Chapter 16: Traffic and Parking

A. INTRODUCTION

This chapter examines the potential traffic and parking impacts of the proposed Fresh Kills Park roads. The analysis of transit and pedestrians is presented in Chapter 17, "Transit and Pedestrians."

The new park road connections across the site to existing streets and highways would provide important connections between the West Shore Expressway (Route 440) on the west and Richmond Avenue on the east. These new connections would provide access to the park as well as new public streets across the Fresh Kills site. For these reasons, the proposed park roads are analyzed as both access roads and as potential new vehicular routes between Richmond Avenue and the West Shore Expressway.

As discussed in Chapter 1, "Project Description," the proposed project would consist of the following road options:

- Completion of the Yukon Avenue Connection as a two-lane road, crossing Landfill Section 6/7 and connecting on the east with a new intersection at Richmond Avenue (see Figure 1-8); and
- Options for completing the East Park road system, which could include four-lane or two lane roads across East Park with new connections at Richmond Hill Road, Yukon Avenue, and Forest Hill Road, or a two-lane, one-way loop road around the base of the landfill with connections at Richmond Hill Road, Yukon Avenue, and Forest Hill Road (see Figure 1-9), an alternative put forward by the Office of the Staten Island Borough President.

What follows is an analysis of the proposed East Park roads and their potential traffic impacts. Since the focus of this analysis is the East Park roads, the intersections that are potentially impacted by these road connections to Richmond Avenue are the subject of this analysis. A comprehensive analysis of the proposed Fresh Kills Park project including the proposed park and all road elements as well as connections to the West Shore Expressway is presented in the *Fresh Kills Park Final Generic Environmental Impact Statement (FGEIS)* (March 2009). This analysis therefore focuses on the five intersections to the east of the proposed park and the analysis is derived from the data presented in that FGEIS (see also the Final Scope of Work to prepare the SEIS presented in Appendix A).

Like the FGEIS analysis, this SEIS analysis includes a presentation of the existing traffic conditions and conditions in the future with and without proposed project (2016 and 2036). Where traffic impacts have been identified, they are summarized at the end of this chapter. Chapter 23, "Impact Avoidance Measures and Mitigation," presents the mitigation for these traffic impacts.

B. METHODOLOGY

INTRODUCTION

Traffic and parking analyses were conducted for the *Fresh Kills Park FGEIS* to evaluate the potential impacts associated with the reasonable worst-case development scenario (RWCDS). In addition, the analysis relies on the Draft Master Plan (March 2006) for certain specific program elements. These documents encompass the range of park design elements and representative park features and activities that form the proposed project for the traffic and parking analysis. As described in greater detail below, the analysis framework evaluates the potential traffic and parking impacts for specific analysis years, study areas, methodologies, and the anticipated geometric and operational changes on study area roadways, and the incremental trips and diversion resulting from the proposed project. Additional details on the methodologies presented in this traffic and parking chapter are presented in the FGEIS, Appendix D, "Transportation Planning Factors Memorandum." This traffic analysis is presented to identify adverse impacts caused by the proposed project, in accordance with the *City Environmental Quality Review (CEQR) Technical Manual* and CEQR and the State Environmental Quality Review Act (SEQRA), and does not directly represent the benefits that will be accrued by the construction of the proposed roads. For a more comprehensive discussion of the purpose, need, and benefits of the proposed roads, see Chapter 1, "Project Description," and Appendix F.

STUDY AREA AND INTERSECTION SELECTION

To assess the potential traffic impacts associated with the proposed project, a study area was designated that considered the location of the proposed park road connections at Richmond Avenue. In total, five (5) intersections were selected for analysis—Richmond Avenue at Richmond Hill Road, Yukon Avenue, and Forest Hill Road; and Forest Hill Road at both Yukon Avenue and Richmond Hill Road (see Figure 16-1).

The following street corridors are in the study area:

- Richmond Avenue Corridor. This corridor includes Richmond Avenue intersections with (from north to south) Richmond Hill Road, Yukon Avenue, and Forest Hill Road.
- Richmond Hill Road Corridor. This corridor extends along Richmond Hill Road from Richmond Avenue on the west to the connection with Forest Hill Road on the east.
- Forest Hill Road Corridor. This corridor extends along Forest Hill Road from Travis Avenue on the east to Richmond Avenue on the west. It includes the Forest Hill Road intersection with Yukon Avenue.

ANALYSIS YEARS

The proposed project is a long-term, phased project with a full build-out over approximately 30 years, (see Chapter 1 for a description of the project phases). Therefore, the traffic analyses listed below examine the following analysis years:

- Baseline (2007) existing conditions;
- Future Without the Proposed Project (2016 and 2036). These are the baseline conditions adjusted to incorporate background growth and other development projects that are expected to be completed in the study area independent of the proposed project through the 2016 and 2036 analysis years.; and

- Future With the Proposed Project Conditions (2016 and 2036). This analysis determines the incremental impacts of the proposed project on local traffic conditions for the 2016 and 2036 analysis years.

BASELINE DATA COLLECTION

Baseline conditions for this analysis are based on the Fresh Kills Park FGEIS (March 2009) baseline conditions data. As described in greater detail in the FGEIS, baseline traffic conditions for the study area were established as per the criteria established in the *New York City Environmental Quality Review (CEQR) Technical Manual*, and the capacity analysis of the study area intersections was performed using the 2000 *Highway Capacity Manual* (HCM) methodology. The baseline traffic data collection was performed in early May 2007. To record the peak activity the weekday traffic data collection was conducted from 7:00 AM-10:00 AM (for the morning period), 12:00 PM-3:00 PM (for the midday period), and 4:00 PM-7:00 PM (for the evening period). The weekend (Saturday) data collection was conducted from 11:00 AM-3:00 PM (for the midday/afternoon period) and 4:00 PM-7:00 PM (for the evening period). In addition to the traffic counts, the traffic data collection program included conducting physical inventories of the study area intersections to gather information on the number of lanes, lane widths, parking regulations, signal timing information, bus stop locations, and other general roadway characteristics.

OPERATIONAL ANALYSIS METHODOLOGY

INTERSECTION ANALYSIS

Methodology

The operation of signalized intersections was analyzed in accordance with CEQR guidelines by applying the methodologies presented in the 2000 HCM, using Highway Capacity Software (HCS) 4.1(f). This procedure evaluates signalized intersections for average delay per vehicle and level of service (LOS). LOS for signalized intersections are based on the average stopped delay per vehicle for the various lane group movements within the intersection. This delay is the basis for an LOS determination for individual lane groups (grouping of movements in one or more travel lanes), the approaches, and the overall intersection.

Although the HCM methodology calculates a volume-to-capacity (v/c) ratio, there is no strict relationship between v/c ratios and LOS as defined in the HCM. A high v/c ratio indicates substantial traffic passing through an intersection, but a high v/c ratio combined with low average delay actually represents the most efficient condition in terms of traffic engineering standards, where an approach or the whole intersection processes traffic close to its theoretical maximum with minimal delay. However, very high v/c ratios—especially those approaching or greater than 1.0—are often correlated with a deteriorated LOS. Other important variables affecting delay include cycle length, progression, and green time. LOS A and B indicate good operating conditions with minimal delay. At LOS C, the number of vehicles stopping is higher, but congestion is still fairly light. LOS D describes a condition where congestion levels are more noticeable and individual cycle failures (a condition where motorists may have to wait for more than one green phase to clear the intersection) can occur. The midpoint of this service level (45 seconds of delay) is considered the threshold of acceptable operating conditions. Conditions at LOS E and F reflect poor service levels, and cycle failures are frequent. The HCM methodology provides for a summary of the total intersection operating conditions, by identifying the two

critical movements (the worst-case from each roadway) and calculating a summary of critical v/c ratio, delay, and LOS.

For unsignalized intersections, the total delay is defined as the total elapsed time from which a vehicle stops at the end of the queue until the vehicle departs from the stop line. This includes the time required for the vehicle to travel from the last-in-queue to the first-in-queue position. The average total delay for any particular minor movement is a function of the service rate or capacity of the approach and the degree of saturation.

The LOS thresholds for unsignalized intersections are different from those for signalized intersections. The primary reason is that drivers expect different levels of performance from different types of transportation facilities. The expectation is that a signalized intersection is designed to carry higher traffic volumes than an unsignalized intersection. In addition, certain driver behavior considerations combine to make delays at signalized intersections less onerous than at unsignalized intersections. For example, drivers at signalized intersections are able to relax during the red interval, whereas drivers on minor approaches to unsignalized intersections must remain attentive to identifying acceptable gaps and vehicle conflicts. Also, there is often much more variability in the amount of delay experienced by individual drivers at unsignalized intersections. For these reasons, the total overall scale of delay thresholds for unsignalized intersections is lower than that of signalized intersections.

The LOS/delay thresholds for signalized and unsignalized intersections, based on the HCM methodology, are presented in Table 16-1.

Table 16-1
Intersection Level of Service (LOS) Criteria

LOS	Average Delay per Vehicle (seconds)	
	Signalized Intersections	**Unsignalized Intersections**
A	less than or equal to 10.0	less than or equal to 10.0
B	> 10.0 to 20.0	> 10.0 to 15.0
C	> 20.0 to 35.0	> 15.0 to 25.0
D	> 35.0 to 55.0	> 25.0 to 35.0
E	> 55.0 to 80.0	> 35.0 to 50.0
F	greater than 80.0	greater than 50.0

Source: Transportation Research Board; 2000 *Highway Capacity Manual*.

Intersection Analysis Significant Impact Criteria

According to the criteria presented in the *CEQR Technical Manual*, for the intersection analysis, traffic impacts are considered significant and require examination of mitigation if they result in an increase in the Build condition of 5 or more seconds of delay in a lane group over No Build levels beyond mid-LOS D. For No Build LOS E, a 4-second increase in delay is considered significant. For No Build LOS F, a 3-second increase in delay is considered significant. Also, if the No Build LOS F condition already corresponds with a delay in excess of 120 seconds, an increase of 1.0 or more seconds of delay is considered significant. In addition, impacts are considered significant if levels of service deteriorate from acceptable A, B, or C in the No Build condition to marginally unacceptable LOS D (a delay in excess of 45 seconds, the midpoint of LOS D), or unacceptable LOS E or F in the future Build condition. The above sliding scale is applicable only if the proposed project would result in five or more vehicle trips through the analysis intersection in the peak hour.

The same sliding scale of significant delays described for signalized intersections applies for unsignalized intersections. For the minor street to trigger significant impacts, at least 90 passenger car equivalents (PCEs) must be identified in the future Build condition in any peak hour.

NO BUILD PROJECTS AND GROWTH FACTORS

Future conditions for this analysis are also based on the *Fresh Kills Park FGEIS* 2016 and 2036 projections. To determine the future traffic conditions, existing (baseline 2007) volumes were increased to reflect expected growth in overall travel through and within the study area's traffic network for the 2016 and 2036 analysis years. The traffic conditions for both these analysis years were assessed with the background growth and the potential No Build projects in place, but without development of the proposed East Park roads. The growth factors used to increase the 2007 baseline traffic volumes for the future analysis years were developed in consultation with the New York City Department of Transportation (NYCDOT).

PROPOSED PROJECT TRAVEL DEMAND ESTIMATES: TRIP GENERATION

The East Park roads would be constructed within the larger Fresh Kills Park, which is proposed to include active and passive recreational uses, cultural facilities, event space and restaurants, educational programming, and ecological enhancement. As the park would be a major attraction for residents of the City and the region, park elements considered for trip generation purposes were organized into six categories: city destination park, regional park, active recreation (including constructed surface/field and indoor sports), restaurants, park-related retail, and cultural facilities. In addition, many acres of the park are natural areas and would not have facilities or be programmed for access.

Large areas of the park are also proposed to be natural areas and not generate trips. These park elements, including tidal and freshwater wetlands, the waterways of Fresh Kill, Main and Richmond Creeks, the Isle of Meadows, and the large areas of landscape enhancement on the landfill mounds, are considered natural areas of the park and would not generate trips.

The projections of trip generation and trip assignments used in this SEIS is also based on the FGEIS.

PROPOSED ROAD CONNECTIONS AND TRAFFIC DIVERSIONS

As described in greater detail in Chapter 1, "Project Description," the proposed Fresh Kills Park project would create a circulation pattern of park roads, with connections to the Northbound and Southbound West Shore Expressway, that, in addition to providing park access, would provide a direct connection between Richmond Avenue on the east and the West Shore Expressway (northbound and southbound lanes) on the west. Since there is currently no such connection, the proposed park roads would create new traffic diversions through the park that would provide local traffic relief. Thus, traffic currently traveling north- and southbound along Richmond Avenue could use these roads to access the West Shore Expressway, and also the reverse travel pattern is true. This traffic would be in addition to the project generated trips discussed above.

C. EXISTING CONDITIONS

DATA COLLECTION

As described above, baseline conditions for this analysis are based on the Fresh Kills Park FGEIS (March 2009) baseline conditions data based on the methodology described above.

STREET NETWORK DESCRIPTION

The traffic study area consists of major collector streets that would connect to the proposed East Park roads. An inventory of the study area intersections was performed to gather information on traffic signal timing, phasing and cycle lengths, street and curbside signage, bus stop locations, pavement markings, and lane dimensions. Official signal timing data obtained from NYCDOT were incorporated into the capacity analyses. A description of the major roadway corridors that comprise the study area is presented below.

RICHMOND AVENUE

Richmond Avenue is a major north-south City arterial, connecting Hylan Boulevard on the south to Forest Avenue on the north. Within the study area, Richmond Avenue is generally four to five lanes wide in each direction (including turning lanes) and ranges in width from 120 to 130 feet. In addition to the north-south connections, Richmond Avenue provides access to the Staten Island Mall, located due east of the project site. Intersections on Richmond Avenue are primarily signalized with varying signal cycle lengths during different times of the day. There are also a number of bus routes that operate on Richmond Avenue, including local service, limited stop service, and express service to Manhattan. These routes include the S40, S44, S55, S56, S59, S61, S94, S84, S94, X10, X11, X17, X19, and X31. Data collected for the FGEIS (May 2007) show that northbound Richmond Avenue handles up to 3,250 vehicles per hour (vph) during the weekday peak hours and up to 3,700 vph during the weekend peak hours; southbound Richmond Avenue handles up to 3,000 vph during the weekday peak hours and up to 2,700 vph during the weekend peak hours.

RICHMOND HILL ROAD

Richmond Hill Road operates east-west between Richmond Avenue and Richmond Road, and provides access to the Staten Island Mall. Within the study area, Richmond Hill Road is a two-way roadway that ranges in width from approximately 35 to 55 feet. It serves two-way weekday peak hour traffic volumes of up to approximately 1,300 vph and weekend peak hour traffic volumes of up to approximately 1,450 vph.

FOREST HILL ROAD

Forest Hill Road operates north-south between Richmond Avenue and Willowbrook Road. Within the study area, Forest Hill Road is a two-way roadway that ranges in width from approximately 33 to 53 feet. It serves two-way weekday peak hour traffic volumes of up to approximately 1,800 vph and weekend peak hour traffic volumes of up to approximately 1,600 vph.

BASELINE TRAFFIC CONDITIONS

Traffic under the existing conditions is presented in Figures 16-2 through 16-6 and in Table 16-2. Table 16-2 summarizes the HCS capacity analysis results for the five analyzed intersections, for the five analysis peak hours, three weekdays and two weekends. As presented in the tables, three (3) of the five (5) analyzed intersections have one or more congested lane groups (worse than mid-LOS D) in one or more peak hours. The AM peak hour has three (3) intersections with one or more congested lane groups. There are two (2) intersections with one or more congested lane groups during the other four analysis peak hours. Locations with notable service constraints, i.e., those operating at worse than mid-LOS D (delay in excess of 45.0 seconds for signalized intersections and 30.0 seconds for unsignalized intersections), are described below for the major corridors.

RICHMOND AVENUE CORRIDOR

Along the Richmond Avenue corridor, the three analyzed intersections currently handle high traffic volumes. Intersections that experience congested conditions in one or more lane groups in the weekday AM peak hour include Richmond Avenue at Richmond Hill Road (southbound left-turn movement), and Richmond Avenue at Forest Hill Road (northbound right-turn movement).

In the weekday midday peak hour, the intersection that experiences congested conditions at one or more lane groups include Richmond Avenue at Richmond Hill Road (southbound left-turn movement). In the weekday PM peak hour this intersection also experiences congested conditions in one or more lane groups (southbound approach).

In the weekend midday peak hour, intersections that experience congested conditions at one or more lane groups include Richmond Avenue at Richmond Hill Road (southbound left-turn movement). In the weekend PM peak hour this intersection also experiences congested conditions at one or more lane groups (southbound left-turn movement).

RICHMOND HILL ROAD CORRIDOR

Richmond Hill Road Corridor begins on the west with the busy intersection of Richmond Hill Road and Richmond Avenue. Currently, this is a T intersection with only a driveway from the local commercial use that provides a limited volume of traffic. The majority of the traffic is along the Richmond Avenue corridor (see the discussion above) with significant volumes of traffic in all peak hours. Vehicles approaching the intersection from Richmond Hill Road currently turn right (northbound on Richmond Avenue) or left (southbound).

At the intersection of Forest Hill Road and Richmond Hill Road, the northbound through- and right-turn and southbound left-turn movements experience congested conditions during all five peak hours. In addition, the westbound approach experiences congestion during the weekday and weekend midday and PM peak hours. Also, the southbound through- and right-turn lane group experiences congestion during the weekday midday and PM, and weekend midday peak hours. The northbound left-turn movement would also operate unacceptably during the weekday PM peak hour.

Table 16-2
2007 Existing Conditions Level of Service Analysis

Intersection	Weekday Peak Hours												Weekend Peak Hours							
	AM				Midday				PM				Midday				PM			
	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	Lane Group	v/c Ratio	Delay (sec)	LOS
Richmond Hill Road and Forest Hill Road																				
Eastbound	L	0.23	14.6	B	L	0.46	17.5	B	L	0.44	17.5	B	L	0.49	18.1	B	L	0.47	17.7	B
	TR	0.48	14.6	B	TR	0.50	14.7	B	TR	0.55	15.7	B	TR	0.54	15.5	B	TR	0.55	15.6	B
Westbound	LTR	0.90	43.8	D	LTR	0.91	45.0	D	LTR	1.00	61.3	E	LTR	1.05	75.7	E	LTR	1.03	72.4	E
Northbound	L	0.13	21.5	C	L	0.34	32.9	C	L	0.52	46.1	D	L	0.13	23.4	C	L	0.30	27.9	C
	TR	0.91	48.4	D	TR	0.96	57.5	E	TR	1.01	69.4	E	TR	0.95	55.2	E	TR	0.92	50.8	D
Southbound	L	1.05	120.7	F	L	1.05	116.9	F	L	1.05	126.2	F	L	1.05	136.2	F	L	1.05	133.7	F
	TR	0.64	30.0	C	TR	1.00	66.5	E	TR	1.02	71.1	E	TR	1.04	78.2	E	TR	0.86	42.7	D
	Intersection		40.6	D	Intersection		49.5	D	Intersection		56.7	E	Intersection		57.7	E	Intersection		47.6	D
Richmond Hill Road and Richmond Avenue																				
Eastbound	LTR	0.01	25.8	C	LTR	0.01	27.3	C	LTR	0.01	27.3	C	LTR	0.01	27.3	C	LTR	0.01	27.3	C
Westbound	L	0.21	28.7	C	L	0.53	38.3	D	L	0.42	34.9	C	L	0.54	39.0	D	L	0.38	33.8	C
	LT	0.13	27.4	C	LT	0.44	35.4	D	LT	0.41	34.6	C	LT	0.53	38.4	D	LT	0.33	32.7	C
	R	0.74	28.8	C	R	0.75	29.1	C	R	0.63	20.6	C	R	0.87	38.5	D	R	0.85	35.7	D
Northbound	L	0.00	32.9	C	L	0.00	31.3	C	L	0.00	27.2	C	L	0.00	31.3	C	L	0.00	31.3	C
	T	0.84	22.9	C	T	0.59	17.6	B	T	0.66	22.8	C	T	0.73	19.8	C	T	0.68	19.0	B
	R	0.14	13.7	B	R	0.26	15.0	B	R	0.33	20.0-	B	R	0.33	15.9	B	R	0.31	15.6	B
Southbound	L	1.05	109.5	F	L	1.05	99.3	F	L	1.05	92.5	F	L	1.05	98.1	F	L	1.05	106.8	F
	TR	0.41	15.6	B	TR	0.63	18.1	B	TR	1.05	59.4	E	TR	0.85	23.1	C	TR	0.72	19.5	B
	Intersection		26.9	C	Intersection		26.2	C	Intersection		46.8	D	Intersection		28.8	C	Intersection		26.3	C
Yukon Avenue and Richmond Avenue																				
Westbound	LR	0.09	26.7	C	LR	0.30	31.1	C	LR	0.27	29.0	C	LR	0.50	35.0+	D	LR	0.25	30.3	C
Northbound	T	0.86	19.4	B	T	0.58	13.7	B	T	0.64	14.5	B	T	0.76	16.4	B	T	0.79	17.0	B
Southbound	L	0.19	39.7	D	L	0.20	37.6	D	L	0.18	39.4	D	L	0.21	37.8	D	L	0.12	36.7	D
	T	0.32	3.9	A	T	0.56	4.1	A	T	0.75	6.9	A	T	0.63	4.5	A	T	0.50	3.8	A
	Intersection		14.9	B	Intersection		9.4	A	Intersection		10.6	B	Intersection		11.5	B	Intersection		11.6	B
Forest Hill Road and Richmond Avenue																				
Westbound	L	0.44	26.0	C	L	0.54	27.4	C	L	0.61	29.2	C	L	0.64	30.0	C	L	0.54	27.6	C
	LR	0.56	28.0	C	LR	0.69	31.8	C	LR	0.79	37.4	D	LR	0.82	39.3	D	LR	0.68	31.5	C
Northbound	T	0.73	10.8	B	T	0.53	8.4	A	T	0.70	10.3	B	T	0.74	10.8	B	T	0.60	9.1	A
	R	1.01	49.2	D	R	0.49	10.0-	A	R	0.85	22.6	C	R	0.78	16.9	B	R	0.77	17.2	B
Southbound	L	0.08	7.5	A	L	0.13	8.6	A	L	0.43	22.9	C	L	0.35	18.5	B	L	0.47	26.4	C
	T	0.30	6.8	A	T	0.62	9.3	A	T	0.87	13.8	B	T	0.52	8.3	A	T	0.61	9.1	A
	Intersection		17.4	B	Intersection		11.5	B	Intersection		15.4	B	Intersection		13.7	B	Intersection		12.3	B
Yukon Avenue and Forest Hill Road																				
Eastbound	L	0.05	19.8	B	L	0.18	21.3	C	L	0.16	21.0	C	L	0.22	21.7	C	L	0.15	20.9	C
Northbound	LT	0.68	18.8	B	LT	0.62	17.5	B	LT	0.71	20.4	C	LT	0.58	16.4	B	LT	0.53	15.3	B
Southbound	T	0.37	12.8	B	T	0.52	15.0	B	T	0.54	15.3	B	T	0.52	15.0	B	T	0.51	14.7	B
	R	0.08	9.9	A	R	0.14	10.4	B	R	0.11	10.2	B	R	0.15	10.6	B	R	0.10	10.1	B
	Intersection		16.2	B	Intersection		16.2	B	Intersection		17.6	B	Intersection		15.7	B	Intersection		15.1	B

Notes: L = Left Turn, T = Through, R = Right Turn, DefL = Defacto Left Turn; LOS = Level of Service.

FOREST HILL ROAD CORRIDOR

There are no major congestion areas along this corridor, with the exception of the above described intersection with Richmond Hill Road.

D. THE FUTURE WITHOUT THE PROPOSED PROJECT (2016 AND 2036)

2016 ANALYSIS

Traffic under the future 2016 conditions is presented in Figures 16-7 through 16-11 and Tables 16-3a and 16-3b. As shown in the tables, with continued growth in travel demand, intersections that were congested under existing conditions would worsen, and there would be additional locations that would become congested in one or more peak hours by 2016.

As shown in Tables 16-3a and 16-3b, under the 2016 No Build conditions, of the 5 analyzed intersections, 3 intersections would experience congestion on one or more movements in the AM peak hour (compared with 3 intersections under the Existing conditions), 2 intersections in the midday peak hour (compared with 2 intersections under Existing conditions), 4 intersections in the PM peak hour (compared with 2 intersections under Existing conditions), 3 intersections in the weekend midday peak hour (compared with 2 under Existing conditions), and 2 intersections in the weekend PM peak hour (compared with 2 intersections under Existing conditions). Newly congested intersections are discussed as follows:

RICHMOND AVENUE

Along the Richmond Avenue Corridor, there would be additional traffic congestion during the weekday PM and weekend midday peak hours at the intersection with Forest Hill Road.

FOREST HILL ROAD

Along the Forest Hill Road Corridor, there would be one additionally congested intersection at Yukon Avenue during the weekday PM peak hour.

2036 ANALYSIS

Traffic under the future 2036 conditions is presented in Figures 16-12 through 16-16. Tables 16-4a and 16-4b summarize the HCS capacity analysis results for the five analyzed intersections for the five analysis peak hours. As shown in the tables, with continued growth in travel demand, levels of service at intersections that were congested under existing conditions would decline, and there would be additional locations that would become congested in one or more peak hours by 2036.

Table 16-3a
2007 Existing and 2016 No Build Conditions Level of Service Analysis
Weekday Peak Hours

	Weekday AM								Weekday Midday								Weekday PM							
	2007 Existing				2016 No Build				2007 Existing				2016 No Build				2007 Existing				2016 No Build			
Intersection	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	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS
Richmond Hill Road and Forest Hill Road																								
Eastbound	L	0.23	14.6	B	L	0.33	16.9	B	L	0.46	17.5	B	L	0.60	22.1	C	L	0.44	17.5	B	L	0.57	21.8	C
	TR	0.48	14.6	B	TR	0.57	16.2	B	TR	0.50	14.7	B	TR	0.59	16.4	B	TR	0.55	15.7	B	TR	0.65	18.0	B
Westbound	LTR	0.90	43.8	D	LTR	1.09	88.6	F	LTR	0.91	45.0	D	LTR	1.11	98.1	F	LTR	1.00	61.3	E	LTR	1.22	138.3	F
Northbound	L	0.13	21.5	C	L	0.27	27.0	C	L	0.34	32.9	C	L	0.41	37.5	D	L	0.52	46.1	D	L	0.63	56.2	E
	TR	0.91	48.4	D	TR	1.13	108.1	F	TR	0.96	57.5	E	TR	1.20	136.5	F	TR	1.01	69.4	E	TR	1.28	168.4	F
Southbound	L	1.05	120.7	F	L	1.52	302.7	F	L	1.05	116.9	F	L	1.25	187.5	F	L	1.05	126.2	F	L	1.24	191.4	F
	TR	0.64	30.0	C	TR	0.86	42.2	D	TR	1.00	66.5	E	TR	1.27	165.7	F	TR	1.02	71.1	E	TR	1.30	175.2	F
	Intersection		40.6	D	Intersection		81.0	F	Intersection		49.5	D	Intersection		108.0	F	Intersection		56.7	E	Intersection		125.7	F
Richmond Hill Road and Richmond Avenue																								
Eastbound	LTR	0.01	25.8	C	LTR	0.01	25.8	C	LTR	0.01	27.3	C	LTR	0.01	27.3	C	LTR	0.01	27.3	C	LTR	0.01	27.3	C
Westbound	L	0.21	28.7	C	L	0.20	28.6	C	L	0.53	38.3	D	L	0.56	39.3	D	L	0.42	34.9	C	L	0.51	37.5	D
	LT	0.13	27.4	C	LT	0.20	28.5	C	LT	0.44	35.4	D	LT	0.59	40.6	D	LT	0.41	34.6	C	LT	0.47	36.4	D
	R	0.74	28.8	C	R	0.89	40.2	D	R	0.75	29.1	C	R	0.90	42.3	D	R	0.63	20.6	C	R	0.76	25.6	C
Northbound	L	0.00	32.9	C	L	0.00	32.9	C	L	0.00	31.3	C	L	0.00	31.3	C	L	0.00	27.2	C	L	0.00	27.2	C
	T	0.84	22.9	C	T	1.01	41.2	D	T	0.59	17.6	B	T	0.72	19.6	B	T	0.66	22.8	C	T	0.80	26.0	C
	R	0.14	13.7	B	R	0.16	13.9	B	R	0.26	15.0	B	R	0.30	15.6	B	R	0.33	20.0-	B	R	0.39	21.0	C
Southbound	L	1.05	109.5	F	L	1.29	195.0	F	L	1.05	99.3	F	L	1.26	174.8	F	L	1.05	92.5	F	L	1.26	169.1	F
	TR	0.41	15.6	B	TR	0.50	16.6	B	TR	0.63	18.1	B	TR	0.75	20.2	C	TR	1.05	59.4	E	TR	1.25	142.6	F
	Intersection		26.9	C	Intersection		43.4	D	Intersection		26.2	C	Intersection		35.0+	D	Intersection		46.8	D	Intersection		94.8	F
Yukon Avenue and Richmond Avenue																								
Westbound	LR	0.09	26.7	C	LR	0.11	26.9	C	LR	0.30	31.1	C	LR	0.36	32.0	C	LR	0.27	29.0	C	LR	0.31	29.7	C
Northbound	T	0.86	19.4	B	T	1.03	41.7	D	T	0.58	13.7	B	T	0.70	15.3	B	T	0.64	14.5	B	T	0.78	16.9	B
Southbound	L	0.19	39.7	D	L	0.22	40.2	D	L	0.20	37.6	D	L	0.23	38.1	D	L	0.18	39.4	D	L	0.21	39.9	D
	T	0.32	3.9	A	T	0.39	4.2	A	T	0.56	4.1	A	T	0.66	4.8	A	T	0.75	6.9	A	T	0.89	10.1	B
	Intersection		14.9	B	Intersection		29.7	C	Intersection		9.4	A	Intersection		10.6	B	Intersection		10.6	B	Intersection		13.4	B
Forest Hill Road and Richmond Avenue																								
Westbound	L	0.44	26.0	C	L	0.56	27.9	C	L	0.54	27.4	C	L	0.66	30.7	C	L	0.61	29.2	C	L	0.75	34.8	C
	LR	0.56	28.0	C	LR	0.71	32.9	C	LR	0.69	31.8	C	LR	0.85	42.7	D	LR	0.79	37.4	D	LR	0.97	63.6	E
Northbound	T	0.73	10.8	B	T	0.86	13.9	B	T	0.53	8.4	A	T	0.63	9.4	A	T	0.70	10.3	B	T	0.83	12.8	B
	R	1.01	49.2	D	R	1.24	135.0	F	R	0.49	10.0-	A	R	0.63	12.8	B	R	0.85	22.6	C	R	1.06	64.3	E
Southbound	L	0.08	7.5	A	L	0.09	7.9	A	L	0.13	8.6	A	L	0.17	10.8	B	L	0.43	22.9	C	L	0.50	28.3	C
	T	0.30	6.8	A	T	0.36	7.2	A	T	0.62	9.3	A	T	0.73	10.7	B	T	0.87	13.8	B	T	1.02	34.2	C
	Intersection		17.4	B	Intersection		33.0	C	Intersection		11.5	B	Intersection		13.7	B	Intersection		15.4	B	Intersection		31.2	C
Yukon Avenue and Forest Hill Road																								
Eastbound	L	0.05	19.8	B	L	0.05	19.9	B	L	0.18	21.3	C	L	0.22	21.7	C	L	0.16	21.0	C	L	0.19	21.4	C
Northbound	LT	0.68	18.8	B	LT	0.84	26.4	C	LT	0.62	17.5	B	LT	0.86	30.2	C	LT	0.71	20.4	C	LT	0.99	51.8	D
Southbound	T	0.37	12.8	B	T	0.48	14.4	B	T	0.52	15.0	B	T	0.65	17.7	B	T	0.54	15.3	B	T	0.67	18.1	B
	R	0.08	9.9	A	R	0.09	10.0+	B	R	0.14	10.4	B	R	0.16	10.6	B	R	0.11	10.2	B	R	0.13	10.4	B
	Intersection		16.2	B	Intersection		21.0	C	Intersection		16.2	B	Intersection		22.5	C	Intersection		17.6	B	Intersection		32.9	C

Notes: L = Left Turn, T = Through, R = Right Turn, DefL = Defacto Left Turn; LOS = Level of Service.

Table 16-3b
2007 Existing and 2016 No Build Conditions Level of Service Analysis
Weekend Peak Hours

Intersection	Weekend Midday								Weekend PM							
	2007 Existing				2016 No Build				2007 Existing				2016 No Build			
	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
Richmond Hill Road and Forest Hill Road																
Eastbound	L	0.49	18.1	B	L	0.64	22.9	C	L	0.47	17.7	B	L	0.62	22.2	C
	TR	0.54	15.5	B	TR	0.64	17.7	B	TR	0.55	15.6	B	TR	0.65	17.9	B
Westbound	LTR	1.05	75.7	E	LTR	1.29	171.9	F	LTR	1.03	72.4	E	LTR	1.28	164.4	F
Northbound	L	0.13	23.4	C	L	0.15	24.3	C	L	0.30	27.9	C	L	0.54	47.2	D
	TR	0.95	55.2	E	TR	1.20	133.6	F	TR	0.92	50.8	D	TR	1.17	123.2	F
Southbound	L	1.05	136.2	F	L	1.32	233.0	F	L	1.05	133.7	F	L	1.51	312.7	F
	TR	1.04	78.2	E	TR	1.33	191.1	F	TR	0.86	42.7	D	TR	1.12	102.3	F
	Intersection		57.7	E	Intersection		128.8	F	Intersection		47.6	D	Intersection		105.9	F
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	LTR	0.01	27.3	C
Westbound	L	0.54	39.0	D	L	0.62	42.3	D	L	0.38	33.8	C	L	0.45	35.7	D
	LT	0.53	38.4	D	LT	0.65	43.9	D	LT	0.33	32.7	C	LT	0.38	34.0	C
	R	0.87	38.5	D	R	1.05	76.2	E	R	0.85	35.7	D	R	1.02	65.8	E
Northbound	L	0.00	31.3	C	L	0.00	31.3	C	L	0.00	31.3	C	L	0.00	31.3	C
	T	0.73	19.8	C	T	0.88	24.5	C	T	0.68	19.0	B	T	0.83	22.3	C
	R	0.33	15.9	B	R	0.39	16.8	B	R	0.31	15.6	B	R	0.36	16.4	B
Southbound	L	1.05	98.1	F	L	1.27	180.0	F	L	1.05	106.8	F	L	1.28	188.5	F
	TR	0.85	23.1	C	TR	1.02	44.0	D	TR	0.72	19.5	B	TR	0.86	23.3	C
	Intersection		28.8	C	Intersection		48.2	D	Intersection		26.3	C	Intersection		36.9	D
Yukon Avenue and Richmond Avenue																
Westbound	LR	0.50	35.0+	D	LR	0.60	37.8	D	LR	0.25	30.3	C	LR	0.30	31.1	C
Northbound	T	0.76	16.4	B	T	0.91	21.8	C	T	0.79	17.0	B	T	0.95	24.5	C
Southbound	L	0.21	37.8	D	L	0.25	38.3	D	L	0.12	36.7	D	L	0.14	36.9	D
	T	0.63	4.5	A	T	0.75	5.7	A	T	0.50	3.8	A	T	0.60	4.3	A
	Intersection		11.5	B	Intersection		14.7	B	Intersection		11.6	B	Intersection		15.9	B
Forest Hill Road and Richmond Avenue																
Westbound	L	0.64	30.0	C	L	0.80	37.8	D	L	0.54	27.6	C	L	0.68	31.5	C
	LR	0.82	39.3	D	LR	1.01	74.3	E	LR	0.68	31.5	C	LR	0.85	43.3	D
Northbound	T	0.74	10.8	B	T	0.88	14.3	B	T	0.60	9.1	A	T	0.72	10.5	B
	R	0.78	16.9	B	R	0.98	38.6	D	R	0.77	17.2	B	R	0.98	40.8	D
Southbound	L	0.35	18.5	B	L	0.41	22.1	C	L	0.47	26.4	C	L	0.56	33.6	C
	T	0.52	8.3	A	T	0.62	9.3	A	T	0.61	9.1	A	T	0.72	10.5	B
	Intersection		13.7	B	Intersection		21.0	C	Intersection		12.3	B	Intersection		17.0	B
Yukon Avenue and Forest Hill Road																
Eastbound	L	0.22	21.7	C	L	0.26	22.3	C	L	0.15	20.9	C	L	0.18	21.3	C
Northbound	LT	0.58	16.4	B	LT	0.77	23.0	C	LT	0.53	15.3	B	LT	0.67	18.8	B
Southbound	T	0.52	15.0	B	T	0.65	17.7	B	T	0.51	14.7	B	T	0.63	17.1	B
	R	0.15	10.6	B	R	0.18	10.8	B	R	0.10	10.1	B	R	0.12	10.3	B
	Intersection		15.7	B	Intersection		19.5	B	Intersection		15.1	B	Intersection		17.6	B

Notes: L = Left Turn, T = Through, R = Right Turn, DefL = Defacto Left Turn; LOS = Level of Service.

Table 16-4a
2007 Existing and 2036 No Build Conditions Level of Service Analysis
Weekday Peak Hours

Intersection	Weekday AM								Weekday Midday								Weekday PM							
	2007 Existing				2036 No Build				2007 Existing				2036 No Build				2007 Existing				2036 No Build			
	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c atio	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	Lane Group	v/c Ratio	Delay (sec)	LOS
Richmond Hill Road and Forest Hill Road																								
Eastbound	L	0.23	14.6	B	L	0.42	20.1	C	L	0.46	17.5	B	L	0.78	33.1	C	L	0.44	17.5	B	L	0.74	30.8	C
	TR	0.48	14.6	B	TR	0.68	19.2	B	TR	0.50	14.7	B	TR	0.70	19.6	B	TR	0.55	15.7	B	TR	0.78	22.6	C
Westbound	LTR	0.90	43.8	D	LTR	1.34	192.0	F	LTR	0.91	45.0	D	LTR	1.39	213.2	F	LTR	1.00	61.3	E	LTR	1.58	298.0	F
Northbound	L	0.13	21.5	C	L	0.49	43.0	D	L	0.34	32.9	C	L	0.49	43.0	D	L	0.52	46.1	D	L	0.75	73.5	E
	TR	0.91	48.4	D	TR	1.34	195.6	F	TR	0.96	57.5	E	TR	1.43	232.1	F	TR	1.01	69.4	E	TR	1.52	271.7	F
Southbound	L	1.05	120.7	F	L	1.83	435.7	F	L	1.05	116.9	F	L	1.51	289.7	F	L	1.05	126.2	F	L	1.49	288.0	F
	TR	0.64	30.0	C	TR	1.01	68.9	E	TR	1.00	66.5	E	TR	1.51	267.4	F	TR	1.02	71.1	E	TR	1.54	279.5	F
	Intersection		40.6	D	Intersection		144.5	F	Intersection		49.5	D	Intersection		186.6	F	Intersection		56.7	E	Intersection		216.4	F
Richmond Hill Road and Richmond Avenue																								
Eastbound	LTR	0.01	25.8	C	LTR	0.01	25.8	C	LTR	0.01	27.3	C	LTR	0.01	27.3	C	LTR	0.01	27.3	C	LTR	0.01	27.3	C
Westbound	L	0.21	28.7	C	L	0.29	30.2	C	L	0.53	38.3	D	L	0.66	43.9	D	L	0.42	34.9	C	L	0.57	39.9	D
	LT	0.13	27.4	C	LT	0.19	28.3	C	LT	0.44	35.4	D	LT	0.72	47.9	D	LT	0.41	34.6	C	LT	0.60	41.3	D
	R	0.74	28.8	C	R	1.06	79.3	E	R	0.75	29.1	C	R	1.08	85.2	F	R	0.63	20.6	C	R	0.90	37.9	D
Northbound	L	0.00	32.9	C	L	0.00	32.9	C	L	0.00	31.3	C	L	0.00	31.3	C	L	0.00	27.2	C	L	0.00	27.2	C
	T	0.84	22.9	C	T	1.21	118.1	F	T	0.59	17.6	B	T	0.86	23.4	C	T	0.66	22.8	C	T	0.96	36.5	D
	R	0.14	13.7	B	R	0.19	14.2	B	R	0.26	15.0	B	R	0.37	16.4	B	R	0.33	20.0-	B	R	0.47	22.5	C
Southbound	L	1.05	109.5	F	L	1.53	296.9	F	L	1.05	99.3	F	L	1.50	279.4	F	L	1.05	92.5	F	L	1.51	275.4	F
	TR	0.41	15.6	B	TR	0.60	17.8	B	TR	0.63	18.1	B	TR	0.90	25.3	C	TR	1.05	59.4	E	TR	1.50	253.2	F
	Intersection		26.9	C	Intersection		95.0	F	Intersection		26.2	C	Intersection		51.0	D	Intersection		46.8	D	Intersection		161.7	F
Yukon Avenue and Richmond Avenue																								
Westbound	LR	0.09	26.7	C	LR	0.13	27.1	C	LR	0.30	31.1	C	LR	0.43	33.4	C	LR	0.27	29.0	C	LR	0.38	30.8	C
Northbound	T	0.86	19.4	B	T	1.23	123.8	F	T	0.58	13.7	B	T	0.84	18.5	B	T	0.64	14.5	B	T	0.93	23.4	C
Southbound	L	0.19	39.7	D	L	0.27	40.9	D	L	0.20	37.6	D	L	0.28	38.8	D	L	0.18	39.4	D	L	0.26	40.5	D
	T	0.32	3.9	A	T	0.46	4.6	A	T	0.56	4.1	A	T	0.80	6.4	A	T	0.75	6.9	A	T	1.06	43.4	D
	Intersection		14.9	B	Intersection		84.2	F	Intersection		9.4	A	Intersection		12.8	B	Intersection		10.6	B	Intersection		35.5	D
Forest Hill Road and Richmond Avenue																								
Westbound	L	0.44	26.0	C	L	0.66	30.8	C	L	0.54	27.4	C	L	0.79	37.1	D	L	0.61	29.2	C	L	0.90	48.8	D
	LR	0.56	28.0	C	LR	0.84	42.1	D	LR	0.69	31.8	C	LR	1.01	74.6	E	LR	0.79	37.4	D	LR	1.16	124.0	F
Northbound	T	0.73	10.8	B	T	1.03	37.6	D	T	0.53	8.4	A	T	0.76	11.1	B	T	0.70	10.3	B	T	1.00	27.1	C
	R	1.01	49.2	D	R	1.48	243.5	F	R	0.49	10.0-	A	R	0.75	16.5	B	R	0.85	22.6	C	R	1.26	142.1	F
Southbound	L	0.08	7.5	A	L	0.10	8.3	A	L	0.13	8.6	A	L	0.21	12.2	B	L	0.43	22.9	C	L	0.60	37.4	D
	T	0.30	6.8	A	T	0.43	7.7	A	T	0.62	9.3	A	T	0.88	14.3	B	T	0.87	13.8	B	T	1.23	118.1	F
	Intersection		17.4	B	Intersection		62.7	E	Intersection		11.5	B	Intersection		18.8	B	Intersection		15.4	B	Intersection		85.2	F
Yukon Avenue and Forest Hill Road																								
Eastbound	L	0.05	19.8	B	L	0.07	20.0+	C	L	0.18	21.3	C	L	0.26	22.3	C	L	0.16	21.0	C	L	0.22	21.8	C
Northbound	LT	0.68	18.8	B	LT	1.08	75.0	E	LT	0.62	17.5	B	LT	1.19	122.7	F	LT	0.71	20.4	C	LT	1.37	198.2	F
Southbound	T	0.37	12.8	B	T	0.57	15.9	B	T	0.52	15.0	B	T	0.77	21.9	C	T	0.54	15.3	B	T	0.79	22.8	C
	R	0.08	9.9	A	R	0.11	10.2	B	R	0.14	10.4	B	R	0.19	10.9	B	R	0.11	10.2	B	R	0.16	10.6	B
	Intersection		16.2	B	Intersection		48.7	D	Intersection		16.2	B	Intersection		61.9	E	Intersection		17.6	B	Intersection		100.3	F

Notes: L = Left Turn, T = Through, R = Right Turn, DefL = Defacto Left Turn; LOS = Level of Service.

Table 16-4b
2007 Existing and 2036 No Build Conditions Level of Service Analysis
Weekend Peak Hours

	Weekend Midday								Weekend PM							
	2007 Existing				2036 No Build				2007 Existing				2036 No Build			
Intersection	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
Richmond Hill Road and Forest Hill Road																
Eastbound	L	0.49	18.1	B	L	0.79	30.8	C	L	0.47	17.7	B	L	0.77	30.5	C
	TR	0.54	15.5	B	TR	0.77	22.1	C	TR	0.55	15.6	B	TR	0.78	22.5	C
Westbound	LTR	1.05	75.7	E	LTR	1.73	362.0	F	LTR	1.03	72.4	E	LTR	1.71	354.8	F
Northbound	L	0.13	23.4	C	L	0.17	25.3	C	L	0.30	27.9	C	L	0.64	57.7	E
	TR	0.95	55.2	E	TR	1.42	229.2	F	TR	0.92	50.8	D	TR	1.39	214.3	F
Southbound	L	1.05	136.2	F	L	1.59	340.5	F	L	1.05	133.7	F	L	1.82	440.8	F
	TR	1.04	78.2	E	TR	1.58	299.0	F	TR	0.86	42.7	D	TR	1.32	184.3	F
	Intersection		57.7	E	Intersection		225.0	F	Intersection		47.6	D	Intersection		195.1	F
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	LTR	0.01	27.3	C
Westbound	L	0.54	39.0	D	L	0.77	52.6	D	L	0.38	33.8	C	L	0.50	37.5	D
	LT	0.53	38.4	D	LT	0.75	50.5	D	LT	0.33	32.7	C	LT	0.49	37.0	D
	R	0.87	38.5	D	R	1.26	154.9	F	R	0.85	35.7	D	R	1.22	137.8	F
Northbound	L	0.00	31.3	C	L	0.00	31.3	C	L	0.00	31.3	C	L	0.00	31.3	C
	T	0.73	19.8	C	T	1.05	54.6	D	T	0.68	19.0	B	T	0.99	36.3	D
	R	0.33	15.9	B	R	0.46	18.1	B	R	0.31	15.6	B	R	0.43	17.5	B
Southbound	L	1.05	98.1	F	L	1.52	284.6	F	L	1.05	106.8	F	L	1.53	292.4	F
	TR	0.85	23.1	C	TR	1.22	124.8	F	TR	0.72	19.5	B	TR	1.03	45.8	D
	Intersection		28.8	C	Intersection		106.7	F	Intersection		26.3	C	Intersection		64.5	E
Yukon Avenue and Richmond Avenue																
Westbound	LR	0.50	35.0+	D	LR	0.72	42.9	D	LR	0.25	30.3	C	LR	0.36	32.0	C
Northbound	T	0.76	16.4	B	T	1.09	64.4	E	T	0.79	17.0	B	T	1.13	81.9	F
Southbound	L	0.21	37.8	D	L	0.30	39.0	D	L	0.12	36.7	D	L	0.17	37.2	D
	T	0.63	4.5	A	T	0.90	9.1	A	T	0.50	3.8	A	T	0.71	5.3	A
	Intersection		11.5	B	Intersection		35.7	D	Intersection		11.6	B	Intersection		46.8	D
Forest Hill Road and Richmond Avenue																
Westbound	L	0.64	30.0	C	L	0.95	58.4	E	L	0.54	27.6	C	L	0.81	38.9	D
	LR	0.82	39.3	D	LR	1.20	141.1	F	LR	0.68	31.5	C	LR	1.02	76.0	E
Northbound	T	0.74	10.8	B	T	1.05	43.6	D	T	0.60	9.1	A	T	0.86	13.5	B
	R	0.78	16.9	B	R	1.16	98.0	F	R	0.77	17.2	B	R	1.16	100.1	F
Southbound	L	0.35	18.5	B	L	0.50	28.3	C	L	0.47	26.4	C	L	0.66	44.5	D
	T	0.52	8.3	A	T	0.75	10.9	B	T	0.61	9.1	A	T	0.87	13.6	B
	Intersection		13.7	B	Intersection		46.8	D	Intersection		12.3	B	Intersection		28.1	C
Yukon Avenue and Forest Hill Road																
Eastbound	L	0.22	21.7	C	L	0.31	23.0	C	L	0.15	20.9	C	L	0.22	21.7	C
Northbound	LT	0.58	16.4	B	LT	1.06	70.1	E	LT	0.53	15.3	B	LT	0.91	34.9	C
Southbound	T	0.52	15.0	B	T	0.77	21.8	C	T	0.51	14.7	B	T	0.75	20.8	C
	R	0.15	10.6	B	R	0.22	11.2	B	R	0.10	10.1	B	R	0.15	10.5	B
	Intersection		15.7	B	Intersection		39.6	D	Intersection		15.1	B	Intersection		25.7	C

Notes: L = Left Turn, T = Through, R = Right Turn, DefL = Defacto Left Turn; LOS = Level of Service.

As shown in Tables 16-4a and 16-4b, under the 2036 No Build conditions, of the 5 analyzed intersections, all 5 intersections would experience congestion on one or more movements in the AM peak hour (compared with 3 intersections under Existing conditions), 4 intersections in the midday peak hour (compared with 2 intersections under Existing conditions), 4 intersections in the PM peak hour (compared with 2 intersections under Existing conditions), 5 intersections in the weekend midday peak hour (compared with 2 under Existing conditions), and 4 intersections in the weekend PM peak hour (compared with 2 intersections under Existing conditions). Newly congested intersections are discussed as follows:

RICHMOND AVENUE

Along the Richmond Avenue Corridor, there would be one additionally congested intersection in the AM peak hour at Yukon Avenue. During the weekday midday peak hour there would be one additionally congested intersection at Forest Hill Road. During the weekday PM peak hour there would be one additionally congested intersection at Forest Hill Road. In the weekend midday and PM peak hours, there would be two additionally congested intersections at Yukon Avenue and Forest Hill Road.

FOREST HILL ROAD

Along the Forest Hill Road Corridor, there would be one additionally congested intersection at Yukon Avenue. The intersection at Yukon Avenue would be congested during all peak hours except the weekend PM peak hour.

E. THE FUTURE WITH THE PROPOSED PROJECT

PROPOSED ROAD EMBANKMENT (2011)

While it is assumed that by 2011 the landfill cover in East Park would be modified to create a new embankment with DSNY landfill service roads, the roads would not be improved as publicly accessible roads. Therefore, this condition does not generate any new traffic pattern or diversions and traffic conditions at the analyzed intersections would therefore be the same as the "Future Without the Proposed Project" described above.

YUKON AVENUE CONNECTION (2016)

ROAD DESCRIPTION

By 2016 it is assumed that a two-lane, two-way road would cross Landfill Section 6/7 to connect at Yukon Avenue. Chapter 1 "Project Description" describes the proposed intersection design.

TRAFFIC IMPACTS

Traffic Diversions

As discussed above, the Yukon Avenue Connection assumes one park connection to Richmond Avenue for vehicular traffic at the intersection of Yukon Avenue and Richmond Avenue. To develop project-related traffic volumes for the 2016 project condition, traffic diversion patterns from the Fresh Kills Park FGEIS were modified to account for a single connection at this location.

Park Trip Assignments

In the 2016 analysis year, there are no modifications to the Fresh Kill Park development program. As presented in the FGEIS the total number of project-generated vehicular trips remains unchanged. Based on the proximity of Yukon Avenue to Forest Hill Road, the inbound and outbound vehicular trip assignments identified for the intersection of Forest Hill Road and Richmond Avenue for the 2016 project condition presented in the FGEIS were applied to the intersection of Yukon Avenue and Richmond Avenue for this SEIS.

Traffic Impacts

Traffic volumes in 2016 with the Yukon Avenue Connection in place are presented in Figures 16-17 through 16-21. Tables 16-5a and 16-5b present the HCS capacity analysis results for the five (5) analyzed intersections for the year 2016 weekday and weekend peak hours, respectively. Table 16-6 summarizes the impacted intersections.

As presented in Tables 16-5a, 16-5b, and 16-6, four (4) out of the five (5) analyzed intersections would experience significant adverse traffic impacts under the 2016 Build conditions. Specifically, the four (4) locations include the intersections of Richmond Hill Road at Forest Hill Road and Richmond Avenue, the intersection of Forest Hill Road at Richmond Avenue and the intersection of Yukon Avenue at Richmond Avenue. The weekend PM peak hour would have two (2) impacted intersections, while the remaining four analyzed peak hours would have three (3) impacted intersections each. The following provides a discussion of the impacted approaches/movements by intersection.

At the intersection of Richmond Hill Road and Forest Hill Road, the westbound approach and the northbound shared through- and right-turn movement would be impacted during all five analyzed peak hours. The southbound shared through and right-turn movement would be impacted during all peak hours except for the weekday AM peak hour.

At the intersection of Richmond Hill Road and Richmond Avenue, the southbound exclusive left-turn movement would be impacted during all five analyzed peak hours. In addition, the westbound exclusive left-turn movement and the shared left-turn and through movement would also be impacted during the weekend midday peak hour.

At the intersection of Yukon Avenue and Richmond Avenue, the newly proposed northbound left-turn movement would operate under congested (mid-LOS D or worse) conditions during all five analyzed peak hours. The newly proposed eastbound left-turn movement would operate under congested conditions during all peak hours except for the weekday AM peak hour. Moreover, the westbound approach would be impacted during the weekday and weekend midday peak hours and the southbound shared through- and right-turn movement would be impacted during the weekday PM peak hour.

At the intersection of Forest Hill Road and Richmond Avenue, the northbound right-turn movement would be impacted in the weekday AM peak hour.

Table 16-5a
2016 No Build and Build Conditions Level of Service Analysis
Weekday Peak Hours

	Weekday AM Peak Hour								Weekday Midday Peak Hour								Weekday PM Peak Hour							
	2016 No Build				2016 Build				2016 No Build				2016 Build				2016 No Build				2016 Build			
Intersection	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	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS
Richmond Hill Road and Forest Hill Road																								
Eastbound	L	0.33	16.9	B	L	0.32	16.9	B	L	0.60	22.1	C	L	0.60	21.9	C	L	0.57	21.8	C	L	0.57	21.6	C
	TR	0.57	16.2	B	TR	0.57	16.3	B	TR	0.59	16.4	B	TR	0.59	16.5	B	TR	0.65	18.0	B	TR	0.65	18.0	B
Westbound	LTR	1.09	88.6	F	LTR	1.12	101.6	F+	LTR	1.11	98.1	F	LTR	1.14	108.8	F+	LTR	1.22	138.3	F	LTR	1.25	151.4	F+
Northbound	L	0.27	27.0	C	L	0.28	27.3	C	L	0.41	37.5	D	L	0.41	37.5	D	L	0.63	56.2	E	L	0.63	56.2	E
	TR	1.13	108.1	F	TR	1.26	161.6	F+	TR	1.20	136.5	F	TR	1.39	216.5	F+	TR	1.28	168.4	F	TR	1.50	261.4	F+
Southbound	L	1.52	302.7	F	L	1.52	302.7	F	L	1.25	187.5	F	L	1.25	187.5	F	L	1.24	191.4	F	L	1.24	191.4	F
	TR	0.86	42.2	D	TR	0.86	42.7	D	TR	1.27	165.7	F	TR	1.29	170.9	F+	TR	1.30	175.2	F	TR	1.31	179.3	F+
	Intersection		81.0	F	Intersection		99.6	F	Intersection		108.0	F	Intersection		132.7	F	Intersection		125.7	F	Intersection		155.2	F
Richmond Hill Road and Richmond Avenue																								
Eastbound	LTR	0.01	25.8	C	LTR	0.01	25.8	C	LTR	0.01	27.3	C	LTR	0.01	27.3	C	LTR	0.01	27.3	C	LTR	0.01	27.3	C
Westbound	L	0.20	28.6	C	L	0.27	29.8	C	L	0.56	39.3	D	L	0.64	43.3	D	L	0.51	37.5	D	L	0.59	40.5	D
	LT	0.20	28.5	C	LT	0.26	29.6	C	LT	0.59	40.6	D	LT	0.68	45.2	D	LT	0.47	36.4	D	LT	0.55	39.1	D
	R	0.89	40.2	D	R	0.80	32.0	C	R	0.90	42.3	D	R	0.79	31.4	C	R	0.76	25.6	C	R	0.67	21.9	C
Northbound	L	0.00	32.9	C	L	0.00	32.9	C	L	0.00	31.3	C	L	0.00	31.3	C	L	0.00	27.2	C	L	0.00	27.2	C
	T	1.01	41.2	D	T	0.94	28.9	C	T	0.72	19.6	B	T	0.72	19.7	B	T	0.80	26.0	C	T	0.79	25.5	C
	R	0.16	13.9	B	R	0.16	13.9	B	R	0.30	15.6	B	R	0.31	15.6	B	R	0.39	21.0	C	R	0.40	21.1	C
Southbound	L	1.29	195.0	F	L	1.29	198.4	F+	L	1.26	174.8	F	L	1.26	177.2	F+	L	1.26	169.1	F	L	1.27	171.9	F+
	TR	0.50	16.6	B	TR	0.47	16.2	B	TR	0.75	20.2	C	TR	0.69	19.1	B	TR	1.25	142.6	F	TR	1.21	124.2	F
	Intersection		43.4	D	Intersection		36.9	D	Intersection		35.0+	D	Intersection		34.5	C	Intersection		94.8	F	Intersection		85.9	F
Yukon Avenue and Richmond Avenue																								
Eastbound					L	0.59	38.3	D					L	1.43	258.9	F					L	1.36	222.3	F
					TR	0.25	28.7	C					TR	0.46	34.3	C					TR	0.43	31.9	C
Westbound	LR	0.11	26.9	C	LTR	0.24	28.5	C	LR	0.36	32.0	C	LTR	0.73	45.6	D+	LR	0.31	29.7	C	LTR	0.51	33.4	C
Northbound					L	0.85	82.9	F					L	0.67	55.8	E					L	0.77	70.6	E
	T	1.03	41.7	D	T	0.90	21.7	C	T	0.70	15.3	B	T	0.63	14.3	B	T	0.78	16.9	B	T	0.67	15.0	B
Southbound	L	0.22	40.2	D	L	0.22	40.2	D	L	0.23	38.1	D	L	0.23	38.1	D	L	0.21	39.9	D	L	0.21	39.9	D
	T	0.39	4.2	A	TR	0.49	12.7	B	T	0.66	4.8	A	TR	0.86	19.4	B	T	0.89	10.1	B	TR	1.14	85.0	F+
	Intersection		29.7	C	Intersection		22.0	C	Intersection		10.6	B	Intersection		31.9	C	Intersection		13.4	B	Intersection		65.4	E
Forest Hill Road and Richmond Avenue																								
Westbound	L	0.56	27.9	C	L	0.52	27.1	C	L	0.66	30.7	C	L	0.61	29.2	C	L	0.75	34.8	C	L	0.70	32.1	C
	LR	0.71	32.9	C	LR	0.66	30.9	C	LR	0.85	42.7	D	LR	0.79	37.3	D	LR	0.97	63.6	E	LR	0.91	50.7	D
Northbound	T	0.86	13.9	B	T	0.79	12.0	B	T	0.63	9.4	A	T	0.60	9.1	A	T	0.83	12.8	B	T	0.78	11.6	B
	R	1.24	135.0	F	R	1.25	138.1	F+	R	0.63	12.8	B	R	0.64	12.9	B	R	1.06	64.3	E	R	1.07	65.3	E
Southbound	L	0.09	7.9	A	L	0.09	7.9	A	L	0.17	10.8	B	L	0.17	10.8	B	L	0.50	28.3	C	L	0.50	28.3	C
	T	0.36	7.2	A	T	0.32	7.0	A	T	0.73	10.7	B	T	0.66	9.7	A	T	1.02	34.2	C	T	0.95	19.3	B
	Intersection		33.0	C	Intersection		33.8	C	Intersection		13.7	B	Intersection		12.7	B	Intersection		31.2	C	Intersection		23.5	C
Yukon Avenue and Forest Hill Road																								
Eastbound	L	0.05	19.9	B	L	0.19	21.4	C	L	0.22	21.7	C	L	0.40	24.5	C	L	0.19	21.4	C	L	0.40	24.5	C
Northbound	LT	0.84	26.4	C	LT	0.83	26.3	C	LT	0.86	30.2	C	LT	0.83	27.5	C	LT	0.99	51.8	D	LT	0.96	43.3	D
Southbound	T	0.48	14.4	B	T	0.44	13.7	B	T	0.65	17.7	B	T	0.59	16.4	B	T	0.67	18.1	B	T	0.61	16.7	B
	R	0.09	10.0+	B	R	0.17	10.8	B	R	0.16	10.6	B	R	0.27	11.7	B	R	0.13	10.4	B	R	0.24	11.4	B
	Intersection		21.0	C	Intersection		20.5	C	Intersection		22.5	C	Intersection		21.0	C	Intersection		32.9	C	Intersection		27.9	C

Notes: L = Left Turn, T = Through, R = Right Turn, DefL = Defacto Left Turn; LOS = Level of Service. + implies a significant adverse impact

Table 16-5b
2016 No Build and Build Conditions Level of Service Analysis
Weekend Peak Hours

Intersection	Weekend Midday Peak Hour								Weekend PM Peak Hour							
	2016 No Build				2016 Build				2016 No Build				2016 Build			
	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
Richmond Hill Road and Forest Hill Road																
Eastbound	L	0.64	22.9	C	L	0.63	22.7	C	L	0.62	22.2	C	L	0.61	22.1	C
	TR	0.64	17.7	B	TR	0.65	17.8	B	TR	0.65	17.9	B	TR	0.66	18.1	B
Westbound	LTR	1.29	171.9	F	LTR	1.32	183.9	F+	LTR	1.28	164.4	F	LTR	1.30	176.3	F+
Northbound	L	0.15	24.3	C	L	0.15	24.3	C	L	0.54	47.2	D	L	0.54	47.2	D
	TR	1.20	133.6	F	TR	1.38	212.1	F+	TR	1.17	123.2	F	TR	1.34	194.5	F+
Southbound	L	1.32	233.0	F	L	1.32	233.0	F	L	1.51	312.7	F	L	1.51	312.7	F
	TR	1.33	191.1	F	TR	1.35	196.9	F+	TR	1.12	102.3	F	TR	1.13	107.7	F+
	Intersection		128.8	F	Intersection		151.9	F	Intersection		105.9	F	Intersection		127.4	F
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	LTR	0.01	27.3	C
Westbound	L	0.62	42.3	D	L	0.72	48.1	D+	L	0.45	35.7	D	L	0.53	38.4	D
	LT	0.65	43.9	D	LT	0.75	50.8	D+	LT	0.38	34.0	C	LT	0.48	36.6	D
	R	1.05	76.2	E	R	0.93	45.8	D	R	1.02	65.8	E	R	0.91	43.5	D
Northbound	L	0.00	31.3	C	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	0.85	23.0	C	T	0.83	22.3	C	T	0.79	21.2	C
	R	0.39	16.8	B	R	0.39	16.9	B	R	0.36	16.4	B	R	0.37	16.4	B
Southbound	L	1.27	180.0	F	L	1.29	185.7	F+	L	1.28	188.5	F	L	1.30	195.8	F+
	TR	1.02	44.0	D	TR	0.98	34.2	C	TR	0.86	23.3	C	TR	0.82	22.0	C
	Intersection		48.2	D	Intersection		41.9	D	Intersection		36.9	D	Intersection		34.7	C
Yukon Avenue and Richmond Avenue																
Eastbound					L	1.71	381.9	F					L	1.21	165.9	F
					TR	0.43	33.6	C					TR	0.41	33.1	C
Westbound	LR	0.60	37.8	D	LTR	1.35	214.8	F+	LR	0.30	31.1	C	LTR	0.60	38.4	D
Northbound					L	0.77	64.7	E					L	0.82	71.2	E
	T	0.91	21.8	C	T	0.81	17.6	B	T	0.95	24.5	C	T	0.85	18.6	B
Southbound	L	0.25	38.3	D	L	0.25	38.3	D	L	0.14	36.9	D	L	0.14	36.9	D
	T	0.75	5.7	A	TR	1.00	33.2	C	T	0.60	4.3	A	TR	0.79	17.1	B
	Intersection		14.7	B	Intersection		51.0	D	Intersection		15.9	B	Intersection		26.4	C
Forest Hill Road and Richmond Avenue																
Westbound	L	0.80	37.8	D	L	0.74	34.2	C	L	0.68	31.5	C	L	0.63	29.7	C
	LR	1.01	74.3	E	LR	0.95	59.4	E	LR	0.85	43.3	D	LR	0.80	37.9	D
Northbound	T	0.88	14.3	B	T	0.83	12.7	B	T	0.72	10.5	B	T	0.67	9.8	A
	R	0.98	38.6	D	R	0.98	39.5	D	R	0.98	40.8	D	R	0.98	41.7	D
Southbound	L	0.41	22.1	C	L	0.41	22.1	C	L	0.56	33.6	C	L	0.56	33.6	C
	T	0.62	9.3	A	T	0.55	8.6	A	T	0.72	10.5	B	T	0.66	9.7	A
	Intersection		21.0	C	Intersection		19.2	B	Intersection		17.0	B	Intersection		16.3	B
Yukon Avenue and Forest Hill Road																
Eastbound	L	0.26	22.3	C	L	0.44	25.1	C	L	0.18	21.3	C	L	0.35	23.5	C
Northbound	LT	0.77	23.0	C	LT	0.75	21.8	C	LT	0.67	18.8	B	LT	0.66	18.4	B
Southbound	T	0.65	17.7	B	T	0.59	16.3	B	T	0.63	17.1	B	T	0.58	15.9	B
	R	0.18	10.8	B	R	0.30	12.0	B	R	0.12	10.3	B	R	0.23	11.3	B
	Intersection		19.5	B	Intersection		18.9	B	Intersection		17.6	B	Intersection		17.3	B

Notes: L = Left Turn, T = Through, R = Right Turn, DefL = Defacto Left Turn; LOS = Level of Service.
+ implies a significant adverse impact

Table 16-6
Significant Adverse Traffic Impacts
2016 Build Conditions

Intersection	Peak Hour	Impact
Richmond Hill Road and Forest Hill Road	AM	X
	Midday	X
	PM	X
	Weekend Midday	X
	Weekend PM	X
Richmond Hill Road and Richmond Avenue	AM	X
	Midday	X
	PM	X
	Weekend Midday	X
	Weekend PM	X
Yukon Avenue and Richmond Avenue	AM	
	Midday	X
	PM	X
	Weekend Midday	X
	Weekend PM	
Forest Hill Road and Richmond Avenue	AM	X
	Midday	
	PM	
	Weekend Midday	
	Weekend PM	
Yukon Avenue and Forest Hill Road	AM	
	Midday	
	PM	
	Weekend Midday	
	Weekend PM	

COMPLETED EAST PARK ROAD SYSTEM (2036)

INTRODUCTION

As described in greater detail in Chapter 1 "Project Description," 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, or a two-lane, one-way loop road around the base of the landfill with connections at Richmond Hill Road, Yukon Avenue, and Forest Hill Road. The analysis below examines each of these potential alternatives. Forest Hill Road and Richmond hill road Connections (four-lane road option).

Park Road Description

Under this option, the proposed project would provide two additional road connections to Richmond Avenue, one at Forest Hill Road and the other at Richmond Hill Road. A description of the proposed intersections is provided in Chapter 1 "Project Description."

Traffic Impacts

Introduction

Traffic volumes in 2036 with the Yukon Avenue, Forest Hill Road and Richmond Hill Road Connections in place are presented in Figures 16-22 through 16-26. Tables 16-7a and 16-7b present the HCS capacity analysis results for the five (5) analyzed intersections for the year 2036 weekday and weekend peak hours, respectively. Table 16-8 identifies the impacted intersections.

Traffic Diversions

With all three connections along Richmond Avenue, traffic diversion patterns developed for FGEIS 2036 analysis years were modified to account for the additional connection at the Yukon Avenue/Richmond Avenue intersection. Specifically, the 2036 traffic diversion patterns developed for the FGEIS were modified and applied to the 2036 SEIS No Build volumes to develop the 2036 SEIS traffic diversion volumes.

Park Trip Assignments

There are no modifications to the park development program assumed in this SEIS so the total number of project-generated vehicular trips remains unchanged from that presented in the FGEIS for the 2036 analysis Conditions. However, with the additional connection at Yukon Avenue, both the in-and outbound project-generated vehicular trip assignments were modified. Specifically, conditions assumed for this SEIS are that project inbound vehicular trip assignments along Richmond Avenue were modified by assigning approximately 17, 16 and 26 percent of project-generated vehicular trips to the intersections of Richmond Hill Road, Yukon Avenue and Forest Hill Road at Richmond Avenue, respectively.

Traffic Impacts

In the 2036 analysis Conditions, the weekday PM and weekend midday peak hours would have the highest number of impacted intersections with five (5) each. The weekday midday and the weekend PM peak hours would have four (4) impacted intersections each. The weekday AM peak hour would have the fewest impacted intersections at three (3). The following provides a discussion of the impacted approaches/movements by intersection.

At the intersection of Richmond Hill Road and Forest Hill Road, the westbound approach and the northbound and southbound shared through- and right-turn movements would be impacted during all five analyzed peak hours.

At the intersection of Richmond Hill Road and Richmond Avenue, the westbound exclusive left-turn movement would be impacted during the weekday and weekend midday peak hours. The northbound through movement would be impacted during the weekday midday and the weekend midday and PM peak hours. The southbound exclusive left-turn movement would be impacted during the weekday PM and weekend midday peak hours. Additionally, the southbound shared through- and right-turn movement would be impacted during all five analyzed peak hours except for the weekday AM peak hour.

At the intersection of Yukon Avenue and Richmond Avenue, the westbound approach would be impacted during the weekend midday peak hour and the proposed northbound left-turn movement would operate under congested conditions during all peak hours. Additionally, the southbound shared through- and right-turn movement would be impacted during the weekday PM and weekend midday peak hours.

Table 16-7a
2036 No Build and Build Conditions Level of Service Analysis
Weekday Peak Hours

Intersection	Weekday AM Peak Hour								Weekday Midday Peak Hour								Weekday PM Peak Hour							
	2036 No Build				2036 Build				2036 No Build				2036 Build				2036 No Build				2036 Build			
	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	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS
Richmond Hill Road and Forest Hill Road																								
Eastbound	L	0.42	20.1	C	L	0.43	20.3	C	L	0.78	33.1	C	L	0.80	34.9	C	L	0.74	30.8	C	L	0.76	32.7	C
	TR	0.68	19.2	B	TR	0.78	22.8	C	TR	0.70	19.6	B	TR	0.82	25.1	C	TR	0.78	22.6	C	TR	0.91	33.4	C
Westbound	LTR	1.34	192.0	F	LTR	1.37	206.5	F+	LTR	1.39	213.2	F	LTR	1.57	292.6	F+	LTR	1.58	298.0	F	LTR	1.83	410.1	F+
Northbound	L	0.49	43.0	D	L	0.49	43.0	D	L	0.49	43.0	D	L	0.49	43.0	D	L	0.75	73.5	E	L	0.75	73.5	E
	TR	1.34	195.6	F	TR	1.48	255.5	F+	TR	1.43	232.1	F	TR	1.65	329.9	F+	TR	1.52	271.7	F	TR	1.75	374.8	F+
Southbound	L	1.83	435.7	F	L	1.83	435.7	F	L	1.51	289.7	F	L	1.51	289.7	F	L	1.49	288.0	F	L	1.49	288.0	F
	TR	1.01	68.9	E	TR	1.03	74.8	E+	TR	1.51	267.4	F	TR	1.57	295.0	F+	TR	1.54	279.5	F	TR	1.63	322.7	F+
	Intersection		144.5	F	Intersection		163.3	F	Intersection		186.6	F	Intersection		232.0	F	Intersection		216.4	F	Intersection		275.1	F
Richmond Hill Road and Richmond Avenue																								
Eastbound	LTR	0.01	25.8	C	L	0.23	26.6	C	LTR	0.01	27.3	C	L	0.49	28.1	C	LTR	0.01	27.3	C	L	0.38	24.9	C
					T	0.17	25.4	C					T	0.19	22.1	C					T	0.21	21.6	C
					R	0.02	11.9	B					R	0.03	8.6	A					R	0.03	9.1	A
Westbound	L	0.29	30.2	C	L	0.45	31.6	C	L	0.66	43.9	D	L	0.98	71.3	E+	L	0.57	39.9	D	L	0.82	44.7	D
	LT	0.19	28.3	C	T	0.09	24.4	C	LT	0.72	47.9	D	T	0.11	21.1	C	LT	0.60	41.3	D	T	0.11	20.5	C
	R	1.06	79.3	E	R	0.91	39.6	D	R	1.08	85.2	F	R	0.78	22.6	C	R	0.90	37.9	D	R	0.75	21.8	C
Northbound	L	0.00	32.9	C	L	0.07	33.0	C	L	0.00	31.3	C	L	0.04	30.9	C	L	0.00	27.2	C	L	0.05	32.7	C
	T	1.21	118.1	F	T	1.17	106.5	F	T	0.86	23.4	C	T	1.08	74.9	E+	T	0.96	36.5	D	T	0.96	41.6	D
	R	0.19	14.2	B	R	0.22	17.7	B	R	0.37	16.4	B	R	0.54	30.0	C	R	0.47	22.5	C	R	0.57	30.1	C
Southbound	L	1.53	296.9	F	L	1.43	251.7	F	L	1.50	279.4	F	L	1.42	241.5	F	L	1.51	275.4	F	L	2.17	576.4	F+
	TR	0.60	17.8	B	TR	0.65	21.8	C	TR	0.90	25.3	C	TR	1.24	142.7	F+	TR	1.50	253.2	F	TR	1.84	411.6	F+
	Intersection		95.0	F	Intersection		80.1	F	Intersection		51.0	D	Intersection		102.9	F	Intersection		161.7	F	Intersection		265.0	F
Yukon Avenue and Richmond Avenue																								
Eastbound					L	0.12	27.2	C					L	0.30	32.7	C					L	0.32	31.6	C
					TR	0.13	27.2	C					TR	0.26	30.5	C					TR	0.24	28.6	C
Westbound	LR	0.13	27.1	C	LTR	0.15	27.3	C	LR	0.43	33.4	C	LTR	0.53	36.1	D	LR	0.38	30.8	C	LTR	0.49	33.0	C
Northbound					L	0.56	53.6	D					L	0.71	59.1	E					L	0.71	64.9	E
	T	1.23	123.8	F	T	1.08	61.7	E	T	0.84	18.5	B	T	0.76	16.4	B	T	0.93	23.4	C	T	0.81	17.7	B
Southbound	L	0.27	40.9	D	L	0.27	40.9	D	L	0.28	38.8	D	L	0.28	38.8	D	L	0.26	40.5	D	L	0.26	40.5	D
	T	0.46	4.6	A	TR	0.53	13.2	B	T	0.80	6.4	A	TR	0.96	26.5	C	T	1.06	43.4	D	TR	1.27	143.6	F+
	Intersection		84.2	F	Intersection		45.4	D	Intersection		12.8	B	Intersection		23.9	C	Intersection		35.5	D	Intersection		91.3	F

Table 16-7a (cont'd)
2036 No Build and Build Conditions Level of Service Analysis
Weekday Peak Hours

Intersection	Weekday AM Peak Hour								Weekday Midday Peak Hour								Weekday PM Peak Hour							
	2036 No Build				2036 Build				2036 No Build				2036 Build				2036 No Build				2036 Build			
	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	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS
Forest Hill Road and Richmond Avenue																								
Eastbound					L	0.10	21.8	C					L	0.10	17.9	B					L	0.13	19.6	B
					T	0.07	21.4	C					T	0.07	17.5	B					T	0.09	18.9	B
					R	0.09	21.7	C					R	0.39	21.9	C					R	0.28	21.5	C
Westbound	L	0.66	30.8	C	L	1.81	405.5	F+	L	0.79	37.1	D	L	1.75	374.4	F+	L	0.90	48.8	D	L	2.14	547.6	F+
	LR	0.84	42.1	D	TR	0.10	21.7	C	LR	1.01	74.6	E	TR	0.13	18.2	B	LR	1.16	124.0	F	TR	0.17	19.8	B
Northbound					L	0.85	82.9	F					L	1.19	173.4	F					L	2.48	726.5	F
	T	1.03	37.6	D	T	1.31	165.1	F+	T	0.76	11.1	B	T	1.20	125.6	F+	T	1.00	27.1	C	T	1.45	230.8	F+
	R	1.48	243.5	F	R	2.18	565.1	F+	R	0.75	16.5	B	R	1.35	201.1	F+	R	1.26	142.1	F	R	2.12	538.6	F+
Southbound	L	0.10	8.3	A	L	0.06	38.5	D	L	0.21	12.2	B	L	0.12	39.4	D	L	0.60	37.4	D	L	0.33	44.6	D
	T	0.43	7.7	A	TR	0.52	19.1	B	T	0.88	14.3	B	TR	1.32	174.1	F+	T	1.23	118.1	F	TR	1.79	386.3	F+
	Intersection		62.7	E	Intersection		222.6	F	Intersection		18.8	B	Intersection		173.4	F	Intersection		85.2	F	Intersection		363.6	F
Yukon Avenue and Forest Hill Road																								
Eastbound	L	0.07	20.0+	C	L	0.14	20.8	C	L	0.26	22.3	C	L	0.40	24.3	C	L	0.22	21.8	C	L	0.36	23.8	C
Northbound	LT	1.08	75.0	E	LT	1.13	92.3	F+	LT	1.19	122.7	F	LT	1.27	152.9	F+	LT	1.37	198.2	F	LT	1.46	234.8	F+
Southbound	T	0.57	15.9	B	T	0.57	16.0	B	T	0.77	21.9	C	T	0.78	22.0	C	T	0.79	22.8	C	T	0.80	22.9	C
	R	0.11	10.2	B	R	0.12	10.3	B	R	0.19	10.9	B	R	0.23	11.3	B	R	0.16	10.6	B	R	0.22	11.2	B
	Intersection		48.7	D	Intersection		58.0	E	Intersection		61.9	E	Intersection		73.5	E	Intersection		100.3	F	Intersection		114.0	F

Notes: L = Left Turn, T = Through, R = Right Turn, DefL = Defacto Left Turn; LOS = Level of Service.
+ implies a significant adverse impact

Table 16-7b
2036 No Build and Build Conditions Level of Service Analysis
Weekend Peak Hours

	Weekend Midday Peak Hour								Weekend PM Peak Hour							
	2036 No Build				2036 Build				2036 No Build				2036 Build			
Intersection	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
Richmond Hill Road and Forest Hill Road																
Eastbound	L	0.79	30.8	C	L	0.82	33.3	C	L	0.77	30.5	C	L	0.80	33.0	C
	TR	0.77	22.1	C	TR	0.89	30.6	C	TR	0.78	22.5	C	TR	0.89	30.6	C
Westbound	LTR	1.73	362.0	F	LTR	2.02	493.2	F+	LTR	1.71	354.8	F	LTR	1.97	472.1	F+
Northbound	L	0.17	25.3	C	L	0.17	25.3	C	L	0.64	57.7	E	L	0.64	57.7	E
	TR	1.42	229.2	F	TR	1.64	323.9	F+	TR	1.39	214.3	F	TR	1.59	302.5	F+
Southbound	L	1.59	340.5	F	L	1.59	340.5	F	L	1.82	440.8	F	L	1.82	440.8	F
	TR	1.58	299.0	F	TR	1.70	352.8	F+	TR	1.32	184.3	F	TR	1.44	236.6	F+
	Intersection		225.0	F	Intersection		286.8	F	Intersection		195.1	F	Intersection		251.2	F
Richmond Hill Road and Richmond Avenue																
Eastbound	LTR	0.01	27.3	C	L	0.43	26.0	C	LTR	0.01	27.3	C	L	0.45	28.9	C
					T	0.19	21.4	C					T	0.19	23.5	C
					R	0.03	9.6	A					R	0.03	9.5	A
Westbound	L	0.77	52.6	D	L	1.02	81.8	F+	L	0.50	37.5	D	L	0.74	41.3	D
	LT	0.75	50.5	D	T	0.14	20.8	C	LT	0.49	37.0	D	T	0.14	22.8	C
	R	1.26	154.9	F	R	0.94	40.6	D	R	1.22	137.8	F	R	0.93	37.5	D
Northbound	L	0.00	31.3	C	L	0.06	33.7	C	L	0.00	31.3	C	L	0.05	31.0	C
	T	1.05	54.6	D	T	1.19	121.2	F+	T	0.99	36.3	D	T	1.13	92.5	F+
	R	0.46	18.1	B	R	0.65	32.1	C	R	0.43	17.5	B	R	0.61	30.3	C
Southbound	L	1.52	284.6	F	L	1.78	401.1	F+	L	1.53	292.4	F	L	1.46	261.5	F
	TR	1.22	124.8	F	TR	1.69	343.0	F+	TR	1.03	45.8	D	TR	1.43	225.2	F+
	Intersection		106.7	F	Intersection		216.8	F	Intersection		64.5	E	Intersection		143.3	F
Yukon Avenue and Richmond Avenue																
Eastbound					L	0.41	37.9	D					L	0.29	32.6	C
					TR	0.24	30.3	C					TR	0.23	30.0	C
Westbound	LR	0.72	42.9	D	LTR	1.08	108.4	F+	LR	0.36	32.0	C	LTR	0.53	35.8	D
Northbound					L	0.82	71.2	E					L	0.85	75.0	E
	T	1.09	64.4	E	T	0.97	27.9	C	T	1.13	81.9	F	T	1.02	39.3	D
Southbound	L	0.30	39.0	D	L	0.30	39.0	D	L	0.17	37.2	D	L	0.17	37.2	D
	T	0.90	9.1	A	TR	1.10	68.1	E+	T	0.71	5.3	A	TR	0.87	19.4	B
	Intersection		35.7	D	Intersection		52.1	D	Intersection		46.8	D	Intersection		31.6	C
Forest Hill Road and Richmond Avenue																
Eastbound					L	0.11	20.0+	C					L	0.11	19.3	B
					T	0.08	19.5	B					T	0.07	18.8	B
					R	0.33	22.8	C					R	0.34	22.4	C
Westbound	L	0.95	58.4	E	L	2.08	522.0	F+	L	0.81	38.9	D	L	1.86	426.3	F+
	LR	1.20	141.1	F	TR	0.24	21.4	C	LR	1.02	76.0	E	TR	0.18	20.1	C
Northbound					L	2.77	857.3	F					L	2.65	803.8	F
	T	1.05	43.6	D	T	1.51	257.9	F+	T	0.86	13.5	B	T	1.26	147.8	F+
	R	1.16	98.0	F	R	1.80	391.8	F+	R	1.16	100.1	F	R	1.97	472.1	F+
Southbound	L	0.50	28.3	C	L	0.28	43.0	D	L	0.66	44.5	D	L	0.36	45.3	D
	T	0.75	10.9	B	TR	0.98	40.9	D	T	0.87	13.6	B	TR	1.23	133.8	F+
	Intersection		46.8	D	Intersection		259.7	F	Intersection		28.1	C	Intersection		229.8	F
Yukon Avenue and Forest Hill Road																
Eastbound	L	0.31	23.0	C	L	0.44	25.1	C	L	0.22	21.7	C	L	0.33	23.3	C
Northbound	LT	1.06	70.1	E	LT	1.13	94.6	F+	LT	0.91	34.9	C	LT	0.97	45.2	D+
Southbound	T	0.77	21.8	C	T	0.78	21.9	C	T	0.75	20.8	C	T	0.75	20.9	C
	R	0.22	11.2	B	R	0.29	11.9	B	R	0.15	10.5	B	R	0.22	11.2	B
	Intersection		39.6	D	Intersection		48.6	D	Intersection		25.7	C	Intersection		29.6	C

Notes: L = Left Turn, T = Through, R = Right Turn, DefL = Defacto Left Turn; LOS = Level of Service.
+ implies a significant adverse impact

Table 16-8
Significant Adverse Traffic Impacts—
2036 Analysis Conditions (4-Lane Road Option)

Intersection	Peak Hour	Impacted Intersection
Richmond Hill Road and Forest Hill Road	AM	X
	Midday	X
	PM	X
	Weekend Midday	X
	Weekend PM	X
Richmond Hill Road and Richmond Avenue	AM	
	Midday	X
	PM	X
	Weekend Midday	X
	Weekend PM	X
Yukon Avenue and Richmond Avenue	AM	
	Midday	
	PM	X
	Weekend Midday	X
	Weekend PM	
Forest Hill Road and Richmond Avenue	AM	X
	Midday	X
	PM	X
	Weekend Midday	X
	Weekend PM	X
Yukon Avenue and Forest Hill Road	AM	X
	Midday	X
	PM	X
	Weekend Midday	X
	Weekend PM	X

At the intersection of Forest Hill Road and Richmond Avenue, the westbound left-turn, the northbound through, and the northbound right-turn movements would be impacted during all five analyzed peak hours. The proposed northbound left-turn movement would operate under congested conditions during all five analyzed peak hours. Additionally, the southbound shared through- and right-turn movement would be impacted during the weekday midday, PM, and weekend PM peak hours.

At the intersection of Yukon Avenue and Forest Hill Road, the northbound approach would be impacted during all the analyzed peak hours.

Mitigation for these potential impacts under the 2016 and 2036 Build Conditions is presented in Chapter 23, "Impact Avoidance Measures and Mitigation."

FOREST HILL ROAD AND RICHMOND HILL ROAD CONNECTIONS: TWO-LANE PARK ROAD OPTION (ALTERNATIVE PARK ROAD WIDTH)

Under this option the East Park road system would have a similar alignment across Fresh Kills except they would only be two lanes wide. Intersection designs would be as presented in Chapter 1 "Project Description." There would also be three connections along Richmond Avenue, at Richmond Hill Road, Yukon Avenue and Forest Hill Road. Since the only difference between this option and the above option is the width of the through road, it is assumed that trip assignments and traffic patterns under this option would be similar to that described above for

the four lane wide road. Thus, the traffic impacts presented above for the four lane wide road would also apply to this two lane wide road.

EAST PARK LOOP ROAD OPTION

Under this option, put forward by the Office of the Staten Island Borough President, the East Park road system would have a similar alignment across Fresh Kills except the trips from Richmond Hill Road or Forest Hill Road are assumed to use an East Park one-way, counterclockwise Loop Road in order to access the Confluence Loop Park Road and, in turn, the reach connections to the West Shore Expressway (both northbound and southbound). There would also be the Yukon Avenue Connection across Landfill Section 6/7. Thus, under this option there are three connections proposed along Richmond Avenue, at Richmond Hill Road, Yukon Avenue and Forest Hill Road. Since the only difference between this option and the above option is the internal park circulation with the East Park Loop Park Road, it is assumed that trip assignments and traffic patterns under this option would be similar to that described above for both the four lane wide road and the two lane wide road. Thus, the traffic impacts presented above for the four lane wide road would also apply to this East Park Loop Road option.

YUKON AVENUE CONNECTION (FOUR-LANE ROAD OPTION)

Introduction

This option calls for widening the Yukon Avenue Connection from 2 lanes in the 2016 condition to 4 lanes in 2036 condition. The alignment across East Park would be the same as in 2016, as would the intersection at Yukon Avenue and Richmond Avenue, but the road width within the park would be widened to four lanes. Thus, with this option, neither the Richmond Hill Road nor Forest Hill Road connections are provided

Thus, under this scenario, the proposed intersection of Yukon Avenue at Richmond Avenue would handle all of the diverted traffic across Fresh Kills that, under the options described above, is assumed to use Richmond Hill Road or Forest Hill Road

An analysis of conditions under this option is presented below.

Traffic Diversions

As discussed above, the Yukon Avenue Connection option assumes only one park connection on Richmond Avenue. Therefore, in order to generate traffic volumes for the 2036 future condition, traffic diversion patterns developed for the FGEIS proposed project were modified to account for one park entrance fronting Richmond Avenue.

Trip Assignments

As described above, it is assumed for the 2036 condition that the Fresh Kills Park project is built out as presented in the FGEIS. Therefore, the total number of park-generated vehicular trips for the 2036 analysis year would remain unchanged from the FGEIS. However, in the 2036 future conditions, unlike the FGEIS proposed project which provides two connections on Richmond Avenue along Forest Hill Road and Richmond Hill Road, this Yukon Avenue Connection option only provides one connection. Vehicle assignments developed for the FGEIS were therefore modified to account for this single connection.

The 2036 Yukon Avenue Connection option build condition traffic volumes are presented in Figures 16-27 to 16-31.

Yukon Avenue Connection Option: 2036 Conditions

For 2036 future traffic conditions under this option, four (4) out of the five (5) intersections would experience significant adverse traffic impacts (see Tables 16-9a and 16-9b). Table 16-10 summarizes the impact analysis results for the five (5) analyzed intersections.

In the 2036 Build Conditions, the weekday PM and weekend midday peak hours would have four (4) impacted intersections each, followed by the weekday AM, midday, and weekend PM peak hours with three (3) each.

At the intersection of Richmond Hill Road and Forest Hill Road, the westbound approach and the northbound and southbound shared through- and right-turn movements would be impacted during all the five analyzed peak hours.

At the intersection of Richmond Hill Road and Richmond Avenue, the westbound exclusive left-turn and the westbound shared left-turn and through movements would be impacted during the weekday midday, PM, and weekend midday peak hours. The southbound exclusive left-turn movement would be impacted during all five analyzed peak hours. The southbound shared through- and right-turn movement would be impacted during the weekday PM, weekend midday and PM peak hours.

At the intersection of Yukon Avenue and Richmond Avenue, the newly proposed eastbound and northbound left-turn movements would operate under congested conditions during all analyzed peak hours. The newly proposed eastbound shared through- and right-turn movement would also operate under congested conditions during all peak hours except the weekday AM peak hour. In addition, the westbound approach and the southbound shared through- and right-turn movement would be impacted during all peak hours except the weekday AM peak hour.

At the intersection of Forest Hill Road and Richmond Avenue the northbound through movement would be impacted during the weekend midday peak hour and the northbound right-turn movement would be impacted during the weekday AM and PM peak hours.

Recommended Mitigation Measures

Recommended mitigation measures for both the 2016 and 2036 traffic impacts presented above are provided in Chapter 23, “Impact Avoidance and Mitigation Measures.”

Parking

The number of project generated trips for the 2036 analysis year would remain the same as in the FGEIS. Therefore, as described in the FGEIS, there would be no impacts on parking with the proposed project.

Table 16-9a
2036 No Build and Yukon Avenue Connection Option Build Conditions Level of Service Analysis
Weekday Peak Hours

Intersection	Weekday AM Peak Hour								Weekday Midday Peak Hour								Weekday PM Peak Hour							
	2036 No Build				2036 Yukon Option Build				2036 No Build				2036 Yukon Option Build				2036 No Build				2036 Yukon Option Build			
	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	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS
Richmond Hill Road and Forest Hill Road																								
Eastbound	L	0.42	20.1	C	L	0.42	19.9	B	L	0.78	33.1	C	L	0.78	32.9	C	L	0.74	30.8	C	L	0.74	30.8	C
	TR	0.68	19.2	B	TR	0.69	19.4	B	TR	0.70	19.6	B	TR	0.72	20.1	C	TR	0.78	22.6	C	TR	0.79	23.1	C
Westbound	LTR	1.34	192.0	F	LTR	1.40	216.3	F+	LTR	1.39	213.2	F	LTR	1.46	243.7	F+	LTR	1.58	298.0	F	LTR	1.67	338.3	F+
Northbound	L	0.49	43.0	D	L	0.49	43.0	D	L	0.49	43.0	D	L	0.49	43.0	D	L	0.75	73.5	E	L	0.75	73.5	E
	TR	1.34	195.6	F	TR	1.51	269.5	F+	TR	1.43	232.1	F	TR	1.69	347.9	F+	TR	1.52	271.7	F	TR	1.80	395.0	F+
Southbound	L	1.83	435.7	F	L	1.83	435.7	F	L	1.51	289.7	F	L	1.51	289.7	F	L	1.49	288.0	F	L	1.49	288.0	F
	TR	1.01	68.9	E	TR	1.03	73.8	E+	TR	1.51	267.4	F	TR	1.56	291.9	F+	TR	1.54	279.5	F	TR	1.63	321.5	F+
	Intersection		144.5	F	Intersection		172.6	F	Intersection		186.6	F	Intersection		230.1	F	Intersection		216.4	F	Intersection		269.7	F
Richmond Hill Road and Richmond Avenue																								
Eastbound	LTR	0.01	25.8	C	LTR	0.01	25.8	C	LTR	0.01	27.3	C	LTR	0.01	27.3	C	LTR	0.01	27.3	C	LTR	0.01	27.3	C
Westbound	L	0.29	30.2	C	L	0.37	31.9	C	L	0.66	43.9	D	L	0.77	52.3	D+	L	0.57	39.9	D	L	0.70	46.7	D+
	LT	0.19	28.3	C	LT	0.27	29.8	C	LT	0.72	47.9	D	LT	0.85	60.8	E+	LT	0.60	41.3	D	LT	0.74	49.4	D+
	R	1.06	79.3	E	R	0.96	51.2	D	R	1.08	85.2	F	R	0.95	49.5	D	R	0.90	37.9	D	R	0.80	27.8	C
Northbound	L	0.00	32.9	C	L	0.00	32.9	C	L	0.00	31.3	C	L	0.00	31.3	C	L	0.00	27.2	C	L	0.00	27.2	C
	T	1.21	118.1	F	T	1.12	83.1	F	T	0.86	23.4	C	T	0.89	25.2	C	T	0.96	36.5	D	T	0.96	36.1	D
	R	0.19	14.2	B	R	0.20	14.3	B	R	0.37	16.4	B	R	0.39	16.8	B	R	0.47	22.5	C	R	0.48	22.9	C
Southbound	L	1.53	296.9	F	L	1.54	302.3	F+	L	1.50	279.4	F	L	1.52	284.5	F+	L	1.51	275.4	F	L	1.52	280.3	F+
	TR	0.60	17.8	B	TR	0.57	17.4	B	TR	0.90	25.3	C	TR	0.87	23.8	C	TR	1.50	253.2	F	TR	1.53	267.6	F+
	Intersection		95.0	F	Intersection		74.1	E	Intersection		51.0	D	Intersection		48.5	D	Intersection		161.7	F	Intersection		169.8	F
Yukon Avenue and Richmond Avenue																								
Eastbound					L	0.85	58.7	E					L	2.94	925.4	F					L	2.62	783.0	F
					TR	0.35	30.4	C					TR	1.03	89.5	F					TR	0.78	45.5	D
Westbound	LR	0.13	27.1	C	LTR	0.30	29.4	C	LR	0.43	33.4	C	LTR	2.51	739.0	F+	LR	0.38	30.8	C	LTR	1.05	100.0	F+
Northbound					L	1.29	213.5	F					L	1.59	330.8	F					L	2.97	946.7	F
	T	1.23	123.8	F	T	1.07	58.9	E	T	0.84	18.5	B	T	0.75	16.2	B	T	0.93	23.4	C	T	0.80	17.4	B
Southbound	L	0.27	40.9	D	L	0.27	40.9	D	L	0.28	38.8	D	L	0.28	38.8	D	L	0.26	40.5	D	L	0.26	40.5	D
	T	0.46	4.6	A	TR	0.59	13.8	B	T	0.80	6.4	A	TR	1.07	58.0	E+	T	1.06	43.4	D	TR	1.45	221.7	F+
	Intersection		84.2	F	Intersection		49.2	D	Intersection		12.8	B	Intersection		138.8	F	Intersection		35.5	D	Intersection		217.6	F

Table 16-9a (cont'd)
2036 No Build and Yukon Avenue Connection Option Build Conditions Level of Service Analysis
Weekday Peak Hours

	Weekday AM Peak Hour								Weekday Midday Peak Hour								Weekday PM Peak Hour							
	2036 No Build				2036 Yukon Option Build				2036 No Build				2036 Yukon Option Build				2036 No Build				2036 Yukon Option Build			
Intersection	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	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS
Forest Hill Road and Richmond Avenue																								
Westbound	L	0.66	30.8	C	L	0.61	29.3	C	L	0.79	37.1	D	L	0.73	33.4	C	L	0.90	48.8	D	L	0.83	40.7	D
	LR	0.84	42.1	D	LR	0.79	37.2	D	LR	1.01	74.6	E	LR	0.94	56.7	E	LR	1.16	124.0	F	LR	1.08	96.5	F
Northbound	T	1.03	37.6	D	T	0.96	20.8	C	T	0.76	11.1	B	T	0.76	11.2	B	T	1.00	27.1	C	T	1.01	31.6	C
	R	1.48	243.5	F	R	1.49	247.6	F+	R	0.75	16.5	B	R	0.75	16.7	B	R	1.26	142.1	F	R	1.27	145.3	F+
Southbound	L	0.10	8.3	A	L	0.10	8.3	A	L	0.21	12.2	B	L	0.21	12.2	B	L	0.60	37.4	D	L	0.60	37.4	D
	T	0.43	7.7	A	T	0.39	7.4	A	T	0.88	14.3	B	T	0.83	12.8	B	T	1.23	118.1	F	T	1.17	91.8	F
	Intersection		62.7	E	Intersection		56.8	E	Intersection		18.8	B	Intersection		16.5	B	Intersection		85.2	F	Intersection		72.6	E
Yukon Avenue and Forest Hill Road																								
Eastbound	L	0.07	20.0+	C	L	0.24	22.0	C	L	0.26	22.3	C	L	0.52	26.8	C	L	0.22	21.8	C	L	0.51	26.5	C
Northbound	LT	1.08	75.0	E	LT	1.05	65.2	E	LT	1.19	122.7	F	LT	1.14	100.5	F	LT	1.37	198.2	F	LT	1.31	170.7	F
Southbound	T	0.57	15.9	B	T	0.52	15.0	B	T	0.77	21.9	C	T	0.71	19.3	B	T	0.79	22.8	C	T	0.73	19.9	B
	R	0.11	10.2	B	R	0.22	11.2	B	R	0.19	10.9	B	R	0.35	12.7	B	R	0.16	10.6	B	R	0.34	12.6	B
	Intersection		48.7	D	Intersection		40.9	D	Intersection		61.9	E	Intersection		49.0	D	Intersection		100.3	F	Intersection		79.5	E

Notes: L = Left Turn, T = Through, R = Right Turn, DefL = Defacto Left Turn; LOS = Level of Service.
+ implies a significant adverse impact
* implies that delays are in excess of 1000 seconds

Table 16-9b
2036 No Build and Yukon Avenue Connection Option Build Conditions Level of Service Analysis
Weekend Peak Hours

	Weekend Midday Peak Hour								Weekend PM Peak Hour							
	2036 No Build				2036 Yukon Option Build				2036 No Build				2036 Yukon Option Build			
Intersection	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
Richmond Hill Road and Forest Hill Road																
Eastbound	L	0.79	30.8	C	L	0.80	31.2	C	L	0.77	30.5	C	L	0.79	30.8	C
	TR	0.77	22.1	C	TR	0.78	22.8	C	TR	0.78	22.5	C	TR	0.79	23.2	C
Westbound	LTR	1.73	362.0	F	LTR	1.82	405.2	F+	LTR	1.71	354.8	F	LTR	1.81	399.4	F+
Northbound	L	0.17	25.3	C	L	0.17	25.3	C	L	0.64	57.7	E	L	0.64	57.7	E
	TR	1.42	229.2	F	TR	1.68	341.4	F+	TR	1.39	214.3	F	TR	1.63	318.9	F+
Southbound	L	1.59	340.5	F	L	1.59	340.5	F	L	1.82	440.8	F	L	1.82	440.8	F
	TR	1.58	299.0	F	TR	1.69	348.9	F+	TR	1.32	184.3	F	TR	1.43	233.8	F+
	Intersection		225.0	F	Intersection		275.3	F	Intersection		195.1	F	Intersection		242.0	F
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	LTR	0.01	27.3	C
Westbound	L	0.77	52.6	D	L	0.92	73.4	E+	L	0.50	37.5	D	L	0.67	44.9	D
	LT	0.75	50.5	D	LT	0.93	74.2	E+	LT	0.49	37.0	D	LT	0.62	42.5	D
	R	1.26	154.9	F	R	1.12	97.3	F	R	1.22	137.8	F	R	1.10	90.9	F
Northbound	L	0.00	31.3	C	L	0.00	31.3	C	L	0.00	31.3	C	L	0.00	31.3	C
	T	1.05	54.6	D	T	1.04	49.6	D	T	0.99	36.3	D	T	0.97	32.4	C
	R	0.46	18.1	B	R	0.48	18.5	B	R	0.43	17.5	B	R	0.45	17.8	B
Southbound	L	1.52	284.6	F	L	1.54	295.6	F+	L	1.53	292.4	F	L	1.56	306.6	F+
	TR	1.22	124.8	F	TR	1.26	140.6	F+	TR	1.03	45.8	D	TR	1.07	59.7	E+
	Intersection		106.7	F	Intersection		108.5	F	Intersection		64.5	E	Intersection		64.7	E
Yukon Avenue and Richmond Avenue																
Eastbound					L	3.87	*	F					L	2.71	824.7	F
					TR	0.91	62.5	E					TR	0.87	57.1	E
Westbound	LR	0.72	42.9	D	LTR	4.66	*	F+	LR	0.36	32.0	C	LTR	1.74	388.2	F+
Northbound					L	2.91	915.9	F					L	2.96	935.1	F
	T	1.09	64.4	E	T	0.96	26.8	C	T	1.13	81.9	F	T	1.01	35.8	D
Southbound	L	0.30	39.0	D	L	0.30	39.0	D	L	0.17	37.2	D	L	0.17	37.2	D
	T	0.90	9.1	A	TR	1.29	150.3	F+	T	0.71	5.3	A	TR	1.04	46.1	D+
	Intersection		35.7	D	Intersection		288.2	F	Intersection		46.8	D	Intersection		151.4	F

Table 16-9b (cont'd)
2036 No Build and Yukon Avenue Connection Option Build Conditions Level of Service Analysis
Weekend Peak Hours

	Weekend Midday Peak Hour								Weekend PM Peak Hour							
	2036 No Build				2036 Yukon Option Build				2036 No Build				2036 Yukon Option Build			
Intersection	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
Forest Hill Road and Richmond Avenue																
Westbound	L	0.95	58.4	E	L	0.88	46.7	D	L	0.81	38.9	D	L	0.75	34.5	C
	LR	1.20	141.1	F	LR	1.13	114.2	F	LR	1.02	76.0	E	LR	0.95	58.5	E
Northbound	T	1.05	43.6	D	T	1.09	59.9	E+	T	0.86	13.5	B	T	0.90	15.3	B
	R	1.16	98.0	F	R	1.16	99.0	F	R	1.16	100.1	F	R	1.16	101.1	F
Southbound	L	0.50	28.3	C	L	0.50	28.3	C	L	0.66	44.5	D	L	0.66	44.5	D
	T	0.75	10.9	B	T	0.69	10.1	B	T	0.87	13.6	B	T	0.83	12.5	B
	Intersection		46.8	D	Intersection		52.1	D	Intersection		28.1	C	Intersection		27.0	C
Yukon Avenue and Forest Hill Road																
Eastbound	L	0.31	23.0	C	L	0.57	27.9	C	L	0.22	21.7	C	L	0.45	25.2	C
Northbound	LT	1.06	70.1	E	LT	1.01	57.2	E	LT	0.91	34.9	C	LT	0.87	30.5	C
Southbound	T	0.77	21.8	C	T	0.71	19.3	B	T	0.75	20.8	C	T	0.68	18.5	B
	R	0.22	11.2	B	R	0.42	13.6	B	R	0.15	10.5	B	R	0.34	12.5	B
	Intersection		39.6	D	Intersection		32.6	C	Intersection		25.7	C	Intersection		22.8	C

Notes: L = Left Turn, T = Through, R = Right Turn, DefL = Defacto Left Turn; LOS = Level of Service.
+ implies a significant adverse impact
* implies that delays are in excess of 1000 seconds

Table 16-10
Significant Adverse Traffic Impact—
Yukon Avenue Connection Option: 2036 Analysis Year

Intersection	Peak Hour	Impact
Richmond Hill Road and Forest Hill Road	AM	X
	Midday	X
	PM	X
	Weekend Midday	X
	Weekend PM	X
Richmond Hill Road and Richmond Avenue	AM	X
	Midday	X
	PM	X
	Weekend Midday	X
	Weekend PM	X
Yukon Avenue and Richmond Avenue	AM	
	Midday	X
	PM	X
	Weekend Midday	X
	Weekend PM	X
Forest Hill Road and Richmond Avenue	AM	X
	Midday	
	PM	X
	Weekend Midday	X
	Weekend PM	
Yukon Avenue and Forest Hill Road	AM	
	Midday	
	PM	
	Weekend Midday	
	Weekend PM	

Source: AKRF, March 2009.

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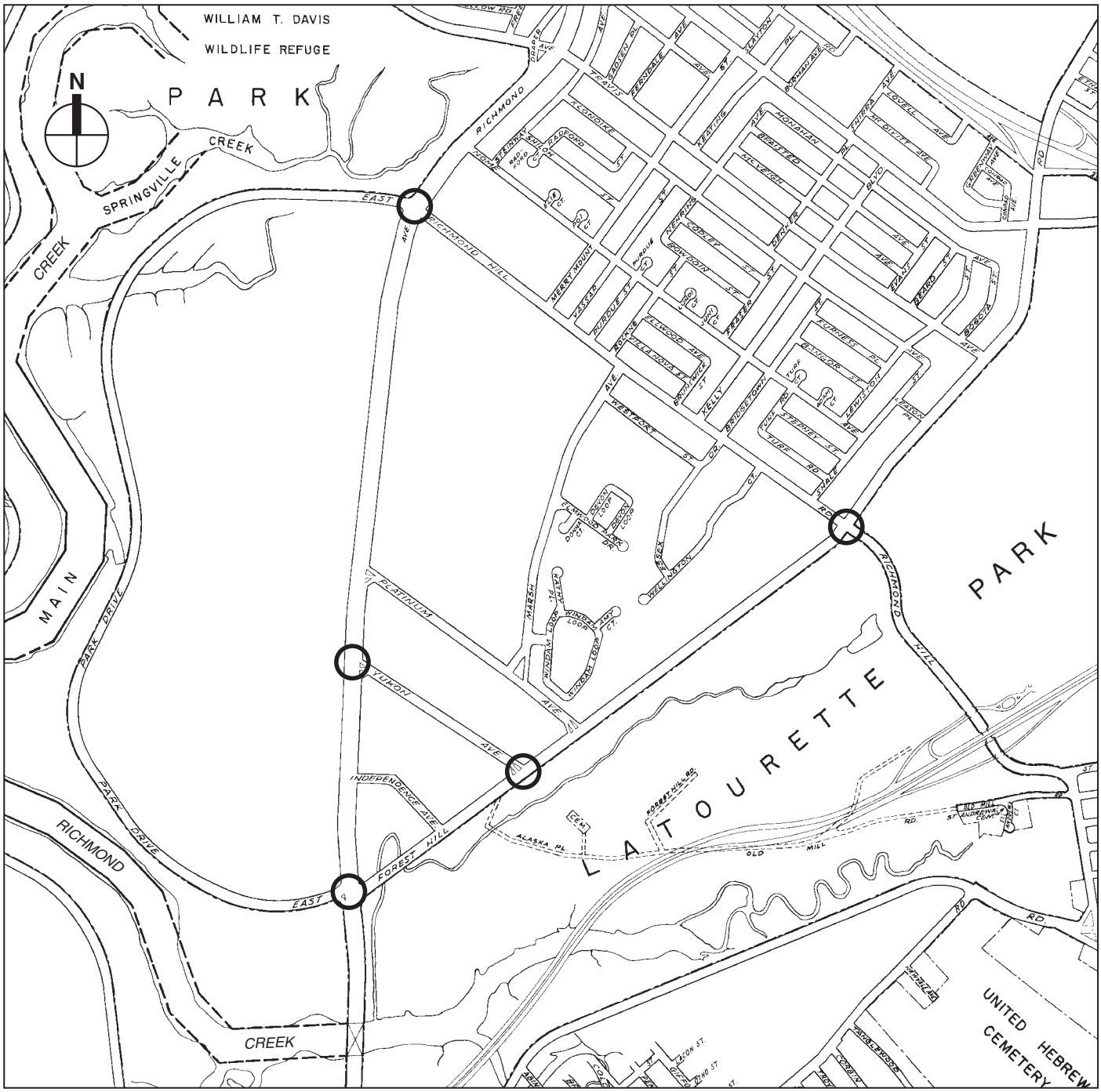
4.16.09

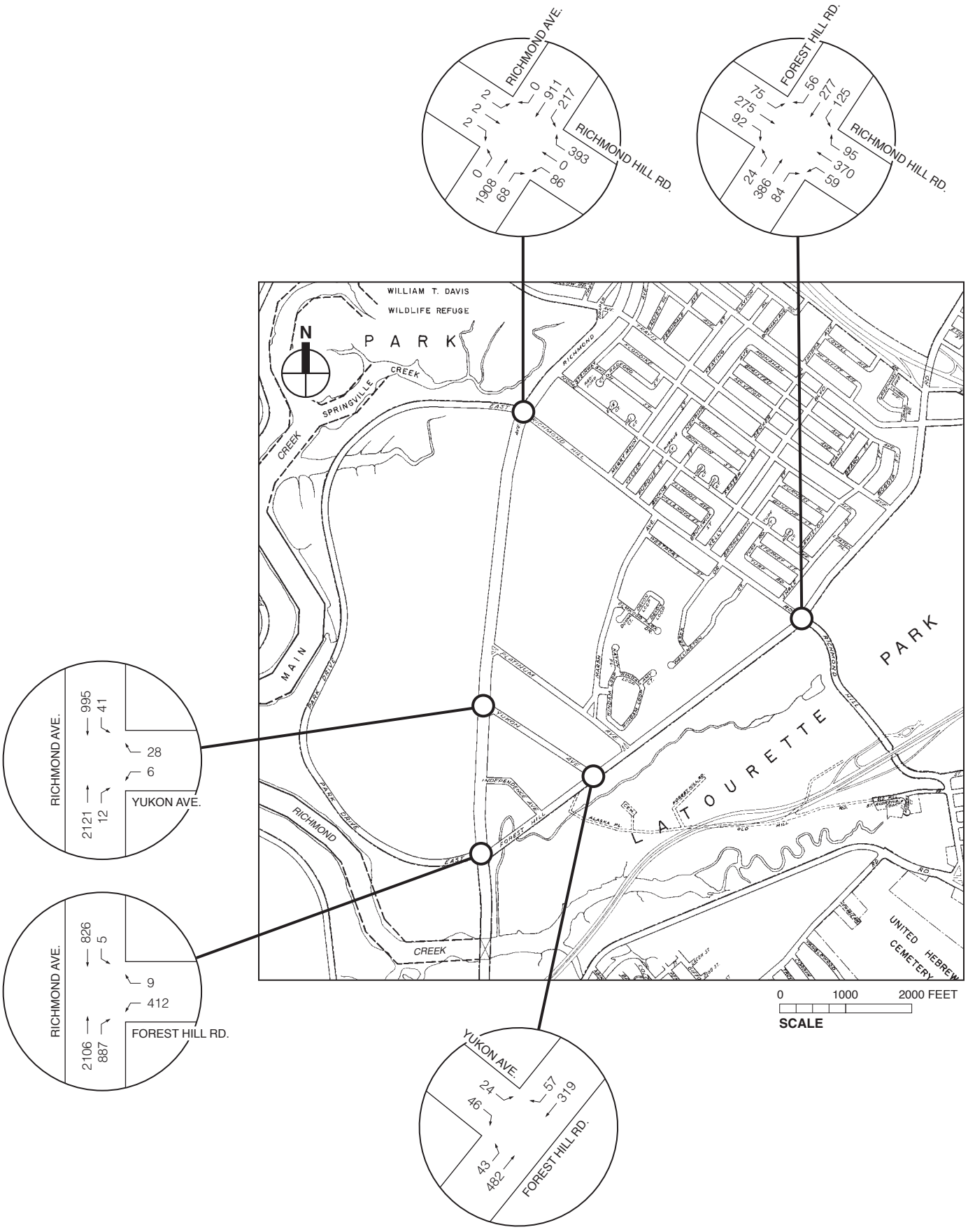


Intersection to be Analyzed

Traffic Study Area

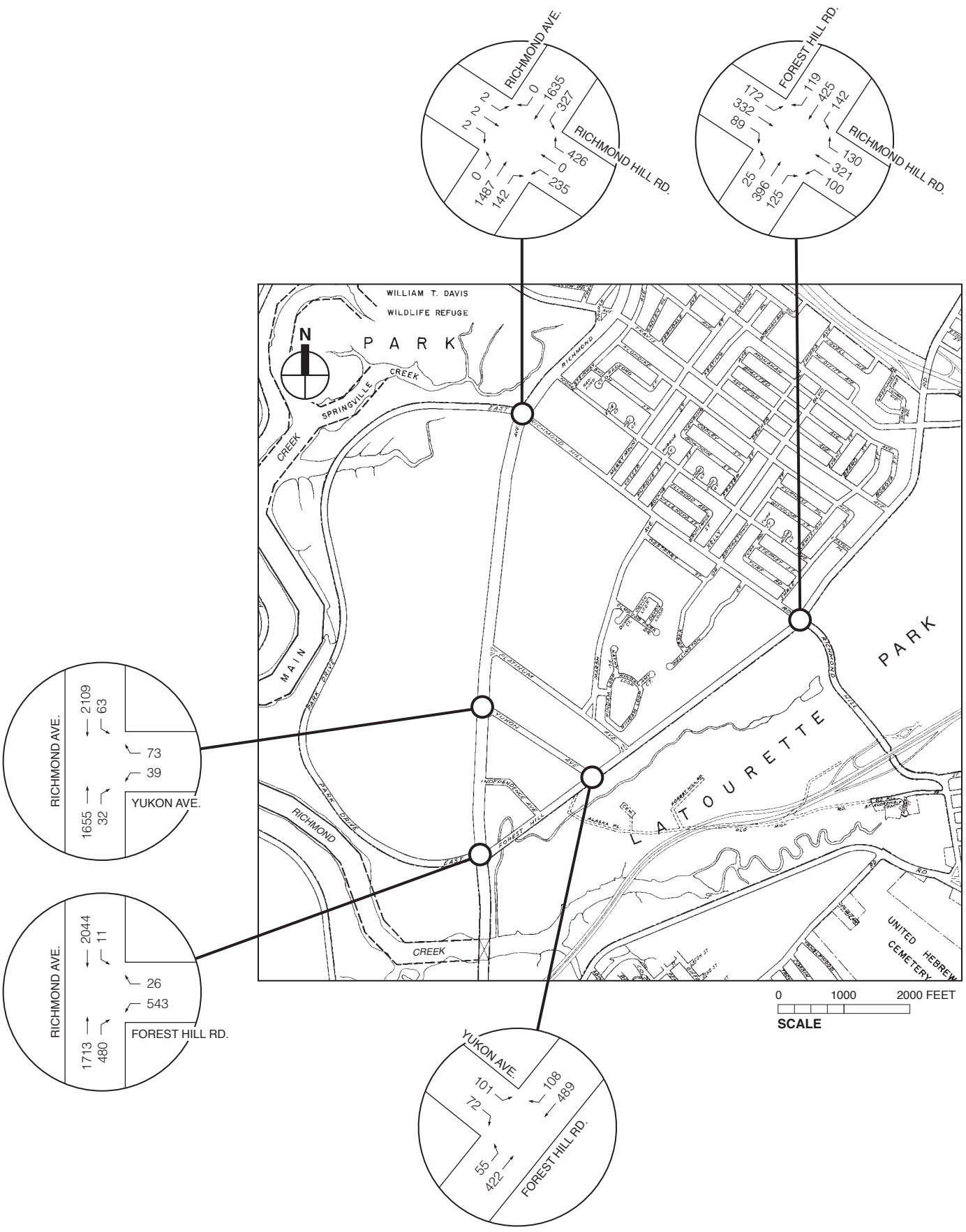
Figure 16-1

6.2.09



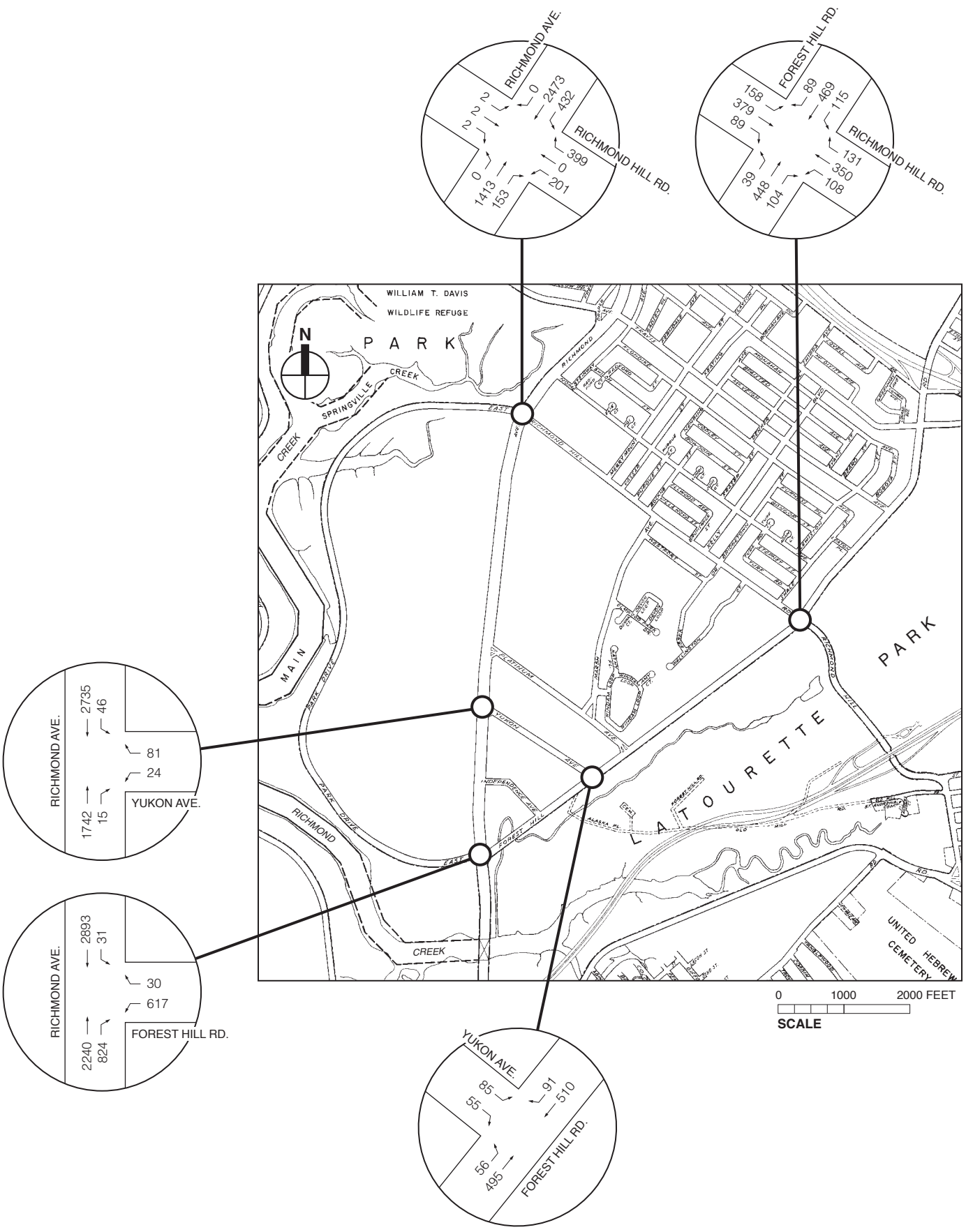
Existing Traffic Volumes
Weekday AM Peak Hour
Figure 16-2

6.2.09



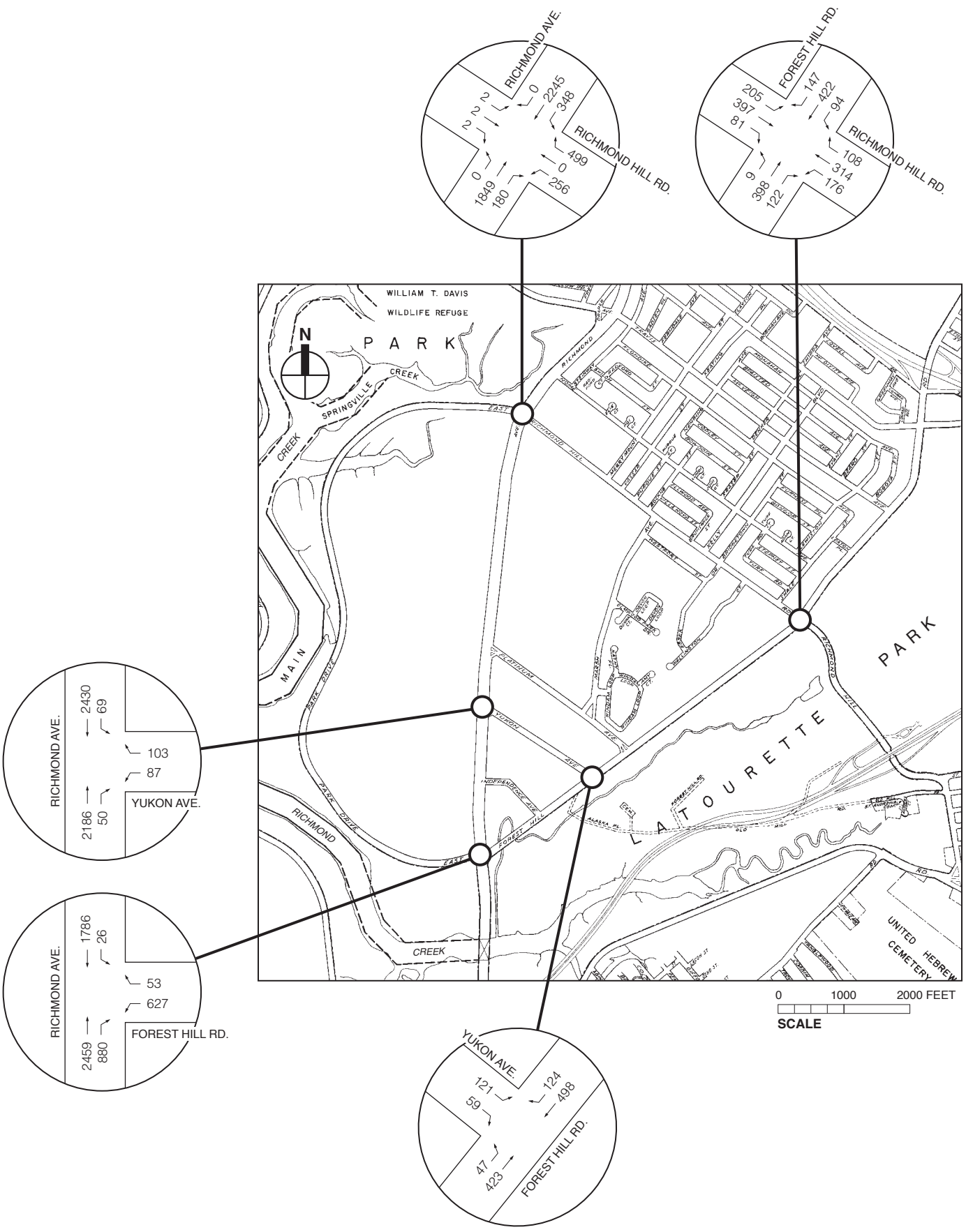
Existing Traffic Volumes
Weekday Midday Peak Hour
Figure 16-3

6.2.09



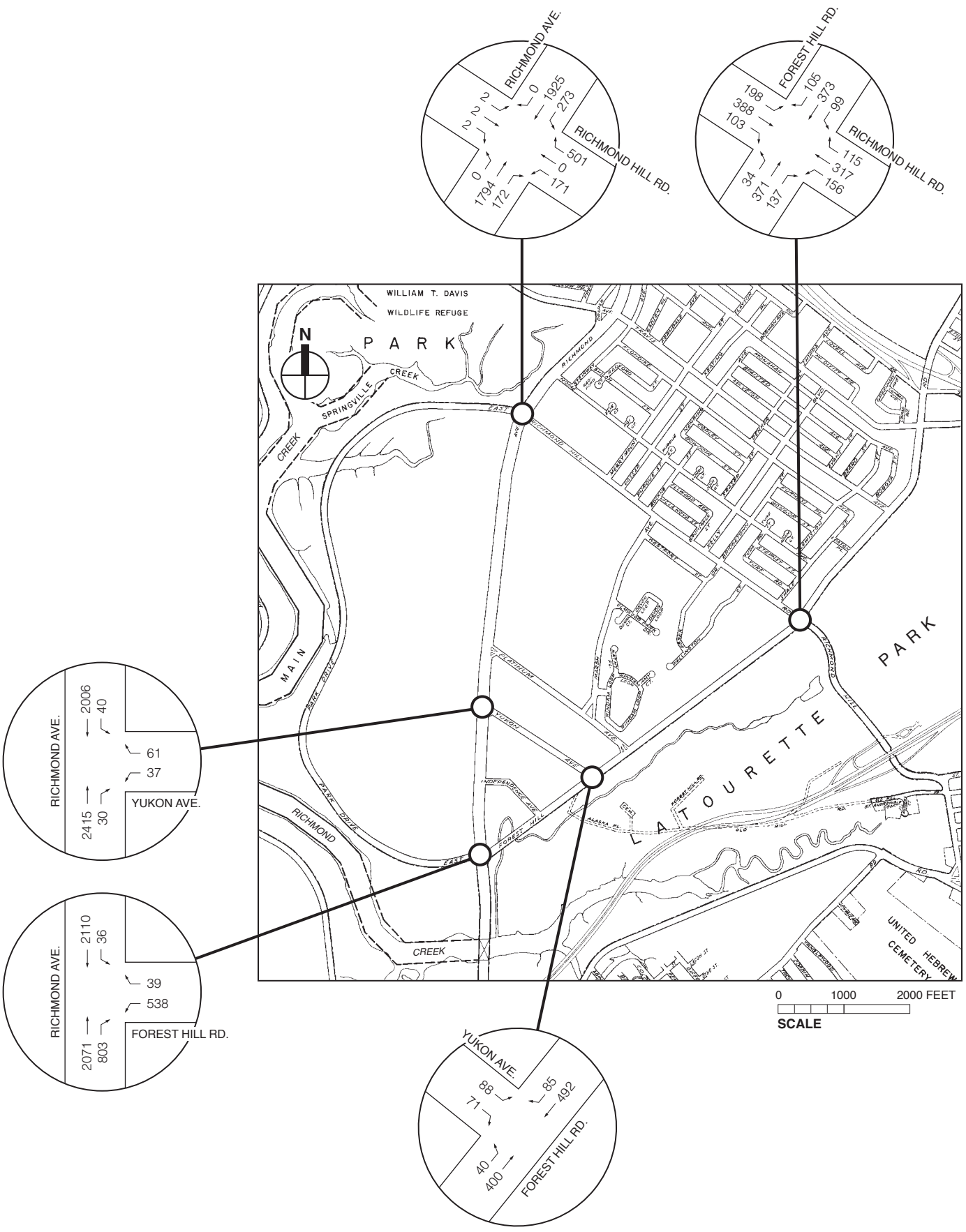
Existing Traffic Volumes
Weekday PM Peak Hour
Figure 16-4

6.2.09



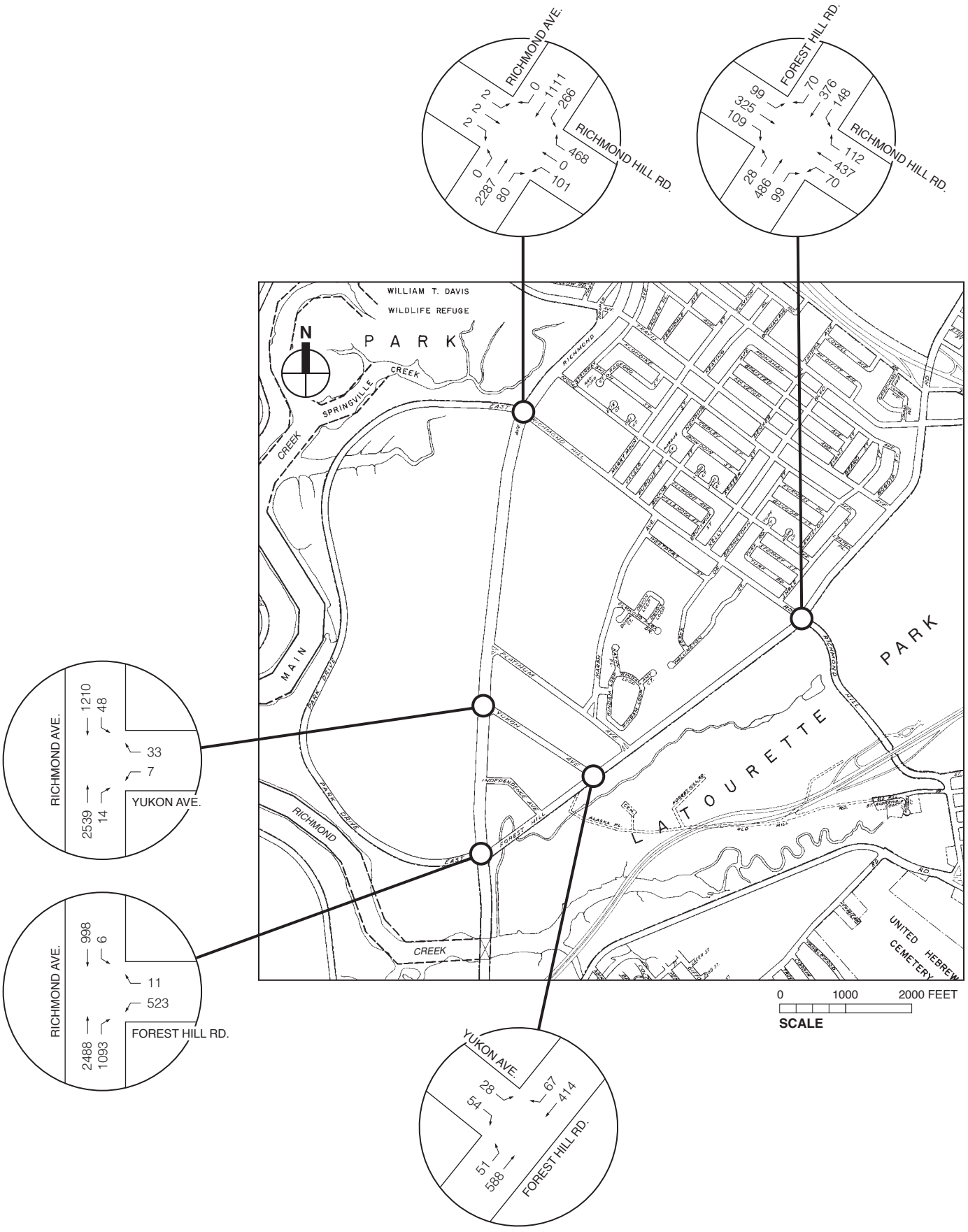
Existing Traffic Volumes
Weekend Midday Peak Hour
Figure 16-5

6.2.09



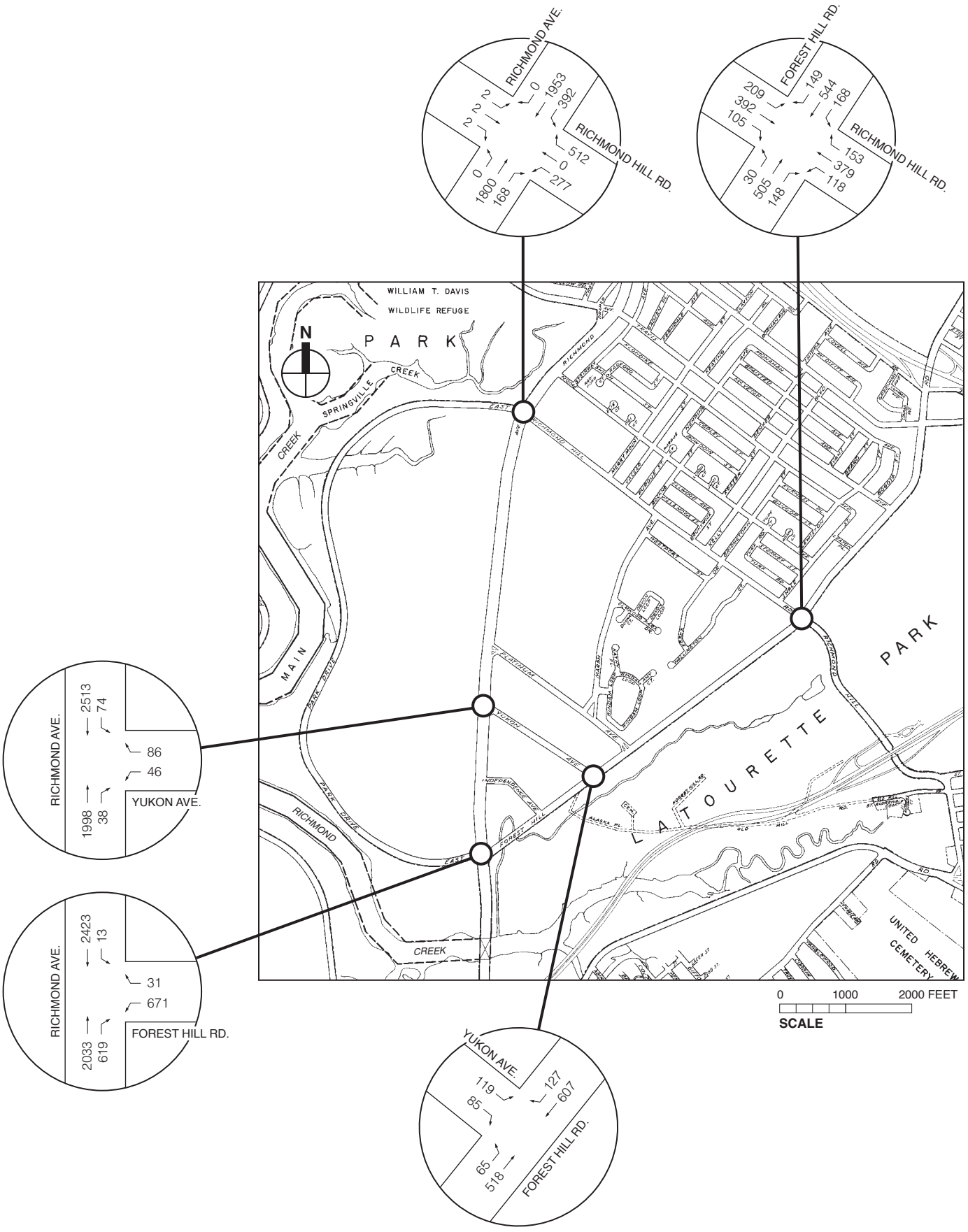
Existing Traffic Volumes
Weekend PM Peak Hour
Figure 16-6

6.2.09



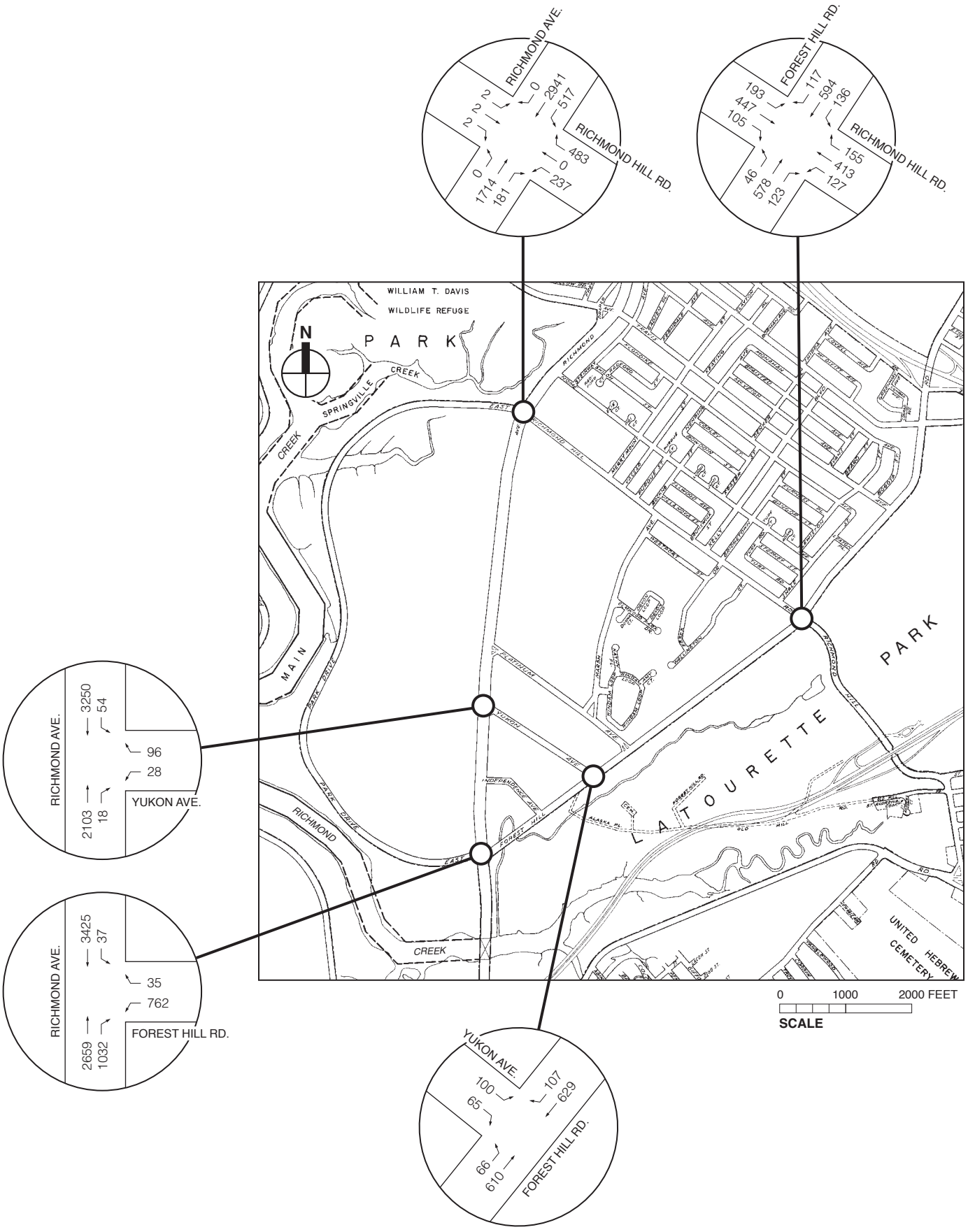
2016 No Build Traffic Volumes
Weekday AM Peak Hour
Figure 16-7

6.2.09



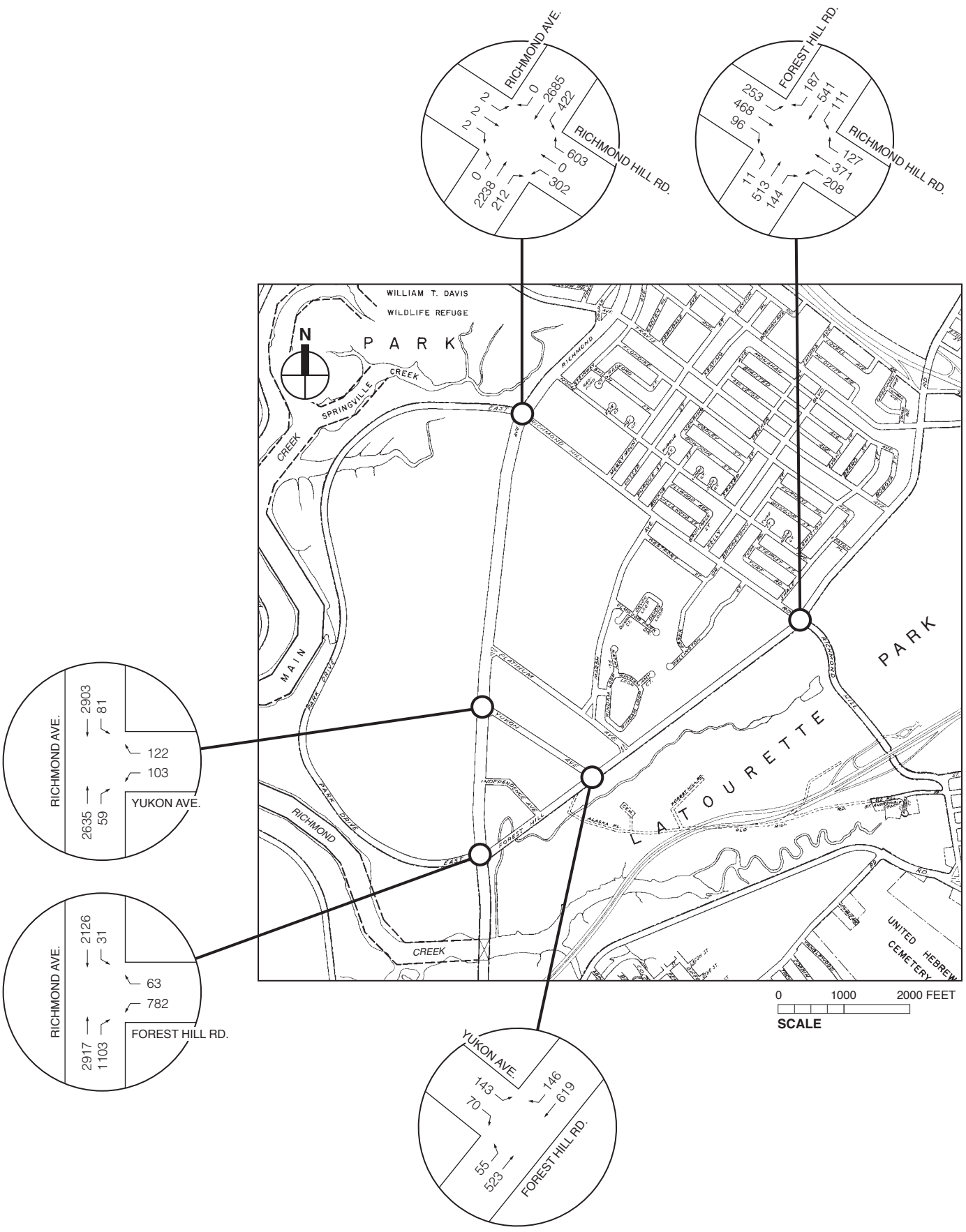
2016 No Build Traffic Volumes
Weekday Midday Peak Hour
Figure 16-8

6.2.09



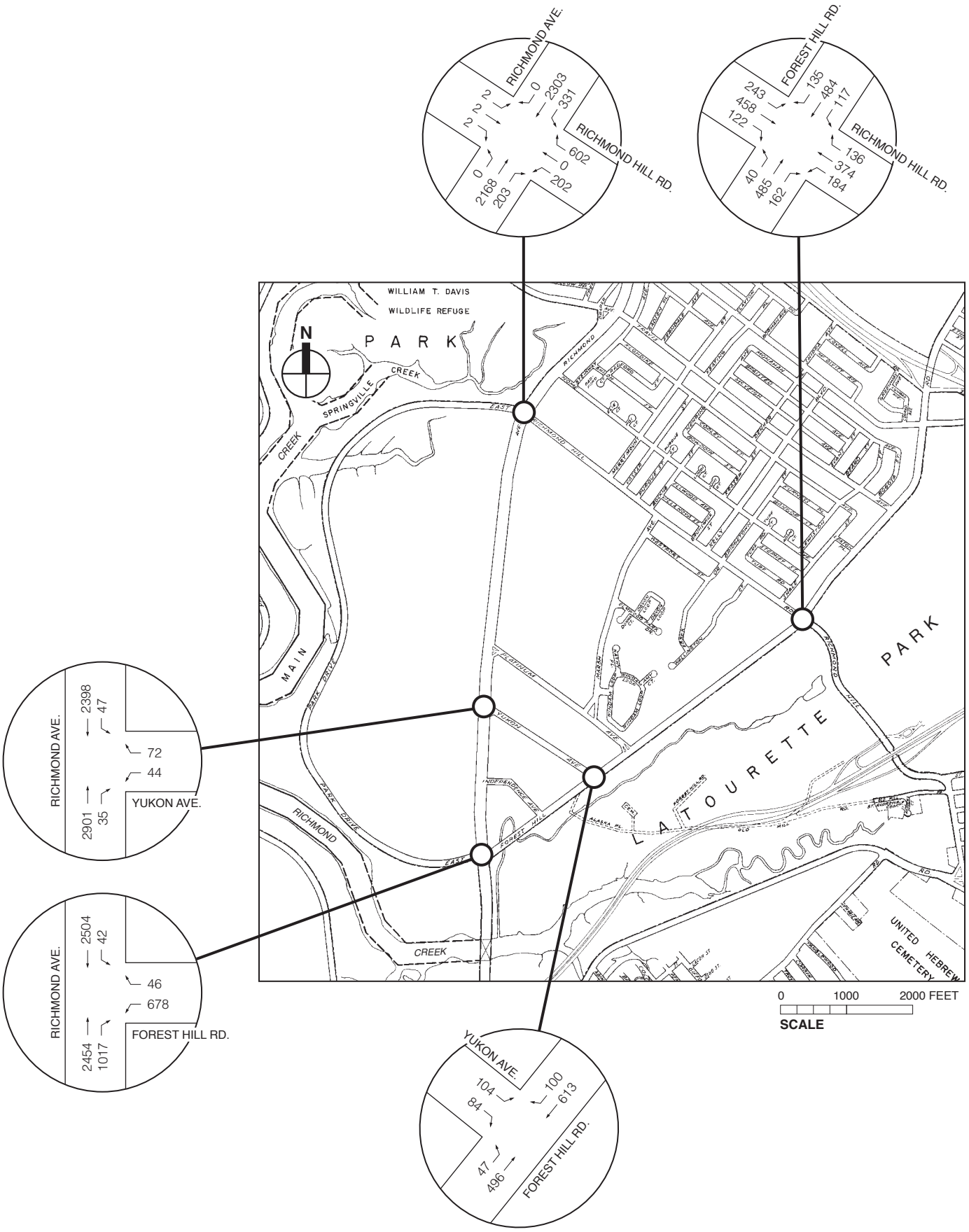
2016 No Build Traffic Volumes
Weekday PM Peak Hour
Figure 16-9

6.2.09



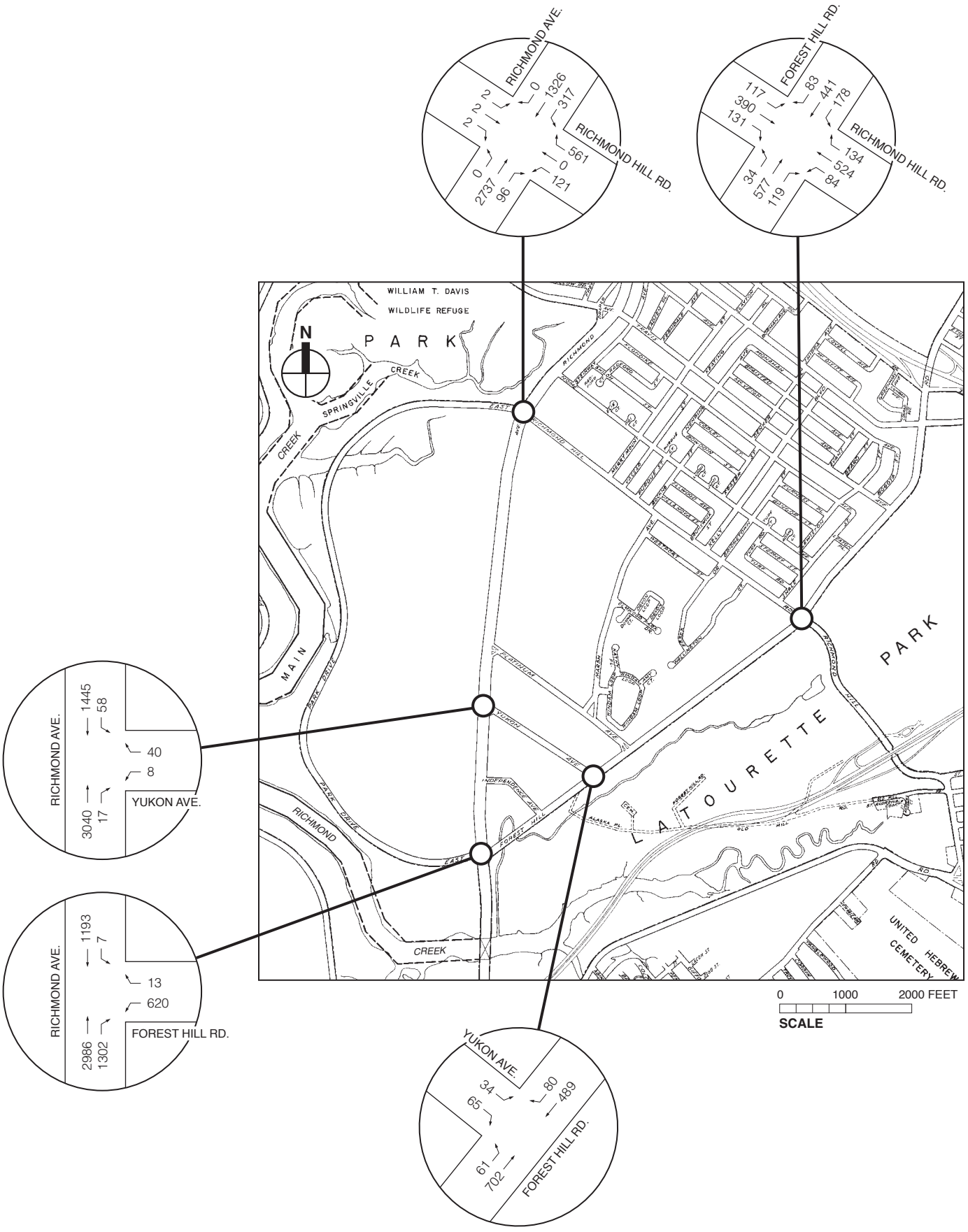
2016 No Build Traffic Volumes
Weekend Midday Peak Hour
Figure 16-10

6.2.09



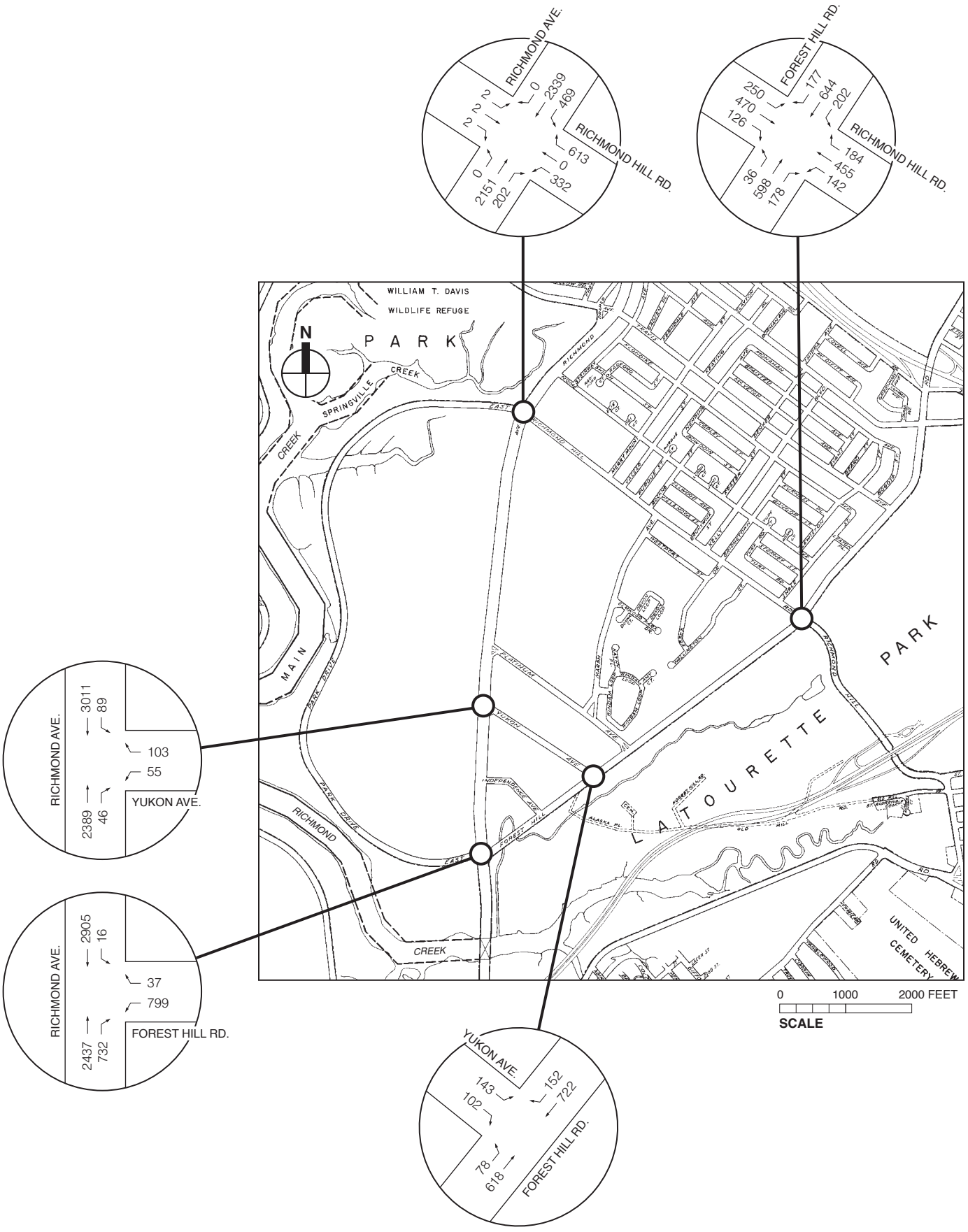
2016 No Build Traffic Volumes
Weekend PM Peak Hour
Figure 16-11

6.2.09



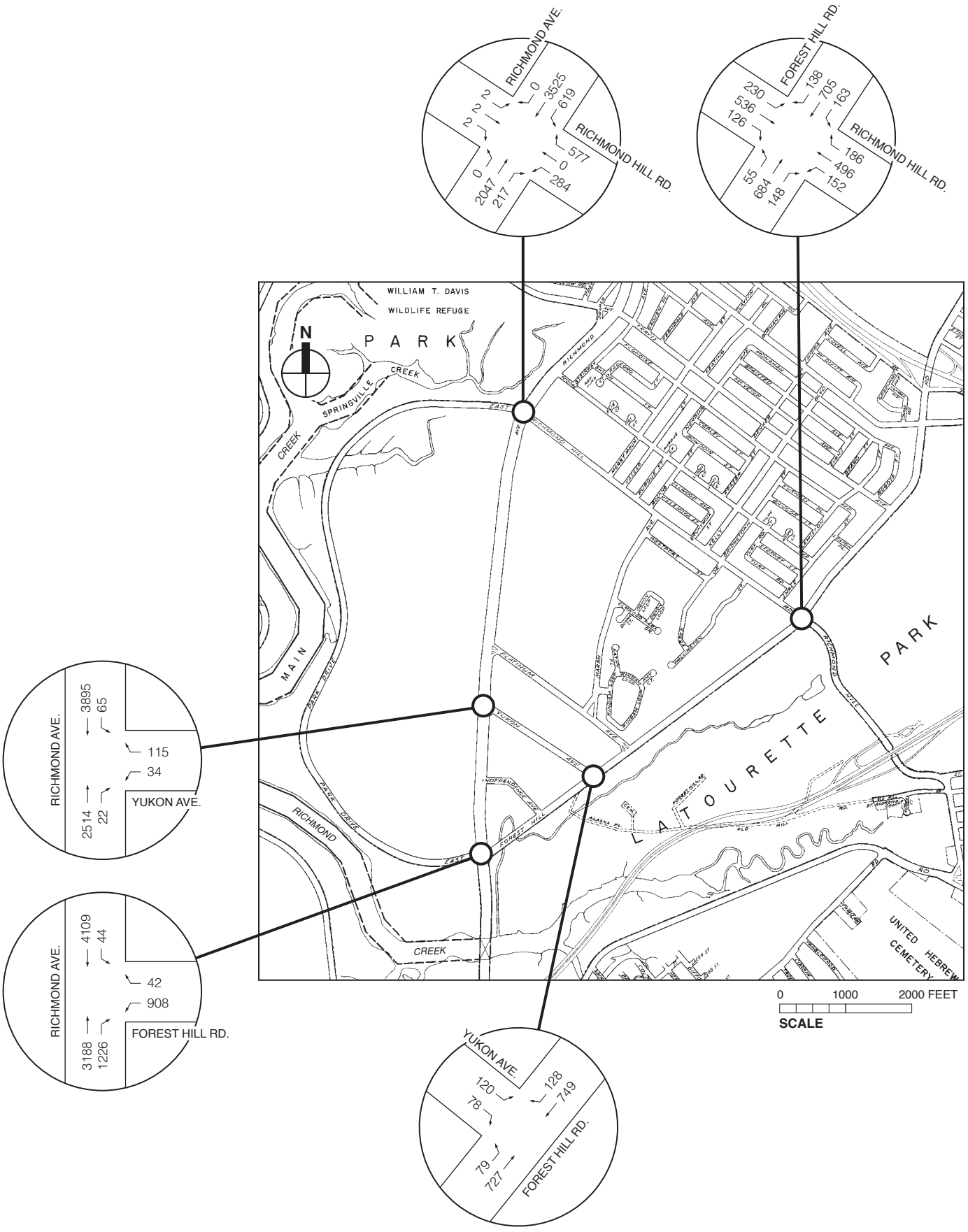
2036 No Build Traffic Volumes
Weekday AM Peak Hour
Figure 16-12

6.2.09



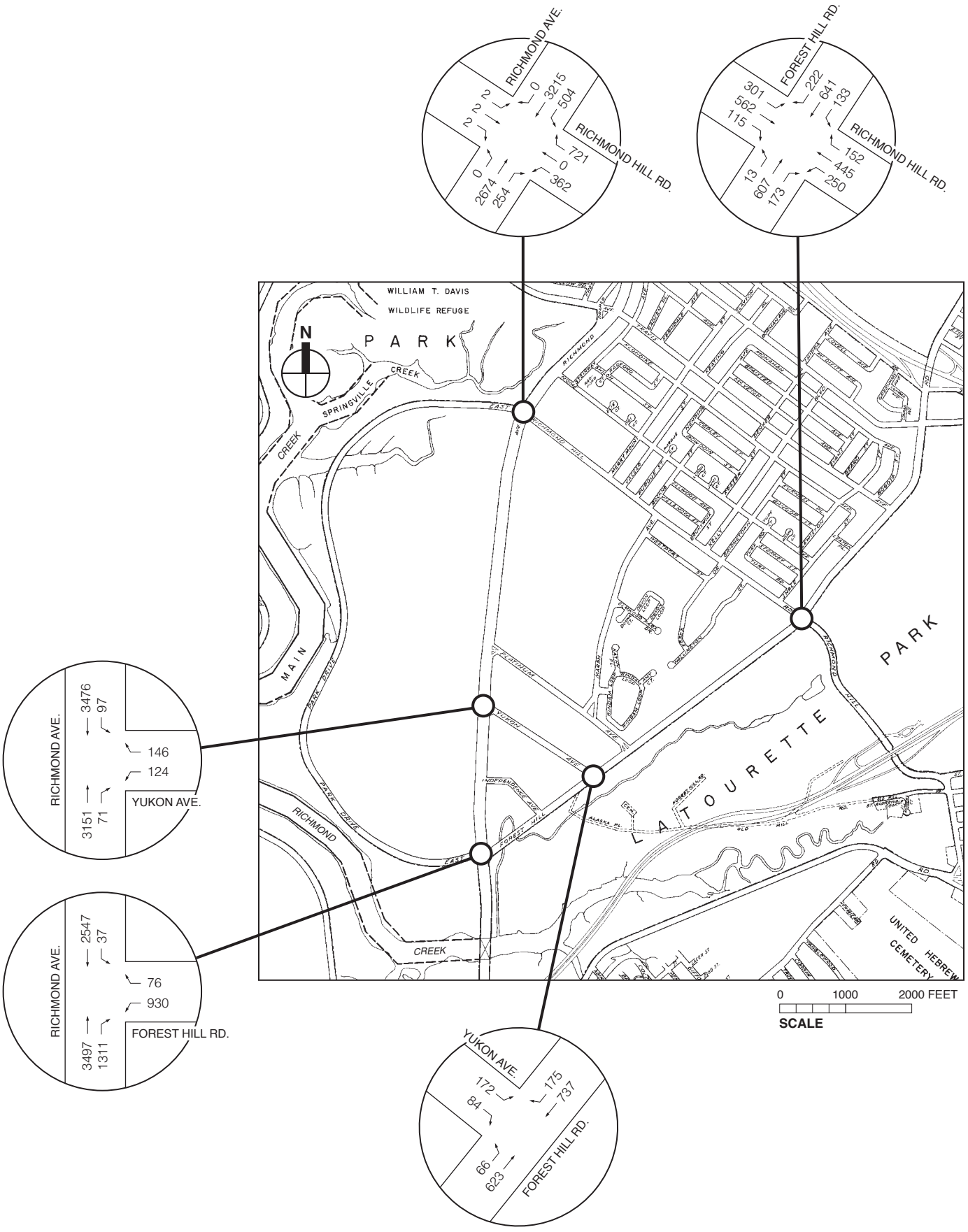
2036 No Build Traffic Volumes
Weekday Midday Peak Hour
Figure 16-13

6.2.09



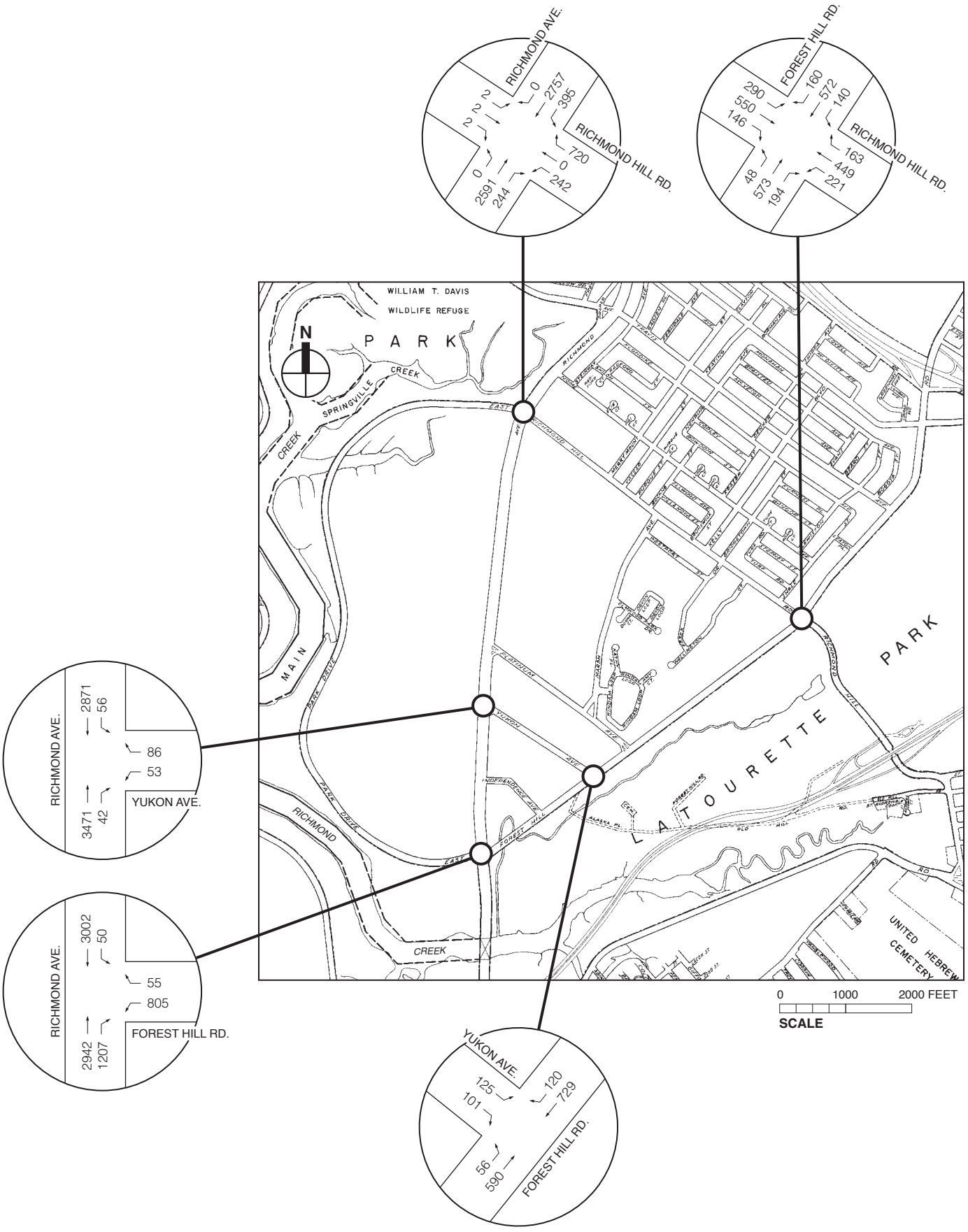
2036 No Build Traffic Volumes
Weekday PM Peak Hour
Figure 16-14

6.2.09

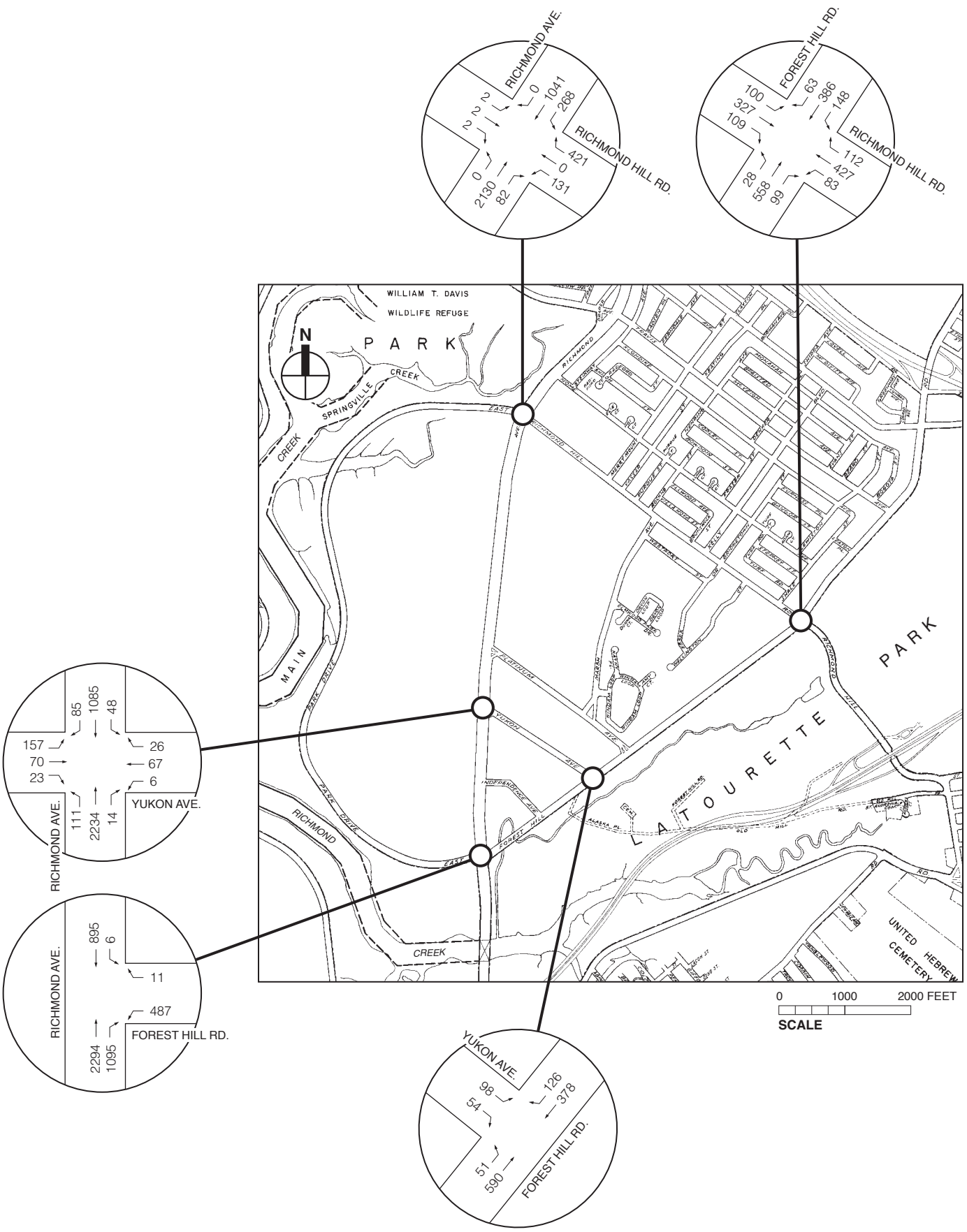


2036 No Build Traffic Volumes
Weekend Midday Peak Hour
Figure 16-15

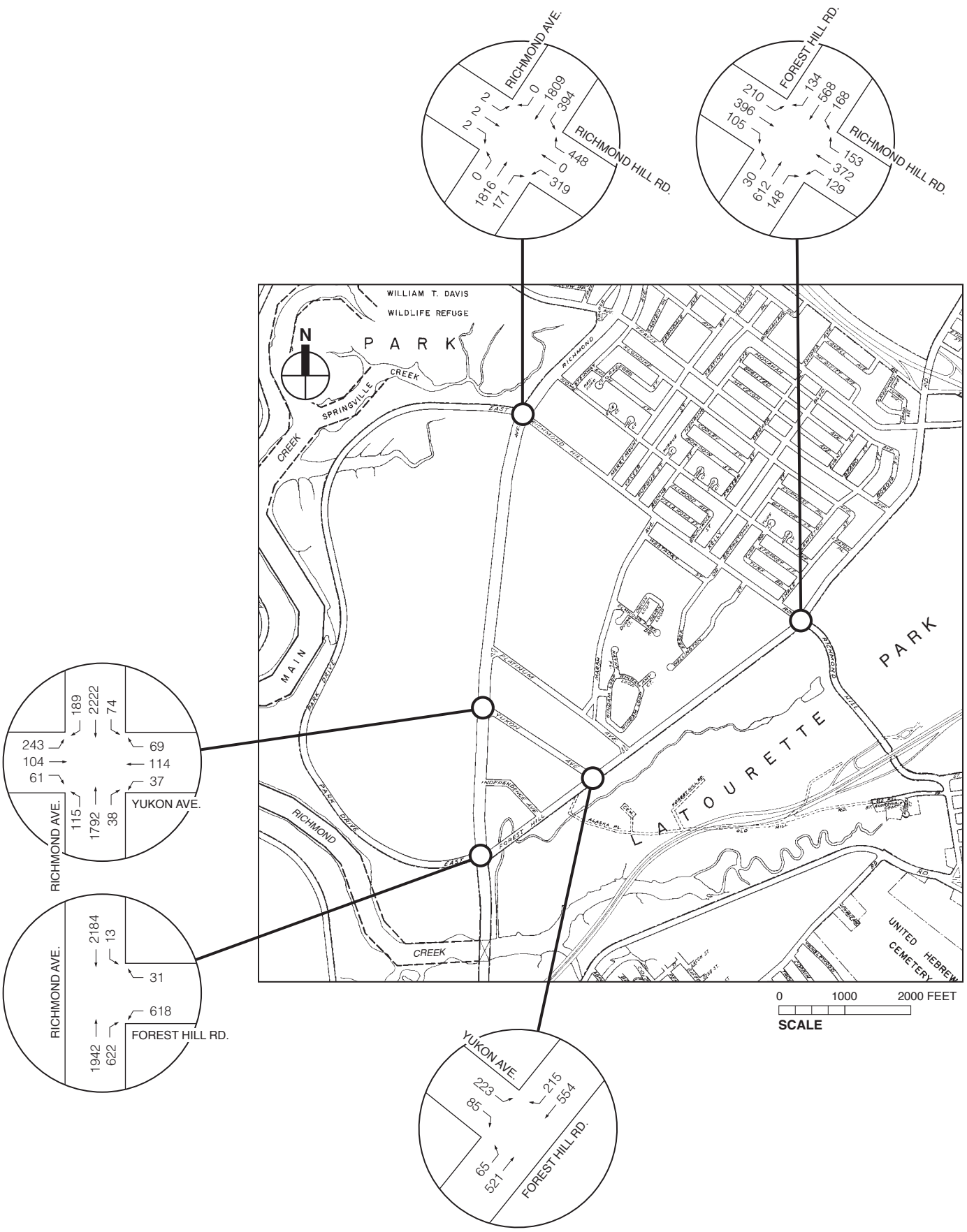
6.2.09



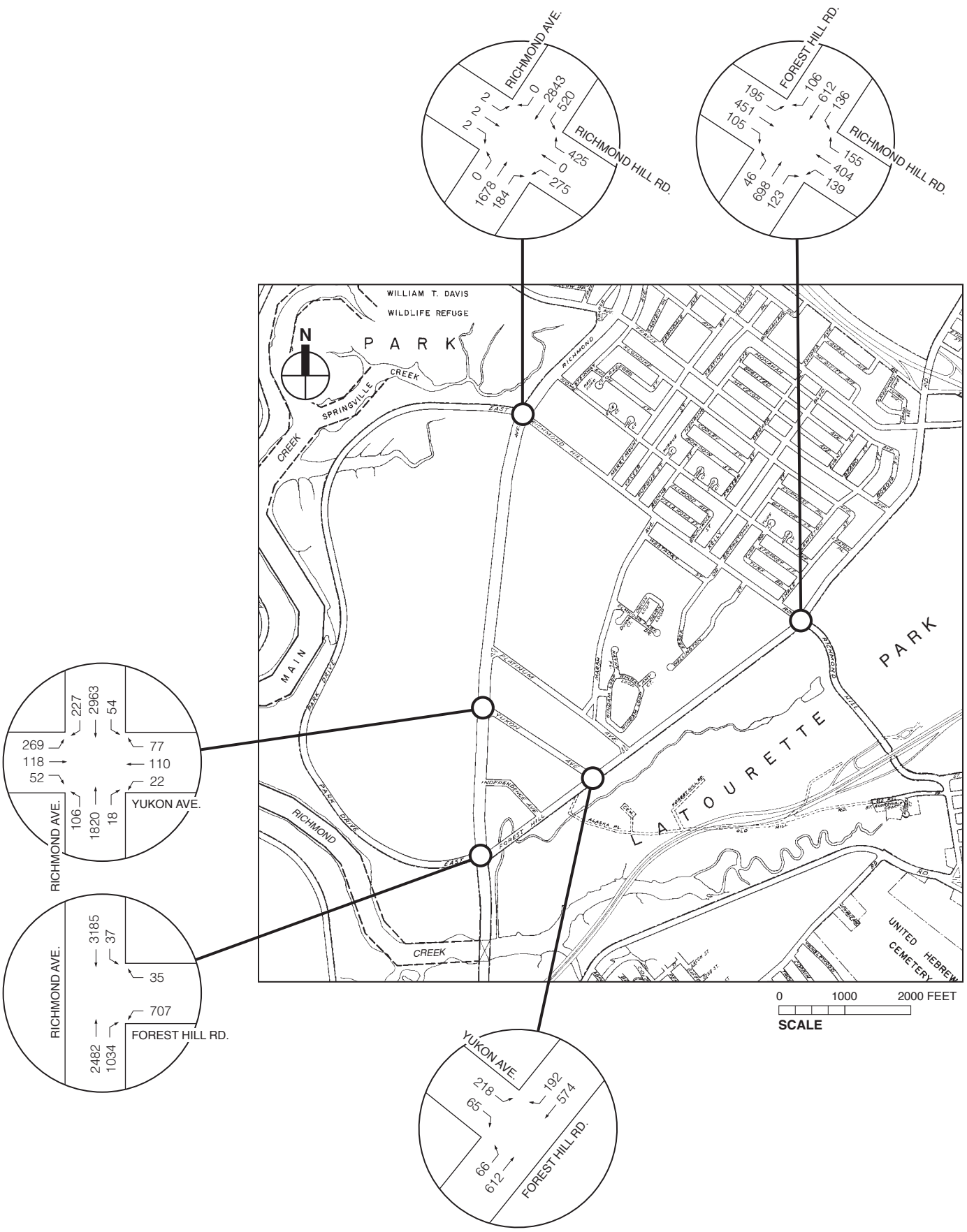
2036 No Build Traffic Volumes
Weekend PM Peak Hour
Figure 16-16



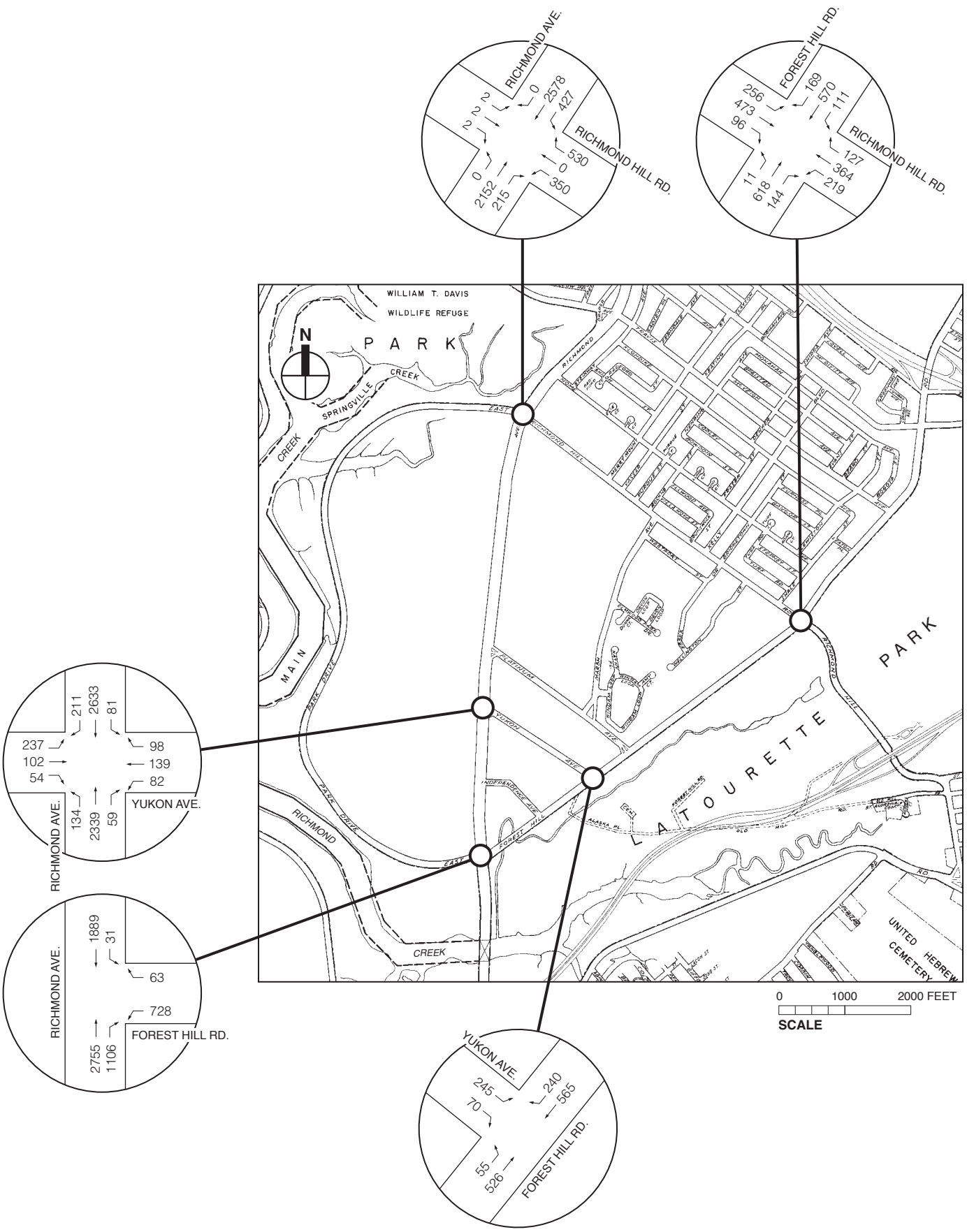
Yukon Avenue Connection
2016 Build Traffic Volumes
Weekday AM Peak Hour
Figure 16-17



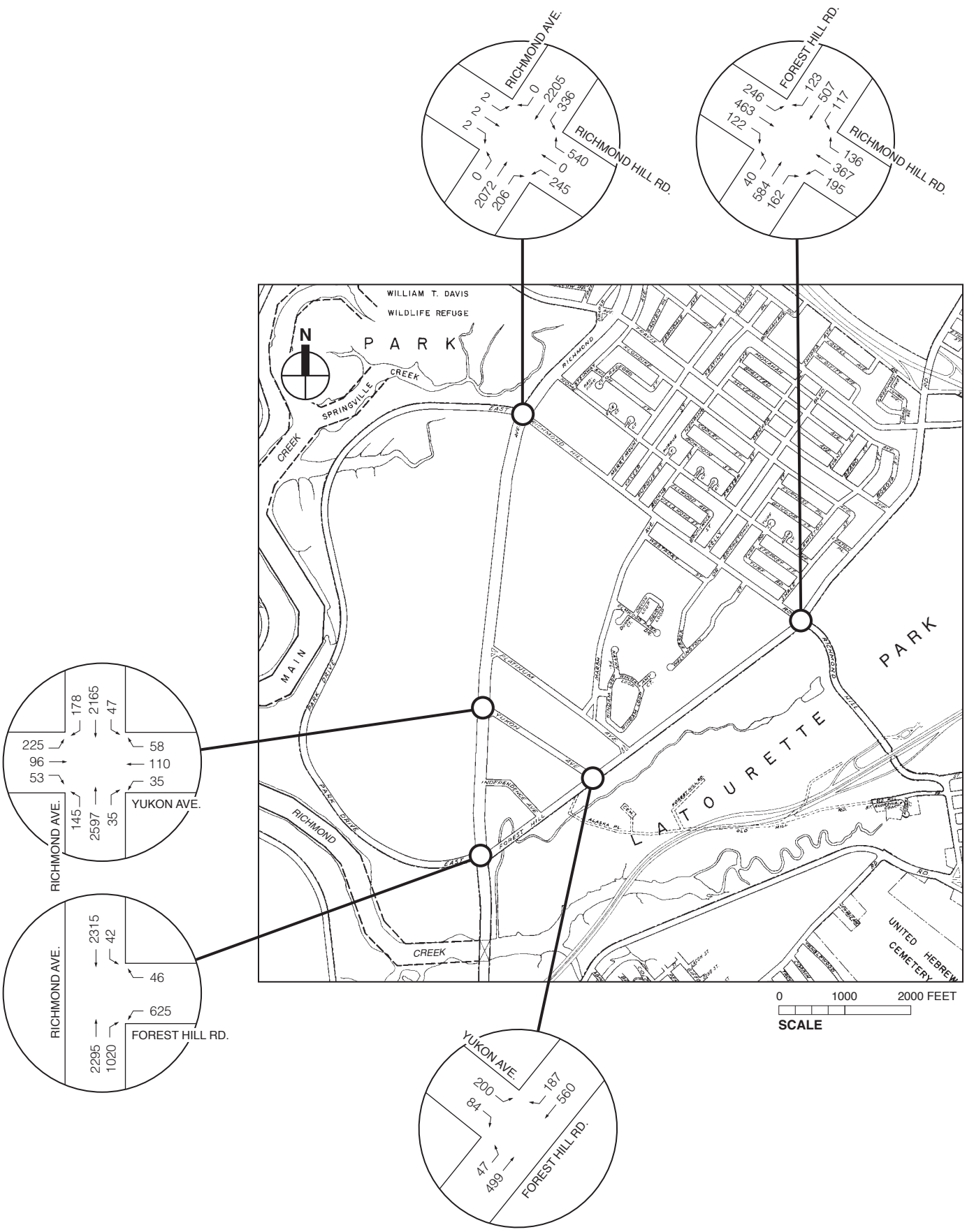
Yukon Avenue Connection
2016 Build Traffic Volumes
Weekday Midday Peak Hour
Figure 16-18



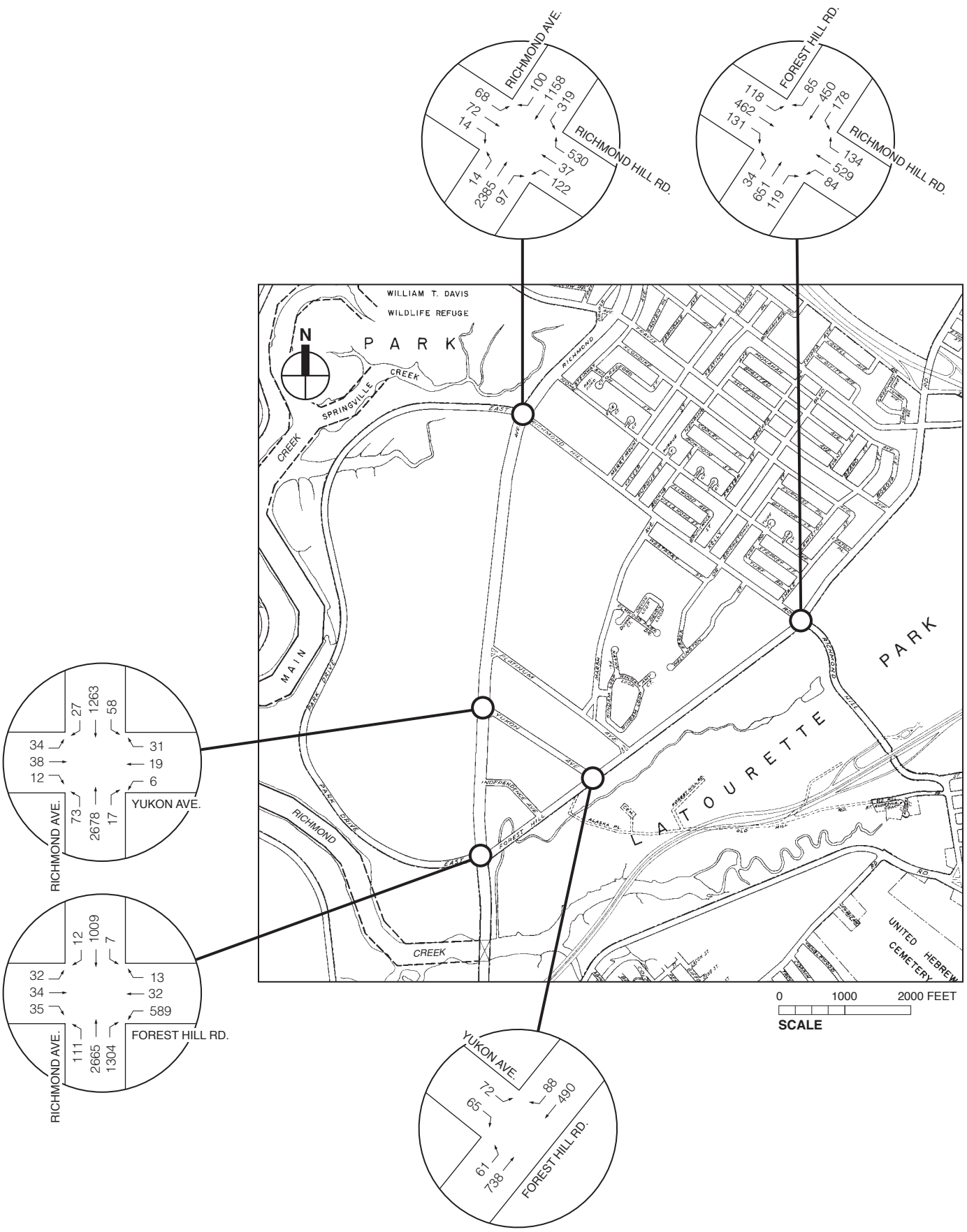
Yukon Avenue Connection
2016 Build Traffic Volumes
Weekday PM Peak Hour
Figure 16-19



Yukon Avenue Connection
2016 Build Traffic Volumes
Weekend Midday Peak Hour
Figure 16-20

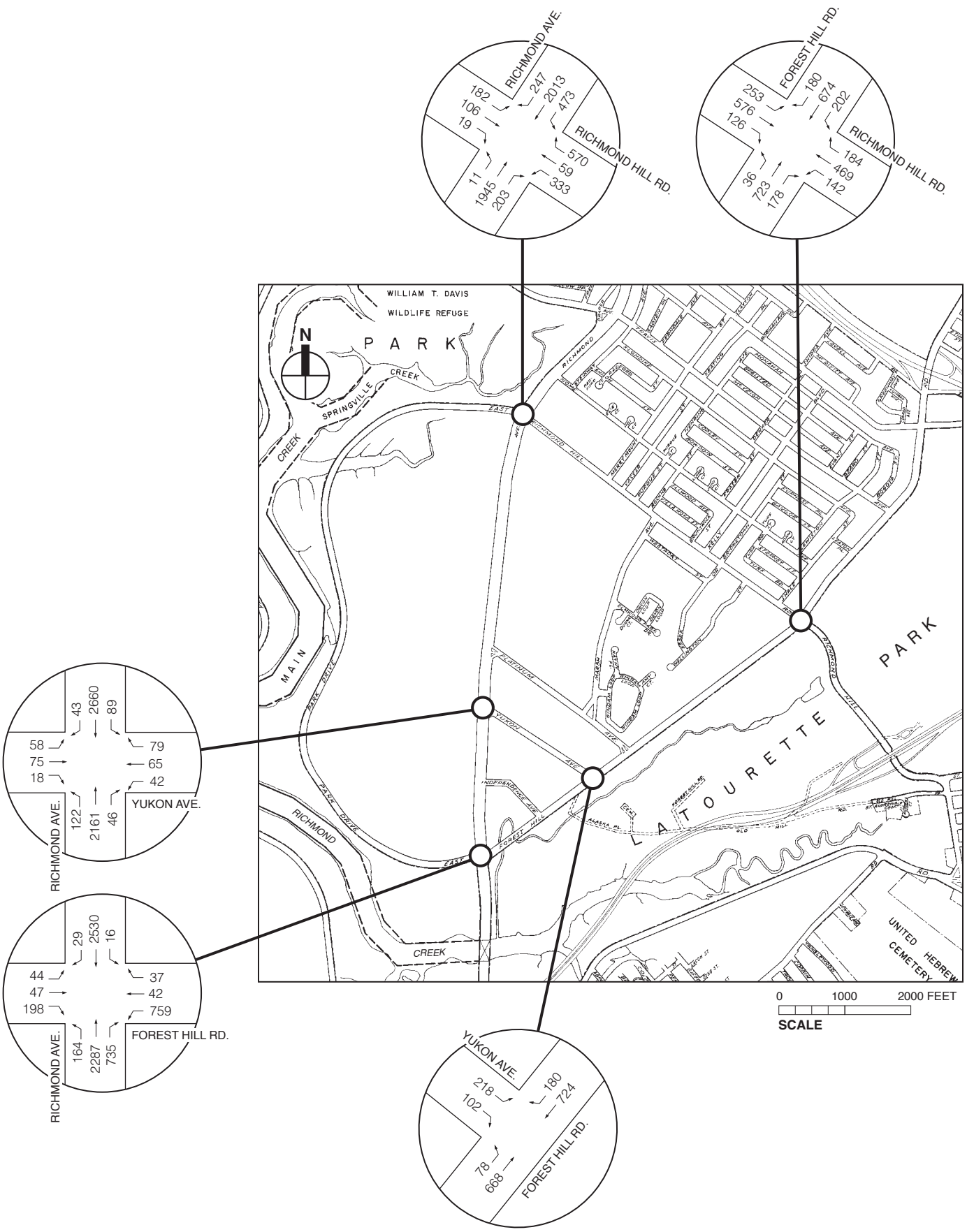


Yukon Avenue Connection
2016 Build Traffic Volumes
Weekend PM Peak Hour
Figure 16-21



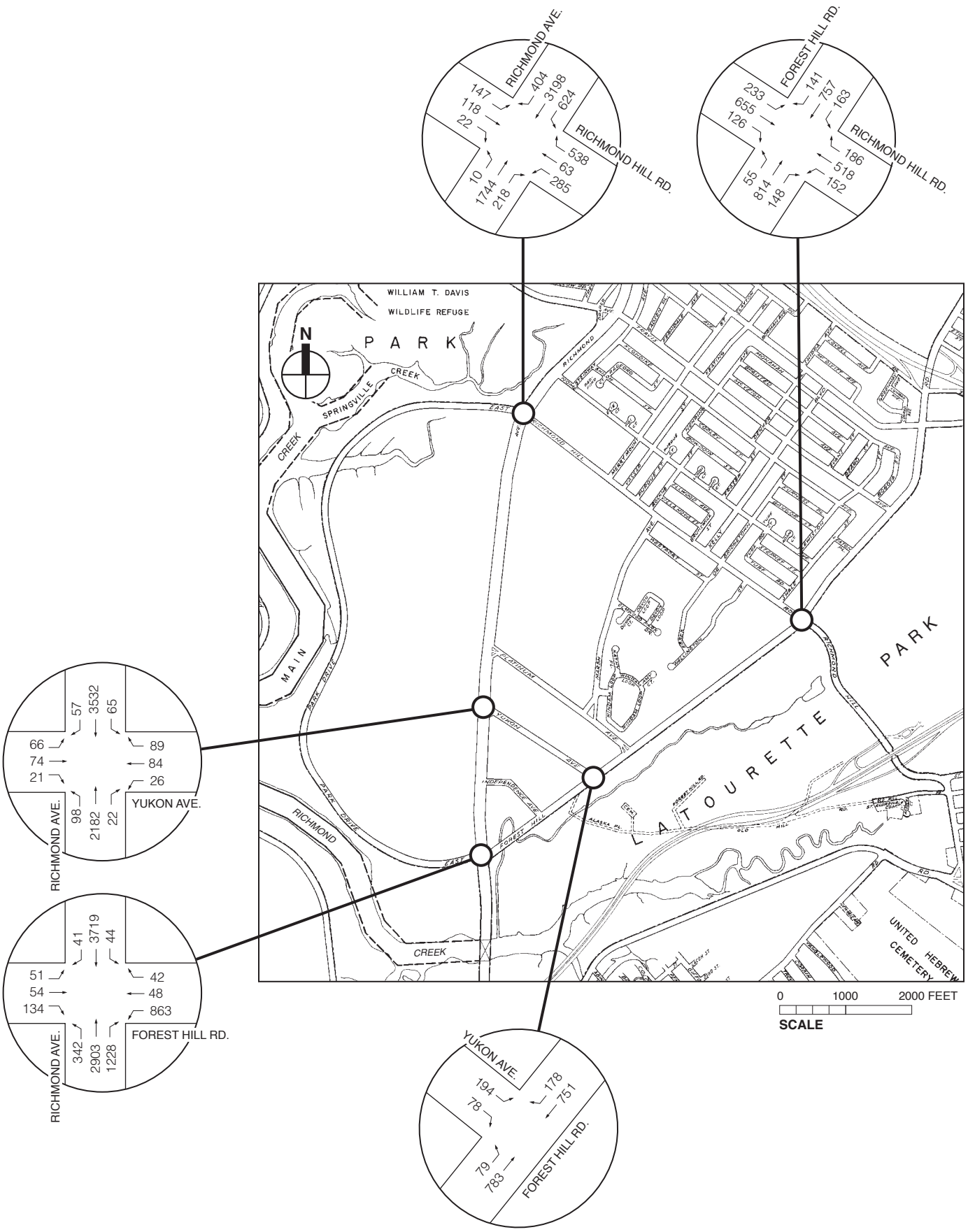
Completed East Park Road System
2036 Build Traffic Volumes
Weekday AM Peak Hour

Figure 16-22



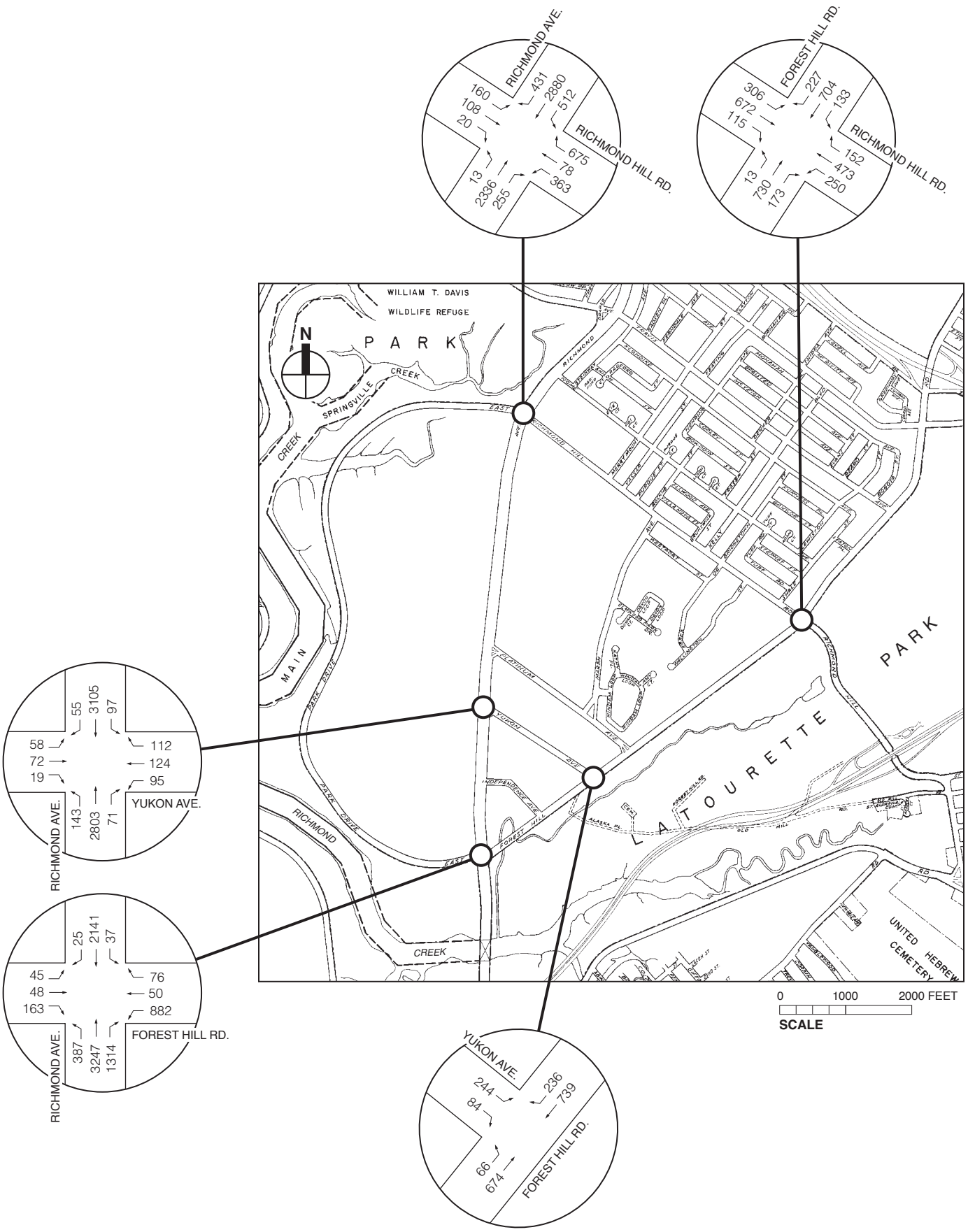
Completed East Park Road System
2036 Build Traffic Volumes
Weekday Midday Peak Hour

Figure 16-23



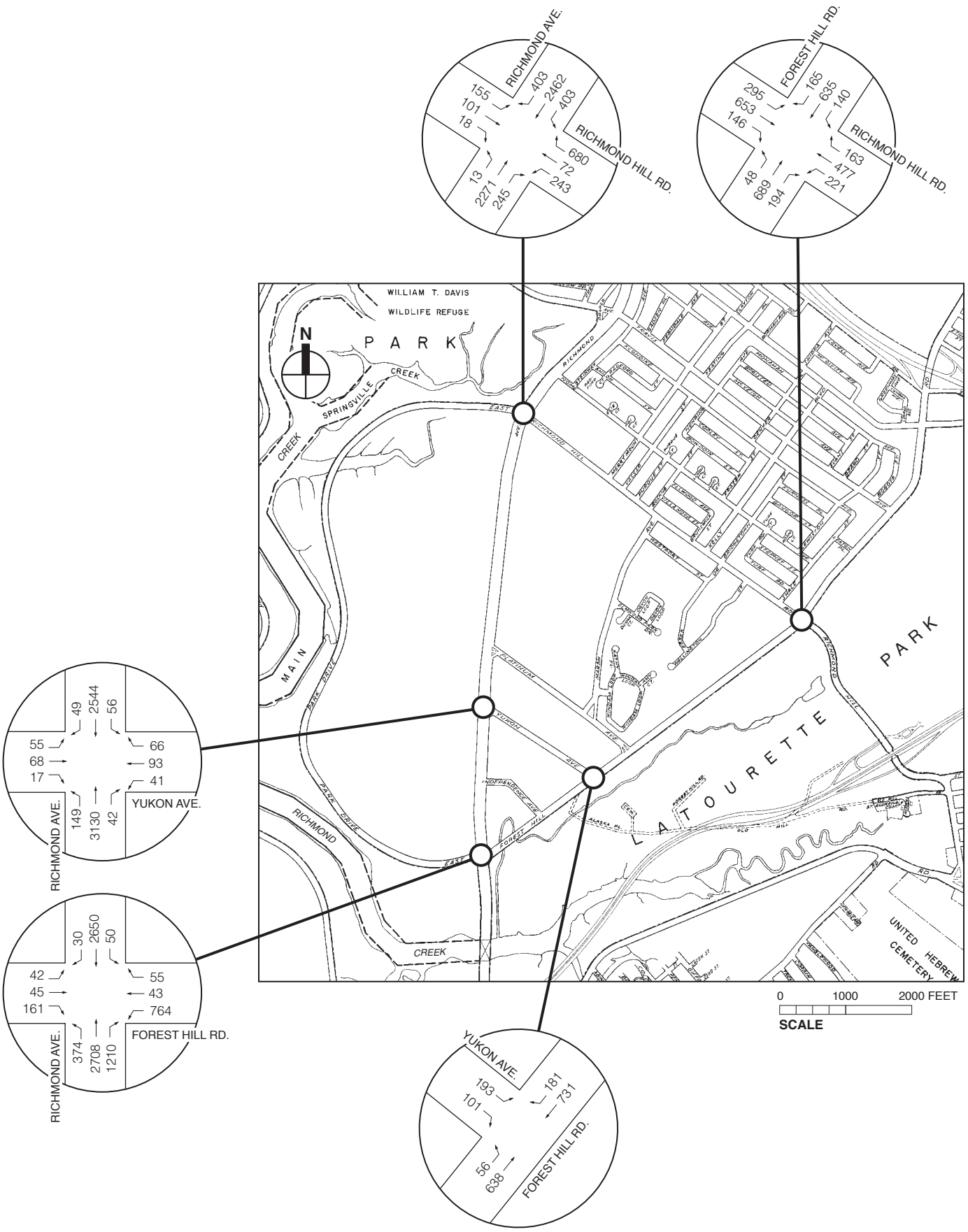
Completed East Park Road System
2036 Build Traffic Volumes
Weekday PM Peak Hour

Figure 16-24

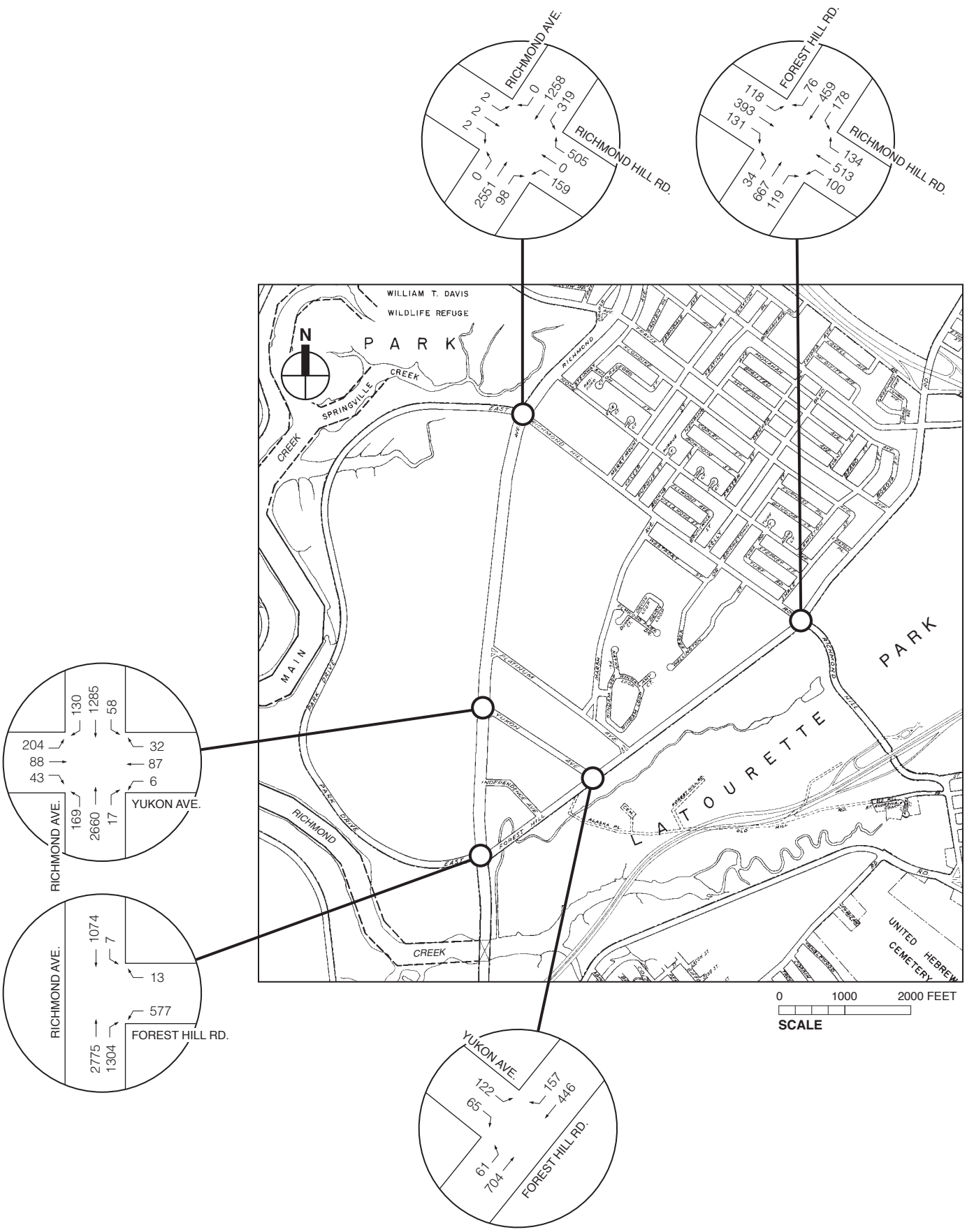


Completed East Park Road System
2036 Build Traffic Volumes
Weekend Midday Peak Hour

Figure 16-25

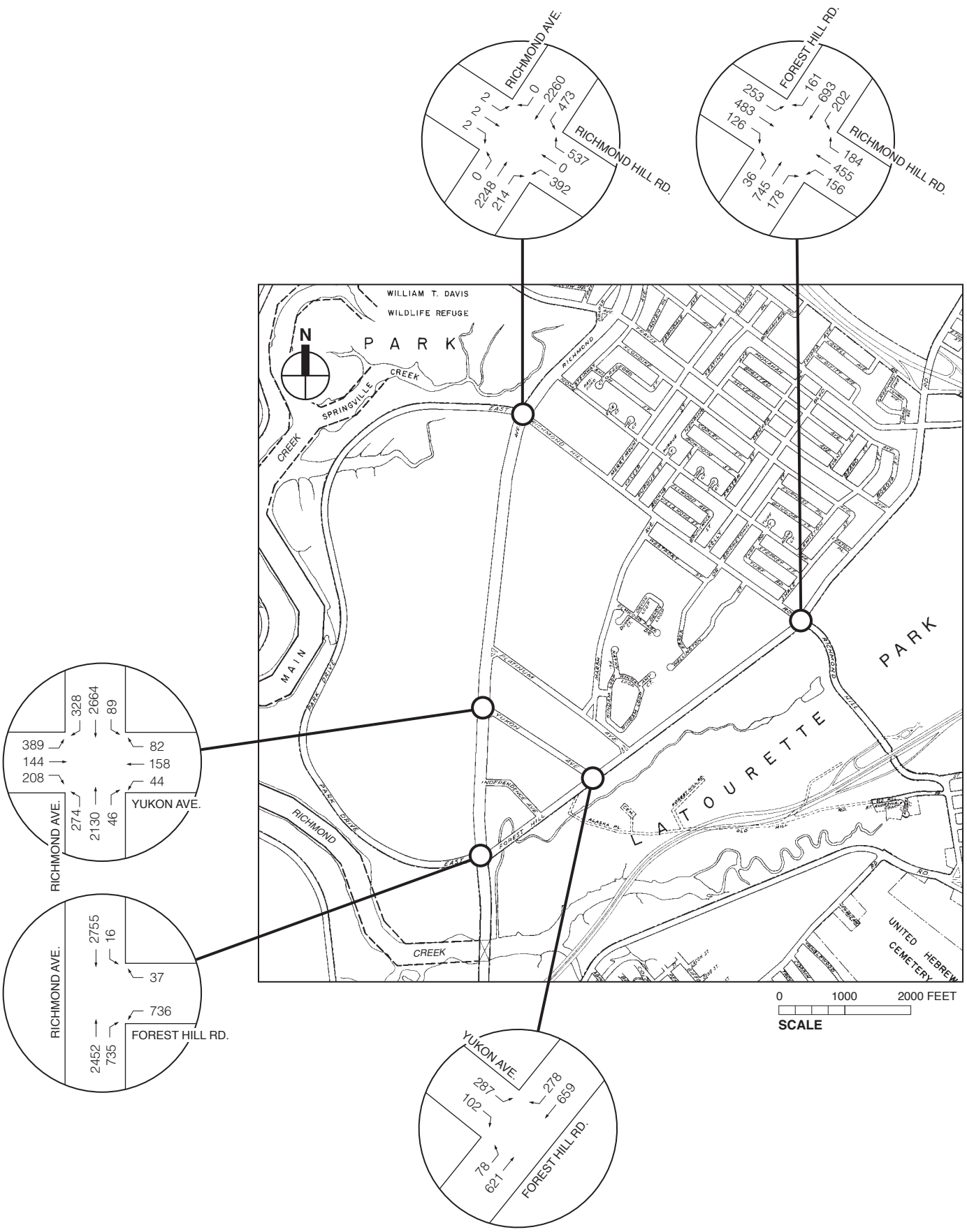


Completed East Park Road System
2036 Build Traffic Volumes
Weekend PM Peak Hour
Figure 16-26



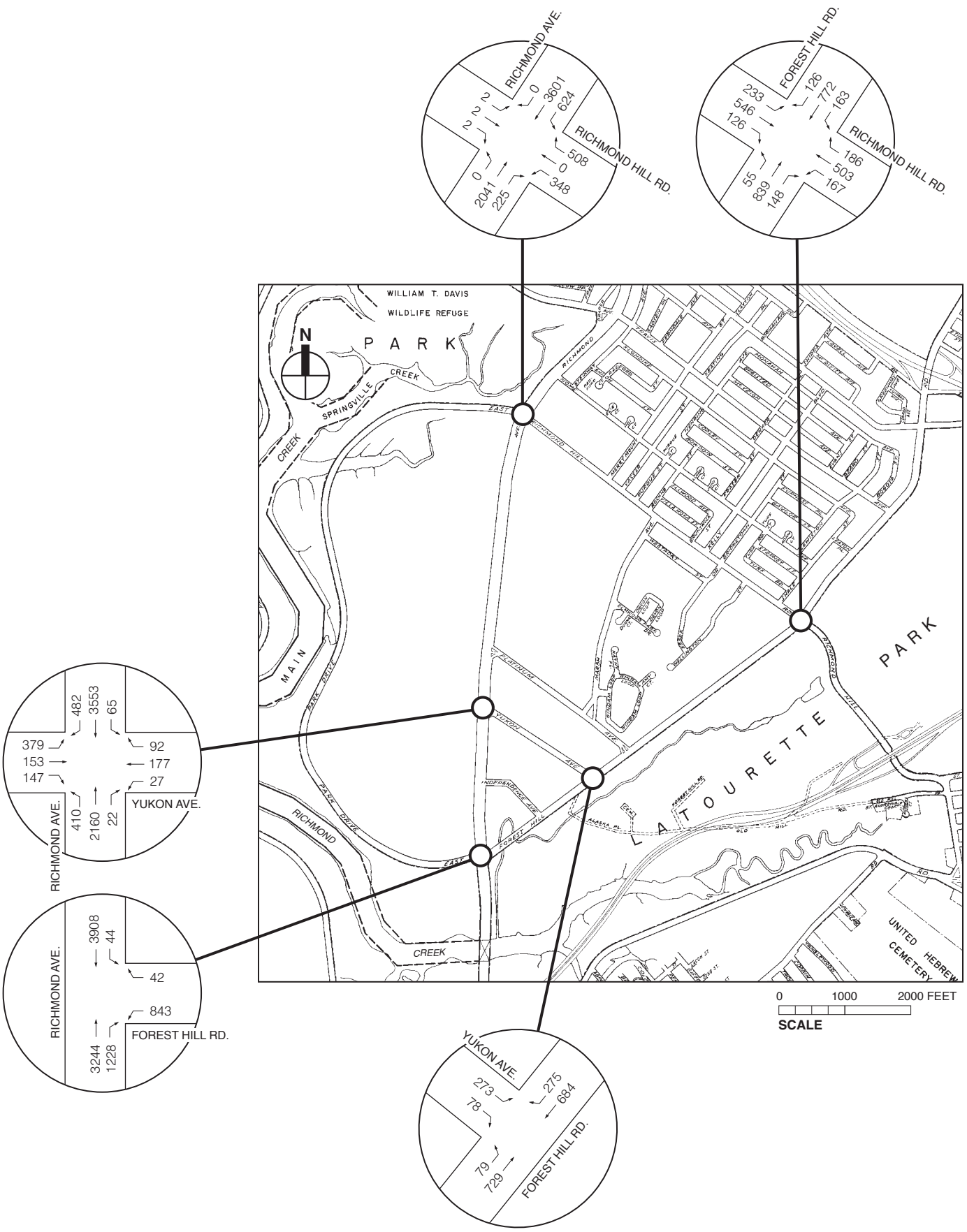
Yukon Avenue Connection Option
2036 Build Traffic Volumes
Weekday AM Peak Hour

Figure 16-27

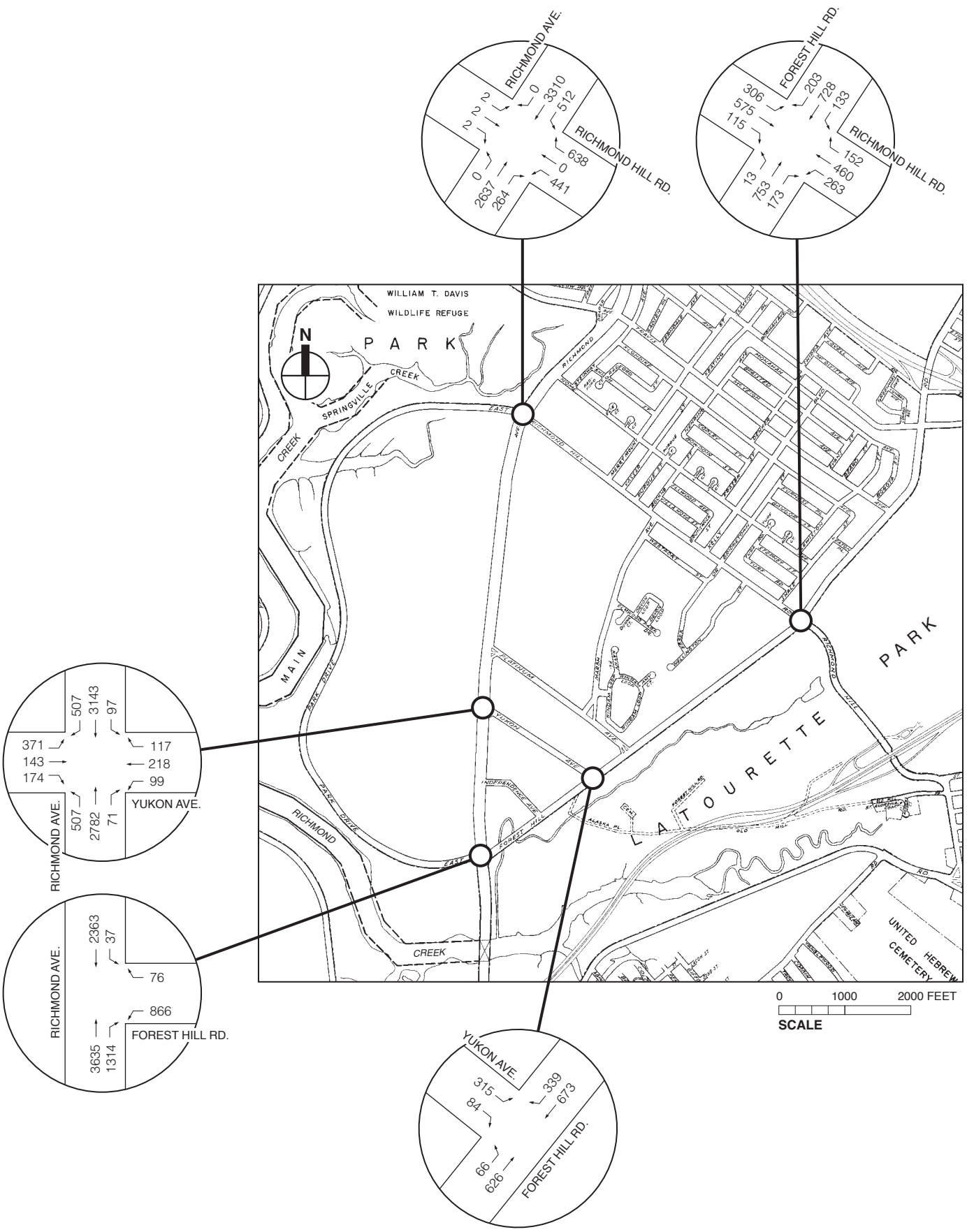


Yukon Avenue Connection Option
2036 Build Traffic Volumes
Weekday Midday Peak Hour

Figure 16-28

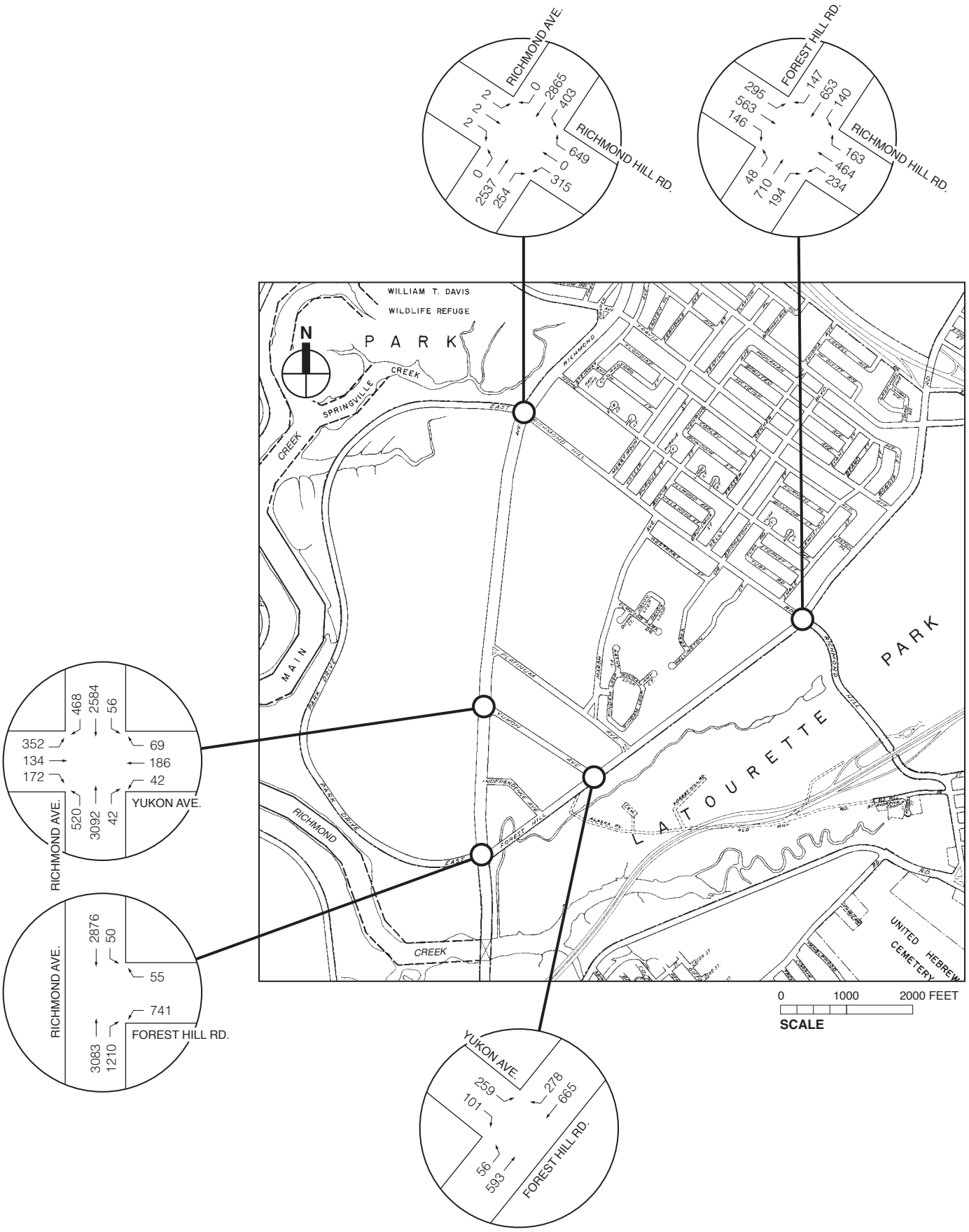


Yukon Avenue Connection Option
2036 Build Traffic Volumes
Weekday PM Peak Hour
Figure 16-29



Yukon Avenue Connection Option
2036 Build Traffic Volumes
Weekend Midday Peak Hour

Figure 16-30



Yukon Avenue Connection Option
2036 Build Traffic Volumes
Weekend PM Peak Hour

Figure 16-31