ 31st Street	NB	L	0.47	16.9	B	0.31	10.9	B	0.36	13.7	B	0.22	10.6	B
		T	0.29	9.1	A	0.22	8.6	A	0.26	8.8	A	0.21	8.5	A
	SB	L	0.06	14.1	B	0.05	13.9	B	0.09	14.4	B	0.05	13.9	B
		T	0.38	16.9	B	0.24	15.3	B	0.35	16.6	B	0.31	16.1	B
	EB	LTR	1.15	124.7	F	0.47	29.0	C	1.11	105.8	F	0.27	25.6	C
	WB	LTR	1.41	225.5	F	0.42	27.8	C	0.92	55.0	E	0.19	24.7	C
		Overall		105.7	F		17.8	B		44.9	D		15.4	B
College Point Blvd @ 32th Ave	NB	T	0.68	30.6	C	0.39	24.9	C	0.61	29.0	C	0.39	24.9	C
	SB	L	0.69	32.6	C	0.55	20.6	C	0.82	40.5	D	0.64	23.9	C
		T	0.65	16.8	B	0.42	13.0	B	0.55	15.0	B	0.35	12.2	B
	WB	L	0.14	20.8	C	0.36	24.0	C	0.22	21.9	C	0.25	22.3	C
		Overall		23.8	C		18.9	B		24.8	C		19.5	B

Table B-1  
2014 Traffic Capacity Analysis (Page 2 of 3)

Locations	Lane Group		AM			MID			PM			MID SAT		
			V/C	DELAY	LOS	V/C	DELAY	LOS	V/C	DELAY	LOS	V/C	DELAY	LOS
College Point Righth turn @ 32 Ave_Whitestone Expressway	NB	TR	0.29	23.8	C	0.28	23.6	C	0.56	28.0	C	0.46	26.2	C
	EB	LT	0.44	13.4	B	0.46	13.9	B	0.59	16.7	B	0.49	14.3	B
	WB	TR	0.63	30.9	C	0.78	38.3	D	0.62	30.4	C	0.72	34.8	C
	Overall			22.8	C		26.9	C		24.8	C		25.4	C
College Point @ Whitestone Expressway Southbound Service Road	SB	L	0.43	22.3	C	0.57	25.2	C	0.56	25.0	C	0.30	20.3	C
		R	0.07	17.5	B	0.16	18.5	B	0.10	17.8	B	0.06	17.4	B
	EB	T	0.52	16.3	B	0.28	13.5	B	0.55	16.7	B	0.33	14.0	B
	WB	T	0.43	15.1	B	0.30	13.7	B	0.37	14.4	B	0.30	13.7	B
	Overall			16.7	B		16.8	B		17.5	B		14.9	B
Parson Blvd @ 20th Ave	NB	DefL	0.62	31.8	C	0.45	20.8	C	0.60	29.9	C			
		LTR										0.83	31.7	C
		TR	0.35	22.5	C	0.26	16.8	B	0.23	20.6	C			
	SB	LTR	0.31	21.2	C	0.27	16.3	B	0.19	19.6	B	0.42	18.3	B
	EB	LTR	0.76	33.1	C	0.64	22.3	C	0.92	44.9	D	0.90	36.9	D
	WB	LTR	0.58	25.9	C	0.34	17.0	B	0.34	21.5	C	0.54	19.9	B
	Overall			27.5	C		19.4	B		33.0	C		27.9	C
Whitestone Expressway Northbound Service Road @ Linden PL	NB	LT	0.87	34.2	C	0.92	38.8	D	1.03	60.5	E	1.09	80.3	F
		R	0.25	19.9	B	0.13	18.2	B	0.17	18.7	B	0.16	18.6	B
	EB	L	0.91	58.1	E	0.45	23.6	C	1.03	85.3	F	0.86	51.1	D
		T	0.29	13.6	B	0.36	14.4	B	0.33	14.0	B	0.39	14.7	B
	WB	TR	0.90	45.9	D	0.63	31.3	C	0.96	53.4	D	1.02	66.7	E
	Overall			36.8	D		29.7	C		53.1	D		60.9	E
Whitestone Expressway Southbound Service Road @ Linden PL	SB	L	0.82	51.1	D	0.83	45.9	D	1.05	94.8	F	1.07	94.6	F
		TR	1.15	121.2	F	0.58	31.1	C	0.76	40.6	D	0.68	37.4	D
	EB	TR	0.62	31.3	C	0.53	29.3	C	0.66	32.2	C	0.99	62.6	E
	WB	L	0.38	13.1	B	0.42	15.0	B	0.37	13.6	B	0.41	18.5	B
	Overall			50.8	D		26.3	C		36.4	D		47.2	D
Whitestone Expressway Southbound Service Road @ Ulmer St-UT	SB	T	0.95	49.7	D	0.61	31.1	C	1.04	73.0	E	0.93	48.1	D
	WB	TR	1.20	132.1	F	0.83	39.0	D	0.86	40.8	D	0.81	37.4	D
	Overall			93.3	F		35.3	D		59.5	E		43.2	D
Whitestone Expressway Southbound Service Road @ Ulmer St-SR	SB	T	0.95	49.7	D	0.61	31.1	C	1.04	73.0	E	0.93	48.1	D
	WB	TR	0.97	55.7	E	0.71	33.2	C	0.77	35.3	D	0.99	59.1	E
	Overall			52.6	D		32.2	C		57.5	E		50.5	D

Table B-1  
2014 Traffic Capacity Analysis (Page 3 of 3)

Locations	Lane Group		AM			MID			PM			MID SAT		
			V/C	DELAY	LOS	V/C	DELAY	LOS	V/C	DELAY	LOS	V/C	DELAY	LOS
Whitestone Expressway Southbound Service Road @ 14th Ave	SB	L	0.56	28.8	C	0.41	25.7	C	0.45	26.3	C	0.43	25.8	C
		TR	0.48	25.3	C	0.24	22.3	C	0.24	22.3	C	0.25	22.4	C
	WB	TR	0.76	31.1	C	0.57	26.3	C	0.65	27.9	C	0.56	25.9	C
		L	0.82	44.3	D	0.52	24.6	C	0.43	24.2	C	0.49	23.5	C
	T	0.64	16.8	B	0.53	14.6	B	0.72	19.3	B	0.64	16.9	B	
Overall				28.0	C		22.1	C		23.8	C		22.2	C
Whitestone Expressway Northbound Service Road @ 14th Ave	NB	L	0.33	17.5	B	0.32	17.4	B	0.52	20.7	C	0.40	18.6	B
		TR	0.43	18.2	B	0.13	15.0	B	0.18	15.5	B	0.19	15.5	B
	WB	LT	1.03	62.6	E	0.61	21.4	C	0.77	26.6	C	0.61	21.5	C
		TR	0.67	22.3	C	0.43	18.2	B	0.41	17.9	B	0.47	18.7	B
	Overall			34.5	C		19.2	B		21.8	C		19.4	B
Whitestone Expressway Northbound Service Road @ 20th Ave	NB	L	1.07	93.7	F	1.07	81.7	F	1.05	83.8	F	1.08	93.3	F
		LT	0.61	36.0	D	0.22	21.4	C	0.36	28.0	C	0.24	26.2	C
		R	0.26	30.6	C	0.44	25.6	C	0.35	28.8	C	0.30	27.8	C
	EB	L	0.66	45.2	D	0.92	52.3	D	1.04	93.7	F	0.71	47.4	D
		LT	0.22	12.2	B	0.24	11.1	B	0.41	17.0	B	0.35	16.1	B
	WB	TR	0.72	33.1	C	0.51	23.1	C	0.60	33.7	C	0.71	36.8	D
		Overall			47.2	D		43.0	D		50.4	D		49.5
Whitestone Expressway Southbound Service Road @ 20th Ave	SB	LTR	0.96	63.5	E	0.82	37.5	D	0.91	57.6	E	0.64	42.4	D
		R	1.02	88.6	F	0.64	34.6	C	0.93	73.6	E	1.06	104.9	F
	WB	T	0.41	38.7	D	0.50	28.8	C	0.61	38.2	D	0.48	35.6	D
		R	0.82	53.4	D	0.94	54.2	D	1.02	78.9	E	0.96	64.6	E
	WB	L	0.99	62.8	E	1.08	88.6	F	0.56	31.1	C	0.70	34.4	C
		T	0.46	16.1	B	0.45	14.3	B	0.60	16.9	B	0.63	17.5	B
Overall			52.4	D		42.7	D		46.4	D		44.1	D	

**Table B-2**  
**2014 Conditions with Improvements (Page 1 of 3)**

**AM Peak Hour**

Locations	Lane		2014 No Action			2014 With Improvements			Improvement Measures
	Group		V/C	DELAY	LOS	V/C	DELAY	LOS	
College Point Blvd @ 20th Avenue	NB	LTR	0.71	22.4	C	0.76	27.0	C	Shift 3 sec of green time from the NB/SB phase to the EB/WB phase
	SB	LTR	0.77	28.6	C	0.84	38.1	D	
	EB	LTR	0.44	25.9	C	0.40	23.0	C	
	WB	LTR	0.93	57.8	E	0.85	42.6	D	
	Overall			35.0	D		33.8	C	
College Point Blvd @ 31st Street	NB	L	0.47	16.9	B	0.55	25.1	C	Shift 7 sec of green time from the NB/SB phase to the EB/WB phase, and 2) Restripe WB approach to provide an exclusive Right and a Left-Thru lane
		T	0.29	9.1	A	0.33	13.0	B	
	SB	L	0.06	14.1	B	0.08	18.5	B	
		T	0.38	16.9	B	0.46	22.3	C	
	EB	LTR	1.15	124.7	F	0.66	29.1	C	
	WB	LTR	1.41	225.5	F				
		LT				0.84	41.4	D	
	R				1.01	69.7	E		
Overall			105.7	F		34.1	C		
Whitestone Expressway Northbound Service Road @ Linden PL	NB	LT	0.87	34.2	C	0.92	41.0	D	Shift 2 sec of green time from NB phase to the EB Only phase
		R	0.25	19.9	B	0.27	21.5	C	
	EB	L	0.91	58.1	E	0.84	46.5	D	
		T	0.29	13.6	B	0.28	12.5	B	
	WB	TR	0.90	45.9	D	0.90	45.9	D	
Overall			36.8	D		37.6	D		
Whitestone Expressway Southbound Service Road @ Linden PL	SB	L	0.82	51.1	D	0.71	40.0	D	Shift 3 sec of green time from EB/WB phase to the Southbound phase
		TR	1.15	121.2	F	1.00	66.9	E	
	EB	TR	0.62	31.3	C	0.70	36.0	D	
	WB	L	0.38	13.1	B	0.39	15.3	B	
		T	0.78	15.7	B	0.82	19.6	B	
Overall			50.8	D		37.3	D		
Whitestone Expressway Southbound Service Road @ Ulmer Street	SB	T	0.95	49.7	D	0.98	58.8	E	1) Widening of southbound approach to provide three moving lanes, 2) shift 2 sec of green time from Southbound phase to the WB U-turn phase
	WB-UT	TR	1.20	132.1	F	1.11	95.5	F	
	WB-SR	TR	0.97	55.7	E	0.97	55.7	E	
	Overall			93.3	F		77.6	E	
Whitestone Expressway Northbound Service Road @ 14th Ave	NB	L	0.33	17.5	B	0.35	19.0	B	Shift 2 sec of green time from the NB phase to the EB/WB phase
		TR	0.43	18.2	B	0.45	19.7	B	
	EB	LT	1.03	62.6	E	0.96	45.2	D	
	WB	TR	0.67	22.3	C	0.63	20.3	C	
	Overall			34.5	C		28.4	C	
Whitestone Expressway Northbound Service Road @ 20th Ave	NB	L	1.07	93.7	F	0.85	49.4	D	Due to the extension of Linden Place from 28th Avenue to 20th Avenue some traffic will be divert from this location, thereby improving the level of service in some lane groups.
		LT	0.61	36.0	D	0.61	36.0	D	
		R	0.26	30.6	C	0.26	30.6	C	
	EB	L	0.66	45.2	D	0.66	45.2	D	
		LT	0.22	12.2	B	0.22	12.2	B	
	WB	TR	0.72	33.1	C	0.72	33.1	C	
Overall			47.2	D		35.6	D		
Whitestone Expressway Southbound Service Road @ 20th Ave	SB	LTR	0.96	63.5	E	0.96	63.5	E	Due to the extension of Linden Place from 28th Avenue to 20th Avenue some traffic will be divert from this location, thereby improving the level of service in some lane groups.
		R	1.02	88.6	F	1.02	88.6	F	
	EB	T	0.41	38.7	D	0.41	38.7	D	
		R	0.82	53.4	D	0.65	45.3	D	
	WB	L	0.99	62.8	E	0.99	62.8	E	
		T	0.46	16.1	B	0.37	14.8	B	
Overall			52.4	D		52.8	D		

Table B-2  
2014 Conditions with Improvements (Page 2 of 3)

**MDPeak Hour**

Locations	Lane		2014 No Action			2014 With Improvements			Improvement Measures
	Group		V/C	DELAY	LOS	V/C	DELAY	LOS	
College Point Blvd @ 20th Avenue	NB	LTR	0.66	19.9	B	0.69	22.3	C	Shift 2 sec of green time from the NB/SB phase to the EB/WB phase
	SB	LTR	0.90	42.4	D	0.95	54.8	D	
	EB	LTR	0.44	25.9	C	0.41	24.0	C	
	WB	LTR	1.01	78.1	E	0.96	61.5	E	
	Overall			44.1		D	43.1		
Whitestone Expressway Northbound Service Road @ 20th Ave	NB	L	1.07	81.7	F	0.85	39.6	D	Due to the extension of Linden Place from 28th Avenue to 20th Avenue some traffic will be divert from this location, thereby improving the level of service in some lane groups.
		LT	0.22	21.4	C	0.22	21.4	C	
		R	0.44	25.6	C	0.44	25.6	C	
	EB	L	0.92	52.3	D	0.92	52.3	D	
		LT	0.24	11.1	B	0.24	11.1	B	
	WB	TR	0.51	23.1	C	0.51	23.1	C	
Overall			43.0		D	30.3		C	
Whitestone Expressway Southbound Service Road @ 20th Ave	SB	LTR	0.82	37.5	D	0.82	37.5	D	Due to the extension of Linden Place from 28th Avenue to 20th Avenue some traffic will be divert from this location, thereby improving the level of service in some lane groups.
		R	0.64	34.6	C	0.64	34.6	C	
	EB	T	0.50	28.8	C	0.50	28.8	C	
		R	0.94	54.2	D	0.79	39.1	D	
	WB	L	1.08	88.6	F	1.08	88.6	F	
		T	0.45	14.3	B	0.35	13.2	B	
Overall			42.7		D	41.1		D	

**PM Peak Hour**

Locations	Lane		2014 No Action			2014 With Improvements			Improvement Measures
	Group		V/C	DELAY	LOS	V/C	DELAY	LOS	
College Point Blvd @ 31st Street	NB	L	0.36	13.7	B	0.42	20.2	C	Shift 7 sec of green time from the NB/SB phase to the EB/WB phase, and 2) Restripe WB approach to provide an exclusive Right and a Left-Thru lane
		T	0.26	8.8	A	0.30	12.6	B	
	SB	L	0.09	14.4	B	0.11	19.1	B	
		T	0.35	16.6	B	0.42	21.8	C	
	EB	LTR	1.11	105.8	F	0.77	33.0	C	
	WB	LTR	0.92	55.0	E				
	Overall			44.9		D	44.3		
Whitestone Expressway Southbound Service Road @ Linden PL	SB	L	1.05	94.8	F	0.92	58.3	E	Shift 3 sec of green time from EB/WB phase to the Southbound phase
		TR	0.76	40.6	D	0.66	34.4	C	
	EB	TR	0.66	32.2	C	0.75	37.6	D	
	WB	L	0.37	13.6	B	0.38	15.8	B	
	Overall			36.4		D	31.7		
Whitestone Expressway Southbound Service Road @ Ulmer Street	SB	T	1.04	73.0	E	0.93	47.1	D	Widening of southbound approach to provide three moving lanes
		R				0.26	26.2	C	
	WB-UT	TR	0.86	40.8	D	0.86	40.8	D	
	WB-SR	TR	0.77	35.3	D	0.77	35.3	D	
Overall			59.5		E	43.2		D	
Whitestone Expressway Northbound Service Road @ 20th Ave	NB	L	1.05	83.8	F	0.84	45.2	D	Due to the extension of Linden Place from 28th Avenue to 20th Avenue some traffic will be divert from this location, thereby improving the level of service in some lane groups.
		LT	0.36	28.0	C	0.36	28.0	C	
		R	0.35	28.8	C	0.35	28.8	C	
	EB	L	1.04	93.7	F	1.04	93.7	F	
		LT	0.41	17.0	B	0.41	17.0	B	
	WB	TR	0.60	33.7	C	0.60	33.7	C	
Overall			50.4		D	40.6		D	
Whitestone Expressway Southbound Service Road @ 20th Ave	SB	LTR	0.91	57.6	E	0.91	57.6	E	Due to the extension of Linden Place from 28th Avenue to 20th Avenue some traffic will be divert from this location, thereby improving the level of service in some lane groups.
		R	0.93	73.6	E	0.93	73.6	E	
	EB	T	0.61	38.2	D	0.61	38.2	D	
		R	1.02	78.9	E	0.88	53.7	D	
	WB	L	0.56	31.1	C	0.56	31.1	C	
	Overall			46.4		D	42.1		

Table B-2  
2014 Conditions with Improvements (Page 3 of 3)

**SAT MD Peak Hour**

Locations	Lane		2014 No Action			2014 With Improvements			Improvement Measures
	Group		V/C	DELAY	LOS	V/C	DELAY	LOS	
College Point @ 20th Avenue	NB	LTR	0.85	32.0	C	0.91	41.6	D	Shift 3 sec of green time from the NB/SB phase to the EB/WB phase
	SB	LTR	0.85	35.1	D	0.92	49.5	D	
	EB	LTR	0.46	26.3	C	0.42	23.3	C	
	WB	LTR	0.96	65.7	E	0.87	46.3	D	
	Overall			40.8	D		42.3	D	
Whitestone Expressway Southbound Service Road @ Linden PL	SB	L	1.07	94.6	F	0.90	50.6	D	Shift 4 seconds of green time from WB phase to the Southbound phase
		TR	0.68	37.4	D	0.57	31.2	C	
	EB	TR	0.99	62.6	E	0.99	62.6	E	
	WB	L	0.41	18.5	B	0.46	22.0	C	
		T	0.58	10.4	B	0.62	13.3	B	
Overall			47.2	D		38.7	D		
Whitestone Expressway Southbound Service Road @ Ulmer St	SB	T	0.93	48.1	D	0.83	38.8	D	Widening of southbound approach to provide three moving lanes
		R				0.21	25.3	C	
	WB-UT	TR	0.81	37.4	D	0.81	37.4	D	
	WB-SR	TR	0.99	59.1	E	0.99	59.1	E	
Overall			50.5	D		48.1	D		
Whitestone Expressway Northbound Service Road @ 20th Ave	NB	L	1.08	93.3	F	0.90	49.6	D	Due to the extension of Linden Place from 28th Avenue to 20th Avenue some traffic will be divert from this location, thereby improving the level of service in some lane groups.
		LT	0.24	26.2	C	0.24	26.2	C	
		R	0.30	27.8	C	0.30	27.8	C	
	EB	L	0.71	47.4	D	0.71	47.4	D	
		LT	0.35	16.1	B	0.35	16.1	B	
	WB	TR	0.71	36.8	D	0.71	36.8	D	
Overall			49.5	D		35.8	D		
Whitestone Expressway Southbound Service Road @ 20th Ave	SB	LTR	0.64	42.4	D	0.64	42.4	D	Due to the extension of Linden Place from 28th Avenue to 20th Avenue some traffic will be divert from this location, thereby improving the level of service in some lane groups.
		R	1.06	104.9	F	1.06	104.9	F	
	EB	T	0.48	35.6	D	0.48	35.6	D	
		R	0.96	64.6	E	0.83	49.0	D	
	WB	L	0.70	34.4	C	0.70	34.4	C	
		T	0.63	17.5	B	0.55	15.9	B	
Overall			44.1	D		41.5	D		



