

## A. INTRODUCTION

Each previous chapter examines the potential for significant adverse impacts resulting from the proposed actions. Significant adverse impacts to traffic have been identified in Chapter 10, “Transportation,” and measures have been considered to mitigate the anticipated impacts. These measures are detailed below.

### PRINCIPAL CONCLUSIONS

#### TRAFFIC

As discussed in Chapter 10, “Transportation,” weekday midday and PM and Saturday midday and PM traffic conditions were evaluated at a total of 38 intersections which center around major arterials that serve the Mall, including Richmond Avenue, Richmond Hill Road, Forest Hill Road, and arterials farther away from the site that collect local traffic. These 38 intersections, where project-generated trips are expected to be most concentrated, were analyzed for the reasonable worst-case scenario of the November to December shopping period post-Thanksgiving. The traffic impact analysis indicates that 14, 26, 24, and 24 intersections would be significantly adversely impacted in the weekday midday, weekday PM, Saturday midday, and Saturday PM peak hours, respectively. In addition, 19, ~~39~~ 37, 43, and 35 lane groups would be significantly adversely impacted in the weekday midday, weekday PM, Saturday midday, and Saturday PM peak hours, respectively.

The recommended mitigation measures to address significant adverse impacts consist of standard signal timing changes, and lane reconfiguration, ~~and parking regulation modifications~~. These measures, which are subject to review and approval by the New York City Department of Transportation (NYCDOT), are considered readily implementable measures as per the *CEQR Technical Manual*. However, at one intersection (the unsignalized intersection of Staten Island Mall East Driveway at Marsh Avenue), the impact on the Mall East Driveway left lane group could only be mitigated by installing a new signal. Therefore, a signal warrant analysis was conducted as per requirements of the Manual of Uniform Traffic Control Devices (MUTCD), 2009 Edition. The signal warrant analysis concluded that Warrant 3A-Peak Hour was satisfied, and therefore the signal would be warranted. In addition, at the intersection of Platinum Avenue and Staten Island Mall Drive, the significant adverse impact could be mitigated by adding to the existing Platinum Avenue signal a left turn phase onto Staten Island Mall Drive. The Applicants have committed to the installation of a new signal and the addition of a left turn phase on an existing signal as described above, and this commitment would be incorporated into a Restrictive Declaration.

Totals of ~~42~~, ~~22~~ 9, ~~45~~ 16, ~~11~~, and ~~47~~ 12 intersections could be fully mitigated in the weekday midday, weekday PM, Saturday midday, and Saturday PM peak hours, respectively. ~~Two~~ One, ~~zero~~, ~~one~~, ~~four~~, and ~~four~~ three intersections could be partially mitigated (one or more significantly adversely impacted lane groups at an intersection could be mitigated, but one or more lane groups at the intersection would remain significantly adversely impacted) in the weekday midday, weekday PM,

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Saturday midday, and Saturday PM peak hours, respectively; and ~~zero, three, five~~ four, ten, twelve, and ~~three~~ nine intersections would remain unmitigated in the weekday midday, weekday PM, Saturday midday, and Saturday PM peak hours, respectively.

The following intersections could not be mitigated in one or more peak hours:

- Richmond Hill Road at Richmond Avenue.
- Forest Hill Road at Richmond Avenue,
- Draper Place at Richmond Avenue,
- Richmond Hill Road at Forest Hill Road.
- Victory Boulevard at Richmond Avenue.
- Signs Road at Richmond Avenue.
- Nome Avenue at Richmond Avenue.
- Drumgoole Road West at Richmond Avenue,
- Richmond Road at Arthur Kill Road-Richmond Hill Road,
- Arthur Kill Road at Corbin Avenue.
- Arthur Kill Road at Drumgoole Road West. and
- Rockland Avenue at Forest Hill Road.

In addition, the following intersections could be partially mitigated in one or more time periods:

- Richmond Hill Road at Richmond Avenue,
- ~~Richmond Hill Road at Forest Hill Road,~~
- Platinum Avenue at Staten Island Mall Drive,
- ~~Victory Boulevard at Richmond Avenue,~~
- Draper Place at Richmond Avenue, and
- ~~Nome Avenue at Richmond Avenue, and~~
- Rockland Avenue at Forest Hill Road.

~~There is potential for additional impacts to be identified between Draft and Final of this Environmental Impact Statement (EIS), and if so, additional measures will be explored, where feasible, to further mitigate the identified impacts. The proposed mitigation measures are subject to review and approval by the NYCDOT, and if certain proposed mitigation measures are deemed infeasible by NYCDOT, alternatives will be analyzed. If no other alternative mitigation measures can be identified, those impact locations would be unmitigated.~~

~~Between Draft and Final of this EIS, additional measures will be explored, where feasible, to further mitigate the identified impacts. If no additional feasible measures can be identified, the projected impacts would remain unmitigated, and would therefore be considered unavoidable adverse impacts. Please also see the “Unavoidable Adverse Impacts” chapter.~~

## **B. TRAFFIC**

As described in Chapter 10, “Transportation,” in the 2019 Future with the Proposed Project (With Action condition), traffic study area vehicle volumes are expected to increase due to the Staten Island Mall (the Mall) enlargement as compared to the 2019 Future without the Proposed Project (No Action condition). As such, a number of intersections would experience significant

adverse impacts to one or more lane groups as a result of the Mall enlargement. This section describes the recommended mitigation measures to address these impacts. As shown in **Table 17-1**, totals of 14, 26, 24, and 24 intersections would be significantly adversely impacted in the weekday midday, weekday PM, Saturday midday, and Saturday PM peak hours, respectively. In addition, 19, ~~39~~ 37, 43, and 35 lane groups would be significantly adversely impacted in the weekday midday, weekday PM, Saturday midday, and Saturday PM peak hours, respectively.

**Table 17-1**  
**No Action versus With Action Intersection Level of Service Summary**

	2019 No Action Conditions				2019 With Action Conditions			
	Weekday Midday Peak Hour	Weekday PM Peak Hour	Saturday Midday Peak Hour	Saturday PM Peak Hour	Weekday Midday Peak Hour	Weekday PM Peak Hour	Saturday Midday Peak Hour	Saturday PM Peak Hour
Number of Intersections Operating at LOS A/B/C	32	27	25	<del>31</del> <u>30</u>	29	21	20	20
Number of Intersections Operating at LOS D	5	<del>9</del> <u>8</u>	11	6	<del>6</del> <u>5</u>	8	6	11
Number of Intersections Operating at LOS E	1	<del>2</del> <u>3</u>	1	<del>0</del> <u>1</u>	<del>2</del> <u>3</u>	<del>7</del> <u>6</u>	8	3
Number of Intersections Operating at LOS F	0	0	1	1	1	<del>2</del> <u>3</u>	4	4
Number of Intersections with Significant Impacts	--	--	--	--	14	26	24	24
Number of Lane Groups Operating at LOS E/F out of Approximately 200 Lane Groups	<del>49</del> <u>21</u>	<del>29</del> <u>32</u>	<del>29</del> <u>30</u>	<del>20</del> <u>21</u>	<del>23</del> <u>25</u>	<del>38</del> <u>39</u>	<del>46</del> <u>48</u>	<del>36</del> <u>37</u>
Number of Lane Groups with Significant Impacts	--	--	--	--	19	<del>39</del> <u>37</u>	43	35

**Table 17-2** summarizes which intersections containing significant adverse impacts could be fully mitigated, partially mitigated (~~one or more significantly adversely impacted lane groups at an intersection could be mitigated, but one or more lane groups at the intersection would remain significantly adversely impacted~~), and which intersections could not be mitigated. As shown in **Table 17-2**, totals of ~~42, 22~~ 9, ~~45~~ 16, 11, and ~~47~~ 12 intersections could be fully mitigated in the weekday midday, weekday PM, Saturday midday, and Saturday PM peak hours, respectively. ~~Two~~ One, ~~zero~~, ~~one~~, ~~four~~, and ~~four~~ three intersections could be partially mitigated in the weekday midday, weekday PM, Saturday midday, and Saturday PM peak hours, respectively; and ~~zero, three, five~~ four, ten, twelve, and ~~three~~ nine intersections would remain unmitigated in the weekday midday, weekday PM, Saturday midday, and Saturday PM peak hours, respectively.

**Table 17-3** summarizes the recommended mitigation measures to address significant adverse impacts, ~~which are subject to review and approval by the New York City Department of Transportation (NYCDOT)~~. As shown in **Table 17-3**, these measures consist of standard signal timing changes and lane reconfiguration, ~~and parking regulation modifications~~, which are considered readily implementable measures as per the 2014 *City Environmental Review (CEQR) Technical Manual*. However, at one intersection (the unsignalized intersection of Staten Island Mall East Driveway at Marsh Avenue), the impact on the Mall East Driveway left lane group could only be mitigated by installing a new signal. Therefore, a signal warrant analysis was conducted as per requirements of the Manual of Uniform Traffic Control Devices (MUTCD), 2009 Edition. The signal warrant analysis concluded that Warrant 3A-Peak Hour was satisfied, and therefore the signal would be warranted. In addition, at the intersection of Platinum Avenue and Staten Island Mall Drive, the significant adverse impact could be mitigated by adding to the existing Platinum Avenue signal a left turn phase onto Staten Island Mall Drive.

**Table 17-2  
Significant Adverse Impact Summary**

	2019 With Action Conditions				2019 Action-With-Mitigation Conditions			
	Weekday Midday Peak Hour	Weekday PM Peak Hour	Saturday Midday Peak Hour	Saturday PM Peak Hour	Weekday Midday Peak Hour	Weekday PM Peak Hour	Saturday Midday Peak Hour	Saturday PM Peak Hour
Number of Intersections With no Significant Adverse Impact	24	12	14	14	24	12	14	14
Number of Intersections That Could be Fully Mitigated	--	--	--	--	<u>12</u> <u>9</u>	<u>22</u> <u>16</u>	<u>45</u> <u>11</u>	<u>47</u> <u>12</u>
Number of Intersections That Could be Partially Mitigated	--	--	--	--	<u>2</u> <u>1</u>	<u>4</u> <u>0</u>	<u>4</u> <u>1</u>	<u>43</u> <u>3</u>
Number of Intersections That Could not be Mitigated	14	26	24	24	<u>0</u> <u>4</u>	<u>3</u> <u>10</u>	<u>5</u> <u>12</u>	<u>3</u> <u>9</u>

A Restrictive Declaration would be recorded at the time of final approval of all land-use related actions required to authorize the proposed project and would provide for the implementation of the mitigation measures as identified in this chapter at the intersection of Marsh Avenue and Staten Island Mall East Driveway and at Platinum Avenue at Staten Island Mall Drive. The Restrictive Declaration would require the Applicants, if so requested by NYCDOT, to install at the Applicants' expense a new traffic signal at the intersection of Marsh Avenue and Staten Island Mall East Driveway; and to install at the Applicants' expense a new left turn phase on the existing traffic signal at Platinum Avenue at Staten Island Mall Drive.

Tables 17-4a to 17-4d compare the volume-to-capacity ratios, delays and levels of service with implementation of these measures to both the No Action and With Action conditions. Table 17-5 summarizes the lane groups that remain unmitigated. As shown in these tables, the following intersections could not be mitigated in one or more peak hours:

**RICHMOND HILL ROAD AT RICHMOND AVENUE**

Unmitigated Impacts would occur on the westbound right lane group and the Richmond Avenue southbound left and southbound through-right lane groups in the weekday PM and Saturday midday peak hours.

**FOREST HILL ROAD AT RICHMOND AVENUE**

Unmitigated impacts would occur on the Richmond Avenue northbound through lane group in the Saturday midday Peak Hour and on the Forest Hill Road westbound left-right lane group in both the Saturday midday and PM peak hours.

**RICHMOND HILL ROAD AT FOREST HILL ROAD**

Unmitigated impacts would occur on the Richmond Hill Road westbound left-through-right lane group and the Forest Hill Road northbound and southbound through-right lane groups in all peak hours.

**Table 17-3  
Recommended Traffic Mitigation Measures**

Intersection	Signal Phase	No Action Signal Timing (Seconds) (1)				Proposed Signal Timing (Seconds) (1)				Recommended Mitigation
		Weekday MD	Weekday PM	Saturday MD	Saturday PM	Weekday MD	Weekday PM	Saturday MD	Saturday PM	
1. Richmond Hill Rd (EB/WB) @ Richmond Ave (NB/SB)	EB/WB	29	29	29	29	29	25	26	27	<ul style="list-style-type: none"> <li>- Restripe westbound approach as two right turn lanes, one shared left-through lane, one exclusive left turn lane, and two eastbound receiving lanes (all 10' wide)</li> <li>- Transfer 2s of green time from NB/SB to NBL/SBL + EBR in Weekday MD.</li> <li>- Transfer 3s of green time from EB/WB to NB/SB in Weekday PM.</li> <li>- Transfer 1s of green time from EB/WB to NBL/SBL + EBR in Weekday PM.</li> <li>- Transfer 3s of green time from EB/WB to NBL/SBL + EBR in Saturday MD.</li> <li>- Transfer 2s of green time from EB/WB to NBL/SBL + EBR in Saturday PM.</li> </ul>
	NB/SB	41	36	41	41	39	39	41	41	
	NBL/SBL + EBR	20	25	20	20	22	26	23	22	
2. SI Mall NW Dway (EB/WB) @ Richmond Ave (NB/SB)	EB	30	30	30	30	30	30	28	28	<ul style="list-style-type: none"> <li>- Transfer 4s of green time from NB/SB to SB in Weekday MD and Saturday MD and PM.</li> <li>- Transfer 2s of green time from NB/SB to SB in Weekday PM.</li> <li>- Transfer 2s of green time from EB to SB in Saturday MD and PM.</li> </ul>
	NB/SB	40	40	37	37	36	38	33	33	
	SB	20	20	23	23	24	22	29	29	
4. Platinum Ave (EB/WB) @ Richmond Ave (NB/SB)	WB	28	28	28	28	28	30	31	33	<ul style="list-style-type: none"> <li>- Transfer 2s of green time from NB/SB to WB in Weekday PM.</li> <li>- Transfer 3s of green time from NB/SB to WB in Saturday MD.</li> <li>- Transfer 4s of green time from NB/SB to WB in Saturday PM.</li> <li>- Transfer 1s of green time from SB to WB in Saturday PM.</li> </ul>
	NB/SB	46	48	46	46	46	46	43	42	
	SB	16	14	16	16	16	14	16	15	
5. Forest Hill Rd (EB/WB) @ Richmond Ave (NB/SB)	WB	32	32	32	32	32	34	32	32	<ul style="list-style-type: none"> <li>- Transfer 2s of green time from NB/SB to WB in Weekday PM.</li> </ul>
	NB/SB	46	46	46	46	46	44	46	46	
	SB	12	12	12	12	12	12	12	12	
6. Richmond Hill Rd (EB/WB) @ SI Mall N Driveway (NB/SB)	EB/WB	54	54	54	54	54	54	51	51	<ul style="list-style-type: none"> <li>- Transfer 3s of green time from EB/WB to NB in Saturday MD and PM.</li> </ul>
	NB	36	36	36	36	36	36	39	39	
7. Richmond Hill Rd (EB/WB) @ Marsh Ave (NB/SB)	WB + NBR	32	32	32	32	32	31	30	30	<ul style="list-style-type: none"> <li>- Transfer 1s of green time from WB + NBR to NBB in Weekday PM.</li> <li>- Transfer 2s of green time from WB + NBR to NB in Saturday MD and PM.</li> </ul>
	EB/WB	36	36	36	36	36	36	36	36	
	NB	22	22	22	22	22	23	24	24	
8. Richmond Hill Rd (EB/WB) @ Forest Hill Rd (NB/SB)	EB	11	11	11	11	10	16	15	20	<ul style="list-style-type: none"> <li>- Restripe WB approach as one 11' wide, 100' long left turn bay, one 11' shared thru-right lane, and 0-2.5' of hatching.</li> <li>- Restripe WB receiving side as one 11' travel lane and 0-2.5' of hatching.</li> <li>- Transfer 1s of green time from EB to EB/WB in Weekday MD.</li> <li>- Transfer 1s of green time from NBL/SBL to NB/SB in Weekday MD and PM.</li> <li>- Transfer 5s of green time from EB/WB to EB in Weekday PM.</li> <li>- Transfer 4s of green time from EB/WB to EB in Saturday MD.</li> <li>- Transfer 9s of green time from EB/WB to EB in Saturday PM.</li> <li>- Transfer 2s of green time from NBL/SBL to NB/SB in Saturday MD and PM.</li> </ul>
	EB/WB	48	48	48	48	49	43	44	39	
	NB/SB	50	50	50	50	51	51	52	52	
	NBL/SBL	11	11	11	11	10	10	9	9	
10. Platinum Ave (EB/WB) @ Staten Island Mall Dr (NB/SB)	EBL/WBL	-	-	-	-	12	12	12	12	<ul style="list-style-type: none"> <li>- Transfer 12s of green time from EB/WB to a new EBL/WBL lead phase in all periods.</li> <li>- Transfer 5s of green time from EB/WB to NB/SB in Weekday MD and PM.</li> <li>- Transfer 6s of green time from EB/WB to NB/SB in Saturday PM.</li> </ul>
	EB/WB	50	50	50	50	33	33	38	32	
	NB/SB	40	40	40	40	45	45	40	46	
11. Platinum Ave (EB/WB) @ Marsh Ave (NB/SB)	WB	36	36	36	36	34	33	33	32	<ul style="list-style-type: none"> <li>- Transfer 2s of green time from WB to SB in Weekday MD.</li> <li>- Transfer 3s of green time from WB to SB in Weekday PM and Saturday MD.</li> <li>- Transfer 4s of green time from WB to SB in Saturday PM.</li> </ul>
	EB + SBR	36	36	36	36	36	36	36	36	
	SB	18	18	18	18	20	21	21	22	

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Table 17-3 (cont'd)  
Recommended Traffic Mitigation Measures

Intersection	Signal Phase	No Action Signal Timing (Seconds) (1)				Proposed Signal Timing (Seconds) (1)				Recommended Mitigation	
		Weekday MD	Weekday PM	Saturday MD	Saturday PM	Weekday MD	Weekday PM	Saturday MD	Saturday PM		
12. SI Mall E Driveway (EB/WB) @ Marsh Ave (NB/SB)	EB	-	-	-	-	36	36	36	36	- Install new signal with phasing plan as shown pending approval.	
	NB/SB	-	-	-	-	54	54	54	54		
14. SI Mall NE Driveway (EB/WB) @ Marsh Ave (NB/SB)	EB	36	36	36	36	36	36	36	37	- Transfer 1s of green time from NB/SB to EB in Saturday PM.	
	NB/SB	54	54	54	54	54	54	54	53		
16. Goethals Rd W - W Caswell Ave/ Staten Island Expy WB Off-Ramp (EB/WB) @ Richmond Ave (NB/SB)	WB	18	18	18	18	18	18	18	18	- Transfer 1s of green time from NB to NB/SB in Weekday PM. - Transfer 2s of green time from EB to NB/SB in Saturday MD.	
	EB	18	18	18	18	18	18	16	18		
	NB	18	18	18	18	18	17	18	18		
	NB/SB	36	36	36	36	36	37	38	36		
19. Victory Blvd (EB/WB) @ Richmond Ave (NB/SB)	WB	15	18	15	15	17	20	15	18	- Transfer 2s of green time from EB/WB to WB in Weekday MD and Saturday PM. - Transfer 1s of green time from EB/WB to WB in Weekday PM. - Transfer 1s of green time from EB/WB to NB/SB in Weekday PM. - Transfer 1s of green time from NBL/SBL to NB/SB in Weekday and Saturday PM. - Transfer 1s of green time from NBL/SBL to WB in Weekday and Saturday PM. - Transfer 2s of green time from NBL/SBL to NB/SB in Saturday MD. - Transfer 2s of green time from EB/WB to NB/SB in Saturday PM.	
	EB/WB	31	31	31	31	29	29	31	27		
	NB/SB	33	30	33	33	33	32	35	36		
	NBL/SBL	11	11	11	11	11	9	9	9		
20. Signs Rd (EB/WB) @ Richmond Ave (NB/SB)	EB	24	24	24	24	23	21	21	22	- Install "No Standing Anytime" for 100' on south curb of EB approach. - Install "No Standing Anytime" for 100' on west curb of SB approach. - Restripe EB approach as one 15' left turn lane and one 12' right turn lane. - Restripe SB approach as three 11' through lanes and one 12.5' right turn lane. - Allow EBR to go during NB phase. - Transfer 1s of green time from EB to NB in Weekday MD and PM and Saturday MD. - Transfer 2s of green time from EB to NB in Saturday PM. - Transfer 2s of green time from EB to NB/SB in Weekday PM and Saturday MD.	
	NB	20	21	20	20	21	22	21	22		
	NB/SB	46	45	46	46	46	47	48	46		
22. Draper Pl (EB/WB) @ Richmond Ave (NB/SB)	EB/WB	29	29	29	29	29	29	29	28	- Transfer 1s of green time from NB/SB to NB in Weekday MD. - Transfer 1s of green time from EB to NB/SB in Saturday PM.	
	NB/SB	34	37	34	34	33	37	34	35		
	NB	27	24	27	27	28	24	27	27		
23. Nome Ave (EB/WB) @ Richmond Ave (NB/SB)	WB	27	27	27	27	28	28	29	27	- Restripe NB approach as one 10' and three 12' thru lanes and one 200' long, 11' wide right turn bay. - Transfer 1s of green time from NB/SB to WB in Weekday MD and PM. - Transfer 2s of green time from NB/SB to WB in Saturday MD.	
	NB/SB	44	38	44	44	43	37	42	44		
	SB	19	25	19	19	19	25	19	19		
24. Drumgoole Rd W (EB/WB) @ Richmond Ave (NB/SB)	EB	45	44	45	45	45	43	45	45	- Transfer 1s of green time from EB to NB/SB in Weekday PM.	
	NB/SB	45	46	45	45	45	47	45	45		

Table 17-3 (cont'd)  
Recommended Traffic Mitigation Measures

Intersection	Signal Phase	No Action Signal Timing (Seconds) (1)				Proposed Signal Timing (Seconds) (1)				Recommended Mitigation
		Weekday MD	Weekday PM	Saturday MD	Saturday PM	Weekday MD	Weekday PM	Saturday MD	Saturday PM	
25. Arthur Kill Rd (EB/WB) @ Richmond Ave (NB/SB)	EB/WB	35	37	35	35	34	34	31	32	<ul style="list-style-type: none"> <li>- Restripe westbound approach as 11' one right turn lane, two 11' through lanes, one 11' left turn lane, and two 11.5' eastbound receiving lanes.</li> <li>- Transfer 1s of green time from EB/WB to NBL/SBL + EBR in all periods.</li> <li>- Transfer 2s of green time from EB/WB to NB/SB in Weekday and Saturday PM.</li> <li>- Transfer 3s of green time from EB/WB to NB/SB in Saturday MD.</li> </ul>
	NBL/SBL + EBR	20	20	20	20	21	21	21	21	
	NB/SB	35	33	35	35	35	35	38	37	
27. Katan Ave (EB/WB) @ Richmond Ave (NB/SB)	EB/WB	36	31	36	36	36	30	34	32	<ul style="list-style-type: none"> <li>- Transfer 1s of green time from EB/WB to NB/SB in Weekday PM.</li> <li>- Transfer 2s of green time from EB/WB to NB/SB in Saturday MD.</li> <li>- Transfer 4s of green time from EB/WB to NB/SB in Saturday PM.</li> </ul>
	NB/SB	54	59	54	54	54	60	56	58	
29. Clarke Ave (EB/WB) @ Arthur Kill Rd (NB/SB)	WB + NBR	40	40	40	40	40	41	40	40	<ul style="list-style-type: none"> <li>- Transfer 1s of green time from SB to NB/SB in Weekday PM.</li> <li>- Transfer 1s of green time from SB to WB in Weekday PM.</li> </ul>
	SB	14	14	14	14	14	12	14	14	
	NB/SB	36	36	36	36	36	37	36	36	
30. Arthur Kill Rd (EB/WB) @ Corbin Ave (NB/SB)	EB/WB	-	-	-	-	-	-	-	-	<ul style="list-style-type: none"> <li>- Install "No Standing Anytime" for 100' on east curb of NB approach.</li> <li>- Restripe NB approach as one 10' left turn lane, one 10' right turn lane, and one 20' southbound receiving lane with parking.</li> </ul>
	NB	-	-	-	-	-	-	-	-	
31. Arthur Kill Rd (EB/WB) @ Drumgoole Rd W (NB/SB)	EBL/WBL	22	20	22	22	19	16	17	16	<ul style="list-style-type: none"> <li>- Restripe EB approach as two 11' left turn lanes, one 15' through-right lane, and 1' of hatching.</li> <li>- Transfer 3s of green time from EBL/WBL to NB/SB in Weekday MD.</li> <li>- Transfer 4s of green time from EBL/WBL to NB/SB in Weekday PM.</li> <li>- Transfer 5s of green time from EBL/WBL to NB/SB in Saturday MD.</li> <li>- Transfer 6s of green time from EBL/WBL to NB/SB in Saturday PM.</li> </ul>
	EB/WB	25	25	25	25	25	25	25	25	
	NB/SB	43	45	43	43	46	49	48	49	
32. Arthur Kill Rd (EB/WB) @ Woodrow Rd (NB/SB)	EB/WB	54	54	54	54	54	58	54	61	<ul style="list-style-type: none"> <li>- Transfer 4s of green time from NB to EB/WB in Weekday PM.</li> <li>- Transfer 7s of green time from NB to EB/WB in Saturday PM.</li> </ul>
	NB	36	36	36	36	36	32	36	29	
35. Rockland Ave (EB/WB) @ Forest Hill Rd (NB/SB)	EBL/WBL	13	18	13	13	16	18	13	17	<ul style="list-style-type: none"> <li>- Transfer 3s of green time from EB/WB to EBL/WBL in Weekday MD.</li> <li>- Transfer 4s of green time from EB/WB to EBL/WBL in Saturday PM.</li> </ul>
	EB/WB	34	29	34	34	31	29	34	30	
	NB/SB	43	43	43	43	43	43	43	43	
36. Rockland Ave (EB/WB) @ Brielle Ave (NB/SB)	WB	13	13	13	13	13	13	13	13	<ul style="list-style-type: none"> <li>- Transfer 1s of green time from EB/WB to NB/SB in Weekday PM.</li> <li>- Transfer 1s of green time from NB/SB to EB/WB in Saturday MD.</li> </ul>
	EB/WB	37	37	37	37	37	36	38	37	
	NB/SB	40	40	40	40	40	41	39	40	
37. Richmond Rd (EB/WB) @ Wilder Ave (NB/SB)	EB/WB	54	78	54	54	54	82	54	54	<ul style="list-style-type: none"> <li>- Transfer 4s of green time from NB to EB/WB in Weekday PM.</li> </ul>
	NB	36	42	36	36	36	38	36	36	
38. Forest Ave (EB/WB) @ Richmond Ave/Morningstar Rd (NB/SB)	WB + NBR	15	15	15	15	15	15	15	15	<ul style="list-style-type: none"> <li>- Transfer 1s of green time from NB to NB/SB in Weekday MD.</li> <li>- Transfer 2s of green time from NB to NB/SB in Weekday PM and Saturday MD and PM.</li> </ul>
	EB/WB	33	33	33	33	33	33	33	33	
	NB	12	12	12	12	11	10	10	10	
	NB/SB	30	30	30	30	31	32	32	32	

Notes :- (1) Signal timings shown indicate green plus yellow (including all red) for each phase.

Table 17-3

Recommended Traffic Mitigation Measures

Intersection	Signal Phase	No-Action Signal Timing (Seconds) (1)				Proposed Signal Timing (Seconds) (1)				Recommended Mitigation
		Weekday MD	Weekday PM	Saturday MD	Saturday PM	Weekday MD	Weekday PM	Saturday MD	Saturday PM	
1. Richmond Hill Rd (EB/WB) @ Richmond Ave (NB/SB)	EB/WB	29	29	29	29	29	<u>29</u>	<u>29</u>	<u>29</u>	- Transfer 2s of green time from NB/SB to NBL/SBL + EBR in Weekday MD and <u>Saturday PM</u> .
	NB/SB	41	36	41	41	39	<u>36</u>	<u>41</u>	<u>39</u>	
	NBL/SBL + EBR	20	25	20	20	22	<u>25</u>	<u>20</u>	<u>22</u>	
2. SI Mall NW Dway (EB/WB) @ Richmond Ave (NB/SB)	EB	30	30	30	30	30	30	28	28	- Transfer 4s of green time from NB/SB to SB in Weekday MD and Saturday MD and PM. - Transfer 2s of green time from NB/SB to SB in Weekday PM. - Transfer 2s of green time from EB to SB in Saturday MD and PM.
	NB/SB	40	40	37	37	36	38	33	33	
	SB	20	20	23	23	24	22	29	29	
4. Platinum Ave (EB/WB) @ Richmond Ave (NB/SB)	WB	28	28	28	28	28	30	31	33	- Transfer 2s of green time from NB/SB to WB in Weekday PM. - Transfer 3s of green time from NB/SB to WB in Saturday MD. - Transfer 4s of green time from NB/SB to WB in Saturday PM. - Transfer 1s of green time from SB to WB in Saturday PM.
	NB/SB	46	48	46	46	46	46	43	42	
	SB	16	14	16	16	16	14	16	15	
5. Forest Hill Rd (EB/WB) @ Richmond Ave (NB/SB)	WB	32	32	32	32	32	34	32	32	- Transfer 2s of green time from NB/SB to WB in Weekday PM.
	NB/SB	46	46	46	46	46	44	46	46	
	SB	12	12	12	12	12	12	12	12	
6. Richmond Hill Rd (EB/WB) @ SI Mall N Driveway (NB/SB)	EB/WB	54	54	54	54	54	54	51	52	- Transfer 3s of green time from EB/WB to NB in Saturday MD. - Transfer 2s of green time from EB/WB to NB in Saturday PM.
	NB	36	36	36	36	36	36	39	38	
7. Richmond Hill Rd (EB/WB) @ Marsh Ave (NB/SB)	WB + NBR	32	32	32	32	32	31	30	30	- Transfer 1s of green time from WB + NBR to NBB in Weekday PM. - Transfer 2s of green time from WB + NBR to NB in Saturday MD and PM.
	EB/WB	36	36	36	36	36	36	36	36	
	NB	22	22	22	22	22	23	24	24	
10. Platinum Ave (EB/WB) @ Staten Island Mall Dr (NB/SB)	EBL/WBL	-	-	-	-	12	12	12	12	- Transfer 12s of green time from EB/WB to a new EBL/WBL lead phase in all periods. - Transfer 5s of green time from EB/WB to NB/SB in Weekday MD and PM. - Transfer 6s of green time from EB/WB to NB/SB in Saturday PM.
	EB/WB	50	50	50	50	33	33	38	32	
	NB/SB	40	40	40	40	45	45	40	46	
11. Platinum Ave (EB/WB) @ Marsh Ave (NB/SB)	WB	36	36	36	36	34	33	33	32	- Transfer 2s of green time from WB to SB in Weekday MD. - Transfer 3s of green time from WB to SB in Weekday PM and Saturday MD. - Transfer 4s of green time from WB to SB in Saturday PM.
	EB + SBR	36	36	36	36	36	36	36	36	
	SB	18	18	18	18	20	21	21	22	
13. SI Mall E Driveway (EB/WB) @ Marsh Ave (NB/SB)	EB	-	-	-	-	36	36	36	36	- Install new signal with phasing plan as shown pending approval.
	NB/SB	-	-	-	-	54	54	54	54	
14. SI Mall NE Driveway (EB/WB) @ Marsh Ave (NB/SB)	EB	36	36	36	36	36	36	36	37	- Transfer 1s of green time from NB/SB to EB in Saturday PM.
	NB/SB	54	54	54	54	54	54	54	53	
16. Goethals Rd W - W Caswell Ave/ Staten Island Expy WB Off-Ramp (EB/WB) @ Richmond Ave (NB/SB)	WB	18	18	18	18	18	18	18	18	- Transfer 1s of green time from NB to NB/SB in Weekday PM. - Transfer 2s of green time from EB to NB/SB in Saturday MD.
	EB	18	18	18	18	18	18	16	18	
	NB	18	18	18	18	18	17	18	18	
	NB/SB	36	36	36	36	36	37	38	36	

Table 17-3

Recommended Traffic Mitigation Measures

Intersection	Signal Phase	No-Action Signal Timing (Seconds) (1)				Proposed Signal Timing (Seconds) (1)				Recommended Mitigation
		Weekday MD	Weekday PM	Saturday MD	Saturday PM	Weekday MD	Weekday PM	Saturday MD	Saturday PM	
22. Draper Pl (EB/WB) @ Richmond Ave (NB/SB)	EB/WB	29	29	29	29	29	29	29	28	- Transfer 1s of green time from NB/SB to NB in Weekday MD. - Transfer 1s of green time from EB to NB/SB in Saturday PM.
	NB/SB	34	37	34	34	33	37	34	35	
	NB	27	24	27	27	28	24	27	27	
23. Nome Ave (EB/WB) @ Richmond Ave (NB/SB)	WB	27	27	27	27	28	28	29	27	- Transfer 1s of green time from NB/SB to EB in Weekday MD.
	NB/SB	44	38	44	44	43	37	42	44	
	SB	19	25	19	19	19	25	19	19	
24. Drumgoole Rd W (EB/WB) @ Richmond Ave (NB/SB)	EB	45	44	45	45	45	43	45	45	- Transfer 1s of green time from EB to NB/SB in Weekday PM.
	NB/SB	45	46	45	45	45	47	45	45	
25. Arthur Kill Rd (EB/WB) @ Richmond Ave (NB/SB)	EB/WB	35	37	35	35	34	34	31	32	- Restripe westbound approach as one 11' right turn lane, two 10' through lanes, and one 10' left turn lane. - Transfer 1s of green time from EB/WB to NBL/SBL + EBR in all periods. - Transfer 2s of green time from EB/WB to NB/SB in Weekday and Saturday PM. - Transfer 3s of green time from EB/WB to NB/SB in Saturday MD.
	NBL/SBL + EBR	20	20	20	20	21	21	21	21	
	NB/SB	35	33	35	35	35	35	38	37	
27. Katan Ave (EB/WB) @ Richmond Ave (NB/SB)	EB/WB	36	31	36	36	36	30	34	32	- Transfer 1s of green time from EB/WB to NB/SB in Weekday PM. - Transfer 2s of green time from EB/WB to NB/SB in Saturday MD. - Transfer 4s of green time from EB/WB to NB/SB in Saturday PM.
	NB/SB	54	59	54	54	54	60	56	58	
29. Clarke Ave (EB/WB) @ Arthur Kill Rd (NB/SB)	WB + NBR	40	40	40	40	40	41	40	40	- Transfer 1s of green time from SB to NB/SB in Weekday PM. - Transfer 1s of green time from SB to WB in Weekday PM.
	SB	14	14	14	14	14	12	14	14	
	NB/SB	36	36	36	36	36	37	36	36	
31. Arthur Kill Rd (EB/WB) @ Drumgoole Rd W (NB/SB)	EBL/WBL	22	20	22	22	19	20	22	22	- Transfer 3s of green time from EBL/WBL to NB/SB in Weekday MD.
	EB/WB	25	25	25	25	25	25	25	25	
	NB/SB	43	45	43	43	46	45	43	43	
32. Arthur Kill Rd (EB/WB) @ Woodrow Rd (NB/SB)	EB/WB	54	54	54	54	54	58	54	61	- Transfer 4s of green time from NB to EB/WB in Weekday PM. - Transfer 7s of green time from NB to EB/WB in Saturday PM.
	NB	36	36	36	36	36	32	36	29	
35. Rockland Ave (EB/WB) @ Forest Hill Rd (NB/SB)	EBL/WBL	13	18	13	13	16	18	13	17	- Transfer 3s of green time from EB/WB to EBL/WBL in Weekday MD. - Transfer 4s of green time from EB/WB to EBL/WBL in Saturday PM.
	EB/WB	34	29	34	34	31	29	34	30	
	NB/SB	43	43	43	43	43	43	43	43	
36. Rockland Ave (EB/WB) @ Brielle Ave (NB/SB)	WB	13	13	13	13	13	13	13	13	- Transfer 1s of green time from EB/WB to NB/SB in Weekday PM. - Transfer 1s of green time from NB/SB to EB/WB in Saturday MD.
	EB/WB	37	37	37	37	37	36	38	37	
	NB/SB	40	40	40	40	40	41	39	40	
37. Richmond Rd (EB/WB) @ Wilder Ave (NB/SB)	EB/WB	54	78	54	54	54	82	54	54	- Transfer 4s of green time from NB to EB/WB in Weekday PM.
	NB	36	42	36	36	36	38	36	36	
38. Forest Ave (EB/WB) @ Richmond Ave/Morningstar Rd (NB/SB)	WB + NBR	15	15	15	15	15	15	15	15	- Transfer 1s of green time from NB to NB/SB in Weekday MD. - Transfer 2s of green time from NB to NB/SB in Weekday PM and Saturday MD and PM.
	EB/WB	33	33	33	33	33	33	33	33	
	NB	12	12	12	12	11	10	10	10	
	NB/SB	30	30	30	30	31	32	32	32	

Notes :

(1) Signal timings shown indicate green plus yellow (including all red) for each phase.

Table 17-4a

2019 Action With Mitigation Traffic Levels of Service - Weekday Midday Peak Hour

	Lane Group	No action			With action			Mitigation		
		V/C Ratio	Delay (sec.)	LOS	V/C Ratio	Delay (sec.)	LOS	V/C Ratio	Delay (sec.)	LOS
1. Richmond Hill Road (E-W) @ Richmond Avenue (N-S)	EB - LTR	0.04	24.7	C	0.04	24.7	C	0.04	24.7	C
	WB - L	0.40	30.0	C	0.40	30.0	C	0.40	30.0	C
	WB - LT	0.43	30.8	C	0.43	30.8	C	0.43	30.8	C
	WB - R	0.66	21.5	C	0.75	24.7	C	0.40	14.4	B
	NB - L	0.02	31.5	C	0.02	31.5	C	0.02	29.8	C
	NB - TR	0.79	25.9	C	0.84	27.4	C	0.89	30.8	C
	SB - L	1.13	125.0	F	1.23	165.0	F*	1.09	108.2	F
2. SI Mall Northwest Driveway (E-W) @ Richmond Avenue (N-S)	SB - TR	0.77	26.1	C	0.84	28.3	C	0.89	32.1	C
	EB - LTR	0.03	23.8	C	0.03	23.8	C	0.03	23.8	C
	NB - TR	0.60	23.5	C	0.62	23.7	C	0.70	27.7	C
	SB - L	0.95	58.9	E	1.20	141.0	F*	0.95	54.2	D
8. Richmond Hill Road (E-W) @ Forest Hill Road (N-S)	SB - T	0.41	9.3	A	0.42	9.4	A	0.42	9.4	A
	EB - L	0.47	24.4	C	0.61	29.0	C	0.82	43.2	D
	EB - TR	0.63	28.4	C	0.74	32.3	C	0.74	32.3	C
	WB - L	-	-	-	-	-	-	0.74	35.8	D
	WB - TR	-	-	-	-	-	-	1.19	124.4	F
	WB - LTR	1.18	122.2	F	1.59	304.0	F*	-	108.0	F
	NB - L	0.19	47.8	D	0.19	47.8	D	0.20	48.8	D
	NB - TR	1.00	61.1	E	1.03	68.5	E*	1.01	61.5	E
	SB - L	0.64	51.1	D	0.64	51.7	D	0.69	52.9	D
	SB - TR	1.17	116.4	F	1.24	147.0	F*	1.21	134.7	F*
10. Platinum Avenue (E-W) @ Staten Island Mall Drive (N-S)	EB - L	0.62	21.5	C	0.77	29.2	C	0.75	28.4	C
	EB - TR	0.11	12.0	B	0.11	12.0	B	0.18	23.0	C
	WB - L	0.35	15.6	B	0.35	15.6	B	0.34	14.6	B
	WB - TR	0.12	12.1	B	0.15	12.3	B	0.24	23.6	C
	NB - LTR	1.07	93.4	F	1.37	214.1	F*	1.05	80.7	F
11. Platinum Avenue (E-W) @ Marsh Avenue (N-S)	SB - LTR	0.55	23.3	C	0.69	26.5	C	0.60	21.0	C
	EB - LT	0.47	24.9	C	0.50	25.5	C	0.50	25.5	C
	WB - T	0.33	23.0	C	0.38	23.7	C	0.41	25.5	C
	SB - L	0.54	44.3	D	0.76	57.7	E*	0.66	47.2	D
13. SI Mall East Driveway (E-W) @ Marsh Avenue (N-S) (Unsignalized in No Action)	SB - R	0.16	10.7	B	0.16	10.7	B	0.16	9.7	A
	EB - L	0.21	14.8	B	0.32	18.6	C	0.20	21.4	C
	EB - R	0.09	9.8	A	0.12	10.2	B	0.17	21.2	C
	NB - L	0.05	7.9	A	0.07	8.1	A	0.18	11.3	B
	NB - T	-	-	-	-	-	-	0.27	11.7	B
19. Victory Boulevard (E-W) @ Richmond Avenue (N-S)	SB - TR	-	-	-	-	-	-	0.33	12.1	B
	EB - L	0.28	27.2	C	0.28	27.2	C	0.30	29.4	C
	EB - T	0.60	32.2	C	0.60	32.2	C	0.65	35.4	D
	EB - R	0.29	26.8	C	0.29	26.8	C	0.32	28.8	C
	WB - L	1.05	66.5	E	1.13	99.9	F*	1.04	61.0	E
	WB - TR	0.52	18.7	B	0.52	18.7	B	0.52	18.7	B
	NB - L	0.53	37.5	D	0.53	38.1	D	0.53	38.1	D
	NB - T	0.89	36.9	D	0.96	44.3	D	0.96	44.3	D
	SB - L	0.33	32.2	C	0.33	33.2	C	0.33	33.2	C
	SB - TR	0.85	34.7	C	0.91	38.3	D	0.91	38.3	D
20. Signs Road (E-W) @ Richmond Avenue (N-S)	EB - L	-	-	-	-	-	-	0.54	33.0	C
	EB - R	-	-	-	-	-	-	0.50	18.7	B
	EB - LR	1.13	97.2	F	1.17	114.7	F*	-	23.6	C
	NB - L	0.95	75.1	E	1.00	87.4	F*	0.94	71.6	E
	NB - T	0.58	8.7	A	0.62	9.3	A	0.61	8.7	A
	SB - T	-	-	-	-	-	-	0.84	24.7	C
	SB - R	-	-	-	-	-	-	0.05	14.3	B
	SB - TR	0.80	23.6	C	0.86	25.6	C	-	24.5	C

**Table 17-4a (cont'd)**  
**2019 Action With Mitigation Traffic Levels of Service - Weekday Midday Peak Hour**

	Lane Group	No action			With action			Mitigation		
		V/C Ratio	Delay (sec.)	LOS	V/C Ratio	Delay (sec.)	LOS	V/C Ratio	Delay (sec.)	LOS
22. Draper Place (E-W) @ Richmond Avenue (N-S)	EB - LT	1.12	119.7	F	1.12	119.7	F	1.12	119.7	F
	WB - LTR	0.14	25.9	C	0.14	25.9	C	0.14	25.9	C
	NB - L	1.13	112.2	F	1.19	134.9	F*	1.13	112.6	F
	NB - TR	0.43	9.5	A	0.47	9.9	A	0.47	9.9	A
	SB - TR	0.78	30.2	C	0.86	32.4	C	0.89	34.4	C
23. Nome Avenue (E-W) @ Richmond Avenue (N-S)	WB - LR	0.84	49.3	D	0.90	56.2	E*	0.86	49.7	D
	NB - T	-	-	-	-	-	-	0.79	25.0	C
	NB - R	-	-	-	-	-	-	0.24	18.1	B
	NB - TR	0.76	23.8	C	0.83	25.6	C	-	24.6	C
	SB - L	1.07	110.9	F	1.07	110.9	F	1.07	110.9	F
	SB - T	0.44	8.2	A	0.48	8.6	A	0.49	9.1	A
25. Arthur Kill Road (E-W) @ Richmond Avenue (N-S)	EB - L	0.16	22.8	C	0.16	22.8	C	0.09	21.7	C
	EB - TR	0.43	24.1	C	0.43	24.1	C	0.45	25.0	C
	WB - L	0.19	22.8	C	0.19	22.8	C	0.21	23.9	C
	WB - T	0.81	36.1	D	0.81	36.1	D	0.45	25.3	C
	WB - R	0.45	13.3	B	0.48	13.6	B	0.49	14.0	B
	NB - L	0.34	34.2	C	0.34	34.2	C	0.32	33.2	C
	NB - TR	0.85	34.4	C	0.92	38.9	D	0.92	38.9	D
	SB - L	1.03	75.2	E	1.08	89.0	F*	1.01	67.0	E
	SB - TR	0.65	27.8	C	0.71	28.9	C	0.71	28.9	C
30. Arthur Kill Road (E-W) @ Corbin Avenue (N-S) (Unsignalized)	WB - LT	0.09	10.9	B	0.11	11.2	B	0.11	11.2	B
	NB - L	-	-	-	-	-	-	0.33	97.0	F
	NB - R	-	-	-	-	-	-	0.25	23.6	C
	NB - LR	0.48	50.5	F	0.59	60.1	F*	-	40.0	E
31. Arthur Kill Road (E-W) @ Drumgoole Road West (N-S)	EB - L	0.62	20.1	C	0.72	22.9	C	0.53	18.9	B
	EB - TR	0.83	46.1	D	0.83	46.1	D	0.83	46.1	D
	WB - L	0.54	18.8	B	0.54	18.8	B	0.61	21.6	C
	WB - TR	0.30	29.9	C	0.30	29.9	C	0.30	29.9	C
	NB - L	0.16	20.3	C	0.16	20.3	C	0.16	18.6	B
	NB - TR	0.74	25.4	C	0.81	27.9	C	0.75	23.7	C
	SB - LTR	0.96	33.3	C	1.08	66.3	E*	1.00	37.8	D
35. Rockland Avenue (E-W) @ Forest Hill Road (N-S)	EB - L	1.03	81.4	F	1.05	85.6	F*	0.99	69.2	E
	EB - TR	0.47	25.5	C	0.48	25.6	C	0.53	28.6	C
	WB - L	0.88	41.8	D	0.97	56.9	E*	0.92	46.2	D
	WB - TR	0.78	34.0	C	0.79	34.4	C	0.89	43.4	D
	NB - L	0.11	16.4	B	0.11	16.5	B	0.11	16.5	B
	NB - TR	1.16	101.6	F	1.23	130.2	F*	1.23	130.2	F*
	SB - L	0.82	73.5	E	0.82	73.5	E	0.82	73.5	E
	SB - T	0.74	27.9	C	0.76	28.7	C	0.76	28.7	C
	SB - R	0.39	20.2	C	0.39	20.2	C	0.39	20.2	C
38. Forest Avenue (E-W) @ Richmond Avenue-Morningstar Road (N-S)	EB - L	0.42	28.7	C	0.42	28.7	C	0.42	28.7	C
	EB - TR	0.93	41.4	D	0.93	41.4	D	0.93	41.4	D
	WB - L	0.91	56.9	E	0.91	56.9	E	0.91	56.9	E
	WB - TR	0.45	16.5	B	0.45	16.5	B	0.45	16.5	B
	NB - L	0.54	21.3	C	0.56	22.1	C	0.56	22.1	C
	NB - T	0.40	20.8	C	0.44	21.5	C	0.44	21.5	C
	NB - R	0.32	10.7	B	0.32	10.7	B	0.32	10.7	B
SB - LTR	0.80	43.4	D	0.86	49.0	D*	0.83	44.2	D	

**Notes:**

EB-Eastbound, WB-Westbound, NB-Northbound, SB-Southbound  
 L-Left, T-Through, R-Right, Dfl-Analysis considers a Defacto Left Lane on this approach  
 V/C Ratio - Volume to Capacity Ratio, sec. - Seconds  
 LOS - Level of Service  
 \* - Denotes a significant adverse impact  
 Highlighted movements denote findings of signifiant impacts  
 Analysis is based on the 2000 Highway Capacity Manual methodology (HCS+, version 5.5)

Table 17-4a

2019 Action With Mitigation Traffic Levels of Service - Weekday Midday Peak Hour

	LANE GROUP	NO-ACTION			WITH-ACTION			MITIGATION		
		V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS
1. Richmond Hill Road (E-W) @ Richmond Avenue (N-S)	EB - LTR	0.04	24.7	C	0.04	24.7	C	0.04	24.7	C
	WB - L	0.40	30.0	C	0.40	30.0	C	0.40	30.0	C
	WB - LT	0.43	30.8	C	0.43	30.8	C	0.43	30.8	C
	WB - R	0.66	21.5	C	0.75	24.7	C	0.71	22.0	C
	NB - L	0.02	31.5	C	0.02	31.5	C	0.02	29.8	C
	NB - TR	0.79	25.9	C	0.84	27.4	C	0.89	30.8	C
	SB - L	1.13	125.0	F	1.23	165.0	F	1.09	108.2	F
	SB - TR	0.77	26.1	C	0.84	28.3	C	0.89	32.1	C
2. SI Mall Northwest Driveway (E-W) @ Richmond Avenue (N-S)	EB - LTR	0.03	23.8	C	0.03	23.8	C	0.03	23.8	C
	NB - TR	0.60	23.5	C	0.62	23.7	C	0.70	27.7	C
	SB - L	0.95	58.9	E	1.20	141.0	F	0.95	54.2	D
	SB - T	0.41	9.3	A	0.42	9.4	A	0.42	9.4	A
8. Richmond Hill Road (E-W) @ Forest Hill Road (N-S)	EB - L	0.47	24.4	C	0.61	29.0	C	0.61	29.0	C
	EB - TR	0.63	28.4	C	0.74	32.3	C	0.74	32.3	C
	WB - LTR	1.18	122.2	F	1.59	304.0	F	1.59	304.0	F
	NB - L	0.19	47.8	D	0.19	47.8	D	0.19	47.8	D
	NB - TR	1.00	61.1	E	1.03	68.5	E	1.03	68.5	E
	SB - L	0.64	51.1	D	0.64	51.7	D	0.64	51.7	D
	SB - TR	1.17	116.4	F	1.24	147.0	F	1.24	147.0	F
10. Platinum Avenue (E-W) @ Staten Island Mall Drive (N-S)	EB - L	0.62	21.5	C	0.77	29.2	C	0.75	28.4	C
	EB - TR	0.11	12.0	B	0.11	12.0	B	0.18	23.0	C
	WB - L	0.35	15.6	B	0.35	15.6	B	0.34	14.6	B
	WB - TR	0.12	12.1	B	0.15	12.3	B	0.24	23.6	C
	NB - LTR	1.07	93.4	F	1.37	214.1	F	1.05	80.7	F
	SB - LTR	0.55	23.3	C	0.69	26.5	C	0.60	21.0	C
11. Platinum Avenue (E-W) @ Marsh Avenue (N-S)	EB - LT	0.47	24.9	C	0.50	25.5	C	0.50	25.5	C
	WB - T	0.33	23.0	C	0.38	23.7	C	0.41	25.5	C
	SB - L	0.54	44.3	D	0.76	57.7	E	0.66	47.2	D
	SB - R	0.16	10.7	B	0.16	10.7	B	0.16	9.7	A
13. SI Mall East Driveway (E-W) @ Marsh Avenue (N-S) (Unsignalized in No-Action)	EB - L	0.21	14.8	B	0.32	18.6	C	0.20	21.4	C
	EB - R	0.09	9.8	A	0.12	10.2	B	0.17	21.2	C
	NB - L	0.05	7.9	A	0.07	8.1	A	0.18	11.3	B
	NB - T	-	-	-	-	-	-	0.27	11.7	B
	SB - TR	-	-	-	-	-	-	0.33	12.1	B
19. Victory Boulevard (E-W) @ Richmond Avenue (N-S)	EB - L	0.39	46.7	D	0.39	46.7	D	0.39	46.7	D
	EB - T	0.83	63.2	E	0.83	63.2	E	0.83	63.2	E
	EB - R	0.42	45.8	D	0.42	45.8	D	0.25	29.8	C
	WB - L	1.09	95.9	F	1.18	133.1	F	1.18	133.1	F
	WB - TR	0.48	21.2	C	0.49	21.3	C	0.49	21.3	C
	NB - L	0.71	60.1	E	0.71	60.5	E	0.71	60.5	E
	NB - T	0.82	41.2	D	0.88	44.6	D	0.88	44.6	D
	SB - L	0.42	46.1	D	0.45	49.8	D	0.45	49.8	D
	SB - TR	0.79	39.8	D	0.84	41.9	D	0.84	41.9	D
20. Signs Road (E-W) @ Richmond Avenue (N-S)	EB - LR	1.13	97.2	F	1.17	114.7	F	1.17	114.7	F
	NB - L	0.95	75.1	E	1.00	87.4	F	1.00	87.4	F
	NB - T	0.58	8.7	A	0.62	9.3	A	0.62	9.3	A
	SB - TR	0.80	23.6	C	0.86	25.6	C	0.86	25.6	C
22. Draper Place (E-W) @ Richmond Avenue (N-S)	EB - LT	1.12	119.7	F	1.12	119.7	F	1.12	119.7	F
	WB - LTR	0.14	25.9	C	0.14	25.9	C	0.14	25.9	C
	NB - L	1.13	112.2	F	1.19	134.9	F	1.13	112.6	F
	NB - TR	0.43	9.5	A	0.47	9.9	A	0.47	9.9	A
	SB - TR	0.78	30.2	C	0.86	32.4	C	0.89	34.4	C
23. Nome Avenue (E-W) @ Richmond Avenue (N-S)	WB - LR	0.84	49.3	D	0.90	56.2	E	0.86	49.7	D
	NB - TR	0.76	23.8	C	0.83	25.6	C	0.85	27.0	C
	SB - L	1.07	110.9	F	1.07	110.9	F	1.07	110.9	F
	SB - T	0.44	8.2	A	0.48	8.6	A	0.49	9.1	A
25. Arthur Kill Road (E-W) @ Richmond Avenue (N-S)	EB - L	0.16	22.8	C	0.16	22.8	C	0.09	21.7	C
	EB - TR	0.43	24.1	C	0.43	24.1	C	0.45	25.0	C
	WB - L	0.19	22.8	C	0.19	22.8	C	0.22	24.1	C
	WB - T	0.81	36.1	D	0.81	36.1	D	0.47	25.5	C
	WB - R	0.45	13.3	B	0.48	13.6	B	0.49	14.0	B
	NB - L	0.34	34.2	C	0.34	34.2	C	0.32	33.2	C
	NB - TR	0.85	34.4	C	0.92	38.9	D	0.92	38.9	D
	SB - L	1.03	75.2	E	1.08	89.0	F	1.01	67.0	E
SB - TR	0.65	27.8	C	0.71	28.9	C	0.71	28.9	C	
30. Arthur Kill Road (E-W) @ Corbin Avenue (N-S) (Unsignalized)	WB - LT	0.09	10.9	B	0.11	11.2	B	0.11	11.2	B
	NB - LR	0.48	50.5	F	0.59	60.1	F	0.59	60.1	F
31. Arthur Kill Road (E-W) @ Drumgoole Road West (N-S)	EB - L	0.62	20.1	C	0.72	22.9	C	0.80	33.0	C
	EB - TR	0.83	46.1	D	0.83	46.1	D	0.83	46.1	D
	WB - L	0.54	18.8	B	0.54	18.8	B	0.61	21.6	C
	WB - TR	0.30	29.9	C	0.30	29.9	C	0.30	29.9	C
	NB - L	0.16	20.3	C	0.16	20.3	C	0.16	18.6	B
	NB - TR	0.74	25.4	C	0.81	27.9	C	0.75	23.7	C
	SB - LTR	0.96	33.3	C	1.08	66.3	E	1.00	37.8	D
35. Rockland Avenue (E-W) @ Forest Hill Road (N-S)	EB - L	1.03	81.4	F	1.05	85.6	F	0.99	69.2	E
	EB - TR	0.47	25.5	C	0.48	25.6	C	0.53	28.6	C
	WB - L	0.88	41.8	D	0.97	56.9	E	0.92	46.2	D
	WB - TR	0.78	34.0	C	0.79	34.4	C	0.89	43.4	D
	NB - L	0.11	16.4	B	0.11	16.5	B	0.11	16.5	B
	NB - TR	1.16	101.6	F	1.23	130.2	F	1.23	130.2	F
	SB - L	0.82	73.5	E	0.82	73.5	E	0.82	73.5	E
SB - T	0.74	27.9	C	0.76	28.7	C	0.76	28.7	C	
38. Forest Avenue (E-W) @ Richmond Avenue-Morningstar Road (N-S)	EB - L	0.40	28.2	C	0.40	28.2	C	0.40	28.2	C
	EB - TR	0.97	46.4	D	0.97	46.4	D	0.97	46.4	D
	WB - L	0.91	56.9	E	0.91	56.9	E	0.91	56.9	E
	WB - TR	0.45	16.5	B	0.45	16.5	B	0.45	16.5	B
	NB - L	0.55	21.6	C	0.57	22.4	C	0.57	22.5	C
	NB - T	0.40	20.8	C	0.44	21.5	C	0.44	21.5	C
	NB - R	0.32	10.7	B	0.32	10.7	B	0.32	10.7	B
	SB - LTR	0.80	43.4	D	0.86	49.0	D	0.83	44.2	D

Notes:  
 EB-Eastbound, WB-Westbound, NB-Northbound, SB-Southbound  
 L-Left, T-Through, R-Right, D/Analysis considers a Defacto Left Lane on this approach  
 V/C Ratio - Volume to Capacity Ratio, sec. - Seconds  
 LOS - Level of Service  
 \* - Denotes a significant adverse impact  
 Analysis is based on the 2000 Highway Capacity Manual methodology (HCS+, version 5.5)

Staten Island Mall Enlargement

Table 17-4b

2019 Action With Mitigation Traffic Levels of Service - Weekday PM Peak Hour

	Lane Group	No Action			With Action			Mitigation		
		V/C Ratio	Delay (sec.)	LOS	V/C Ratio	Delay (sec.)	LOS	V/C Ratio	Delay (sec.)	LOS
1. Richmond Hill Road (E-W) Richmond Avenue (N-S)	EB - LTR	0.05	24.7	C	0.05	24.7	C	0.06	27.9	C
	WB - L	0.39	28.9	C	0.39	28.9	C	0.47	33.6	C
	WB - LT	0.42	29.4	C	0.42	29.4	C	0.54	35.5	D
	WB - R	0.98	39.3	D	1.07	65.7	E*	0.65	17.6	B
	NB - L	0.02	27.4	C	0.02	27.4	C	0.02	26.6	C
	NB - TR	0.79	29.1	C	0.86	31.2	C	0.78	27.0	C
	SB - L	0.77	45.0	D	0.89	56.0	E*	0.85	49.6	D
2. SI Mall Northwest Driveway (E-W) Richmond Avenue (N-S)	SB - TR	1.10	80.1	F	1.20	124.2	F*	1.09	76.1	E
	EB - LTR	0.03	23.8	C	0.03	23.8	C	0.03	23.8	C
	NB - TR	0.59	23.3	C	0.61	23.6	C	0.64	25.4	C
4. Platinum Avenue (E-W) Richmond Avenue (N-S)	SB - L	0.76	37.8	D	1.07	78.6	E*	0.95	44.0	D
	SB - T	0.58	10.6	B	0.59	10.8	B	0.59	10.8	B
	WB - L	0.79	38.8	D	0.97	57.8	E*	0.89	44.1	D
	WB - R	0.24	28.0	C	0.24	28.0	C	0.22	26.2	C
	NB - T	0.67	20.0	B	0.71	20.6	C	0.74	22.6	C
	NB - R	0.32	15.9	B	0.44	17.7	B	0.47	19.3	B
5. Forest Hill Road (E-W) Richmond Avenue (N-S)	SB - L	0.74	55.0	D	0.74	55.0	D	0.74	55.0	D
	SB - T	0.46	9.3	A	0.47	9.5	A	0.49	10.6	B
	WB - L	0.88	39.1	D	0.96	47.9	D*	0.89	38.1	D
	WB - LR	1.02	61.6	E	1.10	87.5	F*	1.02	59.9	E
	NB - T	0.81	23.7	C	0.92	28.2	C	0.96	34.2	C
7. Richmond Hill Road (E-W) Marsh Avenue (N-S)	NB - R	0.43	18.4	B	0.47	19.0	B	0.50	20.7	C
	SB - L	0.50	48.3	D	0.50	48.3	D	0.50	48.3	D
	SB - T	0.88	18.6	B	0.95	23.0	C	0.99	30.0	C
	EB - T	0.40	24.1	C	0.47	25.2	C	0.47	25.2	C
	EB - R	0.77	36.6	D	0.77	36.6	D	0.77	36.6	D
	WB - L	0.50	8.3	A	0.73	13.4	B	0.75	14.5	B
8. Richmond Hill Road (E-W) Forest Hill Road (N-S)	WB - T	0.33	6.0	A	0.35	6.1	A	0.36	6.5	A
	NB - L	0.81	47.8	D	0.87	54.0	D*	0.83	48.1	D
	NB - R	0.55	15.3	B	0.72	19.3	B	0.71	19.1	B
	EB - L	0.52	26.3	C	0.70	33.7	C	0.78	40.1	D
	EB - TR	0.55	25.1	C	0.67	28.3	C	0.67	28.3	C
	WB - L	-	-	-	-	-	-	0.63	36.4	D
	WB - TR	-	-	-	-	-	-	1.52	274.9	F
	WB - LTR	1.17	118.2	F	1.64	324.7	F*	-	235.2	F*
10. Platinum Avenue (E-W) Staten Island Mall Drive (N-S)	NB - L	0.31	48.9	D	0.31	48.9	D	0.33	50.1	D
	NB - TR	1.06	76.0	E	1.09	86.6	F*	1.07	77.1	E
	SB - L	0.85	55.5	E	0.85	54.7	D	0.91	59.3	E
	SB - TR	1.14	102.6	F	1.22	135.7	F*	1.19	124.3	F*
	EB - L	0.50	18.4	B	0.70	25.3	C	0.67	24.6	C
	EB - TR	0.11	12.0	B	0.11	12.0	B	0.18	23.0	C
	WB - L	0.33	15.2	B	0.33	15.2	B	0.31	14.3	B
11. Platinum Avenue (E-W) Marsh Avenue (N-S)	WB - TR	0.14	12.3	B	0.18	12.6	B	0.29	24.2	C
	NB - LTR	0.92	52.2	D	1.21	143.9	F*	0.95	54.3	D
	SB - LTR	0.42	21.2	C	0.57	23.7	C	0.49	19.1	B
	EB - LT	0.43	24.5	C	0.46	25.1	C	0.46	25.1	C
	WB - T	0.24	21.8	C	0.30	22.6	C	0.33	25.1	C
13. SI Mall East Driveway (E-W) Marsh Avenue (N-S) (Unsignalized in No Action)	SB - L	0.70	52.2	D	0.96	86.3	F*	0.78	53.3	D
	SB - R	0.21	11.2	B	0.21	11.2	B	0.20	9.6	A
	EB - L	0.31	20.1	C	0.52	31.8	D*	0.23	21.8	C
	EB - R	0.11	10.3	B	0.15	10.9	B	0.21	21.7	C
	NB - L	0.07	8.2	A	0.10	8.5	A	0.25	12.3	B
	NB - T	-	-	-	-	-	-	0.34	12.4	B
	SB - TR	-	-	-	-	-	-	0.50	14.3	B

**Table 17-4b (cont'd)**  
**2019 Action With Mitigation Traffic Levels of Service - Weekday PM Peak Hour**

	Lane Group	No Action			With Action			Mitigation		
		V/C Ratio	Delay (sec.)	LOS	V/C Ratio	Delay (sec.)	LOS	V/C Ratio	Delay (sec.)	LOS
16. SI Expressway EB Off-Ramp / W Caswell Avenue/Goethals Road N (E-W) Richmond Avenue (N-S)	EB - LT	0.41	39.8	D	0.41	39.8	D	0.41	39.8	D
	WB - LTR	0.65	51.6	D	0.65	51.6	D	0.65	51.6	D
	NB - L	0.68	27.2	C	0.76	32.4	C	0.80	35.6	D
	NB - TR	0.58	15.4	B	0.60	15.7	B	0.60	15.7	B
	SB - L	0.04	20.4	C	0.04	20.4	C	0.04	19.7	B
	SB - TR	0.97	39.9	D	1.01	48.1	D*	0.98	40.2	D
19. Victory Boulevard (E-W) Richmond Avenue (N-S)	EB - L	0.42	31.8	C	0.42	31.8	C	0.42	33.1	C
	EB - T	0.67	33.3	C	0.67	33.3	C	0.72	36.9	D
	EB - R	0.68	36.1	D	0.68	36.1	D	0.74	41.1	D
	WB - L	1.06	52.9	D	1.15	86.6	F*	1.06	56.3	E
	WB - TR	0.79	21.4	C	0.79	21.4	C	0.79	21.4	C
	NB - L	0.56	37.0	D	0.56	38.0	D	0.64	40.6	D
	NB - T	0.97	46.7	D	1.06	71.1	E	0.98	46.7	D
	SB - L	0.23	30.9	C	0.23	32.5	C	0.26	32.9	C
	SB - TR	1.03	56.3	E	1.11	86.5	F*	1.02	53.2	D
20. Signs Road (E-W) Richmond Avenue (N-S)	EB - L	-	-	-	-	-	-	0.49	34.0	C
	EB - R	-	-	-	-	-	-	0.56	20.1	C
	EB - LR	1.13	96.2	F	1.17	116.8	F*	-	24.0	C
	NB - L	1.05	94.4	F	1.11	113.9	F*	1.04	90.8	F
	NB - T	0.56	8.4	A	0.61	9.0	A	0.58	7.3	A
	SB - T	-	-	-	-	-	-	1.11	75.4	E
	SB - R	-	-	-	-	-	-	0.05	13.6	B
	SB - TR	1.12	78.2	E	1.20	113.8	F*	-	74.7	E
22. Draper Place (E-W) Richmond Avenue (N-S)	EB - LT	1.12	92.8	F	1.12	92.8	F	1.12	92.8	F
	WB - LTR	0.13	25.7	C	0.13	25.7	C	0.13	25.7	C
	NB - L	1.11	102.8	F	1.18	130.6	F*	1.18	130.6	F*
	NB - TR	0.45	9.5	A	0.50	10.0	A	0.50	10.0	A
	SB - TR	0.91	31.2	C	1.00	41.1	D	1.00	41.1	D
23. Nome Avenue (E-W) Richmond Avenue (N-S)	WB - LR	0.81	45.9	D	0.88	52.4	D*	0.84	47.1	D
	NB - T	-	-	-	-	-	-	0.98	42.3	D
	NB - R	-	-	-	-	-	-	0.28	22.7	C
	NB - TR	0.92	34.5	C	1.02	50.8	D*	-	41.2	D
	SB - L	0.90	58.2	E	0.90	58.2	E	0.90	58.2	E
	SB - T	0.57	9.4	A	0.62	10.1	B	0.63	10.7	B
24. Drumgoole Road West (E-W) Richmond Avenue (N-S)	EB - L	0.75	25.8	C	0.87	32.2	C	0.90	34.9	C
	EB - LR	0.81	28.4	C	0.93	39.0	D	0.96	43.9	D
	NB - T	0.82	25.3	C	0.89	28.7	C	0.86	26.8	C
	SB - T	0.98	32.8	C	1.04	48.5	D*	1.01	39.9	D
25. Arthur Kill Road (E-W) Richmond Avenue (N-S)	EB - L	0.32	25.9	C	0.32	25.9	C	0.18	23.2	C
	EB - TR	0.48	23.2	C	0.48	23.2	C	0.53	25.8	C
	WB - L	0.12	20.2	C	0.12	20.2	C	0.15	22.6	C
	WB - T	1.06	71.1	E	1.06	71.1	E	0.63	27.5	C
	WB - R	0.43	11.5	B	0.46	11.9	B	0.50	13.5	B
	NB - L	0.54	35.8	D	0.54	35.8	D	0.50	34.6	C
	NB - TR	1.04	61.5	E	1.12	92.4	F*	1.04	60.9	E
	SB - L	1.08	83.4	F	1.12	100.6	F*	1.05	73.2	E
	SB - TR	0.90	34.5	C	0.96	40.2	D	0.90	33.1	C
27. Katan Avenue (E-W) Richmond Avenue (N-S)	EB - LTR	0.37	28.0	C	0.40	28.4	C	0.41	29.5	C
	WB - LTR	0.35	27.6	C	0.37	27.9	C	0.38	29.0	C
	NB - LTR	0.47	11.3	B	0.50	11.8	B	0.49	11.2	B
	SB - LTR	0.94	26.9	C	1.02	45.2	D*	1.00	39.2	D

Staten Island Mall Enlargement

Table 17-4b (cont'd)

2019 Action With Mitigation Traffic Levels of Service - Weekday PM Peak Hour

	Lane Group	No Action			With Action			Mitigation		
		V/C Ratio	Delay (sec.)	LOS	V/C Ratio	Delay (sec.)	LOS	V/C Ratio	Delay (sec.)	LOS
28. Richmond Road (E-W) Arthur Kill Road-Richmond Hill Road (N-S)	WB - LR	0.97	43.0	D	1.11	85.6	F*	1.11	85.6	F*
	NB - T	0.70	28.3	C	0.80	31.3	C	0.80	31.3	C
	NB - R	0.32	3.9	A	0.32	3.9	A	0.32	3.9	A
	SB - L	0.65	17.6	B	0.86	31.4	C	0.86	31.4	C
	SB - T	0.49	15.0	B	0.56	16.3	B	0.56	16.3	B
29. Clarke Avenue (E-W) Arthur Kill Road (N-S)	WB - LR	1.01	46.2	D	1.04	54.3	D*	1.01	44.7	D
	NB - T	0.89	41.9	D	0.96	51.5	D*	0.93	45.7	D
	NB - R	0.41	3.8	A	0.41	3.8	A	0.40	3.2	A
	SB - L	0.57	19.5	B	0.66	25.6	C	0.73	28.3	C
	SB - T	0.72	21.3	C	0.76	23.0	C	0.78	24.4	C
30. Arthur Kill Road (E-W) Corbin Avenue (N-S) (Unsignalized)	WB - LT	0.09	11.3	B	0.12	11.7	B	0.12	11.7	B
	NB - L	-	-	-	-	-	-	0.41	179.9	F
	NB - R	-	-	-	-	-	-	0.37	27.4	D
	NB - LR	0.63	68.6	F	0.77	88.7	F*	-	46.1	E
31. Arthur Kill Road (E-W) Drumgoole Road West (N-S)	EB - L	0.70	22.2	C	0.84	33.5	C	0.60	21.1	C
	EB - TR	0.97	58.9	E	0.97	58.9	E	0.97	58.9	E
	WB - L	0.71	22.0	C	0.71	22.0	C	0.82	28.5	C
	WB - TR	0.46	31.1	C	0.46	31.1	C	0.46	31.1	C
	NB - L	0.41	31.5	C	0.41	31.5	C	0.41	29.2	C
	NB - TR	0.73	23.9	C	0.81	26.8	C	0.74	21.5	C
	SB - LTR	1.13	83.6	F	1.24	135.6	F*	1.13	82.7	F
	SB - R	0.36	24.3	C	0.44	26.0	C	0.52	30.9	C
32. Arthur Kill Road (E-W) Woodrow Road (N-S)	EB - TR	0.92	35.8	D	0.96	42.6	D	0.88	28.9	C
	WB - LT	1.20	110.8	F	1.42	209.1	F*	1.20	110.2	F
	NB - L	0.17	21.2	C	0.17	21.2	C	0.20	24.3	C
35. Rockland Avenue (E-W) Forest Hill Road (N-S)	NB - R	0.36	24.3	C	0.44	26.0	C	0.52	30.9	C
	EB - L	1.05	77.1	E	1.05	77.2	E	1.05	77.2	E
	EB - TR	0.54	30.0	C	0.55	30.1	C	0.55	30.1	C
	WB - L	0.81	24.0	C	0.91	39.7	D	0.91	39.7	D
	WB - TR	0.98	55.2	E	1.00	59.9	E*	1.00	59.9	E*
	NB - L	0.20	17.5	B	0.21	17.6	B	0.21	17.6	B
	NB - TR	1.15	95.0	F	1.22	127.7	F*	1.22	127.7	F*
	SB - L	0.95	83.2	F	0.95	83.2	F	0.95	83.2	F
	SB - T	0.95	39.4	D	0.97	43.5	D	0.97	43.5	D
	SB - R	0.74	26.5	C	0.74	26.5	C	0.74	26.5	C
36. Rockland Avenue (E-W) Brielle Avenue (N-S)	EB - L	0.78	24.2	C	0.84	28.5	C	0.87	31.7	C
	EB - TR	0.45	15.4	B	0.46	15.6	B	0.47	16.4	B
	WB - LTR	0.82	32.6	C	0.85	34.3	C	0.88	37.0	D
	NB - LTR	0.03	17.1	B	0.03	17.1	B	0.03	16.5	B
37. Richmond Road (E-W) Wilder Avenue (N-S)	SB - LTR	1.05	57.7	E	1.08	70.9	E*	1.05	58.1	E
	EB - TR	0.69	19.1	B	0.77	22.0	C	0.73	18.1	B
	WB - LT	1.10	72.8	E	1.22	123.0	F*	1.10	69.9	E
38. Forest Avenue (E-W) @ Richmond Avenue-Morningstar Road (N-S)	NB - LR	0.39	35.3	D	0.43	36.2	D	0.49	40.7	D
	EB - L	0.41	28.7	C	0.41	28.7	C	0.41	28.7	C
	EB - TR	0.92	40.3	D	0.92	40.3	D	0.92	40.3	D
	WB - L	1.20	138.7	F	1.20	138.7	F	1.20	138.7	F
	WB - TR	0.51	17.2	B	0.51	17.2	B	0.51	17.2	B
	NB - L	0.41	19.7	B	0.42	20.3	C	0.43	20.4	C
	NB - T	0.44	21.6	C	0.48	22.3	C	0.48	22.3	C
	NB - R	0.27	10.2	B	0.27	10.2	B	0.27	10.2	B
SB - LTR	1.00	64.3	E	1.07	83.8	F*	0.98	58.2	E	

Notes:

EB-Eastbound, WB-Westbound, NB-Northbound, SB-Southbound

L-Left, T-Through, R-Right, Dfl-Analysis considers a Defacto Left Lane on this approach

V/C Ratio - Volume to Capacity Ratio, sec. - Seconds

LOS - Level of Service

\* - Denotes a significant adverse impact

Highlighted movements denote findings of significant impacts

Analysis is based on the 2000 Highway Capacity Manual methodology (HCS+, version 5.5)

Table 17-4b

## 2019 Action With Mitigation Traffic Levels of Service - Weekday PM Peak Hour

	LANE GROUP	NO-ACTION			WITH-ACTION			MITIGATION		
		V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS
1. Richmond Hill Road (E-W) @ Richmond Avenue (N-S)	EB - LTR	0.05	24.7	C	0.05	24.7	C	0.05	24.7	C
	WB - L	0.39	28.9	C	0.39	28.9	C	0.39	28.9	C
	WB - LT	0.42	29.4	C	0.42	29.4	C	0.42	29.4	C
	WB - R	0.98	39.3	D	1.07	65.7	E *	1.07	65.7	E *
	NB - L	0.02	27.4	C	0.02	27.4	C	0.02	27.4	C
	NB - TR	0.79	29.1	C	0.86	31.2	C	0.86	31.2	C
	SB - L	0.77	45.0	D	0.89	56.0	E *	0.89	56.0	E *
	SB - TR	1.10	80.1	F	1.20	124.2	F *	1.20	124.2	F *
2. SI Mall Northwest Driveway (E-W) @ Richmond Avenue (N-S)	EB - LTR	0.03	23.8	C	0.03	23.8	C	0.03	23.8	C
	NB - TR	0.59	23.3	C	0.61	23.6	C	0.64	25.4	C
	SB - L	0.76	37.8	D	1.07	78.6	E *	0.95	44.0	D
	SB - T	0.58	10.6	B	0.59	10.8	B	0.59	10.8	B
4. Platinum Avenue (E-W) @ Richmond Avenue (N-S)	WB - L	0.79	38.8	D	0.97	57.8	E *	0.89	44.1	D
	WB - R	0.24	28.0	C	0.24	28.0	C	0.22	26.2	C
	NB - T	0.67	20.0	B	0.71	20.6	C	0.74	22.6	C
	NB - R	0.32	15.9	B	0.44	17.7	B	0.47	19.3	B
	SB - L	0.74	55.0	D	0.74	55.0	D	0.74	55.0	D
	SB - T	0.46	9.3	A	0.47	9.5	A	0.49	10.6	B
5. Forest Hill Road (E-W) @ Richmond Avenue (N-S)	WB - L	0.88	39.1	D	0.96	47.9	D *	0.89	38.1	D
	WB - LR	1.02	61.6	E	1.10	87.5	F *	1.02	59.9	E
	NB - T	0.81	23.7	C	0.92	28.2	C	0.96	34.2	C
	NB - R	0.43	18.4	B	0.47	19.0	B	0.50	20.7	C
	SB - L	0.50	48.3	D	0.50	48.3	D	0.50	48.3	D
	SB - T	0.88	18.6	B	0.95	23.0	C	0.99	30.0	C
7. Richmond Hill Road (E-W) @ Marsh Avenue (N-S)	EB - T	0.40	24.1	C	0.47	25.2	C	0.47	25.2	C
	EB - R	0.77	36.6	D	0.77	36.6	D	0.77	36.6	D
	WB - L	0.50	8.3	A	0.73	13.4	B	0.75	14.5	B
	WB - T	0.33	6.0	A	0.35	6.1	A	0.36	6.5	A
	NB - L	0.81	47.8	D	0.87	54.0	D *	0.83	48.1	D
	NB - R	0.55	15.3	B	0.72	19.3	B	0.71	19.1	B
8. Richmond Hill Road (E-W) @ Forest Hill Road (N-S)	EB - L	0.52	26.3	C	0.70	33.7	C	0.70	33.7	C
	EB - TR	0.55	25.1	C	0.67	28.3	C	0.67	28.3	C
	WB - LTR	1.17	118.2	F	1.64	324.7	F *	1.64	324.7	F *
	NB - L	0.31	48.9	D	0.31	48.9	D	0.31	48.9	D
	NB - TR	1.06	76.0	E	1.09	86.6	F *	1.09	86.6	E *
	SB - L	0.85	55.5	E	0.85	54.7	D	0.85	54.7	D
	SB - TR	1.14	102.6	F	1.22	135.7	F *	1.22	135.7	F *
10. Platinum Avenue (E-W) @ Staten Island Mall Drive (N-S)	EB - L	0.50	18.4	B	0.70	25.3	C	0.67	24.6	C
	EB - TR	0.11	12.0	B	0.11	12.0	B	0.18	23.0	C
	WB - L	0.33	15.2	B	0.33	15.2	B	0.31	14.3	B
	WB - TR	0.14	12.3	B	0.18	12.6	B	0.29	24.2	C
	NB - LTR	0.92	52.2	D	1.21	143.9	F *	0.95	54.3	D
	SB - LTR	0.42	21.2	C	0.57	23.7	C	0.49	19.1	B
11. Platinum Avenue (E-W) @ Marsh Avenue (N-S)	EB - LT	0.43	24.5	C	0.46	25.1	C	0.46	25.1	C
	WB - T	0.24	21.8	C	0.30	22.6	C	0.33	25.1	C
	SB - L	0.70	52.2	D	0.96	86.3	F *	0.78	53.3	D
	SB - R	0.21	11.2	B	0.21	11.2	B	0.20	9.6	A
13. SI Mall East Driveway (E-W) @ Marsh Avenue (N-S) (Unsignalized in No-Action)	EB - L	0.31	20.1	C	0.52	31.8	D *	0.23	21.8	C
	EB - R	0.11	10.3	B	0.15	10.9	B	0.21	21.7	C
	NB - L	0.07	8.2	A	0.10	8.5	A	0.25	12.3	B
	NB - T	-	-	-	-	-	-	0.34	12.4	B
	SB - TR	-	-	-	-	-	-	0.50	14.3	B
16. SI Expressway EB Off-Ramp/ W Caswell Avenue/Goethals Road N (E-W) @ Richmond Avenue (N-S)	EB - LT	0.41	39.8	D	0.41	39.8	D	0.41	39.8	D
	WB - LTR	0.65	51.6	D	0.65	51.6	D	0.65	51.6	D
	NB - L	0.68	27.2	C	0.76	32.4	C	0.80	35.6	D
	NB - TR	0.58	15.4	B	0.60	15.7	B	0.60	15.7	B
	SB - L	0.04	20.4	C	0.04	20.4	C	0.04	19.7	B
	SB - TR	0.97	39.9	D	1.01	48.1	D *	0.98	40.2	D
19. Victory Boulevard (E-W) @ Richmond Avenue (N-S)	EB - L	0.50	51.2	D	0.50	51.2	D	0.50	51.2	D
	EB - T	0.92	71.9	E	0.92	71.9	E	0.92	71.9	E
	EB - R	0.97	88.8	F	0.97	88.8	F	0.97	88.8	F
	WB - L	1.29	177.0	F	1.38	221.2	F *	1.38	221.2	F *
	WB - TR	0.78	27.4	C	0.78	27.5	C	0.78	27.5	C
	NB - L	0.75	60.1	E	0.75	60.8	E	0.75	60.8	E
	NB - T	0.80	39.7	D	0.87	42.7	D	0.87	42.7	D
	SB - L	0.28	40.0	D	0.30	43.7	D	0.30	43.7	D
	SB - TR	0.84	40.1	D	0.91	43.0	D	0.91	43.0	D
20. Signs Road (E-W) @ Richmond Avenue (N-S)	EB - LR	1.13	96.2	F	1.17	116.8	F *	1.17	116.8	E *
	NB - L	1.05	94.4	F	1.11	113.9	F *	1.11	113.9	E *
	NB - T	0.56	8.4	A	0.61	9.0	A	0.61	9.0	A
	SB - TR	1.12	78.2	E	1.20	113.8	F *	1.20	113.8	E *

Table 17-4b

## 2019 Action With Mitigation Traffic Levels of Service - Weekday PM Peak Hour

	LANE GROUP	NO-ACTION			WITH-ACTION			MITIGATION		
		V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS
22. Draper Place (E-W) @ Richmond Avenue (N-S)	EB - LT	1.12	92.8	F	1.12	92.8	F	1.12	92.8	F
	WB - LTR	0.13	25.7	C	0.13	25.7	C	0.13	25.7	C
	NB - L	1.11	102.8	F	1.18	130.6	F *	1.18	130.6	F *
	NB - TR	0.45	9.5	A	0.50	10.0	A	0.50	10.0	A
	SB - TR	0.91	31.2	C	1.00	41.1	D	1.00	41.1	D
23. Nome Avenue (E-W) @ Richmond Avenue (N-S)	WB - LR	0.81	45.9	D	0.88	52.4	D *	0.88	52.4	D *
	NB - TR	0.92	34.5	C	1.02	50.8	D *	1.02	50.8	D *
	SB - L	0.90	58.2	E	0.90	58.2	E	0.90	58.2	E
	SB - T	0.57	9.4	A	0.62	10.1	B	0.62	10.1	B
24. Drumgoole Road West (E-W) @ Richmond Avenue (N-S)	EB - L	0.75	25.8	C	0.87	32.2	C	0.90	34.9	C
	EB - LR	0.81	28.4	C	0.93	39.0	D	0.96	43.9	D
	NB - T	0.82	25.3	C	0.89	28.7	C	0.86	26.8	C
	SB - T	0.98	32.8	C	1.04	48.5	D *	1.01	39.9	D
25. Arthur Kill Road (E-W) @ Richmond Avenue (N-S)	EB - L	0.32	25.9	C	0.32	25.9	C	0.18	23.2	C
	EB - TR	0.48	23.2	C	0.48	23.2	C	0.53	25.8	C
	WB - L	0.12	20.2	C	0.12	20.2	C	0.15	22.8	C
	WB - T	1.06	71.1	E	1.06	71.1	E	0.66	28.0	C
	WB - R	0.43	11.5	B	0.46	11.9	B	0.50	13.5	B
	NB - L	0.54	35.8	D	0.54	35.8	D	0.50	34.6	C
	NB - TR	1.04	61.5	E	1.12	92.4	F *	1.04	60.9	E
	SB - L	1.08	83.4	F	1.12	100.6	F *	1.05	73.2	E
	SB - TR	0.90	34.5	C	0.96	40.2	D	0.90	33.1	C
27. Katan Avenue (E-W) @ Richmond Avenue (N-S)	EB - LTR	0.37	28.0	C	0.40	28.4	C	0.41	29.5	C
	WB - LTR	0.35	27.6	C	0.37	27.9	C	0.38	29.0	C
	NB - LTR	0.47	11.3	B	0.50	11.8	B	0.49	11.2	B
	SB - LTR	0.94	26.9	C	1.02	45.2	D *	1.00	39.2	D
28. Richmond Road (E-W) @ Arthur Kill Road-Richmond Hill Road (N-S)	WB - LR	0.97	43.0	D	1.11	85.6	F *	1.11	85.6	F *
	NB - T	0.70	28.3	C	0.80	31.3	C	0.80	31.3	C
	NB - R	0.32	3.9	A	0.32	3.9	A	0.32	3.9	A
	SB - L	0.65	17.6	B	0.86	31.4	C	0.86	31.4	C
	SB - T	0.49	15.0	B	0.56	16.3	B	0.56	16.3	B
29. Clarke Avenue (E-W) @ Arthur Kill Road (N-S)	WB - LR	1.01	46.2	D	1.04	54.3	D *	1.01	44.7	D
	NB - T	0.89	41.9	D	0.96	51.5	D *	0.93	45.7	D
	NB - R	0.41	3.8	A	0.41	3.8	A	0.40	3.2	A
	SB - L	0.57	19.5	B	0.66	25.6	C	0.73	28.3	C
	SB - T	0.72	21.3	C	0.76	23.0	C	0.78	24.4	C
30. Arthur Kill Road (E-W) @ Corbin Avenue (N-S) (Unsignalized)	WB - LT	0.09	11.3	B	0.12	11.7	B	0.12	11.7	B
	NB - LR	0.63	68.6	F	0.77	88.7	F *	0.77	88.7	F *
31. Arthur Kill Road (E-W) @ Drumgoole Road West (N-S)	EB - L	0.70	22.2	C	0.84	33.5	C	0.84	33.5	C
	EB - TR	0.97	58.9	E	0.97	58.9	E	0.97	58.9	E
	WB - L	0.71	22.0	C	0.71	22.0	C	0.71	22.0	C
	WB - TR	0.46	31.1	C	0.46	31.1	C	0.46	31.1	C
	NB - L	0.41	31.5	C	0.41	31.5	C	0.41	31.5	C
	NB - TR	0.73	23.9	C	0.81	26.8	C	0.81	26.8	C
	SB - LTR	1.13	83.6	F	1.24	135.6	F *	1.24	135.6	F *
32. Arthur Kill Road (E-W) @ Woodrow Road (N-S)	EB - TR	0.92	35.8	D	0.96	42.6	D	0.88	28.9	C
	WB - LT	1.20	110.8	F	1.42	209.1	F *	1.20	110.2	F
	NB - L	0.17	21.2	C	0.17	21.2	C	0.20	24.3	C
	NB - R	0.36	24.3	C	0.44	26.0	C	0.52	30.9	C
35. Rockland Avenue (E-W) @ Forest Hill Road (N-S)	EB - L	1.05	77.1	E	1.05	77.2	E	1.05	77.2	E
	EB - TR	0.54	30.0	C	0.55	30.1	C	0.55	30.1	C
	WB - L	0.81	24.0	C	0.91	39.7	D	0.91	39.7	D
	WB - TR	0.98	55.2	E	1.00	59.9	E	1.00	59.9	E
	NB - L	0.20	17.5	B	0.21	17.6	B	0.21	17.6	B
	NB - TR	1.15	95.0	F	1.22	127.7	F *	1.22	127.7	F *
	SB - L	0.95	83.2	F	0.95	83.2	F	0.95	83.2	F
	SB - T	0.95	39.4	D	0.97	43.5	D	0.97	43.5	D
	SB - R	0.74	26.5	C	0.74	26.5	C	0.74	26.5	C
36. Rockland Avenue (E-W) @ Brielle Avenue (N-S)	EB - L	0.78	24.2	C	0.84	28.5	C	0.87	31.7	C
	EB - TR	0.45	15.4	B	0.46	15.6	B	0.47	16.4	B
	WB - LTR	0.82	32.6	C	0.85	34.3	C	0.88	37.0	D
	NB - LTR	0.03	17.1	B	0.03	17.1	B	0.03	16.5	B
	SB - LTR	1.05	57.7	E	1.08	70.9	E *	1.05	58.1	E
37. Richmond Road (E-W) @ Wilder Avenue (N-S)	EB - TR	0.69	19.1	B	0.77	22.0	C	0.73	18.1	B
	WB - LT	1.10	72.8	E	1.22	123.0	F *	1.10	69.9	E
	NB - LR	0.39	35.3	D	0.43	36.2	D	0.49	40.7	D
38. Forest Avenue (E-W) @ Richmond Avenue-Morningstar Road (N-S)	EB - L	0.40	28.2	C	0.40	28.2	C	0.40	28.2	C
	EB - TR	0.96	44.8	D	0.96	44.8	D	0.96	44.8	D
	WB - L	1.20	138.7	F	1.20	138.7	F	1.20	138.7	F
	WB - TR	0.51	17.2	B	0.51	17.2	B	0.51	17.2	B
	NB - L	0.41	19.9	B	0.43	20.5	C	0.44	20.7	C
	NB - T	0.44	21.6	C	0.48	22.3	C	0.48	22.3	C
	NB - R	0.27	10.2	B	0.27	10.2	B	0.27	10.2	B
	SB - LTR	1.00	64.3	E	1.07	83.8	F *	0.98	58.2	E

## Notes:

EB-Eastbound, WB-Westbound, NB-Northbound, SB-Southbound

L-Left, T-Through, R-Right, Df-Analysis considers a Defacto Left Lane on this approach

V/C Ratio - Volume to Capacity Ratio, sec. - Seconds

LOS - Level of Service

\* - Denotes a significant adverse impact

Analysis is based on the 2000 Highway Capacity Manual methodology (HCS+, version 5.5)

**Table 17-4c**

**2019 Action With Mitigation Traffic Levels of Service - Saturday Midday Peak Hour**

	Lane Group	No Action			With Action			Mitigation		
		V/C Ratio	Delay (sec.)	LOS	V/C Ratio	Delay (sec.)	LOS	V/C Ratio	Delay (sec.)	LOS
1. Richmond Hill Road (E-W) Richmond Avenue (N-S)	EB - LTR	0.04	24.7	C	0.04	24.7	C	0.05	27.0	C
	WB - L	0.51	31.1	C	0.51	31.1	C	0.59	35.4	D
	WB - LT	0.55	31.9	C	0.55	31.9	C	0.69	39.3	D
	WB - R	0.98	43.6	D	1.10	80.8	F*	0.63	18.9	B
	NB - L	0.02	31.4	C	0.02	31.4	C	0.02	28.9	C
	NB - TR	0.87	27.7	C	0.95	31.8	C	0.95	31.8	C
	SB - L	1.13	118.1	F	1.28	177.1	F*	1.10	101.3	F
2. SI Mall Northwest Driveway (E-W) Richmond Avenue (N-S)	SB - TR	1.00	42.6	D	1.12	84.3	F*	1.12	84.3	F*
	EB - LTR	0.03	23.8	C	0.03	23.8	C	0.03	25.3	C
	NB - TR	0.79	28.4	C	0.82	29.1	C	0.94	37.6	D
	SB - L	1.10	90.4	F	1.45	242.9	F*	1.09	81.4	F
4. Platinum Avenue (E-W) Richmond Avenue (N-S)	SB - T	0.55	10.4	B	0.57	10.7	B	0.55	9.5	A
	WB - L	0.84	40.9	D	1.04	75.3	E*	0.92	45.9	D
	WB - R	0.42	31.1	C	0.42	31.1	C	0.37	27.7	C
	NB - T	0.83	24.6	C	0.88	26.2	C	0.95	33.2	C
	NB - R	0.42	18.3	B	0.58	20.9	C	0.62	23.9	C
	SB - L	0.55	43.5	D	0.55	43.5	D	0.55	43.5	D
5. Forest Hill Road (E-W) Richmond Avenue (N-S)	SB - T	0.45	9.3	A	0.47	9.5	A	0.50	11.2	B
	WB - L	0.69	31.9	C	0.78	34.8	C	0.78	34.8	C
	WB - LR	1.06	77.5	E	1.15	112.4	F*	1.15	112.4	F*
	NB - T	1.08	64.1	E	1.23	129.0	F*	1.23	129.0	F*
	NB - R	0.46	18.2	B	0.51	18.9	B	0.51	18.9	B
6. Richmond Hill Road (E-W) SI Mall North Driveway (N-S)	SB - L	0.55	50.5	D	0.55	50.5	D	0.55	50.5	D
	SB - T	0.87	18.2	B	0.96	23.4	C	0.96	23.4	C
	EB - TR	0.34	12.0	B	0.36	12.2	B	0.39	14.1	B
	WB - LT	0.50	14.1	B	0.61	16.1	B	0.65	18.9	B
	NB - L	0.82	38.3	D	0.99	62.1	E*	0.90	43.6	D
7. Richmond Hill Road (E-W) Marsh Avenue (N-S)	NB - R	0.26	22.5	C	0.37	24.1	C	0.33	21.5	C
	EB - T	0.47	25.3	C	0.55	26.9	C	0.55	26.9	C
	EB - R	0.58	29.0	C	0.58	29.0	C	0.58	29.0	C
	WB - L	0.56	9.6	A	0.89	25.4	C	0.93	32.8	C
	WB - T	0.25	5.3	A	0.27	5.5	A	0.28	6.3	A
	NB - L	0.97	66.4	E	1.06	90.8	F*	0.95	59.5	E
8. Richmond Hill Road (E-W) Forest Hill Road (N-S)	NB - R	0.60	16.0	B	0.82	22.6	C	0.81	21.9	C
	EB - L	0.50	25.1	C	0.73	34.5	C	0.84	44.8	D
	EB - TR	0.67	28.2	C	0.83	34.9	C	0.83	34.9	C
	WB - L	-	-	-	-	-	-	1.17	124.6	F
	WB - TR	-	-	-	-	-	-	1.51	271.4	F
	WB - LTR	1.19	123.5	F	1.84	416.6	F*	-	248.5	F*
	NB - L	0.24	47.6	D	0.24	47.6	D	0.28	49.5	D
	NB - TR	1.17	117.6	F	1.21	133.5	F*	1.16	109.5	F
	SB - L	0.56	50.8	D	0.56	50.8	D	0.64	53.5	D
10. Platinum Avenue (E-W) Staten Island Mall Drive (N-S)	SB - TR	1.16	112.2	F	1.26	153.7	F*	1.21	130.0	F*
	EB - L	0.72	25.3	C	0.98	56.0	E*	0.84	31.9	C
	EB - TR	0.10	11.9	B	0.10	11.9	B	0.13	19.2	B
	WB - L	0.48	17.6	B	0.48	17.6	B	0.41	12.5	B
	WB - TR	0.12	12.1	B	0.16	12.4	B	0.21	20.0	B
	NB - LTR	1.21	141.2	F	1.63	322.2	F*	1.63	322.2	F*
11. Platinum Avenue (E-W) Marsh Avenue (N-S)	SB - LTR	0.75	28.7	C	0.94	42.7	D	0.94	42.7	D
	EB - LT	0.58	26.7	C	0.63	27.7	C	0.63	27.7	C
	WB - T	0.39	23.9	C	0.48	25.3	C	0.53	28.4	C
	SB - L	0.63	47.5	D	0.93	78.4	E*	0.76	50.5	D
	SB - R	0.23	11.3	B	0.23	11.3	B	0.22	9.7	A

Staten Island Mall Enlargement

Table 17-4c (cont'd)

2019 Action With Mitigation Traffic Levels of Service - Saturday Midday Peak Hour

	Lane Group	No Action			With Action			Mitigation		
		V/C Ratio	Delay (sec.)	LOS	V/C Ratio	Delay (sec.)	LOS	V/C Ratio	Delay (sec.)	LOS
13. SI Mall East Driveway (E-W) Marsh Avenue (N-S) (Unsignalized in No Action)	EB - L	0.46	24.3	C	0.78	55.8	F*	0.31	22.8	C
	EB - R	0.13	10.0	A	0.18	10.6	B	0.24	22.1	C
	NB - L	0.09	8.1	A	0.13	8.4	A	0.34	13.4	B
	NB - T	-	-	-	-	-	-	0.36	12.7	B
	SB - TR	-	-	-	-	-	-	0.37	12.6	B
16. SI Expressway EB Off-Ramp/W Caswell Avenue/Goethals Road N (E-W) Richmond Avenue (N-S)	EB - LT	0.36	38.7	D	0.36	38.7	D	0.43	42.9	D
	WB - LTR	0.58	47.6	D	0.58	47.6	D	0.58	47.6	D
	NB - L	0.75	31.2	C	0.85	39.6	D	0.85	40.0	D
	NB - TR	0.59	15.4	B	0.62	15.9	B	0.59	14.8	B
	SB - L	0.04	20.4	C	0.04	20.4	C	0.04	19.0	B
	SB - TR	1.04	53.8	D	1.09	74.1	E*	1.02	46.8	D
19. Victory Boulevard (E-W) Richmond Avenue (N-S)	EB - L	0.59	37.3	D	0.59	37.3	D	0.59	37.3	D
	EB - T	0.49	28.8	C	0.49	28.8	C	0.49	28.8	C
	EB - R	0.94	57.4	E	0.94	57.4	E	0.94	57.4	E
	WB - L	1.13	101.4	F	1.26	157.1	F*	1.26	157.1	F*
	WB - TR	0.74	21.9	C	0.74	21.9	C	0.74	21.9	C
	NB - L	0.55	37.4	D	0.55	37.4	D	0.63	41.1	D
	NB - T	1.00	48.8	D	1.09	80.1	F*	1.02	52.0	D
	SB - L	0.24	32.3	C	0.24	32.4	C	0.27	34.8	C
	SB - TR	1.03	55.5	E	1.13	92.0	F*	1.05	58.8	E
20. Signs Road (E-W) Richmond Avenue (N-S)	EB - L	-	-	-	-	-	-	0.61	35.1	D
	EB - R	-	-	-	-	-	-	0.55	20.5	C
	EB - LR	1.13	98.4	F	1.20	127.6	F*	-	25.4	C
	NB - L	0.94	70.2	E	1.01	87.5	F*	0.95	70.3	E
	NB - T	0.64	9.4	A	0.70	10.3	B	0.67	8.4	A
	SB - T	-	-	-	-	-	-	1.08	60.1	E
	SB - R	-	-	-	-	-	-	0.05	13.1	B
	SB - TR	1.06	54.9	D	1.16	97.1	F*	-	59.5	E
22. Draper Place (E-W) Richmond Avenue (N-S)	EB - LT	1.03	62.1	E	1.03	62.1	E	1.03	62.1	E
	WB - LTR	0.14	25.8	C	0.14	25.8	C	0.14	25.8	C
	NB - L	1.13	105.4	F	1.20	134.0	F*	1.20	134.0	F*
	NB - TR	0.52	10.1	B	0.57	10.7	B	0.57	10.7	B
	SB - TR	1.07	64.7	E	1.20	120.2	F*	1.20	120.2	F*
23. Nome Avenue (E-W) Richmond Avenue (N-S)	WB - LR	1.05	88.6	F	1.15	125.6	F*	1.06	89.3	F
	NB - T	-	-	-	-	-	-	0.99	39.5	D
	NB - R	-	-	-	-	-	-	0.47	22.1	C
	NB - TR	0.93	30.5	C	1.03	48.1	D*	-	37.8	D
	SB - L	1.12	122.9	F	1.12	122.9	F	1.12	122.9	F
24. Drumgoole Road West (E-W) Richmond Avenue (N-S)	EB - L	0.96	35.2	D	1.12	86.1	F*	1.12	86.1	F*
	EB - LR	1.02	48.5	D	1.19	114.2	F*	1.19	114.2	F*
	NB - T	0.94	33.1	C	1.03	51.7	D*	1.03	51.7	D*
	SB - T	0.97	32.9	C	1.05	54.1	D*	1.05	54.1	D*
	SB - L	0.25	26.1	C	0.25	26.1	C	0.15	25.1	C
25. Arthur Kill Road (E-W) Richmond Avenue (N-S)	EB - L	0.25	26.1	C	0.25	26.1	C	0.15	25.1	C
	EB - TR	0.41	23.8	C	0.41	23.8	C	0.47	27.3	C
	WB - L	0.11	21.2	C	0.11	21.2	C	0.13	24.5	C
	WB - T	1.01	59.8	E	1.01	59.8	E	0.63	29.6	C
	WB - R	0.56	14.4	B	0.59	15.1	B	0.66	18.3	B
	NB - L	0.35	33.7	C	0.35	33.7	C	0.33	32.7	C
	NB - TR	1.09	77.1	E	1.19	118.8	F*	1.08	69.1	E
	SB - L	1.11	95.9	F	1.16	115.3	F*	1.09	86.4	F
SB - TR	0.67	27.4	C	0.74	28.7	C	0.67	25.5	C	

Table 17-4c (cont'd)

## 2019 Action With Mitigation Traffic Levels of Service - Saturday Midday Peak Hour

	Lane Group	No Action			With Action			Mitigation		
		V/C Ratio	Delay (sec.)	LOS	V/C Ratio	Delay (sec.)	LOS	V/C Ratio	Delay (sec.)	LOS
27. Katan Avenue (E-W) Richmond Avenue (N-S)	EB - LTR	0.24	22.2	C	0.26	22.5	C	0.28	24.2	C
	WB - LTR	0.21	21.8	C	0.23	22.0	C	0.24	23.7	C
	NB - LTR	0.45	13.8	B	0.50	14.4	B	0.48	13.1	B
	SB - LTR	0.92	29.4	C	1.05	57.3	E*	1.01	43.2	D
28. Richmond Road (E-W) Arthur Kill Road-Richmond Hill Road (N-S)	WB - LR	0.93	38.4	D	1.11	87.2	F*	1.11	87.2	F*
	NB - T	0.64	28.1	C	0.77	32.2	C	0.77	32.2	C
	NB - R	0.29	3.9	A	0.29	3.9	A	0.29	3.9	A
	SB - L	0.69	17.7	B	0.95	44.4	D	0.95	44.4	D
	SB - T	0.60	16.9	B	0.69	19.1	B	0.69	19.1	B
30. Arthur Kill Road (E-W) Corbin Avenue (N-S) (Unsignalized)	WB - LT	0.11	10.8	B	0.15	11.3	B	0.15	11.3	B
	NB - L	-	-	-	-	-	-	0.27	105.8	F
	NB - R	-	-	-	-	-	-	0.31	22.5	C
	NB - LR	0.44	39.4	E	0.58	49.2	E*	-	32.7	D
31. Arthur Kill Road (E-W) Drumgoole Road West (N-S)	EB - L	0.82	25.8	C	0.98	53.8	D*	0.77	24.2	C
	EB - TR	0.75	39.4	D	0.75	39.4	D	0.75	39.4	D
	WB - L	0.64	19.4	B	0.64	19.4	B	0.79	25.2	C
	WB - TR	0.37	30.4	C	0.37	30.4	C	0.37	30.4	C
	NB - L	0.43	34.3	C	0.43	34.3	C	0.43	31.4	C
	NB - TR	0.86	30.9	C	0.97	43.5	D	0.86	26.9	C
	SB - LTR	1.14	90.9	F	1.38	198.5	F*	1.14	88.8	F
35. Rockland Avenue (E-W) Forest Hill Road (N-S)	EB - L	0.83	43.9	D	0.86	47.6	D	0.86	47.6	D
	EB - TR	0.41	24.8	C	0.42	25.0	C	0.42	25.0	C
	WB - L	0.96	51.5	D	1.08	86.7	F*	1.08	86.7	F*
	WB - TR	0.79	33.4	C	0.81	34.4	C	0.81	34.4	C
	NB - L	0.18	17.2	B	0.21	17.5	B	0.21	17.5	B
	NB - TR	1.18	108.5	F	1.27	149.2	F*	1.27	149.2	F*
	SB - L	0.77	61.5	E	0.77	61.5	E	0.77	61.5	E
	SB - T	0.85	32.6	C	0.88	35.2	D	0.88	35.2	D
36. Rockland Avenue (E-W) Brielle Avenue (N-S)	SB - R	0.38	19.8	B	0.38	19.8	B	0.38	19.8	B
	EB - L	0.87	36.0	D	0.96	51.3	D*	0.93	44.0	D
	EB - TR	0.40	15.0	B	0.42	15.2	B	0.41	14.5	B
	WB - LTR	0.95	39.3	D	0.98	45.3	D*	0.95	39.3	D
	NB - LTR	0.03	17.1	B	0.03	17.1	B	0.03	17.8	B
38. Forest Avenue (E-W) @ Richmond Avenue Morningstar Road (N-S)	SB - LTR	0.77	29.9	C	0.81	32.0	C	0.84	34.4	C
	EB - L	0.42	28.2	C	0.42	28.2	C	0.42	28.2	C
	EB - TR	1.03	58.7	E	1.03	58.7	E	1.03	58.7	E
	WB - L	1.00	75.3	E	1.00	75.3	E	1.00	75.3	E
	WB - TR	0.49	16.9	B	0.49	16.9	B	0.49	16.9	B
	NB - L	0.52	21.0	C	0.55	22.2	C	0.57	22.5	C
	NB - T	0.46	21.7	C	0.52	22.8	C	0.52	22.8	C
	NB - R	0.29	10.4	B	0.29	10.4	B	0.29	10.4	B
SB - LTR	0.86	47.0	D	0.96	62.4	E*	0.89	47.5	D	

**Notes:**  
EB-Eastbound, WB-Westbound, NB-Northbound, SB-Southbound  
L-Left, T-Through, R-Right, Dfl-Analysis considers a Defacto Left Lane on this approach  
V/C Ratio - Volume to Capacity Ratio, sec. - Seconds  
LOS - Level of Service  
\* - Denotes a significant adverse impact  
Highlighted movements denote findings of signifiant impacts  
Analysis is based on the 2000 Highway Capacity Manual methodology (HCS+, version 5.5)

Table 17-4c

## 2019 Action With Mitigation Traffic Levels of Service - Saturday Midday Peak Hour

	LANE GROUP	NO-ACTION			WITH-ACTION			MITIGATION		
		V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS
1. Richmond Hill Road (E-W) @ Richmond Avenue (N-S)	EB - LTR	0.04	24.7	C	0.04	24.7	C	<u>0.04</u>	<u>24.7</u>	C
	WB - L	0.51	31.1	C	0.51	31.1	C	<u>0.51</u>	<u>31.1</u>	C
	WB - LT	0.55	31.9	C	0.55	31.9	C	<u>0.55</u>	<u>31.9</u>	C
	WB - R	0.98	43.6	D	1.10	80.8	F *	<u>1.10</u>	<u>80.8</u>	F *
	NB - L	0.02	31.4	C	0.02	31.4	C	<u>0.02</u>	<u>31.4</u>	C
	NB - TR	0.87	27.7	C	0.95	31.8	C	<u>0.95</u>	<u>31.8</u>	C
	SB - L	1.13	118.1	F	1.28	177.1	F *	<u>1.28</u>	<u>177.1</u>	F *
	SB - TR	1.00	42.6	D	1.12	84.3	F *	<u>1.12</u>	<u>84.3</u>	F *
2. SI Mall Northwest Driveway (E-W) @ Richmond Avenue (N-S)	EB - LTR	0.03	23.8	C	0.03	23.8	C	0.03	25.3	C
	NB - TR	0.79	28.4	C	0.82	29.1	C	0.94	37.6	D
	SB - L	1.10	90.4	F	1.45	242.9	F *	1.09	81.4	F
	SB - T	0.55	10.4	B	0.57	10.7	B	0.55	9.5	A
4. Platinum Avenue (E-W) @ Richmond Avenue (N-S)	WB - L	0.84	40.9	D	1.04	75.3	E *	0.92	45.9	D
	WB - R	0.42	31.1	C	0.42	31.1	C	0.37	27.7	C
	NB - T	0.83	24.6	C	0.88	26.2	C	0.95	33.2	C
	NB - R	0.42	18.3	B	0.58	20.9	C	0.62	23.9	C
	SB - L	0.55	43.5	D	0.55	43.5	D	0.55	43.5	D
	SB - T	0.45	9.3	A	0.47	9.5	A	0.50	11.2	B
5. Forest Hill Road (E-W) @ Richmond Avenue (N-S)	WB - L	0.69	31.9	C	0.78	34.8	C	0.78	34.8	C
	WB - LR	1.06	77.5	E	1.15	112.4	F *	1.15	112.4	F *
	NB - T	1.08	64.1	E	1.23	129.0	F *	1.23	129.0	F *
	NB - R	0.46	18.2	B	0.51	18.9	B	0.51	18.9	B
	SB - L	0.55	50.5	D	0.55	50.5	D	0.55	50.5	D
	SB - T	0.87	18.2	B	0.96	23.4	C	0.96	23.4	C
6. Richmond Hill Road (E-W) @ SI Mall North Driveway (N-S)	EB - TR	0.34	12.0	B	0.36	12.2	B	0.39	14.1	B
	WB - LT	0.50	14.1	B	0.61	16.1	B	0.65	18.9	B
	NB - L	0.82	38.3	D	0.97	58.1	E *	0.88	41.7	D
	NB - R	0.26	22.5	C	0.39	24.5	C	0.36	21.8	C
7. Richmond Hill Road (E-W) @ Marsh Avenue (N-S)	EB - T	0.47	25.3	C	0.55	26.9	C	0.55	26.9	C
	EB - R	0.58	29.0	C	0.58	29.0	C	0.58	29.0	C
	WB - L	0.56	9.6	A	0.89	25.4	C	0.93	32.8	C
	WB - T	0.25	5.3	A	0.27	5.5	A	0.28	6.3	A
	NB - L	0.97	66.4	E	1.06	90.8	F *	0.95	59.5	E
	NB - R	0.60	16.0	B	0.82	22.6	C	0.81	21.9	C
8. Richmond Hill Road (E-W) @ Forest Hill Road (N-S)	EB - L	0.50	25.1	C	0.73	34.5	C	<u>0.73</u>	<u>34.5</u>	C
	EB - TR	0.67	28.2	C	0.83	34.9	C	<u>0.83</u>	<u>34.9</u>	C
	WB - LTR	1.19	123.5	F	1.84	416.6	F *	<u>1.84</u>	<u>416.6</u>	F *
	NB - L	0.24	47.6	D	0.24	47.6	D	<u>0.24</u>	<u>47.6</u>	D
	NB - TR	1.17	117.6	F	1.21	133.5	F *	<u>1.21</u>	<u>133.5</u>	F *
	SB - L	0.56	50.8	D	0.56	50.8	D	<u>0.56</u>	<u>50.8</u>	D
	SB - TR	1.16	112.2	F	1.26	153.7	F *	<u>1.26</u>	<u>153.7</u>	F *
	SB - LTR	1.16	112.2	F	1.26	153.7	F *	<u>1.26</u>	<u>153.7</u>	F *
10. Platinum Avenue (E-W) @ Staten Island Mall Drive (N-S)	EB - L	0.72	25.3	C	0.98	56.0	E *	0.84	31.9	C
	EB - TR	0.10	11.9	B	0.10	11.9	B	0.13	19.2	B
	WB - L	0.48	17.6	B	0.48	17.6	B	0.41	12.5	B
	WB - TR	0.12	12.1	B	0.16	12.4	B	0.21	20.0	B
	NB - LTR	1.21	141.2	F	1.63	322.2	F *	1.63	322.2	F *
	SB - LTR	0.75	28.7	C	0.94	42.7	D	0.94	42.7	D
11. Platinum Avenue (E-W) @ Marsh Avenue (N-S)	EB - LT	0.58	26.7	C	0.63	27.7	C	0.63	27.7	C
	WB - T	0.39	23.9	C	0.48	25.3	C	0.53	28.4	C
	SB - L	0.63	47.5	D	0.93	78.4	E *	0.76	50.5	D
	SB - R	0.23	11.3	B	0.23	11.3	B	0.22	9.7	A
13. SI Mall East Driveway (E-W) @ Marsh Avenue (N-S) (Unsignalized in No-Action)	EB - L	0.46	24.3	C	0.78	55.8	F *	0.31	22.8	C
	EB - R	0.13	10.0	A	0.18	10.6	B	0.24	22.1	C
	NB - L	0.09	8.1	A	0.13	8.4	A	0.34	13.4	B
	NB - T	-	-	-	-	-	-	0.36	12.7	B
	SB - TR	-	-	-	-	-	-	0.37	12.6	B
16. SI Expressway EB Off-Ramp/ W Caswell Avenue/Goethals Road N (E-W) @ Richmond Avenue (N-S)	EB - LT	0.36	38.7	D	0.36	38.7	D	0.43	42.9	D
	WB - LTR	0.58	47.6	D	0.58	47.6	D	0.58	47.6	D
	NB - L	0.75	31.2	C	0.85	39.6	D	0.85	40.0	D
	NB - TR	0.59	15.4	B	0.62	15.9	B	0.59	14.3	B
	SB - L	0.04	20.4	C	0.04	20.4	C	0.04	19.0	B
	SB - TR	1.04	53.8	D	1.09	74.1	E *	1.02	46.8	D
19. Victory Boulevard (E-W) @ Richmond Avenue (N-S)	EB - L	<u>0.66</u>	<u>57.9</u>	<u>E</u>	<u>0.66</u>	<u>57.9</u>	<u>E</u>	<u>0.66</u>	<u>57.9</u>	<u>E</u>
	EB - T	<u>0.68</u>	<u>50.5</u>	<u>D</u>	<u>0.68</u>	<u>50.5</u>	<u>D</u>	<u>0.68</u>	<u>50.5</u>	<u>D</u>
	EB - R	<u>1.33</u>	<u>213.0</u>	<u>F</u>	<u>1.33</u>	<u>213.0</u>	<u>F</u>	<u>1.33</u>	<u>213.0</u>	<u>F</u>
	WB - L	<u>1.15</u>	<u>117.4</u>	<u>F</u>	<u>1.28</u>	<u>174.3</u>	<u>F *</u>	<u>1.28</u>	<u>174.3</u>	<u>F *</u>
	WB - TR	<u>0.69</u>	<u>24.7</u>	<u>C</u>	<u>0.69</u>	<u>24.7</u>	<u>C</u>	<u>0.69</u>	<u>24.7</u>	<u>C</u>
	NB - L	<u>0.73</u>	<u>55.4</u>	<u>E</u>	<u>0.73</u>	<u>59.2</u>	<u>E</u>	<u>0.73</u>	<u>59.2</u>	<u>E</u>
	NB - T	<u>0.92</u>	<u>45.4</u>	<u>D</u>	<u>1.01</u>	<u>59.5</u>	<u>E</u>	<u>1.01</u>	<u>59.5</u>	<u>E</u>
	SB - L	<u>0.32</u>	<u>46.6</u>	<u>D</u>	<u>0.32</u>	<u>48.7</u>	<u>D</u>	<u>0.32</u>	<u>48.7</u>	<u>D</u>
	SB - TR	<u>0.95</u>	<u>46.1</u>	<u>D</u>	<u>1.04</u>	<u>65.8</u>	<u>E</u>	<u>1.04</u>	<u>65.8</u>	<u>E</u>
	SB - LTR	<u>0.95</u>	<u>46.1</u>	<u>D</u>	<u>1.04</u>	<u>65.8</u>	<u>E</u>	<u>1.04</u>	<u>65.8</u>	<u>E</u>
20. Signs Road (E-W) @ Richmond Avenue (N-S)	EB - LR	1.13	98.4	F	1.20	127.6	F *	<u>1.20</u>	<u>127.6</u>	<u>F *</u>
	NB - L	0.94	70.2	E	1.01	87.5	F *	<u>1.01</u>	<u>87.5</u>	<u>F *</u>
	NB - T	0.64	9.4	A	0.70	10.3	B	<u>0.70</u>	<u>10.3</u>	<u>B</u>
	SB - TR	1.06	54.9	D	1.16	97.1	F *	<u>1.16</u>	<u>97.1</u>	<u>F *</u>

Table 17-4c

## 2019 Action With Mitigation Traffic Levels of Service - Saturday Midday Peak Hour

	LANE GROUP	NO-ACTION			WITH-ACTION			MITIGATION		
		V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS
22. Draper Place (E-W) @ Richmond Avenue (N-S)	EB - LT	1.03	62.1	E	1.03	62.1	E	1.03	62.1	E
	WB - LTR	0.14	25.8	C	0.14	25.8	C	0.14	25.8	C
	NB - L	1.13	105.4	F	1.20	134.0	F *	1.20	134.0	F *
	NB - TR	0.52	10.1	B	0.57	10.7	B	0.57	10.7	B
	SB - TR	1.07	64.7	E	1.20	120.2	F *	1.20	120.2	F *
23. Nome Avenue (E-W) @ Richmond Avenue (N-S)	WB - LR	1.05	88.6	F	1.15	125.6	F *	1.15	125.6	F *
	NB - TR	0.93	30.5	C	1.03	48.1	D *	1.03	48.1	D *
	SB - L	1.12	122.9	F	1.12	122.9	F	1.12	122.9	F
	SB - T	0.59	9.6	A	0.65	10.4	B	0.68	11.8	B
24. Drumgoole Road West (E-W) @ Richmond Avenue (N-S)	EB - L	0.96	35.2	D	1.12	86.1	F *	1.12	86.1	F *
	EB - LR	1.02	48.5	D	1.19	114.2	F *	1.19	114.2	F *
	NB - T	0.94	33.1	C	1.03	51.7	D *	1.03	51.7	D *
	SB - T	0.97	32.9	C	1.05	54.1	D *	1.05	54.1	D *
25. Arthur Kill Road (E-W) @ Richmond Avenue (N-S)	EB - L	0.25	26.1	C	0.25	26.1	C	0.15	25.1	C
	EB - TR	0.41	23.8	C	0.41	23.8	C	0.47	27.3	C
	WB - L	0.11	21.2	C	0.11	21.2	C	<u>0.14</u>	<u>24.6</u>	C
	WB - T	1.01	59.8	E	1.01	59.8	E	<u>0.66</u>	<u>30.1</u>	C
	WB - R	0.56	14.4	B	0.59	15.1	B	0.66	18.3	B
	NB - L	0.35	33.7	C	0.35	33.7	C	0.33	32.7	C
	NB - TR	1.09	77.1	E	1.19	118.8	F *	1.08	69.1	E
	SB - L	1.11	95.9	F	1.16	115.3	F *	1.09	86.4	F
	SB - TR	0.67	27.4	C	0.74	28.7	C	0.67	25.5	C
27. Katan Avenue (E-W) @ Richmond Avenue (N-S)	EB - LTR	0.24	22.2	C	0.26	22.5	C	0.28	24.2	C
	WB - LTR	0.21	21.8	C	0.23	22.0	C	0.24	23.7	C
	NB - LTR	0.45	13.8	B	0.50	14.4	B	0.48	13.1	B
	SB - LTR	0.92	29.4	C	1.05	57.3	E *	1.01	43.2	D
28. Richmond Road (E-W) @ Arthur Kill Road-Richmond Hill Road (N-S)	WB - LR	0.93	38.4	D	1.11	87.2	F *	1.11	87.2	F *
	NB - T	0.64	28.1	C	0.77	32.2	C	0.77	32.2	C
	NB - R	0.29	3.9	A	0.29	3.9	A	0.29	3.9	A
	SB - L	0.69	17.7	B	0.95	44.4	D	0.95	44.4	D
	SB - T	0.60	16.9	B	0.69	19.1	B	0.69	19.1	B
30. Arthur Kill Road (E-W) @ Corbin Avenue (N-S) (Unsignalized)	WB - LT	0.11	10.8	B	0.15	11.3	B	0.15	11.3	B
	NB - LR	0.44	39.4	E	0.58	49.2	E *	<u>0.58</u>	<u>49.2</u>	E *
31. Arthur Kill Road (E-W) @ Drumgoole Road West (N-S)	EB - L	0.82	25.8	C	0.98	53.8	D *	<u>0.98</u>	<u>53.8</u>	D *
	EB - TR	0.75	39.4	D	0.75	39.4	D	<u>0.75</u>	<u>39.4</u>	D
	WB - L	0.64	19.4	B	0.64	19.4	B	<u>0.64</u>	<u>19.4</u>	B
	WB - TR	0.37	30.4	C	0.37	30.4	C	<u>0.37</u>	<u>30.4</u>	C
	NB - L	0.43	34.3	C	0.43	34.3	C	<u>0.43</u>	<u>34.3</u>	C
	NB - TR	0.86	30.9	C	0.97	43.5	D	<u>0.97</u>	<u>43.5</u>	D
	SB - LTR	1.14	90.9	F	1.38	198.5	F *	<u>1.38</u>	<u>198.5</u>	F *
35. Rockland Avenue (E-W) @ Forest Hill Road (N-S)	EB - L	0.83	43.9	D	0.86	47.6	D	0.86	47.6	D
	EB - TR	0.41	24.8	C	0.42	25.0	C	0.42	25.0	C
	WB - L	0.96	51.5	D	1.08	86.7	F *	1.08	86.7	F *
	WB - TR	0.79	33.4	C	0.81	34.4	C	0.81	34.4	C
	NB - L	0.18	17.2	B	0.21	17.5	B	0.21	17.5	B
	NB - TR	1.18	108.5	F	1.27	149.2	F *	1.27	149.2	F *
	SB - L	0.77	61.5	E	0.77	61.5	E	0.77	61.5	E
	SB - T	0.85	32.6	C	0.88	35.2	D	0.88	35.2	D
SB - R	0.38	19.8	B	0.38	19.8	B	0.38	19.8	B	
36. Rockland Avenue (E-W) @ Brielle Avenue (N-S)	EB - L	0.87	36.0	D	0.96	51.3	D *	0.93	44.0	D
	EB - TR	0.40	15.0	B	0.42	15.2	B	0.41	14.5	B
	WB - LTR	0.95	39.3	D	0.98	45.3	D *	0.95	39.3	D
	NB - LTR	0.03	17.1	B	0.03	17.1	B	0.03	17.8	B
	SB - LTR	0.77	29.9	C	0.81	32.0	C	0.84	34.4	C
38. Forest Avenue (E-W) @ Richmond Avenue-Morningstar Road (N-S)	EB - L	<u>0.41</u>	<u>27.7</u>	<u>C</u>	<u>0.41</u>	<u>27.7</u>	<u>C</u>	<u>0.41</u>	<u>27.7</u>	<u>C</u>
	EB - TR	<u>1.06</u>	<u>70.8</u>	<u>E</u>	<u>1.06</u>	<u>70.8</u>	<u>E</u>	<u>1.06</u>	<u>70.8</u>	<u>E</u>
	WB - L	1.00	75.3	E	1.00	75.3	E	1.00	75.3	E
	WB - TR	0.49	16.9	B	0.49	16.9	B	0.49	16.9	B
	NB - L	<u>0.53</u>	<u>21.3</u>	<u>C</u>	<u>0.56</u>	<u>22.5</u>	<u>C</u>	<u>0.58</u>	<u>22.9</u>	<u>C</u>
	NB - T	0.46	21.7	C	0.52	22.8	C	0.52	22.8	C
	NB - R	0.29	10.4	B	0.29	10.4	B	0.29	10.4	B
	SB - LTR	0.86	47.0	D	0.96	62.4	E *	0.89	47.5	D

## Notes:

EB-Eastbound, WB-Westbound, NB-Northbound, SB-Southbound

L-Left, T-Through, R-Right, Df-Analysis considers a Defacto Left Lane on this approach

V/C Ratio - Volume to Capacity Ratio, sec. - Seconds

LOS - Level of Service

\* - Denotes a significant adverse impact

Analysis is based on the 2000 Highway Capacity Manual methodology (HCS+, version 5.5)

Staten Island Mall Enlargement

Table 17-4d

2019 Action With Mitigation Traffic Levels of Service - Saturday PM Peak Hour

	Lane Group	No Action			With Action			Mitigation		
		V/C Ratio	Delay (sec.)	LOS	V/C Ratio	Delay (sec.)	LOS	V/C Ratio	Delay (sec.)	LOS
1. Richmond Hill Road (E-W) @ Richmond Avenue (N-S)	EB - LTR	0.04	24.7	C	0.04	24.7	C	0.05	26.2	C
	WB - L	0.37	27.9	C	0.37	27.9	C	0.41	29.9	C
	WB - LT	0.40	28.3	C	0.40	28.3	C	0.44	30.4	C
	WB - R	1.12	83.1	F	1.27	146.6	F*	0.72	19.3	B
	NB - L	0.02	31.4	C	0.02	31.4	C	0.02	29.7	C
	NB - TR	0.86	27.5	C	0.95	32.6	C	0.95	32.6	C
	SB - L	1.12	118.7	F	1.27	177.3	F*	1.14	120.9	F
2. SI Mall Northwest Driveway (E-W) @ Richmond Avenue (N-S)	SB - TR	0.80	26.9	C	0.92	32.0	C	0.92	32.0	C
	EB - LTR	0.03	23.8	C	0.03	23.8	C	0.04	25.3	C
	NB - TR	0.74	27.6	C	0.78	28.3	C	0.89	34.9	C
	SB - L	0.95	54.7	D	1.29	172.9	F*	0.97	50.3	D
4. Platinum Avenue (E-W) @ Richmond Avenue (N-S)	SB - T	0.41	9.3	A	0.43	9.5	A	0.42	8.4	A
	WB - L	0.92	48.0	D	1.15	113.8	F*	0.94	46.9	D
	WB - R	0.28	28.6	C	0.28	28.6	C	0.23	24.1	C
	NB - T	0.74	22.4	C	0.78	23.5	C	0.87	29.2	C
	NB - R	0.26	16.4	B	0.41	18.2	B	0.45	21.6	C
	SB - L	0.44	40.9	D	0.44	40.9	D	0.49	43.1	D
5. Forest Hill Road (E-W) @ Richmond Avenue (N-S)	SB - T	0.39	8.8	A	0.41	8.9	A	0.45	11.8	B
	WB - L	0.66	31.8	C	0.77	35.2	D	0.77	35.2	D
	WB - LR	1.01	65.3	E	1.12	100.3	F*	1.12	100.3	F*
	NB - T	0.86	25.5	C	1.01	42.4	D	1.01	42.4	D
	NB - R	0.45	18.6	B	0.50	19.4	B	0.50	19.4	B
	SB - L	0.31	44.3	D	0.31	44.3	D	0.31	44.3	D
6. Richmond Hill Road (E-W) @ SI Mall North Driveway (N-S)	SB - T	0.83	17.1	B	0.93	21.5	C	0.93	21.5	C
	EB - TR	0.28	11.4	B	0.30	11.6	B	0.32	13.4	B
	WB - LT	0.41	12.9	B	0.51	14.3	B	0.55	16.7	B
	NB - L	0.76	34.6	C	0.96	56.8	E*	0.88	41.0	D
	NB - R	0.24	22.2	C	0.36	24.0	C	0.33	21.4	C
7. Richmond Hill Road (E-W) @ Marsh Avenue (N-S)	EB - T	0.41	24.4	C	0.51	26.2	C	0.51	26.2	C
	EB - R	0.60	29.9	C	0.60	29.9	C	0.60	29.9	C
	WB - L	0.57	9.4	A	0.90	25.1	C	0.94	32.6	C
	WB - T	0.21	5.1	A	0.23	5.2	A	0.24	6.0	A
	NB - L	0.93	58.6	E	1.04	81.8	F*	0.93	54.8	D
	NB - R	0.69	17.9	B	0.95	34.4	C	0.94	32.1	C
8. Richmond Hill Road (E-W) @ Forest Hill Road (N-S)	EB - L	0.57	27.1	C	0.84	42.3	D	0.76	42.3	D
	EB - TR	0.64	27.2	C	0.81	34.1	C	0.81	34.1	C
	WB - L	-	-	-	-	-	-	1.10	100.6	F
	WB - TR	-	-	-	-	-	-	1.78	391.7	F
	WB - LTR	1.19	122.9	F	1.86	427.0	F*	-	346.9	F*
	NB - L	0.24	47.8	D	0.24	47.8	D	0.28	49.9	D
	NB - TR	1.14	103.4	F	1.18	119.9	F*	1.13	97.2	F
	SB - L	0.47	47.4	D	0.47	49.8	D	0.54	50.2	D
	SB - TR	1.16	111.4	F	1.26	157.3	F*	1.21	132.2	F*
10. Platinum Avenue (E-W) @ Staten Island Mall Drive (N-S)	EB - L	0.52	18.9	B	0.81	32.8	C	0.80	34.6	C
	EB - TR	0.08	11.8	B	0.08	11.8	B	0.13	23.2	C
	WB - L	0.36	15.4	B	0.36	15.4	B	0.35	15.2	B
	WB - TR	0.14	12.2	B	0.18	12.6	B	0.29	24.9	C
	NB - LTR	1.21	142.0	F	1.71	360.6	F*	1.17	122.7	F
	SB - LTR	0.78	30.1	C	1.00	56.6	E*	0.84	28.8	C
11. Platinum Avenue (E-W) @ Marsh Avenue (N-S)	EB - LT	0.60	27.0	C	0.65	28.2	C	0.65	28.2	C
	WB - T	0.32	22.9	C	0.39	23.9	C	0.45	27.8	C
	SB - L	0.65	48.1	D	0.98	89.2	F*	0.75	48.5	D
	SB - R	0.20	11.0	B	0.20	11.0	B	0.19	9.0	A

Table 17-4d (cont'd)  
 2019 Action With Mitigation Traffic Levels of Service - Saturday PM Peak Hour

	Lane Group	No Action			With Action			Mitigation		
		V/C Ratio	Delay (sec.)	LOS	V/C Ratio	Delay (sec.)	LOS	V/C Ratio	Delay (sec.)	LOS
13. SI Mall East Driveway (E-W) @ Marsh Avenue (N-S)	EB - L	0.53	30.1	D	0.97	101.3	F*	0.31	23.0	C
	EB - R	0.12	10.2	B	0.19	11.0	B	0.24	22.1	C
	NB - L	0.10	8.2	A	0.13	8.6	A	0.37	14.2	B
	NB - T	-	-	-	-	-	-	0.42	13.3	B
	SB - TR	-	-	-	-	-	-	0.43	13.3	B
14. SI Mall Northeast Driveway (E-W) @ Marsh Avenue (N-S)	EB - L	0.65	30.3	C	0.89	45.9	D*	0.86	41.9	D
	EB - R	0.03	19.6	B	0.05	19.9	B	0.05	19.2	B
	NB - L	0.02	9.5	A	0.02	9.6	A	0.02	10.0	B
	NB - T	0.53	15.0	B	0.63	17.0	B	0.64	18.0	B
	SB - TR	0.61	16.5	B	0.79	22.0	C	0.81	23.5	C
19. Victory Boulevard (E-W) @ Richmond Avenue (N-S)	EB - L	0.25	26.5	C	0.25	26.5	C	0.30	30.8	C
	EB - T	0.57	31.3	C	0.57	31.3	C	0.67	37.9	D
	EB - R	0.24	25.8	C	0.24	25.8	C	0.28	29.6	C
	WB - L	1.11	86.8	F	1.23	139.0	F*	1.08	69.2	E
	WB - TR	0.45	17.5	B	0.45	17.5	B	0.46	18.2	B
	NB - L	0.42	34.3	C	0.42	35.5	D	0.49	36.9	D
	NB - T	0.98	46.0	D	1.09	80.5	F*	0.98	43.7	D
	SB - L	0.23	32.5	C	0.23	33.1	C	0.27	34.7	C
20. Signs Road (E-W) @ Richmond Avenue (N-S)	EB - L	-	-	-	-	-	-	0.29	32.8	C
	EB - R	-	-	-	-	-	-	0.41	18.7	B
	EB - LR	0.85	47.3	D	0.92	56.0	E*	-	22.3	C
	NB - L	1.00	80.1	F	1.09	106.6	F*	0.96	67.8	E
	NB - T	0.68	19.9	A	0.76	11.2	B	0.73	9.7	A
	SB - T	-	-	-	-	-	-	1.00	37.9	D
	SB - R	-	-	-	-	-	-	0.03	14.1	B
	SB - TR	0.92	27.2	C	1.02	43.3	D	-	37.7	D
22. Draper Place (E-W) @ Richmond Avenue (N-S)	EB - LT	0.83	43.3	D	0.83	43.3	D	0.87	47.7	D
	WB - LTR	0.18	26.3	C	0.18	26.3	C	0.18	27.2	C
	NB - L	1.12	102.1	F	1.21	139.2	F*	1.21	139.2	F*
	NB - TR	0.56	10.5	B	0.63	11.3	B	0.62	10.7	B
	SB - TR	0.91	33.2	C	1.03	54.0	D*	1.00	43.0	D
23. Nome Avenue (E-W) @ Richmond Avenue (N-S)	WB - LR	0.86	51.4	D	0.95	64.1	E*	0.95	64.1	E*
	NB - T	-	-	-	-	-	-	1.00	40.1	D
	NB - R	-	-	-	-	-	-	0.32	18.5	B
	NB - TR	0.96	34.4	C	1.08	67.6	E*	-	38.7	D
	SB - L	1.12	124.6	F	1.12	124.6	F	1.12	124.6	F
24. Drumgoole Road West (E-W) @ Richmond Avenue (N-S)	SB - T	0.49	8.6	A	0.56	9.3	A	0.56	9.3	A
	EB - L	0.81	26.6	C	0.96	40.1	D	0.96	40.1	D
	EB - LR	0.89	31.9	C	1.05	63.1	E*	1.05	63.1	E*
	NB - T	0.78	25.0	C	0.87	29.0	C	0.87	29.0	C
25. Arthur Kill Road (E-W) @ Richmond Avenue (N-S)	SB - T	0.92	29.4	C	1.02	45.6	D*	1.02	45.6	D*
	EB - L	0.22	25.0	C	0.22	25.0	C	0.12	23.8	C
	EB - TR	0.49	24.6	C	0.49	24.6	C	0.54	27.4	C
	WB - L	0.17	22.3	C	0.17	22.3	C	0.21	25.3	C
	WB - T	1.01	61.7	E	1.01	61.7	E	0.61	28.7	C
	WB - R	0.46	13.0	B	0.50	13.6	B	0.54	15.4	B
	NB - L	0.45	35.2	D	0.45	35.2	D	0.42	34.1	C
	NB - TR	0.94	39.9	D	1.04	62.1	E*	0.97	42.9	D
	SB - L	0.99	60.1	E	1.05	77.6	E*	0.99	58.2	E
	SB - TR	0.76	29.5	C	0.86	32.4	C	0.80	29.1	C
27. Katan Avenue (E-W) @ Richmond Avenue (N-S)	EB - LTR	0.25	22.3	C	0.28	22.7	C	0.32	26.3	C
	WB - LTR	0.23	22.0	C	0.24	22.2	C	0.28	25.6	C
	NB - LTR	0.39	13.1	B	0.44	13.6	B	0.41	11.2	B
	SB - LTR	0.95	32.1	C	1.10	73.7	E*	1.01	41.7	D

**Staten Island Mall Enlargement**

**Table 17-4d (cont'd)**

**2019 Action With Mitigation Traffic Levels of Service - Saturday PM Peak Hour**

	Lane Group	No Action			With Action			Mitigation		
		V/C Ratio	Delay (sec.)	LOS	V/C Ratio	Delay (sec.)	LOS	V/C Ratio	Delay (sec.)	LOS
28. Richmond Road (E-W) @ Arthur Kill Road-Richmond Hill Road (N-S)	WB - LR	0.96	41.5	D	1.13	96.2	F*	1.13	96.2	F*
	NB - T	0.57	26.6	C	0.70	29.8	C	0.70	29.8	C
	NB - R	0.33	4.1	A	0.33	4.1	A	0.33	4.1	A
	SB - L	0.63	15.7	B	0.88	30.7	C	0.88	30.7	C
	SB - T	0.52	15.5	B	0.63	17.6	B	0.63	17.6	B
30. Arthur Kill Road (E-W) @ Corbin Avenue (N-S) (Unsignalized)	WB - LT	0.08	10.4	B	0.12	10.8	B	0.12	10.8	B
	NB - L	-	-	-	-	-	-	0.34	99.3	F
	NB - R	-	-	-	-	-	-	0.30	21.1	C
31. Arthur Kill Road (E-W) @ Drumgoole Road West (N-S)	NB - LR	0.49	40.9	E	0.64	55.5	F*	-	34.1	D
	EB - L	0.76	23.1	C	0.93	43.5	D	0.75	24.4	C
	EB - TR	0.85	44.9	D	0.85	44.9	D	0.85	44.9	D
	WB - L	0.74	21.5	C	0.74	21.5	C	0.94	35.7	D
	WB - TR	0.39	30.6	C	0.39	30.6	C	0.39	30.6	C
	NB - L	0.49	38.9	D	0.49	38.9	D	0.49	35.4	D
	NB - TR	0.83	29.0	C	0.94	38.1	D	0.81	23.9	C
SB - LTR	1.14	91.1	F	1.37	193.2	F*	1.14	88.5	F	
32. Arthur Kill Road (E-W) @ Woodrow Road (N-S)	EB - TR	0.73	21.2	C	0.79	24.3	C	0.69	15.5	B
	WB - LT	1.00	39.1	D	1.34	175.5	F*	1.03	41.7	D
	NB - L	0.20	21.5	C	0.20	21.5	C	0.26	27.4	C
	NB - R	0.35	24.0	C	0.45	26.0	C	0.59	36.0	D
35. Rockland Avenue (E-W) @ Forest Hill Road (N-S)	EB - L	0.89	48.9	D	0.91	53.1	D	0.86	36.6	D
	EB - TR	0.41	24.8	C	0.42	24.9	C	0.49	28.7	C
	WB - L	0.84	38.4	D	0.96	57.2	E*	0.90	44.9	D
	WB - TR	0.65	30.0	C	0.67	30.6	C	0.77	37.8	D
	NB - L	0.07	16.1	B	0.08	16.2	B	0.08	16.2	B
	NB - TR	1.18	107.9	F	1.28	154.4	F*	1.28	154.4	F*
	SB - L	0.68	52.4	D	0.68	52.4	D	0.68	52.4	D
	SB - T	0.71	26.9	C	0.74	27.9	C	0.74	27.9	C
	SB - R	0.33	19.2	B	0.33	19.2	B	0.33	19.2	B
38. Forest Avenue (E-W) @ Richmond Avenue-Morningstar Road (N-S)	EB - L	0.32	26.1	C	0.32	26.1	C	0.32	26.1	C
	EB - TR	0.96	44.3	D	0.96	44.3	D	0.96	44.3	D
	WB - L	0.98	70.4	E	0.98	70.4	E	0.98	70.4	E
	WB - TR	0.46	16.5	B	0.46	16.5	B	0.46	16.5	B
	NB - L	0.56	22.3	C	0.60	23.6	C	0.61	24.1	C
	NB - T	0.46	21.6	C	0.52	22.8	C	0.52	22.8	C
	NB - R	0.29	10.3	B	0.29	10.3	B	0.29	10.3	B
SB - LTR	0.98	58.2	E	1.09	89.5	F*	1.00	60.7	E	

**Notes:**

EB-Eastbound, WB-Westbound, NB-Northbound, SB-Southbound  
 L-Left, T-Through, R-Right, Df-Analysis considers a Defacto Left Lane on this approach  
 V/C Ratio - Volume to Capacity Ratio, sec. - Seconds  
 LOS - Level of Service  
 \* - Denotes a significant adverse impact  
 Highlighted movements denote findings of significant impacts  
 Analysis is based on the 2000 Highway Capacity Manual methodology (HCS+, version 5.5)

Table 17-4d

## 2019 Action With Mitigation Traffic Levels of Service - Saturday PM Peak Hour

	LANE GROUP	NO-ACTION			WITH-ACTION			MITIGATION		
		V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS
1. Richmond Hill Road (E-W) @ Richmond Avenue (N-S)	EB - LTR	0.04	24.7	C	0.04	24.7	C	0.04	24.7	C
	WB - L	0.37	27.9	C	0.37	27.9	C	0.37	27.9	C
	WB - LT	0.40	28.3	C	0.40	28.3	C	0.40	28.3	C
	WB - R	1.12	83.1	F	1.27	146.6	F	1.21	121.2	F
	NB - L	0.02	31.4	C	0.02	31.4	C	0.02	29.7	C
	NB - TR	0.86	27.5	C	0.95	32.6	C	1.01	44.3	D
	SB - L	1.12	118.7	F	1.27	177.3	F	1.14	120.9	F
	SB - TR	0.80	26.9	C	0.92	32.0	C	0.97	39.8	D
2. SI Mall Northwest Driveway (E-W) @ Richmond Avenue (N-S)	EB - LTR	0.03	23.8	C	0.03	23.8	C	0.04	25.3	C
	NB - TR	0.74	27.6	C	0.78	28.3	C	0.89	34.9	C
	SB - L	0.95	54.7	D	1.29	172.9	F	0.97	50.3	D
	SB - T	0.41	9.3	A	0.43	9.5	A	0.42	8.4	A
4. Platinum Avenue (E-W) @ Richmond Avenue (N-S)	WB - L	0.92	48.0	D	1.15	113.8	F	0.94	46.9	D
	WB - R	0.28	28.6	C	0.28	28.6	C	0.23	24.1	C
	NB - T	0.74	22.4	C	0.78	23.5	C	0.87	29.2	C
	NB - R	0.26	16.4	B	0.41	18.2	B	0.45	21.6	C
	SB - L	0.44	40.9	D	0.44	40.9	D	0.49	43.1	D
	SB - T	0.39	8.8	A	0.41	8.9	A	0.45	11.8	B
5. Forest Hill Road (E-W) @ Richmond Avenue (N-S)	WB - L	0.66	31.8	C	0.77	35.2	D	0.77	35.2	D
	WB - LR	1.01	65.3	E	1.12	100.3	F	1.12	100.3	F
	NB - T	0.86	25.5	C	1.01	42.4	D	1.01	42.4	D
	NB - R	0.45	18.6	B	0.50	19.4	B	0.50	19.4	B
	SB - L	0.31	44.3	D	0.31	44.3	D	0.31	44.3	D
	SB - T	0.83	17.1	B	0.93	21.5	C	0.93	21.5	C
6. Richmond Hill Road (E-W) @ SI Mall North Driveway (N-S)	EB - TR	0.28	11.4	B	0.30	11.6	B	0.31	12.8	B
	WB - LT	0.41	12.9	B	0.51	14.3	B	0.54	15.9	B
	NB - L	0.76	34.6	C	0.94	53.3	D	0.89	43.1	D
	NB - R	0.24	22.2	C	0.38	24.4	C	0.36	22.6	C
7. Richmond Hill Road (E-W) @ Marsh Avenue (N-S)	EB - T	0.41	24.4	C	0.51	26.2	C	0.51	26.2	C
	EB - R	0.60	29.9	C	0.60	29.9	C	0.60	29.9	C
	WB - L	0.57	9.4	A	0.90	25.1	C	0.94	32.6	C
	WB - T	0.21	5.1	A	0.23	5.2	A	0.24	6.0	A
	NB - L	0.93	58.6	E	1.04	81.8	F	0.93	54.8	D
	NB - R	0.69	17.9	B	0.95	34.4	C	0.94	32.1	C
8. Richmond Hill Road (E-W) @ Forest Hill Road (N-S)	EB - L	0.57	27.1	C	0.84	42.3	D	0.84	42.3	D
	EB - TR	0.64	27.2	C	0.81	34.1	C	0.81	34.1	C
	WB - LTR	1.19	122.9	F	1.86	427.0	F	1.86	427.0	F
	NB - L	0.24	47.8	D	0.24	47.8	D	0.24	47.8	D
	NB - TR	1.14	103.4	F	1.18	119.9	F	1.18	119.9	F
	SB - L	0.47	47.4	D	0.47	49.8	D	0.47	49.8	D
	SB - TR	1.16	111.4	F	1.26	157.3	F	1.26	157.3	F
10. Platinum Avenue (E-W) @ Staten Island Mall Drive (N-S)	EB - L	0.52	18.9	B	0.81	32.8	C	0.80	34.6	C
	EB - TR	0.08	11.8	B	0.08	11.8	B	0.13	23.2	C
	WB - L	0.36	15.4	B	0.36	15.4	B	0.35	15.2	B
	WB - TR	0.14	12.2	B	0.18	12.6	B	0.29	24.9	C
	NB - LTR	1.21	142.0	F	1.71	360.6	F	1.17	122.7	F
	SB - LTR	0.78	30.1	C	1.00	56.6	E	0.84	28.8	C
11. Platinum Avenue (E-W) @ Marsh Avenue (N-S)	EB - LT	0.60	27.0	C	0.65	28.2	C	0.65	28.2	C
	WB - T	0.32	22.9	C	0.39	23.9	C	0.45	27.8	C
	SB - L	0.65	48.1	D	0.98	89.2	F	0.75	48.5	D
	SB - R	0.20	11.0	B	0.20	11.0	B	0.19	9.0	A
13. SI Mall East Driveway (E-W) @ Marsh Avenue (N-S)	EB - L	0.53	30.1	D	0.97	101.3	F	0.31	23.0	C
	EB - R	0.12	10.2	B	0.19	11.0	B	0.24	22.1	C
	NB - L	0.10	8.2	A	0.13	8.6	A	0.37	14.2	B
	NB - T	-	-	-	-	-	-	0.42	13.3	B
	SB - TR	-	-	-	-	-	-	0.43	13.3	B
14. SI Mall Northeast Driveway (E-W) @ Marsh Avenue (N-S)	EB - L	0.65	30.3	C	0.89	45.9	D	0.86	41.9	D
	EB - R	0.03	19.6	B	0.05	19.9	B	0.05	19.2	B
	NB - L	0.02	9.5	A	0.02	9.6	A	0.02	10.0	B
	NB - T	0.53	15.0	B	0.63	17.0	B	0.64	18.0	B
	SB - TR	0.61	16.5	B	0.79	22.0	C	0.81	23.5	C
19. Victory Boulevard (E-W) @ Richmond Avenue (N-S)	EB - L	0.35	45.2	D	0.35	45.2	D	0.35	45.2	D
	EB - T	0.79	59.0	E	0.79	59.0	E	0.79	59.0	E
	EB - R	0.33	43.5	D	0.33	43.5	D	0.33	43.5	D
	WB - L	1.15	119.9	F	1.28	175.4	F	1.28	175.4	F
	WB - TR	0.42	20.1	C	0.42	20.1	C	0.42	20.1	C
	NB - L	0.57	52.0	D	0.57	53.1	D	0.57	53.1	D
	NB - T	0.91	44.7	D	1.01	60.3	E	1.01	60.3	E
	SB - L	0.31	47.3	D	0.31	49.8	D	0.31	49.8	D
	SB - TR	0.76	39.0	D	0.84	42.1	D	0.84	42.1	D
	20. Signs Road (E-W) @ Richmond Avenue (N-S)	EB - LR	0.85	47.3	D	0.92	56.0	E	0.92	56.0
NB - L		1.00	80.1	F	1.09	106.6	F	1.09	106.6	F
NB - T		0.68	9.9	A	0.76	11.2	B	0.76	11.2	B
SB - TR		0.92	27.2	C	1.02	43.3	D	1.02	43.3	D
22. Draper Place (E-W) @ Richmond Avenue (N-S)	EB - LT	0.83	43.3	D	0.83	43.3	D	0.87	47.7	D
	WB - LTR	0.18	26.3	C	0.18	26.3	C	0.18	27.2	C
	NB - L	1.12	102.1	F	1.21	139.2	F	1.21	139.2	F
	NB - TR	0.56	10.5	B	0.63	11.3	B	0.62	10.7	B
	SB - TR	0.91	33.2	C	1.03	54.0	D	1.00	43.0	D
23. Nome Avenue (E-W) @ Richmond Avenue (N-S)	WB - LR	0.86	51.4	D	0.95	64.1	E	0.95	64.1	E
	NB - TR	0.96	34.4	C	1.08	67.6	E	1.08	67.6	E
	SB - L	1.12	124.6	F	1.12	124.6	F	1.12	124.6	F
	SB - T	0.49	8.6	A	0.56	9.3	A	0.56	9.3	A

Table 17-4d

## 2019 Action With Mitigation Traffic Levels of Service - Saturday PM Peak Hour

	LANE GROUP	NO-ACTION			WITH-ACTION			MITIGATION		
		V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS
24. Drumgoole Road West (E-W) @ Richmond Avenue (N-S)	EB - L	0.81	26.6	C	0.96	40.1	D	0.96	40.1	D
	EB - LR	0.89	31.9	C	1.05	63.1	E *	1.05	63.1	E *
	NB - T	0.78	25.0	C	0.87	29.0	C	0.87	29.0	C
	SB - T	0.92	29.4	C	1.02	45.6	D *	1.02	45.6	D *
25. Arthur Kill Road (E-W) @ Richmond Avenue (N-S)	EB - L	0.22	25.0	C	0.22	25.0	C	0.12	23.8	C
	EB - TR	0.49	24.6	C	0.49	24.6	C	0.54	27.4	C
	WB - L	0.17	22.3	C	0.17	22.3	C	0.22	25.5	C
	WB - T	1.01	61.7	E	1.01	61.7	E	0.63	29.1	C
	WB - R	0.46	13.0	B	0.50	13.6	B	0.54	15.4	B
	NB - L	0.45	35.2	D	0.45	35.2	D	0.42	34.1	C
	NB - TR	0.94	39.9	D	1.04	62.1	E *	0.97	42.9	D
	SB - L	0.99	60.1	E	1.05	77.6	E *	0.99	58.2	E
	SB - TR	0.76	29.5	C	0.86	32.4	C	0.80	29.1	C
27. Katan Avenue (E-W) @ Richmond Avenue (N-S)	EB - LTR	0.25	22.3	C	0.28	22.7	C	0.32	26.3	C
	WB - LTR	0.23	22.0	C	0.24	22.2	C	0.28	25.6	C
	NB - LTR	0.39	13.1	B	0.44	13.6	B	0.41	11.2	B
	SB - LTR	0.95	32.1	C	1.10	73.7	E *	1.01	41.7	D
28. Richmond Road (E-W) @ Arthur Kill Road-Richmond Hill Road (N-S)	WB - LR	0.96	41.5	D	1.13	96.2	F *	1.13	96.2	F *
	NB - T	0.57	26.6	C	0.70	29.8	C	0.70	29.8	C
	NB - R	0.33	4.1	A	0.33	4.1	A	0.33	4.1	A
	SB - L	0.63	15.7	B	0.88	30.7	C	0.88	30.7	C
SB - T	0.52	15.5	B	0.63	17.6	B	0.63	17.6	B	
30. Arthur Kill Road (E-W) @ Corbin Avenue (N-S) (Unsignalized)	WB - LT	0.08	10.4	B	0.12	10.8	B	0.12	10.8	B
	NB - LR	0.49	40.9	E	0.64	55.5	F *	0.64	55.5	F *
31. Arthur Kill Road (E-W) @ Drumgoole Road West (N-S)	EB - L	0.76	23.1	C	0.93	43.5	D	0.93	43.5	D
	EB - TR	0.85	44.9	D	0.85	44.9	D	0.85	44.9	D
	WB - L	0.74	21.5	C	0.74	21.5	C	0.74	21.5	C
	WB - TR	0.39	30.6	C	0.39	30.6	C	0.39	30.6	C
	NB - L	0.49	38.9	D	0.49	38.9	D	0.49	38.9	D
	NB - TR	0.83	29.0	C	0.94	38.1	D	0.94	38.1	D
	SB - LTR	1.14	91.1	F	1.37	193.2	F *	1.37	193.2	F *
32. Arthur Kill Road (E-W) @ Woodrow Road (N-S)	EB - TR	0.73	21.2	C	0.79	24.3	C	0.69	15.5	B
	WB - LT	1.00	39.1	D	1.34	175.5	F *	1.03	41.7	D
	NB - L	0.20	21.5	C	0.20	21.5	C	0.26	27.4	C
	NB - R	0.35	24.0	C	0.45	26.0	C	0.59	36.0	D
35. Rockland Avenue (E-W) @ Forest Hill Road (N-S)	EB - L	0.89	48.9	D	0.91	53.1	D	0.86	36.6	D
	EB - TR	0.41	24.8	C	0.42	24.9	C	0.49	28.7	C
	WB - L	0.84	38.4	D	0.96	57.2	E *	0.90	44.9	D
	WB - TR	0.65	30.0	C	0.67	30.6	C	0.77	37.8	D
	NB - L	0.07	16.1	B	0.08	16.2	B	0.08	16.2	B
	NB - TR	1.18	107.9	F	1.28	154.4	F *	1.28	154.4	F *
	SB - L	0.68	52.4	D	0.68	52.4	D	0.68	52.4	D
	SB - T	0.71	26.9	C	0.74	27.9	C	0.74	27.9	C
SB - R	0.33	19.2	B	0.33	19.2	B	0.33	19.2	B	
38. Forest Avenue (E-W) @ Richmond Avenue-Morningstar Road (N-S)	EB - L	0.30	25.8	C	0.30	25.8	C	0.30	25.8	C
	EB - TR	1.00	51.1	D	1.00	51.1	D	1.00	51.1	D
	WB - L	0.98	70.4	E	0.98	70.4	E	0.98	70.4	E
	WB - TR	0.46	16.5	B	0.46	16.5	B	0.46	16.5	B
	NB - L	0.57	22.6	C	0.61	24.0	C	0.63	24.7	C
	NB - T	0.46	21.6	C	0.52	22.8	C	0.52	22.8	C
	NB - R	0.29	10.3	B	0.29	10.3	B	0.29	10.3	B
	SB - LTR	0.98	58.2	E	1.09	89.5	F *	1.00	60.7	E

## Notes:

EB-Eastbound, WB-Westbound, NB-Northbound, SB-Southbound

L-Left, T-Through, R-Right, Df-Analysis considers a Defacto Left Lane on this approach

V/C Ratio - Volume to Capacity Ratio, sec. - Seconds

LOS - Level of Service

\* - Denotes a significant adverse impact

Analysis is based on the 2000 Highway Capacity Manual methodology (HCS+, version 5.5)

**Table 17-5  
Action With Mitigation Unmitigated Impacted Lane Groups**

	Lane Group	No Action			With Action			Mitigation		
		V/C Ratio	Delay (sec.)	LOS	V/C Ratio	Delay (sec.)	LOS	V/C Ratio	Delay (sec.)	LOS
<b>Weekday Midday Peak Hour</b>										
8. Richmond Hill Road (E-W) @ Forest Hill Road (N-S)	SB - TR	1.17	116.4	F	1.24	147.0	F	1.21	134.7	F
35. Rockland Avenue (E-W) @ Forest Hill Road (N-S)	NB - TR	1.16	101.6	F	1.23	130.2	F	1.23	130.2	F
<b>Weekday PM Peak Hour</b>										
8. Richmond Hill Road (E-W) @ Forest Hill Road (N-S)	WB - L	-	-	-	-	-	-	0.63	36.4	D
	WB - TR	-	-	-	-	-	-	1.52	274.9	F
	WB - LTR	1.17	118.2	F	1.64	324.7	F	-	235.2	F
	SB - TR	1.14	102.6	F	1.22	135.7	F	1.19	124.3	F
22. Draper Place (E-W) @ Richmond Avenue (N-S)	NB - L	1.11	102.8	F	1.18	130.6	F	1.18	130.6	F
28. Richmond Road (E-W) @ Arthur Kill Road-Richmond Hill Road (N-S)	WB - LR	0.97	43.0	D	1.11	85.6	F	1.11	85.6	F
35. Rockland Avenue (E-W) @ Forest Hill Road (N-S)	WB - TR	0.98	55.2	E	1.00	59.9	E	1.00	59.9	E
	NB - TR	1.15	95.0	F	1.22	127.7	F	1.22	127.7	F
<b>Saturday Midday Peak Hour</b>										
1. Richmond Hill Road (E-W) @ Richmond Avenue (N-S)	SB - TR	1.00	42.6	D	1.12	84.3	F	1.12	84.3	F
5. Forest Hill Road (E-W) @ Richmond Avenue (N-S)	WB - LR	1.06	77.5	E	1.15	112.4	F	1.15	112.4	F
	NB - T	1.08	64.1	E	1.23	129.0	F	1.23	129.0	F
8. Richmond Hill Road (E-W) @ Forest Hill Road (N-S)	WB - L	-	-	-	-	-	-	1.17	124.6	F
	WB - TR	-	-	-	-	-	-	1.51	271.4	F
	WB - LTR	1.19	123.5	F	1.84	416.6	F	-	248.5	F
	SB - TR	1.16	112.2	F	1.26	153.7	F	1.21	130.0	F
10. Platinum Avenue (E-W) @ Staten Island Mall Drive (N-S)	NB - LTR	1.21	141.2	F	1.63	322.2	F	1.63	322.2	F
19. Victory Boulevard (E-W) @ Richmond Avenue (N-S)	WB - L	1.13	101.4	F	1.26	157.1	F	1.26	157.1	F
22. Draper Place (E-W) @ Richmond Avenue (N-S)	NB - L	1.13	105.4	F	1.20	134.0	F	1.20	134.0	F
	SB - TR	1.07	64.7	E	1.20	120.2	F	1.20	120.2	F
24. Drumgoole Road West (E-W) @ Richmond Avenue (N-S)	EB - L	0.96	35.2	D	1.12	86.1	F	1.12	86.1	F
	EB - LR	1.02	48.5	D	1.19	114.2	F	1.19	114.2	F
	NB - T	0.94	33.1	C	1.03	51.7	D	1.03	51.7	D
	SB - T	0.97	32.9	C	1.05	54.1	D	1.05	54.1	D
28. Richmond Road (E-W) @ Arthur Kill Road-Richmond Hill Road (N-S)	WB - LR	0.93	38.4	D	1.11	87.2	F	1.11	87.2	F
35. Rockland Avenue (E-W) @ Forest Hill Road (N-S)	WB - L	0.96	51.5	D	1.08	86.7	F	1.08	86.7	F
	NB - TR	1.18	108.5	F	1.27	149.2	F	1.27	149.2	F
<b>Saturday PM Peak Hour</b>										
5. Forest Hill Road (E-W) @ Richmond Avenue (N-S)	WB - LR	1.01	65.3	E	1.12	100.3	F	1.12	100.3	F
8. Richmond Hill Road (E-W) @ Forest Hill Road (N-S)	WB - L	-	-	-	-	-	-	1.10	100.6	F
	WB - TR	-	-	-	-	-	-	1.78	391.7	F
	WB - LTR	1.19	122.9	F	1.86	427.0	F	-	346.9	F
	SB - TR	1.16	111.4	F	1.26	157.3	F	1.21	132.2	F
22. Draper Place (E-W) @ Richmond Avenue (N-S)	NB - L	1.12	102.1	F	1.21	139.2	F	1.21	139.2	F
23. Nome Avenue (E-W) @ Richmond Avenue (N-S)	WB - LR	0.86	51.4	D	0.95	64.1	E	0.95	64.1	E
24. Drumgoole Road West (E-W) @ Richmond Avenue (N-S)	EB - LR	0.89	31.9	C	1.05	63.1	E	1.05	63.1	E
	SB - T	0.92	29.4	C	1.02	45.6	D	1.02	45.6	D
28. Richmond Road (E-W) @ Arthur Kill Road-Richmond Hill Road (N-S)	WB - LR	0.96	41.5	D	1.13	96.2	F	1.13	96.2	F
35. Rockland Avenue (E-W) @ Forest Hill Road (N-S)	NB - TR	1.18	107.9	F	1.28	154.4	F	1.28	154.4	F

Table 17-5

## Action With Mitigation Unmitigated Impacted Lane Groups

WEEKDAY MIDDAY PEAK HOUR										
	LANE GROUP	NO-ACTION			WITH-ACTION			MITIGATION		
		V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS
8. Richmond Hill Road (E-W) @ Forest Hill Road (N-S)	WB - LTR	1.18	122.2	F	1.59	304.0	F	1.59	304.0	F
	NB - TR	1.00	61.1	E	1.03	68.5	E	1.03	68.5	E
	SB - TR	1.17	116.4	F	1.24	147.0	F	1.24	147.0	F
19. Victory Boulevard (E-W) @ Richmond Avenue (N-S)	WB - L	1.09	95.9	F	1.18	133.1	F	1.18	133.1	F
20. Signs Road (E-W) @ Richmond Avenue (N-S)	EB - LR	1.13	97.2	E	1.17	114.7	E	1.17	114.7	E
	NB - L	0.95	75.1	E	1.00	87.4	F	1.00	87.4	F
30. Arthur Kill Rd (E-W) @ Corbin Ave (N-S)	NB - LR	0.48	50.5	F	0.59	60.1	F	0.59	60.1	F
35. Rockland Avenue (E-W) @ Forest Hill Road (N-S)	NB - TR	1.16	101.6	F	1.23	130.2	F	1.23	130.2	F
WEEKDAY PM PEAK HOUR										
	LANE GROUP	NO-ACTION			WITH-ACTION			MITIGATION		
		V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS
1. Richmond Hill Road (E-W) @ Richmond Avenue (N-S)	WB - R	0.98	39.3	D	1.07	65.7	E	1.07	65.7	E
	SB - L	0.77	45.0	D	0.89	56.0	E	0.89	56.0	E
	SB - TR	1.10	80.1	F	1.20	124.2	F	1.20	124.2	F
8. Richmond Hill Road (E-W) @ Forest Hill Road (N-S)	WB - LTR	1.17	118.2	F	1.64	324.7	F	1.64	324.7	F
	NB - TR	1.06	76.0	E	1.09	86.6	F	1.09	86.6	F
	SB - TR	1.14	102.6	F	1.22	135.7	F	1.22	135.7	F
19. Victory Boulevard (E-W) @ Richmond Avenue (N-S)	WB - L	1.29	177.0	F	1.38	221.2	F	1.38	221.2	F
20. Signs Road (E-W) @ Richmond Avenue (N-S)	EB - LR	1.13	96.2	F	1.17	116.8	F	1.17	116.8	F
	NB - L	1.05	94.4	F	1.11	113.9	F	1.11	113.9	F
	SB - TR	1.12	78.2	E	1.20	113.8	F	1.20	113.8	F
22. Draper Place (E-W) @ Richmond Avenue (N-S)	NB - L	1.11	102.8	F	1.18	130.6	F	1.18	130.6	F
23. Nome Avenue (E-W) @ Richmond Avenue (N-S)	WB - LR	0.81	45.9	D	0.88	52.4	D	0.88	52.4	D
	NB - TR	0.92	34.5	C	1.02	50.8	D	1.02	50.8	D
28. Richmond Road (E-W) @ Arthur Kill Road-Richmond Hill Road (N-S)	WB - LR	0.97	43.0	D	1.11	85.6	F	1.11	85.6	F
30. Arthur Kill Rd (E-W) @ Corbin Ave (N-S)	NB - LR	0.63	68.6	E	0.77	88.7	E	0.77	88.7	E
31. Arthur Kill Road (E-W) @ Drumgoole Road West (N-S)	SB - LTR	1.13	83.6	F	1.24	135.6	F	1.24	135.6	F
35. Rockland Avenue (E-W) @ Forest Hill Road (N-S)	WB - TR	0.98	55.2	E	1.00	59.9	E	1.00	59.9	E
	NB - TR	1.15	95.0	F	1.22	127.7	F	1.22	127.7	F
SATURDAY MIDDAY PEAK HOUR										
	LANE GROUP	NO-ACTION			WITH-ACTION			MITIGATION		
		V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS
1. Richmond Hill Road (E-W) @ Richmond Avenue (N-S)	WB - R	0.98	43.6	D	1.10	80.8	F	1.10	80.8	F
	SB - L	1.13	118.1	F	1.28	177.1	F	1.28	177.1	F
	SB - TR	1.00	42.6	D	1.12	84.3	F	1.12	84.3	F
5. Forest Hill Road (E-W) @ Richmond Avenue (N-S)	WB - LR	1.06	77.5	E	1.15	112.4	F	1.15	112.4	F
	NB - T	1.08	64.1	E	1.23	129.0	F	1.23	129.0	F
8. Richmond Hill Road (E-W) @ Forest Hill Road (N-S)	WB - LTR	1.19	123.5	F	1.84	416.6	F	1.84	416.6	F
	NB - TR	1.17	117.6	F	1.21	133.5	F	1.21	133.5	F
	SB - TR	1.16	112.2	F	1.26	153.7	F	1.26	153.7	F
10. Platinum Avenue (E-W) @ Staten Island Mall Drive (N-S)	NB - LTR	1.21	141.2	F	1.63	322.2	F	1.63	322.2	F
19. Victory Boulevard (E-W) @ Richmond Avenue (N-S)	WB - L	1.15	117.4	F	1.28	174.3	F	1.28	174.3	F
	NB - T	0.92	45.4	D	1.01	59.5	E	1.01	59.5	E
	SB - TR	0.95	46.1	D	1.04	65.8	E	1.04	65.8	E
20. Signs Road (E-W) @ Richmond Avenue (N-S)	EB - LR	1.13	98.4	F	1.20	127.6	F	1.20	127.6	F
	NB - L	0.94	70.2	E	1.01	87.5	F	1.01	87.5	F
	SB - TR	1.06	54.9	D	1.16	97.1	F	1.16	97.1	F
22. Draper Place (E-W) @ Richmond Avenue (N-S)	NB - L	1.13	105.4	F	1.20	134.0	F	1.20	134.0	F
	SB - TR	1.07	64.7	E	1.20	120.2	F	1.20	120.2	F
23. Nome Avenue (E-W) @ Richmond Avenue (N-S)	WB - LR	1.05	88.6	F	1.15	125.6	F	1.15	125.6	F
	NB - TR	0.93	30.5	C	1.03	48.1	D	1.03	48.1	D
24. Drumgoole Road West (E-W) @ Richmond Avenue (N-S)	EB - L	0.96	35.2	D	1.12	86.1	F	1.12	86.1	F
	EB - LR	1.02	48.5	D	1.19	114.2	F	1.19	114.2	F
	NB - T	0.94	33.1	C	1.03	51.7	D	1.03	51.7	D
	SB - T	0.97	32.9	C	1.05	54.1	D	1.05	54.1	D
28. Richmond Road (E-W) @ Arthur Kill Road-Richmond Hill Road (N-S)	WB - LR	0.93	38.4	D	1.11	87.2	F	1.11	87.2	F
30. Arthur Kill Rd (E-W) @ Corbin Ave (N-S)	NB - LR	0.44	39.4	E	0.58	49.2	E	0.58	49.2	E
31. Arthur Kill Road (E-W) @ Drumgoole Road West (N-S)	EB - L	0.82	25.8	C	0.98	53.8	D	0.98	53.8	D
	SB - LTR	1.14	90.9	F	1.38	198.5	F	1.38	198.5	F
35. Rockland Avenue (E-W) @ Forest Hill Road (N-S)	WB - L	0.96	51.5	D	1.08	86.7	F	1.08	86.7	F
	NB - TR	1.18	108.5	F	1.27	149.2	F	1.27	149.2	F

**SATURDAY PM PEAK HOUR**

	LANE GROUP	NO-ACTION			WITH-ACTION			MITIGATION		
		V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS	V/C RATIO	Delay (sec.)	LOS
1. Richmond Hill Road (E-W) @ Richmond Avenue (N-S)	WB - R	1.12	83.1	E	1.27	146.6	F	1.21	121.2	F
5. Forest Hill Road (E-W) @ Richmond Avenue (N-S)	WB - LR	1.01	65.3	E	1.12	100.3	F	1.12	100.3	F
8. Richmond Hill Road (E-W) @ Forest Hill Road (N-S)	WB - LTR	1.19	122.9	F	1.86	427.0	F	1.86	427.0	F
	NB - TR	1.14	103.4	F	1.18	119.9	E	1.18	119.9	E
	SB - TR	1.16	111.4	F	1.26	157.3	F	1.21	132.2	F
19. Victory Boulevard (E-W) @ Richmond Avenue (N-S)	WB - L	1.15	119.9	E	1.28	175.4	E	1.28	175.4	E
	NB - T	0.91	44.7	D	1.01	60.3	E	1.01	60.3	E
20. Signs Road (E-W) @ Richmond Avenue (N-S)	EB - LR	0.85	47.3	D	0.92	56.0	E	0.92	56.0	E
	NB - L	1.00	80.1	F	1.09	106.6	F	1.09	106.6	F
22. Draper Place (E-W) @ Richmond Avenue (N-S)	NB - L	1.12	102.1	F	1.21	139.2	F	1.21	139.2	F
23. Nome Avenue (E-W) @ Richmond Avenue (N-S)	WB - LR	0.86	51.4	D	0.95	64.1	E	0.95	64.1	E
	NB - TR	0.96	34.4	C	1.08	67.6	E	1.08	67.6	E
24. Drumgoole Road West (E-W) @ Richmond Avenue (N-S)	EB - LR	0.89	31.9	C	1.05	63.1	E	1.05	63.1	E
	SB - T	0.92	29.4	C	1.02	45.6	D	1.02	45.6	D
28. Richmond Road (E-W) @ Arthur Kill Road-Richmond Hill Road (N-S)	WB - LR	0.96	41.5	D	1.13	96.2	F	1.13	96.2	F
30. Arthur Kill Rd (E-W) @ Corbin Ave (N-S)	NB - LR	0.49	40.9	E	0.64	55.5	E	0.64	55.5	E
31. Arthur Kill Road (E-W) @ Drumgoole Road West (N-S)	SB - LTR	1.14	91.1	E	1.37	193.2	E	1.37	193.2	E
35. Rockland Avenue (E-W) @ Forest Hill Road (N-S)	NB - TR	1.18	107.9	F	1.28	154.4	F	1.28	154.4	F

**VICTORY BOULEVARD AT RICHMOND AVENUE**

Unmitigated impacts would occur on the Victory Boulevard westbound left lane group in all peak hours. In addition, unmitigated impacts would occur on the Richmond Avenue northbound through lane group in the Saturday midday and PM peak hours and on the Richmond Avenue southbound through-right lane group in the Saturday midday peak hour.

**SIGNS ROAD AT RICHMOND AVENUE**

Unmitigated impacts would occur on the Signs Road eastbound left-right lane group and the Richmond Avenue northbound left turn lane group in all peak hours. In addition, unmitigated impacts would occur on the southbound through-right lane group in the weekday PM and Saturday midday peak hours.

**DRAPER PLACE AT RICHMOND AVENUE**

Unmitigated impacts would occur on the Richmond Avenue northbound left lane group in the weekday PM and Saturday midday peak hours and the southbound through-right lane group in the Saturday midday peak hour.

**NOME AVENUE AT RICHMOND AVENUE**

Unmitigated impacts would occur on the Nome Avenue westbound left-right lane group and the Richmond Avenue northbound through-right lane group in the weekday PM and Saturday midday and PM peak hours.

**DRUMGOOLE ROAD WEST AT RICHMOND AVENUE**

Unmitigated impacts would occur on the Drumgoole Road West eastbound left-right lane group and the Richmond Avenue southbound through lane group in the Saturday midday and PM peak hours. In addition, unmitigated impacts would occur on the Drumgoole Road West eastbound left lane group and the Richmond Avenue ~~southbound~~ northbound through lane group in the Saturday midday peak hour.

**RICHMOND ROAD AT ARTHUR KILL ROAD-RICHMOND HILL ROAD**

Unmitigated impacts would occur on the Richmond Road westbound left-right lane group in the weekday PM and Saturday midday and PM peak hours.

**ARTHUR KILL ROAD AT CORBIN AVENUE**

Unmitigated impacts would occur on the Corbin Avenue northbound left-right lane group in all peak hours.

**ARTHUR KILL ROAD AT DRUMGOOLE ROAD WEST**

Unmitigated impacts would occur on the Drumgoole Road West southbound left-through-right lane group in the weekday PM and Saturday midday and PM peak hours. In addition, an unmitigated impact would occur on the eastbound left lane group in the Saturday midday peak hour.

**ROCKLAND AVENUE AT FOREST HILL ROAD**

Unmitigated impacts would occur on the Rockland Avenue westbound through-right lane group in the weekday PM peak hour, the Rockland Avenue westbound left lane group in the Saturday

## Staten Island Mall Enlargement

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midday peak hour, and the Forest Hill Road northbound through lane group in the weekday PM and Saturday midday peak hours.

In addition, the following intersections could be partially mitigated in one or more time periods:

### **RICHMOND HILL ROAD AT RICHMOND AVENUE**

An unmitigated impact would occur on the Richmond Avenue southbound through Hill Road westbound right lane group during the Saturday midday PM peak hour. The impacts impact on the Richmond Avenue southbound left turn and Richmond Hill Road eastbound right lane groups lane group could be mitigated through signal timing modifications during the weekday midday and Saturday PM peak hours, and lane restriping

### **RICHMOND HILL ROAD AT FOREST HILL ROAD**

~~An unmitigated impact would occur on the Forest Hill Road southbound through right lane group during all peak hours and an unmitigated impact would occur on the overall westbound approach in the weekday PM and Saturday midday and PM peak hours. The impacts on the Forest Hill Road northbound through right lane group in all peak hours and the overall westbound approach in the weekday midday peak hour could be mitigated through signal timing modifications and lane restriping.~~

### **PLATINUM AVENUE AT STATEN ISLAND MALL DRIVE**

An unmitigated impact would occur on the Staten Island Mall Drive northbound left-through-right lane group during the Saturday midday peak hour. The impact on the Platinum Avenue eastbound left lane group could be mitigated through signal timing modifications the addition of a new east-west left turn phase (see Applicants' letter of commitment in Appendix 4). In addition, impacts that occur on the northbound left-through-right lane group during the weekday midday and PM and Saturday PM peak hour and on the southbound left-through-right lane group in the Saturday PM peak hour could be mitigated through signal timing modifications.

### **VICTORY BOULEVARD AT RICHMOND AVENUE**

~~An unmitigated impact would occur on the Victory Boulevard westbound left lane group during the Saturday midday peak hour. The impacts on the Richmond Avenue northbound and southbound through right lane groups could be mitigated through signal timing modifications.~~

### **DRAPER PLACE AT RICHMOND AVENUE**

An unmitigated impact would occur on the Richmond Avenue northbound left lane group during the Saturday PM peak hour. The impact on the Richmond Avenue southbound through-right lane group during the Saturday PM peak hour and on the northbound left lane group during the weekday midday peak hour could be mitigated through signal timing modifications.

~~An unmitigated impact would occur on the Nome Avenue westbound left-right lane group during the Saturday PM peak hour. The impact on the Richmond Avenue northbound through-right lane group could be mitigated through signal timing modifications and lane restriping.~~

### **ROCKLAND AVENUE AT FOREST HILL ROAD**

An unmitigated impact would occur on the Forest Hill Road northbound through-right lane group during the weekday midday and Saturday PM peak hours. The impacts on the Rockland Avenue eastbound left lane group during the weekday midday peak hour and the westbound left lane group during the weekday midday and Saturday PM peak hours could be mitigated through signal timing modifications.

The following intersections could be fully mitigated in one or more peak hours:

**STATEN ISLAND MALL NORTHWEST DRIVEWAY AT RICHMOND AVENUE**

Impacts would occur on the Richmond Avenue southbound left turn lane group during all peak hours and could be mitigated through signal timing modifications.

**PLATINUM AVENUE AT RICHMOND AVENUE**

Impacts would occur on the Platinum Avenue westbound left turn lane group during the weekday PM and Saturday midday and PM peak hours and could be mitigated through signal timing modifications.

**FOREST HILL ROAD AT RICHMOND AVENUE**

Impacts would occur on the Forest Hill Road westbound left turn and westbound left-right lane groups during the weekday PM peak hour and could be mitigated through signal timing modifications.

**RICHMOND HILL ROAD AT STATEN ISLAND MALL NORTH DRIVEWAY**

Impacts would occur on the Staten Island Mall North Driveway northbound left turn lane group during the Saturday midday and PM peak hours and could be mitigated through signal timing modifications.

**RICHMOND HILL ROAD AT MARSH AVENUE**

Impacts would occur on the Marsh Avenue northbound left turn lane group during the weekday PM and Saturday midday and PM peak hours and could be mitigated through signal timing modifications.

**PLATINUM AVENUE AT MARSH AVENUE**

Impacts would occur on the Marsh Avenue southbound left turn lane group during all peak hours and could be mitigated through signal timing modifications.

**STATEN ISLAND MALL EAST DRIVEWAY AT MARSH AVENUE**

Impacts would occur on the Staten Island Mall East Driveway left turn lane group during the weekday PM and Saturday midday and PM peak hours and could be mitigated through the installation of a traffic signal. A signal warrant analysis was prepared for this intersection and was submitted for NYCDOT's review and approval. The analysis indicated that this intersection would meet the MUTCD's criteria for Warrant 3A – Peak Hour. See Applicants' letter of commitment in **Appendix 4**.

**STATEN ISLAND MALL NORTHEAST DRIVEWAY AT MARSH AVENUE**

An impact would occur on the Staten Island Mall Northeast Driveway eastbound left turn lane group during the Saturday PM peak hour and could be mitigated through signal timing modifications.

**STATEN ISLAND EXPRESSWAY EASTBOUND OFF-RAMP, GOETHALS ROAD NORTH, AND WEST CASWELL AVENUE AT RICHMOND AVENUE**

Impacts would occur on the Richmond Avenue southbound through-right lane group during the weekday PM and Saturday midday peak hour and could be mitigated through signal timing modifications.

**NOME AVENUE AT RICHMOND AVENUE**

An impact would occur on the Nome Avenue westbound left-right lane group during the weekday midday peak hour and could be mitigated through signal timing modifications.

**DRUMGOOLE ROAD WEST AT RICHMOND AVENUE**

An impact would occur on the Richmond Avenue southbound through lane group during the weekday PM peak hour and could be mitigated through signal timing modifications.

**ARTHUR KILL ROAD AT RICHMOND AVENUE**

Impacts would occur on the Richmond Avenue northbound through-right lane group during the weekday PM and Saturday midday and PM peak hours and on the southbound left turn lane group during all peak hours. These impacts could be mitigated through signal timing modifications and restriping the westbound approach from one 14-foot wide receiving lane, one 13-foot wide receiving lane, one 12-foot wide left turn lane, one 12-foot wide through lane, and one 12-foot wide right turn lane to two 11-foot wide receiving lanes, one 10-foot wide left turn lane, two 10-foot wide through lanes, and one 11-foot wide right turn lane.

**KATAN AVENUE AT RICHMOND AVENUE**

Impacts would occur on the Richmond Avenue southbound left-through-right lane group during the weekday PM and Saturday midday and PM peak hours and could be mitigated through signal timing modifications.

**CLARKE AVENUE AT ARTHUR KILL ROAD**

Impacts would occur on the Clarke Avenue westbound left-right lane group and the Arthur Kill Road northbound through lane group during the weekday PM peak hour and could be mitigated through signal timing modifications.

**ARTHUR KILL ROAD AT DRUMGOOLE ROAD WEST**

An impact would occur on the Drumgoole Road West southbound left-through-right lane group during the weekday midday peak hour and could be mitigated through signal timing modifications.

**ARTHUR KILL ROAD AT WOODROW ROAD**

Impacts would occur on the Arthur Kill Road westbound left-through lane group during the weekday and Saturday PM peak hours and could be mitigated through signal timing modifications.

**ROCKLAND AVENUE AT BRIELLE AVENUE**

An impact would occur on the southbound left-through-right lane group during the weekday PM peak hour. In addition impacts would occur on the eastbound left and westbound left-through-right lane groups during the Saturday midday peak hour. All impacts could be mitigated through signal timing modifications.

**RICHMOND ROAD AT WILDER AVENUE**

An impact would occur on the Richmond Road westbound left-through lane group during the weekday PM peak hour and could be mitigated through signal timing modifications.

### **FOREST AVENUE AT RICHMOND AVENUE AND MORNINGSTAR ROAD**

Impacts would occur on the Morningstar Road southbound left-through-right lane group during all peak hours and could be mitigated through signal timing modifications.

#### **IMPLEMENTATION**

As noted earlier, each of the traffic capacity improvements described in **Table 17-3** fall within the jurisdiction of NYCDOT for implementation. All expenses related to the design and installation of the new or modified traffic signals, and proposed geometric modifications, traffic signs and pavement marking removals/installations at the traffic signal locations will be funded by the Applicant. The implementation of the mitigation measures would result in the loss of approximately 13 on-street parking spaces during all peak hours due to capacity improvements needed at the intersections of Signs Road at Richmond Avenue, and Arthur Kill Road and Corbin Avenue. No designated truck loading/unloading zones or bus layover space would be affected by the proposed parking modifications for mitigation.

It should be noted that the Applicants have agreed to perform a follow-up traffic monitoring plan within six months of the proposed project being fully built and occupied. The purpose of the monitoring plan is to further study the proposed mitigation measures identified in the FEIS, and explore potential mitigation measures for potential impacts identified as partially mitigated and unmitigated. The Applicants would inform NYCDOT of the status of the plan's development and would submit for NYCDOT's review and approval a scope of work that includes critical locations where significant traffic impacts have been identified. Data collection to be conducted for the monitoring plan would include 24-hour Automatic Traffic Recorder (ATR) machine counts, manual turning movement counts, vehicle classification counts, intersection geometry and field information, signal timing and signal progression and any relevant information necessary for conducting the traffic monitoring plan. The traffic monitoring program would also include field observations of intersection operations and queue lengths, intersection capacity, and level of service analyses using the Highway Capacity Software (HCS) and Synchro/SimTraffic to determine whether actual future Build conditions have, in fact, resulted in significant traffic impacts and verify the need for mitigation measures identified in the FEIS or similar measures identified through the traffic monitoring plan. In addition, the traffic monitoring plan would include recommendations to improve intersection operations, if necessary. The Applicants would be responsible for any costs associated with the monitoring effort warranted due to project-generated traffic as well as the design and construction of the proposed mitigation measures.

#### **EFFECT OF TRAFFIC MITIGATION ON PEDESTRIAN OPERATIONS**

As proposed, traffic mitigation measures must be assessed to determine if they would affect pedestrians, pedestrian safety and operational conditions. As described in Chapter 10, "Transportation," the low level of anticipated project-generated pedestrian trips to and from the project site is not expected to be high enough to create any significant adverse impacts to pedestrian facilities in and around the Mall. In addition, existing pedestrian volume in this section of Staten Island is very low. Pedestrians crossing Richmond Avenue, which has a cross-section of up to 12 lanes wide, are provided with center medians for refuge. The existing signal timing provides adequate walk time to cross to the corresponding median locations from either side of Richmond Avenue at an analysis walking speed of 3.5 feet per second, but inadequate time at this speed to cross the entire roadway. Adjusting the existing signal timing by the 2 to 4 seconds mentioned above would maintain adequate times for pedestrians to cross to the center

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medians. Therefore, implementing the proposed mitigation measures would not result in any significant adverse impacts to pedestrians.

**EFFECTS OF TRAFFIC MITIGATION MEASURES ON MOBILE SOURCE AIR QUALITY**

As described in Chapter 11, “Air Quality,” two intersections were considered for assessment of potential impacts from emissions associated with the vehicle trips generated by the proposed project on air quality. The two locations analyzed were the intersection of Richmond Avenue and Forest Hill Road and the intersection of Richmond Avenue and Richmond Hill Road. The mobile source air quality analysis concludes that the proposed project would not result in significant adverse impacts on air quality.

With the proposed measures that would be implemented for traffic mitigation, the flow of traffic would generally improve, reducing delays and improving the level of service. It is anticipated that these traffic improvements would improve speeds and reduce idling, thereby resulting in lower air pollutant emissions from mobile sources. Therefore, no air quality mitigation is required. However, since the proposed traffic mitigation measures described in this chapter would alter traffic conditions when compared with the proposed project without mitigation, the localized air quality impacts with mitigation were modeled for each of the analysis sites described in Chapter 11, “Air Quality.” Traffic mitigation measures were not required during the Saturday PM peak at Richmond Avenue and Forest Hill Road, which was the peak period analyzed for CO at this location (Site 1). Since this represents the period with the maximum number of project generated trips and the greatest potential for significant air quality impacts, an analysis of the potential air quality impacts from traffic mitigation measures at this analysis site was not warranted.

**Table 17-6** shows the future maximum predicted 8-hour average CO concentration without the proposed project (No Action), as well as with the proposed project with and without the implementation of the traffic mitigation measures (With Action and With Traffic Mitigation).

**Table 17-6  
8-Hour Average CO Concentrations with Traffic Mitigation**

Analysis Site	Location	Time Period	8-Hour Average Concentration (ppm)				
			No Action	With Action	With Traffic Mitigation	Increment with Traffic Mitigation	<i>De Minimis with Traffic Mitigation</i>
2	Richmond Avenue and Richmond Hill Road	Saturday PM	2.4	2.4	2.4	0.0	3.3
<b>Notes:</b> 8-hour standard (NAAQS) is 9 ppm. Increment with Traffic Mitigation = With Traffic Mitigation – No Action							

The results indicate that the proposed project with the traffic mitigation measures would not result in any violations of the 8-hour CO standard (9 ppm) as the 8-hour average concentrations with traffic mitigation would be less than the standard. In addition, the incremental increase in 8-hour average CO concentration would not result in a violation of the CEQR *de minimis* CO criteria, calculated to be 3.3 ppm per the *CEQR Technical Manual* guidance. As indicated in Chapter 11, “Air Quality,” mobile source CO emissions from the proposed project would not result in a significant adverse impact on air quality in the Saturday PM peak period; therefore, no significant adverse air quality impacts would be anticipated for other peak periods.

Table 17-7 shows the maximum predicted 24-hour average PM<sub>10</sub> concentrations without the proposed project, with the proposed project, and with the proposed project and implementation of the traffic mitigation measures (No Action, With Action, With Traffic Mitigation).

**Table 17-7**  
**24-Hour Average PM<sub>10</sub> Concentrations with Traffic Mitigation**

Analysis Site	Location	24-Hour Concentration (µg/m <sup>3</sup> )		
		No Action	With Action	With Traffic Mitigation
1	Richmond Avenue and Forest Hill Road	67.8	69.9	69.7
2	Richmond Avenue and Richmond Hill Road	66.4	68.45	68.6

**Notes:**  
NAAQS—24-hour average 150 µg/m<sup>3</sup>.  
Concentration includes a background concentration of 48.0 µg/m<sup>3</sup>.

Future maximum predicted 24-hour and annual average PM<sub>2.5</sub> concentrations were determined so that they could be compared with the *de minimis* criteria for PM<sub>2.5</sub>. Consistent with CEQR guidance, PM<sub>2.5</sub> concentrations are presented as an incremental change in concentrations for both the proposed project without traffic mitigation measures (as compared with the No Action) and for the proposed project with traffic mitigation measures (as compared with the No Action). The maximum predicted localized 24-hour average and neighborhood-scale annual average PM<sub>2.5</sub> concentration increments are presented in Tables 17-8 and 17-9, respectively. The results show that the maximum daily (24-hour) PM<sub>2.5</sub> increments with traffic mitigation measures (Table 17-8) are predicted to be below the *de minimis* criterion of 6.9 µg/m<sup>3</sup>, and the maximum annual average PM<sub>2.5</sub> increments (Table 17-9) are not predicted to exceed the applicable *de minimis* criterion of 0.1 µg/m<sup>3</sup>.

Therefore, no significant adverse air quality impacts would occur as a result of the proposed traffic mitigation measures.

**Table 17-8**  
**24-Hour Average PM<sub>2.5</sub> Concentration Increments with Traffic Mitigation**

Analysis Site	Location	Increment (µg/m <sup>3</sup> )	Increment with Traffic Mitigation (µg/m <sup>3</sup> )	De Minimis Criteria
1	Richmond Avenue and Forest Hill Road	0.7	0.7	6.9
2	Richmond Avenue and Richmond Hill Road	1.0	0.9	6.9

**Note:** PM<sub>2.5</sub> *de minimis* criteria — 24-hour average, not to exceed more than half the difference between the background concentration and the 24-hour standard of 35 µg/m<sup>3</sup>.

**Table 17-9**  
**Annual Average PM<sub>2.5</sub> Concentration Increments with Traffic Mitigation**

Analysis Site	Location	Increment (µg/m <sup>3</sup> )	Increment with Traffic Mitigation (µg/m <sup>3</sup> )
1	Richmond Avenue and Forest Hill Road	0.040	0.041
2	Richmond Avenue and Richmond Hill Road	0.095	0.059

**Note:** PM<sub>2.5</sub> *de minimis* criteria—annual (neighborhood scale) 0.1 µg/m<sup>3</sup>.

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