

## A. INTRODUCTION

This chapter examines a number of alternatives to the proposed Fresh Kills Park Plan. In accordance with the Final Scope of Work issued in August 2006, this analysis considers the following alternatives:

- The No Action Alternative, which assumes no rezoning or other proposed actions;
- A Two-Lane Park Road Alternative (Alternative Park Road Width);
- Alternative Alignment: Richmond Hill Road Connection (west of Landfill Section 6/7);
- Alternative Alignment: Staten Island Borough President's Office (SIBPO) Proposal (i.e., reuse of New York City Department of Sanitation [DSNY] haul roads alignment);
- Alternative Alignment: SIBPO Modified Proposal;
- Alternative Alignment: Yukon Avenue Crossing; and
- Less Intensive Programming Alternative (Lesser Impact).

In developing these alternatives, it was the objective of DPR to provide in this chapter a full range of alternatives for the proposed project that particularly addressed certain key technical areas, including natural resources (with a focus on wetlands and habitats), potential landfill impacts, (which could have indirect impacts on water resources and public health, for example), traffic and circulation air quality, and noise. In accordance with New York City Environmental Quality Review (CEQR)/State Environmental Quality Review (SEQR), these impacts are compared with the proposed project and its environmental impacts, as well as the alternatives ability to make the project sponsors goals and objectives. To that end, the alternatives evaluated in this chapter included multiple alternatives with respect to road impacts and alignments, and the evaluation and comparison of impacts with the proposed project. This FGEIS also includes a number of alternatives that were added in response to comments raised on the DGEIS.

This alternatives analysis first examines the No Action Alternative. This alternative is required under CEQR/SEQR for all environmental impact statements. Under this alternative, it is assumed that the proposed project and other actions do not move forward at Fresh Kills and the "No Build" or "Future Without the Proposed Project" is the future condition.

The second alternative assumes a Two-Lane Park Road and is compared with the proposed Four-Lane Park Road design that is presented as the proposed project in this Generic EIS (GEIS). The third alternative, the Alternative Road Alignment (west of Landfill Section 6/7) assumes that the Richmond Hill Road Connection (a 2036 project) is constructed along the west side of Landfill Section 6/7 rather than along the eastern alignment presented in this GEIS. The 2016 Proposed Roads Alternative is an examination of conditions that assume the proposed 2016 road network is developed, but not the 2016 park program. The fourth alternative is an examination of a proposal submitted by the SIBPO during the review of the DEIS. It assumes reuse of the existing DSNY haul roads alignment with a circulation pattern around Landfill

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Section 6/7, in addition to the Yukon Crossing. A minor modification of this alternative is also presented. Also included as a new alternative is the Yukon Avenue Crossing Alignment assumes a crossing of the landfill at Yukon Avenue only, and only one connection at Richmond Avenue 2016 and 2036, with a new intersection at Yukon Avenue and Richmond Avenue. A modification of this alignment is also presented. Lastly, this analysis assumes a lesser impact alternative. That alternative essentially assumes no roads or active recreational facilities at Fresh Kills.

## **B. NO ACTION ALTERNATIVE**

### **DESCRIPTION**

The No Action Alternative assumes that the proposed project is not implemented. This includes no mapping of parkland and the corresponding amendments to the zoning map; no mapping of new roadways and demapping of unbuilt paper streets; and no capital funding for the construction of public facilities. This alternative essentially reflects conditions discussed as the “Future Without the Proposed Project” in Chapters 2 through 21 through the analysis years 2016 and 2036. This analysis compares conditions under the No Action Alternative to conditions with the proposed project through 2036.

### **LAND USE, ZONING AND PUBLIC POLICY**

Under the No Action Alternative, it is assumed that the project site would remain as Fresh Kills Landfill and the associated properties undergoing final closure through the completion of final closure construction and post closure monitoring and maintenance. No other development is expected on the project site through the 2016 and 2036 analysis years. Closure construction at both Landfill Sections 1/9 and 6/7 will be completed by 2016. This would include the installation of final cover on the landfill mounds and implementation of all environmental control and monitoring systems.

There are a number of projects that are expected to take place in the study area under the No Action Alternative. These projects include roadway improvements, commercial, residential, and hotel construction, and industrial projects.

The benefits to the area expected to result from the proposed action—including the creation of a 2,163-acre regional park and public access to the waterfront—would not be realized under this alternative.

### **SOCIOECONOMIC CONDITIONS**

As stated above, the project site would remain a closed landfill absent the proposed project and no other development is expected on the project site absent the proposed project. After closure of the landfill, a small number of employees would remain to oversee the maintenance and operations of the closed landfill. The study area would see nominal increases in both the residential population and employees in the future without the project. Neither the proposed action nor the No Action Alternative would displace populations, employees, or businesses. However, the project’s goals of creating a park to complement both the existing residential neighborhoods surrounding the project site and the region as a whole would not be met under the No Action Alternative.

## **COMMUNITY FACILITIES**

Under the No Action Alternative, the project site would remain a closed landfill and there would be an increase in the residential population of the study area. However, like the proposed project, the No Action Alternative would not have any significant adverse impacts on community facilities.

## **OPEN SPACE**

Under the No Action Alternative, the 2,163-acre park that would result from the proposed project would not be constructed. Therefore, under the No Action Alternative, although open space ratios in the area are adequate due to the large existing parks, open space ratios for the study area population would not see the dramatic increase that would occur under the future with the proposed project.

## **SHADOWS**

In the No Action Alternative, wind turbines would not be constructed on the project site and no new shadows would be cast. However, the shadows from the wind turbines under consideration with the proposed project would be very slender, and would not be expected to impact open space users and activities that are proposed within the park, nor would they be expected to impact in any way the planting program that is proposed in these areas.

## **HISTORIC RESOURCES**

Under the No Action Alternative, it is assumed that the project site would remain a closed landfill and no development on the site would occur, therefore, it is expected that no potential impacts to archaeological resources would occur. With the proposed project, it is recommended that individual construction projects be reviewed by an archaeologist to determine if the project could impact locations that were identified in the Phase 1A archaeological documentary study (see GEIS Appendices) as possessing moderate, moderate to high, or high sensitivity for pre-contact or historic-period archaeological resources.

With respect to architectural resources, under the No Action Alternative, it is assumed that the project site would remain a closed landfill and no development on the site would occur. Similarly, no significant adverse impacts are expected in the future with the proposed project. One architectural resource, the Sleight Family Cemetery (a.k.a. Blazing Star Burial Ground) New York City Landmark (NYCL) is located in the project site; however, no direct or indirect impacts to this resource are expected to result from the proposed project, and no construction activities are currently planned within 90 feet of this resource.

## **URBAN DESIGN AND VISUAL RESOURCES**

Under the No Action Alternative, it is assumed that the visual enhancements associated with the construction of the proposed park would be foregone. Although there are a number of projects anticipated to be completed in the study area, these projects would not involve any alterations to block form, streetscape, street pattern or hierarchy, natural resources, or topography. A number of these projects, described in Chapter 2, "Land Use, Zoning, and Public Policy," are road improvement projects, but they would not alter alignments or configurations or create new streets.

## **NEIGHBORHOOD CHARACTER**

The No Action Alternative would not provide the benefits to neighborhood character associated with the proposed project, nor would it have either the positive or negative impact on traffic patterns that occur under the proposed project. However, under this alternative, the land use, open space, natural resources, and urban design benefits to the local neighborhood of the proposed project would be foregone.

## **NATURAL RESOURCES**

Neither the No Action Alternative nor the proposed project would result in significant adverse impacts on natural resources or water quality. In general, implementation of the post-closure monitoring and maintenance activities in the No Action Alternative would not result in significant adverse impacts to terrestrial or aquatic natural resources within the project site. The natural resources within the project site would be expected to be similar to those present under the existing condition, with some changes occurring naturally due to successional changes in the plant community. *Phragmites* would likely continue to invade portions of the *Spartina*-dominated saltmarsh within the project site where tidal flow is restricted. Upland and wetland woodlands on the site would continue to mature, and where contiguous to other woodlands (e.g., at the southern portion of the project site south of Landfill Section 2/8, just north of Arden Heights Woods), may support wildlife characteristic of forest interior landscape. Palustrine emergent and scrub-shrub wetlands would continue to mature and may gain additional woody plant species. Invasive plant species would continue to invade the project site. The tidal creeks and wetlands, freshwater wetlands and open water areas, woodlands and fields would continue to provide landscape for fish and wildlife currently described as using the landscapes present within the project site. In addition, with this alternative, the benefits of the proposed project would be foregone, including the extensive enhancement of landscape.

## **HAZARDOUS MATERIALS**

In the No Action Alternative, it is assumed that landfill closure would be completed in accordance with approved DSNY closure plans with oversight by the New York State Department of Environmental Conservation (DEC). It is expected that closure construction at Landfill Sections 6/7 and 1/9 will be completed by 2016. The leachate collection and containment system and landfill gas management system would continue to operate after landfill closure as required by DEC. Without the proposed project, no other development is expected on the project site through the 2016 and 2036 analysis years. The remediation of contamination in areas where spills have not been reported, or for which there is no other regulatory action, would likely take place only if contamination were encountered during soil disturbance as part of New York City Department of Sanitation DSNY operations. Overall, in the No Action Alternative there would be a low potential for disturbance of hazardous materials, but there would likely be less extensive remediation of hazardous materials than would be associated with the future with the proposed project.

While a greater intensity of construction would occur with the proposed project as compared to the No Action Alternative, this additional construction would be closely monitored and would occur in compliance with all applicable state and federal requirements to eliminate the potential for any impacts from hazardous materials. The No Action Alternative would also not include the final covering of the project site with soils that are acceptable for park use.

## **WATERFRONT REVITALIZATION PROGRAM**

The No Action Alternative would not be consistent with City coastal zone objectives or waterfront plans for the site. Most notably, the No Action Alternative would continue to preclude public access to the waterfront and would not improve scenic views to the water that would be provided with the proposed project.

In contrast, the proposed project would be consistent with the Waterfront Revitalization Program (WRP) policies and standards. Most importantly, the development of a public park on the project site would be consistent with the borough and City goals for revitalizing and providing public access in the coastal zone.

## **INFRASTRUCTURE**

Under the No Action Alternative, increased project demands on infrastructure would not occur; however neither this alternative nor the proposed project would cause increases to the degree that there would be significant adverse impacts on these services.

## **SOLID WASTE AND SANITATION SERVICES**

Under the No Action Alternative, it is assumed that the final closure construction of all the landfill sections would be completed by 2016, and by 2036, all landfill sections would be closed and DSNY would continue to operate and manage the Fresh Kills Landfill environmental control systems, along with implementation of the monitoring and maintenance programs. It is expected that the City would continue to manage and transport its solid waste and recyclables through the 2036 analysis year. It is also assumed that the Staten Island Waste Transfer Station would continue to operate and handle the borough's waste stream.

For the project site, the increased demands on solid waste and sanitation services would be less in the No Action Alternative than under the proposed project, but neither this alternative nor the proposed project would result in increases to the degree that there would be significant adverse impacts on these services.

## **ENERGY**

Under the No Action Alternative, the increased demands on energy systems would be smaller than those under the proposed project, but neither this alternative nor the proposed project would cause significant adverse impacts on utilities.

## **TRAFFIC AND PARKING**

### *TRAFFIC*

In the No Action Alternative, traffic and parking demand levels in the study area would increase as a result of general background growth and future developments in the area. Under the 2016 No Action Alternative conditions, of the 35 intersections analyzed, 23 intersections would experience congestion on one or more movements in the AM peak hour, 20 intersections in the midday peak hour, 24 intersections in the PM peak hour, 23 intersections in the Saturday midday peak hour, and 19 intersections in the Saturday PM peak hour. Under the 2036 No Action Alternative conditions, of the 35 intersections analyzed, 28 intersections would experience congestion on one or more movements in the AM peak hour, 25 intersections in the midday peak

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hour, 27 intersections in the PM peak hour, 27 intersections in the Saturday midday peak hour, and 25 intersections in the Saturday PM peak hour.

### *PARKING*

Under the proposed project no impacts would occur on local parking. Thus, conditions would be similar to the No Action Alternative.

### **TRANSIT AND PEDESTRIANS**

The proposed project would not adversely impact transit and pedestrian conditions. Thus, conditions in the No Action Alternative would not be significantly different from that under the proposed project.

### **AIR QUALITY**

With respect to mobile sources, no violations of the National Ambient Air Quality Standards (NAAQS) are predicted to occur under either the No Action Alternative or under the proposed project. In addition, as under the proposed project, the No Action Alternative would not result in impacts from heating systems.

### **NOISE**

Under the proposed project no impact would occur at local sensitive receptors. Thus, conditions under this No Action Alternative would be similar to the proposed project.

### **CONSTRUCTION**

Since the No Action Alternative would entail only the closure of the landfill, this alternative would not generate as much construction activity or disruption as the proposed project. Construction-related impacts on historic archaeological and architectural resources would be similar since the same sites would have the potential to be impacted, though with the proposed project, measures would be put in place during construction to ensure that impacts do not occur.

The No Action Alternative would not have the construction-related noise and traffic of the proposed project. However, neither this alternative nor the proposed project would result in significant adverse impacts on air quality, noise, traffic, or transit during construction.

### **PUBLIC HEALTH**

In the No Action Alternative, it is assumed that landfill closure will be completed in accordance with approved DSNY closure plans with oversight by DEC. It is expected that closure construction at Landfill Sections 6/7 and 1/9 will be completed by 2016. The leachate collection and containment system and landfill gas management system will continue to operate after landfill closure as required by DEC. Without the proposed project, no other development is expected on the project site through the 2016 and 2036 analysis years.

While a greater intensity of construction would occur with the proposed project as compared to the No Action Alternative, this additional construction would be closely monitored and would occur in compliance with all applicable state and federal requirements to minimize any impact from hazardous materials.

## MITIGATION

Under the No Action Alternative, there would not be the significant impacts of the proposed project (e.g., traffic, wetlands) that require mitigation.

## UNAVOIDABLE ADVERSE IMPACTS

The No Action Alternative would not have any unavoidable adverse impacts. The proposed project would have limited unavoidable adverse traffic impacts.

## C. TWO-LANE PARK ROAD ALTERNATIVE (ALTERNATIVE PARK ROAD WIDTH)<sup>1</sup>

### INTRODUCTION

The purpose of this alternative is to provide a comparison of the four lane road design presented in this GEIS with a narrower road footprint. The principal areas of comparison are the physical geometric differences between a two-lane and four-lane road design, potential landfill conflicts, environmental impacts, park design conflicts, and costs. A detailed description of the alternative follows with a comparison analysis.

### DESCRIPTION OF THE ALTERNATIVE

The two-lane alternative design assumes two 12-foot travel lanes, a 4-foot textured median, and 6-foot shoulders (see Figure 22-1). The combination of median and shoulder widths would allow for bypassing of stalled vehicles, so that a single stopped vehicle does not block an entire direction of travel. The shoulders would also contribute to improved sight distance along the inside of curved roadway segments and help keep the roadside clear of hazards.

With respect to the Forest Hill Road and Richmond Hill Road Connections, the road coverage associated with this two-lane alternative would differ from that under the four-lane alternative in terms of magnitude or extent. This provides certain advantages. For example, the smaller footprint of the two-lane alternative would provide a significant advantage in the segment along the berm along Richmond Avenue. While the base of the roadway embankment would be approximately 80 percent as wide as the four-lane at the basin crossings, along the berm the narrower two-lane width would require 50 percent less width into the basins and wetlands.

In addition, under the two-lane alternative, the Loop Park Road configuration plus pedestrians and bicycles requires roughly 57 feet of width at the bridge crossings. The existing bridge provides 50 feet between the parapets. However, in this alternative, unlike with the four-lane design, proposing a narrower configuration to avoid the cost of widening the bridge or constructing a second bridge (as with the proposed project) would be feasible, and is typical of situations in which the New York State Department of Transportation (NYSDOT) approves retaining substandard features. Therefore, the proposed two-lane alternative narrows the roadway to 50 feet. Other modifications, such as narrowing or eliminating the median or narrowing the traffic lanes to 11 feet, could also be considered.

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<sup>1</sup> Details on the design and evaluation of this alternative are presented in the “Road Alternatives Report,” Arup et al., January 2008.

In this two-lane alternative, since the bridge would have a shared vehicular/pedestrian function, a second barrier or rail would need to be added to separate the roadway from the bicycle/pedestrian path. A steel bicycle rail would also be added on the outboard side of the pedestrian sidewalk.

Similarly, under the two-lane alternative, since the Richmond Creek Bridge is exactly the same width as the Main Creek Bridge (50 feet), the same alternative design assumptions apply, and this alternative would be substantially identical to the Main Creek Bridge (two-lane alternative). Two lanes of traffic and pedestrians and cyclists would be accommodated on the existing reconfigured bridge, with the same constraints and similar opportunities for improving the appearance of the structure. As a result, under this alternative, costs are reduced, as are wetland impacts from new bridges over Main and Richmond Creeks.

In addition to the elimination of the pedestrian/bicycle bridges over the creeks, a two-lane alternative at the north shore underpass and south shore underpass below the West Shore Expressway would require a total width of 60 feet to accommodate the traffic lanes, pedestrian/bicycle path and barriers in this configuration. The width of the existing roadway and barriers on the north shore is roughly 40 feet. Therefore the proposed new north shore bulkhead would be located roughly 20 feet out from the back of the existing south (water side) barrier. The width of the existing roadway and barrier on the rough shore is roughly 28 feet. Therefore the proposed new south shore bulkhead would be located roughly 32 feet out from the back of the existing south (water side) barrier.

With the four-lane design, these wetland impacts are reduced (see the discussion below). In addition, these impacts could be further reduced if the proposed roadway cross section were narrowed. Options for doing so include eliminating the 4-foot median, reducing the width of the shoulders from 6 feet to as little as 2 feet, and reducing the lane widths from 12 feet to 11 feet. Reducing the bicycle path from 10 feet to 8 feet could be considered. These design options could further reduce or eliminate these impacts under this alternative.

A more detailed comparison of the four-lane design with this two lane road alternative follows.

### **OVERVIEW OF ENVIRONMENTAL IMPACTS**

The Two-Lane Park Road Alternative would have impacts similar to the proposed project with its four-lane park road proposal with a few key exceptions. Like the proposed project, under the Two-Lane Park Road Alternative, it is assumed that the project site would be developed as a park with proposed access roads. The benefits expected to result from the proposed project—including the creation of a 2,163-acre regional park and public access to the waterfront—would also be realized under this alternative. Neither the proposed project nor the alternatives would have an impact on socioeconomic conditions or community facilities. Both would provide significant open space benefits as well as benefits for urban design and visual resources. Neither would have shadow impacts or impacts on historic architectural resources. Both have the potential to impact archaeological resources, which would have to be addressed as the project designs are advanced in order to determine if specific areas of archaeological impact could occur and if any field research is necessary. Neither would significantly adversely impact neighborhood character. Hazardous materials impacts would be similar, although a somewhat greater intensity of construction would occur with the proposed project as compared to the Two-Lane Park Road Alternative, this additional construction is not expected to greatly affect the project's need to comply with all applicable city, state and federal requirements to eliminate the



potential for any impacts from hazardous materials including on-site testing of soils, as necessary.

Both would be generally consistent with the City waterfront revitalization program policies. Most importantly, the development of a public park on the project site would be consistent with the borough and City goals for revitalizing and providing public access in the coastal zone. Under both the four-lane proposal and the Two-Lane Park Road Alternative, the increased demands on solid waste and sanitation services would be similar and neither this alternative nor the proposed project would result in increases to the degree that there would be significant adverse impacts on these services. Likewise, the increased demands on energy systems would be smaller than those under the proposed project, but neither this alternative nor the proposed project would cause significant adverse impacts on utilities. While a greater intensity of construction would occur with the proposed project as compared with this alternative, as it relates to the roads, like the proposed project this additional construction would be closely monitored and would occur in compliance with all applicable state and federal requirements to minimize any public health impacts. In addition, other requirements of the proposed project with respect to public health protections would also be provided to protect public health. Traffic volumes would be the same, thus the traffic impacts would be similar, as would the impacts on air and noise conditions. Impacts on transit and pedestrians would also be similar. With the proposed project, there would be no unavoidable adverse impacts. All impacts of the proposed project would be avoided or mitigated.

Where the proposed project and this alternative differ is primarily in the areas of road design and engineering, conflicts with infrastructure and landfill systems, natural resources, and park design. The differences between the four-lane road design and this alternative are described in greater detail below.

## **TWO-LANE PARK ROAD ALTERNATIVE DETAILED COMPARISON OF IMPACTS**

As stated above, the footprint of the Two-Lane Park Road Alternative is such that the two-lane roadway width, in addition to the full width path for pedestrians and bicyclists, falls within the paved width of the Four-Lane roadway that was analyzed for impacts in this GEIS.

### *SOUTH LOOP PARK ROAD (2016)*

- *Geometry.* The Two-Lane Park Road Alternative differs from the Four-Lane designs at the crossing beneath the West Shore Expressway overpasses and at Richmond Creek Bridge, where the Two-Lane Park Road Alternative maintains a typical cross section.

The narrower Two-Lane Park Road Alternative would require less roadway outside (waterward) of the existing shoreline. It may be possible to further reduce the width under the West Shore Expressway by eliminating the median and reducing the shoulders which further reduce the impact on the Kills, but would not be optimal from a design perspective (i.e., risk that a stalled vehicle could block travel in that direction). However, the Two-Lane Park Road Alternative does allow for both the roadway and the path for pedestrians and bicyclists to be located on the existing Richmond Creek Bridge.

- *Landfill Conflicts.* Under this alternative, the outfall from Stormwater Basin K1 (serving Landfill Section 1/9) would need to be extended, though at shorter distance than with the Four-Lane proposal. In the vicinity of Landfill Section 2/8, the proposed roadway fits comfortably within the footprint of the existing DSNY service road. As with the Four-Lane proposal, the landfill utilities that lay below the existing roadbed need to be protected and

their manhole and valve covers and related hardware need to be raised in order to be flush with the new surface. An entrance/exit point from South Loop Road Park would also be provided at the Landfill Section 2/8 Flare Station.

- *Environmental Impacts.* The two-lane South Loop Park Road extends 31 feet into the Fresh Kills shoreline under the West Shore Expressway. The tidal wetland impacts for the Two-Lane Park Road Alternative totals approximately 0.31 acres of regulated tidal open water (as compared with 0.7 acres under the four-lane proposal). This shoreline is currently degraded, steep sloped, and the water is both deep and shaded. As with the four-lane proposal, the potential tidal wetland impacts at this location could be offset by tidal wetland creation and enhancements at other locations, although the extent of the mitigation would be less. In addition, no new pedestrian/bikeway bridge is required over Main Creek. Under the four-lane proposal this new bridge would require new piles into Main Creek and the decking and coverage of the proposed bridge. Like the four-lane proposal, the Two-Lane Park Road Alternative has minimal environmental impact elsewhere as it occupies more or less the alignment of existing DSNY service haul roads in this segment.
- *Park Design Conflicts.* Under this alternative, pedestrians and cyclists could share the existing Richmond Creek Bridge, which is wide enough to allow for physical separation of cars and buses from non-motorized lanes. The small program area at the Terrace would also not be compromised by a narrower South Loop Road.

#### *NORTH LOOP PARK ROAD*

- *Geometry.* Like the four-lane-road proposal, this Two-Lane Park Road Alternative alignment includes curves with a 300-foot radius at the West Shore Expressway Bridge crossing. The West Loop Park Road profile is provided in Figure 22-2. In this segment, the Two-Lane Park Road Alternative differs from the Four-Lane Alternative at the crossing beneath the West Shore Expressway and at Main Creek Bridge.

In the segment beneath the highway, as with the South Loop Road, the Two-Lane Park Road Alternative maintains a typical cross section, but requires less roadway extension into the water and tidal wetlands as compared with the Four-Lane Alternative. Additionally, the Two-Lane Park Road Alternative allows for a full width path for pedestrians and bicyclists to be located on the existing Main Creek Bridge. Like the South Loop Park Road the proposed road under this alternative would require some modifications to existing landfill infrastructure including a drainage outfall serving the West Shore Expressway that needs to be extended or replaced.

- *Landfill Conflicts.* The proposed two-lane alternative alignment passes close to, but is designed to avoid, intruding into Landfill Section 3/4 and its completed closure system. However, the alignment traverses landfill Stormwater Basins Q and F. However, the modifications what would be necessary to these systems would be similar to the four-lane proposal. In addition, as with the four-lane proposal, access points are to be provided to accommodate landfill post-closure operation and maintenance activities, the section 3/4 landfill gas flare station and the basins.
- *Environmental Impacts.* The two-lane North Loop Park Road extends into the creek in the area under the West Shore Expressway bridges, extending the existing shoreline out into the water by 19 feet, thus impacting DEC mapped tidal wetlands and regulated tidal open water. However, the shoreline area is degraded and steep-sloped and the water is deep and shaded. Thus, as with the four-lane proposal, impacts of this filling could be mitigated by tidal

wetlands at other locations in the park although the extent of the mitigation would be less than under the four-lane proposal. In addition, no new pedestrian/bikeway bridge is required over Main Creek. Under the four-lane proposal this new bridge would require new piles into Main Creek and the decking and coverage of the proposed bridge. Otherwise, like the four-lane proposal, the Two-Lane Park Road Alternative has minimal environmental impact elsewhere as it occupies more or less the alignment of existing DSNY service haul roads in this segment.

- *Park Design Issues.* Like the four-lane proposal, the Two-Lane Park Road proposal for this segment provides a graceful, arcing access road to the Creek Landing and the almost entirely non-motorized North Park. However, the two-lane version of this road preserves more space for waterfront and park activity in the Creek Landing, and prioritizes park recreational activities like bike and pedestrian path alignments. No new pedestrian and cycle bridge over Main Creek is required, a significant advantage in terms of park development.

#### *EAST LOOP PARK ROAD*

Similar to the Four-Lane Alternative, the Two-Lane Park Road Alternative presents two options for East Loop Road. Both are described below.

- *Geometry.*
  - *Option 1.* This option involves separate northbound and southbound roadways, each including two 6-foot-wide shoulders and one 12-foot-wide travel lane, to allow for bypass of stalled vehicles. Under the Four-lane Alternative, some curves have non-standard radii.
  - *Option 2.* This option involves a single roadway with 6-foot-wide shoulders, two 12-foot-wide travel lanes and a 4-foot median. It includes compact single lane roundabouts at both ends, which allow them to be placed in more desirable locations based on NYS DOT and FHWA design guidelines for roundabouts. To narrow its footprint, Option 2 adheres more closely to the existing DSNY roadbed in the two-lane than in the four-lane version.
- *Infrastructure.* There are no known infrastructure elements unrelated to the landfill in the vicinity of East Loop Road (either Option 1 or Option 2). As with the other landfill segments discussed above, the four-lane proposal, the landfill gas transmission manhole covers would need to be raised to the new surface elevation and other modifications would be necessary.
- *Landfill Conflicts.*
  - *Option 1.* The west leg of the Two-Lane Park Road Alternative occupies the bed of an existing DSNY service road. Like the four-lane proposal, the Two-Lane Park Road Alternative has reduced storage capacity in the Basin C2 due to encroachment by the park road. This can be addressed by modifying the existing culvert connection between Basin C1 and C2. In addition, the extent of the encroachment associated with the Two-Lane Park Road Alternative is less than that for the Four-Lane Alternative due to the narrower roadway width.
  - *Option 2.* Under this option, the north roundabout sits over the landfill cutoff wall and leachate trench as well as a landfill gas transmission main. Construction of protective concrete slabs above the leachate cutoff wall, as described for Option 1 is proposed.

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- *Environmental Impacts.* Like the four-lane proposal, the Two-Lane Park Road Alternative has no tidal wetland impacts in this segment.
- *Park Conflicts.* Like the four-lane proposal, Option 1 under this alternative infringes less on a flat area in the northwest portion of this planning area, allowing the construction of a larger parking lot for park use.

### FOREST HILL ROAD CONNECTION

Under this alternative, the Two-Lane Park Road Alternative for the Forest Hill Road connection follows a similar horizontal alignment and profile as for the Four-Lane proposal. At the intersection with Richmond Avenue, the two-lane approach provides an eastbound left turn bay approaching Richmond Avenue as well one through and one right turn lane, along with restriping of northbound Richmond Avenue to provide a left turn bay onto Forest Hill Road and re-striping for a right turn bay from southbound Richmond Avenue. The specific differences between this proposal and the proposal project are as follows:

- *Geometry.* The Two-Lane Park Road Alternative is a wide road but is similar to the Four-Lane proposal in its geometry, with a sweeping and curvilinear alignment that minimizes interference with landfill infrastructure elements. It meets or exceeds the design criteria along its length and veers no more than 20 feet from the footprint of the Four-Lane proposal.
- *Landfill Conflicts.* Like the four-lane proposal, the Two-Lane Park Road Alternative passes over Section Landfill 6/7 and must account for these conditions and potential conflicts in the same manner as the Four-Lane proposal. The specific features and systems that may be influenced by the road alignment include: final cover protections and the foundation support properties of the solid waste in the landfill, and protection of the landfill gas, stormwater, and leachate management system.

The placement of the road over the landfill final cover system requires a detailed evaluation of potential sliding of the roadway embankment along the interface between the landfill geosynthetic drainage layer and geosynthetic barrier layer. Due to the narrower road width of road in the Two-Lane Park Road Alternative this is expected to apply a lesser load to the landfill surface than the four-lane proposal. Nonetheless, like the four-lane proposal, this alternative would densify the waste beneath the roadbed ahead of road construction in a similar manner. Like the our lane alternative, this alignment crosses the southern landfill gas collection header ring at two locations, crosses eight lateral landfill gas collection pipes and passes over one landfill gas extraction well. Like the four-lane proposal this alternative requires that landfill gas lines be rerouted through a protective carrier pipe that would protect the pipes from crushing, and allow access to flush the pipes, remove condensate, or if needed remove and replace the pipes. With this alignment, the landfill gas wells are to be either decommissioned and reinstalled outside of the alignment or be provided with a lateral header connection from outside of the roadway.

The two-lane road alternative would also include placement of lateral vent channels perpendicular to the road alignment at a one vent per 200-foot spacing for sampling the soil vapor beneath the road.

As with the four-lane proposal, swales and ditches would be introduced to intercept runoff that would otherwise flow onto the road. Swales would be placed along much of the north edge of the road to intercept mound runoff on the uphill side. A culvert would also be added under the roadway on the west side to convey flows westward toward Basin C2. The length of this culvert under this alternative is less than that required for the Four-Lane proposal.

Similar to the Four-Lane proposal, as the roadway descends from the mound onto the viaduct, the alignment spans over the leachate collection trench and cut-off wall, requiring that one end of the span be placed within the landfill. For the Two-Lane Park Road Alternative, the width of the end pier and mechanically stabilized earth wall are less than that of the Four-Lane proposal.

- *Environmental Impacts.* Both the four-lane proposal and this two-lane alternative would impact freshwater wetlands in the viaduct segment. Under this alternative, the freshwater wetland impacts for the Two-Lane Park Road Alternative total approximately 0.70 acres. This two-lane alternative would therefore reduce the wetland impacts as compared to the four-lane proposal which would impact about 1.1 acres. The impact calculations correspond to the maximum amount of potential permanent footprint impacts associated with a viaduct. In the four-lane proposal and this alternative, the viaduct roadway design option would have the opportunity to reduce the extent of actual wetland resource impacts in several ways. The open areas under the viaduct and the hydrologic connectivity provided for the wetlands both north and south of the alignment are advantages of the viaduct option. The affected area is dominated by common reed (*Phragmites communis*), which would be replaced by native freshwater marsh plant communities. Under both the four-lane proposal and this alternative, new stormwater management controls are necessary in road segment.
- *Park Design Conflicts.* Both the proposed Four-Lane proposal and the Two-Lane Park Road Alternative for the Forest Hill Road connection provide a short and direct route to the Loop Program areas. Views from the roadway on the viaduct and on the section across the landfill would be of significant park features. A viaduct creates a relationship between the driver and the creek while reducing impact on the wetland area. The slim roadway leaves more land for park use and brings the park closer to travelers.

#### *WEST LOOP PARK ROAD/SIGNATURE BRIDGE (2036)*

By 2026, the Fresh Kills Park would feature an appealing iconic bridge across the Fresh Kills as the main component of West Loop Road. The bridge would link the North and South Park Roads.

- *Geometry.* In this segment, the roadway horizontal curvature is very similar to that of the four-lane proposal, with a slight improvement in radius at the north end (to 325 feet). The profile, also similar.
- *Landfill Conflicts.* On the south side of the Fresh Kills, the West Loop Park Road traverses land presently occupied by DSNY landfill management and maintenance facilities (part of Plant 1). However those facilities are scheduled for future abandonment and are not expected to conflict with the park's implementation. In the same area, like the four-lane proposal, the alignment passes over a water line, a landfill gas transmission main, and an underground electrical line; however neither alternative has and conflicts with major landfill infrastructure.
- *Environmental Impacts.* Under this alternative, the tidal wetland impacts for the Two-Lane Park Road Alternative totals approximately 1.06 acres—0.11 acres of DEC mapped tidal wetlands and approximately 0.95 acres of regulated tidal open water both direct and indirect impacts such as shadows. This is less than the approximately 3 acres under the four-lane proposal. As with the four-lane proposal, impacts of this construction in and over the water could be mitigated by tidal wetlands at other locations in the park, although the extent of the mitigation would less than under the four-lane proposal. As with the four-lane proposal,

depending on its design, this new bridge would require new piles into Fresh Kills along with the decking and coverage of the proposed bridge. Otherwise, like the four-lane proposal, the Two-Lane Park Road Alternative has minimal environmental impact elsewhere as it occupies more or less the alignment of existing DSNY service roads in this segment.

- *Park Design Conflicts.* A two-lane West Loop Road and signature bridge would serve the purposes described under the Four-Lane Alternative—iconic marker, gateway to the largest concentration of destination programs, hinge between park sectors, architectural feature with unique vistas of the water—with less impact on the waterway.

### *RICHMOND HILL ROAD CONNECTION (2036)*

Like the Four-Lane proposal, the Two-Lane Park Road Alternative follows a similar alignment in as the Four-Lane proposal in connecting the East Loop Park Road to Richmond Hill Road over the Yukon saddle and through the basins east of Landfill Section 6/7. However, it differs from the four-lane proposal in its impacts on freshwater wetlands.

- *Geometry.* The Two-Lane Park Road Alternative exceeds the design criteria, except at the horizontal curve approaching the Richmond Avenue intersection, where a curve of a 300 foot radius is provided. Here, justification for retention of the non-standard horizontal curve is the same as for the Four-Lane proposal.

The two lane alignment differs in the northern segment of the road from the four-lane proposal in that it allows for minimal impacts to the stream outlets from Basin B1 to the south. The alignment passes between the garage and the stream. Since the desired profile lies approximately  $\pm 10$  feet below the elevation of the parking lot and  $\pm 10$  feet above the elevation of the stream, a retaining wall is required on each side of the roadway along that stretch of roadway, which allows the stream to be retained (see also the discussion under “Environmental” below).

At Richmond Avenue, the Two-Lane Park Road Alternative incorporates an eastbound to northbound left turn bay, a through lane and combined through/right turn lane at the eastbound approach to the intersection. The narrower roadway adds some flexibility to the eastbound approach as compared to the Four-Lane proposal, allowing for the approach angle and shoulder widths to be adjusted during detailed design to achieve the most favorable overall geometric balance.

- *Landfill Conflicts.* As with the Four-Lane proposal, the alignment under the proposed Two-Lane Alternative passes over the landfill along the Yukon saddle segment, in a manner similar to the Four-Lane proposal. Some of the specific differences between the two-lane park road and the four proposals with respect to landfill infrastructure are described below.

In both the Four-Lane proposal and this Two-Lane Alternative, the design must account for the unusual roadbed conditions, as well as the road’s influence on continuing landfill post-closure operations. In general, the roadway foundation design and analysis of landfill related impacts are similar to those described along the Forest Hill Road segment described above.

Among the affected elements along the Yukon saddle are two landfill gas collection laterals, crossing of landfill gas collection headers, covering of a leachate stone trench and a water line. Culverts would also be introduced to maintain drainage conveyance patterns.

As it descends from the landfill section, the alignment spans over the leachate collection trench and cutoff wall. This requires that one end of the span be placed within the landfill, similar to the crossing along the Forest Hill Road connection.

In both the Four-Lane proposal and the two-lane alternative, as the road traverses Basin B1, its embankment severs the southern portion of the southern end of the basin, requiring a culvert beneath the embankment to maintain its hydraulic function. Similarly, a pair of multi-barrel culverts is proposed to maintain the hydraulic connection at the north end of Basin B1. In between, the alignment takes up the space of an existing gravel access road leading to groundwater and landfill gas monitoring wells. Protected pullouts are to be provided at each monitoring well. The landfill gas interceptor venting system is also affected along this segment of roadway.

In the northern segment of the road, as with the four-lane proposal, a portion of the Two-Lane Park Road Alternative alignment overlaps the cutoff wall. Here, protective slabs are proposed to shield the cut-off wall from the influence of roadway loads.

Both the Four-Lane proposal and this Two-Lane Park Road Alternative require filling a portion of Basin B1. However, the estimated encroachments into Basin B1 and the wetlands are each less than that of the Four-Lane proposal due to the reduced road width.

- *Environmental Impacts.* The Two-Lane Park Road Alternative impacts approximately 3.23 acres of freshwater wetlands. The Four-Lane proposal would impact 4.3. Both the Four-Lane proposal and this alternative roadway would be contained within retaining walls in the northern segment of the road, preventing encroachment on the adjacent wetland stream. Further south, the road is able to fit almost entirely on an existing DSNY service road adjacent to existing wetlands. The loss of freshwater wetlands landscape in this area would be mitigated elsewhere on site. Several culverts would also be required under the road to convey water between the wetlands along this stretch of the road alignment.
- *Park Design Issues.* Under both the Four-Lane proposal and this alternative, the Richmond Hill Road connection would serve as the northeastern gateway into the park from the local neighborhoods. .

#### *TRAFFIC OPERATIONS*

Overall, traffic levels within the park would be moderate to low, at less than half the capacity of the Two-Lane Park Road Alternative on all park roads, and below those that can be effectively handled by signalized intersections within the park, or by the roundabout proposed under Option 2 for East Loop Road. Thus, as with the four-lane proposal, normal traffic operations on the Two-Lane Park Road Alternative are expected to be satisfactory.

#### **SUMMARY CONCLUSIONS**

Provided below is a summary of the comparison of this Two-Lane Park Road Alternative and the Four-Lane design examined in this GEIS. This summary comparison is made with respect to impacts on the landfill, the environment, the park, and traffic operations.

#### *LANDFILL IMPACTS*

With regard to the landfill closure cover system, the horizontal extent of the road embankments under this alternative would be greater under the Four-Lane design than this Two-Lane Alternative, and the wider embankments would result in settlement over a larger area. The wider embankments would also apply more weight to the landfill cover system, waste, and underlying soils, which could result in a lower degree of stability and increased stress on the closure system's geomembrane layer.

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Both alternatives cross the leachate management system four times as they traverse Landfill Section 6/7 and both alternatives encroach on the stormwater basin at the north end of the Richmond Hill Road Connection in 2036. However, the Four-Lane design affects an additional length of cutoff wall and leachate collection trench at the north end of the Richmond Hill Road Connection. This Two-Lane Park Road Alternative requires the least extensive protective measures due to its narrower footprint and would also require a smaller bridge, with a smaller pier penetrating the waste, at the two grade-separated leachate system crossings along the east edge of Landfill Section 6/7.

Impacts on the landfill gas management system are on the whole relatively minor, but are slightly greater for the Four-Lane design as compared with the Two-Lane Park Road Alternative. Similarly, both require adjustments to the stormwater management system to accommodate the loss of capacity in basins B1, C2, F, and Q, but the differences are pronounced only at Basin B1 where the Four-Lane Design intrudes more extensively. There are no significant differences among the alternatives in terms of impacts to the environmental monitoring system.

### *ENVIRONMENTAL IMPACTS*

All of the proposed roadway alignments encroach on both regulated and unregulated freshwater and tidal wetlands. The entire eastern edge of the site is bounded by wetlands; in order to enter the site from Richmond Avenue, it is necessary to cross them. The design proposes to offset limited landscape losses by creating an extensive system of healthy wetlands, meadows, and woodland.

- The Four-Lane proposal directly and indirectly impacts approximately 8.75 acres of tidal and freshwater wetlands.
- The Two-Lane Road Alternative directly and indirectly impacts approximately 5.55 acres of tidal and freshwater wetlands.

### *PARK IMPACTS*

All of the alternatives provide access to park features and scenic views of park natural features. The Two-Lane Alternative succeeds to a greater degree in limiting the visual and physical intrusion of the road in the landscape. In so doing, the two-lane road is more consistent with park design intentions to provide access to the huge site and its features, while prioritizing bike, pedestrian, and boater experience over cars. In addition, the two-lane road affords opportunities for a greater degree of grade separation between pedestrian/bicycle paths and the roads, as well as providing more room on side slopes for a landscape corridor with native plantings and beneficial stormwater management functions.

Given that traffic volumes do not warrant a wider roadway, there is no advantage to either the Four-Lane design from a park perspective, and given the intention to limit the physical presence of roadways and interference with wetlands, the Four-Lane Design is less desirable from a park perspective.



## TRAFFIC OPERATIONS

### *Traffic Operations on the Proposed Park Roads*

The analyses indicate that the projected traffic levels within the park would be low on all park roads, and well within the capacity of a two-lane road. Therefore, normal traffic operations are expected to be acceptable for both the four-lane design and this Two-Lane Park Road Alternative. The Four-Lane design, however, does provide spare capacity on all legs of the primary park road network, which would provide added flexibility in dealing with incidents, major park venue events, and roadway maintenance.

### *Traffic Operations Outside the Proposed Park*

The traffic analysis shows that the park roads would have similar impacts on functionality of the surrounding street network. The traffic analyses indicate that the Four-Lane design provides no greater relief to local traffic congestion than the Two-Lane Alternative.

## **D. ALTERNATIVE ALIGNMENT: RICHMOND HILL ROAD CONNECTION (WEST OF LANDFILL SECTION 6/7)<sup>1</sup>**

### **INTRODUCTION**

This alternative examines the potential impacts of a roadway alignment for the Richmond Hill Road Connection that extends around the west side of Landfill Section 6/7 rather than passing over the Landfill via the “Yukon Saddle” and heading north along Richmond Avenue berm and crossing the stormwater basins and wetlands to reach the intersection of Richmond Hill Road at Richmond Avenue. Figure 1-12 in Chapter 1, “Project Description,” shows the general alignment of this proposed alternative. As described in greater detail below, three specific corridors were considered along this alignment: 1) a placement off the landfill (outside the solid waste management unit area boundary); 2) a placement on the existing landfill service road; and 3) a placement up the higher elevation of the landfill. As described below, this Alternative Road Alignment would have impacts similar to the proposed project in many respects, including traffic conditions at this intersection of Richmond Hill Road at Richmond Avenue, which is a long-term proposal for the project and is in the 2036 analysis year. However, there are specific differences with respect to road geometry, landfill conflicts, environmental impacts, and park conflicts that are described below. A more detailed description follows.

### **OVERVIEW OF ENVIRONMENTAL IMPACTS**

Like the proposed project, under this Alternative Road Alignment it is assumed that the project site would developed as a park with proposed access roads. The benefits expected to result from the proposed project—including the creation of a 2,163-acre regional park and public access to the waterfront—would also be realized under this alternative. Neither the proposed project or the alternatives would have an impact on socioeconomic conditions or community facilities. Both would provide significant open space benefits as well as benefits for urban design and visual resources. Neither would have shadow impacts or impacts on historic architectural resources. Both have the potential to impact archaeological resources, which would have to be addressed as

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<sup>1</sup> Details on the design and evaluation of this alternative are presented in the “Conceptual Alternatives Road Report,” Arup et al., September, 2007.

the project designs are advanced in order to determine if specific areas of archaeological impact could occur and if any field research is necessary. Neither significantly adversely impact neighborhood character. Hazardous materials impacts would be similar, although a somewhat greater intensity of construction would occur with the proposed project as compared to the Two-Lane Park Road Alternative. This additional construction is not expected to greatly affect the project's need to comply with all applicable City, state, and federal requirements to eliminate the potential for any impacts from hazardous materials, including on-site testing of soils, as necessary.

Both would be generally consistent with New York City waterfront revitalization program policies. Most importantly, the development of a public park on the project site would be consistent with the borough and City goals for revitalizing and providing public access in the coastal zone. Under both the four-lane proposal and this alternative, the increased demands on solid waste and sanitation services would be similar and neither this alternative or the proposed project would result in increases to the degree that there would be significant adverse impacts on these services. Likewise, the increased demands on energy systems would be smaller than those under the proposed project, but neither this alternative or the proposed project would cause significant adverse impacts on utilities. While a greater intensity of construction would occur with the proposed project as compared with this alternative, as it relates to the roads, like the proposed project this additional construction would be closely monitored and would occur in compliance with all applicable state and federal requirements to minimize any public health impacts. In addition, other requirements of the proposed project with respect to public health protections would also be provided to protect public health. Traffic volumes would be the same, thus the traffic impacts would be similar, as would the impacts on air and noise conditions. Impacts on transit and pedestrians would also be similar. With the proposed project, there would be no unavoidable adverse impacts. All impacts of the proposed project would be avoided or mitigated.

Where the proposed project and this alternative differ is primarily in the areas of road design and engineering, conflicts with landfill systems, natural resources, and park design. The differences between the proposed alignment along the eastern corridor for the Richmond Hill Road Connection and this alternative are described in greater detail below.

### **DESCRIPTION OF ALTERNATIVES AND IMPACTS OF THREE ALIGNMENT CORRIDORS WEST OF LANDFILL SECTION 6/7**

An assessment of the major impacts related to three alternative roadway corridors under this alternative follows. These alternative alignments include off-landfill, on landfill service road, and up landfill slope.

#### *OFF-LANDFILL PLACEMENT*

The off-landfill alignment avoids significant interaction with the landfill infrastructure. In developing the off-landfill option the roadway was placed outside and as near the landfill cutoff wall as possible, at an elevation above the 100-year flood level, with conceptual allowances for drainage. In the western corridor, an off-landfill road would have to be constructed on a berm in the wetlands or on structure, as there is only a narrow strip of land between the landfill perimeter and open water. Much of this section of Main Creek includes tidal wetlands that have been mapped by DEC, that have been mapped as part of the National Wetlands Inventory, requiring a U.S. Army Corps of Engineers (ACOE) permit, and designated as significant coastal fish and

wildlife landscape by the New York State Department of State (NYS DOS). All three agencies would be involved in the review of any impacts to these designated areas, DEC and ACOE in a permitting capacity. This alignment would be costly to construct as either a two-lane or four-lane Park Road and would have the following impacts:

- It is estimated that the alignment could impact up to 14 acres of land area below the 10-foot contour line as currently surveyed. This would include activities such as filling and grading in both tidal wetlands and tidal wetland adjacent areas, interrupting mapped high marsh, intertidal marsh, and some formerly connected wetlands linked hydrologically and ecologically with the William T. Davis Wildlife Refuge to the North.
- A portion of the roadway would be constructed within existing tidal wetland areas, which would require review by NYSDOS and permitting by DEC and ACOE. Assuming about half of this area (7 acres) is tidal wetlands, mitigation under the Tidal Wetlands Act and State Environmental Quality Review (SEQR) may require 24 to 32 acres of new or substantially improved tidal wetlands. Under the two-lane alignment this potential impact reduces to 11 acres of impacted tidal wetlands adjacent area (estimated at 5 to 6 acres of tidal wetlands), or an estimated mitigation area of 15 to 24 acres. In either case, from a natural resource perspective, an alignment with less impact on tidal wetlands would be much preferred.
- If there are other viable alternatives without substantial wetland impacts, it may be difficult or impossible to get permits for this alignment.
- Soft soils within the tidal wetland area would likely not provide an adequate foundation for embankment roadway construction without engineering modifications such as overexcavation and replacement, and sheet pile bulkheads.
- A significant volume of fill would need to be imported to achieve a finished roadway elevation above the 100-year flood elevation; alternatively, construction of the roadway on a pile-supported viaduct would be costly.
- Placing the roadway on water's edge restricts park visitors' contact with Main Creek. Without massive wetland filling in addition to that for the roadway, a waterside pedestrian/bike path would not be possible in this scenario.
- No creek-side space would be available for a landscape buffer that would provide landscape, filter road runoff to reduce wetland impacts, and reduce the visual prominence and noise of the road.

The impacts associated with the two-lane alternative only differ from those of the four-lane alternative in degree. The roadway would be about two-thirds and the base of the embankment approximately three-fourths as wide, but would principally result in the same impacts.

#### *ON-SERVICE ROAD PLACEMENT*

This road location on the landfill section slope was selected to alleviate a significant portion of the shoreline and wetland impacts cited above, as well as avoiding major impacts on the landfill cover, and to provide a strong, compacted road base that minimizes the depth of municipal solid waste under the road. In developing this alternative, the outside edge of the proposed roadway was designed to generally coincide with the outside edge of the service road, to avoid placing the leachate system chambers, manholes, vents, and their frequently used access covers within the pavement area. Given that the existing perimeter service road is about 20 feet wide, and typically fitted between sloping sides, both the four-lane and two-lane versions, which are approximately

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60 and 40 feet wide, extend well outside the existing paved footprint and its plateau. The greater width is obtained by raising the new road surface to where its inside edge meets the side of the landfill without cutting into the landfill cover, which would necessitate reshaping extensive portions of the mound slope.

The consequence of raising the roadway profile is that this placement would still intrude into the environmentally sensitive creek shore and would cause disruption to landfill infrastructure and long-term operations as follows:

- To avoid cutting into the landfill cover, up to 10 feet of fill would need to be placed above the existing service road surface to achieve a finished roadway that integrates properly with the existing slope, with the necessary stormwater management provisions.
- Existing leachate collection and pumping station enclosures would need to be vertically extended to meet the final grade elevations and traffic bearing covers installed.
- The top of the leachate cutoff wall would need to be protected and hardened to alleviate the load from the overlying roadway fill.
- Should repairs to the leachate trench and cutoff wall become necessary, the high overlaying embankment will severely hamper access. In addition, such interventions would result in disruption and potential closure of the Park Road.
- The existing service road would be eliminated and landfill maintenance vehicles and activities would have to share the road with park users and commuters. Even with the addition of auxiliary pavement, the slower movements and stoppages of maintenance vehicles are likely to cause friction with faster vehicles and safety concerns. A separated maintenance road is not feasible, as it would not be able to access the critical infrastructure lying in the area of the cut-off wall.
- Auxiliary accommodations for parking and filling of over-the-road tanker trucks used to collect landfill gas condensate would need to be incorporated into the design. Special precautions for protecting landfill maintenance personnel from roadway traffic would need to be implemented during periodic maintenance of the leachate pumps or electrical systems.
- Placing the roadway on the service road still results in intrusion into the wetland buffer and diminishes the opportunity for and appeal of a waterside pedestrian/bike path.
- Minimal space would be available for the landscape buffer and filtration of road runoff.

Again, the impacts associated with the two-lane alternative differ from those of the four-lane alternative in degree. The narrower roadway would not require as high an embankment over the existing service road, reaching a height of 6 feet above the leachate trench, nor extend as far laterally. Nonetheless, the list of issues would read much the same.

### *UP-LANDFILL PLACEMENT*

In this alignment, the road is placed higher up on the landfill sections west slope so that the road embankment does not impinge on critical perimeter landfill infrastructure features. Since the slope of the roadway embankment and that of the Landfill Section 6/9 are similar (at approximately 33 percent), development of useful alignment, profile, and cross sections required the testing of several side slope locations. The placement depicted was chosen because it rests on a shelf that is wide enough not to cause the new roadway embankment to chase the downhill side

with fill onto the service road, nor to cut into the uphill side up to the next plateau. These constraints were considered important because this part of the landfill will already have met final closure requirements by the time of road construction.

While this placement avoids impacts on the Main Creek shore, the service road, and the leachate collection/cutoff wall system, it places the road far up on the Landfill Section, with projected elevations near elevation 90, a deeper waste strata of the landfill, and with the potential to have the following effects on the environment and the landfill systems:

- Placement of the roadway at this elevation may reduce the short-term slope stability factor of safety below the generally recommended value of 1.5.
- Waste deposits could be expected to settle several feet due to mechanical compression and future decomposition, and require additional up front capital cost to mitigate impacts.
- Foundation improvement techniques would be necessary to stabilize this waste prior to road construction. Even with preventive measures, more variability in settlement following foundation improvement could be expected due to the inability to reach and treat lower strata.
- The stabilization treatments would likely require a significant amount of energy or resources (i.e. more compaction effort, greater surcharge thickness, deeper drilling for stone columns) in attempting to better improve the long-term performance of material lower in the profile.
- Areas of the east mound adjacent to the western corridor are scheduled for closure construction in 2007 and 2008, ahead of roadway construction. To ensure the integrity and performance of the landfill cover system, areas already experiencing landfill closure construction would need to be deconstructed prior to foundation improvement and reconstructed as a part of the roadway.
- The deconstruction and reconstruction of the cover system would require that an area as wide as the roadway grading, plus an additional 25 feet on each side of the grading limits, be cleared of cover soils, and that the geomembrane be cut at a location approximately 5 to 10 feet inside of the area that has been uncovered to apply roadway foundation improvements and modify the gas system. The geomembrane's cut edge would need to be cleaned and protected during roadway foundation improvement and base grading.
- The roadway position on the landfill would conflict with landfill gas wells and with header and lateral collection lines. Modifications to the gas system features along the western slope of east mound would be necessary to accommodate roadway construction.
- After settlement or compression of the waste, soil backfill and regrading will be needed to restore surface integrity. In reconstructing the cover, the gas vent layer (under membrane composite) will be replaced by overlapping the new composite with the existing material, the new membrane must be placed and welded, tested, certified, and accepted by DEC. Similarly, the drainage layer geotextile or composite (above the membrane) will be replaced by overlapping with the existing material and the barrier solids (roadway subbase material) placed. Reconstruction of the geomembrane cover welds will likely be made using extrusion welds, which are more difficult to construct and test for continuity than fusion welds typically made along the edges of new geomembrane panels.

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### *WEST ALIGNMENT SUMMARY*

All three west alignments described above were proven to have significant impacts, to be problematic and undesirable in comparison to eastern alignment proposed in this GEIS for the following reasons:

- The on-landfill alignment pushes the road well up Landfill Section 6/7, interfering with views from the North Park and William T. Davis Wildlife Refuge, a condition that runs counter to the park goal of leaving this northern section pristine and natural.
- The 9- to 14-foot rise of the landfill service road scenario above the existing perimeter features significantly impacts upon landfill infrastructure and would compromise DSNY landfill maintenance and operations. The on-service road scenario proves to be the least desirable alignment in all three corridors, as it consistently conflicts with critical landfill infrastructure and seriously compromises maintenance and operation requirements.
- The on-landfill alignment rises to approximately elevation 90, traversing some of the thickest, most unconsolidated layers of waste that are presently being capped. This will result in significant initial and long-term settlement that will not adequately respond to preloading and other foundation improvement measures. Initial construction and the large initial settlement will require cap removal and reconstruction. Differential settlement would continue in the longer term, resulting in undesirable levels of degradation for both the road and the landfill, requiring excessive intervention.
- The off landfill alignment would result in significant impacts on tidal wetlands and natural resources of Main Creek and William T. Davis Wildlife Refuge as well as views and experiences from North Park and William T. Davis Wildlife Refuge.

## **E. ALTERNATIVE ALIGNMENT: STATEN ISLAND BOROUGH PRESIDENT'S OFFICE (SIBPO) PROPOSAL<sup>1</sup>**

### **INTRODUCTION**

During the course of the public review of the Fresh Kills Park DGEIS, a number of comments were raised by the Staten Island Borough President's Office (SIBPO) and members of the public regarding the park road system proposed in the DGEIS. Presented as part of the SIBPO comments on the DGEIS submitted by the SIBPO was a modified alternative for the roadway design, specifically the road alignment through East Park.

The SIBPO alternative essentially calls for a two-lane, one-way road that loops around Landfill Section 6/7 and utilizes the alignment of the existing haul roads. In addition to being a one-way road in a counterclockwise direction around the landfill, this alternative also proposes a new segment of a four-lane road across Landfill Section 6/7 that would connect directly to Richmond Avenue at Yukon Avenue. The connection to Yukon Avenue was not proposed in the DGEIS (the two project-proposed connections were at Richmond Hill Road and Forest Hill Road both at Richmond Avenue). Thus, under this alternative, the loop around Landfill Section 6/7 would

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<sup>1</sup> This entire section is new to the FGEIS. This alternative is based on the report Fresh Kills Landfill Staten Island Borough President's Office Evaluation of Roadway Alternative in East Park (Draft Report), prepared by URS for the New York City Department of Design and Construction, February 2009.

have two-way connections at three intersections along Richmond Avenue, Richmond Hill Road, Yukon Avenue and Forest Hill Road (from north to south).

Figure 22-3a shows this alternative roadway alignment. Under this alternative, a typical two-lane section includes two 11-foot travel lanes, a two-foot left shoulder, and an eight-foot-wide right shoulder.

This proposal was put forth for the purposes of determining if such an alignment could potentially have less of an impact on the landfill systems and on-site wetlands, and therefore could possibly be implemented sooner and for less cost than the proposed project. Assuming these assumptions to be feasible, under this modified alternative, all three connections at Richmond Avenue are also assumed to be completed by 2016 (the DGEIS assumed only the Forest Hill Road connection would be completed by 2016 and the Richmond Hill Road connection would be completed by 2036).

As described in greater detail below, this alternative would have impacts similar to the proposed project in many respects although in some cases the impacts may be of a lesser magnitude. There are also specific design differences with respect to road geometry, landfill conflicts, environmental impacts, and park conflicts that are described in greater detail below.

#### **DESCRIPTION OF ALTERNATIVE**

This alternative has two components, it creates a one-directional loop around East Park and it extends Yukon Avenue westward across Landfill Section 6/7 toward Main Creek where it connects with the East Park loop drive near the Main Creek Bridge. Under this alternative, the East Park loop road would be in lieu of the Richmond Hill Road and Forest Hill Road four-lane extensions under the proposed project.

Under this alternative, the two-lane loop road would be a one-directional roadway. In addition, the intersection geometry at the Richmond Avenue intersections with Richmond Hill and Forest Hill Roads as was analyzed in the DGEIS would be similar. Additionally, a four lane bi-directional extension of Yukon Avenue to the Main Creek Bridge would bisect the Loop Road and would create a Richmond Avenue intersection with Yukon Avenue into a four-way intersection with two approach lanes and two receiving lanes on the eastbound approach. This also creates a four-way intersection with the road Loop Road and reconfigures the Main Creek Bridge intersection from a four-way intersection. The East Park Loop Road typical section as proposed under this alternative includes two 11-foot travel lanes, a two-foot left shoulder, and an eight-foot-wide right shoulder.

#### **COMPARISON OF ROAD DESIGN OBJECTIVES FOR THE PROPOSED ALIGNMENT AND SIBPO ALTERNATIVE**

The roads proposed under this alternative do not fit precisely into the functional classification system described by AASHTO Policy on Geometric Design of Highways and Streets (2004). For the purpose of determining required supplementary design criteria, the system evaluated was classified as an “Urban Collector Road.”

Design criteria for the proposed roads and this alternative are as follows:

- Design Speed: 35 mph;
- Two percent minimum cross slope across the entire roadway.
- Minimum Radius for Horizontal Curves: 408 feet (2 percent), 510 feet (-2 percent)

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- Maximum Grade: 7 percent
- Minimum Grade: 0.50 percent
- Cross Slope: 2 percent, 1.5 percent minimum
- Stopping Sight Distance (Horizontal and Vertical): 250 feet
- Maximum Rate of Superelevation: 4 percent
- Rollover: 4 percent between lanes, 8 percent between travel land and shoulder
- Maximum Relative Gradient: 0.62 percent to 4 percent (NYCDDC standard practice)
- Side Slope: 4:1 without guide rail, 2:1 with guide rail

### DESIGN SPEED

Under this alternative, at locations where the minimum radius for 35 mph could not be accommodated, a lower design speed would be necessary with the appropriate signage (26 of the 71 curves proposed in this alternative are substandard for the proposed design speed in order to more closely follow the alignment of the existing haul roads).

### PHYSICAL CONSTRAINTS

In general there are certain areas where minimal impacts to Landfill Section 6/7 including the existing and proposed gabion walls would occur under this alternative. In order to implement this alternative, minor realignments along with other design modifications would need to be identified and recommended to avoid these impacts.

### HORIZONTAL STOPPING SIGHT DISTANCE

Stopping sight distance is affected by various factors including cut slopes and object heights. In the evaluation of the proposed this roadway alternative, the location and slope of Landfill Section 6/7 was considered first, including the introduction of a three-foot-wide drainage buffer strip of the two-foot shoulder with a proposed slope of 1 vertical to 3 horizontal. The road segments where the slope represents an obstruction is when the curve is to the left (i.e., towards the landfill mound).

As a result of this analysis, any gabion walls located on a horizontal curve to the left would impact the horizontal stopping sight distance. The smallest gabion wall height is two feet, six inches tall. AASHTO's requirement when an object would obstruct sight is two feet, therefore all gabion walls obstruct the drivers line of sight. Also the gabion wall locations (except for one) do not meet the required horizontal sightline offset.

### RADIUS OF HORIZONTAL CURVE

The minimum required horizontal radius is determined by the road's functional classification, its design speed and the superelevation rate. Based on the AASHTO Policy on Geometric Design of Highways and Streets, the minimum required horizontal curve for a two percent superelevation rate (away from the landfill mound) at a 35 mph design speed is 408 feet when the curve is to the right and 510 feet when the curve is to the left (adverse cross slope).

Based on the two percent superelevation rate and 35 mph design speed as described above, there are a number of locations where the horizontal curves do not comply with the minimum radius required.



### VERTICAL GEOMETRY

The maximum allowable grade for a roadway is determined by its functional classification, the design speed, and the terrain and the maximum allowable grade is seven percent. The minimum desirable grade is 0.5 percent, but is ultimately controlled by the design of the drainage system.

This alternative roadway does not exceed the maximum allowable grade; however, it does not meet the minimum desirable grade in many locations. In order to produce cross sections and determine possible impacts to the landfill facilities and due to the fact that existing ground did not follow a “smooth line,” a proposed vertical alignment (following the existing grades) was developed. However, this drainage consideration could be addressed by providing a cross-slope of two percent along the entire roadway.

### PROPOSED PAVEMENT

To avoid impact to the existing Landfill Section 6/7 liner which is located approximately three feet below existing grade under the existing DSNY haul roads, a proposed pavement section for this alternative was developed assuming the existing (haul road) pavement structure remains in place. The proposed top of the new pavement would be typically located approximately four inches above the existing pavement surface. The following is recommended for these areas (and subject to DEC approval):

- For areas of overlay on existing pavement: Scarify existing pavement to be overlaid; - Truing and leveling as necessary between the existing and proposed pavement section; 2-inch wearing course; 2-inch binder course.
- For areas of new pavement: install 6 inches of flexible pavement; install 24 inches of selected base material wrapped with geogrid reinforcement.

A flexible pavement system over the haul roads, rather than rigid (concrete) or composite (asphalt overlay over unreinforced concrete base) could avoid any potential differential settlement over landfill haul roads.

A field investigation confirmed that some vents fall within the limits of pavement of this alternative roadway.

### GRADING AND DRAINAGE

The landfill stormwater management system consists of a series of swales, gabion downchutes, culverts, inlet pipes and control basins. The design intent of this alternative is to direct the runoff of the last tier/terrace of Landfill Section 6/7 across the roadway pavement by providing a two percent roadway cross-slope. This design is at odds with standard design practice and has the potential to contribute to hydroplaning and icing conditions, because this alternative would continue to allow some of the surface runoff from the landfill mound to be carried across the roadway surface. However, there are techniques to avoid this impact. Since the drainage area contributing to runoff that crosses the roadway varies through the site, it is recommended that further studies be performed during the design stage.

Final capping of the southern portion of Landfill Section 6/7 (i.e., areas south of Yukon Avenue) has not yet been completed. This may allow for the modification of stormwater management plans to accommodate this alternative that would reduce the quantity of stormwater runoff flowing across the proposed roadway.

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Final capping of the northern portion of the site (approximately defined as those areas to the north of Yukon Avenue) is complete. As a result, impact avoidance on these road segments above could require excavation and backfilling a portion of the landfill cap. These activities could threaten the integrity of the landfill liner, and therefore are not recommended in the northern portion of the site. Other alternatives, which would not necessitate disturbing the Landfill 6/7 final cover is recommended.

### *DSNY MAINTENANCE*

It is important to note that under this alternative, maintenance of the Fresh Kills Park leachate pump system would require periodic lane closures. The leachate pumps are all located along the outer lane of the Loop Road. This would require periodic capacity reductions from two lanes to one, which was analyzed to determine the effect on operations. There are no pumps located along the bidirectional link between the Main Creek and Richmond Creek Bridges. There are also no pumps along the extension of Yukon Avenue. An analysis of environmental impacts with this alternative is presented below.

### **OVERVIEW OF ENVIRONMENTAL IMPACTS**

Like the proposed project, it is assumed that with this alternative road alignment, the project site would be developed as a park with proposed access roads. The benefits expected to result from the proposed project—including the creation of a 2,163-acre regional park and public access to the waterfront—would be realized under this alternative. Neither the proposed project nor this alternative would have an impact on socioeconomic conditions or community facilities and neither would involve the displacement or relocation of the existing businesses. Both would provide significant benefits with respect to urban design and visual resources. Neither would have shadow impacts or impacts on historic architectural resources. Both have the potential to impact archaeological resources; this would have to be addressed as the project designs are advanced in order to determine if specific areas of archaeological impact could occur and if any additional field investigation is necessary. Neither the proposed project nor this alternative significantly adversely impact neighborhood character. Hazardous materials impacts would also be similar.

Both the proposed project and this alternative would be generally consistent with New York City waterfront revitalization program policies. Most importantly, the development of a public park on the project site would be consistent with the borough and City goals for revitalizing and providing public access in the coastal zone. Under both the proposed project and this alternative, the increased demands on solid waste and sanitation services would be similar and neither this alternative nor the proposed project would result in increases to the degree that there would be significant adverse impacts on these services. Likewise, neither this alternative nor the proposed project would result in any significant adverse impacts on utilities. Like the proposed project construction activity under this alternative would be closely monitored and would be required to comply with all applicable state and federal requirements to minimize any public health impacts. In addition, other requirements of the proposed project with respect to public health protections would be provided.

Where the proposed project and this alternative differ is primarily in the areas of road design and engineering, conflicts with landfill systems, natural resources, and park design. These differences are described in greater detail below.

### PUMP STATIONS

As part of the leachate conveyance system there are 14 existing pump stations located on the outboard side of the existing haul road (around Landfill Section 6/7) out of which 13 are located in the proximity of this alignment. Due to the lack of adequate space for the proposed roadway section, this roadway alignment alternative does not allow for a shoulder in the proximity of the existing pump stations. The following are potential impacts the roadway proposals may have on the pump stations:

- Roofs of pump stations located adjacent to the traveled-way could carry loading in excess of H-20 from an errant vehicle.
- Maintenance procedures would have to be altered in order for maintenance workers to safely perform their duties at any station located within the traveled-way.
- Gas vents and electrical cabinets could be struck by an errant vehicle, endangering operation of the pump station.

### GAS MANAGEMENT SYSTEM

#### Active Landfill Gas Collection System

Extraction wells and gas header pipes are unaffected by this alternative, as they are all located in the interior of the mound and outside of the roadway grading limits.

However, eight condensate tanks for the north would be impacted by this alternative because they are currently located underneath the existing and proposed roadway. At these locations, equipment, loading, and excavation constraints would be implemented to avoid any damage to the existing gas collection system. In addition, six drip leg vaults lie within the proposed roadway.

#### Passive Landfill Gas Venting System

In Landfill Section 6/7, a geocomposite gas venting layer with passive vents along the landfill section perimeter is proposed for the southern portion of Landfill Section 6/7. Several of the passive gas vents in this area fall within the southern portion of the landfill section and within the grading limits of this alternative alignment.

On the northern section of Landfill Section 6/7, several gas vents fall within the roadway grading limits. In this case, minor realignment along with other design solutions would need to be addressed to avoid these impacts.

### WETLANDS IMPACTS

#### Freshwater Wetlands

This alternative impacts freshwater wetlands at multiple locations, specifically at the three connections between the park roads and Richmond Avenue and along the westernmost perimeter road. These impacts include:

- Filling impacts to the wetland areas in multiple locations;
- Addition of impervious surface within the wetland areas at the Richmond Hill Road and Forest Hill Road crossings; and
- Shading impacts from structures developed over wetlands.

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Table 22-1 summarizes the area of the freshwater wetlands to be filled under the two alternatives due to the construction of roads under this alternative.

**Table 22-1**

**SIBPO Roadway Alternative: Impacts to Wetlands**

<u>SIBPO Roadway Alternative</u>	<u>Proposed Project(4-lanes)</u>
1.92 acres filled	4.3 acres filled
<b>Source:</b> Fresh Kills Landfill Staten Island Borough President's Office Evaluation of Roadway Alternative in East Park (Draft Report), prepared by URS for the New York City Department of Design and Construction, February 2009.	

Thus, this alternative results in a lesser impact compared to the proposed project (four lane alternative) as presented in the DGEIS. However, it is noted that the wetlands impacted under this alternative might be considered higher-value resources than those disturbed by the proposed alignment. Impacts to East Park wetlands in the DGEIS are limited to wetlands that resulted primarily the creation of Fresh Kills Landfill stormwater management basins, whereas this alternative primarily disturbs more naturally occurring wetlands.

Tidal Wetlands

In this alternative, impacts to the tidal wetlands occur in the northeast corner of the site where a connection would be constructed between the park roads and Richmond Avenue at Richmond Hill Road. These impacts include filling impacts to the wetland areas in multiple locations and the addition of impervious surface within the wetland area at the Richmond Hill Road and Forest Hill road crossings. In contrast, the proposed project would not require the filling of any tidal wetlands in East Park.

Regulatory Review

The Forest Hill Connector would traverse a large, established wetland and requires significant improvement in order to meet highway standards, all of which would require extensive wetland permitting and possible creation of off-setting wetlands to mitigate the issue. In that regard, the SIBPO Alternative is similar to the proposed project.

FLOODPLAIN

This alternative may increase the amount of roadway within the 100-year floodplain compared to the proposed project. However, neither has a significant adverse impact on the floodplain.

ROADWAY POLLUTANTS

Stormwater runoff carries pollutants such as oil, grease, or de-icing salts, that can contaminate downstream water bodies. The roadway alternative described in the DGEIS includes provisions for collecting stormwater through a system of structures and detention basins. This process would serve to remove a portion of pollutants carried in stormwater runoff. This alternative proposes to only convey stormwater from the perimeter roads into the nearest water body, or DSNY drainage basin, thereby eliminating the opportunity for pre-treatment and reducing overall stormwater quality as compared to the proposed project.

HYDROLOGY

Road pavement increases the imperviousness of a site, thereby increasing the quantity of runoff. Table 22-2 summarizes the total impervious area due to roadways in the final condition under the two

alternatives. The impervious area was estimated using lane-miles. For the purposes of developing this table, the 20-foot existing perimeter haul road was assumed to consist of 1.5 lanes.

**Table 22-2**  
**SIBPO Alternative: Road Surface Area**

	<b>Proposed Project(4-lanes)</b>	<b>SIBPO Alternative</b>
Area of New Road (acres)	<b>17.0</b>	<b>24.9</b>
Less Existing Road Removed/Resurfaced	<b>1.9</b>	<b>9.2</b>
<b>Total Area of New Impervious Surface</b>	<b>15.1</b>	<b>15.7</b>
<b>Source:</b> Fresh Kills Landfill Staten Island Borough President's Office Evaluation of Roadway Alternative in East Park (Draft Report), prepared by URS for the New York City Department of Design and Construction, February 2, 2009.		

Since a large portion of the roadways proposed in this alternative would be constructed in the same location as existing haul roads, they represent only a small increase in total impervious area in East Park (and by extension stormwater runoff quantities) compared to the proposed project.

**HABITAT IMPACTS**

Roadways can impair the ability of wildlife to move between or within a habitat. Amphibians and reptiles can be especially susceptible to these impacts when roads are constructed near aquatic habitat, as these animals can be cut off from water bodies or upland areas that are used for breeding or foraging. Noise and air pollution, increased human activity, invasive species and potential vehicle collisions can have degrading effects on habitat located near roadways.

Most of the roadways proposed in this alternative would be constructed in the same location as the existing landfill haul roads. While the new roads under this alternative will be wider than the existing haul roads, disturbances will mostly be limited to previously disturbed areas. However, the location of these roads near major wetlands on the north, west, and south edges of East Park, as well as the increased traffic that will be carried along these corridors, could lead to habitat fragmentation impacts if habitats are located upland of the roadway. Additionally, placement of traffic closer to water bodies and wetlands by this alternative, as compared to the proposed project, is likely to have a greater degradation impact to aquatic habitat at the perimeter of the site.

**SCHEDULE**

It is estimated that this alternative would take a minimum of 45 months to implement (East Park Roads only.) These estimates assume a permitting duration of one year. However, no assessment of the permitting implications required to construct the Forest Hill Road Connector has been performed. Project implementation could also be significantly extended given the permitting issues at this site (e.g., wetlands, landfill modifications).

**TRAFFIC**

**Introduction**

As discussed above, this alternative examines a modified alternative that calls for a two-lane, one-way road that would loop around Landfill Section 6/7 (the DGEIS alternative for the Richmond Hill Road Connections was a four-lane, two-way road) with a new four-lane, two-

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way connection across Landfill Section 6/7 at Yukon Avenue. Thus, under this alternative, the loop around Landfill Section 6/7 would have two-way connections at all three intersections. In addition to being a two-way road in a counterclockwise direction around the landfill, this alternative differs in design by proposing a four-lane road across Landfill Section 6/7 that would connect directly to Richmond Avenue at Yukon Avenue. The Yukon Avenue connection was not proposed in the DGEIS (the two project-proposed connections were at Richmond Hill Road and Forest Hill Road both at Richmond Avenue). Under the this alternative, all three connections at Richmond Avenue could potentially be completed by 2016 (the traffic analysis presented in Chapter 16, "Traffic and Parking," assumes the Forest Hill Road connection is completed by 2016 and the Richmond Hill Road connection is completed by 2036).

The new intersection of Yukon Avenue at Richmond Avenue created as part of this alternative would capture some of the diverted traffic across Fresh Kills that, under the proposed project (see Chapter 16, "Traffic and Parking"), is assumed to use the Richmond Hill Road or Forest Hill Road connections with Richmond Avenue. As discussed in Chapter 16, "Traffic and Parking," the Forest Hill Road and the Richmond Hill Road intersections with Richmond Avenue were examined in the 2016/2036 and 2036 analysis years. Under this alternative, both intersections are assumed to be completed by 2016. Therefore, in addition to the intersections along the Yukon Avenue corridor, for the SIBPO alternative these two intersections were analyzed in both the 2016 and 2036 analysis years. Likewise, the intersection of Forest Hill Road at Richmond Hill Road was analyzed in both the 2016 and 2036 analysis years with this alternative.

Thus, for assessing the traffic operating conditions under this alternative, a total of five intersections were selected for detailed analysis (see Figure 22-3b). These include the intersections of Forest Hill Road at Richmond Avenue, Yukon Avenue and Richmond Hill Road as well as the intersections of Richmond Avenue at Yukon Avenue and Richmond Hill Road. The existing, 2016, and 2036 No Build and 2016 and 2036 Build conditions traffic volumes for this alternative are presented in Figures 22-4 through 22-28. Since, this alternative would not affect traffic patterns at other intersections analyzed in the study area, the quantified analysis will be limited to these five intersections. In addition to the off-site roads, this alternative has additional internal signalized and unsignalized intersections as compared to the proposed project. Potential traffic operating conditions for these internal intersections were examined qualitatively and are discussed in the proceeding sections.

### Traffic Diversions

With the completion of all three connections at Richmond Avenue as assumed under this alternative by the year 2016, traffic diversion patterns developed for the proposed project for the 2016 and 2036 Build 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 proposed project were modified and applied to both the 2016 and 2036 No Build volumes to develop the traffic diversion volumes for the year 2016 and 2036 under this alternative.

### Trip Assignments

With this alternative there are no modifications to the park development program so the total number of project-generated vehicular trips for the 2016 and 2036 analysis years would remain unchanged. However, with the additional connection at the intersection of Yukon Avenue and Richmond Avenue, both the in-and outbound project generated vehicular trip assignments were modified. Specifically, the proposed project inbound vehicular trip assignments along Richmond

Avenue were modified to by assigning approximately 17, 16 and 26 percent of project-generated (park and diversion related) vehicular trips to the intersections of Richmond Hill Road, Yukon Avenue and Forest Hill Road at Richmond Avenue, respectively.

Comparison of Traffic Conditions

2016

As presented in Table 22-3, for 2016 conditions (based on an assessment of the redistribution of project generated trips and diverted traffic with all three connections in place as proposed by this alternative), future traffic conditions under this alternative are expected to be worse than the 2016 proposed project future condition in terms of the overall number of impacted intersections with all five (5) intersections experiencing significant adverse traffic impacts. Under the 2016 proposed project future conditions, only four (4) out of the five (5) intersections would experience significant adverse traffic impacts. Specifically, four (4) locations including 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 and Forest Hill Road would remain impacted under both the proposed project and this alternative. However, under this alternative, the intersection of Yukon Avenue at Richmond Avenue would be impacted (this intersection was not impacted under the proposed project). Overall, traffic operating conditions at the park entrances at Richmond Hill Road and Yukon Avenue would generally decline under this alternative; whereas, traffic operating conditions would improve at the park entrance at Forest Hill Road and Richmond Avenue under this alternative. Tables 22-4a and 22-4b summarizes the HCS capacity analysis results for the five (5) analyzed intersections for the year 2016 weekday and weekend peak hours, respectively.

**Table 22-3**  
**Comparison of Significant Adverse Traffic Impact**  
**Proposed Project and SIBPO Alternative: 2016 Analysis Year**

<u>Intersection</u>	<u>Peak Hour</u>	<u>Proposed Project</u>	<u>SIBPO Alternative</u>
<u>Richmond Hill Road and Forest Hill Road</u>	<u>AM</u>	X	X
	<u>Midday</u>	X	X
	<u>PM</u>	X	X
	<u>Weekend Midday</u>	X	X
	<u>Weekend PM</u>	X	X
<u>Richmond Hill Road and Richmond Avenue</u>	<u>AM</u>	X	
	<u>Midday</u>	X	X
	<u>PM</u>	X	X
	<u>Weekend Midday</u>	X	X
	<u>Weekend PM</u>	X	X
<u>Yukon Avenue and Richmond Avenue</u>	<u>AM</u>		
	<u>Midday</u>		
	<u>PM</u>		X
	<u>Weekend Midday</u>		
	<u>Weekend PM</u>		
<u>Forest Hill Road and Richmond Avenue</u>	<u>AM</u>	X	X
	<u>Midday</u>	X	X
	<u>PM</u>	X	X
	<u>Weekend Midday</u>	X	X
	<u>Weekend PM</u>	X	X
<u>Yukon Avenue and Forest Hill Road</u>	<u>AM</u>		
	<u>Midday</u>	X	
	<u>PM</u>	X	X
	<u>Weekend Midday</u>		
	<u>Weekend PM</u>		

**Source:** AKRF, March 2009.

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With respect to the specific impacts at the intersection of Richmond Hill Road and Richmond Avenue, the westbound shared left and through movement would not be impacted during the weekend midday peak hour under this alternative but would be impacted under the 2016 proposed project. However, the northbound through movement would be impacted during the weekend midday peak hour under this alternative, but would not be impacted under the 2016 proposed project. The southbound left-turn movement would be impacted during the weekday PM and weekend midday peak hours under this alternative, but would be impacted during all the peak hours under the 2016 proposed project. Also, the southbound shared through and right-turn movement would be impacted during all peak hours except the weekday AM peak hour under this alternative, but would not be impacted under the 2016 proposed project.

At the intersection of Yukon Avenue and Richmond Avenue, the proposed northbound left-turn movement would operate under congested conditions during the weekday AM and PM peak hours under this alternative. Also, the southbound shared through and right-turn movement would be impacted during the weekday PM peak hour under this alternative, but would not be impacted under the 2016 proposed project.

The number of impacted lane groups/approaches at the intersection of Forest Hill Road and Richmond Avenue would remain the same between the 2016 proposed project and future conditions under this alternative. However, the overall conditions would be improved at this intersection due to the reassignments of project generated trips and diverted traffic to the two additional park entrances located at Richmond Hill Road and Yukon Avenue at Richmond Avenue as proposed under this alternative.

At the intersection of Yukon Avenue and Forest Hill Road, the northbound approach would be impacted during the weekday PM peak hour under this alternative, while this intersection would be impacted during the weekday midday and PM peak hours under the 2016 proposed project.

### 2036

For 2036 future traffic conditions, (based on an assessment of the redistribution of project generated trips and diverted traffic with all three connections in place as proposed under this alternative), all of the five (5) analyzed intersections would be impacted under this alternative, as compared to four (4) intersections impacted under the proposed project. As presented in Table 22-5, this alternative would result in an additional impacted location at the intersection of Yukon Avenue and Richmond Avenue (this intersection was not impacted under the proposed project in the 2036 future conditions). Tables 22-6a and 22-6b summarizes the HCS capacity analysis results for the five (5) analyzed intersections for the year 2036 weekday and weekend peak hours, respectively.



Table 22-4a

2016 No Build, Build and SIBPO Alternative Build Conditions Level of Service Analysis  
 Weekday Peak Hours

Intersection	Weekday AM Peak Hour												Weekday Midday Peak Hour												Weekday PM Peak Hour																																																																																																																																																																																																																																																																																																																																																										
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Eastbound	L	0.33	16.9	B	L	0.32	16.9	B	L	0.33	17.0	B	L	0.60	22.1	C	L	0.60	21.9	C	L	0.61	22.4	C	L	0.57	21.8	C	L	0.57	21.6	C	L	0.58	22.1	C	TR	0.57	16.2	B	TR	0.57	16.3	B	TR	0.64	17.9	B	TR	0.59	16.4	B	TR	0.68	18.8	B	TR	0.65	18.0	B	TR	0.65	18.0	B	TR	0.76	21.7	C	LTR	1.09	88.6	F	LTR	1.12	101.6	F	LTR	1.11	95.7	F	LTR	1.11	98.1	F	LTR	1.14	108.8	F	LTR	1.15	113.2	F	LTR	1.22	138.3	F	LTR	1.25	151.4	F	LTR	1.30	176.3	F	Northbound	L	0.27	27.0	C	L	0.28	27.3	C	L	0.28	27.3	C	L	0.41	37.5	D	L	0.41	37.5	D	L	0.41	37.5	D	L	0.63	56.2	E	L	0.63	56.2	E	L	0.63	56.2	E	L	0.63	56.2	E	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	1.24	151.1	F	TR	1.20	136.5	F	TR	1.39	216.5	F	TR	1.36	203.6	F	TR	1.28	168.4	F	TR	1.50	261.4	F	TR	1.46	243.7	F	Southbound	L	1.52	302.7	F	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	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	0.87	43.1	D	TR	1.27	165.7	F	TR	1.29	170.9	F	TR	1.29	172.8	F	TR	1.30	175.2	F	TR	1.31	179.3	F	TR	1.31	180.2	F																																																																																																													
Intersection	81.0	F	Intersection	99.6	F	Intersection	93.6	F	Intersection	108.0	F	Intersection	132.7	F	Intersection	127.9	F	Intersection	125.7	F	Intersection	155.2	F	Intersection	152.5	F																																																																																																																																																																																																																																																																																																																																																									
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Eastbound	LTR	0.01	25.8	C	LTR	0.01	25.8	C	L	0.16	25.6	C	L	0.14	25.0	C	LTR	0.01	27.3	C	LTR	0.01	27.3	C	L	0.23	23.0	C	L	0.15	21.6	C	LTR	0.01	27.3	C	LTR	0.01	27.3	C	L	0.23	22.2	C	T	0.17	21.1	C	T	0.03	9.1	A	T	0.03	9.1	A	T	0.03	9.1	A	T	0.03	9.1	A	T	0.03	9.1	A	Westbound	L	0.20	28.6	C	L	0.27	29.8	C	L	0.38	29.6	C	L	0.56	39.3	D	L	0.64	43.3	D	L	0.51	37.5	D	L	0.58	40.1	D	L	0.58	40.1	D	L	0.58	40.1	D	L	0.58	40.1	D	L	0.58	40.1	D	LT	0.20	28.5	C	LT	0.26	29.6	C	T	0.07	24.2	C	LT	0.59	40.6	D	LT	0.68	45.2	D	LT	0.47	36.4	D	LT	0.56	39.5	D	T	0.07	20.0	C	R	0.89	40.2	D	R	0.80	32.0	C	R	0.76	26.5	C	R	0.90	42.3	D	R	0.79	31.4	C	R	0.65	17.4	B	R	0.76	25.6	C	R	0.67	21.9	C	R	0.67	21.9	C	R	0.67	21.9	C	Northbound	L	0.00	32.9	C	L	0.00	32.9	C	L	0.05	32.8	C	L	0.00	31.3	C	L	0.00	31.3	C	L	0.04	30.8	C	L	0.00	27.2	C	L	0.00	27.2	C	L	0.00	27.2	C	L	0.00	27.2	C	T	1.01	41.2	D	T	0.94	29.3	C	T	0.98	38.6	D	T	0.72	19.6	B	T	0.72	19.7	B	T	0.90	35.9	D	T	0.80	26.0	C	T	0.78	25.3	C	T	0.80	30.4	C	Southbound	R	0.16	13.9	B	R	0.16	13.9	B	R	0.19	17.2	B	R	0.30	15.6	B	R	0.31	15.6	B	R	0.45	27.7	C	R	0.39	21.0	C	R	0.40	21.1	C	R	0.48	27.5	C	L	1.29	195.0	F	L	1.29	198.4	F	L	1.20	158.6	F	L	1.26	174.8	F	L	1.26	177.2	F	L	1.18	143.8	F	L	1.26	169.1	F	L	1.27	171.9	F	L	1.81	415.4	F	TR	0.50	16.6	B	TR	0.47	16.2	B	TR	0.53	20.1	C	TR	0.75	20.2	C	TR	0.69	19.1	B	TR	0.98	47.0	D	TR	1.25	142.6	F	TR	1.21	124.2	F	TR	1.44	230.3	F
Intersection	43.4	D	Intersection	37.0	D	Intersection	39.3	D	Intersection	35.0+	D	Intersection	34.5	C	Intersection	46.2	D	Intersection	94.8	F	Intersection	86.1	F	Intersection	158.5	F																																																																																																																																																																																																																																																																																																																																																									
Yukon Avenue and Richmond Avenue																																																																																																																																																																																																																																																																																																																																																																																			
Eastbound									L	0.10	27.0	C	TR	0.10	26.8	C					L	0.16	29.7	C	TR	0.16	29.2	C					L	0.17	28.1	C	TR	0.17	27.6	C	Westbound	LR	0.11	26.9	C	LR	0.11	26.9	C	LTR	0.11	26.9	C	LR	0.36	32.0	C	LR	0.35	31.9	C	LR	0.31	29.7	C	LR	0.31	29.6	C	LTR	0.32	29.9	C	Northbound	L	0.42	47.2	D	L	0.42	47.2	D	L	0.42	47.2	D	L	0.33	41.5	D	L	0.33	41.5	D	L	0.33	41.5	D	L	0.33	41.5	D	L	0.38	45.8	D	Southbound	T	1.03	41.7	D	T	0.97	28.6	C	T	0.90	21.8	C	T	0.70	15.3	B	T	0.72	15.6	B	T	0.78	16.9	B	T	0.77	16.7	B	T	0.77	16.7	B	T	0.67	15.0	B	L	0.22	40.2	D	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	T	0.37	4.2	A	TR	0.45	12.3	B	TR	0.66	4.8	A	TR	0.64	4.6	A	TR	0.80	17.3	D	TR	0.89	10.1	B	TR	0.87	9.5	A	TR	1.06	51.6	D																																																																																																																																																																				
Intersection	29.7	C	Intersection	20.9	C	Intersection	19.7	B	Intersection	10.6	B	Intersection	10.7	B	Intersection	17.5	B	Intersection	13.4	B	Intersection	13.0	B	Intersection	37.4	D																																																																																																																																																																																																																																																																																																																																																									
Forest Hill Road and Richmond Avenue																																																																																																																																																																																																																																																																																																																																																																																			
Eastbound					L	0.47	27.1	C	T	0.13	20.7	C	R	0.04	19.7	B	L	0.08	21.6	C	T	0.06	21.2	C	R	0.05	21.2	C	L	0.65	31.9	C	T	0.18	20.6	C	R	0.11	19.9	B	L	0.08	17.7	B	T	0.06	17.4	B	R	0.11	17.9	B	L	0.70	32.0	C	T	0.19	18.7	B	R	0.08	17.6	B	L	0.11	19.3	B	T	0.08	18.8	B	Westbound	L	0.56	27.9	C	L	1.41	229.8	F	L	1.52	277.1	F	L	0.66	30.7	C	L	1.64	328.1	F	L	1.46	246.8	F	L	0.75	34.8	C	L	1.72	357.4	F	L	1.78	388.8	F	L	1.78	388.8	F	Northbound	LR	0.71	32.9	C	TR	0.16	21.0	C	TR	0.08	21.6	C	LR	0.85	42.7	D	TR	0.22	21.1	C	TR	0.11	17.9	B	LR	0.97	63.6	E	TR	0.22	19.2	B	TR	0.22	19.2	B	TR	0.14	19.5	B	L	0.83	79.7	E	L	0.51	51.1	D	L	0.51	51.1	D	L	0.84	80.7	F	L	0.51	50.8	D	L	0.93	96.8	F	L	0.57	54.3	D	T	0.86	13.9	B	T	1.13	92.1	F	T	1.09	70.9	E	T	0.63	9.4	A	T	0.96	40.8	D	T	0.83	12.8	B	T	1.25	146.1	F	T	1.19	118.7	F	R	1.24	135.0	F	R	1.95	462.1	F	R	1.83	407.2	F	R	0.63	12.8	B	R	1.14	118.2	F	R	1.06	64.3	E	R	1.92	450.3	F	R	1.78	387.7	F	Southbound	L	0.09	7.9	A	L	0.06	38.4	D	L	0.06	38.4	D	L	0.17	10.8	B	L	0.10	39.0	D	L	0.10	39.0	D	L	0.28	43.0	D	L	0.28	43.0	D	T	0.36	7.2	A	TR	0.52	20.8	C	TR	0.44	18.2	B	TR	0.73	10.7	B	TR	1.21	129.8	F	TR	1.10	79.9	E	TR	1.02	34.2	C	TR	1.74	362.6	F	TR	1.49	251.8	F																																																								
Intersection	33.0	C	Intersection	142.9	F	Intersection	137.0	F	Intersection	13.7	B	Intersection	111.4	F	Intersection	87.7	F	Intersection	31.2	C	Intersection	274.8	F	Intersection	224.7	F																																																																																																																																																																																																																																																																																																																																																									
Yukon Avenue and Forest Hill Road																																																																																																																																																																																																																																																																																																																																																																																			
Eastbound	L	0.05	19.9	B	L	0.05	19.9	B	L	0.11	20.5	C	L	0.22	21.7	C	L	0.30	22.8	C	L	0.19	21.4	C	L	0.19	21.4	C	L	0.28	22.6	C	Northbound	LT	0.84	26.4	C	LT	0.93	36.0	D	LT	0.87	29.5	C	LT	0.86	30.2	C	LT	1.02	60.2	E	LT	0.99	51.8	D	LT	1.17	112.0	F	LT	1.06	69.4	E	Southbound	T	0.48	14.4	B	T	0.51	14.8	B	T	0.48	14.4	B	T	0.65	17.7	B	T	0.69	18.8	B	T	0.67	18.1	B	T	0.70	19.0	B	T	0.67	18.2	B	R	0.09	10.0+	B	R	0.09	10.0+	B	R	0.09	10.1	B	R	0.16	10.6	B	R	0.16	10.6	B	R	0.13	10.4	B	R	0.13	10.4	B	R	0.14	10.4	B																																																																																																																																																																																																																																																	
Intersection	21.0	C	Intersection	26.8	C	Intersection	22.8	C	Intersection	22.5	C	Intersection	36.4	D	Intersection	25.6	C	Intersection	32.9	C	Intersection	63.2	E	Intersection	41.0	D																																																																																																																																																																																																																																																																																																																																																									

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 22-4b**

**2016 No Build, Build and SIBPO Alternative Build Conditions Level of Service Analysis**

**Weekend Peak Hours**

Intersection	Weekend Midday Peak Hour												Weekend PM Peak Hour																
	No Build				Build				SIBPO Alternative				No Build				Build				SIBPO Alternative								
	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	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	0.64	23.2	C	L	0.62	22.2	C	L	0.61	22.1	C	L	0.63	22.5	C	L	0.63	22.5	C
		TR	0.64	17.7	B	TR	0.65	17.8	B	TR	0.73	20.6	C	TR	0.65	17.9	B	TR	0.66	18.1	B	TR	0.74	20.6	C	TR	0.74	20.6	C
	Westbound	LTR	1.29	171.9	F	LTR	1.32	183.9	F	LTR	1.40	216.4	F	LTR	1.28	164.4	F	LTR	1.30	176.3	F	LTR	1.37	205.4	F	LTR	1.37	205.4	F
	Northbound	L	0.15	24.3	C	L	0.15	24.3	C	L	0.15	24.3	C	L	0.54	47.2	D	L	0.54	47.2	D	L	0.54	47.2	D	L	0.54	47.2	D
	Southbound	TR	1.20	133.6	F	TR	1.38	212.1	F	TR	1.35	197.5	F	TR	1.17	123.2	F	TR	1.34	194.5	F	TR	1.31	182.4	F	TR	1.31	182.4	F
		L	1.32	233.0	F	L	1.32	233.0	F	L	1.32	233.0	F	L	1.51	312.7	F	L	1.51	312.7	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	1.35	198.5	F	TR	1.12	102.3	F	TR	1.13	107.7	F	TR	1.13	108.5	F	TR	1.13	108.5	F
	Intersection		128.8	F	Intersection		151.9	F	Intersection		153.0	F	Intersection		105.9	F	Intersection		127.4	F	Intersection		128.9	F	Intersection		128.9	F	
Richmond Hill Road and Richmond Avenue	Eastbound	LTR	0.01	27.3	C	LTR	0.01	27.3	C	L	0.21	22.0	C	LTR	0.01	27.3	C	LTR	0.01	27.3	C	L	0.23	24.4	C	L	0.23	24.4	C
										T	0.15	20.9	C					T	0.15	23.0	C	T	0.15	23.0	C	T	0.15	23.0	C
										R	0.02	9.5	A					R	0.02	9.5	A	R	0.02	9.5	A	R	0.02	9.5	A
	Westbound	L	0.62	42.3	D	L	0.70	47.0	D	L	0.84	46.2	D	L	0.45	35.7	D	L	0.53	38.4	D	L	0.61	34.0	C	L	0.61	34.0	C
		LT	0.65	43.9	D	LT	0.77	52.2	D	T	0.08	20.2	C	LT	0.38	34.0	C	LT	0.48	36.6	D	LT	0.48	36.6	D	T	0.08	22.2	C
		R	1.05	76.2	E	R	0.93	46.0	D	R	0.79	24.2	C	R	1.02	65.8	E	R	0.91	43.5	D	R	0.77	23.4	C	R	0.77	23.4	C
	Northbound	L	0.00	31.3	C	L	0.00	31.3	C	L	0.05	33.6	C	L	0.00	31.3	C	L	0.00	31.3	C	L	0.04	30.9	C	L	0.04	30.9	C
		T	0.88	24.5	C	T	0.84	22.7	C	T	0.99	47.1	D	T	0.83	22.3	C	T	0.80	21.4	C	T	0.94	37.5	D	T	0.94	37.5	D
		R	0.39	16.8	B	R	0.39	16.9	B	R	0.54	28.4	C	R	0.36	16.4	B	R	0.37	16.4	B	R	0.51	27.3	C	R	0.51	27.3	C
	Southbound	L	1.27	180.0	F	L	1.29	185.7	F	L	1.48	271.4	F	L	1.28	188.5	F	L	1.30	195.8	F	L	1.21	160.5	F	L	1.21	160.5	F
	TR	1.02	44.0	D	TR	0.98	34.2	C	TR	1.30	166.5	F	TR	0.86	23.3	C	TR	0.82	22.0	C	TR	1.08	75.5	E	TR	1.08	75.5	E	
	Intersection		48.2	D	Intersection		41.9	D	Intersection		107.8	F	Intersection		36.9	D	Intersection		34.7	C	Intersection		57.2	E	Intersection		57.2	E	
Yukon Avenue and Richmond Avenue	Eastbound								L	0.20	30.8	C						L	0.14	29.3	C	L	0.14	29.3	C	L	0.14	29.3	C
									TR	0.16	29.1	C						TR	0.15	29.0	C	TR	0.15	29.0	C	TR	0.15	29.0	C
	Westbound	LR	0.60	37.8	D	LR	0.59	37.3	D	LTR	0.69	42.4	D	LR	0.30	31.1	C	LR	0.29	30.9	C	LTR	0.33	31.7	C	LTR	0.33	31.7	C
	Northbound								L	0.39	43.0	D						L	0.41	43.8	D	L	0.41	43.8	D	L	0.41	43.8	D
	Southbound	T	0.91	21.8	C	T	0.89	20.6	C	T	0.81	17.7	B	T	0.95	24.5	C	T	0.93	23.0	C	T	0.85	18.9	B	T	0.85	18.9	B
	L	0.25	38.3	D	L	0.25	38.3	D	L	0.25	38.3	D	L	0.14	36.9	D	L	0.14	36.9	D	L	0.14	36.9	D	L	0.14	36.9	D	
	T	0.75	5.7	A	T	0.74	5.5	A	TR	0.91	22.1	C	T	0.60	4.3	A	T	0.58	4.2	A	TR	0.72	15.6	B	TR	0.72	15.6	B	
	Intersection		14.7	B	Intersection		14.0	B	Intersection		21.7	C	Intersection		15.9	B	Intersection		15.0	B	Intersection		18.5	B	Intersection		18.5	B	
Forest Hill Road and Richmond Avenue	Eastbound				L	0.65	31.2	C	L	0.09	19.8	B						L	0.61	29.9	C	L	0.09	19.0	B	L	0.09	19.0	B
					T	0.17	19.8	B	T	0.07	19.3	B						T	0.16	19.7	B	T	0.06	18.6	B	T	0.06	18.6	B
					R	0.08	18.9	B	R	0.09	19.7	B						R	0.09	19.0	B	R	0.09	19.1	B	R	0.09	19.1	B
	Westbound	L	0.80	37.8	D	L	1.72	362.7	F	L	1.73	368.6	F	L	0.68	31.5	C	L	1.58	299.2	F	L	1.56	291.6	F	L	1.56	291.6	F
		LR	1.01	74.3	E	TR	0.30	21.5	C	TR	0.20	20.9	C	LR	0.85	43.3	D	TR	0.24	20.8	C	TR	0.15	19.7	B	TR	0.15	19.7	B
	Northbound				L	1.05	127.4	F	L	0.65	59.2	E						L	0.90	91.4	F	L	0.55	53.2	D	L	0.55	53.2	D
		T	0.88	14.3	B	T	1.25	143.8	F	T	1.24	136.2	F	T	0.72	10.5	B	T	1.01	48.1	D	T	1.03	53.3	D	T	1.03	53.3	D
	R	0.98	38.6	D	R	1.56	288.5	F	R	1.51	266.7	F	R	0.98	40.8	D	R	1.66	334.1	F	R	1.66	334.1	F	R	1.66	334.1	F	
Southbound	L	0.41	22.1	C	L	0.23	41.7	D	L	0.23	41.7	D	L	0.56	33.6	C	L	0.31	43.7	D	L	0.31	43.7	D	L	0.31	43.7	D	
	T	0.62	9.3	A	TR	1.00	44.9	D	TR	0.82	27.4	C	T	0.72	10.5	B	TR	1.14	96.9	F	TR	1.03	53.1	D	TR	1.03	53.1	D	
	Intersection		21.0	C	Intersection		141.3	F	Intersection		141.9	F	Intersection		17.0	B	Intersection		118.3	F	Intersection		108.7	F	Intersection		108.7	F	
Yukon Avenue and Forest Hill Road	Eastbound	L	0.26	22.3	C	L	0.26	22.3	C	L	0.34	23.4	C	L	0.18	21.3	C	L	0.18	21.3	C	L	0.25	22.1	C	L	0.25	22.1	C
	Northbound	LT	0.77	23.0	C	LT	0.92	35.6	D	LT	0.82	26.0	C	LT	0.67	18.8	B	LT	0.80	24.0	C	LT	0.71	20.3	C	LT	0.71	20.3	C
	Southbound	T	0.65	17.7	B	T	0.69	18.8	B	T	0.65	17.7	B	T	0.63	17.1	B	T	0.67	18.0	B	T	0.63	17.2	B	T	0.63	17.2	B
		R	0.18	10.8	B	R	0.18	10.8	B	R	0.19	10.9	B	R	0.12	10.3	B	R	0.12	10.3	B	R	0.13	10.3	B	R	0.13	10.3	B
	Intersection		19.5	B	Intersection		25.4	C	Intersection		21.0	C	Intersection		17.6	B	Intersection		20.3	C	Intersection		18.4	B	Intersection		18.4	B	

**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 22-5**

**Comparison of Significant Adverse Traffic Impact**  
**Proposed Project and SIBPO Alternative: 2036 Analysis Year**

<u>Intersection</u>	<u>Peak Hour</u>	<u>Proposed Project</u>	<u>SIBPO Alternative</u>
<u>Richmond Hill Road and Forest Hill Road</u>	AM	X	X
	Midday	X	X
	PM	X	X
	Weekend Midday	X	X
	Weekend PM	X	X
<u>Richmond Hill Road and Richmond Avenue</u>	AM		
	Midday	X	X
	PM	X	X
	Weekend Midday	X	X
	Weekend PM	X	X
<u>Yukon Avenue and Richmond Avenue</u>	AM		
	Midday		
	PM		X
	Weekend Midday		X
	Weekend PM		
<u>Forest Hill Road and Richmond Avenue</u>	AM	X	X
	Midday	X	X
	PM	X	X
	Weekend Midday	X	X
	Weekend PM	X	X
<u>Yukon Avenue and Forest Hill Road</u>	AM	X	X
	Midday	X	X
	PM	X	X
	Weekend Midday	X	X
	Weekend PM	X	X

**Source:** AKRF, March 2009.

Overall, conditions at the intersections of Richmond Avenue and Forest Hill Road at Richmond Hill Road are generally expected to be similar between the this alternative and the 2036 project conditions. Conditions at the intersection of Yukon Avenue and Richmond Avenue would become worse under this alternative; whereas, conditions would generally improve at the intersections of Richmond Avenue and Yukon Avenue at Forest Hill Road under this alternative.

At the intersection of Yukon Avenue and Richmond Avenue, the westbound approach would be impacted during the weekend midday peak hour under this alternative, but would not be impacted under the 2036 proposed project. The proposed northbound left-turn movement would operate under congested conditions during all peak hours under this alternative. Also, the southbound shared through and right-turn movement would be impacted during the weekday PM and weekend midday peak hours under this alternative, but would not be impacted under the 2036 proposed project.

At the intersection of Forest Hill Road and Richmond Avenue, the southbound shared through and right-turn movement would not be impacted during the weekend midday peak hour under this alternative, but would be impacted under the 2036 proposed project.

At the intersection of Yukon Avenue and Forest Hill Road, the northbound approach would be impacted during all the analyzed peak hours under this alternative and under the 2036 proposed project.



**Table 22-6b**

**2036 No Build, Build and SIBPO Alternative Build Conditions Level of Service Analysis**

**Weekend Peak Hours**

Intersection	Weekend Midday Peak Hour												Weekend PM Peak Hour																																											
	No Build				Build				SIBPO Alternative				No Build				Build				SIBPO Alternative																																			
	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	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	0.82	33.3	C	L	0.77	30.5	C	L	0.80	33.0	C	L	0.80	33.0	C	L	0.80	33.0	C	TR	0.77	22.1	C	TR	0.89	30.6	C	TR	0.89	30.6	C	TR	0.78	22.5	C	TR	0.89	30.6	C	TR	0.89	30.6	C	TR	0.89	30.6	C
Westbound	LTR	1.73	362.0	F	LTR	2.02	493.2	F +	LTR	2.02	493.2	F +	LTR	1.71	354.8	F	LTR	1.97	472.1	F +	LTR	1.97	472.1	F +	LTR	1.97	472.1	F +	LTR	1.73	362.0	F	LTR	2.02	493.2	F +	LTR	2.02	493.2	F +	LTR	1.71	354.8	F	LTR	1.97	472.1	F +	LTR	1.97	472.1	F +				
Northbound	L	0.17	25.3	C	L	0.17	25.3	C	L	0.17	25.3	C	L	0.64	57.7	E	L	0.64	57.7	E	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	1.64	323.9	F +	TR	1.39	214.3	F	TR	1.59	302.5	F +	TR	1.59	302.5	F +	TR	1.59	302.5	F +
Southbound	L	1.59	340.5	F	L	1.59	340.5	F	L	1.59	340.5	F	L	1.82	440.8	F	L	1.82	440.8	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	1.70	352.8	F +	TR	1.32	184.3	F	TR	1.44	236.6	F +	TR	1.44	236.6	F +				
	Intersection 225.0 F				Intersection 286.8 F				Intersection 286.8 F				Intersection 195.1 F				Intersection 251.2 F				Intersection 251.2 F																																			
Richmond Hill Road and Richmond Avenue																																																								
Eastbound	LTR	0.01	27.3	C	L	0.45	26.5	C	L	0.43	26.0	C	LTR	0.01	27.3	C	L	0.48	29.6	C	L	0.45	28.9	C	L	0.45	28.9	C	T	0.19	21.4	C	T	0.19	21.4	C	T	0.19	21.4	C	T	0.19	23.5	C	T	0.19	23.5	C								
Westbound	L	0.77	52.6	D	L	1.02	81.8	F +	L	1.02	81.8	F +	L	0.50	37.5	D	L	0.74	41.3	D	L	0.74	41.3	D	L	0.74	41.3	D	LT	0.75	50.5	D	T	0.14	20.8	C	T	0.14	20.8	C	LT	0.49	37.0	D	T	0.14	22.8	C	T	0.14	22.8	C				
Northbound	R	1.26	154.9	F	R	0.94	40.6	D	R	0.94	40.6	D	R	1.22	137.8	F	R	0.93	37.5	D	R	0.93	37.5	D	R	0.93	37.5	D	L	0.00	31.3	C	L	0.37	39.2	D	L	0.06	33.7	C	L	0.00	31.3	C	L	0.28	34.4	C	L	0.05	31.0	C				
Southbound	L	1.52	284.6	F	L	1.78	401.1	F +	L	1.78	401.1	F +	L	1.53	292.4	F	L	1.46	261.5	F	L	1.46	261.5	F	L	1.46	261.5	F	T	1.05	54.6	D	T	1.18	117.2	F +	T	1.19	121.2	F +	T	0.99	36.3	D	T	1.13	92.9	F +	T	1.13	92.5	F +				
	Intersection 106.7 F				Intersection 213.8 F				Intersection 216.8 F				Intersection 64.5 E				Intersection 142.2 F				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	0.24	30.3	C	TR	0.24	30.3	C	TR	0.24	30.3	C																
Westbound	LR	0.72	42.9	D	LR	0.70	42.0	D	LTR	1.08	108.4	F +	LR	0.36	32.0	C	LR	0.35	31.9	C	LR	0.35	31.9	C	LTR	0.53	35.8	D	L	0.82	71.2	E	L	0.82	71.2	E	L	0.85	75.0	E	L	0.85	75.0	E												
Northbound	T	1.09	64.4	E	T	1.01	37.3	D	L	0.82	71.2	E	T	1.13	81.9	F	T	1.06	53.6	D	T	1.02	39.3	D	T	1.09	64.4	E	T	0.97	27.9	C	T	0.97	27.9	C	T	1.13	81.9	F	T	1.06	53.6	D												
Southbound	L	0.30	39.0	D	L	0.30	39.0	D	L	0.30	39.0	D	L	0.17	37.2	D	L	0.17	37.2	D	L	0.17	37.2	D	T	0.90	9.1	A	L	0.30	39.0	D	L	0.30	39.0	D	L	0.17	37.2	D	L	0.17	37.2	D												
	Intersection 35.7 D				Intersection 22.6 C				Intersection 52.1 D				Intersection 46.8 D				Intersection 31.9 C				Intersection 31.6 C																																			
Forest Hill Road and Richmond Avenue																																																								
Eastbound					L	0.29	22.9	C	L	0.11	20.0+	C					L	0.25	21.4	C	L	0.11	19.3	B	T	0.20	20.9	C	T	0.08	19.5	B	T	0.08	19.5	B	T	0.08	19.5	B																
Westbound	L	0.95	58.4	E	R	0.32	22.6	C	R	0.33	22.8	C	L	0.81	38.9	D	L	0.33	22.3	C	R	0.34	22.4	C	L	2.16	556.7	F +	L	2.08	522.0	F +	L	1.91	447.0	F +	L	2.16	556.7	F +	L	2.08	522.0	F +												
Northbound	LR	1.20	141.1	F	TR	0.39	23.6	C	TR	0.24	21.4	C	LR	1.02	76.0	E	TR	0.32	21.9	C	TR	0.18	20.1	C	L	3.27	*	F	L	2.77	857.3	F	L	3.14	*	F	L	3.27	*	F	L	2.77	857.3	F												
Southbound	T	1.05	43.6	D	T	1.48	243.8	F +	T	1.51	257.9	F +	T	0.86	13.5	B	T	1.23	134.0	F +	T	1.26	147.8	F +	R	1.16	98.0	F	R	1.80	391.8	F +	R	1.80	391.8	F +	R	1.16	100.1	F	R	1.97	472.1	F +												
	Intersection 46.8 D				Intersection 269.2 F				Intersection 259.7 F				Intersection 28.1 C				Intersection 244.5 F				Intersection 229.8 F																																			
Yukon Avenue and Forest Hill Road																																																								
Eastbound	L	0.31	23.0	C	L	0.31	23.0	C	L	0.44	25.1	C	L	0.22	21.7	C	L	0.22	21.7	C	L	0.33	23.3	C	LT	1.06	70.1	E	LT	1.27	155.2	F +	LT	1.13	94.6	F +	LT	0.91	34.9	C	LT	1.09	81.8	F +	LT	0.97	45.2	D +								
Northbound	LT	1.06	70.1	E	T	0.84	25.5	C	T	0.78	21.9	C	T	0.75	20.8	C	T	0.82	23.9	C	T	0.75	20.9	C	T	0.77	21.8	C	T	0.84	25.5	C	T	0.78	21.9	C	T	0.75	20.8	C	T	0.82	23.9	C												
Southbound	R	0.22	11.2	B	R	0.22	11.2	B	R	0.29	11.9	B	R	0.15	10.5	B	R	0.15	10.5	B	R	0.22	11.2	B	T	0.75	21.8	C	R	0.22	11.2	B	R	0.29	11.9	B	R	0.15	10.5	B	R	0.15	10.5	B												
	Intersection 39.6 D				Intersection 77.7 E				Intersection 48.6 D				Intersection 25.7 C				Intersection 47.4 D				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

\* implies that delays are in excess of 1000 seconds

Mitigation

As discussed above, all five (5) analyzed intersections will be impacted under this alternative in the future conditions. Four (4) out of the five (5) impacted intersections are also impacted under the 2016 proposed project future traffic conditions. Specifically, the commonly impacted intersections are Richmond Hill Road at Forest Hill Road and Richmond Avenue, Forest Hill Road at Richmond Avenue and Yukon Avenue at Forest Hill Road. The same mitigation measures identified for the proposed project (see Chapter 23, "Mitigation") would also be required to mitigate the impacts associated with this alternative, with some minor adjustments (see Table 22-7). The intersection of Forest Hill Road and Richmond Avenue would be unmitigated for all peak hours for both the 2016 proposed project and this alternative. The intersection of Richmond Hill Road and Forest Hill Road would also be unmitigated for all peak hours except the weekday AM peak hour for both the 2016 proposed project and this alternative.

For the intersection of Richmond Hill Road and Richmond Avenue, the weekday AM peak hour would not be impacted, while the weekday midday and weekend PM peak hours would be mitigated by approach daylighting. The weekday PM and weekend midday peak hours would remain unmitigated under this alternative. Please note that the under the 2016 proposed project, only the weekend midday peak hour would remain unmitigated.

The intersection of Yukon Avenue and Richmond Avenue would be impacted under this alternative, but not impacted under the 2016 proposed project. The mitigation measures identified in Table 22-7 would mitigate the impacts at this intersection. The extent of the effectiveness of the recommended mitigation measures for the five (5) analyzed intersections for the 2016 future conditions are presented in Tables 22-8 to 22-12.

For the intersection of Yukon Avenue and Forest Hill Road, the impact during the weekday PM peak hour would be mitigated by approach daylighting under this alternative. The remaining peak hours are not impacted. Under the 2016 proposed project, in addition to approach daylighting, transferring green time is also required to mitigate the impact during the weekday PM peak hour. This intersection would not be impacted during the weekday AM and weekend midday and PM peak hours under the 2016 proposed project.

Under the 2036 future traffic conditions, all five (5) analyzed intersections would be impacted, while only four (4) intersections would be impacted under the 2036 proposed project future traffic conditions. The intersections of Richmond Hill Road at Forest Hill Road and Forest Hill Road at Richmond Avenue would remain unmitigated for all peak hours for both this alternative and the 2036 proposed project future traffic conditions. The intersection of Richmond Hill Road at Richmond Avenue would also remain unmitigated for all peak hours except for the weekday AM peak hour. The intersection of Richmond Avenue and Richmond Hill Road is not impacted under the 2036 proposed project and under this alternative proposed mitigation measures for other intersections under this alternative are presented in Table 22-13.

For the intersection of Yukon Avenue and Forest Hill Road, approach daylighting would be required to mitigate the impacts during all five (5) peak hours under this alternative. Under the 2036 proposed project, in addition to the daylighting mitigation measure, additional mitigation measures including the transferring of green time would be required to mitigate the impacts under the 2036 proposed project future traffic conditions.

For the newly impacted intersection of Yukon Avenue and Richmond Avenue under the 2036 SIBPO Alternative future traffic conditions (this intersection was not impacted under the 2036 proposed project future traffic conditions), the mitigation measures identified in Table 22-13

**Table 22-7**  
**SIBPO Alternative Recommended Mitigation Measures**  
**2016 Build Year**

Intersection	Mitigation Measures																				
	Weekday Peak Hours			Weekend Peak Hours																	
	AM	Midday	PM	Midday	PM																
Richmond Hill Road and Forest Hill Road	Develop a new signal timing/phasing plan: <table border="1" style="font-size: small;"> <thead> <tr> <th>Phase</th> <th>Green</th> <th>Amber</th> <th>Red</th> </tr> </thead> <tbody> <tr> <td>EB/WB</td> <td>36</td> <td>3</td> <td>2</td> </tr> <tr> <td>NB/SB</td> <td>35</td> <td>3</td> <td>2</td> </tr> <tr> <td>EB</td> <td>6</td> <td>3</td> <td>0</td> </tr> </tbody> </table> <p style="font-size: small;">Cycle length = 90 seconds</p>	Phase	Green	Amber	Red	EB/WB	36	3	2	NB/SB	35	3	2	EB	6	3	0	Unmitigated	Unmitigated	Unmitigated	Unmitigated
Phase	Green	Amber	Red																		
EB/WB	36	3	2																		
NB/SB	35	3	2																		
EB	6	3	0																		
Richmond Hill Road and Richmond Avenue *	Not impacted	Daylight the SB approach to provide an additional moving lane	Unmitigated	Unmitigated	Daylight the SB approach to provide an additional moving lane.																
Yukon Avenue and Richmond Avenue *	Not impacted	Not impacted	Daylight SB approach	Not impacted	Not impacted																
Forest Hill Road and Richmond Avenue	Unmitigated	Unmitigated	Unmitigated	Unmitigated	Unmitigated																
Yukon Avenue and Forest Hill Road *	Not impacted	Not impacted	Daylight NB approach	Not impacted	Not impacted																

**Notes:**  
EB = eastbound; WB = westbound; NB = northbound; SB = southbound  
\* Daylight at intersection approaches implies that curbside parking is prohibited for approximately 100-feet.

**Table 22-8**

**2016 No Build, Build, SIBPO Alternative and Build with Mitigation Conditions Level of Service Analysis**

**Weekday AM Peak Hour**

Intersection	2016 No Build				2016 Build				2016 Build with Mitigation				SIBPO Alternative				SIBPO Alt. with Mitigation			
	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 Westbound Northbound Southbound	L	0.33	16.9	B	L	0.32	16.9	B	L	0.40	20.3	C	L	0.33	17.0	B	L	0.41	20.7	C
	TR	0.57	16.2	B	TR	0.57	16.3	B	TR	0.62	20.0	B	TR	0.64	17.9	B	TR	0.70	22.3	C
	LTR	1.09	88.6	F	LTR	1.12	101.6	F	LTR	1.07	80.5	F	LTR	1.11	95.7	F	LTR	1.05	75.8	E
	L	0.27	27.0	C	L	0.28	27.3	C	L	0.19	20.7	C	L	0.28	27.3	C	L	0.19	20.7	C
	TR	1.13	108.1	F	TR	1.26	161.6	F	TR	1.12	100.1	F	TR	1.24	151.1	F	TR	1.10	92.0	F
	L	1.52	302.7	F	L	1.52	302.7	F	L	1.52	300.7	F	L	1.52	302.7	F	L	1.52	300.7	F
	TR	0.86	42.2	D	TR	0.86	42.7	D	TR	0.76	32.0	C	TR	0.87	43.1	D	TR	0.77	32.1	C
	Intersection		81.0	F	Intersection		99.6	F	Intersection		76.2	E	Intersection		93.6	F	Intersection		72.1	E
	Richmond Hill Road and Richmond Avenue Eastbound Westbound Northbound Southbound	LTR	0.01	25.8	C	LTR	0.01	25.8	C	LTR	0.01	25.8	C	L	0.16	25.6	C	Not impacted		
													T	0.14	25.0	C				
												R	0.02	11.9	B					
L		0.20	28.6	C	L	0.27	29.8	C	L	0.27	29.8	C	L	0.38	29.6	C				
LT		0.20	28.5	C	LT	0.26	29.6	C	LT	0.26	29.6	C	T	0.07	24.2	C				
R		0.89	40.2	D	R	0.80	32.0	C	R	0.78	29.9	C	R	0.76	26.5	C				
L		0.00	32.9	C	L	0.00	32.9	C	L	0.00	32.1	C	L	0.05	32.8	C				
T		1.01	41.2	D	T	0.94	29.3	C	T	0.97	33.6	C	T	0.98	38.6	D				
R		0.16	13.9	B	R	0.16	13.9	B	R	0.17	14.7	B	R	0.19	17.2	B				
L		1.29	195.0	F	L	1.29	198.4	F	L	1.20	158.6	F	L	1.20	158.6	F				
TR	0.50	16.6	B	TR	0.47	16.2	B	TR	0.48	17.1	B	TR	0.53	20.1	C					
Intersection		43.4	D	Intersection		37.0	D	Intersection		36.7	D	Intersection		39.3	D					
Forest Hill Road and Richmond Avenue Eastbound Westbound Northbound Southbound					L	0.47	27.1	C	Unmitigated	L	0.08	21.6	C	Unmitigated						
					T	0.13	20.7	C		T	0.06	21.2	C							
					R	0.04	19.7	B		R	0.05	21.2	C							
	L	0.56	27.9	C	L	1.41	229.8	F		L	1.52	277.1	F							
	LR	0.71	32.9	C	TR	0.16	21.0	C		TR	0.08	21.6	C							
					L	0.83	79.7	E		L	0.51	51.1	D							
	T	0.86	13.9	B	T	1.13	92.1	F		T	1.09	70.9	E							
	R	1.24	135.0	F	R	1.95	462.1	F		R	1.83	407.2	F							
	L	0.09	7.9	A	L	0.06	38.4	D		L	0.06	38.4	D							
	T	0.36	7.2	A	TR	0.52	20.8	C		TR	0.44	18.2	B							
Intersection		33.0	C	Intersection		142.9	F	Intersection		137.0	F									

**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 22-9**

**2016 No Build, Build, SIBPO Alternative and Build with Mitigation Conditions Level of Service Analysis**

**Weekday Midday Peak Hour**

Intersection	2016 No Build				2016 Build				2016 Build with Mitigation				SIBPO Alternative				SIBPO Alt. with Mitigation			
	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	0.60	22.1	C	L	0.60	21.9	C	Unmitigated				L	0.61	22.4	C	Unmitigated			
	TR	0.59	16.4	B	TR	0.59	16.5	B					TR	0.68	18.8	B				
Westbound	LTR	1.11	98.1	F	LTR	1.14	108.8	F +					LTR	1.15	113.2	F +				
Northbound	L	0.41	37.5	D	L	0.41	37.5	D					L	0.41	37.5	D				
	TR	1.20	136.5	F	TR	1.39	216.5	F +					TR	1.36	203.6	F +				
Southbound	L	1.25	187.5	F	L	1.25	187.5	F					L	1.25	187.5	F				
	TR	1.27	165.7	F	TR	1.29	170.9	F +	TR	1.29	172.8	F +								
	Intersection	108.0	F	Intersection	132.7	F			Intersection	127.9	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	L	0.23	23.0	C	L	0.23	23.0	C
													T	0.15	21.6	C	T	0.15	21.6	C
Westbound	L	0.56	39.3	D	L	0.64	43.3	D	L	0.64	43.3	D	R	0.02	8.6	A	R	0.02	8.6	A
	LT	0.59	40.6	D	LT	0.68	45.2	D	LT	0.68	45.2	D	L	0.80	43.3	D	L	0.80	43.3	D
Northbound	R	0.90	42.3	D	R	0.79	31.4	C	R	0.77	29.4	C	T	0.08	20.8	C	T	0.08	20.8	C
	L	0.00	31.3	C	L	0.00	31.3	C	L	0.00	30.4	C	R	0.65	17.4	B	R	0.65	17.4	B
	T	0.72	19.6	B	T	0.72	19.7	B	T	0.74	20.9	C	L	0.04	30.8	C	L	0.04	30.8	C
Southbound	R	0.30	15.6	B	R	0.31	15.6	B	R	0.32	16.5	B	T	0.90	35.9	D	T	0.90	35.9	D
	L	1.26	174.8	F	L	1.26	177.2	F +	L	1.18	143.8	F	R	0.45	27.7	C	R	0.45	27.7	C
	TR	0.75	20.2	C	TR	0.69	19.1	B	TR	0.71	20.3	C	L	1.18	143.8	F	L	1.18	143.8	F
													TR	0.98	47.0	D +	TR	0.78	30.0	C
	Intersection	35.0+	D	Intersection	34.5	C			Intersection	32.6	C	Intersection	46.2	D	Intersection	40.0	D			
Forest Hill Road and Richmond Avenue																				
Eastbound					L	0.65	31.9	C	Unmitigated				L	0.08	17.7	B	Unmitigated			
					T	0.18	20.6	C					T	0.06	17.4	B				
Westbound	L	0.66	30.7	C	R	0.11	19.9	B					R	0.11	17.9	B				
	LR	0.85	42.7	D	L	1.64	328.1	F +					L	1.46	246.8	F +				
Northbound					L	0.84	80.7	F					TR	0.11	17.9	B				
	T	0.63	9.4	A	T	0.96	40.8	D					L	0.51	50.8	D				
Southbound	R	0.63	12.8	B	R	1.14	118.2	F +	T	0.98	44.5	D								
	L	0.17	10.8	B	L	0.10	39.0	D	R	1.14	118.2	F +								
	T	0.73	10.7	B	TR	1.21	129.8	F +	L	0.10	39.0	D								
	Intersection	13.7	B	Intersection	111.4	F			Intersection	87.7	F	Intersection	87.7	F						
Yukon Avenue and Forest Hill Road																				
Eastbound	L	0.22	21.7	C	L	0.22	21.7	C	L	0.22	21.7	C	L	0.30	22.8	C	Not impacted			
Northbound	LT	0.86	30.2	C	LT	1.02	60.2	E +	LT	0.90	32.5	C	LT	0.92	37.0	D				
	T	0.65	17.7	B	T	0.69	18.8	B	T	0.69	18.8	B	T	0.65	17.8	B				
Southbound	R	0.16	10.6	B	R	0.16	10.6	B	R	0.16	10.6	B	R	0.17	10.7	B				
	Intersection	22.5	C	Intersection	36.4	D			Intersection	24.3	C	Intersection	25.6	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 22-10**  
**2016 No Build, Build, SIBPO Alternative and Build with Mitigation Conditions Level of Service Analysis**

**Weekday PM Peak Hour**

Intersection	2016 No Build				2016 Build				2016 Build with Mitigation				SIBPO Alternative				SIBPO Alt. with Mitigation							
	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	0.57	21.8	C	L	0.57	21.6	C	Unmitigated	L	0.58	22.1	C	Unmitigated	L	0.58	22.1	C	Unmitigated	L	0.58	22.1	C	
	TR	0.65	18.0	B	TR	0.65	18.0	B		TR	0.76	21.7	C		TR	0.76	21.7	C						
	LTR	1.22	138.3	F	LTR	1.25	151.4	F		LTR	1.30	176.3	F		LTR	1.30	176.3	F						
	L	0.63	56.2	E	L	0.63	56.2	E		L	0.63	56.2	E		L	0.63	56.2	E						
	TR	1.28	168.4	F	TR	1.50	261.4	F		TR	1.46	243.7	F		TR	1.46	243.7	F						
Westbound	L	0.63	56.2	E	L	0.63	56.2	E	L	0.63	56.2	E	L	0.63	56.2	E	L	0.63	56.2	E				
	TR	1.28	168.4	F	TR	1.50	261.4	F	TR	1.46	243.7	F	TR	1.46	243.7	F	TR	1.46	243.7	F				
	L	1.24	191.4	F	L	1.24	191.4	F	L	1.24	191.4	F	L	1.24	191.4	F	L	1.24	191.4	F				
	TR	1.30	175.2	F	TR	1.31	179.3	F	TR	1.31	180.2	F	TR	1.31	180.2	F	TR	1.31	180.2	F				
	Intersection	125.7			F	Intersection	155.2			F	Intersection	152.5			F	Intersection	152.5			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	L	0.23	22.2	C	Unmitigated	L	0.23	22.2	C			
	L	0.51	37.5	D	L	0.58	40.1	D	L	0.58	40.1	D	T	0.17	21.1	C		T	0.17	21.1	C			
	LT	0.47	36.4	D	LT	0.56	39.5	D	LT	0.56	39.5	D	R	0.03	9.1	A		R	0.03	9.1	A			
	R	0.76	25.6	C	R	0.67	21.9	C	R	0.65	20.7	C	L	0.67	34.1	C		L	0.67	34.1	C			
	L	0.00	27.2	C	L	0.00	27.2	C	L	0.00	26.5	C	T	0.07	20.0+	C		T	0.07	20.0+	C			
Westbound	TR	0.80	26.0	C	T	0.78	25.3	C	T	0.80	26.9	C	R	0.63	17.4	B	R	0.63	17.4	B				
	R	0.39	21.0	C	R	0.40	21.1	C	R	0.41	22.2	C	L	0.04	32.6	C	L	0.04	32.6	C				
	L	1.26	169.1	F	L	1.27	171.9	F	L	1.21	146.4	F	T	0.80	30.4	C	T	0.80	30.4	C				
	TR	1.25	142.6	F	TR	1.21	124.2	F	TR	1.25	141.1	F	R	0.48	27.5	C	R	0.48	27.5	C				
	Intersection	94.8			F	Intersection	86.1			F	Intersection	92.3			F	Intersection	158.5			F				
Yukon Avenue and Richmond Avenue Eastbound	LR	0.31	29.7	C	LR	0.31	29.6	C	Not impacted	L	0.17	28.1	C	Not impacted	L	0.17	28.1	C	L	0.17	28.1	C		
	L	0.21	39.9	D	L	0.21	39.9	D		TR	0.17	27.6	C		TR	0.17	27.6	C	TR	0.17	27.6	C		
	T	0.78	16.9	B	T	0.77	16.7	B		LTR	0.32	29.9	C		LTR	0.32	29.9	C	LTR	0.32	29.9	C		
	L	0.21	39.9	D	L	0.21	39.9	D		L	0.38	45.8	D		L	0.38	45.8	D	L	0.38	45.8	D		
	T	0.89	10.1	B	T	0.87	9.5	A		T	0.67	15.0	B		T	0.67	15.0	B	T	0.67	15.0	B		
Forest Hill Road and Richmond Avenue Eastbound	L	0.21	39.9	D	L	0.21	39.9	D	L	0.21	39.9	D	L	0.21	39.9	D	L	0.21	39.9	D				
	TR	1.06	51.6	D	TR	1.06	51.6	D	TR	1.06	51.6	D	TR	1.06	51.6	D	TR	1.06	51.6	D				
	Intersection	13.4			B	Intersection	13.0			B	Intersection	37.4			D	Intersection	30.8			C				
	Westbound	L	0.75	34.8	C	L	0.70	32.0	C	Unmitigated	L	0.11	19.3	B	Unmitigated	L	0.11	19.3	B	Unmitigated	L	0.11	19.3	B
		TR	1.06	64.3	E	TR	1.25	146.1	F		T	0.08	18.8	B		T	0.08	18.8	B		T	0.08	18.8	B
L		0.50	28.3	C	L	0.28	43.0	D	R		0.09	19.0	B	R		0.09	19.0	B	R		0.09	19.0	B	
TR		1.02	34.2	C	TR	1.74	362.6	F	L		1.78	388.8	F	L		1.78	388.8	F	L		1.78	388.8	F	
Intersection		31.2			C	Intersection	274.8				F	Intersection	224.7			F	Intersection	224.7			F			
Yukon Avenue and Forest Hill Road Eastbound	L	0.19	21.4	C	L	0.19	21.4	C	L	0.19	22.1	C	L	0.28	22.6	C	Unmitigated	L	0.28	22.6	C			
	LT	0.99	51.8	D	LT	1.17	112.0	F	LT	0.99	46.6	D	LT	1.06	69.4	E		LT	1.06	69.4	E			
	T	0.67	18.1	B	T	0.70	19.0	B	T	0.69	18.0	B	T	0.67	18.2	B		T	0.67	18.2	B			
	R	0.13	10.4	B	R	0.13	10.4	B	R	0.13	9.9	A	R	0.14	10.4	B		R	0.14	10.4	B			
	Intersection	32.9			C	Intersection	63.2			E	Intersection	31.4			C	Intersection		41.0			D			
Northbound	L	0.19	21.4	C	L	0.19	21.4	C	L	0.19	22.1	C	L	0.28	22.6	C	Unmitigated	L	0.28	22.6	C			
	LT	0.99	51.8	D	LT	1.17	112.0	F	LT	0.99	46.6	D	LT	1.06	69.4	E		LT	1.06	69.4	E			
	T	0.67	18.1	B	T	0.70	19.0	B	T	0.69	18.0	B	T	0.67	18.2	B		T	0.67	18.2	B			
	R	0.13	10.4	B	R	0.13	10.4	B	R	0.13	9.9	A	R	0.14	10.4	B		R	0.14	10.4	B			
	Intersection	32.9			C	Intersection	63.2			E	Intersection	31.4			C	Intersection		41.0			D			
Southbound	L	0.19	21.4	C	L	0.19	21.4	C	L	0.19	22.1	C	L	0.28	22.6	C	Unmitigated	L	0.28	22.6	C			
	LT	0.99	51.8	D	LT	1.17	112.0	F	LT	0.99	46.6	D	LT	1.06	69.4	E		LT	1.06	69.4	E			
	T	0.67	18.1	B	T	0.70	19.0	B	T	0.69	18.0	B	T	0.67	18.2	B		T	0.67	18.2	B			
	R	0.13	10.4	B	R	0.13	10.4	B	R	0.13	9.9	A	R	0.14	10.4	B		R	0.14	10.4	B			
	Intersection	32.9			C	Intersection	63.2			E	Intersection	31.4			C	Intersection		41.0			D			

**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 22-11**  
**2016 No Build, Build, SIBPO Alternative and Build with Mitigation Conditions Level of Service Analysis**  
**Weekend Midday Peak Hour**

Intersection	2016 No Build				2016 Build				2016 Build with Mitigation				SIBPO Alternative				SIBPO Alt. with Mitigation			
	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	0.64	22.9	C	L	0.63	22.7	C	Unmitigated	L	0.64	23.2	C	Unmitigated	L	0.64	22.9	C		
	TR	0.64	17.7	B	TR	0.65	17.8	B		TR	0.73	20.6	C		TR	0.73	20.6	C		
	LTR	1.29	171.9	F	LTR	1.32	183.9	F		LTR	1.40	216.4	F		LTR	1.40	216.4	F		
	L	0.15	24.3	C	L	0.15	24.3	C		L	0.15	24.3	C		L	0.15	24.3	C		
	TR	1.20	133.6	F	TR	1.38	212.1	F		TR	1.35	197.5	F		TR	1.35	197.5	F		
	L	1.32	233.0	F	L	1.32	233.0	F		L	1.32	233.0	F		L	1.32	233.0	F		
	TR	1.33	191.1	F	TR	1.35	196.9	F		TR	1.35	198.5	F		TR	1.35	198.5	F		
	Intersection	128.8	F	Intersection	151.9	F		Intersection	153.0	F										
Richmond Hill Road and Richmond Avenue Eastbound	LTR	0.01	27.3	C	LTR	0.01	27.3	C	Unmitigated	L	0.21	22.0	C	Unmitigated	L	0.21	22.0	C		
	L	0.62	42.3	D	L	0.70	47.0	D		T	0.15	20.9	C		T	0.15	20.9	C		
	LT	0.65	43.9	D	LT	0.77	52.2	D		R	0.02	9.5	A		R	0.02	9.5	A		
	R	1.05	76.2	E	R	0.93	46.0	D		L	0.84	46.2	D		L	0.84	46.2	D		
	L	0.00	31.3	C	L	0.00	31.3	C		T	0.08	20.2	C		T	0.08	20.2	C		
	T	0.88	24.5	C	T	0.84	22.7	C		R	0.79	24.2	C		R	0.79	24.2	C		
	R	0.39	16.8	B	R	0.39	16.9	B		L	0.05	33.6	C		L	0.05	33.6	C		
	L	1.27	180.0	F	L	1.29	185.7	F		T	0.99	47.1	D		T	0.99	47.1	D		
	TR	1.02	44.0	D	TR	0.98	34.2	C		R	0.54	28.4	C		R	0.54	28.4	C		
		Intersection	48.2	D	Intersection	41.9	D			Intersection	107.8	F								
Forest Hill Road and Richmond Avenue Eastbound	L	0.65	31.2	C	L	0.65	31.2	C	Unmitigated	L	0.09	19.8	B	Unmitigated	L	0.09	19.8	B		
	T	0.17	19.8	B	T	0.17	19.8	B		T	0.07	19.3	B		T	0.07	19.3	B		
	R	0.08	18.9	B	R	0.08	18.9	B		R	0.09	19.7	B		R	0.09	19.7	B		
	L	1.72	362.7	F	L	1.72	362.7	F		L	1.73	368.6	F		L	1.73	368.6	F		
	TR	0.30	21.5	C	TR	0.30	21.5	C		TR	0.20	20.9	C		TR	0.20	20.9	C		
	L	1.05	127.4	F	L	1.05	127.4	F		L	0.65	59.2	E		L	0.65	59.2	E		
	T	1.25	143.8	F	T	1.25	143.8	F		T	1.24	136.2	F		T	1.24	136.2	F		
	R	1.56	288.5	F	R	1.56	288.5	F		R	1.51	266.7	F		R	1.51	266.7	F		
L	0.41	22.1	C	L	0.23	41.7	D	L	0.23	41.7	D	L	0.23	41.7	D					
T	0.62	9.3	A	TR	1.00	44.9	D	TR	0.82	27.4	C	TR	0.82	27.4	C					
	Intersection	21.0	C	Intersection	141.3	F		Intersection	141.9	F										

**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 22-12**

**2016 No Build, Build, SIBPO Alternative and Build with Mitigation Conditions Level of Service Analysis**

**Weekend PM Peak Hour**

Intersection	2016 No Build				2016 Build				2016 Build with Mitigation				SIBPO Alternative				SIBPO Alt. with Mitigation							
	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 Westbound Northbound Southbound	L	0.62	22.2	C	L	0.61	22.1	C	Unmitigated	L	0.63	22.5	C	Unmitigated	L	0.63	22.5	C	Unmitigated	L	0.63	22.5	C	
	TR	0.65	17.9	B	TR	0.66	18.1	B		TR	0.74	20.6	C		TR	0.74	20.6	C						
	LTR	1.28	164.4	F	LTR	1.30	176.3	F +		LTR	1.37	205.4	F +		LTR	1.37	205.4	F +						
	L	0.54	47.2	D	L	0.54	47.2	D		L	0.54	47.2	D		L	0.54	47.2	D						
	TR	1.17	123.2	F	TR	1.34	194.5	F +		TR	1.31	182.4	F +		TR	1.31	182.4	F +						
	L	1.51	312.7	F	L	1.51	312.7	F		L	1.51	312.7	F		L	1.51	312.7	F						
	TR	1.12	102.3	F	TR	1.13	107.7	F +		TR	1.13	108.5	F +		TR	1.13	108.5	F +						
	Intersection	105.9	F	Intersection	127.4	F	Intersection	128.9		F	Intersection	128.9	F											
	Richmond Hill Road and Richmond Avenue Eastbound Westbound Northbound Southbound	LTR	0.01	27.3	C	LTR	0.01	27.3		C	LTR	0.01	27.3		C	L	0.23	24.4		C	L	0.23	24.4	C
		L	0.45	35.7	D	L	0.53	38.4		D	L	0.53	38.4		D	T	0.15	23.0		C	T	0.15	23.0	C
LT		0.38	34.0	C	LT	0.48	36.6	D	LT	0.48	36.6	D	R	0.02	9.5	A	R	0.02	9.5	A				
R		1.02	65.8	E	R	0.91	43.5	D	R	0.89	39.5	D	L	0.61	34.0	C	L	0.61	34.0	C				
L		0.00	31.3	C	L	0.00	31.3	C	L	0.00	30.4	C	T	0.08	22.2	C	T	0.08	22.2	C				
T		0.83	22.3	C	T	0.80	21.4	C	T	0.82	22.9	C	R	0.77	23.4	C	R	0.77	23.4	C				
R		0.36	16.4	B	R	0.37	16.4	B	R	0.38	17.4	B	C	0.94	37.5	D	C	0.94	37.5	D				
L		1.28	188.5	F	L	1.30	195.8	F +	L	1.21	160.5	F	R	0.51	27.3	C	R	0.51	27.3	C				
TR		0.86	23.3	C	TR	0.82	22.0	C	TR	0.84	23.6	C	L	1.21	160.5	F	L	1.21	160.5	F				
TR		0.86	23.3	C	TR	0.82	22.0	C	TR	1.08	75.5	E +	TR	1.08	75.5	E +	TR	0.86	30.6	C				
Intersection	36.9	D	Intersection	34.7	C	Intersection	33.4	C	Intersection	57.2	E	Intersection	39.6	D										
Forest Hill Road and Richmond Avenue Eastbound Westbound Northbound Southbound	L	0.68	31.5	C	L	0.61	29.9	C	Unmitigated	L	0.09	19.0	B	Unmitigated	L	0.09	19.0	B						
	LR	0.85	43.3	D	T	0.16	19.7	B		T	0.06	18.6	B		T	0.06	18.6	B						
	T	0.72	10.5	B	R	0.09	19.0	B		R	0.09	19.1	B		R	0.09	19.1	B						
	R	0.98	40.8	D	L	1.58	299.2	F +		L	1.56	291.6	F +		L	1.56	291.6	F +						
	L	0.56	33.6	C	TR	0.24	20.8	C		TR	0.15	19.7	B		TR	0.15	19.7	B						
	T	0.72	10.5	B	L	0.90	91.4	F		L	0.55	53.2	D		L	0.55	53.2	D						
	TR	0.72	10.5	B	T	1.01	48.1	D +		T	1.03	53.3	D +		T	1.03	53.3	D +						
	Intersection	17.0	B	Intersection	118.3	F	Intersection	108.7		F	Intersection	108.7	F											

**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 22-13**  
**SIBPO Alternative Recommended Mitigation Measures**  
**2036 Build Year**

Intersection	Mitigation Measures				
	Weekday Peak Hours			Weekend Peak Hours	
	AM	Midday	PM	Midday	PM
Richmond Hill Road and Forest Hill Road	Unmitigated	Unmitigated	Unmitigated	Unmitigated	Unmitigated
Richmond Hill Road and Richmond Avenue	Not impacted	Unmitigated	Unmitigated	Unmitigated	Unmitigated
Yukon Avenue and Richmond Avenue <sup>(1)</sup> *	Restripe the WB approach to provide one 12-ft left-turn lane and one 12-ft shared through and right-turn lane	Restripe the WB approach to provide one 12-ft left-turn lane and one 12-ft shared through and right-turn lane	Daylight SB approach to provide an additional moving lane. Restripe the WB approach to provide one 12-ft left-turn lane and one 12-ft shared through and right-turn lane	Daylight SB approach to provide an additional moving lane. Restripe the WB approach to provide one 12-ft left-turn lane and one 12-ft shared through and right-turn lane Shift 2 seconds of green time from the NB/SB phase to the EB/WB phase.	Restripe the WB approach to provide one 12-ft left-turn lane and one 12-ft shared through and right-turn lane
Forest Hill Road and Richmond Avenue	Unmitigated	Unmitigated	Unmitigated	Unmitigated	Unmitigated
Yukon Avenue and Forest Hill Road *	Daylight the NB approach.	Daylight the NB approach.	Daylight the NB approach.	Daylight the NB approach.	Daylight the NB approach.

**Notes:**  
EB = eastbound; WB = westbound; NB = northbound; SB = southbound  
(1) Intersection of Yukon Avenue and Richmond Avenue was not impacted during the weekday AM, midday and weekend PM peak hours and was analyzed under mitigation conditions for verification purposes only.  
\* Daylight at intersection approaches implies that curbside parking is prohibited for approximately 100-feet.

would mitigate all the impacts at this intersection. The extent of the effectiveness of the recommended mitigation measures for the five (5) analyzed intersections for the 2036 future conditions are presented in Tables 22-14 to 22-18.

#### Parking

The number of project generated trips for the 2016 build year would remain the same between the 2016 proposed project and this alternative. Similarly, the number of project generated trips will also remain the same between the 2036 proposed project and this alternative's future conditions. Therefore, there would no changes in this alternative with respect to future parking conditions and they would be the same as the corresponding 2016 and 2036 proposed project future parking conditions.

#### AIR QUALITY AND NOISE

This alternative, like the proposed project, would no have any impacts with respect to local air quality or noise conditions. With the allocation of vehicular trips (both diversions and park generated) to 3 rather four intersections, changes air quality and noise conditions at the monitored locations could be somewhat less under this alternative as compared with the proposed project.

### **F. ALTERNATIVE ALIGNMENT: SIBPO MODIFIED PROPOSAL<sup>1</sup>**

Based on a design review of the SIBPO Alternative, a modified alignment was developed with a revised conceptual design that proposes an alternative alignment with minimal substandard features at a design speed of 35 mph, while still maintaining the SIBPO Alternative design intent, wherever feasible. This alternative also includes recommendations that minimize and/or mitigate impacts and conflicts with landfill features.

For instance, this modified alternative includes a revised horizontal alignment which accounts for the typical recommended roadway sections and eliminates substandard curves identified in the analysis of this alternative. Additionally, this modified alternative recommends a revised vertical alignment which coincides with the revised horizontal alignment, and proposes a number of solutions to eliminate adverse and substandard drainage conditions. The roadway alignment presented in this modified alternative also does not conflict with any drip leg vaults as does the above-described alternative.

This alternative would fill slightly more acres of wetland than the above described SIBPO Alternative; however, it would fill fewer acres of wetland than the proposed project (4-lane alternative). It is, however, noted that the wetlands impacted by the alternative might be considered higher-value resources than those impacted by the proposed project, since they are more naturally occurring wetlands. This alternative may also increase the amount of roadway within the 100-year floodplain.

While no lighting was proposed as part of the above described SIBPO Alternative, this alternative also recommends lighting on park roads to improve safety.

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<sup>1</sup> This alternative was presented in the *Fresh Kills Landfill Evaluation of Roadway Alternative in East Park Draft Report*, prepared by URS Corporation for the New York City Department of Design and Construction (February 2009). It is a modification of the alternative submitted by the SIBPO as part of the DGEIS comments.

## **G. ALTERNATIVE ALIGNMENT: YUKON AVENUE CROSSING**

### **INTRODUCTION**

During the course of the public review of the Fresh Kills Park DGEIS, a number of comments were raised as to additional road alignment alternatives that could have different impact than the proposed project particularly with respect to impacts on natural resources (including wetlands), the landfill systems and post closure care (and the secondary effects on groundwater, surface water natural resources and public health), traffic air and noise conditions. Analyzed in the section above is one such modified road alignment alternative as presented by the SIBPO. In addition, this modified roadway alternative has been developed and assumes a road alignment at Fresh Kills with only one crossing of the landfill, the Yukon Crossing, and only one connection to Richmond Avenue, with a new 4-way intersection at Richmond Avenue and Yukon Avenue. This proposal was put forth for the purposes of determining if such a modified project road alignment could meet DPR's goals and objectives while having less of an impact on the landfill systems and on-site wetlands.

As described below, this alignment would have impacts similar to the proposed project in many respects. However, there are specific differences with respect to degree of impacts on the landfill conflicts due to road geometry and environmental impacts, with a particular reduction in wetland impacts that are described in greater detail below.

### **DESCRIPTION OF ALTERNATIVE**

This alternative essentially examines a four-lane, two-way road across Landfill Section 6/7, which is similar to the proposed project. With this alternative, neither the segments of road connecting to Richmond Hill Road or Forest Hill Road are provided in either the 2016 or 2036 analysis years. In this alternative, the only connection to Richmond Avenue for vehicular access to the through-connection to the West Shore Expressway is made at the Yukon Avenue intersection. Road design criteria under this alternative are similar to the proposed project and assumes:

- A 35 mph design speed;
- Two percent minimum cross slope across the entire roadway;
- Minimum Radius for Horizontal Curves: 408 feet (2 percent), 510 feet (-2 percent);
- Maximum Grade: 7 percent;
- Minimum Grade: 0.50 percent;
- Cross Slope: 2 percent, 1.5 percent minimum;
- Stopping Sight Distance (Horizontal and Vertical): 250 feet;
- Maximum Rate of Superelevation: 4 percent;
- Rollover: 4 percent between lanes, 8 percent between travel land and shoulder;
- Maximum Relative Gradient: 0.62 percent to 4 percent (NYCDDC standard practice); and
- Side Slope: 4:1 without guide rail, 2:1 with guide rail.

**Table 22-14**  
**2036 No Build, Build, SIBPO Alternative and Build with Mitigation Conditions Level of Service Analysis**

**Weekday AM Peak Hour**

Intersection	2036 No Build				2036 Build				2036 Build with Mitigation				SIBPO Alternative				SIBPO Alt. with Mitigation						
	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 Westbound Northbound Southbound	L	0.42	20.1	C	L	0.43	20.3	C	Unmitigated	L	0.43	20.3	C	Unmitigated	L	0.43	20.3	C	Unmitigated	L	0.43	20.3	C
	TR	0.68	19.2	B	TR	0.78	22.8	C		TR	0.78	22.8	C		TR	0.78	22.8	C					
	LTR	1.34	192.0	F	LTR	1.37	206.5	F +		LTR	1.37	206.5	F +		LTR	1.37	206.5	F +					
	L	0.49	43.0	D	L	0.49	43.0	D		L	0.49	43.0	D		L	0.49	43.0	D					
	TR	1.34	195.6	F	TR	1.48	255.5	F +		TR	1.48	255.5	F +		TR	1.48	255.5	F +					
	L	1.83	435.7	F	L	1.83	435.7	F		L	1.83	435.7	F		L	1.83	435.7	F					
	TR	1.01	68.9	E	TR	1.03	74.8	E +		TR	1.03	74.8	E +		TR	1.03	74.8	E +					
	Intersection	144.5	F	Intersection	163.3	F		Intersection	163.3	F		Intersection	163.3	F									
Yukon Avenue and Richmond Avenue <sup>(1)</sup> Eastbound Westbound Northbound Southbound	LR	0.13	27.1	C	LR	0.13	27.1	C	Not impacted	L	0.12	27.2	C	Not impacted	L	0.12	27.2	C					
	L	0.02	26.0	C	L	0.02	26.0	C		L	0.02	26.0	C										
	TR	0.15	27.4	C	TR	0.15	27.4	C		TR	0.15	27.4	C										
	L	0.56	53.6	D	L	0.56	53.6	D		L	0.56	53.6	D										
	T	1.08	61.7	E	T	1.08	61.7	E		T	1.08	61.7	E										
	L	0.27	40.9	D	L	0.27	40.9	D		L	0.27	40.9	D										
	T	0.46	4.6	A	T	0.41	4.4	A		T	0.53	13.2	B										
	Intersection	84.2	F	Intersection	53.8	D		Intersection	45.4	D		Intersection	45.4	D									
Forest Hill Road and Richmond Avenue Eastbound Westbound Northbound Southbound	L	0.66	30.8	C	L	0.20	23.3	C	Unmitigated	L	0.10	21.8	C	Unmitigated	L	0.10	21.8	C					
	LR	0.84	42.1	D	LR	0.15	22.2	C		LR	0.07	21.4	C		LR	0.09	21.7	C					
	T	1.03	37.6	D	T	0.09	21.7	C		T	0.09	21.7	C		T	0.09	21.7	C					
	R	1.48	243.5	F	R	1.81	407.8	F +		R	1.81	405.5	F +		R	1.81	405.5	F +					
	L	0.10	8.3	A	L	0.15	22.3	C		L	0.10	21.7	C		L	0.10	21.7	C					
	T	0.43	7.7	A	L	0.92	95.4	F		L	0.85	82.9	F		L	0.85	82.9	F					
		Intersection	62.7	E	Intersection	216.8	F			Intersection	222.6	F			Intersection	222.6	F						
Yukon Avenue and Forest Hill Road Eastbound Northbound Southbound	L	0.07	20.0+	C	L	0.07	20.0+	C	L	0.07	20.0+	C	L	0.14	20.8	C	L	0.14	20.8	C			
	LT	1.08	75.0	E	LT	1.18	114.2	F +	LT	1.03	58.6	E	LT	1.13	92.3	F +	LT	0.98	45.9	D			
	T	0.57	15.9	B	T	0.58	16.2	B	T	0.58	16.2	B	T	0.57	16.0	B	T	0.57	16.0	B			
	R	0.11	10.2	B	R	0.11	10.2	B	R	0.11	10.2	B	R	0.12	10.3	B	R	0.12	10.3	B			
		Intersection	48.7	D	Intersection	72.6	E		Intersection	40.4	D		Intersection	58.0	E		Intersection	32.4	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  
(1) Intersection not impacted in the SIBPO Alternative but analysis was conducted to incorporate permanent geometric/signal phasing changes proposed as mitigation measures in other peak hours



**Table 22-15**

**2036 No Build, Build, SIBPO Alternative and Build with Mitigation Conditions Level of Service Analysis**

**Weekday Midday Peak Hour**

Intersection	2036 No Build				2036 Build				2036 Build with Mitigation				SIBPO Alternative				SIBPO Alt. with Mitigation						
	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	0.78	33.1	C	L	0.80	34.9	C	Unmitigated	L	0.80	34.9	C	Unmitigated	L	0.80	34.9	C	Unmitigated	L	0.80	34.9	C
	TR	0.70	19.6	B	TR	0.82	25.1	C		TR	0.82	25.1	C		TR	0.82	25.1	C					
	LTR	1.39	213.2	F	LTR	1.57	292.6	F +		LTR	1.57	292.6	F +		LTR	1.57	292.6	F +					
	L	0.49	43.0	D	L	0.49	43.0	D		L	0.49	43.0	D		L	0.49	43.0	D					
	TR	1.43	232.1	F	TR	1.65	329.9	F +		TR	1.65	329.9	F +		TR	1.65	329.9	F +					
	L	1.51	289.7	F	L	1.51	289.7	F		L	1.51	289.7	F		L	1.51	289.7	F					
	TR	1.51	267.4	F	TR	1.57	295.0	F +		TR	1.57	295.0	F +		TR	1.57	295.0	F +					
Intersection		186.6	F	Intersection		232.0	F	Intersection		232.0	F	Intersection		232.0	F	Intersection		232.0	F				
Richmond Hill Road and Richmond Avenue Eastbound	LTR	0.01	27.3	C	L	0.51	28.7	C	Unmitigated	L	0.49	28.1	C	Unmitigated	L	0.49	28.1	C					
					T	0.19	22.1	C		T	0.19	22.1	C		T	0.19	22.1	C					
					R	0.06	8.9	A		R	0.03	8.6	A		R	0.03	8.6	A					
	L	0.66	43.9	D	L	0.98	71.3	E +		L	0.98	71.3	E +		L	0.98	71.3	E +					
	LT	0.72	47.9	D	T	0.11	21.1	C		T	0.11	21.1	C		T	0.11	21.1	C					
	R	1.08	85.2	F	R	0.78	22.6	C		R	0.78	22.6	C		R	0.78	22.6	C					
	L	0.00	31.3	C	L	0.22	33.5	C		L	0.04	30.9	C		L	0.04	30.9	C					
	T	0.86	23.4	C	T	1.07	72.6	E +		T	1.08	74.9	E +		T	1.08	74.9	E +					
	R	0.37	16.4	B	R	0.54	30.0	C		R	0.54	30.0	C		R	0.54	30.0	C					
	L	1.50	279.4	F	L	1.42	241.5	F		L	1.42	241.5	F		L	1.42	241.5	F					
TR	0.90	25.3	C	TR	1.24	143.0	F +	TR	1.24	142.7	F +	TR	1.24	142.7	F +								
Intersection		51.0	D	Intersection		101.4	F	Intersection		102.9	F	Intersection		102.9	F								
Yukon Avenue and Richmond Avenue <sup>(1)</sup> Eastbound	LR	0.43	33.4	C	LR	0.42	33.2	C	Not impacted	L	0.30	32.7	C	Not impacted	L	0.26	31.4	C					
								TR		0.26	30.5	C	TR		0.26	30.5	C						
								LTR		0.53	36.1	D	L		0.16	29.5	C						
								L		0.71	59.1	E	TR		0.43	33.7	C						
								T		0.76	16.4	B	L		0.71	59.1	E						
Westbound	L	0.84	18.5	B	T	0.79	17.2	B					T	0.76	16.4	B	T	0.76	16.4	B			
	L	0.28	38.8	D	L	0.28	38.8	D					L	0.28	38.8	D	L	0.28	38.8	D			
	T	0.80	6.4	A	T	0.72	5.3	A					TR	0.96	26.5	C	TR	0.96	26.5	C			
	Intersection		12.8	B	Intersection		11.9	B	Intersection		23.9	C	Intersection		23.7	C							
Forest Hill Road and Richmond Avenue Eastbound	L	0.22	19.5	B	L	0.22	19.5	B	Unmitigated	L	0.10	17.9	B	Unmitigated	L	0.10	17.9	B					
					T	0.19	18.8	B		T	0.07	17.5	B		T	0.07	17.5	B					
					R	0.38	21.7	C		R	0.39	21.9	C		R	0.39	21.9	C					
	L	0.79	37.1	D	L	1.81	402.5	F +		L	1.75	374.4	F +		L	1.75	374.4	F +					
	LR	1.01	74.6	E	TR	0.22	19.1	B		TR	0.13	18.2	B		TR	0.13	18.2	B					
					L	1.69	380.0	F		L	1.19	173.4	F		L	1.19	173.4	F					
	T	0.76	11.1	B	T	1.17	110.0	F +		T	1.20	125.6	F +		T	1.20	125.6	F +					
	R	0.75	16.5	B	R	1.35	201.1	F +		R	1.35	201.1	F +		R	1.35	201.1	F +					
	L	0.21	12.2	B	L	0.12	39.4	D		L	0.12	39.4	D		L	0.12	39.4	D					
	T	0.88	14.3	B	TR	1.36	193.8	F +		TR	1.32	174.1	F +		TR	1.32	174.1	F +					
Intersection		18.8	B	Intersection		181.9	F	Intersection		173.4	F	Intersection		173.4	F								
Yukon Avenue and Forest Hill Road Eastbound	L	0.26	22.3	C	L	0.26	22.3	C	Unmitigated	L	0.27	23.1	C	Unmitigated	L	0.40	24.3	C					
	LT	1.19	122.7	F	LT	1.41	212.7	F +		LT	1.27	152.9	F +		LT	1.11	87.4	F					
	T	0.77	21.9	C	T	0.81	23.5	C		T	0.79	22.0	C		T	0.78	22.0	C					
	R	0.19	10.9	B	R	0.19	10.9	B		R	0.19	10.4	B		R	0.23	11.3	B					
	Intersection		61.9	E	Intersection		105.6	F		Intersection		61.1	E		Intersection		47.3	D					

**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  
(1) Intersection not impacted in the SIBPO Alternative but analysis was conducted to incorporate permanent geometric/signal phasing changes proposed as mitigation measures in other peak hours

**Table 22-16**

**2036 No Build, Build, SIBPO Alternative and Build with Mitigation Conditions Level of Service Analysis**

**Weekday PM Peak Hour**

Intersection	2036 No Build				2036 Build				2036 Build with Mitigation				SIBPO Alternative				SIBPO Alt. with Mitigation						
	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	0.74	30.8	C	L	0.76	32.7	C	Unmitigated	L	0.76	32.7	C	Unmitigated									
	TR	0.78	22.6	C	TR	0.91	33.4	C		TR	0.91	33.4	C										
	LTR	1.58	298.0	F	LTR	1.83	410.1	F		LTR	1.83	410.1	F										
	L	0.75	73.5	E	L	0.75	73.5	E		L	0.75	73.5	E										
	TR	1.52	271.7	F	TR	1.75	374.8	F		TR	1.75	374.8	F										
	L	1.49	288.0	F	L	1.49	288.0	F		L	1.49	288.0	F										
	TR	1.54	279.5	F	TR	1.63	322.7	F		TR	1.63	322.7	F										
Intersection				216.4	F	Intersection				275.1	F	Intersection				275.1	F						
Richmond Hill Road and Richmond Avenue Eastbound	LTR	0.01	27.3	C	L	0.41	25.5	C	Unmitigated	L	0.38	24.9	C	Unmitigated									
					T	0.21	21.6	C		T	0.21	21.6	C										
					R	0.06	9.3	A		R	0.03	9.1	A										
	L	0.57	39.9	D	L	0.82	44.7	D		L	0.82	44.7	D										
	LT	0.60	41.3	D	T	0.11	20.5	C		T	0.11	20.5	C										
	R	0.90	37.9	D	R	0.75	21.8	C		R	0.75	21.8	C										
	L	0.00	27.2	C	L	0.28	36.3	D		L	0.05	32.7	C										
	T	0.96	36.5	D	T	0.96	41.1	D		T	0.96	41.6	D										
	R	0.47	22.5	C	R	0.57	30.1	C		R	0.57	30.1	C										
	L	1.51	275.4	F	L	2.17	576.4	F		L	2.17	576.4	F										
TR	1.50	253.2	F	TR	1.84	411.2	F	TR	1.84	411.6	F												
Intersection				161.7	F	Intersection				262.2	F	Intersection				265.0	F						
Yukon Avenue and Richmond Avenue Eastbound									Not impacted	L	0.32	31.6	C	L	0.29	30.6	C						
										TR	0.24	28.6	C	TR	0.24	28.6	C						
	LR	0.38	30.8	C	LR	0.37	30.7	C		LTR	0.49	33.0	C	L	0.09	26.9	C						
														TR	0.47	32.8	C						
														L	0.71	64.9	E						
Westbound										L	0.71	64.9	E	T	0.81	17.7	B						
										T	0.81	17.7	B	L	0.26	40.5	D						
										L	0.26	40.5	D	TR	1.00	33.4	C						
										TR	1.27	143.6	F										
Intersection				35.5	D	Intersection				19.6	B	Intersection				91.3	F	Intersection				28.4	C
Forest Hill Road and Richmond Avenue Eastbound					L	0.29	22.1	C	Unmitigated	L	0.13	19.6	B	Unmitigated									
					T	0.21	20.3	C		T	0.09	18.9	B										
					R	0.27	21.4	C		R	0.28	21.5	C										
	L	0.90	48.8	D	L	2.21	579.5	F		L	2.14	547.6	F										
	LR	1.16	124.0	F	TR	0.30	21.5	C		TR	0.17	19.8	B										
					L	2.74	842.5	F		L	2.48	726.5	F										
					T	1.43	222.6	F		T	1.45	230.8	F										
					R	2.12	538.6	F		R	2.12	538.6	F										
					L	0.33	44.6	D		L	0.33	44.6	D										
					TR	1.84	406.9	F		TR	1.79	386.3	F										
Intersection				85.2	F	Intersection				371.3	F	Intersection				363.6	F						
Yukon Avenue and Forest Hill Road Eastbound	L	0.22	21.8	C	L	0.22	21.8	C	L	0.23	22.6	C	L	0.36	23.8	C	L	0.36	23.8	C			
	LT	1.37	198.2	F	LT	1.63	309.6	F	LT	1.36	190.2	F	LT	1.46	234.8	F	LT	1.28	155.4	F			
	T	0.79	22.8	C	T	0.85	26.2	C	T	0.83	24.4	C	T	0.80	22.9	C	T	0.80	22.9	C			
					R	0.16	10.6	B	R	0.16	10.1	B	R	0.22	11.2	B	R	0.22	11.2	B			
	Intersection				100.3	F	Intersection				158.6	F	Intersection				101.6	F	Intersection				79.5

**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 22-17

2036 No Build, Build, SIBPO Alternative and Build with Mitigation Conditions Level of Service Analysis

Weekend Midday Peak Hour

Intersection	2036 No Build				2036 Build				2036 Build with Mitigation				SIBPO Alternative				SIBPO Alt. with Mitigation						
	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 Westbound Northbound Southbound	L	0.79	30.8	C	L	0.82	33.3	C	Unmitigated	L	0.82	33.3	C	Unmitigated	L	0.82	33.3	C	Unmitigated	L	0.82	33.3	C
	TR	0.77	22.1	C	TR	0.89	30.6	C		TR	0.89	30.6	C		TR	0.89	30.6	C					
	LTR	1.73	362.0	F	LTR	2.02	493.2	F		LTR	2.02	493.2	F		LTR	2.02	493.2	F					
	L	0.17	25.3	C	L	0.17	25.3	C		L	0.17	25.3	C		L	0.17	25.3	C					
	TR	1.42	229.2	F	TR	1.64	323.9	F		TR	1.64	323.9	F		TR	1.64	323.9	F					
	L	1.59	340.5	F	L	1.59	340.5	F		L	1.59	340.5	F		L	1.59	340.5	F					
	TR	1.58	299.0	F	TR	1.70	352.8	F		TR	1.70	352.8	F		TR	1.70	352.8	F					
	Intersection	225.0			F	Intersection	286.8			F	Intersection	286.8			F	Intersection	286.8			F			
	Richmond Hill Road and Richmond Avenue Eastbound Westbound Northbound Southbound	LTR	0.01	27.3	C	L	0.45	26.5		C	Unmitigated	L	0.43		26.0	C	Unmitigated	L		0.43	26.0	C	
		L	0.77	52.6	D	L	1.02	81.8		F		L	1.02		81.8	F		L		1.02	81.8	F	
LT		0.75	50.5	D	T	0.14	20.8	C	T	0.14		20.8	C	T	0.14	20.8		C					
R		1.26	154.9	F	R	0.94	40.6	D	R	0.94		40.6	D	R	0.94	40.6		D					
L		0.00	31.3	C	L	0.37	39.2	D	L	0.06		33.7	C	L	0.06	33.7		C					
T		1.05	54.6	D	T	1.18	117.2	F	T	1.19		121.2	F	T	1.19	121.2		F					
R		0.46	18.1	B	R	0.65	32.1	C	R	0.65		32.1	C	R	0.65	32.1		C					
L		1.52	284.6	F	L	1.78	401.1	F	L	1.78		401.1	F	L	1.78	401.1		F					
TR		1.22	124.8	F	TR	1.69	343.5	F	TR	1.69		343.0	F	TR	1.69	343.0		F					
Intersection		106.7			F	Intersection	213.8			F		Intersection	216.8			F		Intersection	216.8			F	
Yukon Avenue and Richmond Avenue Eastbound Westbound Northbound Southbound	LR	0.72	42.9	D	LR	0.70	42.0	D	Not impacted	L	0.41	37.9	D	Not impacted	L	0.41	37.9	D					
	L	0.33	30.7	C	L	0.33	30.7	C		L	0.33	30.7	C										
	TR	0.62	37.2	D	TR	0.62	37.2	D		TR	0.62	37.2	D										
	L	0.82	71.2	E	L	0.82	71.2	E		L	0.82	71.2	E										
	T	1.09	64.4	E	T	1.01	37.3	D		T	0.97	27.9	C		T	1.02	40.0	D					
	L	0.30	39.0	D	L	0.30	39.0	D		L	0.30	39.0	D		L	0.30	39.0	D					
	T	0.90	9.1	A	T	0.82	6.8	A		TR	1.10	68.1	E		TR	0.91	22.4	C					
	Intersection	35.7			D	Intersection	22.6			C	Intersection	52.1			D	Intersection	31.9			C			
	Forest Hill Road and Richmond Avenue Eastbound Westbound Northbound Southbound	L	0.29	22.9	C	L	0.29	22.9		C	Unmitigated	L	0.11		20.0+	C	Unmitigated	L	0.11	20.0+	C		
		T	0.20	20.9	C	T	0.32	22.6		C		T	0.08		19.5	B		T	0.08	19.5	B		
R		0.32	22.6	C	R	2.16	556.7	F	R	0.33		22.8	C	R	0.33	22.8		C					
L		2.16	556.7	F	L	0.39	23.6	C	L	2.08		522.0	F	L	2.08	522.0		F					
LR		1.20	141.1	F	TR	0.39	23.6	C	TR	0.24		21.4	C	TR	0.24	21.4		C					
L		3.27	*	F	L	3.27	*	F	L	2.77		857.3	F	L	2.77	857.3		F					
T		1.05	43.6	D	T	1.48	243.8	F	T	1.51		257.9	F	T	1.51	257.9		F					
R		1.16	98.0	F	R	1.80	391.8	F	R	1.80		391.8	F	R	1.80	391.8		F					
L		0.50	28.3	C	L	0.28	43.0	D	L	0.28		43.0	D	L	0.28	43.0		D					
T		0.75	10.9	B	TR	1.04	57.8	E	TR	0.98		40.9	D	TR	0.98	40.9		D					
Intersection	46.8			D	Intersection	269.2			F	Intersection	259.7			F	Intersection	259.7			F				
Yukon Avenue and Forest Hill Road Eastbound Northbound Southbound	L	0.31	23.0	C	L	0.31	23.0	C	L	0.33	24.7	C	L	0.44	25.1	C	L	0.44	25.1	C			
	LT	1.06	70.1	E	LT	1.27	155.2	F	LT	1.02	55.7	E	LT	1.13	94.6	F	LT	0.99	48.7	D			
	T	0.77	21.8	C	T	0.84	25.5	C	T	0.81	22.1	C	T	0.78	21.9	C	T	0.78	21.9	C			
	R	0.22	11.2	B	R	0.22	11.2	B	R	0.21	10.1	B	R	0.29	11.9	B	R	0.29	11.9	B			
	Intersection	39.6			D	Intersection	77.7			E	Intersection	35.2			D	Intersection	48.6			D			

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 22-18**

**2036 No Build, Build, SIBPO Alternative and Build with Mitigation Conditions Level of Service Analysis**

**Weekend PM Peak Hour**

Intersection	2036 No Build				2036 Build				2036 Build with Mitigation				SIBPO Alternative				SIBPO Alt. with Mitigation					
	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 Westbound Northbound Southbound	L	0.77	30.5	C	L	0.80	33.0	C	Unmitigated	L	0.80	33.0	C	L	0.80	33.0	C	Unmitigated	L	0.80	33.0	C
	TR	0.78	22.5	C	TR	0.89	30.6	C		TR	0.89	30.6	C	TR	0.89	30.6	C		TR	0.89	30.6	C
	LTR	1.71	354.8	F	LTR	1.97	472.1	F +		LTR	1.97	472.1	F +	LTR	1.97	472.1	F +		LTR	1.97	472.1	F +
	L	0.64	57.7	E	L	0.64	57.7	E		L	0.64	57.7	E	L	0.64	57.7	E		L	0.64	57.7	E
	TR	1.39	214.3	F	TR	1.59	302.5	F +		TR	1.59	302.5	F +	TR	1.59	302.5	F +		TR	1.59	302.5	F +
	L	1.82	440.8	F	L	1.82	440.8	F		L	1.82	440.8	F	L	1.82	440.8	F		L	1.82	440.8	F
	TR	1.32	184.3	F	TR	1.44	236.6	F +		TR	1.44	236.6	F +	TR	1.44	236.6	F +		TR	1.44	236.6	F +
Intersection			195.1	F	Intersection			251.2	F	Intersection			251.2	F	Intersection			251.2	F			
Richmond Hill Road and Richmond Avenue Eastbound Westbound Northbound Southbound	LTR	0.01	27.3	C	L	0.48	29.6	C	Unmitigated	L	0.45	28.9	C	L	0.45	28.9	C	Unmitigated	L	0.45	28.9	C
					T	0.19	23.5	C		T	0.19	23.5	C	T	0.19	23.5	C		T	0.19	23.5	C
					R	0.06	9.8	A		R	0.03	9.5	A	R	0.03	9.5	A		R	0.03	9.5	A
	L	0.50	37.5	D	L	0.74	41.3	D		L	0.74	41.3	D	L	0.74	41.3	D		L	0.74	41.3	D
	LT	0.49	37.0	D	T	0.14	22.8	C		T	0.14	22.8	C	T	0.14	22.8	C		T	0.14	22.8	C
	R	1.22	137.8	F	R	0.93	37.5	D		R	0.93	37.5	D	R	0.93	37.5	D		R	0.93	37.5	D
	L	0.00	31.3	C	L	0.28	34.4	C		L	0.05	31.0	C	L	0.05	31.0	C		L	0.05	31.0	C
	T	0.99	36.3	D	T	1.13	92.9	F +		T	1.13	92.5	F +	T	1.13	92.5	F +		T	1.13	92.5	F +
	R	0.43	17.5	B	R	0.61	30.3	C		R	0.61	30.3	C	R	0.61	30.3	C		R	0.61	30.3	C
	L	1.53	292.4	F	L	1.46	261.5	F		L	1.46	261.5	F	L	1.46	261.5	F		L	1.46	261.5	F
TR	1.03	45.8	D	TR	1.43	225.8	F +	TR	1.43	225.2	F +	TR	1.43	225.2	F +	TR	1.43	225.2	F +			
Intersection			64.5	E	Intersection			142.2	F	Intersection			143.3	F	Intersection			143.3	F			
Yukon Avenue and Richmond Avenue <sup>(1)</sup> Eastbound Westbound Northbound Southbound	LR	0.36	32.0	C	LR	0.35	31.9	C	Not impacted	L	0.29	32.6	C	L	0.25	31.3	C	L	0.25	31.3	C	
										TR	0.23	30.0	C	TR	0.23	30.0	C	TR	0.23	30.0	C	
										LTR	0.53	35.8	D	L	0.15	29.2	C	L	0.15	29.2	C	
														TR	0.45	34.0	C	TR	0.45	34.0	C	
										L	0.85	75.0	E	L	0.85	75.0	E	L	0.85	75.0	E	
								T	1.02	39.3	D	T	1.02	39.3	D	T	1.02	39.3	D			
								L	0.17	37.2	D	L	0.17	37.2	D	L	0.17	37.2	D			
								TR	0.87	19.4	B	TR	0.87	19.4	B	TR	0.87	19.4	B			
Intersection			46.8	D	Intersection			31.9	C	Intersection			31.6	C	Intersection			31.5	C			
Forest Hill Road and Richmond Avenue Eastbound Westbound Northbound Southbound					L	0.25	21.4	C	Unmitigated	L	0.11	19.3	B	Unmitigated	L	0.11	19.3	B				
					T	0.18	20.0	B		T	0.07	18.8	B		T	0.07	18.8	B				
					R	0.33	22.3	C		R	0.34	22.4	C		R	0.34	22.4	C				
	L	0.81	38.9	D	L	1.91	447.0	F +		L	1.86	426.3	F +		L	1.86	426.3	F +				
	LR	1.02	76.0	E	TR	0.32	21.9	C		TR	0.18	20.1	C		TR	0.18	20.1	C				
					L	3.14	*	F		L	2.65	803.8	F		L	2.65	803.8	F				
					T	1.23	134.0	F +		T	1.26	147.8	F +		T	1.26	147.8	F +				
	R	1.16	100.1	F	R	1.97	472.1	F +		R	1.97	472.1	F +		R	1.97	472.1	F +				
	L	0.66	44.5	D	L	0.36	45.3	D		L	0.36	45.3	D		L	0.36	45.3	D				
	T	0.87	13.6	B	TR	1.27	152.3	F +		TR	1.23	133.8	F +		TR	1.23	133.8	F +				
Intersection			28.1	C	Intersection			244.5	F	Intersection			229.8	F	Intersection			229.8	F			
Yukon Avenue and Forest Hill Road Eastbound Northbound Southbound	L	0.22	21.7	C	L	0.22	21.7	C	L	0.22	21.7	C	L	0.33	23.3	C	L	0.33	23.3	C		
	LT	0.91	34.9	C	LT	1.09	81.8	F +	LT	0.96	41.4	D	LT	0.97	45.2	D	LT	0.85	27.3	C		
	T	0.75	20.8	C	T	0.82	23.9	C	T	0.82	23.9	C	T	0.75	20.9	C	T	0.75	20.9	C		
	R	0.15	10.5	B	R	0.15	10.5	B	R	0.15	10.5	B	R	0.22	11.2	B	R	0.22	11.2	B		
	Intersection			25.7	C	Intersection			47.4	D	Intersection			30.3	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  
\* implies that delays are in excess of 1000 seconds  
(1) Intersection not impacted in the SIBPO Alternative but analysis was conducted to incorporate permanent geometric/signal phasing changes proposed as mitigation measures in other peak hours

## **OVERVIEW OF ENVIRONMENTAL IMPACTS**

Like the proposed project, it is assumed that with this alternative road alignment, the project site would be developed within the proposed Fresh Kills Park with the proposed park access roads. Therefore, under this alternative, the benefits expected to result from the proposed project as a whole—including the creation of a 2,163-acre regional park and public access to the waterfront—would be realized. Neither the proposed project nor this alternative would have an impact on socioeconomic conditions or community facilities and neither would involve the displacement or relocation of the existing businesses. Both would provide significant benefits with respect to urban design and visual resources. Neither would have shadow impacts or impacts on historic architectural resources. Both have the potential to impact archaeological resources that would need to be addressed as the project designs are advanced in order to determine if specific areas of archaeological impact could occur and if any additional field investigation is necessary. Neither the proposed project nor this alternative significantly adversely impact neighborhood character. Hazardous materials impacts would also be similar.

Both the proposed project and this alternative would be generally consistent with New York City waterfront revitalization program policies. Most importantly, the development of a public park on the project site would be consistent with the borough and City goals for revitalizing and providing public access in the coastal zone. Under both the proposed project and this alternative, the increased demands on solid waste and sanitation services would be similar and neither this alternative nor the proposed project would result in increases to the degree that there would be significant adverse impacts on these services. Likewise, neither this alternative nor the proposed project would result in any significant adverse impacts on utilities. In addition, other requirements of the proposed project with respect to public health protections would be provided.

Where the proposed project and this alternative differ is primarily in the areas of road design and engineering, conflicts with landfill systems, natural resources, and park design. This alternative would provide more open space than the proposed project with respect to East Park since it would have only one road across the East Park. Similarly, it would have less of an impact on wetlands and natural resources (including habitat fragmentation) with no connection at Forest Hill Road or Richmond Hill Road which include wetland crossings. It would also have less of an impact on landfill infrastructure with only one crossing of Landfill Section 6/7 and no impacts on the stormwater basins that would be impacted by the Richmond Hill connection. This alternative could increase noise levels at this location due to increased traffic (see discussion below); however no adverse noise impacts are expected. In addition, this alternative would not have a significant impact with respect to air quality.

## **TRAFFIC AND PARKING IMPACTS**

### **TRAFFIC**

#### **Introduction**

As discussed above, the Yukon Avenue Alternative presented a modified alternative that calls for a four-lane, two-way road that would cross Landfill Section 6/7 (the DGEIS alternative for the Richmond Hill Road Connections was a four-lane, two-way road) with a new connection across Yukon Avenue. Thus, under this alternative, neither the segments of road connecting to Richmond Hill Road or Forest Hill Road are provided in either the 2016 or 2036 analysis years.

## **Fresh Kills Park GEIS**

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The only connection to Richmond Avenue for vehicular access to the through-connection to the West Shore Expressway is made at the Yukon Avenue intersection. In addition, like the proposed project, it is assumed that with this alternative road alignment, the project site would be developed within the proposed Fresh Kills Park with the proposed park access roads. Under the Yukon Avenue Alternative, only the connection at Yukon Avenue and Richmond Avenue could potentially be completed by 2016 (the traffic analysis presented in Chapter 16, “Traffic and Parking,” assumes the Forest Hill Road connection is completed by 2016 and the Richmond Hill Road connection is completed by 2036).

The new intersection of Yukon Avenue at Richmond Avenue created as part of the Yukon Avenue Alternative would capture all of the diverted traffic across Fresh Kills that, under the proposed project (see Chapter 16, “Traffic and Parking”), is assumed to use the Richmond Hill Road or Forest Hill Road connections with Richmond Avenue. As discussed in Chapter 16, “Traffic and Parking,” for the purposes of traffic analysis, the Forest Hill Road and the Richmond Hill Road intersections with Richmond Avenue were examined in the 2016/2036 and 2036 analysis years, respectively. Under the Yukon Avenue Alternative, only the intersection of Yukon Avenue and Richmond Avenue is assumed to be completed in the 2016 and the 2036 future conditions, serving as the sole through connection for vehicular traffic between Richmond Avenue and the West Shore Expressway. Therefore, in addition to the intersections along the Yukon Avenue corridor (analyzed for the Yukon Avenue Alternative) the intersections of Richmond Hill Road and Forest Hill Road at Richmond Avenue were analyzed in both the 2016 and 2036 analysis years as they would serve as the basis for comparison between the proposed project and the Yukon Avenue Alternative. Likewise, the intersection of Forest Hill Road at Richmond Hill Road was analyzed in both the 2016 and 2036 analysis years with this alternative.

Thus, for assessing the traffic operating conditions under the Yukon Avenue Alternative, a total of five intersections were selected for detailed analysis (see Figure 22-29). These include the intersections of Forest Hill Road at Richmond Avenue, Yukon Avenue and Richmond Hill Road as well as the intersections of Richmond Avenue at Yukon Avenue and Richmond Hill Road. The existing, 2016, and 2036 No Build and 2016 and 2036 Build conditions traffic volumes for this alternative are presented in Figures 22-30 through 22-54. Since, this alternative would not affect traffic patterns at other intersections analyzed in the study area, the quantified analysis will be limited to these five intersections. In addition to the off-site roads, like the proposed project, it is assumed that with this alternative road alignment, the project site would be developed within the proposed Fresh Kills Park with the proposed park access roads.

### Traffic Diversions

As discussed above, the Yukon Avenue Alternative assumes only one park connection on Richmond Avenue for vehicular traffic at the intersection of Yukon Avenue and Richmond Avenue for the 2016 and 2036 future conditions. To generate traffic volumes for the 2016 and 2036 Yukon Avenue Alternative future conditions, traffic diversion patterns developed for the proposed project were modified.

### Trip Assignments

With the Yukon Avenue Alternative there are no modifications to the park development program; therefore, the total number of project-generated vehicular trips for the 2016 and 2036 analysis years would remain unchanged. The Yukon Avenue connection alternative resembles the 2016 proposed project future conditions in terms of providing only one connection along

Richmond Avenue. Based on the proximity of Yukon Avenue to Forest Hill Road, the inbound and outbound vehicular trip assignments developed for the intersection of Forest Hill Road and Richmond Avenue for the 2016 proposed project were also applied to the intersection of Yukon Avenue and Richmond Avenue. In the 2036 future conditions, unlike the proposed project which provides two connections on Richmond Avenue along Forest Hill Road and Richmond Hill Road, the Yukon Avenue Alternative only provides one connection at Yukon Avenue. Vehicle assignments developed for the proposed project were modified to account for this single connection.

*Proposed Project and Yukon Avenue Alternative: 2016 Conditions*

As presented in Table 22-19, for 2016 future traffic conditions (based on an assessment of the redistribution of project generated trips and diverted traffic with only one connection in place as proposed by the Yukon Avenue Alternative), the Yukon Avenue Alternative future conditions are expected to be similar to the 2016 proposed project future condition in terms of the overall number of impacted intersections with four (4) out of the five (5) intersections experiencing significant adverse traffic impacts. Specifically, three (3) locations including the intersections of Richmond Hill Road at Forest Hill Road and Richmond Avenue, and the intersection of Forest Hill Road at Richmond Avenue would remain impacted under both the proposed project and Yukon Avenue Alternative conditions. However, the intersection of Yukon Avenue and Forest Hill Road would no longer be impacted under the Yukon Avenue Alternative as compared to the proposed project. Furthermore, under the Yukon Avenue Alternative, the intersection of Yukon Avenue at Richmond Avenue would be impacted (this intersection was not impacted under the proposed project). Overall, traffic operating conditions at the park entrance at Yukon Avenue and Richmond Avenue would be congested and/or impacted during all five analyzed peak hours in the 2016 Yukon Avenue Alternative future conditions. Traffic operating conditions at the intersection of Forest Hill Road and Richmond Avenue would be similar to the No Build conditions under the 2016 Yukon Avenue Alternative future conditions. Tables 22-20a and 22-20b summarizes the HCS capacity analysis results for the five (5) analyzed intersections for the year 2016 weekday and weekend peak hours, respectively.

With respect to the specific impacts at the intersection of Richmond Hill Road and Forest Hill Road between the 2016 proposed project and the Yukon Avenue Alternative future conditions, this intersection would have the same number of impacts at the same approaches for all analyzed peak hours under both future conditions.

At the intersection of Richmond Hill Road and Richmond Avenue, there would be the same number of impacts at the same approaches for all five analyzed peak hours except for the weekend midday peak hour. During the weekend midday peak hour, the westbound exclusive left-turn movement would be impacted under the Yukon Avenue Alternative but would not be impacted under the proposed project.

**Table 22-19**  
**Comparison of Significant Adverse Traffic Impact**  
**2016 Proposed Project and Yukon Avenue Alternative**

<u>Intersection</u>	<u>Peak Hour</u>	<u>Proposed Project</u>	<u>Yukon Avenue Alternative</u>
<u>Richmond Hill Road and Forest Hill Road</u>	AM	X	X
	Midday	X	X
	PM	X	X
	Weekend Midday	X	X
	Weekend PM	X	X
<u>Richmond Hill Road and Richmond Avenue</u>	AM	X	X
	Midday	X	X
	PM	X	X
	Weekend Midday	X	X
	Weekend PM	X	X
<u>Yukon Avenue and Richmond Avenue</u>	AM		
	Midday		X
	PM		X
	Weekend Midday		X
	Weekend PM		
<u>Forest Hill Road and Richmond Avenue</u>	AM	X	X
	Midday	X	
	PM	X	
	Weekend Midday	X	
	Weekend PM	X	
<u>Yukon Avenue and Forest Hill Road</u>	AM		
	Midday	X	
	PM	X	
	Weekend Midday		
	Weekend PM		

**Source:** AKRF, February 2009.

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 under the 2016 Yukon Avenue Alternative future conditions. 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 under the Yukon Avenue Alternative but would not be impacted under the proposed project. The southbound shared through and right-turn movement would be impacted during the weekday PM peak hour under the Yukon Avenue Alternative but would not be impacted under the proposed project.

With the park entrance relocated to the intersection of Yukon Avenue and Richmond Avenue under the Yukon Avenue Alternative, the intersection of Forest Hill Road and Richmond Avenue would operate at similar traffic conditions as the No Build conditions for all five analyzed peak hours except for the weekday AM peak hour during which the northbound right-turn movement would be impacted.

Under the Yukon Avenue Alternative, the intersection of Yukon Avenue and Forest Hill Road would not be impacted under any of the five analyzed peak hours. However, this intersection





**Table 22-20b**

**2016 No Build, Build and Yukon Avenue Alternative Build Conditions Level of Service Analysis**

**Weekend Peak Hours**

Intersection	Weekend Midday Peak Hour												Weekend PM Peak Hour															
	No Build				Build				Yukon Avenue Alternative				No Build				Build				Yukon Avenue Alternative							
	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	0.64	22.9	C	L	0.63	22.7	C	L	0.63	22.7	C	L	0.62	22.2	C	L	0.61	22.1	C	L	0.61	22.1	C
	Westbound				TR	0.64	17.7	B	TR	0.65	17.8	B	TR	0.65	17.8	B	TR	0.65	17.9	B	TR	0.66	18.1	B	TR	0.66	18.1	B
	Northbound				LTR	1.29	171.9	F	LTR	1.32	183.9	F +	LTR	1.32	183.9	F +	LTR	1.28	164.4	F	LTR	1.30	176.3	F +	LTR	1.30	176.3	F +
	Southbound				L	0.15	24.3	C	L	0.15	24.3	C	L	0.15	24.3	C	L	0.54	47.2	D	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	1.38	212.1	F +	TR	1.17	123.2	F	TR	1.34	194.5	F +	TR	1.34	194.5	F +
					L	1.32	233.0	F	L	1.32	233.0	F	L	1.32	233.0	F	L	1.51	312.7	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	1.35	196.9	F +	TR	1.12	102.3	F	TR	1.13	107.7	F +	TR	1.13	107.7	F +
					Intersection	128.8	F	Intersection	151.9	F	Intersection	151.9	F	Intersection	105.9	F	Intersection	127.4	F	Intersection	127.4	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	LTR	0.01	27.3	C	LTR	0.01	27.3	C
	Westbound				L	0.62	42.3	D	L	0.70	47.0	D	L	0.72	48.1	D +	L	0.45	35.7	D	L	0.53	38.4	D	L	0.53	38.4	D
	Northbound				LT	0.65	43.9	D	LT	0.77	52.2	D +	LT	0.75	50.8	D +	LT	0.38	34.0	C	LT	0.48	36.6	D	LT	0.48	36.6	D
	Southbound				R	1.05	76.2	E	R	0.93	46.0	D	R	0.93	45.8	D	R	1.02	65.8	E	R	0.91	43.5	D	R	0.91	43.5	D
					L	0.00	31.3	C	L	0.00	31.3	C	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	0.84	22.7	C	T	0.85	23.0	C	T	0.83	22.3	C	T	0.80	21.4	C	T	0.79	21.2	C
					R	0.39	16.8	B	R	0.39	16.9	B	R	0.39	16.9	B	R	0.36	16.4	B	R	0.37	16.4	B	R	0.37	16.4	B
					L	1.27	180.0	F	L	1.29	185.7	F +	L	1.29	185.7	F +	L	1.28	188.5	F	L	1.30	195.8	F +	L	1.30	195.8	F +
				TR	1.02	44.0	D	TR	0.98	34.2	C	TR	0.98	34.2	C	TR	0.86	23.3	C	TR	0.82	22.0	C	TR	0.82	22.0	C	
				Intersection	48.2	D	Intersection	41.9	D	Intersection	41.9	D	Intersection	36.9	D	Intersection	34.7	C	Intersection	34.7	C	Intersection	34.7	C				
Yukon Avenue and Richmond Avenue	Eastbound												L	1.71	381.9	F					L	1.21	165.9	F				
	Westbound				LR	0.60	37.8	D	LR	0.59	37.3	D	TR	0.43	33.6	C	LR	0.30	31.1	C	TR	0.41	33.1	C	LR	0.41	33.1	C
	Northbound				T	0.91	21.8	C	T	0.89	20.6	C	LTR	1.35	214.8	F +	T	0.95	24.5	C	LTR	0.60	38.4	D	T	0.95	24.5	C
	Southbound				L	0.25	38.3	D	L	0.25	38.3	D	L	0.77	64.7	E	L	0.14	36.9	D	L	0.82	71.2	E	L	0.14	36.9	D
					T	0.75	5.7	A	T	0.74	5.5	A	T	0.81	17.6	B	T	0.60	4.3	A	T	0.85	18.6	B	T	0.85	18.6	B
					L	0.25	38.3	D	L	0.25	38.3	D	L	0.25	38.3	D	L	0.14	36.9	D	L	0.14	36.9	D	L	0.14	36.9	D
					T	0.75	5.7	A	T	0.74	5.5	A	TR	1.00	33.2	C	T	0.58	4.2	A	TR	0.79	17.1	B	T	0.58	4.2	A
					Intersection	14.7	B	Intersection	14.0	B	Intersection	51.0	D	Intersection	15.9	B	Intersection	15.0	B	Intersection	26.4	C	Intersection	26.4	C			
Forest Hill Road and Richmond Avenue	Eastbound																L	0.61	29.9	C					L	0.63	29.7	C
	Westbound				L	0.80	37.8	D	L	1.72	362.7	F +	LR	0.74	34.2	C	L	0.68	31.5	C	TR	0.24	20.8	C	LR	0.80	37.9	D
	Northbound				LR	1.01	74.3	E	TR	0.30	21.5	C	LR	0.95	59.4	E	LR	0.85	43.3	D	L	1.58	299.2	F +	L	0.90	91.4	F
	Southbound				L	1.05	127.4	F	L	1.05	127.4	F	T	0.83	12.7	B	T	0.72	10.5	B	T	1.01	48.1	D +	T	0.67	9.8	A
					T	0.88	14.3	B	T	1.25	143.8	F +	R	0.98	39.5	D	R	0.98	40.8	D	R	1.66	334.1	F +	R	0.98	41.7	D
					R	0.98	38.6	D	R	1.56	288.5	F +	L	0.41	22.1	C	L	0.56	33.6	C	L	0.31	43.7	D	L	0.56	33.6	C
					L	0.41	22.1	C	L	0.23	41.7	D	T	0.55	8.6	A	L	0.56	33.6	C	TR	1.14	96.9	F +	T	0.66	9.7	A
					T	0.62	9.3	A	TR	1.00	44.9	D	T	0.55	8.6	A	T	0.72	10.5	B	T	1.14	96.9	F +	T	0.66	9.7	A
				Intersection	21.0	C	Intersection	141.3	F	Intersection	19.2	B	Intersection	17.0	B	Intersection	118.3	F	Intersection	16.3	B	Intersection	16.3	B				
Yukon Avenue and Forest Hill Road	Eastbound				L	0.26	22.3	C	L	0.26	22.3	C	L	0.44	25.1	C	L	0.18	21.3	C	L	0.18	21.3	C	L	0.35	23.5	C
	Northbound				LT	0.77	23.0	C	LT	0.92	35.6	D	LT	0.75	21.8	C	LT	0.67	18.8	B	LT	0.80	24.0	C	LT	0.66	18.4	B
	Southbound				T	0.65	17.7	B	T	0.69	18.8	B	T	0.59	16.3	B	T	0.63	17.1	B	T	0.67	18.0	B	T	0.58	15.9	B
					R	0.18	10.8	B	R	0.18	10.8	B	R	0.30	12.0	B	R	0.12	10.3	B	R	0.12	10.3	B	R	0.23	11.3	B
					Intersection	19.5	B	Intersection	25.4	C	Intersection	18.9	B	Intersection	17.6	B	Intersection	20.3	C	Intersection	17.3	B	Intersection	17.3	B			
					Intersection	19.5	B	Intersection	25.4	C	Intersection	18.9	B	Intersection	17.6	B	Intersection	20.3	C	Intersection	17.3	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

\* implies that delays are in excess of 1000 seconds

would be impacted during the weekday midday and PM peak hours under the proposed project future conditions.

Proposed Project and Yukon Avenue Alternative: 2036 Conditions

For 2036 future traffic conditions, (based on an assessment of the redistribution of project generated trips and diverted traffic with only one connection in place as proposed by the Yukon Avenue Alternative), the Yukon Avenue Alternative future conditions are expected to be similar to the 2036 proposed project future condition in terms of the overall number of impacted intersections with four (4) out of the five (5) intersections experiencing significant adverse traffic impacts. Specifically, as presented in Table 22-21, three (3) locations including the intersections of Richmond Hill Road at Forest Hill Road and Richmond Avenue, and the intersection of Forest Hill Road at Richmond Avenue would remain impacted under both the proposed project and Yukon Avenue Alternative future conditions. However, the intersection of Yukon Avenue and Forest Hill Road would no longer be impacted under the Yukon Avenue Alternative as compared to the proposed project. Furthermore, under the Yukon Avenue Alternative, the intersection of Yukon Avenue at Richmond Avenue would be impacted (this intersection was not impacted under the proposed project). Tables 22-22a and 22-22b summarizes the HCS capacity analysis results for the five (5) analyzed intersections for the year 2036 weekday and weekend peak hours, respectively.

**Table 22-21**  
**Comparison of Significant Adverse Traffic Impact**  
**2036 Proposed Project and Yukon Avenue Alternative**

<u>Intersection</u>	<u>Peak Hour</u>	<u>Proposed Project</u>	<u>Yukon Avenue Alternative</u>
<u>Richmond Hill Road and Forest Hill Road</u>	<u>AM</u>	X	X
	<u>Midday</u>	X	X
	<u>PM</u>	X	X
	<u>Weekend Midday</u>	X	X
	<u>Weekend PM</u>	X	X
<u>Richmond Hill Road and Richmond Avenue</u>	<u>AM</u>		X
	<u>Midday</u>	X	X
	<u>PM</u>	X	X
	<u>Weekend Midday</u>	X	X
	<u>Weekend PM</u>	X	X
<u>Yukon Avenue and Richmond Avenue</u>	<u>AM</u>		
	<u>Midday</u>		X
	<u>PM</u>		X
	<u>Weekend Midday</u>		X
	<u>Weekend PM</u>		X
<u>Forest Hill Road and Richmond Avenue</u>	<u>AM</u>	X	X
	<u>Midday</u>	X	
	<u>PM</u>	X	X
	<u>Weekend Midday</u>	X	X
	<u>Weekend PM</u>	X	
<u>Yukon Avenue and Forest Hill Road</u>	<u>AM</u>	X	
	<u>Midday</u>	X	
	<u>PM</u>	X	
	<u>Weekend Midday</u>	X	
	<u>Weekend PM</u>	X	

**Source:** AKRF, February 2009.

Overall, under the 2036 Yukon Avenue Alternative future conditions, traffic operating conditions at the intersection of Yukon Avenue and Richmond Avenue are expected to

## **Fresh Kills Park GEIS**

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deteriorate further as compared to the 2016 Yukon Avenue Alternative future conditions. Specifically, this intersection is expected to be congested during all five analyzed peak hours with significant adverse impacts during four out of the five analyzed peak hours.

At the intersection of Richmond Hill Road and Forest Hill Road, there would be the same number of impacts at the same approaches for all analyzed peak hours between the 2036 proposed project and Yukon Avenue Alternative future conditions.

The intersection of Richmond Hill Road and Richmond Avenue would be impacted during all analyzed peak hours under the Yukon Avenue Alternative but would only be impacted during four (4) of the five (5) analyzed peak hours under the 2036 proposed project. Specifically, during the AM peak hour, the southbound left-turn movement would be impacted under this alternative but would not be impacted under the proposed project. During the weekday midday peak hour, the northbound through and the southbound shared through and right-turn movements would not be impacted under this alternative but would be impacted under the proposed project. Also, the westbound shared left-turn and through movements would be impacted under this alternative but would not be impacted under the proposed project. During the weekday PM peak hour, the westbound exclusive left-turn and the shared left-turn and through movements would be impacted under this alternative but would not be impacted under the proposed project. During the weekend midday peak hour, the northbound through movement would not be impacted under this alternative but would be impacted under the proposed project. The westbound shared left-turn and through movement would be impacted under this alternative but would not be impacted under the proposed project. During the weekend PM peak hour, the northbound through movement would not be impacted under this alternative but would be impacted under the proposed project.

The intersection of Yukon Avenue and Richmond Avenue would be congested (mid-LOS D or worse) and/or impacted during all five analyzed peak hours under the 2036 Yukon Avenue Alternative future conditions. Specifically, 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.

Under the 2036 Yukon Avenue Alternative future conditions, the intersection of Forest Hill Road and Richmond Avenue would be impacted during three out of the five analyzed peak hours. Specifically, 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. Under the 2036 proposed project future conditions, this intersection would be impacted during all analyzed peak hours.

Under the 2036 Yukon Avenue Alternative future conditions, the intersection of Yukon Avenue and Forest Hill Road would not be impacted during any of the analyzed peak hours, while it would be impacted during all peak hours under the 2036 proposed project future conditions. Specifically, the northbound approach would be impacted during all analyzed peak hours under the 2036 proposed project future conditions.

### Mitigation

As discussed above, four (4) out of the five (5) analyzed intersections would be impacted under the 2016 Yukon Avenue Alternative future traffic conditions. Three (3) out of the four (4)



**Table 22-22b**

**2036 No Build, Build and Yukon Avenue Alternative Build Conditions Level of Service Analysis**

**Weekend Peak Hours**

Intersection	Weekend Midday Peak Hour												Weekend PM Peak Hour																															
	No Build				Build				Yukon Avenue Alternative				No Build				Build				Yukon Avenue Alternative																							
	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	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	0.80	31.2	C	L	0.77	30.5	C	L	0.80	33.0	C	L	0.79	30.8	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	TR	0.79	30.2	C
Westbound	LTR	1.73	362.0	F	LTR	2.02	493.2	F +	LTR	1.82	405.2	F +	LTR	1.71	354.8	F	LTR	1.97	472.1	F +	LTR	1.81	399.4	F +																				
Northbound	L	0.17	25.3	C	L	0.17	25.3	C	L	0.17	25.3	C	L	0.64	57.7	E	L	0.64	57.7	E	L	0.64	57.7	E																				
Southbound	TR	1.42	229.2	F	TR	1.64	323.9	F +	TR	1.68	341.4	F +	TR	1.39	214.3	F	TR	1.59	302.5	F +	TR	1.63	318.9	F +																				
	L	1.59	340.5	F	L	1.59	340.5	F	L	1.59	340.5	F	L	1.82	440.8	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	1.69	348.9	F +	TR	1.32	184.3	F	TR	1.44	236.6	F +	TR	1.43	233.8	F +																				
	Intersection			225.0	F	Intersection			286.8	F	Intersection			275.3	F	Intersection			195.1	F	Intersection			251.2	F	Intersection			242.0	F														
Richmond Hill Road and Richmond Avenue																																												
Eastbound	LTR	0.01	27.3	C	L	0.45	26.5	C	LTR	0.01	27.3	C	LTR	0.01	27.3	C	L	0.48	29.6	C	LTR	0.01	27.3	C																				
Westbound	L	0.77	52.6	D	L	1.02	81.8	F +	L	0.92	73.4	E +	L	0.50	37.5	D	L	0.74	41.3	D	L	0.67	44.9	D																				
Northbound	LT	0.75	50.5	D	T	0.14	20.8	C	LT	0.93	74.2	E +	LT	0.49	37.0	D	T	0.14	22.8	C	LT	0.62	42.5	D																				
Southbound	R	1.26	154.9	F	R	0.94	40.6	D	R	1.12	97.3	F +	R	1.22	137.8	F	R	0.93	37.5	D	R	1.10	90.9	F																				
	L	0.00	31.3	C	L	0.37	39.2	D	L	0.00	31.3	C	L	0.00	31.3	C	L	0.28	34.4	C	L	0.00	31.3	C																				
	T	1.05	54.6	D	T	1.18	117.2	F +	T	1.04	49.6	D	T	0.99	36.3	D	T	1.13	92.9	F +	T	0.97	32.4	C																				
	R	0.46	18.1	B	R	0.65	32.1	C	R	0.48	18.5	B	R	0.43	17.5	B	R	0.61	30.3	C	R	0.45	17.8	B																				
	L	1.52	284.6	F	L	1.78	401.1	F +	L	1.54	295.6	F +	L	1.53	292.4	F	L	1.46	261.5	F +	L	1.56	306.6	F +																				
	TR	1.22	124.8	F	TR	1.69	343.5	F +	TR	1.26	140.6	F +	TR	1.03	45.8	D	TR	1.43	225.8	F +	TR	1.07	59.7	E +																				
	Intersection			106.7	F	Intersection			213.8	F	Intersection			108.5	F	Intersection			64.5	E	Intersection			142.2	F	Intersection			64.7	E														
Yukon Avenue and Richmond Avenue																																												
Eastbound									L	3.87	*	F									L	2.71	824.7	F																				
Westbound	LR	0.72	42.9	D	LR	0.70	42.0	D	TR	0.91	62.5	E	LR	0.36	32.0	C	LR	0.35	31.9	C	TR	0.87	57.1	E																				
Northbound									LTR	4.66	*	F +					LTR	1.74	388.2	F +																								
Southbound	T	1.09	64.4	E	T	1.01	37.3	D	L	2.91	915.9	F	T	1.13	81.9	F	T	1.06	53.6	D	L	2.96	935.1	F																				
	L	0.30	39.0	D	L	0.30	39.0	D	T	0.96	26.8	C	L	0.17	37.2	D	L	0.17	37.2	D	T	1.01	35.8	D																				
	T	0.90	9.1	A	T	0.82	6.8	A	L	0.30	39.0	D	L	0.71	5.3	A	L	0.65	4.7	A	L	0.17	37.2	D																				
	Intersection			35.7	D	Intersection			22.6	C	Intersection			288.2	F	Intersection			46.8	D	Intersection			31.9	C	Intersection			151.4	F														
Forest Hill Road and Richmond Avenue																																												
Eastbound					L	0.29	22.9	C									L	0.25	21.4	C																								
Westbound	L	0.95	58.4	E	T	0.20	20.9	C	L	0.88	46.7	D	L	0.81	38.9	D	T	0.18	20.0	B	L	0.75	34.5	C																				
Northbound	LR	1.20	141.1	F	R	0.32	22.6	C	LR	1.13	114.2	F	LR	1.02	76.0	E	R	0.33	22.3	C	LR	0.95	58.5	E																				
Southbound					L	2.16	556.7	F +					L	1.91	447.0	F +	L	1.91	447.0	F +																								
	T	1.05	43.6	D	TR	0.39	23.6	C	T	1.09	59.9	E +	TR	0.32	21.9	C	T	1.23	134.0	F +	T	0.90	15.3	B																				
	R	1.16	98.0	F	L	3.27	*	F	R	1.16	99.0	F	L	3.14	*	F	R	1.97	472.1	F +	R	1.16	101.1	F																				
	L	0.50	28.3	C	T	1.48	243.8	F +	L	0.50	28.3	C	T	0.86	13.5	B	L	0.36	45.3	D	L	0.66	44.5	D																				
	T	0.75	10.9	B	R	1.80	391.8	F +	T	0.69	10.1	B	L	0.66	44.5	D	TR	1.27	152.3	F +	T	0.83	12.5	B																				
	Intersection			46.8	D	Intersection			269.2	F	Intersection			52.1	D	Intersection			28.1	C	Intersection			244.5	F	Intersection			27.0	C														
Yukon Avenue and Forest Hill Road																																												
Eastbound	L	0.31	23.0	C	L	0.31	23.0	C	L	0.57	27.9	C	L	0.22	21.7	C	L	0.22	21.7	C	L	0.45	25.2	C																				
Northbound	LT	1.06	70.1	E	LT	1.27	155.2	F +	LT	1.01	57.2	E	LT	0.91	34.9	C	LT	1.09	81.8	F +	LT	0.87	30.5	C																				
Southbound	T	0.77	21.8	C	T	0.84	25.5	C	T	0.71	19.3	B	T	0.75	20.8	C	T	0.82	23.9	C	T	0.68	18.5	B																				
	R	0.22	11.2	B	R	0.22	11.2	B	R	0.42	13.6	B	R	0.15	10.5	B	R	0.15	10.5	B	R	0.34	12.5	B																				
	Intersection			39.6	D	Intersection			77.7	E	Intersection			32.6	C	Intersection			25.7	C	Intersection			47.4	D	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

impacted intersections are also impacted under the 2016 proposed project future traffic conditions. Specifically, the commonly impacted intersections are Richmond Hill Road at Forest Hill Road and Richmond Avenue and Forest Hill Road at Richmond Avenue. The same mitigation measures identified for the proposed project (see Chapter 23, “Mitigation”) would also be required to mitigate the impacts associated with the Yukon Avenue Alternative, with some minor adjustments (see Table 22-23). The intersection of Richmond Hill Road and Forest Hill Road would be unmitigated for all analyzed peak hours except the weekday AM peak hour for both the 2016 proposed project and the Yukon Avenue Alternative. The intersection of Richmond Hill Road and Richmond Avenue would be unmitigated during the weekend midday peak hour for both the 2016 proposed project and the Yukon Avenue Alternative. The other four peak hours would be mitigated by signal retiming. The intersection of Forest Hill Road and Richmond Avenue would be unmitigated for all peak hours for the 2016 proposed project. Under the 2016 Yukon Avenue Alternative future conditions, the impact during the weekday AM peak hour could be mitigated by signal retiming. The remaining peak hours are not impacted.

The intersection of Yukon Avenue and Richmond Avenue would be impacted under the Yukon Avenue Alternative but not impacted under the 2016 proposed project. The mitigation measures identified in Table 22-23 would mitigate the impacts at this intersection. The extent of the effectiveness of the recommended mitigation measures for the five (5) analyzed intersections for the 2016 future conditions are presented in Tables 22-24 to 22-28.

Under both the 2036 proposed project and Yukon Avenue Alternative future traffic conditions, four (4) out of the five (5) analyzed intersections will be impacted. The intersection of Richmond Hill Road at Forest Hill Road would remain unmitigated for all analyzed peak hours for both the Yukon Avenue Alternative and the 2036 proposed project future traffic conditions. The intersection of Richmond Hill Road at Richmond Avenue would also remain unmitigated for all peak hours except for the weekday AM peak hour under the 2036 Yukon Avenue Alternative future conditions. Under the 2036 Yukon Avenue Alternative, the impact at this intersection during the weekday AM peak hour would be mitigated by signal retiming (see Table 22-29).

The intersection of Forest Hill Road and Richmond Avenue would be unmitigated for all analyzed peak hours under the 2036 proposed project future conditions. Under the Yukon Avenue Alternative future conditions, this intersection would be unmitigated during the weekend midday peak hour. The impacts during the weekday AM and PM peak hours would be mitigated by signal retiming (see Table 22-29).

For the newly impacted intersection of Yukon Avenue and Richmond Avenue under the 2036 Yukon Avenue Alternative future traffic conditions (this intersection was not impacted under the 2036 proposed project future traffic conditions), the mitigation measures identified in Table 22-29 would mitigate all the impacts at this intersection except for the weekday PM and weekend midday peak hours. The extent of the effectiveness of the recommended mitigation measures for the five (5) analyzed intersections for the 2036 future conditions are presented in Tables 22-30 to 22-34.

### Parking

The number of project generated trips for the 2016 build year will remain the same between the 2016 proposed project and the Yukon Avenue Alternative future conditions. Similarly, the number of project generated trips will also remain the same between the 2036 proposed project and the Yukon Avenue Alternative future conditions. Therefore, there would be no changes in

the Yukon Avenue Alternative future parking conditions and they would be the same as the corresponding 2016 and 2036 proposed project future parking conditions.

## **H. LESS INTENSIVE PROGRAMMING ALTERNATIVE (LESSER IMPACT)**

### **DESCRIPTION**

This alternative examines the potential impacts of less intensive programming for the park and a reduced roadway network. The park would not include any active recreational areas, amenities, cultural/educational facilities, banquet halls, restaurants, etc., and would consist of completing closure of the landfill and subsequently landscaping the project site. Under the Lesser Impact Alternative, the proposed roads would also not be constructed. This analysis compares conditions under the Lesser Impact Alternative to conditions with the proposed project through 2036.

### **LAND USE, ZONING AND PUBLIC POLICY**

Under the Lesser Impact Alternative, it is assumed that the entirety of the Fresh Kills project site would be mapped as parkland and landscaped, however, no active recreational areas or public amenities would be constructed on the site. This alternative would provide some public access to the site along footpaths, but there would be no roads constructed as part of the project.

The benefits to the area expected to result from the proposed project—including the creation of a 2,163-acre regional park with a variety of active recreational areas and other amenities, including significant public access to the waterfront—would not be realized under this alternative and would not meet the goals of providing waterfront public access, or active recreational and cultural amenities.

### **SOCIOECONOMIC CONDITIONS**

As stated above, the project site would be landscaped and would include small footpaths, however, no recreational areas, public amenities, or new roads would be constructed on the site. After closure of the landfill, a small number of employees would remain to oversee the maintenance and operations of the closed landfill, however, the number of parks employees on site to maintain the park under this alternative would be minimal. Neither the proposed project nor the Lesser Impact Alternative would displace populations, employees, or businesses. However, the project's goals of creating a park with a variety of recreational uses to complement both the existing residential neighborhoods surrounding the project site and the region as a whole would not be met under the Lesser Impact Alternative, and there would be fewer new jobs created than under the proposed project.

### **COMMUNITY FACILITIES**

Neither the Lesser Impact Alternative, or the proposed project would have any significant adverse impacts on community facilities.

### **OPEN SPACE**

The park that would result from the Lesser Impact Alternative would not include any recreational facilities or public amenities. While the Lesser Impact Alternative would still



**Table 22-23**  
**Yukon Avenue Alternative Recommended Mitigation Measures**  
**2016 Build Year**

Intersection	Mitigation Measures																				
	Weekday Peak Hours			Weekend Peak Hours																	
	AM	Midday	PM	Midday	PM																
Richmond Hill Road and Forest Hill Road	Develop a new signal timing/phasing plan: <table border="1" style="font-size: small;"> <tr> <td>Phase</td> <td>Green</td> <td>Amber</td> <td>Red</td> </tr> <tr> <td>EB/WB</td> <td>36</td> <td>3</td> <td>2</td> </tr> <tr> <td>NB/SB</td> <td>35</td> <td>3</td> <td>2</td> </tr> <tr> <td>EB</td> <td>6</td> <td>3</td> <td>0</td> </tr> </table> <p style="text-align: center; font-size: x-small;">Cycle length = 90 seconds</p>	Phase	Green	Amber	Red	EB/WB	36	3	2	NB/SB	35	3	2	EB	6	3	0	Unmitigated	Unmitigated	Unmitigated	Unmitigated
Phase	Green	Amber	Red																		
EB/WB	36	3	2																		
NB/SB	35	3	2																		
EB	6	3	0																		
Richmond Hill Road and Richmond Avenue	Shift 1 second of green time from the NB / SB phase to the NB left / SB left phase.	Shift 1 second of green time from the NB / SB phase to the NB left / SB left phase.	Shift 1 second of green time from the NB / SB phase to the NB left / SB left phase.	Unmitigated	Shift 1 second of green time from the NB / SB phase to the NB left / SB left phase.																
Yukon Avenue and Richmond Avenue <sup>(1)</sup> *	Restrip the WB approach to provide one 12-ft left-turn lane and one 12-ft shared through and right-turn lane	Restrip the WB approach to provide one 12-ft left-turn lane and one 12-ft shared through and right-turn lane	Restrip the WB approach to provide one 12-ft left-turn lane and one 12-ft shared through and right-turn lane Daylight the SB approach to provide an additional moving lane	Restrip the WB approach to provide one 12-ft left-turn lane and one 12-ft shared through and right-turn lane	Restrip the WB approach to provide one 12-ft left-turn lane and one 12-ft shared through and right-turn lane																
Forest Hill Road and Richmond Avenue	Shift 1 second of green time from the WB phase to the NB / SB phase.	Not impacted	Not impacted	Not impacted	Not impacted																

**Notes:**  
EB = eastbound; WB = westbound; NB = northbound; SB = southbound  
(1) Intersection of Yukon Avenue and Richmond Avenue was not impacted during the weekday AM and weekend PM peak hours and was analyzed under mitigation conditions for verification purposes only.  
\* Daylight at intersection approaches implies that curbside parking is prohibited for approximately 100-feet.

**Table 22-24**

**2016 No Build, Build, Yukon Avenue Alternative and Build with Mitigation Conditions Level of Service Analysis**

**Weekday AM Peak Hour**

Intersection	No Build				Build				2016 Build with Mitigation				Yukon Avenue Alternative				Yukon Alt. with Mitigation							
	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	0.40	20.3	C	L	0.32	16.9	B	L	0.40	20.3	C				
	TR	0.57	16.2	B	TR	0.57	16.3	B	TR	0.62	20.0-	B	TR	0.57	16.3	B	TR	0.62	20.0-	B				
	Westbound																							
	LTR	1.09	88.6	F	LTR	1.12	101.6	F +	LTR	1.07	80.5	F	LTR	1.12	101.6	F +	LTR	1.07	80.5	F				
	L	0.27	27.0	C	L	0.28	27.3	C	L	0.19	20.7	C	L	0.28	27.3	C	L	0.19	20.7	C				
	Northbound																							
TR	1.13	108.1	F	TR	1.26	161.6	F +	TR	1.12	100.1	F	TR	1.26	161.6	F +	TR	1.12	100.1	F					
Southbound																								
L	1.52	302.7	F	L	1.52	302.7	F	L	1.52	300.7	F	L	1.52	302.7	F	L	1.52	300.7	F					
TR	0.86	42.2	D	TR	0.86	42.7	D	TR	0.76	32.0	C	TR	0.86	42.7	D	TR	0.76	32.0	C					
Intersection			81.0	F	Intersection			99.6	F	Intersection			76.2	E	Intersection			99.6	F	Intersection			76.2	E
Richmond Hill Road and Richmond Avenue	Eastbound																							
	LTR	0.01	25.8	C	LTR	0.01	25.8	C	LTR	0.01	25.8	C	LTR	0.01	25.8	C	LTR	0.01	25.8	C				
	L	0.20	28.6	C	L	0.27	29.8	C	L	0.27	29.8	C	L	0.27	29.8	C	L	0.27	29.8	C				
	Westbound																							
	LT	0.20	28.5	C	LT	0.26	29.6	C	LT	0.26	29.6	C	LT	0.26	29.6	C	LT	0.26	29.6	C				
	R	0.89	40.2	D	R	0.80	32.0	C	R	0.78	29.9	C	R	0.80	32.0	C	R	0.78	29.9	C				
	Northbound																							
	L	0.00	32.9	C	L	0.00	32.9	C	L	0.00	32.1	C	L	0.00	32.9	C	L	0.00	32.1	C				
	T	1.01	41.2	D	T	0.94	29.3	C	T	0.97	33.6	C	T	0.94	28.9	C	T	0.96	33.0	C				
	Southbound																							
R	0.16	13.9	B	R	0.16	13.9	B	R	0.17	14.7	B	R	0.16	13.9	B	R	0.17	14.7	B					
L	1.29	195.0	F	L	1.29	198.4	F +	L	1.20	158.6	F	L	1.29	198.4	F +	L	1.20	158.6	F					
TR	0.50	16.6	B	TR	0.47	16.2	B	TR	0.48	17.1	B	TR	0.47	16.2	B	TR	0.48	17.1	B					
Intersection			43.4	D	Intersection			37.0	D	Intersection			36.7	D	Intersection			36.9	D	Intersection			36.4	D
Yukon Avenue and Richmond Avenue <sup>(1)</sup>	Eastbound								Not impacted															
	Westbound																							
	LR	0.11	26.9	C	LR	0.11	26.9	C					L	0.59	38.3	D	L	0.58	37.8	D				
	Northbound																							
	T	1.03	41.7	D	T	0.97	28.6	C					LTR	0.25	28.7	C	TR	0.25	28.7	C				
	Southbound																							
	L	0.22	40.2	D	L	0.22	40.2	D					L	0.85	82.9	F	L	0.85	82.9	F				
T	0.39	4.2	A	T	0.37	4.2	A					T	0.90	21.7	C	T	0.90	21.7	C					
Intersection			29.7	C	Intersection			20.9	C	Intersection			22.0	C	Intersection			22.0	C					
Forest Hill Road and Richmond Avenue	Eastbound																							
	Westbound																							
	L	0.56	27.9	C	L	0.47	27.1	C					L	0.52	27.1	C	L	0.54	28.2	C				
	Northbound																							
	LR	0.71	32.9	C	TR	0.16	21.0	C					LR	0.66	30.9	C	LR	0.69	32.7	C				
	Southbound																							
	T	0.86	13.9	B	T	1.13	92.1	F +					T	0.79	12.0	B	T	0.78	10.9	B				
	R	1.24	135.0	F	R	1.95	462.1	F +					R	1.25	138.1	F +	R	1.22	125.8	F				
	Eastbound																							
	L	0.09	7.9	A	L	0.06	38.4	D					L	0.09	7.9	A	L	0.09	7.4	A				
T	0.36	7.2	A	TR	0.52	20.8	C					T	0.32	7.0	A	T	0.32	6.4	A					
Intersection			33.0	C	Intersection			142.9	F	Intersection			33.8	C	Intersection			31.3	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

(1) Intersection not impacted in the Yukon Avenue Alternative but analysis was conducted to incorporate permanent geometric/signal phasing changes proposed as mitigation measures in other peak hours

**Table 22-25**

**2016 No Build, Build, Yukon Avenue Alternative and Build with Mitigation Conditions Level of Service Analysis**

**Weekday Midday Peak Hour**

Intersection	No Build				Build				2016 Build with Mitigation				Yukon Avenue Alternative				Yukon Alt. with Mitigation						
	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 Westbound Northbound Southbound	L	0.60	22.1	C	L	0.60	21.9	C	Unmitigated	L	0.60	21.9	C	Unmitigated	L	0.60	21.9	C	Unmitigated	L	0.60	21.9	C
	TR	0.59	16.4	B	TR	0.59	16.5	B		TR	0.59	16.5	B		TR	0.59	16.5	B					
	LTR	1.11	98.1	F	LTR	1.14	108.8	F		LTR	1.14	108.8	F		LTR	1.14	108.8	F					
	L	0.41	37.5	D	L	0.41	37.5	D		L	0.41	37.5	D		L	0.41	37.5	D					
	TR	1.20	136.5	F	TR	1.39	216.5	F		TR	1.39	216.5	F		TR	1.39	216.5	F					
	L	1.25	187.5	F	L	1.25	187.5	F		L	1.25	187.5	F		L	1.25	187.5	F					
	TR	1.27	165.7	F	TR	1.29	170.9	F		TR	1.29	170.9	F		TR	1.29	170.9	F					
	Intersection	108.0	F	Intersection	132.7	F		Intersection	132.7	F		Intersection	132.7	F									
Richmond Hill Road and Richmond Avenue Eastbound Westbound Northbound Southbound	LTR	0.01	27.3	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			
	L	0.56	39.3	D	L	0.64	43.3	D	L	0.64	43.3	D	L	0.64	43.3	D	L	0.64	43.3	D			
	LT	0.59	40.6	D	LT	0.68	45.2	D	LT	0.68	45.2	D	LT	0.68	45.2	D	LT	0.68	45.2	D			
	R	0.90	42.3	D	R	0.79	31.4	C	R	0.77	29.4	C	R	0.79	31.4	C	R	0.77	29.4	C			
	L	0.00	31.3	C	L	0.00	31.3	C	L	0.00	30.4	C	L	0.00	31.3	C	L	0.00	30.4	C			
	T	0.72	19.6	B	T	0.72	19.7	B	T	0.74	20.9	C	T	0.72	19.7	B	T	0.74	20.9	C			
	R	0.30	15.6	B	R	0.31	15.6	B	R	0.32	16.5	B	R	0.31	15.6	B	R	0.32	16.5	B			
	L	1.26	174.8	F	L	1.26	177.2	F	L	1.18	143.8	F	L	1.26	177.2	F	L	1.18	143.8	F			
	TR	0.75	20.2	C	TR	0.69	19.1	B	TR	0.71	20.3	C	TR	0.69	19.1	B	TR	0.71	20.3	C			
		Intersection	35.0+	D	Intersection	34.5	C		Intersection	32.6	C		Intersection	34.5	C		Intersection	32.6	C				
Yukon Avenue and Richmond Avenue Eastbound Westbound Northbound Southbound	LR	0.36	32.0	C	LR	0.35	31.9	C	Not impacted	L	1.43	258.9	F	L	1.26	183.4	F						
										TR	0.46	34.3	C	TR	0.46	34.3	C						
										LTR	0.73	45.6	D	LTR	0.73	45.6	D						
										L	0.67	55.8	E	L	0.67	55.8	E						
										T	0.63	14.3	B	T	0.63	14.3	B						
										L	0.23	38.1	D	L	0.23	38.1	D						
										TR	0.86	19.4	B	TR	0.86	19.4	B						
	Intersection	10.6	B	Intersection	10.7	B		Intersection	31.9	C		Intersection	27.8	C									
Forest Hill Road and Richmond Avenue Eastbound Westbound Northbound Southbound	L LR	0.66 0.85	30.7 42.7	C D	L	0.65	31.9	C	Unmitigated	L	0.61	29.2	C	Not impacted	L	0.61	29.2	C					
					T	0.18	20.6	C		TR	0.79	37.3	D										
					R	0.11	19.9	B		L	0.84	80.7	F										
					L	1.64	328.1	F		T	0.96	40.8	D										
					TR	0.22	21.1	C		R	1.14	118.2	F										
					L	0.84	80.7	F		L	0.10	39.0	D										
					T	0.96	40.8	D		TR	1.21	129.8	F										
					R	1.14	118.2	F			Intersection	12.7	B										
					L	0.17	10.8	B			Intersection	111.4	F										
					T	0.73	10.7	B			Intersection	111.4	F										
	Intersection	13.7	B	Intersection	111.4	F		Intersection	12.7	B													
Yukon Avenue and Forest Hill Road Eastbound Northbound Southbound	L	0.22	21.7	C	L	0.22	21.7	C	L	0.22	21.7	C	L	0.40	24.5	C							
	LT	0.86	30.2	C	LT	1.02	60.2	E	LT	0.90	32.5	C	LT	0.83	27.5	C							
	T	0.65	17.7	B	T	0.69	18.8	B	T	0.69	18.8	B	T	0.59	16.4	B							
	R	0.16	10.6	B	R	0.16	10.6	B	R	0.16	10.6	B	R	0.27	11.7	B							
		Intersection	22.5	C	Intersection	36.4	D		Intersection	24.3	C		Intersection	21.0	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 22-26**

**2016 No Build, Build, Yukon Avenue Alternative and Build with Mitigation Conditions Level of Service Analysis**

**Weekday PM Peak Hour**

Intersection	No Build				Build				2016 Build with Mitigation				Yukon Avenue Alternative				Yukon Alt. with Mitigation					
	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 Westbound Northbound Southbound	L	0.57	21.8	C	L	0.57	21.6	C	Unmitigated	L	0.57	21.6	C	L	0.57	21.6	C	Unmitigated	L	0.57	21.8	C
	TR	0.65	18.0	B	TR	0.65	18.0	B		TR	0.65	18.0	B	TR	0.65	18.0	B		TR	0.65	18.0	B
	LTR	1.22	138.3	F	LTR	1.25	151.4	F		LTR	1.25	151.4	F	LTR	1.25	151.4	F		LTR	1.25	151.4	F
	L	0.63	56.2	E	L	0.63	56.2	E		L	0.63	56.2	E	L	0.63	56.2	E		L	0.63	56.2	E
	TR	1.28	168.4	F	TR	1.50	261.4	F		TR	1.50	261.4	F	TR	1.50	261.4	F		TR	1.50	261.4	F
	L	1.24	191.4	F	L	1.24	191.4	F		L	1.24	191.4	F	L	1.24	191.4	F		L	1.24	191.4	F
	TR	1.30	175.2	F	TR	1.31	179.3	F		TR	1.31	179.3	F	TR	1.31	179.3	F		TR	1.31	179.3	F
	Intersection	125.7	F	Intersection	155.2	F		Intersection	155.2	F		Intersection	155.2	F		Intersection	155.2	F				
Richmond Hill Road and Richmond Avenue Eastbound Westbound Northbound Southbound	LTR	0.01	27.3	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		
	L	0.51	37.5	D	L	0.58	40.1	D	L	0.58	40.1	D	L	0.59	40.5	D	L	0.59	40.5	D		
	LT	0.47	36.4	D	LT	0.56	39.5	D	LT	0.56	39.5	D	LT	0.55	39.1	D	LT	0.55	39.1	D		
	R	0.76	25.6	C	R	0.67	21.9	C	R	0.65	20.7	C	R	0.67	21.9	C	R	0.65	20.7	C		
	L	0.00	27.2	C	L	0.00	27.2	C	L	0.00	26.5	C	L	0.00	27.2	C	L	0.00	26.5	C		
	T	0.80	26.0	C	T	0.78	25.3	C	T	0.80	26.9	C	T	0.79	25.5	C	T	0.81	27.1	C		
	R	0.39	21.0	C	R	0.40	21.1	C	R	0.41	22.2	C	R	0.40	21.1	C	R	0.41	22.2	C		
	L	1.26	169.1	F	L	1.27	171.9	F	L	1.21	146.4	F	L	1.27	171.9	F	L	1.21	146.4	F		
	TR	1.25	142.6	F	TR	1.21	124.2	F	TR	1.25	141.1	F	TR	1.21	124.2	F	TR	1.25	141.1	F		
		Intersection	94.8	F	Intersection	86.1	F		Intersection	92.3	F		Intersection	85.9	F		Intersection	92.2	F			
Yukon Avenue and Richmond Avenue Eastbound Westbound Northbound Southbound	LR	0.31	29.7	C	LR	0.31	29.6	C	Not impacted	L	1.36	222.3	F	L	1.24	173.8	F					
										TR	0.43	31.9	C	TR	0.43	31.9	C					
										LTR	0.51	33.4	C	LTR	0.50	33.4	C					
										L	0.77	70.6	E	L	0.77	70.6	E					
										T	0.67	15.0	B	T	0.67	15.0	B					
										L	0.21	39.9	D	L	0.21	39.9	D					
										TR	1.14	85.0	F	TR	0.90	20.2	C					
	Intersection	13.4	B	Intersection	13.0	B		Intersection	65.4	E		Intersection	27.5	C								
Forest Hill Road and Richmond Avenue Eastbound Westbound Northbound Southbound	L LR	0.75 0.97	34.8 63.6	C E	L	0.70	32.0	C	Unmitigated	L	0.70	32.1	C	Not impacted								
					T	0.19	18.7	B		TR	0.91	50.7	D									
					R	0.08	17.6	B		L	0.70	32.1	C									
					L	1.72	357.4	F		L	0.93	96.8	F									
					TR	0.22	19.2	B		T	1.25	146.1	F									
					L	0.93	96.8	F		R	1.92	450.3	F									
					T	0.83	12.8	B		L	0.28	43.0	D									
					R	1.06	64.3	E		TR	1.74	362.6	F									
					L	0.50	28.3	C														
					T	1.02	34.2	C		Intersection	274.8	F	Intersection		23.5	C						
	Intersection	31.2	C	Intersection	274.8	F		Intersection	23.5	C												
Yukon Avenue and Forest Hill Road Eastbound Northbound Southbound	L	0.19	21.4	C	L	0.19	21.4	C	L	0.19	22.1	C	L	0.40	24.5	C						
	LT	0.99	51.8	D	LT	1.17	112.0	F	LT	0.99	46.6	D	LT	0.96	43.3	D						
	T	0.67	18.1	B	T	0.70	19.0	B	T	0.69	18.0	B	T	0.61	16.7	B						
	R	0.13	10.4	B	R	0.13	10.4	B	R	0.13	9.9	A	R	0.24	11.4	B						
		Intersection	32.9	C	Intersection	63.2	E	Intersection	31.4	C	Intersection	27.9	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  
 \* implies that delays are in excess of 1000 seconds

**Table 22-27**

**2016 No Build, Build, Yukon Avenue Alternative and Build with Mitigation Conditions Level of Service Analysis**

**Weekend Midday Peak Hour**

Intersection	No Build				Build				2016 Build with Mitigation				Yukon Avenue Alternative				Yukon Alt. with Mitigation																	
	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 Westbound Northbound Southbound	L	0.64	22.9	C	L	0.63	22.7	C	Unmitigated	L	0.63	22.7	C	Unmitigated	L	0.63	22.7	C		L	0.63	22.7	C		L	0.63	22.7	C						
	TR	0.64	17.7	B	TR	0.65	17.8	B		TR	0.65	17.8	B		TR	0.65	17.8	B		TR	0.65	17.8	B											
	LTR	1.29	171.9	F	LTR	1.32	183.9	F		LTR	1.32	183.9	F		LTR	1.32	183.9	F		LTR	1.32	183.9	F											
	L	0.15	24.3	C	L	0.15	24.3	C		L	0.15	24.3	C		L	0.15	24.3	C		L	0.15	24.3	C		L	0.15	24.3	C						
	TR	1.20	133.6	F	TR	1.38	212.1	F		TR	1.38	212.1	F		TR	1.38	212.1	F		TR	1.38	212.1	F		TR	1.38	212.1	F						
	L	1.32	233.0	F	L	1.32	233.0	F		L	1.32	233.0	F		L	1.32	233.0	F		L	1.32	233.0	F		L	1.32	233.0	F						
	TR	1.33	191.1	F	TR	1.35	196.9	F		TR	1.35	196.9	F		TR	1.35	196.9	F		TR	1.35	196.9	F		TR	1.35	196.9	F						
	Intersection	128.8	F	Intersection	151.9	F		Intersection	151.9	F		Intersection	151.9	F		Intersection	151.9	F		Intersection	151.9	F												
Richmond Hill Road and Richmond Avenue Eastbound Westbound Northbound Southbound	LTR	0.01	27.3	C	LTR	0.01	27.3	C	Unmitigated	LTR	0.01	27.3	C	Unmitigated	LTR	0.01	27.3	C		LTR	0.01	27.3	C		LTR	0.01	27.3	C		LTR	0.01	27.3	C	
	L	0.62	42.3	D	L	0.70	47.0	D		L	0.72	48.1	D		L	0.72	48.1	D		L	0.72	48.1	D		L	0.72	48.1	D						
	LT	0.65	43.9	D	LT	0.77	52.2	D		LT	0.75	50.8	D		LT	0.75	50.8	D		LT	0.75	50.8	D		LT	0.75	50.8	D						
	R	1.05	76.2	E	R	0.93	46.0	D		R	0.93	45.8	D		R	0.93	45.8	D		R	0.93	45.8	D		R	0.93	45.8	D						
	L	0.00	31.3	C	L	0.00	31.3	C		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	0.84	22.7	C		T	0.85	23.0	C		T	0.85	23.0	C		T	0.85	23.0	C		T	0.85	23.0	C						
	R	0.39	16.8	B	R	0.39	16.9	B		R	0.39	16.9	B		R	0.39	16.9	B		R	0.39	16.9	B		R	0.39	16.9	B						
L	1.27	180.0	F	L	1.29	185.7	F	L	1.29	185.7	F	L	1.29	185.7	F	L	1.29	185.7	F	L	1.29	185.7	F											
TR	1.02	44.0	D	TR	0.98	34.2	C	TR	0.98	34.2	C	TR	0.98	34.2	C	TR	0.98	34.2	C	TR	0.98	34.2	C											
	Intersection	48.2	D	Intersection	41.9	D		Intersection	41.9	D		Intersection	41.9	D		Intersection	41.9	D		Intersection	41.9	D												
Yukon Avenue and Richmond Avenue Eastbound Westbound Northbound Southbound	LR	0.60	37.8	D	LR	0.59	37.3	D	Not impacted	L	1.71	381.9	F	Not impacted	L	1.71	381.9	F		L	1.71	381.9	F		L	1.71	381.9	F		L	1.71	381.9	F	
	TR	0.43	33.6	C	TR	0.43	33.6	C		TR	0.43	33.6	C		TR	0.43	33.6	C		TR	0.43	33.6	C		TR	0.43	33.6	C						
	LTR	1.35	214.8	F	LTR	1.35	214.8	F		LTR	1.35	214.8	F		LTR	1.35	214.8	F		LTR	1.35	214.8	F		LTR	1.35	214.8	F						
	T	0.91	21.8	C	T	0.89	20.6	C		T	0.77	64.7	E		T	0.77	64.7	E		T	0.77	64.7	E		T	0.77	64.7	E						
	L	0.25	38.3	D	L	0.25	38.3	D		L	0.81	17.6	B		L	0.81	17.6	B		L	0.81	17.6	B		L	0.81	17.6	B						
	T	0.75	5.7	A	T	0.74	5.5	A		L	0.25	38.3	D		L	0.25	38.3	D		L	0.25	38.3	D		L	0.25	38.3	D						
	TR	1.00	33.2	C	TR	1.00	33.2	C		TR	1.00	33.2	C		TR	1.00	33.2	C		TR	1.00	33.2	C		TR	1.00	33.2	C						
	Intersection	14.7	B	Intersection	14.0	B		Intersection	51.0	D		Intersection	38.9	D		Intersection	38.9	D		Intersection	38.9	D												
Forest Hill Road and Richmond Avenue Eastbound Westbound Northbound Southbound	L	0.65	31.2	C	L	0.65	31.2	C	Unmitigated	L	0.74	34.2	C	Not impacted	L	0.74	34.2	C		L	0.74	34.2	C		L	0.74	34.2	C		L	0.74	34.2	C	
	T	0.17	19.8	B	T	0.17	19.8	B		T	0.83	12.7	B		T	0.83	12.7	B		T	0.83	12.7	B		T	0.83	12.7	B						
	R	0.08	18.9	B	R	0.08	18.9	B		R	0.98	39.5	D		R	0.98	39.5	D		R	0.98	39.5	D		R	0.98	39.5	D						
	L	1.72	362.7	F	L	1.72	362.7	F		L	0.95	59.4	E		L	0.95	59.4	E		L	0.95	59.4	E		L	0.95	59.4	E						
	TR	0.30	21.5	C	TR	0.30	21.5	C		TR	0.30	21.5	C		TR	0.30	21.5	C		TR	0.30	21.5	C		TR	0.30	21.5	C						
	L	1.05	127.4	F	L	1.05	127.4	F		L	1.05	127.4	F		L	1.05	127.4	F		L	1.05	127.4	F		L	1.05	127.4	F						
	T	1.25	143.8	F	T	1.25	143.8	F		T	1.25	143.8	F		T	1.25	143.8	F		T	1.25	143.8	F		T	1.25	143.8	F						
R	1.56	288.5	F	R	1.56	288.5	F	R	1.56	288.5	F	R	1.56	288.5	F	R	1.56	288.5	F	R	1.56	288.5	F											
L	0.41	22.1	C	L	0.23	41.7	D	L	0.41	22.1	C	L	0.41	22.1	C	L	0.41	22.1	C	L	0.41	22.1	C											
T	0.62	9.3	A	TR	1.00	44.9	D	T	0.55	8.6	A	T	0.55	8.6	A	T	0.55	8.6	A	T	0.55	8.6	A											
	Intersection	21.0	C	Intersection	141.3	F		Intersection	19.2	B		Intersection	19.2	B		Intersection	19.2	B		Intersection	19.2	B												

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 22-28**

**2016 No Build, Build, Yukon Avenue Alternative and Build with Mitigation Conditions Level of Service Analysis**

**Weekend PM Peak Hour**

Intersection	No Build				Build				2016 Build with Mitigation				Yukon Avenue Alternative				Yukon Alt. with Mitigation					
	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	0.62	22.2	C	L	0.61	22.1	C	Unmitigated				L	0.61	22.1	C	Unmitigated					
	TR	0.65	17.9	B	TR	0.66	18.1	B					TR	0.66	18.1	B						
	Westbound	LTR	1.28	164.4	F	LTR	1.30	176.3					F	LTR	1.30	176.3						F
	Northbound	L	0.54	47.2	D	L	0.54	47.2					D	L	0.54	47.2						D
	TR	1.17	123.2	F	TR	1.34	194.5	F					TR	1.34	194.5	F						
	Southbound	L	1.51	312.7	F	L	1.51	312.7					F	L	1.51	312.7						F
	TR	1.12	102.3	F	TR	1.13	107.7	F					TR	1.13	107.7	F						
	Intersection	105.9	F	Intersection	127.4	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	LTR	0.01	27.3	C		
	Westbound	L	0.45	35.7	D	L	0.53	38.4	D	L	0.53	38.4	D	L	0.53	38.4	D	L	0.53	38.4	D	
	LT	0.38	34.0	C	LT	0.48	36.6	D	LT	0.48	36.6	D	LT	0.48	36.6	D	LT	0.48	36.6	D		
	R	1.02	65.8	E	R	0.91	43.5	D	R	0.89	39.5	D	R	0.91	43.5	D	R	0.89	39.5	D		
	Northbound	L	0.00	31.3	C	L	0.00	31.3	C	L	0.00	30.4	C	L	0.00	31.3	C	L	0.00	30.4	C	
	T	0.83	22.3	C	T	0.80	21.4	C	T	0.82	22.9	C	T	0.79	21.2	C	T	0.81	22.6	C		
	R	0.36	16.4	B	R	0.37	16.4	B	R	0.38	17.4	B	R	0.37	16.4	B	R	0.38	17.4	B		
	Southbound	L	1.28	188.5	F	L	1.30	195.8	F	L	1.21	160.5	F	L	1.30	195.8	F	L	1.21	160.5	F	
	TR	0.86	23.3	C	TR	0.82	22.0	C	TR	0.84	23.6	C	TR	0.82	22.0	C	TR	0.84	23.6	C		
	Intersection	36.9	D	Intersection	34.7	C	Intersection	33.4	C	Intersection	34.7	C	Intersection	33.3	C							
Yukon Avenue and Richmond Avenue <sup>(1)</sup> Eastbound	LR	0.30	31.1	C	LR	0.29	30.9	C	Not impacted				L	1.21	165.9	F	L	1.05	109.3	F		
	TR	0.41	33.1	C	TR	0.41	33.1	C					TR	0.41	33.1	C						
	Westbound	L	0.15	29.4	C	L	0.15	29.4					C	L	0.15	29.4	C					
	Northbound	TR	0.47	34.4	C	TR	0.47	34.4					C	TR	0.47	34.4	C					
	Southbound	L	0.82	71.2	E	L	0.82	71.2					E	L	0.82	71.2	E					
	T	0.85	18.6	B	T	0.85	18.6	B					T	0.85	18.6	B						
L	0.14	36.9	D	L	0.14	36.9	D	L	0.14	36.9	D	L	0.14	36.9	D							
T	0.60	4.3	A	T	0.58	4.2	A	T	0.79	17.1	B	TR	0.79	17.1	B							
Intersection	15.9	B	Intersection	15.0	B	Intersection	26.4	C	Intersection	24.0	C											
Forest Hill Road and Richmond Avenue Eastbound	L	0.61	29.9	C	L	0.61	29.9	C	Unmitigated				L	0.63	29.7	C	Not impacted					
	TR	0.16	19.7	B	TR	0.09	19.0	B					TR	0.09	19.0	B						
	Westbound	L	1.58	299.2	F	L	1.58	299.2					F	L	0.63	29.7						C
	Northbound	LR	0.85	43.3	D	TR	0.24	20.8					C	LR	0.80	37.9						D
	T	0.72	10.5	B	L	0.90	91.4	F					T	0.67	9.8	A						
	R	0.98	40.8	D	T	1.01	48.1	D					R	0.98	41.7	D						
	Southbound	L	0.56	33.6	C	R	1.66	334.1					F	L	0.56	33.6						C
	T	0.72	10.5	B	L	0.31	43.7	D					T	0.66	9.7	A						
Intersection	17.0	B	Intersection	118.3	F	Intersection	16.3	B	Intersection	16.3	B											

**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

(1) Intersection not impacted in the Yukon Avenue Alternative but analysis was conducted to incorporate permanent geometric/signal phasing changes proposed as mitigation measures in other peak hours

**Table 22-29**  
**Yukon Avenue Alternative Recommended Mitigation Measures**  
**2036 Build Year**

Intersection	Mitigation Measures				
	Weekday Peak Hours			Weekend Peak Hours	
	AM	Midday	PM	Midday	PM
Richmond Hill Road and Forest Hill Road	Unmitigated	Unmitigated	Unmitigated	Unmitigated	Unmitigated
Richmond Hill Road and Richmond Avenue	Shift 1 second of green time from the NB/SB phase to the NB left / SB left phase.	Unmitigated	Unmitigated	Unmitigated	Unmitigated
Yukon Avenue and Richmond Avenue <sup>(1)</sup> *	Restripe the WB approach to provide one 12-ft left-turn lane and one 12-ft shared through and right-turn lane	Restripe the WB approach to provide one 12-ft left-turn lane and one 12-ft shared through and right-turn lane Daylight SB approach to provide an additional moving lane.	Unmitigated	Unmitigated	Restripe the WB approach to provide one 12-ft left-turn lane and one 12-ft shared through and right-turn lane Daylight SB approach.
Forest Hill Road and Richmond Avenue	Shift 1 second of green time from the WB phase to the NB/SB phase.	Not impacted	Shift 1 second of green time from the WB phase to the NB/SB phase.	Unmitigated	Not impacted

**Notes:**  
EB = eastbound; WB = westbound; NB = northbound; SB = southbound  
(1) Intersection of Yukon Avenue and Richmond Avenue was not impacted during the weekday AM peak hour and was analyzed under mitigation conditions for verification purposes only.  
\* Daylight at intersection approaches implies that curbside parking is prohibited for approximately 100-feet.

**Table 22-30**

**2036 No Build, Build, Yukon Avenue Alternative and Build with Mitigation Conditions Level of Service Analysis**

**Weekday AM Peak Hour**

Intersection	No Build				Build				2016 Build with Mitigation				Yukon Avenue Alternative				Yukon Alt. with Mitigation																					
	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 Westbound Northbound Southbound	L	0.42	20.1	C	L	0.43	20.3	C	Unmitigated	L	0.42	19.9	B	Unmitigated	L	0.42	20.1	C	Unmitigated	L	0.42	20.1	C	Unmitigated	L	0.42	20.1	C	Unmitigated	L	0.42	20.1	C					
	TR	0.68	19.2	B	TR	0.78	22.8	C		TR	0.69	19.4	B		TR	0.69	19.4	B		TR	0.69	19.4	B		TR	0.69	19.4	B										
	LTR	1.34	192.0	F	LTR	1.37	206.5	F		LTR	1.40	216.3	F		LTR	1.40	216.3	F		LTR	1.40	216.3	F		LTR	1.40	216.3	F										
	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	0.49	43.0	D		L	0.49	43.0	D										
	TR	1.34	195.6	F	TR	1.48	255.5	F		TR	1.51	269.5	F		TR	1.51	269.5	F		TR	1.51	269.5	F		TR	1.51	269.5	F										
	L	1.83	435.7	F	L	1.83	435.7	F		L	1.83	435.7	F		L	1.83	435.7	F		L	1.83	435.7	F		L	1.83	435.7	F										
	TR	1.01	68.9	E	TR	1.03	74.8	E		TR	1.03	73.8	E		TR	1.03	73.8	E		TR	1.03	73.8	E		TR	1.03	73.8	E										
	Intersection	144.5	F	Intersection	163.3	F		Intersection	172.6	F		Intersection	172.6	F		Intersection	172.6	F		Intersection	172.6	F																
Richmond Hill Road and Richmond Avenue Eastbound Westbound Northbound Southbound	LTR	0.01	25.8	C	L	0.23	26.7	C	Not impacted	LTR	0.01	25.8	C	Not impacted	LTR	0.01	25.8	C	Not impacted	LTR	0.01	25.8	C	Not impacted	LTR	0.01	25.8	C	Not impacted	LTR	0.01	25.8	C	Not impacted	LTR	0.01	25.8	C
					T	0.17	25.4	C																														
					R	0.05	12.1	B																														
	L	0.29	30.2	C	L	0.45	31.6	C		L	0.37	31.9	C		L	0.37	31.9	C		L	0.37	31.9	C		L	0.37	31.9	C										
	LT	0.19	28.3	C	T	0.09	24.4	C		LT	0.27	29.8	C		LT	0.27	29.8	C		LT	0.27	29.8	C		LT	0.27	29.8	C										
	R	1.06	79.3	E	R	0.91	39.6	D		R	0.96	51.2	D		R	0.93	46.0	D		R	0.93	46.0	D		R	0.93	46.0	D										
	L	0.00	32.9	C	L	0.34	37.6	D		L	0.00	32.9	C		L	0.00	32.9	C		L	0.00	32.9	C		L	0.00	32.9	C										
	T	1.21	118.1	F	T	1.17	107.6	F		T	1.12	83.1	F		T	1.15	96.4	F		T	1.15	96.4	F		T	1.15	96.4	F										
	R	0.19	14.2	B	R	0.22	17.7	B		R	0.20	14.3	B		R	0.20	15.1	B		R	0.20	15.1	B		R	0.20	15.1	B										
	L	1.53	296.9	F	L	1.43	251.7	F		L	1.54	302.3	F		L	1.43	251.7	F		L	1.43	251.7	F		L	1.43	251.7	F										
TR	0.60	17.8	B	TR	0.65	21.8	C	TR	0.57	17.4	B	TR	0.59	18.4	B	TR	0.59	18.4	B	TR	0.59	18.4	B															
	Intersection	95.0	F	Intersection	80.0	E		Intersection	74.1	E		Intersection	77.5	E		Intersection	77.5	E		Intersection	77.5	E																
Yukon Avenue and Richmond Avenue <sup>(1)</sup> Eastbound Westbound Northbound Southbound	LR	0.13	27.1	C	LR	0.13	27.1	C	Not impacted	LR	0.13	27.1	C	Not impacted	LR	0.13	27.1	C	Not impacted	LR	0.13	27.1	C	Not impacted	LR	0.13	27.1	C	Not impacted	LR	0.13	27.1	C	Not impacted	LR	0.13	27.1	C
	T	1.23	123.8	F	T	1.12	77.6	E		T	1.29	213.5	F		T	1.29	213.5	F		T	1.29	213.5	F		T	1.29	213.5	F										
	L	0.27	40.9	D	L	0.27	40.9	D		L	1.07	58.9	E		L	1.07	58.9	E		L	1.07	58.9	E		L	1.07	58.9	E										
	T	0.46	4.6	A	T	0.41	4.4	A		L	0.27	40.9	D		L	0.27	40.9	D		L	0.27	40.9	D		L	0.27	40.9	D										
					A	0.59	13.8	B		TR	0.59	13.8	B		TR	0.59	13.8	B		TR	0.59	13.8	B		TR	0.59	13.8	B										
		Intersection	84.2	F	Intersection	53.8	D			Intersection	49.2	D			Intersection	48.9	D			Intersection	48.9	D			Intersection	48.9	D											
Forest Hill Road and Richmond Avenue Eastbound Westbound Northbound Southbound	L	0.66	30.8	C	L	0.20	23.3	C	Unmitigated	L	0.61	29.3	C	Unmitigated	L	0.61	29.3	C	Unmitigated	L	0.61	29.3	C	Unmitigated	L	0.61	29.3	C	Unmitigated	L	0.61	29.3	C	Unmitigated	L	0.61	29.3	C
	LR	0.84	42.1	D	R	0.09	21.7	C		LR	0.79	37.2	D		LR	0.82	40.5	D		LR	0.82	40.5	D		LR	0.82	40.5	D										
	L	1.81	407.8	F	L	0.92	95.4	F		L	0.96	20.8	C		L	0.94	17.8	B		L	0.94	17.8	B															
	TR	0.15	22.3	C	T	1.30	163.1	F		R	1.49	247.6	F		R	1.46	232.4	F		R	1.46	232.4	F															
	L	0.92	95.4	F	R	2.18	565.1	F		L	0.10	8.3	A		L	0.10	7.8	A		L	0.10	7.8	A															
	T	1.03	37.6	D	T	1.30	163.1	F		T	0.39	7.4	A		T	0.38	6.8	A		T	0.38	6.8	A															
	R	1.48	243.5	F	R	2.18	565.1	F		Intersection	56.8	E	Intersection		52.9	D	Intersection	52.9		D	Intersection	52.9	D															
L	0.10	8.3	A	L	0.06	38.5	D																															
T	0.43	7.7	A	TR	0.53	19.3	B																															
	Intersection	62.7	E	Intersection	216.8	F		Intersection	56.8	E		Intersection	52.9	D		Intersection	52.9	D		Intersection	52.9	D																
Yukon Avenue and Forest Hill Road Eastbound Northbound Southbound	L	0.07	20.0+	C	L	0.07	20.0+	C	Not impacted	L	0.24	22.0	C	Not impacted	L	0.24	22.0	C	Not impacted	L	0.24	22.0	C	Not impacted	L	0.24	22.0	C	Not impacted	L	0.24	22.0	C	Not impacted	L	0.24	22.0	C
	LT	1.08	75.0	E	LT	1.18	114.2	F		LT	1.05	65.2	E		LT	1.05	65.2	E		LT	1.05	65.2	E															
	T	0.57	15.9	B	T	0.58	16.2	B		T	0.52	15.0	B		T	0.52	15.0	B		T	0.52	15.0	B															
	R	0.11	10.2	B	R	0.11	10.2	B		R	0.22	11.2	B		R	0.22	11.2	B		R	0.22	11.2	B															
		Intersection	48.7	D	Intersection	72.6	E			Intersection	40.4	D			Intersection	40.9	D			Intersection	40.9	D			Intersection	40.9	D											

**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

(1) Intersection not impacted in the Yukon Avenue Alternative but analysis was conducted to incorporate permanent geometric/signal phasing changes proposed as mitigation measures in other peak hours



**Table 22-31**

**2036 No Build, Build, Yukon Avenue Alternative and Build with Mitigation Conditions Level of Service Analysis**

**Weekday Midday Peak Hour**

Intersection	No Build				Build				2016 Build with Mitigation				Yukon Avenue Alternative				Yukon Alt. with Mitigation																						
	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 Westbound Northbound Southbound	L	0.78	33.1	C	L	0.80	34.9	C	Unmitigated				L	0.78	32.9	C	Unmitigated																						
	TR	0.70	19.6	B	TR	0.82	25.1	C					TR	0.72	20.1	C																							
	LTR	1.39	213.2	F	LTR	1.57	292.6	F					LTR	1.46	243.7	F																							
	L	0.49	43.0	D	L	0.49	43.0	D					L	0.49	43.0	D																							
	TR	1.43	232.1	F	TR	1.65	329.9	F					TR	1.69	347.9	F																							
	L	1.51	289.7	F	L	1.51	289.7	F					L	1.51	289.7	F																							
	TR	1.51	267.4	F	TR	1.57	295.0	F					TR	1.56	291.9	F																							
Intersection		186.6	F	Intersection		232.0	F	Intersection		230.1	F	Intersection		230.1	F																								
Richmond Hill Road and Richmond Avenue Eastbound Westbound Northbound Southbound	LTR	0.01	27.3	C	L	0.51	28.7	C	Unmitigated				LTR	0.01	27.3	C	Unmitigated																						
					T	0.19	22.1	C														T	0.19	22.1	C														
					R	0.06	8.9	A														R	0.06	8.9	A														
	L	0.66	43.9	D	L	0.98	71.3	E					L	0.77	52.3	D						L	0.77	52.3	D														
	LT	0.72	47.9	D	T	0.11	21.1	C					LT	0.85	60.8	E						LT	0.85	60.8	E														
	R	1.08	85.2	F	R	0.78	22.6	C					R	0.95	49.5	D						R	0.95	49.5	D														
	L	0.00	31.3	C	L	0.22	33.5	C					L	0.00	31.3	C						L	0.00	31.3	C														
	T	0.86	23.4	C	T	1.07	72.6	E					T	0.89	25.2	C						T	0.89	25.2	C														
	R	0.37	16.4	B	R	0.54	30.0	C					R	0.39	16.8	B						R	0.39	16.8	B														
	L	1.50	279.4	F	L	1.42	241.5	F					L	1.52	284.5	F						L	1.52	284.5	F														
TR	0.90	25.3	C	TR	1.24	143.0	F	TR	0.87	23.8	C	TR	0.87	23.8	C																								
Intersection		51.0	D	Intersection		101.4	F	Intersection		48.5	D	Intersection		48.5	D																								
Yukon Avenue and Richmond Avenue Eastbound Westbound Northbound Southbound	LR	0.43	33.4	C	LR	0.42	33.2	C	Not impacted				L	2.94	925.4	F	Not impacted																						
													TR	1.03	89.5	F						TR	1.03	89.5	F														
													LTR	2.51	739.0	F						LTR	2.51	739.0	F														
													L	1.59	330.8	F						L	1.59	330.8	F														
													T	0.75	16.2	B						T	0.75	16.2	B														
													L	0.28	38.8	D						L	0.28	38.8	D														
													T	0.80	6.4	A						T	0.72	5.3	A														
Intersection		12.8	B	Intersection		11.9	B	Intersection		138.8	F	Intersection		82.2	F																								
Forest Hill Road and Richmond Avenue Eastbound Westbound Northbound Southbound	LR	1.01	74.6	E	LR	1.81	402.5	F	Unmitigated				L	0.73	33.4	C	Not impacted																						
													TR	0.22	19.1	B						TR	0.22	19.1	B														
													L	1.69	380.0	F						L	1.69	380.0	F														
													T	0.76	11.1	B						T	1.17	110.0	F														
													R	0.75	16.5	B						R	1.35	201.1	F														
													L	0.21	12.2	B						L	0.12	39.4	D														
													T	0.88	14.3	B						TR	1.36	193.8	F														
													Intersection		18.8	B						Intersection		181.9	F	Intersection		16.5	B	Intersection		16.5	B						
													Yukon Avenue and Forest Hill Road Eastbound Northbound Southbound	L	0.26	22.3						C	L	0.26	22.3	C	Not impacted				L	0.52	26.8	C	Not impacted				
														LT	1.19	122.7						F	LT	1.41	212.7	F					LT	1.14	100.5	F					
T	0.77	21.9	C	T	0.81	23.5	C	T	0.71	19.3	B																												
R	0.19	10.9	B	R	0.19	10.9	B	R	0.35	12.7	B																												
Intersection		61.9	E	Intersection		105.6	F	Intersection		61.1	E	Intersection		49.0	D																								

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

**Table 22-32**

**2036 No Build, Build, Yukon Avenue Alternative and Build with Mitigation Conditions Level of Service Analysis**

**Weekday PM Peak Hour**

Intersection	No Build				Build				2016 Build with Mitigation				Yukon Avenue Alternative				Yukon Alt. with Mitigation			
	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	0.74	30.8	C	L	0.76	32.7	C	Unmitigated	L	0.74	30.8	C	Unmitigated	L	0.74	30.8	C	Unmitigated	
	TR	0.78	22.6	C	TR	0.91	33.4	C		TR	0.79	23.1	C		TR	0.79	23.1	C		
	LTR	1.58	298.0	F	LTR	1.83	410.1	F		LTR	1.67	338.3	F		LTR	1.67	338.3	F		
	L	0.75	73.5	E	L	0.75	73.5	E		L	0.75	73.5	E		L	0.75	73.5	E		
	TR	1.52	271.7	F	TR	1.75	374.8	F		TR	1.80	395.0	F		TR	1.80	395.0	F		
Southbound	L	1.49	288.0	F	L	1.49	288.0	F	L	1.49	288.0	F	L	1.49	288.0	F				
	TR	1.54	279.5	F	TR	1.63	322.7	F	TR	1.63	321.5	F	TR	1.63	321.5	F				
	Intersection	216.4		F	Intersection	275.1		F	Intersection	269.7		F	Intersection	269.7		F				
Richmond Hill Road and Richmond Avenue Eastbound	LTR	0.01	27.3	C	L	0.41	25.5	C	Unmitigated	LTR	0.01	27.3	C	Unmitigated	LTR	0.01	27.3	C	Unmitigated	
					T	0.21	21.6	C							T	0.21	21.6	C		
					R	0.06	9.3	A							R	0.06	9.3	A		
	Westbound	L	0.57	39.9	D	L	0.82	44.7		D	L	0.70	46.7		D	L	0.70	46.7		D
		LT	0.60	41.3	D	T	0.11	20.5		C	LT	0.74	49.4		D	LT	0.74	49.4		D
Northbound	R	0.90	37.9	D	R	0.75	21.8	C	R	0.80	27.8	C	R	0.80	27.8	C				
	L	0.00	27.2	C	L	0.28	36.3	D	L	0.00	27.2	C	L	0.00	27.2	C				
Southbound	T	0.96	36.5	D	T	0.96	41.1	D	T	0.96	36.1	D	T	0.96	36.1	D				
	R	0.47	22.5	C	R	0.57	30.1	C	R	0.48	22.9	C	R	0.48	22.9	C				
	L	1.51	275.4	F	L	2.17	576.4	F	L	1.52	280.3	F	L	1.52	280.3	F				
	TR	1.50	253.2	F	TR	1.84	411.2	F	TR	1.53	267.6	F	TR	1.53	267.6	F				
	Intersection	161.7		F	Intersection	262.2		F	Intersection	169.8		F	Intersection	169.8		F				
Yukon Avenue and Richmond Avenue Eastbound	LR	0.38	30.8	C	LR	0.37	30.7	C	Not impacted	L	2.62	783.0	F	Unmitigated	L	2.62	783.0	F		
					T	0.85	19.0	B		TR	0.78	45.5	D		TR	0.78	45.5	D		
					L	0.26	40.5	D		LTR	1.05	100.0	F		LTR	1.05	100.0	F		
	Westbound	T	0.93	23.4	C	T	0.99	19.1		B	L	2.97	946.7		F	L	2.97	946.7	F	
		L	0.26	40.5	D	L	0.26	40.5		D	T	0.80	17.4		B	T	0.80	17.4	B	
Northbound	T	1.06	43.4	D	T	0.99	19.1	B	L	0.26	40.5	D	L	0.26	40.5	D				
					Intersection	19.6		B	TR	1.45	221.7	F	TR	1.45	221.7	F				
	Intersection	35.5		D	Intersection	19.6		B	Intersection	217.6		F	Intersection	217.6		F				
Forest Hill Road and Richmond Avenue Eastbound	L	0.90	48.8	D	L	0.29	22.1	C	Unmitigated	L	0.83	40.7	D	Unmitigated	L	0.83	40.7	D		
	LR	1.16	124.0	F	R	0.27	21.4	C		LR	1.08	96.5	F		LR	1.08	96.5	F		
					L	2.21	579.5	F		L	2.21	579.5	F		L	2.21	579.5	F		
	Westbound	T	1.00	27.1	C	TR	0.30	21.5		C	T	1.01	31.6		C	T	0.99	25.8	C	
		R	1.26	142.1	F	L	2.74	842.5		F	R	1.27	145.3		F	R	1.24	133.1	F	
Northbound	L	0.60	37.4	D	T	1.43	222.6	F	L	0.60	37.4	D	L	0.60	36.7	D				
	TR	1.23	118.1	F	R	2.12	538.6	F	TR	1.17	91.8	F	TR	1.15	81.3	F				
					L	0.33	44.6	D	Intersection	72.6		E	Intersection	65.8		E				
	Intersection	85.2		F	Intersection	371.3		F	Intersection	72.6		E	Intersection	65.8		E				
Yukon Avenue and Forest Hill Road Eastbound	L	0.22	21.8	C	L	0.22	21.8	C	Not impacted	L	0.51	26.5	C	Not impacted	L	0.51	26.5	C		
	LT	1.37	198.2	F	LT	1.63	309.6	F		LT	1.31	170.7	F		LT	1.31	170.7	F		
	T	0.79	22.8	C	T	0.85	26.2	C		T	0.73	19.9	B		T	0.73	19.9	B		
	R	0.16	10.6	B	R	0.16	10.6	B		R	0.34	12.6	B		R	0.34	12.6	B		
					Intersection	158.6		F		Intersection	101.6		F		Intersection	79.5		E		
	Intersection	100.3		F	Intersection	158.6		F	Intersection	101.6		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 22-33**

**2036 No Build, Build, Yukon Avenue Alternative and Build with Mitigation Conditions Level of Service Analysis**

**Weekend Midday Peak Hour**

Intersection	No Build				Build				2016 Build with Mitigation				Yukon Avenue Alternative				Yukon Alt. with Mitigation			
	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	0.79	30.8	C	L	0.82	33.3	C	Unmitigated	L	0.80	31.2	C	Unmitigated						
	TR	0.77	22.1	C	TR	0.89	30.6	C		TR	0.78	22.8	C							
	LTR	1.73	362.0	F	LTR	2.02	493.2	F +		LTR	1.82	405.2	F +							
	Westbound	L	0.17	25.3	C	L	0.17	25.3		C	L	0.17	25.3		C					
		TR	1.42	229.2	F	TR	1.64	323.9		F +	TR	1.68	341.4		F +					
	Northbound	L	1.59	340.5	F	L	1.59	340.5		F	L	1.59	340.5		F					
TR		1.58	299.0	F	TR	1.70	352.8	F +	TR	1.69	348.9	F +								
Intersection		225.0	F	Intersection		286.8	F	Intersection		275.3	F									
Richmond Hill Road and Richmond Avenue Eastbound	LTR	0.01	27.3	C	L	0.45	26.5	C	Unmitigated	LTR	0.01	27.3	C	Unmitigated						
	Westbound	T	0.19	21.4	C	T	0.19	21.4		C	T	0.92	73.4		E +					
		R	0.06	9.8	A	R	0.06	9.8		A	LT	0.93	74.2		E +					
		L	0.77	52.6	D	L	1.02	81.8		F +	R	1.12	97.3		F					
	Northbound	LT	0.75	50.5	D	T	0.14	20.8		C	L	0.00	31.3		C					
		R	1.26	154.9	F	R	0.94	40.6		D	T	1.04	49.6		D					
	Southbound	L	0.00	31.3	C	L	0.37	39.2		D	R	0.48	18.5		B					
		T	1.05	54.6	D	T	1.18	117.2		F +	L	1.54	295.6		F +					
		R	0.46	18.1	B	R	0.65	32.1		C	TR	1.26	140.6		F +					
	Intersection		106.7	F	Intersection		213.8	F		Intersection		108.5	F							
Yukon Avenue and Richmond Avenue Eastbound	LR	0.72	42.9	D	0.70	42.0	D	Not impacted	L	3.87	*	F	Unmitigated							
		Westbound	TR	0.91	62.5	E	TR		0.91	62.5	E	TR		0.91	62.5	E				
			LTR	4.66	*	F +	LTR		4.66	*	F +	LTR		4.66	*	F +				
		Northbound	L	2.91	915.9	F	L		2.91	915.9	F	L		2.91	915.9	F				
			T	0.96	26.8	C	T		0.96	26.8	C	T		0.96	26.8	C				
		Southbound	L	0.30	39.0	D	L		0.30	39.0	D	L		0.30	39.0	D				
T	0.90		9.1	A	T	0.82	6.8	A	TR	1.29	150.3	F +								
Intersection		35.7	D	Intersection		22.6	C	Intersection		288.2	F									
Forest Hill Road and Richmond Avenue Eastbound	LR	0.95	58.4	E	L	0.29	22.9	C	Unmitigated	LR	0.88	46.7	D	Unmitigated						
		LR	1.20	141.1	F	T	0.20	20.9			C	LR	1.13		114.2	F				
		Westbound	R	0.32	22.6	C	R	0.32			22.6	C	L		2.16	556.7	F +			
			L	1.20	141.1	F	TR	0.39			23.6	C	TR		0.39	23.6	C			
		Northbound	L	3.27	*	F	L	3.27			*	F	L		3.27	*	F			
			T	1.05	43.6	D	T	1.48			243.8	F +	T		1.09	59.9	E +			
		Southbound	R	1.16	98.0	F	R	1.80			391.8	F +	R		1.16	99.0	F			
			L	0.50	28.3	C	L	0.28			43.0	D	L		0.50	28.3	C			
			T	0.75	10.9	B	TR	1.04			57.8	E +	T		0.69	10.1	B			
		Intersection		46.8	D	Intersection		269.2			F	Intersection			52.1	D				
Yukon Avenue and Forest Hill Road Eastbound	L	0.31	23.0	C	L	0.31	23.0	C	L	0.33	24.7	C	L	0.57	27.9	C	Not impacted			
	LT	1.06	70.1	E	LT	1.27	155.2	F +	LT	1.02	55.7	E	LT	1.01	57.2	E				
	T	0.77	21.8	C	T	0.84	25.5	C	T	0.81	22.1	C	T	0.71	19.3	B				
	Northbound	R	0.22	11.2	B	R	0.22	11.2	B	R	0.21	10.1	B	R	0.42	13.6		B		
		Intersection	39.6	D	Intersection	77.7	E	Intersection	35.2	D	Intersection	32.6	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 22-34**

**2036 No Build, Build, Yukon Avenue Alternative and Build with Mitigation Conditions Level of Service Analysis**

**Weekend PM Peak Hour**

Intersection	No Build				Build				2016 Build with Mitigation				Yukon Avenue Alternative				Yukon Alt. with Mitigation						
	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	0.77	30.5	C	L	0.80	33.0	C	Unmitigated	L	0.79	30.8	C	Unmitigated	L	0.79	30.8	C	Unmitigated	L	0.79	30.8	C
	TR	0.78	22.5	C	TR	0.89	30.6	C		TR	0.79	23.2	C		TR	0.79	23.2	C					
	LTR	1.71	354.8	F	LTR	1.97	472.1	F		LTR	1.81	399.4	F		LTR	1.81	399.4	F					
	L	0.64	57.7	E	L	0.64	57.7	E		L	0.64	57.7	E		L	0.64	57.7	E					
	TR	1.39	214.3	F	TR	1.59	302.5	F		TR	1.63	318.9	F		TR	1.63	318.9	F					
Westbound	L	1.82	440.8	F	L	1.82	440.8	F	L	1.82	440.8	F	L	1.82	440.8	F							
	TR	1.32	184.3	F	TR	1.44	236.6	F	TR	1.43	233.8	F	TR	1.43	233.8	F							
	Intersection	195.1	F	Intersection	251.2	F	Intersection	242.0	F	Intersection	242.0	F											
Richmond Hill Road and Richmond Avenue Eastbound	LTR	0.01	27.3	C	L	0.48	29.6	C	Unmitigated	LTR	0.01	27.3	C	Unmitigated	LTR	0.01	27.3	C	Unmitigated	LTR	0.01	27.3	C
	L	0.50	37.5	D	L	0.74	41.3	D		L	0.67	44.9	D		L	0.67	44.9	D					
	LT	0.49	37.0	D	T	0.19	23.5	C		LT	0.62	42.5	D		LT	0.62	42.5	D					
	R	1.22	137.8	F	R	0.93	37.5	D		R	1.10	90.9	F		R	1.10	90.9	F					
	L	0.00	31.3	C	L	0.28	34.4	C		L	0.00	31.3	C		L	0.00	31.3	C					
Westbound	T	0.99	36.3	D	T	1.13	92.9	F	T	0.97	32.4	C	T	0.97	32.4	C							
	R	0.43	17.5	B	R	0.61	30.3	C	R	0.45	17.8	B	R	0.45	17.8	B							
	L	1.53	292.4	F	L	1.46	261.5	F	L	1.56	306.6	F	L	1.56	306.6	F							
Northbound	TR	1.03	45.8	D	TR	1.43	225.8	F	TR	1.07	59.7	E	TR	1.07	59.7	E							
	Intersection	64.5	E	Intersection	142.2	F	Intersection	64.7	E	Intersection	64.7	E											
Yukon Avenue and Richmond Avenue Eastbound	LR	0.36	32.0	C	LR	0.35	31.9	C	Not impacted	L	2.71	824.7	F	Not impacted	L	2.46	711.6	F					
	L	0.17	37.2	D	L	0.17	37.2	D		TR	0.87	57.1	E		TR	0.87	57.1	E					
	T	0.71	5.3	A	T	0.65	4.7	A		LTR	1.74	388.2	F		L	0.40	40.0	D					
	Intersection	46.8	D	Intersection	31.9	C	Intersection	151.4		F	TR	0.70	42.3		D								
	L	1.13	81.9	F	T	1.06	53.6	D		L	2.96	935.1	F		L	2.96	935.1	F					
Westbound	L	0.17	37.2	D	L	0.17	37.2	D	T	1.01	35.8	D	T	1.01	35.8	D							
	T	0.71	5.3	A	T	0.65	4.7	A	L	0.17	37.2	D	L	0.17	37.2	D							
	Intersection	46.8	D	Intersection	31.9	C	Intersection	151.4	F	TR	1.04	46.1	D	TR	1.01	36.0	D						
Forest Hill Road and Richmond Avenue Eastbound	L	0.81	38.9	D	L	0.25	21.4	C	Unmitigated	L	0.75	34.5	C	Not impacted	L	0.75	34.5	C					
	LR	1.02	76.0	E	T	0.18	20.0	B		LR	0.95	58.5	E		TR	0.87	30.5	C					
	L	0.86	13.5	B	R	0.33	22.3	C		T	0.90	15.3	B		L	0.68	18.5	B					
	R	1.16	100.1	F	L	1.91	447.0	F		R	1.16	101.1	F		L	0.66	44.5	D					
	L	0.66	44.5	D	TR	0.32	21.9	C		L	0.66	44.5	D		T	0.83	12.5	B					
Westbound	T	0.87	13.6	B	L	3.14	*	F	TR	0.90	15.3	B	TR	0.83	12.5	B							
	Intersection	28.1	C	Intersection	244.5	F	Intersection	27.0	C	Intersection	27.0	C											
	L	0.86	13.5	B	T	1.23	134.0	F	Intersection	27.0	C												
Yukon Avenue and Forest Hill Road Eastbound	L	0.22	21.7	C	L	0.22	21.7	C	Not impacted	L	0.45	25.2	C	Not impacted	L	0.45	25.2	C					
	LT	0.91	34.9	C	LT	1.09	81.8	F		LT	0.87	30.5	C		LT	0.87	30.5	C					
	T	0.75	20.8	C	T	0.82	23.9	C		TR	0.68	18.5	B		TR	0.68	18.5	B					
	R	0.15	10.5	B	R	0.15	10.5	B		L	0.34	12.5	B		L	0.34	12.5	B					
Northbound	Intersection	25.7	C	Intersection	47.4	D	Intersection	30.3	C	Intersection	22.8	C	Intersection	22.8	C								
	Intersection	25.7	C	Intersection	47.4	D	Intersection	30.3	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

improve passive open space ratios for the study area population due to the mapping, open space ratios would not see the dramatic improvement benefits that would occur under the future with the proposed project.

## **SHADOWS**

Neither this alternative nor the proposed project would have an shadow impacts.

## **HISTORIC RESOURCES**

Under the Lesser Impact Alternative, it is assumed that the project site would be landscaped, however, since no recreational uses, public amenities, or roads would be constructed, it is expected that no potential impacts to archaeological resources would occur. With the proposed project, it is recommended that individual construction projects be reviewed by an archaeologist to determine if the project could impact locations that were identified in the Phase 1A archaeological documentary study as possessing moderate, moderate to high, or high sensitivity for pre-contact or historic-period archaeological resources.

With respect to architectural resources, under the Lesser Impact Alternative, since it is assumed that only landscaping would occur on the project site, there would be no significant adverse impacts to architectural resources. Similarly, no significant adverse impacts are expected in the future with the proposed project. One architectural resource, the Sleight Family Cemetery (a.k.a. Blazing Star Burial Ground) New York City Landmark (NYCL) is located in the project site; however, no direct or indirect impacts to this resource are expected to result from the Lesser Impact Alternative or from the proposed project, and no construction activities are currently planned within 90 feet of this resource in either scenario.

## **URBAN DESIGN AND VISUAL RESOURCES**

Under the Lesser Impact Alternative, it is assumed that many of the visual enhancements associated with the construction of the proposed park would be foregone. Although the site would be landscaped, the active recreational uses and public amenities would not be constructed.

## **NEIGHBORHOOD CHARACTER**

The Lesser Impact Alternative would not provide all of the benefits to neighborhood character associated with the recreational uses and public amenities planned under the proposed project, nor would it have either the positive or negative impacts on traffic circulation that occur under the proposed project.

## **NATURAL RESOURCES**

The Lesser Impact Alternative would avoid the impacts to freshwater and tidal wetlands that would occur as a result of the roads and marine infrastructure that are part of the proposed project. Thus, the freshwater and wetland mitigation would not be necessary. However, it would also not include the overall benefits of the project with respect to freshwater and tidal wetland enhancements.

## **HAZARDOUS MATERIALS**

In the Lesser Impact Alternative, it is assumed that landfill closure would be completed in accordance with approved DSNY closure plans with oversight by the New York State

## **Fresh Kills Park GEIS**

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Department of Environmental Conservation (DEC). It is expected that closure construction at Landfill Sections 6/7 and 1/9 will be completed by 2016. Without the proposed project, the project site would be landscaped; however, no active recreational uses, public amenities, or roads would be constructed on the site. Overall, in the Lesser Impact Alternative there would be a low potential for disturbance of hazardous materials, but there would likely be less soil cover than would be associated with the future with the proposed project since public access would be limited.

While a greater intensity of construction would occur with the proposed project as compared to the Lesser Impact Alternative, this additional construction would be closely monitored and would occur in compliance with all applicable state and federal requirements to eliminate the potential for any impacts from hazardous materials.

### **WATERFRONT REVITALIZATION PROGRAM**

The Lesser Impact Alternative would be consistent with many of the City coastal zone objectives or waterfront plans for the site; however, it would not provide the same level of public access to the waterfront that would be provided with the proposed project. Thus it would not meet the goals for public access and recreational use of the waterfront on City-owned properties.

In contrast, under the proposed project, the development of a public park with active recreational uses and public amenities on the project site would be fully consistent with the borough and City goals for revitalizing and providing public access in the coastal zone.

### **INFRASTRUCTURE**

Under the Lesser Impact Alternative, increased demands on infrastructure would not occur; however neither this alternative nor the proposed project would cause increases to the degree that there would be significant adverse impacts on these services.

### **SOLID WASTE AND SANITATION SERVICES**

Under the Lesser Impact Alternative, as in the future with the proposed project, it is assumed that the final closure construction of all the landfill sections would be completed by 2016, and by 2036, all landfill sections would be closed and DSNY would continue to operate and manage the Fresh Kills Landfill environmental control systems, along with implementation of the monitoring and maintenance programs.

For the project site, the increased demands on solid waste and sanitation services would be less in the Lesser Impact Alternative than under the proposed project, but neither this alternative nor the proposed project would result in increases to the degree that there would be significant adverse impacts on these services.

### **ENERGY**

Under the Lesser Impact Alternative, the increased demands on energy systems would be smaller than those under the proposed project, but neither this alternative nor the proposed project would cause significant adverse impacts on utilities.

## **TRAFFIC AND PARKING**

### *TRAFFIC*

In the Lesser Impact Alternative, traffic and parking demand levels in the study area would increase as a result of general background growth and future developments in the area. However, since the park on the project site under this alternative would have less intense uses than the proposed project, there would be minimal additional traffic introduced to the study area. However, this alternative would also not include the roadway connections to the West Shore Expressway that would relieve local traffic congestion. It is therefore not expected that any traffic impacts would occur under this alternative.

### *PARKING*

Under the Lesser Impact Alternative, no impacts would occur on local off-site parking. Thus, conditions would be similar to the future with the proposed project.

## **TRANSIT AND PEDESTRIANS**

The proposed project would not adversely impact transit and pedestrian conditions. Thus, conditions in the Lesser Impact Alternative would not be significantly different from that under the proposed project. No expanded transit service onto the project site would be necessary.

## **AIR QUALITY**

With respect to mobile sources, no violations of the National Ambient Air Quality Standards (NAAQS) are predicted to occur under either the Lesser Impact Alternative or under the proposed project. In addition, as under the proposed project, the Lesser Impact Alternative would not result in impacts from heating systems.

## **NOISE**

Under the proposed project no impacts would occur at local sensitive receptors. Thus, conditions under this Lesser Impact Alternative would be similar to the proposed project.

## **CONSTRUCTION**

Since the Lesser Impact Alternative would not involve the construction of active recreational uses, public amenities, or new roads on the site, it would not generate as much construction activity or disruption as the proposed project. The Lesser Impact Alternative would have less construction-related noise and traffic than the proposed project. However, neither this alternative nor the proposed project would result in significant adverse impacts on air quality, noise, traffic, or transit during construction.

## **PUBLIC HEALTH**

In the Lesser Impact Alternative, it is assumed that landfill closure will be completed in accordance with approved DSNY closure plans with oversight by DEC. It is expected that closure construction at Landfill Sections 6/7 and 1/9 will be completed by 2016. The leachate collection and containment system and landfill gas management system will continue to operate after landfill closure as required by DEC.

## **Fresh Kills Park GEIS**

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While a greater intensity of construction would occur with the proposed project as compared to the Lesser Impact Alternative, this additional construction would be closely monitored and would occur in compliance with all applicable state and federal requirements to minimize any impact from hazardous materials. The proposed project would also include all the necessary measures to avoid impacts to landfill infrastructure, environmental monitoring and maintenance systems, and would provide the other measures necessary to avoid impacts to park users and the general public relative to public health. Therefore, neither this alternative nor the proposed project would impact public health.

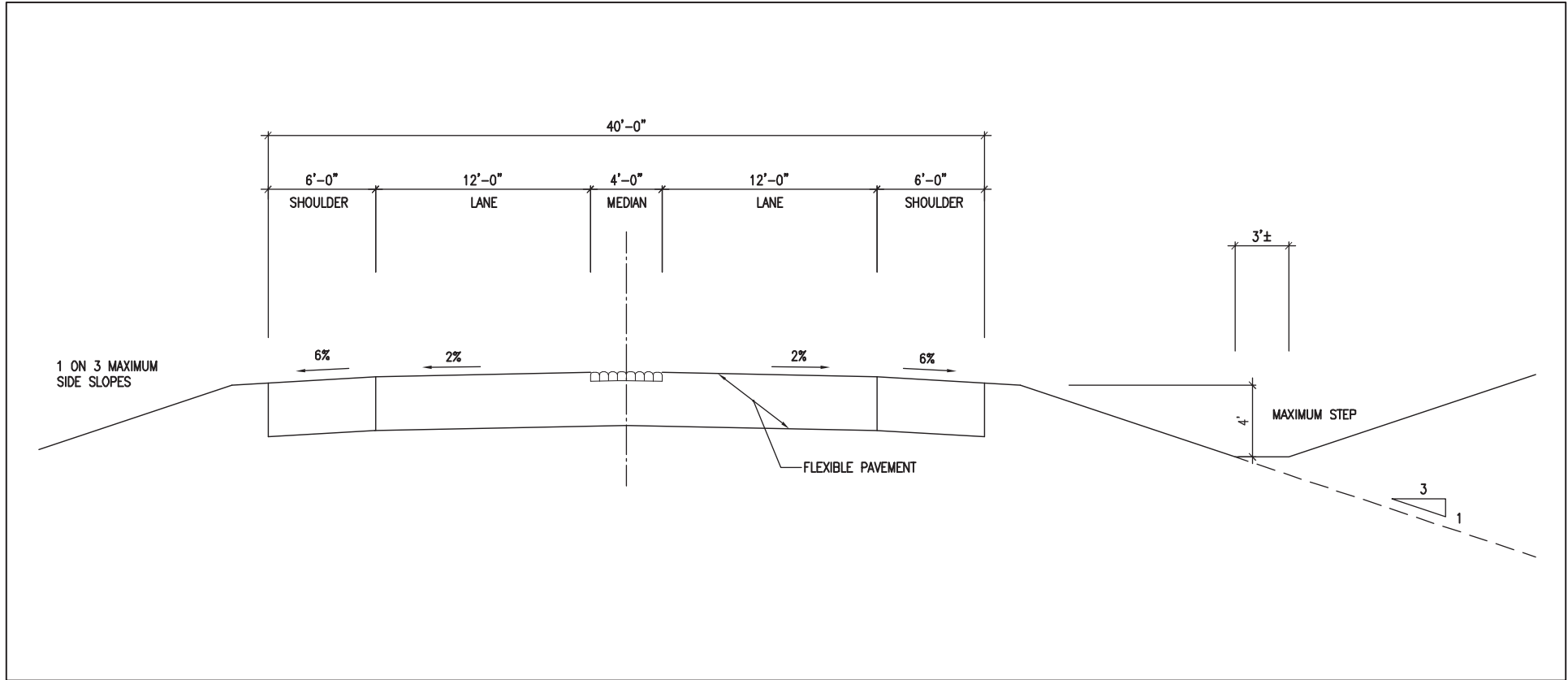
### **MITIGATION**

Under the Lesser Impact Alternative, there would not be the significant impacts of the proposed project (e.g., traffic, wetlands) that require mitigation. However, under the proposed project all impacts can be mitigated while meeting the goals of this project.

### **UNAVOIDABLE ADVERSE IMPACTS**

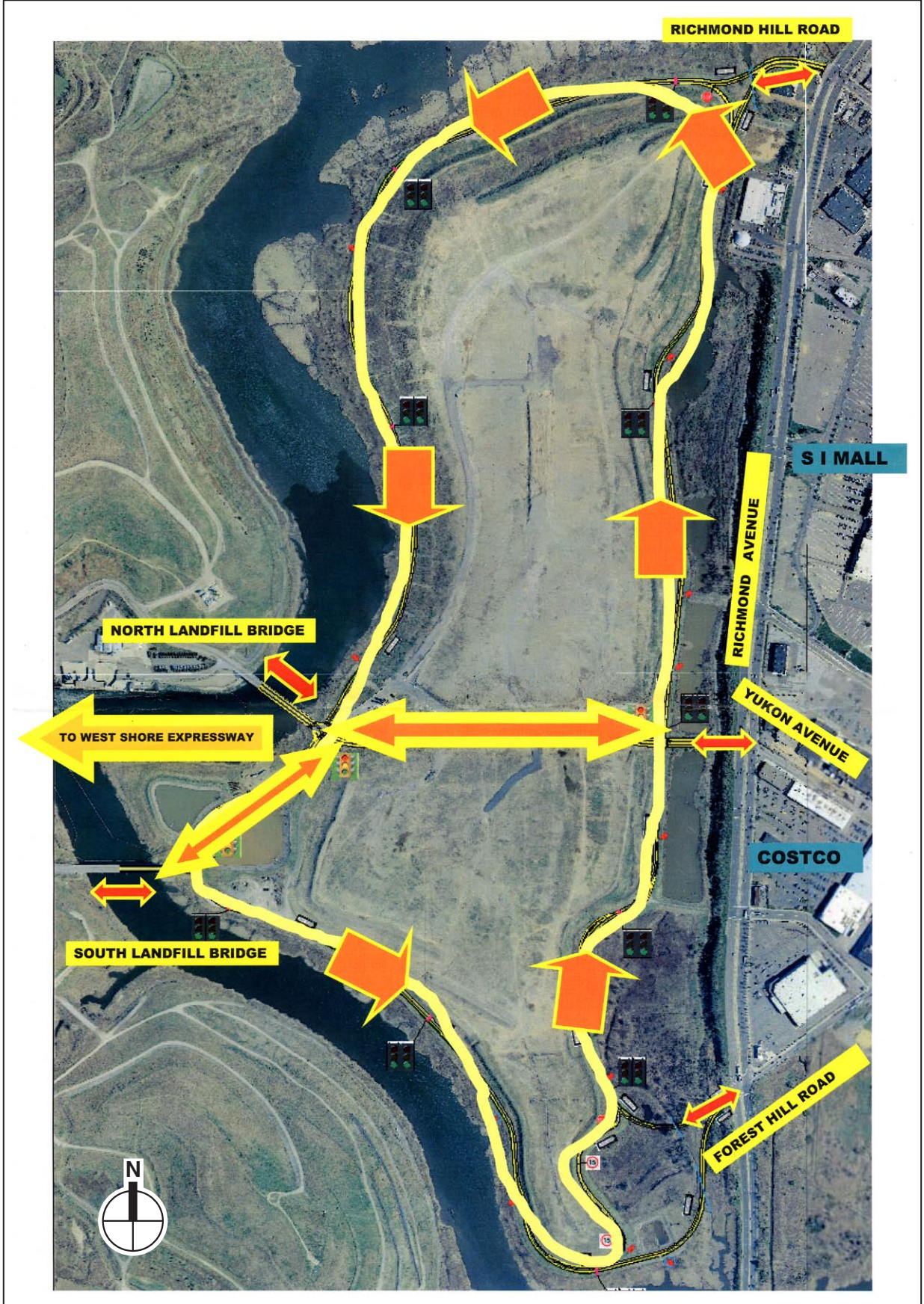
Unlike the proposed project, the Lesser Impact Alternative would not have any unavoidable adverse impacts. \*



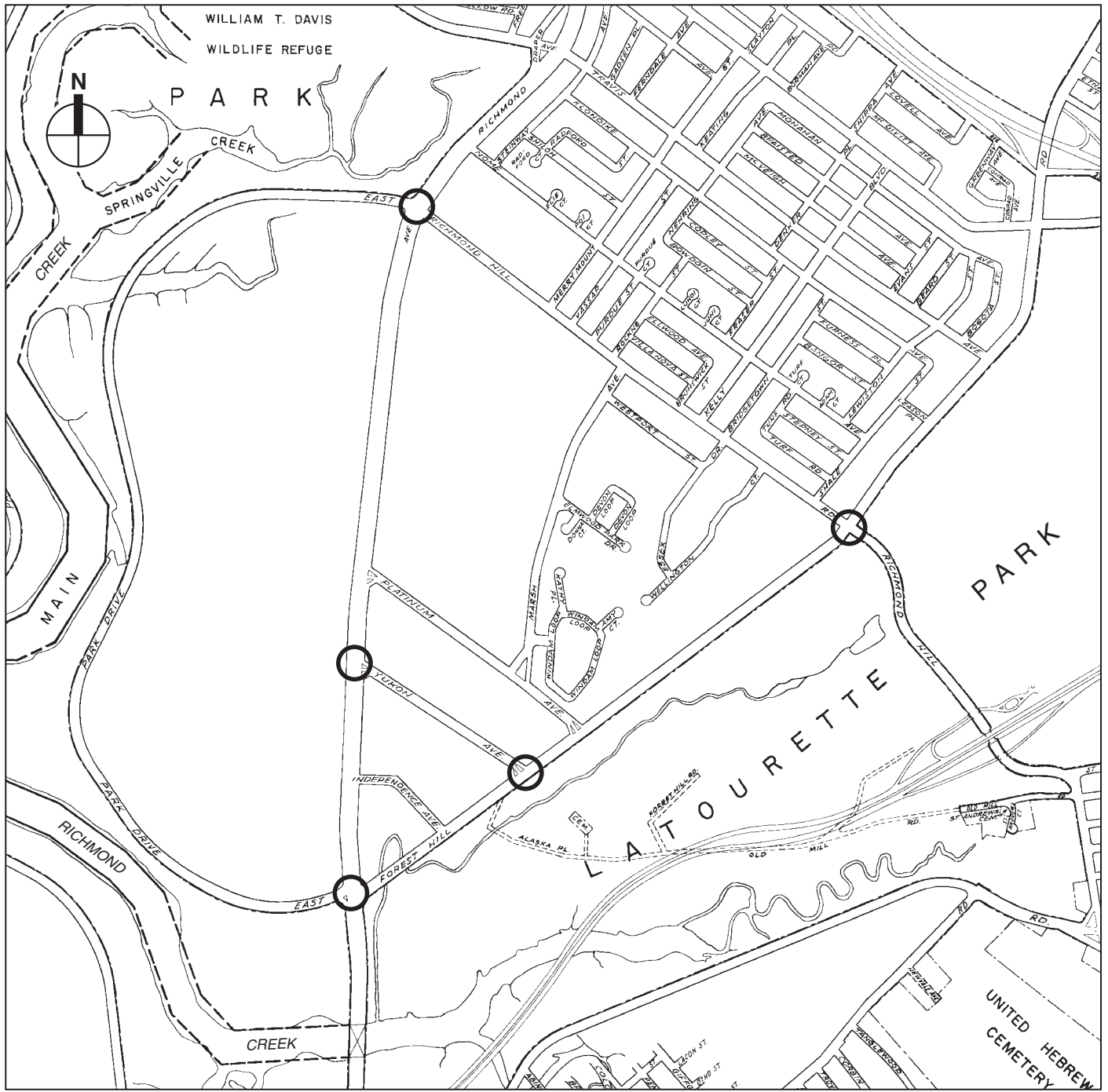




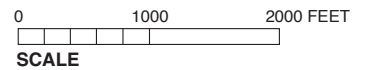




Staten Island Borough President  
Office (SIBPO) Alternative  
Road Alignment  
Figure 22-3a

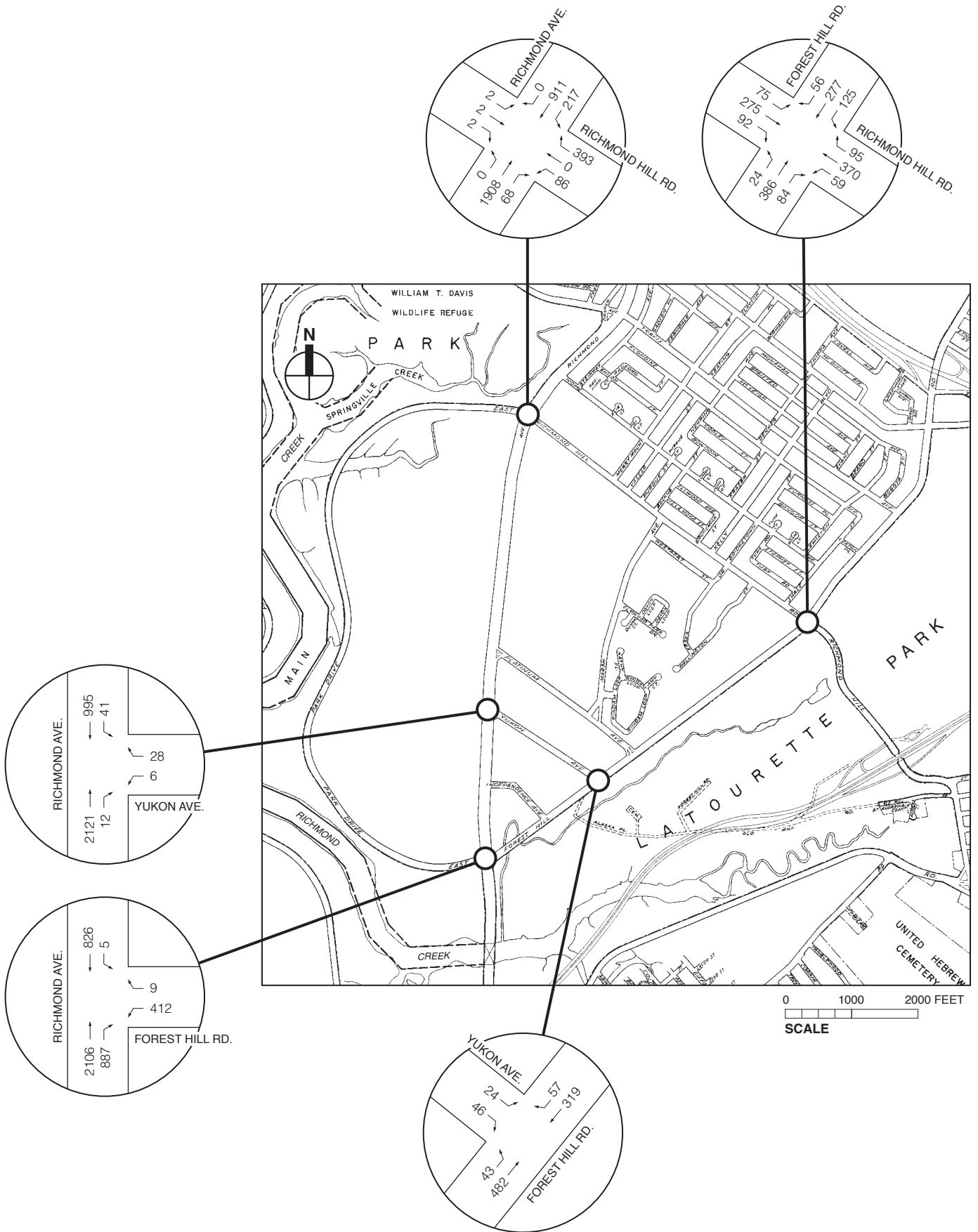


○ Intersection to be Analyzed

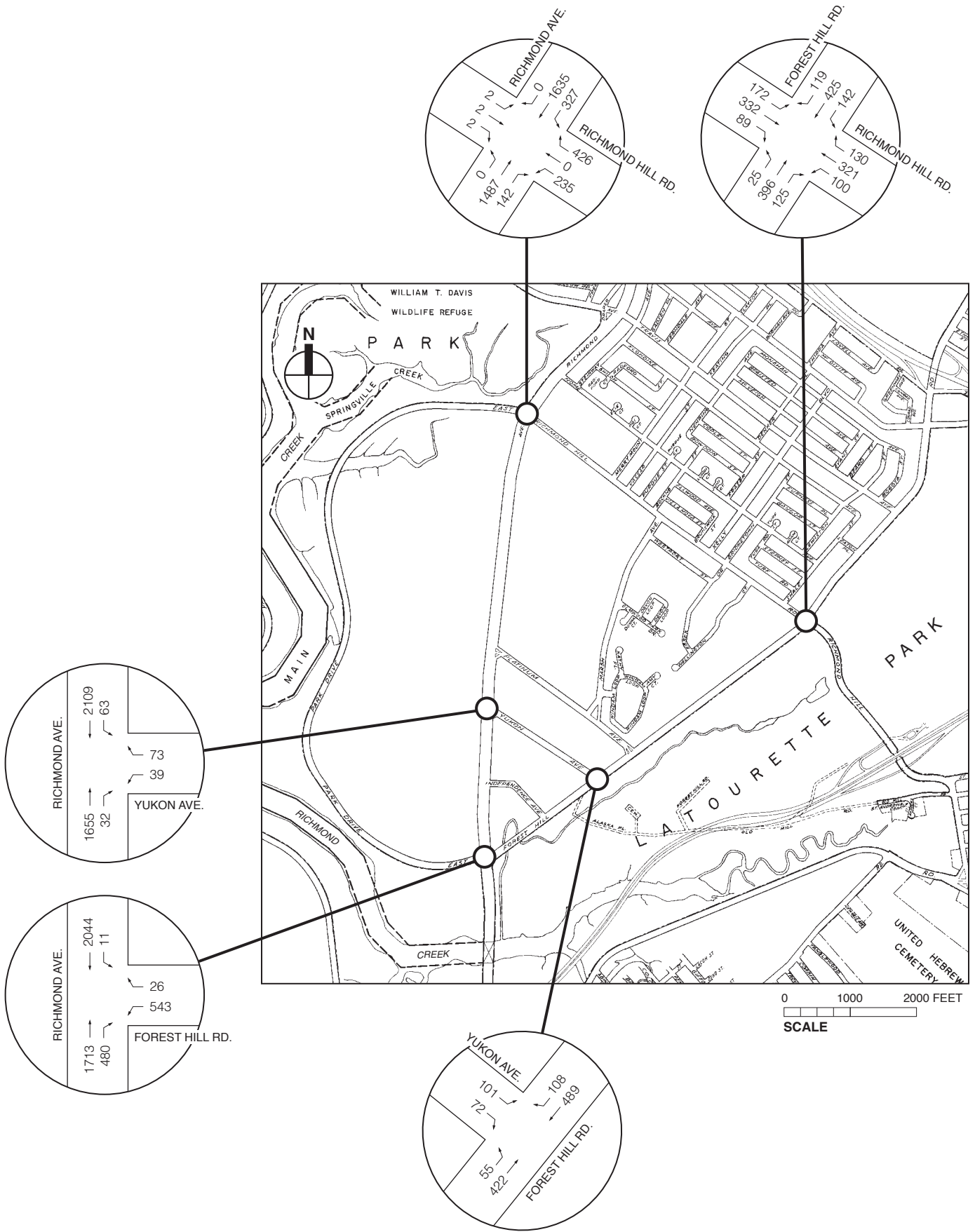


Staten Island Borough President  
Office (SIBPO) Alternative  
Traffic Study Area  
**Figure 22-3b**

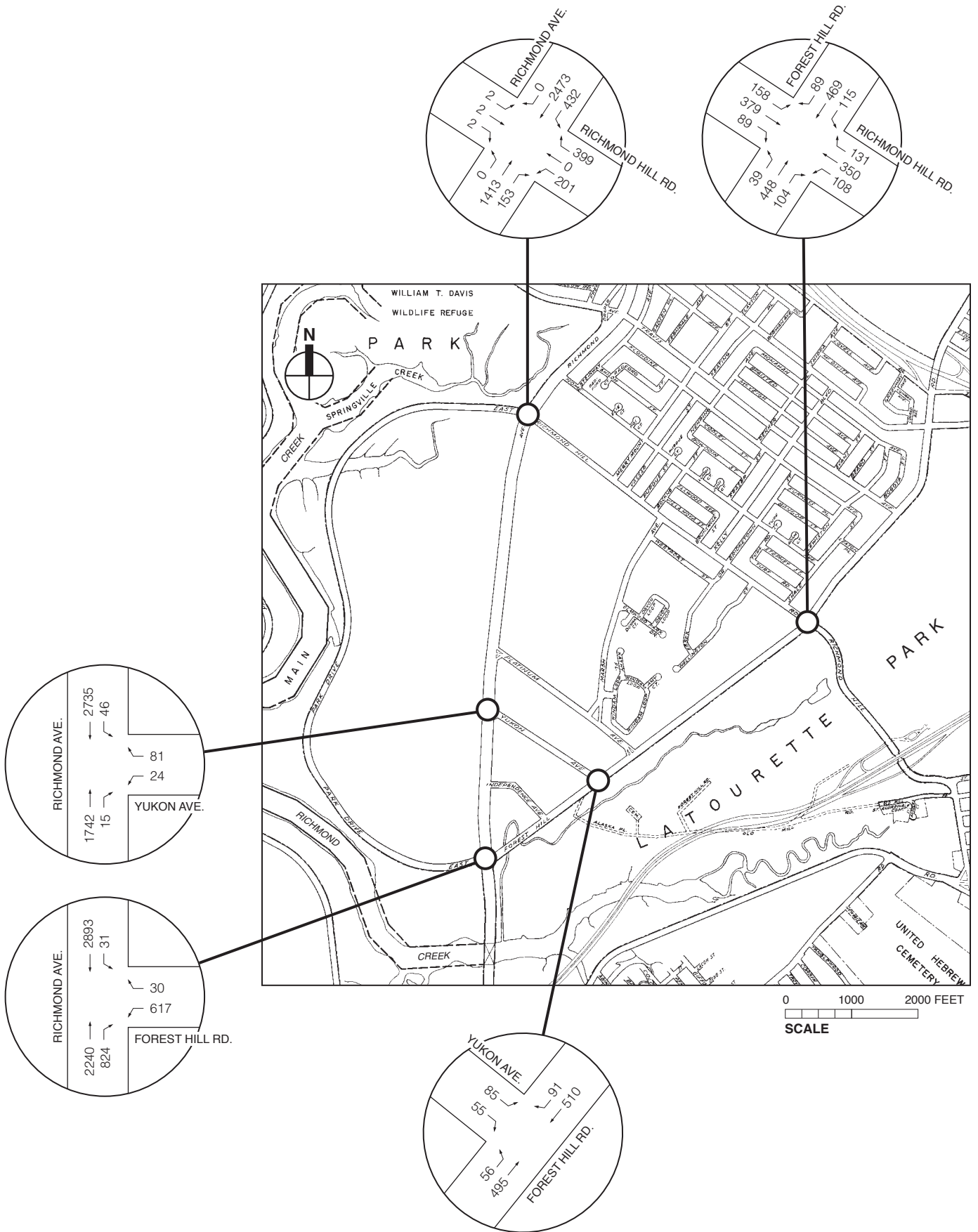




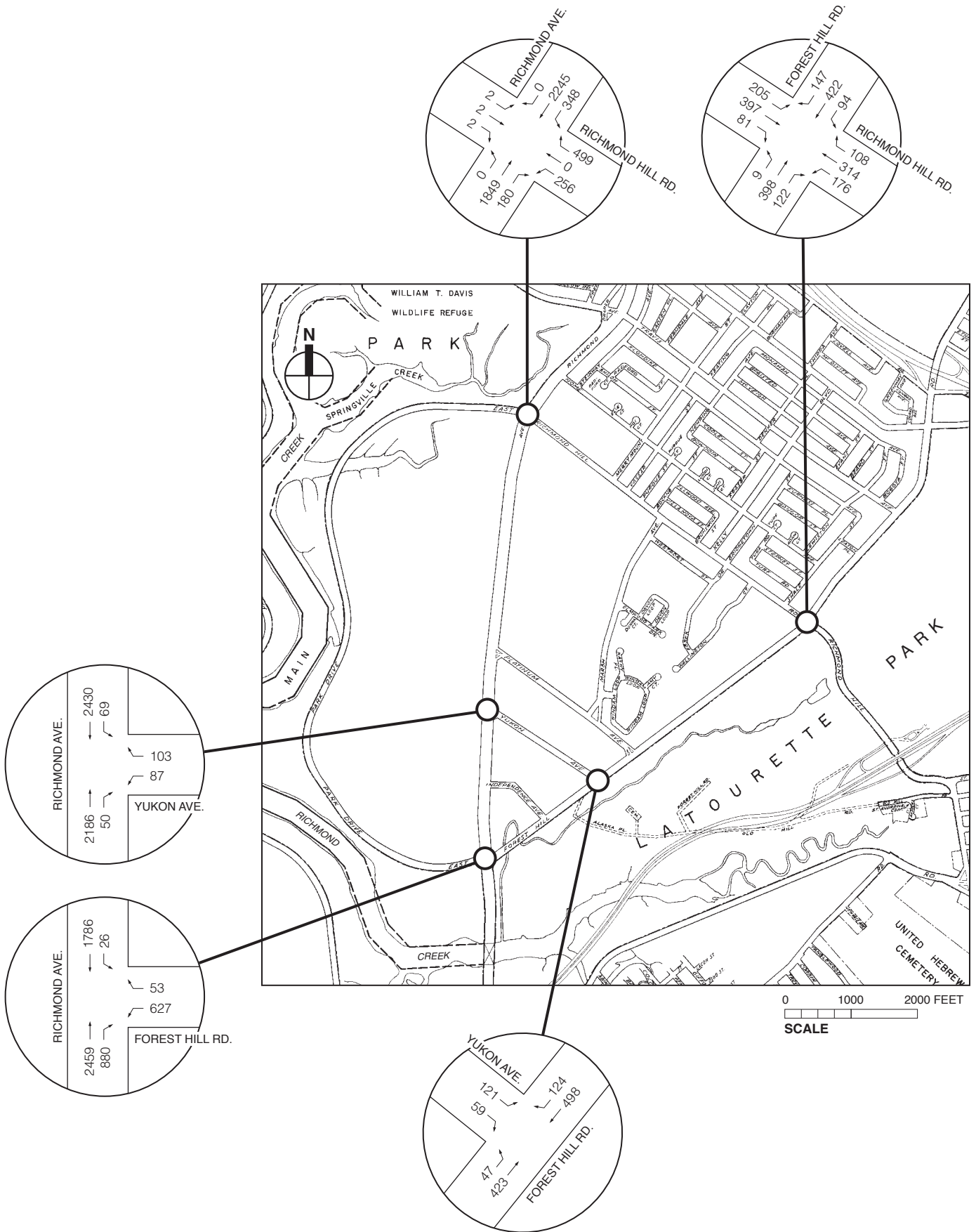
SIBPO Alternative  
Existing Traffic Volumes  
Weekday AM Peak Hour  
**Figure 22-4**



SIBPO Alternative  
 Existing Traffic Volumes  
 Weekday Midday Peak Hour  
**Figure 22-5**

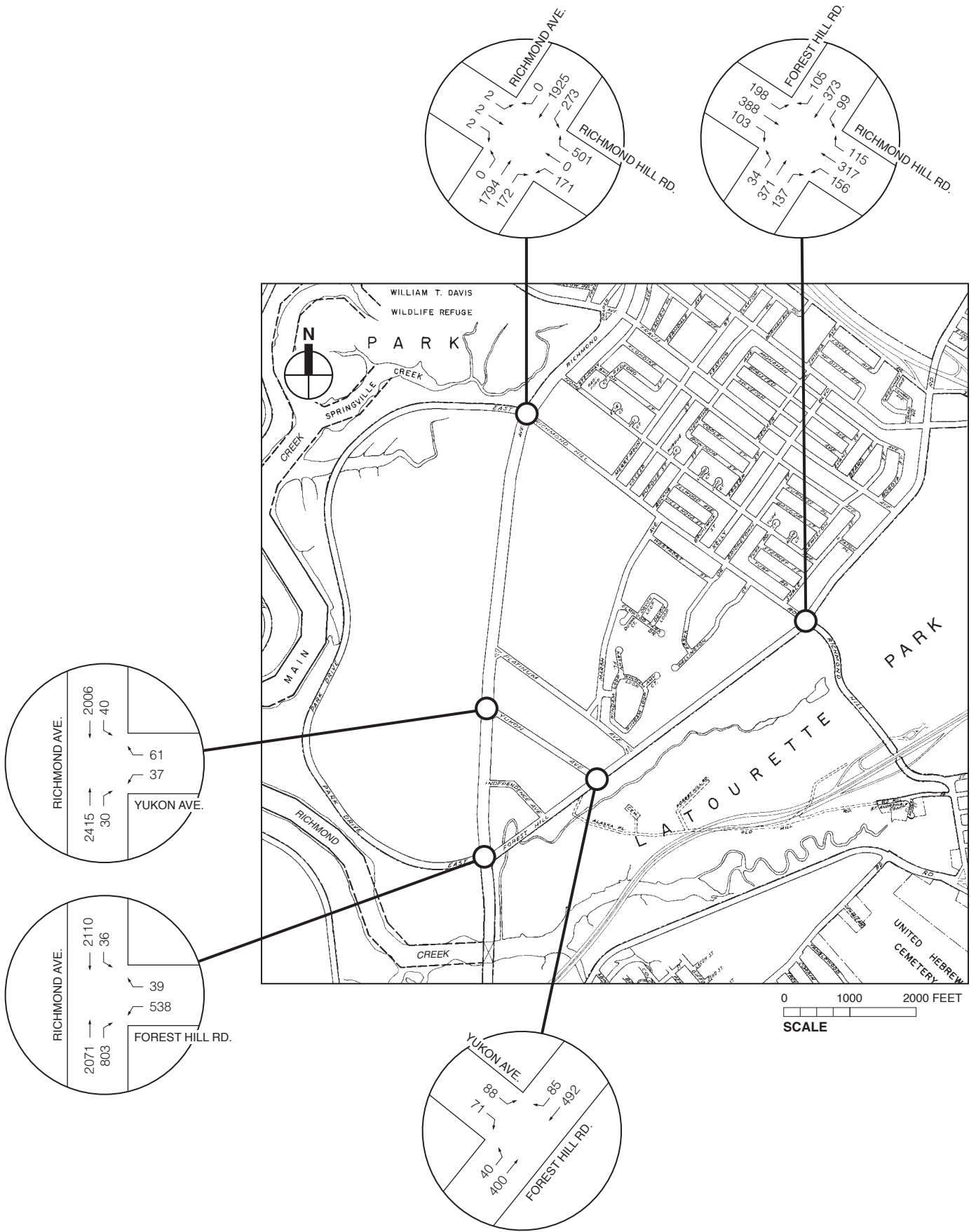


SIBPO Alternative  
Existing Traffic Volumes  
Weekday PM Peak Hour  
**Figure 22-6**

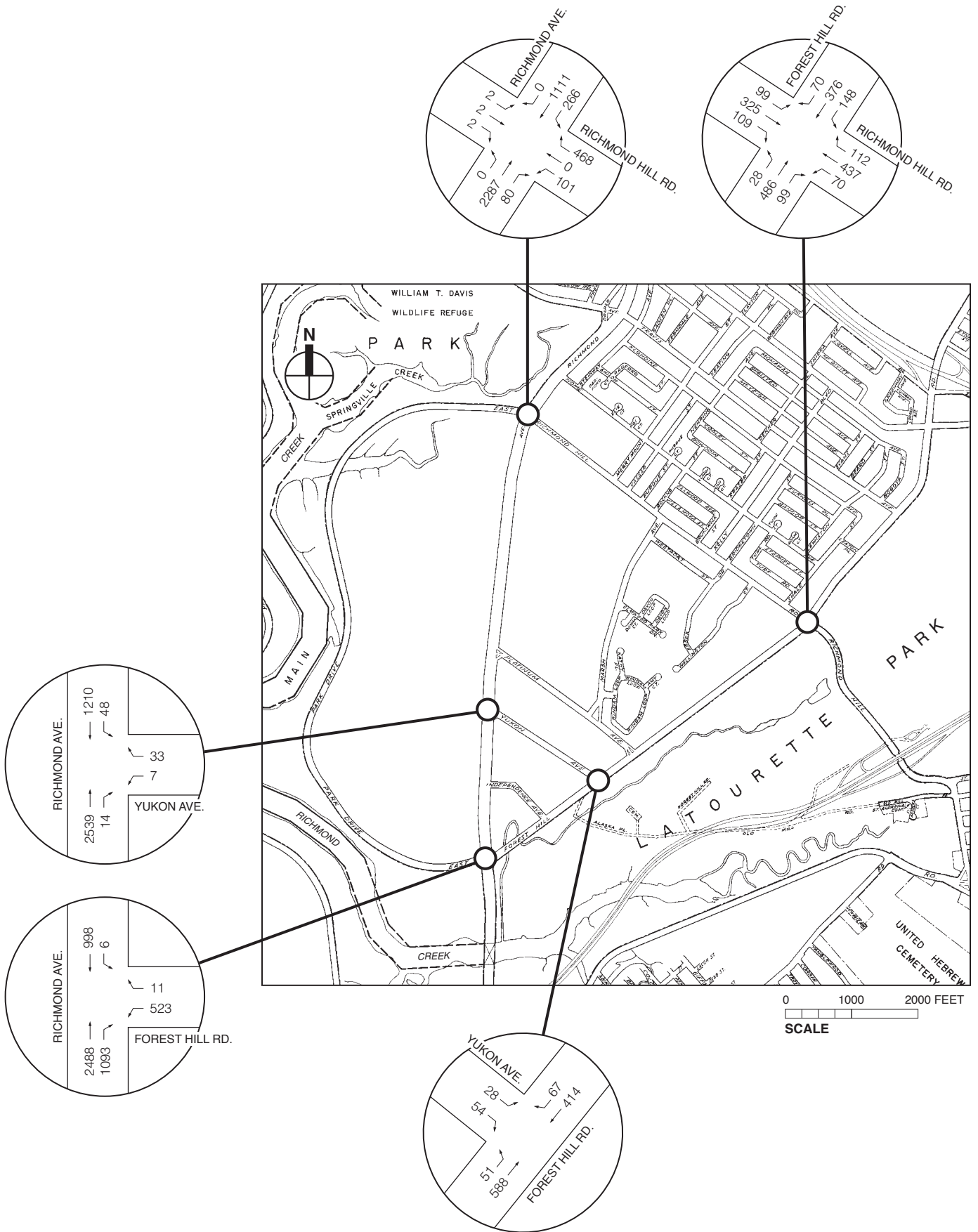


SIBPO Alternative  
Existing Traffic Volumes  
Weekend Midday Peak Hour  
**Figure 22-7**

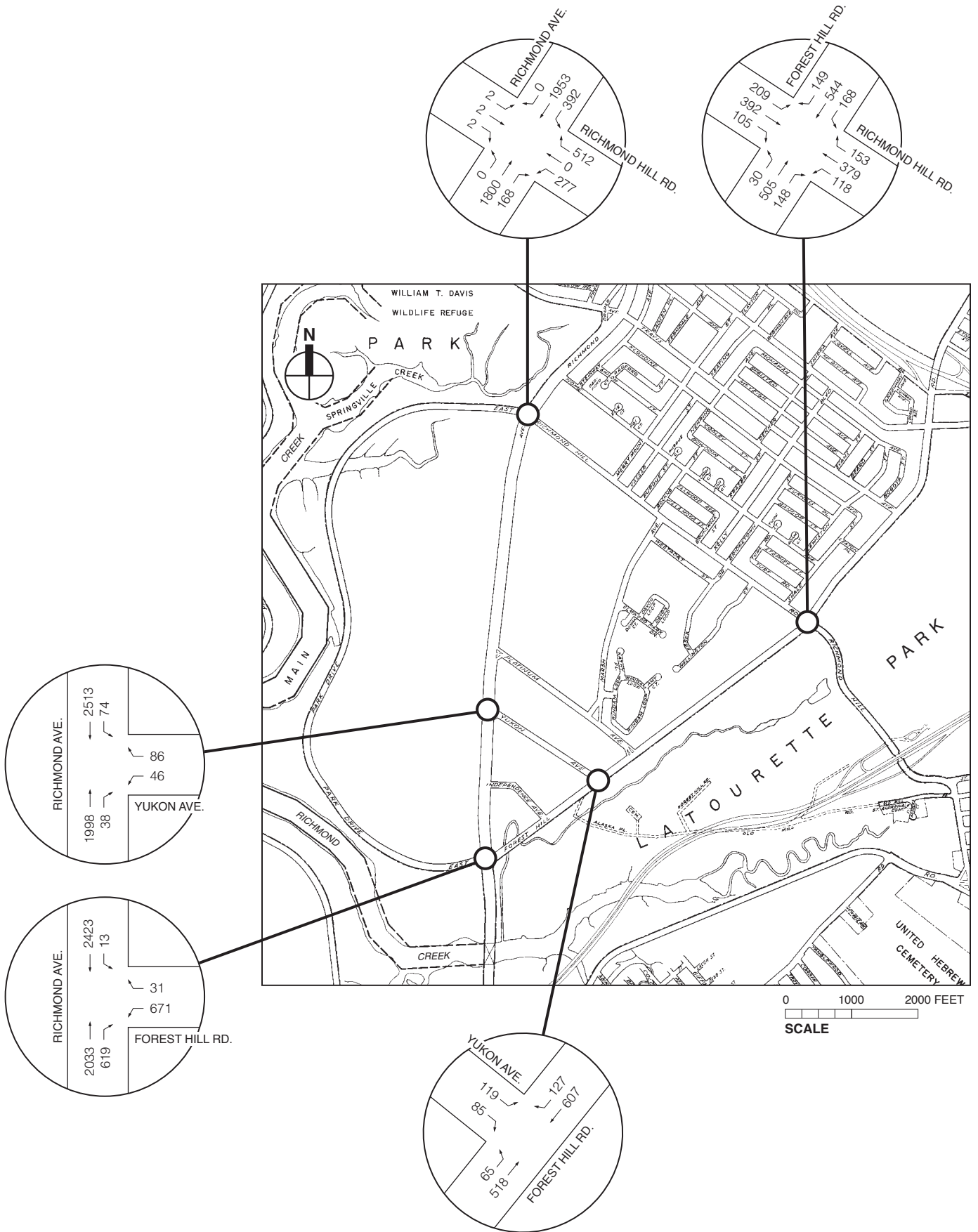




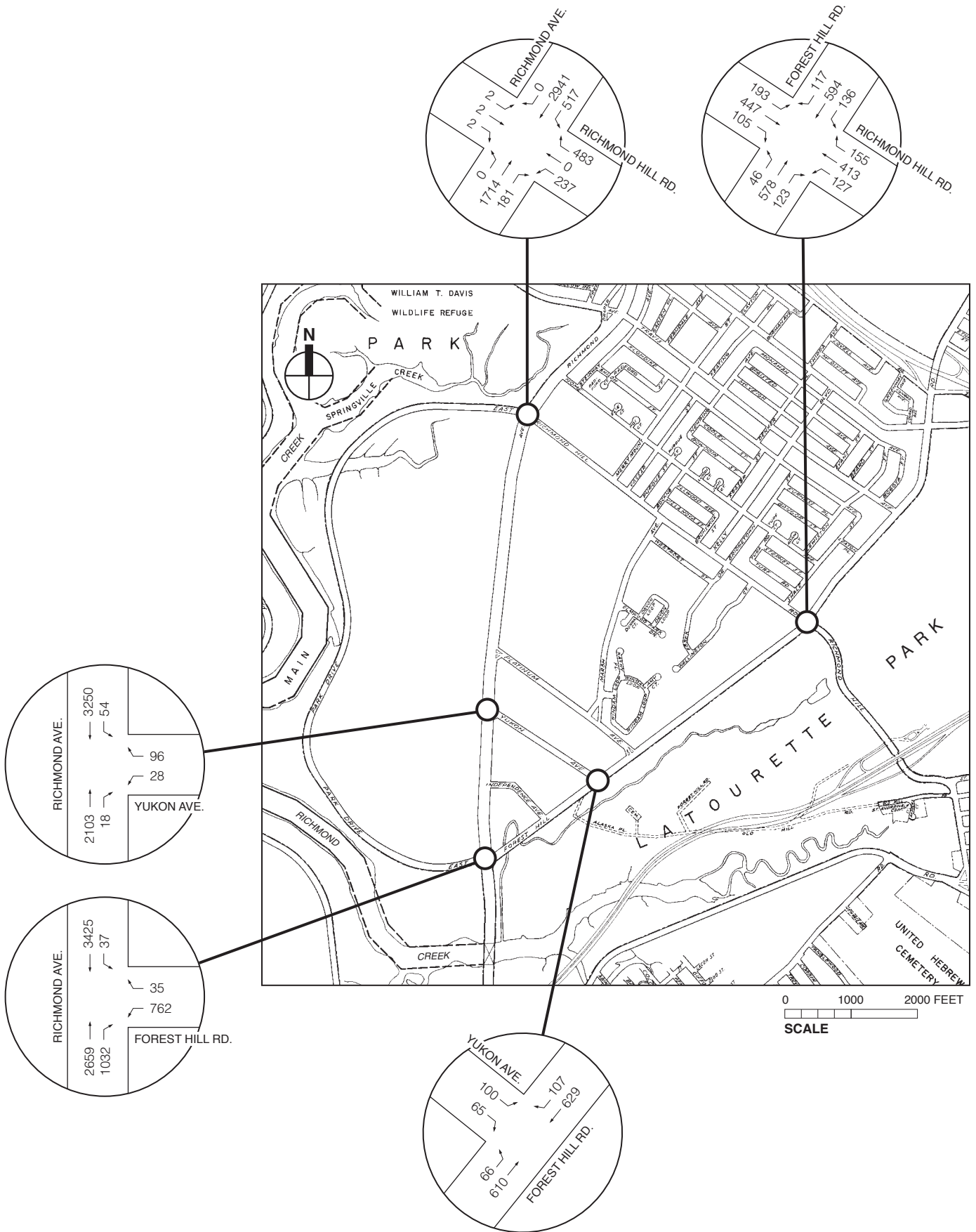
SIBPO Alternative  
 Existing Traffic Volumes  
 Weekend PM Peak Hour  
**Figure 22-8**



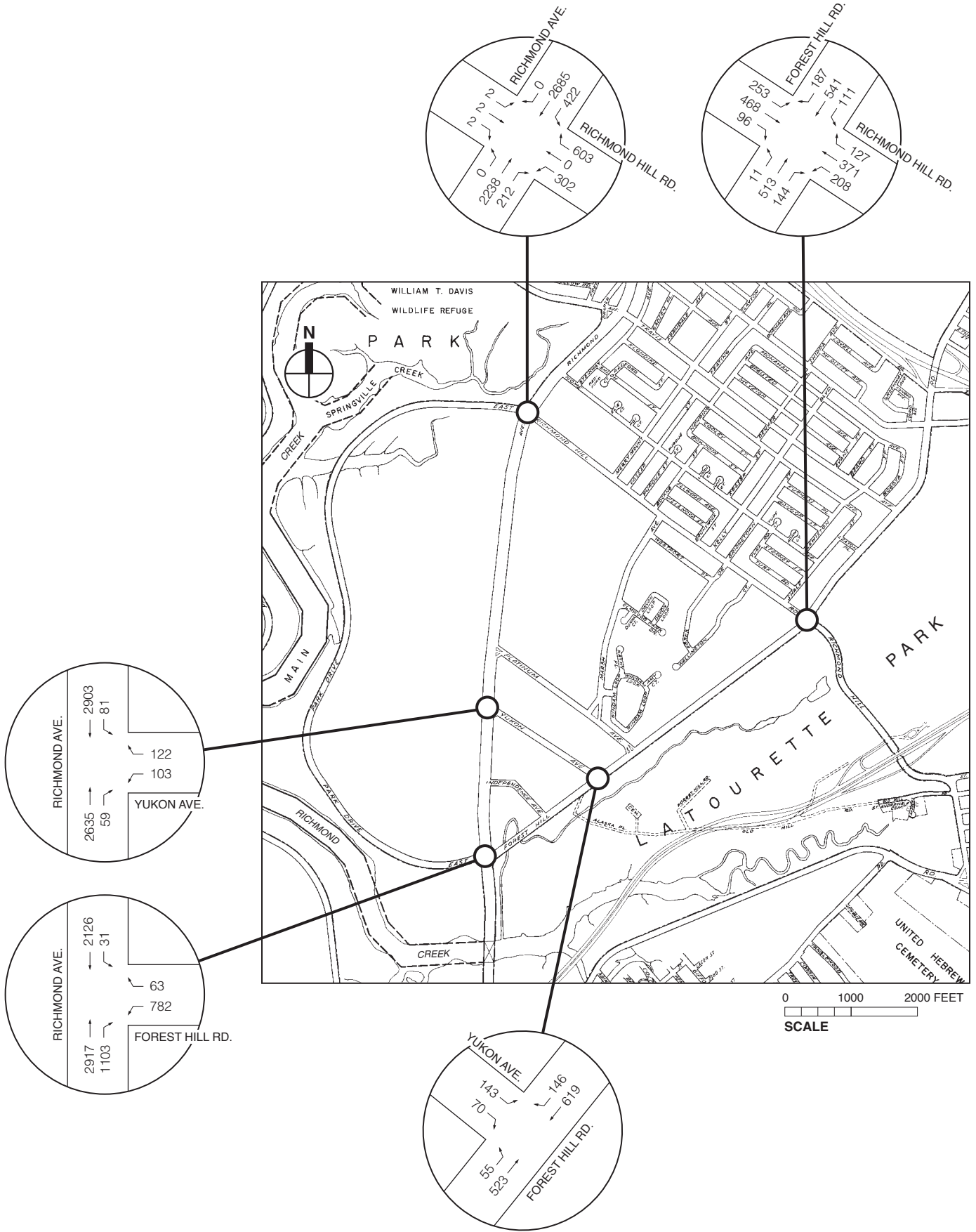
SIBPO Alternative  
 2016 No Build Traffic Volumes  
 Weekday AM Peak Hour  
**Figure 22-9**



SIBPO Alternative  
 2016 No Build Traffic Volumes  
 Weekday Midday Peak Hour  
**Figure 22-10**

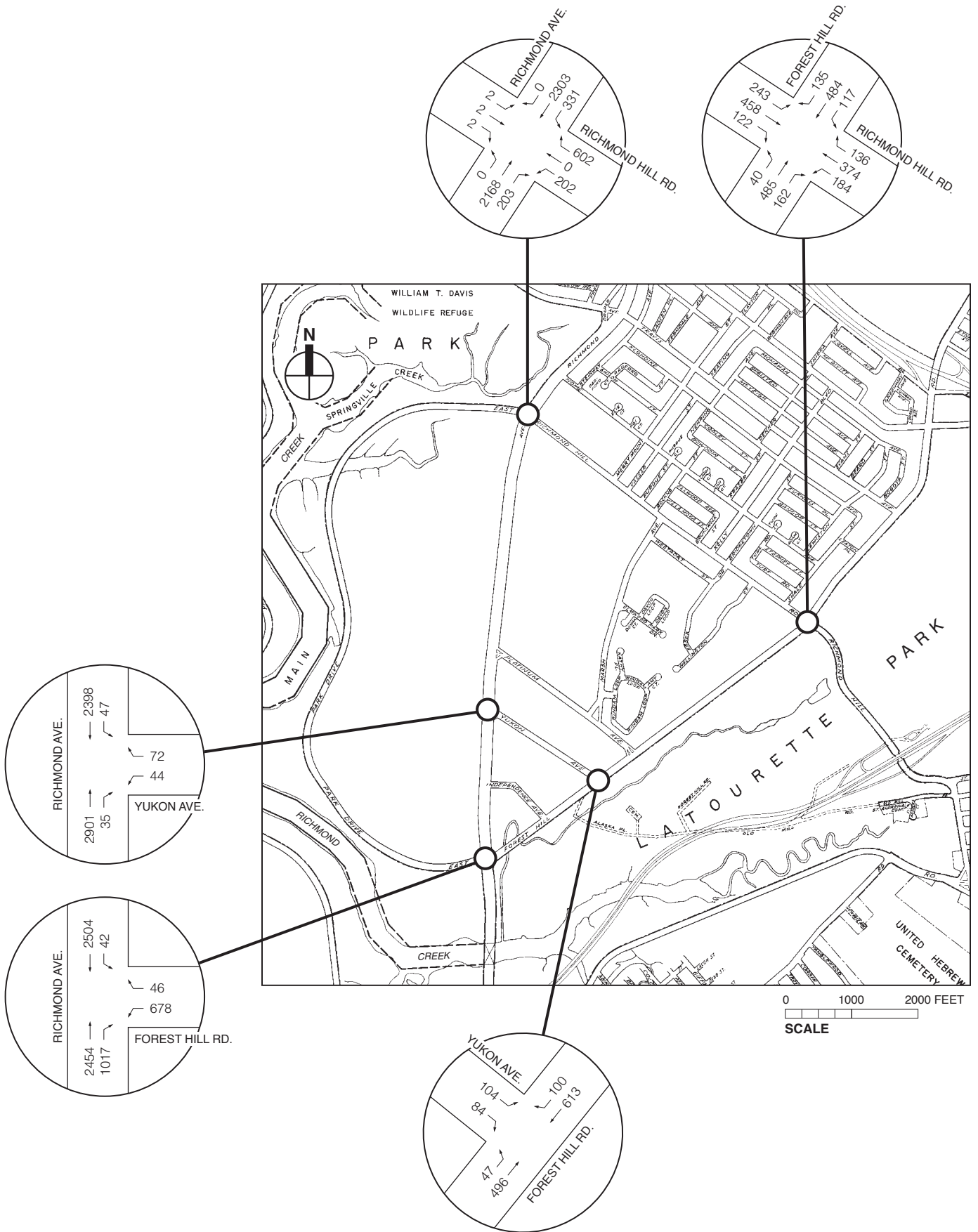


SIBPO Alternative  
 2016 No Build Traffic Volumes  
 Weekday PM Peak Hour  
**Figure 22-11**

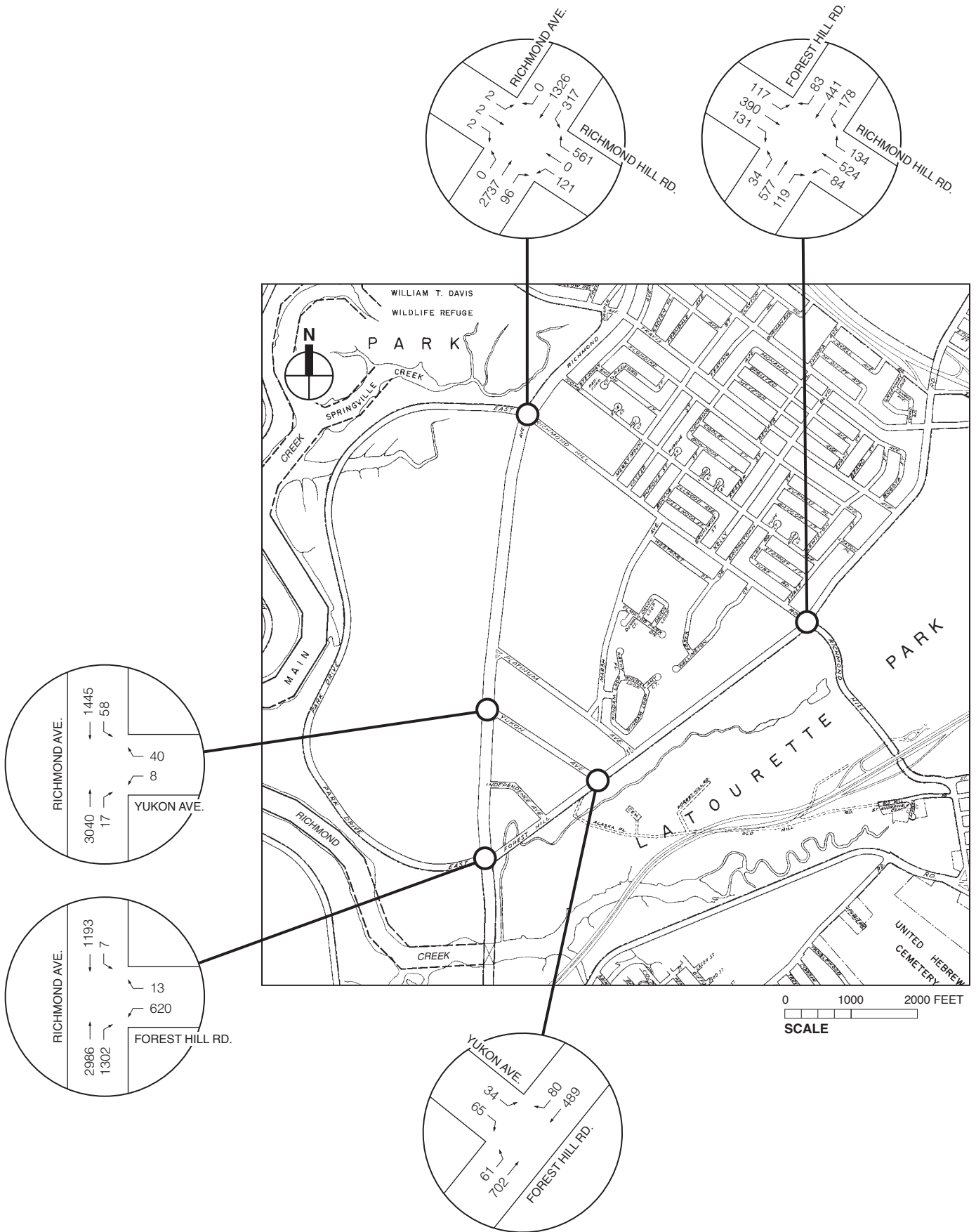


SIBPO Alternative  
 2016 No Build Traffic Volumes  
 Weekend Midday Peak Hour  
**Figure 22-12**

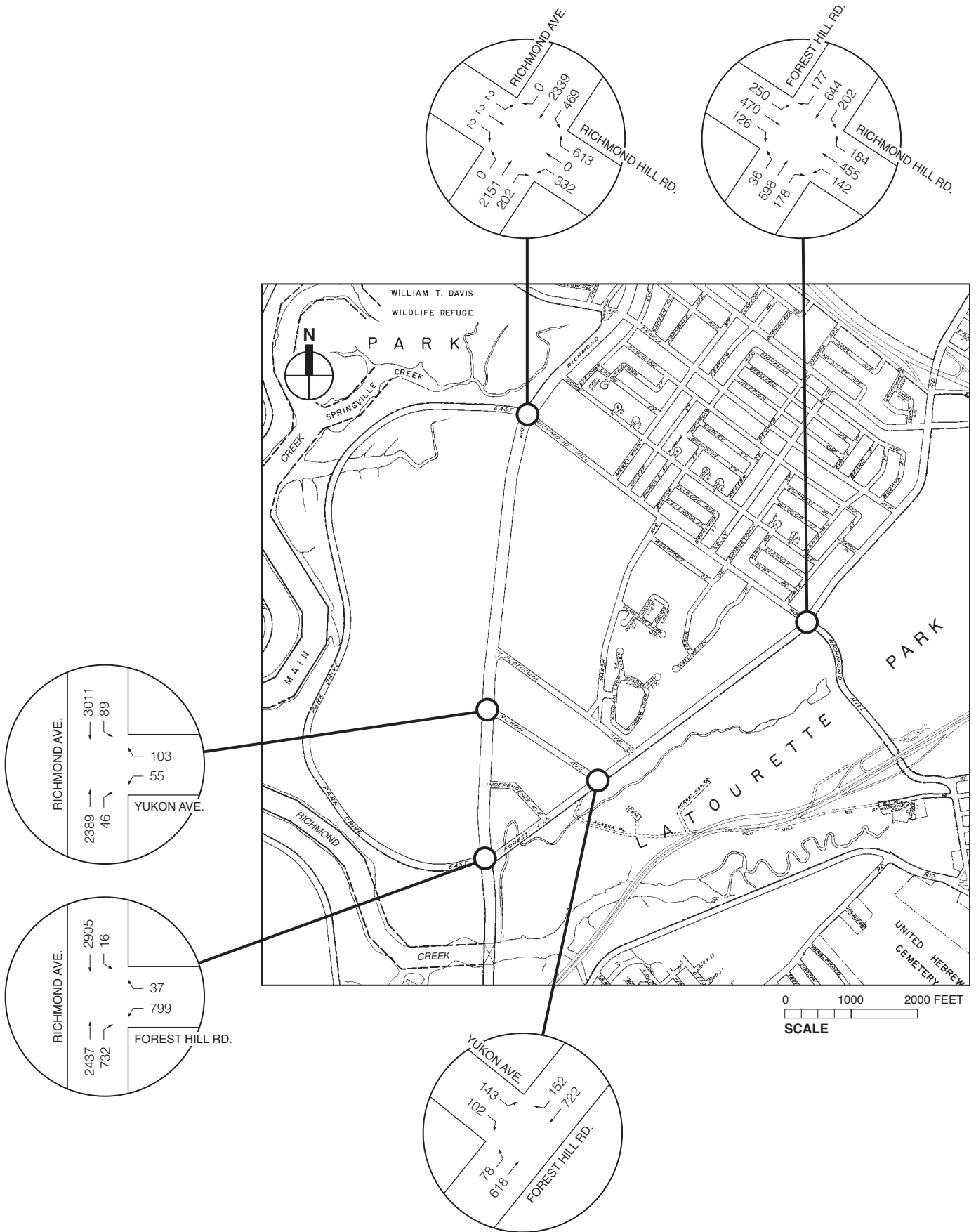




SIBPO Alternative  
 2016 No Build Traffic Volumes  
 Weekend PM Peak Hour  
**Figure 22-13**

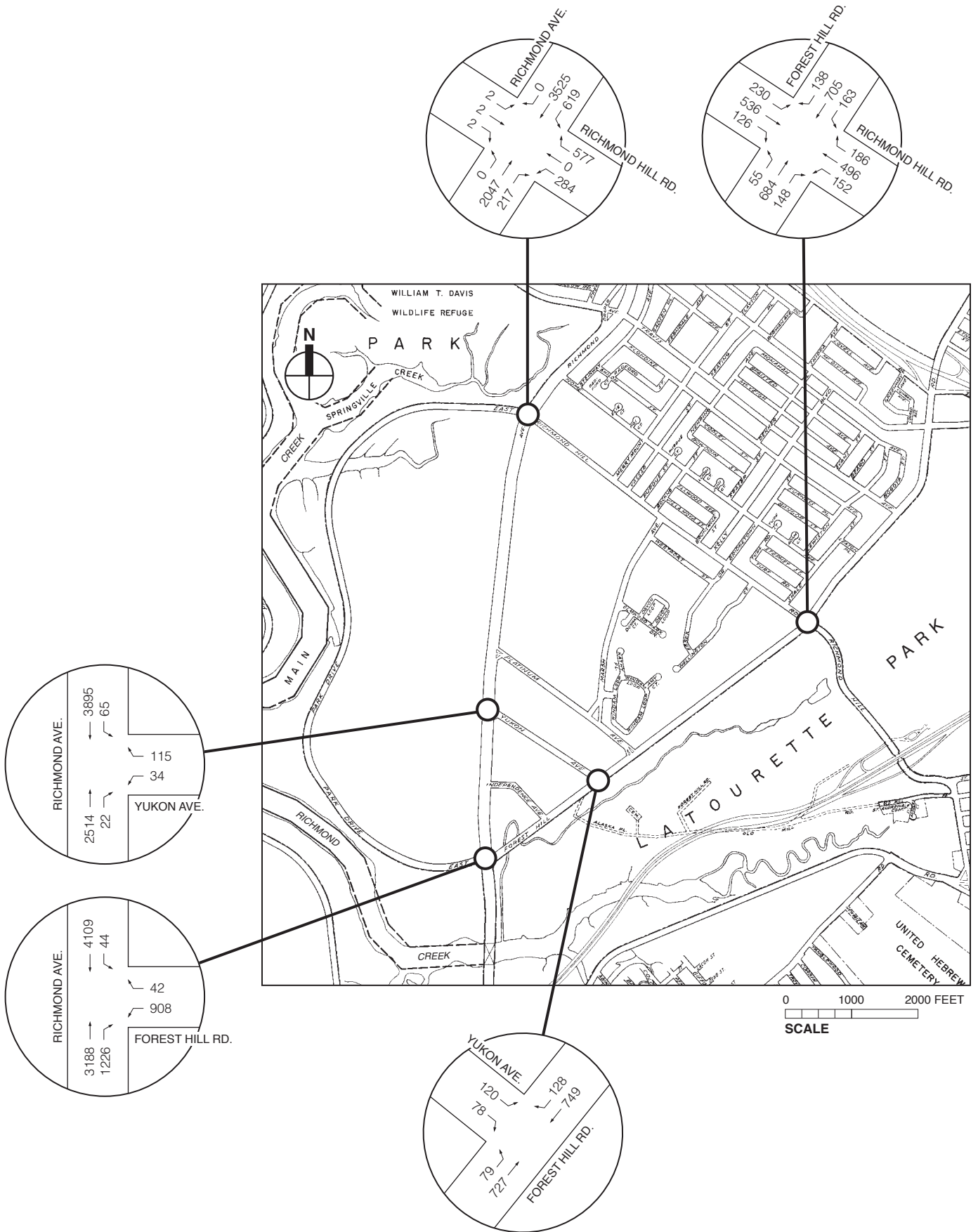


SIBPO Alternative  
 2036 No Build Traffic Volumes  
 Weekday AM Peak Hour  
**Figure 22-14**

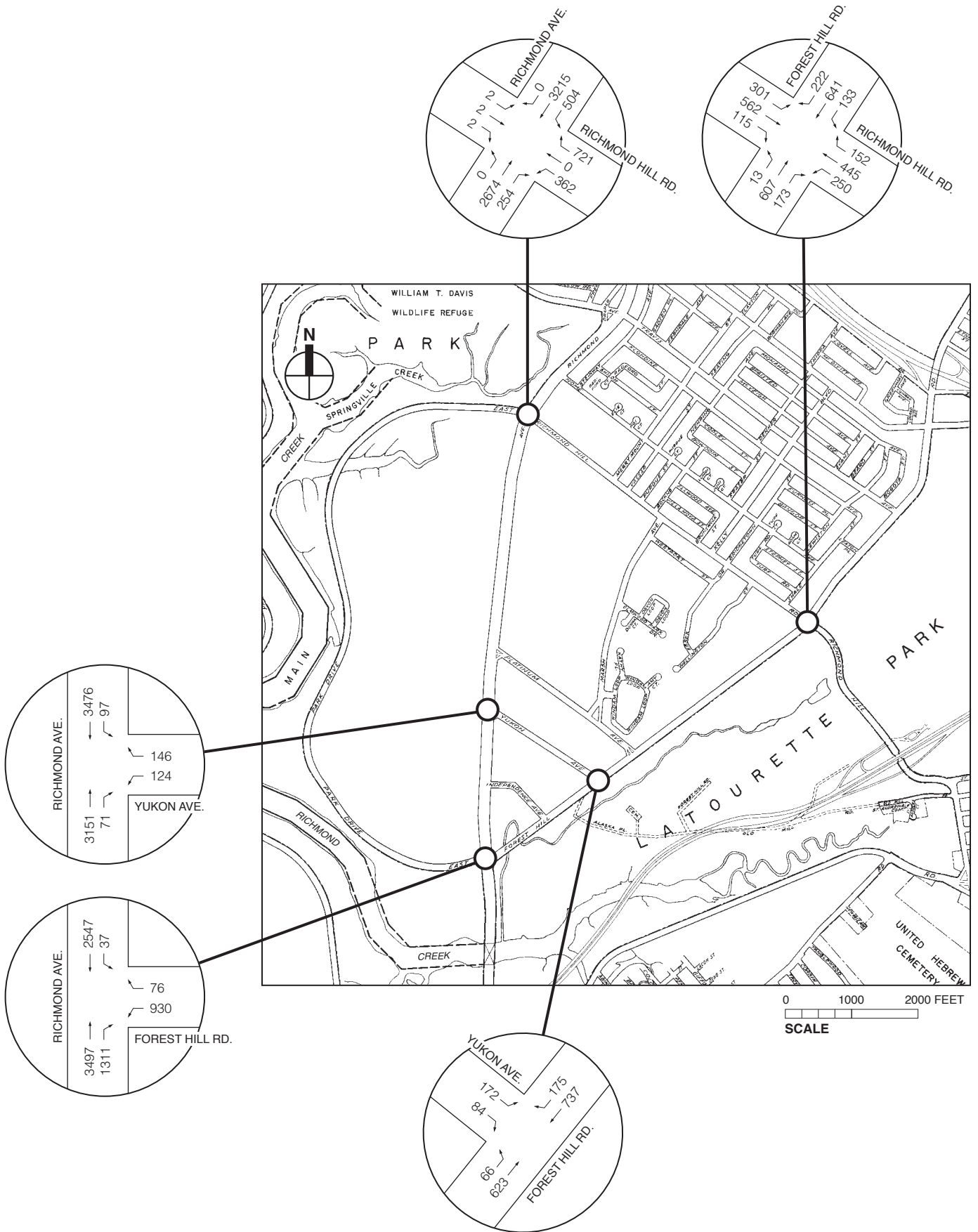


SIBPO Alternative  
 2036 No Build Traffic Volumes  
 Weekday Midday Peak Hour  
**Figure 22-15**

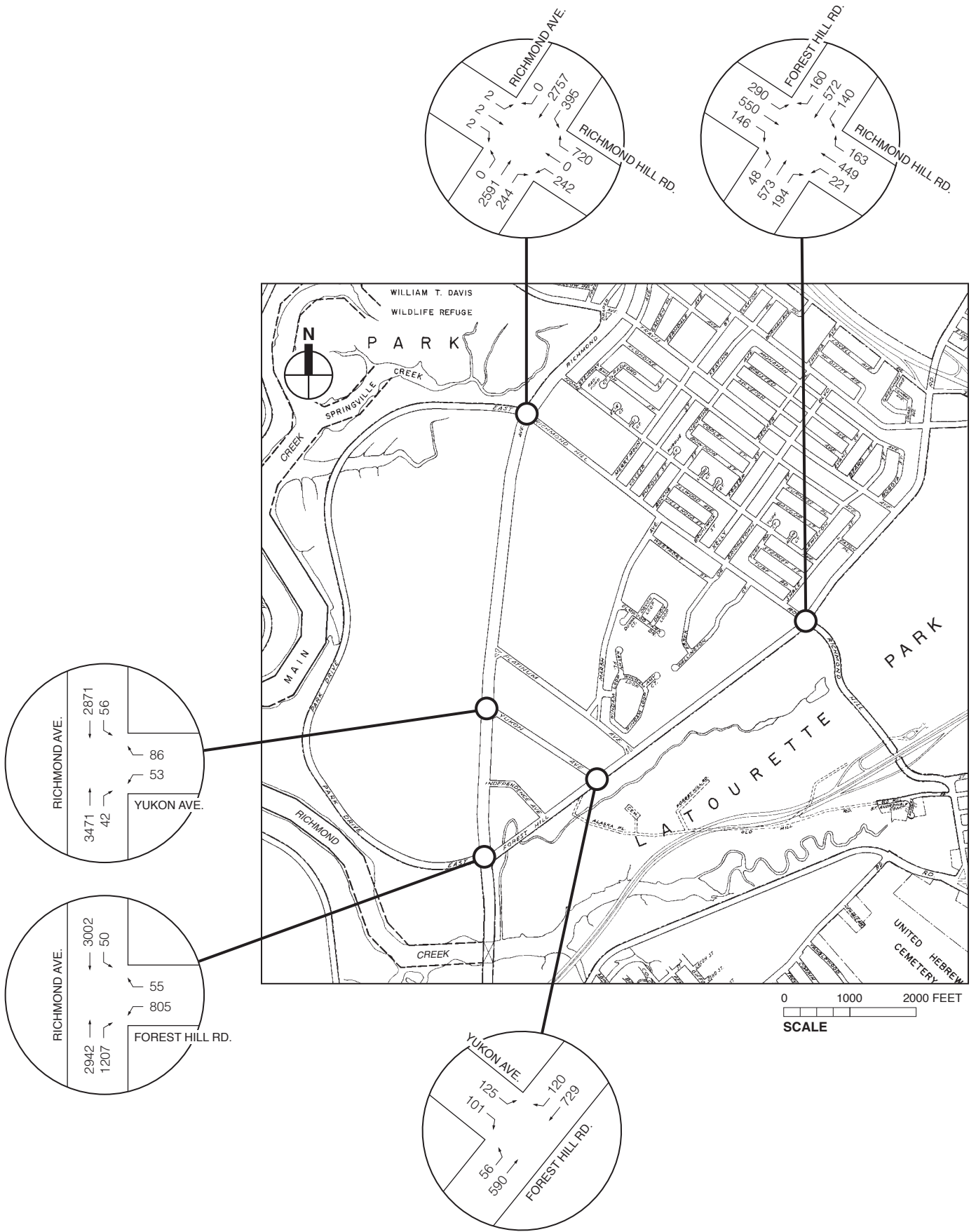




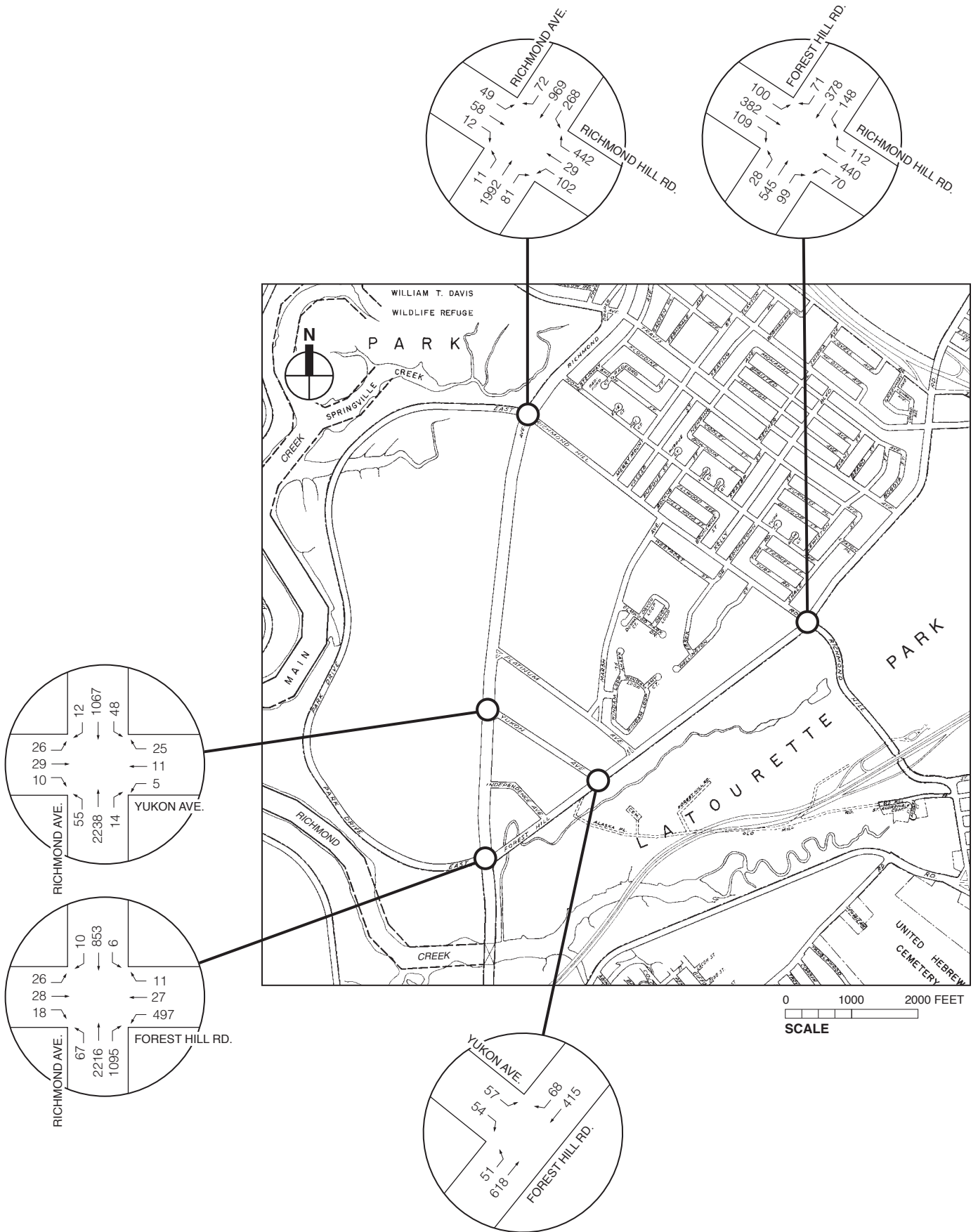
SIBPO Alternative  
 2036 No Build Traffic Volumes  
 Weekday PM Peak Hour  
**Figure 22-16**



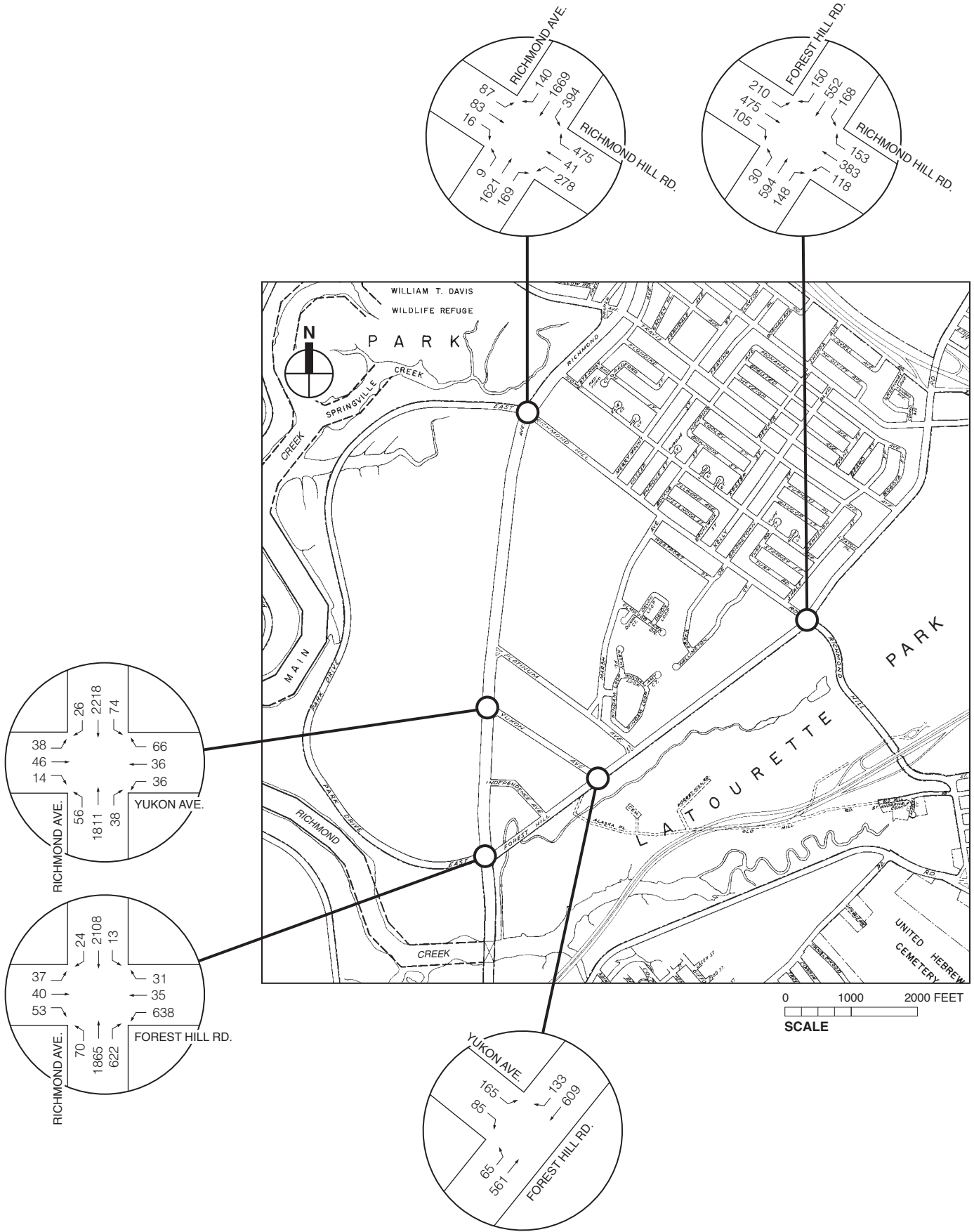
SIBPO Alternative  
 2036 No Build Traffic Volumes  
 Weekend Midday Peak Hour  
**Figure 22-17**



SIBPO Alternative  
 2036 No Build Traffic Volumes  
 Weekend PM Peak Hour  
**Figure 22-18**

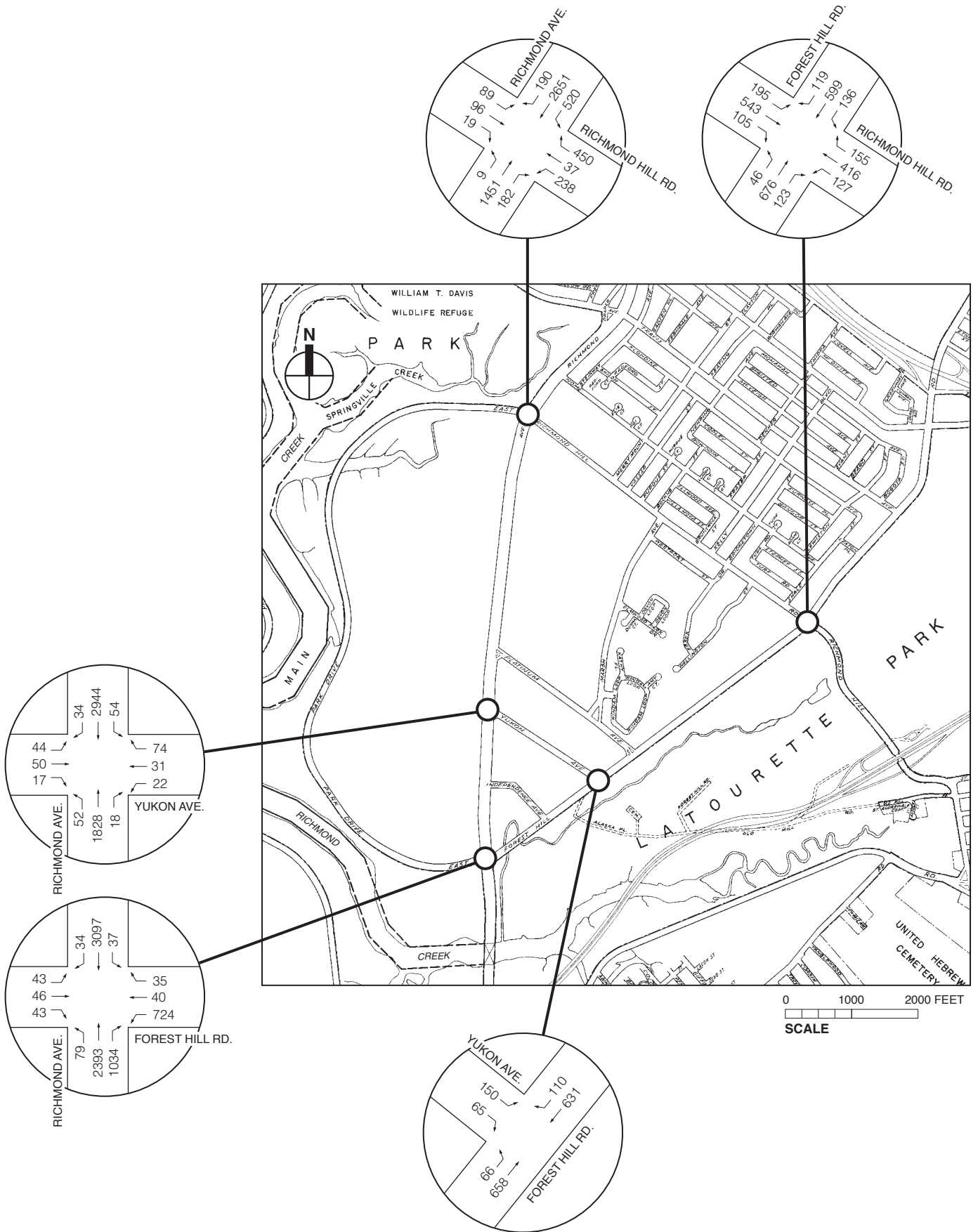


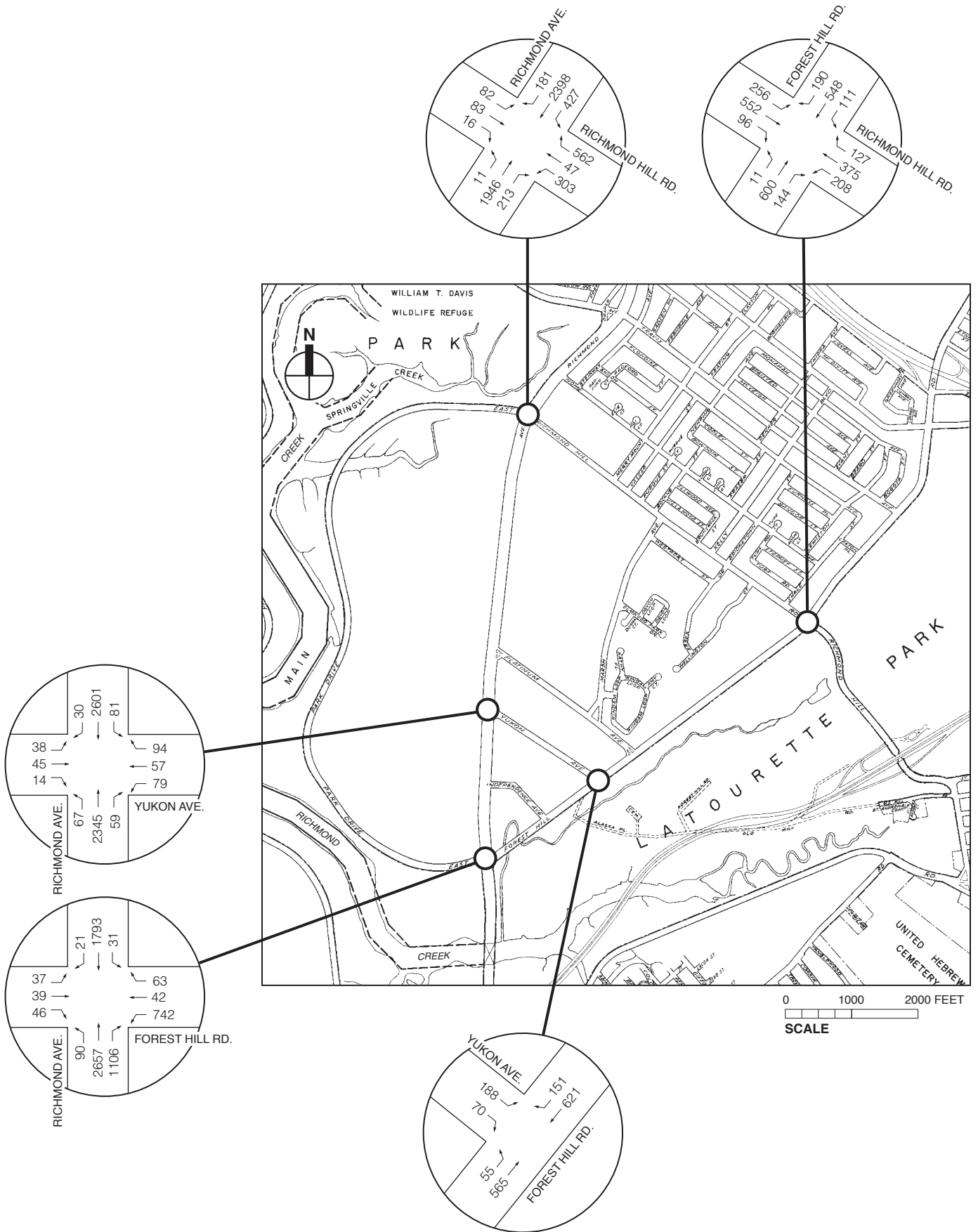
SIBPO Alternative  
 2016 Build Traffic Volumes  
 Weekday AM Peak Hour  
**Figure 22-19**



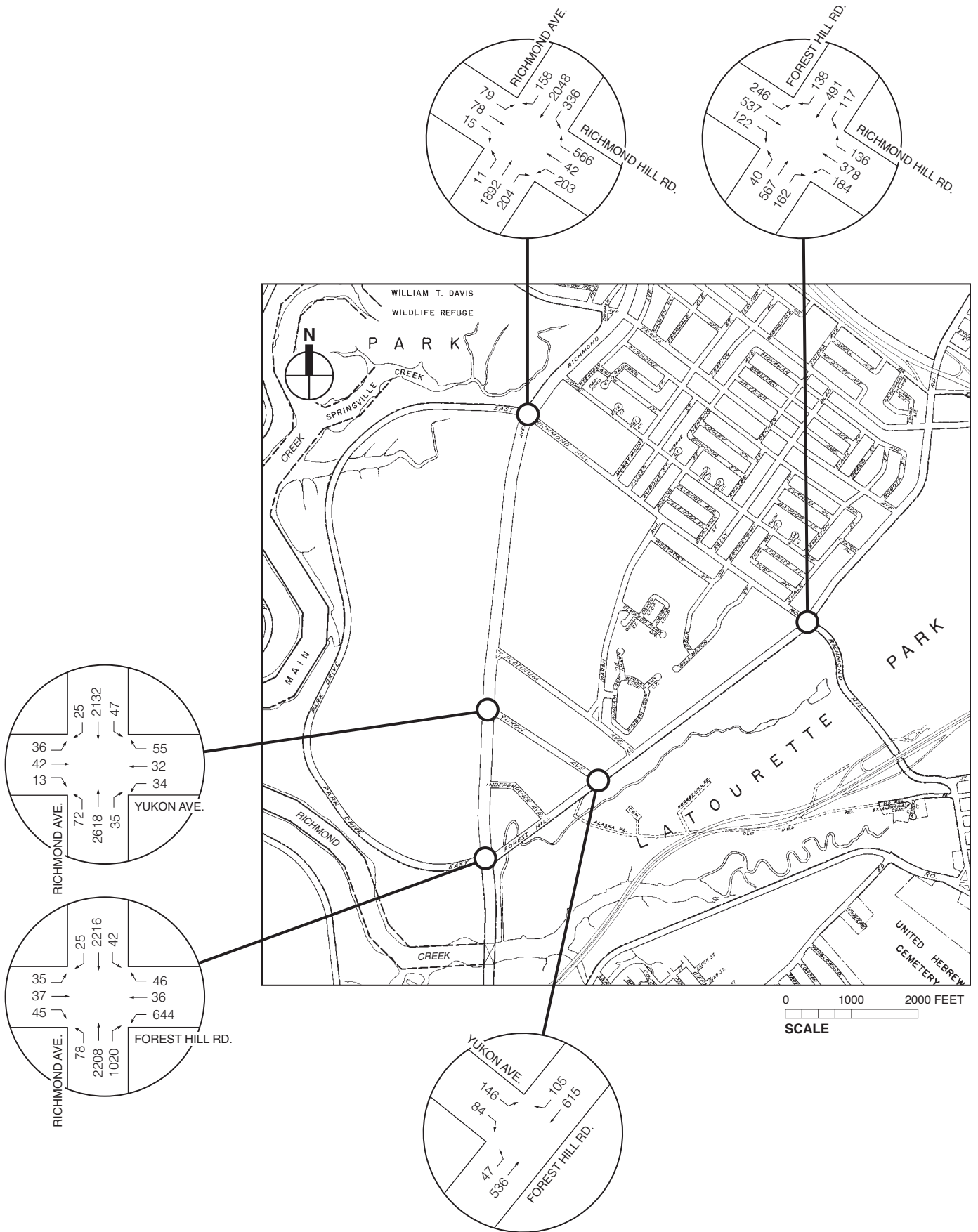
SIBPO Alternative  
 2016 Build Traffic Volumes  
 Weekday Midday Peak Hour  
**Figure 22-20**





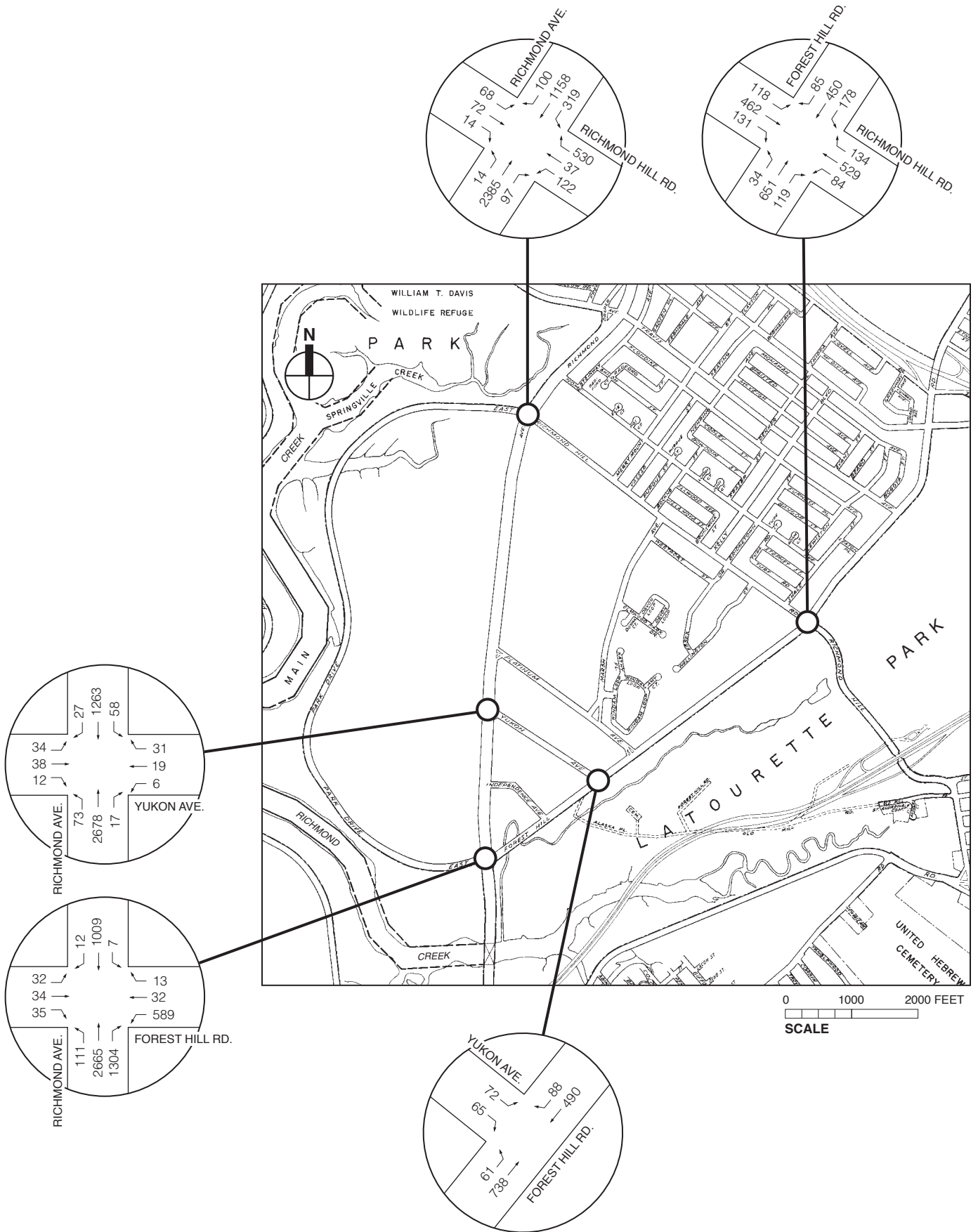


SIBPO Alternative  
 2016 Build Traffic Volumes  
 Weekend Midday Peak Hour  
**Figure 22-22**

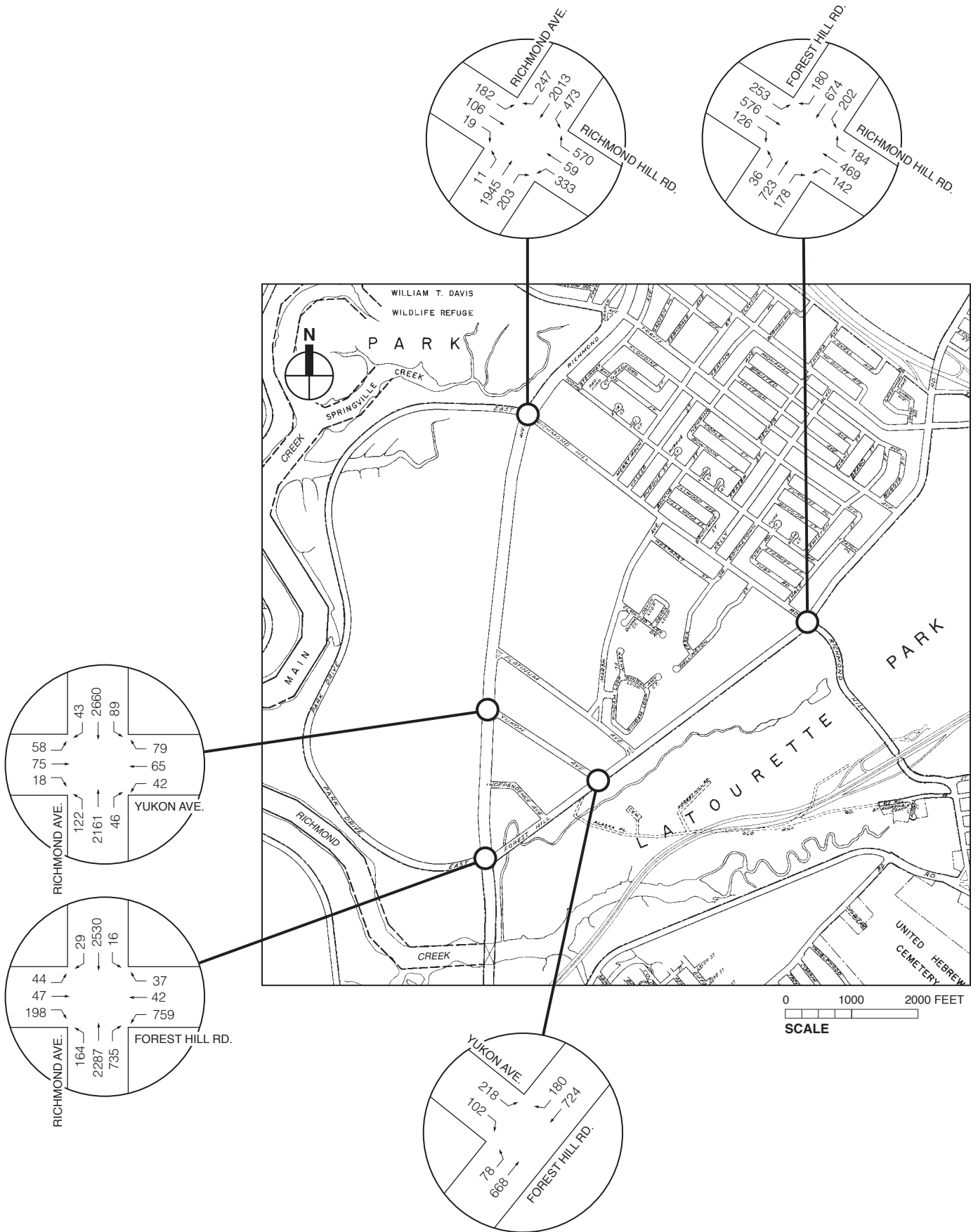


SIBPO Alternative  
 2016 Build Traffic Volumes  
 Weekend PM Peak Hour  
**Figure 22-23**

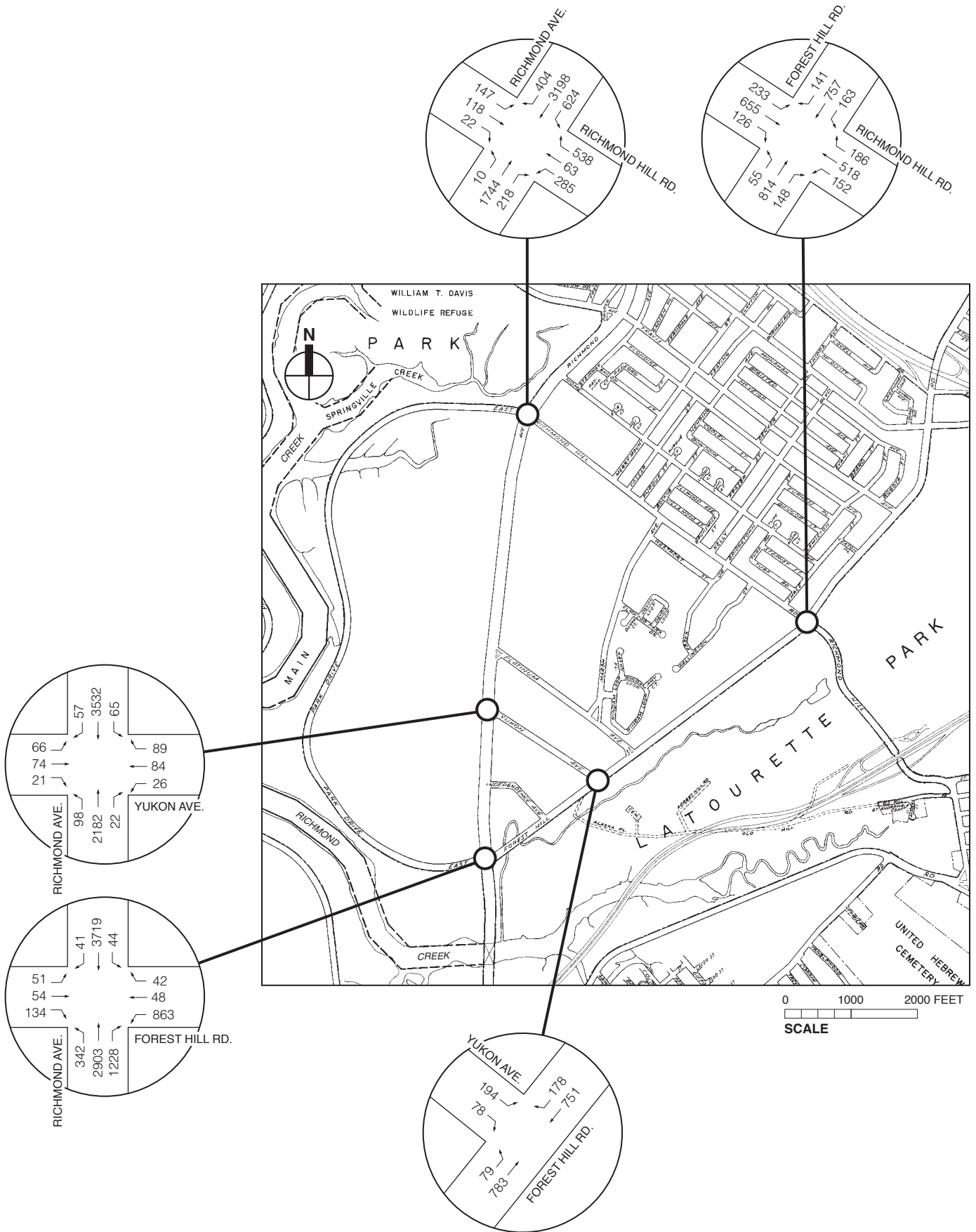




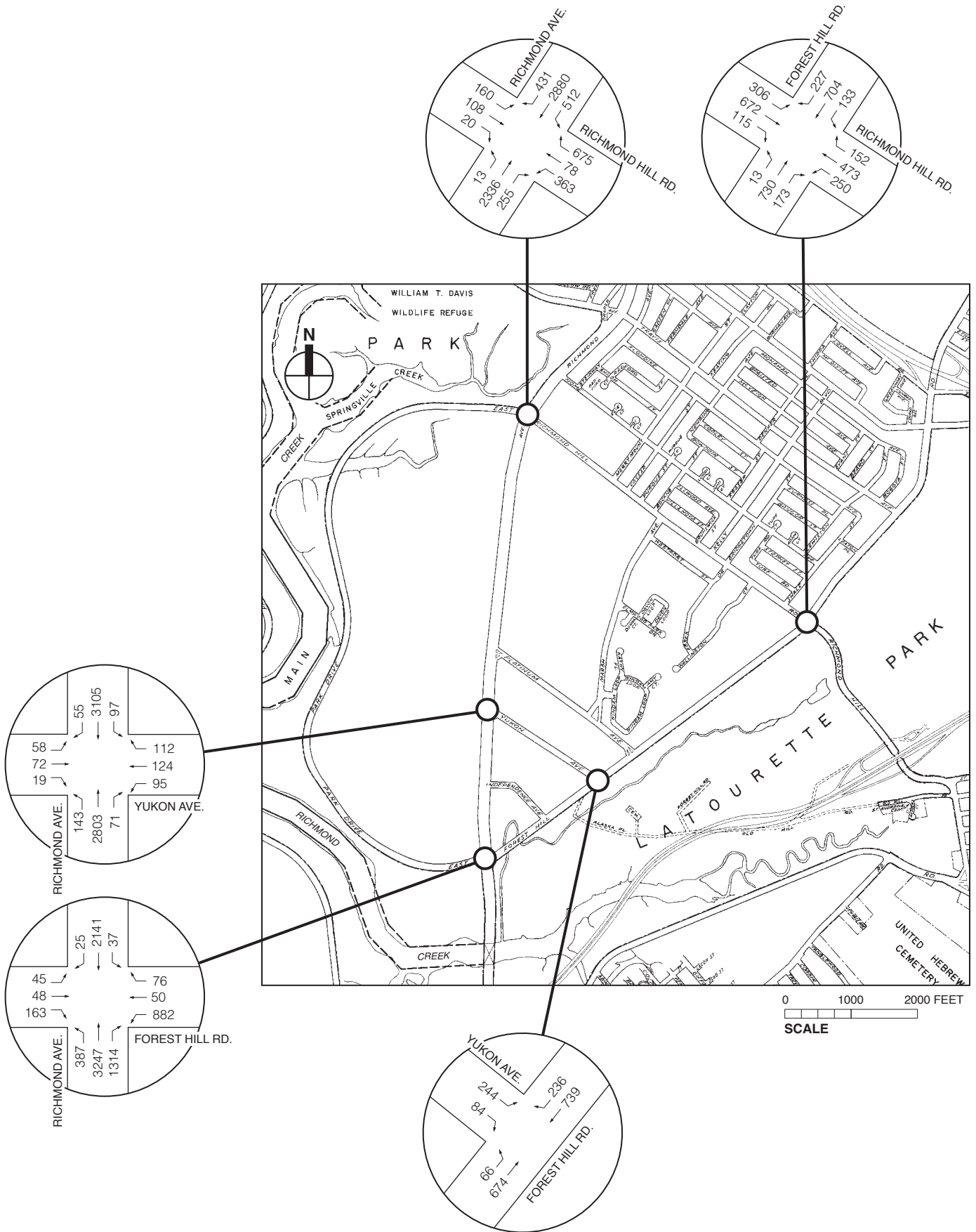
SIBPO Alternative  
 2036 Build Traffic Volumes  
 Weekday AM Peak Hour  
**Figure 22-24**



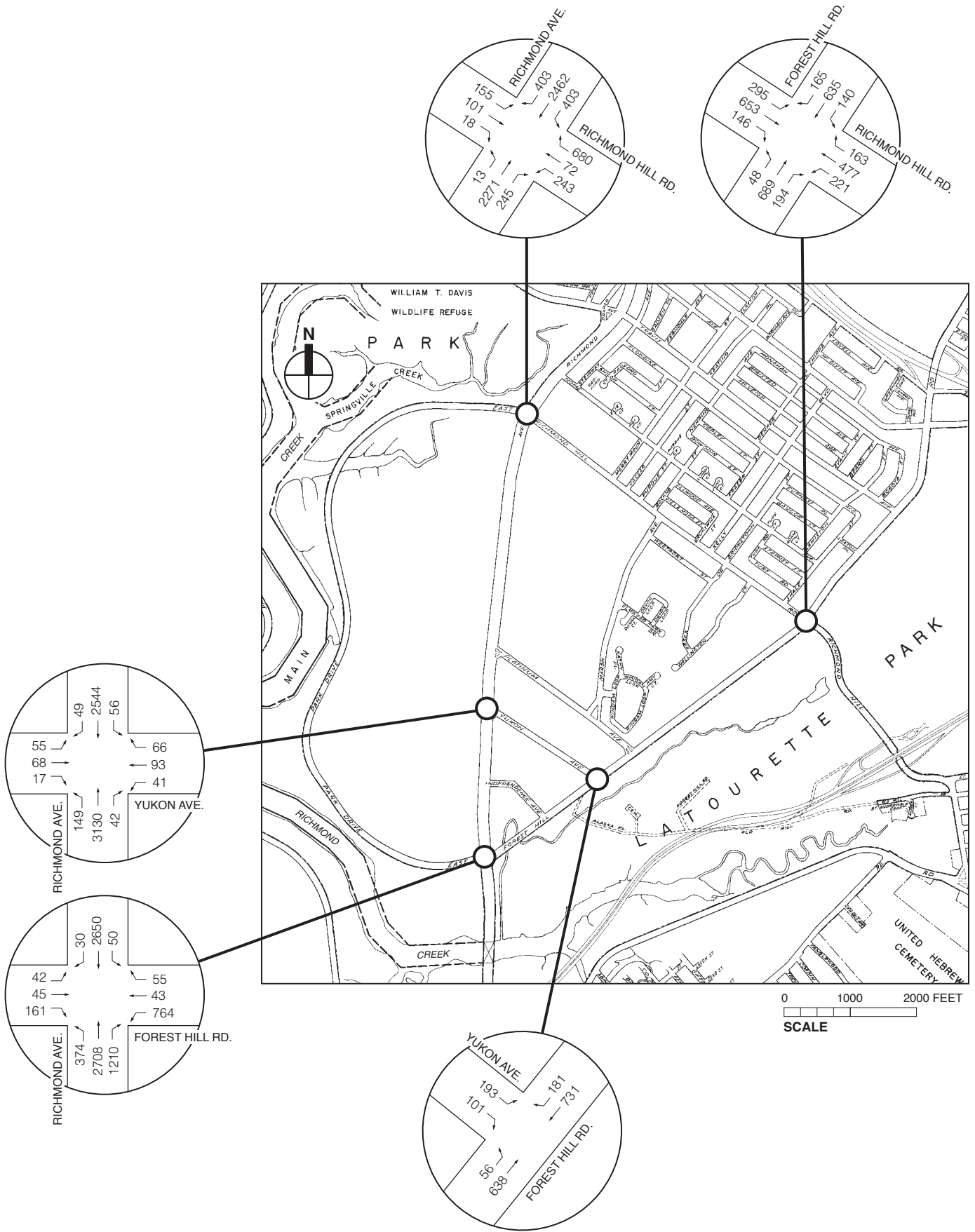
SIBPO Alternative  
 2036 Build Traffic Volumes  
 Weekday Midday Peak Hour  
**Figure 22-25**



SIBPO Alternative  
 2036 Build Traffic Volumes  
 Weekday PM Peak Hour  
**Figure 22-26**

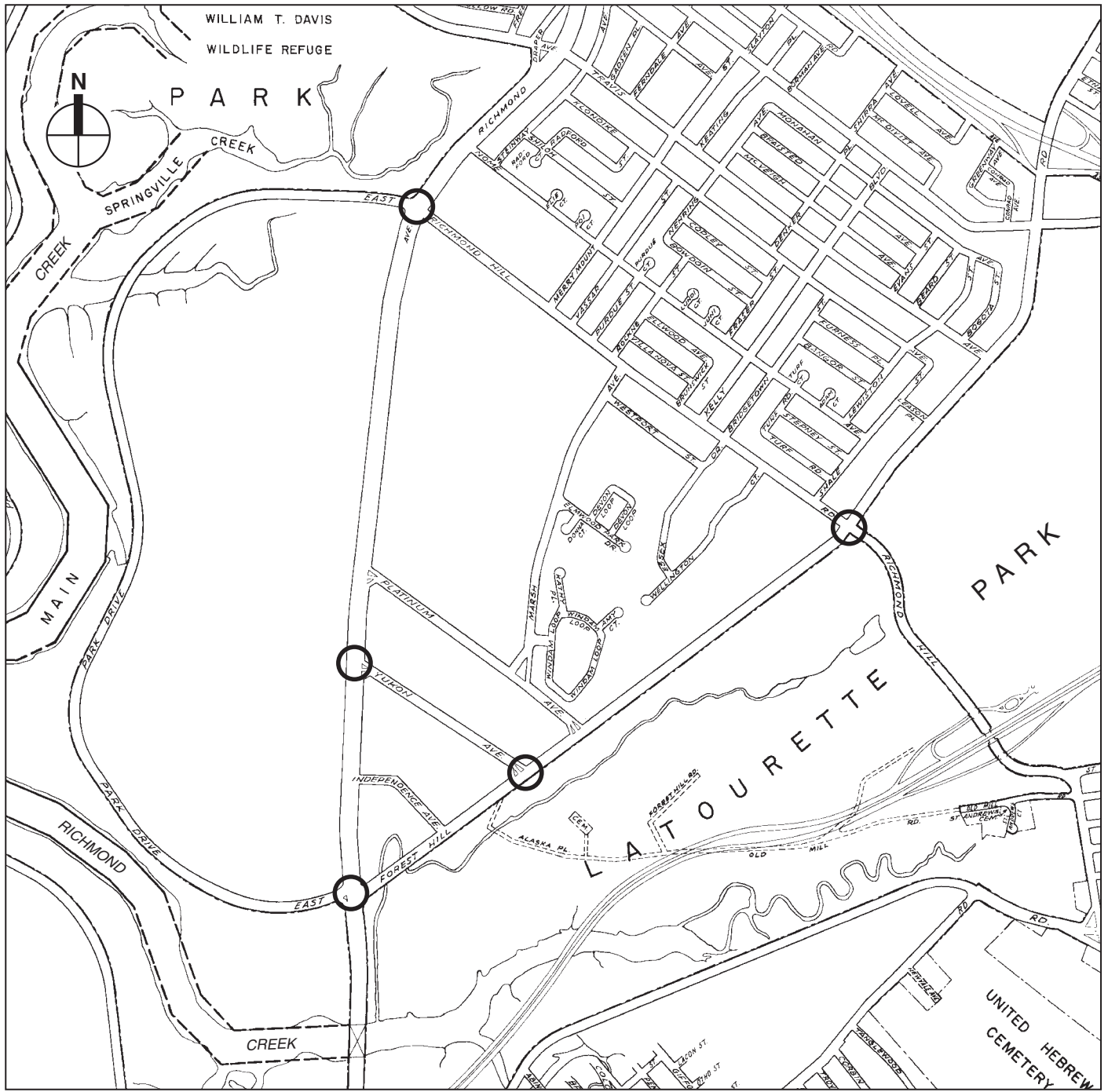


SIBPO Alternative  
 2036 Build Traffic Volumes  
 Weekend Midday Peak Hour  
**Figure 22-27**

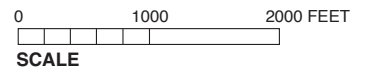


SIBPO Alternative  
 2036 Build Traffic Volumes  
 Weekend PM Peak Hour  
**Figure 22-28**

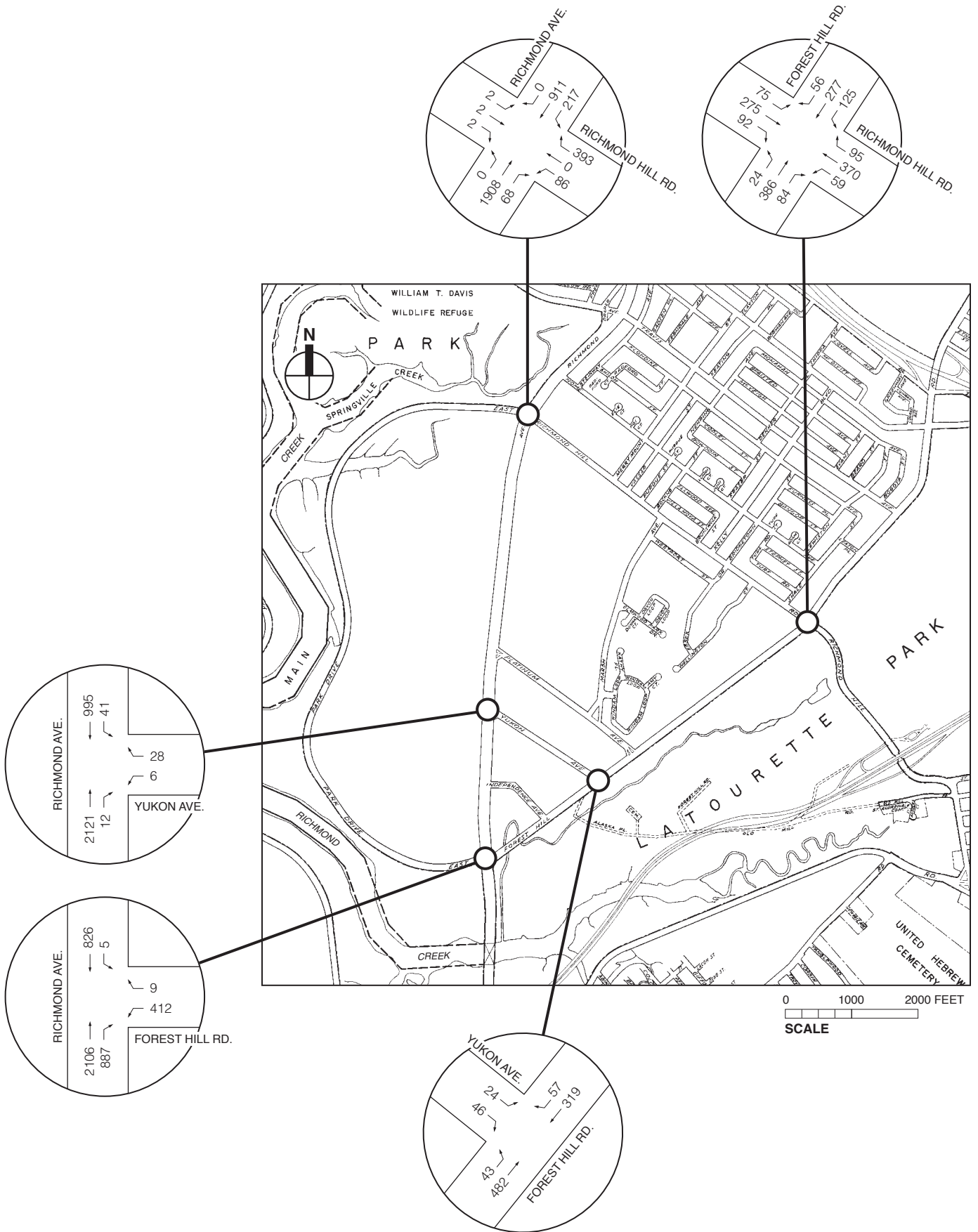




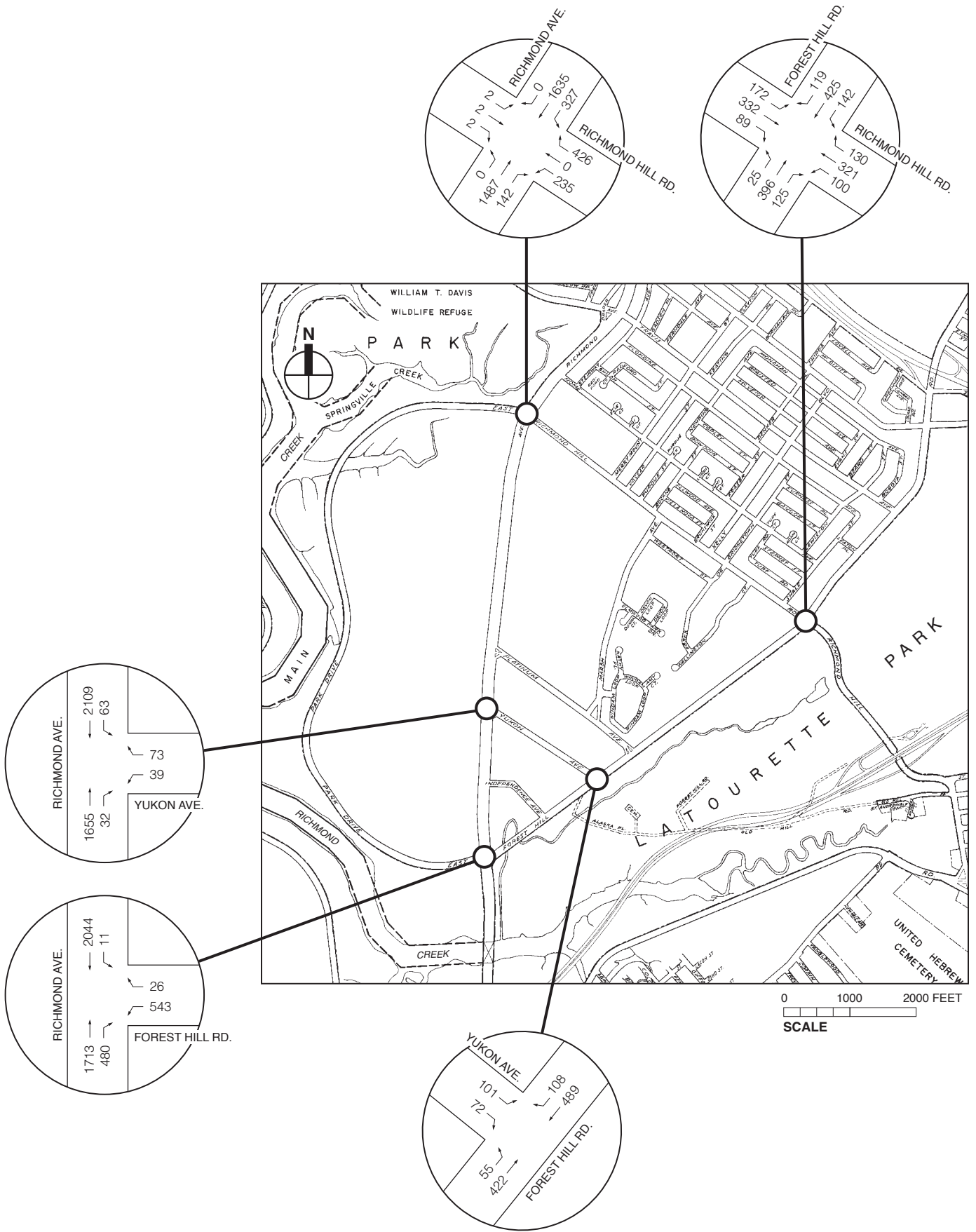
○ Intersection to be Analyzed



Yukon Avenue Alternative  
Traffic Study Area  
Figure 22-29

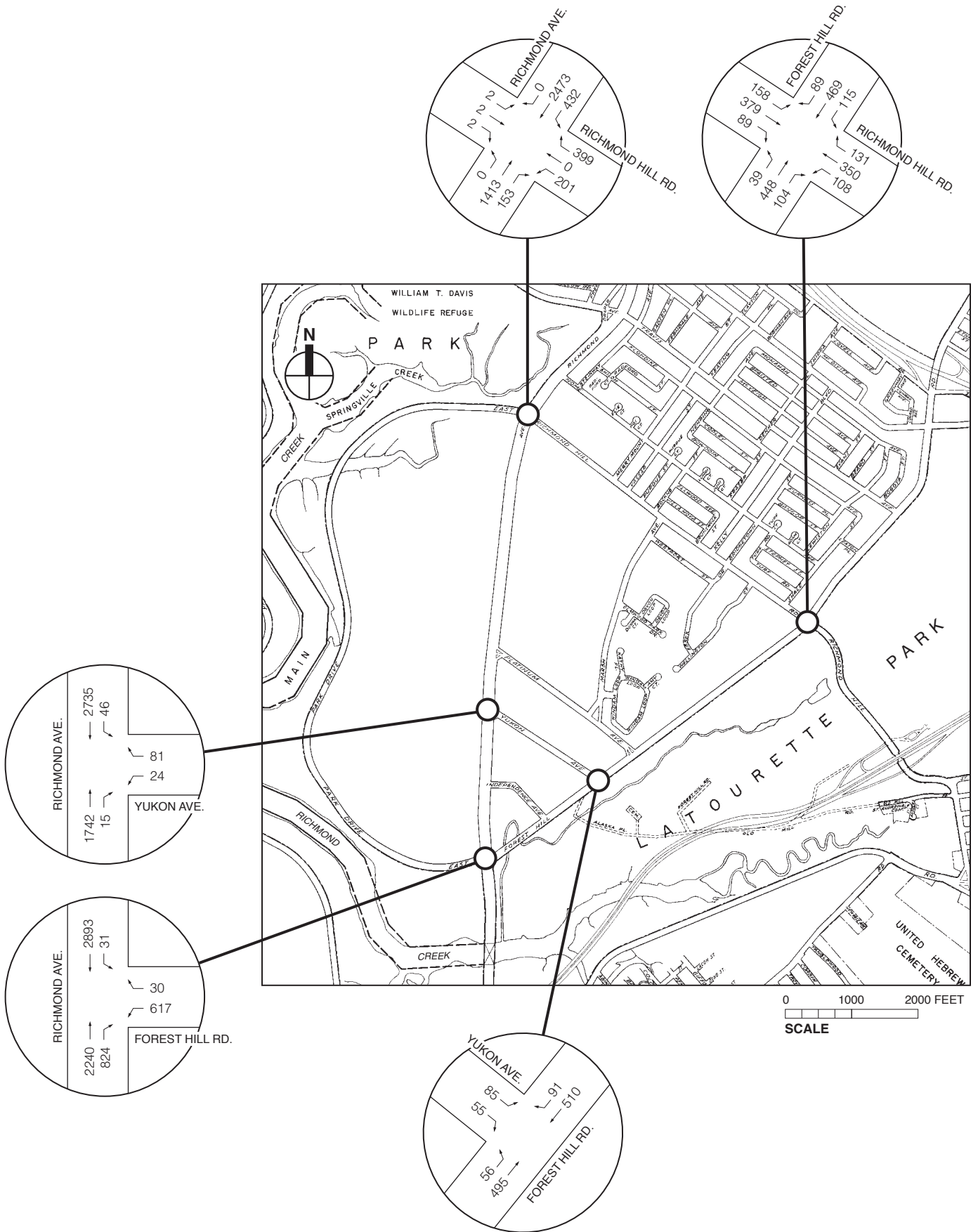


Yukon Avenue Alternative  
 Existing Traffic Volumes  
 Weekday AM Peak Hour  
**Figure 22-30**

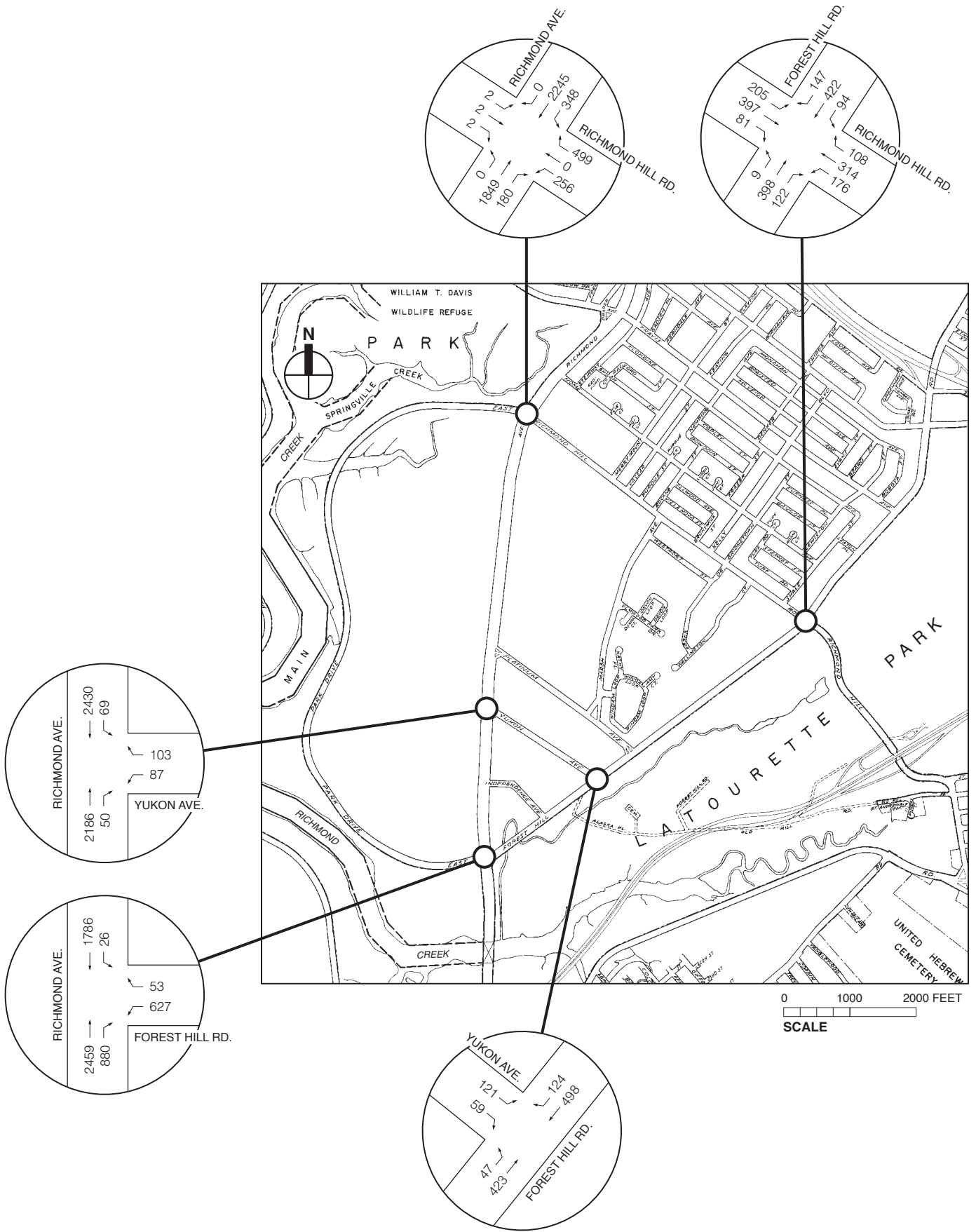


Yukon Avenue Alternative  
 Existing Traffic Volumes  
 Weekday Midday Peak Hour  
**Figure 22-31**

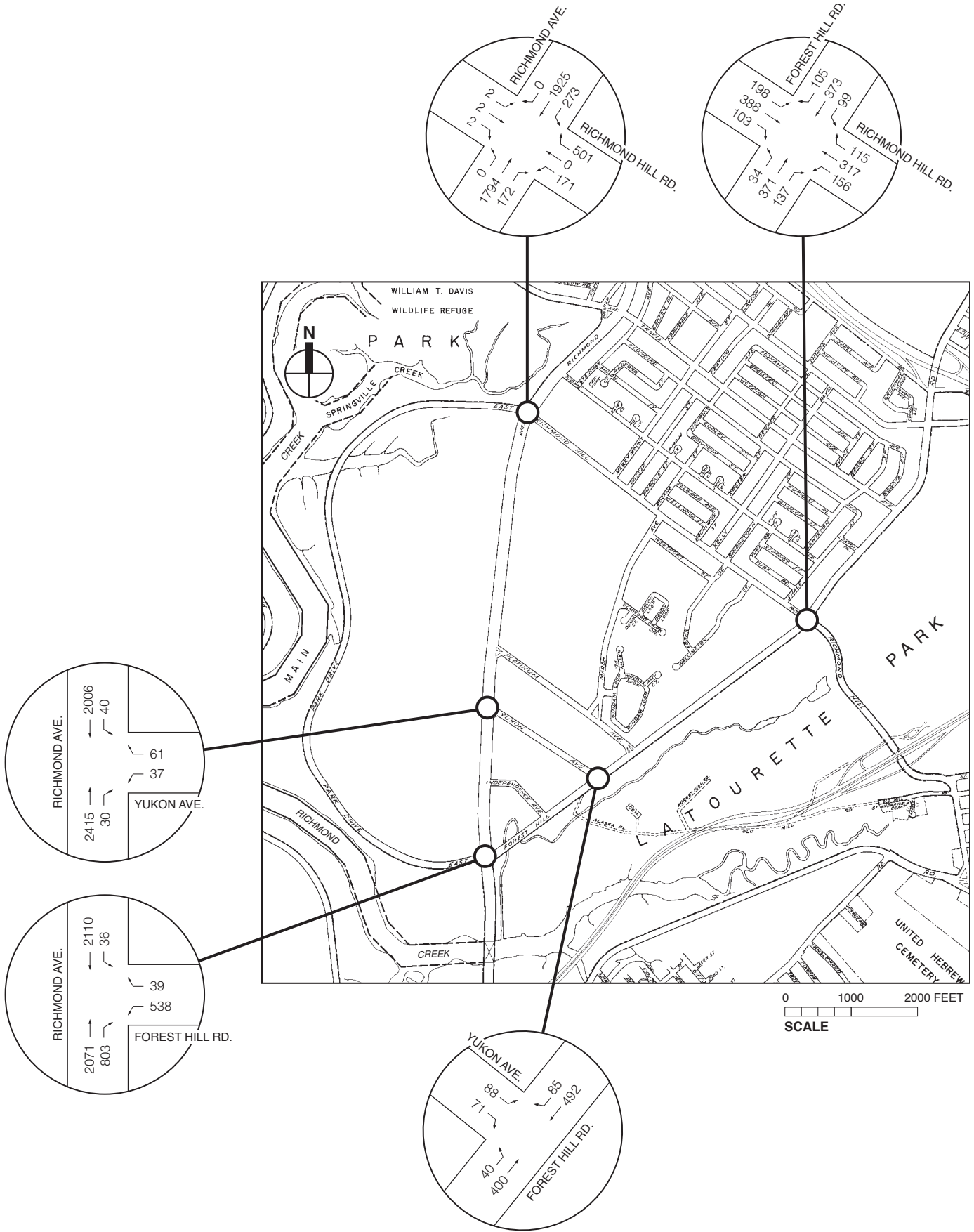




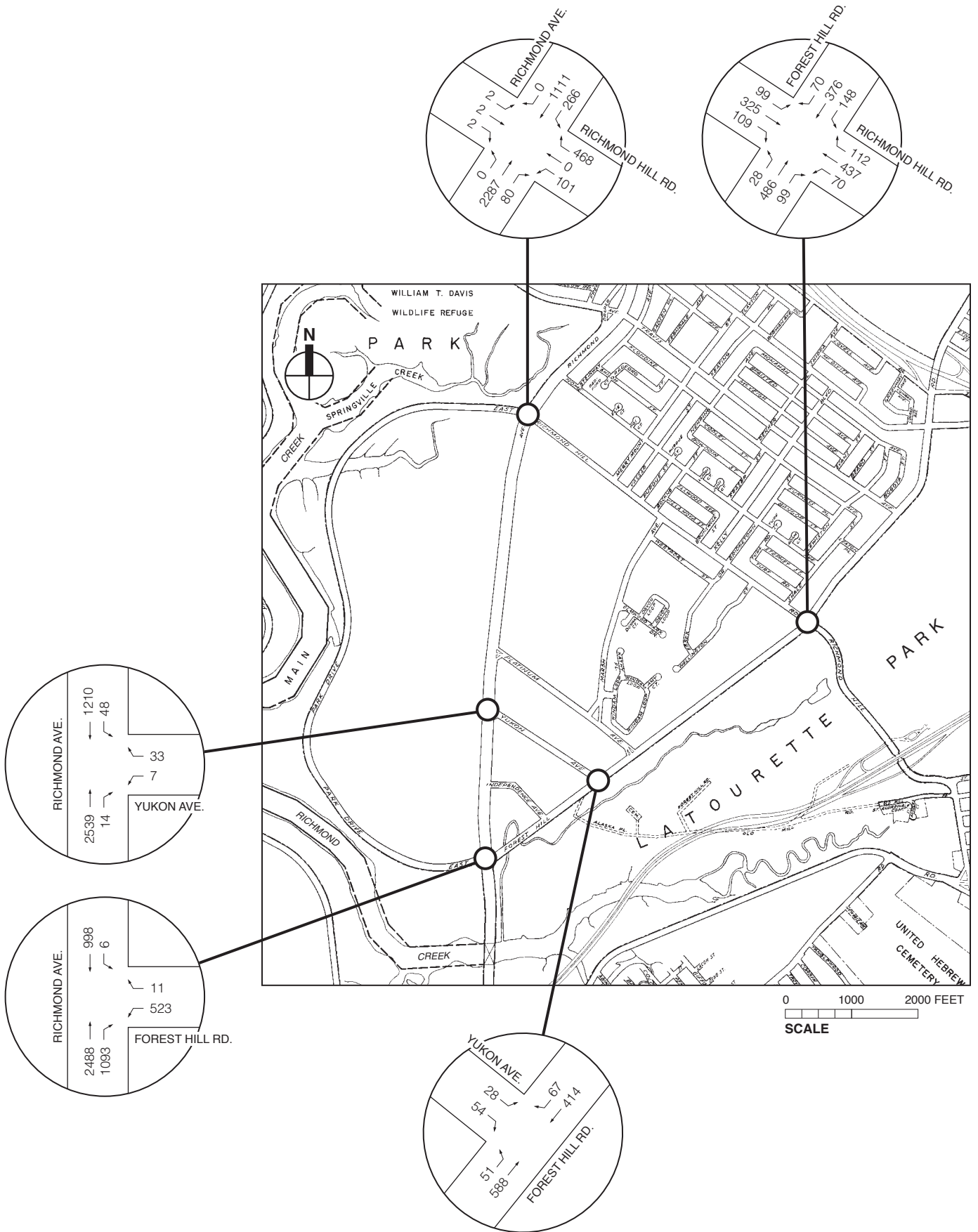
Yukon Avenue Alternative  
Existing Traffic Volumes  
Weekday PM Peak Hour  
**Figure 22-32**



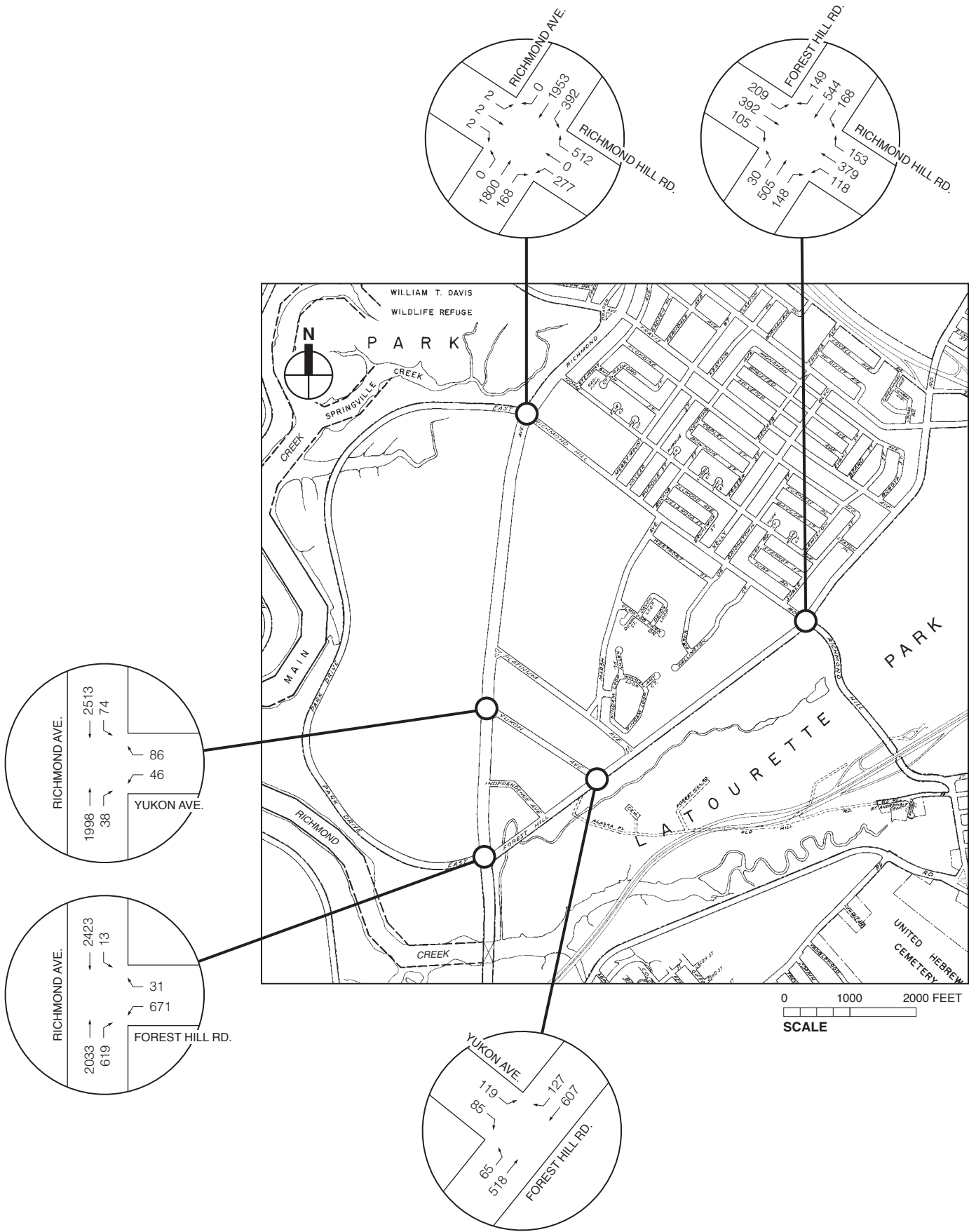
Yukon Avenue Alternative  
Existing Traffic Volumes  
Weekend Midday Peak Hour  
**Figure 22-33**



Yukon Avenue Alternative  
 Existing Traffic Volumes  
 Weekend PM Peak Hour  
**Figure 22-34**

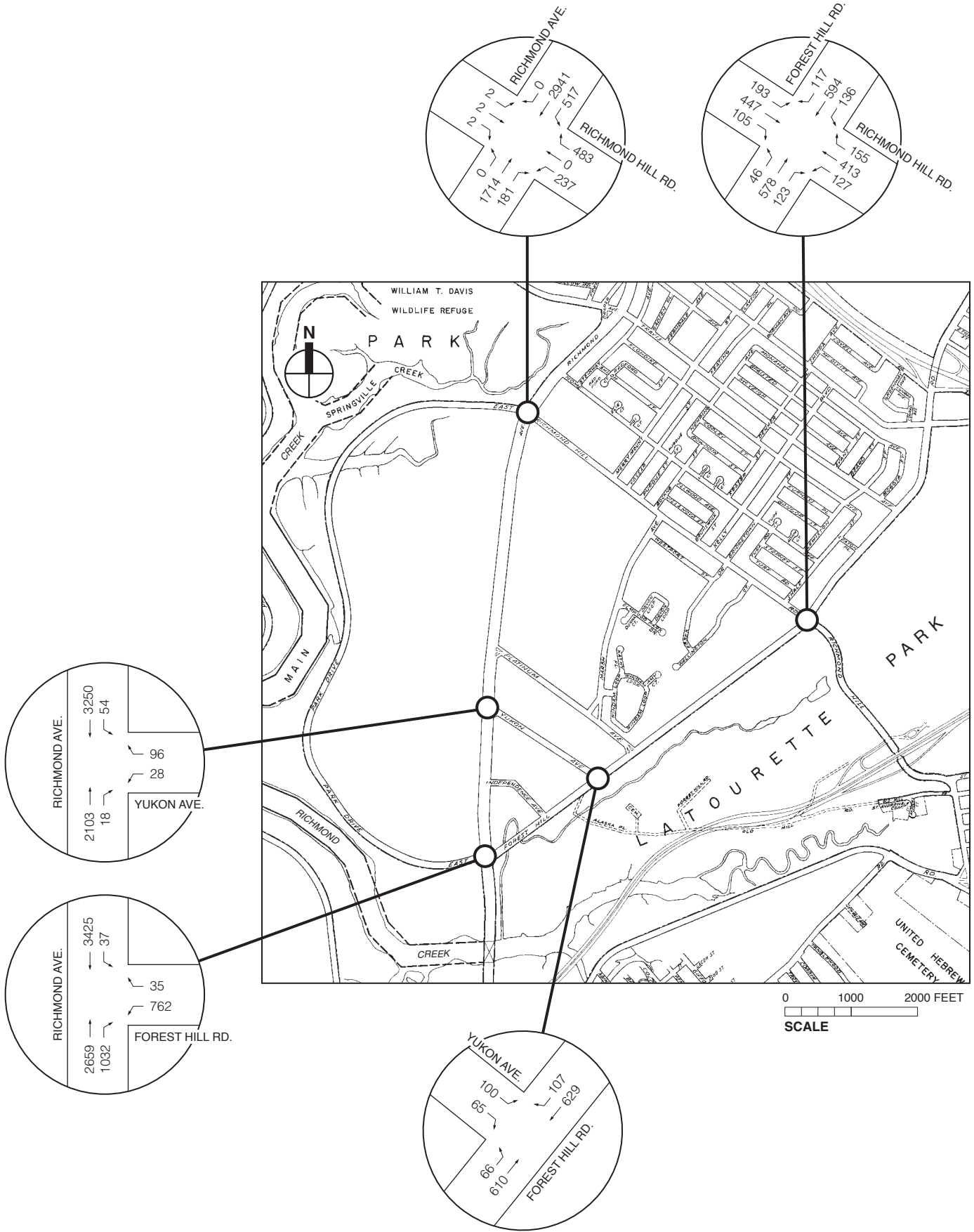


Yukon Avenue Alternative  
 2016 No Build Traffic Volumes  
 Weekday AM Peak Hour  
**Figure 22-35**

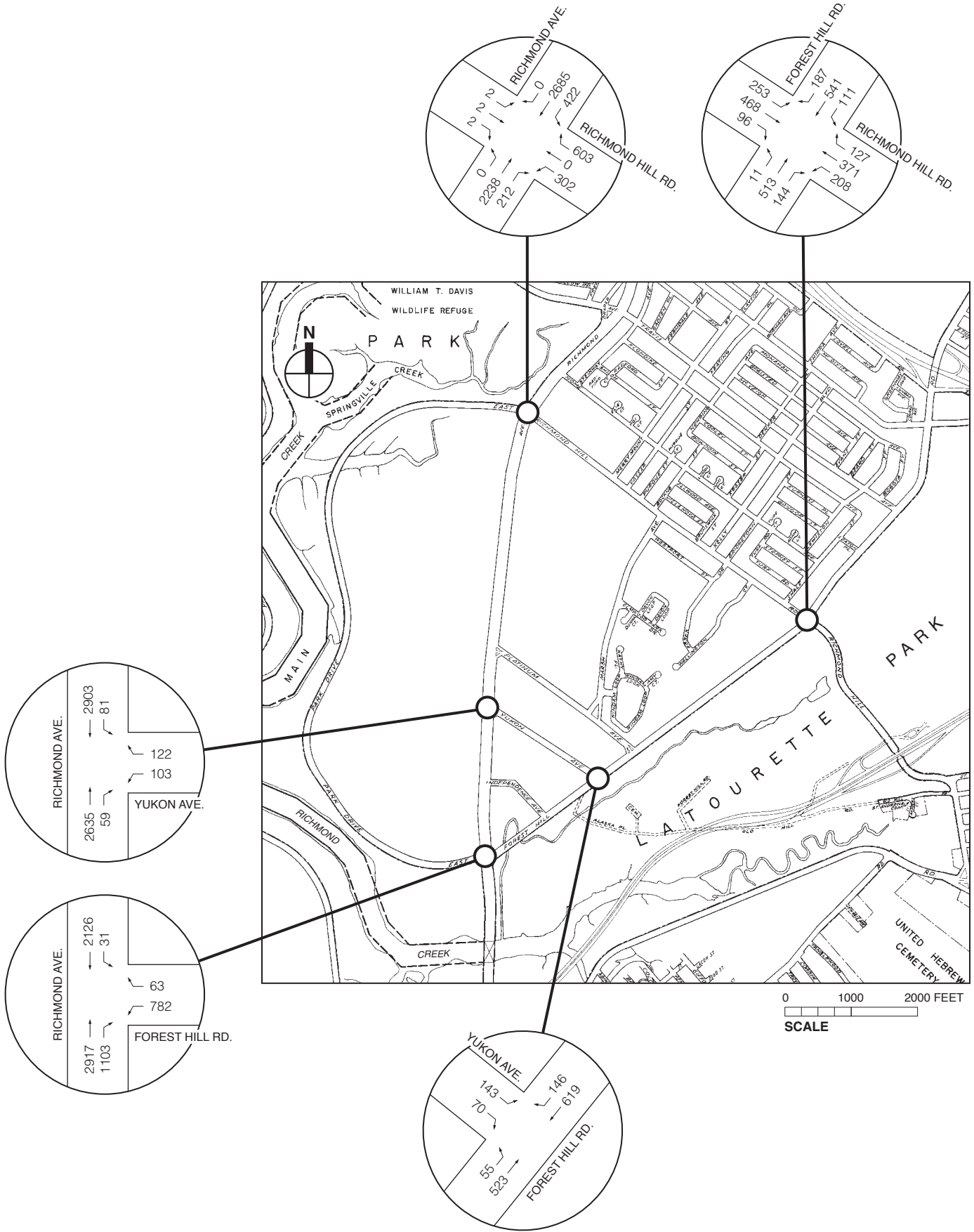


Yukon Avenue Alternative  
 2016 No Build Traffic Volumes  
 Weekday Midday Peak Hour  
**Figure 22-36**

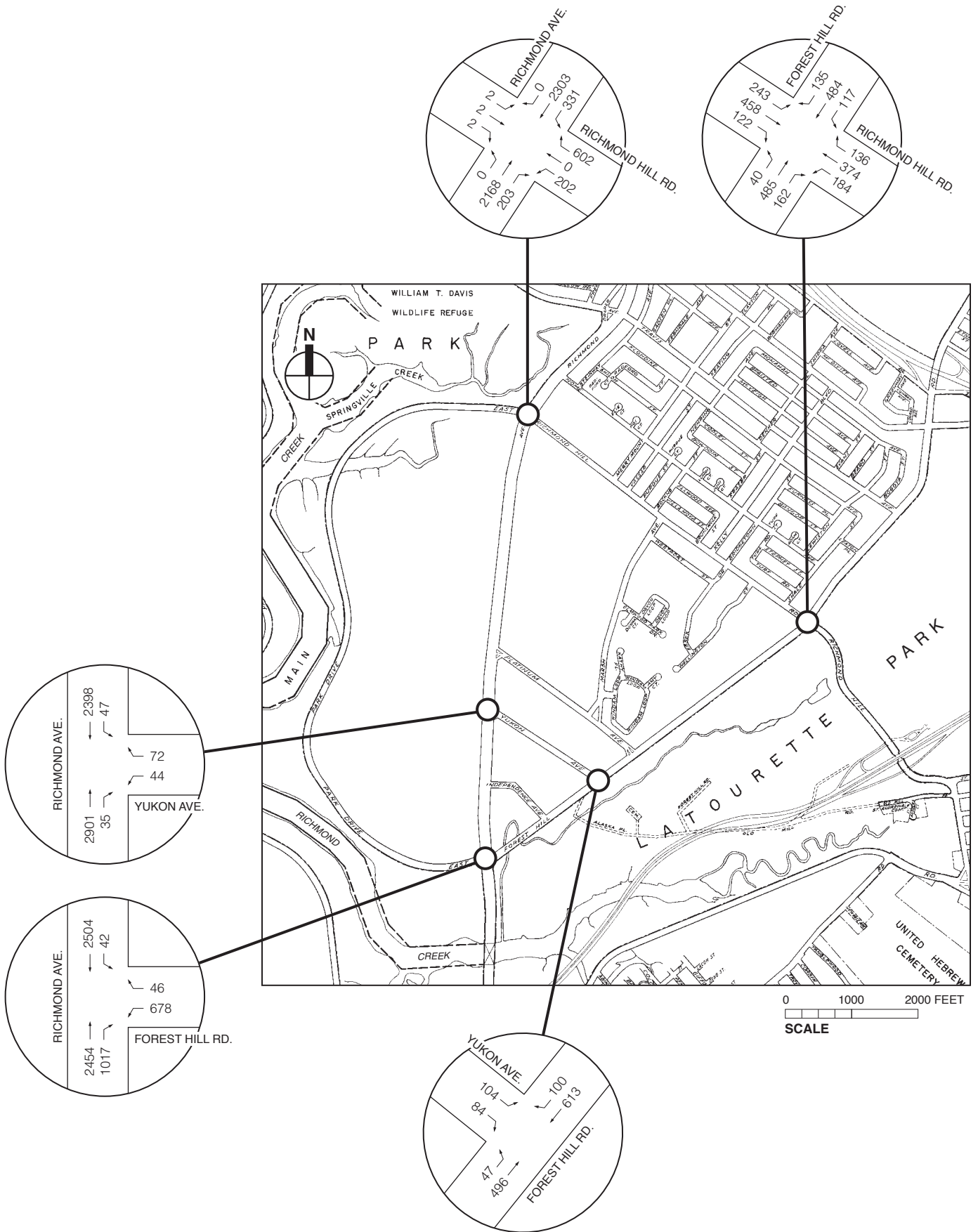




Yukon Avenue Alternative  
 2016 No Build Traffic Volumes  
 Weekday PM Peak Hour  
**Figure 22-37**

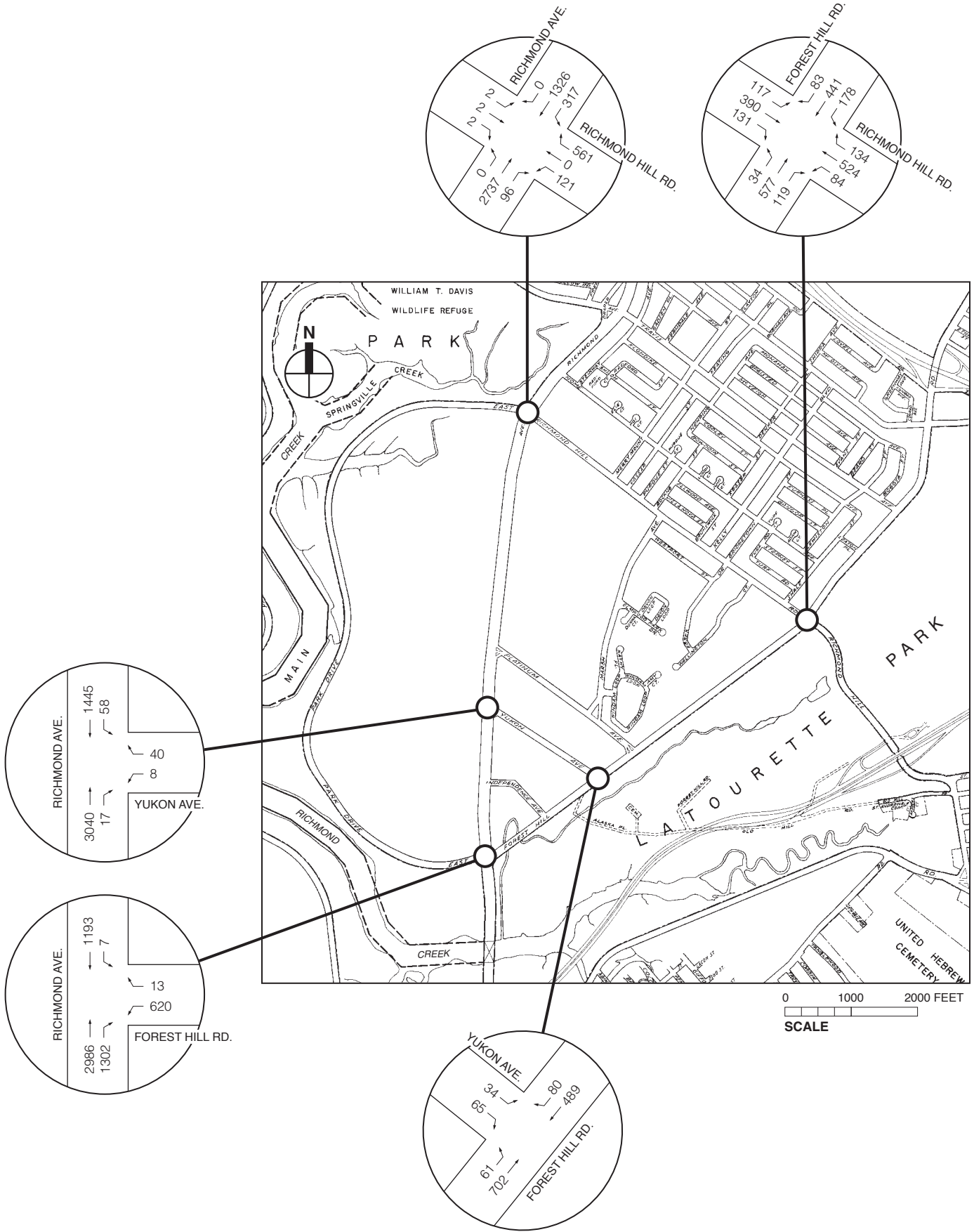


Yukon Avenue Alternative  
 2016 No Build Traffic Volumes  
 Weekend Midday Peak Hour  
**Figure 22-38**

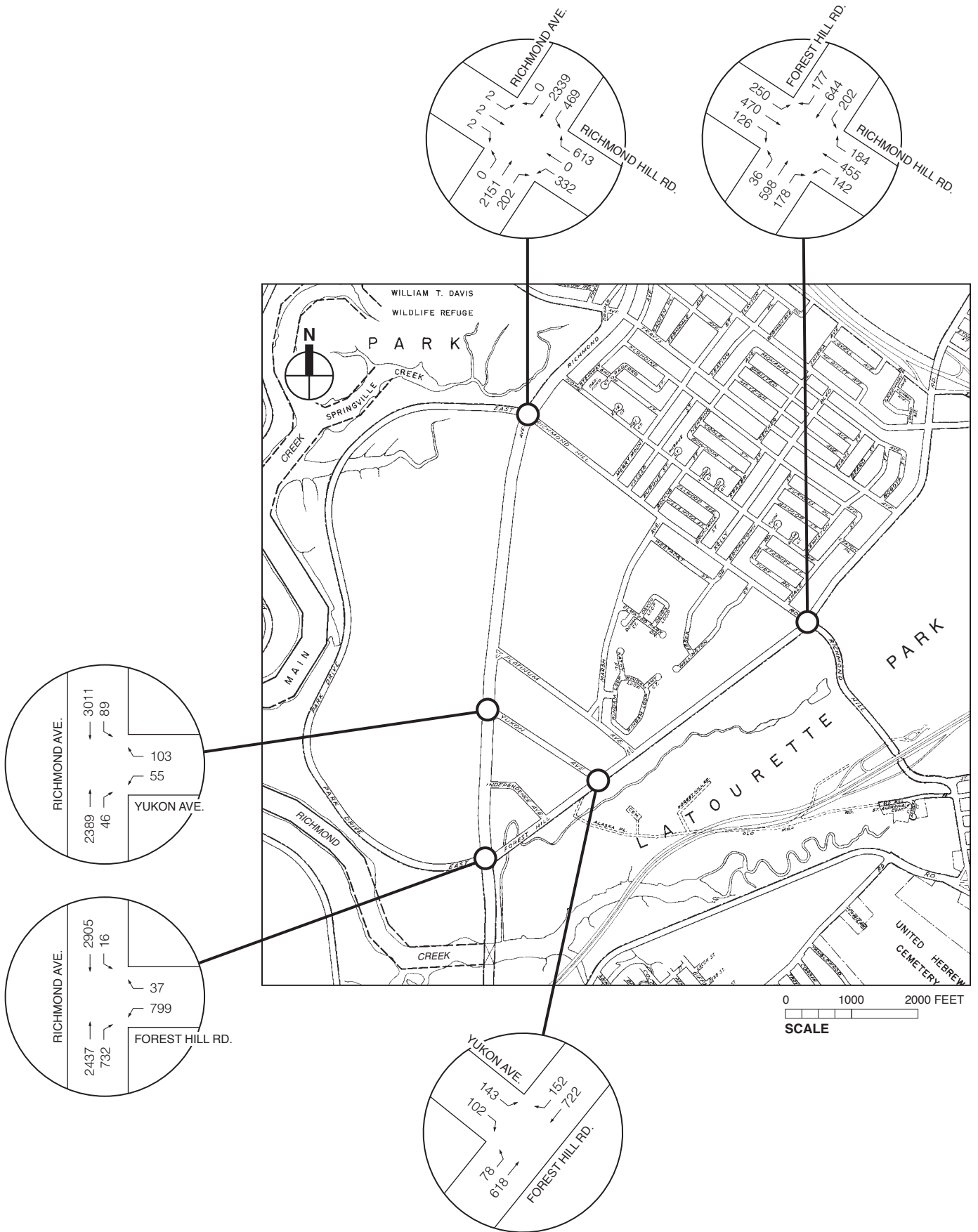


Yukon Avenue Alternative  
 2016 No Build Traffic Volumes  
 Weekend PM Peak Hour  
**Figure 22-39**

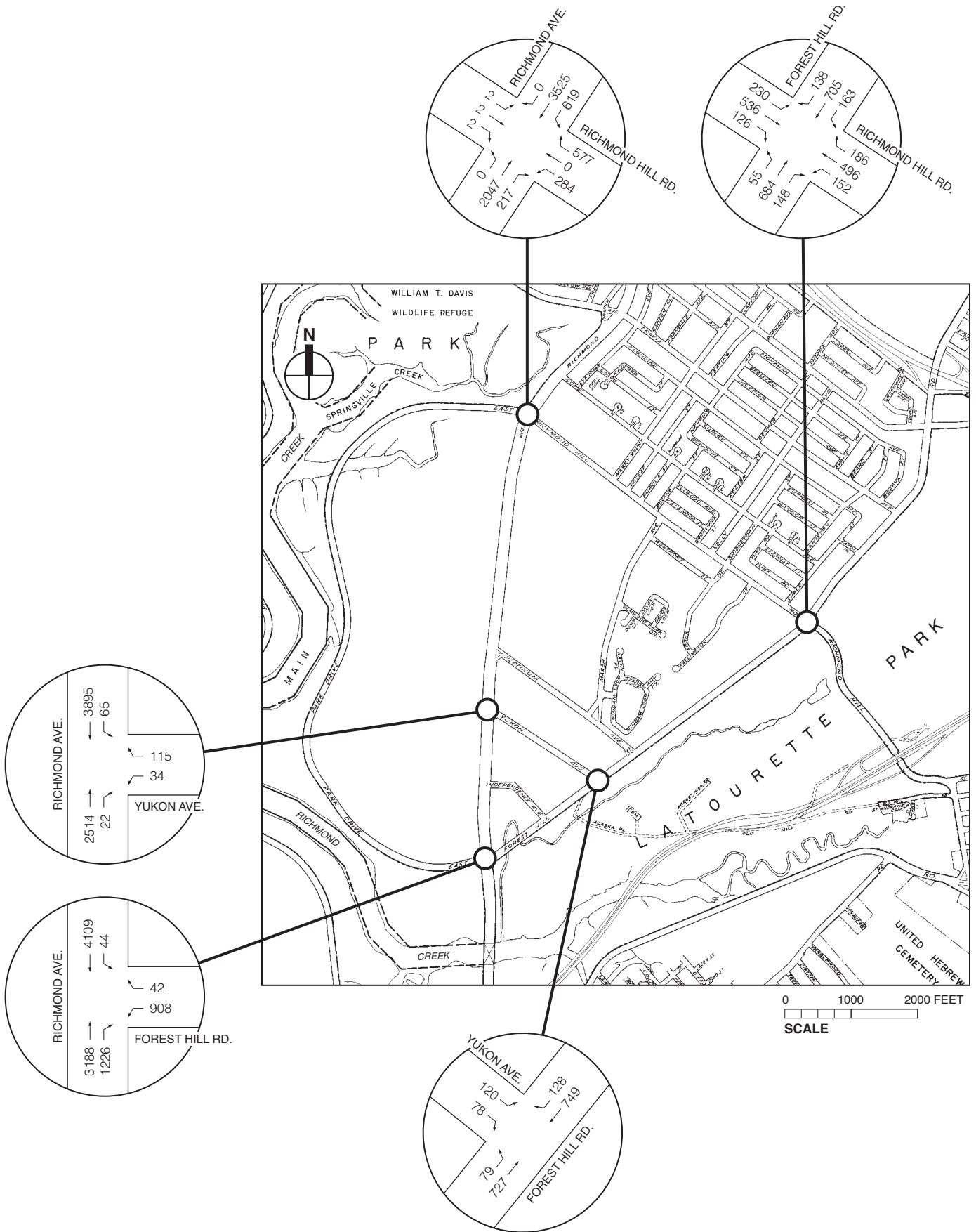




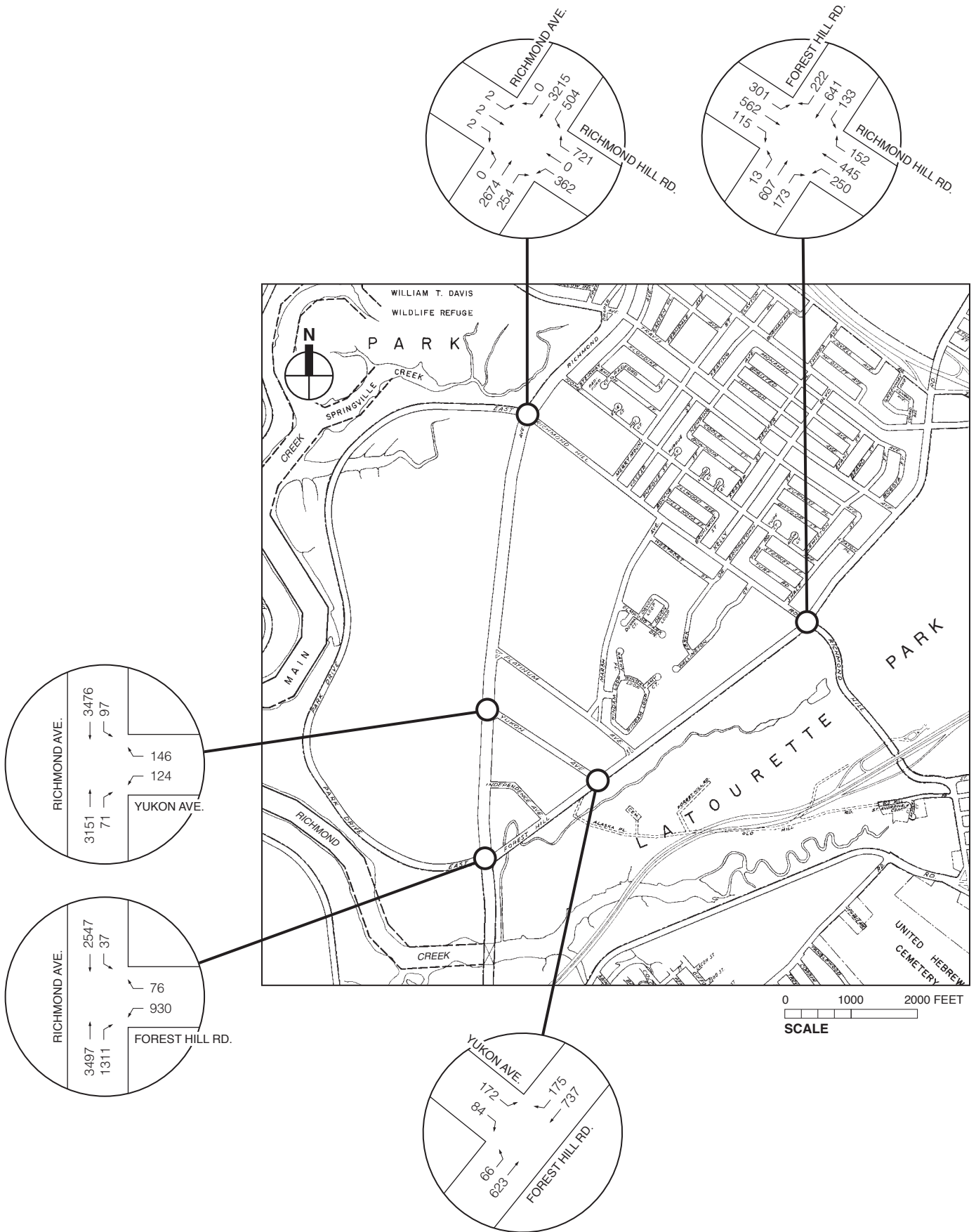
Yukon Avenue Alternative  
 2036 No Build Traffic Volumes  
 Weekday AM Peak Hour  
**Figure 22-40**



Yukon Avenue Alternative  
 2036 No Build Traffic Volumes  
 Weekday Midday Peak Hour  
**Figure 22-41**



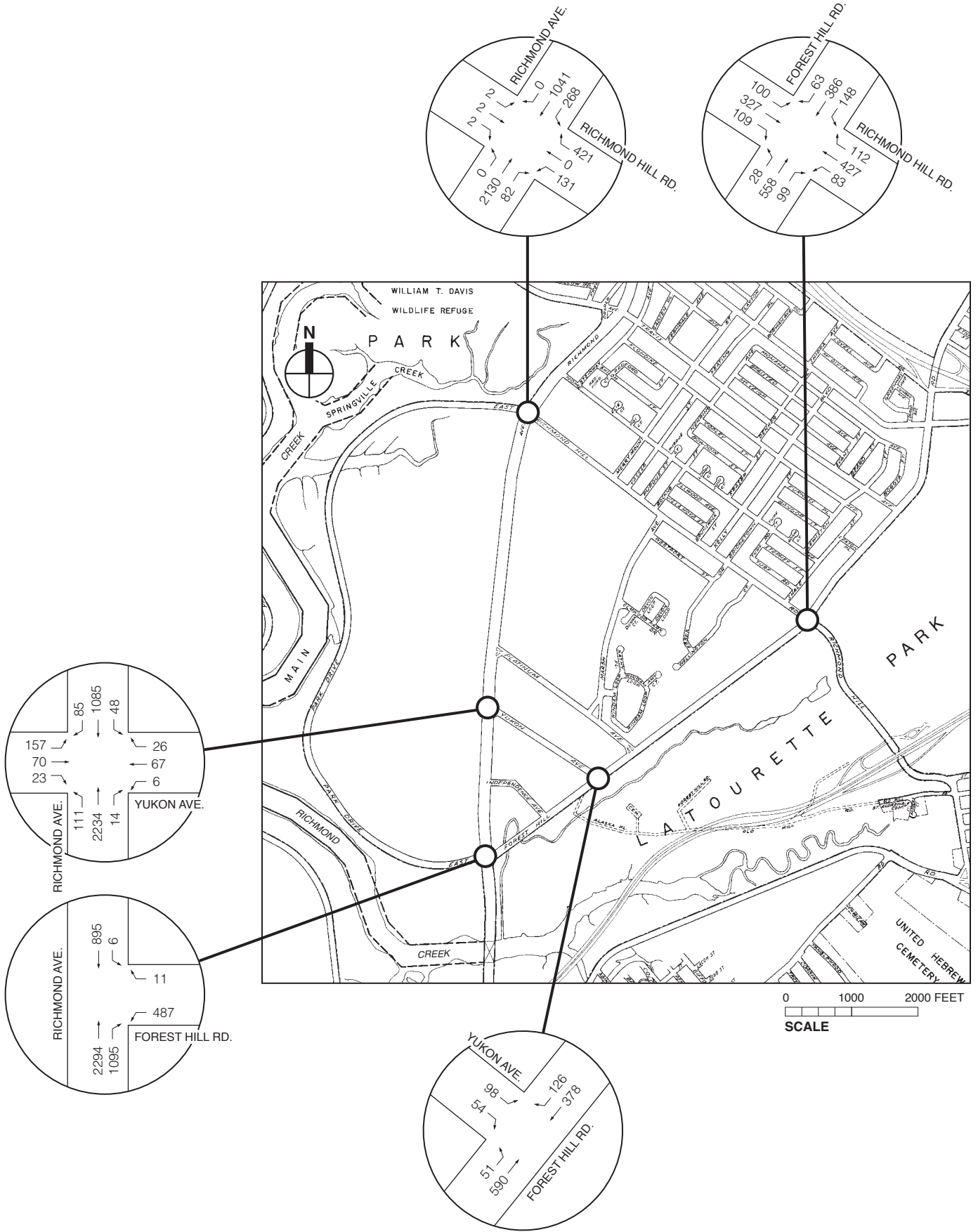
Yukon Avenue Alternative  
 2036 No Build Traffic Volumes  
 Weekday PM Peak Hour  
**Figure 22-42**



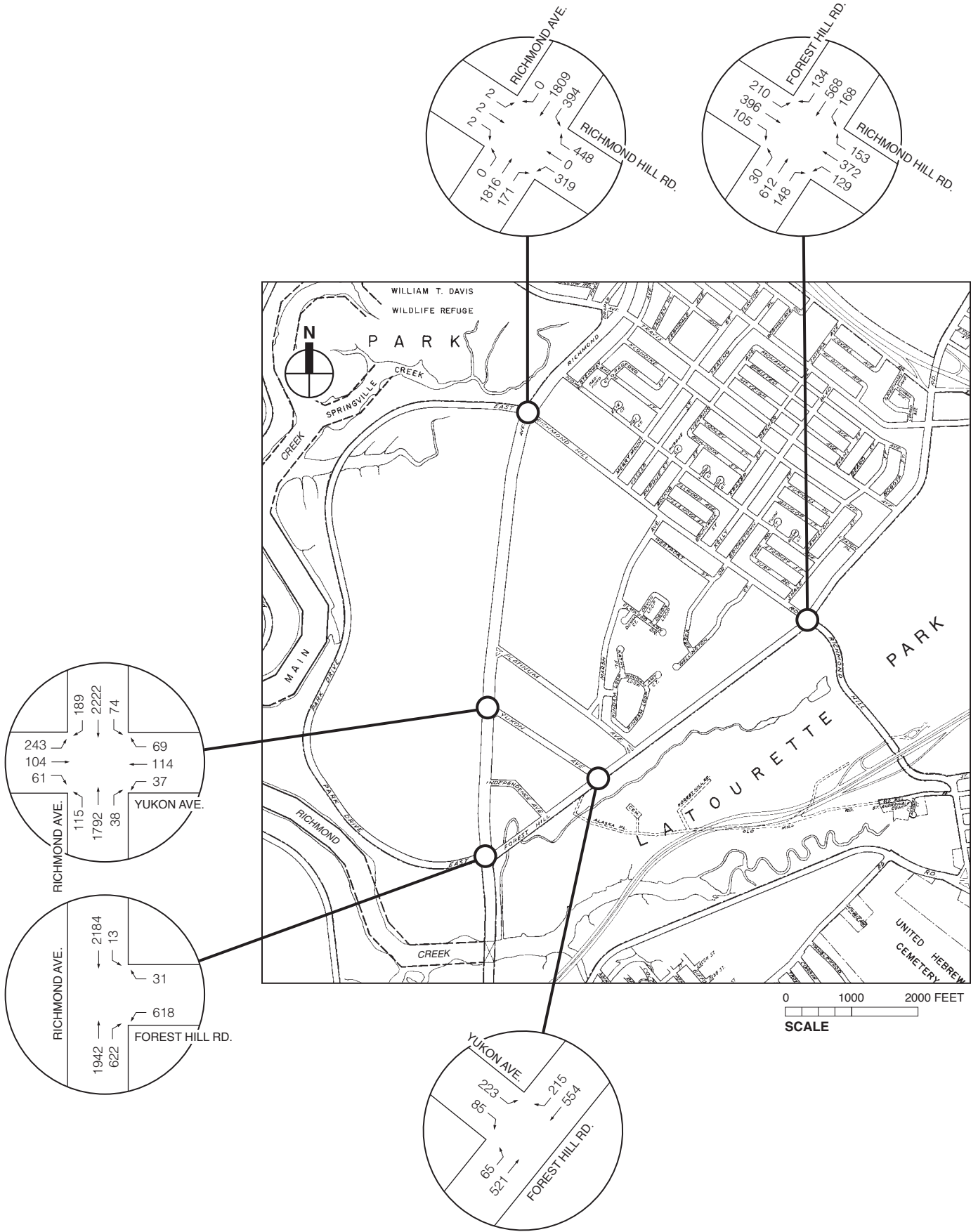
Yukon Avenue Alternative  
 2036 No Build Traffic Volumes  
 Weekend Midday Peak Hour  
**Figure 22-43**



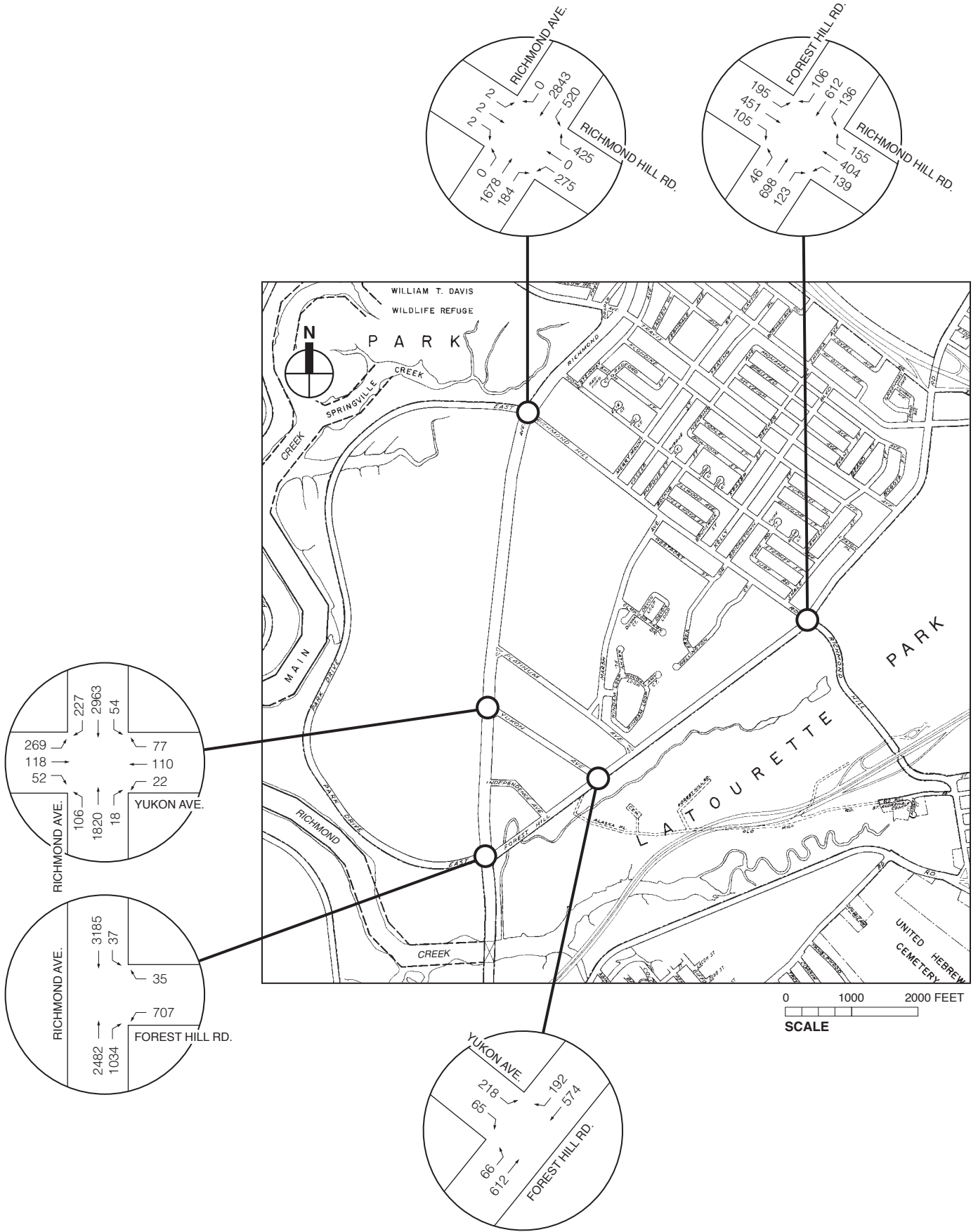




Yukon Avenue Alternative  
 2016 Build Traffic Volumes  
 Weekday AM Peak Hour  
**Figure 22-45**

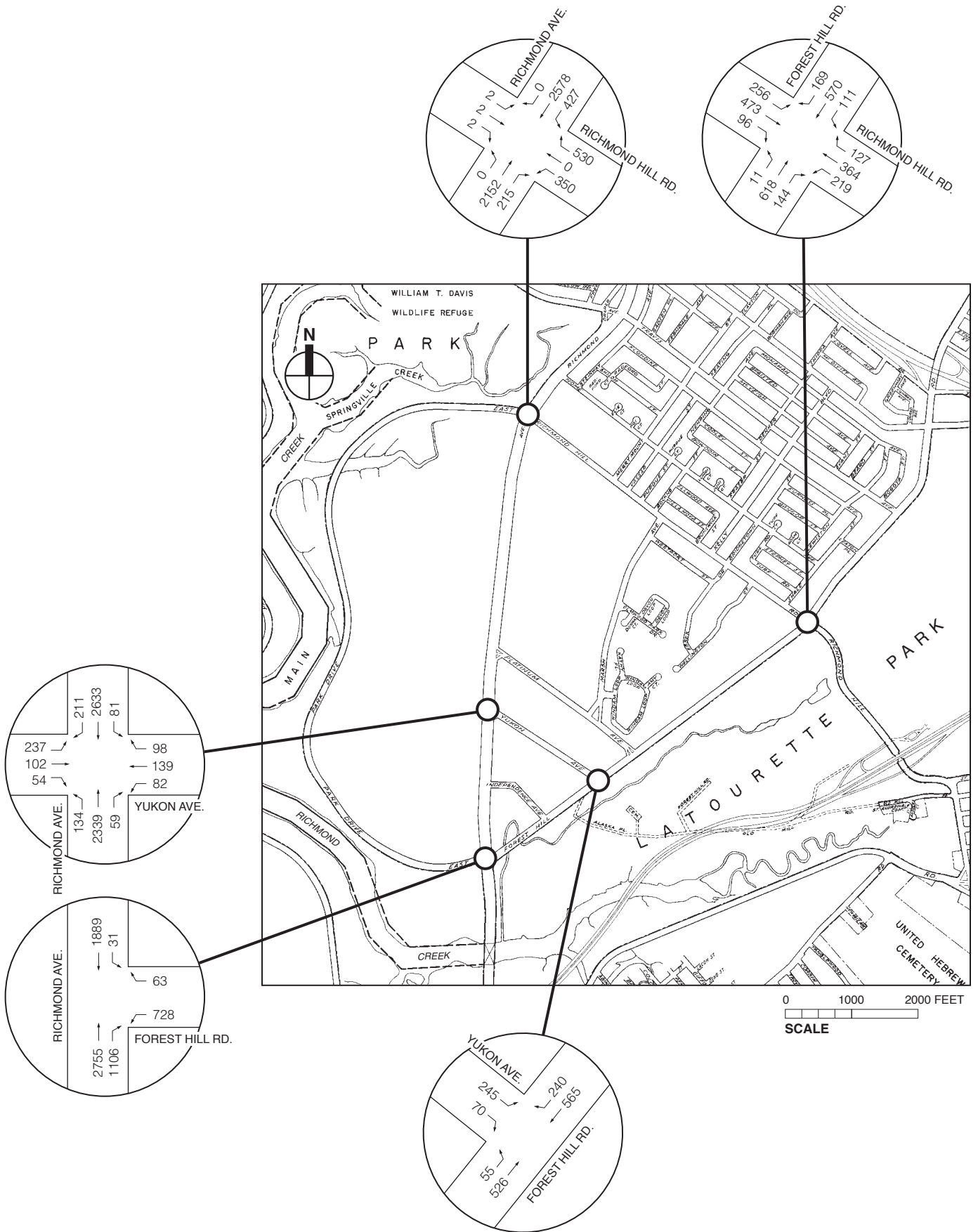


Yukon Avenue Alternative  
 2016 Build Traffic Volumes  
 Weekday Midday Peak Hour  
**Figure 22-46**

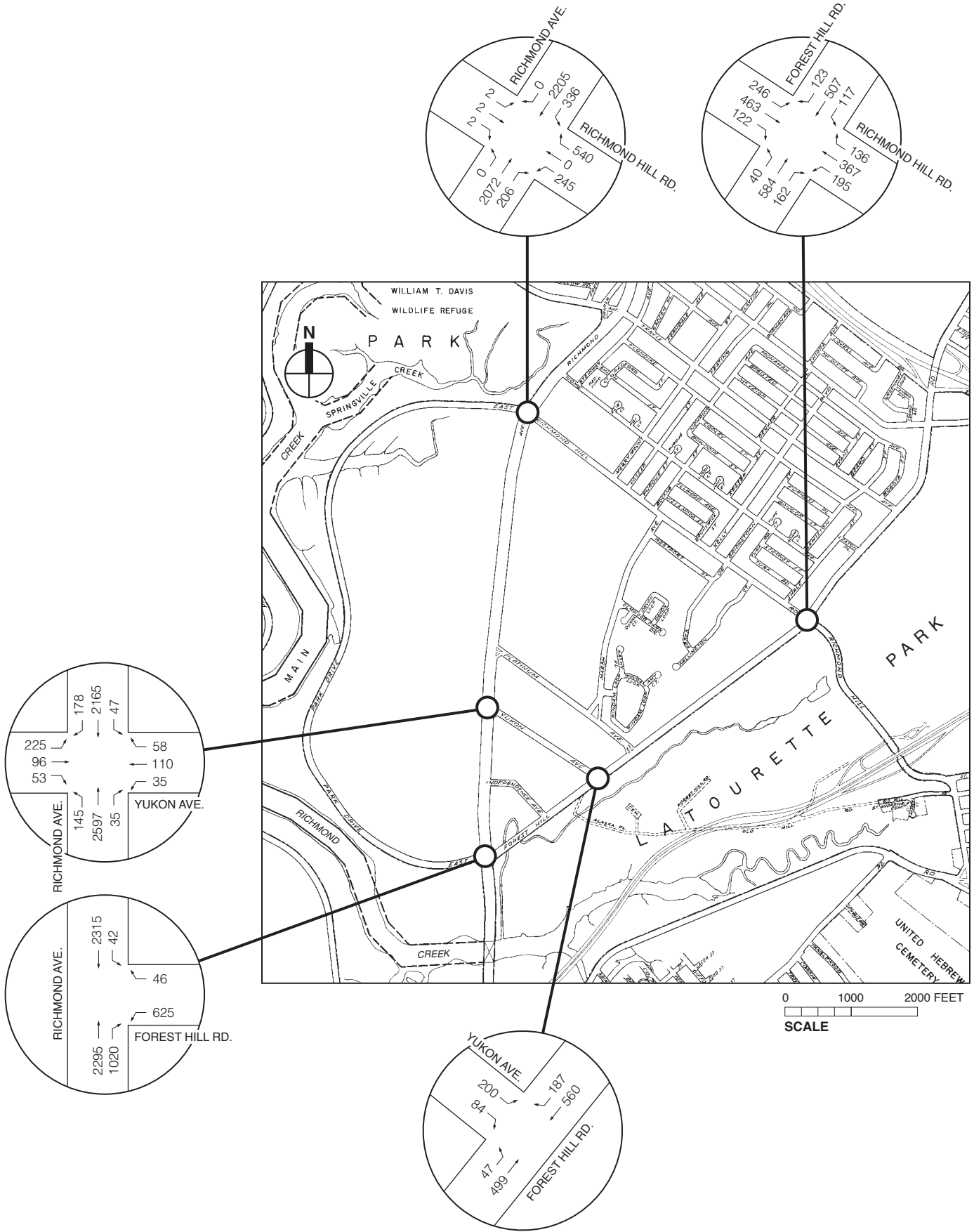


Yukon Avenue Alternative  
 2016 Build Traffic Volumes  
 Weekday PM Peak Hour  
**Figure 22-47**

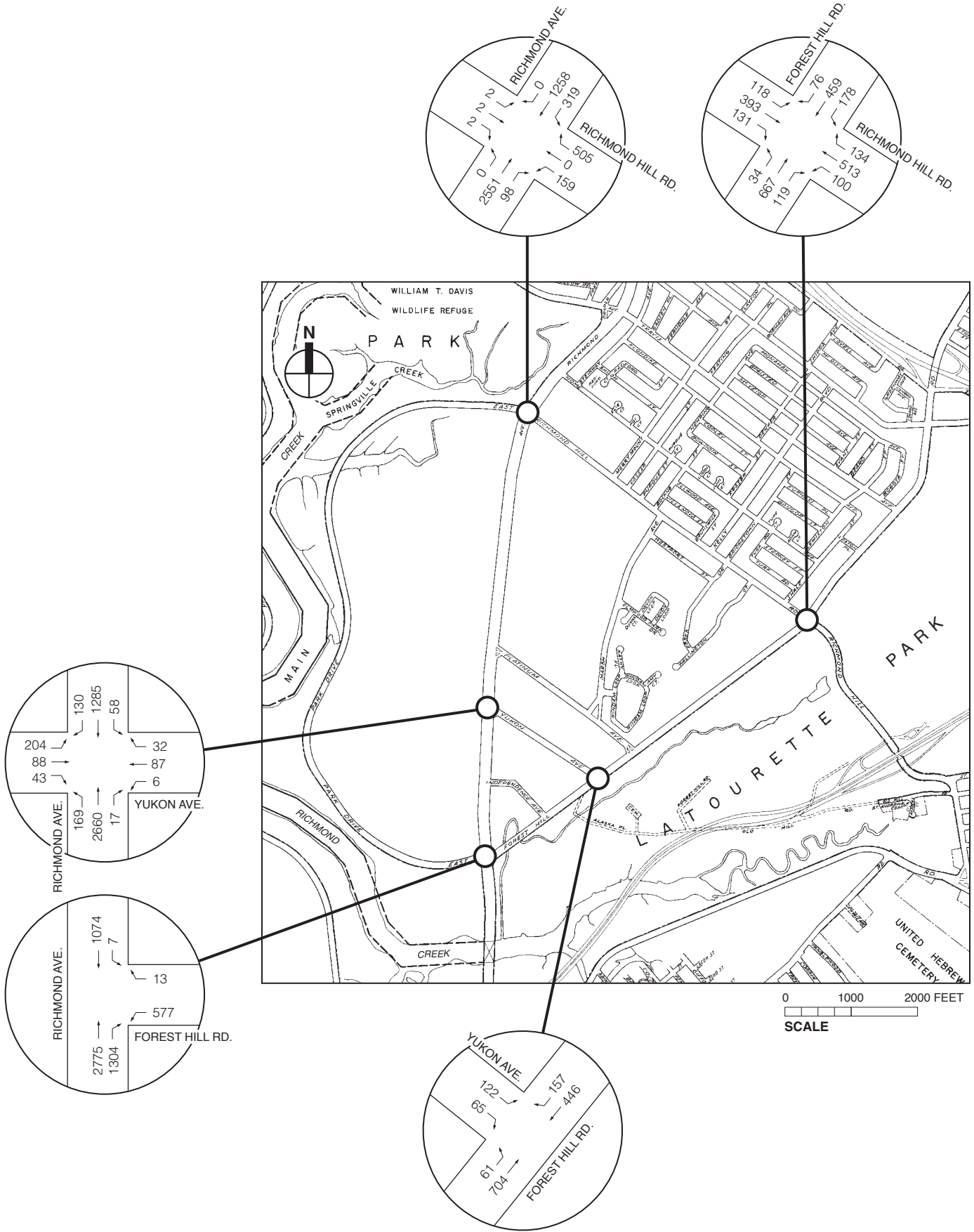




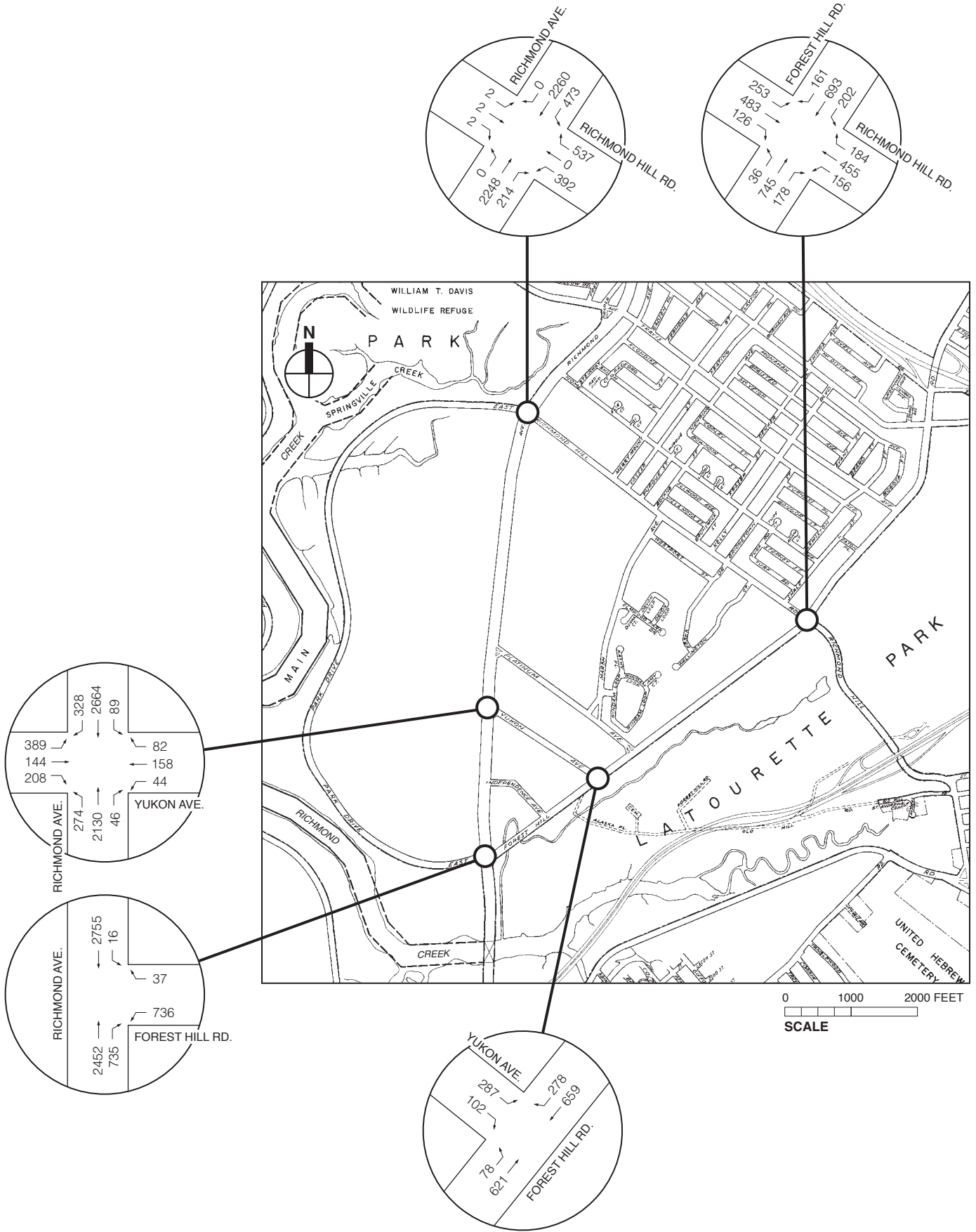
Yukon Avenue Alternative  
 2016 Build Traffic Volumes  
 Weekend Midday Peak Hour  
**Figure 22-48**



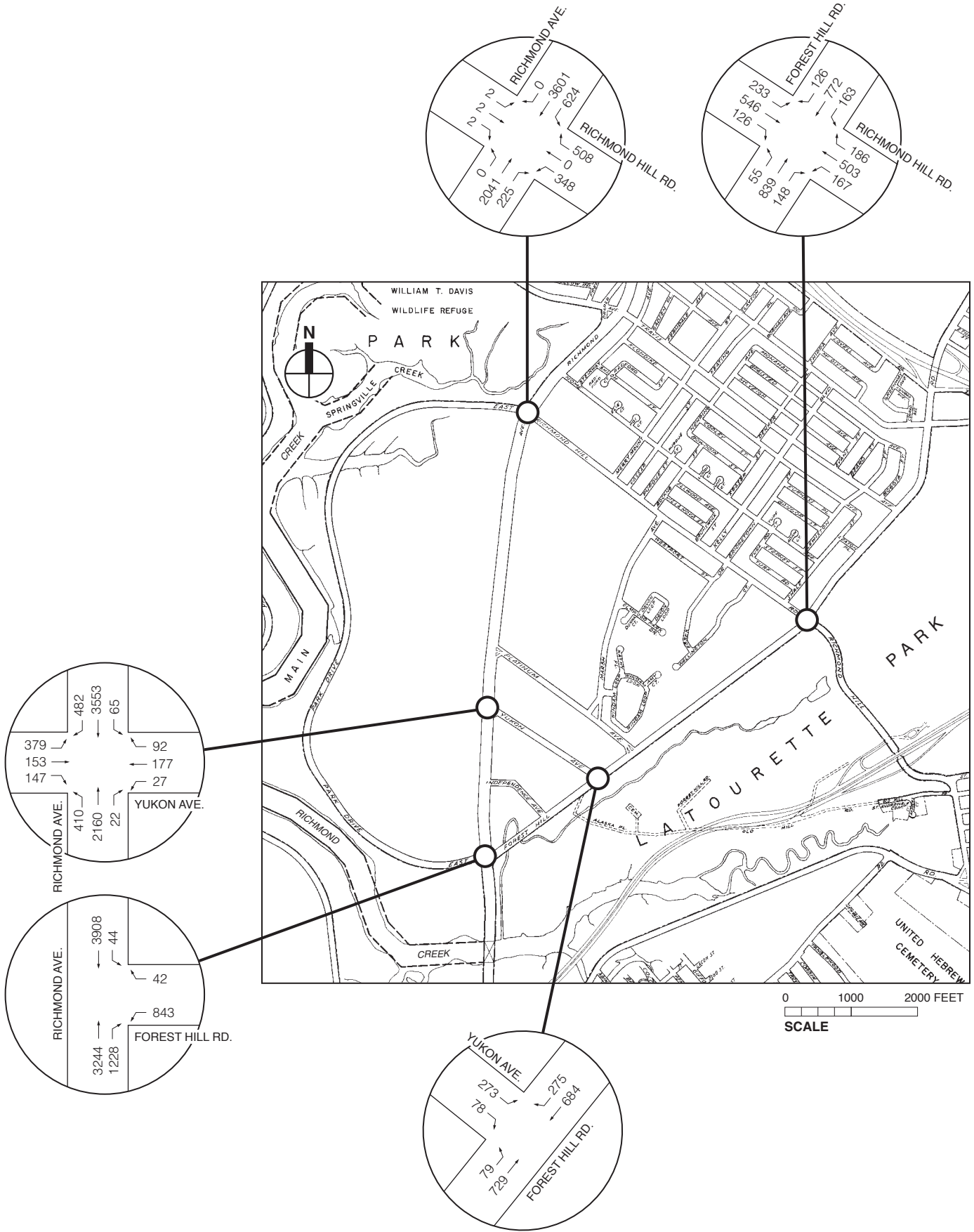
Yukon Avenue Alternative  
 2016 Build Traffic Volumes  
 Weekend PM Peak Hour  
**Figure 22-49**



Yukon Avenue Alternative  
 2036 Build Traffic Volumes  
 Weekday AM Peak Hour  
**Figure 22-50**

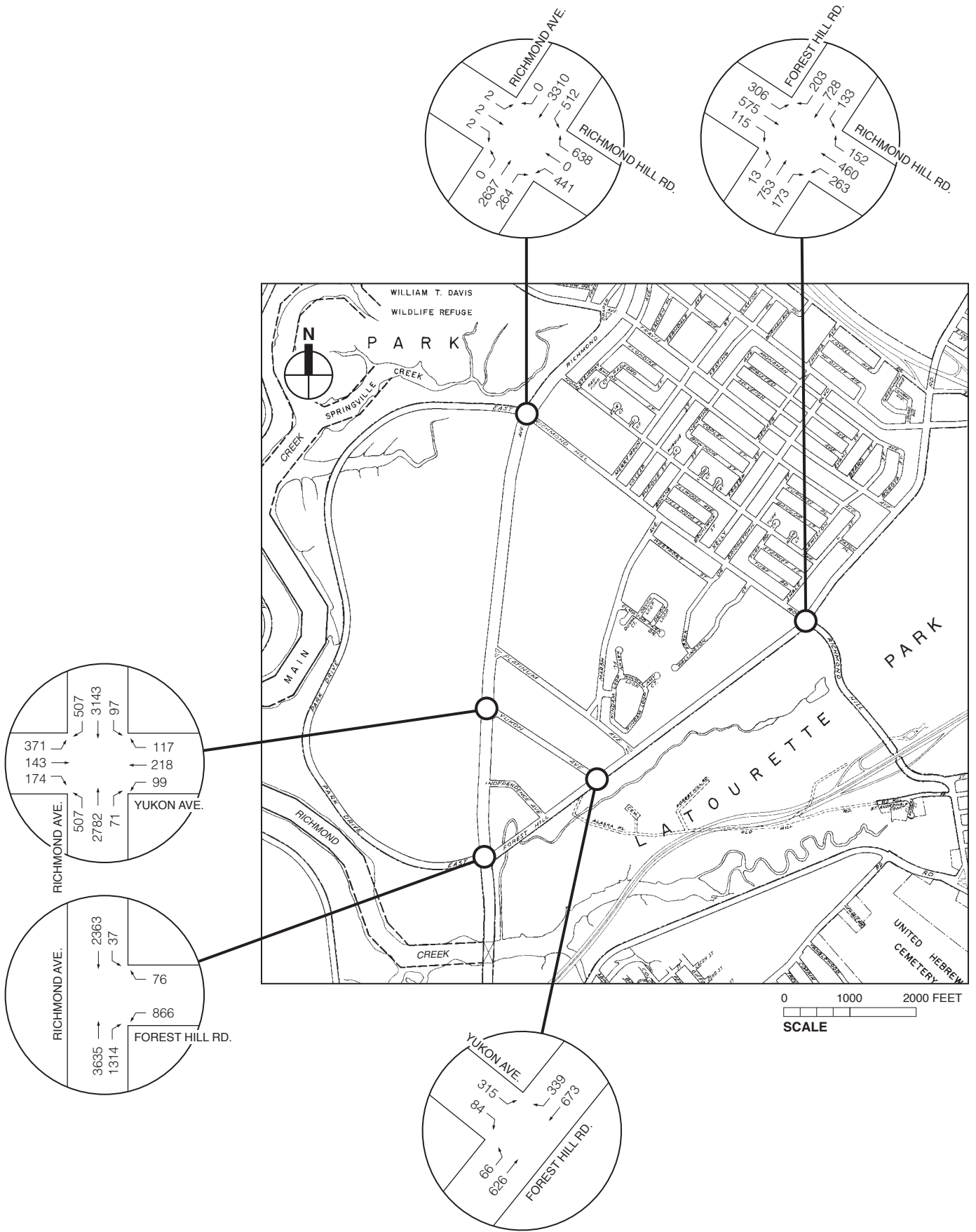


Yukon Avenue Alternative  
 2036 Build Traffic Volumes  
 Weekday Midday Peak Hour  
**Figure 22-51**

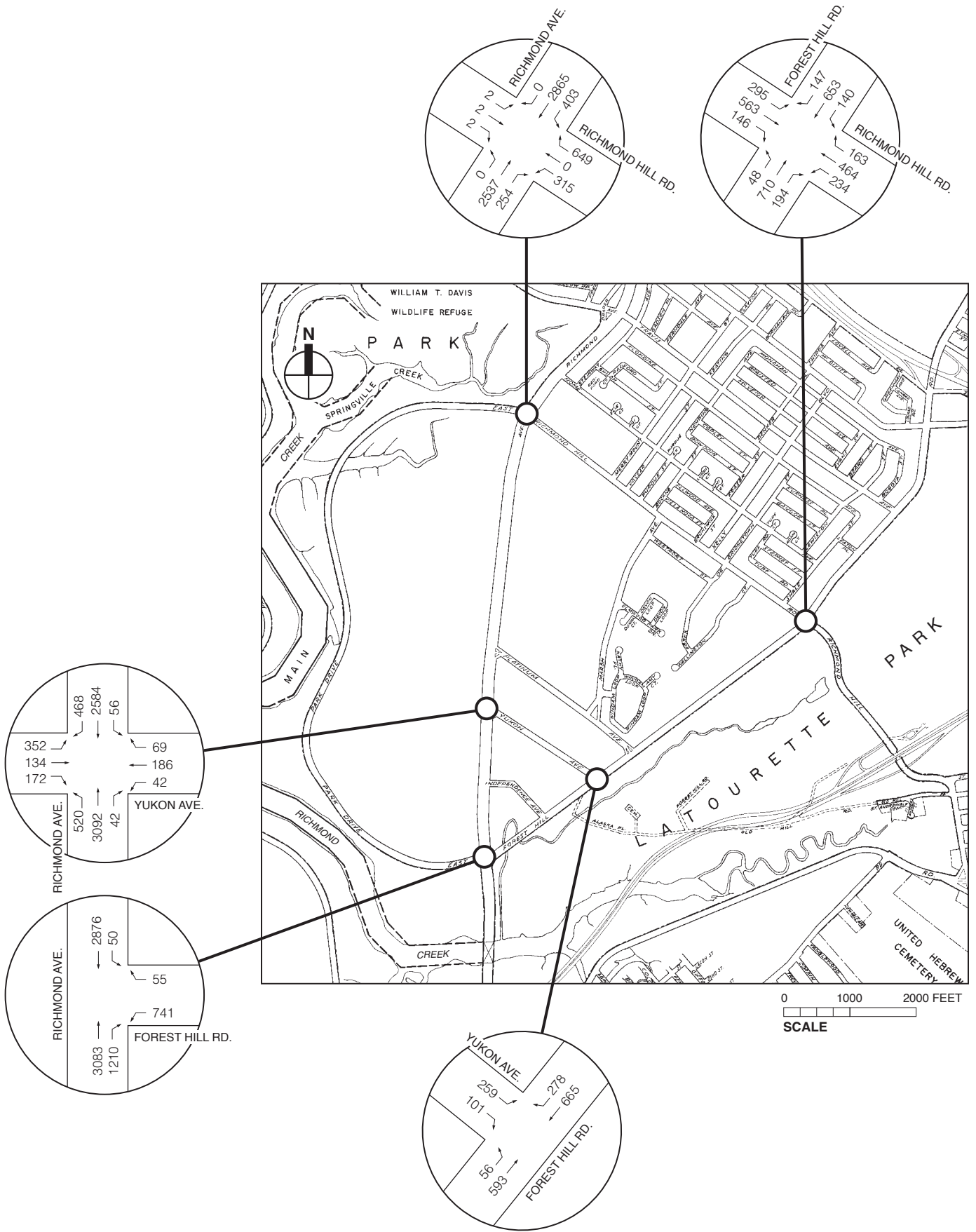


Yukon Avenue Alternative  
 2036 Build Traffic Volumes  
 Weekday PM Peak Hour  
**Figure 22-52**





Yukon Avenue Alternative  
 2036 Build Traffic Volumes  
 Weekend Midday Peak Hour  
**Figure 22-53**



Yukon Avenue Alternative  
 2036 Build Traffic Volumes  
 Weekend PM Peak Hour  
**Figure 22-54**