

APPENDIX F

SUPPLEMENTAL TRAFFIC DATA



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Draft Memorandum

To: Michael Marrella, New York City Department of Parks & Recreation, Fresh Kills Park Project

From: Adnan Pasha, P.E., and James Seto, AKRF

Date: October 6, 2009

Re: Evaluation of Proposed East Park Road Connections—Purpose and Need Supporting Data

cc: Robert White, AKRF

A. INTRODUCTION

This memorandum has been prepared to provide supporting data relative to the purpose and need for the park road connections proposed for the Fresh Kills Park East Park road system. It has been prepared in response to comments on the Fresh Kills Park East Park Roads Draft Supplemental Environmental Impact Statement DSEIS raised by the New York State Department of Environmental Conservation (DEC) regarding the purpose and need for the proposed East Park roads (in particular, the long-term projects) given that the traffic impacts would remain on the local network with the proposed project in place, and that given projected volumes of traffic, that the proposed road widths (specifically with respect to the four-lane road options) are not entirely justified. The comments also requested a clearer justification of the improvements in the traffic that would be expected with the proposed East Park Roads Project.

This memorandum has therefore been prepared to provide further justification for the proposed roads with respect to the following points:

- Improvements in local travel time and shortened travel distances given that the proposed roads would eliminate the need for the public to drive around the large Fresh Kills property;
- Improvements in local traffic levels of service conditions that would otherwise not be realized without completion of park roads; and
- Neighborhood character benefits with respect to the reduced volumes of traffic through local communities such as the Travis neighborhood.

One of the principal objectives of the proposed Fresh Kills Park circulation plan, a critical component of which in the proposed East Park roads and the connection to Richmond Avenue, is to provide improved local connectivity, specifically between Richmond Avenue, which runs along the east boundary of the project site, and the West Shore Expressway, a state highway with regional interstate connections that runs through the site. Once fully completed, the Fresh Kills Park road system will provide three

connections on Richmond Avenue at Forest Hill and Richmond Hill Roads, and Yukon Avenue. The first connection at Yukon Avenue is proposed to be completed by 2016 providing access to the Confluence Loop Park Road, Creek Landing, and the West Shore Expressway. After 2016, the entire East Park road system (which could include two- or four-lane roads across East Park) will be completed providing two new connections at Richmond Hill Road and Forest Hill Road, in addition to the connection at Yukon Avenue. These three connections are necessary for improving traffic conditions along Richmond Avenue—a major arterial providing connection between Richmond Parkway on the south and the Staten Island Expressway on the north—which in addition to carrying the regular commuter traffic, accommodates significant traffic generated by the commercial and retail land uses (e.g., Staten Island Mall). In addition, by the EIS analysis year 2036, traffic volumes on Richmond Avenue are expected to increase significantly due to the background growth, other development (no build) projects and park generated traffic volumes. With the proposed East Park road system in place, the three proposed connections would help facilitate the flow of traffic, specifically on the heavily congested segment of Richmond Avenue between Forest Hill and Richmond Hill Roads.

The East Park roads were analyzed in detail—based on the *City Environmental Quality Review (CEQR)* methodologies—in the June 2009 *Fresh Kills East Park Roads Draft Supplemental Environmental Impact Statement (DSEIS)*. That analysis evaluated the new park road connections in terms of “level-of-service (LOS),” based on the CEQR criteria, and evaluation of other roadway measures-of-effectiveness (MOE), such as travel-time was not included in the DSEIS. As stated above, the purpose of this memorandum is to further explain the improvements in local traffic circulation that are expected with the proposed East Park road.

As part of the environmental public review process, the DSEIS was reviewed by City and State agencies, including DEC which has the jurisdiction over the existing landfill infrastructure at the site. Therefore, as stated above, the principal goal of this memorandum is to provide supporting data and a better understanding of the purpose and need for the proposed East Park roads.

B. ANALYSIS FRAMEWORK

TRAFFIC VOLUMES

As stated above, the proposed East Park roads would provide an alternative and more direct route between the West Shore Expressway and Richmond Avenue. In the absence of such a route, drivers will continue to have to drive around the Fresh Kills property (as they currently do) to access the West Shore Expressway. This increases travel distance and travel time, for traffic destined for West Shore Expressway from the neighboring communities of Richmond, Richmondtown, Oakwood, and New Dorp neighborhoods (see Figure F-1). In addition, in the absence of East Park roads, the corridors along the periphery of the park (i.e., Richmond Avenue, Arthur Kill Road, and Victory Boulevard/Travis Avenue) would experience more congested traffic conditions, specifically in 2036, when the overall traffic volumes in the study area will increase substantially due to the background growth, future developments and park generated traffic. These increased traffic volumes on the park periphery roads in the 2016 and 2036 future conditions without the East Park roads in place are presented in Figures F-2 through F-5 for the weekday PM and weekend midday peak hours. As shown in these figures, in the 2036 future conditions, without the proposed East Park roads, the Victory Boulevard and Arthur Kill Road corridors would experience up to approximately 950 and 1,100 additional vehicles, respectively, during the weekday and weekend peak hours, respectively. With the proposed East Park road connections in place, these additional vehicles would be dispersed to the internal park road system from Richmond Avenue without adding to the traffic levels along Victory Boulevard and Arthur Kill Road.

TRAVEL TIME RUNS

To estimate the increase in travel time without the East Park roads in place, travel time runs were conducted to determine current travel times as compared with the conditions under the proposed project. Five travel time runs were conducted on the corridors along the periphery of the park (i.e., Richmond

Avenue, Arthur Kill Road, and Victory Boulevard/Travis Avenue). The results of travel time runs are discussed in detail in the proceeding sections.

The travel time runs were conducted for two routes, which are the routes most likely to be travelled by the park-generated and diverted traffic. The two routes are presented in Figure F-6 and are described below.

Alternate Route 1: Travis Avenue / Victory Boulevard

In the absence of the proposed park road connections at Richmond Hill Road and/or Yukon Avenue, drivers would need to access the park and West Shore Expressway via Travis Avenue and Victory Boulevard. For travel time estimation purposes, vehicles were assumed to start their travel at the intersection of Richmond and Yukon Avenues. Heading northbound on Richmond Avenue, at the intersection of Draper Place, these vehicles would turn left to continue northwest on Draper Place to access Victory Boulevard via Travis Avenue. These vehicles were then assumed to continue southwest on Victory Boulevard until they reach the West Shore Expressway northbound and southbound service roads. Park-destined vehicles would continue along the southbound service road to the intersection of Wild Avenue to enter the Fresh Kills Park. Diverted traffic would access the West Shore Expressway via the existing northbound or southbound ramps. A total of five travel time runs were conducted along this route during the weekday PM and weekend (Saturday) midday peak hours to obtain travel times.

Alternate Route 2: Arthur Kill Road

In the absence of a park connection at Forest Hill Road and/or Yukon Avenue, drivers would be expected to access the park and West Shore Expressway via Arthur Kill Road. These vehicles are assumed to start their travel at the intersection of Richmond Avenue and Yukon Avenue, then head southbound on Richmond Avenue. From Richmond Avenue, the vehicles would continue onto Drumgoole Road West, and then travel west on Arthur Kill Road to reach the West Shore Expressway northbound and southbound service roads to reach the Fresh Kills Park and the Expressway. A total of five travel time runs were conducted along this route during the weekday PM and weekend (Saturday) midday peak hours to obtain current travel times.

TRAFFIC CAPACITY ANALYSIS

The DSEIS qualitatively assessed the traffic conditions in the absence of the proposed East Park roads (i.e., the No Build Alternative). However, for the purposes of this memorandum, a quantified traffic analysis was performed for the intersections located along the Fresh Kills Park perimeter roads in order to compare the LOS conditions both with-and without the proposed East Park road connections. In total, 19 intersections along the periphery of the park (previously analyzed in the FGEIS) were selected in the traffic study area (see Figure F-7) to assess the traffic conditions both with and without the East Park roads.

The analysis presented in this memorandum compares the LOS conditions resulting from the construction of a “single” roadway connection (i.e., the Yukon Avenue Connection only) with conditions with all three road connections in place. The traffic analysis relied on the build conditions data presented in the March 2009 *Fresh Kills Park FGEIS* for the intersections along park’s perimeter roads. The diverted and park generated traffic assumed to be using the East Park road system was added to the network in order to assess how it affects local intersections and operations along Arthur Kill road and Victory Boulevard as well as its affect on local intersections in places such as the Travis neighborhood. The analysis was performed for the weekday PM and weekend midday peak hours for the 2016 conditions with no East Park roads and the Yukon Avenue-Only Connection, and for the 2036 conditions with no East Park roads, the Yukon Avenue-Only Connection, and the Completed East Park road system. The capacity analysis was conducted as per the methodologies of the *2000 Highway Capacity Manual* using Highway Capacity Software (HCS) Version 4.1f.

2016 Build Conditions

For the 2016 condition, it is assumed that the build out of Fresh Kills Park and the roads west of East Park (including the connections and ramps associated with the West Shore Expressway) would proceed as described in the *Fresh Kills Park FGEIS* (March 2009). Absent the proposed East Park roads, vehicles would have to utilize the streets at the periphery of the park, including Richmond Avenue, Arthur Kill Road, Travis Avenue, and Victory Boulevard in order to access the park from the West Shore Expressway (see Table 1).

Yukon Avenue Connection

By 2016, the East Park roads proposed project would extend Yukon Avenue (as a two-lane park road) west into the park from its current intersection with Richmond Avenue. From there, the park road would extend across East Park to connect with the Confluence Loop Park Road near the Richmond Creek Bridge. This proposed park road would cross Landfill Section 6/7 and is referred to as the Yukon Avenue Connection in the DSEIS. The overall project generated traffic assignment inbound and outbound percentages for the park components which are expected to utilize the park connection on Richmond Avenue are presented in Appendix A to this memorandum.

Table 1
2016 Conditions Assumptions Comparison

Components	2016 Build—Without East Park Roads ⁽¹⁾	2016 Build—Yukon Avenue Only Connection ⁽¹⁾
Fresh Kills Park Build-Out	X	X
East Park Roads		X
Yukon Avenue Connection		X
Roads West of East Park	X	X
WSE connections	X	X
Note: WSE = West Shore Expressway.		
Source: 1. <i>Fresh Kills Park East Park Roads DSEIS</i> (June 2009).		

Therefore, for the 2016 analysis conditions, the traffic LOS and the travel time runs both with and without the proposed East Park roads were compared to the 2016 No Build traffic LOS presented in the FGEIS.

2036 Build Conditions

Absent the proposed East Park roads, it is assumed that the Fresh Kills Park and the roads west of East Park would be completed as described in the FGEIS (March 2009). With the build-out of Fresh Kills Park by the year 2036, an even greater number of park-generated vehicles (as compared with the year 2016) would need to utilize the streets and roadways (as described above) at the periphery of the park in order to access the park from the West Shore Expressway connections.

Table 2
2036 Conditions Assumptions Comparison

Components	2036 Build—Without East Park Roads ⁽¹⁾	2036 Build—Yukon Avenue-Only Option ⁽¹⁾	2036 Build—Completed East Park Road System ⁽¹⁾
Fresh Kills Build Out	X	X	X
East Park Roads		X	X
Richmond Hill Road Connection			X
Yukon Avenue Connection		X	X
Forest Hill Road Connection			X
Roads west of East Park	X	X	X
WSE connections	X	X	X
Note: WSE = West Shore Expressway.			
Source: 1. <i>Fresh Kills Park East Park Roads DSEIS</i> (June 2009).			

As described in greater detail in the DSEIS, under consideration are a number of options for completion of the East Park road system. These include two- or four-lane roads across East Park with new

connections at Richmond Hill Road, Yukon Avenue, and Forest Hill Road, a two-lane loop road around the base of the landfill with connections at Richmond Hill Road, Yukon Avenue, and Forest Hill Road, and a Yukon Avenue only option (as a four-lane road) without the Richmond Hill Road and Forest Hill Road connections. Each of these roadway options are further described in Chapter 1, "Project Description."

C. ANALYSIS RESULTS

TRAVEL TIME RUNS

As stated above, five travel time runs were conducted on the street along the periphery of the Fresh Kills property to determine current travel times without the East Park road connections. The existing average travel times for the two routes (see Figure F-6) are summarized in Tables 3 and 4, respectively.

Table 3
Existing Average Travel Times: Alternate Route 1

Segment	From	To	Average Travel Time	
			Weekday PM Peak Period	Weekend Midday Peak Period
1	Richmond Avenue and Yukon Avenue	Richmond Avenue and Richmond Hill Road	2 minutes 49 seconds	3 minutes 13 seconds
2	Richmond Avenue and Richmond Hill Road	Richmond Avenue and Draper Place	2 minutes 52 seconds	2 minutes 28 seconds
3	Richmond Avenue and Draper Place	Victory Boulevard and Travis Avenue	2 minutes 57 seconds	2 minutes 20 seconds
4	Victory Boulevard and Travis Avenue	Victory Boulevard and Wild Avenue	1 minute 20 seconds	1 minute 44 seconds
5	Victory Boulevard and Wild Avenue	Victory Boulevard and WSE Service Roads	1 minute 18 seconds	1 minute 3 seconds
6	Victory Boulevard and WSE Service Roads	Wild Avenue and WSE Service Roads	33 seconds	40 seconds
Total Travel Time			11 minutes 16 seconds	11 minutes 28 seconds

Note: WSE = West Shore Expressway.
Source: Travel time surveys conducted by AKRF in September 2009.

Table 4
Existing Average Travel Times: Alternate Route 2

Segment	From	To	Average Travel Time	
			Weekday PM Peak Period	Weekend Midday Peak Period
A	Richmond Avenue and Yukon Avenue	Richmond Avenue and Forest Hill Road	51 seconds	1 minute 25 seconds
B	Richmond Avenue and Forest Hill Road	Arthur Kill Road and Drumgoole Road	2 minutes 47 seconds	1 minute 55 seconds
C	Arthur Kill Road and Drumgoole Road	Arthur Kill Road and Woodrow Road	1 minute 28 seconds	1 minute 34 seconds
D	Arthur Kill Road and Woodrow Road	Arthur Kill Road and Arden Avenue	2 minutes 33 seconds	2 minute 10 seconds
E	Arthur Kill Road and Arden Avenue	Arthur Kill Road and WSE NB Service Road	1 minute 14 seconds	1 minute 20 seconds
Subtotal Travel Time			8 minute 53 seconds	8 minute 24 seconds
F	Arthur Kill Road and WSE NB Service Road	WSE Mainline at Muldoon Avenue	1 minute 24 seconds	1 minute 22 seconds
G	WSE Mainline at WSE Mainline	WSE Mainline south of Fresh Kills Creek	42 seconds	50 seconds
Total Travel Time			10 minutes 59 seconds	10 minutes 36 seconds

Notes: WSE = West Shore Expressway; NB = northbound.
Source: Travel time surveys conducted by AKRF in September 2009.

2016 BUILD CONDITIONS

Absent the proposed East Park road connections at the intersection of Richmond and Yukon Avenues, drivers (from east of Richmond Avenue) seeking to access the West Shore Expressway and the park would have to travel routes identified above. Park-destined vehicles would either travel north to reach the Expressway entrances at Victory Boulevard or south to reach the Expressway entrances at Arden Avenue.¹

On average, the Victory Boulevard/Travis Avenue route adds approximately 3.3 miles and an additional 11 minutes to the average travel time in the absence of the proposed East Park road connections. As for the Arthur Kill Road/Arden Avenue route, it adds approximately 2.8 miles and an additional 8 minutes to the average travel time in the absence of the proposed East Park road connections.

With the proposed East Park roads and the park entrances at the Richmond and Yukon Avenues, drivers at the Richmond Avenue/Yukon Avenue intersection would continue west on the Yukon Avenue Connection park road to reach the Confluence Loop Park Road where they could either access the confluence area of the park or the northbound and the southbound West Shore Expressway. To reach the northbound West Shore Expressway, drivers would continue through onto the north leg of the Confluence Loop Park Road to reach the West Shore Expressway northbound service road on the east side of the West Shore Expressway mainline. To reach the southbound West Shore Expressway, drivers would make a left turn to reach the south leg of the Confluence Loop Park Road, across the Richmond Creek Bridge, under the West Shore Expressway, and turn left onto the West Shore Expressway southbound service road. The distance for drivers from this intersection to reach the northbound and southbound West Shore Expressway utilizing the East Park roads would be approximately 1.3 miles, resulting in approximately 3 minutes of travel time, assuming a 30 mph speed limit on the internal park roads.

The travel distance and time comparison for the 2016 conditions are presented in Table 5a and 5b.

Table 5a
2016 Build Conditions: Estimated Travel Distance Comparison

From	To		
	Without East Park Roads		Yukon Avenue-Only Connection
	WSE (Victory Boulevard)	WSE (Arden Avenue)	WSE (Confluence Loop Road)
Richmond Avenue and Yukon Avenue	3.3 miles	2.8 miles	1.3 miles
Note: Approximate travel distances based on <i>Fresh Kills Park East Park Roads DSEIS (June 2009)</i> and GIS aerials.			
Source: AKRF, Inc., October 2009.			

Table 5b
2016 Build Conditions: Estimated Travel Time Comparison

From	To		
	Without East Park Roads		Yukon Avenue-Only Connection *
	WSE (Victory Boulevard)	WSE (Arden Avenue)	WSE (Confluence Loop Road)
Richmond Avenue and Yukon Avenue	11 minutes	8 minutes	3 minutes
Note: * Estimated travel time assumes free flow speeds with no traffic controls on internal park road intersections. In the future conditions with the traffic controls in place, the estimated travel time based on free flow speeds is expected to increase by an additional 1 to 2 minutes.			
Source: AKRF, Inc., October 2009.			

¹ With the reconfiguration of the West Shore Expressway connections and ramps in the future conditions.

2036 BUILD CONDITIONS

As described in the preceding sections, under consideration are several options for the completed 2036 East Park road system. The travel time savings for each of these options (compared with the Build conditions without the East Park roads) are discussed in the following sections.

Completed East Park Road System (Four-Lane Park Roads)

Yukon Avenue Connection

Absent the proposed East Park roads, the distance drivers would need to travel around the Fresh Kills property from the intersection of Richmond Avenue and Yukon Avenue to reach the West Shore Expressway and the park would be the same as described in the above section for the 2016 Build conditions. Likewise, with the Yukon Avenue Connection in place, the distance to travel across the park roads to reach the West Shore Expressway service roads would also be the same.

Forest Hill Road Connection

Absent the proposed East Park roads, drivers at the intersection of Richmond Avenue and Forest Hill Road seeking access to the West Shore Expressway and the park, would need to travel south on Richmond Avenue to reach the West Shore Expressway entrances at Arden Avenue. This more limited road network would require them to travel south on Richmond Avenue through Drumgoole Road to reach Arthur Kill Road. Drivers would turn west along Arthur Kill Road for a distance of about 1.6 miles to reach northbound or southbound entrances to the West Shore Expressway at the Arden Avenue. Thus, the total distance is about 2.4 miles (a travel time of approximately 7 minutes) to get around the Fresh Kills property.

However, with the Richmond Avenue and Forest Hill Road connection in place, drivers could continue onto the Forest Hill Connection to reach the Confluence Loop Park Road. To access the northbound West Shore Expressway, drivers would turn north and cross the Main Creek Bridge to the north leg of the Confluence Loop Park Road to reach the West Shore Expressway northbound service road on the east side of the West Shore Expressway mainline. To access the southbound West Shore Expressway, drivers would continue onto the south leg of the Confluence Loop Park Road, across the Richmond Creek Bridge, under the West Shore Expressway, and then turn left onto the West Shore Expressway southbound service road. The distance for drivers from this intersection to reach the northbound and southbound West Shore Expressway utilizing the East Park roads would be approximately 1.7 miles (a projected travel time of about 3 minutes).

Richmond Hill Road Connection

Absent the proposed East Park roads, drivers seeking access to the West Shore Expressway and the park at the intersection of Richmond Avenue and Richmond Hill Road, would need to drive north on Richmond Avenue and make a left turn at the Draper Place/Travis Avenue intersection and then head west on Travis Avenue to the intersection with Victory Boulevard. At Victory Boulevard the driver would again have the make a left turn, and than travel through the commercial core of the Travis neighborhood to reach the ramps of the West Shore Expressway. Thus, this total diversion is about 2.4 miles (approximately 8 minutes) around the Fresh Kills property.

However, with the Richmond Avenue and Richmond Hill Road Connection in place, drivers would continue on this park road to reach the Yukon Avenue Connection and then go west to reach the Confluence Loop Park Road at the center of Fresh Kills Park via either the Richmond Creek or Main Creek Bridges. The distance for drivers from this intersection to reach the northbound and southbound West Shore Expressway utilizing the East Park roads would be approximately 2.3 miles (approximately 5 minutes of travel time).

Completed East Park Road System (Two-Lane Park Roads)

Since the roadway alignment under this option would the same as the four-lane park road option described above, the travel distances would be the same.

East Park Loop Road Option

As described above, this option would have all three park connections on Richmond Avenue at Richmond Hill Road, Yukon Avenue, and Forest Hill Road as one option under the completed East Park road system. Therefore, the diverted travel distances and travel times without the proposed East Park roads would be the same as those described for the completed East Park road system. How they differ is the internal roadway alignment within East Park. The travel routes for each of the three Richmond Avenue connections under this road option are described below.

Yukon Avenue Connection

With the proposed East Park roads Loop Road Option and the park entrances at the Richmond and Yukon Avenues, drivers at the Richmond Avenue and Yukon Avenue intersection would continue west on the Yukon Avenue Connection park road and the East Park Loop Road in order to reach the Confluence Loop Park Road where they could access the confluence area of the park or the northbound and the southbound West Shore Expressway. To reach the northbound West Shore Expressway, drivers would continue across the Main Creek Bridge onto the north leg of the Confluence Loop Park Road to reach the West Shore Expressway northbound service road on the east side of the West Shore Expressway mainline. To reach the southbound West Shore Expressway, drivers would make a left-turn to reach the south leg of the Confluence Loop Park Road, across the Richmond Creek Bridge, under the West Shore Expressway, and turn left onto the West Shore Expressway southbound service road. The distance for drivers from this intersection to reach the northbound and southbound West Shore Expressway utilizing the East Park roads would be approximately 1.3 miles (approximately 3 minutes of travel time).

Forest Hill Road Connection

With the Forest Hill Road Connection and East Park Loop Road in place, drivers would continue west into the park and then take the East Park Loop Road south to reach the Confluence Loop Road. Once drivers are on the Confluence Loop Road, the routes to the northbound and southbound West Shore Expressway would be accessible. The distance for drivers from this intersection to reach the northbound and southbound West Shore Expressway utilizing the East Park Loop Road would be approximately 1.8 miles (approximately 4 minutes of travel time).

Richmond Hill Road Connection

With the Richmond Avenue and Richmond Hill Road Connection and East Park Loop Road in place, drivers would continue west into the park and then follow the East Park Loop Road alignment to connect with the Yukon Avenue connection park road just east of the Main Creek Bridge. To reach the northbound West Shore Expressway, drivers would make a right turn onto the Main Creek Bridge to reach the north leg of the Confluence Loop Park Road to access the northbound service road on the east side of the West Shore Expressway mainline. To reach the southbound West Shore Expressway, drivers would continue south to the south leg of the Confluence Loop Park Road, cross the Richmond Creek Bridge, continue under the West Shore Expressway mainline and then make a left-turn onto the southbound service road. The distance for drivers from this intersection to reach the northbound and southbound West Shore Expressway utilizing the East Park roads would be approximately 2.1 miles (approximately 4 minutes of travel time).

Yukon Avenue Connection (Four-Lane Road Option)

Since the roadway alignment within East Park and intersection of Richmond Avenue and Yukon Avenue would be the same as the 2016 conditions. The travel distances described for the 2016 conditions above would be the same for the 2036 conditions.

The travel distance and time comparisons for the various options for the 2036 conditions are presented in Table 6a and 6b, respectively.

Table 6a
2036 Build Conditions: Estimated Travel Distance Comparison

From	To				
	Without East Park Roads		Yukon Avenue- Connection	Completed East Park Road System	East Park Loop Road Option
	WSE (Victory Boulevard)	WSE (Arden Avenue)	WSE (Confluence Loop Road)	WSE (Confluence Loop Road)	WSE (Confluence Loop Road)
Richmond Avenue and Yukon Avenue	3.3 miles	2.8 miles	1.3 miles	1.3 miles	1.3 miles
Richmond Avenue and Forest Hill Road	3.7 miles	2.4 miles	N/A	1.7 miles	1.8 miles
Richmond Avenue and Richmond Hill Road	2.4 miles	3.7 miles	N/A	2.3 miles	2.1 miles

Note: Approximate travel distances based on *Fresh Kills Park East Park Roads DSEIS (June 2009)* and GIS aerials.
Source: AKRF, Inc., October 2009.

Table 6b
2036 Build Conditions: Estimated Travel Time Comparison

From	To				
	Without East Park Roads		Yukon Avenue Connection *	Completed East Park Road System *	East Park Loop Road Option *
	WSE (Victory Boulevard)	WSE (Arden Avenue)	WSE (Confluence Loop Road)	WSE (Confluence Loop Road)	WSE (Confluence Loop Road)
Richmond Avenue and Yukon Avenue	11 minutes	8 minutes	3 minutes	3 minutes	3 minutes
Richmond Avenue and Forest Hill Road	12 minutes	7 minutes	N/A	3 minutes	4 minutes
Richmond Avenue and Richmond Hill Road	8 minutes	11 minutes	N/A	5 minutes	4 minutes

Note: * Estimated travel time assumes free flow speeds with no traffic controls on internal park road intersections. In the future conditions with the traffic controls in place, the estimated travel time based on free flow speeds is expected to increase by an additional 1 to 2 minutes.
Source: AKRF, Inc., October 2009.

TRAFFIC ANALYSIS

As discussed above, quantified traffic analysis was conducted for 19 intersections and the future park entrances at the periphery of the park for the 2016 and 2036 Build conditions for the weekday PM and weekend midday peak hours. Traffic LOS comparisons presented in this section evaluates study area intersection approaches/lane-groups in terms of changes in congestion levels, i.e., defined as LOS D, E, or F by the *CEQR Technical Manual* (delays in excess of 45 seconds for signalized intersections and in excess of 30 seconds for unsignalized intersections). Detailed traffic LOS comparisons between various scenarios are presented in Appendix B to this memorandum. A summary of traffic level of service analysis for each Build scenarios is presented as follows:

2016 Analysis Conditions

As presented in Table 7, during the weekday PM peak hour (Without East Park Roads) there would be a total of 33 congested approaches/lane groups (31 signalized and 2 unsignalized). Similarly, under the Build (Yukon Avenue-Only Connection) conditions, there would also be a total of 33 congested approaches/lane groups (32 signalized and 1 unsignalized).

During the weekend midday peak hour, under the Build (Without East Park Roads) conditions, there would be a total of 31 congested approaches/lane groups (29 signalized and 2 unsignalized). Under the

Build (Yukon Avenue-Only Connection) conditions, there would be 29 congested approaches/lane groups (27 signalized and 2 unsignalized).

2036 Build Conditions

As presented in Table 8, during the weekday PM peak hour – Without East Park Roads conditions, there would be a total of 51 congested approaches/lane groups (45 signalized and 6 unsignalized). With the proposed park roads, the Yukon Avenue Connection only, there would be 49 congested approaches/lane groups (46 signalized and 3 unsignalized). With a full and completed Park Road System (3 connections), there would be 46 congested approaches/lane groups (43 signalized and 3 unsignalized).

During the weekend midday peak hour, under the Build (Without East Park Roads) conditions, there would be a total of 56 congested approaches/lane groups (50 signalized and 6 unsignalized). Under the Build (Yukon Avenue Connection-Only), there would be 46 congested approaches/lane groups (43 signalized only and 3 unsignalized). With the completed East Park road system conditions, there would be 42 congested approaches/lane groups (39 signalized and 3 unsignalized).

Table 7
2016 No Build and Build Conditions Comparison

Congested Approaches/ Lane Groups	No Build	Build—Without East Park Roads	Build—Yukon Avenue Connection
Weekday PM Peak Hour			
Signalized ⁽¹⁾	30	31	32
Unsignalized ⁽²⁾	1	2	1
Total	31	33	33
Weekend Midday Peak Hour			
Signalized ⁽¹⁾	27	29	27
Unsignalized ⁽²⁾	1	2	2
Total	28	31	29
Notes:			
(1) As defined in the <i>CEQR Technical Manual (2001)</i> , approaches/lane groups at signalized intersections are considered congested if the average vehicle delay exceeds mid-LOS D (45 seconds).			
(2) As defined in the <i>CEQR Technical Manual (2001)</i> , approaches/lane groups at unsignalized intersections are considered congested if the delay exceeds mid-LOS D (30 seconds).			

Table 8
2036 No Build and Build Conditions Comparison

Congested Approaches/ Lane Groups	No Build	Build—Without East Park Roads	Build—Yukon Avenue Connection	Build—Completed East Park Road System
Weekday PM Peak Hour				
Signalized ⁽¹⁾	37	45	46	43
Unsignalized ⁽²⁾	1	6	3	3
Total	38	51	49	46
Weekend Midday Peak Hour				
Signalized ⁽¹⁾	39	50	43	39
Unsignalized ⁽²⁾	1	6	3	3
Total	40	56	46	42
Notes:				
(1) As defined in the <i>CEQR Technical Manual (2001)</i> , approaches/lane groups at signalized intersections are considered congested if the average vehicle delay exceeds mid-LOS D (45 seconds).				
(2) As defined in the <i>CEQR Technical Manual (2001)</i> , approaches/lane groups at unsignalized intersections are considered congested if the average vehicle delay exceeds mid-LOS D (30 seconds).				

D. SUMMARY OF FINDINGS

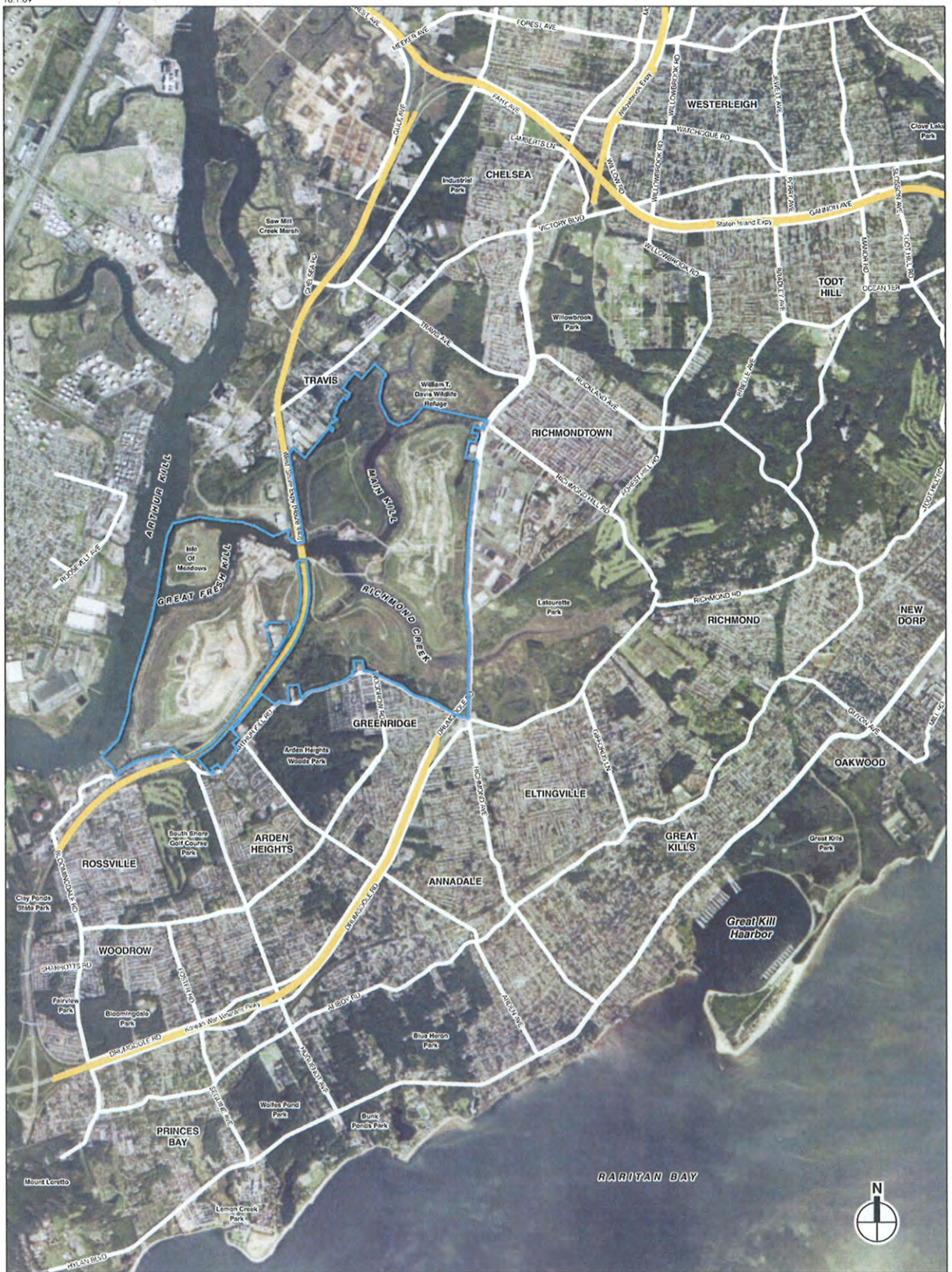
Without the proposed East Park road connections, traffic destined for the West Shore Expressway from the neighboring communities of Richmond, Richmondtown, Oakwood, and New Dorp would experience increased travel times as drivers would have to continue to drive around the Fresh Kills property to access the Expressway. This would result in increased traffic volumes on streets/roadways along the Fresh Kills Park periphery, specifically, on Victory Boulevard and Arthur Kill Road. On average, Victory Boulevard and Arthur Kill Road could experience an additional 1,000 hourly vehicles—including the park-generated traffic as well as the diverted traffic accessing the West Shore Expressway in the absence of East Park road connections—during the weekday PM and Weekend midday peak hours.

Consequently, the additional driving along the Fresh Kills property would result in increased travel times for vehicles accessing the West Shore Expressway. Overall, without the East Park road connections in place, the average travel time for vehicles accessing the West Shore Expressway (from points along Richmond Avenue at Forest Hill Road, Yukon Avenue and Richmond Hill Road) would increase by approximately 4 to 8 minutes.

In the absence of the proposed East Park road connections, the additional traffic volumes on streets/roadways along the Fresh Kills Park periphery would also cause in capacity constraints on the study area intersections. Specifically, during the weekend midday peak hour in the future 2036 conditions, the traffic conditions at the study area intersections would experience congestion. Overall, during this peak hour in 2036 future conditions, an additional 10 and 14 intersection approaches/lane-groups would operate under congested conditions without the proposed East Park road connections in place as compared to the future build conditions with the Yukon Avenue-Only and completed East Park road connections, respectively.

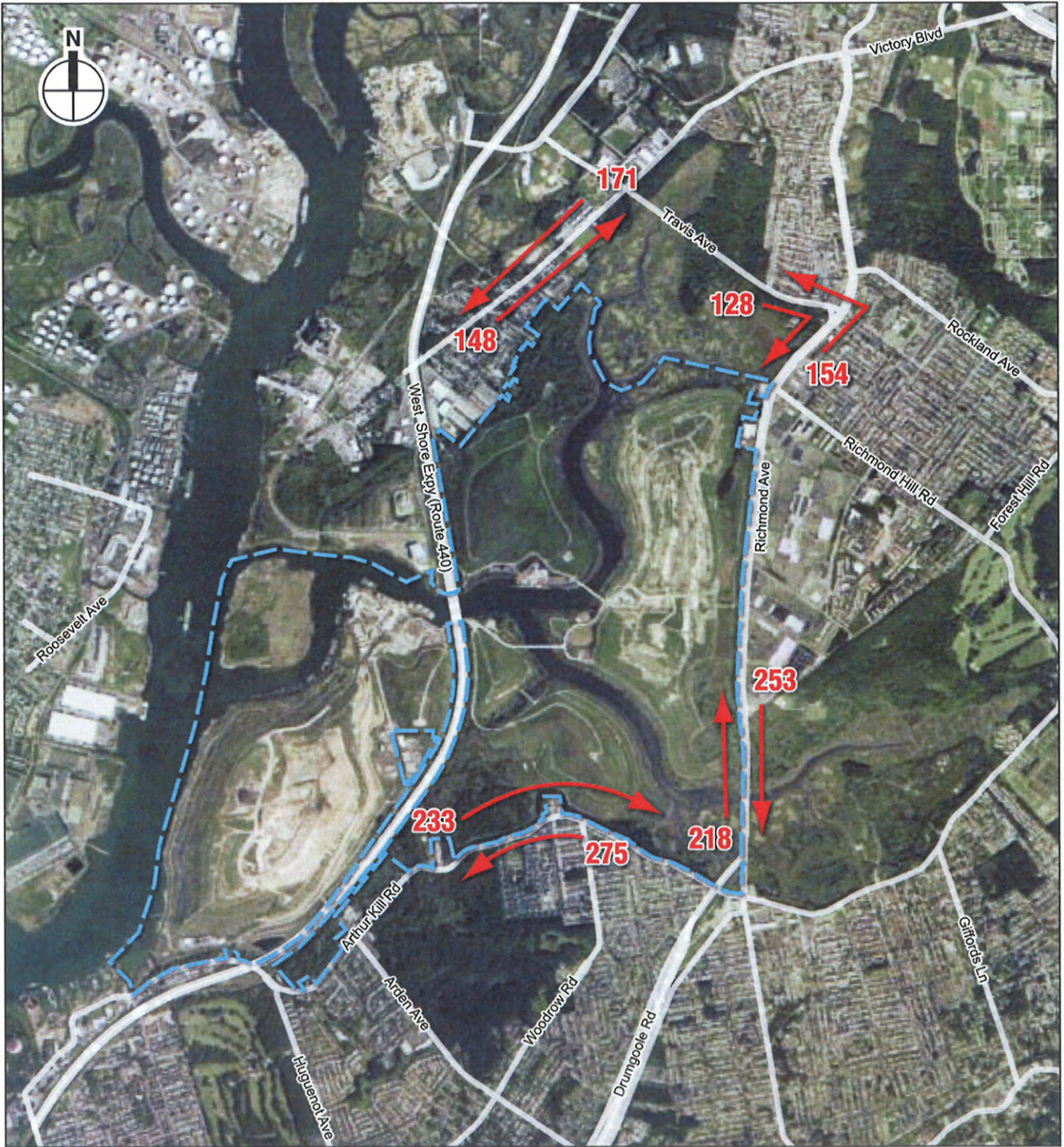
In summary, the proposed East Park road connections in the future conditions would have an overall beneficial effect on the study area traffic and transportation conditions. Specifically, these connections would provide the following benefits:

- Less traffic volumes on study area street/roadways and intersections in the future conditions by providing an alternative and more direct route to reach the West Shore Expressway from Richmond Avenue and vice-versa;
- Savings in travel time resulting from the more direct connection between West Shore Expressway and Richmond Avenue; and
- Less congestion on study area intersections along the Fresh Kills Park periphery as fewer vehicles would travel through these intersections to access park destinations and West Shore Expressway. *



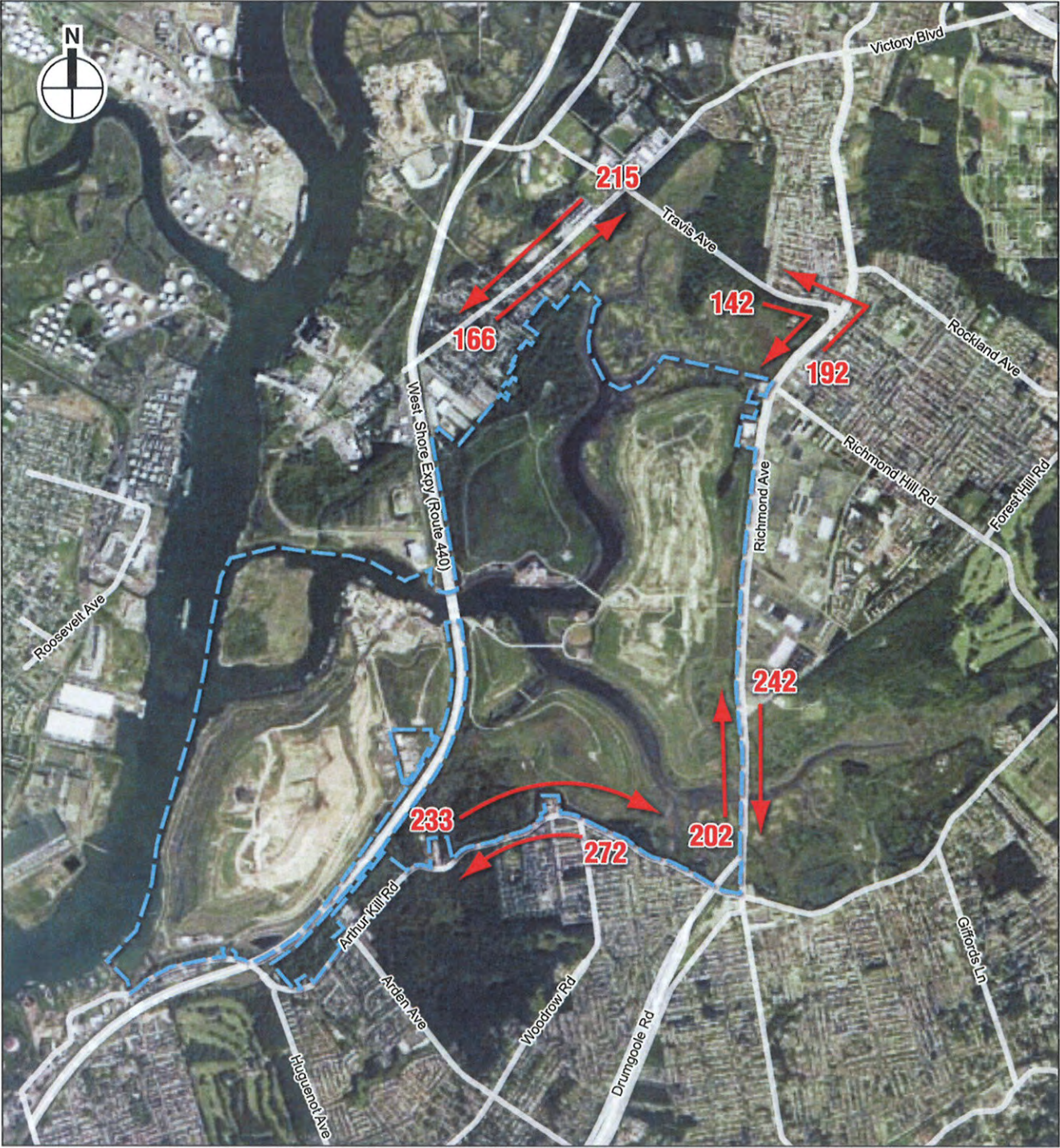
Project Site Boundary

0 1 MILE
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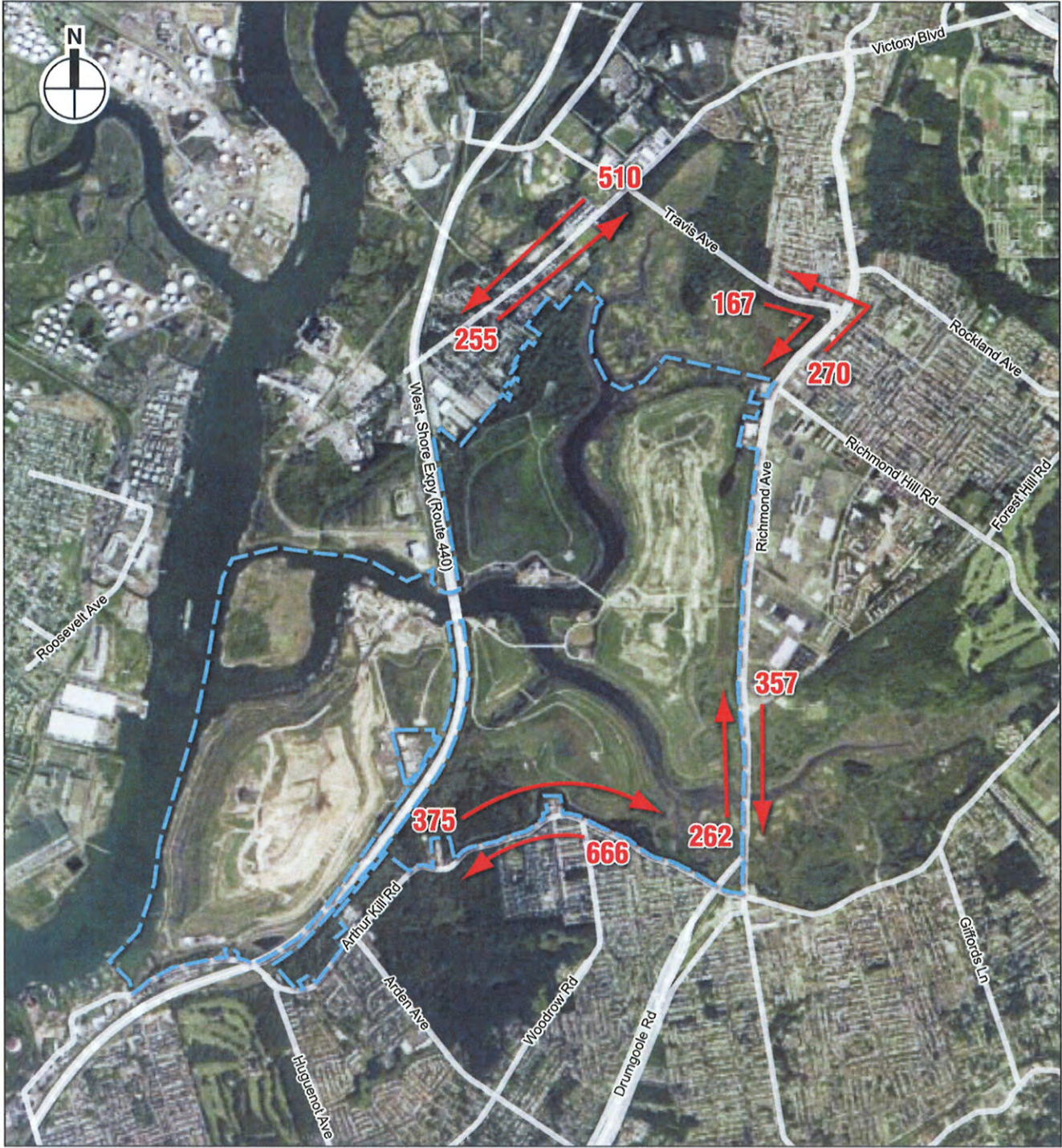
- - - Fresh Kills Project Site Boundary
- ➔ Traffic Volumes Rerouted to the Existing Street Network Absent the Proposed East Park Roads

2016 Build Without East Park Roads
Weekday PM Peak Hour



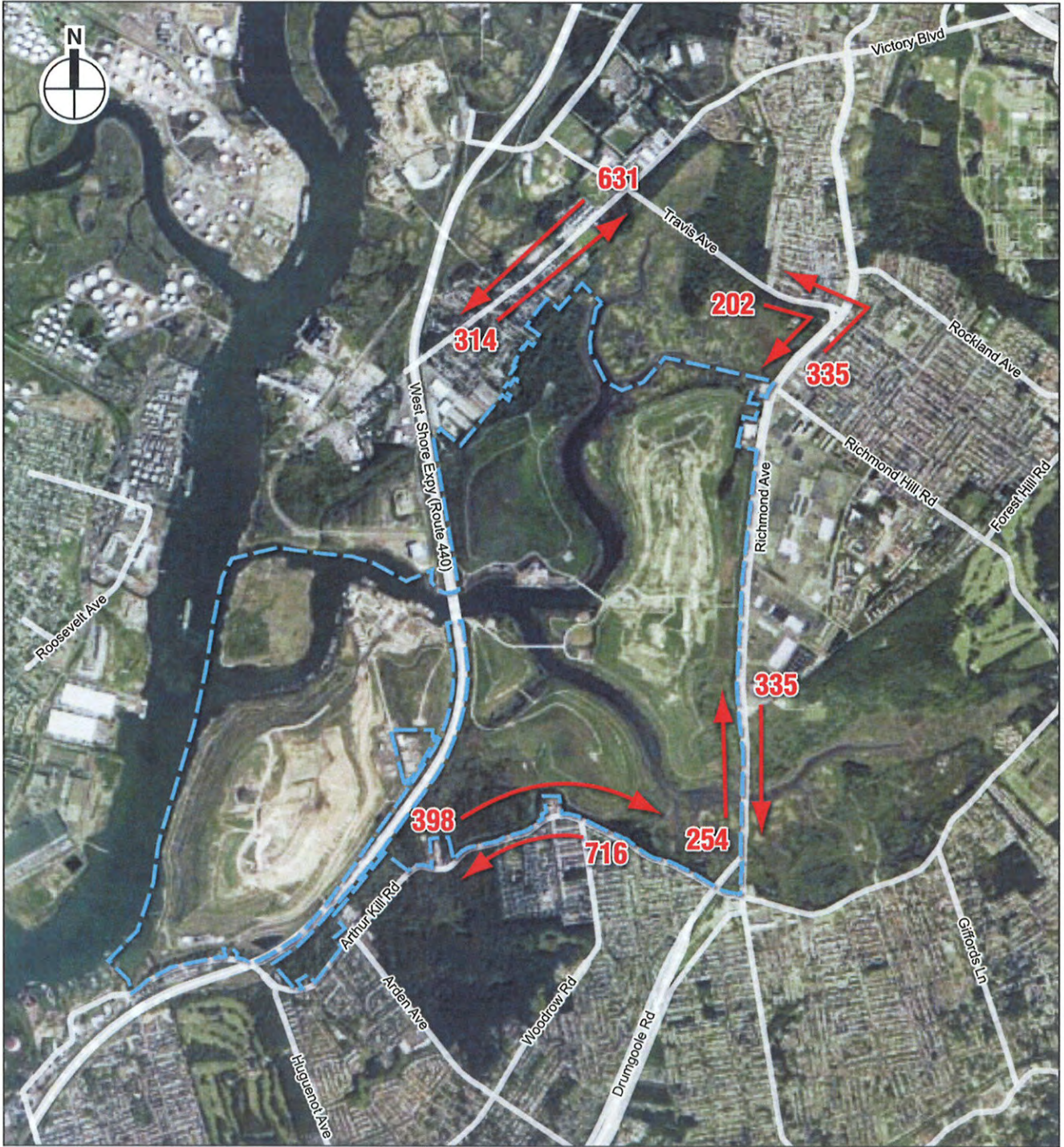
- - - Fresh Kills Project Site Boundary
- ➔ Traffic Volumes Rerouted to the Existing Street Network Absent the Proposed East Park Roads

2016 Build Without East Park Roads
Weekend Midday Peak Hour
Figure F-3



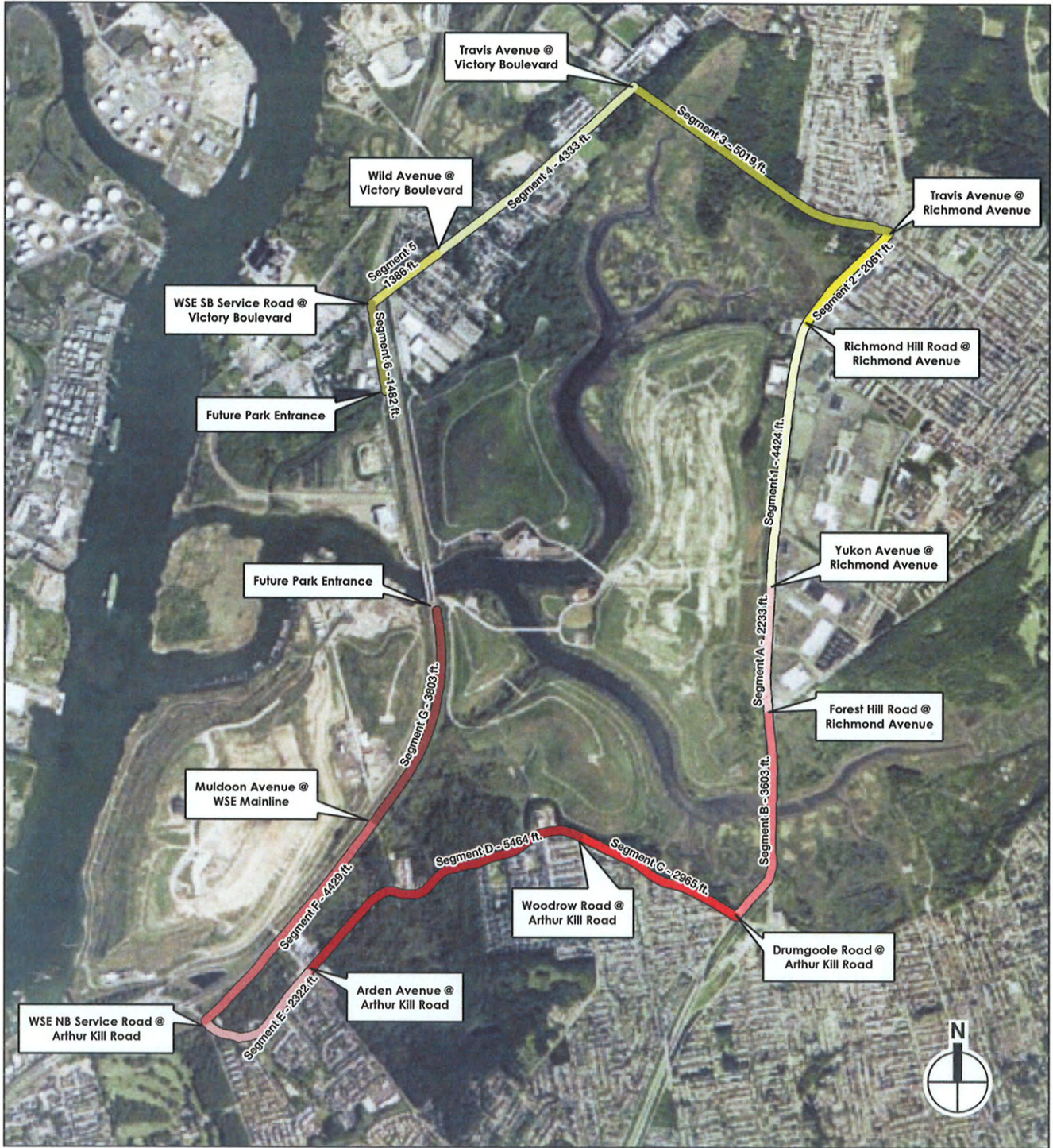
- - - Fresh Kills Project Site Boundary
- ➔ Traffic Volumes Rerouted to the Existing Street Network Absent the Proposed East Park Roads

2036 Build Without East Park Roads
Weekday PM Peak Hour

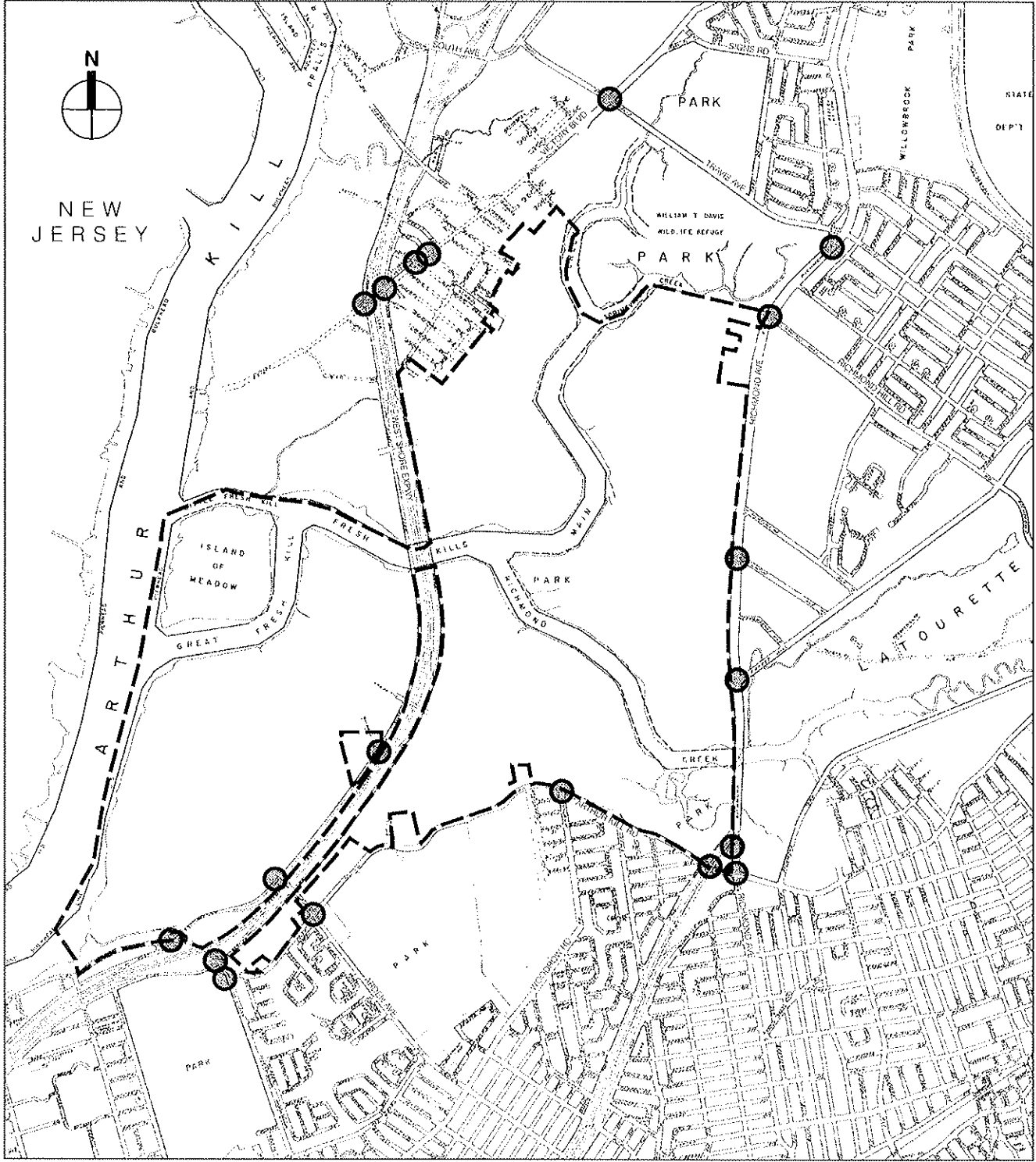


- - - Fresh Kills Project Site Boundary
- ➔ Traffic Volumes Rerouted to the Existing Street Network Absent the Proposed East Park Roads

2036 Build Without East Park Roads
Weekend Midday Peak Hour



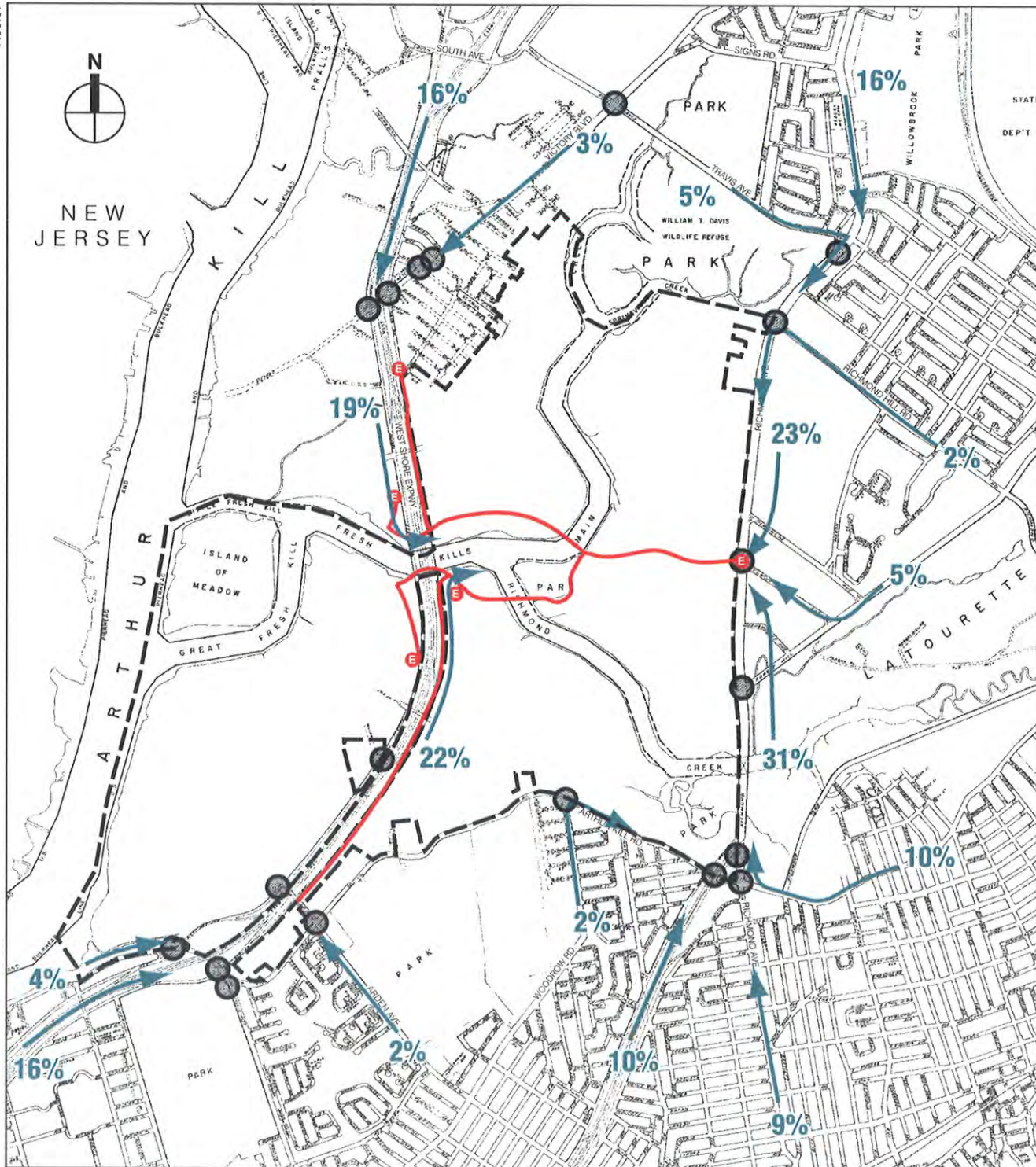
Existing Travel Time Run
Roadway Segments
Figure F-6



- Fresh Kills Project Site Boundary
- Analysis Intersection

Appendix A

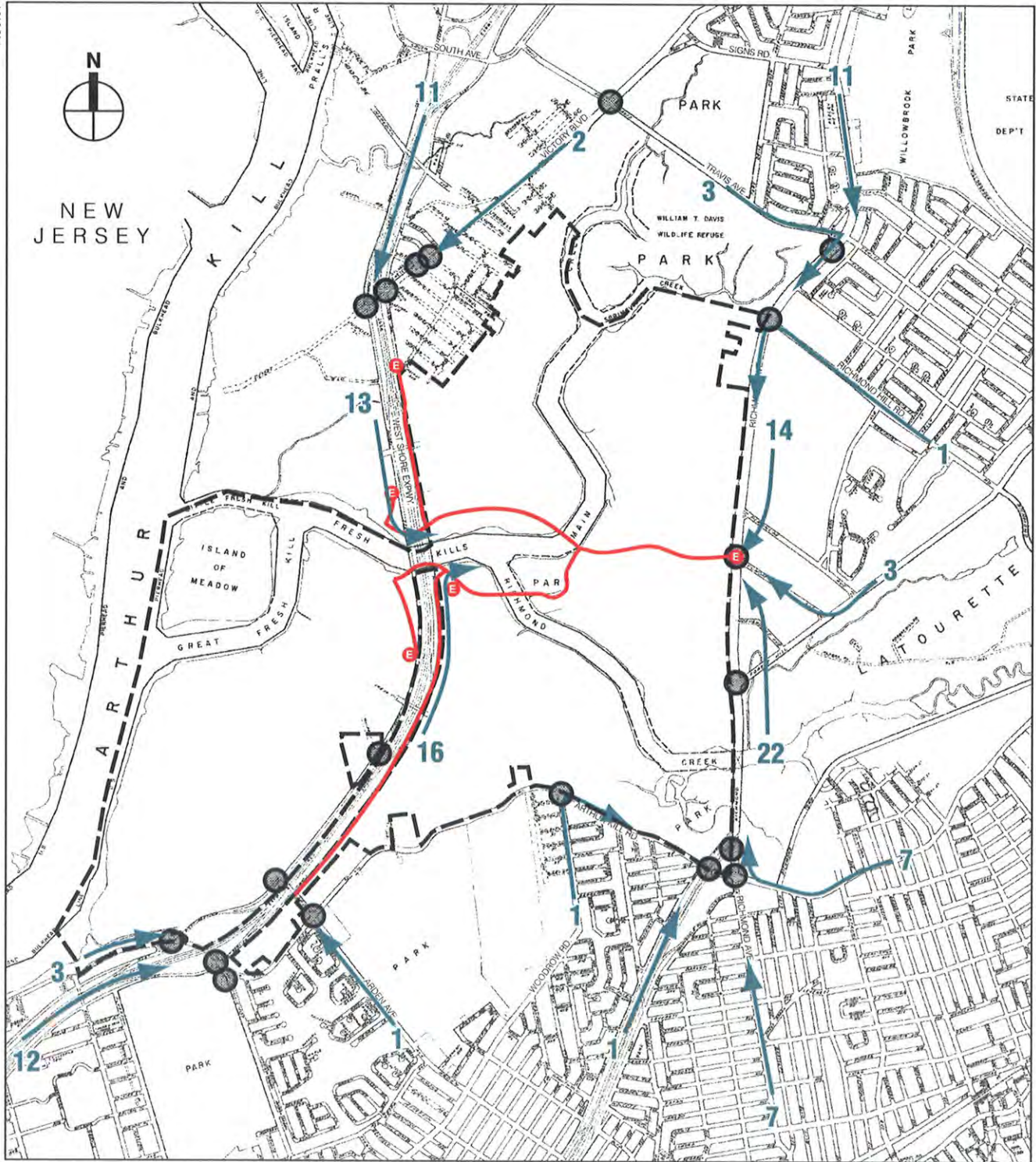
Project Generated Traffic Assignments



- Fresh Kills Project Site Boundary
- Analysis Intersection
- Inbound Traffic For Park Components Utilizing Richmond Avenue Park Entrance/Exit
- Park Road
- Park Road Entrance/Exit

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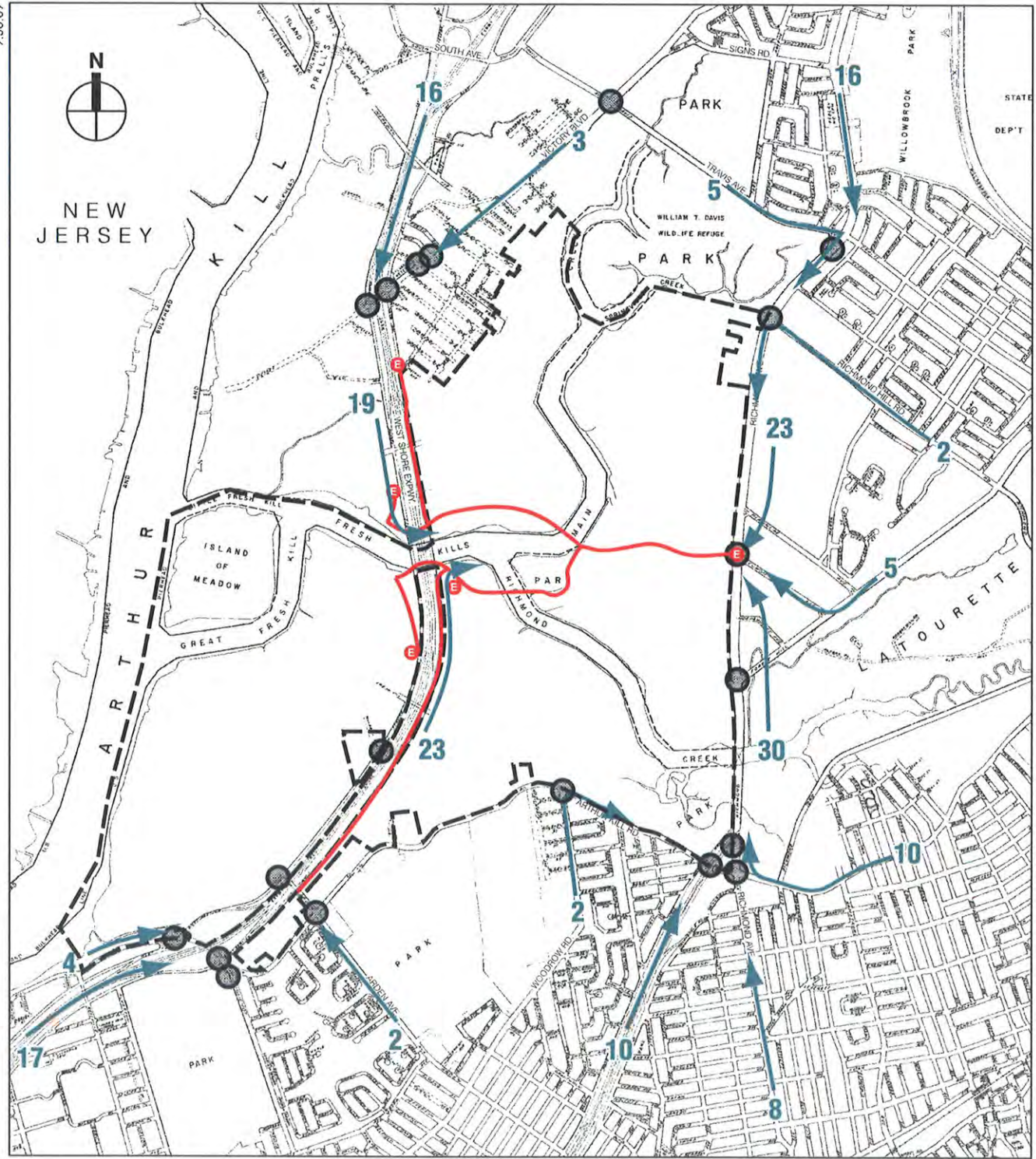
2016 Yukon Avenue - Only Connection
Project Generated Traffic Assignments (Inbound)
All Peak Hours



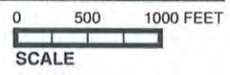
- Fresh Kills Project Site Boundary
- Analysis Intersection
- Inbound Traffic For Park Components Utilizing Richmond Avenue Park Entrance/Exit
- Park Road
- Park Road Entrance/Exit

0 500 1000 FEET
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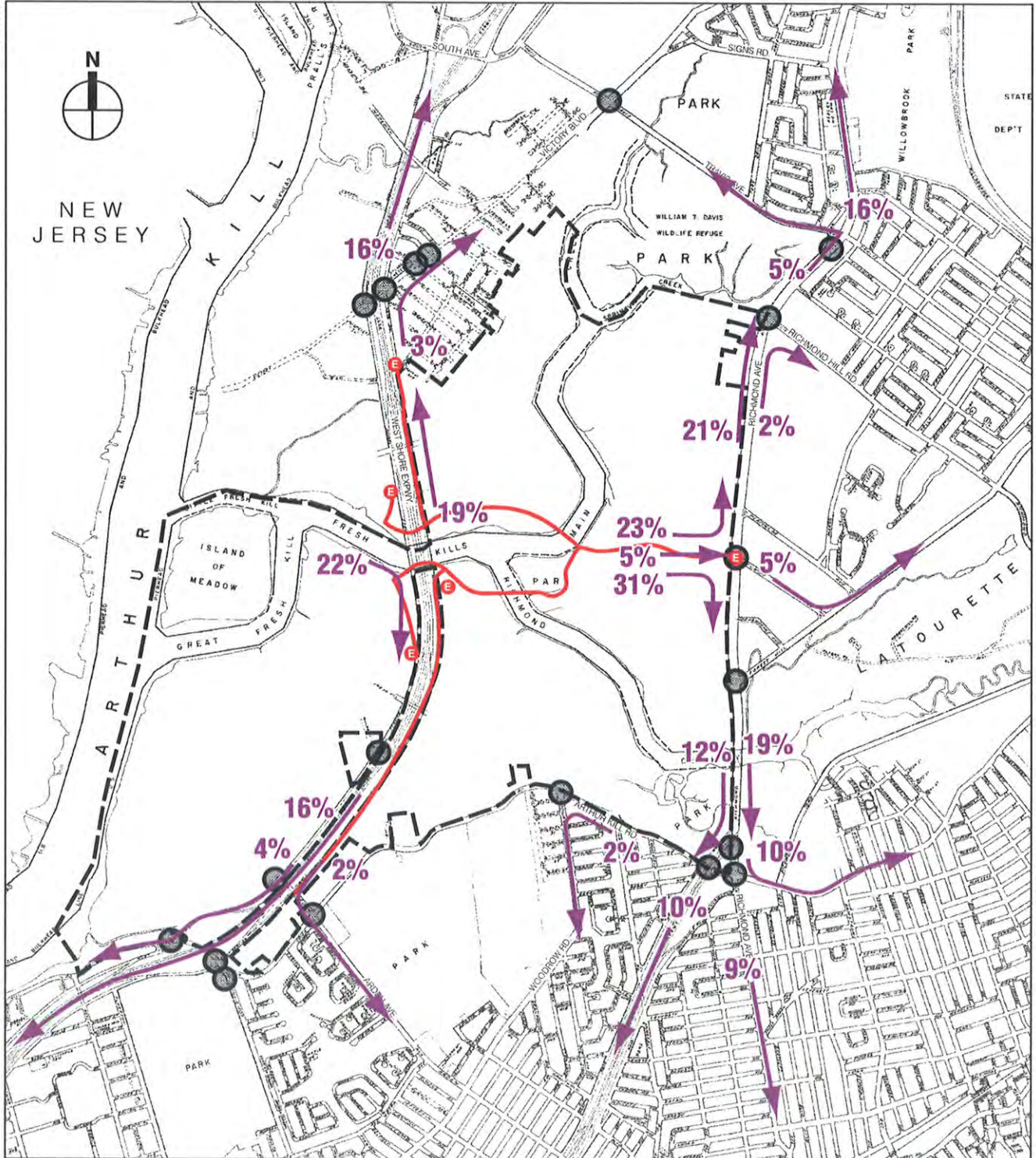
2016 Yukon Avenue - Only Connection
Project Generated Traffic Volumes (Inbound)
Weekday PM Peak Hour



- Fresh Kills Project Site Boundary
- Analysis Intersection
- ➔ Inbound Traffic For Park Components Utilizing Richmond Avenue Park Entrance/Exit
- Park Road
- E Park Road Entrance/Exit



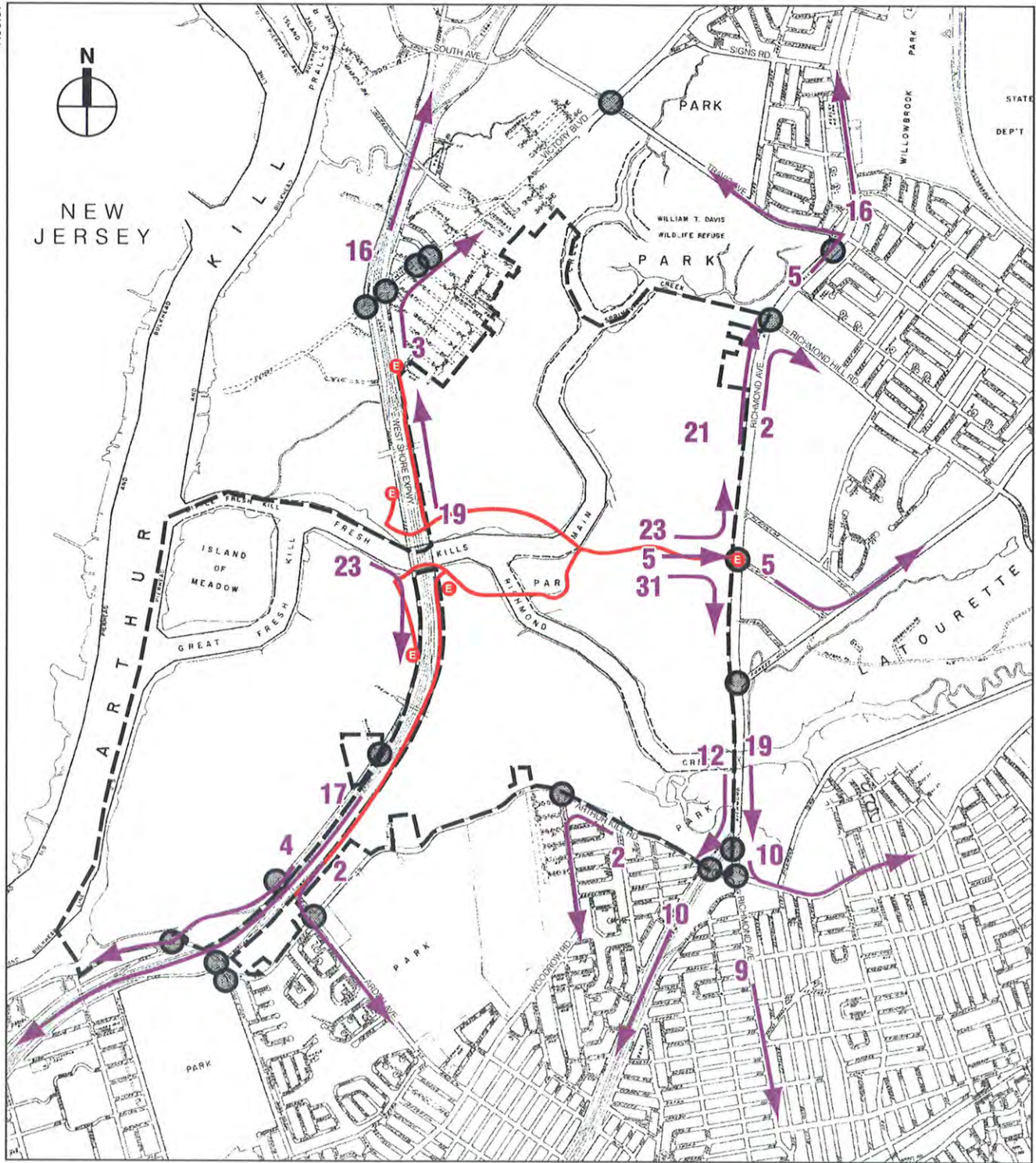
2016 Yukon Avenue - Only Connection
 Project Generated Traffic Volumes (Inbound)
 Weekend Midday Peak Hour
Figure A-1b



- Fresh Kills Project Site Boundary
- Analysis Intersection
- ➔ Outbound Traffic For Park Components Utilizing Richmond Avenue Park Entrance/Exit
- Park Road
- ⓔ Park Road Entrance/Exit

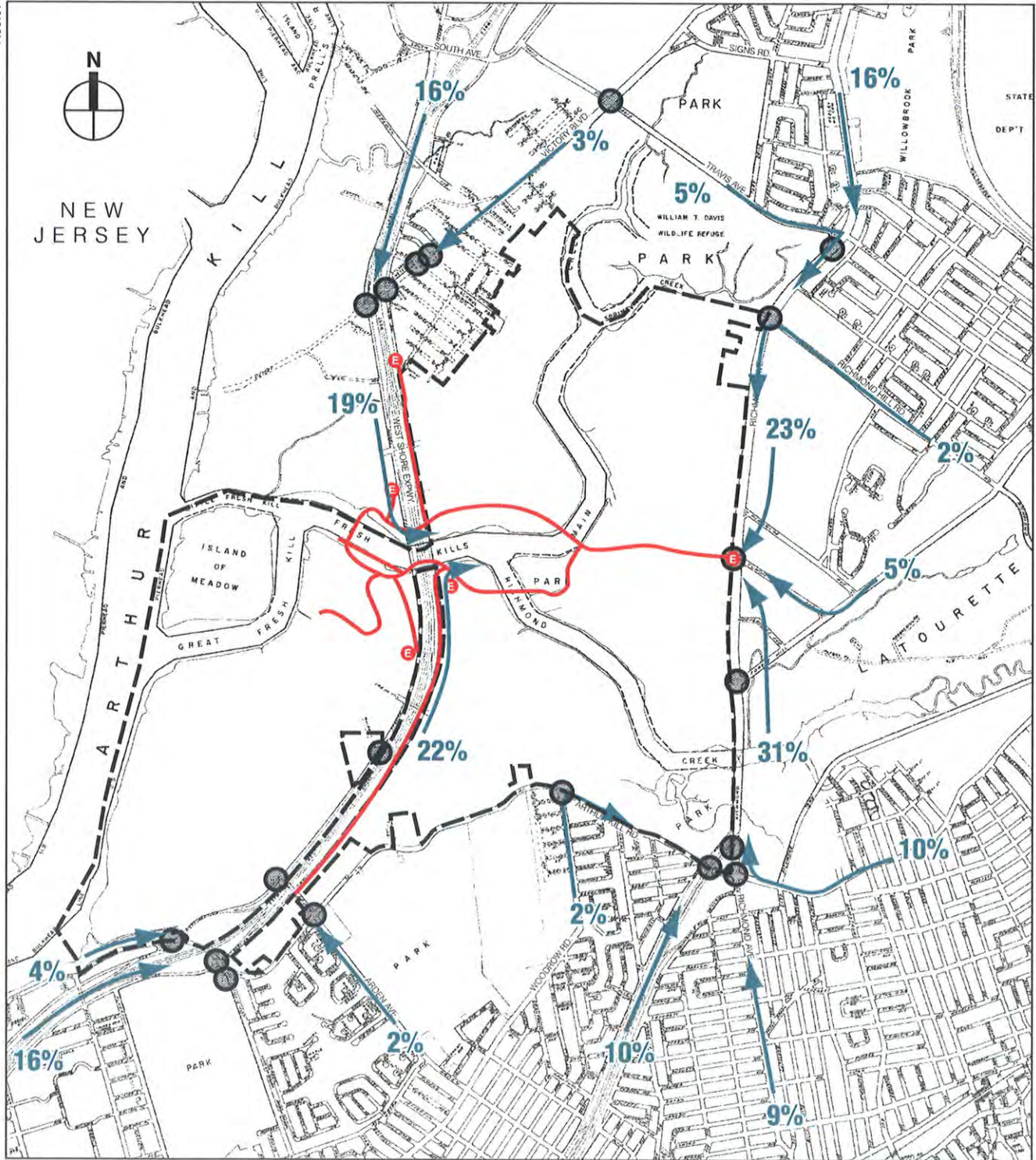
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SCALE

2016 Yukon Avenue - Only Connection
Project Generated Traffic Assignments (Outbound)
All Peak Hours



- Fresh Kills Project Site Boundary
- Analysis Intersection
- ➔ Outbound Traffic For Park Components Utilizing Richmond Avenue Park Entrance/Exit
- Park Road
- E Park Road Entrance/Exit

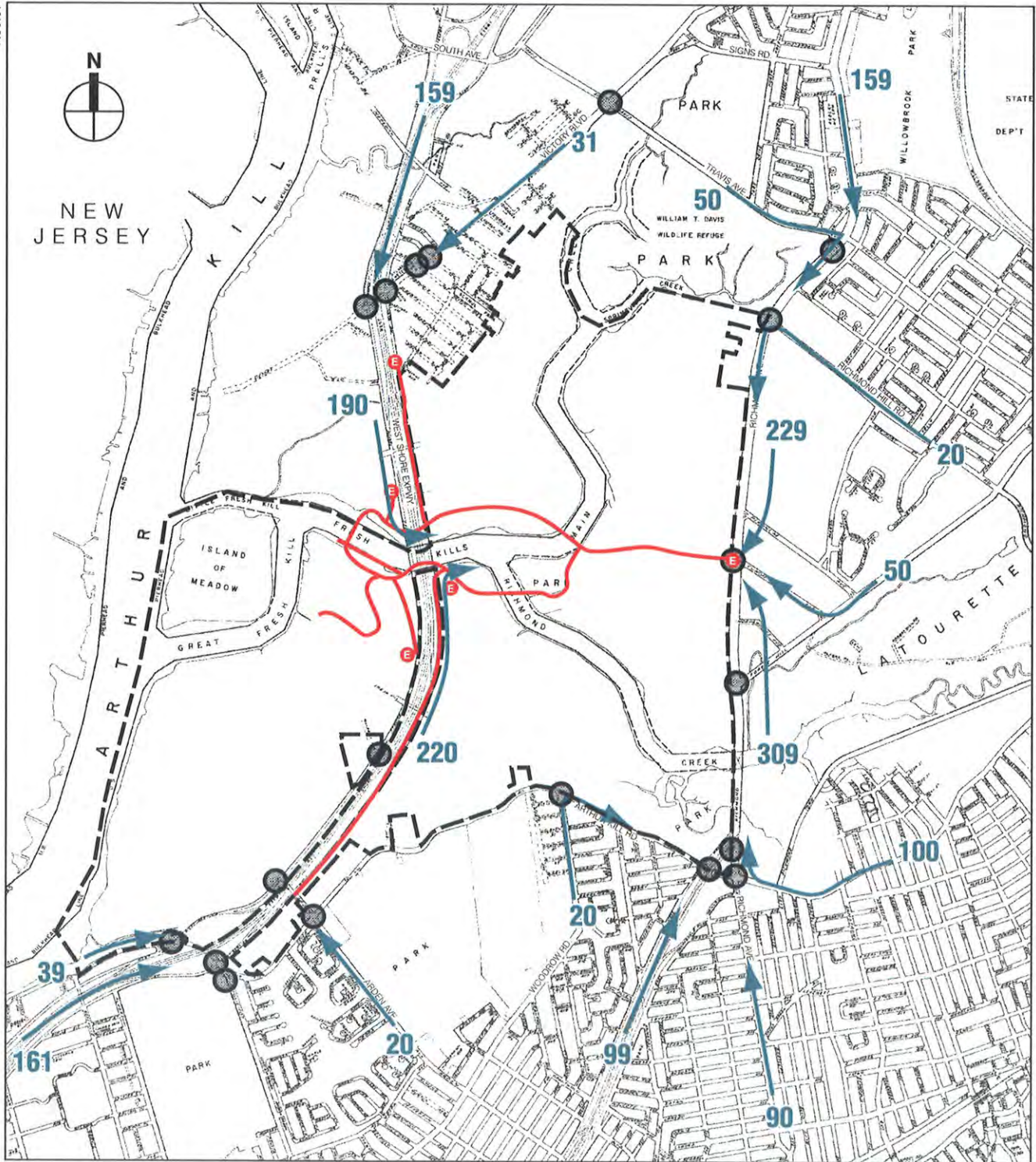
2016 Yukon Avenue - Only Connection
 Project Generated Traffic Volumes (Outbound)
 Weekend Midday Peak Hour



- Fresh Kills Project Site Boundary
- Analysis Intersection
- Inbound Traffic For Park Components Utilizing Richmond Avenue Park Entrance/Exit
- Park Road
- Park Road Entrance/Exit

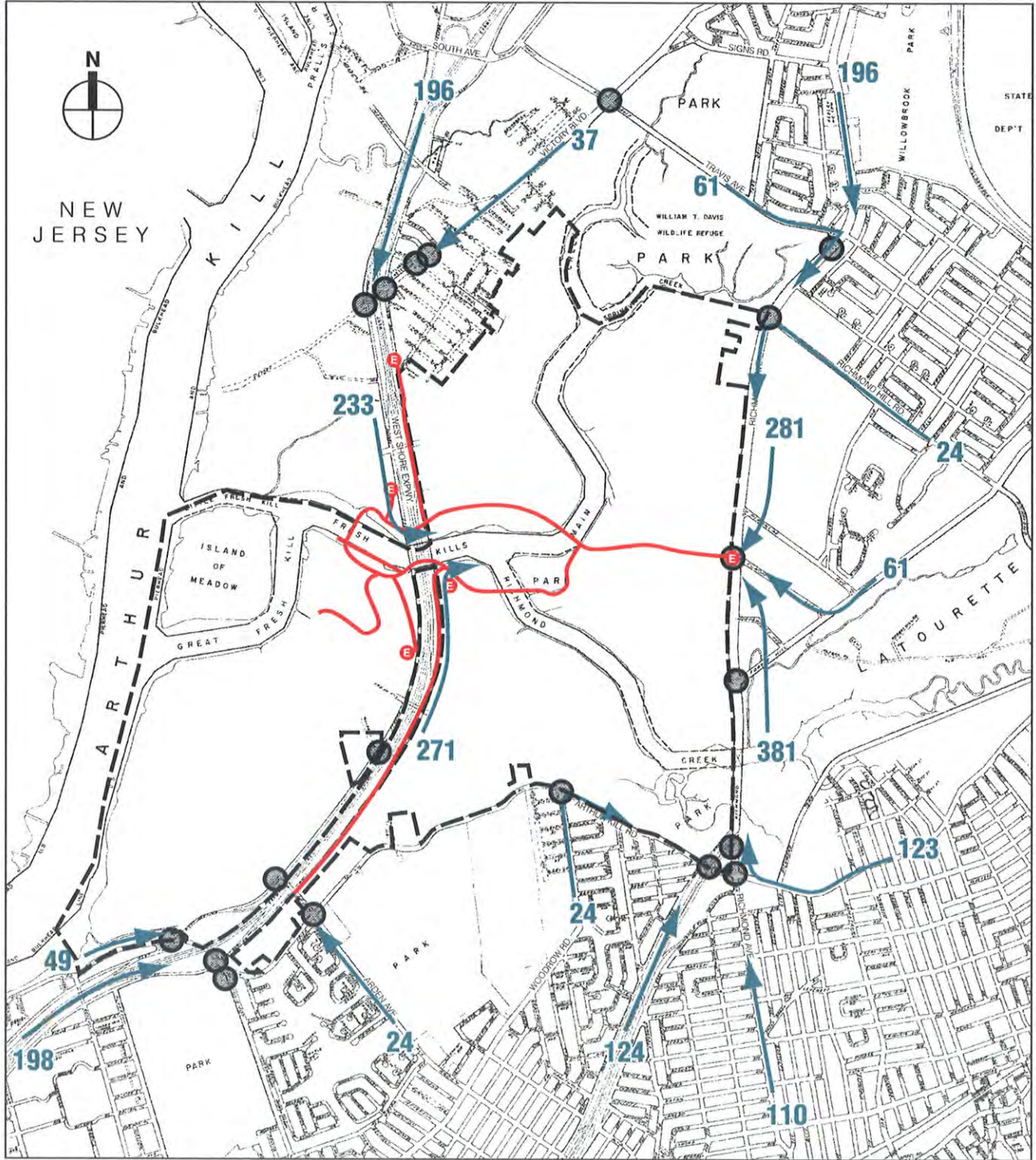
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2036 Yukon Avenue - Only Connection
Project Generated Traffic Assignments (Inbound)
All Peak Hours



2036 Yukon Avenue - Only Connection
 Project Generated Traffic Volumes (Inbound)
 Weekday PM Peak Hour

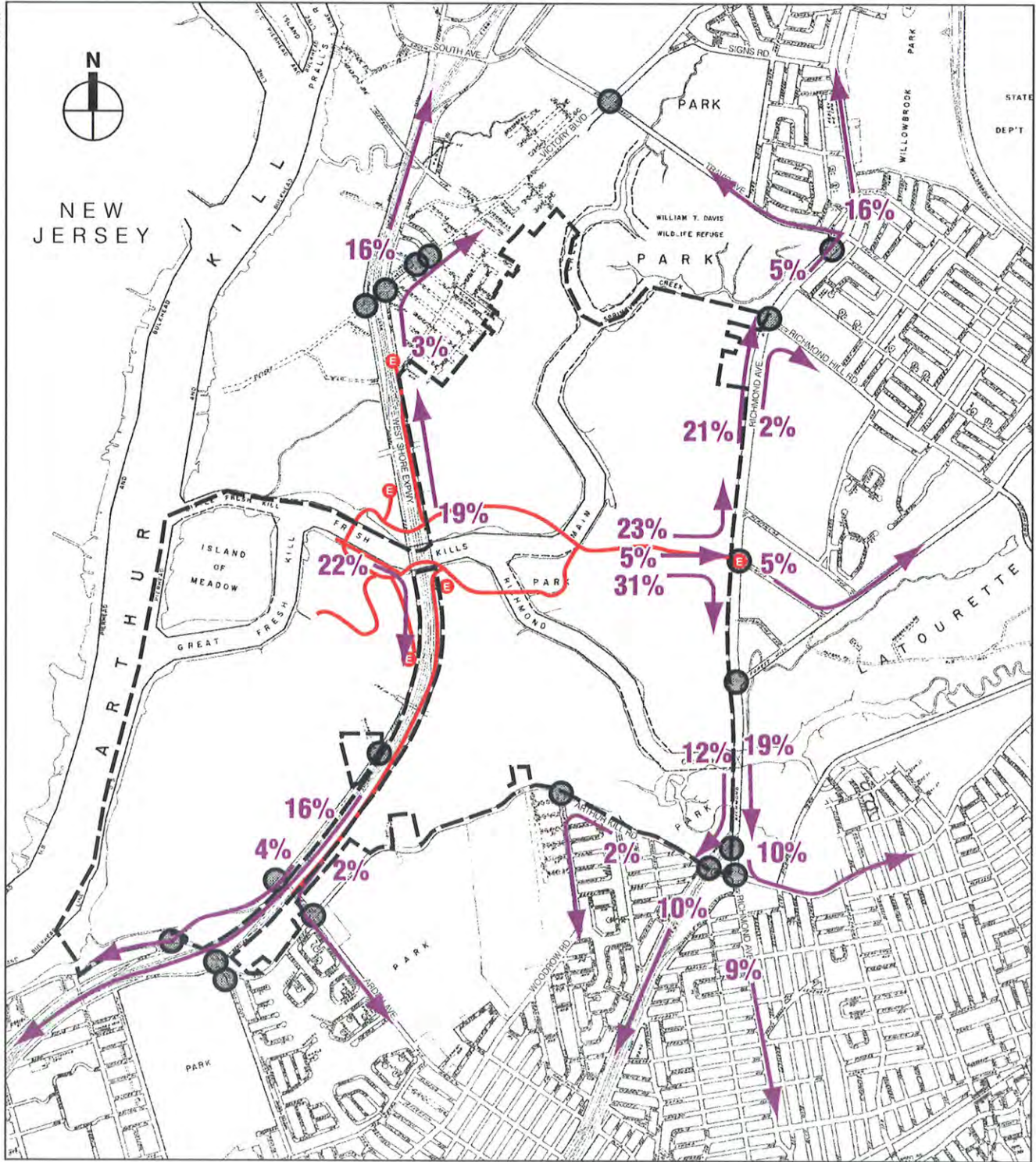
Figure A-3a



- Fresh Kills Project Site Boundary
- Analysis Intersection
- Inbound Traffic For Park Components Utilizing Richmond Avenue Park Entrance/Exit
- Park Road
- Park Road Entrance/Exit

0 500 1000 FEET
SCALE

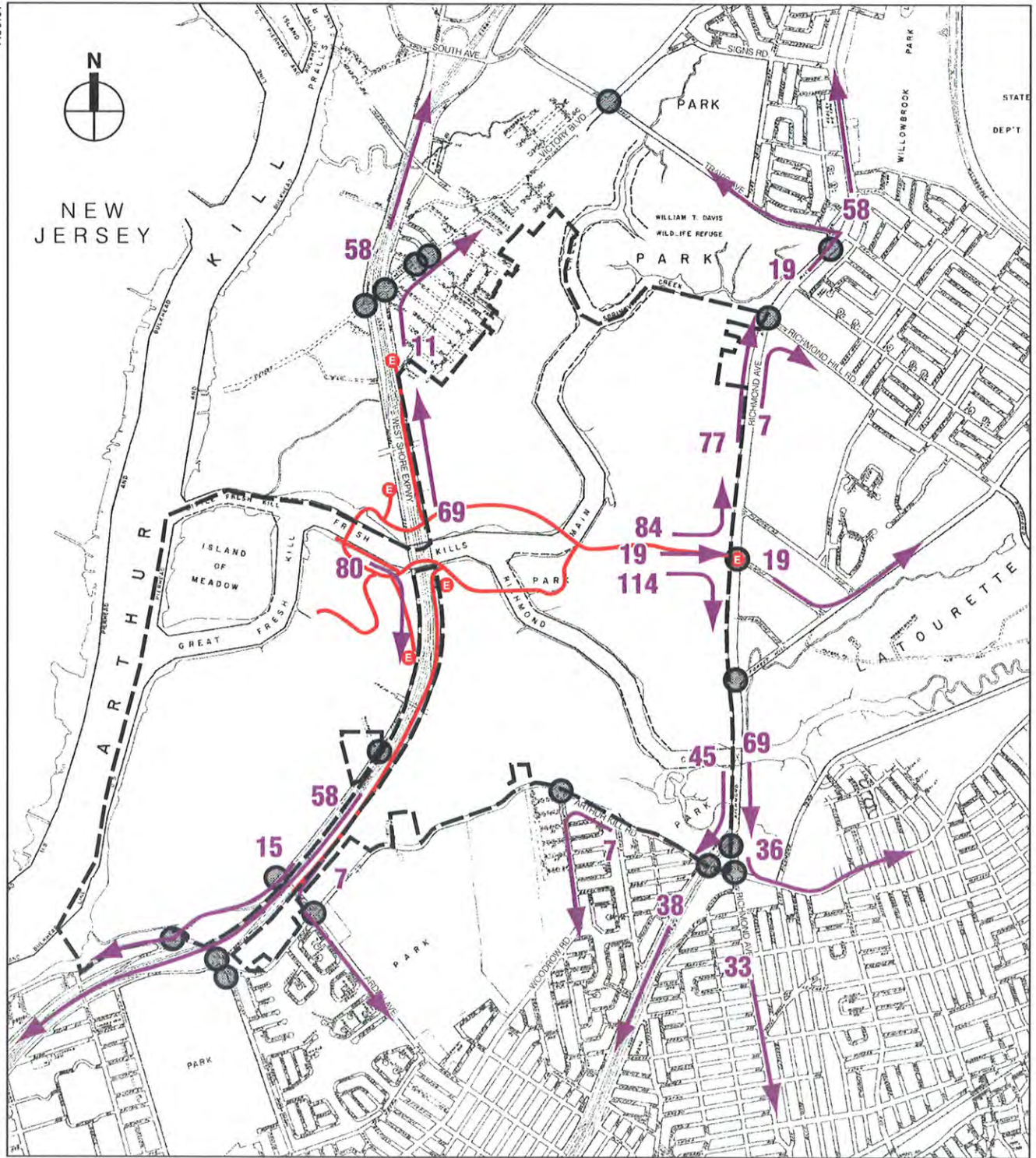
2036 Yukon Avenue - Only Connection
Project Generated Traffic Volumes (Inbound)
Weekend Midday Peak Hour



- Fresh Kills Project Site Boundary
- Analysis Intersection
- ➔ Outbound Traffic For Park Components Utilizing Richmond Avenue Park Entrance/Exit
- Park Road
- ⓔ Park Road Entrance/Exit

0 500 1000 FEET
SCALE

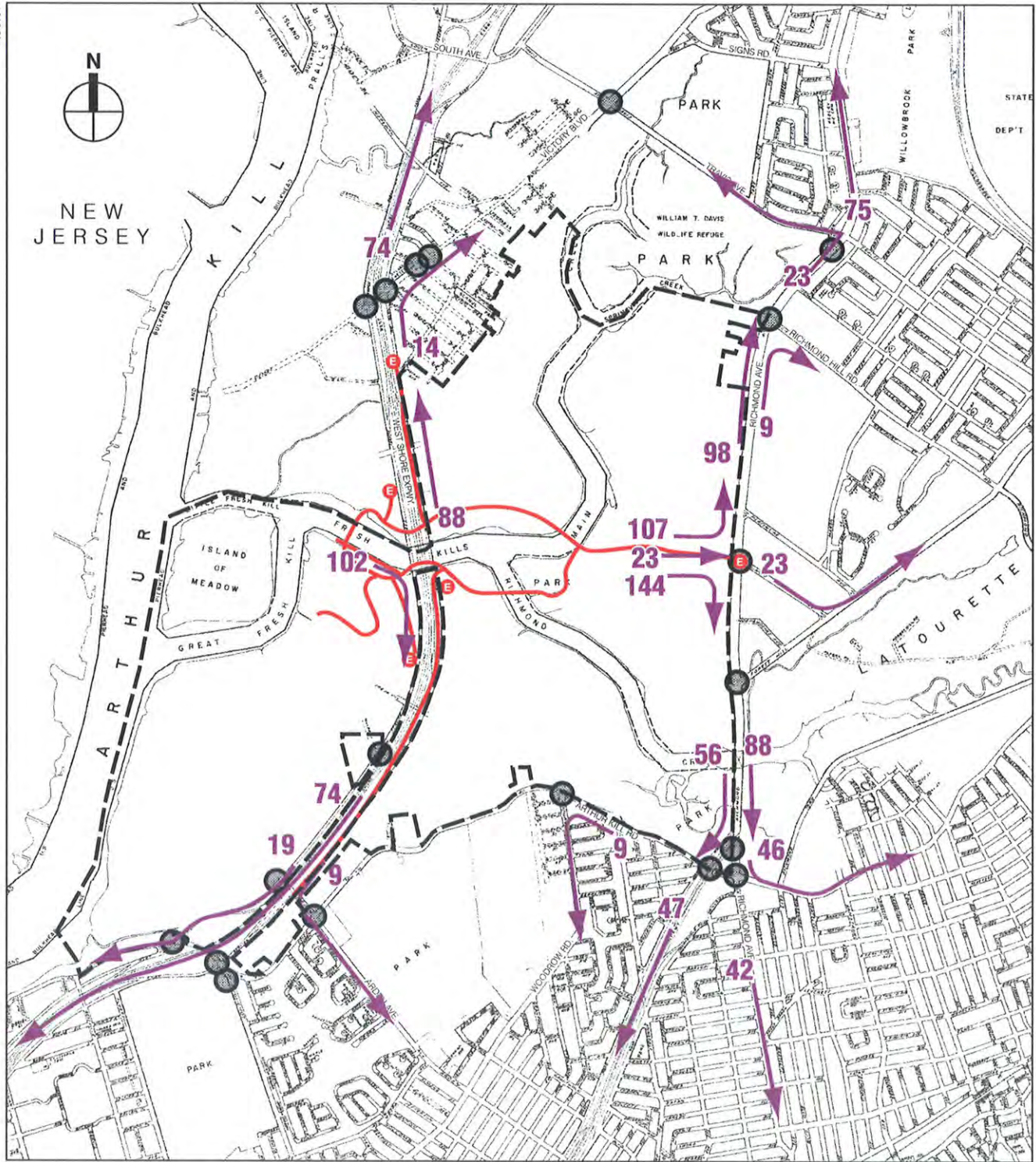
2036 Yukon Avenue - Only Connection
Project Generated Traffic Assignments (Outbound)
All Peak Hours



- Fresh Kills Project Site Boundary
- Analysis Intersection
- ➔ Outbound Traffic For Park Components Utilizing Richmond Avenue Park Entrance/Exit
- Park Road
- ⓔ Park Road Entrance/Exit

0 500 1000 FEET
SCALE

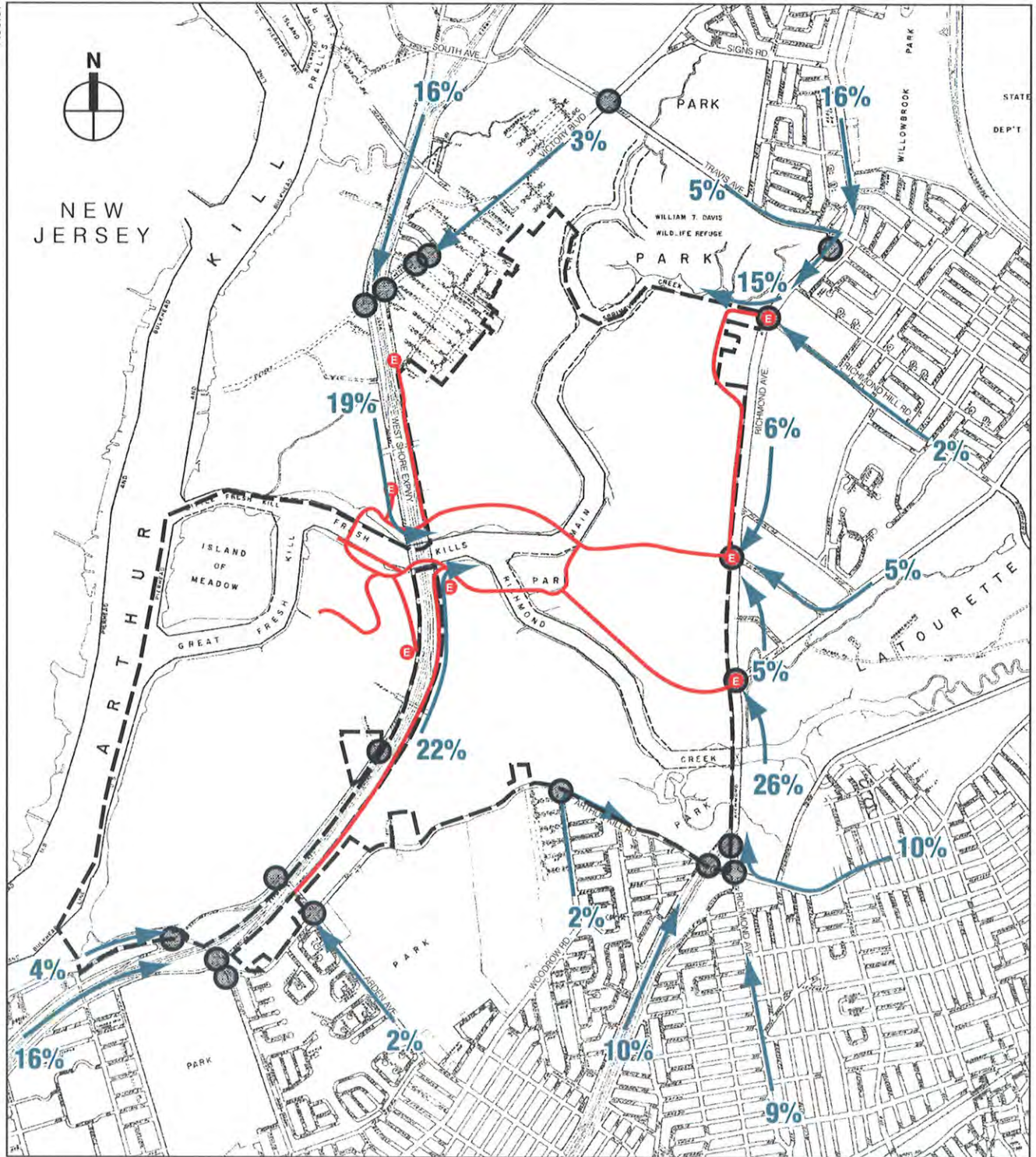
2036 Yukon Avenue - Only Connection
Project Generated Traffic Volumes (Outbound)
Weekday PM Peak Hour



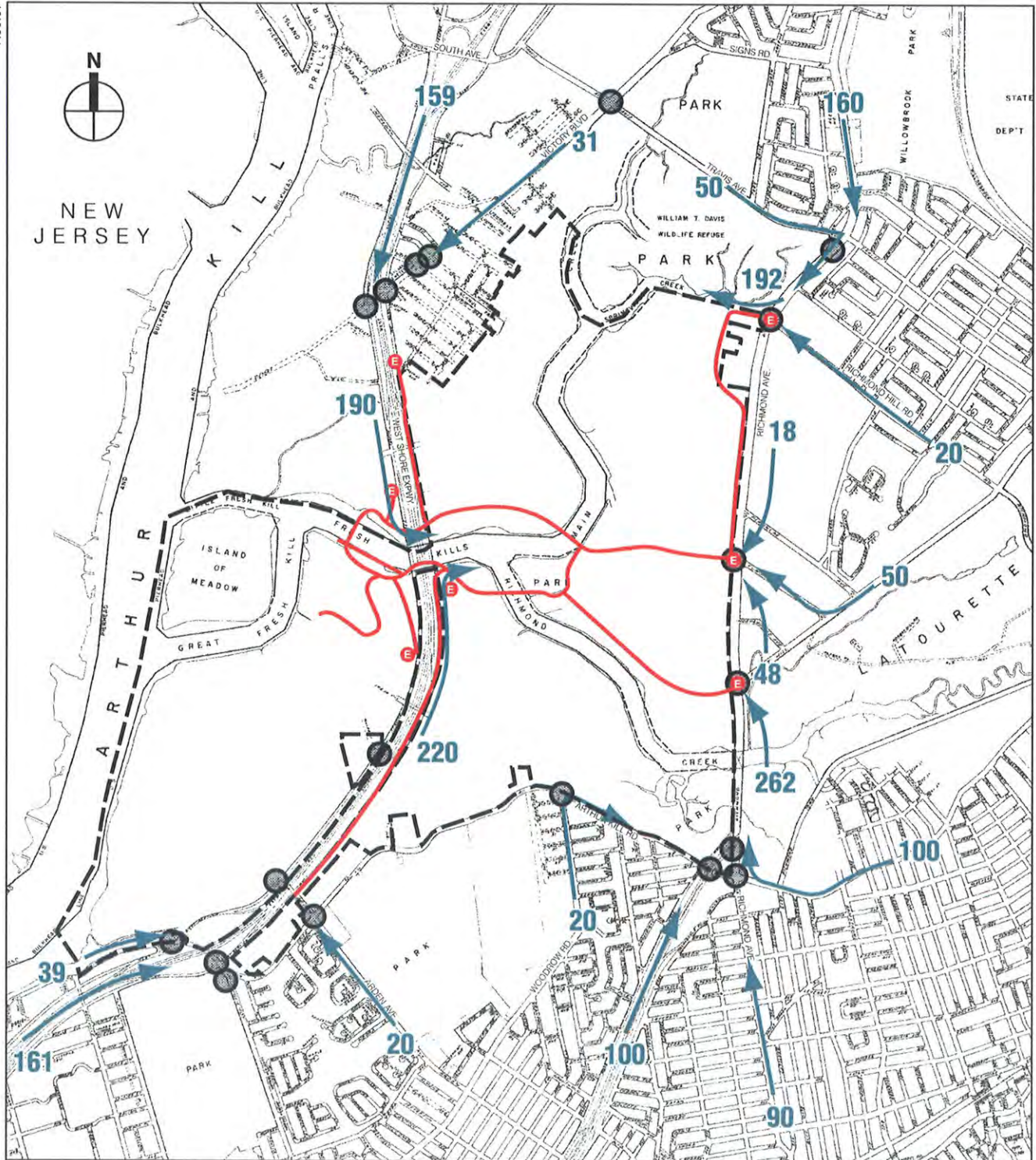
- Fresh Kills Project Site Boundary
- Analysis Intersection
- Outbound Traffic For Park Components Utilizing Richmond Avenue Park Entrance/Exit
- Park Road
- Park Road Entrance/Exit

0 500 1000 FEET
SCALE

2036 Yukon Avenue - Only Connection
Project Generated Traffic Volumes (Outbound)
Weekend Midday Peak Hour



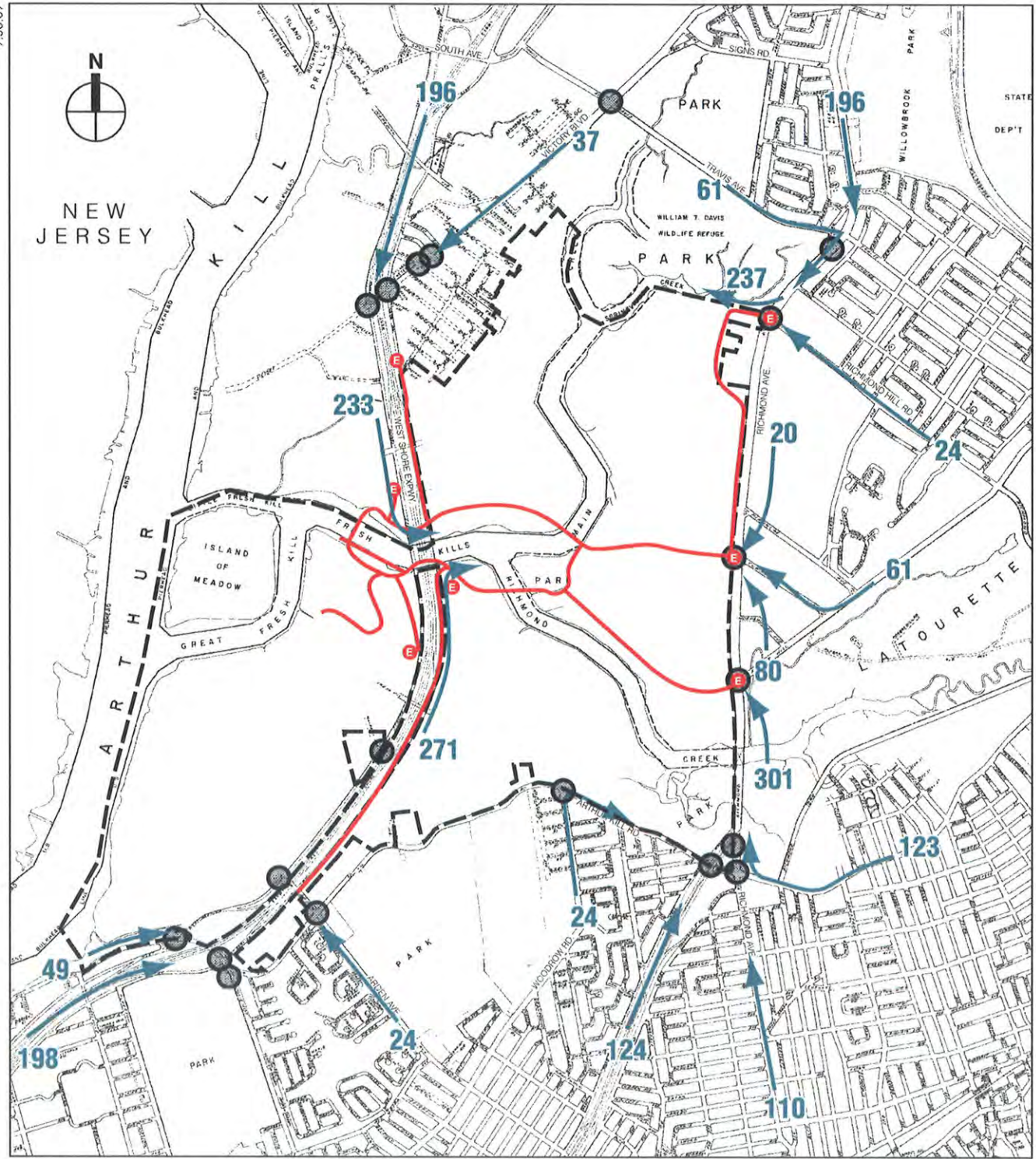
2036 Completed East Park Road System
 Project Generated Traffic Assignments (Inbound)
 All Peak Hours



- Fresh Kills Project Site Boundary
- Analysis Intersection
- Inbound Traffic For Park Components Utilizing Richmond Avenue Park Entrance/Exit
- Park Road
- Park Road Entrance/Exit

0 500 1000 FEET
SCALE

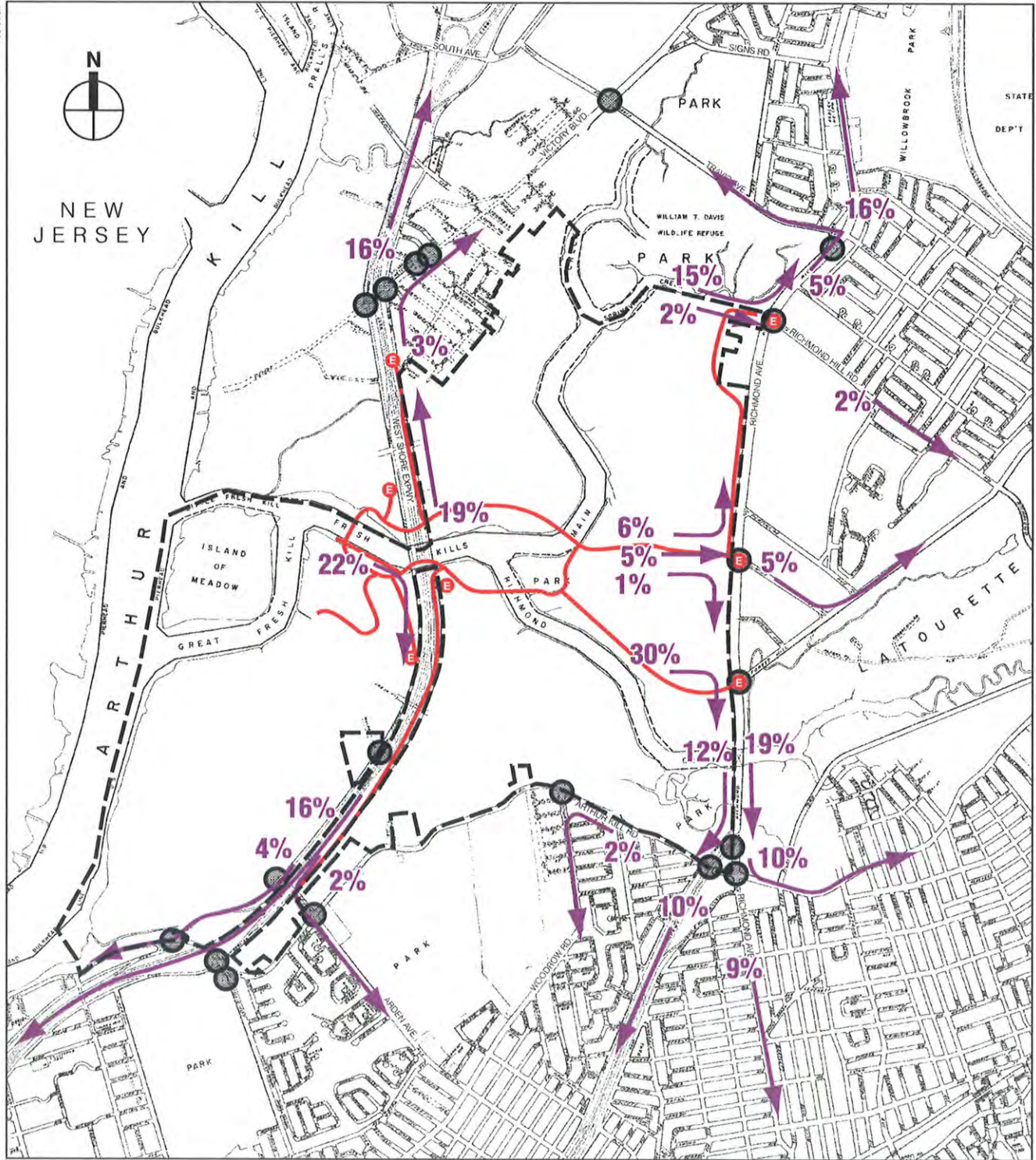
2036 Completed East Park Road System
Project Generated Traffic Volumes (Inbound)
Weekday PM Peak Hour



- Fresh Kills Project Site Boundary
- Analysis Intersection
- Inbound Traffic For Park Components Utilizing Richmond Avenue Park Entrance/Exit
- Park Road
- Park Road Entrance/Exit

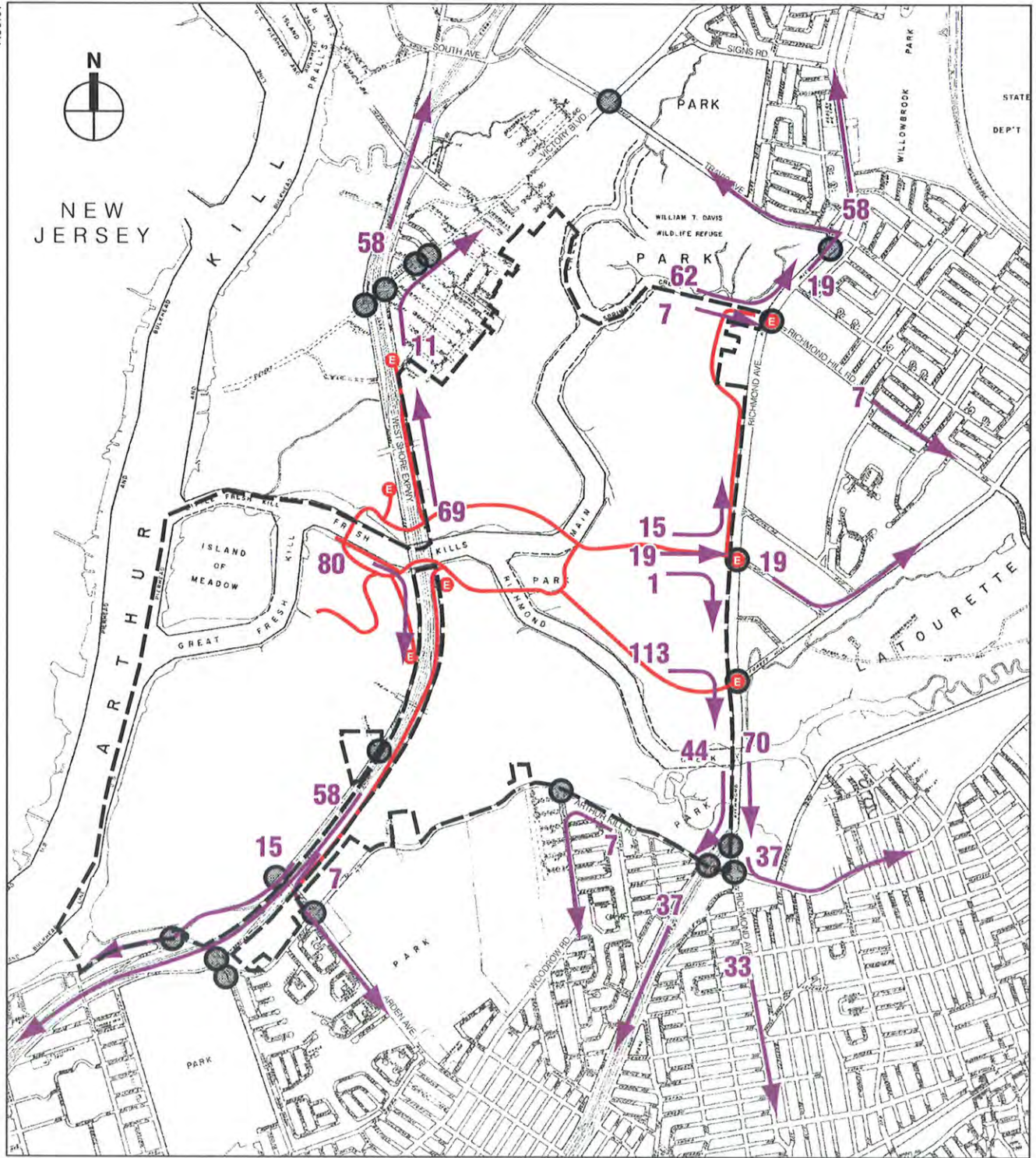
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SCALE

2036 Completed East Park Road System
Project Generated Traffic Volumes (Inbound)
Weekend Midday Peak Hour



2036 Completed East Park Road System
 Project Generated Traffic Assignments (Outbound)
 All Peak Hours

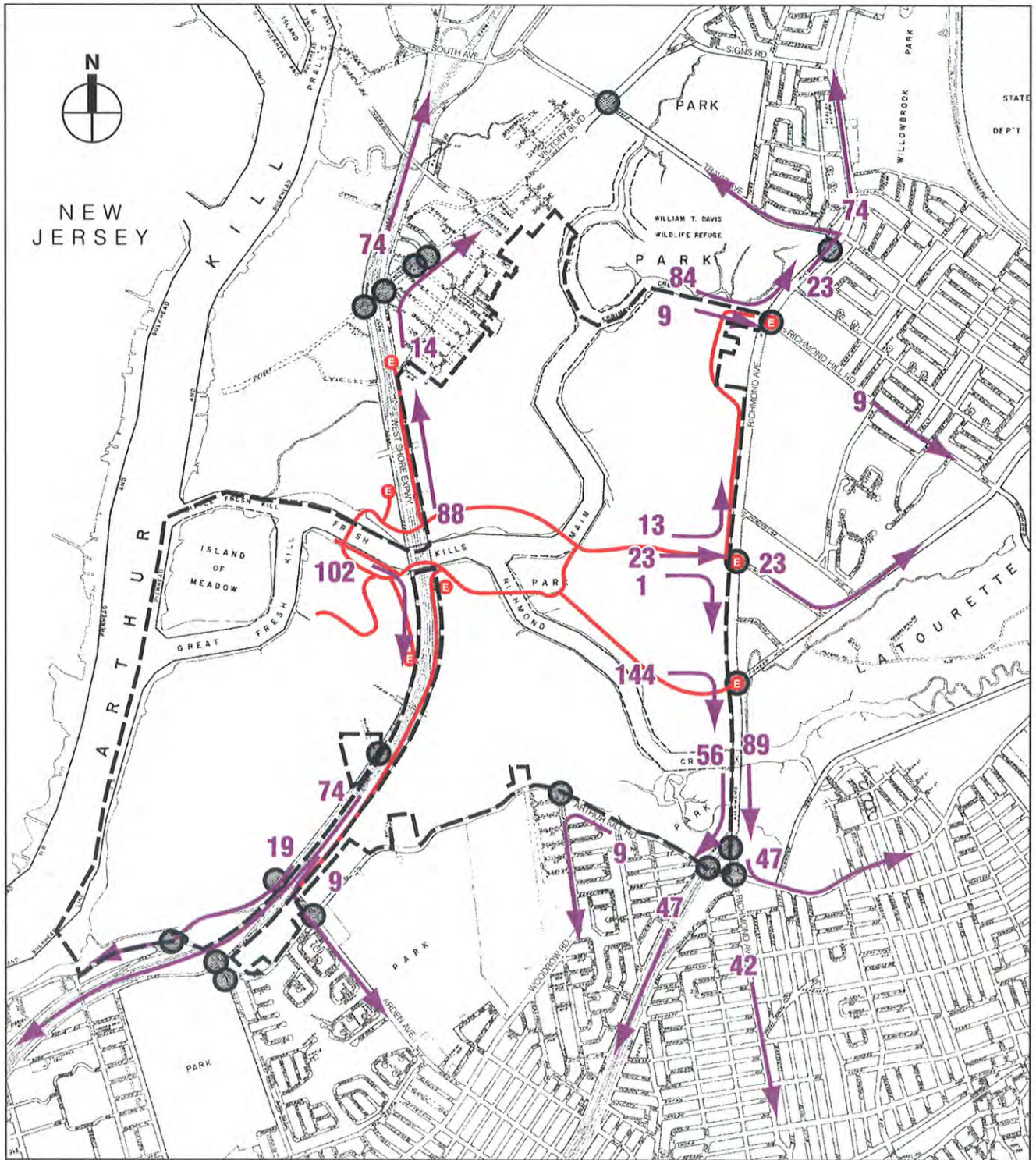
Figure A-6



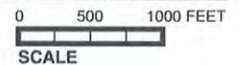
- Fresh Kills Project Site Boundary
- Analysis Intersection
- ➔ Outbound Traffic For Park Components Utilizing Richmond Avenue Park Entrance/Exit
- Park Road
- ⓔ Park Road Entrance/Exit

0 500 1000 FEET
SCALE

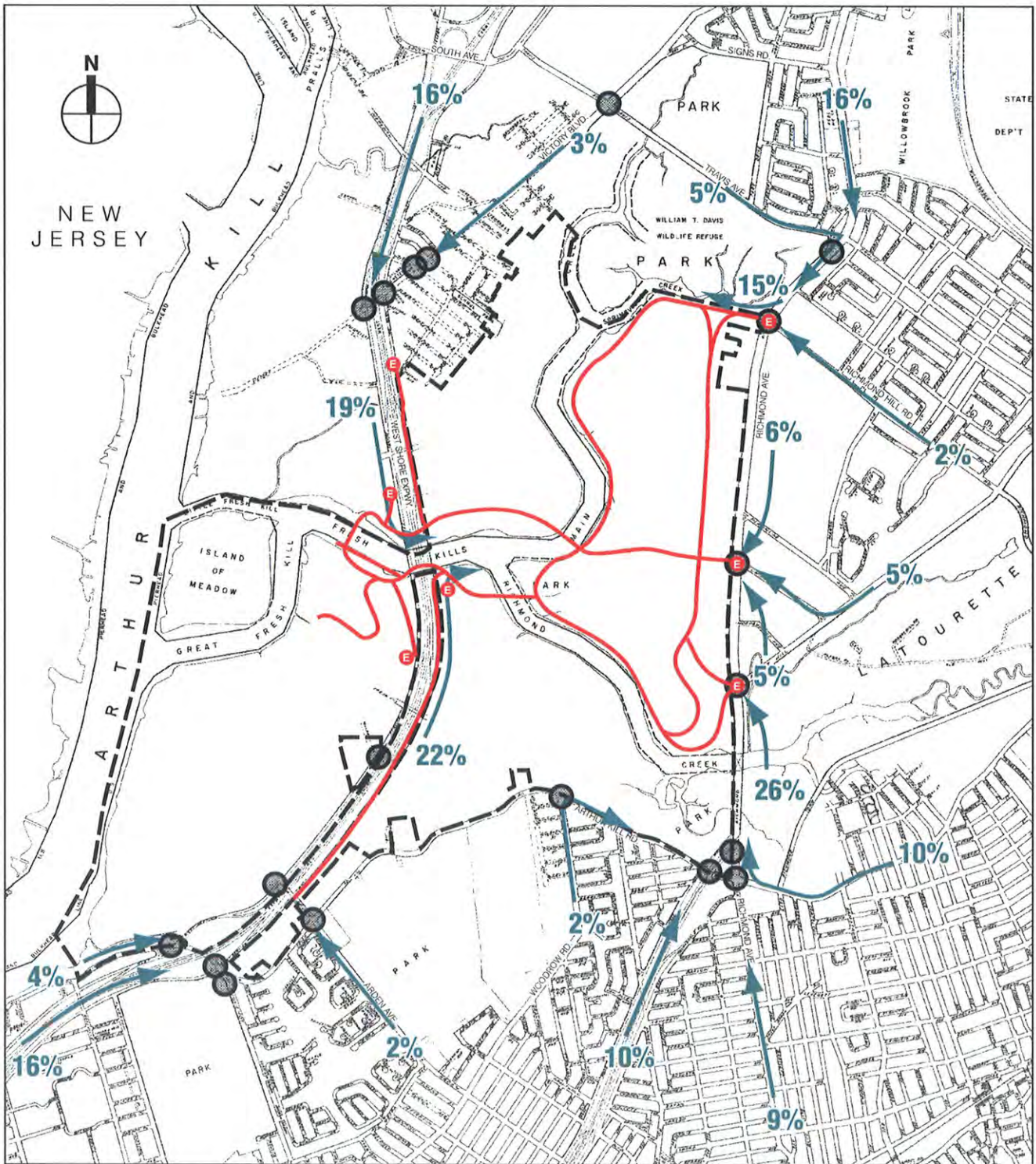
2036 Completed East Park Road System
Project Generated Traffic Volumes (Outbound)
Weekday PM Peak Hour



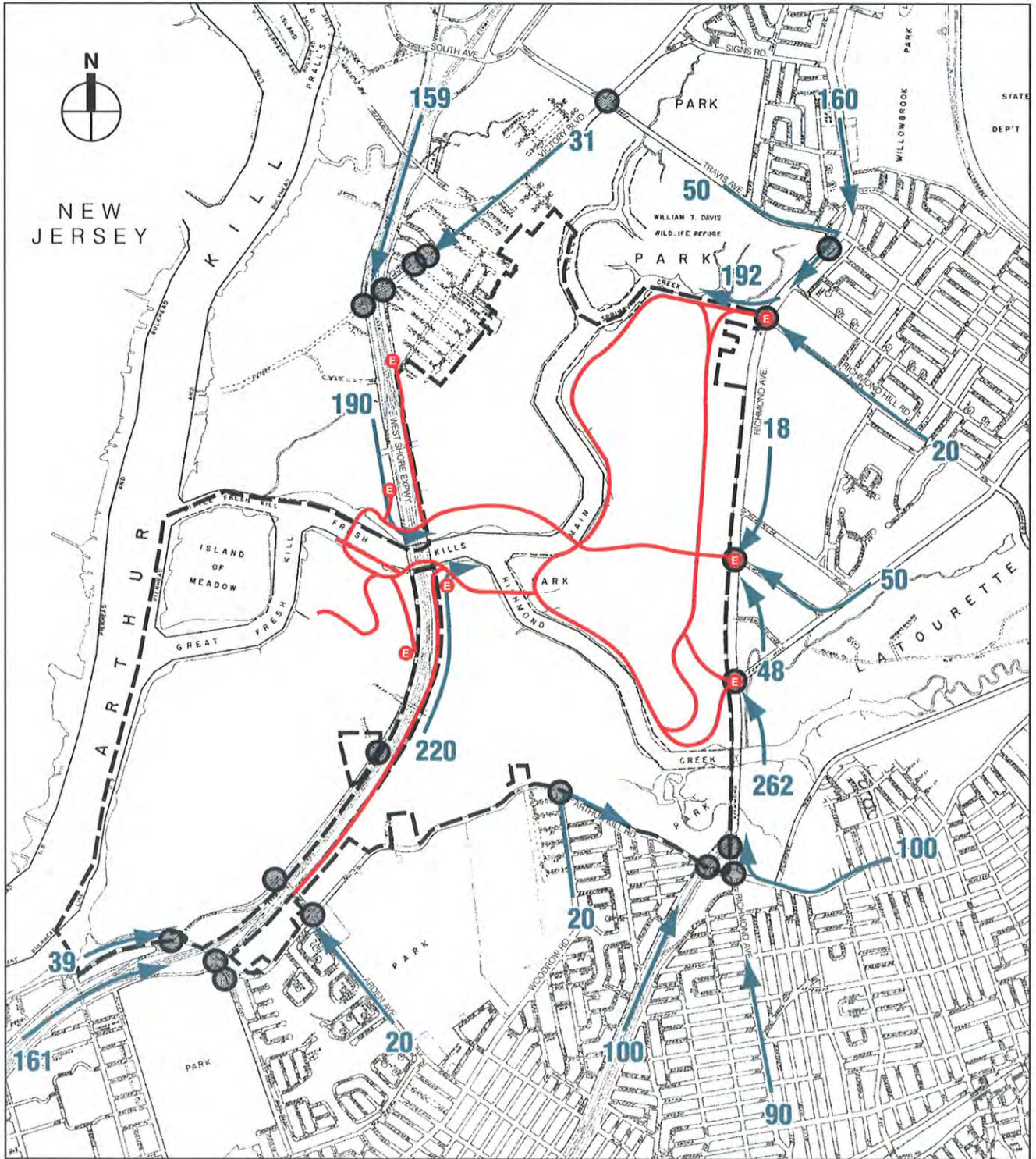
- Fresh Kills Project Site Boundary
- Analysis Intersection
- Outbound Traffic For Park Components Utilizing Richmond Avenue Park Entrance/Exit
- Park Road
- Park Road Entrance/Exit



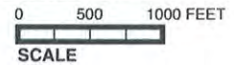
2036 Completed East Park Road System
 Project Generated Traffic Volumes (Outbound)
 Weekend Midday Peak Hour



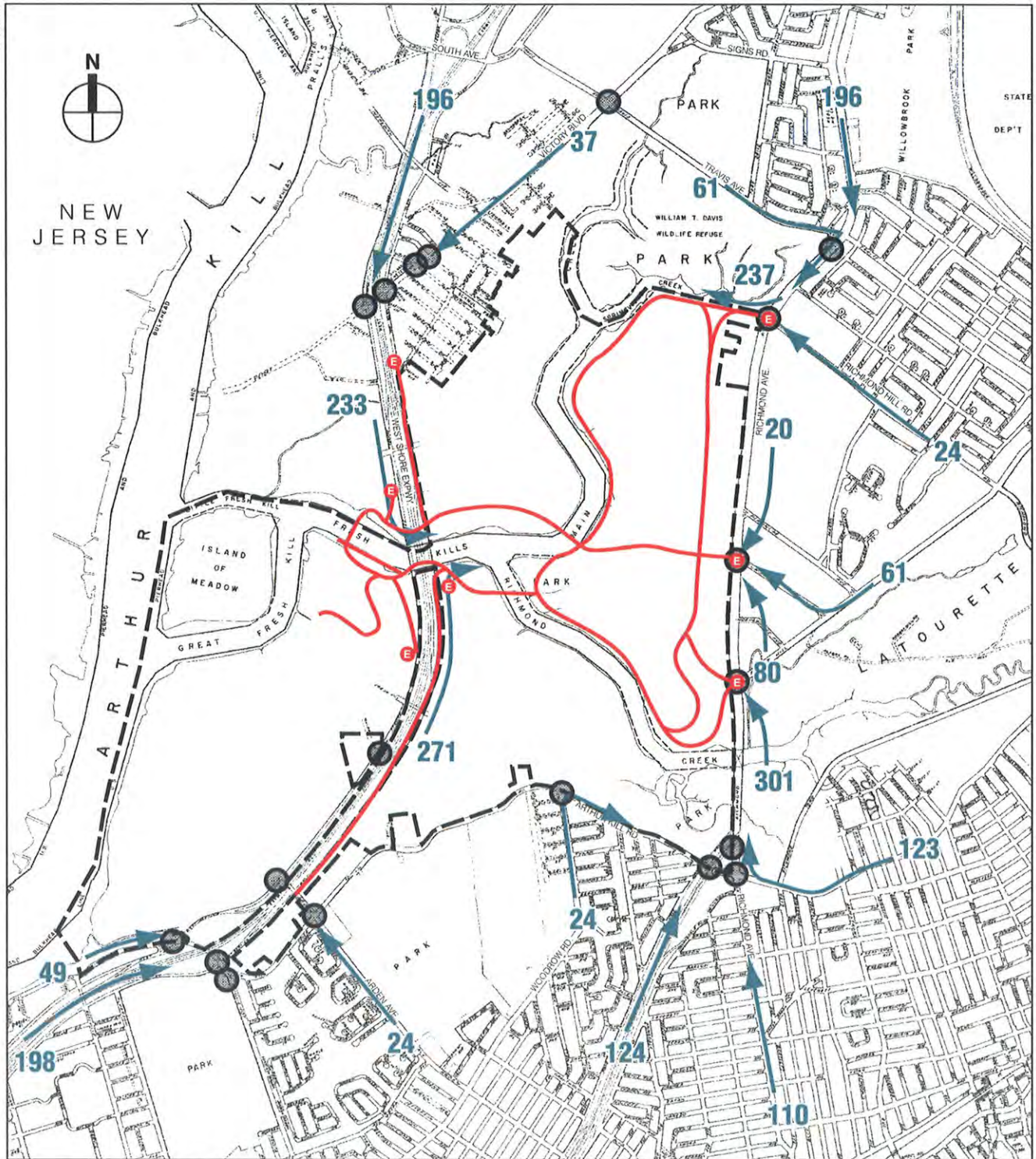
East Park Loop Road Option (SIBPO Alternative)
 Project Generated Traffic Assignments (Inbound)
 All Peak Hours



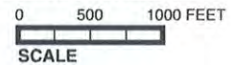
- Fresh Kills Project Site Boundary
- Analysis Intersection
- Inbound Traffic For Park Components Utilizing Richmond Avenue Park Entrance/Exit
- Park Road
- Park Road Entrance/Exit



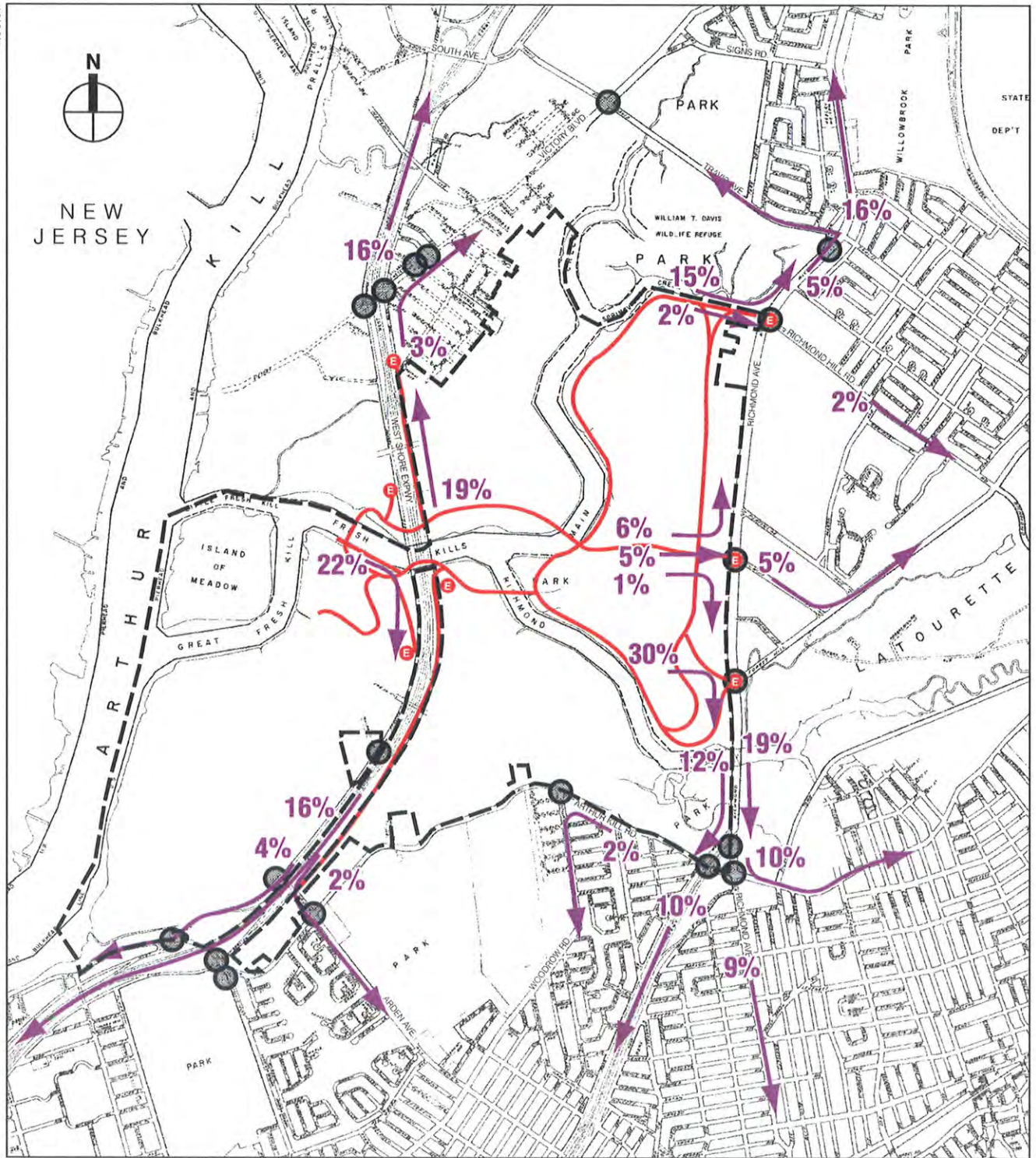
East Park Loop Road Option (SIBPO Alternative)
 Project Generated Traffic Assignments (Inbound)
 Weekday PM Peak Hour



- Fresh Kills Project Site Boundary
- Analysis Intersection
- Inbound Traffic For Park Components Utilizing Richmond Avenue Park Entrance/Exit
- Park Road
- Park Road Entrance/Exit

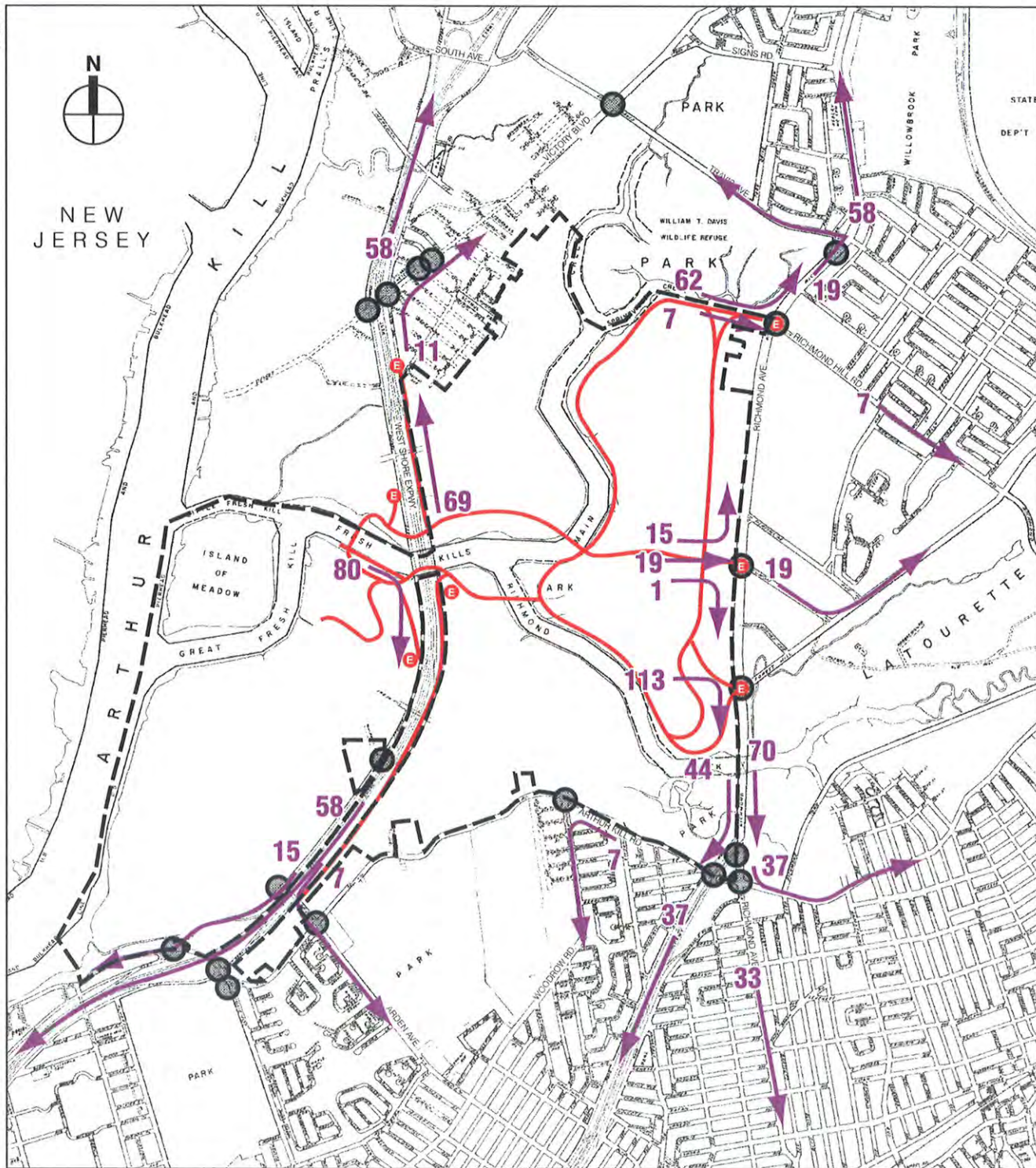


East Park Loop Road Option (SIBPO Alternative)
 Project Generated Traffic Volumes (Inbound)
 Weekend Midday Peak Hour



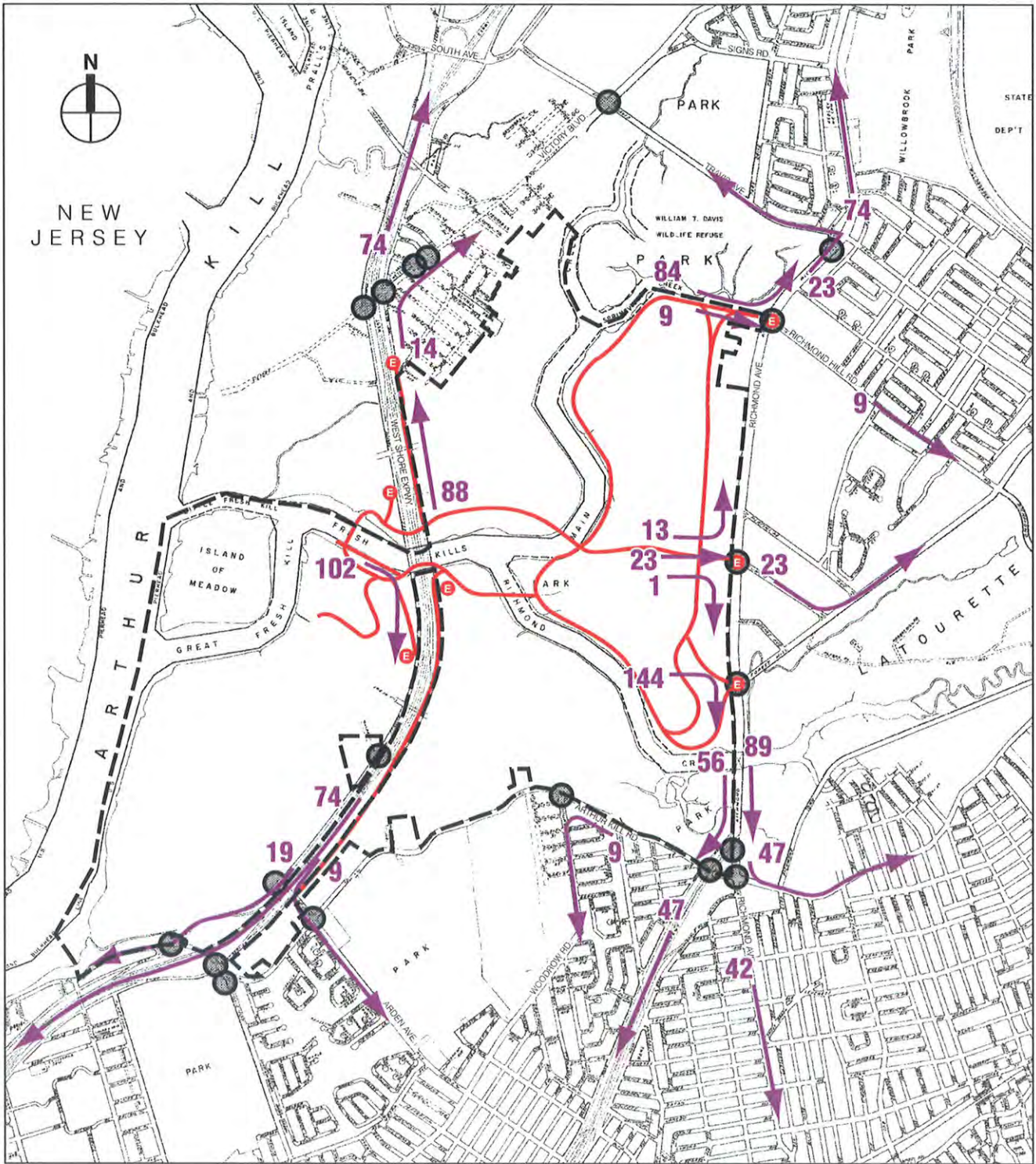
- Fresh Kills Project Site Boundary
- Analysis Intersection
- ➔ Outbound Traffic For Park Components Utilizing Richmond Avenue Park Entrance/Exit
- Park Road
- ⓔ Park Road Entrance/Exit

East Park Loop Road Option (SIBPO Alternative)
 Project Generated Traffic Assignments (Outbound)
 All Peak Hours



- Fresh Kills Project Site Boundary
- Analysis Intersection
- Outbound Traffic For Park Components Utilizing Richmond Avenue Park Entrance/Exit
- Park Road
- Park Road Entrance/Exit

East Park Loop Road Option (SIBPO Alternative)
 Project Generated Traffic Volumes (Outbound)
 Weekday PM Peak Hour



- Fresh Kills Project Site Boundary
- Analysis Intersection
- Outbound Traffic For Park Components Utilizing Richmond Avenue Park Entrance/Exit
- Park Road
- Park Road Entrance/Exit

East Park Loop Road Option (SIBPO Alternative)
 Project Generated Traffic Volumes (Outbound)
 Weekend Midday Peak Hour

Appendix B

HCS Analysis

Table B-1
2016 No Build and Build Conditions Level of Service Analysis
Weekday PM Peak Hour

Intersection	2016 No Build				2016 Build - Without East Park Roads				2016 Build - Yukon Avenue-Only Connection				
	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS	
	Signalized Intersections												
Victory Boulevard and West Shore Expressway (SB) Ramps	TR	0.42	19.1	B	TR	0.42	19.1	B	TR	0.44	19.3	B	
	L	1.43	231.6	F	L	1.50	264.7	F	L	1.45	243.1	F	
	T	0.14	15.1	B	T	0.14	15.1	B	T	0.14	15.1	B	
	LTR	0.28	15.9	B	LTR	0.29	16.1	B	LTR	0.28	16.0	B	
	Intersection	107.3	F	Intersection	123.1	F	Intersection	111.8	F				
Victory Boulevard and West Shore Expressway (NB) Ramps	L	0.44	23.0	C	L	0.47	24.6	C	L	0.44	23.1	C	
	T	0.29	16.7	B	T	0.29	16.8	B	T	0.14	15.2	B	
	T	0.64	23.5	C	T	0.67	24.5	C	T	0.64	23.6	C	
	R	0.10	14.8	B	R	0.10	14.8	B	R	0.10	14.8	B	
	L	0.27	15.9	B	L	0.27	16.0	B	L	0.27	16.0	B	
	T	0.18	15.2	B	T	0.20	15.3	B	T	0.41	17.4	B	
	R	0.66	21.9	C	R	0.72	24.0	C	R	0.68	22.6	C	
		Intersection	20.1	C	Intersection	21.1	C	Intersection	20.4	C			
Victory Boulevard and Wild Avenue	LTR	0.67	18.4	B	LTR	0.71	19.9	B	LTR	0.55	15.6	B	
	LTR	0.77	21.9	C	LTR	0.84	26.7	C	LTR	0.78	22.3	C	
	LTR	0.04	19.7	B	LTR	0.04	19.7	B	LTR	0.04	19.7	B	
		Intersection	20.3	C	Intersection	23.5	C	Intersection	19.6	B			
Victory Boulevard and Travis Avenue	L	0.34	21.1	C	L	0.38	23.1	C	L	0.36	21.9	C	
	T	0.53	20.7	C	T	0.57	21.6	C	T	0.55	21.1	C	
	R	0.36	18.0	B	R	0.37	18.2	B	R	0.17	15.5	B	
	L	0.21	17.0	B	L	0.23	17.5	B	L	0.22	17.2	B	
	T	0.74	27.1	C	T	0.78	28.9	C	T	0.76	27.8	C	
	R	0.28	16.9	B	R	0.28	16.9	B	R	0.28	16.9	B	
	L	1.28	201.1	F	L	1.35	226.4	F	L	1.31	210.5	F	
	TR	0.50	20.2	C	TR	0.50	20.2	C	TR	0.50	20.2	C	
	L	0.55	25.1	C	L	0.55	25.1	C	L	0.55	25.1	C	
	TR	1.11	91.2	F	TR	1.11	91.2	F	TR	1.11	91.2	F	
		Intersection	51.1	D	Intersection	52.7	D	Intersection	53.0	D			
	Draper Place and Richmond Avenue	LT	1.23	160.2	F	LT	1.23	160.2	F	LT	1.23	160.2	F
LTR		0.21	29.9	C	LTR	0.21	29.9	C	LTR	0.21	29.9	C	
L		1.31	189.2	F	L	1.33	200.8	F	L	1.33	198.7	F	
TR		0.47	3.2	A	TR	0.47	3.2	A	TR	0.44	3.1	A	
TR		1.15	99.6	F	TR	1.15	100.9	F	TR	1.16	103.3	F	
		Intersection	79.0	E	Intersection	80.8	F	Intersection	83.4	F			
Richmond Hill Road and Richmond Avenue	LTR	0.01	27.3	C	LTR	0.01	27.3	C	LTR	0.01	27.3	C	
	L	0.51	37.5	D	L	0.50	37.2	D	L	0.59	40.5	D	
	LT	0.47	36.4	D	LT	0.48	36.8	D	LT	0.55	39.1	D	
	R	0.76	25.6	C	R	0.77	26.3	C	R	0.67	21.9	C	
	L	0.00	27.2	C	L	0.00	27.2	C	L	0.00	27.2	C	
	T	0.80	26.0	C	T	0.81	26.2	C	T	0.79	25.5	C	
	R	0.39	21.0	C	R	0.39	21.0	C	R	0.40	21.1	C	
	L	1.26	169.1	F	L	1.28	178.4	F	L	1.27	171.9	F	
	TR	1.25	142.6	F	TR	1.26	144.0	F	TR	1.21	124.1	F	
		Intersection	94.8	F	Intersection	96.4	F	Intersection	85.9	F			
Yukon Avenue and Richmond Avenue	L				L				L	1.36	222.3	F	
	TR				TR				TR	0.43	31.9	C	
	LR	0.31	29.7	C	LR	0.31	29.7	C	LTR	0.51	33.4	C	
	L				L				L	0.77	70.6	E	
	T	0.78	16.9	B	T	0.78	17.0	B	T	0.67	15.0	B	
	L	0.21	39.9	D	L	0.21	39.9	D	L	0.21	39.9	D	
	Intersection	13.4	B	Intersection	13.5	B	Intersection	65.3	E				
Forest Hill Road and Richmond Avenue	L	0.75	34.8	C	L	0.75	34.9	C	L	0.70	32.1	C	
	LR	0.97	63.6	E	LR	0.97	64.1	E	LR	0.91	50.7	D	
	T	0.83	12.8	B	T	0.83	12.9	B	T	0.78	11.6	B	
	R	1.06	64.3	E	R	1.07	65.3	E	R	1.07	65.3	E	
	L	0.50	28.3	C	L	0.50	28.3	C	L	0.50	28.3	C	
	T	1.02	34.2	C	T	1.03	35.0*	D	T	0.95	19.2	B	
	Intersection	31.2	C	Intersection	31.7	C	Intersection	23.5	C				
Arthur Kill Road and Richmond Avenue	L	0.25	27.9	C	L	0.25	27.9	C	L	0.25	27.9	C	
	TR	0.65	26.8	C	TR	0.67	27.5	C	TR	0.66	27.2	C	
	L	0.23	24.6	C	L	0.26	25.8	C	L	0.25	25.2	C	
	T	1.23	147.5	F	T	1.26	158.3	F	T	1.25	152.6	F	
	R	0.63	16.1	B	R	0.63	16.1	B	R	0.64	16.3	B	
	L	0.70	43.1	D	L	0.72	44.3	D	L	0.71	43.8	D	
	TR	1.23	140.4	F	TR	1.23	140.4	F	TR	1.23	143.4	F	
	L	1.24	158.8	F	L	1.24	158.8	F	L	1.25	164.1	F	
	TR	1.26	154.7	F	TR	1.26	154.7	F	TR	1.15	108.2	F	
		Intersection	114.0	F	Intersection	115.1	F	Intersection	105.3	F			

Notes: L = Left Turn, T = Through, R = Right Turn, LOS = Level of Service.
 * implies delays are in excess of 1000 seconds

Table B-1 (cont'd)
2016 No Build and Build Conditions Level of Service Analysis
Weekday PM Peak Hour

Intersection	2016 No Build				2016 Build - Without East Park Roads				2016 Build - Yukon Avenue-Only Connection			
	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS
Signalized Intersections												
Arthur Kill Road and Woodrow Road	TR	0.56	15.6	B	TR	0.63	16.9	B	TR	0.40	13.1	B
Eastbound	LT	1.40	210.1	F	LT	1.59	293.2	F	LT	1.20	125.7	F
Westbound	L	0.12	20.6	C	L	0.13	20.7	C	L	0.13	20.6	C
Northbound	R	0.57	29.2	C	R	0.57	29.2	C	R	0.58	29.3	C
	Intersection	102.9		F	Intersection	139.7		F	Intersection	72.7		E
Arden Avenue and Arthur Kill Road	L	0.63	32.9	C	L	0.88	56.9	E	L	0.80	46.1	D
Eastbound	T	1.20	135.6	F	T	1.30	175.5	F	T	1.20	137.0	F
	R	0.27	23.2	C	R	0.27	23.2	C	R	0.27	23.2	C
Westbound	L	0.93	59.3	E	L	0.28	17.6	B	L	0.28	17.6	B
	TR	0.17	10.7	B	TR	0.39	13.0	B	TR	0.39	13.0	B
Northbound	LTR	0.86	41.0	D	LTR	0.93	50.3	D	LTR	0.57	27.9	C
Southbound	L	1.32	210.9	F	L	1.36	228.9	F	L	0.80	49.6	D
	TR	0.72	32.4	C	TR	0.88	46.2	D	TR	0.83	41.2	D
	Intersection	75.4		E	Intersection	88.7		F	Intersection	61.4		E
Arthur Kill Road and Huguenot Avenue	LT	0.25	10.0+	B	LT	0.26	10.1	B	LT	0.13	9.2	A
Eastbound	L	0.37	12.9	B	L	0.38	13.1	B	L	0.30	11.5	B
Westbound	TR	0.39	11.1	B	TR	0.08	9.0	A	TR	0.08	9.0	A
Northbound	L	0.85	28.5	C	L	0.85	28.5	C	L	0.85	28.5	C
	R	0.16	12.9	B	R	0.16	12.9	B	R	0.16	12.9	B
	Intersection	16.1		B	Intersection	17.6		B	Intersection	18.8		B
Drumgoole Road and Richmond Avenue	L	1.25	146.3	F	L	1.26	149.1	F	L	1.13	98.0	F
Eastbound	LR	1.25	148.5	F	LR	1.26	151.5	F	LR	1.13	99.8	F
Northbound	T	1.17	110.3	F	T	1.17	110.3	F	T	1.18	114.3	F
Southbound	T	1.26	146.2	F	T	1.26	146.2	F	T	1.19	117.9	F
	Intersection	135.9		F	Intersection	136.9		F	Intersection	110.4		F
Arthur Kill Road and Drumgoole Road	L	1.40	223.3	F	L	1.46	252.6	F	L	0.96	52.2	D
Eastbound	TR	1.20	143.3	F	TR	1.32	195.1	F	TR	1.26	169.2	F
Westbound	L	0.65	23.5	C	L	0.65	23.5	C	L	0.65	23.5	C
	TR	0.62	35.2	D	TR	0.66	36.1	D	TR	0.64	35.6	D
Northbound	L	0.49	37.4	D	L	0.69	58.8	E	L	0.60	48.0	D
	TR	1.22	129.3	F	TR	1.22	129.3	F	TR	1.22	131.3	F
Southbound	LTR	1.25	141.2	F	LTR	1.25	144.0	F	LTR	1.14	94.7	F
	Intersection	124.9		F	Intersection	133.2		F	Intersection	95.4		F
Arthur Kill Road and West Shore Expressway (NB) Service Road	L	1.90	441.7	F	L	0.83	32.2	C	L	0.98	57.4	E
Eastbound	T	0.53	12.7	B	T	0.53	12.8	B	T	0.49	12.3	B
Westbound	TR	0.66	14.4	B	TR	0.37	10.9	B	TR	0.37	10.9	B
Northbound	LTR	0.91	46.1	D	LTR	0.93	49.6	D	LTR	0.88	39.5	D
	Intersection	71.1		E	Intersection	21.7		C	Intersection	24.8		C
Arthur Kill Road and West Shore Expressway (SB) Service Road	TR	0.53	16.7	B	TR	0.54	16.7	B	TR	0.54	16.7	B
Eastbound	L	1.15	126.3	F	L	0.62	28.6	C	L	0.63	28.9	C
Westbound	T	0.29	14.1	B	T	0.29	14.1	B	T	0.29	14.1	B
Southbound	LTR	1.27	149.2	F	LTR	1.28	150.8	F	LTR	1.28	150.8	F
	Intersection	89.5		F	Intersection	81.9		F	Intersection	81.9		F
Unsignalized Intersections												
Muldoon Avenue and West Shore Expressway (SB) Service Road	R	0.08	20.1	C	R	0.08	21.2	C	R	0.12	28.5	D
Arden Avenue and West Shore Expressway (SB) Service Road	L	2.44	905.7	F	L	20.70	*	F	L	25.88	*	F
Westbound	L	0.68	12.0	B	L	0.71	12.6	B	L	0.69	12.2	B
Arden Avenue and West Shore Expressway (NB) Ramps												
Eastbound					LT	0.00	8.8	A	LT	0.00	8.7	A
Northbound					TR	0.11	13.5	B	TR	0.11	13.4	B
Arthur Kill Road and Park West Entrance												
Eastbound					LT	0.02	9.0	A	LT	0.02	8.9	A
Southbound					LR	0.31	31.6	D	LR	0.23	22.3	C
Arthur Kill Road and Park East Entrance												
Eastbound					LT	0.00	8.9	A	LT	0.00	8.9	A
Southbound					LR	0.02	17.5	C	LR	0.02	17.5	C
Victory Boulevard and Melvin Avenue												
Eastbound	LT	0.00	8.9	A	LT	0.00	9.0	A	LT	0.00	8.9	A
Northbound	LTR	0.17	20.8	C	LTR	0.23	23.6	C	LTR	0.18	18.6	C
Southbound	LR	0.05	19.2	C	LR	0.05	20.6	C	LR	0.04	17.6	C

Notes: L = Left Turn, T = Through, R = Right Turn, LOS = Level of Service.
 * implies delays are in excess of 1000 seconds

Table B-2
2016 No Build and Build Conditions Level of Service Analysis
Weekend Midday Peak Hour

Intersection	2016 No Build				2016 Build - Without East Park Roads				2016 Build - Yukon Avenue- Only Connection			
	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS
Signalized Intersections												
Victory Boulevard and West Shore Expressway (SB) Ramps	TR	0.35	17.9	B	TR	0.35	17.9	B	TR	0.36	18.1	B
Eastbound	L	1.46	245.2	F	L	1.57	291.7	F	L	1.49	258.8	F
Westbound	T	0.11	14.8	B	T	0.11	14.8	B	T	0.11	14.8	B
Southbound	LTR	0.26	15.8	B	LTR	0.27	15.9	B	LTR	0.27	15.9	B
	Intersection			F	Intersection			F	Intersection			F
Victory Boulevard and West Shore Expressway (NB) Ramps	L	0.39	21.1	C	L	0.42	22.7	C	L	0.39	21.3	C
Eastbound	T	0.32	17.1	B	T	0.03	14.2	B	T	0.16	15.4	B
Westbound	Y	0.61	22.6	C	T	0.65	23.8	C	T	0.61	22.7	C
	R	0.11	14.9	B	R	0.12	15.0	B	R	0.12	15.0	B
Northbound	L	0.26	15.9	B	L	0.27	16.0	B	L	0.27	16.0	B
	T	0.22	15.6	B	T	0.25	15.8	B	T	0.51	18.5	B
	R	0.72	24.0	C	R	0.80	28.3	C	R	0.76	25.7	C
	Intersection			C	Intersection			C	Intersection			C
Victory Boulevard and Wild Avenue	LTR	0.64	17.5	B	LTR	0.70	19.3	B	LTR	0.51	14.9	B
Eastbound	LTR	0.71	19.8	B	LTR	0.83	25.8	C	LTR	0.74	20.7	C
Westbound	LTR	0.04	19.7	B	LTR	0.04	19.7	B	LTR	0.04	19.7	B
Southbound	Intersection			B	Intersection			C	Intersection			B
Victory Boulevard and Travis Avenue	L	0.25	18.3	B	L	0.29	19.8	B	L	0.26	19.0	B
Eastbound	T	0.57	21.6	C	T	0.63	23.0	C	T	0.60	22.3	C
	R	0.35	17.9	B	R	0.37	18.2	B	R	0.14	15.3	B
Westbound	L	0.26	18.0	B	L	0.30	19.0	B	L	0.28	18.4	B
	T	0.68	24.7	C	T	0.74	26.7	C	T	0.71	25.6	C
	R	0.29	17.0	B	R	0.29	17.0	B	R	0.29	17.0	B
Northbound	L	1.16	145.4	F	L	1.23	172.4	F	L	1.19	154.2	F
	TR	0.61	22.5	C	TR	0.61	22.5	C	TR	0.61	22.5	C
Southbound	L	0.59	28.0	C	L	0.59	28.0	C	L	0.59	28.0	C
	TR	0.78	28.9	C	TR	0.78	28.9	C	TR	0.78	28.9	C
	Intersection			C	Intersection			C	Intersection			C
Draper Place and Richmond Avenue	LT	1.24	163.3	F	LT	1.24	163.3	F	LT	1.24	163.3	F
Eastbound	LTR	0.14	28.1	C	LTR	0.14	28.1	C	LTR	0.14	28.1	C
Westbound	L	1.32	193.2	F	L	1.36	207.7	F	L	1.35	205.8	F
Northbound	TR	0.60	4.4	A	TR	0.60	4.4	A	TR	0.56	4.1	A
Southbound	TR	1.24	140.8	F	TR	1.24	142.0	F	TR	1.25	145.5	F
	Intersection			F	Intersection			F	Intersection			F
Richmond Hill Road and Richmond Avenue	LTR	0.01	27.3	C	LTR	0.01	27.3	C	LTR	0.01	27.3	C
Eastbound	L	0.62	42.3	D	L	0.61	41.7	D	L	0.72	48.1	D
Westbound	LT	0.65	43.9	D	LT	0.66	44.7	D	LT	0.75	50.8	D
	R	1.05	76.2	E	R	1.07	82.5	F	R	0.93	45.8	D
Northbound	L	0.00	31.3	C	L	0.00	31.3	C	L	0.00	31.3	C
	T	0.88	24.5	C	T	0.88	24.7	C	T	0.85	23.0	C
	R	0.39	16.8	B	R	0.39	16.8	B	R	0.39	16.9	B
Southbound	L	1.27	180.0	F	L	1.31	195.0	F	L	1.29	185.7	F
	TR	1.02	44.0	D	TR	1.02	44.9	D	TR	0.98	34.2	C
	Intersection			D	Intersection			D	Intersection			D
Yukon Avenue and Richmond Avenue									L	1.71	381.9	F
Eastbound									TR	0.43	33.6	C
Westbound	LR	0.60	37.8	D	LR	0.60	37.8	D	LTR	1.35	214.8	F
Northbound									L	0.77	64.7	E
	T	0.91	21.8	C	T	0.91	22.1	C	T	0.81	17.6	B
Southbound	L	0.25	38.3	D	L	0.25	38.3	D	L	0.25	38.3	D
	T	0.75	5.7	A	T	0.75	5.7	A	TR	1.00	33.2	C
	Intersection			B	Intersection			B	Intersection			D
Forest Hill Road and Richmond Avenue	L	0.80	37.8	D	L	0.80	38.0	D	L	0.74	34.2	C
Westbound	LR	1.01	74.3	E	LR	1.01	74.8	E	LR	0.95	59.4	E
Northbound	T	0.88	14.3	B	T	0.88	14.4	B	T	0.83	12.7	B
	R	0.98	38.6	D	R	0.98	39.5	D	R	0.98	39.5	D
Southbound	L	0.41	22.1	C	L	0.41	22.1	C	L	0.41	22.1	C
	T	0.62	9.3	A	T	0.63	9.3	A	T	0.55	8.6	A
	Intersection			C	Intersection			C	Intersection			B
Arthur Kill Road and Richmond Avenue	L	0.19	26.5	C	L	0.19	26.5	C	L	0.19	26.5	C
Eastbound	TR	0.71	29.9	C	TR	0.75	31.2	C	TR	0.74	30.6	C
Westbound	L	0.48	38.7	D	L	0.55	46.8	D	L	0.51	42.2	D
	T	1.23	148.9	F	T	1.27	163.0	F	T	1.25	156.3	F
	R	0.65	17.7	B	R	0.65	17.7	B	R	0.67	18.1	B
Northbound	L	0.80	48.4	D	L	0.84	51.2	D	L	0.82	49.8	D
	TR	1.28	158.5	F	TR	1.28	158.5	F	TR	1.28	160.9	F
Southbound	L	1.25	163.0	F	L	1.25	163.0	F	L	1.27	170.9	F
	TR	0.72	29.2	C	TR	0.72	29.2	C	TR	0.61	26.4	C
	Intersection			F	Intersection			F	Intersection			F

Notes: L = Left Turn, T = Through, R = Right Turn; LOS = Level of Service.
 * implies delays are in excess of 1000 seconds

Table B-2 (cont'd)
2016 No Build and Build Conditions Level of Service Analysis
Weekend Midday Peak Hour

Intersection	2016 No Build				2016 Build - Without East				2016 Build - Yukon Avenue-			
	Lane Group	v/c Ratio	Delay (sec)	LOS	Park Roads				Only Connection			
					Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS
Signalized Intersections												
Arthur Kill Road and Woodrow Road	TR	0.75	20.2	C	TR	0.83	24.3	C	TR	0.61	16.4	B
Eastbound	LT	1.22	133.9	F	LT	1.43	224.8	F	LT	1.11	89.7	F
Westbound	L	0.22	21.8	C	L	0.23	21.9	C	L	0.23	21.9	C
Northbound	R	0.71	34.3	C	R	0.71	34.3	C	R	0.71	34.5	C
	Intersection	61.7		E	Intersection	95.8		F	Intersection	48.4		D
Arden Avenue and Arthur Kill Road	L	0.57	31.0	C	L	0.88	57.7	E	L	0.76	44.1	D
Eastbound	T	0.85	42.3	D	T	0.95	54.9	D	T	0.86	42.6	D
	R	0.11	21.1	C	R	0.11	21.1	C	R	0.11	21.1	C
Westbound	L	1.04	80.3	F	L	0.35	17.8	B	L	0.33	16.3	B
	TR	0.25	11.4	B	TR	0.50	14.7	B	TR	0.50	14.7	B
Northbound	LTR	0.78	35.9	D	LTR	0.87	43.8	D	LTR	0.51	26.6	C
Southbound	L	0.72	47.8	D	L	0.75	51.7	D	L	0.46	28.2	C
	TR	0.74	33.8	C	TR	0.94	53.6	D	TR	0.87	44.9	D
	Intersection	41.2		D	Intersection	43.0		D	Intersection	32.7		C
Arthur Kill Road and Huguenet Avenue	LT	0.25	10.0	A	LT	0.26	10.0+	B	LT	0.13	9.2	A
Eastbound	L	0.31	11.9	B	L	0.31	12.0	B	L	0.26	10.9	B
Westbound	TR	0.49	12.2	B	TR	0.16	9.5	A	TR	0.16	9.5	A
Northbound	L	1.14	100.8	F	L	1.14	100.8	F	L	1.14	100.8	F
	R	0.17	13.0	B	R	0.17	13.0	B	R	0.17	13.0	B
	Intersection	40.8		D	Intersection	49.3		D	Intersection	55.2		E
Drumgoole Road and Richmond Avenue	L	1.25	149.1	F	L	1.26	153.1	F	L	1.14	101.8	F
Eastbound	LR	1.25	146.7	F	LR	1.26	150.5	F	LR	1.13	100.4	F
Northbound	T	1.27	151.8	F	T	1.27	151.8	F	T	1.28	156.8	F
Southbound	T	1.01	49.3	D	T	1.02	52.8	D	T	0.93	34.4	C
	Intersection	123.3		F	Intersection	125.4		F	Intersection	106.6		F
Arthur Kill Road and Drumgoole Road	L	1.27	166.3	F	L	1.35	200.9	F	L	0.88	38.1	D
Eastbound	TR	1.25	163.2	F	TR	1.40	224.7	F	TR	1.33	196.2	F
Westbound	L	0.71	21.1	C	L	0.71	21.1	C	L	0.71	21.1	C
	TR	0.48	32.6	C	TR	0.53	33.4	C	TR	0.51	33.0	C
Northbound	L	0.17	20.9	C	L	0.44	34.9	C	L	0.31	27.2	C
	TR	1.19	119.1	F	TR	1.19	119.1	F	TR	1.20	122.0	F
Southbound	LTR	1.34	186.9	F	LTR	1.36	192.0	F	LTR	1.19	120.2	F
	Intersection	127.1		F	Intersection	139.3		F	Intersection	101.3		F
Arthur Kill Road and West Shore Expressway (NB) Service Road	L	1.42	238.0	F	L	1.44	248.9	F	L	2.21	582.3	F
Eastbound	T	0.48	12.2	B	T	0.49	12.2	B	T	0.41	11.4	B
Westbound	TR	0.90	22.8	C	TR	0.58	13.1	B	TR	0.58	13.1	B
Northbound	LTR	0.99	21.5	C	LTR	0.62	22.4	C	LTR	0.58	20.9	C
	Intersection	37.4		D	Intersection	38.2		D	Intersection	103.3		F
Arthur Kill Road and West Shore Expressway (SB) Service Road	TR	0.59	17.5	B	TR	0.59	17.6	B	TR	0.59	17.6	B
Eastbound	L	1.41	231.8	F	L	0.78	44.4	D	L	0.78	44.4	D
Westbound	T	0.22	13.5	B	T	0.23	13.6	B	T	0.23	13.6	B
Southbound	LTR	0.99	48.3	D	LTR	1.00	50.2	D	LTR	1.00	50.2	D
	Intersection	58.2		E	Intersection	31.4		C	Intersection	31.4		C
Unsignalized Intersections												
Muldoon Avenue and West Shore Expressway (SB) Service Road	R	0.38	18.4	C	R	0.41	20.1	C	R	0.56	31.1	D
Arden Avenue and West Shore Expressway (SB) Service Road	L	1.55	397.1	F	L	10.00	-	F	L	13.16	-	F
Westbound	L	0.48	9.4	A	L	0.51	9.6	A	L	0.49	9.4	A
Arden Avenue and West Shore Expressway (NB) Ramps												
Eastbound					LT	0.00	9.1	A	LT	0.00	9.0	A
Northbound					TR	0.09	11.6	B	TR	0.09	11.4	B
Arthur Kill Road and Park West Entrance												
Eastbound					LT	0.03	9.0	A	LT	0.03	8.9	A
Southbound					LR	0.39	33.2	D	LR	0.28	22.5	C
Arthur Kill Road and Park East Entrance												
Eastbound					LT	0.00	8.9	A	LT	0.00	8.8	A
Southbound					LR	0.04	23.4	C	LR	0.03	18.2	C
Victory Boulevard and Melvin Avenue												
Eastbound	LT	0.00	8.6	A	LT	0.00	8.8	A	LT	0.00	8.7	A
Northbound	LTR	0.18	21.0	C	LTR	0.25	24.3	C	LTR	0.19	18.3	C
Southbound	LR	0.05	22.1	C	LR	0.06	25.1	D	LR	0.04	19.6	C

Notes: L = Left Turn, T = Through, R = Right Turn; LOS = Level of Service
 * implies delays are in excess of 1000 seconds

Table B-3
2036 No Build and Build Conditions Level of Service Analysis
Weekday PM Peak Hour

Intersection	2036 No Build				2036 Build - Without East				2036 Build - Yukon Avenue- Only Connection				2036 Build - Completed East							
	Lane Group	v/c Ratio	Delay (sec)	LOS	Park Roads				Lane Group	v/c Ratio	Delay (sec)	LOS	Park Road System							
					Lane Group	v/c Ratio	Delay (sec)	LOS					Lane Group	v/c Ratio	Delay (sec)	LOS				
Signalized Intersections																				
Victory Boulevard and West Shore Expressway (SB) Ramps	TR	0.51	20.7	C	TR	0.51	20.7	C	TR	0.52	21.1	C	TR	0.52	21.1	C				
Eastbound	L	1.89	437.0	F	L	2.88	878.5	F	L	2.01	491.3	F	L	2.02	492.6	F				
Westbound	T	0.17	15.4	B	T	0.17	15.4	B	T	0.17	15.4	B	T	0.17	15.4	B				
Southbound	LTR	0.32	16.4	B	LTR	0.45	17.7	B	LTR	0.45	17.6	B	LTR	0.45	17.6	B				
	Intersection	194.0			F	Intersection	429.5			F	Intersection	203.7			F	Intersection	264.4			F
Victory Boulevard and West Shore Expressway (NB) Ramps	L	0.72	42.8	D	L	1.58	330.0	F	L	0.82	50.3	E	L	0.82	50.3	E				
Eastbound	T	0.33	17.3	B	T	0.34	17.4	B	T	0.17	15.4	B	T	0.17	15.4	B				
Westbound	T	0.77	28.3	C	T	1.21	132.1	F	T	0.81	30.9	C	T	0.81	30.9	C				
Northbound	R	0.12	15.0	B	R	0.12	15.1	B	R	0.12	15.1	B	R	0.12	15.0	B				
	L	0.31	16.4	B	L	0.32	16.5	B	L	0.32	16.5	B	L	0.32	16.5	B				
	T	0.20	16.4	B	T	0.20	16.2	B	T	0.55	19.2	B	T	0.58	19.9	B				
	R	0.77	26.3	C	R	0.98	54.2	D	R	0.82	29.6	C	R	0.82	29.6	C				
	Intersection	24.1			C	Intersection	82.9			F	Intersection	28.7			C	Intersection	26.7			C
Victory Boulevard and Wild Avenue	LTR	0.79	23.2	C	LTR	0.85	30.2	D	LTR	0.87	18.5	D	LTR	0.87	18.5	D				
Eastbound	LTR	0.96	40.2	D	LTR	1.43	219.0	F	LTR	1.02	54.4	D	LTR	1.01	53.5	D				
Westbound	LTR	0.05	19.7	B	LTR	0.05	19.7	B	LTR	0.05	19.7	B	LTR	0.05	19.7	B				
Southbound	Intersection	32.2			C	Intersection	142.7			F	Intersection	39.7			D	Intersection	39.2			D
Victory Boulevard and Travis Avenue	L	0.68	47.6	D	L	0.98	119.4	F	L	0.99	118.4	F	L	0.99	118.4	F				
Eastbound	T	0.83	23.0	C	T	0.78	28.6	C	T	0.87	24.3	C	T	0.82	24.3	C				
Westbound	R	0.42	18.9	B	R	0.46	19.8	B	R	0.20	15.9	B	R	0.20	15.9	B				
Northbound	L	0.32	19.7	B	L	0.40	28.4	C	L	0.30	21.1	C	L	0.36	21.1	C				
Southbound	Y	0.88	36.7	D	Y	1.24	144.2	F	Y	0.95	45.9	D	Y	0.95	45.9	D				
	R	0.33	17.7	B	R	0.33	17.7	B	R	0.33	17.7	B	R	0.33	17.7	B				
	L	1.50	289.3	F	L	2.15	570.5	F	L	1.54	302.9	F	L	1.54	302.9	F				
	TR	0.60	22.3	C	TR	0.60	22.3	C	TR	0.60	22.3	C	TR	0.60	22.3	C				
	L	0.60	42.7	D	L	0.80	42.7	D	L	0.80	42.7	D	L	0.80	42.7	D				
	TR	1.33	180.7	F	TR	1.33	180.7	F	TR	1.33	180.7	F	TR	1.33	180.7	F				
	Intersection	85.0			F	Intersection	127.2			F	Intersection	91.5			F	Intersection	91.5			F
Drapel Place and Richmond Avenue	LT	1.48	257.8	F	LT	1.48	257.8	F	LT	1.48	257.8	F	LT	1.48	257.8	F				
Eastbound	LTR	0.25	30.4	C	LTR	0.25	30.4	C	LTR	0.25	30.4	C	LTR	0.25	30.4	C				
Westbound	L	1.55	285.8	F	L	1.76	386.4	F	L	1.62	325.5	F	L	1.62	325.5	F				
Northbound	TR	0.56	3.6	A	TR	0.50	3.6	A	TR	0.54	3.5	A	TR	0.50	3.3	A				
Southbound	TR	1.38	109.7	F	TR	1.38	201.1	F	TR	1.46	234.6	F	TR	1.46	234.6	F				
	Intersection	144.3			F	Intersection	156.1			F	Intersection	168.7			F	Intersection	172.1			F
Richmond Hill Road and Richmond Avenue	LTR	0.01	27.3	C	LTR	0.01	27.3	C	LTR	0.01	27.3	C	L	0.38	24.9	C				
Eastbound	T	0.21	16.6	B	T	0.21	16.6	B	T	0.21	16.6	B	T	0.21	16.6	B				
Westbound	L	0.57	39.0	D	L	0.59	40.5	D	L	0.70	46.7	D	L	0.83	61.1	D				
Northbound	LT	0.60	41.3	D	LT	0.59	40.8	D	LT	0.74	49.4	D	LT	0.74	49.4	D				
Southbound	R	0.90	37.6	D	R	1.02	61.8	E	R	0.90	27.8	C	R	0.75	21.8	C				
	L	0.00	27.2	C	L	0.00	27.2	C	L	0.00	27.2	C	L	0.05	32.7	C				
	T	0.06	36.5	D	T	0.06	37.1	D	T	0.06	36.1	D	T	0.06	41.6	D				
	R	0.47	22.5	C	R	0.47	22.5	C	R	0.48	22.9	C	R	0.57	30.1	C				
	L	1.51	275.4	F	L	1.56	306.0	F	L	1.52	280.3	F	L	1.52	276.4	F				
	TR	1.50	253.2	F	TR	1.50	254.6	F	TR	1.53	267.4	F	TR	1.54	271.1	F				
	Intersection	161.7			F	Intersection	166.5			F	Intersection	169.7			F	Intersection	265.0			F
Yukon Avenue and Richmond Avenue	L	2.87	783.0	F	L	2.87	783.0	F	L	2.87	783.0	F	L	0.32	31.8	C				
Eastbound	TR	0.78	45.5	D	TR	0.78	45.5	D	TR	0.78	45.5	D	TR	0.78	45.5	D				
Westbound	LTR	1.05	100.0	F	LTR	1.05	100.0	F	LTR	1.05	100.0	F	LTR	0.49	33.0	C				
Northbound	L	2.97	946.7	F	L	2.97	946.7	F	L	2.97	946.7	F	L	0.71	64.9	E				
Southbound	T	0.80	17.4	B	T	0.80	17.4	B	T	0.81	17.4	B	T	0.81	17.7	B				
	L	0.26	40.5	D	L	0.26	40.5	D	L	0.26	40.5	D	L	0.26	40.5	D				
	TR	1.45	221.6	F	TR	1.45	221.6	F	TR	1.45	221.6	F	TR	1.27	143.9	F				
	Intersection	35.5			D	Intersection	36.1			D	Intersection	217.5			F	Intersection	91.3			F
Forest Hill Road and Richmond Avenue	L	0.13	19.0	B	L	0.13	19.0	B	L	0.13	19.0	B	L	0.13	19.0	B				
Eastbound	T	0.09	19.9	B	T	0.09	19.9	B	T	0.09	19.9	B	T	0.09	19.9	B				
Westbound	L	0.90	48.8	D	L	0.90	49.1	D	L	0.83	40.7	D	L	2.14	547.6	F				
Northbound	LR	1.10	124.0	F	LR	1.16	123.8	F	LR	1.08	96.5	F	LR	0.17	10.6	B				
Southbound	T	1.60	27.1	C	T	1.60	27.8	C	T	1.01	31.6	C	T	1.45	236.8	F				
	R	1.26	142.1	F	R	1.27	143.4	F	R	1.27	145.3	F	R	2.12	538.6	F				
	L	0.60	37.4	D	L	0.60	37.4	D	L	0.60	37.4	D	L	0.33	44.8	D				
	T	1.23	118.1	F	T	1.23	119.3	F	T	1.17	91.6	F	T	1.70	386.3	F				
	Intersection	85.2			F	Intersection	86.1			F	Intersection	72.5			E	Intersection	353.6			F
Arthur Kill Road and Richmond Avenue	L	0.30	39.3	C	L	0.30	39.3	C	L	0.30	39.3	C	L	0.30	39.3	C				
Eastbound	TR	0.77	30.5	C	TR	0.83	32.8	C	TR	0.79	31.3	C	TR	0.79	31.3	C				
Westbound	L	0.46	39.8	D	L	0.46	40.4	D	L	0.46	40.4	D	L	0.46	40.4	D				
Northbound	T	1.48	253.9	F	T	1.60	334.1	F	T	1.50	269.6	F	T	1.50	262.0	F				
Southbound	R	0.76	20.3	C	R	0.76	20.3	C	R	0.88	28.6	C	R	0.88	28.6	C				
	L	0.83	51.2	D	L	1.05	60.0	F	L	0.85	52.8	D	L	0.85	52.8	D				
	TR	1.46	243.7	F	TR	1.40	243.7	F	TR	1.55	282.1	F	TR	1.55	282.5	F				
	L	1.49	264.5	F	L	1.40	264.5	F	L	1.55	201.7	F	L	1.55	201.7	F				
	TR	1.51	264.5	F	TR	1.51	264.5	F	TR	1.40	217.9	F	TR	1.41	219.1	F				
	Intersection	191.0			F	Intersection	263.2			F	Intersection	182.7			F	Intersection	183.1			F
Arthur Kill Road and Woodrow Road	TR	0.68	18.1	B	TR	0.68	18.1	B	TR	0.47	14.0	B	TR	0.47	14.0	B				
Eastbound	LY	1.50	434.9	F	LY	2.88	873.6	F	LY	1.56	270.1	F	LY	1.56	270.1	F				
Westbound	L	0.14	20.0	C	L	0.10	21.4	C	L	0.15	20.0	C	L	0.15	20.0	C				
Northbound	R	0.68	33.3	C	R	0.68	33.3	C	R	0.73	35.7	D	R	0.73	35.7	D				
	Intersection	202.4			F	Intersection	433.7			F	Intersection	150.8			F	Intersection	150.8			F
Arden Avenue and Arthur Kill Road	L	0.77	41.2	D	L	1.47	298.2	F	L	1.04	93.4	F	L	1.04	93.4	F				
Eastbound	T	1.44	236.5	F	T	1.54	282.3	F	T	1.54	282.3	F	T	1.54	282.3	F				
Westbound	R	0.32	24.0	C	R	0.32	24.0	C	R	0.32	24.0	C	R	0.32	24.0	C				
Northbound	L	1.11	107.5	F	L	0.33	18.4	B	L	0.33	18.4	B	L	0.33	18.4	B				
Southbound	TR	0.59	11.9	B	TR	0.48	14.3	B	TR	0.58	14.3	B	TR	0.48	14.3	B				
	LTR	1.18	129.1	F	LTR	2.13	547.6	F	LTR	0.77	37.0	D	LTR	0.77	37.0	D				
	L	2.02	516.9	F	L	2.10	553.3	F	L	1.05	103.5	F	L	1.05	103.5	F				

Table B-3 (cont'd)
2036 No Build and Build Conditions Level of Service Analysis
Weekday PM Peak Hour

Intersection	2036 No Build				2036 Build - Without East				2036 Build - Yukon Avenue				2036 Build - Completed East							
	Signalized Intersections				Park Roads				Only Connection				Park Road System							
	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS				
Signalized Intersections																				
Arthur Kill Road and Huguenot Avenue	LT	0.30	10.4	B	LT	0.31	10.4	B	LT	0.14	9.3	A	LT	0.14	9.3	A				
Eastbound	L	0.49	15.7	B	L	0.50	16.1	B	L	0.37	12.5	B	L	0.37	12.5	B				
Westbound	TR	0.46	11.9	B	TR	0.10	9.1	A	TR	0.10	9.1	A	TR	0.10	9.1	A				
Northbound	L	1.02	60.0	E	L	1.02	60.0	E	L	1.02	60.0	E	L	1.02	60.0	E				
Southbound	R	0.19	13.1	B	R	0.10	13.1	B	R	0.19	13.1	B	R	0.10	13.1	B				
	Intersection	25.7			C	Intersection	30.4			C	Intersection	34.0			C	Intersection	34.0			C
Drumgoole Road and Richmond Avenue	L	1.50	253.9	F	L	1.50	257.3	F	L	1.41	217.6	F	L	1.41	217.6	F				
Eastbound	LR	1.50	256.3	F	LR	1.51	259.0	F	LR	1.42	219.8	F	LR	1.42	219.8	F				
Northbound	T	1.40	209.8	F	T	1.40	209.8	F	T	1.53	267.8	F	T	1.53	268.1	F				
Southbound	T	1.51	258.6	F	T	1.51	258.6	F	T	1.48	236.2	F	T	1.46	237.2	F				
	Intersection	242.0			F	Intersection	243.1			F	Intersection	240.7			F	Intersection	241.1			F
Arthur Kill Road and Drumgoole Road	L	1.82	398.7	F	L	1.92	445.4	F	L	1.26	158.8	F	L	1.26	158.8	F				
Eastbound	TR	1.43	242.0	F	TR	1.70	309.2	F	TR	1.51	278.2	F	TR	1.51	278.2	F				
Westbound	L	0.78	25.5	C	L	0.78	25.5	C	L	0.78	25.5	C	L	0.78	25.5	C				
Northbound	TR	0.74	38.8	D	TR	1.02	73.4	E	TR	0.76	39.8	D	TR	0.76	39.8	D				
Southbound	L	0.59	48.7	D	L	2.08	548.9	F	L	0.73	64.3	E	L	0.73	64.3	E				
	TR	1.46	236.2	F	TR	1.46	236.2	F	TR	1.53	267.4	F	TR	1.53	267.4	F				
	LTR	1.50	251.4	F	LTR	1.50	254.2	F	LTR	1.38	201.3	F	LTR	1.36	192.2	F				
	Intersection	219.3			F	Intersection	245.7			F	Intersection	160.7			F	Intersection	187.6			F
Arthur Kill Road and West Shore Expressway (NB) Service Road	L	2.60	757.8	F	L	1.32	182.2	F	L	1.60	300.0	F	L	1.60	300.0	F				
Eastbound	T	0.63	14.2	B	T	0.64	14.3	B	T	0.58	13.4	B	T	0.58	13.4	B				
Westbound	TR	0.79	17.5	B	TR	0.44	11.6	B	TR	0.44	11.6	B	TR	0.44	11.6	B				
Northbound	LTR	1.06	79.4	E	LTR	1.08	89.2	F	LTR	1.01	65.6	E	LTR	1.01	65.6	E				
	Intersection	118.3			F	Intersection	53.7			D	Intersection	78.5			E	Intersection	78.5			E
Arthur Kill Road and West Shore Expressway (SB) Service Road	TR	0.63	18.2	B	TR	0.67	18.9	B	TR	0.67	18.9	B	TR	0.67	18.9	B				
Eastbound	L	1.69	351.6	F	L	1.01	94.7	F	L	1.02	96.5	F	L	1.02	96.5	F				
Westbound	T	0.34	14.8	B	T	0.34	14.8	B	T	0.34	14.6	B	T	0.34	14.6	B				
Southbound	LTR	1.52	257.7	F	LTR	1.54	267.0	F	LTR	1.54	267.0	F	LTR	1.54	267.0	F				
	Intersection	195.4			F	Intersection	142.5			F	Intersection	142.8			F	Intersection	142.6			F
Unsignalized Intersections																				
Muldoon Avenue and West Shore Expressway (SB) Service Road	R	0.13	26.4	D	R	0.17	34.0	D	R	0.22	47.6	E	R	0.24	52.0	F				
Arden Avenue and West Shore Expressway (SB) Service Road	L	8.25	*	F	L	245.00	*	F	L	122.50	*	F	L	122.50	*	F				
Westbound	L	0.82	18.5	C	L	0.91	23.7	C	L	0.83	17.3	C	L	0.83	17.3	C				
Arden Avenue and West Shore Expressway (NB) Ramps					LT	0.00	11.7	B	LT	0.00	9.2	A	LT	0.00	9.2	A				
Eastbound					TR	0.11	19.5	B	TR	0.13	15.1	C	TR	0.13	15.1	C				
Arthur Kill Road and Park West Entrance					LT	0.03	9.4	A	LT	0.03	9.4	A	LT	0.03	9.4	A				
Eastbound					LR	0.36	32.0	D	LR	0.36	32.0	D	LR	0.36	32.0	D				
Southbound																				
Arthur Kill Road and Park East Entrance					LT	0.00	10.8	B	LT	0.00	9.3	A	LT	0.00	9.3	A				
Eastbound					LR	0.09	47.8	E	LR	0.04	21.4	C	LR	0.04	21.4	C				
Southbound																				
Victory Boulevard and Melvin Avenue	LT	0.01	9.4	A	LT	0.01	10.9	B	LT	0.01	9.5	A	LT	0.01	9.5	A				
Eastbound	LTR	0.28	30.0	D	LTR	0.71	98.7	F	LTR	0.32	28.1	D	LTR	0.32	28.1	D				
Northbound	LR	0.08	25.4	D	LR	0.17	52.8	F	LR	0.07	23.9	C	LR	0.07	23.9	C				
Southbound																				

Notes: L = Left Turn, T = Through, R = Right Turn, LOS = Level of Service.
 * implies delays are in excess of 1000 seconds

Table B-4
2036 No Build and Build Conditions Level of Service Analysis
Weekend Midday Peak Hour

Intersection	2036 No Build				2036 Build - Without East				2036 Build - Yukon Avenue -				2036 Build - Completed East			
	Park Roads				Only Connection				Park Road System							
	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS
Signalized Intersections																
Victory Boulevard and West Shore Expressway (SB) Ramps																
Eastbound	TR	0.42	19.0	B	TR	0.42	19.0	B	TR	0.44	19.3	B	TR	0.44	19.3	B
Westbound	L	1.88	433.0	F	L	3.00	672.4	F	L	2.03	499.1	F	L	2.03	499.1	F
	T	0.13	15.0	B	T	0.13	15.0	B	T	0.13	15.0	B	T	0.13	15.0	B
Southbound	LTR	0.29	16.1	B	LTR	0.45	17.0	B	LTR	0.45	17.0	B	LTR	0.45	17.0	B
	Intersection	204.0			Intersection	506.1			Intersection	214.1			Intersection	214.1		
Victory Boulevard and West Shore Expressway (NB) Ramps																
Eastbound	L	0.61	32.2	C	L	1.48	294.2	F	L	0.70	41.0	D	L	0.70	41.0	D
	T	0.36	17.7	B	T	0.38	17.9	B	T	0.17	15.5	B	T	0.17	15.5	B
Westbound	T	0.72	26.4	C	T	1.27	155.3	F	T	0.78	29.0	C	T	0.78	29.0	C
	R	0.13	15.2	B	R	0.15	15.3	B	R	0.15	15.3	B	R	0.15	15.3	B
Northbound	L	0.30	16.3	B	L	0.32	16.4	B	L	0.32	16.4	B	L	0.32	16.4	B
	T	0.25	15.8	B	T	0.36	16.9	B	T	0.89	22.3	C	T	0.72	23.8	C
Southbound	R	0.82	26.7	C	R	1.10	89.8	F	R	0.89	37.4	D	R	0.89	37.4	D
	Intersection	23.7			Intersection	95.0			Intersection	27.8			Intersection	27.8		
Victory Boulevard and Wild Avenue																
Eastbound	LTR	0.75	21.2	C	LTR	0.96	40.0	D	LTR	0.61	17.0	B	LTR	0.61	17.0	B
Westbound	LTR	0.87	28.6	C	LTR	1.49	247.3	F	LTR	0.97	43.2	D	LTR	0.97	43.2	D
Southbound	LTR	0.05	19.7	B	LTR	0.05	19.7	B	LTR	0.05	19.7	B	LTR	0.05	19.7	B
	Intersection	25.0			Intersection	158.4			Intersection	32.5			Intersection	32.5		
Victory Boulevard and Travis Avenue																
Eastbound	L	0.43	26.1	C	L	0.77	72.6	E	L	0.82	44.7	D	L	0.82	44.7	D
	T	0.58	24.4	C	T	0.67	34.9	C	T	0.73	29.0	C	T	0.73	29.0	C
Westbound	R	0.41	16.8	B	R	0.47	20.0	B	R	0.15	15.4	B	R	0.15	15.4	B
	L	0.40	22.2	C	L	0.77	90.9	E	L	0.47	25.8	C	L	0.47	25.8	C
	T	0.61	30.4	C	T	1.24	145.2	F	T	0.89	37.4	D	T	0.89	37.4	D
	R	0.35	17.8	B	R	0.35	17.8	B	R	0.35	17.8	B	R	0.35	17.8	B
Northbound	L	2.75	846.4	F	L	4.00	*	F	L	2.86	896.4	F	L	2.86	896.4	F
	TR	0.72	26.2	C	TR	0.72	26.2	C	TR	0.72	26.2	C	TR	0.72	26.2	C
Southbound	L	0.94	73.4	E	L	0.94	73.4	E	L	0.94	73.4	E	L	0.94	73.4	E
	TR	0.93	43.2	D	TR	0.93	43.2	D	TR	0.93	43.2	D	TR	0.93	43.2	D
	Intersection	82.4			Intersection	188.5			Intersection	91.1			Intersection	91.1		
Draper Place and Richmond Avenue																
Eastbound	LT	1.50	271.9	F	LT	1.50	271.9	F	LT	1.50	271.9	F	LT	1.50	271.9	F
Westbound	LTR	0.17	28.4	C	LTR	0.17	28.4	C	LTR	0.17	28.4	C	LTR	0.17	28.4	C
Northbound	L	1.57	209.0	F	L	1.60	403.3	F	L	1.65	336.7	F	L	1.65	336.7	F
	TR	0.72	5.4	A	TR	0.72	5.4	A	TR	0.68	5.0	A	TR	0.65	4.7	A
Southbound	TR	1.48	240.2	F	TR	1.48	250.8	F	TR	1.50	207.3	F	TR	1.50	207.3	F
	Intersection	155.5			Intersection	169.2			Intersection	186.9			Intersection	186.8		
Richmond Hill Road and Richmond Avenue																
Eastbound	LTR	0.01	27.3	C	LTR	0.01	27.3	C	LTR	0.01	27.3	C	L	0.43	26.0	C
	T	0.10	21.4	C	T	0.03	9.8	A	T	0.03	9.8	A	T	0.03	9.8	A
Westbound	L	0.77	52.6	D	L	0.78	51.5	D	L	0.92	73.4	E	L	1.02	81.8	F
	LT	0.75	50.5	D	LT	0.76	51.0	D	LT	0.83	74.2	E	LT	0.14	20.8	C
	R	1.26	154.9	F	R	1.42	224.6	F	R	1.12	97.3	F	R	0.94	40.6	D
Northbound	L	0.00	31.3	C	L	0.00	31.3	C	L	0.00	31.3	C	L	0.00	33.7	C
	T	1.05	54.6	D	T	1.09	56.0	E	T	1.04	49.6	D	T	1.10	121.2	F
	R	0.46	18.1	B	R	0.47	18.2	B	R	0.48	18.5	B	R	0.65	32.1	C
Southbound	L	1.52	284.0	F	L	1.64	337.3	F	L	1.54	295.6	F	L	1.78	401.1	F
	TR	1.22	124.8	F	TR	1.22	126.1	F	TR	1.26	140.6	F	TR	1.69	343.0	F
	Intersection	168.7			Intersection	120.0			Intersection	108.5			Intersection	216.8		
Yukon Avenue and Richmond Avenue																
Eastbound	L	3.67	*	F	L	3.67	*	F	L	3.67	*	F	L	0.41	37.9	D
	TR	0.91	62.5	E	TR	0.91	62.5	E	TR	0.91	62.5	E	TR	0.24	20.3	C
Westbound	LTR	4.66	*	F	LTR	4.66	*	F	LTR	4.66	*	F	LTR	1.08	108.4	F
Northbound	L	2.01	915.9	F	L	2.01	915.9	F	L	2.01	915.9	F	L	0.82	71.2	E
	T	0.96	26.8	C	T	0.96	26.8	C	T	0.97	27.9	C	T	0.97	27.9	C
Southbound	L	0.30	39.0	D	L	0.30	39.0	D	L	0.30	39.0	D	L	0.30	39.0	D
	T	0.90	9.1	A	T	0.90	9.2	A	TR	1.29	150.3	F	TR	1.10	68.1	E
	Intersection	35.7			Intersection	36.5			Intersection	289.2			Intersection	52.1		
Forest Hill Road and Richmond Avenue																
Eastbound	L	0.11	20.0	C	L	0.11	20.0	C	L	0.11	20.0	C	L	0.11	20.0	C
	T	0.08	19.5	B	T	0.08	19.5	B	T	0.08	19.5	B	T	0.08	19.5	B
Westbound	L	0.95	58.4	E	L	0.95	58.8	E	L	0.88	46.7	D	L	2.08	522.0	F
	LR	1.20	141.1	F	LR	1.21	141.0	F	LR	1.13	114.2	F	LR	0.24	21.4	C
Northbound	L	2.77	857.3	F	L	2.77	857.3	F	L	2.77	857.3	F	L	2.77	857.3	F
	T	1.05	43.6	D	T	1.00	44.0	D	T	1.09	50.9	E	T	1.51	257.9	F
	R	1.16	98.0	F	R	1.10	99.5	F	R	1.10	99.0	F	R	1.80	391.0	F
Southbound	L	0.50	28.3	C	L	0.50	28.3	C	L	0.50	28.3	C	L	0.28	43.0	D
	T	0.75	10.9	B	T	0.75	11.0	B	T	0.69	10.1	B	TR	0.98	40.9	D
	Intersection	48.8			Intersection	47.6			Intersection	52.1			Intersection	259.7		
Arthur Kill Road and Richmond Avenue																
Eastbound	L	0.22	28.0	C	L	0.22	28.0	C	L	0.22	28.0	C	L	0.22	28.0	C
	TR	0.85	35.8	D	TR	0.97	49.1	D	TR	0.80	38.1	D	TR	0.89	38.1	D
Westbound	L	0.74	72.1	E	L	0.74	72.1	E	L	0.74	72.1	E	L	0.74	72.1	E
	T	1.48	254.5	F	T	1.72	359.6	F	T	1.50	265.1	F	T	1.50	265.1	F
	R	0.78	22.6	C	R	0.78	22.0	C	R	0.93	36.2	D	R	0.93	36.2	D
Northbound	L	0.98	67.9	E	L	1.21	149.7	F	L	0.98	73.3	E	L	0.98	73.3	E
	TR	1.52	267.7	F	TR	1.52	267.7	F	TR	1.61	305.6	F	TR	1.61	305.3	F
Southbound	L	1.50	269.6	F	L	1.50	269.6	F	L	1.58	308.5	F	L	1.58	308.5	F
	TR	0.86	35.4	D	TR	0.86	35.4	D	TR	0.74	29.8	C	TR	0.74	29.8	C
	Intersection	161.5			Intersection	183.2			Intersection	182.4			Intersection	182.2		
Arthur Kill Road and Woodrow Road																
Eastbound	TR	0.50	29.0	C	TR	1.10	80.1	F	TR	0.72	19.4	B	TR	0.72	19.4	B
Westbound	LT	1.83	402.9	F	LT	3.13	884.1	F	LT	1.62	307.9	F	LT	1.62	307.9	F
Northbound	L	0.27	22.4	C	L	0.32	23.2	C	L	0.28	22.6	C	L	0.28	22.6	C
	R	0.84	44.0	D	R	0.84	44.0	D	R	0.90	50.9	D	R	0.90	50.9	D
	Intersection	188.0			Intersection	440.3			Intersection	136.6			Intersection	136.6		
Arden Avenue and Arthur Kill Road																
Eastbound	L	0.71	37.6	D	L	1.62	325.1	F	L	1.01	89.3	F	L	1.01	89.3	F
	T	1.02	72.8	E	T	1.13	107.4	F	T	1.13	107.4	F	T	1.13	107.4	F
Westbound	R	0.13	21.4	B	R	0.13	21.4	B	R	0.13	21.4	B	R	0.13	21.4	B
	L	1.32	180.8	F	L	0.42	19.9	B	L	0.42	19.9	B	L	0.42	19.9	B
	TR	0.29	11.9	B	TR	0.62	17.0	B	TR	0.62	17.0	B	TR	0.62	17.0	B
Northbound	LTR	1.11	104.0	F	LTR	2.36	652.9	F	LTR	0.71	34.4	C	LTR	0.71	34.4	C
Southbound	L	1.07	124.7	F	L	1.12	143.6	F	L	0.99	33.					

Table B-4 (cont'd)
2036 No Build and Build Conditions Level of Service Analysis

Weekend Midday Peak Hour

Intersection	2036 No Build				2036 Build - Without East				2036 Build - Yukon Avenue				2036 Build - Completed East			
	Park Roads				Only Connection				Park Road System							
	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS
Signalized Intersections																
Arthur Kill Road and Huguenot Avenue																
Eastbound	LT	0.30	10.3	B	LT	0.31	10.4	B	LT	0.15	0.3	A	LT	0.15	0.3	A
Westbound	L	0.41	13.8	B	L	0.42	14.1	B	L	0.31	11.7	B	L	0.31	11.7	B
	TR	0.59	13.4	B	TR	0.20	0.7	A	TR	0.20	0.7	A	TR	0.20	0.7	A
Northbound	L	1.37	195.7	F	L	1.37	195.7	F	L	1.37	195.7	F	L	1.37	195.7	F
	R	0.20	13.2	B	R	0.20	13.2	B	R	0.20	13.2	B	R	0.20	13.2	B
	Intersection	72.8	E	Intersection	90.7	F	Intersection	103.6	F	Intersection	103.6	F				
Drumgoole Road and Richmond Avenue																
Eastbound	L	1.50	257.7	F	L	1.51	261.8	F	L	1.44	231.0	F	L	1.44	231.0	F
	LR	1.40	253.8	F	LR	1.50	257.7	F	LR	1.43	227.9	F	LR	1.43	227.9	F
Northbound	T	1.52	261.5	F	T	1.52	261.5	F	T	1.68	324.7	F	T	1.66	324.5	F
Southbound	T	1.20	121.8	F	T	1.20	121.8	F	T	1.14	88.2	F	T	1.14	88.2	F
	Intersection	222.5	F	Intersection	224.0	F	Intersection	238.1	F	Intersection	238.1	F				
Arthur Kill Road and Drumgoole Road																
Eastbound	L	1.02	318.3	F	L	1.00	439.2	F	L	1.14	119.1	F	L	1.14	119.1	F
	TR	1.50	269.4	F	TR	1.01	450.1	F	TR	1.60	315.8	F	TR	1.60	315.8	F
Westbound	L	0.85	27.4	C	L	0.85	27.4	C	L	0.85	27.4	C	L	0.85	27.4	C
	TR	0.57	34.2	C	TR	0.93	52.9	D	TR	0.61	34.9	C	TR	0.61	34.9	C
Northbound	L	0.21	22.5	C	L	2.06	544.4	F	L	0.40	32.3	C	L	0.40	32.3	C
	TR	1.43	222.0	F	TR	1.43	222.9	F	TR	1.52	264.0	F	TR	1.52	264.0	F
Southbound	L	1.61	304.8	F	L	1.62	310.0	F	L	1.46	238.9	F	L	1.42	221.6	F
	Intersection	218.9	F	Intersection	259.5	F	Intersection	199.3	F	Intersection	194.7	F				
Arthur Kill Road and West Shore Expressway (NB) Service Road																
Eastbound	L	1.67	344.3	F	L	2.01	494.5	F	L	3.03	945.4	F	L	3.03	945.4	F
	T	0.58	13.4	B	T	0.58	13.5	B	T	0.48	12.1	B	T	0.48	12.1	B
Westbound	TR	1.07	61.0	E	TR	0.69	15.0	B	TR	0.69	15.0	B	TR	0.69	15.0	B
Northbound	L	0.69	25.3	C	L	0.72	27.0	C	L	0.68	24.3	C	L	0.68	24.3	C
	Intersection	67.8	E	Intersection	72.4	E	Intersection	160.2	F	Intersection	160.2	F				
Arthur Kill Road and West Shore Expressway (SB) Service Road																
Eastbound	TR	0.69	19.5	B	TR	0.74	20.7	C	TR	0.74	20.7	C	TR	0.74	20.7	C
Westbound	L	2.20	581.6	F	L	1.38	232.1	F	L	1.39	235.3	F	L	1.39	235.3	F
	T	0.26	13.8	B	T	0.26	13.9	B	T	0.26	13.9	B	T	0.26	13.9	B
Southbound	L	1.18	110.4	F	L	1.21	122.6	F	L	1.21	122.6	F	L	1.21	122.6	F
	Intersection	131.4	F	Intersection	74.8	E	Intersection	75.1	E	Intersection	75.1	E				
Unsignalized Intersections																
Muldon Avenue and West Shore Expressway (SB) Service Road																
Eastbound	R	0.58	27.1	D	R	0.70	58.0	F	R	0.97	103.5	F	R	1.04	127.3	F
Arden Avenue and West Shore Expressway (SB) Service Road																
Westbound	L	3.53	*	F	L	37.63	*	F	L	27.36	*	F	L	30.10	*	F
Southbound	L	0.58	10.3	B	L	0.69	12.2	B	L	0.60	10.5	B	L	0.60	10.5	B
Arden Avenue and West Shore Expressway (NB) Ramps																
Eastbound	LT	0.00	0.0	A	LT	0.00	11.6	B	LT	0.00	0.0	A	LT	0.00	0.0	A
Northbound	TR	0.11	13.4	B	TR	0.10	12.4	B	TR	0.10	12.4	B	TR	0.10	12.4	B
Arthur Kill Road and Park West Entrance																
Eastbound	LT	0.05	11.2	B	LT	0.04	9.3	A	LT	0.04	9.3	A	LT	0.04	9.3	A
Southbound	LR	1.41	349.1	F	LR	0.46	34.8	D	LR	0.46	34.8	D	LR	0.46	34.8	D
Arthur Kill Road and Park East Entrance																
Eastbound	LT	0.01	11.0	B	LT	0.01	9.2	A	LT	0.01	9.2	A	LT	0.01	9.2	A
Southbound	LR	0.14	61.1	F	LR	0.05	22.1	C	LR	0.05	22.1	C	LR	0.05	22.1	C
Victory Boulevard and Melvin Avenue																
Eastbound	LT	0.00	0.0	A	LT	0.00	10.7	B	LT	0.00	9.1	A	LT	0.00	9.1	A
Northbound	L	0.27	28.0	D	L	0.84	132.4	F	L	0.32	26.2	D	L	0.32	26.2	D
Southbound	LR	0.08	29.3	D	LR	0.23	85.0	F	LR	0.07	26.4	D	LR	0.07	26.4	D

Notes: L = Left Turn, T = Through, R = Right Turn; LOS = Level of Service
* implies delays are in excess of 1900 seconds