PREPARED FOR:
DISTRICT DIVISION OF TRANSPORTATION

Klingle Road

FEASIBILITY STUDY

AUGUST 2001

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Washington, D.C.

District Division of Transportation

Executive Summary

EXECUTIVE SUMMARY

Throughout the preparation of this feasibility study, the District of Columbia, Department of Public Works, District Division of Transportation (DDOT) considered all correspondence, and other indications of interest or concern on the part of the public regarding the proposed project. Discussions were held with federal, state, and local officials to define project tasks. The resulting scope of study is indicated by the foregoing Table of Contents and the materials presented in the subsequent sections of the document and its incorporations by reference.

The scope of the project involved evaluating seven options for the future management of the approximately 0.7-miles-long Klingle Road right-of-way (ROW) located between Cortland Place and Porter Street. Since 1991, this section of Klingle Road has been closed to vehicular traffic. The Council of the District of Columbia never administratively closed it, however. The need to perform a feasibility study evolved when plans were developed in 1991 to reconstruct the roadway and stormwater and drainage system.

In August 1999, The Louis Berger Group, Inc. (Berger) was tasked by the DDOT to perform a traffic assessment and a feasibility study for the closed portion of Klingle Road. As part of this process, Berger identified potential uses, or options, for the Klingle Road ROW, which are:

- Option A: No Action
- Option B: No Build
- Option C: Green Space
- Option D: Bicycle, Recreation and Facility Management
- Option E: Rebuild Klingle Road to its Original Alignment
- Option F: Build Klingle Road to Accommodate Vehicular, Pedestrian and Bicycle Uses
- Option G: Build Klingle Road as a One-Lane (One-Way) Road with a Pedestrian/Bicycle Lane

These proposed options were evaluated based on their potential impacts on various environmental attributes, such as biology, water resources, traffic, socioeconomics, and cultural resources. A summary of the conclusions reached in this feasibility study for those site attributes found to potentially affect or be affected by the proposed options follows.

Geology, Topography, Soils

All of the proposed options include the repair of the existing retaining walls. Additionally, all of the proposed options, excluding the No Action Option, include the repair or the replacement of the stormwater and drainage system. Repairing the existing retaining walls and the existing stormwater and drainage system would afford short-term, minor impacts from construction activities, but would provide long-term benefits to the geology, topography, and soils in the project area. During construction, soil would be temporarily displaced to access the existing system. Appropriate sedimentation and erosion controls would be maintained at all times during construction. The repair of the existing system would result in long-term benefits to the geology, topography, and soils through the reduction of erosion and sedimentation into the valley from uncontrolled stormwater runoff. These short-term, minor impacts and long-term benefits would result under all of the options excluding the No Action Option.

Biological Resources

In assessing the environmental consequences of the proposed options to vegetation, wetlands, and wildlife, several areas were defined within the project area as “critical.” These critical areas include any location where trees greater or equal to 24-inches diameter breast height (dbh) occur; wetlands exist; or threatened and endangered species have been documented. No wetlands or threatened and endangered species occur within the project area. Locations where trees with a dbh of greater or equal to 24-inches occur are shown in Exhibit 3-6. Any construction activities in portions where large dbh trees are documented to occur should avoid the trees where possible and should incorporate best management practices (BMPs) into construction plans to minimize potential impacts.

All of the proposed actions, excluding the No Action Option, include repairs to the existing stormwater and drainage system. Repairing the existing system would create short-term, minor impacts, but would provide long-term benefits to the flora and fauna communities in the project area. Activities to repair the system would result in short-term, minor impacts by displacing vegetation and by disturbing wildlife during construction. Repair of the existing stormwater and drainage system would result in long-term benefits to the biological resources by reducing the adverse effects associated with high-flow events that have been magnified by the highly urbanized character of the surrounding area. Repair of the existing system should help to reduce erosion and subsequent sedimentation associated with high-flow storm events. On-going habitat degradation or loss associated with erosion, sedimentation, and degraded water quality would be reduced, resulting in an overall improvement in habitat quality within the project area. These short-term, minor impacts and long-term benefits would result under all of the following options excluding the No Action Option.

Water Resources

All of the proposed options include the repair of the existing retaining walls. Additionally, all of the proposed options, excluding the No Action Option include the repair or the replacement of the stormwater and drainage system. Repairing the existing retaining walls and the stormwater and drainage system would afford short-term, minor impacts from construction activities to water resources in the area, but would provide long-term benefits through the reduction of erosion and sedimentation into the valley from uncontrolled stormwater runoff. In addition, uncontrolled, untreated stormwater runoff would be effectively reduced, thus improving the overall water quality of the Klingle Creek. Reintroduction of vehicular traffic would potentially impact water resources, introducing oils and greases, and other pollutants into the system.

Floodplain Encroachment

Executive Order (EO) 11988 requires federal agencies to take action to minimize occupancy and modification of the floodplain. Specifically, EO 11988 prohibits federal agencies from funding construction in the 100-year floodplain unless there are no practicable options. Approximately half of the currently closed portion of Klingle Road is within the 100-year floodplain as indicated by the Flood Insurance Rate Maps, Community-Panel Numbers 110001-0010 and 110001-0020 and Federal Emergency Management Agency (FEMA) Q3 Flood Data for Washington, D.C. For all of the proposed options, design standards and construction activities would be prepared and would be conducted to minimize potential harm to or within the floodplain. The floodplain has been altered and would be altered no matter the Option chosen due to the need to rehabilitate the existing retaining wall. Increases in impervious surfaces within the drainage area have permanently altered the flows entering the system, thus affecting the drainage patterns.

Hazardous Materials

An Environmental Data Resources (EDR) Report was utilized for this feasibility study to search available databases relating to hazardous waste materials and storage within a 1.5-mile radius of the center point of the closed portion of Klingle Road. According to the EDR report, several contaminated or possibly contaminated sites with in the 1.5 mile radius have been included in federal and state databases, although most have been removed from critical status lists. Any of these options chosen, excluding the No Action Option would require a that a Phase I Environmental Assessment be conducted within the project area.

Air Quality

Air quality in the Washington metropolitan region (which includes Washington, D.C. has been improving steadily over the last ten years. The region exceeds the federal air quality standard for ozone. It is unlikely, that any build option would increase traffic, rather existing traffic patterns would shift, and therefore would not produce adverse short-term or long-term impacts on air quality. Ozone, one of the most serious pollutants, must be evaluated from a regional standpoint and is therefore not evaluated in this feasibility study.

Noise

Noise is one of the most-noticed environmental pollutants; therefore potential noise impacts should be carefully evaluated with special

consideration given to sensitive noise receptors, such as residences, businesses, schools, and parks in the project area. Klingle Road operated as a collector roadway until 1990 and no new construction of areas that might be considered sensitive noise receptors has occurred during the period of closure. All of the proposed options would produce short-term impacts from construction noise associated with the repair of retaining walls; Options C-G would produce short-term impacts from construction noise associated with and removal of the asphalt. Options E-G, which include the rebuilding of Klingle Road and its reopening to vehicular traffic, would have noise impacts on the adjacent areas, which are primarily residential and commercial and would necessitate additional noise analysis in accordance with FHWA regulations.

Land Use

None of the proposed options would impact current land use in the project study area. In the neighborhoods surrounding the project area, land use designations are not expected to be directly or indirectly altered by any of the proposed options.

Zoning

None of the proposed options would impact current zoning in the project study area. The majority of land in the area is zoned for residential and community business uses. In the neighborhoods surrounding the project area, current zoning is not expected to be directly or indirectly altered by any of the proposed options.

Socioeconomic Issues

It is unlikely that any of the proposed options would have any effect on businesses or migration in or out of the area. Permanent closure of the road would not have short-term or long-term impacts on economic development because the road has been closed since 1991 and surrounding businesses have had time to adjust to the resulting traffic patterns.

Eight census tracts within the study boundary were identified and used to build a community profile of the area surrounding Klingle Road (see Appendix B for Methodology). Census tracts are defined as small, locally delineated statistical areas, generally having stable boundaries and designed to have relatively homogeneous demographic characteristics. The population in the entire study area is predominantly white and higher in income level when compared to the citywide population. There are differences in income and racial composition between the tracts within the study area, however, based on the project's options, none of the tracts would experience short-term or long-term adverse impacts on minority and/or low-income residents in the study area.

Public Services and Utilities

The proposed options would have varying degrees of impact on services and utilities in the area. Failure to correct drainage problems, as proposed in the No Action Option, would result in further erosion and lack of ground coverage of existing underground storm, sewer and gas lines. Removal of the existing asphalt, as proposed in Options C and D, would also impact storm, sewer and gas lines, since it would lessen the ground coverage and support for such lines. Any design and construction activities for any of the proposed options would require close coordination with representatives from all utilities and services in the area. Options C and D, which involve the removal of the existing road bed may have long-term adverse impacts to both scheduled and emergency maintenance of several major utilities. WASA, WMATA and Washington Gas have stated their need to "access" utilities located in Klingle Valley and in the ROW. Design of access routes or feasibility of complete relocation of these utilities was not part of the scope of work for this study but should be taken into future consideration when deciding feasibility of any of the road removal option.

Traffic Circulation and Access to Residential and Commercial Areas

Klingle Road is listed as a collector for vehicular traffic on the District of Columbia's Functional Classification Map. Reopening Klingle Road would produce negligible long-term beneficial impacts to traffic congestion or safety at surrounding intersections. Given the limited size of the ROW, reopening Klingle Road would only lead to minor improvements in relieving congestion at surrounding intersections. A more detailed traffic study, including new

traffic count, would be necessary to fully determine impacts of reopening Klingle Road.

Cultural Resources

No fieldwork was conducted for this analysis. All information used was either archival in nature or readily available from the State Historic Preservation Office (SHPO) or the National Park Service. Review of the existing information indicates that three historic districts listed in the National Register of Historic Places bound the study area. If it were determined, through further analyses, that any of the proposed options would have an adverse effect on a historic district, the DDOT would develop a plan to mitigate the adverse effect, again in consultation with the SHPO and interested parties. The DDOT would fulfill this responsibility under Section 106 of the National Historic Preservation Act, in accordance with the Advisory Council on Historic Preservation Procedures for Protection of Historic Properties (36 CFR 800).

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1.0

Introduction

1.0 INTRODUCTION

1.1 BACKGROUND AND OVERVIEW

Klingle Road is located in northwest Washington, D.C. and runs west to northeast from the Washington National Cathedral to Beach Drive in Rock Creek Park (Exhibits 1-1 and 1-2). Klingle Road is listed as a collector for vehicular traffic on the District of Columbia's Functional Classification Map. Collectors serve to collect and to distribute traffic in residential and commercial areas with average daily traffic ranging between 2,000 and 8,000 vehicles per day and to provide direct access to a major traffic generator such as a Washington Metropolitan Area Transit Authority (WMATA) Metro station or a large complex of apartments.

The segment of Klingle Road between Porter Street and Cortland Place (approximate designations) was closed to vehicular traffic in 1991 because of deterioration of the roadway related to drainage failure. Failure of the drainage system has resulted in severe deterioration of the roadway, retaining walls, and underlying stormwater system (Exhibit 1-3). In August 1991, the U.S. Department of Transportation, Federal Highway Administration (FHWA) issued a Final Programmatic Section 4(f) Evaluation and Approval for Klingle Road from Woodley Road to Porter Street in anticipation of a reconstruction project for the closed portion of Klingle Road. A plan for reconstruction of the roadway and associated infrastructure was initiated at that time, but later was cancelled.

Klingle Road remains a right of way (ROW) on the federal-aid system and has not been administratively closed by the Council of the District of Columbia. Exhibit 1-4 shows the ROW. The District Division of Transportation (DDOT), under the District of Columbia Department of Public Works, is responsible for the maintenance of Klingle Road. Klingle Valley is the stream valley through which Klingle Creek flows before converging with Rock Creek. It includes the ROW and land owned by the National Park Service.

This document, together with its appendices and incorporations by reference, constitutes a feasibility study to be utilized in the transportation planning process. Its purpose is to present an analysis of the environmental consequences of a proposed strategy by the DDOT to determine the appropriate management of the Klingle Road ROW.

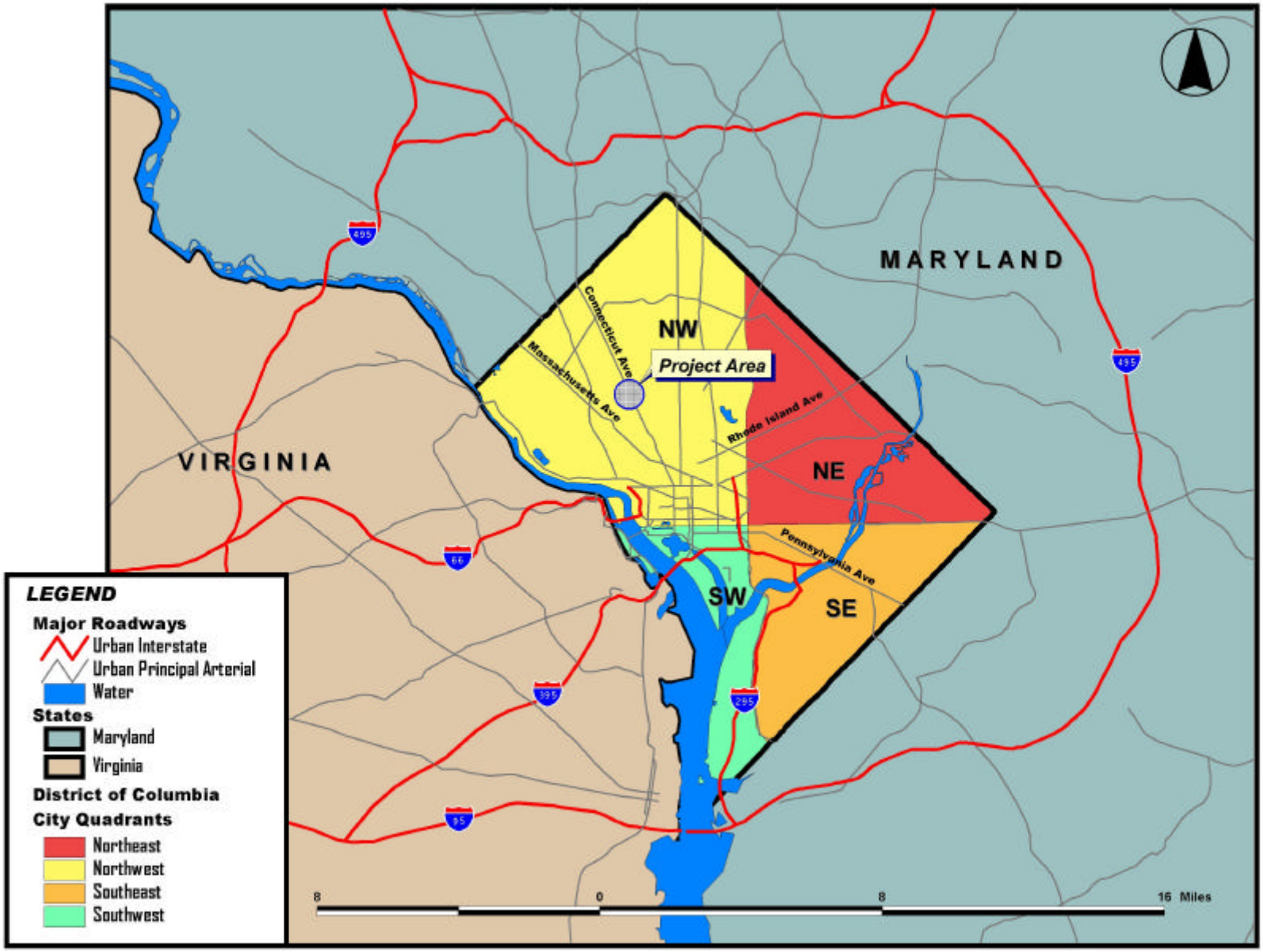
The need to perform this analysis evolved when plans were developed in 1991 to reconstruct the roadway and drainage system.

1.2 PROBLEM STATEMENT

A preferred option has not been identified by the DDOT as several options are under consideration. The purpose of the options under consideration is to determine the future management and use of the segment of Klingle Road that is currently closed to traffic between Porter Street and Cortland Place. The need for the study is to ensure proper management and maintenance of the closed portion of roadway on the federal-aid system as well as to address the deteriorating infrastructure associated with the roadway and the possible reopening of Klingle road as an east-west connection for vehicular traffic. All proposed options will address the environmental deterioration resulting from stormwater runoff and erosion.

EXHIBIT 1-1

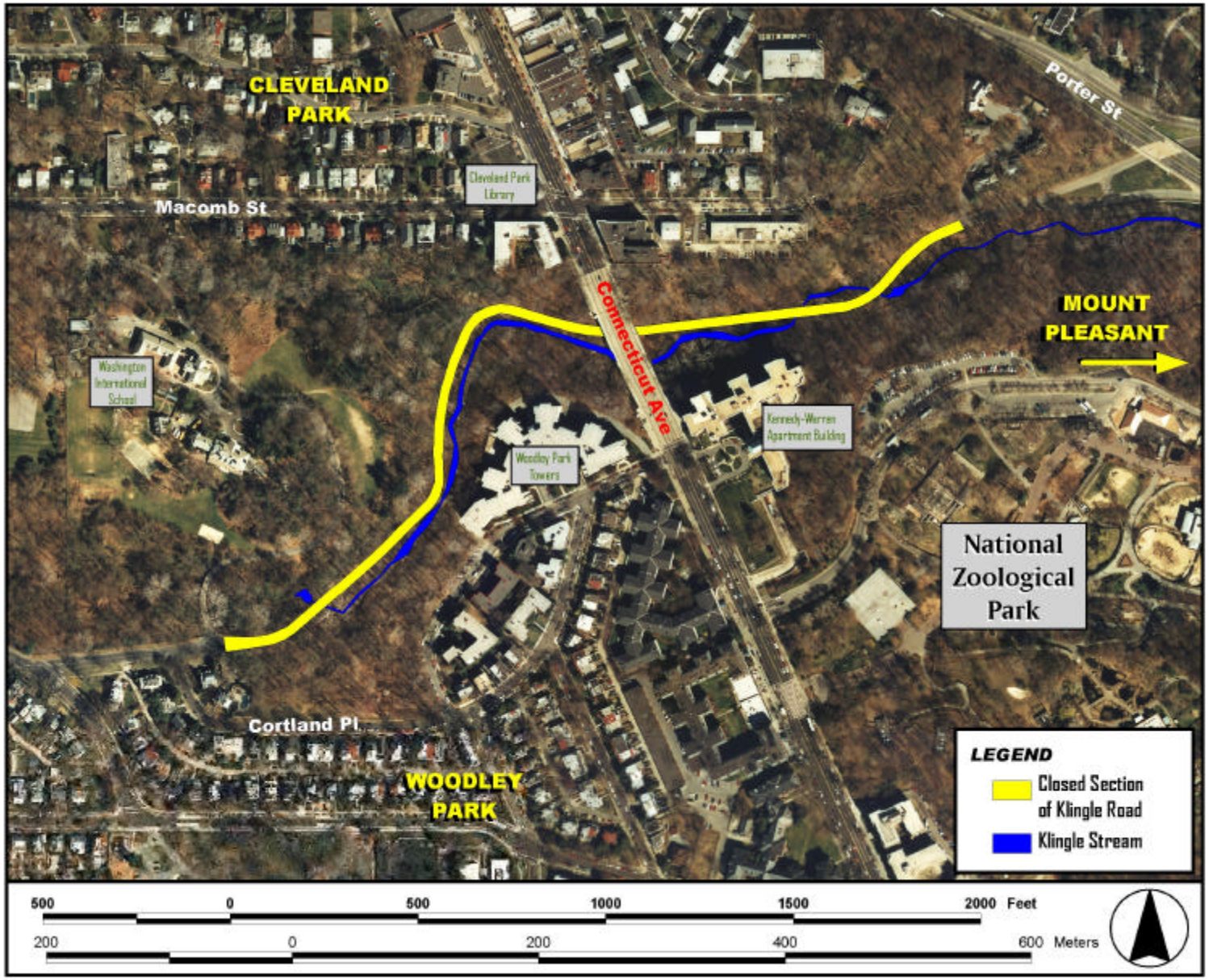
Regional Map



Source: ESRI Data & Maps, 1999.

EXHIBIT 1-2

Site Location Map



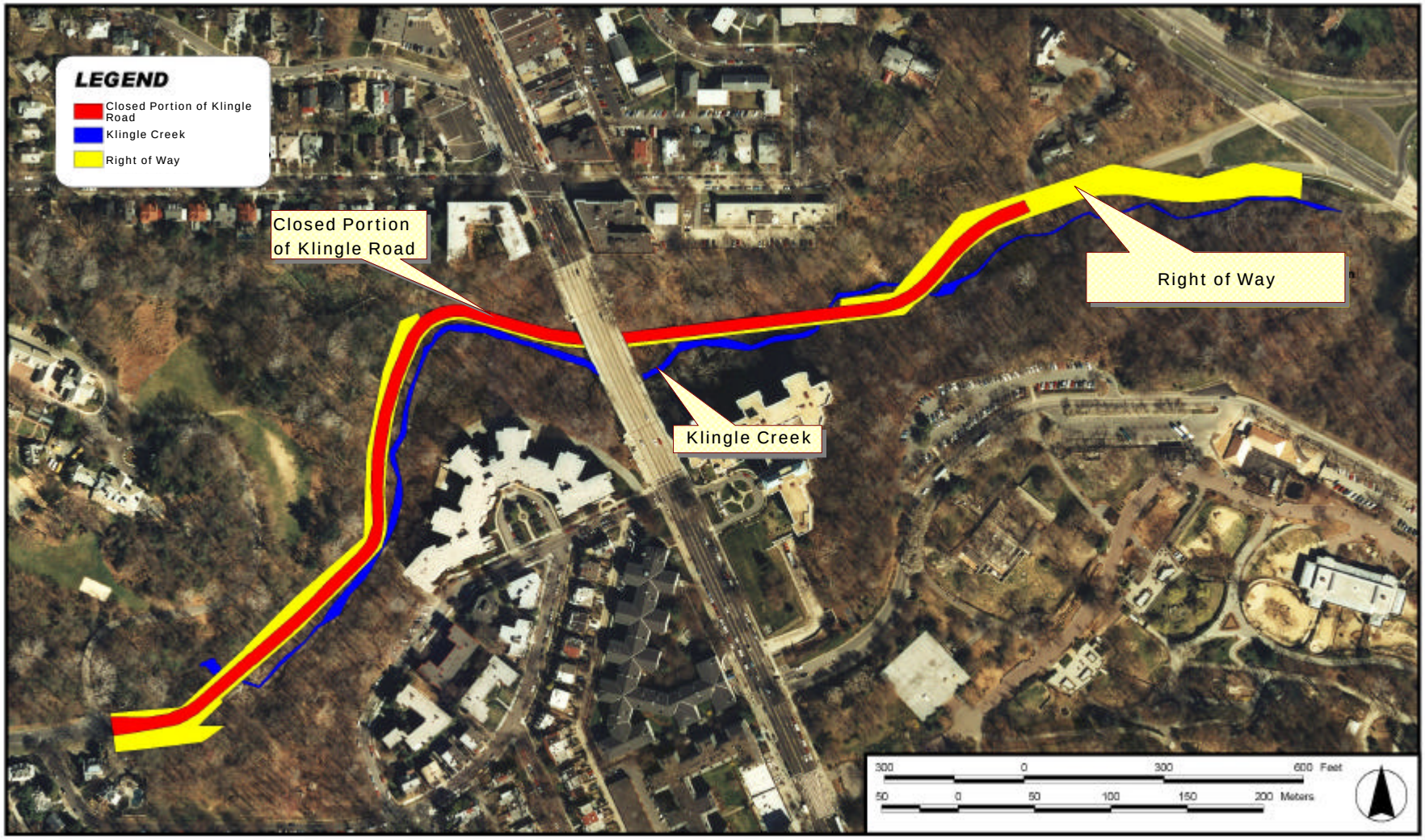
Source: National Capital Planning Commission (NCPC), 1995.

EXHIBIT 1-3 Photographs taken of Klingle Road during rain storm on April 4, 2000

Source: The Louis Berger Group, Inc.

EXHIBIT 1-4

Right of Way Map



Source: DPW, 1991 and NCPC, 1995.

2.0

Options

2.0 OPTIONS

This section provides a description of the options being considered for Klingle Road. The seven options being considered include the following:

- Option A: No Action
- Option B: No Build
- Option C: Green Space
- Option D: Bike, Recreation and Facility Management
- Option E: Rebuild Klingle Road to Its Original Alignment
- Option F: Rebuild Klingle Road to Accommodate Vehicular, Pedestrian and Bicycle Uses
- Option G: Build Klingle Road as One-Lane (One-Way) Road with a Pedestrian/Bicycle Lane

It should be noted that:

1. No option has been selected as the preferred option by the District Division of Transportation (DDOT).
2. Options requiring the permanent closure of Klingle Road to vehicular traffic would require approval from the Council of the District of Columbia and official administrative action would be necessary.

2.1 OPTION A: NO ACTION

The No Action Option for transportation projects proposes to include short-term minor restoration types of activities, such as safety and maintenance improvements, which serve to maintain continuing operation of the existing roadway. Under the No Action Option, Klingle Road would remain permanently closed, however, it would be necessary to repair existing retaining walls to avoid further collapse of the pavement into Klingle Creek.

The approximate cost for the completion of tasks associated with Option A is estimated to be $272,000. This estimated cost takes into consideration the repair/replacement of 300 feet of retaining wall where deterioration of the existing structures is most severe. Costs include a concrete retaining wall, with riprap protection along its base, guardrails along this portion of the road, and a drainage inlet where structural failure is currently occurring.

2.2 OPTION B: NO BUILD

The No Build Option proposed to include the repair of existing retaining walls as proposed under the No Action Option. In addition, the existing drainage system would be repaired or would be replaced. Replacement could be accomplished by two alternative methods: 1) the existing drains, which follow the creek bed, would be removed and would be replaced; or 2) the existing drains would be abandoned in place and a new system would be constructed under the existing roadbed. Both options for the drainage system would require detailed engineering analysis to determine the preferred method. The replacement of the existing drainage system would alleviate existing drainage-related deficiencies in the Klingle Creek watershed.

The approximate cost for the completion of tasks associated with Option B is estimated to be $858,000. This estimated cost makes several assumptions, which include:

1. All construction would take place between wall barriers located at the east and west ends of closed portion of the Klingle Road, approximately 2,500 feet of roadway.
2. To maintain drainage and safety, approximately, 2000 feet of roadway will be resurfaced over existing pavement, while approximately 500 feet of roadway will require complete removal of existing pavement, rebuild of base course, and a new pavement.
3. Approximately 460 feet of retaining wall will be rebuilt and restored.
4. Roughly 230 feet of bank stabilization will be added to the Klingle Valley Creek banks.
5. A storm drain will be rebuilt for approximately 150 feet.

6. Three culverts that bring the Klingle Valley Creek under the roadway will be restored.

2.3 OPTION C: GREEN SPACE

The Green Space Option proposes to include the repair of the existing retaining walls and the repair or replacement of the existing drainage system as proposed in the No Build Option. In addition, Klingle Road would be permanently closed and the existing roadbed would be removed, allowing the area of permanent closure to return to a natural state. Engineering design under this option would include removal of the existing roadway and its appurtenant structures; backfill of the right of way (ROW) with a borrowed-soils base (approximately 18-inches in depth); sodding with 4 inches of topsoil; and grading to direct drainage.

The approximate cost for the completion of tasks associated with Option C is estimated to be $1,107,000. Construction activities needed to accomplish Option C, which were taken into consideration when calculating the estimated cost, included the following:

1. All construction would take place between wall barriers located at the east and west ends of closed portion of the Klingle Road, approximately 2,500 feet of roadway;
2. Demolition and removal of the portion of Klingle Road that lies between engineer stations 6 + 25 and 31 + 70 (current location of east and west wall barriers);
3. Backfill of approximately 6,900 cubic yards of earth;
4. Stabilization of surface by applying roughly 7,700 square yards of sod and topsoil;
5. Construction of all stream bank stabilization features and drainage structures associated with the No Build Option; and
6. The implementation of all necessary sediment control devices.

2.4 OPTION D: BIKE, RECREATION AND FACILITY MANAGEMENT

The Bike, Recreation and Facility Management Option proposes to include the repair of the existing retaining walls and the repair or replacement of the existing drainage system as proposed in Options B and C. In addition, Klingle Road would be permanently closed to vehicular traffic and would be converted to a bike path. The existing roadbed would be replaced by an approximately 8- to 10-foot-wide, hard-surface bike path, which would be constructed within the existing ROW and in compliance with DDOT standards. In addition, the bike path would be constructed to support utility service trucks that require access to the utilities underlying the Connecticut Avenue Bridge. The area adjacent to the bike path would be reestablished as a recreational area. Engineering design would include removal of the existing roadway and its appurtenant structures; backfill of the ROW with a construction-grade soils base to a depth in compliance with DDOT standards; contouring and paving the bike path; and grading to direct drainage.

The approximate cost for the completion of tasks associated with Option D is estimated to be $1,131,000. Construction activities needed to accomplish Option C that were taken into consideration when calculating the estimated cost, included the following:

1. All elements considered necessary for the No Build Option were also included under Option D;
2. Additional lighting and park amenities, including benches, were provided; and
3. Bicycle striping of a 12-foot wide roadway was incorporated.

2.5 OPTION E: REBUILD KLINGLE ROAD TO ITS ORIGINAL ALIGNMENT

The Rebuild Klingle Road to its Original Alignment Option proposes to include the repair of the existing retaining walls and the repair or replacement of the existing drainage system as proposed in Options B-D. In addition, Klingle Road would be reopened to two-way vehicular traffic,

following the rebuilding of the road to its original dimensions. The existing roadbed would be removed and a hard-surface roadway would be reconstructed within the existing ROW. Engineering design would include removal of the existing roadway and its appurtenant structures; backfill of the ROW with a construction-grade soils base to a depth in compliance with DDOT standards; contouring and paving of the road according to DDOT standards; and grading to direct drainage. Appropriate traffic signalization and drainage work also would be included under this option. Total reconstruction of Klingle Road would necessitate a reevaluation of the August 1991 Final Programmatic Section 4(f) Evaluation and Approval.

The approximate cost for the completion of tasks associated with Option E is estimated to be $3,810,000. The cost does take into consideration a contingency factor; however it does not include engineering fees, which are typically 10 percent of total project cost. To calculate the approximate cost associated with Option E, the Design and Engineer drawings for the reconstruction of Klingle Road to its original alignment were utilized. These drawings restore Klingle Road and address all drainage failing drainage features. Using the materials and quantities charts, an appropriate unit of cost was applied to each material using professional experience and expertise. The unit cost takes into consideration both installation and material fees.

The outcome of this costing analysis estimated that the cost per foot of roadway was $22.00 and the cost of per foot of drainage was $10.00 for the Klingle Road Valley. These estimated costs per foot were used in calculating the cost for Options D, F, and G.

2.6 OPTION F: BUILD KLINGLE ROAD TO ACCOMMODATE VEHICULAR, PEDESTRIAN AND BIKE USES

The Build Klingle Road to Accommodate Vehicular, Pedestrian, and Bike Uses Option, proposes to rebuild and widen Klingle Road from its original dimensions to accommodate two-way vehicular traffic, as well as pedestrian and bicycle uses. All existing drainage-related damages and deficiencies would be addressed. The width of the roadway would vary from 25- to 30-feet-wide with one 8- to 10-foot-wide bike lane. Engineering assumptions made for the roadway are without the bike lane and are based on the plans for reconstruction of the roadway developed by the DDOT in 1991. As part of this option, necessary stormwater improvements would be made and drainage improvements would be implemented. The feasibility of this option is constrained due to the limited ROW of the existing roadway.

The approximate cost for the completion of tasks associated with Option F is estimated to be $5,170,000. The cost for this option assumes that Klingle Road will be rebuilt to its original alignment with the addition of a bike lane. Therefore, the cost for this option is the cost of Option E plus the cost for a bike lane and an escalated drainage cost due to the increase of impervious surface. Bike lane installation used the per foot cost for roadway established in determining costs for Option E ($22.00). The drainage cost for Option E was escalated by 15 percent due to the increase in impervious surface. Furthermore, this option also takes into consideration a contingency cost; however engineering fees were not a factor.

2.7 OPTION G: BUILD KLINGLE ROAD AS A ONE-LANE (ONE-WAY) ROAD AND PEDESTRIAN/BIKE LANE

The Build Klingle Road as a One-Lane (One-Way) Road and Pedestrian/Bike Lane Option proposes to include the repair of the existing retaining walls and the repair or replacement of the existing drainage system as proposed in Options B-E. In addition, one lane of Klingle Road would be reopened to one-way vehicular traffic with an associated 8- to 10-foot-wide bike path. The existing roadbed would be removed and a hard surface roadway approximately 12-feet-wide would be constructed within the existing ROW. Engineering design would include removal of the existing roadway and its appurtenant structures; backfill of the ROW with a construction-grade soils base to a depth in compliance with DDOT standards; contouring and paving of the road in recognition and compliance with DDOT standards, and grading to direct drainage. Appropriate traffic signalization would be included under this option. The direction of traffic on the road during peak periods would be determined through an analysis of traffic operations.

The approximate cost for the completion of tasks associated with Option G is estimated to be $3,515,000. The cost for this option assumes that Klingle Road will be rebuilt as a one-way road to its original alignment with the addition of a bike lane. The cost for this option is similar to Option E. It includes Option E's drainage costs; however the narrowing of the roadway and the addition of a bike lane will reduce the amount of pavement in comparison to Option E. Therefore, Option G is slightly lower in cost then Option E. Per foot cost for roadway established in determining costs for Option E ($22.00) was again used to calculate total roadway and bike lane costs. Furthermore, this option also takes into consideration a contingency cost; however engineering fees were not a factor.

The cost estimates for each of the options were established using base cost data derived from *R.S. Means Building Construction Cost Data*, *59th Annual Edition, 2001*. These costs have been adjusted based on actual field engineering experience in the Washington D.C. metropolitan area.

2.8 SUMMARY

Because of the nature of the project area and the surrounding environment, several of the proposed options necessitate many of the same actions. Table 2-1 summarizes the necessary requirements for each option.

In summary, the following preliminary conclusions can be made:

- The retaining wall repair would be required under all options; and
- Drainage system repair or replacement would be necessary under all options except Option A: No Action.

The potential impacts associated with the implementation of each of the proposed options is discussed in Section 3.0.

Table 2-1. Summary of Options—Requirements

Option	Retaining Structure	Drainage System Repair	Bike Path	Roadway		Green Space
				1 lane	2 lanes	
A	Yes	No	No	No	No	No
B	Yes	Yes	No	No	No	No
C	Yes	Yes	No	No	No	Yes
D	Yes	Yes	Yes	No	No	Yes
E	Yes	Yes	No	No	Yes	No
F	Yes	Yes	Yes	No	Yes	No
G	Yes	Yes	Yes	Yes	No	No

No: not implemented

Yes: implemented

3.0

Affected Environment and Environmental Consequences

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This section provides a concise description of the existing environmental, social, and economic settings and the potential environmental consequences of the proposed options presented in Section 2.0. The existing environmental conditions and status of Klingle Road and the Klingle Road Valley will be used to establish and determine baseline conditions. These baseline conditions will be used to evaluate the environmental benefits and consequences associated with the proposed options. Environmentally, socially, and/or economically sensitive locations or features in the project's impact area also are identified and are described in this section.

All of the proposed options, excluding the No Action Option, include the repair and/or replacement of the existing stormwater and drainage system. Regardless of the option selected, it is imperative that the stormwater and drainage system in Klingle Road be repaired. On-site evaluations were critical in characterizing the poor environmental conditions currently present in Klingle Valley. The repair or replacement of the existing stormwater and drainage system would result in short-term adverse impacts, but would provide long-term benefits to the local geology, soils, biological resources and water resources in and downstream of Klingle Valley. In addition, a new or restored drainage system will also improve the socioeconomic conditions of the area.

The following sub-sections provide specific analyses of the potential consequences associated with each proposed option.

3.1 GEOLOGY, TOPOGRAPHY, AND SOILS

The geology, topography, and soils in the project area were assessed for their suitability for implementation of the proposed options. These characteristics were considered because they can inhibit or restrict use of an area under an option considered for the project.

3.1.1 Affected Environment

Geology

The project area is located in the Piedmont Physiographic Province, an area characterized by metamorphosed rocks of sedimentary, volcanic, and plutonic origins. Regionally, outcrops of these rocks are typically confined to stream valleys. Such is the case in Klingle Valley, which transcends five generally north to south trending bands of metamorphic rock formations. Rock formations occurring in the project area include: Kensington tonalite, Sykesville formation, garnetiferous biotite-horblend tonalite, Laurel formation, and quartz gabbro, quartz diorite (USGS, 1994).

In the western end of the project area, the tops of the ridges to the north and south of Klingle Valley are capped by colluvium, unsorted gravel, sand, silt, and clay. The capping generally consists of sparse pebbles scattered in a reddish-brown clay matrix (USGS, 1994).

The metamorphic formations occurring across the project area are expressed at the surface as small outcrops and float (large, detached boulders that may appear to be outcrops). These metamorphic formations and associated float are largely responsible for the steep slopes that occur across the project area.

Topography

Topography on and adjacent to the project area ranges from moderately to steeply sloped terrain bisected by Klingle Creek. Elevations within the Klingle Creek watershed range from approximately 395 feet above mean sea level (msl) near its western boundary to approximately 40 feet msl where the drainage enters Rock Creek on its eastern boundary. Elevations in the project area range from approximately 245 feet above msl at the western boundary of the site to approximately 70 feet above msl at Porter Street. Side slopes adjacent to the existing road and Klingle Creek range from moderately steep to steep and, in some places, exceed 30 percent

(Exhibits 3-1 and 3-2). The slope of the valley floor ranges from approximately 2 percent to greater than 12 percent (USGS, 1983). Furthermore, historical contour maps circa 1892 were obtained (Coast and Geodetic Survey, 1892) for comparison to investigate topographical change of Klingle Valley over time (Exhibit 3-3). This comparison concluded that the topography of Klingle Valley for the past 100 years has remained very similar and has experienced only moderate changes as a result of urban development.

Soils

According to the *Soil Survey of the District of Columbia* (USDA, 1976), soils mapped in the project area include Brandywine gravelly loam, Manor loam, Joppa gravelly sandy loam, and Udorthents (Exhibit 3-4). The Brandywine gravelly loam and Joppa gravelly sandy loam dominate the western half of the project area, upstream of the Connecticut Avenue Bridge, while Manor loam dominates the downstream section of the project area. Soil properties and characteristics, as defined by the Natural Resources Conservation Service, include the following (USDA, 1976).

Brandywine gravelly loam. The Brandywine gravelly loam, 8 to 15 percent slopes, is a moderately sloping, somewhat excessively to excessively drained soil that occurs on ridge tops and side slopes in strongly dissected areas of the Piedmont Plateau. Runoff on this phase of the Brandywine series is medium and the hazard for erosion is moderate. Slopes and stoniness moderately limit the soil for most building purposes. In addition, slope grade, low available water capacity, and stoniness limit the potential for landscaping vegetation, and for most recreational uses.

Brandywine gravelly loam. The Brandywine gravelly loam, 15 to 40 percent slopes, is a strongly sloping to steep, somewhat excessively drained soil occurring on side slopes and bluffs above streams and ravines in highly dissected areas of the Piedmont Plateau. Runoff on this phase of the Brandywine series is rapid, and the hazard for erosion is severe. Slopes and stoniness severely limit the soil for most building purposes. These topographic conditions, together with low available water capacity, and stoniness also limit the potential for landscaping vegetation, and for most recreational uses.

Joppa gravelly sandy loam. The Joppa gravelly sandy loam, 15 to 40 percent slopes, is a strongly sloping to steep, well-drained to excessively drained soil on side slopes. Permeability and runoff are rapid and the hazard of erosion is severe. Areas where this soil occurs generally have poor potential for use as building sites because of slope.

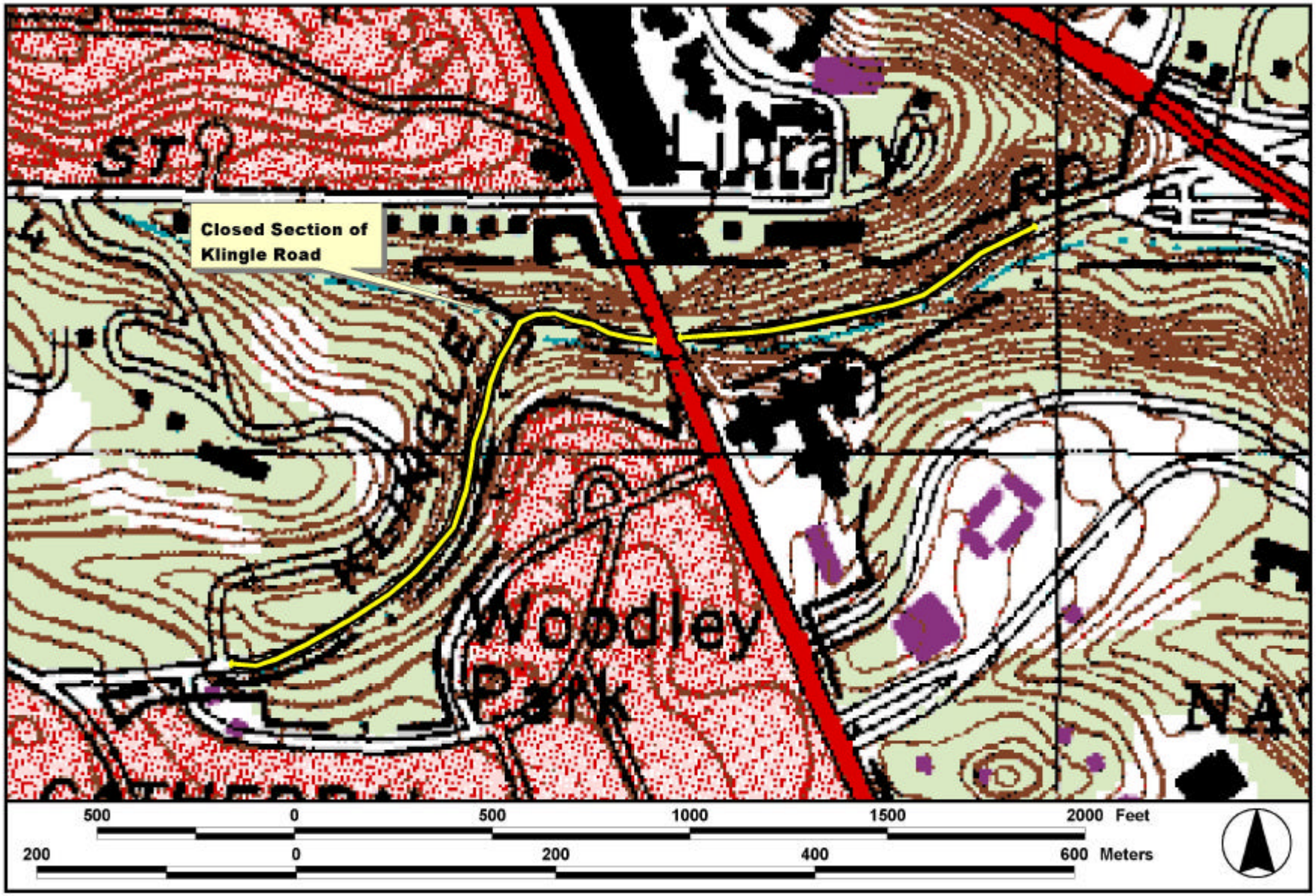
Manor loam. The Manor loam, 15 to 40 percent slopes, is a strongly sloping to steep, well-drained to somewhat excessively drained soil occurring on ridgetops and sideslopes in strongly dissected areas of the Piedmont Plateau. Permeability in the soil is moderate; runoff is rapid; and the hazard of erosion is severe. Building on the soil is severely limited due to the steep slopes. Slopes, some stoniness, and moderate available water capacity also limit the potential for establishing most types of vegetation.

Udorthents. Udorthents, loamy smoothed, are mapped in a small area on the eastern edge of the project area adjacent to Porter Street. This mapping unit consists of disturbed areas previously cut or filled for development. Permeability in the unit is variable, runoff is medium to rapid, and internal drainage is variable. Areas of the soil that have not been built on vary widely with respect to uses and limitations for different land uses. The disturbed nature of the unit makes onsite characterization necessary to determine uses and limitations.

None of the soils identified in the project area are defined as hydric, prime, or unique farmland soils.

EXHIBIT 3-1

Topography Map A:
Klingle Road

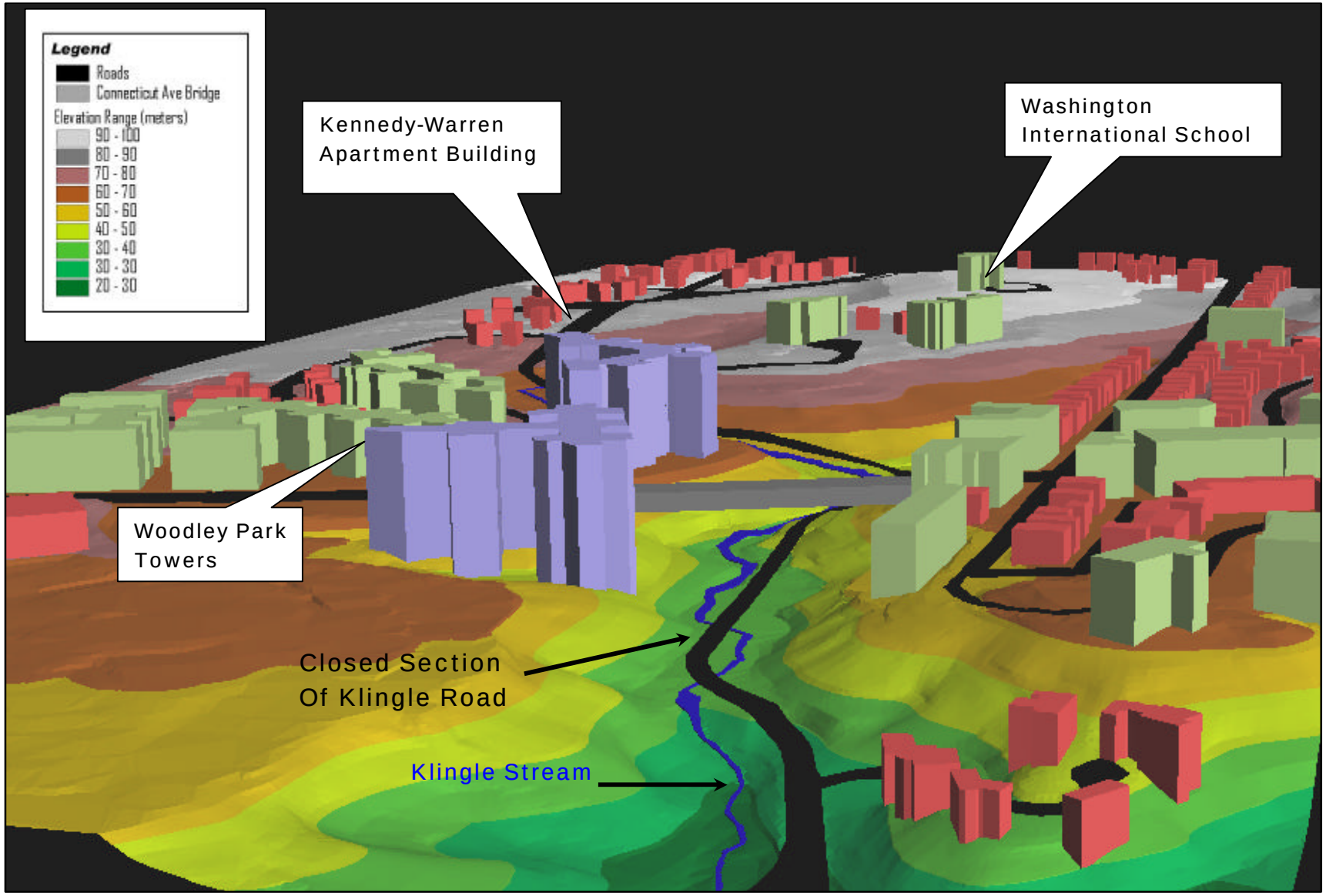


Source: USGS Quad: Washington West, DC, MD, VA; Photorevised 1983.

EXHIBIT 3-2

Topography Map B:
3-D Modeling

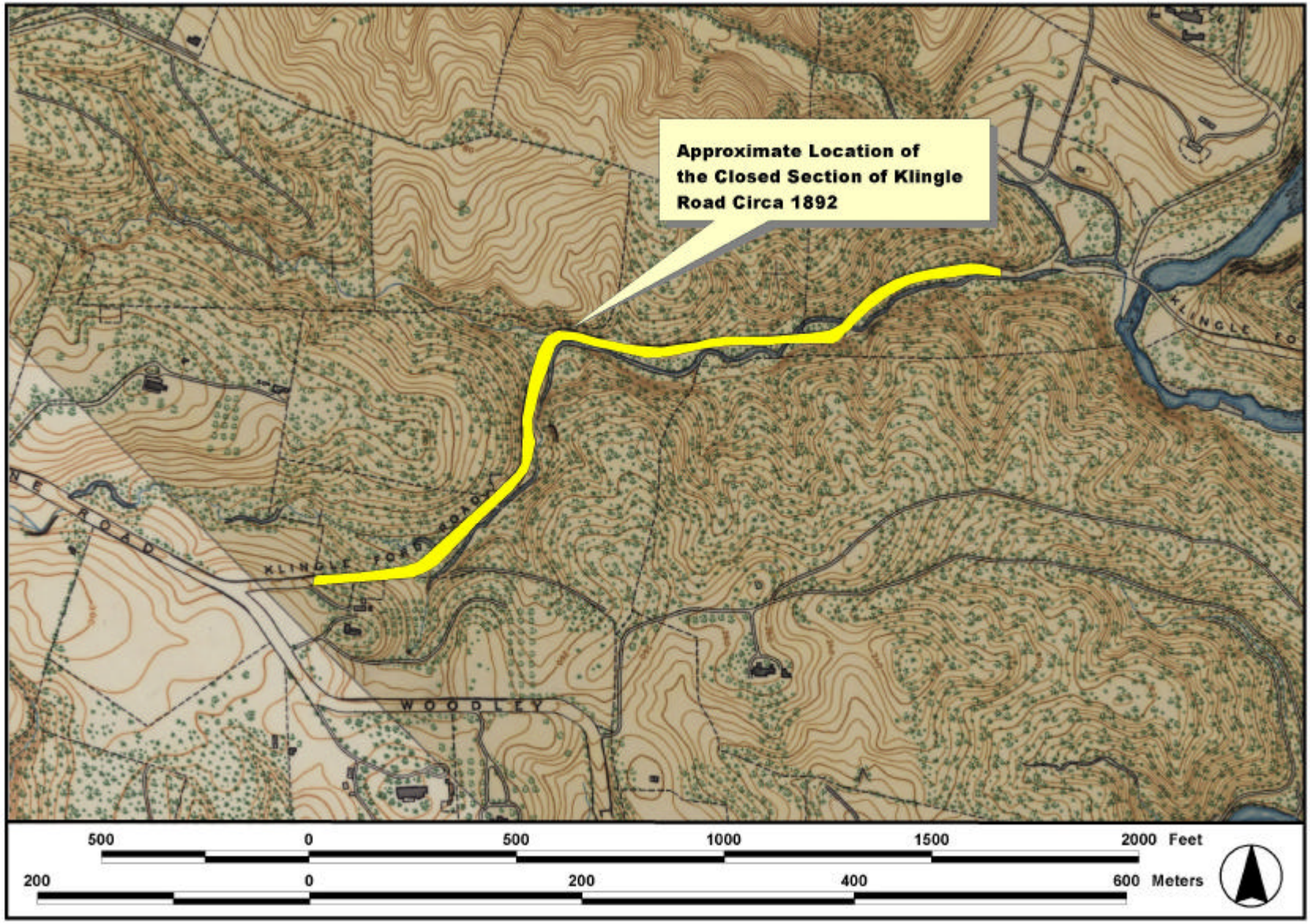
View of Klingle Valley looking Southwest



Source: Topography Data from NCPC, 1996.

EXHIBIT 3-3

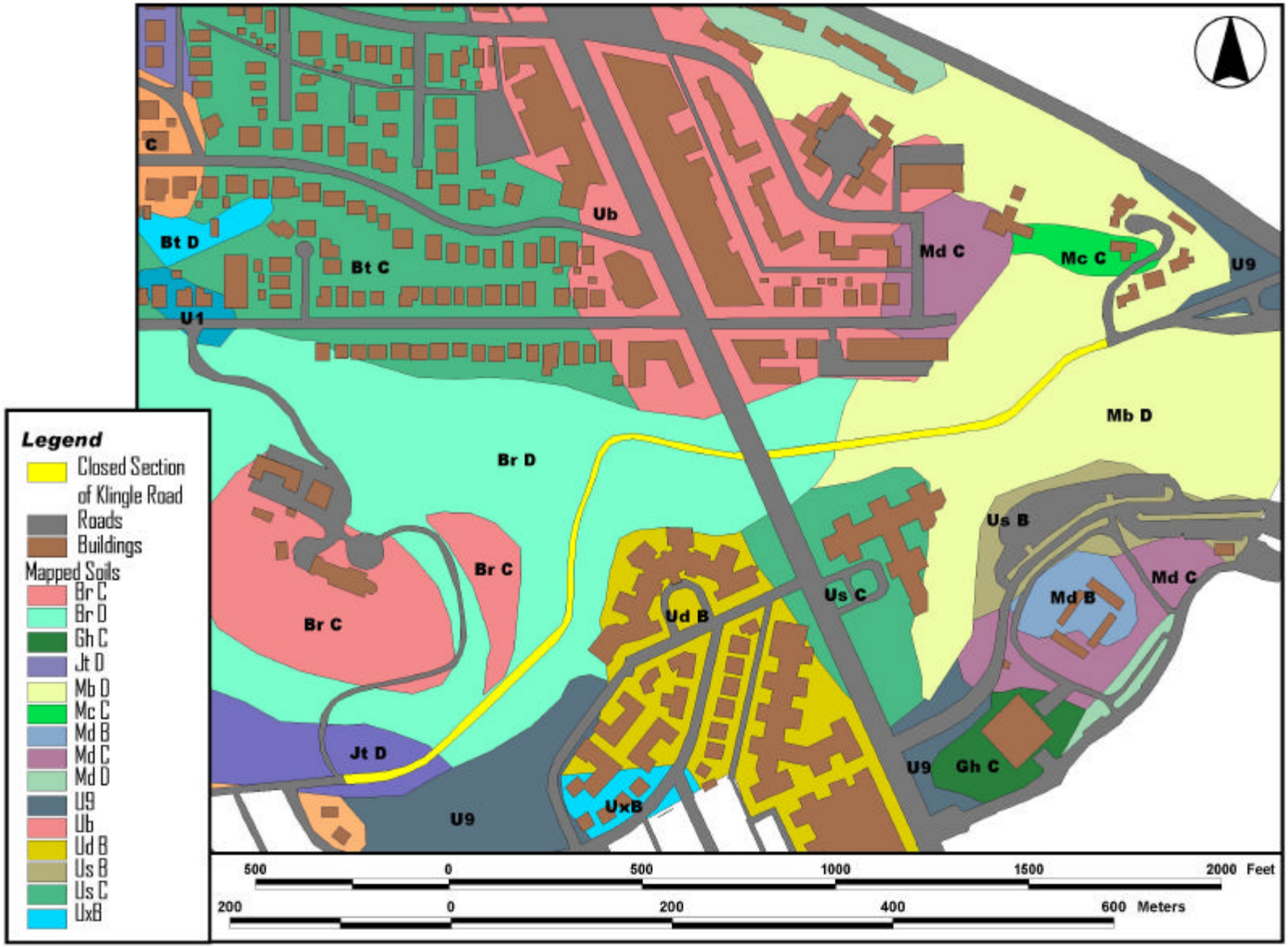
Topography Map C: Circa 1892



Source: Coast and Geodetic Survey, District of Columbia, Sheet #33, 1892; Engraved by Evans & Bartle, Washington DC 1893.

EXHIBIT 3-4

Soil Map



Source: Soil Survey of District of Columbia, 1976.

3.1.2 Environmental Consequences

The analysis of the environmental consequences of the proposed options to local geology, topography, and soils, defined several areas as "critical". These critical areas include any location where the slopes are greater than 15 percent; the soils are defined as highly susceptible to erosion, or both (Exhibit 3-5). Any construction/development activity should be approached with caution in the defined critical areas.

Under all options, properly designed erosion and sediment control measures would be implemented during the repair of the existing retaining walls and, under options B-G, during the repair or replacement of the stormwater and drainage system in order to minimize adverse environmental impacts.

Option A: No Action

Action Items

- Road remains closed.
- Repair existing retaining wall to avoid further pavement collapse into creek.
- Maintenance activities.

Both short-term and long-term adverse impacts to soils would be expected under the No Action Option. Short-term adverse impacts to soils resulting from erosion during the repair of the retaining walls would be expected. Adverse effects to water quality and aquatic habitat associated with the transport and deposition of eroded soil would also be expected because of the proximity of the retaining walls to Klingle Creek. Implementation of properly designed best management practices (BMPs) would be necessary to minimize erosion during construction activities.

Although the No Action Option includes repair of the retaining walls, continued degradation of the existing road and stormwater conveyance structures would be expected as a result of the aging of the system and erosion associated with uncontrolled flows during high-runoff events. Loss of soil resources as a result of erosion and impacts to water quality and aquatic habitats associated with the deposition of eroded soils would also be expected.

Option B: No Build

Action Items

- Road remains closed.
- Repair existing retaining wall to avoid further pavement collapse into creek.
- Replace stormwater and drainage system by one of two methods described in Section 2.0.

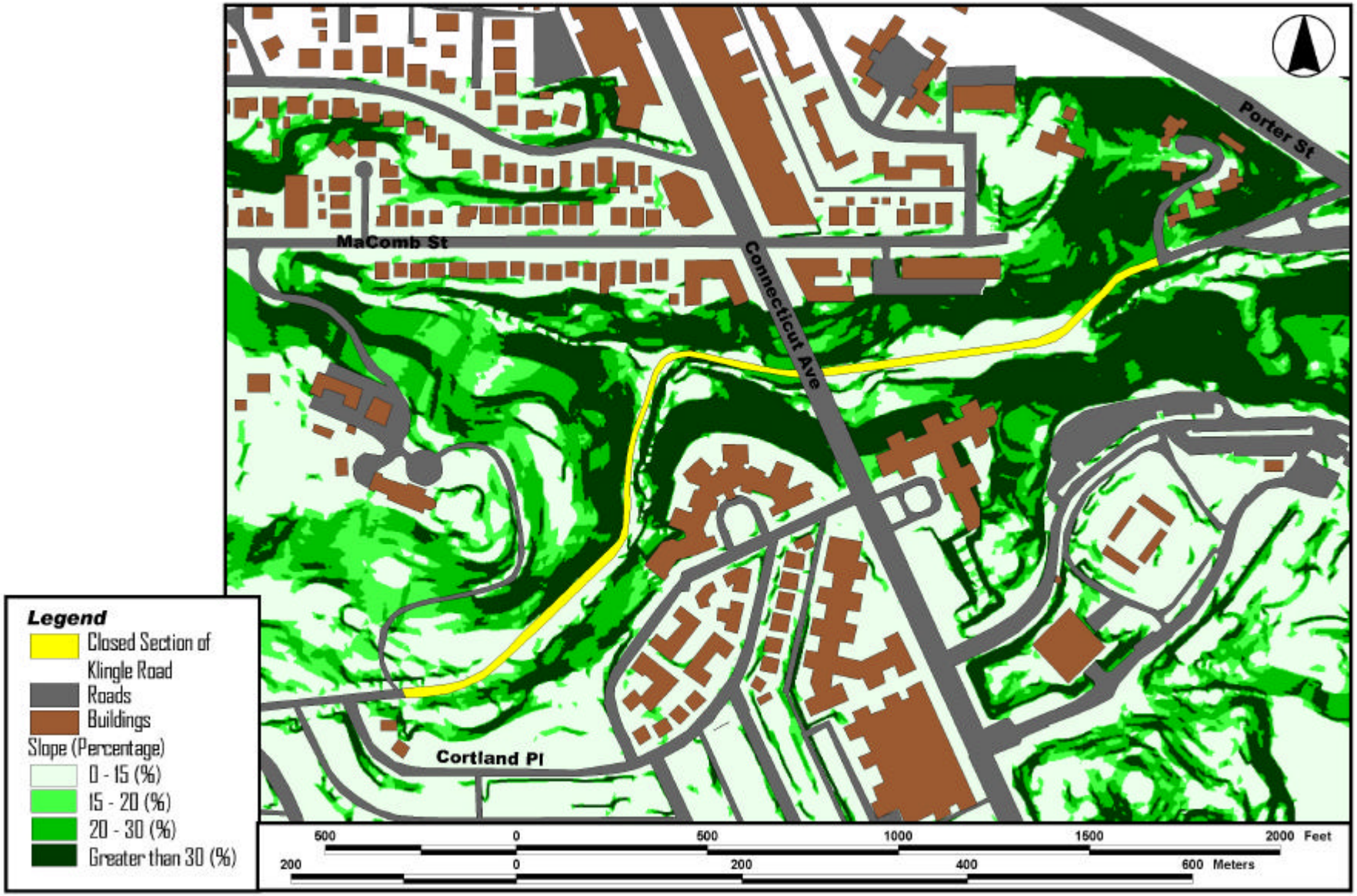
Repair of the retaining walls and replacement of the existing stormwater and drainage system would result in short-term adverse impacts, but would provide long-term benefits to soils in Klingle Valley. Short-term adverse impacts to soils resulting from erosion during the repair of the retaining walls would be expected. Adverse effects to water quality and aquatic habitat associated with the transport and deposition of eroded soil into Klingle Creek would also be expected because of the proximity of the retaining walls to the creek. Implementation of properly designed BMPs would be necessary to minimize erosion during construction activities.

Removal of vegetation or hardened surfaces, such as the existing road surface, along with excavation to access and replace the existing stormwater and drainage system, would temporarily expose soils to increased erosion. Removal and replacement of the existing stormwater and drainage structures that follow the creek bed could result in substantial adverse impacts to soils as a result of excessive erosion because of the proximity of the existing structures to Klingle Creek and steep slopes. Long-term adverse impacts to water quality and aquatic habitats would also be expected as eroded soils would be transported and deposited downcreek. Abandonment of existing stormwater and drainage structures and construction of a new system under the location of the existing roadbed would have short-term impacts with the potential expose soils to excessive erosion because of the occurrence of steep slopes at several locations along the roadbed.

Following the repair or replacement of the existing drainage system, long-term beneficial impacts would be expected as a result of a reduction in erosion associated with uncontrolled runoff during high-flow events.

EXHIBIT 3-5

Slope Map



Source: Topography Data from NCPC, 1996.

Long-term adverse effects related to erosion would result from the continuing degradation of the road.

Option C: Green Space

Action Items

- Road permanently closed.
- Repair existing retaining wall to avoid further pavement collapse into creek.
- Replace stormwater and drainage system by one of two methods described in Section 2.0.
- Remove road; backfill ROW; sod with topsoil; grade to direct drainage.

Short-term adverse and long-term beneficial impacts to soils would be expected under the Green Space Option. Impacts to soils associated with repair of the retaining walls and with the replacement of the existing stormwater and drainage system are discussed under Option B.

Permanent closure and removal of the asphalt road would result in short-term adverse impacts to soils in Klingle Valley. Because of the magnitude of the structural damages and the need for heavy equipment, the work would not be confined to the existing roadway, thereby increasing impacts to the geology, topography, and soils. Removal of the existing road surface could result in increased erosion of soils exposed by the removal of the asphalt. Flows from Klingle Creek presently follow sections of the existing road during high-flow events. Stormwater flows over unstable soils, combined with steep slopes and the high erodibility of soils in Klingle Valley, could result in excessive erosion and associated sedimentation. If selected, this option would require the implementation of BMPs for erosion and sediment control. Continued implementation of BMPs for erosion and sediment control would be necessary during revegetation within the ROW area.

Long–term beneficial impacts, following the stabilization of soils and the recolonization of vegetation within the green space, would include: a) a decrease in impervious surface associated with removal of the asphalt roadway; b) improved wildlife habitats; and c) improved water quality.

Option D: Bike, Recreation, and Facility Management

Action Items

- Road remains closed to vehicular traffic.
- Repair existing retaining wall to avoid further pavement collapse into creek.
- Replace stormwater and drainage system by one of two methods described in Section 2.0.
- Remove existing road; backfill ROW; and grade to direct drainage.
- Contour and pave hard-surface bike path capable of supporting utility and maintenance trucks.
- Reestablish area adjacent to bike path as a recreation area.

Short-term adverse and long-term beneficial impacts would be expected under Option D. Impacts to soils associated with repair of the retaining walls and replacement of the existing stormwater and drainage system are discussed under Option B.

Removal of the existing asphalt road would result in short-term adverse impacts to soils in Klingle Valley. Because of the magnitude of the structural damages and the need for heavy equipment, the work would not be confined to the existing roadway, thereby increasing impacts to the geology, topography, and soils. Removal of the existing road surface could result in excessive erosion of soils exposed by the removal of the hard top. Flows from Klingle Creek presently follow sections of the existing road during high-flow events. Stormwater flows over unstable soils, combined with steep slopes and the high erodibility of soils in Klingle Valley, could result in excessive erosion and associated sedimentation. If selected, this option would require the implementation of BMPs for erosion and sediment control.

Long-term beneficial impacts to soils, following the repair and upgrading of the existing drainage structures, would be expected as a result of a reduction in erosion associated with uncontrolled runoff during high-flow events.

Because of the high erodibility of the soils in the project area and the steepness of the natural topography, the bike path would require long-term maintenance to ensure soil and slope stability.

Option E: Rebuild Klingle Road to its Original Alignment

Action Items

- Repair existing retaining wall to avoid further pavement collapse into creek.
- Replace stormwater and drainage system by one of two methods described in Section 2.0.
- Remove road; backfill ROW; and grade to direct drainage.
- Rebuild road to its original dimensions; reopen road to two-way vehicular traffic.

Short-term adverse and long-term beneficial impacts to geology, topography, and soils would be expected under Option E. Impacts to soils associated with repair of the retaining walls and replacement of the existing stormwater and drainage system are discussed under Option B.

Removal of the existing asphalt road would result in short-term adverse impacts to soils in Klingle Valley. Heavy machinery and reduced working space would result in temporary adverse effects to soils. Removal of the existing road surface would result in excessive erosion of soils exposed by the removal of the hard top. Most soils occurring in the Klingle Road ROW have severe erosion potentials because of their physical characteristics and steep slopes. Disturbance of areas on or immediately adjacent to steep slopes could result in adverse effects associated with erosion and subsequent deposition into water bodies. Flows from Klingle Creek presently follow sections of the existing road during high-flow events. Stormwater flows over unstable soils, combined with steep slopes and the high erodibility of soils in Klingle Valley, could result in excessive erosion and associated sedimentation. If selected, this option would require the implementation of BMPs for erosion and sediment control.

Reconstruction of Klingle Road to its original alignment would involve major topographic modifications and subsequent short-term adverse effects on local soils and downstream water quality. Adverse impacts to geology, topography, and soils resulting from construction activities, like excavation, grading and the placement of fill, could occur in areas not disturbed by construction of the existing road.

Following the repair or replacement of the existing drainage structures, long-term beneficial impacts would be expected from a reduction in erosion associated with uncontrolled runoff during high-flow events.

Because of the high erodibility of the soils in the project area and the steepness of the natural topography, the road would require long-term maintenance to ensure soil and slope stability.

Option F: Build Klingle Road To Accommodate Vehicular, Pedestrian and Bike Uses

Actions Items

- Repair existing retaining wall to avoid further pavement collapse into creek.
- Replace stormwater and drainage system by one of two methods described in Section 2.0.
- Remove existing road; backfill ROW; grade to direct drainage.
- Contour and pave hard-surface bike path.
- Rebuild and widen two-lane road to 25-30 feet of width, open to vehicular traffic in both directions.

Short-term and long-term adverse and long-term beneficial affects to geology, topography, and soils would be expected under Option F. Impacts to soils associated with repair of the retaining walls and replacement of the existing stormwater and drainage system are discussed under Option B.

Removal of the existing asphalt road would result in short-term adverse impacts to soils in Klingle Valley. Because of the magnitude of structural damage and need for the use of heavy equipment, the work would not be confined to the footprint of the existing roadway and areas not affected by previous roadwork would be disturbed. Removal of the existing road surface could result in excessive erosion of soils exposed by the removal of the hard

top. Flows from Klingle Creek presently follow sections of the existing road during high-flow events. Stormwater flows over unstable soils, combined with steep slopes and the high erodibility of soils in Klingle Valley, could result in excessive erosion and associated sedimentation. If selected, this option would require the implementation of BMPs for erosion and sediment control.

Widening of the existing ROW would be necessary to accommodate a two-lane road and hard-surface bike path. The construction of a wider roadway would present a long-term adverse impact to the geology, topography, and soils by permanently altering the existing topography and soils. Existing conditions do not provide the necessary space required to expand the roadway to accommodate pedestrian and bicycle traffic. Soils and topography would be affected as a result of bank cutting and the placement of fill that would be required to widen the right-of-way. In addition, a significant amount of bank stabilization would be required along both sides of the road in a number of areas due to the occurrence of steep slopes and high erosion potentials. Additional studies would be required to determine the best design and placement of the road with regard to safety and design requirements and the minimization of environmental impacts. The degree of impacts to topography and soils would depend on placement and configuration of the road and bikeway. In all cases, excavation of steep banks and the placement of fill in areas adjacent to Klingle Creek would likely be required. Adverse impacts to geology, topography, and soils resulting from construction activities, like excavation, grading and the placement of fill, would occur in areas not previously disturbed by construction of the existing road.

The repair of existing drainage damage and upgrading of deficient drainage structures may impact geology, topography, and soils temporarily during construction activities. However, the long-term impact of these repairs would ultimately benefit the geology, topography and soils by reducing erosion during high flow events and allowing the resources to stabilize.

Because of the high erodibility of the soils in the project area and the steepness of the natural topography, the road would require long-term maintenance to ensure soil and slope stability, and safety.

Option G: Build Klingle Road as a One-Lane (One-Way) Road with a Pedestrian/Bicycle Lane

Action Items

- Repair existing retaining wall to avoid further pavement collapse into creek.
- Replace stormwater and drainage system by one of two methods described in Section 2.0.
- Remove existing road; backfill ROW; grade to direct drainage.
- Contour and pave hard-surface bike path.
- Rebuild one-lane (one-way) road, open to vehicular traffic.

Short-term adverse and long-term beneficial impacts to geology, topography and soils would be expected under Option G. Impacts to soils associated with repair of the retaining walls and replacement of the existing stormwater and drainage system are discussed under Option B.

Removal of the existing asphalt road would result in short-term adverse impacts to soils in Klingle Valley. Heavy machinery and reduced working space would result in temporary adverse effects to soils. Removal of the existing road surface would result in excessive erosion of soils exposed by the removal of the hard top. Most soils occurring in the Klingle Road ROW have severe erosion potentials because of their physical characteristics and steep slopes. Disturbance of areas on or immediately adjacent to steep slopes could result in adverse effects associated with erosion and subsequent deposition into water bodies. Flows from Klingle Creek presently follow sections of the existing road during high-flow events. Stormwater flows over unstable soils, combined with steep slopes and the high erodibility of soils in Klingle Valley, could result in excessive erosion and associated sedimentation. If selected, this option would require the implementation of BMPs for erosion and sediment control.

Adverse impacts to geology, topography and soils resulting from construction activities, like excavation, grading and the placement of fill, would occur in areas not disturbed by construction of the existing road where the new road and pedestrian/bicycle lane is realigned within the existing ROW.

Long-term beneficial impacts following the repair or replacement of the existing drainage structures would be expected resulting from a reduction in erosion associated with uncontrolled runoff during high-flow events.

Because of the high erodibility of the soils in the project area and the steepness of the natural topography, the road and pedestrian/bicycle lane would require long-term maintenance to ensure soil and slope stability.

3.2 BIOLOGICAL RESOURCES

3.2.1 Affected Environment

The biological resources of this site have been determined through resource agency contacts and direct field observations. Field surveys were conducted to determine the extent of invasive species coverage on-site, to characterize the forest habitat, and to determine whether jurisdictional wetlands occur in the project area. Dominant vegetative species were recorded, while vegetative communities, including wetlands, were examined for habitat type and size. Habitats were analyzed and compared to habitat requirements of species known to occur in the vicinity, including species of special status, in order to assess their potential use of the area. Direct observations of wildlife and/or signs of wildlife were also recorded.

Vegetation

Vegetation occurring in the Klingle Road project area was characterized by direct field observations made during site visits conducted on April 12, 2000 and June 19 through June 21, 2000. Specifically, the affected area was surveyed for the presence of trees with a diameter at breast height (dbh) greater than 24-inches (Table 3-1), which is the criterion used by Montgomery County, Maryland; the District of Columbia does not have any established benchmark. The affected area was also surveyed for the overall ground cover. The percent of the understory comprised of invasive species was also estimated. Appendix B details the methodology used and the results of the survey.

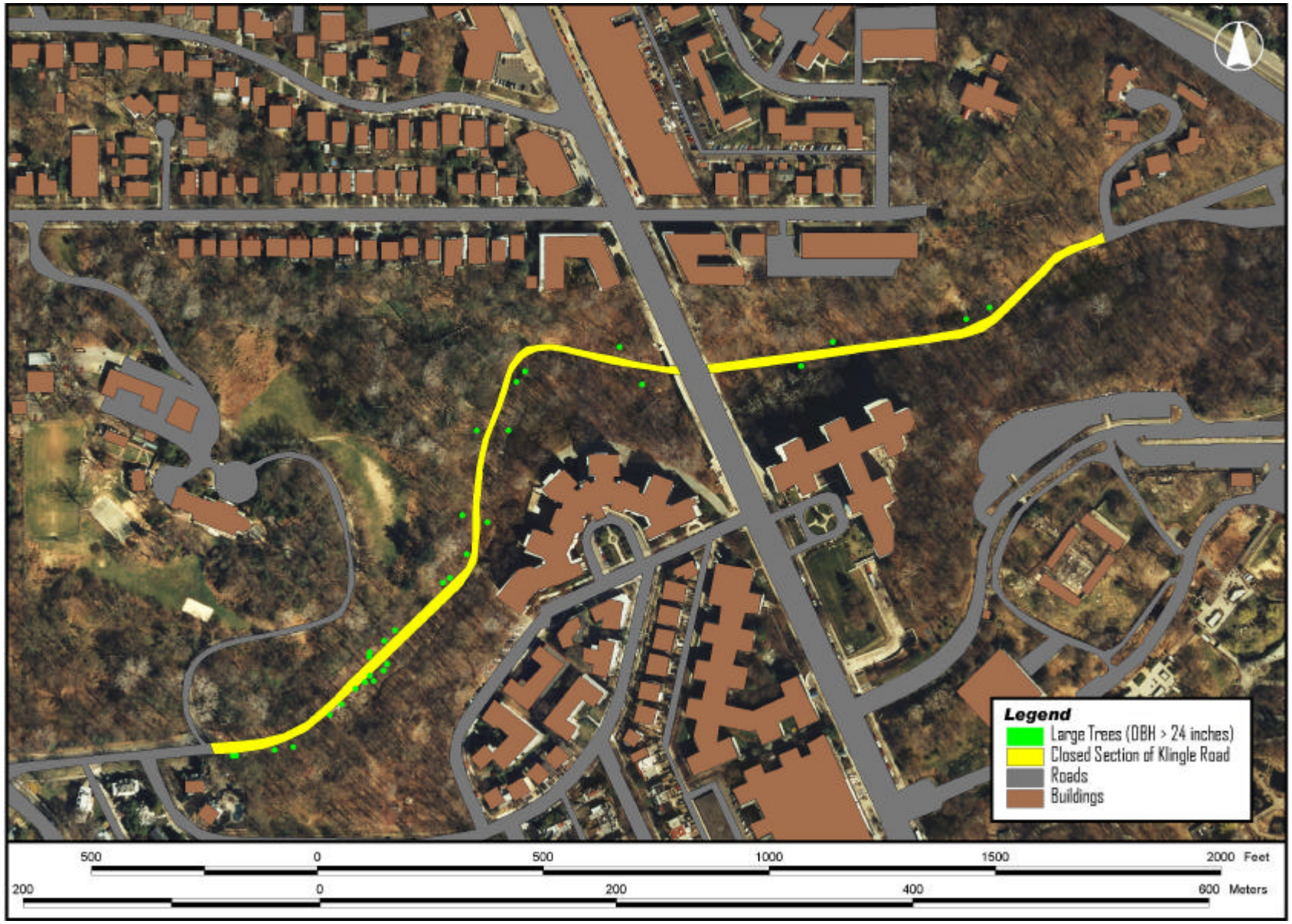
Exhibit 3-6 shows the approximate locations of the large diameter trees in the Klingle Road ROW. General forest stand composition was also noted. A total of 31 24-inch dbh trees occur in the project study area (the area 25 feet to either side of the road centerline). Of these 31 trees, tulip poplar (*Liriodendron tulipifera*) is the dominant species, making up 55 percent of the population. The overall species composition comprises a poplar-oak-hickory mix.

The affected area was surveyed for the presence and dominance of invasive species. This was achieved through a random plot method where 160 random meter-square plots were surveyed for vegetative cover. The percent coverage of each species was determined within the meter-square plots. A large percentage of area included bare ground with no vegetative cover. Of the 39 species identified using the random plot method, 12 were defined as invasive species. These 12 species are, on average, 17 percent of the coverage within the project area, whereas native species are 10 percent, and bare ground averages 79 percent of the ground cover. The most common invasive plant species occurring in the proposed project area is English ivy (*Hedera helix*). English ivy, hich probably originated in adjacent upslope properties, dominates the ground cover over large areas on the site. Pachysandra (*Pachysandra-terminalis*), which is commonly used as landscaping groundcover in surrounding neighborhoods, also occurs as a monotypic groundcover at locations scattered throughout the affected area.

Table 3-2 lists vegetative species documented within the project study area and indicates whether they are native plants, originated from nearby cultivation, or are invasive species. The list is not inclusive of all plant species that occur in the project area, but it includes a list of common tree species occurring on the site, along with all herbaceous, vine, sapling, and shrub species that were identified in the 160 individual meter-square plots characterized in the invasive species survey.

EXHIBIT 3-6

Tree Survey Map



Source: Aerial Photography provided by NCPC, 1995.

TABLE 3-1: TREES IN THE PROJECT AREA WITH GREATER THAN 24-INCH DBH

SCIENTIFIC NAME	COMMON NAME	DBH
Liriodendron tulipifera	Tulip poplar	24.2
Quercus rubra	Red oak	24.3
Liriodendron tulipifera	Tulip poplar	24.8
Carya sp.	Hickory species	25.5
Liriodendron tulipifera	Tulip poplar	25.6
Carya sp.	Hickory species	25.8
Quercus alba	White oak	25.8
Fagus grandifolia	American beech	25.9
Liriodendron tulipifera	Tulip poplar	26.2
Liriodendron tulipifera	Tulip poplar	26.6
Quercus rubra	Red oak	27.8
Liriodendron tulipifera	Tulip poplar	27.9
Liriodendron tulipifera	Tulip poplar	28.0
Quercus rubra	Red oak	28.1
Platanus occidentalis	Sycamore	28.2
Liriodendron tulipifera	Tulip poplar	28.6
Liriodendron tulipifera	Tulip poplar	29.2
Carya sp.	Hickory species	30.8
Liriodendron tulipifera	Tulip poplar	31.4
Liriodendron tulipifera	Tulip poplar	32.0
Carya sp.	Hickory species	32.6
Carya sp.	Hickory species	34.0
Quercus rubra	Red oak	35.6
Quercus alba	White oak	35.6
Liriodendron tulipifera	Tulip poplar	36.2
Liriodendron tulipifera	Tulip poplar	38.7
Liriodendron tulipifera	Tulip poplar	41.3
Liriodendron tulipifera	Tulip poplar	41.5
Liriodendron tulipifera	Tulip poplar	42.1
Liriodendron tulipifera	Tulip poplar	42.8
Platanus occidentalis	Sycamore	47.1

Source: The Louis Berger Group, Inc., 2000

TABLE 3-2: VEGETATIVE COMPOSITION

SCIENTIFIC NAME	COMMON NAME	INVASIVE	ESCAPE	NATIVE
HERBACEOUS/VINE SPECIES				
Alliaria petiolata	Garlic mustard	X	--	--
Arisaema triphyllum	Jack-in-the-pulpit	--	--	X
Asclepias syriaca	Common milkweed	--	--	X
Bidens vulgata	Beggar-ticks	--	--	X
Boehmeria cylindrica	False nettle	--	--	X
Celastrus scandens	Bittersweet	--	--	X
Circaea quadrisulcata	Enchanter's nightshade	--	--	X
Commelina communis	Asiatic dayflower	X	--	--
Cryptotaenia canadensis	Honewort	--	--	X
Duchesnea indica	Indian strawberry	X	--	--
Fragaria sp.	Strawberry	--	--	X
Hedera Helix	English ivy	X	--	--
Impatiens capensis	Spotted jewelweed	--	--	X
Ipomoea hederacea	Ivy-leaved morning glory	X	--	--
Lonicera japonica	Honeysuckle	X	--	--
Mitchella repens	Partridgeberry	--	--	X
Pachysandra-terminalis	Pachysandra	X	X	--
Parthenocissus quinquefolia	Virginia creeper	--	--	X
Polygonum amphibium	Water smartweed	--	--	X
Polygonum persicaria	Lady's thumb	X	--	--
Rubus phoenicolasius	Wineberry	X	--	--
Rubus sp.	Blackberry	--	--	X

SCIENTIFIC NAME	COMMON NAME	INVASIVE	ESCAPE	NATIVE
HERBACEOUS/VINE SPECIES, continued				
Sanicula gregaria	Clustered snakeroot	--	--	X
Toxicodendron radicans	Poison ivy	--	--	X
Urtica dioica	Stinging nettle	X	--	--
Vinca sp.	Perriwinkle	--	X	--
Viola papilionacea	Common blue violet	--	--	X
Vitis sp.	Grape vine	--	--	X
Vitis aestivalis	Pigeon grape	--	--	X
SAPLING/SHRUB SPECIES				
Acer negundo	Box elder sapling	--	--	X
Acer platanoides	Norway maple sapling	X	X	--
Ailanthus altissima	Tree-of-Heaven	X	--	--
Asimina triloba	Paw paw	--	--	X
Carya sp.	Hickory sapling	--	--	X
Cercis canadensis	Redbud	--	--	X
Fagus grandifolia	Beech sapling	--	--	X
Lindera Benzoin	Spicebush	--	--	X
Morus sp.	Mulberry	--	--	X
Ulmus sp.	Elm sapling	--	--	X
Ulmus americana	American elm sapling	--	--	X
TREE SPECIES				
Acer negundo	Box elder	--	--	X
Acer platanoides	Norway maple	X	X	--
Acer saccharinum	Silver maple	--	--	X
Acer sp.	Japanese maple	--	X	--

SCIENTIFIC NAME	COMMON NAME	INVASIVE	ESCAPE	NATIVE
TREE SPECIES, continued				
Asimina triloba	Paw paw	--	--	X
Ailanthus altissima	Tree-of-Heaven	X	--	--
Carya cordiformis	Bitternut hickory	--	--	X
Carya glabra	Pignut hickory	--	--	X
Carya sp.	Hickory	--	--	X
Fagus grandifolia	American beech	--	--	X
Liriodendron tulipifera	Tulip poplar	--	--	X
Morus alba	White mulberry	X	--	--
Paulownia tomentosa	Paulownia	X	--	--
Platanus occidentalis	American sycamore	--	--	X
Quercus alba	White oak	--	--	X
Quercus palustris	Northern pin oak	--	--	X
Quercus rubra	Northern red oak	--	--	X
Ulmus sp.	Elm	--	--	X

Source: The Louis Berger Group, Inc., 2000

Executive Order 11990, Protection of Wetlands

Executive Order 11990, Protection of Wetlands, requires federal agencies to take action to minimize the loss of wetlands. Wetlands are defined as those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions (33 CFR, Part 328.3). The U.S. Army Corps of Engineers regulates development in wetland areas pursuant to Section 404 of the Clean Water Act (33 CFR, Parts 320-330). Three elements are

used to identify wetlands: hydrology, hydrophytic vegetation, and hydric soils.

The characterization of wetlands in the project area was based on the review of the United States Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) map of the area, *the Soil Survey of the District of Columbia*, and site investigations conducted on June 21, 2000.

Analysis of the 1:24,000 scale NWI map for the Washington West Quadrangle indicated that no wetland habitats occur within the potential area of impact. Additionally, the District of Columbia Wetland Conservation Plan (CWP, 1997) was reviewed to determine if wetlands were documented to occur in the vicinity of the project area. The plan does not document the occurrence of any wetlands within the project area or in any areas in Klingle Valley. The *Soil Survey of the District of Columbia* also indicated that no hydric soils are mapped within the potential area of impact (USDA, 1976). Hydric soils are soils that are saturated, flooded, or ponded for long enough during the growing season to develop anaerobic (oxygen-deficient) conditions in their upper part. Anaerobic soil conditions are conducive to the establishment of vegetation that is adapted for growth under oxygen-deficient conditions and is typically found in wetlands (hydrophytic vegetation).

The assessment of the project area for the presence of jurisdictional wetlands was based on procedures established in the *Corps of Engineers Wetlands Delineation Manual* (1987) and related technical and policy guidance. No areas within the potential project area exhibited the three parameters indicative of the presence of jurisdictional wetlands; therefore, no jurisdictional wetlands were determined to exist within the potential areas of impact. However, Klingle Creek is considered "waters of the United States" under Section 404 of the Clean Water Act, and construction permitting associated with potential impacts to the creek would be required. A small potential wetland occurs in the northwestern section of the project area in association with a ponded section of Klingle Creek on private property immediately adjacent to the Klingle Road ROW. A determination of whether jurisdictional wetlands occur in association with the ponded area, or their extent, was not determined because the site is located entirely on private property and not within the Klingle Road ROW.

Wildlife

As an urban green space, Klingle Valley provides habitat for a variety of wildlife adapted to urban conditions and human populations. Mammalian species that can be expected to utilize the area for habitat include grey squirrel (*Sciurus caroliniensis*), whitetail deer (*Odocoileus virginianus*), raccoon (*Procyon lotor*), and opossum (*Didelphis virginiana*). Avian species seen on site during field visits conducted in April and June 2000 include the American crow (*Corvus brachyrhynchos*), mallard (*Anas platyrhynchos*), pileated woodpecker (*Dryocopus pileatus*), blue jay (*Cyanocitta cristata*), mourning dove (*Zenaida macroura*), and green back heron (*Butorides virescens*). A variety of songbirds may be expected to utilize the site as well. Amphibian and reptilian species are reported to occur in the area but were not seen during the site visits.

Bioassessment studies to characterize the ecology and water quality of streams in the District of Columbia were conducted in 1988, 1993, and 1998. Results of the 1988 study conducted by the District of Columbia Department of Consumer and Regulatory Affairs (DCRA) Housing and Regulatory Administration Environmental Control Division (Johnson, 1988) indicate that water quality in the Klingle Creek was fair to poor. Fish, crayfish, and salamanders were reported to be present in the creek. Samples of benthic macroinvertebrates taken in the creek were dominated by chironomid, indicating the creek was organically enriched.

Stream characterizations conducted by W.C. Banta (1993) indicate the creek was moderately impaired and showed evidence of loss of instream cover, increased imbeddedness, channel alteration, and bottom scouring. A benthic macroinvertebrate sample from the creek collected 28 individuals from 14 taxa. The sample included six species of chironomid, a crayfish (*Cambarus robustus*), tipulids, oligochaets and several other species not identified in the study. The dominance of chironomid and the ratio of scrapers to filter-collectors in the sample indicated eutrophication and organic enrichment of the creek. Toxic pollution, organic pollution,

eutrophication, and environmental degradation all appeared to be impacting Klingle Creek at the time of the study.

Biological data provided by the District of Columbia Department of Health (DOH) Watershed Protection Division (1998) indicated aquatic life in Klingle Creek is impacted by poor water quality and habitat degradation. Based on evaluations by the DOH of benthic macroinvertebrates and fish collections, the creek has a low diversity of aquatic species, consisting primarily of species tolerant of adverse conditions.

Additionally, DOH Division of Fisheries and Wildlife and Water Quality conducted a fisheries assessment of Klingle Creek on August 29 and September 15, 2000. Three fish species were identified during the electrofishing survey. Fish were identified in most pools from the confluence of Klingle Creek with Rock Creek upstream for about 885 feet (269 meters), where the elevation of the creek rises approximately 18 feet (six meters) through a series of small falls. No fish species were identified above the falls. Forty-six pools were identified below the fall area and all but three contained fish. The blacknose dace (*Rhinichthys atratulus*) occurred in all pools that had fish and was the most common fish in the creek. In total, 254 blacknose dace were identified in the survey. Six American eels (*Anguilla rostrata*) were identified in five pools and four creek chubs (*Semotilus atromaculatus*) were found in two pools. Only one pool contained all three fish species and six pools contained at least two species (Ryan, 2000). The DOH study concluded that Klingle Creek acts as a refuge for species found in Rock Creek, and consequently, is an important system to the overall health of Rock Creek.

Threatened and Endangered Species

In accordance with Section 7 of the Endangered Species Act (ESA) of 1973, the project area was evaluated for the potential occurrences of federally threatened and endangered species. The ESA requires any federal agency that funds, authorizes, or carries out an action to ensure their action is not likely to jeopardize the continued existence of any endangered or threatened species (including plant species) or to result in the destruction or adverse modification of designated critical habitats.

USFWS, National Park Service (NPS), D.C. Natural Heritage Program and the Superintendent of Rock Creek Park were consulted to determine potential for the presence of any rare, threatened, or endangered species within the project area (Appendix A). USFWS listed no federally threatened, endangered, or proposed plant or animal species occurring in the project vicinity (R.J. Pennington, USFWS, written comm. to K. Laden, DDOT, July 19, 2000). The D.C. Natural Heritage Program also had no record of rare, threatened, or endangered species in the project vicinity (Dr. James L. Sherald, NPS, written comm. to S. Cauley, The Louis Berger Group, November 6, 2000). A letter describing the project along with a map showing the site location was sent from The Louis Berger Group, Inc. to Adrienne Coleman, Superintendent of Rock Creek Park, on November 16, 2000 to formally request the current list of special status species that are known to occur, or that could potentially occur on or in the vicinity of the Klingle Road site. The letter also requested information on any other known sensitive natural resources or ecosystems in the proposed project area that should be considered in the environmental feasibility study (Appendix A). At this time no comments have been received.

3.2.2 Environmental Consequences

In assessing the environmental consequences of the proposed options to vegetation, wetlands, and wildlife, several areas were defined within the project area as “critical.” These critical areas include any location where trees greater or equal to 24-inches dbh occur, wetlands exist, or threatened and endangered species have been documented. No wetlands or threatened and endangered species occur within the project area. Locations where trees with a dbh of greater or equal to 24-inches occur are shown in Exhibit 3-6. Any construction development activity in areas where large dbh trees are documented to occur should avoid the trees where possible and should incorporate BMPs into construction plans to minimize potential impacts.

All of the proposed options, excluding the No Action Option, include repairs and necessary upgrade of the existing stormwater and drainage system. Repair of the existing system would result in short-term adverse impacts, but

would provide long-term benefits to biological resources in Klingle Valley. Removal of vegetation or hardened surfaces such as the existing road surface would expose soils to increased erosion. Repairing the existing system would create short-term adverse impacts but would provide long-term benefits to the flora and fauna communities in the project area. Short-term adverse impacts would include displacing vegetation and disturbing wildlife during construction. Repair of the existing stormwater and drainage system would result in long-term benefits to the biological resources by reducing the adverse impacts associated with high-flow events that have been magnified by the highly urbanized character of the surrounding area. Repair of the existing system would help to reduce erosion and subsequent sedimentation associated with high-flow storm events. On-going habitat degradation or loss associated with erosion, sedimentation, and degraded water quality would be reduced, thereby resulting in an overall improvement in habitat quality in the project area. These short-term, adverse impacts and long-term benefits would result under all of the following options, excluding the No Action Option.

Option A: No Action

Action Items

- Road remains closed.
- Repair existing retaining wall to avoid further pavement collapse into creek.
- Maintenance activities.

Long-term adverse effects to biological resources that are associated with the No Action Option would be expected. Under the No Action Option, uncontrolled stormwater associated with storm events would continue to affect aquatic habitats; specifically, the continued erosion of the streambanks and steep slopes and the resultant deposition of eroded sediments in downstream habitats. Although repairs to the retaining wall are proposed, the continuing degradation of the existing road surface would be expected to adversely impact in-stream habitats, especially in areas where the road is located immediately adjacent to or within the current flow path of the creek. Unstable streambanks and side slopes associated with uncontrolled stormwater runoff would preclude the establishment of vegetation, which, if established over time, would act to stabilize conditions and to reduce erosion.

Option B: No Build

Action Items

- Road remains closed.
- Repair existing retaining wall to avoid further pavement collapse into creek.
- Replace stormwater and drainage system by one of two methods described in Section 2.0.

Repair of the existing stormwater and drainage system would result in short-term adverse impacts, but would provide long-term benefits to biological resources in Klingle Valley, regardless of the method chosen. Repairing the existing drainage system and retaining walls would create short-term adverse impacts, but would provide long-term benefits to the flora and fauna communities in the project area. Short-term adverse impacts would include the displacement of vegetation and the disturbance of wildlife during construction. Impacts related to the repair of the stormwater and drainage system would be dependent on the method of replacement chosen. Replacing the existing system would have short-term adverse impacts on the in-stream habitat; however, the removal of untreated, uncontrolled stormwater flows would have long-term benefits.

Repair of the existing stormwater and drainage system would reduce the current adverse impacts associated with high-flow events, which have been magnified by the highly urbanized character of the surrounding area. Repair of the existing system would help to reduce erosion and subsequent sedimentation associated with high-flow storm events. On-going habitat degradation or loss associated with erosion, sedimentation, and degraded water quality would be reduced resulting in an overall improvement to the quality of habitat. The long-term adverse impacts of this option would include the continued degradation of the existing road and subsequent increase in erosion and sedimentation problems.

Option C: Green Space

Action Items

- Repair existing retaining wall to avoid further pavement collapse into creek.
- Replace stormwater and drainage system by one of two methods described in Section 2.0.
- Road permanently closed.
- Remove road; backfill ROW; sod with topsoil; grade to direct drainage.

As with Option B, repair of the existing drainage system would result in short-term adverse impacts, but would provide long-term benefits to biological resources in Klingle Valley, regardless of the chosen method of replacement. Repairing the existing stormwater and drainage system and retaining walls would create short-term adverse impacts, but would provide long-term benefits to the flora and fauna communities in the project area as described under Option B. On-going habitat degradation or loss associated with erosion, sedimentation, and degraded water quality would be reduced resulting in an overall improvement to the quality of habitat.

The permanent closure and removal of the asphalt road would result in short-term adverse impacts to the biological resources in Klingle Valley. Adverse impacts to trees located immediately adjacent to the existing road could occur as a result of damage to root systems during the demolition process. Removal of the existing road surface could also result in excessive erosion of soils exposed by its removal. Erosion of exposed soils and subsequent deposition could adversely affect terrestrial and aquatic habitats in and downstream of Klingle Creek. Due to the magnitude of the structural damages (road collapse) and the need for heavy equipment use, the work would not be confined to the existing roadway, increasing potential short-term impacts to the biological resources.

To prevent excessive erosion and the associated sedimentation, the implementation of temporary BMPs for erosion and sediment control would be implemented during road removal. Continued implementation of erosion control measures would be necessary after completion of construction activities and during re-vegetation within the green space area.

Long–term beneficial impacts to biological resources, following the stabilization of soils and recolonization of vegetation within the green space, would include: a) decrease in impervious surface associated with removal of the asphalt roadway; b) restored wildlife habitats; c) improved water quality; d) increased connectedness between habitats in the valley, and e) benefits associated with the absence of vehicle use, traffic, and noise.

As mentioned, reestablishment of vegetation in the area, following the removal of the existing road surface, would benefit biological habitat conditions in Klingle Valley. Proper preparation of soils in the areas previously covered by road surface would be necessary to promote establishment of native vegetation. Benefits to natural vegetative communities and the establishment of high-quality wildlife habitat would be limited, unless long-term efforts are made to control the establishment and spread of exotic invasive plant species occurring in the project area. Under a non-control approach, exotic invasive landscape vegetation would potentially dominate the vegetative communities in the reestablished green space.

Option D: Bike, Recreation, and Facility Management

Action Items

- Repair existing retaining wall to avoid further pavement collapse into creek.
- Replace stormwater and drainage system by one of two methods described in Section 2.0.
- Road remains closed to vehicular traffic.
- Remove existing road; backfill ROW; and grade to direct drainage.
- Contour and pave hard-surface bike path capable of supporting utility and maintenance trucks.
- Reestablish area adjacent to bike path as a recreation area.

Rebuilding Klingle Road as a bike trail, which would provide recreational and facility management opportunities, with the necessary stormwater improvements would have both adverse impacts and benefits to the biological resources in the project area. Because of the magnitude of the structural damages (road collapse) and the need for the use of heavy

equipment, the work would not be confined to the existing roadway, increasing impacts to biological resources. Short-term adverse and long-term beneficial impacts would be expected under Option D. Short-term adverse impacts associated with the repair and upgrade of stormwater and drainage structures discussed under Option B would also be expected under Option D.

Repairing the existing stormwater and drainage system and retaining walls would create short-term adverse impacts, but would provide long-term benefits to the flora and fauna communities in the project area. Short-term adverse impacts would include the displacement of vegetation and the disturbance of wildlife during construction. On-going habitat degradation or loss associated with erosion, sedimentation, and degraded water quality would be reduced resulting in an overall improvement to the quality of habitat.

The existing road surface is currently used for recreational activities, like hiking and jogging. Consequently, an increase in use of the area following its establishment as a bike path would not have additional adverse effects resulting from an increase in human activities.

Option E: Rebuild Klingle Road

Action Items

- Repair existing retaining wall to avoid further pavement collapse into creek.
- Replace stormwater and drainage system by one of two methods described in Section 2.0.
- Remove road; backfill ROW; and grade to direct drainage.
- Rebuild road to its original dimensions; reopen road to two-way vehicular traffic.

Short-term and long-term adverse and long-term beneficial effects to biological resources in Klingle Valley would be expected under Option E. Short-term adverse, as well as long-term beneficial effects to biological resources associated with the repair of retaining walls and repair and replacement of the existing stormwater and drainage system are discussed under Option B.

Reconstruction of Klingle Road would impose long-term adverse impacts to the vegetative community within the project area. Recruitment of some tree and shrub species has occurred immediately adjacent to and within the project area. This vegetation would be permanently removed to accommodate construction and the roadway. Reconstructing Klingle Road to its original alignment would require the removal of some large trees (greater or equal to 24-inch dbh) to accommodate the footprint of the road. Adjustment of the road alignment would be made where necessary and where possible to avoid direct impacts to large diameter trees, in particular where they occur outside of the road's original alignment. In addition, long-term adverse impacts to large trees located immediately adjacent to the footprint of the roadway would occur during construction and following the reopening. Damage to root systems during construction would weaken affected trees and, over time, potentially kill them. To minimize potential adverse impacts and to protect and to reduce potential damage to large diameter trees occurring adjacent to the project area, BMPs would be incorporated into construction plans.

Road reconstruction would have long-term adverse impacts on the wildlife resources that utilize Klingle Valley in a seasonal or permanent fashion. Reconstruction of the road would reintroduce vehicular traffic into the valley, reducing habitat suitability. Lighting associated with the road, along with an overall increase in human activities following road completion, would also limit use of the area by some species. Increased fragmentation of Klingle Valley associated with reconstruction of the road would further limit wildlife use.

Option F: Build Klingle Road To Accommodate Vehicular, Pedestrian and Bike Uses

Actions Items

- Repair existing retaining wall to avoid further pavement collapse into creek.

- Replace stormwater and drainage system by one of two methods described in Section 2.0.
- Remove existing road; backfill ROW; grade to direct drainage.
- Contour and pave hard-surface bike path.
- Rebuild and widen two-lane road to 25-30 feet, open to vehicular traffic in both directions.

Short-term and long-term adverse and long-term beneficial affects to biological resources in Klingle Valley would be expected under Option F. Short-term adverse as well as long- term beneficial affects to biological resources associated with the repair of retaining walls and repair and replacement of the existing stormwater and drainage system are discussed under option B.

Reconfiguration of Klingle Road would impose major long-term impacts on the vegetative community within the project area. Recruitment of some tree and shrub species has occurred immediately adjacent to, and within, the road right-of-way. This vegetation would be removed to accommodate reconstruction of a two-lane road and hard-surface bike path. In addition, widening of the existing footprint of the road to accommodate pedestrian and bikeway facilities would result in the removal of most of the trees identified in the proposed project area to have diameter breast heights if greater than 24-inches. Large trees not directly affected as a result of removal would probably be adversely affected due to their proximity to the construction activities and, following completion of construction, due to their close proximity to the completed road and bike path. Damage to root systems during construction could weaken effected trees and over time potentially kill the trees.

Widening of the existing footprint of the road under Option F would require encroachment or redirection of the existing stream channel particularly in the central and western sections of the proposed project area. Channelization or redirection of the creek to accommodate the road and bike path would directly affect aquatic species utilizing the creek as a result of habitat removal or relocation. Adverse effects to aquatic species would not be expected to be extensive due to the currently degraded condition of the creek.

Road reconfiguration associated with implementation of Option F would also have long term impacts on terrestrial wildlife and birds that utilize Klingle Valley for habitat. Reconstruction of the road with a hard-surface bike path would reintroduce vehicular traffic along with additional pedestrian and bicycle traffic into the valley reducing its potential for use by wildlife. Lighting associated with the road along with an overall increase in human activities following road completion would also limit use of the area by wildlife. Increased fragmentation of Klingle Valley and permanent removal of vegetation associated with reconstruction of the road with the associated bike path would further decrease the viability for use of the valley by wildlife species.

Option G: Build Klingle Road as a One Lane (One-Way) Road with a Pedestrian/Bicycle Lane

Action Items

- Repair existing retaining wall to avoid further pavement collapse into creek.
- Replace stormwater and drainage system by one of two methods described in Section 2.0.
- Remove existing road; backfill ROW; grade to direct drainage.
- Rebuild one-lane (one-way) road, open to vehicular traffic.
- Contour and pave hard-surface bike path.

Repair of the existing stormwater and drainage system would result in short-term adverse impacts, but would provide long-term benefits to biological resources in Klingle Valley as described under Option B.

Short-term and long-term adverse impacts to the floral and faunal species would be expected to occur if the roadway were reconfigured within the existing right-of-way to accommodate one-way vehicular traffic and a pedestrian/bicycle lane. The reconfiguration of Klingle Road would require the removal of some large trees (greater or equal to 24-inch dbh) to accommodate the footprint of the road. Adjustment of the road alignment would be made where necessary and where possible to avoid direct impacts to large diameter trees, particularly where they occur outside of the road's

original alignment. In addition, long-term adverse impacts to nearby large trees located immediately adjacent to the footprint of the roadway would occur during construction and following the reopening. Damage to root systems during construction could weaken affected trees over time and could potentially kill the trees. To minimize potential adverse impacts to the trees and to protect and reduce potential damage to large diameter trees occurring adjacent to the proposed project area, BMPs would be incorporated into construction plans.

Road reconstruction would have long-term adverse impacts on the wildlife resources that utilize Klingle Valley on a permanent and/or temporary basis. Reconstruction of the road would reintroduce vehicular traffic into the valley, reducing habitat suitability. Lighting associated with the road, along with an overall increase in human activities following road reconfiguration, would also limit use of the area for some species. Increased fragmentation of Klingle Valley associated with reconstruction of the road would further limit use of the valley by wildlife species.

3.3 WATER RESOURCES

Klingle Creek, a tributary of Rock Creek, is designated as "Special Waters of the District of Columbia" according to the Water Quality Standards, 21 D.C. Municipal Regulations (DCMR) Section 1102.5 (DOH, 2000). Section 1102.4 requires maintenance of the water quality at or above the existing conditions and no long-term water quality effects. This sub-section evaluates the potential impacts associated with the proposed options in the context of these regulations.

3.3.1 Affected Environment

Surface water resources in and adjacent to the Klingle Road project area are characterized by Klingle Creek and a few, small, temporarily ponded areas associated with stormwater outfalls and restricted conveyances. Klingle Creek flows east from its headwaters near Macomb Street for approximately 0.8 miles to its confluence with Rock Creek just south of the Porter Street bridge over Rock Creek. Klingle Creek crosses Klingle Road then flows adjacent to the road's eastern section for approximately half of the existing road's length. The Klingle Creek watershed drains an area approximately 0.5 square miles (320 acres) between Woodley Park and Cleveland Park (Exhibit 3-7).

Klingle Creek is a small stream with a flow rate of less than one cubic foot per second (cfs) (Banta, 1993). Existing stream channel and water quality conditions in Klingle Creek are not representative of a small, healthy urban creek. The level of urban development in Klingle Creek and the surrounding area has limited the ability of the creek to effectively drain the additional runoff from the watershed. As a result of this increased volume of stormwater runoff, the stream channel has had to adjust to accommodate the high volumes of urban stormwater runoff. Increases in the volume and in the flow rate of stormwater runoff entering Klingle Creek has lead to erosion of the streambanks and the streambed. This erosion and associated sediment transport and deposition decreases water quality and the quality of aquatic habitat within the stream system.

Stream Morphology

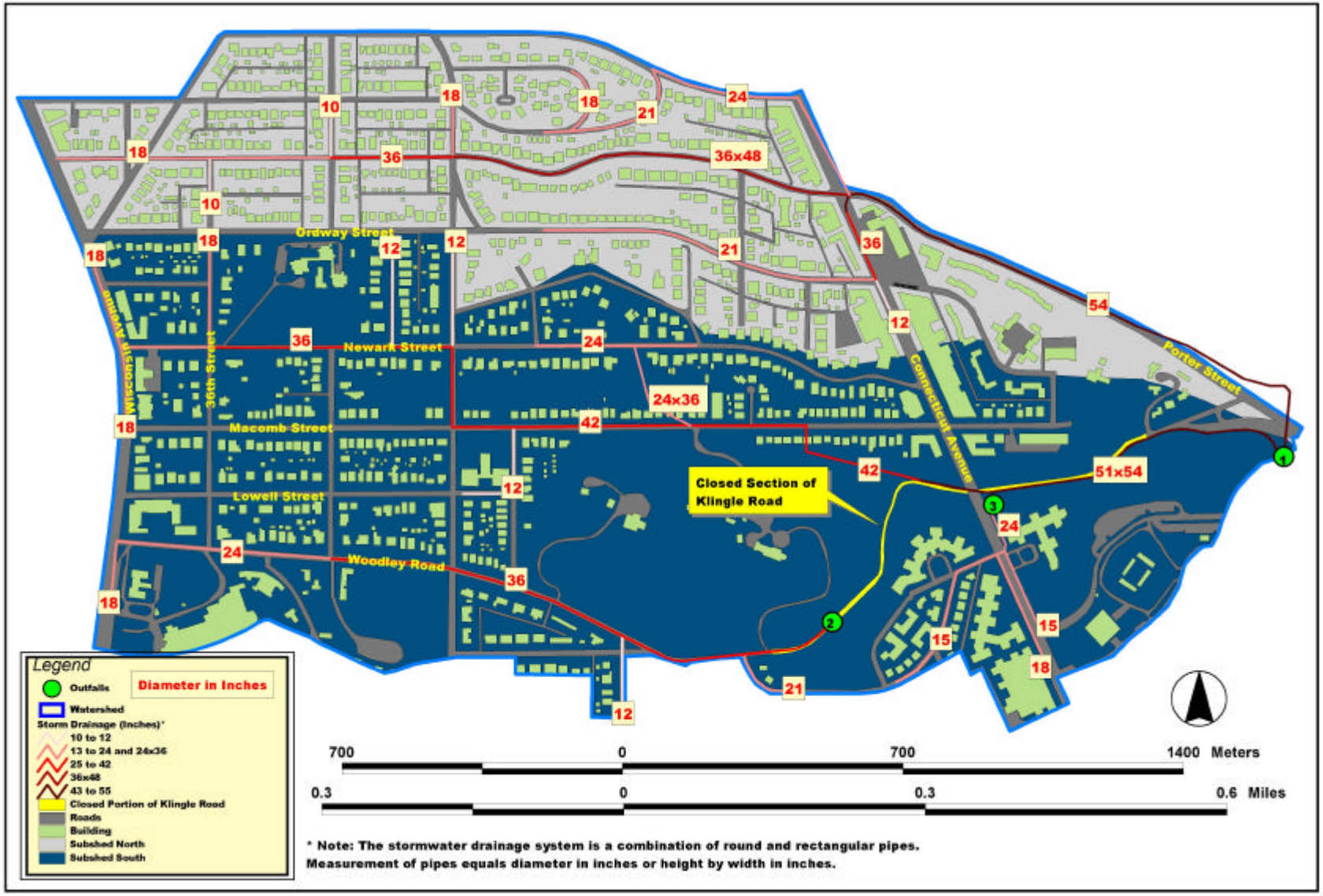
Field assessment of the channel conditions of Klingle Creek indicates the stream channel and creek banks are impacted by streambank and bed erosion. The applicable regional curves for bankful (the water level reached during a 2-year storm) dimensions were used to determine the average stream channel morphology. For a 0.5-square-mile watershed, the average stream channel dimensions are approximately 1.3-feet-deep by 12-feet-wide, with a cross-sectional area of approximately 15-square-feet. Stream channel measurements in four random locations show these dimensions were exceeded in Klingle Creek, indicating that the stream channel is degrading because of increased stormwater flow.

Stormwater and Sewer Conveyance Systems

Nine stormwater outfalls are located in the Klingle Creek watershed. An existing storm sewer system also traverses Klingle Valley (Exhibit 3-7). The sewer line alignment indicates the watershed was subdivided into a

EXHIBIT 3-7

Watershed/Drainage Map



Source: NCPC, Air Survey Corporation Commission, March 1991 and DC Department of Public Works, Sewerage System, November 1986.

north and south subwatersheds. In the north subwatershed, surface runoff is collected in a stormwater drain line adjacent to Porter Street, running from Wisconsin Avenue to the outfall into Rock Creek. Four branches feed into the Porter Street trunk line. The south subwatershed, Klingle Creek, has three distinct outfall systems, as follows:

- Outfall #1 drains to the Newark-Macomb-Klingle Road storm drain collector, discharging to Rock Creek through an outfall structure sharing a headwall with the Porter Street storm sewer line.
- Outfall #2 drains to the Woodley-Klingle Road storm drain collector, discharging to Klingle Creek approximately 200-feet west of Cortland Place.
- Outfall #3 drains an 18-inch collector along Cortland Place from Devonshire Place to Connecticut Avenue and two storm drains two blocks to the east and west sides of Connecticut Avenue, discharging to Klingle Creek from near the south abutment of the Connecticut Avenue Bridge.

The Klingle Creek watershed occurs within the Rock Creek Sewer System Drainage Basin service area. The Klingle Road sanitary sewer collector services a population of approximately 4,000 people and conveys approximately 0.47-million gallons per day of sewage (NPS, 1979). The deteriorated condition of the existing road and odors persistent during multiple site visits indicate the sanitary collector system may be compromised in several locations within Klingle Valley (See Section 3.12.1 for additional discussion of the sewer system potentially affecting the proposed project area.)

Water Quality

Water quality within Klingle Creek has been compromised because of surrounding development; pollutants associated with urban runoff; the degraded condition of the stormwater conveyance systems; the collapse of Klingle Road; and the potentially degraded condition of the sanitary collector system located within the Klingle Creek watershed. Typical pollutants include suspended solids, heavy metals, oils and greases, and organics. These pollutants pose a threat to human and environmental health.
Bioassessments to characterize the ecological character and water quality characteristics of streams in the District of Columbia were conducted in 1988, 1993, and 1998. Conditions in Klingle Creek were characterized in the three studies. Results of the 1988 study conducted by the District of Columbia DCRA Housing and Regulatory Administration Environmental Control Division (Johnson, 1988) indicate that water quality in Klingle Creek was fair to poor. Samples of benthic macroinvertebrates taken in the creek were dominated by chironomid, indicating that the creek was organically enriched.

Stream characterizations conducted in 1993 indicate the stream was moderately impaired and showed evidence of loss of in-stream cover, increased imbeddedness, channel alteration, and bottom scouring (Banta, 1993). A benthic macroinvertebrate sample from the creek collected 28 individuals from 14 taxa. The sample included six species of chironomid. The dominance of chironomid and the ratio of scrapers to filter-collectors in the sample indicated eutrophication and organic enrichment of the creek. Toxic pollution, organic pollution, eutrophication, and environmental degradation all appeared to be impacting the stream at the time of the study.

Biological data provided by the DOH Watershed Protection Division from the 1998 study indicate Klingle Creek is impacted by water quality and habitat degradation. Based on benthic macroinvertebrates and fish collections evaluations conducted by the DOH, it is concluded that the creek has a low diversity of aquatic species, consisting primarily of species tolerant of adverse conditions. Klingle Creek water quality conditions were ranked as fair/poor according to the 1998 rapid bioassessment of stream in the District of Columbia. The poor rating of the water quality conditions was attributed to urban runoff and the presence of the storm water outfalls in the watershed. Dry weather sampling showed an elevated Carbon Oxygen Demand (COD) level resulting from nutrients present in the creek and low concentrations of trace metals in the sediment.

3.3.2 Environmental Consequences

Option A: No Action

Action Items

- Road remains closed.
- Repair existing retaining wall to avoid further pavement collapse into creek.
- Maintenance activities.

Short-term and long-term adverse impacts on the hydrology and the water quality conditions would be expected to continue with the implementation of the No Action Option. Erosion of the streambed, destabilization of the stream banks, and undercutting would continue as a result of increased flow from the uncontrolled stormwater runoff from the surrounding urban area. These adverse impacts would be expected to further degrade stream habitat. In addition, the increased flow conditions would undercut the retaining wall supporting the roadway, requiring continual improvements and maintenance to the wall. Continued undercutting could lead to the collapse of both the retaining wall and the road into the stream channel in places, further modifying stream flows and impacting instream habitats. Consequently, Klingle Creek will continue to transport sediment and poor water quality to Rock Creek.

Option B: No Build

Action Items

- Road remains closed.
- Repair existing retaining wall to avoid further pavement collapse into creek.
- Replace stormwater and drainage system by one of two methods described in Section 2.0.

Short-term adverse impacts on water quality would be expected to occur during the repair of the retaining walls and the repair or replacement of the stormwater and drainage system. These impacts would be mitigated using proper design and implementation of sediment controls during the construction phase. However, the long-term impacts of this option would benefit the environmental conditions of the creek, only if the hydrologic regime conditions in the stream were reduced to natural or pre-urban development conditions. Control and diversion of stormwater runoff would reduce the streambed and bank erosion by reducing the volume of stormwater flow. Long-term impacts would be expected from continuous degradation of the existing roadway. As a result, Klingle Creek would continue to impact Rock Creek water quality conditions.

Option C: Green Space

Action Items

- Road permanently closed.
- Repair existing retaining wall to avoid further pavement collapse into creek.
- Replace stormwater and drainage system by one of two methods described in Section 2.0.
- Remove road; backfill ROW; sod with topsoil; grade to direct drainage.

Short-term adverse impacts on the hydrology and water quality would be expected to occur during the repair of the retaining walls and the repair or replacement of the stormwater and drainage system. In addition, removal of the asphalt road would temporarily expose the soil on steep slopes and substantially increase the potential for erosion. The eroded material would have an adverse impact on the aquatic habitat of Klingle Creek and Rock Creek, therefore proper design and implementation of short- and long-term sediment control and management practices would be essential. Post-construction erosion control measures would be implemented until successful revegetation of the affected area is accomplished. The long-term impacts of Option C on the hydrology and water quality would be beneficial by reducing the volume of storm runoff, as well as of erosion material, into Klingle Creek and consequently into Rock Creek.

Option D: Bike, Recreation, and Facility Management

Action Items

- Road remains closed to vehicular traffic.
- Repair existing retaining wall to avoid further pavement collapse into creek.

- Replace stormwater and drainage system by one of two methods described in Section 2.0.
- Remove existing road; backfill ROW; and grade to direct drainage.
- Contour and pave hard-surface bike path capable of supporting utility and maintenance trucks.
- Reestablish area adjacent to bike path as a recreation area.

If this option were implemented, short-term adverse impacts on the hydrology and water quality would be expected to occur during the construction and the repair of the retaining walls and the stormwater and drainage system. Proper design and implementation of BMPs would be essential to minimize the impacts on Klingle Creek and Rock Creek. By reducing the volume of stormwater runoff in Klingle Creek, the long-term impacts of the option on the hydrology and water quality would be beneficial.

The long-term impacts of vehicular traffic on the water quality would be negative because of an increase in the concentrations of metals, oil, and grease associated with traffic.

Option E: Rebuild Klingle Road to its Original Alignment

Action Items

- Repair existing retaining wall to avoid further pavement collapse into creek.
- Replace stormwater and drainage system by one of two methods described in Section 2.0.
- Remove road; backfill ROW; and grade to direct drainage.
- Rebuild road to its original dimensions; reopen road to two-way vehicular traffic.

The construction process could temporarily impact water quality and aquatic habitats in Klingle Creek and Rock Creek. Short-term, adverse impacts that would occur as a result of construction activities would be mitigated with the proper placement and maintenance of stormwater and erosion and sediment controls during construction.

Long-term impacts of this option would be expected to be beneficial as a result of a reduction in the volume of uncontrolled runoff entering Klingle Creek. The long-term impacts of the vehicular traffic on the water quality would be negative because of an increase in the concentrations of metals, oil and grease associated with traffic.

Option F: Build Klingle Road To Accommodate Vehicular, Pedestrian and Bike Uses

Actions Items

- Repair existing retaining wall to avoid further pavement collapse into creek.
- Replace stormwater and drainage system by one of two methods described in Section 2.0.
- Remove existing road; backfill ROW; grade to direct drainage.
- Contour and pave hard-surface bike path.
- Rebuild and widen two-lane road to 25-30 feet, open to vehicular traffic in both directions.

Under Option F Klingle Road would be reopened to accommodate vehicular, bike and pedestrian traffic. This option involves replacing the existing road with a new and a wider road that can support two-lanes of vehicular traffic and complies with DDOT standards and the D.C. design specifications. In addition, a bike lane and sidewalks would be built to accommodate bike and pedestrian traffic. These three uses cannot be accommodated within the existing Klingle Road ROW. Widening of the Klingle Road ROW requires additional studies to determine the new road alignment and the extent of stream channel modification or realignment necessary to accommodate the two-lane road and bike path.

Rebuilding Klingle Road to accommodate the vehicular, bike and pedestrian traffic also requires the replacement or repair of the retaining wall and the drainage system.

The construction process would temporarily impact water quality and aquatic habitats in Klingle Creek and Rock Creek. Short-term, adverse impacts that would occur due to construction activities would be minimized through the

use of proper placement and maintenance of stormwater and erosion and sediment controls during construction. Long-term impacts of this alternative would be expected. Beneficial impacts would result from a reduction in the volume of uncontrolled runoff entering the Klingle Creek channel. The long term impacts of the vehicular traffic on the water quality would be adverse due to the increase in the concentrations of metals, oil and grease associated with vehicular traffic.

Furthermore, modification of the stream channel to accommodate the road and the bike path could also result in adverse effects on the water quality and habitat within Klingle Creek and downstream (Rock Creek) if proper management practices to address modified flows were not incorporated into the design of this option.

Option G: Build Klingle Road as a One-Lane (One-Way) Road with a Pedestrian/Bicycle Lane

Action Items

- Repair existing retaining wall to avoid further pavement collapse into creek.
- Replace stormwater and drainage system by one of two methods described in Section 2.0.
- Remove existing road; backfill ROW; and grade to direct drainage.
- Rebuild one-lane (one-way) road, open to vehicular traffic.
- Contour and pave hard-surface bike path.

Under Option G Klingle Road would be reopened to accommodate vehicular, bike and pedestrian traffic. This option involves replacing the existing road with a new road that can support one-lane of vehicular traffic and complies with DDOT standards and the D.C. design specifications. In addition, a bike lane and sidewalks would be built to accommodate bike and pedestrian traffic. Additional studies will be required to determine the new road alignment and the extent of stream channel modification or realignment necessary to accommodate the one-lane road and bike path.

Rebuilding Klingle Road to accommodate the vehicular, bike and pedestrian traffic also requires the replacement or repair of the retaining wall and the drainage system.

The construction process would temporarily impact water quality and aquatic habitats in Klingle Creek and Rock Creek. Short-term, adverse impacts that would occur due to construction activities would be minimized through the use of proper placement and maintenance of stormwater and erosion and sediment controls during construction. Long-term impacts of this alternative would be expected. Beneficial impacts would result from a reduction in the volume of uncontrolled runoff entering the Klingle Creek channel. The long term impacts of the vehicular traffic on the water quality would be adverse due to the increase in the concentrations of metals, oil and grease associated with vehicular traffic.

Furthermore, modification of the stream channel to accommodate the road and the bike path could also result in adverse effects on the water quality and habitat within Klingle Creek and downstream (Rock Creek) if proper management practices to address modified flows were not incorporated into the design of this option.

3.4 FLOODPLAIN ENCROACHMENT

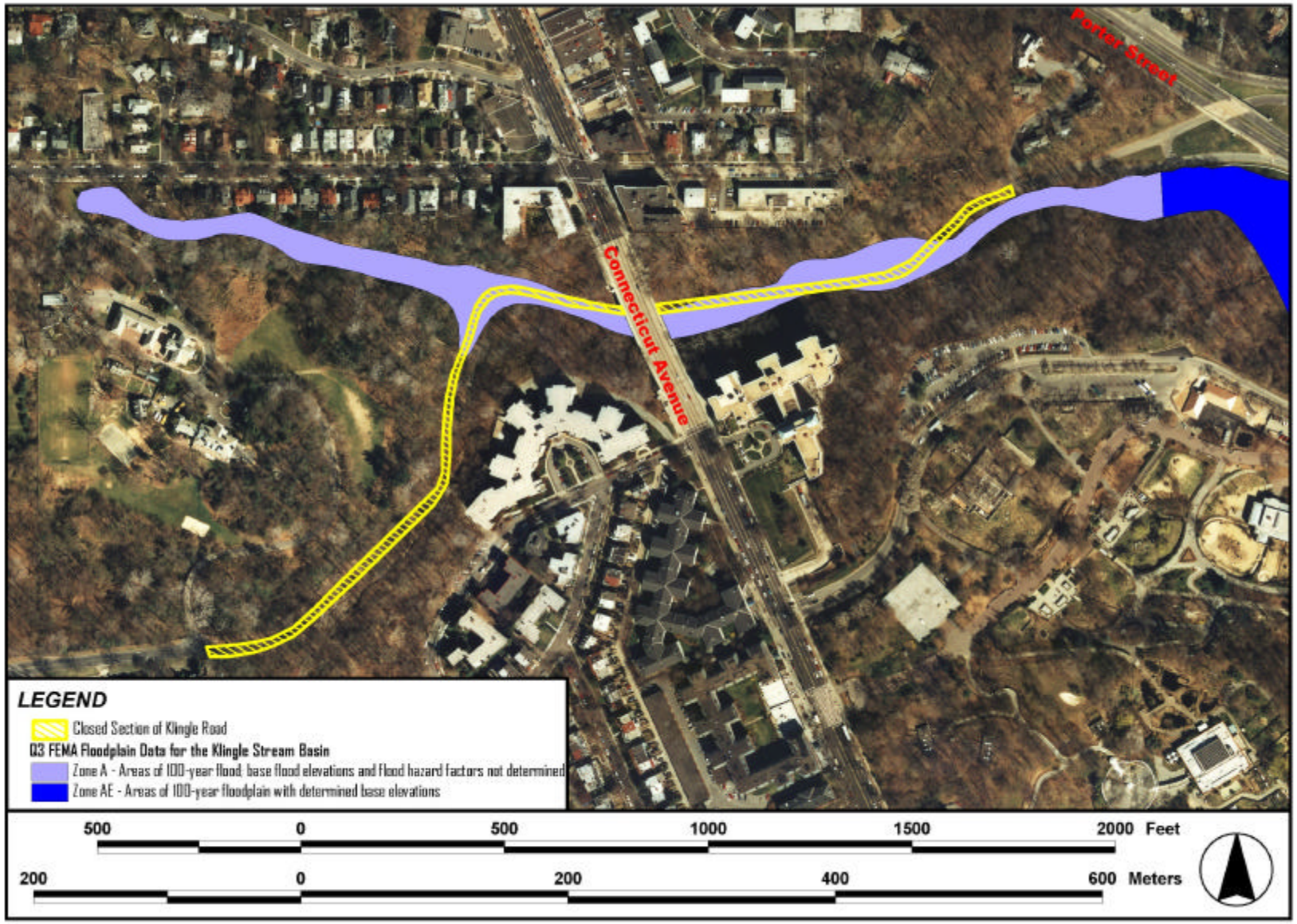
Executive Order (EO) 11988 requires federal agencies to take action to minimize occupancy and modification of the floodplain. Specifically, EO 11988 prohibits federal agencies from funding construction in the 100-year floodplain unless there are no practicable options.

3.4.1 Affected Environment

As shown in Exhibit 3-8, approximately half of the currently closed portion of Klingle Road is within the 100-year floodplain as indicated by the Flood Insurance Rate Maps, Community-Panel Numbers 110001-0010 and 110001-0020 and Federal Emergency Management Agency (FEMA) Q3 Flood Data for Washington, D.C.

EXHIBIT 3-8

Floodplain Map



Source: FEMA Q3 Flood Data, September 1998.

3.4.2 Environmental Consequences

The location of Klingle Road within the 100-year floodplain makes it mandatory for the DDOT and the FHWA to follow EO 11988 for all the proposed options. In accordance with this EO, the DDOT must prepare and circulate a notice containing an explanation of why the selected option is proposed to be located in the floodplain. The DDOT and FHWA must "consider options to avoid adverse effects and incompatible development in the floodplains" including design considerations "to minimize potential harm to or within the floodplain."

Option A: No Action

Action Items

- Road remains closed.
- Repair existing retaining wall to avoid further pavement collapse into creek.
- Maintenance activities.

All construction activities would follow the FHWA Design Standards for Highways in National Flood Insurance Program Mapped Floodplains (Memorandum dated April 2, 1986, Appendix C). In addition, because of the potential for modification to the floodplain resulting from construction activities, coordination with FEMA would be conducted by the DDOT (Memorandum dated June 25, 1982, Appendix C). Design standards and construction activities would be prepared and would be conducted to minimize potential short-term and long-term adverse impacts to or within the floodplain. Long-term impacts to the floodplain would be expected because of the modification of the stream channel resulting from the retaining wall.

Option B: No Build

Action Items

- Road remains closed.
- Repair existing retaining wall to avoid further pavement collapse into creek.
- Replace stormwater and drainage system by one of two methods described in Section 2.0.

All construction activities would follow the FHWA Design Standards for Highways in National Flood Insurance Program Mapped Floodplains (Memorandum dated April 2, 1986, Appendix C). In addition, because of the potential for modification to the floodplain resulting from construction activities, coordination with FEMA would be conducted by the DDOT (Memorandum dated June 25, 1982, Appendix C). Design standards and construction activities would be prepared and would be conducted to minimize potential short-term and long-term adverse impacts to or within the floodplain. Long-term impacts to the floodplain would be expected because of the modification of the stream channel resulting from the repair of the retaining wall. On the other hand, the repair of the stormwater and drainage system would stabilize flows, thereby allowing the stream to reach equilibrium and providing long-term benefits.

Option C: Green Space

Action Items

- Road permanently closed.
- Repair existing retaining wall to avoid further pavement collapse into creek.
- Replace stormwater and drainage system by one of two methods described in Section 2.0.
- Remove road; backfill ROW; sod with topsoil; and grade to direct drainage.

Although this option is being considered to minimize potential harm to or within the existing floodplain, removal of the asphalt and repair of the drainage would potentially modify the floodplain. All construction activities would follow the FHWA Design Standards for Highways in National Flood Insurance Program Mapped Floodplains (Memorandum dated April 2, 1986, Appendix C). In addition, because of the potential for modification of the floodplain resulting from construction activities, coordination with FEMA would be conducted by the DDOT (Memorandum dated June 25, 1982, Appendix C). Design standards and construction activities would be prepared and would be conducted to minimize potential short-term and long-term adverse impacts to or within the floodplain. Long-term impacts to the floodplain would be expected due to the modification of the stream channel

resulting from the repair of the retaining wall. On the other hand, the repair of the stormwater and drainage system would stabilize flows, thereby allowing the stream to reach equilibrium and providing long-term benefits.

Option D: Bike, Recreation, and Facility Management

Action Items

- Road remains closed to vehicular traffic.
- Repair existing retaining wall to avoid further pavement collapse into creek.
- Replace stormwater and drainage system by one of two methods described in Section 2.0.
- Remove existing road; backfill ROW; and grade to direct drainage.
- Contour and pave hard-surface bike path capable of supporting utility and maintenance trucks.
- Reestablish area adjacent to bike path as a recreation area.

All construction activities would follow the FHWA Design Standards for Highways in National Flood Insurance Program Mapped Floodplains (Memorandum dated April 2, 1986, Appendix C). In addition, because of the potential for modification of the floodplain resulting from construction activities, coordination with FEMA would be conducted by the DDOT (Memorandum dated June 25, 1982, Appendix C). Long-term impacts to the floodplain would be expected due to the modification of the stream channel resulting from the repair of the retaining wall. On the other hand, the repair of the stormwater and drainage system would stabilize flows, thereby allowing the stream to reach equilibrium and providing long-term benefits.

Option E: Rebuild Klingle Road to its Original Alignment

Action Items

- Repair existing retaining wall to avoid further pavement collapse into creek.
- Replace stormwater and drainage system by one of two methods described in Section 2.0.
- Remove road; backfill ROW; and grade to direct drainage.
- Rebuild road to its original dimensions; reopen road to two-way vehicular traffic.

All construction activities would follow the FHWA Design Standards for Highways in National Flood Insurance Program Mapped Floodplains (Memorandum dated April 2, 1986, Appendix C). In addition, because of the potential for modification of the floodplain resulting from construction activities, coordination with FEMA would be conducted by the DDOT (Memorandum dated June 25, 1982, Appendix C). Long-term impacts to the floodplain would be expected due to the modification of the stream channel resulting from the repair of the retaining wall. On the other hand, the repair of the stormwater and drainage system would stabilize flows, thereby allowing the stream to reach equilibrium and providing long-term benefits.

Option F: Build Klingle Road To Accommodate Vehicular, Pedestrian and Bike Uses

Actions Items

- Repair existing retaining wall to avoid further pavement collapse into creek.
- Replace stormwater and drainage system by one of two methods described in Section 2.0.
- Remove existing road; backfill ROW; grade to direct drainage.
- Contour and pave hard-surface bike path.
- Rebuild and widen two-lane road to 25-30 feet of width, open to vehicular traffic in both directions.

All construction activities would follow the FHWA Design Standards for Highways in National Flood Insurance Program Mapped Floodplains (Memorandum dated April 2, 1986, Appendix C). Because of the potential for modification of the floodplain resulting from construction activities, coordination with FEMA would be conducted by the DDOT (Memorandum dated June 25, 1982, Appendix C). Widening of the existing ROW would be necessary to accommodate a two-lane road and hard-surface bike path. New encroachment into the floodplain of Klingle Creek would be necessary due to site restrictions and limited space. Additional studies would be necessary to determine the best placement of the road and bike path and the degree of new floodplain encroachment or modification that would be necessary to implement the option. Long-term impacts would be expected as a result of further modification of floodplain characteristics and associated

effects on flows during flood events both in Klingle Valley and in downstream habitats. Design standards and construction activities would be prepared and conducted to minimize potential short-term and long-term adverse impacts to, or within, the floodplain or to downstream habitats. Long-term impacts to the floodplain would also be expected due to the modification of the stream channel resulting from the repair of the retaining wall. Repair of the stormwater and drainage system would result in long-term beneficial effects by reducing the amount of uncontrolled stormwater runoff flows in Klingle Valley during storm events.

Option G: Build Klingle Road as a One-Lane (One-Way) Road with a Pedestrian/Bicycle Lane

Action Items

- Repair existing retaining wall to avoid further pavement collapse into creek.
- Replace stormwater and drainage system by one of two methods described in Section 2.0.
- Remove existing road; backfill ROW; and grade to direct drainage.
- Rebuild one-lane (one-way) road, open to vehicular traffic.
- Contour and pave hard-surface bike path.

All construction and design activities for this option would be undertaken by the DDOT as described for options A-E. Design standards and construction activities would be prepared and conducted to minimize potential short-term and long-term adverse impacts to or within the floodplain. Long-term impacts to the floodplain would be expected due to the modification of the stream channel resulting from the repair of the retaining wall. On the other hand, the repair of the stormwater and drainage system would stabilize flows, thereby allowing the stream to reach equilibrium and providing long-term benefits.

3.5 HAZARDOUS MATERIALS

Federal guidelines recommend a review of potential hazardous materials in the vicinity of the project area because of potential impacts from construction activities.

3.5.1 Affected Environment

A Phase I study was not conducted for the closed portion of Klingle Road, however, Environmental Data Resources, Inc. (EDR) was utilized to conduct a search of available databases as identified by American Society for Testing and Materials (ASTM) Standard E-1527-00. The complete report by EDR is included in Appendix C (EDR, October 20, 2000). For the closed portion of Klingle Road and using the center point (for radius search) of the intersection of Klingle Road and Connecticut Avenue, Washington D.C., EDR found the following.

The U.S. Environmental Protection Agency (EPA) investigated concern regarding exposure to lead from paint chips from the Glover Bridge in September 1999. The results of this investigation were analyzed by the Agency for Toxic Substances and Disease Registry (ATSDR). ATSDR concluded that the levels of lead detected in surface soil and from bridge paint samples are a public health hazard. This rating is used for sites that pose a public health hazard because of the existence of long-term exposures (greater than one year) to hazardous substances or conditions that could result in adverse health effects. Planned remediation for this issue is currently in progress by the D.C. government.

It is important to note, while information may be included in the federal or state databases, it does not necessarily indicate the presence of an environmental problem or public health threat. The full EDR report contains information on each site including information on violation status, classification, facility status, and other data. A full Phase I study under ASTM Standard E-1527-00 is recommended for any option selected.

Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) List

The CERCLIS list is a nationwide database created by the EPA to maintain and regulate those facilities or sites that the EPA has investigated or will investigate for suspected or uncontrolled releases of hazardous substances, contaminants, or pollutants as reported by states, municipalities, private companies, and private citizens under CERCLA (or the Superfund Program). Once a site is placed on the CERCLIS list, it may be subjected to several

additional levels of evaluation to determine the severity of the contamination, from discovery and preliminary assessment to site inspection, and possibly the application of the EPA's Hazard Ranking System (HRS). Such a determination could ultimately place the site under consideration for inclusion on the National Priorities List (NPL). Inclusion on the CERCLIS list does not confirm the presence of an environmental problem or a public health threat. EDR's review of the CERCLIS list dated 4/16/2000 revealed three CERCLIS sites exist in the study area. These sites include:

- UDC Oil Spill 1977; 4200 Connecticut Ave., N.W.
- Soapstone Creek Oil Spill Resp.; 4411 Connecticut Ave., N.W.
- Archibald Glover Park Outfall, 42nd & Edmund Sts., N.W.

More details on these sites are included in Appendix C.

National Priorities List (NPL)

The EPA's NPL (or Superfund List) is a federal listing of uncontrolled or abandoned hazardous or toxic waste sites that can potentially pose risk to human health or to the environment. The list is created from the CERCLIS database and is primarily based upon a score that each site or facility receives from the HRS. After a site or facility has been identified as a CERCLIS site, the EPA conducts an assessment of the property. The HRS score associated with the degree of environmental risk found is one of the determinations made as to whether the site is placed on the NPL. These sites are then prioritized for possible long-term remedial action and referred to the state for further action under state programs. There were no mapped sites found in EDR's search of available, or "reasonably ascertainable," government records either on the target property or within the ASTM Standard E-1527-00 search radius around the target property for the NPL database.

Resource Conservation and Recovery Information System (RCRIS) List

The RCRIS list is a compilation of records from a nationwide database created to maintain and to regulate sites or facilities that handle, treat, store, or dispose of hazardous wastes under the Resource Conservation and Recovery Act (RCRA). Inclusion on the list is not necessarily indicative of contamination; rather, it indicates the presence of potential sources of contamination.

- **Small Quantity Generator (SQG):** Generates in one or more months between 220 pounds and 2,200 pounds of hazardous waste. EDR's review of the RCRIS-SQG list dated 6/21/2000 revealed four sites within approximately 0.5-miles of the target property. Details of these sites are included in Appendix C.
- **Large Quantity Generator (LQG):** Generates in one or more months 2,200 pounds of hazardous waste. There were no mapped sites found in EDR's search of available government records, whether on the target property or within the ASTM Standard E-1527-00 search radius around the target property for the RCRIS-LQG database.
- **Treatment, Storage, and Disposal Facility (TSD):** Site where a hazardous waste substance is treated, stored, or disposed. There were no mapped sites found in EDR's search of available government records, whether on the target property or within the ASTM Standard E-1527-00 search radius around the target property for the RCRIS-TSD database.

Emergency Response Notification System (ERNS) List

The ERNS list is a compilation of records from a national computer database and retrieval system created to store information on accidental releases of oil and hazardous substances. The information stored in this database is acquired through the National Response Center. Each incident report is required to contain and provide the discharge name, date of release, amount released, and type of substance released. EDR's review of the ERNS list dated 8/8/2000 revealed two ERNS sites within approximately 0.5-miles of the target property. Details of these sites are included in Appendix C.

Leaking Underground Storage Tank (LUST) List

LUST incident reports contain an inventory of reported leaking underground storage tank incidents. The data come from the DCRA's District of Columbia LUST Cases List. EDR's review of the LUST list dated 9/5/2000

revealed 40 LUST sites within approximately 1.5-miles of the target property. Details of these sites are included in Appendix C.

Underground Storage Tank (UST) List

The Underground Storage Tank database contains registered USTs. The data come from the DCRA's District of Columbia UST Database List. EDR's review of the UST list dated 7/19/1999 revealed that there are 78 UST sites within approximately 0.5 miles of the target property. Details of these sites are included in Appendix C.

3.5.2 Environmental Consequences

Under all of the options considered, some construction would be necessary, if only to repair the retaining walls along Klingle Road. Under all of the options, with the exception of the No Action Option, repair to or replacement of the underground stormwater and drainage system would be necessary. Under any option selected, the DDOT should perform a Phase I Environmental Site Assessment in accordance with the ASTM Standard E-1527-00. All potential above-ground and underground sources of hazardous waste in the project area should be investigated.

3.6 AIR QUALITY

3.6.1 Affected Environment

FHWA guidelines on air quality specify which pollutants should be analyzed given the varied differences from one region to another. The level of detail in an air quality study will also vary according to the size of the project. According to *Regional Approaches to Improving Air Quality*, a publication distributed by EPA, states and communities cannot independently solve their air pollution problems because air pollution is not contained within political boundaries. This is especially relevant to an area such as Washington, D.C. that only covers a land area of approximately 68 square miles. Since air pollution is regional in nature and would have effects beyond Washington, D.C. boundaries, air quality was considered on a regional level for this report. It is also unlikely that any of the build options would produce induced effects (new traffic) and would instead shift existing traffic from other roads back onto Klingle Road. In this feasibility study, five of the most common pollutants measured in the Washington, D.C. metropolitan region are reviewed: ozone, carbon monoxide, sulfur dioxide, nitrogen dioxide, and particulate matter.

Ozone

The Washington, D.C. metropolitan region exceeds the federal air quality standard for one air pollutant: ground-level ozone or smog. Ground-level ozone is formed when volatile organic compounds (VOC) and nitrogen oxides (NOx) react in sunlight. Common sources of VOCs and NOxs include emissions from utilities, industrial sources, trucks, cars, buses, lawnmowers, boats, and commercial products such as solvents, cleaning solutions, paints, and insecticides. VOC and NOx may travel many miles before forming into ozone. Frequently, ozone occurs in suburban and rural areas of the Washington, D.C. metropolitan region, far away from the sources that cause it. It is estimated that one-third of the pollution-causing ozone formation in the region comes from outside of the region (Metropolitan Washington Council of Governments, 2000).

Carbon Monoxide

Carbon monoxide (CO) is a colorless, odorless gas that forms when carbon in fuels is not completely burned. CO concentrations in ambient air typically come from the incomplete combustion of fuels from motor vehicles (Metropolitan Washington Air Quality Committee, 1997). The acceptable CO standard is 35 parts per million over a 1-hour period or 9 parts per million over an 8-hour period. Since 1990, 8-hour average CO levels have steadily declined in the Washington region and are in attainment of national health standards (Metropolitan Washington Air Quality Committee, 1997).

Sulfur Dioxide

Sulfur dioxide is a gas that forms when sulfur-bearing fuels (typically coal and oil) are burned. It can damage trees, crops, and other plants in the natural environment. In combination with nitrogen dioxide, sulfur dioxide can

also lead to the formation of acid rain. Sulfur dioxide in this region is measured in 3-hour concentrations. Overall, monitoring levels indicate sulfur dioxide levels are low and declining in the Washington region (Metropolitan Washington Air Quality Committee, 1997).

Nitrogen Dioxide

Nitrogen dioxide is a gaseous pollutant that can irritate the lungs and can lower resistance to respiratory infections. This gas is formed by the combustion of fuels at high temperatures, both from vehicles and industrial uses. Average annual rates as measured in the region show no discernible trend of either an increase or decrease since 1985 (Metropolitan Washington Air Quality Committee, 1997).

Particulate Matter

Particulate matter is the name given to solid or liquid particles found in the air, typically particles less than 10 microns in diameter (referred to as PM_{10}). PM_{10} may cause health problems, such as respiratory infections, cancer and premature death. It also is a major cause of reduced visibility in many regions of the country (Metropolitan Washington Air Quality Committee, 1997). In this region, PM_{10} has been measured since 1989 according to new EPA guidelines. Since that time, PM_{10} rates have experienced a general decline and concentration levels at all monitoring stations have been well below the national standards (Metropolitan Washington Air Quality Committee, 1997).

3.6.2 Environmental Consequences

According to FHWA guidelines, the Clean Air Act, the primary pollutant that needs to be analyzed during this stage of feasibility study is CO. By 1989, levels of CO reached the accepted health standard at all regional monitoring locations and have continued a downward trend since that time. The metropolitan region is meeting the federal standard for all previously mentioned pollutants except ozone, though ozone concentration levels have generally improved over the last decade. According to research and analysis by the Metropolitan Washington Air Quality Committee, the highest one-hour ozone levels have declined by almost ten percent and the average number of high-ozone days each summer has also steadily dropped (Metropolitan Washington Air Quality Committee, 1997). FHWA does not require the analysis of ozone at the project level because ozone is an area-wide pollutant and should be analyzed at a greater scale than at the project level. Under options A-E, it is assumed that regional air quality will neither improve or decline given the small geographic size of the road and the assumption that most of the proposed vehicular trips would not be induced. Further study of air quality may be necessary to determine microscale effects of traffic on air quality.

3.7 NOISE

The FHWA encourages state and local governments to consider noise and land use compatibility for all federally funded road projects. Noise is one of the most-noticed environmental pollutants, therefore potential noise impacts should be carefully evaluated with special consideration given to sensitive noise receptors, like residences, businesses, schools, and parks in the project area. However, in the consideration of noise for each project option, it is important to note that Klingle Road operated as a collector roadway until 1991.

3.7.1 Affected Environment

Sensitive noise receptors in the project area would include the primary residential areas surrounding Klingle Road, as well as the Washington International School and the National Zoological Park. The two apartment buildings located nearby the closed portion of Klingle Road are the Kennedy-Warren Apartment Building and Woodley Park Towers; they would also be considered as potentially sensitive noise receptors. The area surrounding the closed portion of Klingle Road is a mix of undeveloped property and open space abutments to residential and institutional areas. Connecticut Avenue, a heavily traveled roadway in Washington, D.C. that runs above Klingle Road, bisects the closed portion of the roadway.

3.7.2 Environmental Consequences

Option A: No Action

Action Items

- Road remains closed.
- Repair existing retaining wall to avoid further pavement collapse into creek.

Under this option there would be no short-term or long-term adverse impacts related to noise in the project area with the exception of temporary noise elevations during the reconstruction of the retaining walls. Since the closed portion of Klingle Road would not be opened to traffic under this option, no long-term adverse impacts associated with noise would be anticipated.

Option B: No Build

Action Items

- Road remains closed.
- Repair existing retaining wall to avoid further pavement collapse into creek.
- Replace stormwater and drainage system by one of two methods described in Section 2.0.

Noise impacts would be associated with the repair of the retaining walls and the replacement or repair of the stormwater and drainage system and would be expected to be adverse and short-term in nature. Under this option, the closed portion of Klingle Road would not be opened to traffic and no long-term adverse impacts associated with noise would be anticipated.

Option C: Green Space

Action Items

- Road permanently closed.
- Repair existing retaining wall to avoid further pavement collapse into creek.
- Replace stormwater and drainage system by one of two methods described in Section 2.0.
- Remove road; backfill ROW; sod with topsoil; and grade to direct drainage.

Noise impacts would be associated with the repair of the retaining walls and the replacement or repair of the stormwater and drainage system and would be expected to be adverse and short-term in nature. Under this option, the closed portion of Klingle Road would not be opened to traffic and no long-term adverse impacts associated with noise would be anticipated.

Option D: Bike, Recreation, and Facility Management

Action Items

- Road remains closed to vehicular traffic.
- Repair existing retaining wall to avoid further pavement collapse into creek.
- Replace stormwater and drainage system by one of two methods described in Section 2.0.
- Remove existing road; backfill ROW; and grade to direct drainage.
- Contour and pave hard-surface bike path capable of supporting utility and maintenance trucks.
- Reestablish area adjacent to bike path as a recreation area.

Impacts associated with Option D would be similar to the adverse short-term construction impacts discussed for options B and C. Since the closed portion of Klingle Road would not be opened to traffic under this option, no long-term adverse impacts associated with noise would be anticipated.

Option E: Rebuild Klingle to Original Alignment

Action Items

- Repair existing retaining wall to avoid further pavement collapse into creek.
- Replace stormwater and drainage system by one of two methods described in Section 2.0.
- Remove road; backfill ROW; and grade to direct drainage.
- Rebuild road to its original dimensions; reopen road to two-way vehicular traffic.

Under Option E, the currently closed portion of Klingle Road would be reopened to traffic. Noise impacts associated with the reopening (change repair and rebuilding of the road) would be expected short-term adverse. Opening the roadway to two-way traffic would necessitate an additional noise analysis in accordance with FHWA regulations. At a minimum, an analysis would include a more detailed description of noise-sensitive areas, like residences, businesses, schools, and parks, and would include information on the number and types of activities that could be affected. The analysis would also include the extent of the impact in decibels at each sensitive area. If mitigation for noise is warranted for noise impacts, activities should be undertaken in accordance with the FHWA regulations.

Option F: Build Klingle Road To Accommodate Vehicular, Pedestrian and Bike Uses

Actions Items

- Repair existing retaining wall to avoid further pavement collapse into creek.
- Replace stormwater and drainage system by one of two methods described in Section 2.0.
- Remove existing road; backfill ROW; grade to direct drainage.
- Contour and pave hard-surface bike path.
- Rebuild and widen two-lane road to 25-30 feet, open to vehicular traffic in both directions.

Under Option F, the currently closed portion of Klingle Road would be rebuilt and widened allowing for the reintroduction of traffic. Noise impacts associated with this reopening would be expected to be short-term adverse. Opening the roadway to a widened two-lane roadway with accompanying recreation path would necessitate an additional noise analysis under FHWA guidelines. At a minimum, an analysis would include a more detailed description of noise-sensitive areas, like residences, businesses, schools, and parks, and would include information on the number and types of activities that could be affected. The analysis would also include the extent of the impact in decibels at each sensitive area. If mitigation for noise is warranted for noise impacts, activities should be undertaken in accordance with the FHWA regulations.

Option G: Build Klingle Road as a One-Lane (One-Way) Road with a Pedestrian/Bicycle Lane

Action Items

- Repair existing retaining wall to avoid further pavement collapse into creek.
- Replace stormwater and drainage system by one of two methods described in Section 2.0.
- Remove existing road; backfill ROW; and grade to direct drainage.
- Rebuild one-lane (one-way) road, open to vehicular traffic.
- Contour and pave hard-surface bike path.

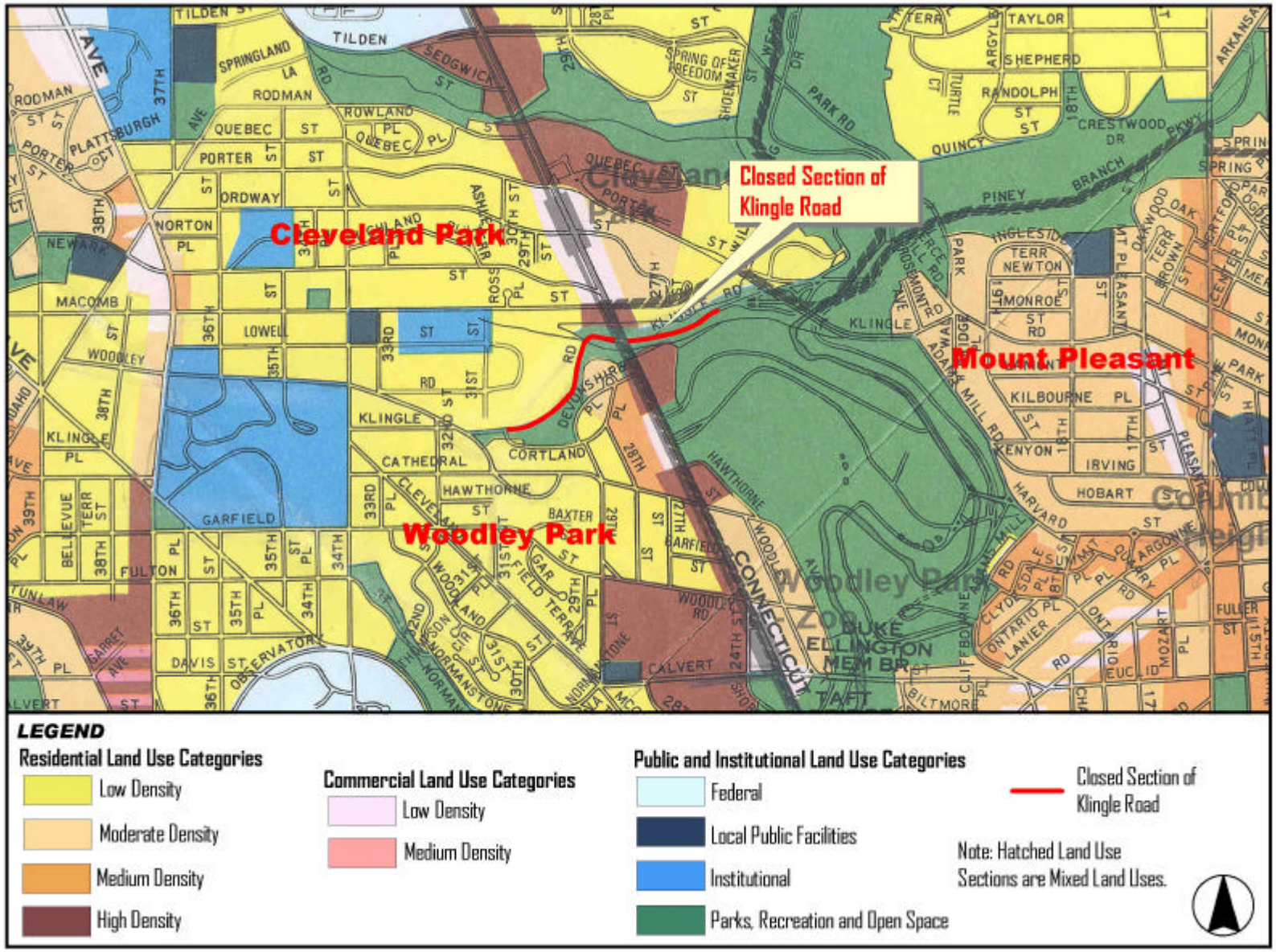
Noise impacts associated with the reopening of the road would be expected to be short-term adverse. Opening the roadway to two-way traffic would necessitate an additional noise analysis in accordance with FHWA regulations. At a minimum, an analysis would include a more detailed description of noise-sensitive areas, like residences, businesses, schools, and parks, and would include information on the number and types of activities that could be affected. The analysis would also include the extent of the impact in decibels at each sensitive area. If mitigation for noise is warranted for noise impacts, activities should be undertaken in accordance with the FHWA regulations.

3.8 LAND USE

The land use designations for the areas surrounding and adjacent to Klingle Road were examined using the District of Columbia Generalized Land Use Map (Exhibit 3-9) and were verified through field reconnaissance. The area studied is bordered by Rodman Street and Piney Branch Road on the north; 16th Street on the east; Cleveland Avenue, Calvert Street, and Harvard Street on the south; and Wisconsin Avenue and 31st Street on the west. Included in this area are the neighborhoods of Mount Pleasant, Woodley Park, and Cleveland Park.

EXHIBIT 3-9

Land Use Map



Source: District of Columbia Generalized Land Use Map, DC 1995.

3.8.1 Affected Environment

Klingle Road

The closed portion of Klingle Road is designated as park, recreation, and open space and connects to Rock Creek Park, which shares the same designation. Immediately adjacent to or near the closed portion of Klingle Road are apartment buildings, residential areas, the National Zoological Park, the Washington International School, and a property owned by the Embassy of India.

Mount Pleasant

The majority of the Mount Pleasant neighborhood is designated as moderate-density residential. Other land uses in the neighborhood include areas along 16th Street designated as medium-density residential and an area of low-density commercial along Mount Pleasant Street.

Woodley Park

The Woodley Park neighborhood is primarily designated as low-density residential. Other land use designations include the following:

- high-density residential (at Devonshire Place east of Connecticut Avenue and the area between Calvert Street and Woodley Road and 29th Street and 24th Street);
- medium-density residential (in the area of Connecticut Avenue, 28th Street, Cortland Place, and Cathedral Avenue);
- moderate-density residential (at Devonshire Place west of Connecticut Avenue, between Hawthorne Street and Connecticut Avenue, and Calvert Street and Cathedral Avenue);
- local public facility (at the corner of Cleveland Avenue and Calvert Street);
- a Metro station (on Connecticut Avenue between Calvert Street and Woodley Road);
- low-density commercial (along Connecticut Avenue between Calvert Street and Woodley Road and Cathedral Avenue and Devonshire Place); and
- parks, recreation and open space (the area of Rock Creek Park east of Hawthorne Street and the area between Klingle Road, Cortland Place, Devonshire Place, and Connecticut Avenue).

Cleveland Park

The land use in the Cleveland Park neighborhood is primarily designated as low-density residential. Other land use designations include the following:

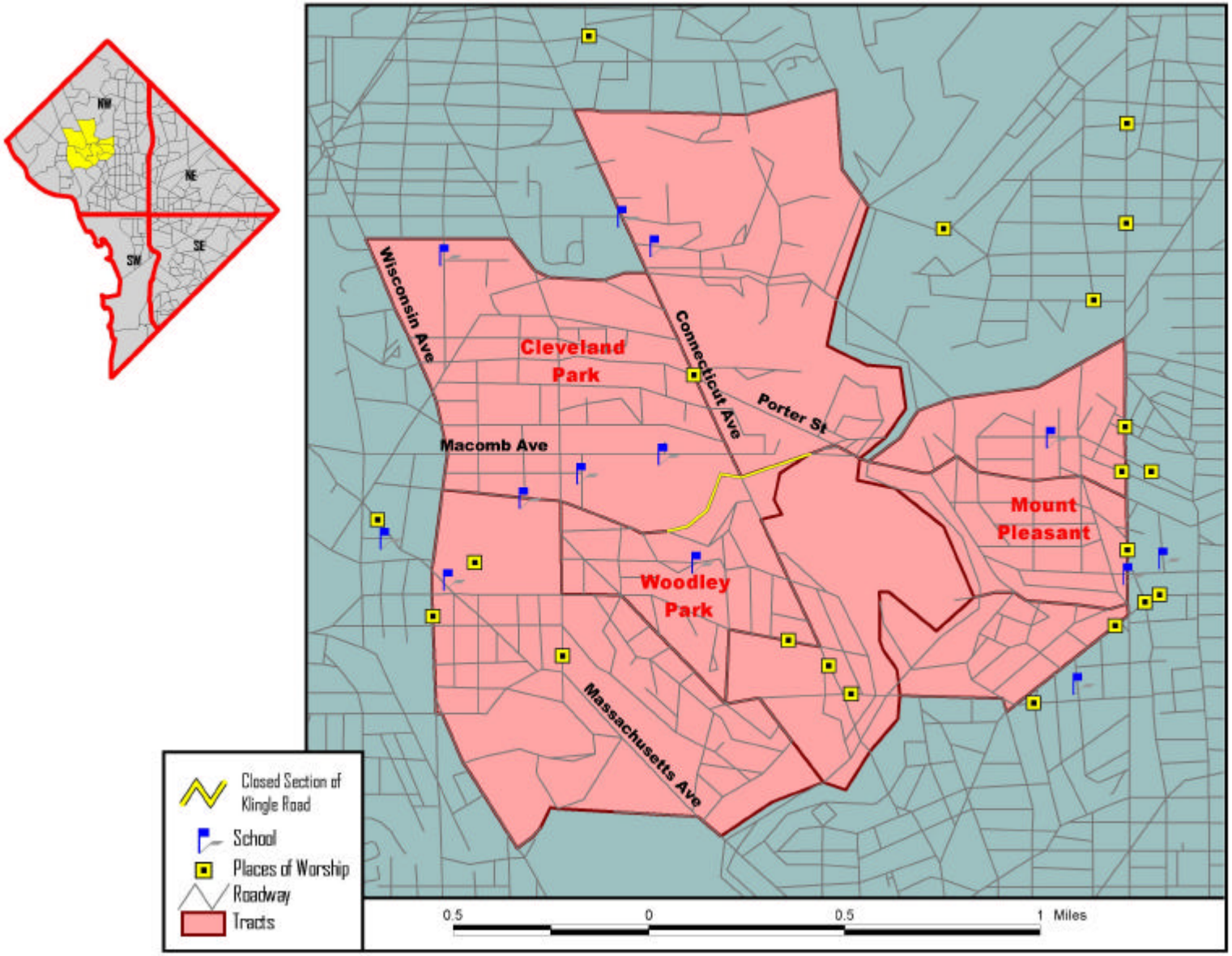
- high-density residential (along Connecticut Avenue between Klingle Road and Macomb Street and the area between Porter Street and Rodman Street that extends east of Connecticut Avenue and covers most of Quebec Street);
- medium-density residential (to the east of Wisconsin Avenue between Macomb Street and Newark Street);
- moderate-density residential (to the east of Connecticut Avenue between Porter Street and Macomb Street and dispersed along Wisconsin Avenue between Woodley Road and Norton Place);
- low-density commercial (along Connecticut Avenue between Porter Street and Macomb Street and along Wisconsin Avenue between Macomb Street and Norton Place);
- parks, recreation and open space (on Macomb Street between 35th Street and 34th Street and the area north of Quebec Street and east of Connecticut Avenue that contains Rock Creek Park);
- institutional (the area between 33rd Street, Macomb Street, Lowell Street, and 31st Street, and between Wisconsin Avenue, 36th Street, Woodley Road and Lowell Street, and between 34th Street, Ordway Street, Newark Street and 36th Street);
- a Metro station (at Connecticut Avenue and Porter Street); and
- a local public facility (between Macomb Street, Lowell Street, 33rd Street, and 34th Street).

Schools

There are 17 schools located in the areas immediately surrounding the closed portion of Klingle Road (Exhibit 3-10). The names and location of the schools are listed in Table 3-3.

EXHIBIT 3-10

Places of Worship and Schools Map



Source: The Louis Berger Group, 2000.

TABLE 3-3: SCHOOLS SURROUNDING THE CLOSED PORTION OF KLINGLE ROAD

School	Address
Maret School	3000 Cathedral Avenue, NW
Annunciation School	3825 Klingle Place, NW
West Elementary School	1338 Farragut Street, NW
Wilson Senior High School	3950 Chesapeake Street, NW
Hearst Elementary School	3950 37th Street, NW
Edmund Burke Middle School	2955 Upton Street, NW
University of the District of Columbia	4200 Connecticut Avenue, NW
Eaton Elementary School	3301 Lowell Street, NW
Oyster Elementary School	300 Bryant Street, NW
Stoddert Elementary School	4001 Calvert Street, NW
H.D. Cooke Elementary School	2525 17th Street, NW
Beauvoir, The National Cathedral Elementary School	3500 Woodley Rd, NW
George Bancroft Elementary School	1755 Newton Street, NW
Bell Multicultural Middle School	3145 Hiatt Place, NW
Washington International School	3100 Macomb St., NW
Lincoln Middle School	3101 16th Street, NW
St. Albans School	Mt. Saint Alban

Source: The Louis Berger Group, Inc. 2000. Table prepared by the Louis Berger Group Inc. using available address information for each school.

Places of Worship

There are 21 places of worship located in the areas immediately surrounding the closed portion of Klingle Road (Exhibit 3-10). The names and location of the places of worship are listed in Table 3-4.

Parks and Recreation Areas

Parks and recreation areas that are located in the areas immediately surrounding the closed portion of Klingle Road include Rock Creek Park and its extensions and the National Zoological Park.

Public Buildings

The Cleveland Park Public Library is a public building located off of Connecticut Avenue, near the closed portion of Klingle Road.

Tregaron Property

Tregaron, also known as The Causeway, consists of 20 acres at 3029 Klingle Road. The property contains a brick neo-classical mansion that was designed in 1912 by Charles Adams Platt. The Washington International School has a campus on Tregaron that includes seven buildings on six acres of land. The outdoor facilities at the Tregaron Campus include a practice field, volleyball area, and basketball court.

3.8.2 Environmental Consequences

The proposed options are not expected to have any short-term or long-term adverse impacts on land use in the project area under Options A through Option G.

3.9 ZONING

3.9.1 Affected Environment

Current zoning was examined using the District of Columbia Zoning Map to determine the existing zoning designations for the area surrounding

TABLE 3-4: PLACES OF WORSHIP SURROUNDING THE CLOSED PORTION OF KLINGLE ROAD

Place of Worship	Address
Canaan Baptist Church	1607 Monroe St NW
Casa del Pueblo United Methodist Church	1459 Columbia Rd NW
Christian Science Churches	1770 Euclid St NW
Conquesthouse Ministries	4300 16th St NW
Meridian Hills Baptist Church	3146 16th St NW
National Baptist Memorial Church	1501 Columbia Rd NW
Orthodox Church of Jesus Christ	2732 34th St NW
St. Germaine Foundation	2307 Calvert St NW
Seventh Day Adventists Organizations	3150 Chesapeake St NW
St Thomas Apostle Church Rectory	2665 Woodly Rd NW
Trinity AME Zion Church	3505 16th St NW
Washington Seventh Day Baptist Church	4700 16th St NW
Zion Baptist Church	4290 Blagden Ave NW
St Stephen & the Incarnation Episcopal Church	1525 Newton St NW
Unification Church of Washington	1610 Columbia Rd NW
Russian Orthodox Church of Saint John	4001 17th St NW
Capital Memorial Seventh Day Adventist Church	3150 Chesapeake St NW
Adas Israel Congregation	Connecticut Ave/ Porter Street
Sukyo Mahikari	2639 Connecticut Ave NW
I Am Accredited Temple	2307 Calvert St NW
Temple Micah	2829 Wisconsin Ave NW
Global Renewal	3855 Massachusetts Ave NW
Washington National Cathedral	Massachusetts/ Wisconsin Avenues NW

Source: The Louis Berger Group, Inc. 2000. Table prepared by the Louis Berger Group Inc. using available address information for each place of worship.

Klingle Road. The area studied is bordered by Rodman Street and Piney Branch Road on the north, 16th Street on the east, Cleveland Avenue, Calvert Street, and Harvard Street on the south and Wisconsin Avenue and 31st Street on the west. Included in this area are the neighborhoods of Mount Pleasant, Woodley Park, and Cleveland Park.

As seen in Table 3-5, 10 of the 30 zoning districts present in the District of Columbia are represented in the neighborhoods surrounding Klingle Road. Five of the 18 overlay districts are also in this area. The majority of land in the area is zoned for residential and community business uses. Areas to the east of Klingle Road are mainly designated for row dwellings and flats (R4), and moderate-density apartment homes (R-5-B). West of Klingle Road, one-family detached dwellings (R-1-A, R-1-B) and one-family semi-detached dwellings (R2) are the dominant zoning districts.

Klingle Road

Immediately adjacent to Klingle Road, there are a variety of zoning districts. East of the road, the National Zoological Park is the dominant land use and does not have a zoning designation. The remaining land east of the road is zoned for apartment homes (R-5-D, R-5-B). The land immediately west of Klingle Road is classified as R-1-A and C-2-A, allowing for one-family detached dwellings and medium-density community business center. Similar zoning variations can be found in the surrounding neighborhoods of Mount Pleasant, Woodley Park and Cleveland Park.

Mount Pleasant

Mount Pleasant was identified as the area between 16th Street and Rock Creek Park/National Zoological Park that is bounded by Piney Branch Road on the north and Harvard Street on the south. Within this area, four of the ten zoning districts were represented, with R-5-D, R-5-B, and R-4 being the dominant districts. Areas classified as R-5-D and R-5-B were mainly found in the areas between Piney Branch Road and Lamont Street and around Harvard Street. The remainder of Mount Pleasant is zoned for row dwellings (R4) with a small area and for medium-density community business center (C-2-A) at Mount Pleasant Street between Lamont Street and Irving Street.

TABLE 3-5: SUMMARY OF ZONING DESIGNATIONS IN THE VICINITY OF THE KLINGLE ROAD STUDY AREA

R-1-A	One-Family Detached Dwellings
R-1-B	One-Family Detached Dwellings
R2	One-Family Semi-Detached Dwellings
R3	Row Dwellings
R4	Row Dwellings and Flats
R-5-A	Low Density Apartment Houses
R-5-B	Moderate Density Apartment Houses
R-5-D	Medium-High Density Apartment Houses
C-2-A	Medium Density Community Business Center-
C-3-A	Medium Bulk Major Business and Employment
Overlay Districts	
NC	Neighborhood Commercial
WP	Woodley Park
CP	Cleveland Park
TSP	Tree and Slope Protection
NO	Naval Observatory

Source: Zoning Map of the District of Columbia

Woodley Park

Woodley Park consists of the area west of Rock Creek Park and the National Zoological Park and east of 31st Street that is bordered by Klingle Road on the north and Cleveland Avenue/Calvert Street on the south. Similar to Mount Pleasant, the majority of Woodley Park is zoned for apartment homes and one-family dwellings. The area of Woodley Park east of Connecticut Avenue consists mainly of the National Zoological Park with the remaining land zoned R-5-B, R-5-D, and R4. The area west of Connecticut Avenue and south of Klingle Road is zoned for apartment homes (R-5-B). Along Connecticut Avenue, medium-density apartment homes are the primary zoning district, along with C-2-A near Calvert Road.

Cleveland Park

Zoning in Cleveland Park was examined for the area between Rodman Street and Woodley Road/Klingle Road/Porter Street with Rock Creek Park on the east and Wisconsin Avenue and Idaho Avenue on the west. Along Connecticut Avenue, the zoning in Cleveland Park is mainly commercial (C-3-A, C-2-A). Although zoning for apartment homes (R-5-D) also exists around Connecticut Avenue, the majority of areas zoned for multi-family dwellings are found just east of Wisconsin Avenue. The remainder of Cleveland Park is zoned for one-family homes (R-1-A, R-1-B, R-2).

3.9.2 Environmental Consequences

The areas surrounding Klingle Road are zoned as a combination of low to high-density residential and medium-density commercial. These zoned parcels of land would not be expected to experience short-term or long-term adverse impacts resulting from the implementation options A through G.

3.10 SOCIOECONOMIC ISSUES AND ENVIRONMENTAL JUSTICE

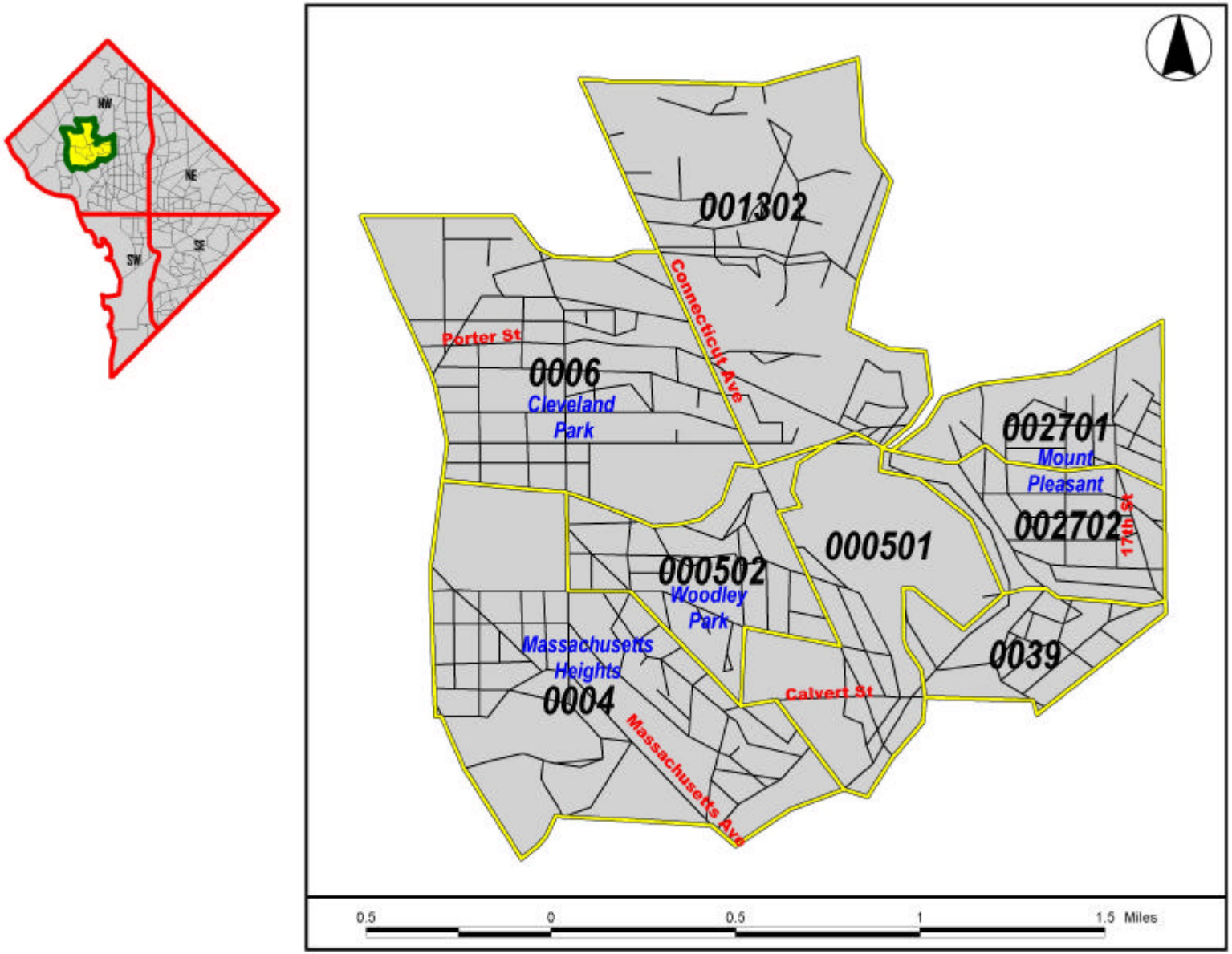
3.10.1 Affected Environment

According to the FHWA, Office of Environment and Planning, a community impact analysis should identify a geographic region, incorporating the communities that may be impacted by the project based on scoping, public involvement, and interagency coordination (FHWA, 1996). The study boundary was identified by geocoding all addresses obtained at the public meeting held on March 15, 2000, and letters, comment cards, and emails received from concerned citizens (Appendix B). Geocoding is a process of identifying coordinates of a location given its address.

After the study boundary was defined (Exhibit 3-11), the community profile was investigated. A community profile provides an overview of the area, which is used as a basis for identifying potential impacts of all the options suggested for Klingle Road. This sub-section describes community characteristics, such as population demographics and

EXHIBIT 3-11

Tracts Within Socioeconomic Study Boundary



Source: ESRI Data & Maps, 1999

economic and social characteristics of the communities. To support the text, a series of maps and tables summarize important data and depict physical characteristics. New models were not generated for this feasibility study; instead, existing information and census data were used (from the D.C. Office of Planning or other local and federal agencies).

Population

According to 1990 U.S. Census data, the study area was home to approximately 34,630 residents. Between 1990 and 1997, population estimates for the total study area population declined 6.5 percent, even though two of the tracts experienced population increases (Claritas Estimates, 1998). Tables 3-6 and 3-7, and Exhibit 3-12 compare the population within the given census tracts of the study area. Between 1990 and 1997, six of the eight tracts experienced declines in population, with the greatest declines occurring in tracts east of Klingle Valley. However, these two tracts retain a population significantly higher than several of the tracts west of Klingle Creek. Of the eight tracts, two experienced small to moderate population increases during the same time period. Tract 0004.00, located west of Klingle Valley, increased in population by 3.6 percent, and tract 0027.01, located east of the Klingle Valley, increased by 3.3 percent over the same time period.

Within the study area, African Americans compose 16.0 percent of the population and whites compose 77.5 percent. Citywide, the white population comprises 34.3 percent of the total population, while the African American population makes up approximately 62.3 percent of the D.C. population. Racial composition varies greatly within the tracts of the study area as indicated in Table 3-8. The majority of the population is white except for tracts 0027.01, 0027.02 and 0039, where the white population does not outnumber the African American and Hispanic population combined (Table 3-9).

Age of Population

The majority of residents in the study area are between the ages of 25 and 54. Only 8.8 percent of the population in the area is between the ages of 5 and 17. The population distribution of the study area resembles the population distribution of the city as whole, in which the greatest concentration of ages is also between 25 and 54.

TABLE 3-6: POPULATION CHANGE IN TRACTS

CENSUS TRACT	PERCENT POPULATION 1990—1997	POPULATION 1998	PERCENT POPULATION 1997—1998
0004.00	8.9%	1,487	3.6%
0005.01	-2.2%	2,654	-2.2%
0005.02	-6.9%	3,409	-4.0%
0006.00	-6.3%	4,248	-8.6%
0013.02	-6.1%	4,975	-11.4%
0027.01	-10.3%	4,584	3.3%
0027.02	-9.0%	5,207	-8.3%
0039.00	0.2%	3,978	-13.6%
Total	-5.6%	30,542	-6.5%

Source: State Data Center , U.S. Census, and Claritas, 1998

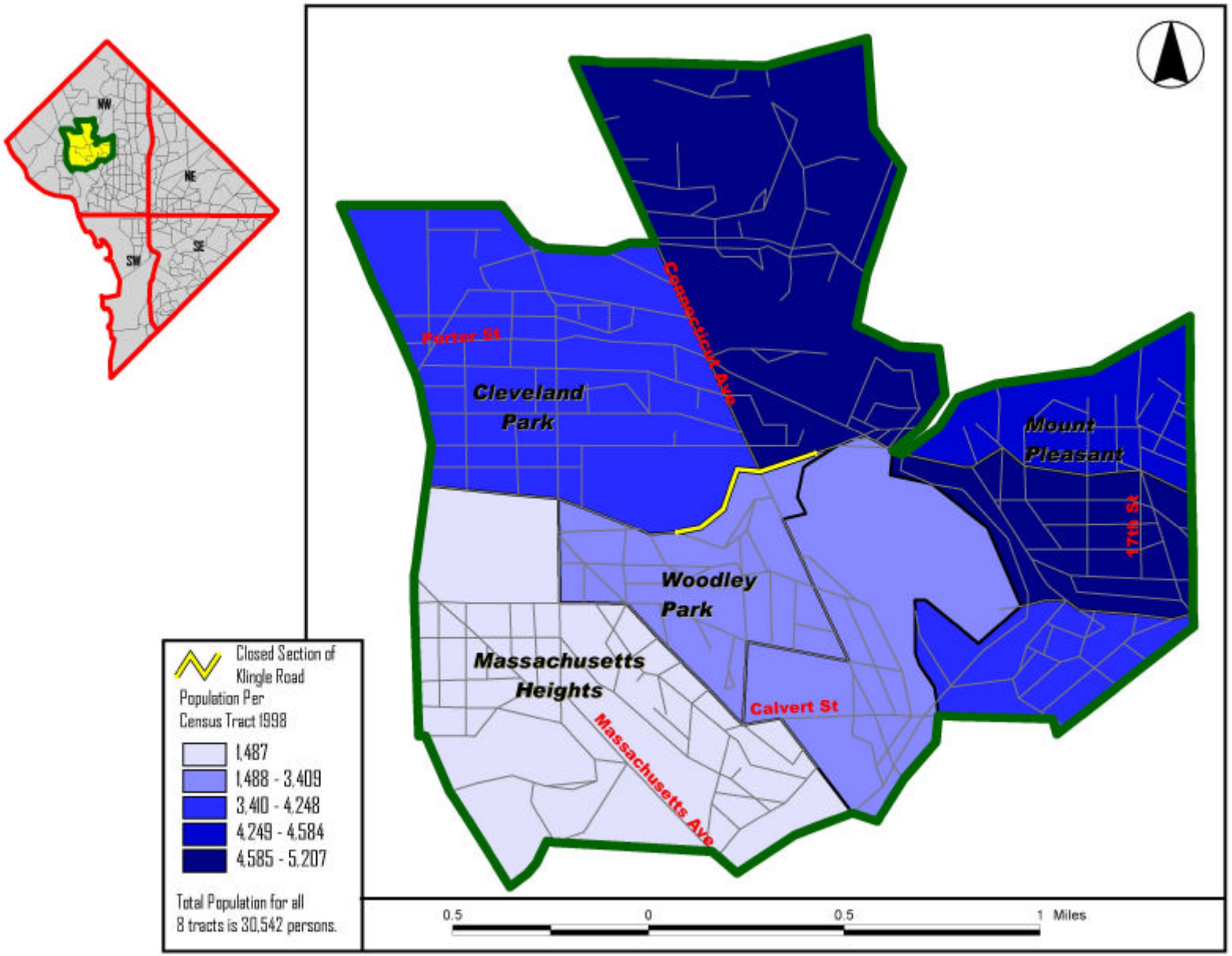
TABLE 3-7: POPULATION OF STUDY AREA TRACTS

CENSUS TRACT	POPULATION 1990	POPULATION 1997
0004.00	1,319	1,436
0005.01	2,774	2,714
0005.02	3,816	3,551
0006.00	4,960	4,646
0013.02	5,976	5,612
0027.01	4,950	4,438
0027.02	6,242	5,681
0039.00	4,593	4,603
Total	34,630	32,681

Source: State Data Center , U.S. Census, and Claritas, 1998

EXHIBIT 3-12

Population Map



Source: DC State Data Center, 2000; ESRI Data & Maps, 1999.

TABLE 3-8: RACIAL COMPOSITION OF STUDY AREA

RACE	ACTUAL POPULATION STUDY AREA	PERCENT POPULATION STUDY AREA	ACTUAL POPULATION D.C.	PERCENT POPULATION D.C.
White	23,684	77.5%	179,577	34.3%
African American	4,891	16.0%	325,840	62.3%
American Indian, Eskimo, Aleut	131	0.5%	1,768	0.4%
Asian or Pacific Islander	1,836	6.0%	15,939	3.0%

Source: State Data Center , U.S. Census, and Claritas, 1998

TABLE 3-9: PERCENT RACE PER TRACT

CENSUS TRACT	TRACT POPULATION	AFRICAN AMERICAN	WHITE	ASIAN	HISPANIC
0004.00	1,339	3.93%	83.92%	4.15%	6.93%
0005.01	2,697	4.97%	83.22%	4.83%	6.76%
0005.02	3,816	2.96%	84.88%	2.91%	9.17%
0006.00	4,960	8.57%	79.88%	2.66%	8.79%
0013.02	5,976	5.82%	80.96%	4.59%	8.42%
0027.01	4,896	41.77%	33.88%	5.45%	18.89%
0027.02	6,242	30.94%	35.57%	1.14%	30.62%
0039.00	4,593	32.68%	44.18%	1.65%	20.01%

Source: State Data Center , U.S. Census, and Claritas, 1998

Income

Census data for the study area indicate significant discrepancies in household and median income between the various tracts (Table 3-10). Citywide, the per capita income is $29,383 and the median household income is $43,011. Within the study area these values are higher, with an average per capita income of $56,889 (Exhibit 3-13) and the median household income of $79,282 (Exhibit 3-14) (U.S. Census, 1990 and Claritas, 1998).

TABLE 3-10: MEDIAN HOUSEHOLD INCOME/PER CAPITA INCOME PER TRACT

LOCATION	HOUSEHOLDS	MEDIAN HOUSEHOLD INCOME	POPULATION	PER CAPITA INCOME
City-Wide	224,500	$43,011	523,124	$29,383
0004.00	567	$206,667	1,487	$98,565
0005.01	1,856	$55,112	2,654	$46,424
0005.02	1,927	$77,727	3,409	$62,533
0006.00	1,891	$90,991	4,248	$89,600
0013.02	3,782	$66,156	4,975	$68,741
0027.01	2,100	$42,629	4,584	$26,861
0027.02	2,127	$49,063	5,207	$25,701
0039.00	2,433	$45,908	3,978	$36,687

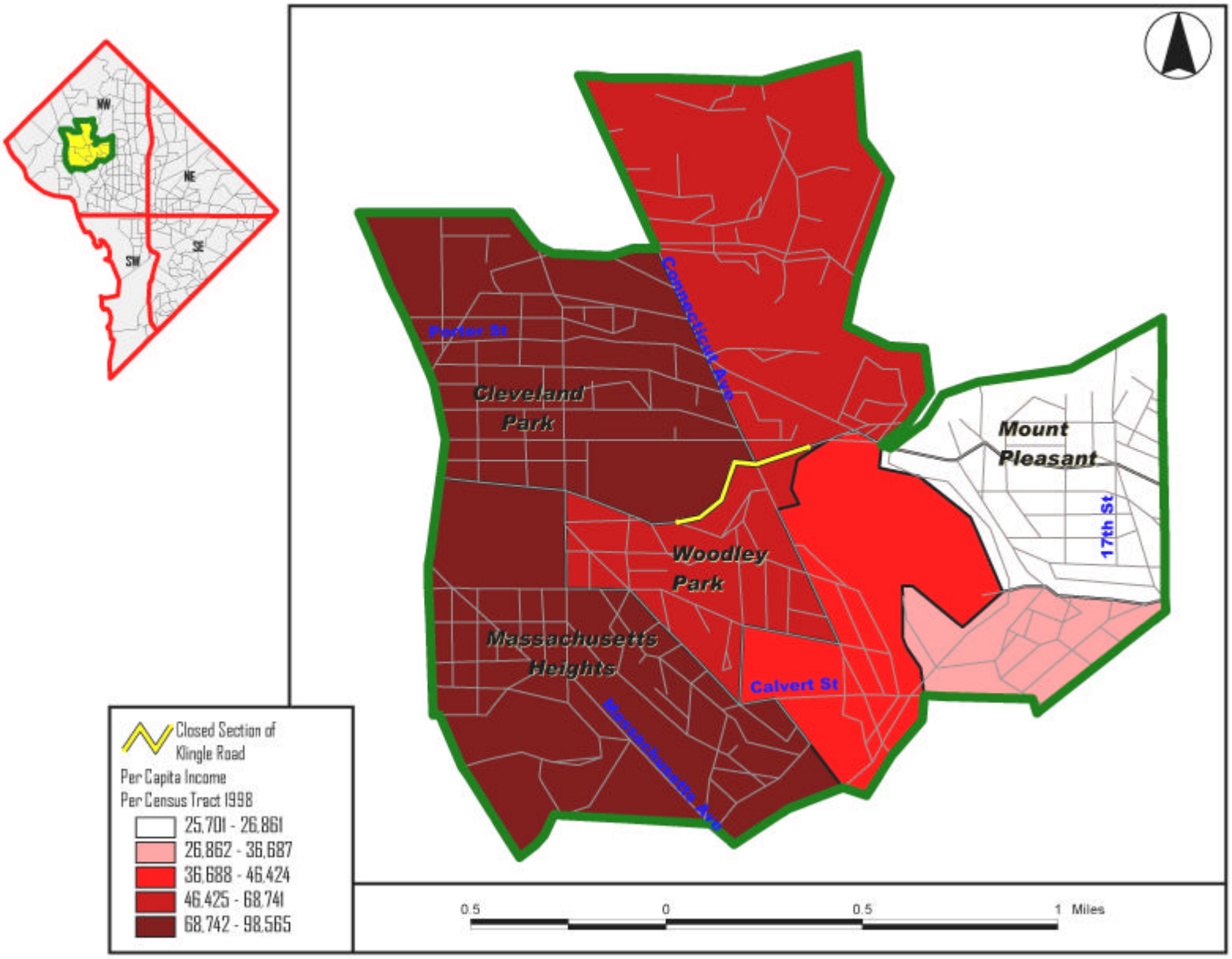
Source: State Data Center, U.S. Census and Claritas 1998

Within the study area, income varies greatly between the tracts. Tract 0004.00 has a median household income of $206,667 and a per capita income of $98,565. The three tracts with the lowest income levels include 0027.01, 0027.02 and 0039.00, located east of Klingle Creek in the Mount Pleasant neighborhood, with median household incomes of $26,861, $25,701 and $36,687 respectively. These three tracts also contain the greatest number of persons living below the poverty level defined by the U.S. Department of Health and Human Services within the study area (Table 3-11 and Exhibit 3-15).

Table 3-12 shows that the greatest number of college graduates resides in tract 0004.00, which also contains the highest per capita and median household incomes.

EXHIBIT 3-13

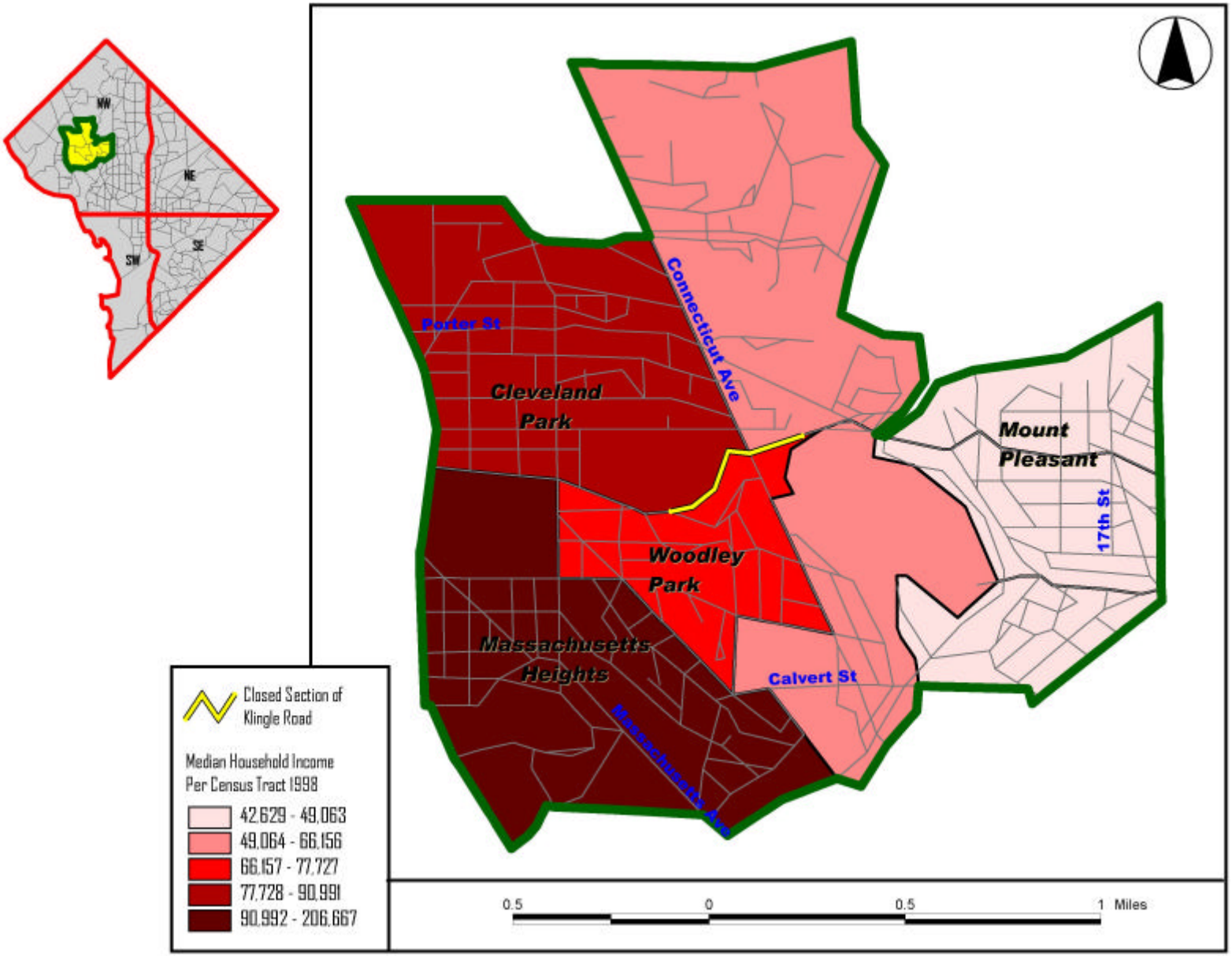
Per Capita Income



Source: DC State Data Center, 2000; ESRI Data & Maps, 1999.

EXHIBIT 3-14

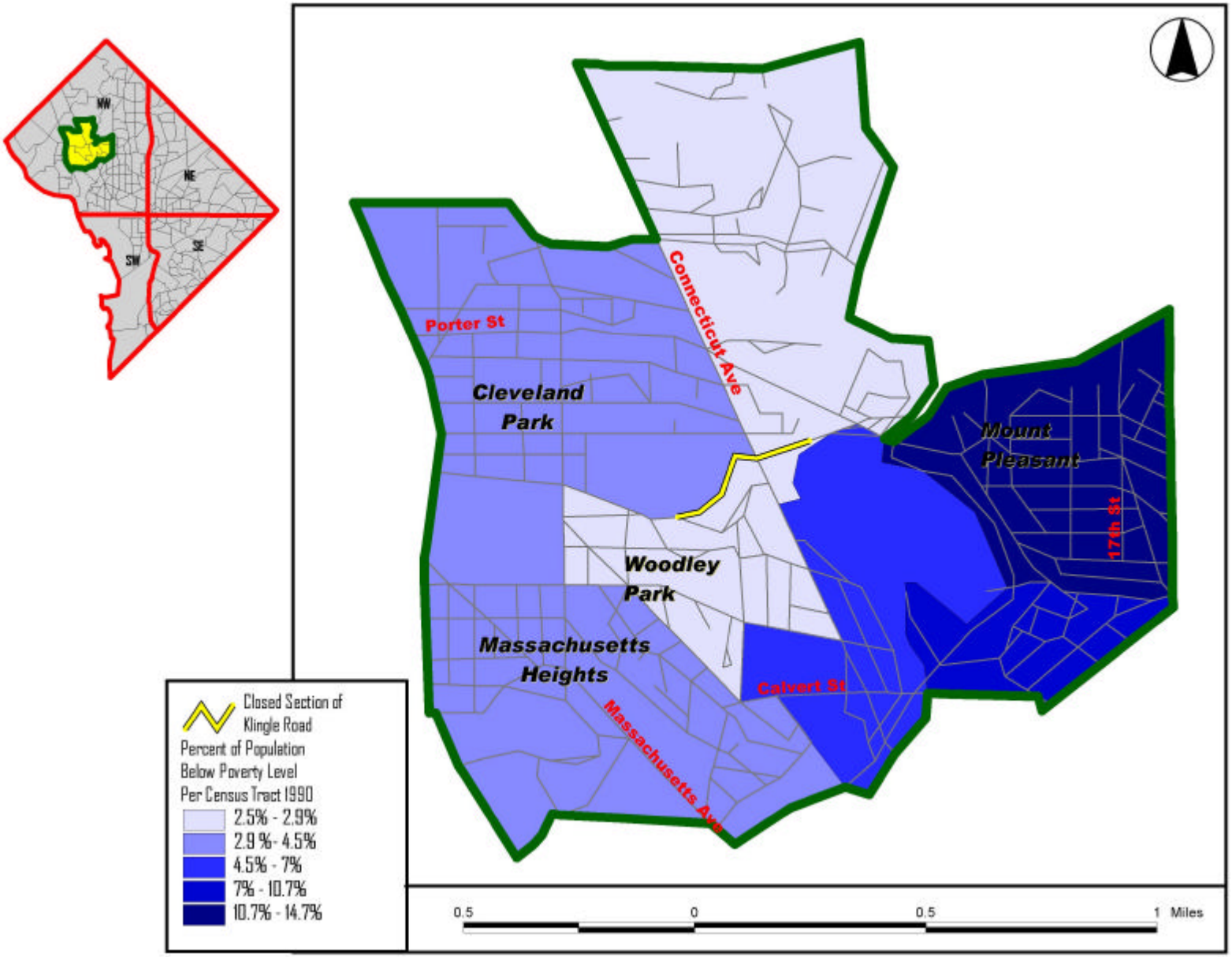
Median Household Income



Source: DC State Data Center, 2000; ESRI Data & Maps, 1999.

EXHIBIT 3-15

Poverty Level Map



Source: DC State Data Center, 2000; ESRI Data & Maps, 1999.

TABLE 3-11: PERCENT BELOW POVERTY PER TRACT

LOCATION	PERSONS FOR WHOM POVERTY IS MEASURED	PERCENT BELOW POVERTY LEVEL
Citywide	570,826	16.9%
Tract 0004.00	1,385	4.1%
Tract 0005.01	2,690	7.0%
Tract 0005.02	3,816	2.5%
Tract 0006.00	4,399	4.5%
Tract 0013.02	5,975	2.9%
Tract 0027.01	4,531	13.7%
Tract 0027.02	6,146	14.7%
Tract 0039.00	4,593	10.7%

Source: State Data Center, U.S. Census, and Claritas, 1998

TABLE 3-12: EDUCATIONAL ATTAINMENT IN STUDY AREA

CENSUS TRACT	PERSONS 25 YEARS AND OVER	PERCENT HIGH SCHOOL GRADUATES	PERCENT COLLEGE GRADUATES
City-Wide	409,131	73.1%	33.3%
0004.00	994	91.2%	72.8%
0005.01	2,432	93.3%	70.1%
0005.02	3,073	95.9%	75.8%
0006.00	3,979	89.8%	69.4%
0013.02	5,334	94.2%	67.0%
0027.01	3,702	76.0%	39.6%
0027.02	4,388	70.9%	41.9%
0039.00	3,504	81.6%	59.7%
Total and Study Area Average	27,406	86.6%	62.0%

Source: State Data Center, U.S. Census, and Claritas, 1998

Environmental Justice

On February 11, 1994, President Clinton signed EO 12898, entitled Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations. The EO directs federal agencies "to make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low income populations in the United States." The purpose of the order is to avoid the disproportionate placement of adverse environmental, economic, social, or health impacts from federal actions and policies on minority and low-income populations. In order to prevent the potential for discrimination and disproportionately high and adverse effects on specific populations, a process must identify minority and low-income populations that might be affected by implementation of a proposed action and options.

3.10.2 Environmental Consequences

Overall, the population is predominantly white and high-income when compared with the entire Washington, D.C. population. There are differences in income and racial composition between the tracts within the study area. However, none of the tracts would experience adverse impacts on minority and/or low-income residents in the study area based on any of the project's proposed options

3.11 PUBLIC SERVICES AND UTILITIES

3.11.1 Affected Environment

Several utilities exist adjacent to and beneath the Klingle Road ROW. This section addresses utilities and community services that may be affected by the proposed options. Specifically, the following utilities and services will be addressed: Verizon (formerly Bell Atlantic), District Cable Vision, D.C. Fire and Emergency Medical Services, Washington Metropolitan Area Transit Authority (WMATA), Potomac Electric Power Company (PEPCO), D.C.

Police Services, D.C. Bureau of Traffic (street lights), Washington Gas, and the Water and Sewer Authority (WASA). The potential of relocating the utilities that are located adjacent to the ROW or underneath the existing road bed is not considered to be feasible at this time. Topography, disruption of service and cost are considered to be prohibitive factors in the complete relocation of these utilities out of the ROW. A more detailed cost and design analysis would be required to determine the full environmental and financial impacts of utility relocation.

Verizon

Verizon, formerly Bell Atlantic, is the primary telephone service provider in the region. Currently, no conduits are located under the roadway or in Klingle Road ROW. A major conduit is located in the alley off of Cortland Place and serves telephone service to this area. It is accessible regardless of the selected option. Therefore, Verizon would not be impacted by the proposed Klingle Road options (Ray Dodd, Verizon, personal communication, May 24, 2000).

District Cable Vision

District Cable Vision is the cable service provider to residents in the District of Columbia. Cable service runs through the Verizon conduits; therefore, the availability of phone service also ensures the availability of cable service. District Cable Vision is currently using the conduit located in the alley off of Cortland Avenue to provide cable service in the area adjacent to the project. Therefore District Cable Vision would not be impacted by the proposed Klingle Road options (Purnell Jackson, District Cable Vision, personal communication, April 24, 2000).

Potomac Electric Power Company (PEPCO)

Two major underground conduits and underground cables are located within the project area. The first conduit is located in the alley east of the Cortland Place and Klingle Road intersection. The second conduit is located near the intersection of Klingle Road and Porter Road to serve the adjacent residential area. PEPCO requires that access to these two conduits be maintained for service purposes. The second conduit is accessible outside of the Jersey barrier prohibiting traffic to the closed portion of Klingle Road; therefore, this conduit would not be affected by any of the Klingle Road options (Jim Slayton, PEPCO, personal communication, May 4, 2000). The underground cables are located along the closed portion of Klingle Road. These lines service street lighting for adjacent roads and sections of Porter Road.

Although, PEPCO was contacted and the project options were made available to PEPCO, the potential impacts of the project on PEPCO's operations are not clear since no official response was received at the time of this writing.

DDOT Bureau of Traffic Services (Street Lights)

Because of the Klingle Road closure in 1991, the high power voltage system at Woodley and Klingle Roads were cut-off at Cortland Place in the early 1990s and the street lights were removed. All lights that are being reinstalled along Porter are fed from a main circuit at Williamsburg Lane and Porter Street; therefore, none of the proposed options would affect street lighting service (Mike Dorsey, DDOT Bureau of Traffic Services, personal communication, April 28, 2000).

Washington Gas

Washington Gas maintains an active 12-inch, wrapped-steel pipeline that runs from the intersection of Klingle Road and Cortland Place, adjacent and underneath the Klingle Road (Douglas Ryan, Washington Gas, personal communication, November 6, 2000). This 12-inch lines runs underneath and alongside Klingle Road until Klingle Road crosses under the Connecticut Avenue Bridge, where the line intersects with a piping tee and continues to run east on Klingle Road as an 8-inch line to the intersection of Porter Street. These lines serve most of the adjacent properties as well as the National Zoological Park. Washington Gas performs a leak survey every three years, which is accomplished by walking the pipeline route. In the event that repairs are necessary, Washington Gas would require a 12-foot-wide surface that would support service equipment (typically a backhoe) to access all portions of the lines. All pipelines not located underneath paved surfaces require a minimum of three to six feet of surface coverage.

Presently, Washington Gas maintains a ROW, but an easement would be necessary in the absence of the existing roadway (Douglas Ryan, Washington Gas, personal communication, November 6, 2000). If the roadway is removed, Washington Gas would request an easement for its existing gas line.

D.C. Police Services

Klingle Road has been closed for approximately 10 years without any known or tangible impacts to emergency response times. In addition Patrol Service Area (PSA) 411 in Mount Pleasant indicated the Klingle Road conditions have not affected the PSA's ability to patrol the area (Sgt. Yolander Jackson, D.C. Police Department, personal communication, April 27, 2000). According to the D.C. Police Department, officers "adjust" to road closings or other obstructions. Lt. Roger Roch of the 2nd District reiterated Sgt. Alexander's statements regarding the ability to provide adequate police services to the Woodley Park area (Lt. Roger Roch, D.C. Police Department, personal communication, April 27, 2000). Anecdotal evidence from local officers suggests that the Klingle Road closure has not adversely affected the police department in providing service to the surrounding areas (Appendix A). Letters describing the project were sent from The Louis Berger Group, Inc. to Lt. Roger Roch of the Second District Police Station and Sgt. Yolander Alexander of the Fourth District Police Station with an attached map for review and comment on October 12, 2000 (Appendix A). At this time, no comments have been received.

Fire and Rescue Services

Fire and Rescue personnel located east and west of Klingle Road affirm that Porter Street currently serves as the access road across Connecticut Avenue. Lt. Herby Sprow of the 5th Battalion stated that if Klingle Road were reopened to vehicular traffic, the Fire and Rescue would continue to use Porter Street, as it is an easier road on which to maneuver a large truck (personal communication, May 1, 2000). Lt. Christopher Jordan of the 4th Battalion stated that, while opening Klingle might be helpful in accessing areas west of the park, it is not necessary for his station to provide adequate service to the area (personal communication, May 1, 2000) (Appendix A). Letters describing the project and an attached map for review and comment were sent from The Louis Berger Group, Inc. to Lt. John Briscoe of the 5th Battalion and Lt. Christopher Jordan of the 4th Battalion on October 12, 2000 (Appendix A). At this time, no comments have been received.

Washington Metropolitan Area Transit Authority (WMATA)

WMATA has a powerstation for Metro located inside the south abutment of the Connecticut Avenue bridge. This powerstation serves the grounding grid, which is located underground and adjacent to Klingle Road. This grounding grid provides the power to Metro in the area. WMATA service vehicles use Klingle Road for access to this particular power station and grounding grid. WMATA requires that access to the area under the Connecticut Avenue Bridge be maintained for a full-size service truck to service this powerstation (Michael Harrison, personal communication, May 9, 2000). A letter describing the project was sent from The Louis Berger Group, Inc. to Michael Harrison of WMATA with an attached map for review and comment on October 17, 2000 (Appendix A). On November 16, 2000 Mr. Harrison responded stating "WMATA has no preference to the options for correcting the problem. We only ask that our maintenance access be continued for the grounding field and that any construction project protect the grounding field" (email communication, November 16, 2000). Mr. Harrison verbally stated on September 22, 2001 that their access needs would not require a paved road.

Water and Sewer Authority (WASA)

A letter describing the project was sent from The Louis Berger Group, Inc. to Jim Shebelski, P.E., of WASA with an attached map for review and comment on October 17, 2000. According to a review of the project study area by WASA representatives, there are no active water mains in the study area. However, there is a four-foot, three-inch round storm drain running alongside Klingle Road. This storm drain primarily carries stormwater from Macomb Street and the surrounding area but not stormwater from Klingle Road. At the east end of Klingle Road, past Connecticut Avenue, a drainpipe that crosses under Klingle Road has collapsed and would need to be repaired in the future (WASA, letter received November, 2000). There is also an active sanitary sewer coming from Woodley Road and running east along Klingle Road to Porter Street. One of the major concerns with road

removal is the loss of surface covering over these lines. Water lines require a minimum of 4.5-feet of coverage, and sewer lines need approximately 5.5-feet. WASA may also request a perpetual ROW in the event the road is removed. The WASA Design Office would need to be included in any design phase for the proposed options (Appendix A).

3.11.2 Environmental Consequences

Option A: No Action

Action Items

- Road remains closed.
- Repair existing retaining wall to avoid further pavement collapse into creek.
- Maintenance activities.

The continued erosion in the area, if left unchecked, may lead to the exposure of gas and water lines. Water lines in particular require several feet of coverage in order to stabilize the lines in the ground. Option A may potentially have adverse short-term and long-term impacts on water, gas, and sewer lines in the area of the closed road.

Option B: No Build

Action Items

- Road remains closed.
- Repair existing retaining wall to avoid further pavement collapse into creek.
- Replace stormwater and drainage system by one of two methods described in Section 2.0.

Short-term impacts may result from repair work. Option B is not anticipated to produce adverse long-term impacts on any of the utilities or public services. Repairing the drainage system would alleviate the erosion problems. Community services such as police and fire and rescue have already adapted their service to the road closure. Phone and cable service would not be impacted by this option.

Option C: Green Space

Action Items

- Road permanently closed.
- Remove road; backfill ROW; sod with topsoil; grade to direct drainage.
- Repair existing retaining wall to avoid further pavement collapse into creek.
- Replace stormwater and drainage system by one of two methods described in Section 2.0.

Option C would have short-term and long-term adverse impacts on Klingle Valley. The removal of the road would require coordination with Washington Gas, WASA, and WMATA.

WMATA also requires an access point to the grounding grid located in the abutment of the Connecticut Avenue Bridge. WASA has stated that removing the asphalt may require additional fill to provide the proper coverage and support for pipelines and that no trees should be planted within 5-feet of the centerline of the sewers (Appendix A). Telephone and cable service would not be impacted by this option. Complete removal of the road would impact the ability of these utilities to fully access their infrastructures in the area of the closed ROW, this would necessitate further study to plan for access of utilities. Relocation or assessment of access routes for maintenance and repair of utilities was not part of the original scope of work for this feasibility study. Further study is necessary to fully determine the adverse impacts on utilities under this option.

Option D: Bike, Recreation, and Facility Management

Action Items

- Road remains closed to vehicular traffic.
- Repair existing retaining wall to avoid further pavement collapse into creek.
- Replace stormwater and drainage system by one of two methods described in Section 2.0.
- Remove existing road; backfill ROW; and grade to direct drainage.
- Contour and pave hard-surface bike path capable of supporting utility and maintenance trucks.

✍ Reestablish area adjacent to bike path as a recreation area.

Ground coverage and disturbance of underground water and sewer lines, as well as utility service access, would need to be addressed with the appropriate coordinating agencies. The bikeway has to be engineered to allow access for maintenance vehicles or other heavy equipment to provide emergency and routine maintenance. Phone and cable service would not be impacted by this option.

Option E: Rebuild Klingle to Original Alignment

Action Items

- Repair existing retaining wall to avoid further pavement collapse into creek.
- Replace stormwater and drainage system by one of two methods described in Section 2.0.
- Remove road; backfill ROW; and grade to direct drainage.
- Rebuild road to its original dimensions; reopen road to two-way vehicular traffic.
- Appropriate roadway lightning and traffic signalization.

Coordination with WASA, WMATA, PEPCO and Washington Gas would be essential to mitigate the level of disturbance and disruption in service of these utilities. Phone and cable service would not be impacted by this option.

Option F: Build Klingle Road To Accommodate Vehicular, Pedestrian and Bike Uses

Actions Items

- Repair existing retaining wall to avoid further pavement collapse into creek.
- Replace stormwater and drainage system by one of two methods described in Section 2.0.
- Remove existing road; backfill ROW; grade to direct drainage.
- Contour and pave hard-surface bike path.
- Rebuild and widen two-lane road to 25-30 feet, open to vehicular traffic in both directions.

Coordination with WASA, WMATA, PEPCO, and Washington Gas would be essential to mitigate the level of disturbance and disruption in service of these utilities. Phone and cable service would not be impacted by this option. Given the limited ROW, topography of Klingle Valley, and excessive costs, it is anticipated that the relocation of certain utilities is not feasible at this time. Further study, including cost and design analysis, would be necessary to determine if relocation of utilities would be feasible.

Option G: Build Klingle Road as a One Lane (One-Way) Road and a Pedestrian/Bicycle Lane

Action Items

- Repair existing retaining wall to avoid further pavement collapse into creek.
- Replace stormwater and drainage system by one of two methods described in Section 2.0.
- Remove existing road; backfill ROW; and grade to direct drainage.
- Rebuild one-lane (one-way) road, open to vehicular traffic.
- Contour and pave hard-surface bike path.
- Appropriate roadway lightning and traffic signalization.

Coordination with WASA, WMATA, PEPCO, and Washington Gas would be essential to mitigate the level of disturbance and disruption in service of these utilities. Phone and cable service would not be impacted by this option.

3.12 TRAFFIC CIRCULATION AND ACCESS TO RESIDENTIAL AND COMMERCIAL AREAS

3.12.1 Affected Environment

Klingle Road is located in northwest Washington, D.C. and runs west to northeast from the National Cathedral to Beach Drive in Rock Creek Park (Exhibits 1-1 and 1-2). Klingle Road is listed as a collector road for vehicular traffic on the District of Columbia's Functional Classification Map. Collectors provide direct access to major traffic generators such as a Metro station or a

large complex of apartments. They may connect a neighborhood to a major arterial roadway. The segment of Klingle Road between Porter Street and Cortland Place (approximate designations) was closed to traffic in 1991 because of deterioration of the roadway related to drainage failure. The Council of the District of Columbia never officially closed this segment of Klingle Road through an administrative action; however, this portion of the road remains closed to traffic.

Using data collected by the DDOT and the Metropolitan Washington Council of Governments, The Louis Berger Group, Inc. conducted a transportation assessment for Klingle Road, which is included as Appendix D. Although not necessarily related to the closing of Klingle Road, the road network surrounding Klingle Road is currently experiencing excessive delays and poor level of service, especially along roads parallel to Klingle Road. The reopening of Klingle Road is one of the options evaluated to improve the east-west cross-town traffic conditions, which provide access to the National Cathedral, American University, upper Georgetown, and the MacArthur Boulevard area as well as many other schools, places of worship, and recreational areas as discussed in Section 3.2. In order to evaluate the potential traffic impacts of reopening Klingle Road, the following intersections were considered for traffic operational analysis:

- Intersection of Connecticut Avenue and Porter Street
- Intersection of Cleveland Avenue and Garfield/32nd Street
- Intersection of 34th Street and Woodley Road
- Intersection of Woodley Road and Klingle Road
- Intersection of Woodley Road and 32nd Street

The detailed transportation assessment is included in this report as Appendix D.

3.12.2 Environmental Consequences

Under options A-D, Klingle Road would remain closed to traffic and the traffic impacts would be considered to be the same for each option. Long-term adverse impacts to traffic patterns would be expected to include a worsening of traffic congestion on east-west cross-town roadways. However, adverse impacts to existing traffic accident patterns would not be anticipated. The opening of Klingle Road to vehicular traffic would result in only minor improvements to traffic operations because the road size is incapable of relieving traffic or reducing the current level of service at surrounding intersections.

Option E: Rebuild Klingle Road to its Original Alignment

Action Items

- Repair existing retaining wall to avoid further pavement collapse into creek.
- Replace stormwater and drainage system by one of two methods described in Section 2.0.
- Remove road; backfill ROW; and grade to direct drainage.
- Rebuild road to its original dimensions; reopen road to two-way vehicular traffic.

Beneficial impacts associated with this option may include a delay reduction at Porter Street and Connecticut Avenue and the potential for a reduction in the number of accidents on neighboring intersections. In addition, opening the roadway to east-west traffic would provide another thoroughfare for cross-town access to schools, places of worship, commercial areas, and public buildings. Adverse impacts to traffic patterns associated with this option may include an increase in traffic volume at Woodley Road and 34th Street, with the already failed eastbound approach experiencing more delays. In addition, it would be expected that most of the already failed approaches at study intersections would continue to operate with an unacceptable level of service.

Option F: Build Klingle Road To Accommodate Vehicular, Pedestrian and Bike Uses

Actions Items

- Repair existing retaining wall to avoid further pavement collapse into creek.
- Replace stormwater and drainage system by one of two methods described in Section 2.0.
- Remove existing road; backfill ROW; grade to direct drainage.
- Contour and pave hard-surface 8-10 foot-wide bike path.

- Rebuild and widen two-lane road to 25-30 feet, open to vehicular traffic in both directions.

Under this option, beneficial impacts may include a delay reduction at Porter Street and Connecticut Avenue and the potential for a reduction in the number of accidents on neighboring intersections. Inherently, an improvement in road design enhances the capacity of the facility and thereby attracts more traffic. Similar to options E and G, it would be expected that most of the already failed approaches at study intersections would continue to operate with an unacceptable level of service.

Option G: Build Klingle Road as a One-Lane (One-Way) Road with a Pedestrian/Bicycle Lane

Action Items

- Repair existing retaining wall to avoid further pavement collapse into creek.
- Replace drainage system by one of two methods described in Section 2.0.
- Remove existing road; backfill ROW; and grade to direct drainage.
- Rebuild one-lane (one-way) road, open to vehicular traffic.
- Contour and pave hard-surface bike path.

Under this option, the flow of traffic would be one-way in direction, possibly reversible, during different peak periods of the day. Determination of traffic direction or designated periods of the day in which to change the direction of the flow of traffic would be determined through future more detailed traffic analysis. It would be expected that during afternoon peak periods, Woodley Road at 34th Street would have a moderate increase in traffic volume and the already failed eastbound approach would experience more delays. Based on the traffic engineering study, it is expected that beneficial impacts to traffic patterns would include a moderate delay reduction on Porter Street and Connecticut Avenue (morning westbound only; afternoon eastbound only) and a moderate delay reduction expected on Cleveland Avenue and Garfield Street. In addition, this option would be expected to reduce the impact on the transportation environment, while addressing the transportation need in the area and taking advantage of travel directional differences during peak periods, thereby providing traffic congestion relief on surrounding affected routes during the time and in the general direction when needed most. In addition, this option would provide an east-west bicycle/pedestrian transportation lane.

3.13 CULTURAL RESOURCES

Sources at the D.C. State Historic Preservation Office and at Rock Creek Park were used to identify cultural resources that might be affected by the proposed options associated with Klingle Road. Archaeological and historical properties were identified on the basis of archival research; no field surveys were undertaken for this feasibility study.

3.13.1 Affected Environment

The Klingle Road project is located within Rock Creek Park, a large urban park that is owned and administered by the NPS. Congress created Rock Creek Park in 1890 and the original park property, known as Reservation 339, encompasses some 1,755 acres. It is a historic district listed in the National Register of Historic Places (NRHP). The enabling legislation that created Rock Creek Park established the Klingle Ford Bridge as the park's downstream boundary. Klingle Valley Park, which includes the Klingle Road study area, is administratively included in Rock Creek Park, but it is not part of the historic district. The Rock Creek Park Historic District is characterized as a picturesque, forested valley with scenic, gorge-like views. Although it was created in the tradition of great American urban parks, its historical significance derives primarily from its qualities as a natural landscape. There are a number of historic structures that contribute to the park's significance, of which the most notable are Pierce-Klingle Mansion and Pierce Mill. Both properties include a number of associated outbuildings or structures. As a significant landscape, the circulation system formed by the road network also contributes to the character of the historic district (Bushong 1990a, 1990b; Wheelock 1993).

There are a number of known archaeological properties within Rock Creek Park, although none are within the Klingle Road project area. There has

been no systematic archaeological survey of Rock Creek Park, but the potential for significant archaeological resources is considered high. Previous archaeological work in Rock Creek Park dates to more than 100 years ago, when William Henry Holmes, one of the fathers of North American archaeology, undertook his studies of aboriginal quarries in the Washington, D.C. metropolitan area (Holmes, 1897). One of these quarry areas, the Piney Branch Quarry Site, is listed on the National Register of Historic Places. This site is located roughly one-half mile east of the Klingle Road project area and it encompasses a 30-acre area of opposing slopes overlooking the Piney Branch floodplain (Potter, n.d.). Soapstone Valley Park, another administrative unit within Rock Creek Park, would also be expected to contain archaeological resources. Klingle Valley could contain Native American archaeological sites associated with the quarry areas in Piney Branch and Soapstone Valley.

Potential archaeological resources in Rock Creek Park could date from the earliest well-documented human occupation of North America, the Paleoindian period (circa 11,000 to 8,000 B.C.). Sites from this period are quite rare and it is most likely that archaeological remains in Rock Creek would be associated with the Archaic (circa 8,000 to 1000 B.C.) or Woodland (circa 1000 B.C. to 1600 A.D.) periods. A modern study of the Piney Branch Quarry Site (Munford, 1982) suggests this site was used most intensively during the Late Archaic period (circa 3000 to 1000 B.C.). Despite the urbanization that has occurred over the past century, prehistoric finds have been reported at many locations in Rock Creek Park (Inashima, 1985) and the surrounding upland areas. Two such sites have been reported in the upland areas surrounding Klingle Valley: the Dumbarton Heights Site (51NW20) and the Garfield Street Site (51NW42). Site survey forms at the D.C. Historic Preservation Division give little information about these sites, as they are based on collections held at the Smithsonian Institution.

Historic settlement had occurred at the mouth of Rock Creek by the late 17th century. By the end of the 18th century, a number of mills had been established along Rock Creek. By the Civil War, the mills along Rock Creek had been eclipsed by those situated along the C&O Canal in Georgetown. One of the best-known industrial sites in Rock Creek Park, Pierce Mill, is located a short distance upstream from Klingle Valley. Aside from industrial sites, such as mills, archaeological resources associated with the 17th, 18th, or 19th centuries could include remains of pioneer settlement, plantations, or fords. Prior to the development of the modern road network, east-west travel across Rock Creek depended on fords. One of the most prominent fords across Rock Creek was located at Pierce Mill. There was also a ford at Klingle Road; this ford was located at the mouth of Klingle Creek, which is approximately in the location of the Porter Street bridge (Exhibit 3-16).

Historical maps of the city do not indicate any structures or potential archaeological sites along the Klingle Road project area (Boschke, 1861; Michler, 1867; U.S. Coast and Geodetic Survey, 1892). Historical settlement was mostly concentrated in the upland areas and the stream valleys were largely undeveloped. The steep topography associated with Rock Creek valley impeded the city's expansion until the late 19th century. Development of the neighborhoods surrounding the Klingle Road project area was facilitated by construction of numerous bridges across Rock Creek and by the expansion of the trolley system in the late 19th century. Today, the Klingle Road project area is flanked by two historic districts that reflect the city's urban expansion that followed the Civil War. Immediately north of Klingle Road, the Cleveland Park Historic District is a large urban neighborhood that includes roughly 1,000 contributing structures representing 18th- and 19th-century estates, late 19th-century Victorian houses, and various 20th-century residences and commercial buildings. The NRHP Nomination Form at the State Historic Preservation Office includes a boundary definition that indicates the district is bounded by Woodley Road and Klingle Road on the south. The Cleveland Park Historic District embodies the leading principles of late 19th-century urban planning and is one of Washington's best examples of a "streetcar suburb."

Tregaron (The Causeway) is one of the most notable properties within the Cleveland Park Historic District, located at 3029 Klingle Road/3100 Macomb Street. This landmark estate includes a mansion, outbuildings, and landscaped grounds designed by Charles Adams Platt, one of the foremost country house architects of the early 20th century. Porter Street, immediately north of its intersection with Klingle Road, also contains a number of properties listed in the NRHP, including Linnean Hill (also known

EXHIBIT 3-16

Source: Historic Resource Study – Rock Creek Park; 1990.

as Pierce-Klingle Mansion), Greystone, Gearing Bungalow, and Pine Crest Manor (Historic Preservation Division, 1995).

The Old Woodley Park Historic District abuts Rock Creek Park immediately south of the Klingle Road project area. Although subdivided in the late 19th century, this neighborhood was developed in the early 20th century. It contains numerous residences and commercial structures attributed to some of Washington's most notable architects and builders (Historic Preservation Division, 1995).

3.13.2 Environmental Consequences

In accordance with Section 106 of the National Historic Preservation Act, the DDOT has initiated consultations with the D.C. Historic Preservation Division, D.C. State Historic Preservation Office, regarding the proposed project options for Klingle Road (Appendix A). Cultural resource investigations undertaken for this feasibility study were limited to a review of readily available information at the State Historic Preservation Office (SHPO) and NPS. It is not known whether any archaeological properties eligible for the NRHP are present within the ROW and its immediate surroundings. However, if the DDOT implements any of the options involving new construction or repairs to the stormwater and drainage system, field surveys would be undertaken to determine whether or not archaeological properties eligible for the NRHP are within the Area of Potential Effect (APE) associated with the undertaking. Based on readily available information, the APE should be considered to have potential for archaeological resources.

This review indicates that three historic districts that are listed in the NRHP bound Klingle Road. As the southern boundary of the Cleveland Park Historic District may coincide with Klingle Road, one or more of the project options may have an impact on this historic property. Administratively, Klingle Valley Park is included within Rock Creek Park. Although Klingle Valley is not included with the Rock Creek Park Historic District, some of the options would have an effect on the traffic circulation system within the historic district. If the DDOT moves forward with any of these options, as discussed below, the DDOT would fulfill its responsibility under Section 106 of the National Historic Preservation Act in accordance with the Advisory Council on Historic Preservation's *Procedures for Protection of Historic Properties* (36 CFR 800), as follows. After defining an appropriate APE, the DDOT would, in consultation with the SHPO and other interested parties, apply the criteria of effect with regard to historic districts. If it is determined that the project would have an adverse effect on a historic district, the DDOT would develop a plan to mitigate the adverse effect, again in consultation with the SHPO and interested parties.

Option A: No Action

Action Items

- Road remains closed.
- Repair existing retaining wall to avoid further pavement collapse into creek.
- Maintenance activities.

Under this option there, would be no short-term or long-term adverse impacts to historic districts and structures. However, implementation of the No Action Option may result in the loss, by erosion, of archaeological resources. This would be mitigated by an archaeological survey to identify archaeological resources. If significant resources are identified, the DDOT would consult with the SHPO to develop an appropriate plan for mitigation.

Option B: No Build

Action Items

- Road remains closed.
- Repair existing retaining wall to avoid further pavement collapse into creek.
- Replace stormwater and drainage system by one of two methods described in Section 2.0.

It is assumed that this would involve some excavation and restoration of the floodplain landscape and that there would be no adverse effect to historic structures or districts. However, there may be some adverse impact to undiscovered archaeological resources. If this option were selected, the DDOT would undertake an archaeological survey of the APE associated

with the drainage improvements to determine whether or not significant archaeological resources are present; if present, the DDOT would develop a plan to avoid or to minimize adverse effects to such resources.

Option C: Green Space

Action Items

- Road remains closed.
- Repair existing retaining wall to avoid further pavement collapse into creek.
- Replace stormwater and drainage system by one of two methods described in Section 2.0.

Like Option B, it is assumed that this option would have no adverse impacts to historic structures or districts; however, there may be undiscovered archaeological resources within the APE. If this option were selected, the DDOT would undertake an archaeological survey of the APE associated with the construction zone to determine whether or not significant archaeological resources are present. If present, the DDOT would develop a plan to avoid or to minimize adverse effects to such resources.

Option D: Bike, Recreation, and Facility Management

Action Items

- Road remains closed to vehicular traffic.
- Repair existing retaining wall to avoid further pavement collapse into creek.
- Replace stormwater and drainage system by one of two methods described in Section 2.0.
- Remove existing road; backfill ROW; and grade to direct drainage.
- Contour and pave hard-surface bike path capable of supporting utility and maintenance trucks.
- Reestablish area adjacent to bike path as a recreation area.

It is uncertain whether this option would have any adverse impact on archaeological resources, historic districts, or individual historic resources. If this option were selected, the DDOT would undertake an archaeological survey of the APE associated with the construction zone to determine whether or not significant archaeological resources are present. If present, the DDOT would develop a plan to avoid or to minimize adverse impacts to such resources. In addition, the DDOT would also undertake a study to determine whether there would be an effect on the Cleveland Park Historic District of any individual historic resources; and, if so, develop a plan to avoid or to minimize adverse impacts to such resources.

Option E: Rebuild Klingle Road to Its Original Alignment

Action Items

- Repair existing retaining wall to avoid further pavement collapse into creek.
- Replace stormwater and drainage system by one of two methods described in Section 2.0.
- Remove road; backfill ROW; and grade to direct drainage.
- Rebuild road to its original dimensions; reopen road to two-way vehicular traffic.

Alternative E would involve rebuilding Klingle Road to its original width and alignment as well as repairs to the stormwater drainage system. If this alternative is selected, DDOT would undertake an archaeological survey of the APE associated with the construction zone, to determine whether or not significant archaeological resources are present. If so, DDOT would develop a plan to avoid or minimize adverse effects to such resources. Also, by altering the existing traffic patterns, this alternative may have an effect on the Rock Creek Park Historic District; if this alternative is selected, DDOT would consult with the SHPO and other interested parties to assess the effect, and if the effect is determined to be adverse, undertake additional consultations to develop plans to mitigate adverse effects. Also, the DDOT would undertake a study to determine whether there would be an effect on the Cleveland Park Historic District, the Woodley Park Historic District, or any individual historic resources, and if so, consult with the SHPO and other interested parties to assess the effect, and if the effect is determined to be adverse, undertake additional consultations to develop plans to mitigate adverse effects.

Option F: Build Klingle Road to Accommodate Vehicular, Pedestrian, and Bicycle Uses

Actions Items

- Repair existing retaining wall to avoid further pavement collapse into creek.
- Replace stormwater and drainage system by one of two methods described in Section 2.0.
- Remove existing road; backfill ROW; grade to direct drainage.
- Contour and pave hard-surface 8-10 foot-wide bike path.
- Rebuild and widen two-lane road to 25-30 feet of width, open to vehicular traffic in both directions.

Implementation of this alternative might have an impact on potential archaeological resources within the construction area; therefore, if this alternative is selected, DDOT would undertake an archaeological survey of the APE associated with the construction zone, to determine whether or not significant archaeological resources are present. If so, DDOT would develop a plan to avoid or minimize adverse effects to such resources. Also, by altering the existing traffic patterns, this alternative may have an effect on the Rock Creek Park Historic District; if this alternative is selected, DDOT would consult with the SHPO and other interested parties to assess the effect, and if the effect is determined to be adverse, undertake additional consultations to develop plans to mitigate adverse effects. Also, the DDOT would undertake a study to determine whether there would be an effect on the Cleveland Park Historic District, the Woodley Park Historic District, or any individual historic resources, and if so, consult with the SHPO and other interested parties to assess the effect, and if the effect is determined to be adverse, undertake additional consultations to develop plans to mitigate adverse effects.

Option G: Build Klingle Road as a Single Lane (One-Way) Road and a Pedestrian/Bicycle Lane

Action Items

- Repair existing retaining wall to avoid further pavement collapse into creek.
- Replace stormwater and drainage system by one of two methods described in Section 2.0.
- Remove existing road; backfill ROW; and grade to direct drainage.
- Rebuild one-lane (one-way) road, open to vehicular traffic.
- Contour and pave hard-surface bike path.

Implementation of this option might have a short-term adverse impact on potential archaeological resources within the construction area; therefore, if this option were selected, the DDOT would undertake an archaeological survey of the APE associated with the construction zone to determine whether or not significant archaeological resources are present. If present, the DDOT would develop a plan to avoid or to minimize adverse effects to such resources. Also, by altering the existing traffic patterns, this option may have an effect on the Rock Creek Park Historic District. If this option is selected, the DDOT would consult with the SHPO and other interested parties to assess the effect and, if the effect were determined to be adverse, would undertake additional consultations to develop plans to mitigate adverse effects.

3.14 SUMMARY

The current environmental conditions in Klingle Valley call for the selection of an option that offers a solution to the following critical issues:

- The stormwater and drainage system is in desperate need of repair or replacement. Continuous degradation of the system translates into further environmental degradation.

- Klingle Road in its present condition represents an environmental and human health hazard.

- The existence of utility lines within the valley requires the establishment of a maintenance program and access for appropriate utility vehicles.

- Taking into consideration the need for continued maintenance operations of utility lines, an access road for maintenance vehicles

should exist under all of the proposed options (including No-Action, Green Space, No-Build, and Bike Path). Consequently, the need for an access road becomes a pivotal factor in the decision-making process for the selection of a particular option.

Implementation of any of the proposed options would have adverse impacts on the local geology, topography and soils. Consequently, it would also affect the water quality conditions in Klingle Creek and Rock Creek. Steep slopes, high erosion potential of the soils, and the flashy character of stormwater runoff in Klingle Valley make the soils highly susceptible to erosion during runoff events. Construction activities associated with the proposed actions would expose soils to increased erosion by removing vegetation or the existing hard top. Adverse effects to water quality and aquatic habitats associated with the transport and deposition of eroded soil would be expected because of the proximity of the project area to Klingle Creek. Adverse effects to the local geology, topography, and soils associated with the use of heavy equipment and excavation, grading, and the placement of fill during construction activities in previously undisturbed areas would be also be expected. Adverse effects to water quality related to vehicular traffic include high concentrations of metals, oils and grease, and organic pollutants.

Long-term beneficial effects to the local geology, topography and soils would be expected following the repair and upgrade of the existing drainage structures as a result of a reduction in erosion associated with uncontrolled runoff during high-flow events. Water quality conditions would also be improved as a consequence of repair or replacement activities of the stormwater and sewer conveyance systems.

Short-term adverse effects to the biological resources would be expected with any construction activities in the project area. Wildlife that currently use the area would potentially be displaced because of increased human activity, reintroduction of vehicular traffic noise, etc. Rehabilitation of the drainage system, regardless of the selected option, would benefit biological resources; particularly aquatic resources that are currently impacted by uncontrolled flows and stormwater runoff.

Long-term impacts of reopening Klingle Road would produce negligible beneficial improvements to traffic congestions or safety at surrounding intersections. Given the limited size of the ROW, reopening Klingle Road would only lead to minor improvements in relieving congestion at surrounding intersections. A more detailed traffic study, including a new traffic count, would be necessary to fully determine the impacts of reopening Klingle Road.

If it is determined, through further analyses, that any of the proposed options would have an adverse effect on a cultural resource, the DDOT should develop a plan to mitigate this effect, in consultation with the SHPO and interested parties. The DDOT would fulfill this responsibility under Section 106 of the National Historic Preservation Act in accordance with the Advisory Council on Historic Preservation *Procedures for Protection of Historic Properties* (36 CFR 800).

Table 3-13 provides a summary of the effects each option would have on the environmental attributes evaluated in this feasibility study.

The implementation of any of the proposed options would involve a substantial amount of engineering modifications (e.g., road construction, utility renewal) in order to substantially improve the environmental conditions in Klingle Valley.

The extent of the work needed, the variety of resources affected, the topographic characteristics, and the socioeconomic and political factors, are only some of the driving forces playing a central role in the selection of an option. Consequently, the execution of an Environmental Impact Statement (EIS) for this area, that would address all of these issues in depth, is highly recommended.

TABLE 3-13: SUMMARY OF IMPACTS

RESOURCE	Option A	Option B	Option C	Option D	Option E	Option F	Option G
Geology, Topography, Soils	*Short-term adverse* *Long-term adverse*	*Short-term adverse* *Beneficial*	*Short-term adverse* *Beneficial*	*Short-term adverse* *Beneficial*	*Short-term adverse* *Beneficial*	*Short-term adverse* *Long-term adverse* *Long-term beneficial*	*Short-term adverse* *Beneficial*
Biological Resources	*Short-term adverse* *Long-term adverse*	*Short-term adverse* *Beneficial*	*Short-term adverse* *Beneficial*	*Short-term adverse* *Beneficial*	*Short-term adverse* *Long-term adverse* *Beneficial*	*Short-term adverse* *Long-term adverse* *Long-term beneficial*	*Short-term adverse* *Long-term adverse* *Beneficial*
Water Resources	*Short-term adverse* *Long-term adverse*	*Short-term adverse* *Beneficial*	*Short-term adverse* *Beneficial*	*Short-term adverse* *Long-term adverse* *Beneficial*	*Short-term adverse* *Long-term adverse* *Beneficial*	*Short-term adverse* *Long-term adverse* *Beneficial*	*Short-term adverse* *Long-term adverse* *Beneficial*
Floodplains	*Short-term adverse* *Long-term adverse*	*Short-term adverse* *Beneficial*	*Short-term adverse* *Long-term adverse* *Beneficial*	*Short-term adverse* *Long-term adverse* *Beneficial*	*Short-term adverse* *Long-term adverse* *Beneficial*	*Short-term adverse* *Long-term adverse* *Long-term beneficial*	*Short-term adverse* *Long-term adverse* *Beneficial*
Hazardous Materials	*No Effect*	*No Effect*	*No Effect*	*No Effect*	*No Effect*	*No Effect*	*No Effect*
Air Quality	*No Effect*	*No Effect*	*No Effect*	*No Effect*	*Further Study*	*Further Study*	*Further Study*
Noise	*Short-term adverse*	*Short-term adverse*	*Short-term adverse*	*Short-term adverse*	*Short-term adverse* *Further Study*	*Short-term adverse* *Further study*	*Short-term adverse* *Further Study*
Land Use	*No effect*	*No effect*	*No effect*	*No effect*	*No effect*	*No effect*	*No effect*
Zoning	*No effect*	*No effect*	*No effect*	*No effect*	*No effect*	*No effect*	*No effect*
Socioeconomics	*No effect*	*No effect*	*No effect*	*No effect*	*No effect*	*No effect*	*No effect*
Public Services and Utilities	*Short-term adverse* *Long-term adverse*	*Short-term adverse*	*Short-term adverse*	*Short-term adverse*	*Short-term adverse*	*Short-term adverse*	*Short-term adverse*
Traffic	*Long-term adverse* *Beneficial* *Further Study*	*Long-term adverse* *Beneficial* *Further Study*	*Long-term adverse* *Beneficial* *Further Study*	*Long-term adverse* *Beneficial* *Further Study*	*Short-term adverse* *Long-term adverse* *Beneficial* *Further Study*	*Short-term adverse* *Long-term adverse* *Beneficial* *Further Study*	*Short-term adverse* *Long-term adverse* *Beneficial* *Further Study*
Cultural Resources	*Further Study*	*Further Study*	*Further Study*	*Further Study*	*Further Study*	*Further Study*	*Further Study*
Cost Estimates	*$272,000*	*$858,000*	*$1,107,000*	*$1,131,000*	*$3,810,000*	*$5,170,000*	*$3,515,000*

4.0

Public Involvement and Agency Coordination

4.0 PUBLIC INVOLVEMENT AND AGENCY COORDINATION

Throughout the development of this feasibility study, the District Division of Transportation (DDOT) has actively sought the input and contribution of citizens, community groups, and city agencies for the Klingle Road study. This community involvement has included public meetings, presentations to Advisory Neighborhood Commissions (ANC) and other groups, analyses of community input and agency coordination, and participation within the D.C. government.

In December 1999, the DDOT presented information at the Cleveland Park Public Library to members of the Cleveland Park Citizens Association and all other interested parties. On March 15, 2000, the DDOT hosted a public informational open house to provide information concerning the Klingle Road project to the public at-large. Letters were sent from the DDOT to community groups, ANCs, advocacy groups, and other individuals who had expressed interest in the project. Notice was provided in both citywide and local community newspapers. Over 200 people attended this event. All attendees were given the opportunity to complete a comment card and add their names to the project mailing list. More than 180 comment forms were returned over the following three months, including email comments from citizens sent to the DDOT. Comments and addresses were geocoded to illustrate the location of citizen responses with respect to the project area. Geocoding the mailing list clearly demonstrated the project effectively reached out to communities on both the east and west sides of Klingle Valley (Appendix B).

In September 2000, the DDOT presented information relating to the Klingle Road study to residents in the Mount Pleasant ANC and all other interested residents at the Mount Pleasant Public Library.

On November 30, 2000, the DDOT hosted a public meeting at its office. This meeting was intended to provide citizens with updated information concerning the study process. Citizens were invited to speak on the record about the Klingle Road study. Similar to the March Public Meeting, attendees were given the opportunity to complete a comment card and add their name to the mailing list. Again, the comment letters as well as the names and addresses from the meeting sign-in sheet were geocoded to determine the effectiveness of the community outreach efforts. Petition signatures were not geocoded as many of them had incomplete addresses or no addresses at all. Approximately 200 names and addresses from the November Public Meeting were geocoded which resulted in a fairly even geographic distribution both east and west of the project study area (Appendix B).

Overall, based on comments received throughout the duration of this feasibility study, the results are almost split evenly. Approximately, half of the respondents, who completed comment cards or signed petitions, are in favor of closing Klingle Road permanently to traffic while the other half favor re-opening Klingle Road to vehicular traffic. Exact numbers are impossible to extract, given the multiple comments received from single individuals and organizations as well as citizens who signed more than one petition in favor of a particular option (Table 4-1).

The DDOT and its consultants have maintained a database and mailing list of over 500 names and addresses. All comments, responses, and emails from concerned individuals and community groups have been incorporated into the public involvement aspect of this feasibility study.

The DDOT also received several petitions from community groups, which were factored into community input. Careful consideration of the written comments and response of citizens helped define the scope of the project. Citizens who attended either the March 15 meeting or the November 30 meeting or sent comments, all received acknowledgement of their comments and were placed on the mailing list to receive notification of all future events concerning this project. DDOT has also received comments

and information from local ANC's, neighborhood citizen associations and several environmental organizations including the Earth Justice Legal Defense Fund, Sierra Club and the Audubon Naturalist Society.

Given the scope of the study, the DDOT has sought to coordinate with many local and federal agencies to facilitate the feasibility study process. Beginning in 1999, the DDOT and its consultants began coordination with the Federal Highway Administration and the National Park Service. The DDOT followed up with coordination letters to the D.C. Department of Health (including the Environmental Health Administration's Water Quality Division, Air Quality Division, Watershed Protection Division and the Fisheries and Wildlife Division), D.C. Department of Consumer and Regulatory Affairs, State Historic Preservation Office, Fish and Wildlife Service (U.S. Department of the Interior), and the National Capital Planning Commission. Also, representatives from utility companies and community services in the study area were consulted regarding how the proposed feasibility study might affect services to residents and businesses in the area.

The DDOT has made every effort to keep the community as a whole informed and involved during the process of this feasibility study.

Table 4-1: Summary of Citizen Input

	Open Klingle Road to Vehicular Traffic	Close Klingle Road to Vehicular Traffic
Individual Comments	178	242
Petition Signatures	---	---
Harvard Street, N.W. Association	20	---
Students/Faculty of Washington International School	---	**25
Woodley Park Towers	---	62
"Save Klingle Valley"-email response form	---	19
"Klingle Valley-Save it Don't Pave It" form letter	---	26
Citizens Petition for the Reopening of Klingle Road	*1,500	---
Klingle Valley Park Association-1994	---	1,176

* 1,500 is an estimate.

** This petition had signatures of both adults and young children, approximately 50 children signed. Signatures of children are, in general, difficult to include in petitions, given the difficulty in verification and children's understanding of the project and the petition concept.

5.0

List of Agencies and Persons Consulted

5.0 LIST OF AGENCIES AND PERSONS CONSULTED

Sgt. Yolander Alexander
D.C. Police Department
4th District Headquarters
6001 Georgia Avenue, NW
Washington, D.C. 20011

Jerusalem Bekele
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Water Quality Division
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Washington, D.C. 20001

Herb Bixhorn
Chief, State Data Center
District of Columbia
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Bernie Bloom
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Lt. John Briscoe
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Adrienne Coleman
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Counsellor & Head of Chancery
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Washington, D.C. 20001

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6.0

References

6.0 REFERENCES

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7.0

List of Preparers

7.0 LIST OF PREPARERS

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8.0

Acronyms

8.0 ACRONYMS

ANC	Advisory Neighborhood Commission
APE	Area of Potential Effect
ASTM	American Society for Testing and Materials
ATSDR	Agency for Toxic Substances and Disease Registry
BMP	Best Management Practice
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CFR	Code of Federal Regulations
cfs	cubic feet per second
CO	Carbon Monoxide
COD	Carbon Oxygen Demand
DCMR	District of Columbia Municipal Regulations
dbh	diameter breast height
DPW	D.C. Department of Public Works
DCRA	Department of Consumer and Regulatory Affairs
DCWCP	D.C. Wetland Conservation Plan
DDOT	District Division of Transportation
EDR	Environmental Data Resources, Inc.
ESA	Endangered Species Act
EPA	Environmental Protection Agency
ESRI	Environmental Research System Institute, Inc.
EO	Executive Order
ERNS	Emergency Response Notification System
FHWA	Federal Highway Administration
HRS	Hazard Routing System
LUST	Leaking Underground Storage Tank
msl	mean sea level
NCPC	National Capital Planning Commission
NO_x	Nitogen Oxides
NPS	National Park Service
NRHP	National Register of Historic Places
NWI	National Wetland Inventory
PEPCO	Potomac Electric Power Company
PM_{10}	Particulate Matter
PSA	Patrol Service Area
RCRA	Resource Conservation and Recovery Act
RCRIS	Resource Conservation and Recovery Information System
ROW	Right of Way
SHPO	State Historic Preservation Office
USGS	United States Geological Survey
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service

USTs	Underground Storage Tanks
WMATA	Washington Metropolitan Transit Authority
WASA	Water and Sewer Authority

Appendix A: Agency Coordination

NCPC
NATIONAL CAPITAL PLANNING COMMISSION

801 Pennsylvania Avenue, NW
Suite 301
Washington, DC 20576
tel 202 482-7200
fax 202 482-7272
www.ncpc.gov

Commission Members

Appointed by the
resident of the United States
Harvey B. Gantt, Chairman
Robert A. Gaines
Margaret G. Vanderbye

ppointed by the Mayor of the
District of Columbia
Arrington Dixon
cia Elwood

Defense
Honorat S. Cohen

Secretary of the Interior
he Honorable Bruce Babbitt

dministrator of General Services
Honorable David J. Barram

Chairman, Committee on
Governmental Affairs
United States Senate
e Honorable Fred Thompson

Chairman, Committee on
Government Reform
S. House of Representatives
The Honorable Dan Burton

Mayor, District of Columbia
norable Anthony A. Williams

Chairman, Council of the
District of Columbia
e Honorable Linda W. Cropp

Executive Director
d W. Griffith

IN REPLY REFER TO:
NCPC File No. 5822

APR - 3 2000

Mr. Maurice Keys
Office of Intermodal Planning
District of Columbia Department of Public Works
Attention: Klingle Road Environmental Assessment
2000 14th Street, NW
Washington, DC 20009

Dear Mr. Keys:

Thank you for the opportunity to comment on the scoping for the proposed Environmental Assessment (EA) for the Klingle Road project, located adjacent to Rock Creek Park in northwest Washington, DC. The EA is being prepared on the currently closed portion of Klingle Road to evaluate alternatives for future use of the right-of-way. These scoping comments are limited to the Commission's role as the central planning agency for the federal government in the National Capital Region and express our general views on planning and environmental issues.

As noted in the provided project materials, preliminary project alternatives include:

- A no action alternative.
- Rebuilding Klingle Road to its original alignment and dimensions.
- Reconfiguring Klingle Road within the existing right-of way.
- No development of a roadway, but addressing drainage issues only.
- Converting the roadway to a bike/recreation corridor.

Your project information indicates that preliminarily discussions with the National Park Service have taken place in the context of non-vehicular use of the right-of-way. The Commission staff reaffirms that position relative to the federal interest in Rock Creek Park, and the project's potential effects on this important resource.

Rock Creek Park is a 1,754-acre urban forest in the District of Columbia. It is the oldest, largest natural urban park in the National Park System and is significant for its exceptional scenic beauty. Its natural forested landscapes stands in contrast to the surrounding cityscape of the District of Columbia. The park mission to preserve and perpetuate the ecological resources of Rock Creek valley in as natural a condition as possible, and to preserve its scenic value for the enjoyment of the public, is grounded in the park's 1890 enabling legislation which established Rock Creek Park for the purpose of providing a "...public park or pleasure ground for the benefit and enjoyment of the people of the United States."

The Commission staff wishes to support the concerns of the National Park Service relative to potential impacts to the park. Rock Creek Park is made up of steep side slopes that bisect several significant east-west trending ridgelines. The park descends along the piedmont fall-line through numerous small rapids and drainage ways along the creek and its sideslope watershed. Floodplain development in the park is fairly restrictive, limited primarily to Rock Creek itself. Most sections of the park are accessible either by automobile or by hiking. Many portions of the park are accessible by walking, usually under one mile. Gradients above the floodplain are surprisingly steep, and provide moderate hiking opportunities.

We want to emphasize that the lands currently being considered in the transportation corridor alternatives will potentially affect Rock Creek Park. Rock Creek Park environs should be considered a unique and significant environmental resource. While the park is the largest existing area of natural terrestrial vegetation in the District, this federal and community resource is being increasingly stressed and degraded. All eastern tributaries of Rock Creek have been paved over in past years. Rock Creek has water quality problems relating to over 200 outfalls into the stream. Uncontrolled runoff and larger volumes of flow, due to reduced infiltration and increased piping of runoff, have scoured Rock Creek instream habitat. The stream also has been evaluated as having poor benthic macroinvertebrate communities indicative of habitat degradation due to urban pollution.

The Commission staff believes the Klingle Road alignment area presents a unique opportunity to offset urbanization impacts that are increasingly affecting the basic ecosystem of the park. Rock Creek Park holds the promise of important restoration of anadromous fish, if aquatic habitat and improved water quality are achieved. Moreover, improved water quality and streamside environment at this point in the drainage system translates to enhanced conditions for all downstream environments including the Potomac River. A chance to upgrade the biodiversity and ecological functions of this drainage reach is available with your planned activity.

We strongly request that assessment of land area be directed toward limited impervious pavement areas within the alignment and that the most compatible form of access, if necessary, be determined in association with the National Park Service.

We appreciate your consideration of our comments at this stage of the project planning. The Commission anticipates your successful completion of the EA and looks forward to the review of the EA information, when available. Please place the Commission on the distribution list pertaining to all project planning. If you have technical questions concerning the information related in this letter, you may contact Mr. Eugene Keller, in the Office of Plans Review, at (202) 482-7251.

Sincerely,

William R. Lawson, FAIA
Acting Executive Director

THE LOUIS BERGER GROUP, INC.
1819 H Street, NW, Suite 900, Washington, DC 20006
Phone: 202.331.7775 Fax 202.293.8224

FAXTRANSMITAL

To: Naresh Sood, Embassy of India	**From:** Kammy Horne
Project Number/Description: Klingle Road	**RE:** Klingle Road/Property
Date: April 21, 2000	
Facsimile Number: 202-319-2840	
Pages (Including Cover): 2	

Mr. Sood,

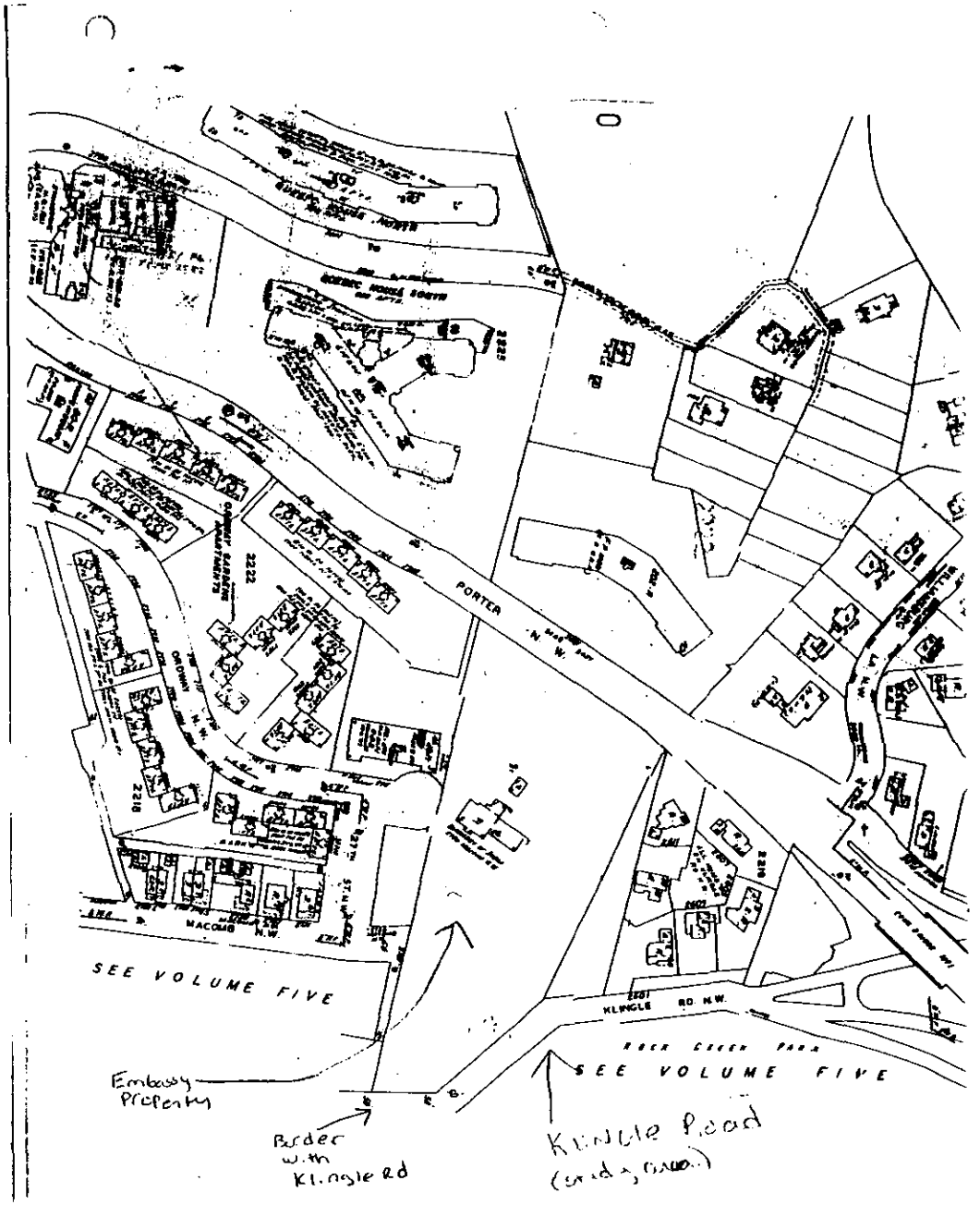
We spoke on Wednesday concerning the property that is owned by the Embassy of India (2700 Macomb NW) that borders Klingle Road. The Louis Berger Group is contracted by the DC Department of Public Works to do an environmental study on the closed portion of this road. It appears that your property access is from Macomb Street, NW, however I want to be sure that you do not require access from Klingle Road.

I have attached a map that shows the property bounded by Macomb, Porter, and Klingle Road. Please let me know if the Embassy has an access point from Klingle Road.

I hope that you can read the attached map—I will try to phone you on Monday (4/24) to discuss this (or you can phone me at your convenience).

Thank you for your assistance. We will continue to keep the Embassy of India informed of meetings regarding this study.

Kammy Horne
(202) 331-7775 ext. 476



R. R. DASH
Counsellor &
Head of Chancery

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2107 Massachusetts
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Fax: (202) 265-4351

WAS/PROP/MISC/4/00

April 26, 2000

Dear Ms. Horne

Please refer to you fax message dated April 21, 2000 addressed to Mr. Sood regarding the Embassy-owned property at 2700 Macomb Street. While, our access to our property presently is from Macomb Street, we would very much like to keep our options open for access from Klingle Road.

2. We would appreciate it if you could keep us informed of any developments in this regard.

Yours sincerely

(R. R. DASH)

Ms. Kammy Horne
Environmental Planner
The Louis Berger Group, Inc.
1819 H Street, NW
Suite 900
Washington, DC 20006

rcvd 01P76-00

GOVERNMENT OF THE DISTRICT OF COLUMBIA
Department of Consumer and Regulatory Affairs

Office of the Director

June 28, 2000

Mr. Kenneth G. Laden
Administrator for Office of Intermodal Planning
Department of Public Works
2000 14th Street, N.W. 7th Floor
Washington, DC 20009

Dear Mr. Laden:

This letter is to acknowledge your letter dated June 19, 2000, regarding the reopening of Klingle Rd. Please be advised that the matter has been referred to Armando Lourenco, Administrator for Building Land Regulation Administration.

you should receive a response from Mr. Lourenco within five (5) business days from the date of this letter. If you have not received a response from Mr. Lourenco by July 6, *2000*, please feel free to contact Ms. Regina Dobbins at (202) 442-8941 for further assistance.

Thank you for bringing this matter to my attention. It is my hope that through cooperative efforts between citizens and the Department, to address issues such as yours, we can help transform the District of Columbia into the model-city of excellence it was designed to be.

Sincerely,

Lloyd Jordan

Lloyd J. Jordan
Director

Correspondence Ticket No 3309

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Chesapeake Bay Field Office
177 Admiral Cochrane Drive
Annapolis, MD 21401

July 19, 2000

Mr. Ken Laden
Administrator
Office of Intermodel Planning
Department of Public Works, D.C.
2000 14th Street, N.W., Seventh Floor
Washington, D.C. 20009

RE: Proposed Reopening of Klingle Road
Environmental Assessment
Rock Creek Park, District of Columbia

Dear Mr. Laden:

This responds to your June 19, 2000, request for information on the presence of species which are federally listed or proposed for listing as endangered or threatened in the above referenced project area. We have reviewed the information you enclosed and are providing comments in accordance with Section 7 of the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*).

Except for occasional transient individuals, no proposed or federally listed endangered or threatened species are known to exist within the project impact area. Therefore, no Biological Assessment or further Section 7 consultation with the U.S. Fish and Wildlife Service is required. Should project plans change, or should additional information on the distribution of listed or proposed species become available, this determination may be reconsidered.

This response relates only to federally protected threatened or endangered species under our jurisdiction. Limited information is currently available regarding the distribution of other rare species in the District of Columbia. However, the Nature Conservancy and National Park Service (NPS) have initiated an inventory of rare species within the District. For further information on such rare species, you should contact Ellen Gray of the DC Natural Heritage Program at (202) 342-1443 ext. 223.

An additional concern of the Service is wetlands protection. Federal and state partners of the Chesapeake Bay Program have adopted an interim goal of no overall net loss of the Basin's remaining wetlands, and the long term goal of increasing the quality and quantity of the Basin's wetlands resource base. Because of this policy and the functions and values wetlands perform, the Service recommends avoiding wetland impacts. All wetlands within the project area should be identified, and if alterations of wetlands proposed, the U.S. Army Corps of Engineers, Baltimore District, should be contacted for permit requirements. They can be reached at (410) 962-3670.

We appreciate the opportunity to provide information relative to fish and wildlife issues, and thank you for your interests in these resources. If you have any questions or need further assistance, please contact Andy Moser at (410) 573-4537.

Sincerely,

Robert J. Pennington
Assistant Field Supervisor
Chesapeake Bay Field Office

GOVERNMENT OF THE DISTRICT OF COLUMBIA
DEPARTMENT OF CONSUMER AND REGULATORY AFFAIRS
BUILDING AND LAND REGULATION ADMINISTRATION

July 31, 2000

Mr. Ken Laden
Administrator
Office of Intermodal Planning
Department of Public Works, D.C.
2000 14th St., N.W., Seventh Floor
Washington, D. C. 20009

Dear Mr. Laden:

We have received your letter addressed to Mr. Gregory McCarthy, SHPO regarding the Klingle Road project. Our primary concerns are: the impact that this project will have on landmark or National Register properties within the "area of potential effect"; and on archaeological resources that would be disturbed or destroyed by construction, installation of storm drainage systems, removal and replacement of asphalt, and those places to be used as staging areas for the project.

If you would like to discuss any of these issues please feel free to contact Nancy Kassner of my staff at (202) 442 - 4663.

Sincerely,

Stephen Raiche
Chief, Historic Preservation Division

GOVERNMENT OF THE DISTRICT OF COLUMBIA
Department of Health

Office of the Senior Deputy Director for Public Health Assurance

★ ★ ★

MEMORANDUM

TO: Ken Laden, Administrator
Office of Intermodal Planning
Department of Public Works

FROM: Theodore J. Gordon
Senior Deputy Director for Public Health Assurance

DATE: August 7, 2000

SUBJECT: Klingle Road

The program managers of the Bureau of Environmental Quality have been meeting with your staff and contractor since May 31, 2000. We initiated the series of meetings, because of our concern that we had not been contacted and we possess a significant amount of data and environmental information on Klingle Road.

We appreciate the time and attention your staff and consultants have spent with our staff and believe that there is a need to maintain closer communications in order to have an accurate assessment of the environment. There are a few concerns that bear to be restated, even though I am sure your staff has kept you informed.

Water Quality Division - Jerusalem Bekele

The Water Quality Standards, 21 DCMR, Section 1102.5 designate "Rock Creek and its tributaries" as "Special Waters of the District of Columbia." The requirements of Section 1102.4 are for the application of BMPs, maintenance of water quality at or above existing conditions and no long term adverse water quality effects. There are wetlands involved and DPW has not complied with previous agreements on wetland mitigation.

Air Quality Division - Donald Wambsgans

The impact of increased traffic resulting from the reopening of Klingle Road should be evaluated using the Air Quality Division's protocol for air quality analysis. The initial meeting with Mr. Keyes and the DPW contractor, Mr. Berger, was inconclusive and subsequent efforts to meet again have not been successful.

Watershed Protection Division - Hamid Karimi

There is severe bank erosion. Storm water BMPs will need to be specially designed in accordance with the requirements of 21 DCMR Section 1104.

Due to difficulties in scheduling a meeting, information was transmitted by letter to the consultant.

Fisheries and Wildlife Division - Ira Palmer

Any transportation related impediments to fish movement, need to be avoided.

Your principal point of contact is James R. Collier, Chief of the Bureau of Environmental Quality.

C: Norman S. Dong, Deputy Mayor for Operations
Jim Wareck, Deputy Director, Federal & Congressional Affairs
Leslie Hotaling, Acting Interim Director

GOVERNMENT OF THE DISTRICT OF COLUMBIA
DEPARTMENT OF PUBLIC WORKS

OFFICE OF INTERMODAL PLANNING

AUG 11 2000

Ms. Adrienne A. Coleman
Superintendent
Nation Park Service
National Capital Region
Rock Creek Park
3545 Williamsburg Lane, N.W.
Washington, D.C. 20008-1207

Dear Ms. Coleman:

As you know the Department of Public Works, District Division of Transportation is conducting an environmental assessment of Klingle Road between Woodley Road and Porter Street, N.W. We request your assistance in locating any traffic data or studies that have been collected or performed by the National Park Service in this general area. In addition, please inform us of the status of the Draft General Management Plan and Environmental Impact Statement and whether the draft is available for review.

Should you have any questions, please contact me or Maurice Keys at (202) 671-2740.

Sincerely,

Kenneth G. Laden
Administrator

2000 14th Street, N.W., Washington, D.C. 20009 (202) 671-2730

THE Louis Berger Group, INC.
1819 H Street, NW, Suite 900, Washington, DC 20006 USA
Tel 202 331 7775 Fax 202 293 0787 Email answers@louisberger.com www.louisberger.com

October 11, 2000

Dr. Ellen Gray
National Park Service
4598 McArthur Boulevard, NW
Washington, DC 20007

Re: Proposed Reopening of Klingle Road Environmental Assessment
Rock Creek Park, District of Columbia

Dear Dr. Gray:

The District of Columbia Department of Public Works (DPW) is preparing an Environmental Assessment (EA) to assess the potential impacts associated with the alternative potential uses of Klingle Road, located in Northwest Washington, DC. As shown on the attached copy of the USGS topographic map for the Washington West, DC-MD-VA Quadrangle, the EA is being prepared for the portion of Klingle Road that is currently closed to vehicular traffic between Porter Street, N.W. and Woodley Road, N.W. Although previous correspondence and discussions between the DPW, the National Park Service, and the public have primarily considered a non-vehicular use of the roadway, it is necessary to prepare an EA which examines various options if federal funds are to be used for any project alternative, including any recreational use. The EA is being prepared under requirements of the National Environmental Policy Act (NEPA) and the implementing regulations of the Council on Environmental Quality and the Federal Highway Administration.

The preliminary project alternatives include:

- The No Action Alternative
- Rebuild Klingle Road to its original alignment and dimensions and repair/replace storm drainage
- No Build Alternative (differs from the No Action Alternative in that drainage problems will be addressed)
- Bike recreation/facility management (conversion of the closed portion of Klingle Road to a bike path with appropriate resurfacing)
- Green Space Alternative (removal of asphalt on Klingle Road to allow the area to return to natural condition)

THE Louis Berger Group, INC.
1819 H Street, NW, Suite 900, Washington, DC 20006 USA
Tel 202 331 7775 Fax 202 293 0787 Email answers@louisberger.com www.louisberger.com

With the exception of the No Action Alternative that must be considered under NEPA, all of the alternatives will correct existing drainage related damage and deficiencies in the Klingle Valley watershed.

The purpose of this correspondence is to formally request the current list of special status species that are known to occur, or that could potentially occur on, or in the vicinity of the Klingle Valley site. We would also like to know if there are any other sensitive natural resources or ecosystems that should be considered in the environmental analysis.

If you have any questions or need additional information, please contact Shannon Cauley at 202-331-7775, ext. 474, or by e-mail at scauley@louisberger.com. Thank you in advance for your assistance.

Sincerely,
The Louis Berger Group, Inc.

Shannon R. Cauley
Senior Ecologist

cc: Mr. Maurice Keys, DCDPW
Mr. Jess Commerford, Director, The Louis Berger Group, Inc.

THE Louis Berger Group, INC.
1819 H Street, NW, Suite 900, Washington, DC 20006 USA
Tel 202 331 7775 Fax 202 293 0787 Email answers@louisberger.com www.louisberger.com

October 12, 2000

Sergeant Yolander Alexander
Fourth District Headquarters
6001 Georgia Avenue, NW
Washington, D.C. 20011

Dear Sergeant Alexander:

The Louis Berger Group, Inc. (Berger) is a consultant to the District of Columbia Department of Public Works (DCDPW) conducting the Klingle Road Environmental Assessment (EA). Per your conversation with Melissa Bird (of Berger) in April 2000, we are now requesting your written confirmation of the Fourth District's needs and concerns as they relate to this project and project alternatives.

Project Description

The District of Columbia Department of Public Works (DPW) is preparing an Environmental Assessment (EA) to assess the potential impacts associated with the alternative potential uses of the Klingle Road right of way, located in Northwest Washington, DC. As shown on the attached map, the EA is being prepared for the portion of Klingle Road that is currently closed to vehicular traffic between Porter Street, N.W. and Woodley Road, N.W. Although previous correspondence and discussions between the DPW, the National Park Service, and the public have primarily considered a non-vehicular use of the roadway, it is necessary to prepare an EA which examines various options if federal funds are to be used for any project alternative, including any recreational use. The EA is being prepared under requirements of the National Environmental Policy Act (NEPA) and the implementing regulations of the Council on Environmental Quality and the Federal Highway Administration.

The preliminary project alternatives include:

- The No Action Alternative
- No Build Alternative (differs from the No Action Alternative in that drainage problems will be addressed)
- Green Space Alternative (removal of asphalt on Klingle Road to allow the area to return to natural condition)
- Bike recreation/facility management (conversion of the closed portion of Klingle Road to a bike path with appropriate resurfacing)
- Rebuild Klingle Road to its original alignment and dimensions and repair/replace storm drainage

Information Request

We are aware that these alternatives may potentially impact the Fourth Districts ability to provide service in the area. On behalf of DCDPW, Berger is requesting written verification of the following information from your office:

- Fourth District's review of this project information.
- The effect of the road closure on providing service in the area.
- Concerns, if any, about crime in the closed portion of the road.

The information provided by your office will become part of the final Environmental Assessment. Also, all written information from your office may be incorporated into the appendix of the EA. If possible, we would like to receive this information in our office by November 3, 2000 in order to prepare for a public hearing on November 29, 2000 at DPW. If you have any questions or need more information please contact either Jess Commerford at 202 331-7775 ext. 459 or Melissa Bird at 202 331-7775 ext. 496. Sergeant Alexander, thank you for your attention to this matter, we look forward to receiving your information on behalf of the Fourth District.

Sincerely,
The Louis Berger Group, Inc.

Jess Commerford, AICP
Director, Planning and Environmental Services

CC: Maurice Keys, DCDPW
Larry D. Walker, The Louis Berger Group

THE Louis Berger Group, INC.
1819 H Street, NW, Suite 900, Washington, DC 20006 USA
Tel 202 331 7775 Fax 202 293 0787 Email answers@louisberger.com www.louisberger.com

October 12, 2000

Lt. Roger Roch
Second District Headquarters
3320 Idaho Avenue, NW
Washington, D.C. 20016

Dear Lt. Roch:

The Louis Berger Group, Inc. (Berger) is a consultant to the District of Columbia Department of Public Works (DCDPW) conducting the Klingle Road Environmental Assessment (EA). Per your conversation with Melissa Bird (of Berger) in April 2000, we are now requesting your written confirmation of the Second District's needs and concerns as they relate to this project and project alternatives.

Project Description

The District of Columbia Department of Public Works (DPW) is preparing an Environmental Assessment (EA) to assess the potential impacts associated with the alternative potential uses of the Klingle Road right of way, located in Northwest Washington, DC. As shown on the attached map, the EA is being prepared for the portion of Klingle Road that is currently closed to vehicular traffic between Porter Street, N.W. and Woodley Road, N.W. Although previous correspondence and discussions between the DPW, the National Park Service, and the public have primarily considered a non-vehicular use of the roadway, it is necessary to prepare an EA which examines various options if federal funds are to be used for any project alternative, including any recreational use. The EA is being prepared under requirements of the National Environmental Policy Act (NEPA) and the implementing regulations of the Council on Environmental Quality and the Federal Highway Administration.

The preliminary project alternatives include:

- The No Action Alternative
- No Build Alternative (differs from the No Action Alternative in that drainage problems will be addressed)
- Green Space Alternative (removal of asphalt on Klingle Road to allow the area to return to natural condition)
- Bike recreation/facility management (conversion of the closed portion of Klingle Road to a bike path with appropriate resurfacing)
- Rebuild Klingle Road to its original alignment and dimensions and repair/replace storm drainage

Information Request

We are aware that these alternatives may potentially impact the Second Districts ability to provide service in the area. On behalf of DCDPW, Berger is requesting written verification of the following information from your office:

- Second District's review of this project information.
- The effect of the road closure on providing service in the area.
- Concerns, if any, about crime in the closed portion of the road.

The information provided by your office will become part of the final Environmental Assessment. Also, all written information from your office may be incorporated into the appendix of the EA. If possible, we would like to receive this information in our office by November 3, 2000 in order to prepare for a public hearing on November 29, 2000 at DPW. If you have any questions or need more information please contact either Jess Commerford at 202 331-7775 ext. 459 or Melissa Bird at 202 331-7775 ext. 496. Lt. Roch, thank you for your attention to this matter, we look forward to receiving your information on behalf of the Second District.

Sincerely,
The Louis Berger Group, Inc.

Jess Commerford, AICP
Director, Planning and Environmental Services

CC: Maurice Keys, DCDPW
Larry D. Walker, The Louis Berger Group

THE Louis Berger Group, INC.
1819 H Street, NW, Suite 900, Washington, DC 20006 USA
Tel 202 331 7775 Fax 202 293 0787 Email answers@louisberger.com www.louisberger.com

October 12, 2000

Lt. John Briscoe
5th Battalion
1763 Lanier Place
Washington, D.C. 20010

Dear Lt. Briscoe:

The Louis Berger Group, Inc. (Berger) is a consultant to the District of Columbia Department of Public Works (DCDPW) conducting the Klingle Road Environmental Assessment (EA). Per your conversation with Melissa Bird (of Berger) in April 2000, we are now requesting your written confirmation of the 5th Battalion's needs and concerns as they relate to this project and project alternatives.

Project Description

The District of Columbia Department of Public Works (DPW) is preparing an Environmental Assessment (EA) to assess the potential impacts associated with the alternative potential uses of the Klingle Road right of way, located in Northwest Washington, DC. As shown on the attached map, the EA is being prepared for the portion of Klingle Road that is currently closed to vehicular traffic between Porter Street, N.W. and Woodley Road, N.W. Although previous correspondence and discussions between the DPW, the National Park Service, and the public have primarily considered a non-vehicular use of the roadway, it is necessary to prepare an EA which examines various options if federal funds are to be used for any project alternative, including any recreational use. The EA is being prepared under requirements of the National Environmental Policy Act (NEPA) and the implementing regulations of the Council on Environmental Quality and the Federal Highway Administration.

The preliminary project alternatives include:

- The No Action Alternative
- No Build Alternative (differs from the No Action Alternative in that drainage problems will be addressed)
- Green Space Alternative (removal of asphalt on Klingle Road to allow the area to return to natural condition)
- Bike recreation/facility management (conversion of the closed portion of Klingle Road to a bike path with appropriate resurfacing)
- Rebuild Klingle Road to its original alignment and dimensions and repair/replace storm drainage

Information Request

We are aware that these alternatives may potentially impact the 5th Battalions ability to provide service in the area. On behalf of DCDPW, Berger is requesting written verification of the following information from your office:

- 5th Battalion's review of this project information.
- The effect of the road closure on providing service in the area.
- Concerns, if any, about fire or safety hazards in the closed portion of the road.
- Needs, if any for an access road to areas in the closed portion of the roadway.

The information provided by your office will become part of the final Environmental Assessment. Also, all written information from your office may be incorporated into the appendix of the EA. If possible, we would like to receive this information in our office by November 3, 2000 in order to prepare for a public hearing on November 29, 2000 at DPW. If you have any questions or need more information please contact either Jess Commerford at 202 331-7775 ext. 459 or Melissa Bird at 202 331-7775 ext. 496. Lt. Briscoe, thank you for your attention to this matter, we look forward to receiving your information on behalf of the 5th Battalion.

Sincerely,
The Louis Berger Group, Inc.

Jess Commerford, AICP
Director, Planning and Environmental Services

CC: Maurice Keys, DCDPW
Larry D. Walker, The Louis Berger Group

THE Louis Berger Group, INC.
1819 H Street, NW, Suite 900, Washington, DC 20006 USA
tel 202 331 7775 Fax 202 293 0787 Email answers@louisberger.com www.louisberger.com

October 12, 2000

Lt. Christopher Jordan
4th Battalion
3420 14th Street, NW
Washington, D.C. 20010

Dear Lt. Jordan:

The Louis Berger Group, Inc. (Berger) is a consultant to the District of Columbia Department of Public Works (DCDPW) conducting the Klingle Road Environmental Assessment (EA). Per your conversation with Melissa Bird (of Berger) in April 2000, we are now requesting your written confirmation of the 4th Battalion's needs and concerns as they relate to this project and project alternatives.

Project Description

The District of Columbia Department of Public Works (DPW) is preparing an Environmental Assessment (EA) to assess the potential impacts associated with the alternative potential uses of the Klingle Road right of way, located in Northwest Washington, DC. As shown on the attached map, the EA is being prepared for the portion of Klingle Road that is currently closed to vehicular traffic between Porter Street, N.W. and Woodley Road, N.W. Although previous correspondence and discussions between the DPW, the National Park Service, and the public have primarily considered a non-vehicular use of the roadway, it is necessary to prepare an EA which examines various options if federal funds are to be used for any project alternative, including any recreational use. The EA is being prepared under requirements of the National Environmental Policy Act (NEPA) and the implementing regulations of the Council on Environmental Quality and the Federal Highway Administration.

The preliminary project alternatives include:

- The No Action Alternative
- No Build Alternative (differs from the No Action Alternative in that drainage problems will be addressed)
- Green Space Alternative (removal of asphalt on Klingle Road to allow the area to return to natural condition)
- Bike recreation/facility management (conversion of the closed portion of Klingle Road to a bike path with appropriate resurfacing)
- Rebuild Klingle Road to its original alignment and dimensions and repair/replace storm drainage

Information Request

We are aware that these alternatives may potentially impact the 4th Battalions ability to provide service in the area. On behalf of DCDPW, Berger is requesting written verification of the following information from your office:

- 4th Battalion's review of this project information.
- The effect of the road closure on providing service in the area.
- Concerns, if any, about fire or safety hazards in the closed portion of the roadway.
- Need, if any, for an access road to areas in the closed portion of the roadway.

The information provided by your office will become part of the final Environmental Assessment. Also, all written information from your office may be incorporated into the appendix of the EA. If possible, we would like to receive this information in our office by November 3, 2000 in order to prepare for a public hearing on November 29, 2000 at DPW. If you have any questions or need more information please contact either Jess Commerford at 202 331-7775 ext. 459 or Melissa Bird at 202 331-7775 ext. 496. Lt. Jordan, thank you for your attention to this matter, we look forward to receiving your information on behalf of the 4th Battalion.

Sincerely,
The Louis Berger Group, Inc.

Jess Commerford, AICP
Director, Planning and Environmental Services

CC: Maurice Keys, DCDPW
Larry D. Walker, The Louis Berger Group

THE Louis Berger Group, INC.
1819 H Street, NW, Suite 900, Washington, DC 20006 USA
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October 17, 2000

Jim Shebelski
Water and Sewer Authority
Design Branch Manager
5000 Overlook Drive
Washington D.C. 20032

Dear Mr. Shebelski:

This is a follow-up to the letter sent to you on October 12th. The Louis Berger Group, Inc. (Berger) is a consultant to the District of Columbia Department of Public Works (DCDPW) conducting the Klingle Road Environmental Assessment (EA). Per your conversation with Melissa Bird (of Berger) in April 2000, we are now requesting your written confirmation of Water and Sewer Authority's needs and concerns as they relate to this project and project alternatives. Attached to this letter is a detailed topography map with the project area identified.

Project Description

The District of Columbia Department of Public Works (DPW) is preparing an Environmental Assessment (EA) to assess the potential impacts associated with the alternative potential uses of the Klingle Road right of way, located in Northwest Washington, DC. As shown on the attached map, the EA is being prepared for the portion of Klingle Road that is currently closed to vehicular traffic between Porter Street, N.W. and Woodley Road, N.W. Although previous correspondence and discussions between the DPW, the National Park Service, and the public have primarily considered a non-vehicular use of the roadway, it is necessary to prepare an EA which examines various options if federal funds are to be used for any project alternative, including any recreational use. The EA is being prepared under requirements of the National Environmental Policy Act (NEPA) and the implementing regulations of the Council on Environmental Quality and the Federal Highway Administration.

The preliminary project alternatives include:

- The No Action Alternative
- No Build Alternative (differs from the No Action Alternative in that drainage problems will be addressed)
- Green Space Alternative (removal of asphalt on Klingle Road to allow the area to return to natural condition)
- Bike recreation/facility management (conversion of the closed portion of Klingle Road to a bike path with appropriate resurfacing)
- Rebuild Klingle Road to its original alignment and dimensions and repair/replace storm drainage

Information Request

We are aware that these alternatives may potentially impact relating to WASA's ability to provide service in the area. On behalf of DCDPW, Louis Berger is requesting written verification of the following information from your office:

- WASA's review of this project information.
- The presence of active water and sewer lines along the closed portion of the road.
- WASA's need for access to the closed portion of Klingle Road for service and maintenance purposes.
- WASA's needs, if any, for an access road to the closed portion of the existing road, if necessary, the width and surface type.
- The types of vehicles/equipment needed, if any.
- The amount of ground coverage required for lines.

The information provided by your office will become part of the final Environmental Assessment. Also, all written information from your office may be incorporated into the appendix of the EA. If possible, we would like to receive this information in our office by October 27, 2000 in order to prepare for a public hearing on November 29, 2000 at DPW. If you have any questions or need more information please contact either Jess Commerford at 202 331-7775 ext. 459 or Melissa Bird at 202 331-7775 ext. 496. Mr. Shebelski, thank you for your attention to this matter, we look forward to receiving your information on behalf of WASA.

Sincerely,

The Louis Berger Group, Inc.

Jess Commerford, AICP
Director, Planning and Environmental Services

Enclosure as cited
CC: Maurice Keys, DCDPW
Larry D. Walker, The Louis Berger Group

THE Louis Berger Group, INC.
1819 H Street, NW, Suite 900, Washington, DC 20006 USA
Tel 202 331 7775 Fax 202 293 0787 Email answers@louisberger.com www.louisberger.com

October 17, 2000

Douglas Ryan
Washington Gas
Workload Distribution
6801 Industrial Road
Springfield, VA 22151

Dear Mr. Ryan:

This is a follow-up to the letter sent to you on October 12th. The Louis Berger Group, Inc.(Berger) is a consultant to the District of Columbia Department of Public Works (DCDPW) conducting the Klingle Road Environmental Assessment (EA). Per your conversation with Melissa Bird (of Berger) in April 2000, we are now requesting your written confirmation of Washington Gas's needs and concerns as they relate to this project and project alternatives. Attached to this letter is a detailed topography map with the project area identified.

Project Description

The District of Columbia Department of Public Works (DPW) is preparing an Environmental Assessment (EA) to assess the potential impacts associated with the alternative potential uses of the Klingle Road right of way, located in Northwest Washington, DC. As shown on the attached map, the EA is being prepared for the portion of Klingle Road that is currently closed to vehicular traffic between Porter Street, N.W. and Woodley Road, N.W. Although previous correspondence and discussions between the DPW, the National Park Service, and the public have primarily considered a non-vehicular use of the roadway, it is necessary to prepare an EA which examines various options if federal funds are to be used for any project alternative, including any recreational use. The EA is being prepared under requirements of the National Environmental Policy Act (NEPA) and the implementing regulations of the Council on Environmental Quality and the Federal Highway Administration.

The preliminary project alternatives include:

- The No Action Alternative
- No Build Alternative (differs from the No Action Alternative in that drainage problems will be addressed)
- Green Space Alternative (removal of asphalt on Klingle Road to allow the area to return to natural condition)
- Bike recreation/facility management (conversion of the closed portion of Klingle Road to a bike path with appropriate resurfacing)
- Rebuild Klingle Road to its original alignment and dimensions and repair/replace storm drainage

Information Request

We are aware that these alternatives may potentially impact Washington Gas's ability to provide gas service in the area or maintain infrastructure. On behalf of DCDPW, Berger is requesting written verification of the following information from your office:

- Washington Gas's review of this project information.
- The presence of active and inactive gas lines in the Connecticut Avenue Bridge.
- The presence of active and inactive gas lines along or underneath the closed portion of Klingle Road.
- The effect road bed removal would have on gas lines.
- Washington Gas's need, if any, for an access road to the closed portion of the existing road, if necessary, the width and surface type.
- The types of vehicles/equipment needed, if any.

The information provided by your office will become part of the final Environmental Assessment. Also, all written information from your office may be incorporated into the appendix of the EA. If possible, we would like to receive this information in our office by November 3, 2000 in order to prepare for a public hearing on November 29, 2000 at DPW. If you have any questions or need more information please contact either Jess Commerford at 202 331-7775 ext. 459 or Melissa Bird at 202 331-7775 ext. 496. Mr. Ryan, thank you for your attention to this matter, we look forward to receiving your information on behalf of Washington Gas.

Sincerely,

The Louis Berger Group, Inc.

Jess Commerford, AICP
Director, Planning and Environmental Services

Enclosure as cited
CC: Maurice Keys, DCDPW
Larry D. Walker, The Louis Berger Group

THE Louis Berger Group, INC.
1819 H Street, NW, Suite 900, Washington, DC 20006 USA
Tel 202 331 7775 Fax 202 293 0787 Email answers@louisberger.com www.louisberger.com

October 17, 2000

Jim Slayton
Potomac Electric Power Company
Engineering Liaison
3400 Benning Road, NE
Bldg. 59, Room 200-B
Washington, D.C. 20019

Dear Mr. Slayton:

This is a follow-up to the letter sent to you on October 12th. The Louis Berger Group, Inc. (Berger) is a consultant to the District of Columbia Department of Public Works (DCDPW) conducting the Klingle Road Environmental Assessment (EA). Per your conversation with Melissa Bird (of Berger) in April 2000, we are now requesting your written confirmation of Potomac Electric Power Company's needs and concerns as they relate to this project and project alternatives. Attached to this letter is a detailed topography map with the project area identified.

Project Description

The District of Columbia Department of Public Works (DPW) is preparing an Environmental Assessment (EA) to assess the potential impacts associated with the alternative potential uses of the Klingle Road right of way, located in Northwest Washington, DC. As shown on the attached map, the EA is being prepared for the portion of Klingle Road that is currently closed to vehicular traffic between Porter Street, N.W. and Woodley Road, N.W. Although previous correspondence and discussions between the DPW, the National Park Service, and the public have primarily considered a non-vehicular use of the roadway, it is necessary to prepare an EA which examines various options if federal funds are to be used for any project alternative, including any recreational use. The EA is being prepared under requirements of the National Environmental Policy Act (NEPA) and the implementing regulations of the Council on Environmental Quality and the Federal Highway Administration.

The preliminary project alternatives include:

- The No Action Alternative
- No Build Alternative (differs from the No Action Alternative in that drainage problems will be addressed)
- Green Space Alternative (removal of asphalt on Klingle Road to allow the area to return to natural condition)
- Bike recreation/facility management (conversion of the closed portion of Klingle Road to a bike path with appropriate resurfacing)
- Rebuild Klingle Road to its original alignment and dimensions and repair/replace storm drainage

Information Request

We are aware that these alternatives may potentially impact PEPCO'S ability to provide service in the area or maintain infrastructure in the area. On behalf of DCDPW, Berger is requesting written verification of the following information from your office:

- PEPCO's review of this project information.
- The presence of existing (active) power lines on the closed portion of Klingle Road.
- The presence of existing (active) power lines in the Connecticut Avenue Bridge.
- The presence of conduits/power stations on the closed portion of Klingle Road.
- PEPCO's need for access, if any, to the closed portion of Klingle Road for service purposes.
- Number of times PEPCO needs to access this area for scheduled maintenance, if any.
- The types of vehicles/equipment needed, if any.

The information provided by your office will become part of the final Environmental Assessment. Also, all written information from your office may be incorporated into the appendix of the EA. If possible, we would like to receive this information in our office by November 3, 2000 in order to prepare for a public hearing on November 29, 2000 at DPW. If you have any questions or need more informati0on please contact either Jess Commerford at 202 331-7775 ext. 459 or Melissa Bird at 202 331-7775 ext. 496. Mr. Slayton, thank you for your attention to this matter, we look forward to receiving your information on behalf of PEPCO.

Sincerely,

The Louis Berger Group, Inc.

Jess Commerford, AICP
Director, Planning and Environmental Services

Enclosure as cited
CC: Maurice Keys, DCDPW
Larry D. Walker, The Louis Berger Group

THE Louis Berger Group, INC.
1819 H Street, NW Suite 900 Washington, DC 20006 USA
Tel 202 331 7775 Fax 202 293 0787 Email answers@louisberger.com www.louisberger.com

October 17, 2000

Michael Harrison
Washington Metropolitan Transit Authority
Office of Renovations
600 5th Street, N.W.
Washington D.C. 20001

Dear Mr. Harrison:

This is a follow-up to the letter sent to you on October 12th. The Louis Berger Group, Inc. (Berger) is a consultant to the District of Columbia Department of Public Works (DCDPW) conducting the Klingle Road Environmental Assessment (EA). Per your conversation with Melissa Bird (of Berger) in April 2000, we are now requesting *your written confirmation of* Washington Metropolitan Transit Authority's needs and concerns as they relate to this project and project alternatives. Attached to this letter is a detailed topography map with the project area identified.

Project Description

The District of Columbia Department of Public Works (DPW) is preparing an Environmental Assessment (EA) to assess the potential impacts associated with the alternative potential uses of the Klingle Road right of way, located in Northwest Washington, DC. As shown on the attached map, the EA is being prepared *for the* portion of Klingle Road that is currently closed to vehicular traffic between Porter Street, N.W. and Woodley Road, N.W. Although previous correspondence and discussions between the DPW, the National Park Service, *and the public have primarily* considered a non-vehicular use of the roadway, it is necessary to prepare an EA which examines various options if federal funds are to be used for any project alternative, including any recreational use. The EA is being prepared under requirements of the National Environmental Policy Act (NEPA) and the implementing regulations of the Council on Environmental Quality and the Federal Highway Administration.

The preliminary project alternatives include:

- The No Action Alternative
- No Build Alternative (differs from the No Action Alternative in that drainage problems will be addressed)
- Green Space Alternative (removal of asphalt on Klingle Road to allow the area to return to natural *condition)*
- Bike recreation/facility management (conversion of the closed portion of Klingle Road to a bike path with appropriate resurfacing)
- Rebuild Klingle Road to its original alignment and dimensions and repair/replace storm drainage

Information Request

We are aware that these alternatives may potentially impact relating to WMATA'S ability to provide METRO service in the area. On behalf of DCDPW, Louis Berger is *requesting written* verification of the following information from your office:

- WMATA's review of this project information.
- The presence of conduits/power stations in the Connecticut Avenue Bridge.
- WMATA's need for access to the closed portion of Klingle Road for service and maintenance purposes.
- Number of times *WMATA/METRO needs to access* the grounding station in the Connecticut Avenue Bridge abutment for scheduled maintenance.
- WMATA's needs, if any, for an access road to the closed portion of the existing road, if necessary, the width and surface type.
- The types of vehicles/equipment needed, if any.

The information provided by your office will become part of the final Environmental Assessment. Also, all *written information* from your office may be incorporated into the appendix of the EA. If possible, we would like to receive this information in our office by October 27, 2000 in order to prepare *for a public hearing on* November 29, 2000 at DPW. If you have any questions or need more information please contact either Jess Commerford at 202 331-7775 ext. 459 or Melissa Bird at 202 331-7775 ext. 496. Mr. Harrison, thank you for your attention to this *matter, we look forward* to receiving your information on behalf of WMATA.

Sincerely,

The Louis Berger Group, Inc.

Jess Commerford, AICP
Director, Planning and Environmental Services

Enclosure as cited
cc: Maurice Keys, DCDPW
Larry D. Walker, The Louis Berger Group, Inc.

Received via email Nov. 3, 2000

Mr. Jess Commerford, AICP
Director of Planning and Environmental Services
The Louis Berger Group, Inc.
Suite 900
1819 H Street, NW
Washington, DC 20006

Dear Mr. Commerford;

This is in response to your attached October 17, 2000, letter requesting information for the environmental assessment (EA) of the closed portion of Klingle Road in northwest Washington, DC. You plan to include the District of Columbia Water and Sewer Authority's (DC WASA) needs and concerns as they relate to this project and the five project alternatives in the environmental assessment. You also requested the presence of active water mains and sewers along the closed portion of Klingle Road.

WATER AND SEWER SYTEMS

DC WASA does not have any active water mains in the study area. The enclosed maps illustrate the sanitary and storm sewers along the closed portion of Klingle Road. The enclosed disks contain the entire sewer maps for the area.

Regarding the storm sewer system, the unimproved stream to the south and east of Klingle Road carries all of the storm water runoff from Klingle and Woodley Roads and the surrounding drainage area. This stream appears to be in National Park Service property and hence may be NPS responsibility for maintenance. There is a 4' 3" round storm drain in Klingle Road, which starts about 300 feet west of Connecticut Avenue and travels east to Porter Street. This storm drain does not carry any storm water from Klingle Road but carries drainage from Macomb Street and the surrounding area. This drain is the responsibility of DC WASA to maintain. At the east end of Klingle Road, east of Connecticut Avenue, one drainpipe that transverses under the road is undermined and collapsed in the stream. It will have to be repaired to prevent future erosion. It should be noted that several existing catch basins are not shown on these maps.

There is a sanitary sewer, which comes from Woodley Road and follows Klingle Road to Porter Street. DC WASA recently sliplined 1670 feet of this sanitary sewer because of maintenance problems. The sliplined sewer starts at Woodley Road and runs to the first manhole east of Connecticut Avenue, which is illustrated on the enclosed maps. The remaining sewer from this manhole to Porter Street will be evaluated for possible lining in the future.

Before summarizing DC WASA's needs and concerns, the following background information describes our involvement in the closing of Klingle Road.

BACKGROUND

In the 1980's, the District of Columbia initiated a federally funded project to reconstruct Klingle Road. DC WASA was not yet created as the responsible agency so that the DC Department of Public Works (DC DPW) developed storm drain and channel improvement plans to correct the drainage problems associated with the deteriorated road and stream. The City planned to construct the new storm drains and channel improvements under the road reconstruction contract. During the review process of the plans for the storm drain and channel improvements, the Nation Park Service expressed an interest to return the channel along Klingle Road to its natural state. Because of this requirement, DC DPW initiated survey work to design a new storm drain system that would convey all of the storm water from Woodley and Klingle Roads in a large storm drain within the road right-of-way. DC DPW did not complete the survey and the subsequent design when the city officially closed the road. Since then the erosion along the road has continued. Since DC WASA has subsequently been created, any storm drainpipe within the road right of way would have to be designed, constructed and maintained by DC WASA.

PROJECT ALTERNATIVES

1) Under the no action alternative, and the other four alternatives, DC WASA will need access to the sanitary and storm sewers for emergency and routine maintenance work. This alternative would not allow DC WASA to construct a storm drainpipe to address the issue of storm drain system deterioration.

2) The "No Build Alternative", will only address the drainage problems. Based on prior studies by DC DPW it would appear that a full storm drain system within the paved road is the best overall solution for this alternative. However, additional engineering and cost studies would be required to verify prior engineering before proceeding with design and construction of this pipe system. Some restoration work will also be required along the road and channel to correct erosion; however, coordination with DPW would be needed to establish responsibilities.

3) The Green Space Alternative includes the removal of asphalt to allow the area to return to natural conditions. If this alternative also includes the removal of the concrete base under the asphalt, then additional fill may be necessary to provide sufficient cover over the existing storm drains, sanitary sewer and other utilities (gas main). This additional fill will also provide adequate surface drainage in low areas. DC WASA requires a minimum of 4 ½ feet of cover over the sanitary and storm sewers. Some stretches of Klingle Road are very steep. Once the

asphalt is removed, these steep slopes will have to be protected to prevent excessive erosion, which could expose and possibly damage the existing utilities and limit future access of vehicles for maintenance of the utilities. The type of surface within the road easement should be strong and durable enough to support the utility maintenance trucks and heavy equipment without causing ruts during wet weather. No trees should be planted in the road right-of-way. Shrubs should not be planted any closer than 5 feet from the centerline of the sewers and structures.

4) Traditional Bike recreation trails generally do not provide adequate access for sewer maintenance vehicles and heavy equipment. The bike trail should be engineered such that there is sufficient width and strength for use by mid-size dump trucks pulling trailers with backhoes. The area should also be graded so that no surface structures like manhole covers are above grade, which could be hazardous for cyclists. Some storm drains will be required at low areas along the trail.

5) Under this alternative to rebuild Klingle Road to its original alignment and dimensions and repair/replace storm drainage, all infrastructure should be built to current standards and codes. Based on prior DC DPW studies, it would appear that the construction of a new storm drain in the paved road from Woodley Road to Porter Street is the optimum solution. The channel along Klingle Road should be restored to natural conditions as required by the National Park Service.

GENERAL REQUIREMENTS FOR ALL ALTERNATIVES

The full width of the road easement will be needed to provide adequate service to existing and possibly future pipelines. If excavation work were required for maintenance purposes, DCWASA would transport backhoes, 5-yard dump trucks, possibly flat bed trucks and backhoe trailers along the right-of-way to work sites. If excavation work is required on the 4' 3" storm sewer, a large tracked backhoe may be necessary. This machine and a regular backhoe will require a wide space for pivoting between the excavation and trucks hauling spoils and backfill material. DC WASA maintenance staff will also drive sewer cleaning vehicles to work sites for emergencies and routine cleaning work. This equipment consists of jet/vacuum trucks, high-pressure water jet trucks, dump trucks pulling sewer cable cleaning machines, the catch basin cleaning dump truck and the sewer televising van.

DC WASA would like to be involved in the review and approval process for all design and construction plans that may affect our sanitary and storm sewers. If you need our staff to discuss our facilities and maintenance procedures, please contact Mr. Cuthbert Braveboy at (202) 264-3828. For any other information please call my office at (202) 787-2379 or send e-mail to jshabels@dcwasa.com.

Sincerely;

James J. Shabelski, PE
Water and Sewer Design Branch

Washington Gas
6801 Industrial Rd
Springfield, VA 22151
November 6, 2000

The Louis Berger Group, Inc.
1819 H St., NW
Suite 900
Washington, DC 20006

FAX Copy
w/o Attachment B.

Attn: Jess Commerford, AICP
Director, Planning and Environmental Services

Dear Mr. Jess Commerford,

Washington Gas (WG) would prefer any of the alternatives that would produce the least disturbance to our piping that runs along this abandoned portion of Klingle Rd. This pipeline is an integral portion of our distribution piping network which supplies natural gas to our customers in Washington DC. If construction is planned that would take place near or across our pipeline then we would require that the rovisions of Attachment A, enclosed with this letter, be met. WG ll also need to review all construction prints for this area that ow plans for any changes in grade or in the location and depth of any proposed utilities that will cross or run parallel to WG pipelines at a distance of less than 5 ft. These drawings should be sent to the Attention of Mr. Allan Melliza, DC Section Leader for Replacement Design at the above address. These proposed construction drawings should be sent at least four months prior to the proposed start of any construction

WG does not have any active natural gas pipelines suspended from the Connecticut Ave bridge that passes over Klingle Rd. Our records indicate that we do have an abandoned 12" steel pipeline hangs from the bottom of the bridge and is located between two of the bridges longitudinal girders.

WG does have a 12" wrapped steel pipeline that operates at 20 psig that passes below the bridge. This 12" pipeline runs from the intersection of Klingle Rd and Cortland Pl NW, alongside and beneath Klingle Rd as shown on the enclosed drawing plot, Attachment B. Just east of the Connecticut Ave. bridge there is a piping tee. From this tee one of our gas pipes, an 8" wrapped steel pipe, continues to run ast beneath and alongside Klingle Rd to the intersection with Porter NW. The other connection of this tee travels northwest up the side the ravine in a parallel direction with Connecticut Ave, NW. Refer to the enclosed drawing plot, Attachment B of this area. This drawing plot shows the approximate location of our natural gas pipeline; however, Washington Gas makes no warranty as to the accuracy of this

Response to Louis Berger Group 11/6/2000

drawing plot. In accordance with Attachment A, "Miss Utility" must be called to obtain the location of these gas pipelines and spot holes must be dug to determine their exact location and their actual depth below ground.

WG has plans to perform two construction projects that are planned to take place near or along Klingle Rd during either the year 2001 or 2002. The first involves replacement of the 8" cast iron pipeline that runs northwest up the side of the ravine from Klingle Rd to where the north side of the Connecticut Ave bridge is located. This cast iron piping replacement along with piping to be replaced alongside Connecticut Ave is highlighted in orange on the enclosed drawing plot labeled Washington Gas, Attachment B. The second construction project involves the replacement of approximately 400 ft of 8" steel piping that runs alongside Klingle Rd just west of the intersection with Porter St. NW. This steel piping replacement is highlighted in blue on the attached drawing plot.

WG performs leak surveys every 3 years on our Distribution mains, such as this pipeline along Klingle Rd. This inspection could be accomplished by walking along the route of the pipeline. If leak repairs are needed, then WG will need a 12 ft wide surface over which we could get a backhoe tractor to travel to reach any portion of our pipeline.

If you have plans to make a field inspection of Klingle Rd along this abandoned section, I would be interested in joining you.

Sincerely,

Douglas W. Ryan

Douglas W. Ryan,
Spec., Construction Design & Planning

Xc: A. Melliza
C:\replacement\WashDC\Klingle rd 11-2000

ATTACHMENT A 11/6/2000

Response to Louis Berger Group regarding proposed Klingle Rd Construction near Washington Gas Distribution Pipeline

1. Notify "Miss Utility" 48 hours prior to construction for gas facility location. Call 1-800-257-7777 for location scheduling.

2. Notify Damage Protection of Washington Gas on (703)750-4205, at least five (5) working days prior to any construction, subsequent maintenance, or repair.

3. Blasting within 100' of Washington Gas facilities shall be conditionally allowed pending approval of a Blasting Plan. Blasting on a Washington Gas right of way shall not be permitted without the prior written approval of the Washington Gas Damage Protection Office. Approval request should be forwarded by mail or fax 30 days in advance of blasting to:

   Washington Gas
   Damage Protection - Room 169B
   6801 Industrial Road
   Springfield, Virginia 22151
   (703) 750-5125 or by fax (703) 750-7584

4. Prior to physically locating the gas pipeline by digging spot holes, no mechanized ditching or excavation shall be allowed within ten (10) feet of the extremities of the pipeline(s), as were marked by Miss Utility. These spot holes must be dug at each bend of the natural gas pipeline and at 75 ft intervals for straight sections of piping. Once spot holes have been dug and the WG pipeline has been located, machine tools may be used as close as 18 inchs from the WG pipeline. No excavation is permitted over any Washington Gas pipeline or within its easement without a Company representative being present. Subgrading, grading, and the placement of fill over Washington Gas pipeline(s) will require the written approval of Washington Gas as to method and extent.

5. Full access must be maintained to, from and along the pipeline(s) at all times. Stockpiling of fill, including spoil, or topsoil over the pipeline(s) is not permitted, unless approved by Washington Gas in writing.

6. Any erosion control measures required for your development including temporary diversion dikes, sediment traps, silt fences, gravel outlets, and emergency spillways that may

ATTACHMENT A 11/6/2000

Response to Louis Berger Group regarding proposed Klingle Rd Construction near Washington Gas Distribution Pipeline

influence or contribute to the degradation of Washington Gas right of way will require the approval of Washington Gas' field representative as to equipment and method. Under no circumstances shall water be impounded on the pipeline(s) right of way.

7. Temporary equipment crossings over the pipeline(s) are permitted with four (4) vertical feet of cover over the pipeline(s) or Washington Gas approved plating material of sufficient size at selected locations as approved by Washington Gas' field representative. Depth of pipe as determined by test holes will determine amount of temporary fill required. No equipment or vehicles may be parked over the pipeline(s).

8. Washington Gas steel pipelines such as the pipeline along Klingle Rd have cathodic protections system which protect steel pipelines from corrosion. Washington Gas must be contacted prior to actual construction so that these cathodic facilities can be identified and efforts taken to prevent damage to them.

9. Relocation or removal of Washington Gas pipeline markers shall not be permitted without the approval of a Washington Gas representative. In addition no pipeline marker shall be obscured from public view.

10. Test spot holes must be dug at all crossings of gas facilities and must include a Washington Gas visual inspection of facilities involved.

11. A minimum of one foot (1) vertical clearance and five (5) feet horizontal clearance must be maintained between other buried utilities that cross or run parallel to WG gas pipelines of twelve inch (12") or <u>less</u> diameter.

12. All proposed roadways and parking areas shall maintain a minimum of four (4) feet from top of pipe to top of finished road surface and three (3) feet minimum vertical cover in open drainage or road ditches. Washington Gas' Corporate Engineering Department may increase these minimum requirements as determined by analysis of the pipe, and other variable conditions and factors. If these determined clearances cannot be maintained, then Washington Gas must be notified so that an alternative means can be taken to properly protect our gas pipeline, such as protective slabs.

ATTACHMENT A 11/6/2000

Response to Louis Berger Group regarding proposed Klingle Rd Construction near Washington Gas Distribution Pipeline

13. Cover above the WG pipeline(s) that are NOT located below roads or other paved areas shall be a minimum of three (3) feet and shall be a maximum of six (6) feet, unless approved by WG.

14. Washington Gas reserves the right to excavate and perform maintenance as needed for our pipeline.

United States Department of the Interior

NATIONAL PARK SERVICE
National Capital Region
Rock Creek Park
3545 Williamsburg Lane, N.W.
Washington, D.C. 20008-1207

IN REPLY REFER TO

D30(NCR-ROCR)
AUG 13 2001

Mr. Kenneth G. Laden, Administrator
D.C. Department of Public Works
2000 14th Street, NW.
Washington, D.C. 20009

Dear Mr. Laden:

We are writing to reaffirm our 1996 position on the Klingle Road project.

We believe that the environment, and thus, the public, would be best served by the permanent closure and removal of the asphalt road, repair or replacement of the inadequate drainage systems, restoration of the natural valley, and construction of a pedestrian, permeable surface trail on the alignment of the old road. With the road removed and all of the improvements described above completed, we would be willing to accept transfer of the right-of-way now under the jurisdiction of the District of Columbia, providing that the appropriate agencies maintain the storm water, sanitary sewer and other utilities in the valley.

We are aware that the public debate over the Klingle Road project has largely centered on transportation and traffic issues. However, the traffic study conducted by the Berger Group concluded that "the opening of Klingle Road under any of the build scenarios would result in only minor improvements to traffic operations due to the fact that the road size [a minor arterial roadway for vehicular traffic on the District of Columbia's Functional Classification Map] is incapable of relieving traffic or the current Level of Service (LOS) at surrounding intersections."

The failure of the Klingle Valley drainage system has resulted in severe deterioration of the roadway and its underlying storm water system and has caused a chronic degradation of the soils and vegetation along the stream. The interim report on the progress of the Klingle Road Environmental Study, prepared by the Berger Group and issued in November 2000 by your office, confirmed that existing conditions in Klingle Creek, a tributary of Rock Creek, are not representative of a healthy urban stream.

The suggestion that Klingle Road could be built with adequate storm water management facilities to protect the valley is not supported by any studies to date. We do not believe that studies could be developed to support that conclusion.

We firmly believe that the construction of the necessary storm water management and sewage systems which would be required by the reconstruction of Klingle Road will exceed the land within the road right-of-way. Use of park land for road or storm water purposes, either in the form of direct or indirect use would be environmentally destructive, and therefore, cannot be permitted by the National Park Service.

We look forward to continuing to work with your office on this important issue.

Sincerely,

Adrienne A. Coleman
Superintendent, Rock Creek Park

Appendix B: Methodology

GOVERNMENT OF THE DISTRICT OF COLUMBIA
DEPARTMENT OF HEALTH
ENVIRONMENTAL HEALTH ADMINISTRATION
WATERSHED PROTECTION DIVISION

FAX COVER SHEET

DATE: 10/8/00 11/8/00

TIME SENT: 1:30

NUMBER OF PAGES: 3 (INCLUDING COVER PAGE)

TO: RAED EL-FARHAN

OFFICE: LOUIS BERGER

ADDRESS:

FAX #: (202) 293 0187

OFFICE #: ( ) 331 7775

FROM: SUZY WARD

OFFICE ADDRESS: 51 N STREET, N.E., 5TH FLOOR
WASHINGTON, D.C. 20002

FAX #: (202) 535 - 1364
OFFICE #: (202) 535 - 2240

COMMENTS: EXCERPT FROM OCT 2000 305 (b) - Klingle Valley W.Q.

Overall Use Support Status Report

Waterbody ID : DCTKV01R
Waterbody Name: KLINGLE VALLEY
Waterbody Type: River
Basin: POTOMAC

Segment Number: 00

Size: 0.80 Miles

---------- Description of the Waterbody ----------

KLINGLE VALLEY TRIBUTARY FLOWS THROUGH A RESIDENTIAL AREA AND DISCHARGES INTO ROCK CREEK FROM THE WEST NEAR THE PORTER STREET BRIDGE. THE STREAM'S REACH PARALLELS THE SOUTH SIDE OF KLINGLE ROAD. A WOODED BUFFER OF A FEW HUNDRED FEET COVERS ONE SIDE OF THE STREAM WITH THE REST OF THE 320 ACRE WATERSHED RESIDENTIAL URBAN AREA. NINE (9) OUTFALLS INCLUDING ONE CSO LINE THE STREAM.

THE ABOVE DESCRIPTION WAS TAKEN FROM 'BIOLOGICAL WATER QUALITY OF THE SURFACE STREAMS OF THE DISTRICT OF COLUMBIA,' W.C. BANTA, THE AMERICAN UNIVERSITY, 1993.

Assessment Date: 0004

---------- Use Support ----------

Designated Use	Fully Supp	Threat	Partial Supp	Not Supported	Not Attained	Not Assessed
OVERALL USE SUPPORT	0.00	0.00	0.00	0.80	0.00	0.00
AQUATIC LIFE SUPPORT	0.00	0.00	0.80	0.00	0.00	0.00
SWIMMABLE	0.00	0.00	0.00	0.00	0.00	0.80
SECONDARY CONTACT REC	0.00	0.00	0.00	0.00	0.00	0.80
FISH CONSUMPTION	0.00	0.00	0.00	0.80	0.00	0.00
NAVIGATION	0.80	0.00	0.00	0.00	0.00	0.00

---------- Nonattainment Causes ----------

Cause	Size	Mag
0100-UNKNOWN TOXICITY	0.80	S
1200-ORGANIC ENRICHMENT/LOW DO	0.80	H
2400-TOTAL TOXICS	0.80	M

---------- Nonattainment Sources ----------

Source	Size	Mag
0400-COMBINED SEWER OVERFLOW	0.80	H
4000-URBAN RUNOFF/STORM SEWERS	0.80	H

---------- Comments on the Assessment ----------

THE EVALUATION OF KLINGLE CREEK'S AQUATIC LIFE SUPPORT USE IS BASED ON LEVEL II RAPID BIOASSESSMENT PROTOCOLS PERFORMED BY WQMB IN 1998. KLINGLE CREEK WAS FOUND TO BE 'PARTIALLY SUPPORTING' OF THIS DESIGNATED USE. IT RECEIVED A 24% OF REFERENCE ON ITS BIOASSESSMENT SCORE AND 66% OF REFERENCE

ON ITS HABITAT ASSESSMENT SCORE. PH, D.O. AND TEMPERATURE WERE IN FULL COMPLIANCE.

THE SWIMMABLE USE STANDARD OF 200 MPN/100ML WAS VIOLATED 66.7% OF THE TIME. THE SWIMMABLE USE WAS NOT SUPPORTED. THE SECONDARY CONTACT RECREATION USE STANDARD OF 1000 MPN/100ML WAS VIOLATED 33.3% OF THE TIME. THE USE WAS NOT SUPPORTED.

DETERMINATION OF THE FISH CONSUMPTION USE WAS BASED ON A PUBLIC HEALTH ADVISORY ISSUED ON NOVEMBER 15, 1994 BY THE D.C. COMMISSIONER OF PUBLIC HEALTH. THE ADVISORY URGES NON-CONSUMPTION OF CATFISH, CARP OR EEL AND LIMITED CONSUMPTION OF OTHER FISH CAUGHT IN ALL DISTRICT OF COLUMBIA WATERS. THIS WATERBODY DID NOT SUPPORT FISH CONSUMPTION CRITERIA.

Vegetation Survey Methodology

Characterization of vegetation was conducted as part of the Environmental Assessment (EA) to determine the potential affects associated with the implementation of alternatives being considered for use of the Klingle Road right-of-way. The survey provides the baseline data necessary to assess potential impacts to vegetation and vegetative communities associated with implementation of each of the alternatives. The characterization and inventory of vegetative resources includes a comprehensive survey of understory vegetation based on random sampling throughout the maximum potential extent of the project area, a general characterization of dominant tree species occurring within the project area, and the identification and location of all trees with diameters at breast height (dbh) of greater than 24 inches. The following describes the methodology used to characterize vegetation in the project area for use in assessing the effects of implementing each of five alternative uses considered in the EA.

Study Area Determination

The assessment area was determined by evaluating the construction and land use requirements for each of the five alternatives consider in the EA. Three of the alternatives considered could potentially directly effect existing vegetation on the site resulting from widening or modifying the existing roads footprint. The maximum potential construction widths, or areas of impact, associated with implementation of these alternatives are identified as follows:

- **28 feet**—Rebuild the road for vehicular use only ((2 x 12 ft. lanes) + (2 x 2 ft. shoulder))
- **40 feet**—Rebuild road for vehicular use plus Pedestrian/Bikeway use assuming a bike/pedestrian path on each side of the road ((2 x 12 ft. lanes) + (2 x 2 ft shoulder) + (2 x 6 ft. path)) (This alternative was considered, but not carried forward in the Environmental Assessment.)
- **6 feet** – Build a bike path, no vehicular use

Using the above projections, the greatest potential area of impact was determined to equal 44 feet (width) by 2,588 feet (length). The area of study was extended to 50 feet, or 25 feet to either side of the centerline of the existing road. The study area was divided into quadrants that were identified by dividing the road into four equal sections of 647 feet by 50 feet, for comparison and data management purposes. Each quadrant was subdivided by the centerline of the road to create 8 total quadrants equaling 647 feet in length and 25 feet in width. Quadrants to the north of the centerline were labeled A, and to the south B.

Understory Vegetative Survey

Characterization of understory vegetation was based on random sampling using meter-square plots located in each of the established quadrants (discussed above). Twenty sampling locations were randomly located in each of the 647 foot by 25 foot quadrants. Plot locations were randomly generated using the Excel Sampling tool to create a sample from a population by treating the input range as a population. Distance down the centerline of the road from the beginning of the quadrant and the distance north or south of the centerline made up the two input ranges. From each of these ranges, Excel selected a random number that combined to determine sampling points. Overall, 160 sampling points were located over the study area. The sampling points were located on the project site. Each sampling point located the center of a meter square plot. Sampling points located in the existing road, in areas where no vegetation occurred, were moved to the edge of the road and the adjustment was recorded. Sampling points located within fenced in private property were also adjusted so that the point would fall outside the private property line.

Sampling plot characterization included the identification and percent coverage of all herbaceous and woody vegetation occurring within the meter square. The strata of the vegetation, whether the species was invasive or indigenous, and the dbh of any trees occurring partially or completely in the plot were also recorded. The presence or absence of exotic invasive plant species in the plots was used as an indicator of the overall quality of habitat.

Plant species diversity, the presence of sensitive or rare plants and the occurrence and potential impacts of exotic invasive plant species in the plots were noted to determine overall community health and to determine potential affects of proposed alternatives.

Tree Survey

Quadrants established for the understory characterization were also used in the tree survey. Dominant tree species located within the potential areas of impact were identified and recorded. All trees with a dbh of 24 inches or greater occurring within the potential areas of impact were identified, measured, and mapped. Each tree was given an identification number associated with its location. Large diameter trees occurring adjacent to the area of potential disturbance and having the potential to be affected by the alternative uses were also recorded. In addition, trees with a dbh of slightly less than 24 inches were noted to better exemplify forest characteristics within the survey area.

Assessment of Data Collected in the Understory Vegetation and the Tree Surveys

Plant species diversity, the presence of sensitive or rare plants and the occurrence and potential impacts of exotic invasive plant species and their effect on native plant species diversity and overall habitat quality will be used to assess the potential adverse effects of implementing the proposed alternatives. Tree species diversity and the presence of large diameter trees, along with the potential for adverse impacts associated with the proposed alternatives will be used to further characterize impacts and mitigation requirements.

METHODOLOGY FOR GEOCODING AND DELINEATION OF STUDY BOUNDARY FOR SOCIAL AND ECONOMIC ISSUES

A. METHODOLOGY

According to the Federal Highway Administration, Office of Environment and Planning, a community impact analysis should identify a geographic region that incorporates the communities expected to be affected by the project based on scoping, public involvement and interagency coordination. In an effort to identify affected communities, a study boundary was identified by geocoding addresses from the original Klingle Road Community Mailing List and then performing a visual analysis of the mapped addresses. The original Klingle Road Community Mailing List consisted of community groups, ANCs, advocacy groups, and other individuals that showed interested in the project from the March 15, 2000 public informational open house. The following five steps were performed to complete the geocoding process and the determination of the study boundary for addressing social and economic issues.

Step One: Clean and Update Klingle Road Mailing List

The Klingle Road Community Mailing List consists of 399 addresses obtained in preparation of the public meeting held on March 15, 2000, as well as, addresses obtained during the meeting and by letters or comment cards that were received by concerned citizens during and after the meeting. The first phase of cleaning the mailing list was to save the Microsoft Access file as a new regular database file. Once this was completed all unnecessary addresses with respect to the social and economic study were deleted. The majority of addresses deleted were for local and federal agency coordination. For instance, Andrew Altman from the District's Office of Planning and U.S. Fish and Wildlife addresses were deleted. After the completion of the above task the Klingle Road Community Mailing had a total of 344 addresses. These addresses included District citizens, heads of Area Neighborhood Commissions and so forth. The last phase of this stage was to correct spelling mistakes in road names and to verify correct abbreviation for street types.

Step Two: Geocoding Klingle Road Mailing Addresses

The process of geocoding is an application of Geographical Information Systems (GIS) that identifies the coordinates of a location using an address table and a reference theme. The address table utilized was the cleaned and updated Klingle Road Mailing List (344 addresses). The reference theme utilized was a street theme with attributes that specify street names, street types, range of addresses that occur along each street, and city quadrants for the District of Columbia. The District of Columbia street theme was a TIGER line file that was downloaded from the U.S. Census web page. The geocoding process was completed using the GIS software package ArcView 3.2 developed by the Environmental Systems Research Institute, Inc. (ESRI).

Step Three: Review Geocoding Results

Of the 344 mailing list addresses, 343 addresses were geocoded (99.7 %) in the initial geocoding batch match. The remaining address could not be geocoded because the address was a P.O. Box and not a mailing address. Due to the success of the initial geocoding, no re-batch matching was necessary. In all, 343 addresses were geocoded and will be used to assist in defining the socioeconomic study boundary (Refer to Figure 1-2).

Step Four: Determine What Geographic Entity to Use for Data Collection

Before performing any visual analysis of the geocoded addresses it was necessary to choose a type of geographical (statistical) boundary system that will direct data collection and help distinguish the study boundary. To determine an appropriate boundary system for data collection, two characteristics were investigated, boundary size and quantity of data. For the District of Columbia there are four types of statistical boundaries (from largest to smallest); Wards, Advisory Neighborhood Commissions (ANCs), U.S. Census tracts, and U.S. Census block groups. There are 37 ANCs in the District of Columbia's 8 Wards. An ANC consists of elected representatives from neighborhood communities and advises the City government on issues relating to zoning, social service programs, health, police protection, sanitation, and recreation. Neither ANCs nor Wards were chosen due to lack of data for ANCs and the large boundary sizes of Wards.

After investigating and searching for both U.S. Census tract and block group data it was determined that demographic and economic data is more readily available in the tract format. With this conclusion, it was determined that data collection for the study area would be based on the U.S. Census tract geographical (statistical) boundary system. In general, tracts are small statistical subdivisions of a county or city. Tracts normally have 2,500 to 8,000 persons and are designed to be homogeneous with respect to population characteristics, economic status, and living conditions. The spatial size of tracts varies widely depending on the density of settlement. All tract statistical data was collected from the U.S. Census Bureau and the District of Columbia's State Data Center. All tract data is based on the 1990 U.S. Census, however Claritas performed projection analysis for years 1997 and 1998.

Step Five: Visual Analysis and Boundary Determination

After geocoding mailing addresses and obtaining a geographic boundary system, the next step was to overlay the tract boundaries with the geocoded address points. The purpose of this exercise was to located address point clusters that could be used to help define the socioeconomic study boundary. The results of this exercise displayed a cluster of addresses (236, 68.6% of the geocoded addresses) that were identified in Cleveland Park, Woodley Park, and Mount Pleasant communities. The remaining addresses (108, 31.4% of the geocoded addresses) were scattered throughout the District of Columbia, however the majority are located in the designated northwest section of the city. In order to limit the socioeconomic study area, tracts that were associated with the location of the 236 clustered addresses were selected and utilized to define the study boundary for social and economic issues (Figure 1-1). Therefore, 8 tracts were selected for the extent of the study area. This included tract numbers 0004.00, 0006.00, 0005.01, 0005.02, 0013.02, 0027.01, 0027.02, and 0039.00 (Figure 1-4).

Upon the completion of determining the extent of the study boundary data was collected for the tracts located in the study boundary and for the District of Columbia as a whole. The data collected will be used to examine the socioeconomic impacts related to the proposed project options. Demographic and Economic data was obtained from the U.S. Census, the District of Columbia State Data Center, the District of Columbia, and the Washington Metropolitan Council of Governments. Data has been collected for the following attributes:

1. Population for 1990, 1997, and 1998.
2. Ethnicity and Race 1998
3. Age 1998
4. Percent of Population Below Poverty 1990
5. Median House Value 1990
6. Median Household Income 1998
7. Education Attainment for Persons Over 25 Years of Age

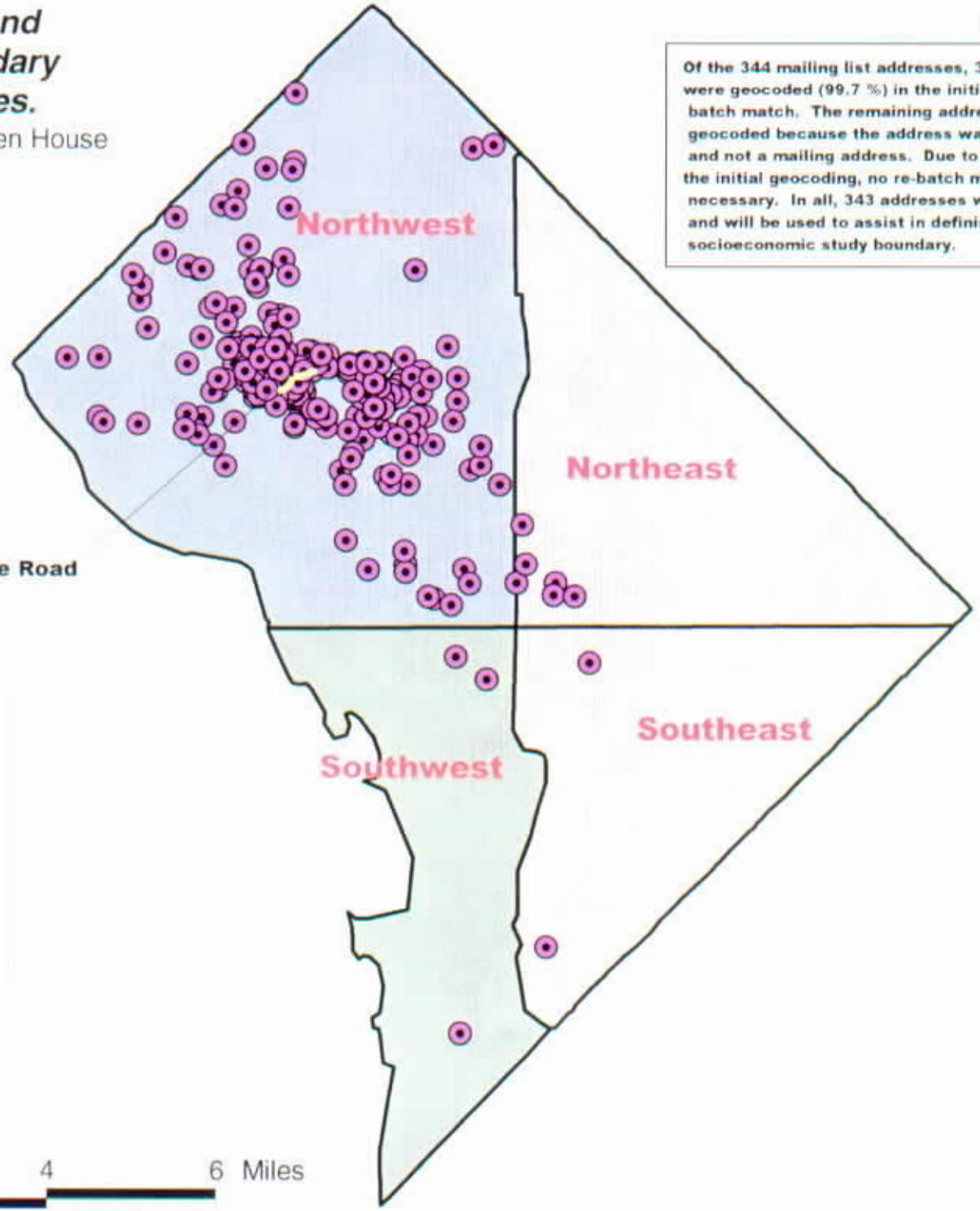
In an effort to verify the study boundary, the above geocoding steps were performed again upon completion of the second public meeting held on November 30, 2000. Of the 209 names and addresses that were collected at the November meeting, 191 (91.4 percent) were geocoded (mapped) (Figure 3). Addresses that were not geocoded included: 11 addresses outside the District of Columbia, 3 addresses that could not be found, and 2 addresses with P.O. Box addresses. This geocoding did not take into consideration petition signatures, because many had incomplete addresses or no addresses at all. The results of the geocoding verified the placement of the established study boundary for evaluating the socio-economic impacts.

Methodology for Geocoding and Determination of Study Boundary for Social and Economic Issues.

Geocoding from the March 15, 2000 Open House

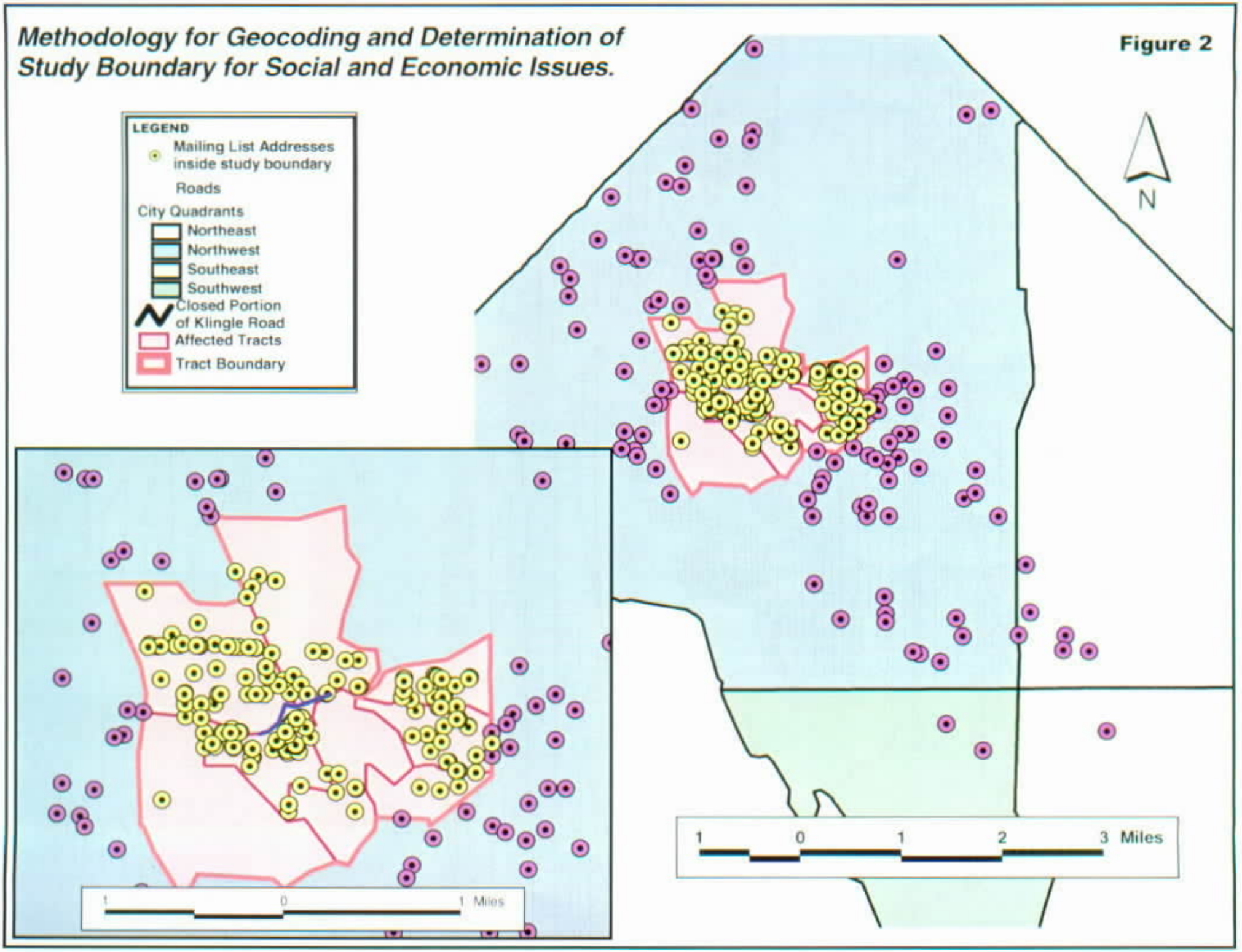
Figure 1

Of the 344 mailing list addresses, 343 addresses were geocoded (99.7 %) in the initial geocoding batch match. The remaining address could not be geocoded because the address was a P.O. Box and not a mailing address. Due to the success of the initial geocoding, no re-batch matching was necessary. In all, 343 addresses were geocoded and will be used to assist in defining the socioeconomic study boundary.



Methodology for Geocoding and Determination of Study Boundary for Social and Economic Issues.

Figure 2

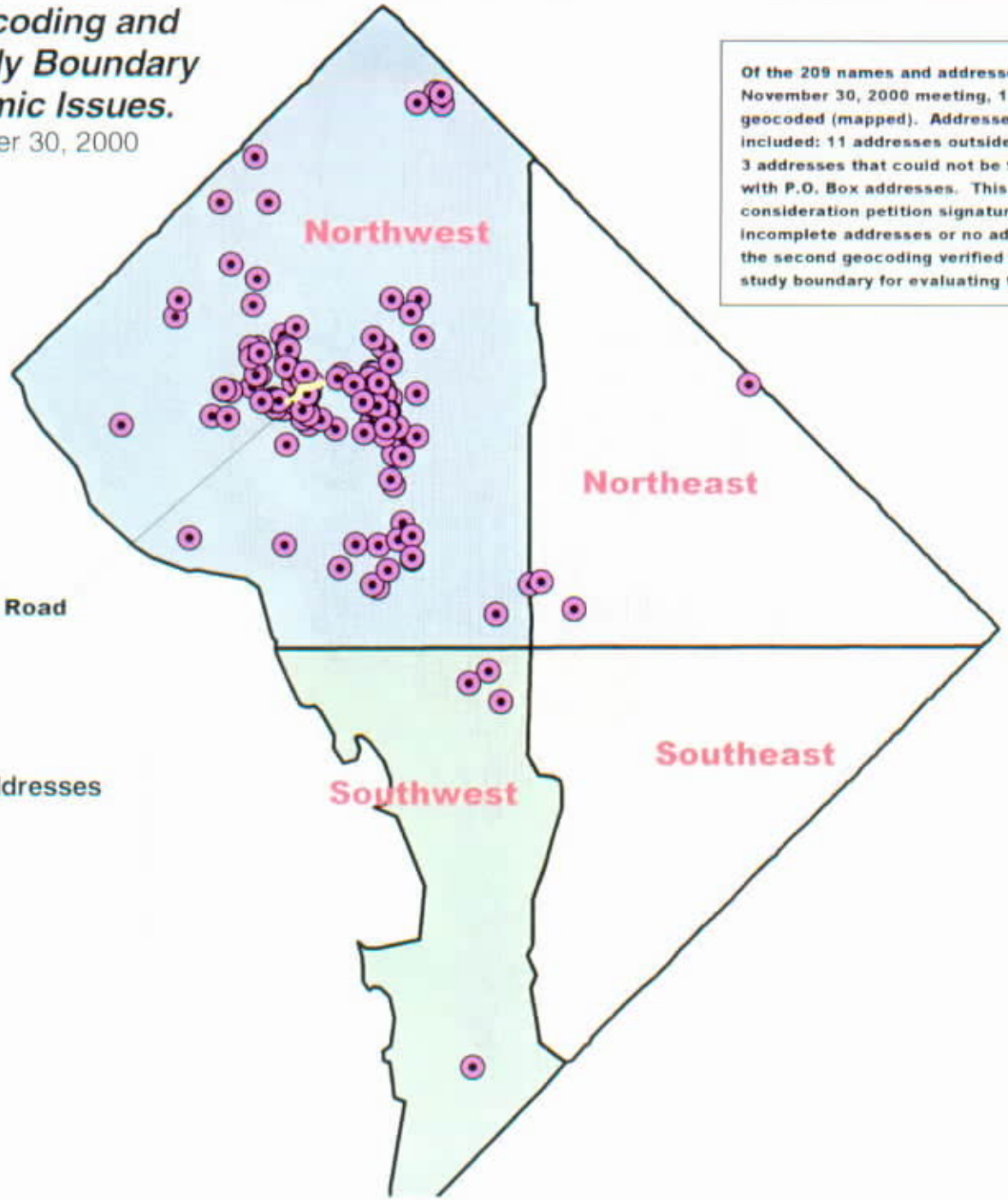


Methodology for Geocoding and Determination of Study Boundary for Social and Economic Issues.

Geocoding from the November 30, 2000 Public Hearing

Figure 3

Of the 209 names and addresses that were collected at the November 30, 2000 meeting, 191(91.4 percent) were geocoded (mapped). Addresses that were not geocoded included: 11 addresses outside the District of Columbia, 3 addresses that could not be found, and 2 addresses with P.O. Box addresses. This geocoding did not take into consideration petition signatures, because many had incomplete addresses or no addresses at all. The results of the second geocoding verified the placement of the established study boundary for evaluating the socio-economic impacts.



Closed Section of Klingle Road

LEGEND

- Mailing List Addresses
- Roads

City Quadrants

- Northeast
- Northwest
- Southeast
- Southwest

2 0 2 4 6 Miles

N

Appendix C: Technical Information

MEMORANDUM

APR 2 1986

Design Standards for Highways
in National Flood Insurance
Program Mapped Floodplains

Associate Administrator for Engineering and Program Development — HNG-31

Regional Federal Highway Administrators Regions 1-10

The FHWA recognizes the National Flood Insurance Program (NFIP) standard that provides for up to a 1-foot increase in flood stages when (1) designating a floodway or (2) evaluating an encroachment where no floodway is designated. This standard is established as the Federal standard under Executive Order 11988, Floodplain Management, and is to be used in designing highways in NFIP mapped floodplains.

The FHWA floodplain regulations were issued in November 1979 (23 CFR 650, subpart A). These regulations established standards for the cost-effective design of highways in floodplains and for consistency with the NFIP. Guidance for complying with the NFIP part of the regulations was provided to the field by Mr R. D. Morgan's memorandum of June 25, 1982, and was titled "Procedures for Coordinating Highway Encroachments on Floodplains with the Federal Emergency Management Agency (FEMA)".

The coordination procedures established that NFIP standards are to be used in designing a highway in a NFIP mapped floodplain. Highways can normally be designed to be consistent with the NFIP standards because the standards provide for a 1-foot rise in the water surface elevation of the 100-year flood. This increase is included in most State and local floodplain regulations. Development, including highways, is permitted that does not cause backwater in excess of this increase.

The courts have generally ruled that the 1-foot rise of water onto affected property is not a taking and therefore does not require compensation. In addition, the property owner is eligible for damage protection under the NFIP. The property owner is further protected from loss in that the flood insurance rates will not be increased for a rise of 1-foot or less.

Some States have elected to adopt more restrictive standards than the NFIP standards. By more restrictive, it is meant that less than 1-foot of increase is permitted. In a few States, no increase is permitted at all. Permitting little or no increase has the effect of limiting floodplain development. Limiting development in this way is a State/local option under the FEMA regulations. The FEMA encourages restrictive standards because the liability of the NFIP is reduced.

However, there may be a cost to others. Application of these more restrictive standards can also result in larger, more costly highway structures and/or right-of-way costs than would have been required under the NFIP standards. These increased costs to meet standards more restrictive than NFIP standards are the responsibility of the State.

Therefore, Federal-aid highway funds should not be used either (1) for payments to property owners or (2) for more costly highway facilities if, in either case, the costs are incurred to meet State standards that require less than a 1-foot rise in water surface elevation for the 100-year flood. Exceptions for designs that limit the water surface to less than a foot may be granted on a case by case basis where the cost effectiveness of such designs can be demonstrated by an economic analysis.

If it is cost effective to exceed the 1-foot increase, FHWA will participate in right-of-way costs for insurable buildings in order to limit flood damage increased for which the State or NFIP might be responsible. Attached are options which should be considered if the 1-foot increase is to be exceeded.

/S/

Rex C. Leathers

Attachment

Procedures for Coordinating Highway Encroachments on Floodplains with Federal Emergency Management Agency (FEMA)

local community with land use juriadiction, whether it is a city, county, state, has the responsibility for enforcing National Flood Insurance program (NFIP) regulations in that community if the community is participating in the NFIP. Most NFIP communities have established a permit requirement for all development within the base (100 year) floodplain. Consistency with NFIP standards is a requirement for Federal-aid highway actions involving regulatory floodways. The community, by necessity, is the one who must submit proposals to FEMA for amendments to NFIP ordinances and maps in that community should it be necessary. Determination of the status of a community's participation in the NFIP and review of applicable NFIP maps and ordinances are, therefore, essential first steps in conducting location hydraulic studies and preparing environmental documents.

Where NFIP maps are available, their use is mandatory in determining whether a highway location alternative will include an encroachment on the base floodplain. Three types of NFIP maps are published: (1) a Flood Hazard Boundary Map (FHBM), (2) a Flood Boundary and Floodway Map (FBFM), and a Flood Insurance Rate Map (FIRM). A FHBM is generally not based on a detailed hydraulic study and, therefore, the floodplain boundaries shown are approximate. A FBFM, on the other hand, is generally derived from a detailed hydraulic study and should provide reasonably accurate information. The hydraulic data from which the FBFM was derived is available through the regional office FEMA. This is normally in the form of computer input data cards for calculating water surface profiles. The FIRM is generally produced at the same time using the same hydraulic model and has appropriate rate zones and flood elevations added.

unities in the regular program of the NFIP [illegible] had detailed flood insurance studies performed. In these communities the NFIP map will be a FIRM and in the majority of cases, a regulatory floodway is in effect.

Communities in the emergency program of the NFIP usually have not had a detailed flood insurance study completed and, usually, only limited floodplain data is available. In this case the community NFIP map will be a FHBM and there will not be a regulatory floodway.

Other possibilities are: (1) the community is not in a FEMA identified flood hazard area and thus there is no NFIP map, (2) a FHBM, FIRM, or FBFM is available but the community is not participating in the NFIP, (3) a community is in the process of converting from the emergency program to the regular program and a detailed flood insurance study is underway, or (4) a community is participating in the regular program, the NFIP map is a FIRM, but no regulatory floodway has been established. Information on community participation in the NFIP is provided in the "National Flood Insurance Program Community Status Book" which is published bimonthly for each State and is available through the Headquarters of FEMA.

Coordination With FEMA

It is intended that there should be highway agency coordination with FEMA in situations where administrative determinations are needed involving a regulatory floodway or where flood risks in NFIP communities are significantly impacted. The circumstances which would ordinarily require coordination with FEMA are:

1. a proposed crossing encroaches on a regulatory floodway and, as such, would require an amendment to the floodway map,

2. a proposed crossing encroaches on a floodplain where a detailed study has been performed but no floodway designated and the maximum 1 foot increase in the base flood elevation would be exceeded,

3. a local community is expected to enter into the regular program within a reasonable period and detailed floodplain studies are underway,

4. a local community is participating in the emergency program and base flood elevation in the vicinity of insurable buildings is increased by more than 1 foot. (Where insurable buildings are not affected, it is sufficient to notify FEMA of changes to base flood elevations as a result of highway construction.)

The draft EIS/EA should indicate the NFIP status of affected communities, the encroachments anticipated and the need for floodway or floodplain ordinance amendments. Coordination means furnishing to FEMA the draft EIS/EA and, upon selection of an alternative, furnishing to FEMA through the community a preliminary site plan and water surface elevation information and technical data in support of a floodway revision request as required. If a determination by FEMA would influence the selection of an alternative, a commitment from FEMA should be obtained prior to the FEIS or FONSI. Otherwise this later coordination may be postponed until the design phase.

For projects that will be processed with a categorical exclusion, coordination may be carried out during design. However, the outcome of the coordination at this time could change the class of environmental processing.

Highway Encroachments Which Are Consistent With Regulatory Floodways In Effect

In many situations it is possible to design and construct highways in a cost-effective manner such that their components are excluded from the floodway. This is the simplest way to be consistent with the standards and should be the initial alternative evaluated. If a project element encroaches on the floodway but has a very minor effect on the floodway water surface elevation (such as piers in the floodway), the project may normally be considered as being consistent with the standards if hydraulic conditions can be improved so that no water surface elevation increase is reflected in the computer printout for the new conditions.

PARTICIPATION OPTIONS FOR LIMITING FLOOD DAMAGE

If a Federal-aid highway project will cause a 100-year flood elevation which is more than 1-foot higher than the base flood elevation shown on a NFIP map at either (1) a National Flood Insurance Program (NFIP) insurable building or (2) an unimproved property with a substantially changed highest or best use, participation may be provided with Federal-aid highway funds by the following option which best fits the State's property management plan:

1. Purchase property

   a. Relocate owners/tenants

   b. Buildings should be:

      (1) Destroyed,

      (2) Relocated out of the floodplain

      (3) Resold with commitment of buyer to:

         (a) Relocate out of the floodplain, or

         (b) Elevate the building above the new 100-year flood level or accomplish other acceptable floodproofing techniques

2. Reimburse Owner for Floodproofing Buildings

   a. Buildings should be elevated to or above the new 100-year flood level or other acceptable floodproofing techniques applied

   b. Owner retains title

   c. Owner arranges for floodproofing

   d. Owner to sign instrument to hold State harmless from future flood damage

   e. Reimbursement for floodproofing is limited to the cost to Purchase property and relocate residents.

3. Purchase Permanent Easement

   a. For unimproved property

   b. Reimbursement is based on before and after appraisal

Revision of Regulatory Floodway So That Highway Encroachment Would Be Consistent

Where it is not cost-effective to design a highway crossing to avoid encroachment on an established floodway, a second alternative would be a modification of the floodway itself. Often, the community will be willing to accept an alternative floodway configuration to accommodate a proposed crossing provided NFIP limitations on increases in the base flood elevation are not exceeded. This approach is useful where the highway crossing does not cause more than a 1 foot rise in the base flood elevation. In some cases, it may be possible to enlarge the floodway or otherwise increase conveyance in the floodway above and below the crossing in order to allow greater encroachment. Such planning is best accomplished when the floodway is first established. However, where the community is willing to amend an established floodway to support this option, the floodway may be revised.

The responsibility for demonstrating that an alternative floodway configuration meets NFIP requirements rests with the community. However, this responsibility may be borne by the agency proposing to construct the highway crossing. Floodway revisions must be based on the hydraulic model which was used to develop the currently effective floodway but updated to reflect existing encroachment conditions. This will allow determination of the increase in the base flood elevation that has been caused by encroachments since the original floodway was established. Alternate floodway configurations may then be analyzed.

Base flood elevation increases are referenced to the profile obtained for existing conditions when the floodway was first established.

Data submitted to FEMA in support of a floodway revision request should include:

1. Copy of current regulatory Flood Boundary Floodway Map, showing existing conditions, proposed highway crossing and revised floodway limits.

2. Copy of computer printouts (input, computation, and output) for the current 100-year model and current 100-year floodway model.

3. Copy of computer printouts (input, computation, and output) for the revised 100-year floodway model. Any fill or development that has occurred in the existing flood fringe area must be incorporated into the revised 100-year floodway model.

4. Copy of engineering certification is required for work performed by private subcontractors.

The revised and current computer data required above should extend far enough upstream and downstream of the floodway revision area in order to tie back into the original floodway and profiles using sound hydraulic engineering practices. This distance will vary depending on the magnitude of the requested floodway revision and the hydraulic characteristics of the stream.

A floodway revision will not be acceptable if development that has occurred in the existing flood fringe area since the adoption of the community's floodway ordinance will now be located within the revised floodway area unless adversely affected adjacent property owners are compensated for the loss.

If the input data representing the original hydraulic model is unavailable, an approximation should be developed. A new model should be established using the original cross-section topographic information, where possible, and the discharges contained in the Flood Insurance Study which establish the original floodway. The model should then be run confining the effective flow area to the currently established floodway and calibrate to reproduce within 0.10 foot, the "With Floodway" elevations provided in the Floodway Data Table for the current floodway. Floodway revisions may then be evaluated using the procedures outlined above.

Floodway Encroachment Where Demonstrably Appropriate

When it would be demonstrably inappropriate to design a highway crossing to avoid encroachment on the floodway and where the floodway cannot be modifed such that the structure could be excluded, FEMA will approve an alternate floodway with backwater in excess of the 1 foot maximum only when the following conditions have been met:

1. A location hydraulic study has been performed in accordance with Federal-Aid Highway Program Manual (FHPM) 6-7-3-2 "Location and Hydraulic Design of Encroachments on Floodplains" (23 CFR 650, Subpart A) and FHWA finds the encroachment is the only practicable alt[illegible]

2. The constructing agency has made appropriate arrangements with affected property owners and the community to obtain flooding easements or otherwise compensate them for future flood losses due to the effects of the structure.

3. The constructing agency has made appropriate arrangements to assure that the National Flood Insurance Program and Flood Insurance Fund do not incur any liability for additional future flood losses to existing structures which are insured under the Program and grandfathered in under the risk status existing prior to the construction of the structure.

4. Prior to initiating construction, the constructing agency provides FEMA with revised flood profiles, floodway and floodplain mapping, and background technical data necessary for FEMA to issue revised Flood Insurance Rate Maps and Flood Boundary and Floodway Maps for the affected area upon completion of the structure.

Highway Encroachment On A Floodplain With A Detailed Study (FIRM)

In communities where a detailed flood insurance study has been performed but no regulatory floodway designated, the highway crossing should be designed to allow no more than a 1 foot increase in the base flood elevation based on technical data from the flood insurance study. Technical data supporting the increased flood elevation should be submitted to the local community and FEMA for their files. Where it is demonstrably inappropriate to design the highway crossing and meet backwater limitations the procedures outlined under

Floodway Encroachment Where Demonstrably Appropriate should be followed in requesting a revision of base floodplain reference elevations.

ihway Encroachment On A Floodplain Indicated On An FHBM

communities where detailed flood insurance studies have not been performed, the highway agency must generate its own technical data to determine the base floodplain elevation and design encroachments in accordance with FHPM 6-7-3-2. Base floodplain elevations should be furnished to the community, and coordination carried out with FEMA as outlined previously where the increase in base flood elevations in the vicinity of insurable buildings exceeds 1 foot.

Highway Encroachment On Unidentified Floodplains

Encroachments which are outside of NFIP communities or NFIP identified flood hazard areas should be designed in accordance with FHPM 6-7-3-2 of the Federal Highway Administration. The NFIP identified flood hazard areas are those delineated on an FHBM, FBFM or FIRM.

To Obtain FEMA Publications

1. National Flood Insurance Program Community Status Book

Write to FEMA, 500 "C" Street, SW., Room 411, Insurance Operations, Washington, D.C. 20472 and request to be placed on the appropriate State mailing list.

2. Flood Insurance Study Report and/or FBFM

Write to FEMA, 500 "C" Street, SW., State and Local Programs Room 418, Washington, D.C. 20472 request:

(a) For future studies,

To be placed on mailing list to receive all studies and maps as they are completed for a State.

(b) For completed studies,

(1) The study for a particular community (provide number).

(2) All the studies for a particular State. You will received about 50 percent of the completed studies to date.

1. FHBM or FIRM for a particular community with ID number,

(a) call NFIP contractor (800)638-6620, (800)492-6605(MD), 897-5900 in D.C., or

(b) write NFIP, P.O. Box 34604, Bethesda, Maryland 20034

MEMORANDUM

ocedures for Coordinating Highway ncroachments on Floodplains with the Federal Emergency Management Agency (FEMA)

JUN 25 1982

HNG-31

Associate Administrator for
Engineering and Operations
Washington, D.C. 20590

Regional Federal Highway
Administrators
Regions 1-10
Direct Federal Division Engineers

Attached are copies of the subject procedures and a letter from Mr. Richard W. Krimm of FEMA dated June 7, 1982. Mr. Krimm has endorsed the procedures and has distributed them to the field offices of FEMA. Please send copies of these procedures to the FHWA Divisions Offices and the States in your Region.

We believe these procedures provide excellent guidance in regard to meeting our responsibility to be consistent with the standards of the National Flood Insurance Program (NFIP) as set forth in the Federal-Aid Highway Program Manual (FHPM) 6-7-3-2, Location and Hydraulic Design of Encroachments n Flood Plains. The procedures establish some flexibility for achieving st-effective encroachments on floodplains within communities that are in ne NFIP. If an encroachment is proposed within an NFIP community, the economic consequences of alternatives can be assessed using the analysis procedures in Hydraulic Engineering Circular No. 17 (HEC 17), the Design of Encroachments on Floodplains Using Risk Analysis. This assessment/analysis can then be used, if needed, to support the community's application to FEMA for approval of an alternate floodway or a floodway revision. For all locations outside of NFIP communities or NFIP identified flood hazard areas, FHPM 6-7-3-2 shall be followed for encroachment design. This policy requires that encroachment designs be supported, as appropriate, by a risk assessment or risk analysis. Economic (risk) analysis, if appropriate, can be accomplished using the guidelines in HEC 17.

We encourage you to work with the States to implement these procedures as a part of Program Emphasis Area Number 2, Cost Effective Design and Construction. We are aware that some State environmental agencies have adopted strict requirements for encroachments on all floodplains, whether rural or urban in nature. These requirements allow the highway designer little discretion to achieve cost-effective designs. In such cases, this subject should be discussed with appropriate State personnel so that practicable State floodplain encroachment requirements can be developed. Implementation of these procedures, along with the economic (risk) assessment/analysis design process required by FHPM 6-7-3-2, has a high potential for achieving significant cost savings in the Federal-aid Highway Program.

/s/
R. D. Morgan

Attachments

Federal Emergency Management Agency

Washington, D.C. 20472

7 JUN 1982

Mr. R. D. Morgan
Associate Administrator for Engineering
And Traffic Operations
Federal Highway Administration
Department of Transportation
Washingtin, D.C. 20590

Dear Mr. Morgan:

This is in response to your letter of May 3 1982, seeking our endorsement of the procedure paper entitled "procedures for Coordinating Highway Encroachments on Floodplains with FEMA." This paper expands upon my internal policy memorandum of December 29, 1981, concerning the Federal Emergency Management Agency's (FEMA's) handling of highway encroachments within regulatory floodways. Your expansion addresses highway agency responsibilities for coordination with FEMA under various situations in which FEMA has identified flood plains, floodways and base flood elevations.

have reviewed your procedure paper and believe that it provides an excellent eline for coordination between highway agencies, communities participating he National Flood Insurance Program (NFIP) and FEMA, when flood plain oachments involving highway construction are proposed. In accordance with Executive Order 11988, the procedures require compliance with NFIP standards and regulations, where practicable, but also provide for responsible actions where no practicable alternative can be identified. These actions include appropriate compensation to affected property owners, assurance that the NFIP will not incur additional liability due to increased flood hazards, and the provision of appropriate technical data to FEMA so that flood insurance maps and studies can be revised as necessary.

We compliment you on your efforts to establish workable operating procedures which incorporate coordination with FEMA on site specific projects. We believe that this procedure paper will facilitate the attainment of our mutual objective of future flood loss reduction. We will provide copies of the paper, with our endorsement to our Regional Offices.

Sincerely,

/S/
Richard W. Krimm
Assistant Associate Director
Office of Natural and Technological
Hazards Programs

Executive Order 11988 May 24, 1977

FLOODPLAIN MANAGEMENT

By virtue of the authority vested in me by the Constitution and statutes of the United States of America, and as President of the United States of America, in furtherance of the National Environmental Policy Act of 1969, as amended (42 U.S.C. 4321 et seq.), the National Flood Insurance Act of 1968, as amended (42 U.S.C. 4001 et seq.), and the Flood Disaster Protection Act of 1973 (Public Law 93-234, 87 Stat. 975), in order to avoid to the extent possible the long and short term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative, it is hereby ordered as follows:

Section 1. Each agency shall provide leadership and shall take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health and welfare, and to restore and preserve the natural and beneficial values served by floodplains in carrying out its responsibilities for (1) acquiring, managing, and disposing of Federal lands and facilities; (2) providing Federally undertaken, financed, or assisted construction and improvements; and (3) conducting Federal activities and programs affecting land use, including but not limited to water and related land resources planning, regulating, and licensing activities.

Sec. 2. In carrying out the activities described in Section 1 of this Order, each agency has a responsibility to evaluate the potential effects of any actions it may take in a floodplain; to ensure that its planning programs and budget requests reflect consideration of flood hazards and

floodplain management; and to prescribe procedures to implement the policies and requirements of this Order, as follows:

(a)(1) Before taking an action, each agency shall determine whether the proposed action will occur in a floodplain -- for major Federal actions significantly affecting the quality of the human environment, the evaluation required below will be included in any statement prepared under Section 102(2)(C) of the National Environmental Policy Act. This determination shall be made according to a Department of Housing and Urban Development (HUD) floodplain map or a more detailed map of an area, if available. If such maps are not available, the agency shall make a determination of the location of the floodplain based on the best available information. The Water Resources Council shall issue guidance on this information not later than October 1, 1977.

(2) If an agency has determined to, or proposes to, conduct, support, or allow an action to be located in a floodplain, the agency shall consider alternatives to avoid adverse effects and incompatible development in the floodplains. If the head of the agency finds that the only practicable alternative consistent with the law and with the policy set forth in this Order requires siting in a floodplain, the agency shall, prior to taking action, (i) design or modify its action in order to minimize potential harm to or within the floodplain, consistent with regulations issued in accord with Section 2(d) of this Order, and (ii) prepare and circulate a notice containing an explanation of why the action is proposed to be located in the floodplain.

(3) For programs subject to the Office of Management and Budget Circular A-95, the agency shall send the notice, not to exceed three pages in length including a location map, to the state and areawide A-95 clearinghouses for the geographic areas affected. The notice shall include: (i) the reasons why the action is proposed to be located in a floodplain; (ii) a statement indicating whether the action conforms to applicable state or local floodplain protection standards and (iii) a list of the alternatives considered. Agencies shall endeavor to allow a brief comment period prior to taking any action.

(4) Each agency shall also provide opportunity for early public review of any plans or proposals for actions in floodplains, in accordance with Section 2(b) of Executive Order No. 11514, as amended, including the development of procedures to accomplish this objective for Federal actions whose impact is not significant enough to require the preparation of an environmental impact statement under Section 102(2)(C) of the National Environmental Policy Act of 1969, as amended.

(b) Any requests for new authorizations or appropriations transmitted to the Office of Management and Budget shall indicate, if an action to be proposed will be located in a floodplain, whether the proposed action is in accord with this Order.

(c) Each agency shall take floodplain management into account when formulating or evaluating any water and land use plans and shall require land and water resources use appropriate to the degree of hazard involved. Agencies shall include adequate provision for the evaluation and consideration of flood hazards in the regulations and operating procedures for the licenses, permits, loan or grants-in-aid programs that they administer. Agencies

shall also encourage and provide appropriate guidance to applicants to evaluate the effects of their proposals in floodplains prior to submitting applications for Federal licenses, permits, loans or grants.

(d) As allowed by law, each agency shall issue or amend existing regulations and procedures within one year to comply with this Order. These procedures shall incorporate the Unified National Program for Floodplain Management of the Water Resources Council, and shall explain the means that the agency will employ to pursue the nonhazardous use of riverine, coastal and other floodplains in connection with the activities under its authority. To the extent possible, existing processes, such as those of the Council on Environmental Quality and the Water Resources Council, shall be utilized to fulfill the requirements of this Order. Agencies shall prepare their procedures in consultation with the Water Resources Council, the Federal Insurance Administration, and the Council on Environmental Quality, and shall update such procedures as necessary.

Sec. 3. In addition to the requirements of Section 2, agencies with responsibilities for Federal real property and facilities shall take the following measures:

(a) The regulations and procedures established under Section 2(d) of this Order shall, at a minimum, require the construction of Federal structures and facilities to be in accordance with the standards and criteria and to be consistent with the intent of those promulgated under the National Flood Insurance Program. They shall deviate only to the extent that the standards of the Flood Insurance Program are demonstrably inappropriate for a given type of structure or facility.

(b) If, after compliance with the requirements of this Order, new construction of structures or

facilities are to be located in a floodplain, accepted floodproofing and other flood protection measures shall be applied to new construction or rehabilitation. To achieve flood protection, agencies shall, wherever practicable, elevate structures above the base flood level rather than filling in land.

(c) If property used by the general public has suffered flood damage or is located in an identified flood hazard area, the responsible agency shall provide on structures, and other places where appropriate, conspicuous delineation of past and probable flood height in order to enhance public awareness of and knowledge about flood hazards.

(d) When property in floodplains is proposed for lease, easement, right-of-way, or disposal to non-Federal public or private parties, the Federal agency shall (1) reference in the conveyance those uses that are restricted under identified Federal, State or local floodplain regulations; and (2) attach other appropriate restrictions to the uses of properties by the grantee or purchaser and any successors, except where prohibited by law; or (3) withhold such properties from conveyance.

Sec. 4. In addition to any responsibilities under this Order and Sections 202 and 205 of the Flood Disaster Protection Act of 1973, as amended (42 U.S.C. 4106 and 4128), agencies which guarantee, approve, regulate, or insure any financial transaction which is related to an area located in a floodplain shall, prior to completing action on such transaction, inform any private parties participating in the transaction of the hazards of locating structures in the floodplain.

Sec. 5. The head of each agency shall submit a report to the Council on Environmental Quality and to the Water Resources Council on June 30, 1978, regarding the status of their procedures and the impact of this Order on the agency's operations. Thereafter, the Water Resources Council shall periodically evaluate agency procedures and their effectiveness.

Sec. 6. As used in this Order:

(a) The term "agency" shall have the same meaning as the term "Executive agency" in Section 105 of Title 5 of the United States Code and shall include the military departments; the directives contained in this Order, however, are meant to apply only to those agencies which perform the activities described in Section 1 which are located in or affecting floodplains.

(b) The term "base flood" shall mean that flood which has a one percent or greater chance of occurrence in any given year.

(c) The term "floodplain" shall mean the lowland and relatively flat areas adjoining inland and coastal waters including floodprone areas of offshore islands, including at a minimum, that area subject to a one percent or greater chance of flooding in any given year.

Sec. 7. Executive Order No. 11296 of August 10, 1966, is hereby revoked. All actions, procedures, and issuances taken under that Order and still in effect shall remain in effect until modified by appropriate authority under the terms of this Order.

Sec. 8. Nothing in this Order shall apply to assistance provided for emergency work essential to save lives and protect property and public health and safety, performed pursuant to Sections 305 and 306 of the Disaster Relief Act of 1974 (88 Stat. 148, 42 U.S.C. 5145 and 5146).

Sec. 9. To the extent the provisions of Section 2(a) of this Order are applicable to projects covered by Section 104(h) of the Housing and Community Development Act of 1974, as amended (88 Stat. 640, 42 U.S.C. 5304(h)), the responsibilities under those provisions may be assumed by the appropriate applicant, if the applicant has also assumed, with respect to such projects, all of the responsibilities for environmental review, decisionmaking, and action pursuant to the National Environmental Policy Act of 1969, as amended.

Jimmy Carter

THE WHITE HOUSE,
May 24, 1977

[FR Doc.77-15121 Filed 5-24-77;1:42 pm]

Biological Water Quality of the Surface Tributary Streams of the District of Columbia

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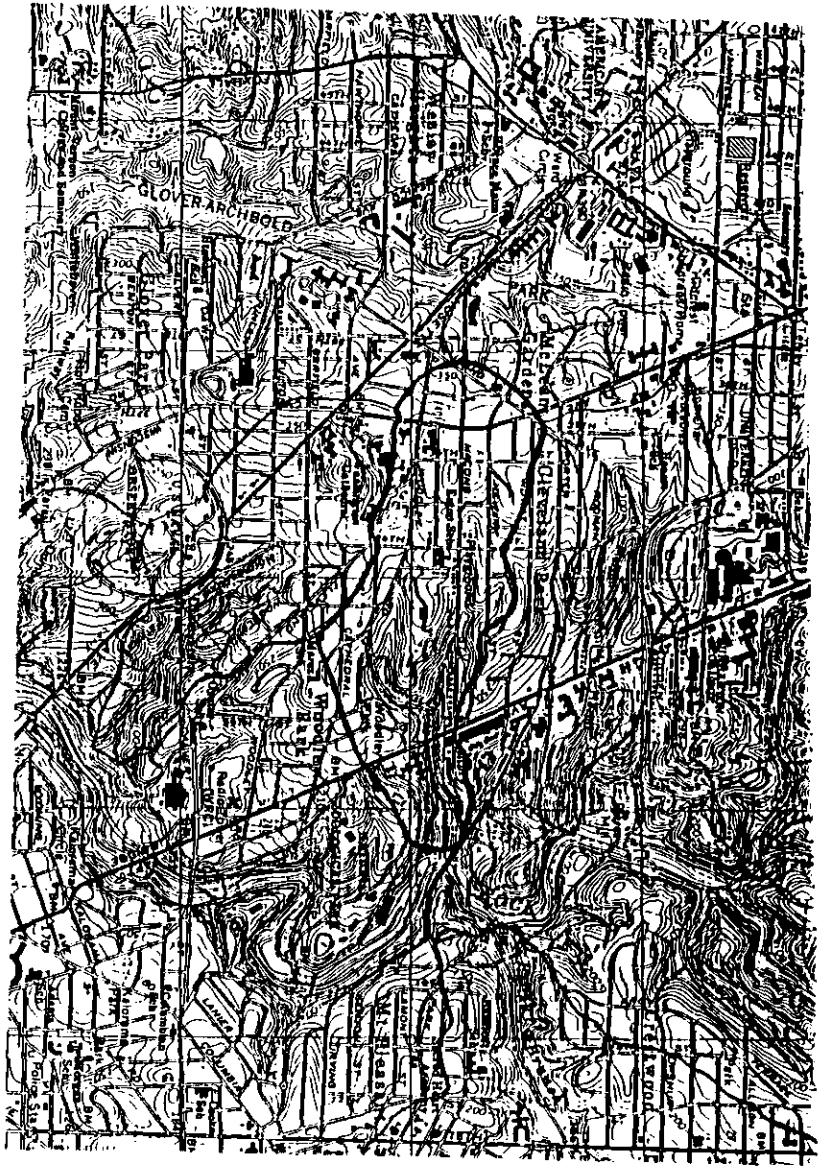
June 4, 1993

Occasional Publications of the Department of Biology
American University Volume 2 Number 1



Klingle Creek KGL03: 03/30/93
Summary of Metrics

Metric	Biological Condition Scoring Criteria and/or (Score) for: Study Station KGL03		Ref. Station BVC05	
1. Taxa Richness	74%	(4)	100%	(6)
2. Modified Hilsenhoff Biotic Index	49%	(0)	100%	(6)
3. Ratio of Scrapers/ filterers	0%	(0)	100%	(6)
4. Ratio EPT/Chironomid abundances	0%	(0)	100%	(6)
5. % Contribution of Dominant Taxon	21%	(2)	32%	(2)
6. EPT Index	0%	(0)	100%	(6)
7. Community Loss Index	1.3	(2)	0	(6)
8. Ratio of Shredders/ Total	60%	(6)	100%	(6)
TOTAL SCORE		14		44
BIOASSESSMENT		32% 'Moderately Impaired'		

Severely Impaired	Moderately Impaired	Slightly Impaired	Not Impaired
	* KGL03		

Klingle Creek (38°55'59"N 73°3'4"W; ADC 9:G6) is our name for a small unnamed stream about 1/2 mile long which discharges into Rock Creek near the Porter Street Bridge over Rock Creek. It parallels the south side of Klingle Road and branches just west of Connecticut Avenue into two branches, one following Klingle Road, the other paralleling the south side of Macomb Street. The watershed is about 1/2 square mile (320 acres), but runoff from the most of its watershed is collected by a storm drain system. A 3'6" storm drain, which parallels Klingle creek and Macomb Street, joins a 4'6" drain from Porter Street just before the combined system empties into Rock Creek through a covered orifice immediately north of the mouth of Klingle Creek. Except for a wooded buffer amounting to a few hundreds of feet on one side, the creek drains mostly residential urban areas. We sampled about 50m above its mouth; this is our third sampling of this stream.

The surface portions of the stream are cut through the Lower paleozoic Oligoclase-mica Facies of the Wissahickon Formation. Upper reaches are in the Kensington Granite Gneiss, a Piedmont formation of unknown geological age. A small proportion of the uppermost portions of the watershed lie in the Patuxent Formation,

Upper Cretaceous sediments of the Coastal Plain. The slope of the stream is 5%, measured from the USGS quadrangle; we measured only 2% by clinometer at the sampling site. The channel is almost 30 feet wide, about 6 of which is occupied by water. The stream is averages about 3.5 inches deep, with pools up to two feet deep. The water flowed at about 0.18 m/sec, for an estimated flow volume of 0.83 cfs (6.2 gps, 0.03 m^3/sec). The bottom was largely sand, gravel and cobble, with some boulders and bedrock where the stream was heavily scoured.

No odors or oils were noticed in the water or sediments; the pale yellow water was clear, with no measurable turbidity. The DO measured 10.8 ppt, 96% saturated at the sampling temperature of 11C. Conductivity was 460 micromho/cm, slightly elevated; the pH measured near 7.

Erosion around the stream testifies to the impact of watershed pavement on its flow during a significant rain. We estimated that during even modest storms the level rises a foot or more above normal levels. Exposed tree roots at higher elevations suggest that during severe storms water may rise to over twice that level, threatening the storm drain and road next to it. The transverse profile of the stream is fairly steep, with slopes above 60°; the north side is effectively canalized by the concrete emplacements of the storm drain. In some places the stream has eroded away a narrow vegetated buffer and it appears to be only a matter of time before the stream seriously threatens both the storm drain system and Klingle road.

The stream scored mostly in the Suboptimal range, with evidence of loss of instream cover, increased imbeddedness, channel alteration, bottom scouring and other evidence of erosion. The score was 93, 70% that of the reference stream. Here is a summary of our measurements of these parameters at this site:

Station	Date	Score	Ref Score	Habatat Assessment
KGL01	01/15/1992	84	127	66
KGL02	01/24/1992	73	127	57
KGL03	03/30/1993	93	133	70

We collected 28 individuals from 14 taxa in a 0.25m^2 kick net sample, of which 6 were species of chironomid. Also present were a crayfish (Cambarus robustus), tipulids, oligochaets and some other invertebrates. The apparent increase in density of animals (individuals/m^2) between January, 1992 and March, 1993 is actually a decrease in relative density because of the much higher seasonal density in the March reference station (BVC05) compared to CBR04:

tion	Date	Density	Relative Density	No. Taxa	Bioassessment
J1	01/15/1992	84.0	20%	8	45%
KGL02	01/24/1992	80.0	19%	6	10%
KGL03	03/30/1993	112.0	10%	14	31%

This table illustrates wide variability among estimates of bioassessment at different dates. However, the variations are only between 'Severely Impaired' and 'Moderately Impaired.'

Erosion, scouring, and deposition of sand and other sediment contribute to the small population size compared to the reference stream. The ratio of scrapers to filterer-collectors was low relative to that of the reference stream in the 1992 samplings, suggesting eutrophication and organic enrichment. The dominance of one taxon, a deposit-feeding oligochaete, indicated community stress; the fact that it was a deposit feeder indicated organic enrichment, also supported by the relatively low DO (71%). This condition seems to have improved during 1992-3; the dominant in KGL03 was a chironomid and the relative importance of deposit feeders has decreased. Impairment due to organic pollution seems to have decreased, but the number of EPT species is reduced, and there is a decrease in both density and diversity relative to the reference station, indicating toxic pollution.

ic pollution, organic pollution, eutrophication and ronmental degradation all appear to be important in this am. Organic pollution, possibly caused by episodic leaks in sewer lines, has decreased during 1992-3. We note no evidence of recent sewer leaks during our sampling visits, but on one preliminary visit to the site in January, 1991, sewage odors were evident in the area of the stream.

Klingle Road is closed pending road work in the area. This may temporarily improved conditions in the stream by reducing traffic and other human activity in the area. Construction may severely impact this small stream; it is likely that even more deterioration may occur unless care is taken to minimize loss of sediment into the stream. Additional canalization would further degrade the stream.

STATION KGL03

1	ISOTOMIDAE	COLLEMBOLA	ISOTOMURUS SP.
1	CAMBARIDAE	DECAPODA	CAMBARUS ROBUSTUS
1	CHIRONOMIDAE	DIPTERA	ABLABESMYIA SP.
6	CHIRONOMIDAE	DIPTERA	CHIRONOMIDAE UNIDENTIFIED
4	CHIRONOMIDAE	DIPTERA	ORTHOCLADIUS? SP.
1	CHIRONOMIDAE	DIPTERA	PARATANYTARSUS SP.
2	CHIRONOMIDAE	DIPTERA	SYMPOTTHASTIA SP. 1
3	CHIRONOMIDAE	DIPTERA	THIENEMANNIMYIA SP. 01
1	TIPULIDAE	DIPTERA	LIMONIA SP. 1
3	TIPULIDAE	DIPTERA	TIPULA SP. 1
1	ENCHYTRAEIDAE	OLIGOCHAETA	ENCHYTRAEID SP. 04
2	ENCHYTRAEIDAE	OLIGOCHAETA	ENCHYTRAEID SP. 13
1	LUMBRICIDAE	OLIGOCHAETA	LUMBRICIDAE UNIDENTIFIED
1	PLANARIIDAE	TURBELLARIA	CURA FORMANII

14 TAXA, 28 INDIVIDUALS

Station: KGL03
Stream Name: KLINGLE ROAD
Collection Date: 03/30/1993
Reference Stream: BVC05
Reference stream collecting date: 03/20/1993
Days between Reference and Station collection: 10
Reference Page: 262
Map coordinates: 9:G6
County: NW DC
Tributary of: ROCK CREEK
Latitude: 38 55'59"
Longitude: 77 03'04"
Predominant land use: RESIDENTIAL
Stream gradient at site measured by clinometer: 3%
Erosion code (1 None, 2 Moderate, 3 Severe): 2
NPS Pollution sources (1 None, 2 Some potential sources, 3 Obvious source): 2
NPS source, if any: RESIDENTIAL
Channel width: 4m
Area collected for biological sampling (square meters): 0.25
Depth of riffle (cm): 6
Depth of run (cm): 9
Depth of pools (cm): 63
Dam present? .F.
Canalized? .T.
Canopy cover (1 - 4) (open - shaded) 3
Sediment odors NONE
Bottoms of stones not deeply imbedded blackened? .F.
Animals: NONE

Clay: 0%
: 0%
: 35%
L .el: 20%
Cobble: 20%
Boulders: 15%
Bedrock: 10%
SAV - Submerged aquatic vegetation: 0%
Muck and mud: 0%
Organic debris deposits: 10%
Weather: CLOUDY
Weather in the past 24 hr: RAIN
Water temperature (C): 11C
Air temperature (C): 16C
Flood stage (1 Below normal, 2 Normal, 3 Above normal): 2
Water odors: NONE
Water oils (0 Absent, 1 Slight, 2 Moderate, 3 Profuse): 0
Water velocity (cm/sec): 0.18
Flow volume, calculated: 0.8
Turbidity (JTU): 0
Water clarity (0 Clear, 1 Discolored, 2 Murky, 3 Muddy, 4 Very Muddy): 0
Water color: YELLOW
Dissolved Oxygen Concentration (ppt): 10.8
Percent saturation of oxygen: 95.6
Conductivity (micromho/cm): 460
6.5
:nt:

1. Bottom Subatrate (Hab. Eval. 0-20): 12
2. Embeddedness (Hab. Eval. 0-20): 11
3. Flow Volume Category (Hab. Eval. 0-20): 4
4. Canopy Coverage Shading (Hab. Eval. 0-20): 11
5. Channel Alteration (Hab. Eval. 0-15): 8
6. Bottom Scouring (Hab. Eval. 0-15) 8
7. Pool/Riffle Run/Bend Ratio (Hab. Eval. 0-15): 12
8. Lower Bank Channel Capacity (Hab. Eval. 0-15): 7
9. Upper Bank Stability (Hab. Eval. 0-10): 5
10. Bank Vegetative Protection (Hab. Eval. 0-10): 6
11. Streamside Cover (Hab. Eval. 0-10): 7
12. Riparian Vegetative Zone (Hab. Eval. 0-10): 2

Score OPTIMAL: 12
Score Sub-Optimal: 12
Score Marginal: 63
Score Poor: 12
Total Score (Hab. Eval.) = 93
Habitat Assessment: 70
No animals collected (N): 28
Animal density (macroinvertebrates / m2) (DENSITY): 112.0
Number of Taxa at Study Site (N_TAX): 14

Number of Taxa at Reference Site (NR_TAXA): 19
Ratio of Number of Taxa Study Site/Ref Site (M1): 74.00
Number of Families at the Study Site (N_FAMS): 7
Number of Families at the Reference Site (NR_FAMS): 13
Ratio of No Families Study Site / Ref Site (M9): 0.54
Hilsenhoff Biotic Index (M2): 4.84
No. of Taxa Omitted (NTX_EXCL): 3
No. of Individuals excluded (N_EXCLU): 3
% of Sample excluded ([N_EXCL/N]*100): 10.71%
Number of Scraper taxa at the Study Site (NTX_SCR): 0
Number of Filter-collector taxa at the study site (NTX_FLCL): 0
Number of scraper individuals (N_SCR): 0
Number of filter-collector taxa Individuals (N_FLCL): 0
Ratio of scrapers / filterers for Sampling Site (PS_SCFL): 0.00
Ratio of scrapers / filterers for Reference Site (PR_SCFL): 0.14
Scraper/Filterer Ratio Study Site / Reference Site (M3): 0.00
Number of EPT Taxa at the Study Site (NTX_EPT): 0
Number of Chironomid Taxa at the Study Site (NTX_CHIRON): 6
Number of EPT individuals at the Study Site (N_EPT): 0
Number of Chironomid individuals at the Study Site (N_CHIRON): 17
EPT/Chironomid Ratio for the Study Site (PS_EPTC): 0.00
EPT/Chironomid Ratio for the Reference Site (PR_EPTC): 0.00
EPT/Chironomid Ratio Study Site / Reference Site (M4): 0.00
Dominant Taxon (DOM_TAXON): CHIRONOMIDAE UNIDENTIFIE
Number of individuals in the Dominant Taxon (N_DOMTAX): 6
Percentage of the sample comprised of the domonant taxon (M5): 21.43
Number of EPT Taxa at the Study Site (NTX_EPT): 0
Number of EPT Taxa at the Reference Site (NRTX_EPT): 9
EPT Index (M6): 0.00
Number of taxa common to both Study Site and Ref. Site (NTX_COM): 1
Number of taxa at Study Site (N_TAXA): 14
Number of taxa at Reference Site (NR_TAXA): 19
Community Loss Index (M7): 1.29
Number of taxa in Study Site not present in the Ref. Site (NTX_SNR): 1
Number of taxa in Ref. Site not present in the Study Site (NTX_RNS): 18
Jaccard Coefficient (M10): 0.03
No. Taxa at Study Site in Shredder Feeding Group (NTX_SRD): 2
Number Non-Shredder taxa (NTX_NSRD): 12
Number of taxa at the Study Site (N_TAXA): 14
Total number of individuals collected: 28
Density - Individuals/m2 112.0
Settled Volume of sample: 99.9
Settled Volume per m2: 999.9
Number of individuals at Study Site in the Shredder feeding group (N_SRD): 4
Proportion of shredders at the Study Site (PS_CPOM): 0.14
Proportion of shredders at the Reference Site (PR_CPOM): 0.24

Prop. shredders Study Site / Reference Site (M8): 60.10
E Taxa Richnes: 4
E HBI - Hilsenhoff Biotic Index: 0
E Filter-Collectors: 0
EPA4 Ratio of EPTs to Chironomids: 0
EPA5 Contribution of Dominant Taxon: 2
EPA6 EPT Ratio: 0
EPA7 Community Loss Index: 2
EPA8 Ratio of Shredders:Total 6
Sum of EPA1-EPA8: 14
Bioassessment: 31.8
Habitat Assessment: 70

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

STREAM NAME Kingle Valley	LOCATION 100m above Con of Rock Creek		
STATION # RIVERMILE	STREAM CLASS		
LAT 38°56'01" LONG 77°03'06"	RIVER BASIN RC		
UTM #	AGENCY		
INVESTIGATORS Pete + Suzy			
FORM COMPLETED BY Pete	DATE 7-29-98 TIME 11:30 AM (PM)	REASON FOR SURVEY Final	

	Habitat Parameter	Condition Category: Optimal	Suboptimal	Marginal	Poor
Parameters to be evaluated in sampling reach	1. Epifaunal Substrate/ Available Cover	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale).	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
	SCORE	20 19 18 17 16	15 14 13 12 (11)	10 9 8 7 6	5 4 3 2 1 0
	2. Embeddedness	Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment.	Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment.
	SCORE	20 19 18 17 16	15 14 13 12 (11)	10 9 8 7 6	5 4 3 2 1 0
	Velocity/Depth regimes	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/depth regime (usually slow-deep).
	SCORE	20 19 18 17 16	15 14 13 12 (11)	10 9 8 7 6	5 4 3 2 1 0
	4. Sediment Deposition	Little or no enlargement of islands or point bars and less than 5% (<20% for low-gradient streams) of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% (20-50% for low-gradient) of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% (50-80% for low-gradient) of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% (80% for low-gradient) of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 (9) 8 7 6	5 4 3 2 1 0
	6. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrate are mostly exposed.	Very little water in channel and mostly present as standing pools.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 (8) 7 6	5 4 3 2 1 0

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

	Habitat Parameter	Condition Category: Optimal	Suboptimal	Marginal	Poor
Parameters to be evaluated beyond sampling reach	6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
	SCORE	20 19 18 17 16	15 (14) 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	7. Frequency of Riffles (or bends)	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 (8) 7 6	5 4 3 2 1 0
	8. Bank Stability (score each bank) Note: determine left or right side by facing downstream.	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
	SCORE ___(LB)	Left Bank 10 9	8 (7) 6	5 4 3	2 1 0
	SCORE ___(RB)	Right Bank 10 9	(8) 7 6	5 4 3	2 1 0
	9. Vegetative Protection (score each bank)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
	SCORE ___(LB)	Left Bank 10 9	8 7 6	5 (4) 3	2 1 0
	SCORE ___(RB)	Right Bank 10 9	8 (7) 6	5 4 3	2 1 0
	10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.
	SCORE ___(LB)	Left Bank 10 9	8 7 (6)	5 4 3	2 1 0
	SCORE ___(RB)	Right Bank (10) 9	8 7 6	5 4 3	2 1 0

Total Score 114

BENTHIC MACROINVERTEBRATE LABORATORY BENCH SHEET (FRONT)

page 1 of 1

STREAM NAME Klingle Valley		LOCATION	
STATION # TKV01	RIVERMILE	STREAM CLASS	
LAT	LONG	RIVER BASIN	
ORET #		AGENCY	
LECTED BY PLM	DATE 10-22-98	LOT #	
XONOMIST	DATE	SUBSAMPLE TARGET ☐ 100 ☐ 200 ☐ 300 ☐ Other	

Enter Family and/or Genus and Species name on blank line.

Organisms		No.	LS	TI	TCR	Organisms		No.	LS	TI	TCR
Oligochaeta	Oligo	3				Megaloptera					
Hirudinea						Coleoptera					
Isopoda											
Amphipoda						Diptera	Chiron	18			
Decapoda	Decapoda	1									
Ephemeroptera						Gastropoda					
						Pelecypoda					
eoptera											
						Other	Shells	2			
Trichoptera	Trichoptera	2									
Hemiptera											

Taxonomic certainty rating (TCR) 1-5: 1=most certain, 5=least certain. If rating is 3-5, give reason (e.g., missing gills). LS= life stage: I = immature; P = pupa; A = adult TI = Taxonomists initials

Total No. Organisms 26 Total No. Taxa 5

TRIBUTARY BIOASSESSMENT BENTHIC INVERTEBRATE SCORING SHEET

Tributary Name: Klingle Valley Ecoregion: PIEDMONT

Station Code: TKV01 Date Collected: 10/22/98

METRICS	SCORE
Taxa Richness	5
EPT Index	1
% Dominant Taxon	18/26 × 100 = 69%

Biotic Index: HBI=Sum of xi ti/n where xi=# individuals in a family, ti=tolerance value of family, n=total # organisms in sample

Calc on reverse

≤ 7.88

~~≤ 3.81~~

Abundance of Scrapers/ (Scrapers+Filterers) Ø

Abundance of Shredders/ Total Ø

Hydropsyche+ Chenmatopsyche/ Total EPT 2/2 = 100%

Total EPT ind /Total # ind 2/26 = 0.08

GOVERNMENT OF THE DISTRICT OF COLUMBIA
Department of Health

Watershed Protection Division

July 15, 2000

Ms Kammy Horne
Louis Berger Group
1819 H St. NW Suite 900
Washington, D C. 20006

Dear Ms. Horne

We are pleased to have made contact with your group concerning Klingle Valley and are hopeful that the information which you requested from us will be useful. Enclosed you will find the most up to date biologic data that the Watershed Protection Division has on the Klingle Valley Branch. This data, collected in 1998, reveals a stream which is obviously impacted by water quality and habitat degradation issues, although not to the extant that many other streams in the district are suffering. Benthic macroinvertebrate and fish collections reveal a low diversity of species, mostly tolerant to adverse conditions. Also enclosed is the Overall Use Support Status Report, 1998 305b Water Quality Report to Congress and the EPA for Klingle Valley.

I hope that you will find these helpful in your work with the issues involved with Klingle Valley and would like to organize a meeting here with one of your staff to update our office on plans for the Valley. The Watershed Protection Division is involved in several stream restoration projects and finds it beneficial to be 'in the loop' concerning any project which has the potential to affect an aquatic resource in the District. If you have any questions concerning the data, please feel free to contact my biological monitoring coordinator, Peter May at 202-535-2251. Thank you.

Sincerely,

Hamid Karimi, Program Manager
Watershed Protection Division

cc. Ken Laden, Department of Public Works
Jim Collier, Bureau of Environmental Quality

51 N Street, N.E., 5th Floor, Washington, D C 20002 • TEL (202) 535-2240 • FAX (202) 535-1364

BENTHIC MACROINVERTEBRATE LABORATORY BENCH SHEET (FRONT)

page 1 of 1

STREAM NAME Klingle Valley		LOCATION	
STATION # TKV01	RIVERMILE	STREAM CLASS	
LAT	LONG	RIVER BASIN	
STORET #		AGENCY	
COLLECTED BY PM	DATE 4-7-98	LOT #	
TAXONOMIST	DATE	SUBSAMPLE TARGET ☐ 100 ☐ 200 ☐ 300 ☐ Other	

Enter Family and/or Genus and Species name on blank line.

Organisms		No.	LS	TI	TCR	Organisms		No.	LS	TI	TCR
Oligochaeta	Oligo	21				Megaloptera					
Hirudinea						Coleoptera					
Isopoda											
Amphipoda	SCUD	1				Diptera	Chiron	160			
							Tipulidae	4			
Decapoda	crayfish	3									
Ephemeroptera						Gastropoda					
						Pelecypoda					
Plecoptera	plecoptera	1									
						Other					
Trichoptera	trichoptera	17									
Hemiptera											

Taxonomic certainty rating (TCR) 1-5:1=most certain, 5=least certain. If rating is 3-5, give reason (e.g., missing gills). LS= life stage: I = immature; P = pupa; A = adult TI = Taxonomists initials

Total No. Organisms 207

Total No. Taxa 7

Rapid Bioassessment Protocols for Use in Streams and Rivers

TRIBUTARY BIOASSESSMENT BENTHIC INVERTEBRATE SCORING SHEET

Tributary Name: Klingle Valley Ecoregion: **PIEDMONT**

Station Code: TKVQ1 Date Collected: 4.7.98

METRICS	SCORE
Taxa Richness	7
EPT Index	2
% Dominant Taxon	$\frac{160}{207} \times 100 = 77.3\%$

Biotic Index: HBI=Sum of xi ti/n where xi=# individuals in a family, ti=tolerance value of family, n=total # organisms in sample

~~Σ 3.85~~
Σ 7.86

Oligo CG	$\frac{21(4)}{207}$ 10	~~0.41~~	1.01
Gammaridae CG	$\frac{1(8)}{207}$ 6	~~0.01~~	0.03
Cambaridae CG	$\frac{3(8)}{207}$ 3	~~0.04~~	0.10
plecoptera SH, S, CG	$\frac{1(2)}{207}$	~~0.01~~	0.01
Trichoptera Fil	$\frac{17(8)}{207}$ 8	~~0.25~~	0.49
Chiron G	$\frac{160(4)}{207}$	~~3.09~~	6.18
Tipulidae SH	$\frac{4(2)}{207}$ 4	~~0.04~~	0.04
		~~Σ 3.85~~	Σ 7.86

Abundance of Scrapers/(Scrapers+Filterers) $1/18 = 0.06 = 6\%$

Abundance of Shredders/Total $4/207 = 0.02 = 2\%$

Hydropsyche+Chenmatopsyche/Total EPT $17/18 = 0.94 = 94\%$

Total EPT ind /Total # ind $\frac{18}{207} = 0.09 = 9\%$

Crib Sheet for Non-gamefish Processing Date of Survey

Crib Name/Code Klingle Valley Branch
Sample Segment 100m above Rock Creek Date 7-29-98

	Pass 1	Pass 2	Pass 3	Total Weight
Biomass	210	85	50	g
Shock Seconds	868	837	764	

Species	Count	Anomaly
1st pass		
B.N. DACE	21 16 30 22 12 6 11 13 3 2	
Northern Cit. Chub	1	
Tot. wt. = 210g		
2nd pass		
B.N. DACE	4 21 18 11	
Tot. wt. = 85g		
3rd Pass		
B.N. DACE	13 11 5 1 — 30	
Tot. wt. = 50g		
1 minnow		

Canopy Densiometer
N 4.16
S 4.16
E 3.12
W 9.36
MEAN = 5.2

Flow

EPT	3in	0.8
	2in	0.0
	3in	0.2

Notes

temp 21.0
pH 6.9
D.O. 3.8
CONDUCTIVITY 55
- Almost no rain in past month
- some sewage odors on trib
- not many crayfish

Overall Use Support Status Report

Waterbody ID : DCTKV01R
Waterbody Name: KLINGLE VALLEY
Waterbody Type: River
Basin: POTOMAC

Segment Number: 00

Size: 0.80 Miles

---------- Description of the Waterbody ----------

KLINGLE VALLEY TRIBUTARY FLOWS THROUGH A RESIDENTIAL AREA AND DISCHARGES INTO ROCK CREEK FROM THE WEST NEAR THE PORTER STREET BRIDGE. THE STREAM'S REACH PARALLELS THE SOUTH SIDE OF KLINGLE ROAD. A WOODED BUFFER OF A FEW HUNDRED FEET COVERS ONE SIDE OF THE STREAM WITH THE REST OF THE 320 ACRE WATERSHED RESIDENTIAL URBAN AREA. NINE (9) OUTFALLS INCLUDING ONE CSO LINE THE STREAM.

THE ABOVE DESCRIPTION WAS TAKEN FROM 'BIOLOGICAL WATER QUALITY OF THE SURFACE STREAMS OF THE DISTRICT OF COLUMBIA,' W.C. BANTA, THE AMERICAN UNIVERSITY, 1993.

Assessment Date: 9802

---------- Use Support ----------

Designated Use	Fully Supp	Threat	Partial Supp	Not Supported	Not Attained	Not Assessed
OVERALL USE SUPPORT	0.00	0.00	0.00	0.80	0.00	0.00
AQUATIC LIFE SUPPORT	0.00	0.00	0.80	0.00	0.00	0.00
SWIMMABLE	0.00	0.00	0.00	0.00	0.00	0.80
SECONDARY CONTACT REC	0.00	0.00	0.00	0.00	0.00	0.80
FISH CONSUMPTION	0.00	0.00	0.00	0.80	0.00	0.00
NAVIGATION	0.80	0.00	0.00	0.00	0.00	0.00

---------- Nonattainment Causes ----------

Cause	Size	Mag
0100-UNKNOWN TOXICITY	0.80	S
1200-ORGANIC ENRICHMENT/LOW DO	0.80	H
2400-TOTAL TOXICS	0.80	M

---------- Nonattainment Sources ----------

Source	Size	Mag
0400-COMBINED SEWER OVERFLOW	0.80	H
4000-URBAN RUNOFF/STORM SEWERS	0.80	H

---------- Comments on the Assessment ----------

THE EVALUATION OF KLINGLE CREEK'S AQUATIC LIFE SUPPORT USE IS BASED ON LEVEL III RAPID BIOASSESSMENT PROTOCOLS PERFORMED BY BANTA, 1993. KLINGLE CREEK WAS FOUND TO BE 'PARTIALLY SUPPORTING' OF THIS DESIGNATED USE.

AN AQUATIC LIFE USE DESIGNATION OF 'PARTIALLY SUPPORTING' WAS DETERMINED BY COMPARING THIS STREAMS BIOASSESSMENT OF 31% TO THE EPA SCALE OF BIOLOGICAL CONDITION (PLAFKIN, 1989, 8-19), GIVING A RATING OF 'MODERATELY IMPAIRED'. THIS SCALE RATES 'SEVERELY IMPAIRED' AT 0-19%, 'MODERATELY IMPAIRED' AT

20-50%, 'SLIGHTLY IMPAIRED' AT 51-79% AND 'NONIMPAIRED' AT 80-100%. EPA 305B GUIDELINE ON CRITERIA FOR AQUATIC LIFE USE SUPPORT CLASSIFICATION RECOMMENDS DESIGNATIONS OF 'NOT SUPPORTING' IF SEVERE IMPAIRMENT EXISTS, 'PARTIALLY SUPPORTING' IF SLIGHT TO MODERATE IMPAIRMENT EXISTS AND 'FULLY SUPPORTING' IF NO IMPAIRMENT EXISTS.

THE BIOASSESSMENT SCORED 31% OF THE REFERENCE STREAM AND THE HABITAT ASSESSMENT SCORED 70% WHICH IS IN THE 'MODERATELY IMPAIRED' RANGE. THE DOMINANCE OF ONE TAXON, A CHIRONOMIDS, AND A DECREASE IN BOTH DENSITY AND DIVERSITY RELATIVE TO THE REFERENCE STATION INDICATES TOXIC POLLUTION ALTHOUGH ORGANIC POLLUTION, EUTROPHICATION AND HABITAT DEGRADATION ALL APPEAR TO BE FACTORS IN IMPAIRMENT. THE DO MEASURED 10.8 PPT AT A TEMPERATURE OF 11 DEGREE CELSIUS AND THE CONDUCTIVITY MEASURED 460 MICROMHOS/CM WHILE THE PH MEASURED 6.5. A 1988 BIOASSESSMENT BY JOHNSON FOUND FISH, CRAYFISH, AND SALAMANDERS PRESENT.

DETERMINATION OF THE FISH CONSUMPTION USE WAS BASED ON A PUBLIC HEALTH ADVISORY ISSUED ON NOVEMBER 15, 1994 BY THE D.C. COMMISSIONER OF PUBLIC HEALTH. THE ADVISORY URGES NON-CONSUMPTION OF CATFISH, CARP OR EEL AND LIMITED CONSUMPTION OF OTHER FISH CAUGHT IN ALL DISTRICT OF COLUMBIA WATERS. THIS WATERBODY DID NOT SUPPORT FISH CONSUMPTION CRITERIA.

Government of the District of Columbia
Department of Health
Environmental Health Administration
51 N Street N.E., Room 6039
Washington, DC 20002

Fisheries & Wildlife Division
Phone: (202) 535-2280
Fax: (202) 535-1373

TO: James Collier, Chief
Bureau of Environmental Quality

FROM: M. Jon Siemien, Chief
Fisheries Research Branch

DATE: September 25, 2000

SUBJECT: Fisheries Assessment of Klingle Branch

Attached please find an assessment of the Klingle Branch tributary of Rock Creek. As you know there are several problems related to the habitat quality of this stream, and a major factor is the present condition of Klingle road which runs parallel to the stream. This assessment addresses the interrelationship of the road and its affect on the fishery found in the stream.

If you have any questions concerning this assessment please contact me on 202-535-2273.

cc: Ira F. Palmer

FISHERIES ASSESSMENT OF KLINGLE BRANCH IN ROCK CREEK

Performed by: Daniel Ryan, Eric Thadey, Jeffery Zahn
Prepared by: Daniel Ryan
Approved by: M. Jon Siemien
Date submitted: September 18, 2000

OVERVIEW

On Tuesday August 29th, and Friday September 15th, members of the Fisheries and Wildlife Division, and a member of the Water Quality Division performed a fisheries assessment of Klingle Branch. The aim of the assessment was to determine species diversity and abundance in relation to the habitat quality and potential of the stream. Observations were made by walking the stream and sampling for fish species by means of electrofishing with a backpack unit. We started at the confluence of Klingle Branch and Rock Creek, and worked our way upstream until we reached the source where the well-defined stream turned into a wetland area of springs and drainage seeps. Efforts to assess the habitat of the stream demanded that we examine potential environmental impacts such as existing roads, storm drains, and nearby sewer lines.

FINDINGS (Fish Diversity)

Three fish species were captured and identified from our electrofishing efforts in Klingle Branch. Fish were discovered in nearly every substantial pool from the mouth of the creek, upstream for about 269 meters. Here there was a distinct fall line and the elevation of the streambed raised approximately six meters through a series of small falls. Pools for this stream are defined as any area that is at least 15 centimeters deep with a surface area of at least 1600 cm2. (It should be noted that these parameters are dependant upon factors such as temperature, precipitation, and runoff.) All pools provide some relief from the direct current of the stream, and all have a sand rubble substrate with larger rocks that concealed many fish that were only discovered by use of the electrofishing equipment. Forty-six pools were identified in this stretch of the stream with all but three containing fish. Each pool that harbored fish contained Blacknose Dace *(Rhinichthys atratulus)* ranging in number from as few as one to as many as 21. In all 254 Blacknose Dace were observed. Five pools revealed six American Eels *(Anguilla rostrata)* in addition to the Dace, and a total of four Creek Chubs *(Semotilus atromaculatus)* were collected from two different pools. Only 1 pool contained all three fish species but a total of six pools had at least 2 species represented (Table 1). No fish species were found above the fall line even in the pools that seemed to mimic the suitable habitats downstream. Other areas that could be classified as riffles or runs did not appear to support any fish life. Further evidence to support the absence of fish in these areas was the number of aquatic insects that were here, coupled with the bottoms of the pools being littered with dead worms and snails; likely washed in from recent rains. These invertebrates were nowhere to be found in the pools that harbored fish, probably because the opportunistic residents had consumed them.

FISHERIES ASSESSMENT OF KLINGLE BRANCH IN ROCK CREEK

RECOMMENDATIONS

In order to protect and enhance the existing fishery in the Klingle Branch tributary of Rock Creek, the Fisheries Research Branch proposes three alternatives for action. Each alternative involves improvements to the system so that the fishery that is present will not only remain but be enhanced.

1) Klingle road is removed. In this alternative the area surrounding Klingle Branch stream would be restored to as natural condition as possible. In conjunction with the road removal, storm water runoff currently entering directly into the stream from the surrounding roads should be dealt with using the current BMP available. Also, sanitary sewers which are leaking into the stream should be repaired to prevent further stream contamination.

2) Klingle road is left in its present condition. In this alternative the area surrounding Klingle Branch stream would also be restored to as natural condition as possible. Even if the road is left in its current condition, storm water runoff currently entering directly into the stream from the surrounding roads should be dealt with using the current BMP available. Currently, in several places water also runs off the existing road surface directly into the stream. These areas should be eliminated so that any runoff is subjected to BMP before entering the stream. Also, sanitary sewers which are leaking into the stream should be repaired to prevent further stream contamination.

3) Klingle road is totally rebuilt. In this alternative the roadway is totally rebuilt and the area surrounding Klingle Branch stream would be restored to as natural condition as possible. As in the other two alternative all areas of storm-water runoff and sanitary sewer leaks into the stream would be eliminated or repaired. Also, during construction, every precaution should be taken to eliminate the chance of new sediment entering the stream.

Each of the three alternatives proposed have one item in common. In each, the Klingle Branch tributary to Rock Creek would be improved by the elimination of direct storm-water runoff, and the elimination of sanitary sewer contamination of the stream. Klingle Branch, since it acts as a refugia for species found in the mainstem of Rock Creek, is an important system to the overall health of Rock Creek. Due to this every attempt should be made to improve its functioning. To this end the suggested improvements should be made to this stream.

Number of Pools (*)	Number of each species found in pools		
	Rhinichthys atratulus	*Anguilla rostrata*	*Semotilus atromaculatus*
28	2		
29	6		
30	19		
31	6		
32	8		
33	6		1
34	-		
35	4		
36	2		
37	15		
38	3		
39	3		
40	4		
41	3		
42	2		
43	3		
44	5		
45	7		
46	12		
Total	254	6	4

The EDR-Radius Map with GeoCheck®

Klingle Road
Int of Connecticut Ave
Washington, DC 20008

Inquiry Number: 554815.3s

October 20, 2000

Environmental Data Resources, Inc.

The Source For Environmental Risk Management Data

3530 Post Road
Southport, Connecticut 06490

Nationwide Customer Service

Telephone: 1-800-352-0050
Fax: 1-800-231-6802
Internet: www.edrnet.com

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Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

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EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc. (EDR). The report meets the government records search requirements of ASTM Standard Practice for Environmental Site Assessments, E 1527-00. Search distances are per ASTM standard or custom distances requested by the user.

TARGET PROPERTY INFORMATION

ADDRESS

INT OF CONNECTICUT AVE
WASHINGTON, DC 20008

COORDINATES

Latitude (North):	38.932200 - 38' 55' 55.9"
Longitude (West):	77.057300 - 77' 3' 26.3"
Universal Tranverse Mercator:	Zone 18
UTM X (Meters):	321672.2
UTM Y (Meters):	4311057.5

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property:	2438077-H1 WASHINGTON WEST, DC MD VA
Source:	USGS 7.5 min quad index

TARGET PROPERTY SEARCH RESULTS

The target property was not listed in any of the databases searched by EDR.

DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the target property or within the ASTM E 1527-00 search radius around the target property for the following databases:

FEDERAL ASTM STANDARD

NPL	National Priority List
Delisted NPL	NPL Deletions
CERC-NFRAP	Comprehensive Environmental Response, Compensation, and Liability Information System
CORRACTS	Corrective Action Report
RCRIS-TSD	Resource Conservation and Recovery Information System
RCRIS-LQG	Resource Conservation and Recovery Information System

STATE ASTM STANDARD

SHWS	State Haz. Waste

FEDERAL ASTM SUPPLEMENTAL

CONSENT	CONSENT
ROD	ROD
MLTS	Material Licensing Tracking System

EXECUTIVE SUMMARY

MINES	Mines Master Index File
NPL Lien	NPL Liens
PADS	PCB Activity Database System
RAATS	RCRA Administrative Action Tracking System
TRIS	Toxic Chemical Release Inventory System
TSCA	Toxic Substances Control Act

STATE OR LOCAL ASTM SUPPLEMENTAL

AST	AST

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were identified.

Elevations have been determined from the USGS 1 degree Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified. EDR's definition of a site with an elevation equal to the target property includes a tolerance of +/- 10 feet. Sites with an elevation equal to or higher than the target property have been differentiated below from sites with an elevation lower than the target property (by more than 10 feet). Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

FEDERAL ASTM STANDARD

CERCLIS: The Comprehensive Environmental Response, Compensation and Liability Information System contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA).
CERCLIS contains sites which are either proposed to or on the National Priorities List (NPL) and sites which are in the screening and assessment phase for possible inclusion on the NPL.

A review of the CERCLIS list, as provided by EDR, and dated **04/16/2000** has revealed that there are 3 CERCLIS sites within approximately 1.5 miles of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
UDC OIL SPILL 1997 SITE	***4200 CONNECTICUT AVE. N***	***1/2 - 1 NNW***	***V92***	***23***
SOAPSTONE CREEK OIL SPILL RESP	4411 CONNECTICUT AVE.,	1 - 2 NNW	W101	25
ARCHIBALD GLOVER PARK OUTFALL	***42ND & EDMUND STREET, N***	***1 - 2 WSW***	***124***	***31***

RCRIS: The Resource Conservation and Recovery Act database includes selected information on sites that generate, store, treat, or dispose of hazardous waste as defined by the Act. The source of this database is the U.S. EPA.

A review of the RCRIS-SQG list, as provided by EDR, and dated **06/21/2000** has revealed that there are 4 RCRIS-SQG sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
UPTOWN CLEANERS	***3333 CONNECTICUT AVE NW***	***0 - 1/8 NNW***	***B7***	***6***

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
INTERNATIONAL VALET	*3420 CONNECTICUT AVE NW*	*1/8 - 1/4 NNW*	*B9*	*6*
CATHEDRAL CUSTOM CLEANERS	*3000 CONNECTICUT AVE NW*	*1/8 - 1/4 SSE*	*14*	*7*
KM INC EXXON SERVICE STATION	*3535 CONNECTICUT AVE NW*	*1/8 - 1/4 NNW*	*G26*	*10*

ERNS: The Emergency Response Notification System records and stores information on reported releases of oil and hazardous substances. The source of this database is the U.S. EPA.

A review of the ERNS list, as provided by EDR, and dated 08/08/2000 has revealed that there are 2 ERNS sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
3701 CONNECTICUT AVE NW AT AN	3701 CONNECTICUT AVE NW	1/4 - 1/2 NNW	S70	19
3701 CT AVE NW APARTMENT BUILD	3701 CT AVE NW APARTMEN	1/4 - 1/2 NNW	S73	19

STATE ASTM STANDARD

LUST: The Leaking Underground Storage Tank Incident Reports contain an inventory of reported leaking underground storage tank incidents. The data come from the Department of Consumer and Regulatory Affairs' District of Columbia LUST Cases list.

A review of the LUST list, as provided by EDR, and dated 09/05/2000 has revealed that there are 40 LUST sites within approximately 1.5 miles of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
CENTER CATHEDRAL MANSION	*3000 CONNECTICUT AV NW*	*1/8 - 1/4 SSE*	*E19*	*9*
CIRCLE MANAGEMENT PROPERTY	*3501 CONNECTICUT AV NW*	*1/8 - 1/4 NNW*	*F21*	*9*
MARET SCHOOL (PRIVATE)	3000 CATHEDRAL AVE., NW	1/4 - 1/2 SSW	H33	12
TEXACO	*4225 CONNECTICUT AV NW*	*1/2 - 1 NNW*	*V93*	*23*
SAINT SOPHIA CHURCH	36TH / MASS. AVE, NW	1/2 - 1 WSW	96	24
ALBAN TOWERS	*3700 MASSACHUSETTS AV N*	*1/2 - 1 WSW*	*97*	*24*
GARFIELD HOUSE APARTME	2844 WISCONSIN AVE NW	1/2 - 1 WSW	98	24
CHARLES E SMITH REALTY PROPERT	*4411 CONNECTICUT AV NW*	*1 - 2 NNW*	*W100*	*25*
CARILLON HOUSE	2500 WISCONSIN AVENUE,	1 - 2 SW	102	25
ANNUNCIATION CATHOLIC CHURCH	*3125 39TH ST NW*	*1 - 2 W*	*103*	*26*
AMOCO OIL CO S/S #3478	*2450 WISCONSIN AV NW*	*1 - 2 SW*	*104*	*26*
CONNECTICUT HOUSE	*4500 CONNECTICUT AV NW*	*1 - 2 NNW*	*105*	*26*
CATHEDRAL AVENUE COOP	4101 CATHEDRAL AVE., NW	1 - 2 W	109	27
3900 TUNLAW COOPERATIVE	*3900 TUNLAW COOPERATIVE*	*1 - 2 WSW*	*110*	*27*
3900 WATSON PLACE INC.	*3900 WATSON PL NW*	*1 - 2 WSW*	*X111*	*27*
WATSON PLACE CONDOMI	3900 WATSON PLACE, NW	1 - 2 WSW	X112	28
BERKSHIRE APARTMENTS	*4201 MASSACHUSETTS AV N*	*1 - 2 W*	*116*	*29*
ESSEX CONDO	*4740 CONNECTICUT AV NW*	*1 - 2 NNW*	*125*	*31*

Lower Elevation	Address	Dist / Dir	Map ID	Page
CONNECTICUT PLAZA APARTMENTS	*2901 CONNECTICUT AV NW*	*1/4 - 1/2 SSE*	*M43*	*14*
CONNECTICUT PLAZA APARTMENTS	*2331 CATHEDRAL AV NW*	*1/4 - 1/2 SSE*	*P60*	*17*
CALVERT WOODLEY APARTMENTS	*2601 WOODLEY RD NW*	*1/2 - 1 SSE*	*89*	*22*
CLEVELAND HOUSE	*2727 29TH ST NW*	*1/2 - 1 S*	*90*	*22*
CALVERT HOUSE APTS.	*2401 CALVERT ST NW*	*1/2 - 1 SSE*	*91*	*23*
ROYAL NETHERLANDS EMBASSY	*4200 LINNEAN AV NW*	*1/2 - 1 N*	*94*	*23*

Lower Elevation	Address	Dist / Dir	Map ID	Page
BRITISH EMBASSY	*3100 MASSACHUSETTS AV N*	*1/2 - 1 SSW*	*95*	*24*
1768 COLUMBIA ROAD ASSOC LLC	*1768 COLUMBIA RD NW*	*1 - 2 SE*	*99*	*25*
CROMWELL APARTMENTS	*1515 OGDEN ST NW*	*1 - 2 E*	*106*	*26*
2100 COOPERATIVE ASSOC	2100 19TH ST, NW	1 - 2 SE	107	27
AMOCO OIL CO S/S #84665	*2307 CHAMPLAIN ST NW*	*1 - 2 SE*	*108*	*27*
WASHINGTON HILTON HOTEL & TOWE	*1919 CONNECTICUT AV NW*	*1 - 2 SSE*	*113*	*28*
DORCHESTER HOUSE APART	2480 16TH ST, NW	1 - 2 ESE	114	28
UNIVERSAL NORTH BLDG	*1875 CONNECTICUT AVE NW*	*1 - 2 SSE*	*115*	*28*
DIPLOMAT APARTMENTS	*2420 16TH ST NW*	*1 - 2 SE*	*117*	*29*
TWIN OAKS APTS - 3800	3800 14TH STREET, NW	1 - 2 ENE	118	29
AMOCO OIL CO (FORMER)	*3037 14TH ST NW*	*1 - 2 ESE*	*119*	*30*
AMERICAN GEOPHYSICAL U	2000 FLORIDA AVE, NW	1 - 2 SSE	Y120	30
PRESIDENT MADISON APPA	1908 FLORIDA AVE., NW	1 - 2 SSE	Y121	30
ADAMS MORGAN FOREIGN CAR SERVI	*1781 FLORIDA AV NW*	*1 - 2 SE*	*122*	*30*
FAIRMONT I LTD PARTNERS	1401 FAIRMONT ST., NW	1 - 2 ESE	123	30
AMOCO	2600 14TH STREET, NW	1 - 2 ESE	126	31

UST: The Underground Storage Tank database contains registered USTs. USTs are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA). The data come from the Department of Consumer & Regulatory Affairs' D.C. UST Database List.

A review of the UST list, as provided by EDR, and dated 07/19/1999 has revealed that there are 78 UST sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
PARKWAY APARTMENTS	3220 CONNECTICUT AV NW	0 - 1/8 NNW	1	5
CLEVELAND PARK BRANCH LIBRARY	3300 CONNECTICUT AV NW	0 - 1/8 NNW	2	5
UNKNOWN	2715 CORTLAND PL NW	0 - 1/8 S	4	5
UNKNOWN	3400 CONNECTICUT AV NW	0 - 1/8 NNW	B6	5
UNKNOWN	2911 NEWARK ST NW	0 - 1/8 NNW	B8	6
UPTOWN THEATER	3426 CONNECTICUT AV NW	1/8 - 1/4 NNW	C10	7
UNKNOWN	3100 CONNECTICUT AV NW	1/8 - 1/4 SSE	11	7
UNKNOWN	3432 CONNECTICUT AV NW	1/8 - 1/4 NNW	C12	7
UNKNOWN	3417 CONNECTICUT AV NW	1/8 - 1/4 NNW	D13	7
CLEVELAND TERRACE CONDOMINIUM	2755 ORDWAY ST NW	1/8 - 1/4 N	15	8
UNKNOWN	3435 CONNECTICUT AV NW	1/8 - 1/4 NNW	D16	9
APARTMENTS	3039 MACOMB ST NW	1/8 - 1/4 WNW	17	9
SMITHSONIAN NAT ZOOLOGICAL PAR	3001 CONNECTICUT AV NW	1/8 - 1/4 SSE	E18	9
CENTER CATHEDRAL MANSION	*3000 CONNECTICUT AV NW*	*1/8 - 1/4 SSE*	*E19*	*9*
CIRCLE MANAGEMENT PROPERTY	*3501 CONNECTICUT AV NW*	*1/8 - 1/4 NNW*	*F21*	*9*
UNKNOWN	3520 CONNECTICUT AV NW	1/8 - 1/4 NNW	F23	10
DCFD ENGINE CO. #28	3522 CONNECTICUT AV NW	1/8 - 1/4 NNW	F24	10
EXXON S/S #2-1806	3535 CONNECTICUT AV NW	1/8 - 1/4 NNW	G27	11
QUEBEC HOUSE	2800 PORTER ST NW	1/4 - 1/2 NNW	28	11
UNKNOWN	3029 KLINGLE RD NW	1/4 - 1/2 SW	29	11
UNKNOWN	2927 ORDWAY ST NW	1/4 - 1/2 NW	30	11
UNKNOWN	3000 WOODLEY RD NW	1/4 - 1/2 SSW	H31	12
APARTMENT BUILDING	3601 CONNECTICUT AV NW	1/4 - 1/2 NNW	I35	12
UNKNOWN	2902 PORTER ST NW	1/4 - 1/2 NNW	I36	12
UNKNOWN	3109 WOODLEY RD NW	1/4 - 1/2 SW	L41	13
UNKNOWN	2865 29TH ST NW	1/4 - 1/2 S	N45	14
UNKNOWN	3126 WOODLEY RD NW	1/4 - 1/2 SW	L46	14
ARCADIA APARMTNETS	3614 CONNECTICUT AV NW	1/4 - 1/2 NNW	I47	14
UNKNOWN	3105 WOODLEY RD NW	1/4 - 1/2 SW	L48	15

EXECUTIVE SUMMARY

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
GLADY'S CARLEY	2926 PORTER ST NW	1/4 - 1/2 NNW	I49	15
UNKNOWN	3117 WOODLEY RD NW	1/4 - 1/2 SW	O50	15
APARTMENT BUILDING	3616 CONNECTICUT AV NW	1/4 - 1/2 NNW	I51	15
UNKNOWN	3113 WOODLEY RD NW	1/4 - 1/2 SW	O52	15
UNKNOWN	3618 CONNECTICUT AV NW	1/4 - 1/2 NNW	I53	16
UNKNOWN	3101 WOODLEY RD NW	1/4 - 1/2 SW	O54	16
UNKNOWN	3201 WOODLEY RD NW	1/4 - 1/2 WSW	55	16
UNKNOWN	3624 CONNECTICUT AV NW	1/4 - 1/2 NNW	56	16
UNKNOWN	3502 30TH ST NW	1/4 - 1/2 NW	57	16
UNKNOWN	2851 29TH ST NW	1/4 - 1/2 S	N58	16
UNKNOWN	3200 WOODLEY RD NW	1/4 - 1/2 WSW	59	17
JOS. C. COLQUITT	3100 HAWTHORNE ST NW	1/4 - 1/2 SW	61	17
UNKNOWN	3008 32ND ST NW	1/4 - 1/2 WSW	Q65	18
UNKNOWN	3006 32ND ST NW	1/4 - 1/2 SW	Q66	18
UNKNOWN	3101 GARFIELD ST NW	1/4 - 1/2 SW	68	18
3701 CONNECTICUT AV CONDO ASSO	3701 CONNECTICUT AV NW	1/4 - 1/2 NNW	S71	19
SEDGWICK GARDENS	3726 CONNECTICUT AV NW	1/4 - 1/2 NNW	S74	19
ARTHUR MEIGS	3224 CATHEDRAL AV NW	1/4 - 1/2 WSW	75	19
RALPH BECKER	2916 32ND ST NW	1/4 - 1/2 SW	T76	20
UNKNOWN	2914 32ND ST NW	1/4 - 1/2 SW	T77	20
UNKNOWN	2912 32ND ST NW	1/4 - 1/2 SW	T78	20
UNKNOWN	2907 32ND ST NW	1/4 - 1/2 SW	T79	20
UNKNOWN	3307 WOODLEY RD NW	1/4 - 1/2 WSW	81	21
UNKNOWN	3200 GARFIELD ST NW	1/4 - 1/2 SW	U82	21
UNKNOWN	3201 GARFIELD ST NW	1/4 - 1/2 SW	U83	21
MICHAEL MEAGHER	3301 MACOMB ST NW	1/4 - 1/2 W	84	21
UNKNOWN	3801 CONNECTICUT AV NW	1/4 - 1/2 NNW	86	21
UNKNOWN	3148 CLEVELAND AV NW	1/4 - 1/2 SW	87	22

Lower Elevation	Address	Dist / Dir	Map ID	Page
KLINGLE APARTMENTS	2755 MACOMB ST NW	0 - 1/8 NE	A3	5
APARTMENTS	2710 MACOMB ST NW	0 - 1/8 NE	A5	5
PORTER STREET APARTMENT	2501 PORTER ST NW	1/8 - 1/4 NE	20	9
UNKNOWN	2929 CONNECTICUT AV NW	1/8 - 1/4 SSE	25	10
CONNECTICUT PLAZA APARTMENTS	2915 CONNECTICUT AV NW	1/4 - 1/2 SSE	34	12
QUEBEC HOUSE APARTMENTS	2801 QUEBEC ST NW	1/4 - 1/2 NNE	J37	13
QUEBEC HOUSE SOUTH APARTMENTS	2800 QUEBEC ST NW	1/4 - 1/2 NNE	J38	13
ADAS ISRAEL CONGREGATION	2750 QUEBEC ST NW	1/4 - 1/2 NNE	J39	13
UNKNOWN	2829 28TH ST NW	1/4 - 1/2 S	K40	13
UNKNOWN	2827 28TH ST NW	1/4 - 1/2 S	K42	14
CONNECTICUT PLAZA APARTMENTS	***2901 CONNECTICUT AV NW***	***1/4 - 1/2 SSE***	***M43***	***14***
UNKNOWN	2900 CONNECTICUT AV NW	1/4 - 1/2 SSE	M44	14
CONNECTICUT PLAZA APARTMENTS	***2331 CATHEDRAL AV NW***	***1/4 - 1/2 SSE***	***P60***	***17***
UNKNOWN	2323 PORTER ST NW	1/4 - 1/2 ENE	62	17
THE CARLTON CONDOMINIUM	2829 CONNECTICUT AV NW	1/4 - 1/2 SSE	63	17
UNKNOWN	2301 CATHEDRAL AV NW	1/4 - 1/2 SE	P64	18
UNKNOWN	2828 CONNECTICUT AV NW	1/4 - 1/2 SSE	R67	18
APARTMENT BUILDING	2824 CONNECTICUT NW	1/4 - 1/2 SSE	R69	19
UNKNOWN	2800 WOODLEY RD NW	1/4 - 1/2 S	80	20
UNKNOWN	2751 WOODLEY PL NW	1/4 - 1/2 SSE	85	21
ST THOMAS THE APOSTLE CHURCH	2665 WOODLEY RD NW	1/4 - 1/2 SSE	88	22

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required

Elapsed ASTM days: Provides confirmation that this EDR report meets or exceeds the 90 day updating requirement of the ASTM standard

FEDERAL ASTM STANDARD RECORDS

NPL: National Priority List
Source: EPA
Telephone: N/A
National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC).

Date of Government Version: 06/13/00
Date Made Active at EDR: 07/06/00
Database Release Frequency: Semi-Annually
Date of Data Arrival at EDR: 06/27/00
Elapsed ASTM days: 9
Date of Last EDR Contact: 08/07/00

DELISTED NPL: NPL Deletions
Source: EPA
Telephone: N/A
The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425 (e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 06/13/00
Date Made Active at EDR: 07/06/00
Database Release Frequency: Semi-Annually
Date of Data Arrival at EDR: 06/27/00
Elapsed ASTM days: 9
Date of Last EDR Contact: 08/07/00

CERCLIS: Comprehensive Environmental Response, Compensation, and Liability Information System
Source: EPA
Telephone: 703-413-0223
CERCLIS contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). CERCLIS contains sites which are either proposed to or on the National Priorities List (NPL) and sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 04/16/00
Date Made Active at EDR: 08/16/00
Database Release Frequency: Quarterly
Date of Data Arrival at EDR: 06/05/00
Elapsed ASTM days: 72
Date of Last EDR Contact: 08/28/00

CERCLIS-NFRAP: No Further Remedial Action Planned
Source: EPA
Telephone: 703-413-0223
As of February 1995, CERCLIS sites designated "No Further Remedial Action Planned" (NFRAP) have been removed from CERCLIS. NFRAP sites may be sites where, following an initial investigation, no contamination was found, contamination was removed quickly without the need for the site to be placed on the NPL, or the contamination was not serious enough to require Federal Superfund action or NPL consideration. EPA has removed approximately 25,000 NFRAP sites to lift the unintended barriers to the redevelopment of these properties and has archived them as historical records so EPA does not needlessly repeat the investigations in the future. This policy change is part of the EPA's Brownfields Redevelopment Program to help cities, states, private investors and affected citizens to promote economic redevelopment of unproductive urban sites.

Date of Government Version: 04/16/00
Date Made Active at EDR: 08/16/00
Database Release Frequency: Quarterly
Date of Data Arrival at EDR: 06/05/00
Elapsed ASTM days: 72
Date of Last EDR Contact: 08/28/00

CORRACTS: Corrective Action Report
Source: EPA
Telephone: 800-424-9346
CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 04/20/00
Date Made Active at EDR: 08/01/00
Database Release Frequency: Semi-Annually
Date of Data Arrival at EDR: 06/12/00
Elapsed ASTM days: 50
Date of Last EDR Contact: 09/12/00

RCRIS: Resource Conservation and Recovery Information System
Source: EPA/NTIS
Telephone: 800-424-9346
Resource Conservation and Recovery Information System. RCRIS includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA).

Date of Government Version: 06/21/00
Date Made Active at EDR: 07/31/00
Database Release Frequency: Semi-Annually
Date of Data Arrival at EDR: 07/10/00
Elapsed ASTM days: 21
Date of Last EDR Contact: 09/26/00

ERNS: Emergency Response Notification System
Source: EPA/NTIS
Telephone: 202-260-2342
Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 08/08/00
Date Made Active at EDR: 09/06/00
Database Release Frequency: Quarterly
Date of Data Arrival at EDR: 08/11/00
Elapsed ASTM days: 26
Date of Last EDR Contact: 08/02/00

FEDERAL ASTM SUPPLEMENTAL RECORDS

BRS: Biennial Reporting System
Source: EPA/NTIS
Telephone: 800-424-9346
The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/31/97
Database Release Frequency: Biennially
Date of Last EDR Contact: 09/18/00
Date of Next Scheduled EDR Contact: 12/18/00

CONSENT: Superfund (CERCLA) Consent Decrees
Source: EPA Regional Offices
Telephone: Varies
Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: N/A
Database Release Frequency: Varies
Date of Last EDR Contact: N/A
Date of Next Scheduled EDR Contact: N/A

ROD: Records Of Decision
Source: NTIS
Telephone: 703-416-0223
Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 01/31/99
Database Release Frequency: Annually
Date of Last EDR Contact: 08/15/00
Date of Next Scheduled EDR Contact: 10/09/00

FINDS: Facility Index System/Facility Identification Initiative Program Summary Report
Source: EPA
Telephone: N/A
Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report. PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 10/13/99
Database Release Frequency: Quarterly
Date of Last EDR Contact: 10/10/00
Date of Next Scheduled EDR Contact: 01/08/01

HMIRS: Hazardous Materials Information Reporting System
Source: U.S. Department of Transportation
Telephone: 202-366-4526
Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 06/30/99
Database Release Frequency: Annually
Date of Last EDR Contact: 07/25/00
Date of Next Scheduled EDR Contact: 10/23/00

MLTS: Material Licensing Tracking System
Source: Nuclear Regulatory Commission
Telephone: 301-415-7169
MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 04/23/00
Database Release Frequency: Quarterly
Date of Last EDR Contact: 10/10/00
Date of Next Scheduled EDR Contact: 01/08/01

MINES: Mines Master Index File
Source: Department of Labor, Mine Safety and Health Administration
Telephone: 303-231-5959

Date of Government Version: 08/01/98
Database Release Frequency: Semi-Annually
Date of Last EDR Contact: 10/02/00
Date of Next Scheduled EDR Contact: 01/01/01

NPL LIENS: Federal Superfund Liens
Source: EPA
Telephone: 205-564-4267
Federal Superfund Liens. Under the authority granted the USEPA by the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner receives notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

Date of Government Version: 10/15/91
Database Release Frequency: No Update Planned
Date of Last EDR Contact: 08/21/00
Date of Next Scheduled EDR Contact: 11/20/00

PADS: PCB Activity Database System
Source: EPA
Telephone: 202-260-3936
PCB Activity Database. PADS identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 01/01/00
Database Release Frequency: Annually
Date of Last EDR Contact: 08/15/00
Date of Next Scheduled EDR Contact: 11/13/00

RAATS: RCRA Administrative Action Tracking System
Source: EPA
Telephone: 202-564-4104
RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

Date of Government Version: 04/17/95
Database Release Frequency: No Update Planned

Date of Last EDR Contact: 09/12/00
Date of Next Scheduled EDR Contact: 12/11/00

TRIS: Toxic Chemical Release Inventory System
Source: EPA
Telephone: 202 260-1531
Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/97
Database Release Frequency: Annually

Date of Last EDR Contact: 09/25/00
Date of Next Scheduled EDR Contact: 12/25/00

TSCA: Toxic Substances Control Act
Source: EPA
Telephone: 202-260-1444
Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site.

Date of Government Version: 12/31/98
Database Release Frequency: Every 4 Years

Date of Last EDR Contact: 09/12/00
Date of Next Scheduled EDR Contact: 12/11/00

DISTRICT OF COLUMBIA ASTM STANDARD RECORDS

SHWS: CERCLIS
Source: EPA
Telephone: 703-413-0223
State Hazardous Waste Sites. State hazardous waste site records are the states' equivalent to CERCLIS. These sites may or may not already be listed on the federal CERCLIS list. Priority sites planned for cleanup using state funds (state equivalent of Superfund) are identified along with sites where cleanup will be paid for by potentially responsible parties. Available information varies by state.

Date of Government Version: 02/24/00
Date Made Active at EDR: 11/11/99
Database Release Frequency: Monthly

Date of Data Arrival at EDR: 08/30/99
Elapsed ASTM days: 73
Date of Last EDR Contact: 09/25/00

LF: N/A
Source: Department of Consumer and Regulatory Affairs
Telephone: 202-767-8512
Solid Waste Facilities/Landfill Sites. SWF/LF type records typically contain an inventory of solid waste disposal facilities or landfills in a particular state. Depending on the state, these may be active or inactive facilities or open dumps that failed to meet RCRA Subtitle D Section 4004 criteria for solid waste landfills or disposal sites

Date of Government Version: N/A
Date Made Active at EDR: N/A
Database Release Frequency: No Update Planned

Date of Data Arrival at EDR: N/A
Elapsed ASTM days: 0
Date of Last EDR Contact: 08/21/00

LUST: District of Columbia LUST Cases
Source: Department of Health
Telephone: 202-645-6080
Leaking Underground Storage Tank Incident Reports. LUST records contain an inventory of reported leaking underground storage tank incidents. Not all states maintain these records, and the information stored varies by state.

Date of Government Version: 09/05/00
Date Made Active at EDR: 10/19/00
Database Release Frequency: Semi-Annually

Date of Data Arrival at EDR: 09/12/00
Elapsed ASTM days: 37
Date of Last EDR Contact: 08/28/00

UST: D.C. UST Database List
Source: Department of Health
Telephone: 202-645-6080
Registered Underground Storage Tanks. UST's are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA) and must be registered with the state department responsible for administering the UST program. Available information varies by state program.

Date of Government Version: 07/19/99
Date Made Active at EDR: 09/22/99
Database Release Frequency: Semi-Annually

Date of Data Arrival at EDR: 07/29/99
Elapsed ASTM days: 55
Date of Last EDR Contact: 08/28/00

DISTRICT OF COLUMBIA ASTM SUPPLEMENTAL RECORDS

AST: List of AST Facilities
Source: Department of Health
Telephone: 202-727-7218

Date of Government Version: 07/19/99
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 08/28/00
Date of Next Scheduled EDR Contact: 12/18/00

EDR PROPRIETARY DATABASES

Former Manufactured Gas (Coal Gas) Sites: The existence and location of Coal Gas sites is provided exclusively to EDR by Real Property Scan, Inc. ©Copyright 1993 Real Property Scan, Inc. For a technical description of the types of hazards which may be found at such sites, contact your EDR customer service representative.

Disclaimer Provided by Real Property Scan, Inc.

The information contained in this report has predominantly been obtained from publicly available sources produced by entities other than Real Property Scan. *While reasonable steps have been taken to insure the accuracy of this report,* Real Property Scan does not guarantee the accuracy of this report. Any liability on the part of Real Property Scan is strictly limited to a refund of the amount paid. No claim is made for the actual existence of toxins at any site. This report does not constitute a legal *opinion.*

HISTORICAL AND OTHER DATABASE(S)

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be *complete. For example, the existence* of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

Oil/Gas Pipelines/Electrical Transmission Lines: This data was obtained by EDR from the USGS in 1994. *It is referred to by* USGS as GeoData Digital Line Graphs from 1:100,000-Scale Maps. It was extracted from the transportation category including some oil, but primarily gas pipelines and electrical transmission lines.

Sensitive Receptors: There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, *EDR indicates those* buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

Flood Zone Data: *This data, available in* select counties across the country, was obtained by EDR in 1999 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 1999 from the U.S. Fish and Wildlife Service.

GEOCHECK ®- PHYSICAL SETTING SOURCE ADDENDUM

TARGET PROPERTY ADDRESS

KLINGLE ROAD
INT OF CONNECTICUT AVE
WASHINGTON, DC 20008

TARGET PROPERTY COORDINATES

Latitude (North):	38.932201 - 38' 55' 55.9"
Longitude (West):	77.057297 - 77' 3' 26.3"
Universal Tranverse Mercator:	Zone 18
UTM X (Meters):	321672.2
UTM Y (Meters):	4311057.5

EDR's GeoCheck Physical Setting Source Addendum has been developed to assist the environmental professional with the collection of physical setting source information in accordance with ASTM 1527-00, Section 7.2.3. Section 7.2.3 requires that a current USGS 7.5 Minute Topographic Map (or equivalent, such as the USGS Digital Elevation Model) be reviewed. It also requires that one or more additional physical setting sources be sought when (1) conditions have been identified in which hazardous substances or petroleum products are likely to migrate to or from the property, and (2) more information than is provided in the current USGS 7.5 Minute Topographic Map (or equivalent) is generally obtained, pursuant to local good commercial or customary practice, to assess the impact of migration of recognized environmental conditions in connection with the property. Such additional physical setting sources generally include information about the topographic, hydrologic, hydrogeologic, and geologic characteristics of a site, and wells in the area.

Assessment of the impact of contaminant migration generally has two principle investigative components:

1. Groundwater flow direction, and
2. Groundwater flow velocity.

Groundwater flow direction may be impacted by surface topography, hydrology, hydrogeology, characteristics of the soil, and nearby wells. Groundwater flow velocity is generally impacted by the nature of the geologic strata. EDR's GeoCheck Physical Setting Source Addendum is provided to assist the environmental professional in forming an opinion about the impact of potential contaminant migration.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW DIRECTION INFORMATION

Groundwater flow direction for a particular site is best determined by a qualified environmental professional using site-specific well data. If such data is not reasonably ascertainable, it may be necessary to rely on other sources of information, such as surface topographic information, hydrologic information, hydrogeologic data collected on nearby properties, and regional groundwater flow information (from deep aquifers).

TOPOGRAPHIC INFORMATION

Surface topography may be indicative of the direction of surficial groundwater flow. This information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

USGS TOPOGRAPHIC MAP ASSOCIATED WITH THIS SITE

Target Property: 2438077-H1 WASHINGTON WEST, DC MD VA
Source: USGS 7.5 min quad index

GENERAL TOPOGRAPHIC GRADIENT AT TARGET PROPERTY

Target Property: General ENE

Source: General Topographic Gradient has been determined from the USGS 1 Degree Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified.

HYDROLOGIC INFORMATION

Surface water can act as a hydrologic barrier to groundwater flow. Such hydrologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Refer to the Physical Setting Source Map following this summary for hydrologic information (major waterways and bodies of water).

FEMA FLOOD ZONE

Target Property County	FEMA Q3 Flood Data Electronic Coverage
WASHINGTON, DC	YES

Flood Plain Panel at Target Property:	1100010010B / CBPP
Additional Panels in search area:	1100010020B / CBPP
	1100010005B / CBPP
	1100010015B / CBPP

NATIONAL WETLAND INVENTORY

NWI Quad at Target Property	NWI Electronic Coverage
WASHINGTON WEST	YES

HYDROGEOLOGIC INFORMATION

Hydrogeologic information obtained by installation of wells on a specific site can often be an indicator of groundwater flow direction in the immediate area. Such hydrogeologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Site-Specific Hydrogeological Data*:

Search Radius:	2.0 miles
Location Relative to TP:	1 - 2 Miles SE
Site Name:	WASHINGTON PLATING
Site EPA ID Number:	DCD047277801
Groundwater Flow Direction:	S TOWARD THE POTOMAC RIVER.
Inferred Depth to Water:	less than 124 feet
Hydraulic Connection:	Information is not available about the hydraulic connection between aquifer(s) underlying the site. *The depth to bedrock is less* than 124 feet.
Sole Source Aquifer:	A sole source aquifer is persent at or near the site
Data Quality:	Information *is inferred in the CERCLIS investigation report(s)*

AQUIFLOW+

Search Radius: 2.000 Miles.

EDR has developed the AQUIFLOW Information System to provide data on the general direction of *groundwater* flow at specific points. EDR has reviewed reports submitted by environmental professionals to regulatory *authorities at select* sites and has extracted the date of the report, groundwater flow direction as determined hydrogeologically, and the depth to water table.

MAP ID	LOCATION FROM TP	GENERAL DIRECTION *GROUNDWATER FLOW*
Not Reported		

GROUNDWATER *FLOW VELOCITY* INFORMATION

Groundwater flow velocity information for a particular site is best determined by a qualified environmental professional using site specific geologic and soil strata data. If such data are not reasonably ascertainable, it may be necessary to rely on other sources of *information, including* geologic age identification, rock stratigraphic unit and soil characteristics data collected on nearby properties and regional soil information. In general, contaminant plumes move more quickly through sandy-gravelly types of soils than silty-clayey types of soils.

GEOLOGIC INFORMATION IN GENERAL AREA OF TARGET PROPERTY

Geologic information can be used by the environmental professional in forming an opinion about *the relative speed* at which contaminant migration may be occurring.

GEOLOGIC AGE IDENTIFICATION

Geologic Code:	Ce
Era:	Paleozoic
System:	Cambrian
Series:	Cambrian

ROCK STRATIGRAPHIC UNIT

Category: Eugeosynclinal Deposits

Geologic Age and Rock Stratigraphic Unit Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - a digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS *Digital Data Series* DDS - 11 (1994).

DOMINANT SOIL COMPOSITION IN GENERAL AREA OF TARGET PROPERTY

The U.S. Department of Agriculture's (USDA) Soil Conservation Service (SCS) *leads the National Cooperative* Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information *for privately* owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing *more detailed* (SSURGO) soil survey maps. The following information is based on Soil Conservation Service STATSGO data.

No soil data reported.

* © 1994 Site Specific Hydrogeological data gathered by C.I.R.C.L.I.S. Alerts, Inc. (Lake Ridge Island, WA). All rights reserved. All of the information that is currently presented are those of the cited EPA reports, which have been completed under a Comprehensive Environmental Response Compensation and Liability Information System (CERCLIS) investigation.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

WELL SEARCH DISTANCE INFORMATION

DATABASE	SEARCH DISTANCE (miles)
Federal USGS	1.000
Federal FRDS PWS	Nearest PWS within 1 mile

FEDERAL USGS WELL INFORMATION

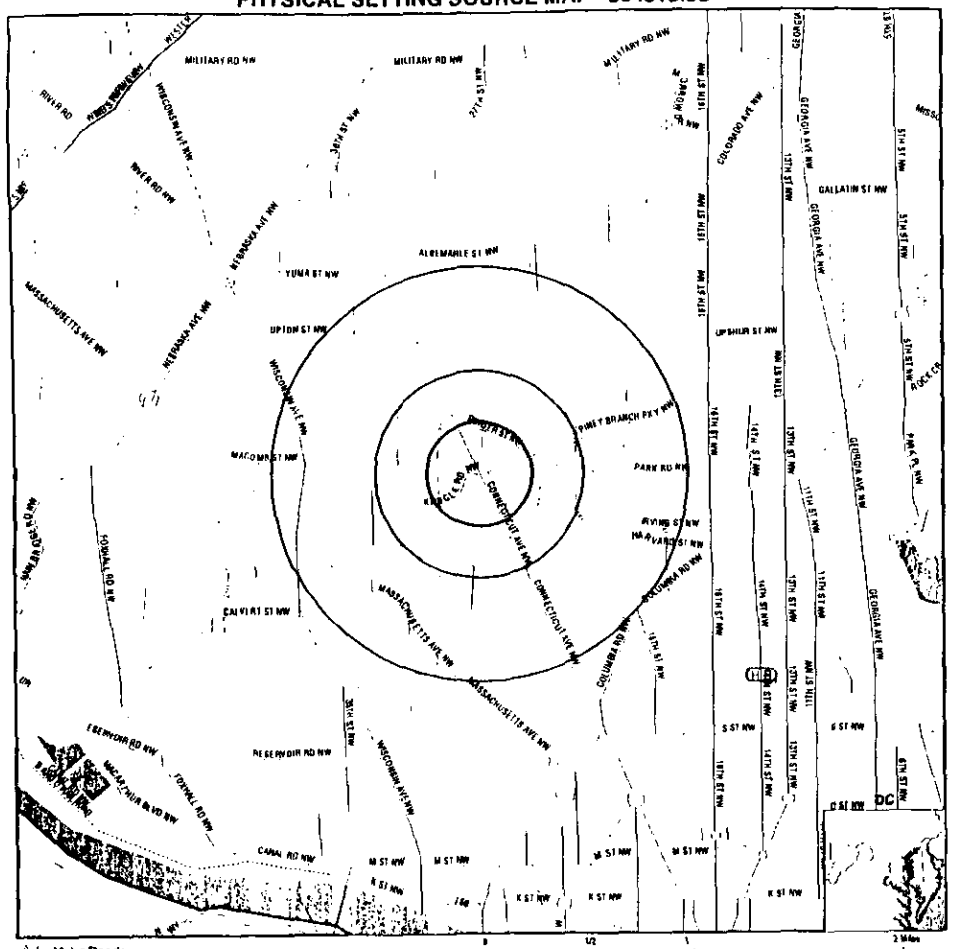
MAP ID	WELL ID	LOCATION FROM TP
No Wells Found		

FEDERAL FRDS PUBLIC WATER SUPPLY SYSTEM INFORMATION

MAP ID	*WELL ID*	LOCATION FROM TP
No PWS System Found		

Note: PWS System location is not always the same as *well location.*

PHYSICAL SETTING SOURCE MAP - 554815.3s



- Major Roads
- Contour Lines
- Water Wells
- Public Water Supply Wells
- Groundwater Flow Direction
- (GI) Indeterminate Groundwater Flow at Location
- (GV) Groundwater Flow Varies at Location
- Cluster of Multiple Icons
- Earthquake epicenter, Richter 5 or greater
- Closest Hydrogeological Data

TARGET PROPERTY:	Klingle Road	CUSTOMER:	Louis Berger & Associates
ADDRESS:	Int of Connecticut Ave	CONTACT:	Melissa Bird
CITY/STATE/ZIP:	Washington DC 20008	INQUIRY #:	554815.3s
LAT/LONG:	38.9322 / 77.0573	DATE:	October 20, 2000 1:30 pm

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS
RADON

AREA RADON INFORMATION

1996 Radon Information:

Zip Code: 20008

Number of sites tested: 644.

Maximum Radon Level: 48.1 pCi/L.
Minimum Radon Level: 0.8 pCi/L

pCi/L <4	pCi/L 4-10	pCi/L 10-20	pCi/L 20-50	pCi/L 50-100	pCi/L >100
514 (79.81%)	108 (16.77%)	19 (2.95%)	3 (0.47%)	0 (0.00%)	0 (0.00%)

HYDROLOGIC INFORMATION

Flood Zone Data: This data, available in select counties across the country, was obtained by EDR in 1999 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 1999 from the U.S. Fish and Wildlife Service.

HYDROGEOLOGIC INFORMATION

AQUIFLOW[R] Information System
Source: EDR proprietary database of groundwater flow information
EDR has developed the AQUIFLOW Information System (AIS) to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted to regulatory authorities at select sites and has extracted the date of the report, hydrogeologically determined groundwater flow direction and depth to water table *information.*

GEOLOGIC INFORMATION

Geologic Age and Rock Stratigraphic Unit
Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - A digital representation of the 1974 P.B. King and H.M. Beikman Map, *USGS Digital Data Series DDS - 11 (1994).*

STATSGO: State Soil Geographic Database
The U.S. Department of Agriculture's (USDA) Soil Conservation Service (SCS) leads the national Cooperative Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps *for STATSGO are compiled by generalizing* more detailed (SSURGO) soil survey maps.

ADDITIONAL ENVIRONMENTAL RECORD SOURCES

FEDERAL WATER WELLS

PWS: Public Water Systems
Source: EPA/Office of Drinking Water
Telephone: 202-260-2805
Public Water System data from the Federal Reporting Data System. A PWS is any water system which provides water to at least 25 people for at least 60 days annually. PWSs provide water from wells, rivers and other sources.

PWS ENF: Public Water Systems Violation and Enforcement Data
Source: EPA/Office of Drinking Water
Telephone: 202-260-2805
Violation and Enforcement data for Public Water Systems from the Safe Drinking Water Information System (SDWIS) after August 1995. Prior to August 1995, the data came from the Federal Reporting Data System (FRDS).

USGS Water Wells: In November 1971 the United States Geological Survey (USGS) implemented a national water resource information tracking system. This database contains descriptive information on sites where the USGS collects or has collected data on surface water and/or groundwater. *The groundwater* data includes information on more than 900,000 wells, springs, and other sources of groundwater.

RADON

Area Radon Information: The National Radon Database has been developed by the U.S. Environmental Protection Agency (USEPA) and is a compilation of the EPA/State Residential Radon Survey and the National Residential Radon Survey. *The* study covers the years 1986 - 1992. Where necessary data has been supplemented by information collected at private sources *such as universities* and research institutions.

EPA Radon Zones: Sections 307 & 309 of IRAA directed EPA to list and identify areas of U.S. with the potential for elevated indoor radon levels.

Statistical Summary Readings: Radon readings for Delaware, D.C., Maryland, Pennsylvania, Virginia and West Virginia. EPA Region 3.

OTHER

Epicenters: World earthquake epicenters, Richter 5 or greater
Source: Department of Commerce, National Oceanic and Atmospheric Administration

FEDERAL ASTM SUPPLEMENTAL

FINDS: The Facility Index System contains both facility information and "pointers" to other sources of information that contain more detail. These include: RCRIS; Permit Compliance System (PCS); Aerometric Information Retrieval System (AIRS); FATES (FIFRA [Federal Insecticide Fungicide Rodenticide Act] and TSCA Enforcement System, FTTS [FIFRA/TSCA Tracking System]; CERCLIS; DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes); Federal Underground Injection Control (FURS); Federal Reporting Data System (FRDS); Surface Impoundments (SIA); TSCA Chemicals in Commerce Information System (CICS); PADS; RCRA-J (medical waste transporters/disposers); TRIS; and TSCA. The source of this database is the U.S. EPA/NTIS.

A review of the FINDS list, as provided by EDR, and dated 10/13/1999 has revealed that there are 6 FINDS sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
UPTOWN CLEANERS	***3333 CONNECTICUT AVE NW***	***0 - 1/8 NNW***	***B7***	***6***
INTERNATIONAL VALET	***3420 CONNECTICUT AVE NW***	***1/8 - 1/4 NNW***	***B9***	***6***
CATHEDRAL CUSTOM CLEANERS	***3000 CONNECTICUT AVE NW***	***1/8 - 1/4 SSE***	***14***	***7***
PARKPLACE CLEANERS	3504 CONNECTICUT AVE. N	1/8 - 1/4 NNW	F22	10
KM INC EXXON SERVICE STATION	***3535 CONNECTICUT AVE NW***	***1/8 - 1/4 NNW***	***G26***	***10***
MARET SCHOOL INC	3000 CATHEDRAL AVE	1/4 - 1/2 SSW	H32	12

HMIRS: The Hazardous Materials Incident Report System contains hazardous material spill incidents reported to the Department of Transportation. The source of this database is the U.S. EPA.

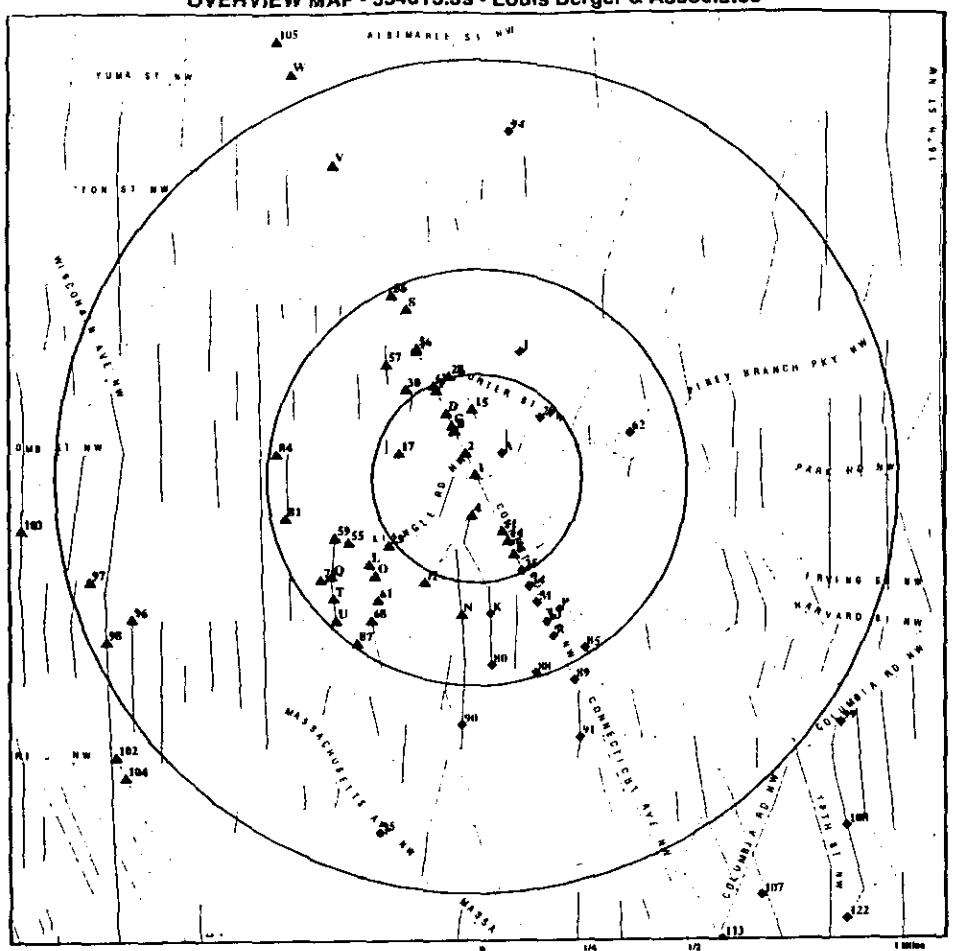
A review of the HMIRS list, as provided by EDR, and dated 06/30/1999 has revealed that there is 1 HMIRS site within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
Not reported	3002 RODMAN ST	1/4 - 1/2 NNW	S72	19

Due to poor or inadequate address information, the following sites were not mapped:

Site Name	Database(s)
GLOVER BRIDGE SITE	CERCLIS
SOAP STONE CREEK	CERC-NFRAP
UNKNOWN	UST
UNKNOWN	UST
BURNT WOOD ROAD NE AT FLORIDA AVE.	ERNS
NATIONAL ARBORETUM BLADENSBURG ROAD NE	ERNS
PARK ROAD AND BEACH DRIVE	ERNS

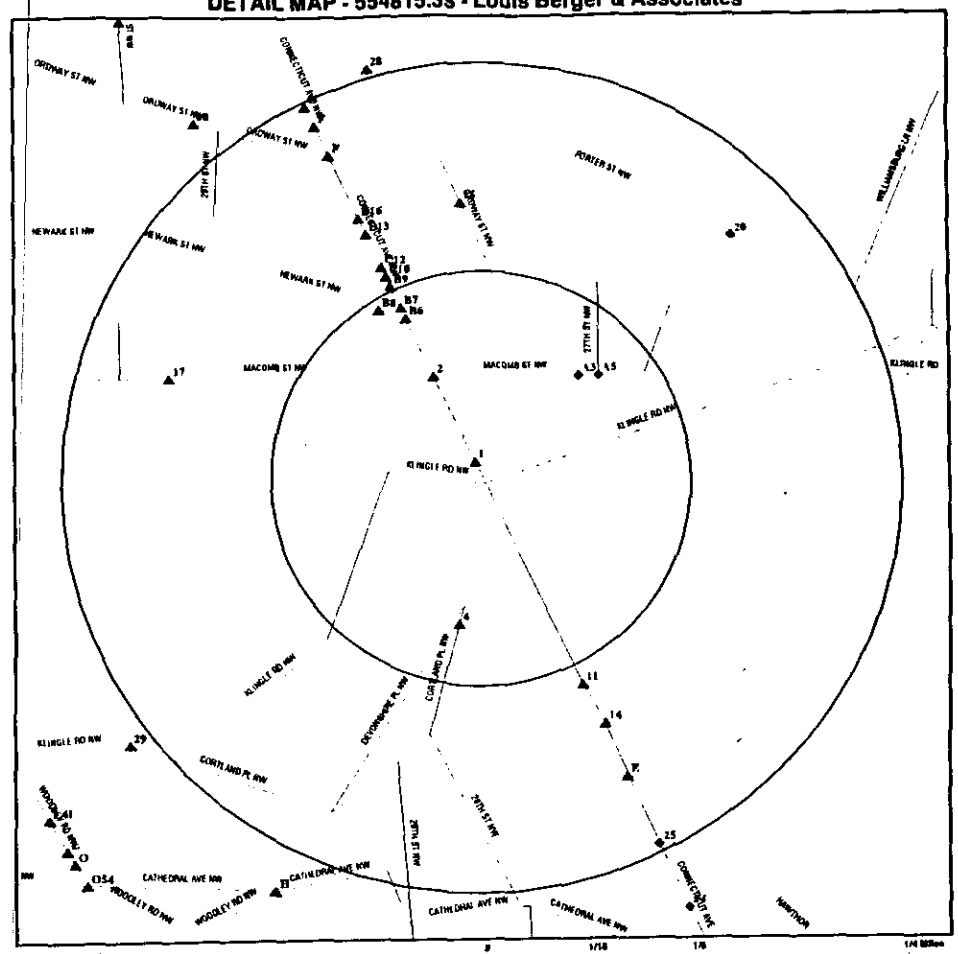
OVERVIEW MAP - 554815.3s - Louis Berger & Associates



- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Coal Gasification Sites (if requested)
- National Priority List Sites
- Landfill Sites
- Power transmission lines
- Oil & Gas pipelines
- 100-year flood zone
- 500-year flood zone
- Wetlands per National Wetlands Inventory

TARGET PROPERTY:	Klingle Road	CUSTOMER:	Louis Berger & Associates
ADDRESS:	Int of Connecticut Ave	CONTACT:	Melissa Bird
CITY/STATE/ZIP:	Washington DC 20008	INQUIRY #:	554815.3s
LAT/LONG:	38.9322 / 77.0573	DATE:	October 20, 2000 1:29 pm

DETAIL MAP - 554815.3s - Louis Berger & Associates



- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Coal Gasification Sites (if requested)
- Sensitive Receptors
- National Priority List Sites
- Landfill Sites
- Power transmission lines
- Oil & Gas pipelines
- 100-year flood zone
- 500-year flood zone

TARGET PROPERTY:	Klingle Road	CUSTOMER:	Louis Berger & Associates
ADDRESS:	Int of Connecticut Ave	CONTACT:	Melissa Bird
CITY/STATE/ZIP:	Washington DC 20008	INQUIRY #:	554815.3s
LAT/LONG:	38.9322 / 77.0573	DATE:	October 20, 2000 1:30 pm

MAP FINDINGS SUMMARY

Database	Target Property	Search Distance (Miles)	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
FEDERAL ASTM STANDARD								
NPL		1.500	0	0	0	0	0	0
Delisted NPL		1.500	0	0	0	0	0	0
CERCLIS		1.500	0	0	0	1	2	3
CERC-NFRAP		1.500	0	0	0	0	0	0
CORRACTS		1.500	0	0	0	0	0	0
RCRIS-TSD		1.500	0	0	0	0	0	0
RCRIS Lg. Quan. Gen.		0.500	0	0	0	NR	NR	0
RCRIS Sm. Quan. Gen.		0.500	1	3	0	NR	NR	4
ERNS		0.500	0	0	2	NR	NR	2
STATE ASTM STANDARD								
State Haz. Waste		1.000	0	0	0	0	NR	0
State Landfill		N/A	N/A	N/A	N/A	N/A	N/A	N/A
LUST		1.500	0	2	3	9	26	40
UST		0.500	7	15	56	NR	NR	78
FEDERAL ASTM SUPPLEMENTAL								
CONSENT		1.500	0	0	0	0	0	0
ROD		1.500	0	0	0	0	0	0
FINDS		0.500	1	4	1	NR	NR	6
HMIRS		0.500	0	0	1	NR	NR	1
MLTS		0.500	0	0	0	NR	NR	0
MINES		0.500	0	0	0	NR	NR	0
NPL Liens		0.500	0	0	0	NR	NR	0
PADS		0.500	0	0	0	NR	NR	0
RAATS		TP	NR	NR	NR	NR	NR	0
TRIS		0.500	0	0	0	NR	NR	0
TSCA		0.500	0	0	0	NR	NR	0
STATE OR LOCAL ASTM SUPPLEMENTAL								
AST		TP	NR	NR	NR	NR	NR	0
EDR PROPRIETARY DATABASES								
Coal Gas		N/A	N/A	N/A	N/A	N/A	N/A	N/A

AQUIFLOW - see EDR Physical Setting Source Addendum

TP = Target Property

NR = Not Requested at this Search Distance

* Sites may be listed in more than one database

MAP FINDINGS

Map ID / Direction / Distance / Distance (ft.) / Elevation	Site	Database(s)	EDR ID Number / EPA ID Number

Coal Gas Site Search: EDR does not presently have coal gas site information available in this state.

1 **NNW** **< 1/8** **60** **Higher**	**PARKWAY APARTMENTS** **3220 CONNECTICUT AV NW** **WASHINGTON, DC 20008**	**UST**	**U002109857** **N/A**
	UST: Facility ID: 3-001782 Owner: DC FIRE PREVENTION BRANCH		
2 **NNW** **< 1/8** **360** **Higher**	**CLEVELAND PARK BRANCH LIBRARY** **3300 CONNECTICUT AV NW** **WASHINGTON, DC 20008**	**UST**	**U003054932** **N/A**
	UST: Facility ID: 3-001804 Owner: D.C. PUBLIC LIBRARY		
A3 **NE** **< 1/8** **450** **Lower**	**KLINGLE APARTMENTS** **2755 MACOMB ST NW** **WASHINGTON, DC 20005**	**UST**	**U002110010** **N/A**
	UST: Facility ID: 3-004167 Owner: GEORGE ECONOMOS & TRUST		
4 **South** **< 1/8** **463** **Higher**	**UNKNOWN** **2715 CORTLAND PL NW** **WASHINGTON, DC 20008**	**UST**	**U003054958** **N/A**
	UST: Facility ID: 3-001871 Owner: DC FIRE PREVENTION BRANCH		
A5 **NE** **< 1/8** **496** **Lower**	**APARTMENTS** **2710 MACOMB ST NW** **WASHINGTON, DC 20008**	**UST**	**U003055007** **N/A**
	UST: Facility ID: 3-004165 Owner: WILLIAM C. SMITH COMPANY		
B6 **NNW** **< 1/8** **564** **Higher**	**UNKNOWN** **3400 CONNECTICUT AV NW** **WASHINGTON, DC 20008**	**UST**	**U003054885** **N/A**

UNKNOWN (Continued) — U003054885

UST
Facility ID: 3-001612
Owner: DC FIRE PREVENTION BRANCH

B7 NNW < 1/8 601 Higher — **UPTOWN CLEANERS**, **3333 CONNECTICUT AVE NW**, **WASHINGTON, DC 20008** — RCRIS-SQG, FINDS — 1000344076, DCD070918206

RCRIS:
Owner: 3333 CON CLEANERS INC (215) 555-1212
Contact: MICHAEL CUNNINGHAM (202) 363-5050
Record Date: 11/08/1985
Classification: Conditionally Exempt Small Quantity Generator
Used Oil Recyc: No
Violation Status: No violations found

FINDS:
Other Pertinent Environmental Activity Identified at Site:
AIRS Facility System (AIRS/AFS)

B8 NNW < 1/8 625 Higher — **UNKNOWN**, **2911 NEWARK ST NW**, **WASHINGTON, DC 20008** — UST — U003055195, N/A

UST:
Facility ID: 3-005331
Owner: DC FIRE PREVENTION BRANCH

B9 NNW 1/8-1/4 675 Higher — **INTERNATIONAL VALET**, **3420 CONNECTICUT AVE NW**, **WASHINGTON, DC 20008** — RCRIS-SQG, FINDS — 1000216659, DCD044758159

RCRIS:
Owner: SUH, JOO BOK (215) 555-1212
Contact: J SUH (202) 966-2966
Record Date: 01/26/1994
Classification: Conditionally Exempt Small Quantity Generator

INTERNATIONAL VALET (Continued) — 1000216659

Used Oil Recyc: No
Violation Status: No violations found

C10 NNW 1/8-1/4 709 Higher — **UPTOWN THEATER**, **3426 CONNECTICUT AV NW**, **, DC 20008** — UST — U003294470, N/A

UST:
Facility ID: 3-001805
Owner: CIRCLE COMPANIES

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11 SSE 1/8-1/4 726 Higher — **UNKNOWN**, **3100 CONNECTICUT AV NW**, **WASHINGTON, DC 20008** — UST — U003054916, N/A

UST:
Facility ID: 3-001781
Owner: 3024 TILDEN ST NW

C12 NNW 1/8-1/4 743 Higher — **UNKNOWN**, **3432 CONNECTICUT AV NW**, **WASHINGTON, DC 20008** — UST — U003054917, N/A

UST:
Facility ID: 3-001784
Owner: 3024 TILDEN ST NW

D13 NNW 1/8-1/4 858 Higher — **UNKNOWN**, **3417 CONNECTICUT AV NW**, **WASHINGTON, DC 20008** — UST — U003054886, N/A

UST:
Facility ID: 3-001613
Owner: 3024 TILDEN ST NW

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14 SSE 1/8-1/4 870 Higher — **CATHEDRAL CUSTOM CLEANERS**, **3000 CONNECTICUT AVE NW**, **WASHINGTON, DC 20008** — RCRIS-SQG, FINDS — 1000240230, DCD083503458

CATHEDRAL CUSTOM CLEANERS (Continued) — 1000240230

RCRIS:
Owner: BERNSTEIN MGMT (202) 363-6301
Contact: CHA H LEE (201) 234-9198
Record Date: 11/08/1985
Classification: Small Quantity Generator
Used Oil Recyc: No
Violation Status: Violations exist

Regulation Violated:	Not reported
Area of Violation:	Generator-All Requirements
Date Violation Determined:	05/05/1989
Priority of Violation:	Low
Schedule Date to Achieve Compliance:	07/02/1989
Actual Date Achieved Compliance:	05/17/1994
Enforcement Action:	Written Informal
Enforcement Action Date:	06/02/1989
Proposed Monetary Penalty:	Not reported
Final Monetary Penalty:	Not reported
Regulation Violated:	Not reported
Area of Violation:	Generator-All Requirements
Date Violation Determined:	03/06/1992
Priority of Violation:	Low
Schedule Date to Achieve Compliance:	04/01/1992
Actual Date Achieved Compliance:	03/25/1992
Enforcement Action:	Written Informal
Enforcement Action Date:	03/06/1992
Proposed Monetary Penalty:	Not reported
Final Monetary Penalty:	Not reported

There are 2 violation record(s) reported at this site

Evaluation	Area of Violation	Date of Compliance
Non-Financial Record Review	Generator-All Requirements	03/25/1992
Compliance Evaluation Inspection (CEI)	Generator-All Requirements	05/17/1994

FINDS:
Other Pertinent Environmental Activity Identified at Site:
AIRS Facility System (AIRS/AFS)

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15 North 1/8-1/4 881 Higher — **CLEVELAND TERRACE CONDOMINIUM**, **2755 ORDWAY ST NW**, **WASHINGTON, DC 20008** — UST — U003055184 / N/A

UST:
Facility ID: 3-005144
Owner: CLEVELAND TERRACE CONDO ASSOC

D16 NNW 1/8-1/4 914 Higher — **UNKNOWN**, **3435 CONNECTICUT AV NW**, **WASHINGTON, DC 20008** — UST — U003054918 / N/A

UST:
Facility ID: 3-001785
Owner: 3024 TILDEN ST NW

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17 WNW 1/8-1/4 1033 Higher — **APARTMENTS**, **3039 MACOMB ST NW**, **WASHINGTON, DC 20008** — UST — U003055006 / N/A

UST:
Facility ID: 3-004164
Owner: WILLIAM C. SMITH COMPANY

E18 SSE 1/8-1/4 1052 Higher — **SMITHSONIAN NAT ZOOLOGICAL PARK**, **3001 CONNECTICUT AV NW OFFICE OF FACILIT**, **WASHINGTON, DC 20008** — UST — U003111902 / N/A

UST:
Facility ID: 3-000670
Owner: SMITHSONIAN NAT ZOOLOGICAL PARK

E19 SSE 1/8-1/4 1052 Higher — **CENTER CATHEDRAL MANSION**, **3000 CONNECTICUT AV NW**, **WASHINGTON, DC 20008** — UST, LUST — U003054825 / N/A

LUST:
Case Number: 97081
Facility Status: Case Open
Product: H

UST:
Facility ID: 3-000163
Owner: COLUMBIA REALTY VENTURE

---

20 NE 1/8-1/4 1104 Lower — **PORTER STREET APARTMENT**, **2501 PORTER ST NW**, **WASHINGTON, DC 20008** — UST — U003055187 / N/A

UST:
Facility ID: 3-005235
Owner: SMITH PROPERTY HOLDINGS 3 L P

F21 NNW 1/8-1/4 1110 Higher — **CIRCLE MANAGEMENT PROPERTY**, **3501 CONNECTICUT AV NW**, **WASHINGTON, DC 20008** — UST, LUST — U002109699 / N/A

CIRCLE MANAGEMENT PROPERTY (Continued) — U002109699

LUST:
Case Number: 91039
Facility Status: Case Closed
Product: G

UST:
Facility ID: 3-000118
Owner: CIRCLE MANAGEMENT INC

F22 NNW 1/8-1/4 1133 Higher — **PARKPLACE CLEANERS**, **3504 CONNECTICUT AVE. N.W.**, **WASHINGTON, DC 20008** — FINDS — 1001879205 / 0000-0791-21

F23 NNW 1/8-1/4 1225 Higher — **UNKNOWN**, **3520 CONNECTICUT AV NW**, **WASHINGTON, DC 20008** — UST — U003054921 / N/A

UST:
Facility ID: 3-001788
Owner: DC FIRE PREVENTION BRANCH

F24 NNW 1/8-1/4 1236 Higher — **DCFD ENGINE CO. #28**, **3522 CONNECTICUT AV NW**, **WASHINGTON, DC 20008** — UST — U003054833 / N/A

UST:
Facility ID: 3-000299
Owner: DC FIRE DEPARTMENT

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25 SSE 1/8-1/4 1293 Lower — **UNKNOWN**, **2929 CONNECTICUT AV NW**, **WASHINGTON, DC 20008** — UST — U003053844 / N/A

UST:
Facility ID: 1-001611
Owner: DC FIRE PREVENTION BRANCH

G26 NNW 1/8-1/4 1304 Higher — **KM INC EXXON SERVICE STATION**, **3535 CONNECTICUT AVE NW**, **WASHINGTON, DC 20008** — RCRIS-SQG, FINDS — 1000732369 / DCD983970526

KM INC EXXON SERVICE STATION (Continued) — 1000732369

RCRIS:
Owner: KM INC
(202) 364-6360
Contact: WILLIAM MILFORD
(202) 364-6360
Record Date: 09/08/1992
Classification: Small Quantity Generator
Used Oil Recyc: No
Violation Status: No violations found

FINDS:
Other Pertinent Environmental Activity Identified at Site:
AIRS Facility System (AIRS/AFS)

G27 NNW 1/8-1/4 1304 Higher — **EXXON S/S #2-1806**, **3535 CONNECTICUT AV NW**, **WASHINGTON, DC 20008** — UST — U002109720 / N/A

UST:
Facility ID: 3-000372
Owner: EXXON COMPANY USA

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28 NNW 1/4-1/2 1347 Higher — **QUEBEC HOUSE**, **2800 PORTER ST NW**, **WASHINGTON, DC 20008** — UST — U002110280 / N/A

UST:
Facility ID: 3-005236
Owner: DC FIRE PREVENTION BRANCH

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29 SW 1/4-1/2 1389 Higher — **UNKNOWN**, **3029 KLINGLE RD NW**, **WASHINGTON, DC 20008** — UST — U003054868 / N/A

UST:
Facility ID: 3-001100
Owner: DC FIRE PREVENTION BRANCH

---

30 NW 1/4-1/2 1445 Higher — **UNKNOWN**, **2927 ORDWAY ST NW**, **WASHINGTON, DC 20008** — UST — U003055183 / N/A

UST:
Facility ID: 3-005143
Owner: UNKNOWN

Map ID / Direction / Distance / Distance (ft.) / Elevation	Site	Database(s)	EDR ID Number / EPA ID Number
H31 SSW 1/4-1/2 1458 Higher	**UNKNOWN** **3000 WOODLEY RD NW** **WASHINGTON, DC 20008** UST: Facility ID: 3-005058 Owner: DC FIRE PREVENTION BRANCH	UST	U003055164 N/A
H32 SSW 1/4-1/2 1459 Higher	**MARET SCHOOL INC** **3000 CATHEDRAL AVE** **WASHINGTON, DC 20008** FINDS: Other Pertinent Environmental Activity Identified at Site: Enforcement Docket System (DOCKET)	FINDS	1001626920 03-86-0214-0
H33 SSW 1/4-1/2 1459 Higher	**MARET SCHOOL (PRIVATE)** **3000 CATHEDRAL AVE., NW** **WASHINGTON, DC 20008** LUST: Case Number: 99062 Facility Status: Case Open Product: H	LUST	1001276719 N/A
34 SSE 1/4-1/2 1515 Lower	**CONNECTICUT PLAZA APARTMENTS** **2915 CONNECTICUT AV NW** **, DC 20008** UST: Facility ID: 1-001779 Owner: CONNECTICUT PLAZA APARTMENTS	UST	U003294394 N/A
I35 NNW 1/4-1/2 1671 Higher	**APARTMENT BUILDING** **3601 CONNECTICUT AV NW** **WASHINGTON, DC 20008** UST: Facility ID: 3-001790 Owner: DC FIRE PREVENTION BRANCH	UST	U002109864 N/A
I36 NNW 1/4-1/2 1679 Higher	**UNKNOWN** **2902 PORTER ST NW** **WASHINGTON, DC 20008**	UST	U003055188 N/A

Map ID / Direction / Distance / Distance (ft.) / Elevation	Site	Database(s)	EDR ID Number / EPA ID Number
	UNKNOWN (Continued) UST: Facility ID: 3-005238 Owner: DC FIRE PREVENTION BRANCH		U003055188
J37 NNE 1/4-1/2 1691 Lower	**QUEBEC HOUSE APARTMENTS** **2801 QUEBEC ST NW** **WASHINGTON, DC 20008** UST Facility ID: 3-004588 Owner: CAFRITZ LEASING MANAGEMENT	UST	U002110138 N/A
J38 NNE 1/4-1/2 1691 Lower	**QUEBEC HOUSE SOUTH APARTMENTS** **2800 QUEBEC ST NW** **WASHINGTON, DC 20008** UST: Facility ID: 3-000100 Owner: CAFRITZ LEASING MANAGEMENT	UST	U003054819 N/A
J39 NNE 1/4-1/2 1712 Lower	**ADAS ISRAEL CONGREGATION** **2750 QUEBEC ST NW** **WASHINGTON, DC 20008** UST: Facility ID: 3-004587 Owner: DC FIRE PREVENTION BRANCH	UST	U002110137 N/A
K40 South 1/4-1/2 1726 Lower	**UNKNOWN** **2829 28TH ST NW** **WASHINGTON, DC 20008** UST: Facility ID: 3-004301 Owner: 2829 28TH STREET L.L.C.	UST	U003055026 N/A
L41 SW 1/4-1/2 1734 Higher	**UNKNOWN** **3109 WOODLEY RD NW** **WASHINGTON, DC 20008** UST: Facility ID: 3-005061 Owner: UNKNOWN	UST	U003055167 N/A

Map ID / Direction / Distance / Distance (ft.) / Elevation	Site	Database(s)	EDR ID Number / EPA ID Number
K42 South 1/4-1/2 1737 Lower	UNKNOWN 2827 28TH ST NW WASHINGTON, DC 20008 UST: Facility ID: 3 004298 Owner: UNKNOWN	UST	U003055025 N/A
M43 SSE 1/4-1/2 1738 Lower	CONNECTICUT PLAZA APARTMENTS 2901 CONNECTICUT AV NW WASHINGTON, DC 20008 LUST: Case Number: 93020 Facility Status: Case Closed Product: H UST: Facility ID: 1-001610 Owner: CONNECTICUT PLAZA APARTMENTS	UST LUST	U002107639 N/A
M44 SSE 1/4-1/2 1738 Lower	UNKNOWN 2900 CONNECTICUT AV NW WASHINGTON, DC 20008 UST: Facility ID: 3-001778 Owner: DC FIRE PREVENTION BRANCH	UST	U003054915 N/A
N45 South 1/4-1/2 1740 Higher	UNKNOWN 2865 29TH ST NW WASHINGTON, DC 20008 UST: Facility ID: 3-004308 Owner: UNKNOWN	UST	U003055028 N/A
L46 SW 1/4-1/2 1755 Higher	UNKNOWN 3126 WOODLEY RD NW WASHINGTON, DC 20008 UST: Facility ID: 3-005064 Owner: UNKNOWN	UST	U003055170 N/A
I47 NNW 1/4-1/2 1755 Higher	ARCADIA APARMTNETS 3614 CONNECTICUT AV NW , DC 20008	UST	U003294464 N/A

Map ID / Direction / Distance / Distance (ft.) / Elevation	Site	Database(s)	EDR ID Number / EPA ID Number
	ARCADIA APARMTNETS (Continued)		U003294464
	UST: Facility ID: 3-001791 Owner: BORGER MANAGEMENT INC.		
L48 SW 1/4-1/2 1757 Higher	UNKNOWN 3105 WOODLEY RD NW WASHINGTON, DC 20008 UST: Facility ID: 3-005060 Owner: UNKNOWN	UST	U003055166 N/A
I49 NNW 1/4-1/2 1765 Higher	GLADY'S CARLEY 2926 PORTER ST NW WASHINGTON, DC 20008 UST: Facility ID: 3-005239 Owner: ROGER W & GLADYS CARLEY	UST	U003055189 N/A
O50 SW 1/4-1/2 1766 Higher	UNKNOWN 3117 WOODLEY RD NW WASHINGTON, DC 20008 UST: Facility ID: 3-005063 Owner: UNKNOWN	UST	U003055169 N/A
I51 NNW 1/4-1/2 1767 Higher	APARTMENT BUILDING 3616 CONNECTICUT AV NW WASHINGTON, DC 20008 UST: Facility ID: 3-001792 Owner: DC FIRE PREVENTION BRANCH	UST	U002109866 N/A
O52 SW 1/4-1/2 1771 Higher	UNKNOWN 3113 WOODLEY RD NW WASHINGTON, DC 20008 UST: Facility ID: 3-005062 Owner: UNKNOWN	UST	U003055168 N/A

Map ID / Direction / Distance / Distance (ft.) / Elevation	Site	Database(s)	EDR ID Number / EPA ID Number
53 NNW 1/4-1/2 1780 Higher	**UNKNOWN** **3618 CONNECTICUT AV NW** **WASHINGTON, DC 20008** UST: Facility ID: 3-001787 Owner: DC FIRE PREVENTION BRANCH	UST	U003054920 N/A
54 SW 1/4-1/2 1788 Higher	**UNKNOWN** **3101 WOODLEY RD NW** **WASHINGTON, DC 20008** UST: Facility ID: 3-005059 Owner: UNKNOWN	UST	U003055165 N/A
55 WSW 1/4-1/2 1805 Higher	**UNKNOWN** **3201 WOODLEY RD NW** **WASHINGTON, DC 20008** UST: Facility ID: 3-005070 Owner: UNKNOWN	UST	U003055176 N/A
56 NNW 1/4-1/2 1816 Higher	**UNKNOWN** **3624 CONNECTICUT AV NW** **WASHINGTON, DC 20008** UST: Facility ID: 3-001786 Owner: DC FIRE PREVENTION BRANCH	UST	U003054919 N/A
57 NW 1/4-1/2 1842 Higher	**UNKNOWN** **3502 30TH ST NW** **WASHINGTON, DC 20008** UST Facility ID: 3-003627 Owner: UNKNOWN	UST	U003054998 N/A
N58 South 1/4-1/2 1866 Higher	**UNKNOWN** **2851 29TH ST NW** **WASHINGTON, DC 20008**	UST	U003055027 N/A

Map ID / Direction / Distance / Distance (ft.) / Elevation	Site	Database(s)	EDR ID Number / EPA ID Number
	UNKNOWN (Continued) UST: Facility ID: 3-004307 Owner: UNKNOWN		U003055027
59 WSW 1/4-1/2 1934 Higher	**UNKNOWN** **3200 WOODLEY RD NW** **WASHINGTON, DC 20008** UST: Facility ID: 3-005052 Owner: UNKNOWN	UST	U003055158 N/A
P60 SSE 1/4-1/2 1955 Lower	**CONNECTICUT PLAZA APARTMENTS** **2331 CATHEDRAL AV NW** **WASHINGTON, DC 20008** LUST: Case Number: 93022 Facility Status: Case Closed Product: H UST: Facility ID: 1-001671 Owner: CONNECTICUT PLAZA APARTMENTS	UST LUST	U002107663 N/A
61 SW 1/4-1/2 1976 Higher	**JOS. C. COLQUITT** **3100 HAWTHORNE ST NW** **WASHINGTON, DC 20008** UST: Facility ID: 3-004082 Owner: JOS. C. COLQUITT	UST	U002110006 N/A
62 ENE 1/4-1/2 2003 Lower	**UNKNOWN** **2323 PORTER ST NW** **WASHINGTON, DC 20008** UST: Facility ID: 3-005233 Owner: UNKNOWN	UST	U003055185 N/A
63 SSE 1/4-1/2 2017 Lower	**THE CARLTON CONDOMINIUM** **2829 CONNECTICUT AV NW** **WASHINGTON, DC 20008**	UST	U003053876 N/A

THE CARLTON CONDOMINIUM (Continued) — U003053876

UST:
Facility ID: 1-001777
Owner: THE CARLTON CONDOMINIUM

P64 SE 1/4-1/2 2057 Lower — UNKNOWN, 2301 CATHEDRAL AV NW, WASHINGTON, DC 20008 — UST — U003053857 / N/A

UST:
Facility ID: 1-001670
Owner: CATHCONN ASSOCIATES LTD

Q65 WSW 1/4-1/2 2207 Higher — UNKNOWN, 3008 32ND ST NW, WASHINGTON, DC 20008 — UST — U003055084 / N/A

UST:
Facility ID: 3-004495
Owner: UNKNOWN

Q66 SW 1/4-1/2 2217 Higher — UNKNOWN, 3006 32ND ST NW, WASHINGTON, DC 20008 — UST — U003055083 / N/A

UST:
Facility ID: 3-004494
Owner: UNKNOWN

R67 SSE 1/4-1/2 2223 Lower — UNKNOWN, 2828 CONNECTICUT AV NW, WASHINGTON, DC 20008 — UST — U003054914 / N/A

UST:
Facility ID: 3-001776
Owner: DC FIRE PREVENTION BRANCH

S8 SW 1/4-1/2 2240 Higher — UNKNOWN, 3101 GARFIELD ST NW, WASHINGTON, DC 20008 — UST — U003054858 / N/A

UST:
Facility ID: 3-000843
Owner: 30/60 M ST. LIMITED PARTNERSHIP

R69 SSE 1/4-1/2 2251 Lower — APARTMENT BUILDING, 2824 CONNECTICUT NW, WASHINGTON, DC 20008 — UST — U003111903 / N/A

UST:
Facility ID: 3-001775
Owner: NATHAN KOTZ

S70 NNW 1/4-1/2 2261 Higher — 3701 CONNECTICUT AVE NW AT AN APARTMENT BUILDING, 3701 CONNECTICUT AVE NW AT AN APARTMENT BUILDING, WASHINGTON, DC — ERNS — 8718877 / N/A

S71 NNW 1/4-1/2 2262 Higher — 3701 CONNECTICUT AV CONDO ASSOC, 3701 CONNECTICUT AV NW, WASHINGTON, DC 20005 — UST — U002109891 / N/A

UST:
Facility ID: 3-001821
Owner: 3701 CONNECTICUT AVENUE

S72 NNW 1/4-1/2 2270 Higher — 3002 RODMAN ST, WASHINGTON, DC — HMIRS — 97110027 / N/A

S73 NNW 1/4-1/2 2322 Higher — 3701 CT AVE NW APARTMENT BUILDING, 3701 CT AVE NW APARTMENT BUILDING, WASHINGTON DC (County), DC — ERNS — 8718876 / N/A

S74 NNW 1/4-1/2 2326 Higher — SEDGWICK GARDENS, 3726 CONNECTICUT AV NW, , DC 20008 — UST — U003294465 / N/A

UST:
Facility ID: 3-001793
Owner: DARO REALTY INC

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75 WSW 1/4-1/2 2341 Higher — ARTHUR MEIGS, 3224 CATHEDRAL AV NW, WASHINGTON, DC 20008 — UST — U002109677 / N/A

Map ID / Direction / Distance / Distance (ft.) / Elevation	Site	Database(s)	EDR ID Number / EPA ID Number
	ARTHUR MEIGS (Continued)		**U002109677**
	UST: Facility ID: 3-000010 Owner: ARTHUR MEIGS		
T76 **SW** **1/4-1/2** **2357** **Higher**	**RALPH BECKER** **2916 32ND ST NW** **WASHINGTON, DC 20008**	**UST**	**U002110064** **N/A**
	UST: Facility ID: 3-004356 Owner: UNKNOWN		
T77 **SW** **1/4-1/2** **2361** **Higher**	**UNKNOWN** **2914 32ND ST NW** **WASHINGTON, DC 20008**	**UST**	**U003055082** **N/A**
	UST: Facility ID: 3-004493 Owner: UNKNOWN		
T78 **SW** **1/4-1/2** **2363** **Higher**	**UNKNOWN** **2912 32ND ST NW** **WASHINGTON, DC 20008**	**UST**	**U003055041** **N/A**
	UST: Facility ID: 3-004354 Owner: UNKNOWN		
T79 **SW** **1/4-1/2** **2369** **Higher**	**UNKNOWN** **2907 32ND ST NW** **WASHINGTON, DC 20008**	**UST**	**U003055040** **N/A**
	UST: Facility ID: 3-004353 Owner: UNKNOWN		
80 **South** **1/4-1/2** **2380** **Lower**	**UNKNOWN** **2800 WOODLEY RD NW** **WASHINGTON, DC 20008**	**UST**	**U003055155** **N/A**
	UST: Facility ID: 3-005049 Owner: DC FIRE PREVENTION BRANCH		

Map ID / Direction / Distance / Distance (ft.) / Elevation	Site	Database(s)	EDR ID Number / EPA ID Number
81 **WSW** **1/4-1/2** **2459** **Higher**	**UNKNOWN** **3307 WOODLEY RD NW** **WASHINGTON, DC 20008**	**UST**	**U003055156** **N/A**
	UST: Facility ID: 3-005050 Owner: UNKNOWN		
U82 **SW** **1/4-1/2** **2536** **Higher**	**UNKNOWN** **3200 GARFIELD ST NW** **WASHINGTON, DC 20008**	**UST**	**U003054859** **N/A**
	UST: Facility ID: 3-000844 Owner: 30/60 M ST LIMITED PARTNERSHIP		
U83 **SW** **1/4-1/2** **2536** **Higher**	**UNKNOWN** **3201 GARFIELD ST NW** **WASHINGTON, DC 20008**	**UST**	**U003054857** **N/A**
	UST: Facility ID: 3-000842 Owner: 30/60 M ST. LIMITED PARTNERSHIP		
84 **West** **1/4-1/2** **2548** **Higher**	**MICHAEL MEAGHER** **3301 MACOMB ST NW** **WASHINGTON, DC 20008**	**UST**	**U003054813** **N/A**
	UST: Facility ID: 3-000050 Owner: MICHAEL MEAGHER		
85 **SSE** **1/4-1/2** **2552** **Lower**	**UNKNOWN** **2751 WOODLEY PL NW** **WASHINGTON, DC 20008**	**UST**	**U003054058** **N/A**
	UST: Facility ID: 1-005048 Owner: UNKNOWN		
86 **NNW** **1/4-1/2** **2556** **Higher**	**UNKNOWN** **3801 CONNECTICUT AV NW** **WASHINGTON, DC 20008**	**UST**	**U003054939** **N/A**

Map ID / Direction / Distance / Distance (ft.) / Elevation	Site	Database(s)	EDR ID Number / EPA ID Number
	UNKNOWN (Continued)		U003054939
	UST: Facility ID: 3-001820 Owner: DC FIRE PREVENTION BRANCH		
87 SW 1/4-1/2 2582 Higher	**UNKNOWN** **3148 CLEVELAND AV NW** **WASHINGTON, DC 20008**	UST	U003054908 N/A
	UST: Facility ID: 3-001739 Owner: 3024 TILDEN ST NW		
88 SSE 1/4-1/2 2583 Lower	**ST THOMAS THE APOSTLE CHURCH** **2665 WOODLEY RD NW** **WASHINGTON, DC 20008**	UST	U002110240 N/A
	UST: Facility ID: 3-005044 Owner: UNKNOWN		
89 SSE 1/2-1 2644 Lower	**CALVERT WOODLEY APARTMENTS** **2601 WOODLEY RD NW** **WASHINGTON, DC 20008**	UST LUST	U002110239 N/A
	LUST: Case Number: 90030 Facility Status: Case Closed Product: H		
	UST: Facility ID: 3-005043 Owner: CALVERT WOODLEY COMPANY		
90 South 1/2-1 3143 Lower	**CLEVELAND HOUSE** **2727 29TH ST NW** **WASHINGTON, DC 20008**	UST LUST	U002110042 N/A
	LUST: Case Number: 96105 Facility Status: Case Closed Product: H		
	UST: Facility ID: 3-004306 Owner: SMITH PROPERTY HOLDINGS (DC) LP		

Map ID / Direction / Distance / Distance (ft.) / Elevation	Site	Database(s)	EDR ID Number / EPA ID Number
91 SSE 1/2-1 3542 Lower	**CALVERT HOUSE APTS.** **2401 CALVERT ST NW** **WASHINGTON, DC 20009**	UST LUST	U002109704 N/A
	LUST: Case Number: 96047 Facility Status: Case Closed Product: H		
	UST: Facility ID: 3-000182 Owner: H. G. SMITHY COMPANY		
V92 NNW 1/2-1 4293 Higher	**UDC OIL SPILL 1997 SITE** **4200 CONNECTICUT AVE. NW** **WASHINGTON, DC 20008**	CERCLIS FINDS	1001126463 DC0001900000
	CERCLIS Classification Data: Site Incident Category: Not reported Ownership Status: Not reported Site Description: THE SITE IS LOCATED IN A HIGHLY COMMERCIAL/RESIDENTIAL AREA IN THE NORTHWEST SECTION OF WASH. DC SOAPSTONE CREEK IS AP PROXIMATELY 500 FT IN AN EASTERLY DIRECTION FROM THE UNIVERSITY Federal Facility: Not reported NPL Status: Not reported CERCLIS Assessment History: Assessment: DISCOVERY Completed: 19970118 Assessment: REMOVAL ASSESSMENT Completed: 19970226 Assessment: UNILATERAL ADMIN ORDER Completed: 19970226 Assessment: PRELIMINARY ASSESSMENT Completed: 19991014 CERCLIS Site Status: NFRAP (No Futher Remedial Action Planned FINDS: Other Pertinent Environmental Activity Identified at Site: Enforcement Docket System (DOCKET)		
V93 NNW 1/2-1 4359 Higher	**TEXACO** **4225 CONNECTICUT AV NW** **WASHINGTON, DC 20008**	UST LUST	U002109752 N/A
	LUST: Case Number: 89013 Facility Status: Case Closed Product: D		
	UST: Facility ID: 3-000685 Owner: KOO L YUEN		
94 North 1/2-1 4406 Lower	**ROYAL NETHERLANDS EMBASSY** **4200 LINNEAN AV NW** **WASHINGTON, DC 20008**	UST LUST	U003054815 N/A

ROYAL NETHERLANDS EMBASSY (Continued) — **U003054815**

LUST:
Case Number: 96003
Facility Status: Case Closed
Product: H

UST:
Facility ID: 3-000056
Owner: ROYAL NETHERLANDS EMBASSY

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95 SSW 1/2-1 4670 Lower — **BRITISH EMBASSY**, **3100 MASSACHUSETTS AV NW**, **WASHINGTON, DC 20008** — UST, LUST — **U002109701**, **N/A**

LUST:
Case Number: 90065
Facility Status: Case Closed
Product: G,H

UST:
Facility ID: 3-000154
Owner: BRITISH EMBASSY

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96 WSW 1/2-1 4674 Higher — **SAINT SOPHIA CHURCH**, **36TH / MASS. AVE, NW**, **WASHINGTON, DC** — LUST — **S100008090**, **N/A**

LUST:
Case Number: 91007
Facility Status: Case Closed
Product: H

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97 WSW 1/2-1 5000 Higher — **ALBAN TOWERS**, **3700 MASSACHUSETTS AV NW**, **WASHINGTON, DC 20016** — UST, LUST — **U002109938**, **N/A**

LUST:
Case Number: 99117
Facility Status: Case Closed
Product: H

UST:
Facility ID: 3-002175
Owner: DC FIRE PREVENTION BRANCH

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98 WSW 1/2-1 5073 Higher — **GARFIELD HOUSE APARTME**, **2844 WISCONSIN AVE NW**, **WASHINGTON, DC** — LUST — **S102509236**, **N/A**

GARFIELD HOUSE APARTME (Continued) — **S102509236**

LUST:
Case Number: 97005
Facility Status: Case Open
Product: H

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99 SE > 1 5525 Lower — **1768 COLUMBIA ROAD ASSOC LLC**, **1768 COLUMBIA RD NW**, **WASHINGTON, DC 20009** — UST, LUST — **U003053831**, **N/A**

LUST:
Case Number: 96041
Facility Status: Case Closed
Product: H

UST:
Facility ID: 1-001545
Owner: 1768 COLUMBIA ROAD ASSOC LLC

W100 NNW > 1 5622 Higher — **CHARLES E SMITH REALTY PROPERTY**, **4411 CONNECTICUT AV NW**, **, DC 20008** — UST, LUST — **U003377565**, **N/A**

LUST:
Case Number: 98108
Facility Status: Case Open
Product: H

W101 NNW > 1 5622 Higher — **SOAPSTONE CREEK OIL SPILL RESPONSE**, **4411 CONNECTICUT AVE., NW**, **WASHINGTON, DC 20008** — CERCLIS — **1001230489**, **DCSFN0305387**

CERCLIS Classification Data:
Site Incident Category: Not reported — Federal Facility: Not reported
Ownership Status: Not reported — NPL Status: Not reported
CERCLIS Assessment History:
Assessment: DISCOVERY — Completed: 19980710
CERCLIS Site Status:
Not reported

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102 SW > 1 5732 Higher — **CARILLON HOUSE**, **2500 WISCONSIN AVENUE, N**, **WASHINGTON, DC 20007** — LUST — **U003054812**, **N/A**

LUST:
Case Number: 93053
Facility Status: Case Closed
Product: H

Map ID / Direction / Distance / Distance (ft.) / Elevation	Site	Database(s)	EDR ID Number / EPA ID Number
103 West > 1 5736 Higher	ANNUNCIATION CATHOLIC CHURCH 3125 39TH ST NW WASHINGTON, DC 20016	UST LUST	U002109940 N/A
104 SW > 1 5811 Higher	AMOCO OIL CO S/S #3478 2450 WISCONSIN AV NW WASHINGTON, DC 21201	UST LUST	U002109683 N/A
105 NNW > 1 6075 Higher	CONNECTICUT HOUSE 4500 CONNECTICUT AV NW WASHINGTON, DC 20008	UST LUST	U002109897 N/A
106 East > 1 6270 Lower	CROMWELL APARTMENTS 1515 OGDEN ST NW WASHINGTON, DC 20010	UST LUST	U002107498 N/A

ANNUNCIATION CATHOLIC CHURCH
LUST:
Case Number: 96043
Facility Status: Case Closed
Product: H
UST:
Facility ID: 3-002177
Owner: ANNUNCIATION CATHOLIC CHURCH

AMOCO OIL CO S/S #3478
LUST:
Case Number: 90040
Facility Status: Case Closed
Product: G
UST:
Facility ID: 3-000016
Owner: AMOCO OIL CO

CONNECTICUT HOUSE
LUST:
Case Number: 91026
Facility Status: Case Closed
Product: H
UST:
Facility ID: 3-001828
Owner: CONNECTICUT HOUSE ASSOC LTD PART

CROMWELL APARTMENTS
LUST:
Case Number: 93004
Facility Status: Case Closed
Product: H
UST:
Facility ID: 1-000003
Owner: 1515 OGDEN ST LTD PARTNERSHIP

Map ID / Direction / Distance / Distance (ft.) / Elevation	Site	Database(s)	EDR ID Number / EPA ID Number
107 SE > 1 6397 Lower	2100 COOPERATIVE ASSOC 2100 19TH ST, NW , DC	LUST	S102834869 N/A
108 SE > 1 6413 Lower	AMOCO OIL CO S/S #84665 2307 CHAMPLAIN ST NW WASHINGTON, DC 20009	UST LUST	U002107506 N/A
109 West > 1 6472 Higher	CATHEDRAL AVENUE COOP 4101 CATHEDRAL AVE., NW WASHINGTON, DC	LUST	S100521467 N/A
110 WSW > 1 6557 Higher	3900 TUNLAW COOPERATIVE 3900 TUNLAW COOPERATIVE WASHINGTON, DC 20007	UST LUST	U002109676 N/A
X111 WSW > 1 6562 Higher	3900 WATSON PLACE INC. 3900 WATSON PL NW WASHINGTON, DC 20016	UST LUST	U002110158 N/A

2100 COOPERATIVE ASSOC
LUST:
Case Number: 88010
Facility Status: Case Closed
Product: H

AMOCO OIL CO S/S #84665
LUST:
Case Number: 91058
Facility Status: Case Open
Product: G,D
UST:
Facility ID: 1-000014
Owner: AMOCO OIL CO

CATHEDRAL AVENUE COOP
LUST:
Case Number: 93042
Facility Status: Case Closed
Product: H

3900 TUNLAW COOPERATIVE
LUST:
Case Number: 92044
Facility Status: Case Closed
Product: H
UST:
Facility ID: 3-000009
Owner: 3900 TUNLAW COOPERATIVE

3900 WATSON PLACE INC. (Continued) — **U002110158**

LUST:
Case Number: 95035
Facility Status: Case Closed
Product: H

UST
Facility ID: 3-004889
Owner: 3900 WATSON PLACE INC

X112 / WSW / > 1 / 6562 / Higher — **WATSON PLACE CONDOMI**, **3900 WATSON PLACE, NW**, **WASHINGTON, DC** — LUST — S100008144 / N/A

LUST:
Case Number: 92008
Facility Status: Case Closed
Product: H

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113 / SSE / > 1 / 6609 / Lower — **WASHINGTON HILTON HOTEL & TOWERS**, **1919 CONNECTICUT AV NW**, **WASHINGTON, DC 20009** — UST, LUST — U003053874 / N/A

LUST:
Case Number: 97029
Facility Status: Case Open
Product: H

UST
Facility ID: 1-001770
Owner: THE WASHINGTON HILTON HOTEL & TO

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114 / ESE / > 1 / 6867 / Lower — **DORCHESTER HOUSE APART**, **2460 16TH ST, NW**, **WASHINGTON, DC** — LUST — S101403098 / N/A

LUST:
Case Number: 91037
Facility Status: Case Closed
Product: H

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115 / SSE / > 1 / 6905 / Lower — **UNIVERSAL NORTH BLDG**, **1875 CONNECTICUT AVE NW**, **WASHINGTON, DC 20009** — RCRIS-SQG, LUST — 1000886511 / DC0000228593

UNIVERSAL NORTH BLDG (Continued) — **1000886511**

RCRIS:
Owner: CAFRITZ COMPANY
(202) 986 6300
Contact: DONALD FISHER
(202) 986 6300
Record Date: 03/28/1994
Classification: Conditionally Exempt Small Quantity Generator
Used Oil Recyc: No
Violation Status: No violations found

LUST:
Case Number: 94020
Facility Status: Case Open
Product: H

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116 / West / > 1 / 6984 / Higher — **BERKSHIRE APARTMENTS**, **4201 MASSACHUSETTS AV NW**, **WASHINGTON, DC 20016** — UST, LUST — U003054821 / N/A

LUST:
Case Number: 95075
Facility Status: Case Open
Product: H

UST:
Facility ID: 3-000102
Owner: BERKSHIRE APARTMENTS

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117 / SE / > 1 / 7078 / Lower — **DIPLOMAT APARTMENTS**, **2420 16TH ST NW**, **WASHINGTON, DC 20009** — UST, LUST — U002107835 / N/A

LUST:
Case Number: 98082
Facility Status: Case Closed
Product: H

UST:
Facility ID: 1-002902
Owner: DIPLOMAT ASSOC LP DARALA INC GP

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118 / ENE / > 1 / 7093 / Lower — **TWIN OAKS APTS - 3800**, **3800 14TH STREET, NW**, **WASHINGTON, DC** — LUST — S101403124 / N/A

LUST:
Case Number: 91070
Facility Status: Case Open
Product: H

Map ID / Direction / Distance / Distance (ft.) / Elevation	Site	Database(s)	EDR ID Number / EPA ID Number
119 ESE > 1 7109 Lower	**AMOCO OIL CO (FORMER)** **3037 14TH ST NW** **WASHINGTON, DC 21230** LUST: Case Number: 97044 Facility Status: Case Closed Product G UST: Facility ID: 1-000031 Owner: AMOCO OIL CO	UST LUST	U002107508 N/A
Y120 SSE > 1 7225 Lower	**AMERICAN GEOPHYSICAL U** **2000 FLORIDA AVE, NW** **, DC** LUST: Case Number: 92026 Facility Status: Case Open Product: G,H	LUST	S102834861 N/A
Y121 SSE > 1 7234 Lower	**PRESIDENT MADISON APPA** **1908 FLORIDA AVE., NW** **WASHINGTON, DC** LUST: Case Number: 93040 Facility Status: Case Closed Product: D	LUST	S100521466 N/A
122 SE > 1 7275 Lower	**ADAMS MORGAN FOREIGN CAR SERVICE** **1781 FLORIDA AV NW** **, DC 20009** LUST: Case Number: 99001 Facility Status: Case Open Product: W UST: Facility ID: 9 000145 Owner: ADAMS MORGAN FOHEIGN CAH SERVICE	UST LUST	U003294591 N/A
123 ESE > 1 7435 Lower	**FAIRMONT I LTD PARTNERS** **1401 FAIRMONT ST., NW** **, DC**	LUST	S102834795 N/A

Map ID / Direction / Distance / Distance (ft.) / Elevation	Site	Database(s)	EDR ID Number / EPA ID Number
	FAIRMONT I LTD PARTNERS (Continued) LUST: Case Number: 94075 Facility Status: Case Closed Product: H		S102834795
124 WSW > 1 7543 Higher	**ARCHIBALD GLOVER PARK OUTFALL OIL SPILL** **42ND & EDMUND STREET, N.W.** **WASHINGTON, DC 20024** CERCLIS Classification Data: Site Incident Category: Not reported Ownership Status: Not reported Federal Facility: Not reported NPL Status: Not reported CERCLIS Assessment History: Assessment: DISCOVERY Completed: 19960222 Assessment: REMOVAL ASSESSMENT Completed: 19960223 CERCLIS Site Status: Not reported	CERCLIS FINDS	1001114749 DC000140506 7
125 NNW > 1 7555 Higher	**ESSEX CONDO** **4740 CONNECTICUT AV NW** **WASHINGTON, DC 20008** LUST: Case Number: 93028 Facility Status: Case Closed Product: H UST: Facility ID: 3-000753 Owner: ESSEX CONDO	UST LUST	U002109763 N/A
126 ESE > 1 7691 Lower	**AMOCO** **2600 14TH STREET, NW** **WASHINGTON, DC 20009** LUST: Case Number: 97032 Facility Status: Case Open Product: G	LUST	U002107512 N/A

ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	Zip	Database(s)	Facility ID
WASHINGTON	1000964120	SOAP STONE CREEK	4500 ALBEMARLE ST.	20008	CERC-NFRAP	
WASHINGTON	90164233	BURNT WOOD ROAD NE AT FLORIDA AVE.	BURNT WOOD ROAD NE AT FLORIDA AVE.		ERNS	
WASHINGTON	1001814362	GLOVER BRIDGE SITE	CONNETICUT AVENUE BETWEEN -	20008	CERCLIS	
WASHINGTON	8855694	NATIONAL ARBORETUM BLADENSBURG ROAD NE	NATIONAL ARBORETUM BLADENSBURG ROAC		ERNS	
WASHINGTON	971229	PARK ROAD AND BEACH DRIVE	PARK ROAD AND BEACH DRIVE		ERNS	
WASHINGTON	U003055030	UNKNOWN	2129 30TH ST NW	20008	UST	3-004323
WASHINGTON	U003055163	UNKNOWN	2961 WOODLEY RD NW	20008	UST	3-005057

Appendix D: Transportation Study

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1. Introduction

The District of Columbia, Division of Transportation (DDOT), proposes to investigate impacts of reopening the existing closed section of Klingle Road between Cortland Place and Porter Street in the Northwest portion of Washington, D.C. A Traffic Engineering Study was conducted to evaluate traffic operations near the study area for various Options. Existing and future traffic analyses were conducted at critical locations within the Study Area. Future traffic operational conditions were analyzed for year 2017, for no build conditions as well as for three (3) build condition scenarios. They are as follows:

- Year 2017 no build conditions: Klingle Road remains closed. (Also referred to as Options A through D)
- Year 2017 build conditions scenario 1: Rebuild Klingle Road to its original (existing) alignment and dimensions and further repair/replace storm drainage to open for vehicular traffic. (Also referred to as Option E)
- Year 2017 build conditions scenario 2: Reconfigure Klingle Road within existing right-of-way to improve alignment and drainage to open for vehicular traffic. (Also referred to as Option F)
- Year 2017 build conditions scenario 3: Build Klingle Road as a one lane (one-way) road and a pedestrian/bicycle lane. (Also referred to as Option G)

DDOT in conjunction with the Washington DC Council of Governments (COG), provided traffic data for this study. In addition, several field studies and observations were made to assess traffic operations and to collect traffic data. This data was then used to establish existing and future conditions. Future traffic volumes were established based on the weighed trip share percentage from the roadways parallel to Klingle Road and based on traffic volumes that were present on Klingle Road prior to its closure.

Operational Level of Service (LOS) analyses were conducted for existing and future scenarios at critical intersections. Safety analysis and travel speed studies along the major roadways within the vicinity of the study area are also included in this report.

This report also serves to evaluate whether the reopening of Klingle Road has specific merit from a traffic operational perspective. Although the primary purpose of the proposed project is related to non-traffic operational factors, the study addresses any additional benefits that could result from one or more of the build Options considered.

2. Project Description

Closed for traffic between Porter Street and Cortland Place in 1990, Klingle Road, which extends east west in direction, is a two-lane road with one lane in each direction. Based on the traffic data collected in 1988 and the "Traffic Impact of Closing Klingle Road on Porter Street" Study conducted in 1995, Klingle Road carried approximately 3,200 vehicles per day and approximately 200 vehicles in each direction during peak hours when the roadway was open to traffic.

The road network surrounding Klingle Road is currently experiencing excessive delays and poor level of service during peak hours, especially along roads parallel to Klingle Road. The reopening of Klingle Road has been suggested as one of the options to improve the east-west cross town traffic conditions, which provide access to the National Cathedral, American University, upper Georgetown, and the MacArthur Boulevard area. In order to evaluate the traffic impact of reopening Klingle Road, the following intersections were considered for traffic operational analysis. They are as follows:

- Intersection of Connecticut Avenue and Porter Street
- Intersection of Cleveland Avenue/Garfield Street/32nd Street

- Intersection of 34th Street and Woodley Road
- Intersection of Woodley Road and Klingle Road
- Intersection of Woodley Road and 32nd Street

Figure 1 shows the study area and key intersections analyzed for this study (Appendix D-3).

3. Existing Conditions

The traffic data used for the analysis was provided by the DDOT and verified by the staff of COG. Several field investigations were also conducted, supplementing this data, to establish the existing traffic conditions. A brief description of the five key intersections analyzed as a part of this study is presented in the following sections.

■ Intersection of Connecticut Avenue and Porter Street

The intersection of Connecticut Avenue and Porter Street is a four-leg intersection, controlled by a traffic signal. Connecticut Avenue is a six-lane street with a reversible center lane during the morning and evening peak periods of traffic operations. During the morning peak period, Connecticut Avenue provides four travel lanes for southbound traffic and two travel lanes for northbound. During the evening peak, Connecticut Avenue provides four travel lanes for northbound traffic and two travel lanes for southbound. The eastbound Porter Street approach has one two0-foot wide travel lane. The westbound approach of Porter Street is composed of a left turn lane, a through lane and a dedicated right turn lane.

■ Intersection of Cleveland Avenue, Garfield Street and 32nd Street

The intersection of Cleveland Avenue, Garfield Street, and 32nd Street is a six-leg intersection controlled by a traffic signal. Cleveland Avenue is a divided street with two lanes in each direction to the southeast of the intersection, and one lane in each direction to the northwest of the intersection. In the northwest approach, Cleveland Avenue has a dedicated left lane, a shared through and a right turn lane. Cleveland Avenue southeast approach has one shared left/through/right lane. Garfield Street extends in east-west direction. The eastbound approach of Garfield Street has one 24-foot travel lane in each direction. The westbound approach via Garfield Street is one way. 32nd Street runs north-south with one lane in each direction.

■ Intersection of 34th Street and Woodley Road

The intersection of 34th Street and Woodley Road is a four-leg signalized intersection. Woodley Road has one lane in each direction. Northbound 34th Street has two shared lanes. The southbound approach has one lane and left-turn movement is prohibited from 7:00 a.m. to 9:30 a.m. and again from 4:00 p.m. to 6:30 p.m.

■ Intersection of Klingle Road and Woodley Road

The intersection of Woodley Road and Klingle Road is an all-way stop sign controlled intersection with one lane on each approach.

■ Intersection of 32nd Street and Woodley Road

At the intersection of 32nd Street and Woodley Road, 32nd Street is controlled by a stop sign. Northbound 32nd Street extends in a north-south direction and terminates at Woodley Road. Woodley Road, posted for a speed limit of 25-miles per hour (mph) operates with one lane in each direction.

Photographs of the study locations are presented in Appendix D-1.

4. Traffic Volume Development Methodology

This section presents the methodology used to collect and develop traffic and transportation data within the study area. The traffic volume data collected was specifically used to establish existing and future traffic

volumes for the study locations. The proposed methodology is discussed in detail in the following sections.

4.1 Traffic Data Collection

The traffic data collected included manual turning movement counts, Automatic Traffic Recorder (ATR) counts, traffic classifications, physical inventories of the key intersections, and inventories of on-street parking. The data was used as the basis for analyzing the existing and future conditions of the study locations.

4.2 Development of Existing Traffic Volumes

Year 2000 existing traffic conditions were developed from the intersection turning movement counts provided by the DDOT. Field traffic data was summarized and analyzed to establish morning (AM) and evening (PM) peak hour traffic volumes. Figure 2 (Appendix D-3) depicts the existing AM peak hour traffic volumes at the intersection of Connecticut Avenue and Porter Street. Figure 3 depicts AM peak hour volumes at the other study locations west of Connecticut Avenue (Appendix D-3). These locations include the intersections of: 34th Street and Woodley Road, Cleveland Avenue/Garfield Street and 32nd Street, Woodley Road and Klingle Road, and Woodley Road and 32nd Street. Figures 4 and 5 depict the PM peak hour traffic volumes for the same locations as discussed above (Appendix D-3).

4.3 Development of Traffic Volumes for Future Conditions

To evaluate the traffic impacts of opening Klingle Road on the surrounding roadway network, future year traffic volumes were developed for no build conditions and three build condition scenarios. These future conditions include:

- Year 2017 no build condition: Klingle Road remains closed.
- Year 2017 build conditions scenario 1: Rebuild Klingle Road to its original (existing) alignment, dimensions and repair/replace storm drainage to open for vehicular traffic.
- Year 2017 build conditions scenario 2: Reconfigure Klingle Road within existing right-of-way to improve alignment and drainage to open for vehicular traffic.
- Year 2017 build conditions scenario 3: Build Klingle Road as a one lane (one-way) road and a pedestrian/bicycle lane.

4.3.1 No Build Traffic Volumes

Under the Year 2017 no build condition, it was assumed that Klingle Road remains closed and the surrounding road network has the same traffic patterns as under existing conditions along with background growth rate for 2017.

To develop no build traffic volume forecasts for the year 2017, a growth rate of one percent per year was used. This annual traffic growth rate factor was provided by the DDOT based on traffic growth trends in the Metropolitan area. This growth factor was applied to the year 2000 traffic volumes to project year 2017 no build traffic volumes.

Assuming a compound growth of one percent per year between 2000 and 2017, the overall growth from year 2000 to year 2017 was estimated to be approximately 18 percent. Figures 6 and 7 depict the projected AM peak hour traffic volumes at the study intersections (Appendix D-3). Figures 8 and 9 depict the projected PM peak hour traffic volumes at the study intersections (Appendix D-3).

4.3.2 Scenario 1: Rebuild Klingle Road to its Original Alignment

Under the Year 2017 build conditions scenario 1, it is assumed that Klingle Road will be restored to its original alignment and dimensions and that repairs or replacements are made as needed to the storm drainage. In this scenario, Klingle Road will regain the same function it had ten years ago. To develop traffic volumes under this condition for 2017, a traffic

diversion pattern was established. The methodology of developing traffic diversion patterns are summarized in the following steps:

Step 1: *Establish the future peak hour traffic volumes on Klingle Road based on data collected in 1988 prior to closing the roadway. This is accomplished by projecting the 1988 traffic data using an annual background growth rate factor of 1 percent per year, compounded.* Based on 1998's 24-hour traffic counts, provided by DDOT, Klingle Road carried 102 and 213 vehicles during AM and PM peak hours heading eastbound and 193 and 138 vehicles heading westbound during AM and PM peak hours. It is assumed by the year 2017 traffic volumes on Klingle Road would increase at the same rate (1 percent per year) as the surrounding roadway network. Based upon the estimate, eastbound Klingle Road would carry approximately 136 and 284 vehicles in AM and PM peak hours, respectively, and westbound Klingle Road will carry 258 and 184 vehicles during AM and PM peak hours.

Step 2: *Identify the parallel roadways from where traffic will be diverted to Klingle Road if Klingle Road was open.* Based on the existing traffic analysis and field investigations, the parallel east-west roadways that would divert traffic to Klingle Road have been identified as Porter Street to the north, Woodley Road, Cathedral Avenue and Cleveland Avenue to the south.

Step 3: *Based on the existing traffic volumes along parallel roadways of Klingle Road, calculate the trip share percentages as a proportion of total traffic volume in the area, as shown on Table 1.* Throughout the preparation of this study, construction has been underway at the intersection of Porter Street and Klingle Road. Due to this construction, motorist travel patterns were assumed to be altered therefore accurate travel patterns data cannot be established. Therefore, trip share percentage method was applied to estimate future traffic diversion on Klingle Road. Based on existing traffic volumes on the surrounding roadway network, a weighted percentage of traffic volumes were calculated from each parallel roadway from where traffic will be diverted to Klingle Road. Weighted distribution factors were developed based on additional distance to be traveled. For example, cross-town traffic on Cleveland Avenue, Woodley Road and Cathedral Avenue has to use Duke Ellington Memorial Bridge to traverse in east-west direction. The distance from Klingle Road to the Duke Ellington Memorial Bridge is twice as long as the distance from Porter Street to Klingle Road. Therefore, weight factors were applied to the trip share percentage with Porter Street having a weight factor of 1 and all the south parallels have a weight factor of 0.5. Table 1 presents the trip share percentage calculations (Appendix D-3).

Step 4: *Calculate diverted traffic volumes on to Klingle Road from each of the parallel roadways in accordance with the calculated trip share percentages in Step 3.* Apply the calculated trip share percentages to the future projected traffic volumes, which were calculated in Step 1 for Klingle Road. The diverted traffic volumes for scenario 1, from all the parallel roads, were calculated and presented on Table 2. Figure 10 depicts the traffic diversion volumes (Appendix D-3).

By assigning the diversion traffic to the study network, build traffic volumes for scenario 1 were developed. Figures 11 and 12 depict the projected AM peak hour traffic volumes and Figures 13 and 14 depict the projected PM peak hour traffic volumes (Appendix D-3).

4.3.3 Scenario 2: Rebuild Klingle Road to Improved Alignment

Inherently, an improved alignment of a highway enhances capacity of the facility and thereby attracts more traffic. Under the build conditions Scenario 2, it is assumed that Klingle Road will be redesigned to improve features such as lane widths, shoulders, horizontal and vertical alignment, etc. These improvements will attract more traffic from its parallel routes. Based on the procedures outlined in the Highway Capacity Manual, it was determined that Klingle Road can accommodate up to 650 vehicles in both directions to operate at a Level of Service (LOS) D under typical conditions. Traffic volumes under this scenario would increase by approximately 35 percent more than the volumes estimated in Scenario 1. The resulting traffic volumes on Klingle Road under Scenario 2 would increase to 184 and 383 vehicles during AM and PM peak hours in the

eastbound direction, respectively, and 348 vehicles during AM peak hour and 248 vehicles during PM peak hour in the westbound direction. Applying the same methodology of scenario 1, traffic diversion was calculated as shown in Table 3 (Appendix D-3). Figure 15 shows the projected traffic diversion volumes for scenario 2 (Appendix D-3). Figures 16 through 19 delineate the projected scenario 2 volumes (Appendix D-3).

4.3.4 Scenario 3: Rebuild Klingle Road to a One Lane (One-Way)

Under this scenario, it is assumed that Klingle Road will be open to public for motor vehicle use as well as non-motorized use. One lane will be provided in the westbound direction, except from 4:00 PM to 6:30 PM, when a reverse in traffic operations (eastbound) would occur. The roadway alignment under this scenario would be on the existing alignment. Therefore, traffic using Klingle Road during the AM would be approximately 258 vehicles per hour in the westbound direction and approximately 284 vehicles per hour in the eastbound direction during the PM. This scenario takes advantage of the travel directional difference, which is predominantly westbound during the AM and eastbound during the PM. This scenario also provides pedestrian and bicycle access in the east-west direction across the park. Figures 20 - 23 present projected traffic volumes during AM and PM peak hours under scenario 3 (Appendix D-3).

5. Intersection Capacity Analysis Methodology

Operational traffic analysis was conducted to determine existing and future traffic operations using the methodology outlined in the latest version of Transportation Research Board (TRB) Special Report 209, the "Highway Capacity Manual"(HCM). Level of service analysis was performed for the five study intersections. The Highway Capacity Manual delineates levels of service from A to F. Following is an explanation of the levels of service for signalized and unsignalized intersections as described in the HCM.

5.1 Level of Service for Signalized Intersections

Level of service (LOS) for a signalized intersection is defined in terms of delay, which is a measure of driver discomfort and frustration, fuel consumption, and lost travel time. Specifically, LOS criteria are stated in terms of the average stopped delay per vehicle for a 15-minute analysis period. Delay may be measured in the field or estimated using procedures outlined in the HCM. Delay is a complex measure and is dependent upon a number of variables, including the quality of progression, the cycle length, the green ratio, and volume to capacity (v/c) ratio for the lane group in question. The LOS criteria for signalized intersections is as follows:

LOS A describes operations with very low control delay, up to 10 seconds per vehicle. This level of service occurs when progression is extremely favorable and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.

LOS B describes operations with control delay greater than 10 and up to 20 seconds per vehicle. This level generally occurs with good progression, short cycle lengths, or both. More vehicles stop than with LOS A, causing higher levels of average delay.

LOS C describes operations with control delay greater than 20 and up to 35 seconds per vehicle. These higher delays may result from fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant at this level, though many still pass through the intersection without stopping.

LOS D describes operations with control delay greater than 35 and up to 55 seconds per vehicle. At level D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high v/c ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.

LOS E describes operations with control delay greater than 55 and up to 80 seconds per vehicle. This level is considered by many agencies to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, or high v/c ratios. Individual cycle failures are frequent occurrences.

LOS F describes operations with control delay in excess of 80 seconds per vehicle. This level is often believed to be unacceptable to most drivers and occurs with over saturation, or, when arrival flow rates exceed the capacity of the intersection. This may also occur at high v/c ratios below 1.0 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing factors to such delay levels.

Level of Service Criteria for Signalized Intersections

LEVEL OF SERVICE	STOPPED DELAY PER VEHICLE (SECONDS)
A	≤10.0
B	>10.0 AND ≤20.0
C	>20.0 AND ≤35.0
D	>35.0 AND ≤55.0
E	>55.0 AND ≤80.0
F	>80.0

5.2 Level of Service for Unsignalized Intersections

The capacity of an unsignalized intersection is evaluated in terms of critical gap size and the LOS is evaluated based on control delay per vehicle (in seconds per vehicle). Control delay includes initial acceleration delay, queue move-up time, stopped delay, and final acceleration delay typically for a 15-minute analysis period. The LOS criteria for unsignalized intersections are defined in the 1997 HCM are as follows:

Level of Service Criteria for Unsignalized Intersections

LEVEL OF SERVICE	AVERAGE TOTAL DELAY (SEC/VEH)
A	≤10.0
B	>10.0 AND ≤15.0
C	>15.0 AND ≤25.0
D	>25.0 AND ≤35.0
E	>35.0 AND ≤50.0
F	>50.0

Average control delay of less than 10 seconds per vehicle is defined as LOS A, and an average control delay of 35 seconds per vehicle is the peak point between LOS D and E. The average control delays of LOS A, B, C and D are considered acceptable for unsignalized intersections, while those associated with LOS E and F are considered unacceptable. LOS F for unsignalized intersections is the result of average control delays in excess of 50 seconds per vehicle.

6. Existing Condition Analysis

6.1 Results of the Existing LOS Analysis

Tables 4 and 5 present the existing level of service for studied signalized intersections during AM and PM peak hours, respectively (Appendix D-3). Table 6 shows the existing AM and PM peak hour level of service for studied unsignalized intersections (Appendix D-3).

The analysis results revealed that Porter Street is experiencing excessive delays and poor level of service (LOS F). Both approaches of Cleveland Avenue at Garfield Street are also experiencing level of service F during AM peak hour. Additionally, Woodley Road eastbound operates with LOS F during AM peak hour. The results also indicate that the existing east-west cross-town roadways paralleling Klingle Road are over crowded during the commuting peaks.

The existing traffic volumes at the unsignalized intersections of Woodley Road and Klingle Road, and Woodley Road and 32nd Street are relatively low, partly due to the closure of Klingle Road east of Cortland Place. In conclusion, the existing levels of service at these unsignalized locations are within acceptable levels.

6.2 Safety/Accident Analysis

The objective of the safety/accident analysis was to identify locations with a high number of accidents and further determine if a discernable pattern of accidents has occurred near the vicinity of the study area. The following locations were considered for the safety/accident analysis. It should be noted that accident data for intersection of Klingle Road with Woodley Road does not exist.

- Intersection of Connecticut Avenue with Porter Street
- Intersection of Klingle Road and Porter Street
- Intersection of 34th Street and Woodley Road

The analysis and the results of the analysis are discussed below.

6.2.1 Accident Data

For the analysis, accident data were obtained from Highway Safety Improvement Program, DDOT records for the years 1993, 1994, and 1995 (latest years summarized) for the study area. The data was summarized for the three years period according to the following accident types:

- Right Angle
- Right Turn
- Rear End
- Sideswipe
- Parked Car
- Fixed Object
- Pedestrian Accident
- Overtaking
- Backing

6.2.2 Results of the Accident Analysis

Over the three-year period between January 1993 and December 1995, 69 accidents occurred within the study area. None of these accidents was fatal. Table 7 provides a summary of accidents by year and type (Appendix D-3). As shown in the table, 33 accidents occurred in 1993; 19 occurred in 1994; and 17 occurred in 1995.

Of the 69 accidents that occurred during the three-year period, 56 accidents occurred at the intersection of Connecticut Avenue and Porter Avenue, one accident occurred at the intersection of Klingle Road and Porter Street and 12 occurred at the intersection of 34th Street and Woodley Road. It should be noted that the highest number of accidents occurred at the intersection of Connecticut Avenue and Porter Avenue. At this intersection, during the three-year period, two types of accidents, sideswipe and rear-end collisions, stand out as being prevalent. Since the detailed police reports for the above accidents were not available at the time of the analysis, it is not possible to determine the actual cause of these accidents. However, the overall number of accidents occurring during the three-year period was relatively normal for the study area.

6.3 Travel Speed Study

Field investigations on travel speed were conducted on Connecticut Avenue and Porter Street during both peak periods and off peak periods.

Connecticut Avenue: Speed runs were performed on Connecticut Avenue in the northbound and the southbound directions during both the peak and non-peak periods. Average northbound travel speed during AM peak periods is 17.3 mph. The average southbound travel speed during PM peak periods is 21.4 mph. Off-peak northbound travel speed averages 17.5 mph and 15.7 mph for southbound. As it is evident from the above data, the peak period travel speeds do not show any reduction from those of off peak travel. This can be attributed to the four travel lanes during off peak periods with curb parking at both sides on Connecticut Avenue. Curb parking is not allowed during peak periods and two more travel lanes are

added to the heavier traffic direction. The reopening of Klingle Road will significantly impact the travel speed on Connecticut Avenue.

Porter Street: Speed runs were also performed on Porter Street in the eastbound and westbound directions during peak and non-peak periods. It is important to note that Porter Street between Connecticut Avenue and Klingle Road was under construction when the travel speed investigation was conducted. The construction has had a direct impact on people's travel patterns. Therefore, the results cannot accurately reflect the true-field operations. This section will have two travel lanes in each direction once construction is complete. If Klingle Road were reopened, there would be stop delay reduction at the intersection of Porter Street and Connecticut Avenue, thereby improving travel speeds along Porter Street.

Summarized travel speed data is provided in Appendix D-2.

7. Future Condition Analysis

7.1 Results of LOS Analysis for No Build Conditions

Tables 8 and 9 present the no build level of service for the signalized intersections during AM and PM peak hours (Appendix D-3). Table 10 presents the no build level of service for the unsignalized intersections (Appendix D-3). Under the future no build conditions, level of service at all signalized intersections would continue to experience more delays when compared to the existing conditions. The intersection of 34th Street and Woodley Road would drop from LOS "D" to LOS "F" for the AM peak hour. The unsignalized intersections would continue to have acceptable level of services if the existing travel patterns were kept unchanged.

7.2 Results of LOS Analysis for Build Conditions Scenario 1

Results of the intersection levels of service analysis for build condition scenario 1 are presented in Tables 11 through 13 (Appendix D-3). Because of the traffic diversion, the roadways parallel to Klingle Road would experience reduction in traffic volumes, thereby improving LOS. Although most of the intersection approaches would continue to operate with the same level of service as under the no build condition, average vehicle delays and volume to capacity (v/c) ratio would be significantly reduced. At the intersection of Porter Street and Connecticut Avenue, for example, Porter Street eastbound would operate with a v/c ratio of 1.53 and 1.39 during AM and PM peak hours, respectively. This is compared to the 2.93 during the AM and 2.81 during the PM v/c ratios under no build conditions. Porter Street westbound through movement will reduce its delay from 150.3 sec/veh (LOS F) to 40 sec/veh (LOS D) during AM peak hour and 40.7 sec/veh (LOS D) to 29.7 sec/veh (LOS C) during PM peak hours. The overall intersection LOS would be improved from no build LOS of F to build LOS of E during both AM and PM peak hours.

The intersection of Cleveland Avenue, Garfield Street, and 32nd Street would also receive improvements to all approaches compared to the no build conditions, except for 32nd Street. However, these improvements would not be as significant as those of Porter Street. Table 14 shows the improved intersections and approaches (Appendix D-3).

Reopening of Klingle Road would add diverted traffic to Woodley Road, thus negative traffic impacts are expected for intersections on Woodley Road. Results of level of service analyses conducted along Woodley Road are shown on Table 15 (Appendix D-3), reflecting deterioration of traffic operations due to the opening of Klingle Road. As can be concluded from the comparisons, although there is increase in delay at the unsignalized intersections, these intersections and approaches will continue to operate with LOS D or better during both peak hours analyzed, except at the intersection with 34th Street. At this intersection, Woodley Road would continue to experience delays and operate at LOS F during the AM peak hour condition.

7.3 Results of LOS Analysis for Build Conditions Scenario 2

Tables 16 through 18 present the results of level of service under build conditions scenario 2 (Appendix D-3). Under this scenario, it is expected that Klingle Road would carry more traffic as compared to the scenario 1,

thereby reducing traffic along its parallel routes and increased traffic volumes on Woodley Road.

The results indicate that the improvements in scenario 1 would experience further reduction in delay at most intersections. This does not include the intersection at Woodley Road at 34th Street, which would experience higher delays. The unsignalized intersections would operate with acceptable levels of service. The comparisons between no build and build scenario 2 conditions are presented in Tables 19 and 20 (Appendix D-3).

7.4 Results of LOS Analysis for Build Conditions Scenario 3

Results of LOS analysis conducted for this scenario are presented in Table 21 and 22 for signalized intersections and in Table 23 for unsignalized intersections (Appendix D-3). A review of these analyses indicate that traffic operations would improve in the westbound direction at the intersection of Connecticut Avenue and Porter Street during the AM peak hour and operations improve in the eastbound direction during the PM peak hour, compared to the no build scenario. Traffic operations at the intersection of 34th Street and Woodley Road would worsen in the westbound direction during the AM peak hour and in the eastbound direction during the PM peak hour. The unsignalized intersections would continue to operate at an acceptable LOS D or better.

8. Conclusion

As a part of the Options Analysis for the possible reopening of Klingle Road, a traffic study was conducted. The study included a comprehensive data collection task and traffic operational analyses for existing and various future scenarios. Under the future scenarios, analyses were performed for no-build and three build scenarios. A traffic safety analysis was also conducted to determine safety concerns in the proximity of Klingle Road.

Existing traffic operational analyses confirmed severe traffic congestion on east-west cross town roadways, which have received majority of diverted traffic resulting from the closure of Klingle Road in 1990. This traffic congestion is expected to worsen over the years, if Klingle Road is to remain closed under the no-build condition.

For the future build conditions, traffic diversion patterns were assessed in order to quantify future operating conditions resulting from the opening of Klingle Road. The analysis of build conditions was performed for three (3) scenarios. The results of scenarios 1 and 2 indicate that any reopening of Klingle Road would lead to significant delay reduction on Porter Street and moderate delay reduction on Cleveland Avenue and Garfield Street. However, most of the already failed approaches at the study intersections will continue to operate with an unacceptable level of service. Woodley Road at 34th Street will experience a significant traffic volume increase and the already failed eastbound approach will experience more delays.

Of the five intersections analyzed in the study area, the results indicate that traffic operations at the intersection of Connecticut Avenue and Porter Street would experience the highest delays compared to the other intersections. As a part of this study, an analysis was conducted to determine various improvements required at this intersection for the design year under the no build scenario to achieve an acceptable level of traffic operation. Results of these analyses indicate that the eastbound approach of Porter Street needs to be widened to accommodate an additional two through lanes, while an additional through lane is needed in the westbound direction as well. Even if these improvements are implemented at this intersection, traffic congestion is expected to shift to other area intersections along Porter Street.

Results of the analysis conducted for scenario 3, indicate that the traffic operations would experience minimum improvements at the intersection of Connecticut Avenue and Porter Street as compared to Scenarios 1 and 2. The intersection of Cleveland Avenue and Garfield Street would experience minor improvements. However, scenario 3 takes advantage of travel directional differences during peak periods and provides an east-west bicycle/pedestrian transportation facility.

Safety analyses conducted in the study area reveal that there were approximately 69 crashes over a three-year period. The majority of these crashes, approximately 56, occurred at the intersection of Connecticut Avenue and Porter Street. Approximately 35 of the 56 crashes were either rear-end or sideswipe type crashes. These types of crashes are typical for an urban signalized intersection. In general, it is expected that the overall accidents in the study area could be reduced if Klingle Road was open due to the diversion of traffic from the intersection of Connecticut Avenue and Porter Street.

In conclusion, build scenario 2 would result in the greatest improvement in terms of delay reduction at four of the key intersections analyzed, followed by build scenarios 1 and 3, respectively. However, actual level of service, particularly those that are already at LOS E or F would not be substantially improved in most cases.

Transportation Study
D-1: Photographs

INTERSECTION OF CONNECTICUT AVENUE AND PORTER STREET

Porter Street Looking West at Connecticut Avenue

Connecticut Avenue Looking North at Porter Street

INTERSECTION OF CLEVELAND AVENUE, GARFIELD STREET, & 32ND STREET

Cleveland Avenue Looking South at Garfield Street

Cleveland Avenue Looking North at Garfield Street

INTERSECTION OF 34TH STREET AND WOODLEY ROAD

34th Street Looking South at Woodley Road

Woodley Road Looking East at 34th Street

INTERSECTION OF WOODLEY ROAD AND KLINGLE ROAD

Klingle Road Looking East at Woodley Road

INTERSECTION OF WOODLEY ROAD AND 32ND STREET

Woodley Road Looking West at 32nd Street

Transportation Study
D-2: Data Summary Sheets

HCS: Signalized Intersections Release 3.1c

Inter: 34th Street & Woodley Road
Analyst: LB
Date: 8/17/00
E/W St: Woodley Road

City/St: Washington D.C.
Proj #: JA-2249
Period: Existing PM Peak Hour
N/S St: 34th Street

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	0	1	0	0	2	0	0	1	0
LGConfig		LTR			LTR			LTR			TR	
Volume	30	18	96	1	0	0	182	889	6		190	0
Lane Width		14.0			10.0			10.0			13.0	
RTOR Vol			0			0			0			0

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left	P				NB	Left	P			
Thru	P					Thru	P			
Right	P					Right				
Peds	X					Peds	X			
WB Left	P				SB	Left	P			
Thru	P					Thru	P			
Right	P					Right				
Peds	X					Peds	X			
NB Right					EB	Right				
SB Right					WB	Right				
Green	25.0						53.0			
Yellow	4.0						4.0			
All Red	2.0						2.0			

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
LTR	399	1437	0.47	0.278	31.0	C	31.0	C
Westbound								
LTR	408	1470	0.01	0.278	23.6	C	23.6	C
Northbound								
LTR	1613	2739	0.75	0.589	17.0	B	17.0	B
Southbound								
TR	1134	1925	0.18	0.589	8.8	A	8.8	A

Intersection Delay = 17.7 (sec/veh) Intersection LOS = B

HCS: Signalized Intersections Release 3.1c

Inter: 34th Street & Woodley Road
Analyst: LB
Date: 8/17/00
E/W St: Woodley Road

City/St: Washington D.C.
Proj #: JA-2249
Period: Existing AM Peak Hour
N/S St: 34th Street

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	0	1	0	0	2	0	0	1	0
LGConfig		LTR			LTR			LTR			TR	
Volume	12	17	260	1	0	0	57	460	2		954	18
Lane Width		14.0			10.0			10.0			13.0	
RTOR Vol			0			0			0			0

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left	P				NB	Left	P			
Thru	P					Thru	P			
Right	P					Right				
Peds	X					Peds	X			
WB Left	P				SB	Left	P			
Thru	P					Thru	P			
Right	P					Right				
Peds	X					Peds	X			
NB Right					EB	Right				
SB Right					WB	Right				
Green	19.0						59.0			
Yellow	4.0						4.0			
All Red	2.0						2.0			

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
LTR	304	1439	1.19	0.211	149.2	F	149.2	F
Westbound								
LTR	273	1293	0.01	0.211	28.2	C	28.2	C
Northbound								
LTR	1269	1936	0.48	0.656	9.1	A	9.1	A
Southbound								
TR	1111	1694	0.97	0.656	35.8	D	35.8	D

Intersection Delay = 47.8 (sec/veh) Intersection LOS = D

HCS: Signalized Intersections Release 3.1c

Inter: 34th Street & Woodley Road
Analyst: LB
Date: 8/17/00
E/W St: Woodley Road

City/St: Washington D.C.
Proj #: JA-2249
Period: 2017 No Build AM Peak Hour
N/S St: 34th Street

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	0	1	0	0	2	0	0	1	0
LGConfig		LTR			LTR			LTR			TR	
Volume	14	20	307	1	0	0	67	543	2		1126	21
Lane Width		14.0			10.0			10.0			13.0	
RTOR Vol			0			0			0			0

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left	P				NB	Left	P			
Thru	P					Thru	P			
Right	P					Right				
Peds	X					Peds	X			
WB Left	P				SB	Left	P			
Thru	P					Thru	P			
Right	P					Right				
Peds	X					Peds	X			
NB Right					EB	Right				
SB Right					WB	Right				
Green	19.0						59.0			
Yellow	4.0						4.0			
All Red	2.0						2.0			

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
LTR	303	1437	1.39	0.211	231.3	F	231.3	F
Westbound								
LTR	249	1179	0.02	0.211	28.2	C	28.2	C
Northbound								
LTR	1209	1845	0.58	0.656	10.7	B	10.7	B
Southbound								
TR	1111	1694	1.09	0.656	69.5	E	69.5	E

Intersection Delay = 80.9 (sec/veh) Intersection LOS = F

HCS: Signalized Intersections Release 3.1c

Inter: 34th Street & Woodley Road
Analyst: LB
Date: 8/17/00
E/W St: Woodley Road

City/St: Washington D.C.
Proj #: JA-2249
Period: 2017 No Build PM Peak Hour
N/S St: 34th Street

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	0	1	0	0	2	0	0	1	0
LGConfig		LTR			LTR			LTR			TR	
Volume	35	21	113	1	0	0	215	1049	7		224	0
Lane Width		14.0			10.0			10.0			13.0	
RTOR Vol			0			0			0			0

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left	P				NB	Left	P			
Thru	P					Thru	P			
Right	P					Right				
Peds	X					Peds	X			
WB Left	P				SB	Left	P			
Thru	P					Thru	P			
Right	P					Right				
Peds	X					Peds	X			
NB Right					EB	Right				
SB Right					WB	Right				
Green	25.0						53.0			
Yellow	4.0						4.0			
All Red	2.0						2.0			

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
LTR	398	1433	0.56	0.278	33.3	C	33.3	C
Westbound								
LTR	404	1455	0.01	0.278	23.6	C	23.6	C
Northbound								
LTR	1577	2678	0.87	0.589	22.1	C	22.1	C
Southbound								
TR	1134	1925	0.21	0.589	9.1	A	9.1	A

Intersection Delay = 21.8 (sec/veh) Intersection LOS = C

HCS: Signalized Intersections Release 3.1c

Inter: 34th Street & Woodley Road
Analyst: LB
Date: 8/17/00
E/W St: Woodley Road

City/St: Washington D.C.
Proj #: JA-2249
Period: 2017 Build AM Peak Hour
N/S St: 34th Street

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	0	1	0	0	2	0	0	1	0
LGConfig		LTR			LTR			LTR			TR	
Volume	14	156	271	1	258	0	34	543	2		1126	21
Lane Width		14.0			10.0			10.0			13.0	
RTOR Vol			0			0			0			0

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left	P				NB	Left	P			
Thru	P					Thru	P			
Right	P					Right				
Peds	X					Peds	X			
WB Left	P				SB	Left	P			
Thru	P					Thru	P			
Right	P					Right				
Peds	X					Peds	X			
NB Right					EB	Right				
SB Right					WB	Right				
Green	19.0						59.0			
Yellow	4.0						4.0			
All Red	2.0						2.0			

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
LTR	298	1413	1.84	0.211	424.3	F	424.3	F
Westbound								
LTR	366	1736	0.80	0.211	49.9	D	49.9	D
Northbound								
LTR	1318	2011	0.50	0.656	9.3	A	9.3	A
Southbound								
TR	1111	1694	1.09	0.656	69.5	E	69.5	E

Intersection Delay = 124.6 (sec/veh) Intersection LOS = F

HCS: Signalized Intersections Release 3.2

Inter: 34th Street & Woodley Road
Analyst: LB
Date: 8/17/00
E/W St: Woodley Road

City/St: Washington D.C.
Proj #: JA-2249
Period: 2017 Build PM Peak Hour
N/S St: 34th Street

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	0	1	0	0	2	0	0	1	0
LGConfig		LTR			LTR			LTR			TR	
Volume	35	305	82	1	184	0	176	1049	7		224	0
Lane Width		14.0			10.0			10.0			13.0	
RTOR Vol			0			0			0			0

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left	P				NB	Left	P			
Thru	P					Thru	P			
Right	P					Right				
Peds	X					Peds	X			
WB Left	P				SB	Left	P			
Thru	P					Thru	P			
Right	P					Right				
Peds	X					Peds	X			
NB Right					EB	Right				
SB Right					WB	Right				
Green	25.0						53.0			
Yellow	4.0						4.0			
All Red	2.0						2.0			

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
LTR	438	1577	1.16	0.278	126.2	F	126.2	F
Westbound								
LTR	489	1759	0.48	0.278	30.4	C	30.4	C
Northbound								
LTR	1606	2728	0.82	0.589	19.6	B	19.6	B
Southbound								
TR	1134	1925	0.21	0.589	9.1	A	9.1	A

Intersection Delay = 43.2 (sec/veh) Intersection LOS = D

HCS: Signalized Intersections Release 3.1c

Inter: 34th Street & Woodley Road
Analyst: LB
Date: 8/17/00
E/W St: Woodley Road

City/St: Washington D.C.
Proj #: JA-2249
Period: 2017 Build AM Peak w Mitigatio
N/S St: 34th Street

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	0	1	0	0	2	0	0	1	0
LGConfig		LTR			LTR			LTR			TR	
Volume	14	204	271	1	348	0	22	543	2		1126	21
Lane Width		14.0			10.0			10.0			13.0	
RTOR Vol			0			0			0			0

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left	P				NB	Left	P			
Thru	P					Thru	P			
Right	P					Right				
Peds	X					Peds	X			
WB Left	P				SB	Left	P			
Thru	P					Thru	P			
Right	P					Right				
Peds	X					Peds	X			
NB Right					EB	Right				
SB Right					WB	Right				
Green	19.0						59.0			
Yellow	4.0						4.0			
All Red	2.0						2.0			

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
LTR	277	1311	2.14	0.211	559.2	F	559.2	F
Westbound								
LTR	368	1745	1.06	0.211	99.9	F	99.9	F
Northbound								
LTR	1404	2141	0.45	0.656	8.7	A	8.7	A
Southbound								
TR	1111	1694	1.09	0.656	69.5	E	69.5	E

Intersection Delay = 162.4 (sec/veh) Intersection LOS = F

HCS: Signalized Intersections Release 3.1c

Inter: 34th Street & Woodley Road
Analyst: LB
Date: 8/17/00
E/W St: Woodley Road

City/St: Washington D.C.
Proj #: JA-2249
Period: 2017 Build PM Peak w Mitigatio
N/S St: 34th Street

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	0	1	0	0	2	0	0	1	0
LGConfig		LTR			LTR			LTR			TR	
Volume	35	404	71	1	248	0	170	1049	7		224	0
Lane Width		14.0			10.0			10.0			13.0	
RTOR Vol			0			0			0			0

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left	P				NB	Left	P			
Thru	P					Thru	P			
Right	P					Right				
Peds	X					Peds	X			
WB Left	P				SB	Left	P			
Thru	P					Thru	P			
Right	P					Right				
Peds	X					Peds	X			
NB Right					EB	Right				
SB Right					WB	Right				
Green	25.0						53.0			
Yellow	4.0						4.0			
All Red	2.0						2.0			

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
LTR	431	1553	1.35	0.278	205.9	F	205.9	F
Westbound								
LTR	488	1756	0.64	0.278	35.0-	C	35.0-	C
Northbound								
LTR	1611	2736	0.81	0.589	19.3	B	19.3	B
Southbound								
TR	1134	1925	0.21	0.589	9.1	A	9.1	A

Intersection Delay = 64.8 (sec/veh) Intersection LOS = E

HCS: Signalized Intersections Release 3.1c

Inter: Connecticut Ave. & Porter St. City/St: Washington D.C.
Analyst: LB Proj #: JA-2249
Date: 8/23/00 Period: Existing AM Peak Hour
E/W St: Porter St. N/S St: Connecticut Ave.

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	1	1	1	0	2	0	0	4	0
LGConfig		LTR		L	T	R		LTR			LTR	
Volume	14	412	48	119	464	229	0	557	76	229	2452	32
Lane Width		12.0		10.0	10.0	10.0		10.0			10.0	
RTOR Vol			0			0			0			0

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination		1	2	3	4			5	6	7	8
EB	Left	P				NB	Left		P		
	Thru	P					Thru		P		
	Right	P					Right		P		
	Peds	X					Peds		X		
WB	Left	P				SB	Left	P			
	Thru	P					Thru	P	P		
	Right	P					Right	P	P		
	Peds	X					Peds	X	X		
NB	Right					EB	Right				
SB	Right					WB	Right				
Green		26.0						27.0	27.0		
Yellow		4.0							4.0		
All Red		1.0						0.0	1.0		

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
LTR	284	984	2.14	0.289	557.0	F	557.0	F
Westbound								
L	80	265	2.13	0.289	577.7	F		
T	497	1722	1.10	0.289	102.0	F	167.5	F
R	418	1447	0.61	0.289	34.0	C		
Northbound								
LTR	969	3229	0.83	0.300	37.4	D	37.4	D
Southbound								
LTR	3698	6164	0.78	0.600	15.3	B	15.3	B

Intersection Delay = 109.2 (sec/veh) Intersection LOS = F

HCS: Signalized Intersections Release 3.1c

Inter: Connecticut Ave. & Porter St. City/St: Washington D.C.
Analyst: LB Proj #: JA-2249
Date: 8/23/00 Period: Existing PM Peak Hour
E/W St: Porter St. N/S St: Connecticut Ave.

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	1	1	1	0	4	0	0	2	0
LGConfig		LTR		L	T	R		LTR			LTR	
Volume	27	540	22	100	262	83	12	1364	99	12	524	27
Lane Width		12.0		10.0	10.0	10.0		10.0			10.0	
RTOR Vol			0			0			0			0

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination		1	2	3	4			5	6	7	8
EB	Left	P				NB	Left		P		
	Thru	P					Thru		P		
	Right	P					Right		P		
	Peds	X					Peds		X		
WB	Left	P				SB	Left	P			
	Thru	P					Thru	P	P		
	Right	P					Right	P	P		
	Peds	X					Peds	X	X		
NB	Right					EB	Right				
SB	Right					WB	Right				
Green		25.0						16.0	39.0		
Yellow		4.0							4.0		
All Red		1.0						0.0	1.0		

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
LTR	351	1264	2.00	0.278	491.3	F	491.3	F
Westbound								
L	80	275	1.50	0.278	311.9	F		
T	478	1722	0.64	0.278	35.1	D	95.8	F
R	402	1447	0.26	0.278	26.9	C		
Northbound								
LTR	2505	5780	0.66	0.433	21.6	C	21.6	C
Southbound								
LTR	1997	3268	0.30	0.611	8.7	A	8.7	A

Intersection Delay = 125.2 (sec/veh) Intersection LOS = F

HCS: Signalized Intersections Release 3.1c

Inter: Connecticut Ave. & Porter St. City/St: Washington D.C.
Analyst: LB Proj #: JA-2249
Date: 8/23/00 Period: 2017 No Build AM Peak Hour
E/W St: Porter St. N/S St: Connecticut Ave.

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	1	1	1	0	2	0	0	4	0
LGConfig		LTR		L	T	R		LTR			LTR	
Volume	17	486	57	140	548	270	0	657	90	270	2893	38
Lane Width		12.0		10.0	10.0	10.0		10.0			10.0	
RTOR Vol			0			0			0			0

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left	P				NB	Left		P		
Thru	P					Thru		P		
Right	P					Right		P		
Peds	X					Peds		X		
WB Left	P				SB	Left	P			
Thru	P					Thru	P	P		
Right	P					Right	P	P		
Peds	X					Peds	X	X		
NB Right					EB	Right				
SB Right					WB	Right				
Green	26.0						27.0	27.0		
Yellow	4.0							4.0		
All Red	1.0						0.0	1.0		

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
LTR	228	788	2.93	0.289	910.3	F	910.3	F
Westbound								
L	80	265	2.50	0.289	742.6	F		
T	497	1722	1.23	0.289	150.3	F	227.0	F
R	418	1447	0.72	0.289	38.8	D		
Northbound								
LTR	967	3224	0.89	0.300	42.0	D	42.0	D
Southbound								
LTR	3698	6164	0.92	0.600	20.9	C	20.9	C

Intersection Delay = 160.1 (sec/veh) Intersection LOS = F

HCS: Signalized Intersections Release 3.1c

Inter: Connecticut Ave. & Porter St. City/St: Washington D.C.
Analyst: LB Proj #: JA-2249
Date: 8/23/00 Period: 2017 No Build PM Peak Hour
E/W St: Porter St. N/S St: Connecticut Ave.

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	1	1	1	0	4	0	0	2	0
LGConfig		LTR		L	T	R		LTR			LTR	
Volume	32	637	26	118	309	98	14	1610	117	14	618	32
Lane Width		12.0		10.0	10.0	10.0		10.0			10.0	
RTOR Vol			0			0			0			0

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left	P				NB	Left		P		
Thru	P					Thru		P		
Right	P					Right		P		
Peds	X					Peds		X		
WB Left	P				SB	Left	P			
Thru	P					Thru	P	P		
Right	P					Right	P	P		
Peds	X					Peds	X	X		
NB Right					EB	Right				
SB Right					WB	Right				
Green	25.0						16.0	39.0		
Yellow	4.0							4.0		
All Red	1.0						0.0	1.0		

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
LTR	294	1060	2.81	0.278	857.7	F	857.7	F
Westbound								
L	80	275	1.77	0.278	426.8	F		
T	478	1722	0.76	0.278	40.7	D	125.2	F
R	402	1447	0.31	0.278	27.7	C		
Northbound								
LTR	2497	5763	0.78	0.433	24.3	C	24.3	C
Southbound								
LTR	1997	3268	0.36	0.611	9.2	A	9.2	A

Intersection Delay = 204.7 (sec/veh) Intersection LOS = F

HCS: Signalized Intersections Release 3.1c

Inter: Connecticut Ave. & Porter St. City/St: Washington D.C.
Analyst: LB Proj #: JA-2249
Date: 8/23/00 Period: 2017 Build AM Peak Hour
E/W St: Porter St. N/S St: Connecticut Ave.

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	1	1	1	0	2	0	0	4	0
LGConfig		LTR		L	T	R		LTR			LTR	
Volume	17	395	57	140	343	270	0	657	90	270	2893	38
Lane Width		12.0		10.0	10.0	10.0		10.0			10.0	
RTOR Vol			0			0			0			0

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left	P				NB	Left		P		
Thru	P					Thru		P		
Right	P					Right		P		
Peds	X					Peds		X		
WB Left	P				SB	Left	P			
Thru	P					Thru	P	P		
Right	P					Right	P	P		
Peds	X					Peds	X	X		
NB Right					EB	Right				
SB Right					WB	Right				
Green	26.0						27.0	27.0		
Yellow	4.0							4.0		
All Red	1.0						0.0	1.0		

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
LTR	367	1272	1.53	0.289	282.1	F	282.1	F
Westbound								
L	80	265	2.50	0.289	742.6	F		
T	497	1722	0.77	0.289	40.0	D	199.1	F
R	418	1447	0.72	0.289	38.8	D		
Northbound								
LTR	967	3224	0.89	0.300	42.0	D	42.0	D
Southbound								
LTR	3698	6164	0.92	0.600	20.9	C	20.9	C

Intersection Delay = 77.3 (sec/veh) Intersection LOS = E

HCS: Signalized Intersections Release 3.1c

Inter: Connecticut Ave. & Porter St. City/St: Washington D.C.
Analyst: LB Proj #: JA-2249
Date: 8/23/00 Period: 2017 Build PM Peak Hour
E/W St: Porter St. N/S St: Connecticut Ave.

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	1	1	1	0	4	0	0	2	0
LGConfig		LTR		L	T	R		LTR			LTR	
Volume	32	411	26	118	179	98	14	1610	117	14	618	32
Lane Width		12.0		10.0	10.0	10.0		10.0			10.0	
RTOR Vol			0			0			0			0

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left	P				NB	Left		P		
Thru	P					Thru		P		
Right	P					Right		P		
Peds	X					Peds		X		
WB Left	P				SB	Left	P			
Thru	P					Thru	P	P		
Right	P					Right	P	P		
Peds	X					Peds	X	X		
NB Right					EB	Right				
SB Right					WB	Right				
Green	25.0						16.0	39.0		
Yellow	4.0							4.0		
All Red	1.0						0.0	1.0		

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
LTR	401	1445	1.39	0.278	223.4	F	223.4	F
Westbound								
L	80	275	1.77	0.278	426.8	F		
T	478	1722	0.44	0.278	29.7	C	147.4	F
R	402	1447	0.31	0.278	27.7	C		
Northbound								
LTR	2497	5763	0.78	0.433	24.3	C	24.3	C
Southbound								
LTR	1997	3268	0.36	0.611	9.2	A	9.2	A

Intersection Delay = 67.4 (sec/veh) Intersection LOS = E

HCS: Signalized Intersections Release 3.1c

Inter: Connecticut Ave. & Porter St. City/St: Washington D.C.
Analyst: LB Proj #: JA-2249
Date: 8/23/00 Period: 2017 Build AM Peak w Mitigatio
E/W St: Porter St. N/S St: Connecticut Ave.

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	1	1	1	0	2	0	0	4	0
LGConfig		LTR		L	T	R		LTR			LTR	
Volume	17	363	57	140	272	270	0	657	90	270	2893	38
Lane Width		12.0		10.0	10.0	10.0		10.0			10.0	
RTOR Vol			0			0			0			0

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	P				NB Left		P		
Thru	P				Thru		P		
Right	P				Right		P		
Peds	X				Peds		X		
WB Left	P				SB Left	P			
Thru	P				Thru	P	P		
Right	P				Right	P	P		
Peds	X				Peds	X	X		
NB Right					EB Right				
SB Right					WB Right				
Green	26.0					27.0	27.0		
Yellow	4.0						4.0		
All Red	1.0					0.0	1.0		

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
LTR	421	1456	1.24	0.289	158.8	F	158.8	F
Westbound								
L	80	265	2.50	0.289	742.6	F		
T	497	1722	0.61	0.289	33.0	C	212.2	F
R	418	1447	0.72	0.289	38.8	D		
Northbound								
LTR	967	3224	0.89	0.300	42.0	D	42.0	D
Southbound								
LTR	3698	6164	0.92	0.600	20.9	C	20.9	C

Intersection Delay = 64.5 (sec/veh) Intersection LOS = E

HCS: Unsignalized Intersections Release 3.1c

TWO-WAY STOP CONTROL(TWSC) ANALYSIS

Analyst: lb
Intersection: Woodley Rd. & 32nd St.
Count Date:
Time Period: Existing AM

Intersection Orientation: East-West Major St.

Vehicle Volume Data:

Movements:	2	3	4	5	7	9
Volume:	1	71	0	5	2	0
HFR:	4	118	0	9	4	0
PHF:	0.25	0.60	1.00	0.53	0.50	1.00
PHV:	0.00	0.00	0.00	0.00	0.00	0.00

Pedestrian Volume Data:

Movements:

Flow:
Lane width:
Walk speed:
% Blockage:

Median Type: None
# of vehicles: 0

Flared approach Movements:

# of vehicles: Northbound 0
# of vehicles: Southbound 0

Lane usage for movements 1,2&3 approach:

Lane 1 L	Lane 1 T	Lane 1 R	Lane 2 L	Lane 2 T	Lane 2 R	Lane 3 L	Lane 3 T	Lane 3 R
N	Y	Y	N	N	N	N	N	N

Channelized: N
Grade: 0.00

Lane usage for movements 4,5&6 approach:

Lane 1 L	Lane 1 T	Lane 1 R	Lane 2 L	Lane 2 T	Lane 2 R	Lane 3 L	Lane 3 T	Lane 3 R
Y	Y	N	N	N	N	N	N	N

Channelized: N
Grade: 0.00

Lane usage for movements 7,8&9 approach:

Lane 1 L	Lane 1 T	Lane 1 R	Lane 2 L	Lane 2 T	Lane 2 R	Lane 3 L	Lane 3 T	Lane 3 R
Y	N	Y	N	N	N	N	N	N

Channelized: N
Grade: 0.00

Lane usage for movements 10,11&12 approach:

Lane 1			Lane 2			Lane 3		
L	T	R	L	T	R	L	T	R
N	N	N	N	N	N	N	N	N

Channelized: N
Grade: 0.00

Data for Computing Effect of Delay to Major Street Vehicles:

	Eastbound	Westbound
Shared ln volume, major th vehicles:	0	5
Shared ln volume, major rt vehicles:	0	0
Sat flow rate, major th vehicles:	1700	1700
Sat flow rate, major rt vehicles:	1700	1700
Number of major street through lanes:	1	1

Length of study period, hrs: 0.25

Worksheet 4 Critical Gap and Follow-up time calculation.

Critical Gap Calculations:

Movement	4	7	9
t c,base	4.1	7.1	6.2
t c,hv	1.0	1.0	1.0
P hv	0.00	0.00	0.00
t c,g		0.2	0.1
G	0.00	0.00	0.00
t 3,lt	0.0	0.7	0.0
t c,T:			
1 stage	0.00	0.00	0.00
t c			
1 stage	4.1	6.4	6.2

Follow Up Time Calculations:

Movement	4	7	9
t f,base	2.2	3.5	3.3
t f,HV	0.9	0.9	0.9
P hv	0.00	0.00	0.00
t f	2.2	3.5	3.3

Worksheet 6 Impedance and capacity equations

Step 1: RT from Minor St.	9	12
Conflicting Flows	63	
Potential Capacity	1007	
Pedestrian Impedance Factor	1.00	
Movement Capacity	1007	
Probability of Queue free St.	1.00	

Step 2: LT from Major St.	4	1
Conflicting Flows	122	
Potential Capacity	1477	
Pedestrian Impedance Factor	1.00	
Movement Capacity	1477	
Probability of Queue free St.	1.00	
Maj. L Shared ln. Prob. Queue Free St	1.00	

Step 4: LT from Minor St.	7	10
Conflicting Flows	73	
Potential Capacity	936	
Pedestrian Impedance Factor	1.00	
Maj. L, Min T Impedance factor	1.00	
Maj. L, Min T Adj. Imp Factor.	1.00	
Cap. Adj. factor due to Impeding mvmnt	1.00	
Movement Capacity	936	

Worksheet 8 Shared Lane Calculations

Shared Lane Calculations

Movement	7	8	9	10	11	12
v(vph)	4		0			
Movement Capacity	936		1007			
Shared Lane Capacity	936					

Worksheet 10 delay,queue length, and LOS

Movement	1	4	7	8	9	10	11	12
v(vph)			4					
C m(vph)		1477	936					
v/c			0.00					
95% queue length								
Control Delay			8.9					
LOS			A					
Approach Delay				8.9				
Approach LOS				A				

Worksheet 11 Shared Major LT Impedance and Delay

Rank 1 Delay Calculations

Movement	2	5
P oj	1.00	1.00
V i1	0	5
V i2	0	0
S i1	1700	1700
S i2	1700	1700
P* oj	1.00	1.00
D maj left	0.0	0.0
N number major st lanes	1	1
Delay, rank 1 mvmts	0.0	0.0

HCS: Unsignalized Intersections Release 3.1c

TWO-WAY STOP CONTROL(TWSC) ANALYSIS

Analyst: lb
Intersection: Woodley Rd. & 32nd St.
Count Date:
Time Period: Existing PM

Intersection Orientation: East-West Major St.

Vehicle Volume Data:

Movements:	2	3	4	5	7	9
Volume:	15	35	0	5	2	0
HFR:	25	58	0	9	4	0
PHF:	0.60	0.60	1.00	0.53	0.50	1.00
PHV:	0.00	0.00	0.00	0.00	0.00	0.00

Pedestrian Volume Data:

Movements:

Flow:
Lane width:
Walk speed:
% Blockage:

Median Type: None
# of vehicles: 0

Flared approach Movements:

# of vehicles: Northbound 0
# of vehicles: Southbound 0

Lane usage for movements 1,2&3 approach:

Lane 1			Lane 2			Lane 3		
L	T	R	L	T	R	L	T	R
N	Y	Y	N	N	N	N	N	N

Channelized: N
Grade: 0.00

Lane usage for movements 4,5&6 approach:

Lane 1			Lane 2			Lane 3		
L	T	R	L	T	R	L	T	R
Y	Y	N	N	N	N	N	N	N

Channelized: N
Grade: 0.00

Lane usage for movements 7,8&9 approach:

Lane 1			Lane 2			Lane 3		
L	T	R	L	T	R	L	T	R
Y	N	Y	N	N	N	N	N	N

Channelized: N
Grade: 0.00

Lane usage for movements 10,11&12 approach:

Lane 1			Lane 2			Lane 3		
L	T	R	L	T	R	L	T	R
N	N	N	N	N	N	N	N	N

Channelized: N
Grade: 0.00

Data for Computing Effect of Delay to Major Street Vehicles:

	Eastbound	Westbound
Shared ln volume, major th vehicles:	0	5
Shared ln volume, major rt vehicles:	0	0
Sat flow rate, major th vehicles:	1700	1700
Sat flow rate, major rt vehicles:	1700	1700
Number of major street through lanes:	1	1

Length of study period, hrs: 0.25

Worksheet 4 Critical Gap and Follow-up time calculation.

Critical Gap Calculations:

Movement	4	7	9
t c,base	4.1	7.1	6.2
t c,hv	1.0	1.0	1.0
P hv	0.00	0.00	0.00
t c,g		0.2	0.1
G	0.00	0.00	0.00
t 3,lt	0.0	0.7	0.0
c c,T:			
1 stage	0.00	0.00	0.00
t c			
1 stage	4.1	6.4	6.2

Follow Up Time Calculations:

Movement	4	7	9
t f,base	2.2	3.5	3.3
t f,HV	0.9	0.9	0.9
P hv	0.00	0.00	0.00
t f	2.2	3.5	3.3

Worksheet 6 Impedance and capacity equations

Step 1: RT from Minor St.	9	12
Conflicting Flows	54	
Potential Capacity	1019	
Pedestrian Impedance Factor	1.00	
Movement Capacity	1019	
Probability of Queue free St.	1.00	

Step 2: LT from Major St.	4	1
Conflicting Flows	83	
Potential Capacity	1526	
Pedestrian Impedance Factor	1.00	
Movement Capacity	1526	
Probability of Queue free St.	1.00	
Maj. L Shared Ln. Prob. Queue Free St.	1.00	

Step 4: LT from Minor St.	7	10
Conflicting Flows	64	
Potential Capacity	947	
Pedestrian Impedance Factor	1.00	
Maj. L, Min T Impedance factor	1.00	
Maj. L, Min T Adj. Imp Factor.	1.00	
Cap. Adj. factor due to Impeding mvmnt	1.00	
Movement Capacity	947	

Worksheet 8 Shared Lane Calculations

Shared Lane Calculations

Movement	7	8	9	10	11	12
v(vph)	4		0			
Movement Capacity	947		1019			
Shared Lane Capacity	947					

Worksheet 10 delay,queue length, and LOS

Movement	1	4	7	8	9	10	11	12
v(vph)			4					
C m(vph)		1526	947					
v/c			0.00					
95% queue length								
Control Delay			8.8					
LOS			A					
Approach Delay				8.8				
Approach LOS				A				

Worksheet 11 Shared Major LT Impedance and Delay

Rank 1 Delay Calculations

Movement	2	5
P oj	1.00	1.00
V i1	0	5
V i2	0	0
S i1	1700	1700
S i2	1700	1700
P* oj	1.00	1.00
D maj left	0.0	0.0
N number major st lanes	1	1
Delay, rank 1 mvmts	0.0	0.0

HCS: Unsignalized Intersections Release 3.1c

TWO-WAY STOP CONTROL(TWSC) ANALYSIS

Analyst: lb
Intersection: Woodley Rd. & 32nd St.
Count Date:
Time Period: No Build AM

Intersection Orientation: East-West Major St.

Vehicle Volume Data:

Movements:	2	3	4	5	7	9
Volume:	1	84	0	5	2	0
HFR:	4	140	0	9	4	0
PHF:	0.25	0.60	1.00	0.53	0.50	1.00
PHV:	0.00	0.00	0.00	0.00	0.00	0.00

Pedestrian Volume Data:

Movements:

Flow:
Lane width:
Walk speed:
% Blockage:

Median Type: None
# of vehicles: 0

Flared approach Movements:

# of vehicles: Northbound 0
# of vehicles: Southbound 0

Lane usage for movements 1,2&3 approach:

Lane 1			Lane 2			Lane 3		
L	T	R	L	T	R	L	T	R
N	Y	Y	N	N	N	N	N	N

Channelized: N
Grade: 0.00

Lane usage for movements 4,5&6 approach:

Lane 1			Lane 2			Lane 3		
L	T	R	L	T	R	L	T	R
Y	Y	N	N	N	N	N	N	N

Channelized: N
Grade: 0.00

Lane usage for movements 7,8&9 approach:

Lane 1			Lane 2			Lane 3		
L	T	R	L	T	R	L	T	R
Y	N	Y	N	N	N	N	N	N

Channelized: N
Grade: 0.00

Lane usage for movements 10,11&12 approach:

Lane 1			Lane 2			Lane 3		
L	T	R	L	T	R	L	T	R
N	N	N	N	N	N	N	N	N

Channelized: N
Grade: 0.00

Data for Computing Effect of Delay to Major Street Vehicles:

	Eastbound	Westbound
Shared ln volume, major th vehicles:	0	5
Shared ln volume, major rt vehicles:	0	0
Sat flow rate, major th vehicles:	1700	1700
Sat flow rate, major rt vehicles:	1700	1700
Number of major street through lanes:	1	1

Length of study period, hrs: 0.25

Worksheet 4 Critical Gap and Follow-up time calculation.

Critical Gap Calculations:

Movement	4	7	9
t c,base	4.1	7.1	6.2
t c,hv	1.0	1.0	1.0
P hv	0.00	0.00	0.00
t c,g		0.2	0.1
G	0.00	0.00	0.00
t 3,lt	0.0	0.7	0.0
t c,T:			
1 stage	0.00	0.00	0.00
t c			
1 stage	4.1	6.4	6.2

Follow Up Time Calculations:

Movement	4	7	9
t f,base	2.2	3.5	3.3
t f,HV	0.9	0.9	0.9
P hv	0.00	0.00	0.00
t f	2.2	3.5	3.3

Worksheet 6 Impedance and capacity equations

Step 1: RT from Minor St.	9	12
Conflicting Flows	74	
Potential Capacity	993	
Pedestrian Impedance Factor	1.00	
Movement Capacity	993	
Probability of Queue free St.	1.00	

Step 2: LT from Major St.	4	1
Conflicting Flows	144	
Potential Capacity	1451	
Pedestrian Impedance Factor	1.00	
Movement Capacity	1451	
Probability of Queue free St.	1.00	
Maj. L Shared ln. Prob. Queue Free St.	1.00	

Step 4: LT from Minor St.	7	10
Conflicting Flows	83	
Potential Capacity	923	
Pedestrian Impedance Factor	1.00	
Maj. L, Min T Impedance factor	1.00	
Maj. L, Min T Adj. Imp Factor.	1.00	
Cap. Adj. factor due to Impeding mvmnt	1.00	
Movement Capacity	923	

Worksheet 8 Shared Lane Calculations

Shared Lane Calculations

Movement	7	8	9	10	11	12
V(vph)	4		0			
Movement Capacity	923		993			
Shared Lane Capacity	923					

Worksheet 10 delay,queue length, and LOS

Movement	1	4	7	8	9	10	11	12
V(vph)			4					
C m(vph)		1451	923					
V/c			0.00					
95% queue length								
Control Delay			8.9					
LOS			A					
Approach Delay				8.9				
Approach LOS				A				

Worksheet 11 Shared Major LT Impedance and Delay

Rank 1 Delay Calculations

Movement	2	5
P oj	1.00	1.00
V i1	0	5
V i2	0	0
S i1	1700	1700
S i2	1700	1700
P* oj	1.00	1.00
D maj left	0.0	0.0
N number major st lanes	1	1
Delay, rank 1 mvmts	0.0	0.0

HCS: Unsignalized Intersections Release 3.1c

TWO-WAY STOP CONTROL(TWSC) ANALYSIS

Analyst: lb
Intersection: Woodley Rd. & 32nd St.
Count Date:
Time Period: No Build PM

Intersection Orientation: East-West Major St.

Vehicle Volume Data:

Movements:	2	3	4	5	7	9
Volume:	18	41	0	5	2	0
HFR:	39	68	0	9	4	0
PHF:	0.60	0.60	1.00	0.53	0.50	1.00
PHV:	0.00	0.00	0.00	0.00	0.00	0.00

Pedestrian Volume Data:

Movements:

Flow:
Lane width:
Walk speed:
% Blockage:

Median Type: None
# of vehicles: 0

Flared approach Movements:

# of vehicles: Northbound 0
# of vehicles: Southbound 0

Lane usage for movements 1,2&3 approach:

	Lane 1			Lane 2			Lane 3	
L	T	R	L	T	R	L	T	R
N	Y	Y	N	N	N	N	N	N

Channelized: N
Grade: 0.00

Lane usage for movements 4,5&6 approach:

	Lane 1			Lane 2			Lane 3	
L	T	R	L	T	R	L	T	R
Y	Y	N	N	N	N	N	N	N

Channelized: N
Grade: 0.00

Lane usage for movements 7,8&9 approach:

	Lane 1			Lane 2			Lane 3	
L	T	R	L	T	R	L	T	R
Y	N	Y	N	N	N	N	N	N

Channelized: N
Grade: 0.00

Lane usage for movements 10,11&12 approach:

	Lane 1			Lane 2			Lane 3	
L	T	R	L	T	R	L	T	R
N	N	N	N	N	N	N	N	N

Channelized: N
Grade: 0.00

Data for Computing Effect of Delay to Major Street Vehicles:

	Eastbound	Westbound
Shared ln volume, major th vehicles:	0	5
Shared ln volume, major rt vehicles:	0	0
Sat flow rate, major th vehicles:	1700	1700
Sat flow rate, major rt vehicles:	1700	1700
Number of major street through lanes:	1	1

Length of study period, hrs: 0.25

Worksheet 4 Critical Gap and Follow-up time calculation.

Critical Gap Calculations:

Movement	4	7	9
t c,base	4.1	7.1	6.2
t c,hv	1.0	1.0	1.0
P hv	0.00	0.00	0.00
t c,g		0.2	0.1
G	0.00	0.00	0.00
t 3,lt	0.0	0.7	0.0
t c,T:			
1 stage	0.00	0.00	0.00
t c			
1 stage	4.1	6.4	6.2

Follow Up Time Calculations:

Movement	4	7	9
t f,base	2.2	3.5	3.3
t f,HV	0.9	0.9	0.9
P hv	0.00	0.00	0.00
t f	2.2	3.5	3.3

Worksheet 6 Impedance and capacity equations

Step 1: RT from Minor St.	9	12
Conflicting Flows	64	
Potential Capacity	1006	
Pedestrian Impedance Factor	1.00	
Movement Capacity	1006	
Probability of Queue free St.	1.00	

Step 2: LT from Major St.	4	1
Conflicting Flows	98	
Potential Capacity	1507	
Pedestrian Impedance Factor	1.00	
Movement Capacity	1507	
Probability of Queue free St.	1.00	
Maj. L Shared ln. Prob. Queue Free St.	1.00	

Step 4: LT from Minor St.	7	10
Conflicting Flows	74	
Potential Capacity	935	
Pedestrian Impedance Factor	1.00	
Maj. L, Min T Impedance factor	1.00	
Maj. L, Min T Adj. Imp Factor.	1.00	
Cap. Adj. factor due to Impeding mvmnt	1.00	
Movement Capacity	935	

Worksheet 8 Shared Lane Calculations

Shared Lane Calculations

Movement	7	8	9	10	11	12
v(vph)	4		0			
Movement Capacity	935		1006			
Shared Lane Capacity	935					

Worksheet 10 delay,queue length, and LOS

Movement	1	4	7	8	9	10	11	12
v(vph)			4					
C m(vph)		1507	935					
v/c			0.00					
95% queue length								
Control Delay			8.9					
LOS			A					
Approach Delay				8.9				
Approach LOS				A				

Worksheet 11 Shared Major LT Impedance and Delay

Rank 1 Delay Calculations

Movement	2	5
P oj	1.00	1.00
v i1	0	5
v i2	0	0
S i1	1700	1700
S i2	1700	1700
P* oj	1.00	1.00
D maj left	0.0	0.0
N number major st lanes	1	1
Delay, rank 1 mvmts	0.0	0.0

HCS: Unsignalized Intersections Release 3.1c

TWO-WAY STOP CONTROL(TWSC) ANALYSIS

Analyst: lb
Intersection: Woodley Rd. & 32nd St.
Count Date:
Time Period: Build s1 AM

Intersection Orientation: East-West Major St.

Vehicle Volume Data:

Movements:	2	3	4	5	7	9
Volume:	137	84	0	263	2	0
HFR:	171	140	0	329	4	0
PHF:	0.80	0.60	1.00	0.80	0.50	1.00
PHV:	0.00	0.00	0.00	0.00	0.00	0.00

Pedestrian Volume Data:

Movements:

Flow:
Lane width:
Walk speed:
% Blockage:

Median Type: None
# of vehicles: 0

Flared approach Movements:

# of vehicles: Northbound 0
# of vehicles: Southbound 0

Lane usage for movements 1,2&3 approach:

Lane 1			Lane 2			Lane 3		
L	T	R	L	T	R	L	T	R
N	Y	Y	N	N	N	N	N	N

Channelized: N
Grade: 0.00

Lane usage for movements 4,5&6 approach:

Lane 1			Lane 2			Lane 3		
L	T	R	L	T	R	L	T	R
Y	Y	N	N	N	N	N	N	N

Channelized: N
Grade: 0.00

Lane usage for movements 7,8&9 approach:

Lane 1			Lane 2			Lane 3		
L	T	R	L	T	R	L	T	R
Y	N	Y	N	N	N	N	N	N

Channelized: N
Grade: 0.00

Lane usage for movements 10,11&12 approach:

Lane 1			Lane 2			Lane 3		
L	T	R	L	T	R	L	T	R
N	N	N	N	N	N	N	N	N

Channelized: N
Grade: 0.00

Data for Computing Effect of Delay to Major Street Vehicles:

	Eastbound	Westbound
Shared ln volume, major th vehicles:	0	263
Shared ln volume, major rt vehicles:	0	0
Sat flow rate, major th vehicles:	1700	1700
Sat flow rate, major rt vehicles:	1700	1700
Number of major street through lanes.	1	1

Length of study period, hrs: 0.25

Worksheet 4 Critical Gap and Follow-up time calculation.

Critical Gap Calculations:

Movement	4	7	9
t c,base	4.1	7.1	6.2
t c,hv	1.0	1.0	1.0
P hv	0.00	0.00	0.00
t c,g		0.2	0.1
G	0.00	0.00	0.00
t 3,lt	0.0	0.0	0.0
t c,T:			
1 stage	0.00	0.00	0.00
t c			
1 stage	4.1	6.4	6.2

Follow Up Time Calculations.

Movement	4	7	9
t f,base	2.2	3.5	3.3
t f,HV	0.9	0.9	0.9
P hv	0.00	0.00	0.00
t f	2.2	3.5	3.3

Worksheet 6 Impedance and capacity equations

Step 1: RT from Minor St.	9	12
Conflicting Flows	241	
Potential Capacity	803	
Pedestrian Impedance Factor	1.00	
Movement Capacity	803	
Probability of Queue free St.	1.00	

Step 2: LT from Major St.	4	1
Conflicting Flows	311	
Potential Capacity	1261	
Pedestrian Impedance Factor	1.00	
Movement Capacity	1261	
Probability of Queue free St.	1.00	
Maj. L Shared ln. Prob. Queue Free St.	1.00	

Step 4: LT from Minor St.	7	10
Conflicting Flows	570	
Potential Capacity	486	
Pedestrian Impedance Factor	1.00	
Maj. L, Min T Impedance factor	1.00	
Maj. L, Min T Adj. Imp Factor.	1.00	
Cap. Adj. factor due to Impeding mvmnt	1.00	
Movement Capacity	486	

Worksheet 8 Shared Lane Calculations

Shared Lane Calculations

Movement	7	8	9	10	11	12
v(vph)	4		0			
Movement Capacity	486		803			
Shared Lane Capacity	486					

Worksheet 10 delay,queue length, and LOS

Movement	1	4	7	8	9	10	11	12
v(vph)			4					
C m(vph)		1261	486					
v/c			0.01					
95% queue length								
Control Delay			12.5					
LOS			B					
Approach Delay				12.5				
Approach LOS				B				

Worksheet 11 Shared Major LT Impedance and Delay

Rank 1 Delay Calculations

Movement	2	5
P oj	1.00	1.00
v i1	0	263
V i2	0	0
S i1	1700	1700
S i2	1700	1700
P* oj	1.00	1.00
D maj left	0.0	0.0
N number major st lanes	1	1
Delay, rank 1 mvmts	0.0	0.0

HCS: Unsignalized Intersections Release 3.1c

TWO-WAY STOP CONTROL(TWSC) ANALYSIS

Analyst: lb
Intersection: Woodley Rd. & 32nd St.
Count Date:
Time Period: Build #1 PM

Intersection Orientation: East-West Major St.

Vehicle Volume Data:

Movements:	2	3	4	5	7	9
Volume:	302	41	0	190	2	0
HFR:	355	68	0	238	4	0
PHF:	0.85	0.60	1.00	0.80	0.50	1.00
PHV:	0.00	0.00	0.00	0.00	0.00	0.00

Pedestrian Volume Data:

Movements:

Flow:
Lane width:
Walk speed:
% Blockage:

Median Type: None
# of vehicles: 0

Flared approach Movements:

# of vehicles: Northbound 0
# of vehicles: Southbound 0

Lane usage for movements 1,2&3 approach:

Lane 1			Lane 2			Lane 3		
L	T	R	L	T	R	L	T	R
N	Y	Y	N	N	N	N	N	N

Channelized: N
Grade: 0.00

Lane usage for movements 4,5&6 approach:

Lane 1			Lane 2			Lane 3		
L	T	R	L	T	R	L	T	R
Y	Y	N	N	N	N	N	N	N

Channelized: N
Grade: 0.00

Lane usage for movements 7,8&9 approach:

Lane 1			Lane 2			Lane 3		
L	T	R	L	T	R	L	T	R
Y	N	Y	N	N	N	N	N	N

Channelized: N
Grade: 0.00

Lane usage for movements 10,11&12 approach:

Lane 1			Lane 2			Lane 3		
L	T	R	L	T	R	L	T	R
N	N	N	N	N	N	N	N	N

Channelized: N
Grade: 0.00

Data for Computing Effect of Delay to Major Street Vehicles:

	Eastbound	Westbound
Shared ln volume, major th vehicles:	0	190
Shared ln volume, major rt vehicles:	0	0
Sat flow rate, major th vehicles:	1700	1700
Sat flow rate, major rt vehicles:	1700	1700
Number of major street through lanes:	1	1

Length of study period, hrs: 0.25

Worksheet 4 Critical Gap and Follow-up time calculation.

Critical Gap Calculations:

Movement	4	7	9
t c,base	4.1	7.1	6.2
t c,hv	1.0	1.0	1.0
P hv	0.00	0.00	0.00
t c,g		0.2	0.1
G	0.00	0.00	0.00
t c,3,lt	0.0	0.7	0.0
t c,T:			
1 stage	0.00	0.00	0.00
t c			
1 stage	4.1	6.4	6.2

Follow Up Time Calculations:

Movement	4	7	9
t f,base	2.2	3.5	3.3
t f,HV	0.9	0.9	0.9
P hv	0.00	0.00	0.00
t f	2.2	3.5	3.3

Worksheet 6 Impedance and capacity equations

Step 1: RT from Minor St.	9	12
Conflicting Flows	369	
Potential Capacity	663	
Pedestrian Impedance Factor	1.00	
Movement Capacity	663	
Probability of Queue free St.	1.00	

Step 2: LT from Major St.	4	1
Conflicting Flows	424	
Potential Capacity	1146	
Pedestrian Impedance Factor	1.00	
Movement Capacity	1146	
Probability of Queue free St.	1.00	
Maj. L Shared Ln. Prob. Queue Free St.	1.00	

Step 4: LT from Minor St.	7	10
Conflicting Flows	627	
Potential Capacity	451	
Pedestrian Impedance Factor	1.00	
Maj. L, Min T Impedance factor	1.00	
Maj. L, Min T Adj. Imp Factor.	1.00	
Cap. Adj. factor due to Impeding mvmnt	1.00	
Movement Capacity	451	

Worksheet 8 Shared Lane Calculations

Shared Lane Calculations

Movement	7	8	9	10	11	12
v(vph)	4		0			
Movement Capacity	451		663			
Shared Lane Capacity	451					

Worksheet 10 delay,queue length, and LOS

Movement	1	4	7	8	9	10	11	12
v(vph)			4					
C m(vph)		1146	451					
v/c			0.01					
95% queue length								
Control Delay			13.1					
LOS			B					
Approach Delay				13.1				
Approach LOS				B				

Worksheet 11 Shared Major LT Impedance and Delay

Rank 1 Delay Calculations

Movement	2	5
P oj	1.00	1.00
V i1	0	190
V i2	0	0
S i1	1700	1700
S i2	1700	1700
P* oj	1.00	1.00
D maj left	0.0	0.0
N number major st lanes	1	1
Delay, rank 1 mvmts	0.0	0.0

HCS: Unsignalized Intersections Release 3.1c

TWO-WAY STOP CONTROL(TWSC) ANALYSIS

Analyst: lb
Intersection: Woodley Rd. & 32nd St.
Count Date:
Time Period: Build w2 AM

Intersection Orientation: East-West Major St.

Vehicle Volume Data:

Movements:	2	3	4	5	7	9
Volume:	205	84	0	351	2	0
HFR:	256	140	0	413	4	0
PHF:	0.80	0.60	1.00	0.85	0.50	1.00
PHV:	0.00	0.00	0.00	0.00	0.00	0.00

Pedestrian Volume Data:

Movements:

Flow:
Lane width:
Walk speed:
% Blockage:

Median Type: None
# of vehicles: 0

Flared approach Movements:

# of vehicles: Northbound 0
# of vehicles: Southbound 0

Lane usage for movements 1,2&3 approach:

Lane 1			Lane 2			Lane 3		
L	T	R	L	T	R	L	T	R
N	Y	Y	N	N	N	N	N	N

Channelized: N
Grade: 0.00

Lane usage for movements 4,5&6 approach:

Lane 1			Lane 2			Lane 3		
L	T	R	L	T	R	L	T	R
Y	Y	N	N	N	N	N	N	N

Channelized: N
Grade: 0.00

Lane usage for movements 7,8&9 approach:

Lane 1			Lane 2			Lane 3		
L	T	R	L	T	R	L	T	R
Y	N	Y	N	N	N	N	N	N

Channelized: N
Grade: 0.00

Lane usage for movements 10,11&12 approach:

Lane 1			Lane 2			Lane 3		
L	T	R	L	T	R	L	T	R
N	N	N	N	N	N	N	N	N

Channelized: N
Grade: 0.00

Data for Computing Effect of Delay to Major Street Vehicles:

	Eastbound	Westbound
Shared ln volume, major th vehicles:	0	351
Shared ln volume, major rt vehicles:	0	0
Sat flow rate, major th vehicles:	1700	1700
Sat flow rate, major rt vehicles:	1700	1700
Number of major street through lanes:	1	1

Length of study period, hrs: 0.25

Worksheet 4 Critical Gap and Follow-up time calculation.

Critical Gap Calculations:

Movement	4	7	9
t c,base	4.1	7.1	6.2
t c,hv	1.0	1.0	1.0
P hv	0.00	0.00	0.00
t c,g		0.2	0.1
G	0.00	0.00	0.00
t 3,lt	0.0	0.7	0.0
t c,T:			
1 stage	0.00	0.00	0.00
t c			
1 stage	4.1	6.4	6.2

Follow Up Time Calculations:

Movement	4	7	9
t f,base	2.2	3.5	3.3
t f,HV	0.9	0.9	0.9
P hv	0.00	0.00	0.00
t f	2.2	3.5	3.3

Worksheet 6 Impedance and capacity equations

Step 1: RT from Minor St.	9	12
Conflicting Flows	326	
Potential Capacity	720	
Pedestrian Impedance Factor	1.00	
Movement Capacity	720	
Probability of Queue free St.	1.00	

Step 2: LT from Major St.	4	1
Conflicting Flows	396	
Potential Capacity	1173	
Pedestrian Impedance Factor	1.00	
Movement Capacity	1173	
Probability of Queue free St.	1.00	
Maj. L Shared ln. Prob. Queue Free St.	1.00	

Step 4: LT from Minor St.	7	10
Conflicting Flows	739	
Potential Capacity	387	
Pedestrian Impedance Factor	1.00	
Maj. L, Min T Impedance factor	1.00	
Maj. L, Min T Adj. Imp Factor	1.00	
Cap. Adj. factor due to Impeding mvmnt	1.00	
Movement Capacity	387	

Worksheet 8 Shared Lane Calculations

Shared Lane Calculations

Movement	7	8	9	10	11	12
v(vph)	4		0			
Movement Capacity	387		720			
Shared Lane Capacity	387					

Worksheet 10 delay,queue length, and LOS

Movement	1	4	7	8	9	10	11	12
v(vph)			4					
C m(vph)		1173	387					
v/c			0.01					
95% queue length								
Control Delay			14.4					
LOS			B					
Approach Delay				14.4				
Approach LOS				B				

Worksheet 11 Shared Major LT Impedance and Delay

Rank 1 Delay Calculations

Movement	2	5
P oj	1.00	1.00
V i1	0	351
V i2	0	0
S i1	1700	1700
S i2	1700	1700
P* oj	1.00	1.00
D maj left	0.0	0.0
D number major st lanes	1	1
Delay, rank 1 mvmts	0.0	0.0

HCS: Unsignalized Intersections Release 3.1c

TWO-WAY STOP CONTROL(TWSC) ANALYSIS

Analyst: lb
Intersection: Woodley Rd. & 32nd St.
Count Date:
Time Period: Build s2 PM

Intersection Orientation: East-West Major St.

Vehicle Volume Data:

Movements:	2	3	4	5	7	9
Volume:	401	41	0	251	2	0
HFR:	456	68	0	314	4	0
PHF:	0.88	0.60	1.00	0.80	0.50	1.00
PHV:	0.00	0.00	0.00	0.00	0.00	0.00

Pedestrian Volume Data:

Movements:

Flow:
Lane width:
Walk speed:
% Blockage:

Median Type: None
# of vehicles: 0

Flared approach Movements:

# of vehicles: Northbound 0
# of vehicles: Southbound 0

Lane usage for movements 1,2&3 approach:

	Lane 1			Lane 2			Lane 3	
L	T	R	L	T	R	L	T	R
N	Y	Y	N	N	N	N	N	N

Channelized: N
Grade: 0.00

Lane usage for movements 4,5&6 approach:

	Lane 1			Lane 2			Lane 3	
L	T	R	L	T	R	L	T	R
Y	Y	N	N	N	N	N	N	N

Channelized: N
Grade: 0.00

Lane usage for movements 7,8&9 approach:

	Lane 1			Lane 2			Lane 3	
L	T	R	L	T	R	L	T	R
Y	N	Y	N	N	N	N	N	N

Channelized: N
Grade: 0.00

Lane usage for movements 10,11&12 approach:

	Lane 1			Lane 2			Lane 3	
L	T	R	L	T	R	L	T	R
N	N	N	N	N	N	N	N	N

Channelized: N
Grade: 0.00

Data for Computing Effect of Delay to Major Street Vehicles:

	Eastbound	Westbound
Shared ln volume, major th vehicles:	0	251
Shared ln volume, major rt vehicles:	0	0
Sat flow rate, major th vehicles:	1700	1700
Sat flow rate, major rt vehicles:	1700	1700
Number of major street through lanes:	1	1

Length of study period, hrs: 0.25

Worksheet 4 Critical Gap and Follow-up time calculation.

Critical Gap Calculations:

Movement	4	7	9
t c,base	4.1	7.1	6.2
t c,hv	1.0	1.0	1.0
P hv	0.00	0.00	0.00
t c,g		0.2	0.1
G	0.00	0.00	0.00
t 3,lt	0.0	0.7	0.0
t c,T:			
1 stage	0.00	0.00	0.00
t c			
1 stage	4.1	6.4	6.2

Follow Up Time Calculations:

Movement	4	7	9
t f,base	2.2	3.5	3.3
t f,HV	0.9	0.9	0.9
P hv	0.00	0.00	0.00
t f	2.2	3.5	3.3

Worksheet 6 Impedance and capacity equations

Step 1: RT from Minor St.	9	12
Conflicting Flows	490	
Potential Capacity	582	
Pedestrian Impedance Factor	1.00	
Movement Capacity	582	
Probability of Queue free St.	1.00	

Step 2: LT from Major St.	4	1
Conflicting Flows	524	
Potential Capacity	1053	
Pedestrian Impedance Factor	1.00	
Movement Capacity	1053	
Probability of Queue free St.	1.00	
Maj. L Shared ln. Prob. Queue Free St.	1.00	

Step 4: LT from Minor St.	7	10
Conflicting Flows	804	
Potential Capacity	355	
Pedestrian Impedance Factor	1.00	
Maj. L, Min T Impedance factor	1.00	
Maj. L, Min T Adj. Imp Factor.	1.00	
Cap. Adj. factor due to Impeding mvmnt	1.00	
Movement Capacity	355	

Worksheet 8 Shared Lane Calculations

Shared Lane Calculations

Movement	7	8	9	10	11	12
v(vph)	4		0			
Movement Capacity	355		582			
Shared Lane Capacity	355					

Worksheet 10 delay,queue length, and LOS

Movement	1	4	7	8	9	10	11	12
v(vph)			4					
C m(vph)		1053	355					
v/c			0.01					
95% queue length								
Control Delay			15.3					
LOS			C					
Approach Delay				15.3				
Approach LOS				C				

Worksheet 11 Shared Major LT Impedance and Delay

Rank 1 Delay Calculations

Movement	2	5
P oj	1.00	1.00
V i1	0	251
V i2	0	0
S i1	1700	1700
S i2	1700	1700
P* oj	1.00	1.00
D maj left	0.0	0.0
N number major st lanes	1	1
Delay, rank 1 mvmts	0.0	0.0

HCS: Unsignalized Intersections Release 3.1c

ALL-WAY STOP CONTROL(AWSC) ANALYSIS

Worksheet 1 - Basic Intersection Information

1. Analyst: LB
2. Intersection: Woodley Rd. & Klingle Rd.
3. Count Date:
4. Time Period: Existing AM Peak

Worksheet 2 - Volume Adjustments and Site Characteristics

	North Bound	South Bound	East Bound	West Bound
	L1	L1	L1	L1
1. LT Volume:	0	1	0	0
2. TH Volume:	3	0	6	0
3. RT Volume:	0	0	0	2
4. Peak Hour Factor:	0.75	0.25	0.50	0.50
5. Flow Rate LT:	0	4	0	0
6. Flow Rate TH:	4	0	12	0
7. Flow Rate RT:	0	0	0	4
8. Flow Rate Total:	4	4	12	4
9. Prop. Heavy Vehicle:	0.00	0.00	0.00	0.00
10. Subject Approach	1	1	1	1
11. Opposing Approach	1	1	1	1
12. Conflicting Approach	1	1	1	1
13. Geometry Group	1	1	1	1
14. T (Time in Hours):	0.250			

Worksheet 3 - Saturation Headway Adjustment Worksheet

	North Bound	South Bound	East Bound	West Bound
	L1	L1	L1	L1
1. Flow Rate Total:	4	4	12	4
2. Flow Rate LT:	0	4	0	0
3. Flow Rate RT:	0	0	0	4
4. Prop LT in lane:	0.00	1.00	0.00	0.00
5. Prop RT in lane:	0.00	0.00	0.00	1.00
6. Prop. Heavy Vehicle:	0.00	0.00	0.00	0.00
7. Geometry Group	1	1	1	1
8. hLT-adj by Table 10-18	0.20	0.20	0.20	0.20
9. hRT-adj by Table 10-18	-0.60	-0.60	-0.60	-0.60
10. hHV-adj Table 10-18	1.70	1.70	1.70	1.70
11. hadj	0.00	0.20	0.00	-0.60

Worksheet 4 - Departure Headway and Service Time

	North Bound	South Bound	East Bound	West Bound
	L1	L1	L1	L1
1. Total lane flow rate	4	4	12	4
2. hd, initial value	3.2	3.2	3.2	3.2
3. x, initial	0.00	0.00	0.01	0.00
4. hd, final value	3.9	4.1	3.9	3.3
5. x, final value	0.00	0.00	0.01	0.00
6. Move-up time, m	2.0	2.0	2.0	2.0
7. Service Time	1.9	2.1	1.9	1.3

Worksheet 5 - Capacity and Level of Service

	North Bound	South Bound	East Bound	West Bound
	L1	L1	L1	L1
1. Total lane flow rate	4	4	12	4
2. Service Time	1.9	2.1	1.9	1.3
3. Degree Utilization, x	0.00	0.00	0.01	0.00
4. Departure Headway, hd	3.9	4.1	3.9	3.3
5. Capacity	911	867	916	1079
6. Delay	7.0	7.2	7.0	6.3
7. Level Of Service	A	A	A	A
8. Delay Approach	7.0	7.2	7.0	6.3
9. LOS, approach	A	A	A	A
10. Delay, Intersection	6.9			

11. LOS, Intersection A

HCS: Unsignalized Intersections Release 3.1c

ALL-WAY STOP CONTROL(AWSC) ANALYSIS

Worksheet 1 - Basic Intersection Information

1. Analyst: LB
2. Intersection: Woodley Rd. & Klingle Rd.
3. Count Date:
4. Time Period: Existing PM Peak

Worksheet 2 - Volume Adjustments and Site Characteristics

	North Bound	South Bound	East Bound	West Bound
	L1	L1	L1	L1
1. LT Volume:	0	15	0	0
2. TH Volume:	3	0	5	0
3. RT Volume:	0	0	0	2
4. Peak Hour Factor:	0.75	0.60	0.50	0.50
5. Flow Rate LT:	0	25	0	0
6. Flow Rate TH:	4	0	10	0
7. Flow Rate RT:	0	0	0	4
8. Flow Rate Total:	4	25	10	4
9. Prop. Heavy Vehicle:	0.00	0.00	0.00	0.00
10. Subject Approach	1	1	1	1
11. Opposing Approach	1	1	1	1
12. Conflicting Approach	1	1	1	1
13. Geometry Group	1	1	1	1

14. T (Time in Hours): 0.250

Worksheet 3 - Saturation Headway Adjustment Worksheet

	North Bound	South Bound	East Bound	West Bound
	L1	L1	L1	L1
1. Flow Rate Total:	4	25	10	4
2. Flow Rate LT:	0	25	0	0
3. Flow Rate RT:	0	0	0	4
4. Prop LT in lane:	0.00	1.00	0.00	0.00
5. Prop RT in lane:	0.00	0.00	0.00	1.00
6. Prop. Heavy Vehicle:	0.00	0.00	0.00	0.00
7. Geometry Group	1	1	1	1
8. hLT-adj by Table 10-18	0.20	0.20	0.20	0.20
9. hRT-adj by Table 10-18	-0.60	-0.60	-0.60	-0.60
10. hHV-adj Table 10-18	1.70	1.70	1.70	1.70
11. hadj	0.00	0.20	0.00	-0.60

Worksheet 4 - Departure Headway and Service Time

	North Bound	South Bound	East Bound	West Bound
	L1	L1	L1	L1
1. Total lane flow rate	4	25	10	4
2. hd, initial value	3.2	3.2	3.2	3.2
3. x, initial	0.00	0.02	0.01	0.00
4. hd, final value	4.0	4.1	4.0	3.4
5. x, final value	0.00	0.03	0.01	0.00
6. Move-up time, m	2.0	2.0	2.0	2.0
7. Service Time	2.0	2.1	2.0	1.4

Worksheet 5 - Capacity and Level of Service

	North Bound	South Bound	East Bound	West Bound
	L1	L1	L1	L1
1. Total lane flow rate	4	25	10	4
2. Service Time	2.0	2.1	2.0	1.4
3. Degree Utilization, x	0.00	0.03	0.01	0.00
4. Departure headway, hd	4.0	4.1	4.0	3.4
5. Capacity	907	868	901	1059
6. Delay	7.0	7.3	7.0	6.4
7. Level Of Service	A	A	A	A
8. Delay Approach	7.0	7.3	7.0	6.4
9. LOS, approach	A	A	A	A
10. Delay, Intersection	7.1			

11. LOS, Intersection A

HCS: Unsignalized Intersections Release 3.1c

ALL-WAY STOP CONTROL(AWSC) ANALYSIS

Worksheet 1 - Basic Intersection Information

1. Analyst: LB
2. Intersection: Woodley Rd. & Klingle Rd.
3. Count Date:
4. Time Period: No Build AM Peak

Worksheet 2 - Volume Adjustments and Site Characteristics

	North Bound	South Bound	East Bound	West Bound
	L1	L1	L1	L1
1. LT Volume:	0	1	0	0
2. TH Volume:	3	0	7	0
3. RT Volume:	0	0	0	2
4. Peak Hour Factor:	0.75	0.25	0.50	0.50
5. Flow Rate LT:	0	4	0	0
6. Flow Rate TH:	4	0	14	0
7. Flow Rate RT:	0	0	0	4
8. Flow Rate Total:	4	4	14	4
9. Prop. Heavy Vehicle:	0.00	0.00	0.00	0.00
10. Subject Approach	1	1	1	1
11. Opposing Approach	1	1	1	1
12. Conflicting Approach	1	1	1	1
13. Geometry Group	1	1	1	1
14. T (Time in Hours): 0.250				

Worksheet 3 - Saturation Headway Adjustment Worksheet

	North Bound	South Bound	East Bound	West Bound
	L1	L1	L1	L1
1. Flow Rate Total:	4	4.	14	4
2. Flow Rate LT:	0	4	0	0
3. Flow Rate RT:	0	0	0	4
4. Prop LT in lane:	0.00	1.00	0.00	0.00
5. Prop RT in lane:	0.00	0.00	0.00	1.00
6. Prop. Heavy Vehicle:	0.00	0.00	0.00	0.00
7. Geometry Group	1	1	1	1
8. hLT-adj by Table 10-18	0.20	0.20	0.20	0.20
9. hRT-adj by Table 10-18	-0.60	-0.60	-0.60	-0.60
10. hHV-adj Table 10-18	1.70	1.70	1.70	1.70
11. hadj	0.00	0.20	0.00	-0.60

Worksheet 4 - Departure Headway and Service Time

	North Bound	South Bound	East Bound	West Bound
	L1	L1	L1	L1
1. Total lane flow rate	4	4	14	4
2. hd, initial value	3.2	3.2	3.2	3.2
3. x, initial	0.00	0.00	0.01	0.00
4. hd, final value	3.9	4.1	3.9	3.3
5. x, final value	0.00	0.00	0.02	0.00
6. Move-up time, m	2.0	2.0	2.0	2.0
7. Service Time	1.9	2.1	1.9	1.3

Worksheet 5 - Capacity and Level of Service

	North Bound	South Bound	East Bound	West Bound
	L1	L1	L1	L1
1. Total lane flow rate	4	4	14	4
2. Service Time	1.9	2.1	1.9	1.3
3. Degree Utilization, x	0.00	0.00	0.02	0.00
4. Departure headway, hd	3.9	4.1	3.9	3.3
5. Capacity	909	866	916	1078
6. Delay	7.0	7.2	7.0	6.3
7. Level Of Service	A	A	A	A
8. Delay Approach	7.0	7.2	7.0	6.3
9. LOS, approach	A	A	A	A
10. Delay, Intersection	6.9			

11. LOS, Intersection A

HCS: Unsignalized Intersections Release 3.1c

ALL-WAY STOP CONTROL(AWSC) ANALYSIS

Worksheet 1 - Basic Intersection Information

1. Analyst:	LB
2. Intersection:	Woodley Rd. & Klingle Rd.
3. Count Date:	
4. Time Period:	No Build PM Peak

Worksheet 2 - Volume Adjustments and Site Characteristics

	North Bound	South Bound	East Bound	West Bound
	L1	L1	L1	L1
1. LT Volume:	0	18	0	0
2. TH Volume:	3	0	6	0
3. RT Volume:	0	0	0	2
4. Peak Hour Factor:	0.75	0.60	0.50	0.50
5. Flow Rate LT:	0	30	0	0
6. Flow Rate TH:	4	0	12	0
7. Flow Rate RT:	0	0	0	4
8. Flow Rate Total:	4	30	12	4
9. Prop. Heavy Vehicle:	0.00	0.00	0.00	0.00
10. Subject Approach	1	1	1	1
11. Opposing Approach	1	1	1	1
12. Conflicting Approach	1	1	1	1
13. Geometry Group	1	1	1	1
14. T (Time in Hours):	0.250			

Worksheet 3 - Saturation Headway Adjustment Worksheet

	North Bound	South Bound	East Bound	West Bound
	L1	L1	L1	L1
1. Flow Rate Total:	4	30	12	4
2. Flow Rate LT:	0	30	0	0
3. Flow Rate RT:	0	0	0	4
4. Prop LT in lane:	0.00	1.00	0.00	0.00
5. Prop RT in lane:	0.00	0.00	0.00	1.00
6. Prop. Heavy Vehicle:	0.00	0.00	0.00	0.00
7. Geometry Group	1	1	1	1
8. hLT-adj by Table 10-18	0.20	0.20	0.20	0.20
9. hRT-adj by Table 10-18	-0.60	-0.60	-0.60	-0.60
10. hHV-adj Table 10-18	1.70	1.70	1.70	1.70
11. hadj	0.00	0.20	0.00	-0.60

Worksheet 4 - Departure Headway and Service Time

	North Bound	South Bound	East Bound	West Bound
	L1	L1	L1	L1
1. Total lane flow rate	4	30	12	4
2. hd, initial value	3.2	3.2	3.2	1.2
3. x, initial	0.00	0.03	0.01	0.00
4. hd, final value	4.0	4.1	4.0	3.4
5. x, final value	0.00	0.03	0.01	0.00
6. Move-up time, m	2.0	2.0	2.0	2.0
7. Service Time	2.0	2.1	2.0	1.4

Worksheet 5 - Capacity and Level of Service

	North Bound	South Bound	East Bound	West Bound
	L1	L1	L1	L1
1. Total lane flow rate	4	30	12	4
2. Service Time	2.0	2.1	2.0	1.4
3. Degree Utilization, x	0.00	0.03	0.01	0.00
4. Departure headway, hd	4.0	4.1	4.0	3.4
5. Capacity	904	867	898	1054
6. Delay	7.0	7.3	7.0	6.4
7. Level Of Service	A	A	A	A
8. Delay Approach	7.0	7.3	7.0	6.4
9. LOS, approach	A	A	A	A
10. Delay, Intersection	7.1			

11. LOS, Intersection A

HCS: Unsignalized Intersections Release 3.1c

ALL-WAY STOP CONTROL(AWSC) ANALYSIS

Worksheet 1 - Basic Intersection Information

1. Analyst: LB
2. Intersection: Woodley Rd. & Klingle Rd.
3. Count Date:
4. Time Period: Build AM Peak

Worksheet 2 - Volume Adjustments and Site Characteristics

	North Bound	South Bound	East Bound	West Bound
	L1	L1	L1	L1
1. LT Volume:	0	137	0	0
2. TH Volume:	3	0	7	0
3. RT Volume:	0	0	0	260
4. Peak Hour Factor:	0.75	0.80	0.50	0.80
5. Flow Rate LT:	0	171	0	0
6. Flow Rate TH:	4	0	14	0
7. Flow Rate RT:	0	0	0	325
8. Flow Rate Total:	4	171	14	325
9. Prop. Heavy Vehicle:	0.00	0.02	0.00	0.02
10. Subject Approach	1	1	1	1
11. Opposing Approach	1	1	1	1
12. Conflicting Approach	1	1	1	1
13. Geometry Group	1	1	1	1
14. T (Time in Hours): 0.250				

Worksheet 3 - Saturation Headway Adjustment Worksheet

	North Bound	South Bound	East Bound	West Bound
	L1	L1	L1	L1
1. Flow Rate Total:	4	171	14	325
2. Flow Rate LT:	0	171	0	0
3. Flow Rate RT:	0	0	0	325
4. Prop LT in lane:	0.00	1.00	0.00	0.00
5. Prop RT in lane:	0.00	0.00	0.00	1.00
6. Prop. Heavy Vehicle:	0.00	0.02	0.00	0.02
7. Geometry Group	1	1	1	1
8. hLT-adj by Table 10-18	0.20	0.20	0.20	0.20
9. hRT-adj by Table 10-18	-0.60	-0.60	-0.60	-0.60
10. hHV-adj Table 10-18	1.70	1.70	1.70	1.70
11. hadj	0.00	0.23	0.00	-0.57

Worksheet 4 - Departure Headway and Service Time

	North Bound	South Bound	East Bound	West Bound
	L1	L1	L1	L1
1. Total lane flow rate	4	171	14	325
2. hd, initial value	3.2	3.2	3.2	3.2
3. x, initial	0.00	0.15	0.01	0.29
4. hd, final value	4.8	4.8	4.6	3.8
5. x, final value	0.01	0.23	0.02	0.34
6. Move-up time, m	2.0	2.0	2.0	2.0
7. Service Time	2.8	2.8	2.6	1.8

Worksheet 5 - Capacity and Level of Service

	North Bound	South Bound	East Bound	West Bound
	L1	L1	L1	L1
1. Total lane flow rate	4	171	14	325
2. Service Time	2.8	2.8	2.6	1.8
3. Degree Utilization, x	0.01	0.23	0.02	0.34
4. Departure headway, hd	4.8	4.8	4.6	3.8
5. Capacity	707	716	744	927
6. Delay	7.8	9.2	7.7	8.7
7. Level Of Service	A	A	A	A
8. Delay Approach	7.8	9.2	7.7	8.7
9. LOS, approach	A	A	A	A
10. Delay, Intersection	8.9			

11. LOS, Intersection A

HCS: Unsignalized Intersections Release 3.1c

ALL-WAY STOP CONTROL(AWSC) ANALYSIS

Worksheet 1 - Basic Intersection Information

1. Analyst:	LB
2. Intersection:	Woodley Rd. & Klingle Rd.
3. Count Date:	
4. Time Period:	Build PM Peak

Worksheet 2 - Volume Adjustments and Site Characteristics

	North Bound	South Bound	East Bound	West Bound
	L1	L1	L1	L1
1. LT Volume:	0	302	0	0
2. TH Volume:	3	0	6	0
3. RT Volume:	0	0	0	187
4. Peak Hour Factor:	0.75	0.85	0.50	0.80
5. Flow Rate LT:	0	355	0	0
6. Flow Rate TH:	4	0	12	0
7. Flow Rate RT:	0	0	0	233
8. Flow Rate Total:	4	355	12	233
9. Prop. Heavy Vehicle:	0.00	0.02	0.00	0.02
10. Subject Approach	1	1	1	1
11. Opposing Approach	1	1	1	1
12. Conflicting Approach	1	1	1	1
13. Geometry Group	1	1	1	1
14. T (Time in Hours):	0.250			

Worksheet 3 - Saturation Headway Adjustment Worksheet

	North Bound	South Bound	East Bound	West Bound
	L1	L1	L1	L1
1. Flow Rate Total:	4	355	12	233
2. Flow Rate LT:	0	355	0	0
3. Flow Rate RT:	0	0	0	233
4. Prop LT in lane:	0.00	1.00	0.00	0.00
5. Prop RT in lane:	0.00	0.00	0.00	1.00
6. Prop. Heavy Vehicle:	0.00	0.02	0.00	0.02
7. Geometry Group	1	1	1	1
8. hLT-adj by Table 10-18	0.20	0.20	0.20	0.20
9. hRT-adj by Table 10-18	-0.60	-0.60	-0.60	-0.60
10. hHV-adj Table 10-18	1.70	1.70	1.70	1.70
11. hadj	0.00	0.23	0.00	-0.57

Worksheet 4 - Departure Headway and Service Time

	North Bound	South Bound	East Bound	West Bound
	L1	L1	L1	L1
1. Total lane flow rate	4	355	12	233
2. hd, initial value	3.2	3.2	3.2	3.2
3. x, initial	0.00	0.32	0.01	0.21
4. hd, final value	4.8	4.7	5.0	4.2
5. x, final value	0.01	0.46	0.02	0.27
6. Move-up time, m	2.0	2.0	2.0	2.0
7. Service Time	2.8	2.7	3.0	2.2

Worksheet 5 - Capacity and Level of Service

	North Bound	South Bound	East Bound	West Bound
	L1	L1	L1	L1
1. Total lane flow rate	4	355	12	233
2. Service Time	2.8	2.7	3.0	2.2
3. Degree Utilization, x	0.01	0.46	0.02	0.27
4. Departure headway, hd	4.8	4.7	5.0	4.2
5. Capacity	704	751	665	813
6. Delay	7.9	11.6	8.1	8.8
7. Level Of Service	A	B	A	A
8. Delay Approach	7.9	11.6	8.1	8.8
9. LOS, approach	A	B	A	A
10. Delay, intersection	10.4			

11. LOS, Intersection B

HCS: Unsignalized Intersections Release 3.1c

ALL-WAY STOP CONTROL(AWSC) ANALYSIS

Worksheet 1 - Basic Intersection Information

1. Analyst:	LB
2. Intersection:	Woodley Rd. & Klingle Rd.
3. Count Date:	
4. Time Period:	Build AM Peak s2

Worksheet 2 - Volume Adjustments and Site Characteristics

	North Bound	South Bound	East Bound	West Bound
	L1	L1	L1	L1
1. LT Volume:	0	205	0	0
2. TH Volume:	1	0	7	0
3. RT Volume:	0	0	0	348
4. Peak Hour Factor:	0.75	0.80	0.50	0.85
5. Flow Rate LT:	0	256	0	0
6. Flow Rate TH:	4	0	14	0
7. Flow Rate RT:	0	0	0	409
8. Flow Rate Total:	4	256	14	409
9. Prop. Heavy Vehicle:	0.00	0.02	0.00	0.02
10. Subject Approach	1	1	1	1
11. Opposing Approach	1	1	1	1
12. Conflicting Approach	1	1	1	1
13. Geometry Group	1	1	1	1
14. T (Time in Hours):	0.250			

Worksheet 3 - Saturation Headway Adjustment Worksheet

	North Bound	South Bound	East Bound	West Bound
	L1	L1	L1	L1
1. Flow Rate Total:	4	256	14	409
2. Flow Rate LT:	0	256	0	0
3. Flow Rate RT:	0	0	0	409
4. Prop LT in lane:	0.00	1.00	0.00	0.00
5. Prop RT in lane:	0.00	0.00	0.00	1.00
6. Prop. Heavy Vehicle:	0.00	0.02	0.00	0.02
7. Geometry Group	1	1	1	1
8. hLT-adj by Table 10-18	0.20	0.20	0.20	0.20
9. hRT-adj by Table 10-18	-0.60	-0.60	-0.60	-0.60
10. hHV-adj Table 10-18	1.70	1.70	1.70	1.70
11. hadj	0.00	0.23	0.00	-0.57

Worksheet 4 - Departure Headway and Service Time

	North Bound	South Bound	East Bound	West Bound
	L1	L1	L1	L1
1. Total lane flow rate	4	256	14	409
2. hd, initial value	3.2	3.2	3.2	3.2
3. x, initial	0.00	0.23	0.01	0.36
4. hd, final value	5.1	5.0	5.0	4.0
5. x, final value	0.01	0.36	0.02	0.46
6. Move-up time, m	2.0	2.0	2.0	2.0
7. Service Time	3.1	3.0	3.0	2.0

Worksheet 5 - Capacity and Level of Service

	North Bound	South Bound	East Bound	West Bound
	L1	L1	L1	L1
1. Total lane flow rate	4	256	14	409
2. Service Time	3.1	3.0	3.0	2.0
3. Degree Utilization, x	0.01	0.36	0.02	0.46
4. Departure headway, hd	5.1	5.0	5.0	4.0
5. Capacity	645	686	676	870
6. Delay	8.1	10.8	8.1	10.4
7. Level Of Service	A	B	A	B
8. Delay Approach	8.1	10.8	8.1	10.4
9. LOS, approach	A	B	A	B
10. Delay, Intersection	10.5			

11. LOS, Intersection B

HCS: Unsignalized Intersections Release 3.1c

ALL-WAY STOP CONTROL(AWSC) ANALYSIS

Worksheet 1 - Basic Intersection Information

1. Analyst: LB
2. Intersection: Woodley Rd. & Klingle Rd.
3. Count Date:
4. Time Period: Build PM Peak s2

Worksheet 2 - Volume Adjustments and Site Characteristics

	North Bound	South Bound	East Bound	West Bound
	L1	L1	L1	L1
1. LT Volume:	0	401	0	0
2. TH Volume:	3	0	6	0
3. RT Volume:	0	0	0	248
4. Peak Hour Factor:	0.75	0.85	0.50	0.80
5. Flow Rate LT:	0	471	0	0
6. Flow Rate TH:	4	0	12	0
7. Flow Rate RT:	0	0	0	310
8. Flow Rate Total:	4	471	12	310
9. Prop. Heavy Vehicle:	0.00	0.02	0.00	0.02
10. Subject Approach	1	1	1	1
11. Opposing Approach	1	1	1	1
12. Conflicting Approach	1	1	1	1
13. Geometry Group	1	1	1	1
14. T (Time in Hours):	0.250			

Worksheet 3 - Saturation Headway Adjustment Worksheet

	North Bound	South Bound	East Bound	West Bound
	L1	L1	L1	L1
1. Flow Rate Total:	4	471	12	310
2. Flow Rate LT:	0	471	0	0
3. Flow Rate RT:	0	0	0	310
4. Prop LT in lane:	0.00	1.00	0.00	0.00
5. Prop RT in lane:	0.00	0.00	0.00	1.00
6. Prop. Heavy Vehicle:	0.00	0.02	0.00	0.02
7. Geometry Group	1	1	1	1
8. hLT-adj by Table 10-18	0.20	0.20	0.20	0.20
9. hRT-adj by Table 10-18	-0.60	-0.60	-0.60	-0.60
10. hHV-adj Table 10-18	1.70	1.70	1.70	1.70
11. hadj	0.00	0.23	0.00	-0.57

Worksheet 4 - Departure Headway and Service Time

	North Bound	South Bound	East Bound	West Bound
	L1	L1	L1	L1
1. Total lane flow rate	4	471	12	310
2. hd, initial value	3.2	3.2	3.2	3.2
3. x, initial	0.00	0.42	0.01	0.28
4. hd, final value	5.2	4.9	5.5	4.5
5. x, final value	0.01	0.64	0.02	0.39
6. Move-up time, m	2.0	2.0	2.0	2.0
7. Service Time	3.2	2.9	3.5	2.5

Worksheet 5 - Capacity and Level of Service

	North Bound	South Bound	East Bound	West Bound
	L1	L1	L1	L1
1. Total lane flow rate	4	471	12	310
2. Service Time	3.2	2.9	3.5	2.5
3. Degree Utilization, x	0.01	0.64	0.02	0.39
4. Departure headway, hd	5.2	4.9	5.5	4.5
5. Capacity	636	722	599	755
6. Delay	8.3	16.2	8.6	10.4
7. Level Of Service	A	C	A	B
8. Delay Approach	8.3	16.2	8.6	10.4
9. LOS, approach	A	C	A	B
10. Delay, Intersection	13.8			

HCS: Signalized Intersections Release 3.1c

Inter: Cleveland Ave. & Garfield St. City/St: Washington D.C.
Analyst: LB Proj #:
Date: 8/24/00 Period: Existing AM Peak Hour
E/W St: Cleveland Ave. N/S St: 32nd St.

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	1	1	0	0	1	0	0	1	0
LGConfig		LTR		L	TR			LTR			LTR	
Volume	0	612	16	117	90	4	6	4	0	17	7	21
Lane Width		16.0		11.0	11.0			15.0			12.0	
RTOR Vol			0			0			0			0

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left	P				NB	Left	P			
Thru	P					Thru	P			
Right	P					Right	P			
Peds	X	X				Peds	X			
WB Left	P				SB	Left	P			
Thru	P					Thru	P			
Right	P					Right	P			
Peds	X	X				Peds	X			
NB Right					EB	Right				
SB Right					WB	Right				
Green	36.0	21.0					15.0			
Yellow	4.0	4.0					4.0			
All Red	2.0	2.0					2.0			

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
LTR	656	1640	1.06	0.400	80.4	F	80.4	F
Westbound								
L	133	332	1.10	0.400	133.7	F		
TR	715	1788	0.16	0.400	17.8	B	82.1	F
Northbound								
LTR	290	1741	0.06	0.167	32.0	C	32.0	C
Southbound								
LTR	228	1369	0.33	0.167	36.9	D	36.9	D

Intersection Delay = 76.9 (sec/veh) Intersection LOS = E

HCS: Signalized Intersections Release 3.1c

Inter: Cleveland Ave. & Garfield St. City/St: Washington D.C.
Analyst: LB Proj #:
Date: 8/24/00 Period: Existing PM Peak Hour
E/W St: Cleveland Ave. N/S St: 32nd St.

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	1	1	0	0	1	0	0	1	0
LGConfig		LTR		L	TR			LTR			LTR	
Volume	0	161	9	249	171	1	3	2	1	8	3	8
Lane Width		16.0		11.0	11.0			15.0			12.0	
RTOR Vol			0			0			0			0

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	P				NB Left	P			
Thru	P				Thru	P			
Right	P				Right	P			
Peds	X	X			Peds				
WB Left	P				SB Left	P			
Thru	P				Thru	P			
Right	P				Right	P			
Peds	X	X			Peds				
NB Right					EB Right				
SB Right					WB Right				
Green	36.0	21.0				15.0			
Yellow	4.0	4.0				4.0			
All Red	2.0	2.0				2.0			

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
LTR	654	1634	0.32	0.400	19.9	B	19.9	B
Westbound								
L	397	993	0.78	0.400	37.9	D		
TR	720	1799	0.30	0.400	19.5	B	30.4	C
Northbound								
LTR	267	1604	0.05	0.167	31.9	C	31.9	C
Southbound								
LTR	233	1398	0.13	0.167	33.1	C	33.1	C

Intersection Delay = 27.7 (sec/veh) Intersection LOS = C

HCS: Signalized Intersections Release 3.1c

Inter: Cleveland Ave. & Garfield St. City/St: Washington D.C.
Analyst: LB Proj #:
Date: 8/24/00 Period: 2017 No Build AM Peak Hour
E/W St: Cleveland Ave. N/S St: 32nd St.

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	1	1	0	0	1	0	0	1	0
LGConfig		LTR		L	TR			LTR			LTR	
Volume	0	722	19	138	106	5	7	5	0	20	8	25
Lane Width		16.0		11.0	11.0			15.0			12.0	
RTOR Vol			0			0			0			0

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	P				NB Left	P			
Thru	P				Thru	P			
Right	P				Right	P			
Peds	X	X			Peds	X			
WB Left	P				SB Left	P			
Thru	P				Thru	P			
Right	P				Right	P			
Peds	X	X			Peds	X			
NB Right					EB Right				
SB Right					WB Right				
Green	36.0	21.0				15.0			
Yellow	4.0	4.0				4.0			
All Red	2.0	2.0				2.0			

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
LTR	656	1641	1.25	0.400	153.8	F	153.8	F
Westbound								
L	94	235	1.83	0.400	438.7	F		
TR	715	1788	0.19	0.400	18.2	B	251.5	F
Northbound								
LTR	287	1722	0.08	0.167	32.2	C	32.2	C
Southbound								
LTR	226	1356	0.39	0.167	38.4	D	38.4	D

Intersection Delay = 167.8 (sec/veh) Intersection LOS = F

HCS: Signalized Intersections Release 3.1c

Inter: Cleveland Ave. & Garfield St. City/St: Washington D.C.
Analyst: LB Proj #:
Date: 8/24/00 Period: 2017 No Build PM Peak Hour
E/W St: Cleveland Ave. N/S St: 32nd St.

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	1	1	0	0	1	0	0	1	0
LGConfig		LTR		L	TR			LTR			LTR	
Volume	0	190	9	294	202	1	3	2	1	9	3	10
Lane Width		16.0		11.0	11.0			15.0			12.0	
RTOR Vol			0			0			0			0

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	P				NB Left	P			
Thru	P				Thru	P			
Right	P				Right	P			
Peds	X	X			Peds				
WB Left	P				SB Left	P			
Thru	P				Thru	P			
Right	P				Right	P			
Peds	X	X			Peds				
NB Right					EB Right				
SB Right					WB Right				
Green	36.0	21.0				15.0			
Yellow	4.0	4.0				4.0			
All Red	2.0	2.0				2.0			

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
LTR	654	1636	0.38	0.400	20.8	C	20.8	C
Westbound								
L	369	922	0.99	0.400	72.4	E		
TR	720	1800	0.35	0.400	20.2	C	51.1	D
Northbound								
LTR	267	1602	0.05	0.167	31.9	C	31.9	C
Southbound								
LTR	231	1388	0.16	0.167	33.6	C	33.6	C

Intersection Delay = 41.9 (sec/veh) Intersection LOS = D

HCS: Signalized Intersections Release 3.1c

Inter: Cleveland Ave. & Garfield St. City/St: Washington D.C.
Analyst: LB Proj #:
Date: 8/24/00 Period: 2017 Build AM Peak Hour
E/W St: Cleveland Ave. N/S St: 32nd St.

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	1	1	0	0	1	0	0	1	0
LGConfig		LTR		L	TR			LTR			LTR	
Volume	0	686	19	138	73	5	7	5	0	20	8	25
Lane Width		16.0		11.0	11.0			15.0			12.0	
RTOR Vol			0			0			0			0

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	P				NB Left	P			
Thru	P				Thru	P			
Right	P				Right	P			
Peds	X	X			Peds	X			
WB Left	P				SB Left	P			
Thru	P				Thru	P			
Right	P				Right	P			
Peds	X	X			Peds	X			
NB Right					EB Right				
SB Right					WB Right				
Green	36.0	21.0				15.0			
Yellow	4.0	4.0				4.0			
All Red	2.0	2.0				2.0			

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
LTR	656	1640	1.19	0.400	128.6	F	128.6	F
Westbound								
L	106	264	1.62	0.400	346.1	F		
TR	713	1783	0.14	0.400	17.5	B	227.6	F
Northbound								
LTR	287	1722	0.08	0.167	32.2	C	32.2	C
Southbound								
LTR	226	1356	0.39	0.167	38.4	D	38.4	D

Intersection Delay = 142.9 (sec/veh) Intersection LOS = F

HCS: Signalized Intersections Release 3.1c

Inter: Cleveland Ave. & Garfield St. City/St: Washington D.C.
Analyst: LB Proj #:
Date: 8/24/00 Period: 2017 Build PM Peak Hour
E/W St: Cleveland Ave. N/S St: 32nd St.

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	1	1	0	0	1	0	0	1	0
LGConfig		LTR		L	TR			LTR			LTR	
Volume	0	159	9	294	163	1	3	2	1	9	3	10
Lane Width		16.0		11.0	11.0			15.0			12.0	
RTOR Vol			0			0			0			0

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	P				NB Left	P			
Thru	P				Thru	P			
Right	P				Right	P			
Peds	X	X			Peds				
WB Left	P				SB Left	P			
Thru	P				Thru	P			
Right	P				Right	P			
Peds	X	X			Peds				
NB Right					EB Right				
SB Right					WB Right				
Green	36.0	21.0				15.0			
Yellow	4.0	4.0				4.0			
All Red	2.0	2.0				2.0			

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
LTR	653	1633	0.32	0.400	19.9	B	19.9	B
Westbound								
L	399	997	0.92	0.400	54.4	D		
TR	720	1799	0.28	0.400	19.3	B	41.8	D
Northbound								
LTR	267	1602	0.05	0.167	31.9	C	31.9	C
Southbound								
LTR	231	1388	0.16	0.167	33.6	C	33.6	C

Intersection Delay = 35.8 (sec/veh) Intersection LOS = D

HCS: Signalized Intersections Release 3.1c

Inter: Cleveland Ave. & Garfield St. City/St: Washington D.C.
Analyst: LB Proj #:
Date: 8/24/00 Period: 2017 Build AM Peak w Mitigat
E/W St: Cleveland Ave. N/S St: 32nd St.

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	1	1	0	0	1	0	0	1	0
LGConfig		LTR		L	TR			LTR			LTR	
Volume	0	674	19	138	61	5	7	5	0	20	8	25
Lane Width		16.0		11.0	11.0			15.0			12.0	
RTOR Vol			0			0			0			0

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	P				NB Left	P			
Thru	P				Thru	P			
Right	P				Right	P			
Peds	X	X			Peds	X			
WB Left	P				SB Left	P			
Thru	P				Thru	P			
Right	P				Right	P			
Peds	X	X			Peds	X			
NB Right					EB Right				
SB Right					WB Right				
Green	36.0	21.0				15.0			
Yellow	4.0	4.0				4.0			
All Red	2.0	2.0				2.0			

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
LTR	656	1640	1.17	0.400	120.7	F	120.7	F
Westbound								
L	109	273	1.58	0.400	326.3	F		
TR	712	1780	0.12	0.400	17.3	B	226.5	F
Northbound								
LTR	287	1722	0.08	0.167	32.2	C	32.2	C
Southbound								
LTR	226	1356	0.39	0.167	38.4	D	38.4	D

Intersection Delay = 136.3 (sec/veh) Intersection LOS = F

HCS: Signalized Intersections Release 3.1c

Inter: Cleveland Ave. & Garfield St. City/St: Washington D.C.
Analyst: LB Proj #:
Date: 8/24/00 Period: 2017 Build PM Peak Hour
E/W St: Cleveland Ave. N/S St: 32nd St.

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	1	1	0	0	1	0	0	1	0
LGConfig		LTR		L	TR			LTR			LTR	
Volume	0	148	9	294	150	1	3	2	1	9	3	10
Lane Width		16.0		11.0	11.0			15.0			12.0	
RTOR Vol			0			0			0			0

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
EB Left	P				NB Left	P		
Thru	P				Thru	P		
Right	P				Right	P		
Peds	X	X			Peds			
WB Left	P				SB Left	P		
Thru	P				Thru	P		
Right	P				Right	P		
Peds	X	X			Peds			
NB Right					EB Right			
SB Right					WB Right			
Green	36.0	21.0			15.0			
Yellow	4.0	4.0			4.0			
All Red	2.0	2.0			2.0			

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
LTR	653	1632	0.30	0.400	19.6	B	19.6	B
Westbound								
L	411	1027	0.89	0.400	49.5	D		
TR	720	1799	0.26	0.400	19.0	B	39.2	D
Northbound								
LTR	267	1602	0.05	0.167	31.9	C	31.9	C
Southbound								
LTR	231	1388	0.16	0.167	33.6	C	33.6	C

Intersection Delay = 34.0 (sec/veh) Intersection LOS = C

HCS: Signalized Intersections Release 3.1c

Inter: Cleveland Ave. & Garfield St. City/St: Washington D.C.
Analyst: LB Proj #:
Date: 8/24/00 Period: Existing AM Peak Hour
E/W St: Garfield St./Woodley Rd. N/S St: 32nd St.

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	0	1	0	1	0	0	1	0	0	1	0
LGConfig	L		R		LTR			LTR			LTR	
Volume	29		275	5	89	27	6	4	0	17	7	21
Lane Width	12.0		12.0		13.0			14.0			12.0	
RTOR Vol			0			0			0			0

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
EB Left	P				NB Left	P		
Thru					Thru	P		
Right	P				Right			
Peds	X	X			Peds			
WB Left	P				SB Left	P		
Thru	P				Thru	P		
Right	P				Right	P		
Peds	X	X			Peds			
NB Right					EB Right			
SB Right					WB Right			
Green	21.0	36.0			15.0			
Yellow	4.0	4.0			4.0			
All Red	2.0	2.0			2.0			

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	123	529	0.29	0.233	34.3	C		
							51.0	D
R	365	1566	0.84	0.233	52.9	D		
Westbound								
LTR	389	1666	0.39	0.233	32.1	C	32.1	C
Northbound								
LTR	282	1689	0.06	0.167	32.0	C	32.0	C
Southbound								
LTR	228	1369	0.33	0.167	36.9	D	36.9	D

Intersection Delay = 43.7 (sec/veh) Intersection LOS = D

HCS: Signalized Intersections Release 3.1c

Inter: Cleveland Ave. & Garfield St. City/St: Washington D.C.
Analyst: LB Proj #:
Date: 8/24/00 Period: Existing PM Peak Hour
E/W St: Garfield St./Woodley Rd. N/S St: 32nd St.

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	0	1	0	1	0	0	1	0	0	1	0
LGConfig	L		R		LTR			LTR			LTR	
Volume	11		255	7	49	15	3	2	1	8	3	8
Lane Width	12.0		12.0		13.0			14.0			12.0	
RTOR Vol			0			0			0			0

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left	P				NB	Left	P			
Thru						Thru	P			
Right	P					Right				
Peds	X	X				Peds				
WB Left	P				SB	Left	P			
Thru	P					Thru	P			
Right	P					Right	P			
Peds	X	X				Peds				
NB Right					EB	Right				
SB Right					WB	Right				
Green	21.0	36.0					15.0			
Yellow	4.0	4.0					4.0			
All Red	2.0	2.0					2.0			

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	162	694	0.10	0.233	28.3	C	46.1	D
R	365	1566	0.78	0.233	47.1	D		
Westbound								
LTR	389	1666	0.26	0.233	29.8	C	29.8	C
Northbound								
LTR	260	1561	0.05	0.167	31.9	C	31.9	C
Southbound								
LTR	233	1398	0.13	0.167	33.1	C	33.1	C

Intersection Delay = 41.0 (sec/veh) Intersection LOS = D

HCS: Signalized Intersections Release 3.1c

Inter: Cleveland Ave. & Garfield St. City/St: Washington D.C.
Analyst: LB Proj #:
Date: 8/24/00 Period: 2017 No Build AM Peak Hour
E/W St: Garfield St./Woodley Rd. N/S St: 32nd St.

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	0	1	0	1	0	0	1	0	0	1	0
LGConfig	L		R		LTR			LTR			LTR	
Volume	34		325	5	106	32	7	5	0	20	8	25
Lane Width	12.0		12.0		13.0			14.0			12.0	
RTOR Vol			0			0			0			0

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left	P				NB	Left	P			
Thru						Thru	P			
Right	P					Right				
Peds	X	X				Peds				
WB Left	P				SB	Left	P			
Thru	P					Thru	P			
Right	P					Right	P			
Peds	X	X				Peds				
NB Right					EB	Right				
SB Right					WB	Right				
Green	21.0	36.0					15.0			
Yellow	4.0	4.0					4.0			
All Red	2.0	2.0					2.0			

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	105	450	0.40	0.233	40.2	D	74.8	E
R	365	1566	0.99	0.233	78.8	E		
Westbound								
LTR	389	1667	0.46	0.233	33.6	C	33.6	C
Northbound								
LTR	278	1670	0.08	0.167	32.2	C	32.2	C
Southbound								
LTR	226	1356	0.39	0.167	38.4	D	38.4	D

Intersection Delay = 58.1 (sec/veh) Intersection LOS = E

HCS: Signalized Intersections Release 3.1c

Inter: Cleveland Ave. & Garfield St. City/St: Washington D.C.
Analyst: LB Proj #:
Date: 8/24/00 Period: 2017 No Build PM Peak Hour
E/W St: Garfield St./Woodley Rd. N/S St: 32nd St.

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	0	1	0	1	0	0	1	0	0	1	0
LGConfig	L		R		LTR			LTR			LTR	
Volume	13		301	8	58	18	3	2	1	9	3	10
Lane Width	12.0		12.0		13.0			14.0			12.0	
RTOR Vol			0			0			0			0

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	P				NB Left	P			
Thru					Thru	P			
Right	P				Right				
Peds	X	X			Peds				
WB Left	P				SB Left	P			
Thru	P				Thru	P			
Right	P				Right	P			
Peds	X	X			Peds				
NB Right					EB Right				
SB Right					WB Right				
Green	21.0	36.0				15.0			
Yellow	4.0	4.0				4.0			
All Red	2.0	2.0				2.0			

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	147	628	0.13	0.233	29.1	C	61.6	E
R	365	1566	0.92	0.233	63.5	E		
Westbound								
LTR	388	1664	0.31	0.233	30.7	C	30.7	C
Northbound								
LTR	260	1558	0.05	0.167	31.9	C	31.9	C
Southbound								
LTR	231	1388	0.16	0.167	33.6	C	33.6	C

Intersection Delay = 51.7 (sec/veh) Intersection LOS = D

HCS: Signalized Intersections Release 3.1c

Inter: Cleveland Ave. & Garfield St. City/St: Washington D.C.
Analyst: LB Proj #:
Date: 8/24/00 Period: 2017 Build AM Peak Hour
E/W St: Garfield St./Woodley Rd. N/S St: 32nd St.

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	0	1	0	1	0	0	1	0	0	1	0
LGConfig	L		R		LTR			LTR			LTR	
Volume	34		320	5	96	32	7	5	0	20	8	25
Lane Width	12.0		12.0		13.0			14.0			12.0	
RTOR Vol			0			0			0			0

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	P				NB Left	P			
Thru					Thru	P			
Right	P				Right				
Peds	X	X			Peds				
WB Left	P				SB Left	P			
Thru	P				Thru	P			
Right	P				Right	P			
Peds	X	X			Peds				
NB Right					EB Right				
SB Right					WB Right				
Green	21.0	36.0				15.0			
Yellow	4.0	4.0				4.0			
All Red	2.0	2.0				2.0			

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	113	484	0.37	0.233	38.1	D	71.6	E
R	365	1566	0.98	0.233	75.5	E		
Westbound								
LTR	388	1662	0.43	0.233	32.9	C	32.9	C
Northbound								
LTR	278	1670	0.08	0.167	32.2	C	32.2	C
Southbound								
LTR	226	1356	0.39	0.167	38.4	D	38.4	D

Intersection Delay = 56.4 (sec/veh) Intersection LOS = E

HCS: Signalized Intersections Release 3.1c

Inter: Cleveland Ave. & Garfield St. City/St: Washington D.C.
Analyst: LB Proj #:
Date: 8/24/00 Period: 2017 Build PM Peak Hour
E/W St: Garfield St./Woodley Rd. N/S St: 32nd St.

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	0	1	0	1	0	0	1	0	0	1	0
LGConfig	L		R		LTR			LTR			LTR	
Volume	13		287	8	51	18	3	2	1	9	3	10
Lane Width	12.0		12.0		13.0			14.0			12.0	
RTOR Vol			0			0			0			0

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left	P				NB	Left	P			
Thru						Thru	P			
Right	P					Right				
Peds	X	X				Peds				
WB Left	P				SB	Left	P			
Thru	P					Thru	P			
Right	P					Right	P			
Peds	X	X				Peds				
NB Right					EB	Right				
SB Right					WB	Right				
Green	21.0	36.0					15.0			
Yellow	4.0	4.0					4.0			
All Red	2.0	2.0					2.0			

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	154	662	0.12	0.233	28.9	C	55.7	E
R	365	1566	0.87	0.233	57.2	E		
Westbound								
LTR	387	1658	0.29	0.233	30.2	C	30.2	C
Northbound								
LTR	260	1558	0.05	0.167	31.9	C	31.9	C
Southbound								
LTR	231	1388	0.16	0.167	33.6	C	33.6	C

Intersection Delay = 47.7 (sec/veh) Intersection LOS = D

HCS: Signalized Intersections Release 3.1c

Inter: Cleveland Ave. & Garfield St. City/St: Washington D.C.
Analyst: LB Proj #:
Date: 8/24/00 Period: 2017 Build AM Peak w Mitigatio
E/W St: Garfield St./Woodley Rd. N/S St: 32nd St.

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	0	1	0	1	0	0	1	0	0	1	0
LGConfig	L		R		LTR			LTR			LTR	
Volume	34		318	5	92	32	7	5	0	20	8	25
Lane Width	12.0		12.0		13.0			14.0			12.0	
RTOR Vol			0			0			0			0

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left	P				NB	Left	P			
Thru						Thru	P			
Right						Right				
Peds	P					Peds				
WB Left	X	X			SB	Left	P			
Thru	P					Thru	P			
Right	P					Right	P			
Peds	P					Peds				
NB Right	X	X			EB	Right				
SB Right					WB	Right				
Green	21.0	36.0					15.0			
Yellow	4.0	4.0					4.0			
All Red	2.0	2.0					2.0			

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	116	499	0.36	0.233	37.4	D	69.8	E
R	365	1566	0.97	0.233	73.7	E		
Westbound								
LTR	387	1660	0.42	0.233	32.7	C	32.7	C
Northbound								
LTR	278	1670	0.08	0.167	32.2	C	32.2	C
Southbound								
LTR	226	1356	0.39	0.167	38.4	D	38.4	D

Intersection Delay = 55.4 (sec/veh) Intersection LOS = E

HCS: Signalized Intersections Release 3.1c

Inter: Cleveland Ave. & Garfield St. City/St: Washington D.C.
Analyst: LB Proj #:
Date: 8/24/00 Period: 2017 Build PM Peak w Mitigatio
E/W St: Garfield St./Woodley Rd. N/S St: 32nd St.

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	0	1	0	1	0	0	1	0	0	1	0
LGConfig	L		R		LTR			LTR			LTR	
Volume	13		282	8	48	18	3	2	1	9	3	10
Lane Width	12.0		12.0		13.0			14.0			12.0	
RTOR Vol			0			0			0			0

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
EB Left	P							
Thru								
Right	P							
Peds	X	X						
WB Left	P							
Thru	P							
Right	P							
Peds	X	X						
NB Right								
SB Right								
NB Left					P			
Thru					P			
Right								
Peds								
SB Left					P			
Thru					P			
Right					P			
Peds								
EB Right								
WB Right								
Green	21.0	36.0			15.0			
Yellow	4.0	4.0			4.0			
All Red	2.0	2.0			2.0			

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	158	676	0.12	0.233	28.8	C	53.6	D
R	365	1566	0.86	0.233	55.1	E		
Westbound								
LTR	386	1655	0.28	0.233	30.1	C	30.1	C
Northbound								
LTR	260.	1558	0.05	0.167	31.9	C	31.9	C
Southbound								
LTR	231	1388	0.16	0.167	33.6	C	33.6	C

Intersection Delay = 46.4 (sec/veh) Intersection LOS = D

HCS: Signalized Intersections Release 3.2

Inter: Connecticut Ave. & Porter St. City/St: Washington D.C.
Analyst: LB Proj #: JA-2249
Date: 8/23/00 Period: 2017 Scenario 3 AM Peak Hour
E/W St: Porter St. N/S St: Connecticut Ave.

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	1	1	1	0	2	0	0	4	0
LGConfig		LTR		L	T	R		LTR			LTR	
Volume	17	486	57	140	343	270	0	657	90	270	2893	38
Lane Width		12.0		10.0	10.0	10.0		10.0			10.0	
RTOR Vol			0			0			0			0

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
EB Left	P							
Thru	P							
Right	P							
Peds	X							
WB Left	P							
Thru	P							
Right	P							
Peds	X							
NB Right								
SB Right								
NB Left						P		
Thru						P		
Right						P		
Peds						X		
SB Left					P			
Thru					P	P		
Right					P	P		
Peds					X	X		
EB Right								
WB Right								
Green	26.0				27.0	27.0		
Yellow	4.0					4.0		
All Red	1.0				0.0	1.0		

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
LTR	374	1295	1.78	0.289	395.2	F	395.2	F
Westbound								
L	80	265	2.50	0.289	742.6	F		
T	497	1722	0.77	0.289	40.0	D	199.1	F
R	418	1447	0.72	0.289	38.8	D		
Northbound								
LTR	967	3224	0.89	0.300	42.0	D	42.0	D
Southbound								
LTR	3698	6164	0.92	0.600	20.9	C	20.9	C

Intersection Delay = 94.1 (sec/veh) Intersection LOS = F

HCS: Signalized Intersections Release 3.2

Inter: Connecticut Ave. & Porter St. City/St: Washington D.C.
Analyst: LB Proj #: JA-2249
Date: 8/23/00 Period: 2017 Scenario 3 PM Peak Hour
E/W St: Porter St. N/S St: Connecticut Ave.

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	1	1	1	0	4	0	0	2	0
LGConfig		LTR		L	T	R		LTR			LTR	
Volume	32	411	26	118	309	98	14	1610	117	14	618	32
Lane Width		*12.0*		*10.0*	*10.0*	*10.0*		*10.0*			*10.0*	
RTOR Vol			0			0			0			0

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left	P				NB	Left		P		
Thru	P					Thru		P		
Right	P					Right		P		
Peds	X					Peds		X		
WB Left	P				SB	Left	P			
Thru	P					Thru	P	P		
Right	P					Right	P	P		
Peds	X					Peds	X	X		
NB Right					EB	Right				
SB Right					WB	Right				
Green	25.0						16.0	39.0		
Yellow	4.0							4.0		
All Red	1.0						0.0	1.0		

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
LTR	286	1031	1.95	0.278	473.0	F	473.0	F
Westbound								
L	80	275	1.77	0.278	426.8	F		
T	478	1722	0.76	0.278	40.7	D	125.2	F
R	402	1447	0.31	0.278	27.7	C		
Northbound								
LTR	2497	5763	0.78	0.433	24.3	C	24.3	C
Southbound								
LTR	1997	3268	0.36	0.611	9.2	A	9.2	A

Intersection Delay = 103.2 (sec/veh) Intersection LOS = F

HCS: Signalized Intersections Release 3.2

Inter: Cleveland Ave. & Garfield St. City/St: Washington D.C.
Analyst: LB Proj #:
Date: 8/24/00 Period: 2017 Scenario 3 AM Peak Hour
E/W St: Cleveland Ave. N/S St: 32nd St.

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	1	1	0	0	1	0	0	1	0
LGConfig		LTR		L	TR			LTR			LTR	
Volume	0	722	19	138	73	5	7	5	0	20	8	25
Lane Width		16.0		11.0	11.0			15.0			12.0	
RTOR Vol			0			0			0			0

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left	P				NB	Left	P			
Thru	P					Thru	P			
Right	P					Right	P			
Peds	X	X				Peds	X			
WB Left	P				SB	Left	P			
Thru	P					Thru	P			
Right	P					Right	P			
Peds	X	X				Peds	X			
NB Right					EB	Right				
SB Right					WB	Right				
Green	36.0	21.0					15.0			
Yellow	4.0	4.0					4.0			
All Red	2.0	2.0					2.0			

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
LTR	656	1640	1.25	0.400	153.8	F	153.8	F
Westbound								
L	94	235	1.83	0.400	438.7	F		
TR	713	1783	0.14	0.400	17.5	B	286.8	F
Northbound								
LTR	287	1722	0.08	0.167	32.2	C	32.2	C
Southbound								
LTR	226	1356	0.39	0.167	38.4	D	38.4	D

Intersection Delay = 172.9 (sec/veh) Intersection LOS = F

HCS: Signalized Intersections Release 3.2

Inter: Cleveland Ave. & Garfield St. City/St: Washington D.C.
Analyst: LB Proj #:
Date: 8/24/00 Period: 2017 Scenario 3 PM Peak Hour
E/W St: Cleveland Ave. N/S St: 32nd St.

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	1	1	0	0	1	0	0	1	0
LGConfig		LTR		L	TR			LTR			LTR	
Volume	0	159	9	294	202	1	3	2	1	9	3	10
Lane Width		16.0		11.0	11.0			15.0			12.0	
RTOR Vol			0			0			0			0

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left	P				NB	Left	P			
Thru	P					Thru	P			
Right	P					Right	P			
Peds	X	X				Peds				
WB Left	P				SB	Left	P			
Thru	P					Thru	P			
Right	P					Right	P			
Peds	X	X				Peds				
NB Right					EB	Right				
SB Right					WB	Right				
Green	36.0	21.0					15.0			
Yellow	4.0	4.0					4.0			
All Red	2.0	2.0					2.0			

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
LTR	653	1632	0.32	0.400	19.9	B	19.9	B
Westbound								
L	399	997	0.92	0.400	54.4	D		
TR	720	1800	0.35	0.400	20.2	C	40.5	D
Northbound								
LTR	269	1611	0.05	0.167	31.8	C	31.8	C
Southbound								
LTR	231	1388	0.16	0.167	33.6	C	33.6	C

Intersection Delay = 35.1 (sec/veh) Intersection LOS = D

HCS: Signalized Intersections Release 3.2

Inter: Cleveland Ave. & Garfield St. City/St: Washington D.C.
Analyst: LB Proj #:
Date: 8/24/00 Period: 2017 Scenario 3 AM Peak Hour
E/W St: Garfield St./Woodley Rd. N/S St: 32nd St.

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	0	1	0	1	0	0	1	0	0	1	0
LGConfig	L		R		LTR			LTR			LTR	
Volume	34		325	5	96	32	7	5	0	20	8	25
Lane Width	12.0		12.0		13.0			14.0			12.0	
RTOR Vol			0			0			0			0

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left	P				NB	Left	P			
Thru						Thru	P			
Right	P					Right				
Peds	X	X				Peds				
WB Left	P				SB	Left	P			
Thru	P					Thru	P			
Right	P					Right	P			
Peds	X	X				Peds				
NB Right					EB	Right				
SB Right					WB	Right				
Green	21.0	36.0					15.0			
Yellow	4.0	4.0					4.0			
All Red	2.0	2.0					2.0			

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	113	484	0.37	0.233	38.1	D		
R	365	1566	0.99	0.233	78.8	E	74.6	E
Westbound								
LTR	388	1662	0.43	0.233	32.9	C	32.9	C
Northbound								
LTR	278	1670	0.08	0.167	32.2	C	32.2	C
Southbound								
LTR	226	1356	0.39	0.167	38.4	D	38.4	D

Intersection Delay = 58.3 (sec/veh) Intersection LOS = E

HCS: Signalized Intersections Release 3.2

Inter: Cleveland Ave. & Garfield St. City/St: Washington D.C.
Analyst: LB Proj #:
Date: 8/24/00 Period: 2017 Scenario 3 PM Peak Hour
E/W St: Garfield St./Woodley Rd. N/S St: 32nd St.

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	0	1	0	1	0	0	1	0	0	1	0
LGConfig	L		R		LTR			LTR			LTR	
Volume	13		287	8	58	18	3	2	1	9	3	10
Lane Width	12.0		12.0		13.0			14.0			12.0	
RTOR Vol			0			0			0			0

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left	P				NB	Left	P			
Thru						Thru	P			
Right	P					Right				
Peds	X	X				Peds				
WB Left	P				SB	Left	P			
Thru	P					Thru	P			
Right	P					Right	P			
Peds	X	X				Peds				
NB Right					EB	Right				
SB Right					WB	Right				
Green	21.0	36.0					15.0			
Yellow	4.0	4.0					4.0			
All Red	2.0	2.0					2.0			

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	147	628	0.13	0.233	29.1	C	55.7	E
R	365	1566	0.87	0.233	57.2	E		
Westbound								
LTR	388	1664	0.31	0.233	30.7	C	30.7	C
Northbound								
LTR	261	1568	0.05	0.167	31.9	C	31.9	C
Southbound								
LTR	231	1388	0.16	0.167	33.6	C	33.6	C

Intersection Delay = 47.5 (sec/veh) Intersection LOS = D

HCS: Signalized Intersections Release 3.2

Inter: 34th Street & Woodley Road City/St: Washington D.C.
Analyst: LB Proj #: JA-2249
Date: 8/17/00 Period: 2017 Scenario 3 AM Peak Hour
E/W St: Woodley Road N/S St: 34th Street

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	0	1	0	0	2	0	0	1	0
LGConfig		LTR			LTR			LTR			TR	
Volume	14	20	307	1	258	0	34	543	2		1126	21
Lane Width		14.0			10.0			10.0			13.0	
RTOR Vol			0			0			0			0

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left	P				NB	Left	P			
Thru	P					Thru	P			
Right	P					Right				
Peds	X					Peds	X			
WB Left	P				SB	Left	P			
Thru	P					Thru	P			
Right	P					Right				
Peds	X					Peds	X			
NB Right					EB	Right				
SB Right					WB	Right				
Green	19.0						59.0			
Yellow	4.0						4.0			
All Red	2.0						2.0			

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
LTR	275	1304	1.53	0.211	293.6	F	293.6	F
Westbound								
LTR	369	1748	0.79	0.211	49.2	D	49.2	D
Northbound								
LTR	1318	2011	0.50	0.656	9.3	A	9.3	A
Southbound								
TR	1111	1695	1.09	0.656	69.5	E	69.5	E

Intersection Delay = 88.6 (sec/veh) Intersection LOS = F

HCS: Signalized Intersections Release 3.2

Inter: 34th Street & Woodley Road
Analyst: LB
Date: 8/17/00
E/W St: Woodley Road

City/St: Washington D.C.
Proj #: JA-2249
Period: 2017 Scenario 3 PM Peak Hour
N/S St: 34th Street

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	0	1	0	0	2	0	0	1	0
LGConfig		LTR			LTR			LTR			TR	
Volume	35	305	82	1	0	0	215	1049	7		224	0
Lane Width		14.0			10.0			10.0			13.0	
RTOR Vol			0			0			0			0

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	P				NB Left	P			
Thru	P				Thru	P			
Right	P				Right				
Peds	X				Peds	X			
WB Left	P				SB Left	P			
Thru	P				Thru	P			
Right	P				Right				
Peds	X				Peds	X			
NB Right					EB Right				
SB Right					WB Right				
Green	25.0					53.0			
Yellow	4.0					4.0			
All Red	2.0					2.0			

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
LTR	448	1613	1.13	0.278	116.2	F	116.2	F
Westbound								
LTR	383	1378	0.01	0.278	23.6	C	23.6	C
Northbound								
LTR	1577	2678	0.87	0.589	22.1	C	22.1	C
Southbound								
TR	1134	1925	0.21	0.589	9.1	A	9.1	A

Intersection Delay = 43.3 (sec/veh) Intersection LOS = D

HCS: Unsignalized Intersections Release 3.2

TWO-WAY STOP CONTROL SUMMARY

Intersection: Woodley Rd. & 32nd St.
Analyst: lb
Project No.:
Date:
East/West Street:
North/South Street:
Intersection Orientation: EW Study period (hrs): 0.25

Sam

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1 L	2 T	3 R	4 L	5 T	6 R
Volume		1	84	0	263	
Hourly Flow Rate, HFR		4	139	0	328	
Percent Heavy Vehicles		--	--	0	--	--
Median Type	Undivided					
RT Channelized?						
Lanes		1	0	0	1	
Configuration		TR		LT		
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7 L	8 T	9 R	10 L	11 T	12 R
Volume	2		0			
Hourly Flow Rate, HFR	4		0			
Percent Heavy Vehicles	0		0			
Percent Grade (%)		0			0	
Median Storage	1					
Flared Approach: Exists?		No				
Storage						
RT Channelized?						
Lanes	0		0			
Configuration		LR				

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		LT		LR				
v (vph)		0		4				
C(m) (vph)		1452		608				
v/c		0.00		0.01				
95% queue length		0.00		0.00				
Control Delay		7.5		11.0				
LOS		A		B				
Approach Delay				11.0				
Approach LOS				B				

HCS: Unsignalized Intersections Release 3.2

TWO-WAY STOP CONTROL SUMMARY

Intersection: Woodley Rd. & 32nd St.
Analyst: lb
Project No.:
Date:
East/West Street:
North/South Street:
Intersection Orientation: EW Study period (hrs): 0.25

SS PM

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		302	41	0	5	
Hourly Flow Rate, HFR		377	68	0	9	
Percent Heavy Vehicles		--	--	0	--	--
Median Type	Undivided					
RT Channelized?						
Lanes		1	0	0	1	
Configuration			TR		LT	
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	2		0			
Hourly Flow Rate, HFR	4		0			
Percent Heavy Vehicles	0		0			
Percent Grade (%)		0			0	
Median Storage	1					
Flared Approach: Exists?		No				
Storage						
RT Channelized?						
Lanes	0		0			
Configuration		LR				

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		LT		LR				
v (vph)		0		4				
C(m) (vph)		1126		594				
v/c		0.00		0.01				
95% queue length		0.00		0.00				
Control Delay		8.2		11.1				
LOS		A		B				
Approach Delay				11.1				
Approach LOS				B				

Phone: Fax:
E-Mail:

ALL-WAY STOP CONTROL(AWSC) ANALYSIS

Intersection: Woodley Rd. & Klingle Rd.
City/State:
Analyst: LB
Project No.:
Time period Analyzed: Scenario 3 AM Peak
Date:
East/West Street:
North/South Street:

Worksheet 2 - Volume Adjustments and Site Characteristics

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume	0	7	0	0	0	260	0	3	0	1	0	0
% Thrus Left Lane												

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	T		R		T		L	
PHF	0.50		0.80		0.75		0.25	
Flow Rate	14		324		4		4	
% Heavy Veh	0		0		0		0	
No. Lanes	1		1		1		1	
Opposing-Lanes	1		1		1		1	
Conflicting-lanes	1		1		1		1	
Geometry group	1		1		1		1	

Duration, T 0.25 hrs.

Worksheet 3 - Saturation Headway Adjustment Worksheet

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rates:								
Total in Lane	14		324		4		4	
Left-Turn	0		0		0		4	
Right-Turn	0		324		0		0	
Prop. Left-Turns	0.0		0.0		0.0		1.0	
Prop. Right-Turns	0.0		1.0		0.0		0.0	
Prop. Heavy Vehicle	0.0		0.0		0.0		0.0	
Geometry Group	1		1		1		1	
Adjustments Table 10-40:								
hLT-adj	0.2		0.2		0.2		0.2	
hRT-adj	-0.6		-0.6		-0.6		-0.6	

hHV-adj	1.7	1.7	1.7	1.7
hadj, computed	0.0	-0.6	0.0	0.2

Worksheet 4 - Departure Headway and Service Time

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow rate	14		324		4		4	
hd, initial value	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20
x, initial	0.01		0.29		0.00		0.00	
hd, final value	4.16		3.33		4.49		4.69	
x, final value	0.02		0.30		0.00		0.01	
Move-up time, m	2.0		2.0		2.0		2.0	
Service Time	2.2		1.3		2.5		2.7	

Worksheet 5 - Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rate	14		324		4		4	
Service Time	2.2		1.3		2.5		2.7	
Utilization, x	0.02		0.30		0.00		0.01	
Dep. headway, hd	4.16		3.33		4.49		4.69	
Capacity	264		574		254		254	
Delay	7.23		7.75		7.51		7.71	
LOS	A		A		A		A	
Approach:								
Delay	7.23		7.75		7.51		7.71	
LOS	A		A		A		A	

Intersection Delay 7.73 Intersection LOS A

HCS: Unsignalized Intersections Release 3.2

Phone: Fax:
E-Mail:

ALL-WAY STOP CONTROL(AWSC) ANALYSIS

Intersection: Woodley Rd. & Klingle Rd.
City/State:
Analyst: LB
Project No.:
Time period Analyzed: Scenario 3 PM Peak
Date:
East/West Street:
North/South Street:

Worksheet 2 - Volume Adjustments and Site Characteristics

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume	0	6	0	0	0	2	0	3	0	302	0	0
% Thrus Left Lane												

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	T		R		T		L	
PHF	0.50		0.50		0.75		0.80	
Flow Rate	12		4		4		377	
% Heavy Veh	0		0		0		0	
No. Lanes	1		1		1		1	
Opposing-Lanes	1		1		1		1	
Conflicting-lanes	1		1		1		1	
Geometry group	1		1		1		1	

Duration, T 0.25 hrs.

Worksheet 3 - Saturation Headway Adjustment Worksheet

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rates:								
Total in Lane	12		4		4		377	
Left-Turn	0		0		0		377	
Right-Turn	0		4		0		0	
Prop. Left-Turns	0.0		0.0		0.0		1.0	
Prop. Right-Turns	0.0		1.0		0.0		0.0	
Prop. Heavy Vehicle	0.0		0.0		0.0		0.0	
Geometry Group	1		1		1		1	
Adjustments Table 10-40:								
hLT-adj	0.2		0.2		0.2		0.2	
hRT-adj	-0.6		-0.6		-0.6		-0.6	

Transportation Study
D-3: Tables and Figures

TABLE 1

TRIP SHARE PERCENTAGE CALCULATION (BASED ON 2000 TRAFFIC VOLUMES)

	AM Peak Period (7:00 - 9:30)				PM Peak Period (4:00 – 6:30)			
	EASTBOUND		WESTBOUND		EASTBOUND		WESTBOUND	
Roadways	Volume	Weight	Volume	Weight	Volume	Weight	Volume	Weight
Porter Street	1687	1	1687	1	2033	1	1901	1
Cleveland Avenue	1325	0.5	546	0.5	557	0.5	1125	0.5
Woodley Road	167	0.5	167	0.5	245	0.5	221	0.5
Cathedral Avenue	167	0.5	167	0.5	245	0.5	221	0.5
South Alternatives Subtotal	1659		880		1047		1567	
Weighed South Alternatives Total	830		440		524		784	
Weighed Total	2517		2127		2557		2685	
	Trip Share Percentage							
Porter Street	67%		79%		80%		71%	
Cleveland Avenue	26%		13%		11%		21%	
Woodley Road	4%		4%		5%		4%	
Cathedral Avenue	3%		4%		4%		4%	

TABLE 2

TRAFFIC DIVERTION FOR SCENARIO 1: KLINGLE ROAD REOPENS WITH PREVIOUS ROAD CONDITION

	AM Peak Hour		PM Peak Hour	
	EASTBOUND	WESTBOUND	EASTBOUND	WESTBOUND
Peak Hour Volumes on Klingle Road	136	258	284	184
Diverted from Porter Street	91	205	226	130
Diverted from Cleveland Avenue	36	33	31	39
Diverted from Woodley Road	5	10	14	7
Diverted from Cathedral Avenue	4	10	13	7

TABLE 3

TRAFFIC DIVERTION FOR SCENARIO 2: KLINGLE ROAD REOPENS WITH IMPROVEMENT OF 10MPH SPEED INCREASE

	AM Peak Hour		PM Peak Hour	
	EASTBOUND	WESTBOUND	EASTBOUND	WESTBOUND
Peak Hour Volumes on Klingle Road	184	348	383	248
Diverted from Porter Street	123	276	305	176
Diverted from Cleveland Avenue	48	45	42	52
Diverted from Woodley Road	7	14	19	10
Diverted from Cathedral Avenue	6	14	18	10

TABLE 4
EXISTING AM PEAK HOUR LEVEL OF SERVICE ANALYSIS
SIGNALIZED INTERSECTIONS

Intersection and Approach	Lane Group	Volume (vph)	v/c Ratio	Delay^ (sec/veh.)	LOS
Connecticut Ave. & Porter St.					
Eastbound (Porter St.)	LTR	474	2.14	557	F
Westbound (Porter St.)	L	119	2.13	577.7	F
Westbound (Porter St.)	T	464	1.1	102	F
Westbound (Porter St.)	R	229	0.61	34	C
Northbound (Connecticut Ave.)	LTR	633	0.83	37.4	D
Southbound (Connecticut Ave.)	LTR	2713	0.78	15.3	B
Intersection Overall				*109.2*	*F*
Cleveland Ave., Garfield St. & 32nd St.					
Northwest Approach (Cleveland Ave.)	L	117	1.1	133.7	F
Northwest Approach (Cleveland Ave.)	TR	94	0.16	17.8	B
Southeast Approach (Cleveland Ave.)	LTR	628	1.06	80.4	F
Eastbound (Garfield St.)	L	29	0.29	34.3	C
Eastbound (Garfield St.)	R	275	0.84	52.9	D
Westbound (Woodley Rd.)	LTR	121	0.39	32.1	C
Northbound (32nd St.)	LTR	10	0.06	32	C
Southbound (32nd St.)	LTR	45	0.33	36.9	D
Intersection Overall				*76.9*	*E*
34th St. & Woodley Rd.					
Eastbound (Woodley Rd.)	LTR	289	1.19	149.2	F
Westbound (Woodley Rd.)	LTR	1	0.01	28.2	C
Northbound (34th St.)	LTR	519	0.48	9.1	A
Southbound (34th St.)	LTR	972	0.97	35.8	D
Intersection Overall				*47.8*	*D*

Note: ^ Stop delay
L-Exclusive left turn lane; T-Through lane; TR-Shared through/right turn lane(s);
LTR-Shared left turn/through/right turn lane(s); R-Exclusive right turn lane

N/a-not available

TABLE 5
EXISTING PM PEAK HOUR LEVEL OF SERVICE ANALYSIS
SIGNALIZED INTERSECTIONS

Intersection and Approach	Lane Group	Volume (vph)	v/c Ratio	Delay^ (sec/veh.)	LOS
Connecticut Ave. & Porter St.					
Eastbound (Porter St.)	LTR	587	2	491.3	F
Westbound (Porter St.)	L	100	1.5	311.9	F
Westbound (Porter St.)	T	262	0.64	35.1	D
Westbound (Porter St.)	R	83	0.26	26.9	C
Northbound (Connecticut Ave.)	LTR	1475	0.66	21.6	C
Southbound (Connecticut Ave.)	LTR	563	0.3	8.7	A
Intersection Overall				125.2	F
Cleveland Ave., Garfield St. & 32nd St.					
Northwest Approach (Cleveland Ave.)	L	249	0.78	37.9	D
Northwest Approach (Cleveland Ave.)	TR	172	0.3	19.5	B
Southeast Approach (Cleveland Ave.)	LTR	170	0.32	19.9	B
Eastbound (Garfield St.)	L	11	0.1	28.3	C
Eastbound (Garfield St.)	R	255	0.78	47.1	D
Westbound (Woodley Rd.)	LTR	71	0.26	29.8	C
Northbound (32nd St.)	LTR	6	0.05	31.9	C
Southbound (32nd St.)	LTR	19	0.13	33.1	C
Intersection Overall				41	D
34th St. & Woodley Rd.					
Eastbound (Woodley Rd.)	LTR	144	0.47	31	C
Westbound (Woodley Rd.)	LTR	1	0.01	23.6	C
Northbound (34th St.)	LTR	1077	0.75	17	B
Southbound (34th St.)	LTR	190	0.18	8.8	A
Intersection Overall				17.7	B

Note: ^ Stop delay
L-Exclusive left turn lane; T-Through lane; TR-Shared through/right turn lane(s);
LTR-Shared left turn/through/right turn lane(s); R-Exclusive right turn lane

N/a-not available

TABLE 6
EXISTING AM AND PM PEAK HOUR LEVEL OF SERVICE ANALYSIS
UNSIGNALIZED INTERSECTIONS

AM PEAK HOUR					
Intersection and Approach	Lane Group	Volume (vph)	v/c Ratio	Delay^ (sec/veh.)	LOS
Woodley Rd. & Klingle Rd.					
Eastbound (Klingle Rd.)	LTR	6	N/A	7	A
Westbound (Klingle Rd.)	LTR	2	N/A	6.3	A
Northbound (Woodley Rd.)	LTR	3	N/A	7	A
Southbound (Woodley Rd.)	LTR	1	N/A	7.2	A
Intersection Overall				6.9	A
Woodley Rd. & 32nd St.					
Northbound (32nd St.)	LR	2	0	8.9	A
Intersection Overall				N/A	N/A
PM PEAK HOUR					
Intersection and Approach	Lane Group	Volume (vph)	v/c Ratio	Delay^ (sec/veh.)	LOS
Woodley Rd. & Klingle Rd.					
Eastbound (Klingle Rd.)	LTR	5	N/A	7	A
Westbound (Klingle Rd.)	LTR	2	N/A	6.4	A
Northbound (Woodley Rd.)	LTR	3	N/A	7	A
Southbound (Woodley Rd.)	LTR	15	N/A	7.3	A
Intersection Overall				7.1	A
Woodley Rd. & 32nd St.					
Northbound (32nd St.)	LR	2	0	8.8	A
Intersection Overall				N/A	N/A

Note: ^ Stop delay
LTR-Shared left turn/through/right turn lane(s); LR-Shared left turn/right turn lane
N/a-not available

TABLE 7

TRAFFIC ACCIDENTS SUMMARY -- (1993 - 1995)

	1993		1994		1995	
Locations	No. of Accidents	Injuries	No. of Accidents	Injuries	No. of Accidents	Injuries
Connecticut Ave. @ Porter St.	25	6	16	2	15	0
Klingle Rd. @ Porter St.	1	0	0	0	0	0
34th St. @ Woodley Rd.	7	4	3	0	2	1
Total	33	10	19	2	17	1

TRAFFIC ACCIDENTS BY TYPE -- (1993 - 1995)

Locations	Right Angle	Left Turn	Right Turn	Rear End	Sideswipe	Head On	Parked Car	Fixed Object	Pedestrian	Overtaking	Backing	Total
Connecticut Ave. @ Porter St.	2	1	1	14	21	0	4	2	5	4	2	56
Klingle Rd. @ Porter St.	0	0	0	1	0	0	0	0	0	0	0	1
34th St. @ Woodley Rd.	6	0	0	2	0	0	2	0	0	2	0	12
Total	8	1	1	17	21	0	6	2	5	6	2	69

TABLE 8
2017 NO BUILD AM PEAK HOUR LEVEL OF SERVICE ANALYSIS
SIGNALIZED INTERSECTIONS

Intersection and Approach	Lane Group	Volume (vph)	v/c Ratio	Delay^ (sec/veh.)	LOS
Connecticut Ave. & Porter St.					
Eastbound (Porter St.)	LTR	560	2.93	910.3	F
Westbound (Porter St.)	L	140	2.5	742.6	F
Westbound (Porter St.)	T	548	1.23	150.3	F
Westbound (Porter St.)	R	270	0.72	38.8	D
Northbound (Connecticut Ave.)	LTR	747	0.89	42	D
Southbound (Connecticut Ave.)	LTR	3201	0.92	20.9	C
Intersection Overall				160.1	F
Cleveland Ave., Garfield St. & 32nd St.					
Northwest Approach (Cleveland Ave.)	L	138	1.83	438.7	F
Northwest Approach (Cleveland Ave.)	TR	111	0.19	18.2	B
Southeast Approach (Cleveland Ave.)	LTR	741	1.25	153.8	F
Eastbound (Garfield St.)	L	34	0.4	40.2	D
Eastbound (Garfield St.)	R	325	0.99	78.8	E
Westbound (Woodley Rd.)	LTR	143	0.46	33.6	C
Northbound (32nd St.)	LTR	12	0.08	32.2	C
Southbound (32nd St.)	LTR	53	0.39	38.4	D
Intersection Overall				167.8	F
34th St. & Woodley Rd.					
Eastbound (Woodley Rd.)	LTR	341	1.39	231.3	F
Westbound (Woodley Rd.)	LTR	1	0.02	28.2	C
Northbound (34th St.)	LTR	612	0.58	10.7	B
Southbound (34th St.)	LTR	1148	1.09	69.5	E
Intersection Overall				80.9	F

Note: ^ Stop delay
L-Exclusive left turn lane; T-Through lane; TR-Shared through/right turn lane(s);
LTR-Shared left turn/through/right turn lane(s); R-Exclusive right turn lane

N/a-not available

TABLE 9
2017 NO BUILD PM PEAK HOUR LEVEL OF SERVICE ANALYSIS
SIGNALIZED INTERSECTIONS

Intersection and Approach	Lane Group	Volume (vph)	v/c Ratio	Delay^ (sec/veh.)	LOS
Connecticut Ave. & Porter St.					
Eastbound (Porter St.)	LTR	695	2.81	857.7	F
Westbound (Porter St.)	L	118	1.77	426.8	F
Westbound (Porter St.)	T	309	0.76	40.7	D
Westbound (Porter St.)	R	98	0.31	27.7	C
Northbound (Connecticut Ave.)	LTR	1741	0.78	24.3	C
Southbound (Connecticut Ave.)	LTR	664	0.36	9.2	A
Intersection Overall				204.7	F
Cleveland Ave., Garfield St. & 32nd St.					
Northwest Approach (Cleveland Ave.)	L	294	0.99	72.4	E
Northwest Approach (Cleveland Ave.)	TR	203	0.35	20.2	C
Southeast Approach (Cleveland Ave.)	LTR	199	0.38	20.8	C
Eastbound (Garfield St.)	L	13	0.13	29.1	C
Eastbound (Garfield St.)	R	301	0.92	63.5	E
Westbound (Woodley Rd.)	LTR	84	0.31	30.7	C
Northbound (32nd St.)	LTR	6	0.05	31.9	C
Southbound (32nd St.)	LTR	22	0.16	33.6	C
Intersection Overall				51.7	D
34th St. & Woodley Rd.					
Eastbound (Woodley Rd.)	LTR	169	0.56	33.3	C
Westbound (Woodley Rd.)	LTR	1	0.01	23.6	C
Northbound (34th St.)	LTR	1271	0.87	22.1	C
Southbound (34th St.)	LTR	224	0.21	9.1	A
Intersection Overall				21.8	C

Note: ^ Stop delay
L-Exclusive left turn lane; T-Through lane; TR-Shared through/right turn lane(s);
LTR-Shared left turn/through/right turn lane(s); R-Exclusive right turn lane

N/a-not available

TABLE 10

2017 NO BUILD AM AND PM PEAK HOUR LEVEL OF SERVICE ANALYSIS

UNSIGNALIZED INTERSECTIONS

AM PEAK HOUR					
Intersection and Approach	Lane Group	Volume (vph)	v/c Ratio	Delay^ (sec/veh.)	LOS
Woodley Rd. & Klingle Rd.					
Eastbound (Klingle Rd.)	LTR	7	N/A	7	A
Westbound (Klingle Rd.)	LTR	2	N/A	6.3	A
Northbound (Woodley Rd.)	LTR	3	N/A	7	A
Southbound (Woodley Rd.)	LTR	1	N/A	7.2	
Intersection Overall				6.9	A
Woodley Rd. & 32nd St.					
Northbound (32nd St.)	LR	2	0	8.9	A
Intersection Overall				N/A	N/A
PM PEAK HOUR					
Intersection and Approach	Lane Group	Volume (vph)	v/c Ratio	Delay^ (sec/veh.)	LOS
Woodley Rd. & Klingle Rd.					
Eastbound (Klingle Rd.)	LTR	6	N/A	7	A
Westbound (Klingle Rd.)	LTR	2	N/A	6.4	A
Northbound (Woodley Rd.)	LTR	3	N/A	7	A
Southbound (Woodley Rd.)	LTR	18	N/A	7.3	A
Intersection Overall				7.1	A
Woodley Rd. & 32nd St.					
Northbound (32nd St.)	LR	2	0	8.9	A
Intersection Overall				N/A	N/A

Note: ^ Stop delay

LTR-Shared left turn/through/right turn lane(s); LR-Shared left turn/right turn lane

N/a-not available

TABLE 11

2017 BUILD (SCENARIO 1) AM PEAK HOUR LEVEL OF SERVICE ANALYSIS

SIGNALIZED INTERSECTIONS

Intersection and Approach	Lane Group	Volume (vph)	v/c Ratio	Delay^ (sec/veh.)	LOS
Connecticut Ave. & Porter St.					
Eastbound (Porter St.)	LTR	469	1.53	282.1	F
Westbound (Porter St.)	L	140	2.5	742.6	F
Westbound (Porter St.)	T	343	0.77	40	D
Westbound (Porter St.)	R	270	0.72	38.8	D
Northbound (Connecticut Ave.)	LTR	747	0.89	42	D
Southbound (Connecticut Ave.)	LTR	3201	0.92	20.9	C
Intersection Overall				77.3	E
Cleveland Ave., Garfield St. & 32nd St.					
Northwest Approach (Cleveland Ave.)	L	138	1.62	346.1	F
Northwest Approach (Cleveland Ave.)	TR	78	0.14	17.5	B
Southeast Approach (Cleveland Ave.)	LTR	705	1.19	128.6	F
Eastbound (Garfield St.)	L	34	0.37	38.1	D
Eastbound (Garfield St.)	R	320	0.98	75.5	E
Westbound (Woodley Rd.)	LTR	133	0.43	32.9	C
Northbound (32nd St.)	LTR	12	0.08	32.2	C
Southbound (32nd St.)	LTR	53	0.39	38.4	D
Intersection Overall				142.9	F
34th St. & Woodley Rd.					
Eastbound (Woodley Rd.)	LTR	441	1.84	424.3	F
Westbound (Woodley Rd.)	LTR	259	0.8	49.9	D
Northbound (34th St.)	LTR	579	0.5	9.3	A
Southbound (34th St.)	LTR	1147	1.09	69.5	E
Intersection Overall				124.6	F

Note: ^ Stop delay
L-Exclusive left turn lane; T-Through lane; TR-Shared through/right turn lane(s);
LTR-Shared left turn/through/right turn lane(s); R-Exclusive right turn lane

N/a-not available

TABLE 12

2017 BUILD (SCENARIO 1) PM PEAK HOUR LEVEL OF SERVICE ANALYSIS

SIGNALIZED INTERSECTIONS

Intersection and Approach	Lane Group	Volume (vph)	v/c Ratio	Delay^ (sec/veh.)	LOS
Connecticut Ave. & Porter St.					
Eastbound (Porter St.)	LTR	469	1.39	223.4	F
Westbound (Porter St.)	L	118	1.77	426.8	F
Westbound (Porter St.)	T	179	0.44	29.7	C
Westbound (Porter St.)	R	98	0.31	27.7	C
Northbound (Connecticut Ave.)	LTR	1741	0.78	24.3	C
Southbound (Connecticut Ave.)	LTR	664	0.36	9.2	A
Intersection Overall				67.4	E
Cleveland Ave., Garfield St. & 32nd St.					
Northwest Approach (Cleveland Ave.)	L	294	0.92	54.4	D
Northwest Approach (Cleveland Ave.)	TR	164	0.28	19.3	B
Southeast Approach (Cleveland Ave.)	LTR	168	0.32	19.9	B
Eastbound (Garfield St.)	L	13	0.12	28.9	C
Eastbound (Garfield St.)	R	287	0.87	57.2	E
Westbound (Woodley Rd.)	LTR	77	0.29	30.2	C
Northbound (32nd St.)	LTR	6	0.05	31.9	C
Southbound (32nd St.)	LTR	22	0.16	33.6	C
Intersection Overall				47.7	D
34th St. & Woodley Rd.					
Eastbound (Woodley Rd.)	LTR	422	1.16	126.2	F
Westbound (Woodley Rd.)	LTR	185	0.48	30.4	C
Northbound (34th St.)	LTR	1232	0.82	19.6	B
Southbound (34th St.)	LTR	224	0.21	9.1	A
Intersection Overall				43.2	D

Note: ^ Stop delay
L-Exclusive left turn lane; T-Through lane; TR-Shared through/right turn lane(s);
LTR-Shared left turn/through/right turn lane(s); R-Exclusive right turn lane

N/a-not available

TABLE 13
2017 BUILD (SCENARIO 1) AM AND PM PEAK HOUR LEVEL OF SERVICE ANALYSIS
UNSIGNALIZED INTERSECTIONS

AM PEAK HOUR					
Intersection and Approach	**Lane Group**	**Volume (vph)**	**v/c Ratio**	**Delay^ (sec/veh.)**	**LOS**
Woodley Rd. & Klingle Rd.					
Eastbound (Klingle Rd.)	LTR	7	N/A	7.7	A
Westbound (Klingle Rd.)	LTR	260	N/A	8.7	A
Northbound (Woodley Rd.)	LTR	3	N/A	7.8	A
Southbound (Woodley Rd.)	LTR	137	N/A	9.2	A
Intersection Overall				8.9	A
Woodley Rd. & 32nd St.					
Northbound (32nd St.)	LR	2	0.01	12.5	B
Intersection Overall				N/A	N/A
PM PEAK HOUR					
Intersection and Approach	**Lane Group**	**Volume (vph)**	**v/c Ratio**	**Delay^ (sec/veh.)**	**LOS**
Woodley Rd. & Klingle Rd.					
Eastbound (Klingle Rd.)	LTR	6	N/A	8.1	A
Westbound (Klingle Rd.)	LTR	187	N/A	8.8	A
Northbound (Woodley Rd.)	LTR	3	N/A	7.9	A
Southbound (Woodley Rd.)	LTR	302	N/A	11.6	B
Intersection Overall				10.4	B
Woodley Rd. & 32nd St.					
Northbound (32nd St.)	LR	2	0.01	13.1	B
Intersection Overall				N/A	N/A

Note: ^ Stop delay
LTR-Shared left turn/through/right turn lane(s); LR-Shared left turn/right turn lane
N/a-not available

TABLE 14
IMPROVED INTERSECTIONS AND APPROACHES

AM PEAK HOUR					
Intersection and Approach	**Lane Group**	**No Build Conditions**		**Build Scenario 1**	
		Delay^ (sec/veh)	**LOS**	**Delay^ (sec/veh)**	**LOS**
Connecticut Ave. & Porter St.					
Eastbound (Porter St.)	LTR	910.3	F	282.1	F
Westbound (Porter St.)	T	150.3	F	40	D
Intersection Overall		160.1	F	77.3	E
Cleveland Ave., Garfield St. & 32nd St.					
Northwest Approach (Cleveland Ave.)	L	438.7	F	346.1	F
Northwest Approach (Cleveland Ave.)	TR	18.2	B	17.5	B
Southeast Approach (Cleveland Ave.)	LTR	153.8	F	128.6	F
Eastbound (Garfield St.)	L	40.2	D	38.1	D
Eastbound (Garfield St.)	R	78.8	E	75.5	E
Westbound (Woodley Rd.)	LTR	33.6	C	32.9	C
Intersection Overall		167.8	F	142.9	F
PM PEAK HOUR					
Intersection and Approach	**Lane Group**	**No Build Conditions**		**Build Scenario 1**	
		Delay^ (sec/veh)	**LOS**	**Delay^ (sec/veh)**	**LOS**
Connecticut Ave. & Porter St.					
Eastbound (Porter St.)	LTR	857.7	F	223.4	F
Westbound (Porter St.)	T	40.7	D	29.7	C
Intersection Overall		160.1	F	67.4	E
Cleveland Ave., Garfield St. & 32nd St.					
Northwest Approach (Cleveland Ave.)	L	72.4	E	54.4	D
Northwest Approach (Cleveland Ave.)	TR	20.2	C	19.3	B
Southeast Approach (Cleveland Ave.)	LTR	20.8	C	19.9	B
Eastbound (Garfield St.)	L	29.1	C	28.9	C
Eastbound (Garfield St.)	R	63.5	E	57.2	E
Westbound (Woodley Rd.)	LTR	30.7	C	30.2	C
Intersection Overall		51.7	D	47.7	D

Note: ^ Stop delay
L-Exclusive left turn lane; T-Through lane; TR-Shared through/right turn lane(s);
LTR-Shared left turn/through/right turn lane(s); R-Exclusive right turn lane

N/a-not available

TABLE 15
DETERIORATED INTERSECTIONS AND APPROACHES

AM PEAK HOUR					
Intersection and Approach	**Lane Group**	**No Build Conditions**		**Build Scenario 1**	
		Delay^ (sec/veh)	**LOS**	**Delay^ (sec/veh)**	**LOS**
34th St. & Woodley Rd.					
Eastbound (Woodley Rd.)	LTR	231.3	F	424.3	F
Westbound (Woodley Rd.)	LTR	28.2	C	49.9	D
Intersection Overall		80.9	F	124.6	F
Woodley Rd. & Klingle Rd.					
Eastbound (Klingle Rd.)	LTR	7	A	7.7	A
Westbound (Klingle Rd.)	LTR	6.3	A	8.7	A
Northbound (Woodley Rd.)	LTR	7	A	7.8	A
Southbound (Woodley Rd.)	LTR	7.2		9.2	A
Intersection Overall		6.9	A	8.9	A
Woodley Rd. & 32nd St.					
Northbound (32nd St.)	LR	8.9	A	12.5	B
Intersection Overall		N/A	N/A	N/A	N/A
PM PEAK HOUR					
Intersection and Approach	**Lane Group**	**No Build Conditions**		**Build Scenario 1**	
		Delay^ (sec/veh)	**LOS**	**Delay^ (sec/veh)**	**LOS**
34th St. & Woodley Rd.					
Eastbound (Woodley Rd.)	LTR	33.3	C	166.9	F
Westbound (Woodley Rd.)	LTR	23.6	C	30.4	C
Intersection Overall		21.8	C	54.1	D
Woodley Rd. & Klingle Rd.					
Eastbound (Klingle Rd.)	LTR	7	A	8.1	A
Westbound (Klingle Rd.)	LTR	6.4	A	8.8	A
Northbound (Woodley Rd.)	LTR	7	A	7.9	A
Southbound (Woodley Rd.)	LTR	7.3	A	11.6	B
Intersection Overall		7.1	A	10.4	B
Woodley Rd. & 32nd St.					
Northbound (32nd St.)	LR	8.9	A	13.1	B
Intersection Overall		N/A	N/A	N/A	N/A

Note: ^ Stop delay
LTR-Shared left turn/through/right turn lane(s); LR-Shared left turn/right turn lane
N/a-not available

TABLE 16
2017 BUILD (SCENARIO 2) AM PEAK HOUR LEVEL OF SERVICE ANALYSIS
SIGNALIZED INTERSECTIONS

Intersection and Approach	Lane Group	Volume (vph)	v/c Ratio	Delay^ (sec/veh.)	LOS
Connecticut Ave. & Porter St.					
Eastbound (Porter St.)	LTR	437	1.24	158.8	F
Westbound (Porter St.)	L	140	2.5	742.6	F
Westbound (Porter St.)	T	272	0.61	33	D
Westbound (Porter St.)	R	270	0.72	38.8	D
Northbound (Connecticut Ave.)	LTR	747	0.89	42	D
Southbound (Connecticut Ave.)	LTR	3201	0.92	20.9	C
Intersection Overall				64.5	E
Cleveland Ave., Garfield St. & 32nd St.					
Northwest Approach (Cleveland Ave.)	L	138	1.58	326.3	F
Northwest Approach (Cleveland Ave.)	TR	66	0.12	17.3	B
Southeast Approach (Cleveland Ave.)	LTR	693	1.17	120.7	F
Eastbound (Garfield St.)	L	34	0.36	37.4	D
Eastbound (Garfield St.)	R	318	0.97	73.7	E
Westbound (Woodley Rd.)	LTR	129	0.42	32.7	C
Northbound (32nd St.)	LTR	12	0.08	32.2	C
Southbound (32nd St.)	LTR	53	0.39	38.4	D
Intersection Overall				136.3	F
34th St. & Woodley Rd.					
Eastbound (Woodley Rd.)	LTR	489	2.14	559.2	F
Westbound (Woodley Rd.)	LTR	349	1.06	99.9	F
Northbound (34th St.)	LTR	567	0.45	8.7	A
Southbound (34th St.)	LTR	1147	1.09	69.5	E
Intersection Overall				162.4	F

Note: ^ Stop delay
L-Exclusive left turn lane; T-Through lane; TR-Shared through/right turn lane(s);
LTR-Shared left turn/through/right turn lane(s); R-Exclusive right turn lane
N/a-not available

TABLE 17
2017 BUILD (SCENARIO 2) PM PEAK HOUR LEVEL OF SERVICE ANALYSIS
SIGNALIZED INTERSECTIONS

Intersection and Approach	Lane Group	Volume (vph)	v/c Ratio	Delay^ (sec/veh.)	LOS
Connecticut Ave. & Porter St.					
Eastbound (Porter St.)	LTR	390	1.09	102.3	F
Westbound (Porter St.)	L	118	1.77	426.8	F
Westbound (Porter St.)	T	133	0.33	27.6	C
Westbound (Porter St.)	R	98	0.31	27.7	C
Northbound (Connecticut Ave.)	LTR	1741	0.78	24.3	C
Southbound (Connecticut Ave.)	LTR	664	0.36	9.2	A
Intersection Overall				47.9	D
Cleveland Ave., Garfield St. & 32nd St.					
Northwest Approach (Cleveland Ave.)	L	294	0.89	49.5	D
Northwest Approach (Cleveland Ave.)	TR	151	0.26	19	B
Southeast Approach (Cleveland Ave.)	LTR	157	0.3	19.6	B
Eastbound (Garfield St.)	L	13	0.12	28.8	C
Eastbound (Garfield St.)	R	282	0.86	55.1	E
Westbound (Woodley Rd.)	LTR	74	0.28	30.1	C
Northbound (32nd St.)	LTR	6	0.05	31.9	C
Southbound (32nd St.)	LTR	22	0.16	33.6	C
Intersection Overall				46.4	D
34th St. & Woodley Rd.					
Eastbound (Woodley Rd.)	LTR	510	1.35	205.9	F
Westbound (Woodley Rd.)	LTR	249	0.64	35	C
Northbound (34th St.)	LTR	1226	0.81	19.3	B
Southbound (34th St.)	LTR	224	0.21	9.1	A
Intersection Overall				64.8	E

Note: ^ Stop delay
L-Exclusive left turn lane; T-Through lane; TR-Shared through/right turn lane(s);
LTR-Shared left turn/through/right turn lane(s); R-Exclusive right turn lane

N/a-not available

TABLE 18
2017 BUILD (SCENARIO 2) AM AND PM PEAK HOUR LEVEL OF SERVICE ANALYSIS
UNSIGNALIZED INTERSECTIONS

AM PEAK HOUR					
Intersection and Approach	**Lane Group**	**Volume (vph)**	**v/c Ratio**	**Delay^ (sec/veh.)**	**LOS**
Woodley Rd. & Klingle Rd.					
Eastbound (Klingle Rd.)	LTR	7	N/A	8.1	A
Westbound (Klingle Rd.)	LTR	348	N/A	10.4	B
Northbound (Woodley Rd.)	LTR	3	N/A	8.1	A
Southbound (Woodley Rd.)	LTR	205	N/A	10.8	B
Intersection Overall				10.5	B
Woodley Rd. & 32nd St.					
Northbound (32nd St.)	LR	2	0.01	14.1	B
Intersection Overall				N/A	N/A
PM PEAK HOUR					
Intersection and Approach	**Lane Group**	**Volume (vph)**	**v/c Ratio**	**Delay^ (sec/veh.)**	**LOS**
Woodley Rd. & Klingle Rd.					
Eastbound (Klingle Rd.)	LTR	6	N/A	8.6	A
Westbound (Klingle Rd.)	LTR	248	N/A	10.4	B
Northbound (Woodley Rd.)	LTR	3	N/A	8.3	A
Southbound (Woodley Rd.)	LTR	401	N/A	16.2	B
Intersection Overall				13.8	B
Woodley Rd. & 32nd St.					
Northbound (32nd St.)	LR	2	0.01	15.3	C
Intersection Overall				N/A	N/A

Note: ^ Stop delay
LTR-Shared left turn/through/right turn lane(s); LR-Shared left turn/right turn lane
N/a-not available

TABLE 19
IMPROVED INTERSECTIONS AND APPROACHES

AM PEAK HOUR					
Intersection and Approach		**No Build Conditions**		**Build Scenario 2**	
	Lane Group	**Delay^ (sec/veh)**	**LOS**	**Delay^ (sec/veh)**	**LOS**
Connecticut Ave. & Porter St.					
Eastbound (Porter St.)	LTR	910.3	F	158.8	F
Westbound (Porter St.)	T	150.3	F	33	D
Intersection Overall		160.1	F	64.5	E
Cleveland Ave., Garfield St. & 32nd St.					
Northwest Approach (Cleveland Ave.)	L	438.7	F	326.3	F
Northwest Approach (Cleveland Ave.)	TR	18.2	B	17.3	B
Southeast Approach (Cleveland Ave.)	LTR	153.8	F	120.7	F
Eastbound (Garfield St.)	L	40.2	D	37.4	D
Eastbound (Garfield St.)	R	78.8	E	73.7	E
Westbound (Woodley Rd.)	LTR	33.6	C	32.7	C
Intersection Overall		167.8	F	136.3	F
PM PEAK HOUR					
Intersection and Approach		**No Build Conditions**		**Build Scenario 2**	
	Lane Group	**Delay^ (sec/veh)**	**LOS**	**Delay^ (sec/veh)**	**LOS**
Connecticut Ave. & Porter St.					
Eastbound (Porter St.)	LTR	857.7	F	102.3	F
Westbound (Porter St.)	T	40.7	D	27.6	C
Intersection Overall		160.1	F	47.9	D
Cleveland Ave., Garfield St. & 32nd St.					
Northwest Approach (Cleveland Ave.)	L	72.4	E	49.5	D
Northwest Approach (Cleveland Ave.)	TR	20.2	C	19	B
Southeast Approach (Cleveland Ave.)	LTR	20.8	C	19.6	B
Eastbound (Garfield St.)	L	29.1	C	28.8	C
Eastbound (Garfield St.)	R	63.5	E	55.1	E
Westbound (Woodley Rd.)	LTR	30.7	C	30.1	C
Intersection Overall		51.7	D	46.4	D

Note: ^ Stop delay
L-Exclusive left turn lane; T-Through lane; TR-Shared through/right turn lane(s);
LTR-Shared left turn/through/right turn lane(s); R-Exclusive right turn lane

N/a-not available

TABLE 20
DETERIORATED INTERSECTIONS AND APPROACHES

AM PEAK HOUR					
Intersection and Approach		**No Build Conditions**		**Build Scenario 2**	
	Lane Group	**Delay^ (sec/veh)**	**LOS**	**Delay^ (sec/veh)**	**LOS**
34th St. & Woodley Rd.					
Eastbound (Woodley Rd.)	LTR	231.3	F	559.2	F
Westbound (Woodley Rd.)	LTR	28.2	C	99.9	F
Intersection Overall		80.9	F	162.4	F
Woodley Rd. & Klingle Rd.					
Eastbound (Klingle Rd.)	LTR	7	A	8.1	A
Westbound (Klingle Rd.)	LTR	6.3	A	10.4	B
Northbound (Woodley Rd.)	LTR	7	A	8.1	A
Southbound (Woodley Rd.)	LTR	7.2		10.8	B
Intersection Overall		6.9	A	10.5	B
Woodley Rd. & 32nd St.					
Northbound (32nd St.)	LR	8.9	A	14.1	B
Intersection Overall		N/A	N/A	N/A	N/A
PM PEAK HOUR					
Intersection and Approach		**No Build Conditions**		**Build Scenario 2**	
	Lane Group	**Delay^ (sec/veh)**	**LOS**	**Delay^ (sec/veh)**	**LOS**
34th St. & Woodley Rd.					
Eastbound (Woodley Rd.)	LTR	33.3	C	205.9	F
Westbound (Woodley Rd.)	LTR	23.6	C	35	C
Intersection Overall		21.8	C	64.8	E
Woodley Rd. & Klingle Rd.					
Eastbound (Klingle Rd.)	LTR	7	A	8.6	A
Westbound (Klingle Rd.)	LTR	6.4	A	10.4	B
Northbound (Woodley Rd.)	LTR	7	A	8.3	A
Southbound (Woodley Rd.)	LTR	7.3	A	16.2	B
Intersection Overall		7.1	A	13.8	B
Woodley Rd. & 32nd St.					
Northbound (32nd St.)	LR	8.9	A	15.3	C
Intersection Overall		N/A	N/A	N/A	N/A

Note: ^ Stop delay
LTR-Shared left turn/through/right turn lane(s); LR-Shared left turn/right turn lane
N/a-not available

TABLE 21
2017 SCENARIO 3 AM PEAK HOUR LEVEL OF SERVICE ANALYSIS
SIGNALIZED INTERSECTIONS

Intersection and Approach	Lane Group	Volume (vph)	v/c Ratio	Delay^ (sec/veh.)	LOS
Connecticut Ave. & Porter St.					
Eastbound (Porter St.)	LTR	560	1.78	395.2	F
Westbound (Porter St.)	L	140	2.5	742.6	F
Westbound (Porter St.)	T	343	0.77	40	D
Westbound (Porter St.)	R	270	0.72	38.8	D
Northbound (Connecticut Ave.)	LTR	747	0.89	42	D
Southbound (Connecticut Ave.)	LTR	3201	0.92	20.9	C
Intersection Overall				94.1	F
Cleveland Ave., Garfield St. & 32nd St.					
Northwest Approach (Cleveland Ave.)	L	138	1.83	438.7	F
Northwest Approach (Cleveland Ave.)	TR	78	0.14	17.5	B
Southeast Approach (Cleveland Ave.)	LTR	741	1.25	153.8	F
Eastbound (Garfield St.)	L	34	0.37	38.1	D
Eastbound (Garfield St.)	R	325	0.99	78.8	E
Westbound (Woodley Rd.)	LTR	133	0.43	32.9	C
Northbound (32nd St.)	LTR	12	0.08	32.2	C
Southbound (32nd St.)	LTR	53	0.39	38.4	D
Intersection Overall				172.9	F
34th St. & Woodley Rd.					
Eastbound (Woodley Rd.)	LTR	341	1.53	293.6	F
Westbound (Woodley Rd.)	LTR	259	0.79	49.2	D
Northbound (34th St.)	LTR	579	0.5	9.3	A
Southbound (34th St.)	LTR	1147	1.09	69.5	E
Intersection Overall				88.6	F

Note: ^ Stop delay
L-Exclusive left turn lane; T-Through lane; TR-Shared through/right turn lane(s);
LTR-Shared left turn/through/right turn lane(s); R-Exclusive right turn lane

N/a-not available

TABLE 22
2017 SCENARIO 3 PM PEAK HOUR LEVEL OF SERVICE ANALYSIS
SIGNALIZED INTERSECTIONS

Intersection and Approach	Lane Group	Volume (vph)	v/c Ratio	Delay^ (sec/veh.)	LOS
Connecticut Ave. & Porter St.					
Eastbound (Porter St.)	LTR	469	1.95	473	F
Westbound (Porter St.)	L	118	1.77	426.8	F
Westbound (Porter St.)	T	309	0.76	40.7	D
Westbound (Porter St.)	R	98	0.31	27.7	C
Northbound (Connecticut Ave.)	LTR	1741	0.78	24.3	C
Southbound (Connecticut Ave.)	LTR	664	0.36	9.2	A
Intersection Overall				103.2	F
Cleveland Ave., Garfield St. & 32nd St.					
Northwest Approach (Cleveland Ave.)	L	294	0.92	54.4	D
Northwest Approach (Cleveland Ave.)	TR	203	0.35	20.2	C
Southeast Approach (Cleveland Ave.)	LTR	168	0.32	19.9	B
Eastbound (Garfield St.)	L	13	0.13	29.1	C
Eastbound (Garfield St.)	R	287	0.87	57.2	E
Westbound (Woodley Rd.)	LTR	84	0.31	30.7	C
Northbound (32nd St.)	LTR	6	0.05	31.9	C
Southbound (32nd St.)	LTR	22	0.16	33.6	C
Intersection Overall				47.5	D
34th St. & Woodley Rd.					
Eastbound (Woodley Rd.)	LTR	422	1.13	116.2	F
Westbound (Woodley Rd.)	LTR	1	0.01	23.6	C
Northbound (34th St.)	LTR	1271	0.87	22.1	C
Southbound (34th St.)	LTR	224	0.21	9.1	A
Intersection Overall				43.3	D

Note: ^ Stop delay
L-Exclusive left turn lane; T-Through lane; TR-Shared through/right turn lane(s);
LTR-Shared left turn/through/right turn lane(s); R-Exclusive right turn lane
N/a-not available

TABLE 23
2017 SCENARIO 3 AM AND PM PEAK HOUR LEVEL OF SERVICE ANALYSIS
UNSIGNALIZED INTERSECTIONS

AM PEAK HOUR					
Intersection and Approach	**Lane Group**	**Volume (vph)**	**v/c Ratio**	**Delay^ (sec/veh.)**	**LOS**
Woodley Rd. & Klingle Rd.					
Eastbound (Klingle Rd.)	LTR	7	N/A	7.23	A
Westbound (Klingle Rd.)	LTR	260	N/A	7.75	A
Northbound (Woodley Rd.)	LTR	3	N/A	7.51	A
Southbound (Woodley Rd.)	LTR	1	N/A	7.71	A
Intersection Overall				7.73	A
Woodley Rd. & 32nd St.					
Northbound (32nd St.)	LR	2	0	11	B
Intersection Overall				N/A	N/A
PM PEAK HOUR					
Intersection and Approach	**Lane Group**	**Volume (vph)**	**v/c Ratio**	**Delay^ (sec/veh.)**	**LOS**
Woodley Rd. & Klingle Rd.					
Eastbound (Klingle Rd.)	LTR	6	N/A	7.79	A
Westbound (Klingle Rd.)	LTR	2	N/A	7.14	A
Northbound (Woodley Rd.)	LTR	3	N/A	7.3	A
Southbound (Woodley Rd.)	LTR	302	N/A	10.27	B
Intersection Overall				10.14	B
Woodley Rd. & 32nd St.					
Northbound (32nd St.)	LR	2	0	11.1	B
Intersection Overall				N/A	N/A

Note: ^ Stop delay
LTR-Shared left turn/through/right turn lane(s); LR-Shared left turn/right turn lane(s)
N/a-not available

TABLE 24

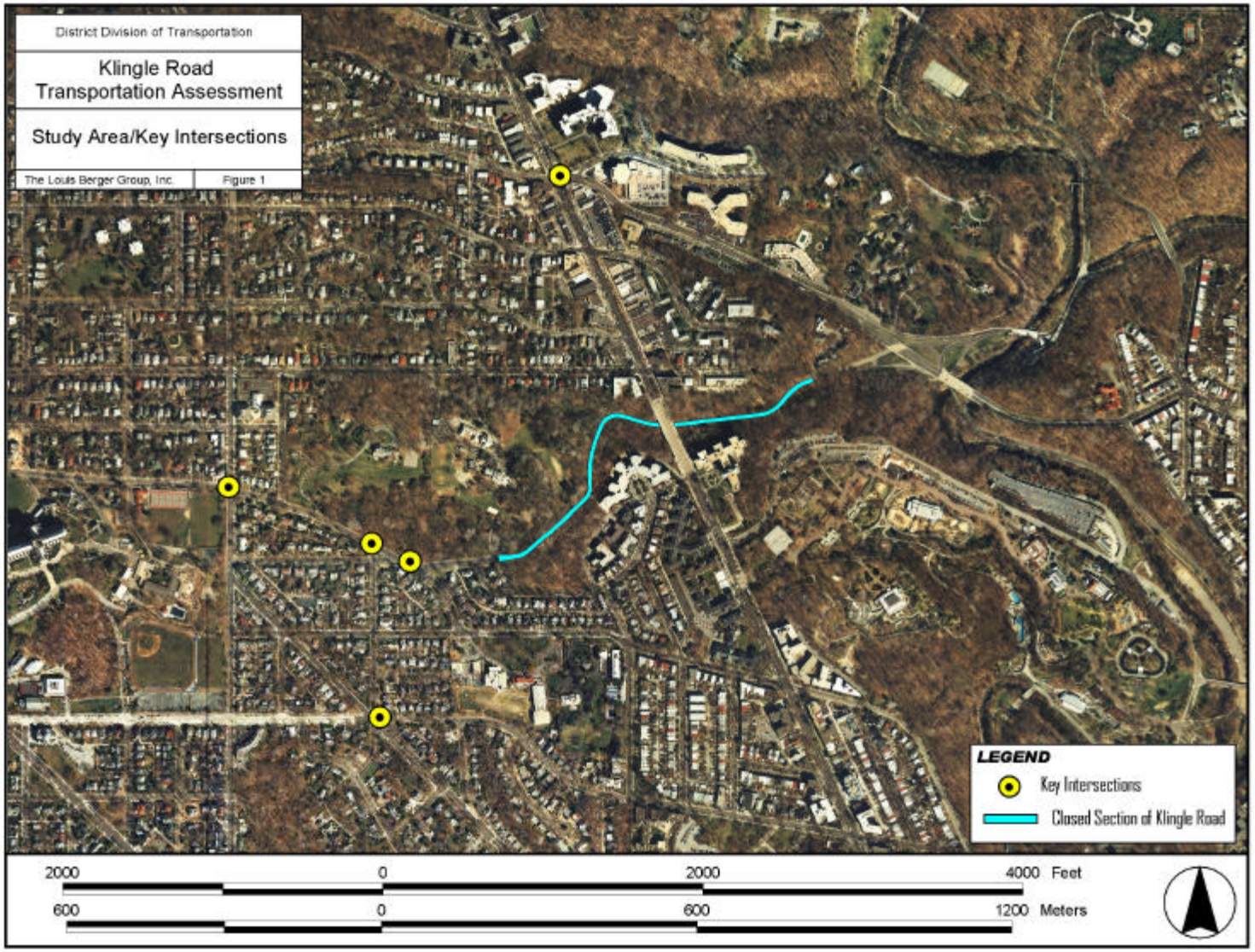
TRAVEL TIME AND SPEED STUDY
PORTER STREET BETWEEN WISCONSIN AVE. AND ADAMS MILL RD.(1.5 Miles)

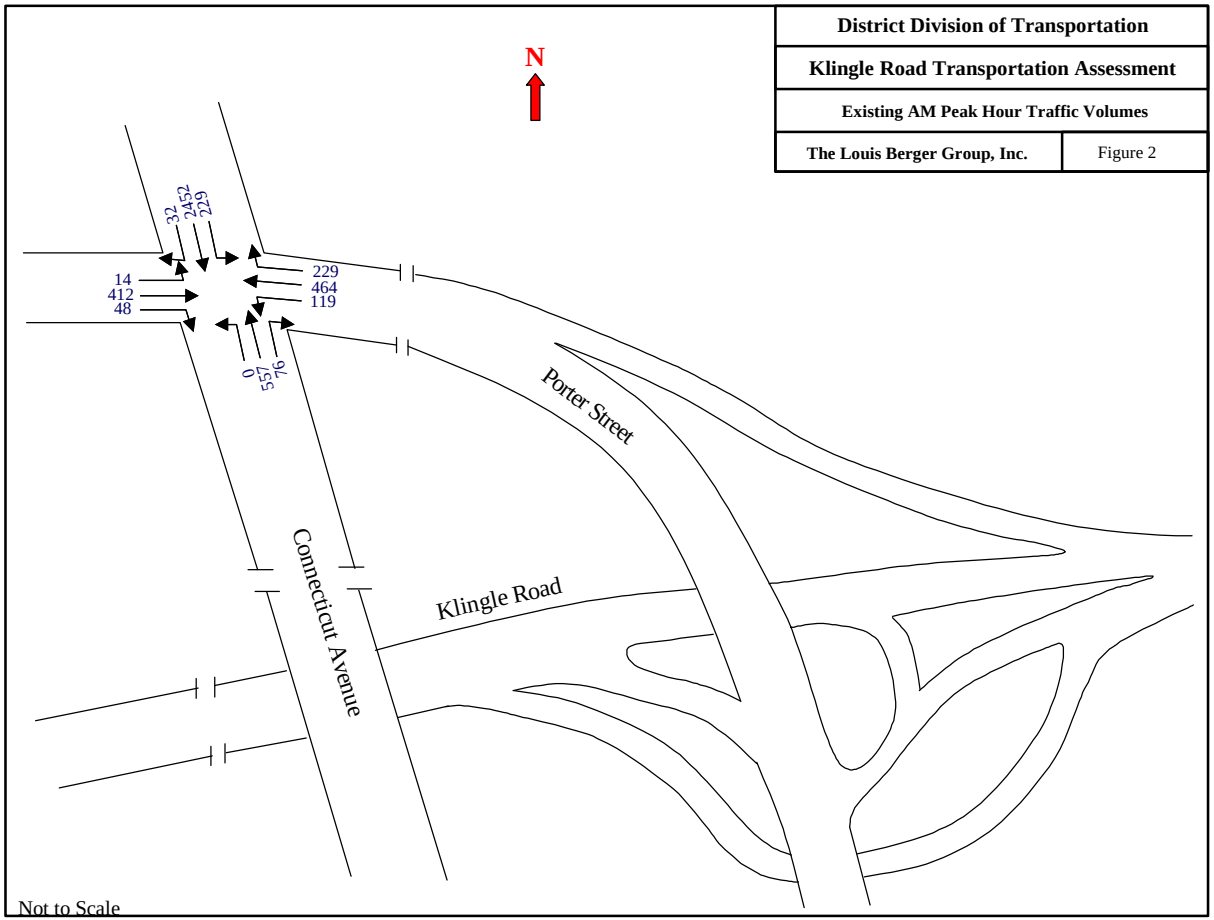
	Eastbound Approach (Midday Period)					Westbound Approach (Midday Period)				
Run No.	Trip Time	Travel Speed (mph)	Running Time	Stopped Time	Running Speed (mph)	Trip Time	Travel Speed (mph)	Running Time	Stopped Time	Running Speed (mph)
1	5'27"	16.5	5'14"	13"	17.2	5'26"	16.56	4'44"	42"	19.01
2	5'52"	15.3	5'8"	44"	17.53	6'40"	13.51	5'15"	1'25"	17.14
3	5'24"	16.7	4'53"	31"	18.43	4'52"	18.5	4'34"	18"	19.81
Average	5'34"	16.2	5'5"	29"	17.7	5'39"	16.2	4'51"	48"	18.7

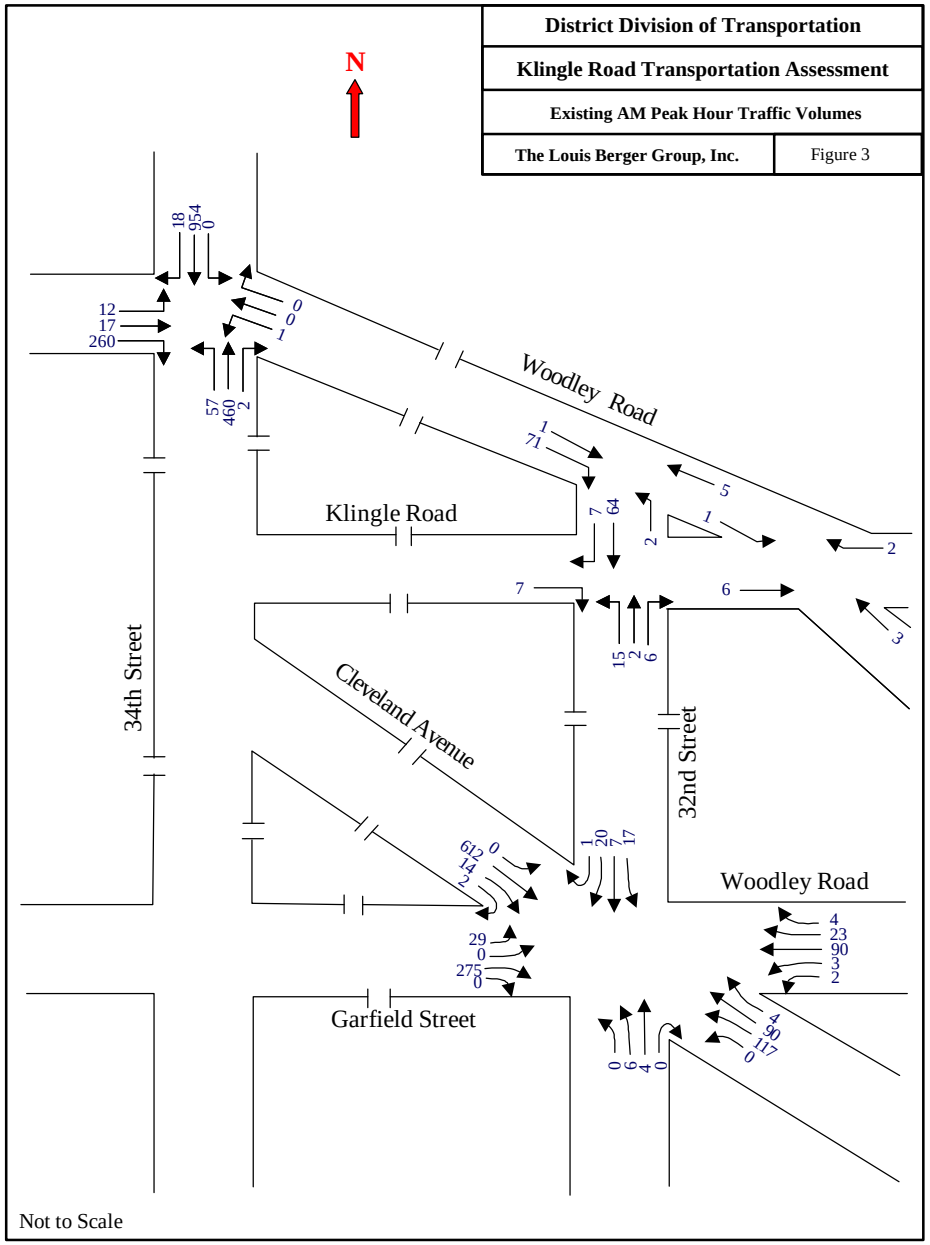
Note: There was construction work on Porter Street during the speed run

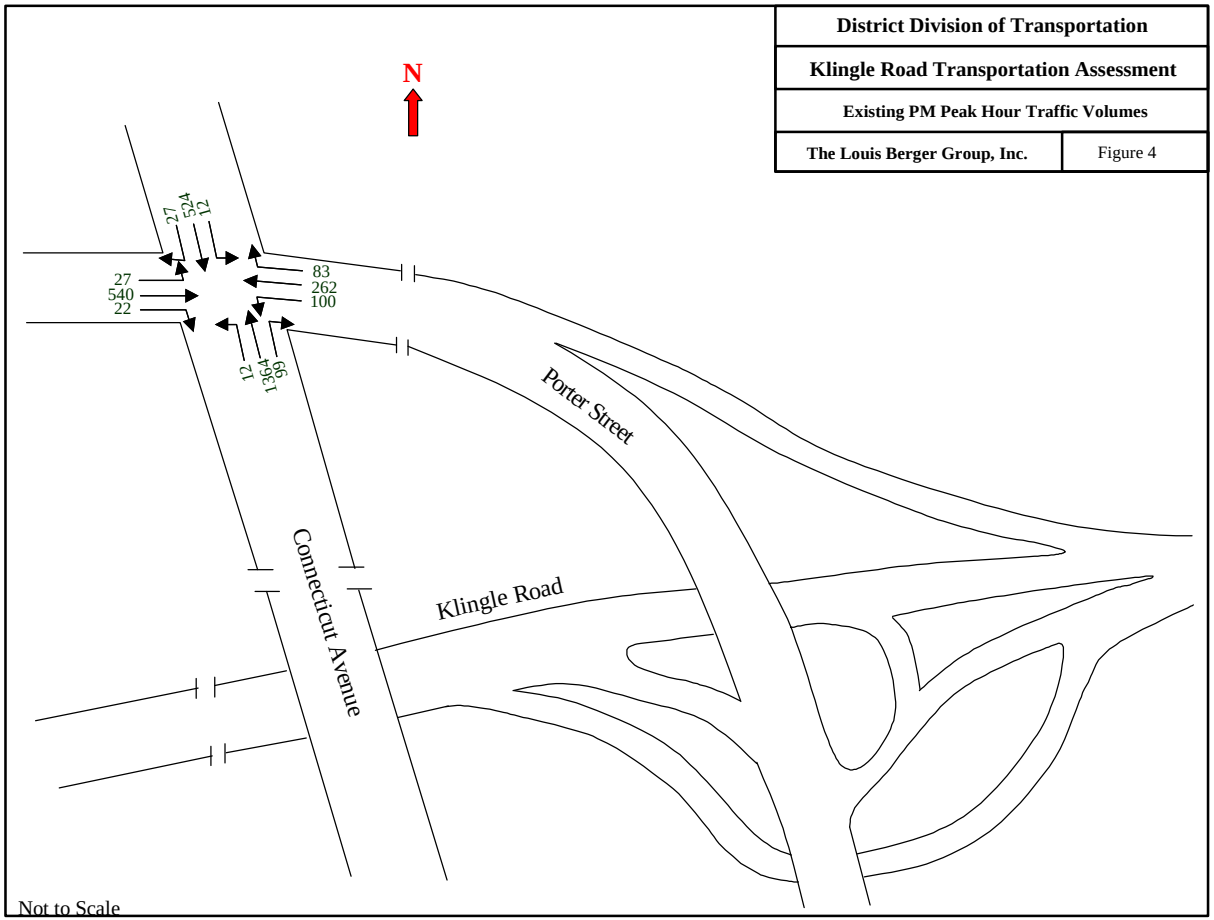
TRAVEL TIME AND SPEED STUDY
CONNECTICUT AVENUE BETWEEN FLORIDA AVE. AND ALBEMARLE DR. (2.5 Miles)

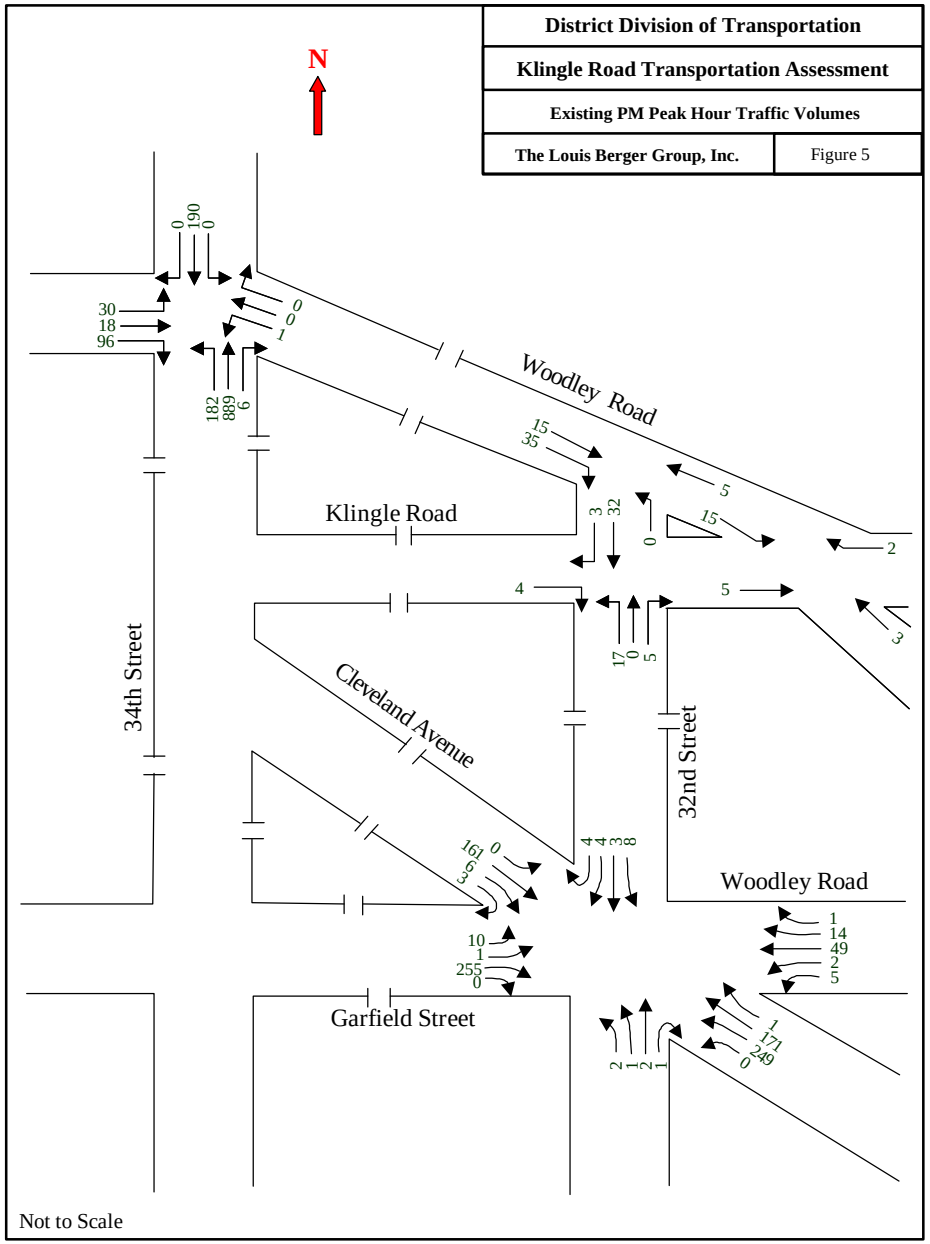
	Northbound Approach (Midday Period)					Southbound Approach (Midday Period)				
Run No.	Trip Time	Travel Speed (mph)	Running Time	Stopped Time	Running Speed (mph)	Trip Time	Travel Speed (mph)	Running Time	Stopped Time	Running Speed (mph)
1	9'28"	15.8	7'5"	2'23"	21.18	11'3"	13.57	9'13"	1'50"	16.27
2	7'57"	18.9	6'20"	1'37"	23.68	9'53"	15.18	7'23"	2'30"	20.32
3	8'8"	18.4	6'51"	1'17"	21.9	8'15"	18.18	6'18"	1'57"	23.81
4	8'12"	18.3	6'52"	1'20"	21.84	9'20"	16.07	7'36"	1'44"	19.74
5	10'10"	14.8	8'2"	2'8"	18.67	9'50"	15.25	7'22"	2'28"	20.36
6	8'3"	18.6	6'47"	1'13"	22.11					
Average	8'40"	17.5	7'0"	1'40"	21.6	9'40"	15.7	7'38"	2'2"	20.1

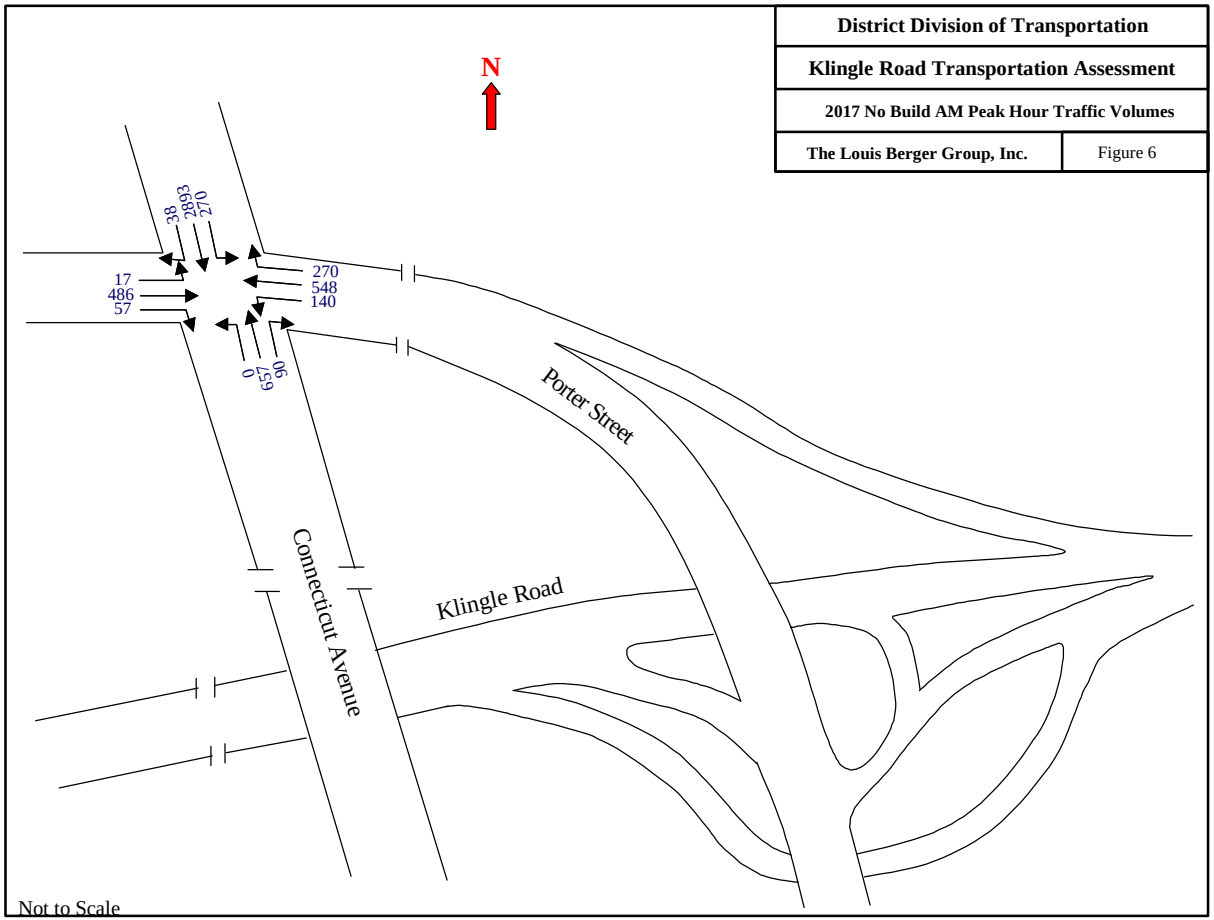

District Division of Transportation
Klingle Road
Transportation Assessment
Study Area/Key Intersections
The Louis Berger Group, Inc.
Figure 1
LEGEND
Key Intersections
Closed Section of Klingle Road
2000
0
2000
4000 Feet
600
0
600
1200 Meters

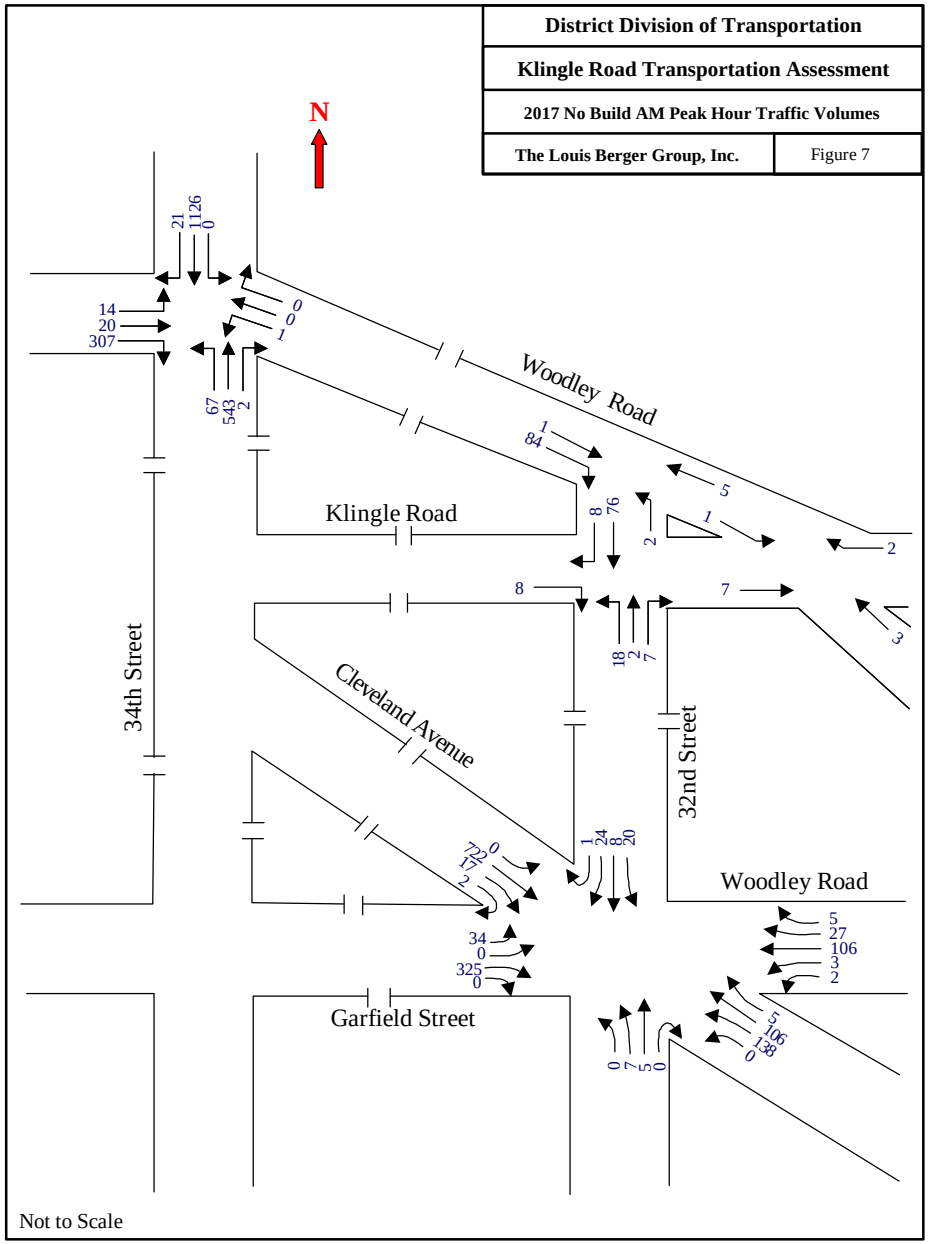

District Division of Transportation
Klingle Road Transportation Assessment
Existing AM Peak Hour Traffic Volumes
The Louis Berger Group, Inc.
Figure 2
N
32
245
229
14
412
48
229
464
119
0
557
76
Porter Street
Connecticut Avenue
Klingle Road
Not to Scale

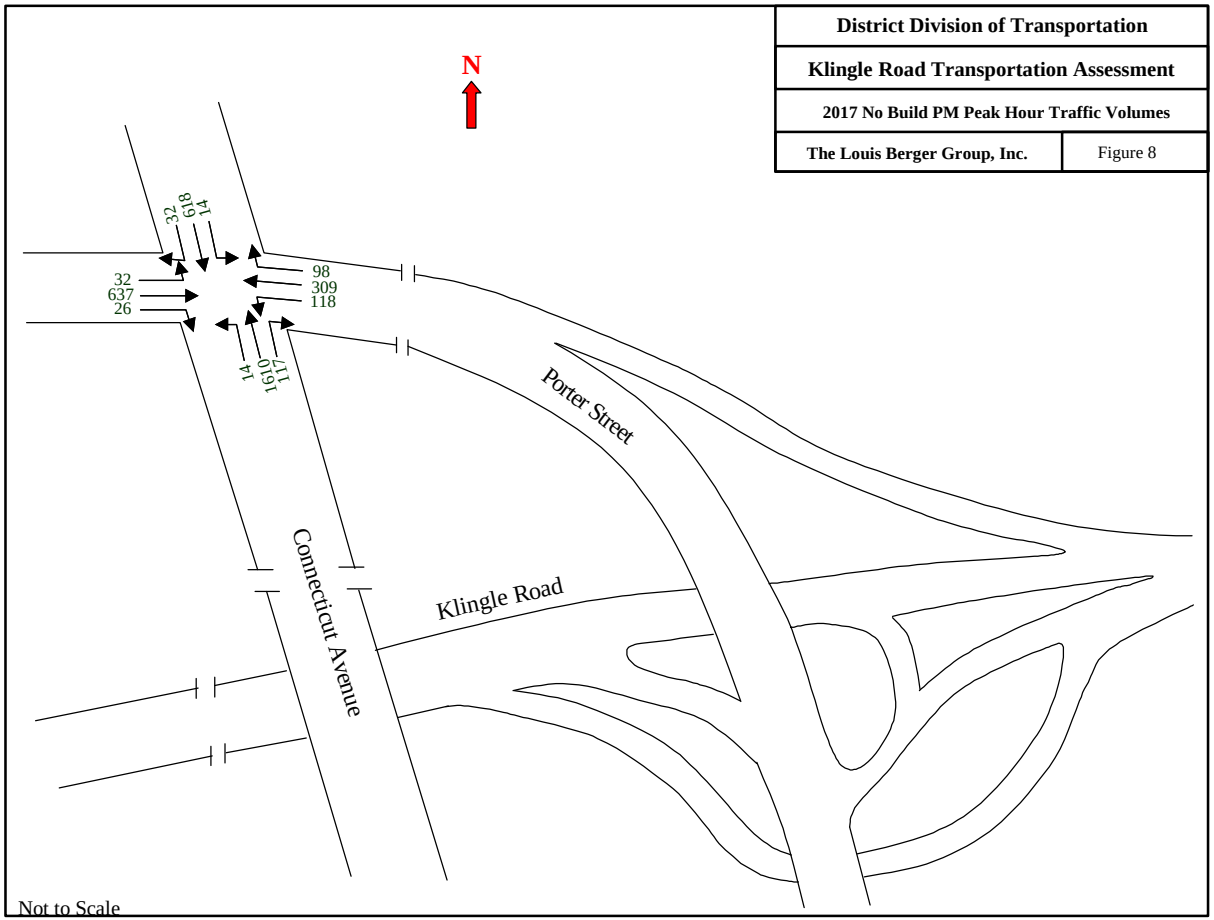

District Division of Transportation
Klingle Road Transportation Assessment
Existing AM Peak Hour Traffic Volumes
The Louis Berger Group, Inc.
Figure 3
N
Woodley Road
Klingle Road
34th Street
Cleveland Avenue
32nd Street
Woodley Road
Garfield Street
Not to Scale

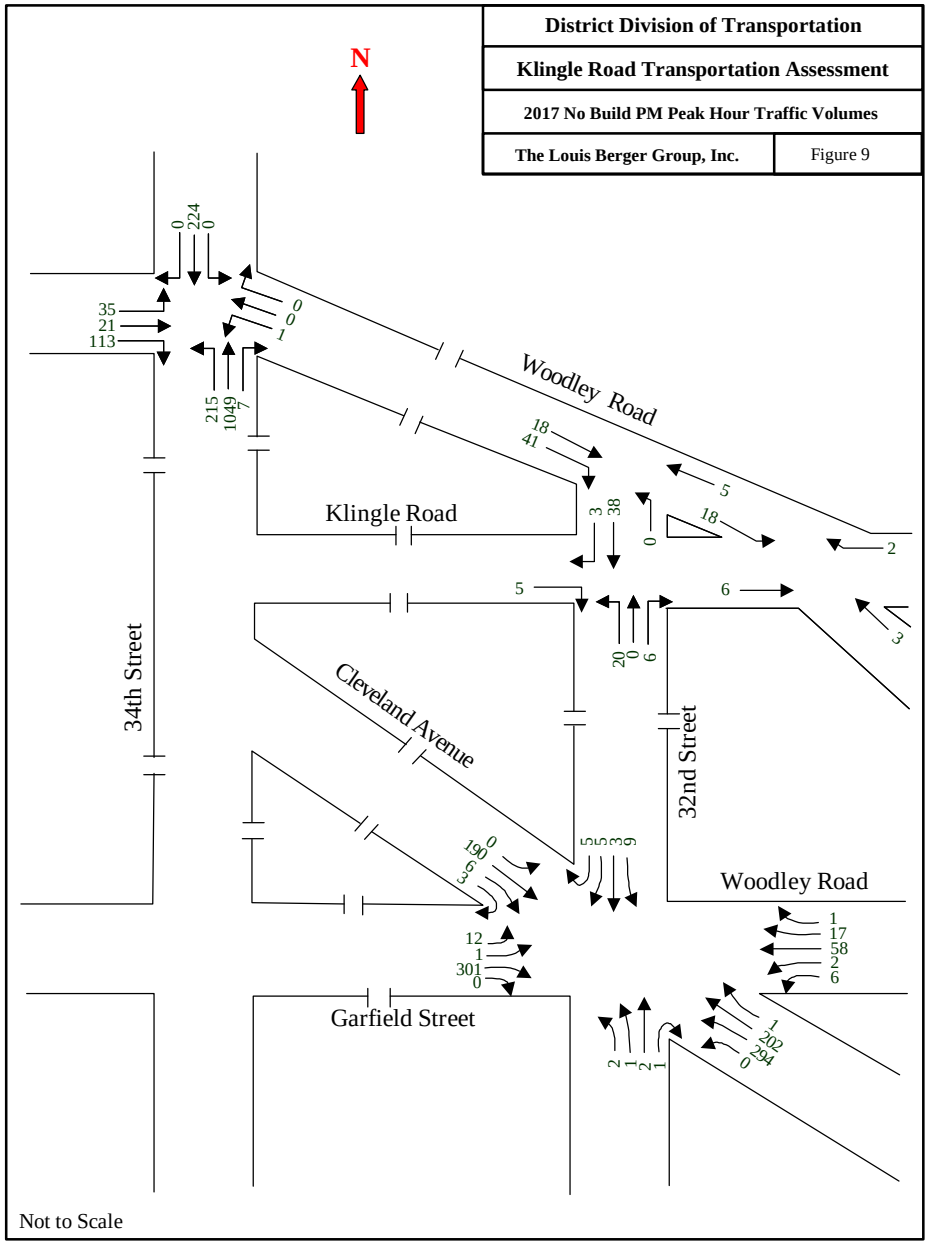

District Division of Transportation
Klingle Road Transportation Assessment
Existing PM Peak Hour Traffic Volumes
The Louis Berger Group, Inc.
Figure 4
N
27
524
12
27
540
22
83
262
100
12
1364
99
Porter Street
Connecticut Avenue
Klingle Road
Not to Scale

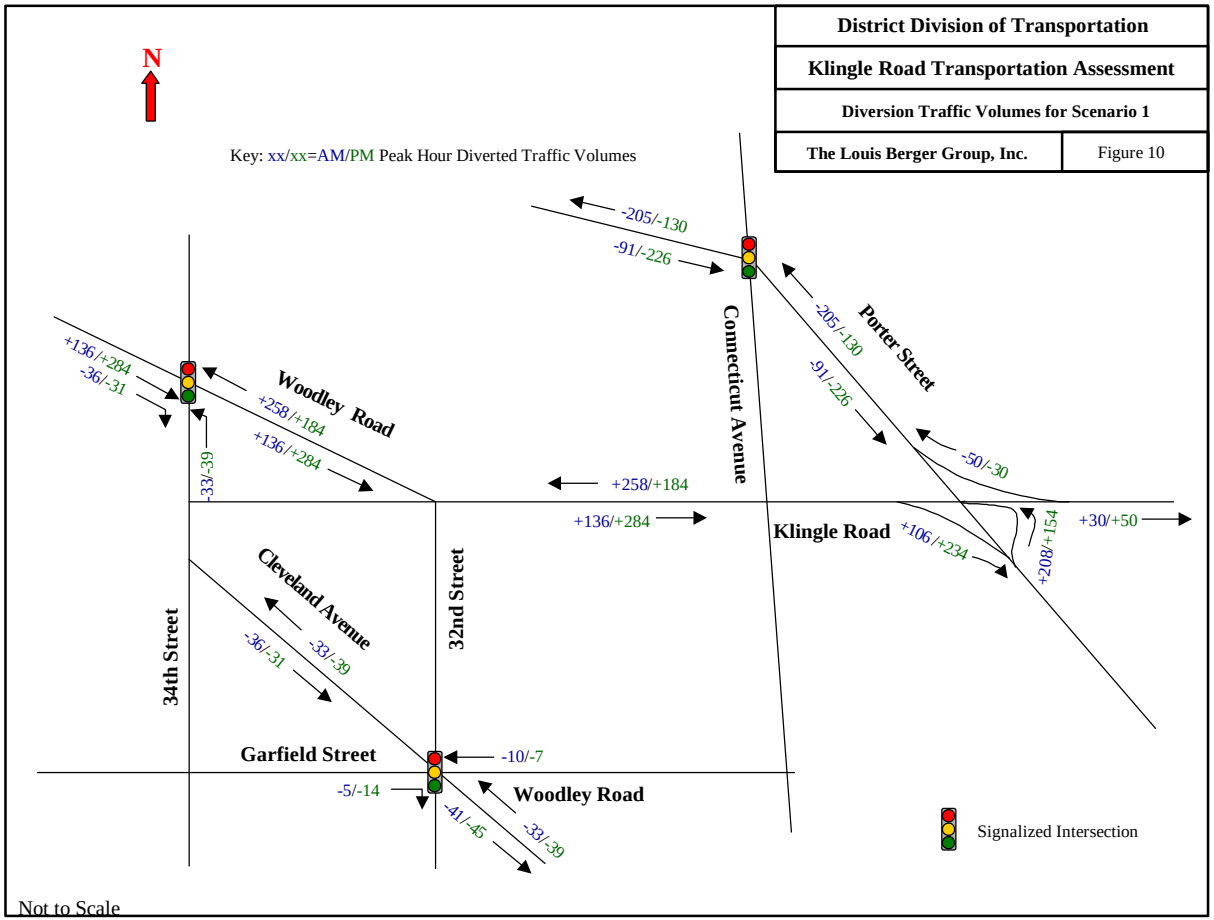

District Division of Transportation
Klingle Road Transportation Assessment
Existing PM Peak Hour Traffic Volumes
The Louis Berger Group, Inc.
Figure 5
N
Woodley Road
Klingle Road
34th Street
Cleveland Avenue
32nd Street
Woodley Road
Garfield Street
Not to Scale

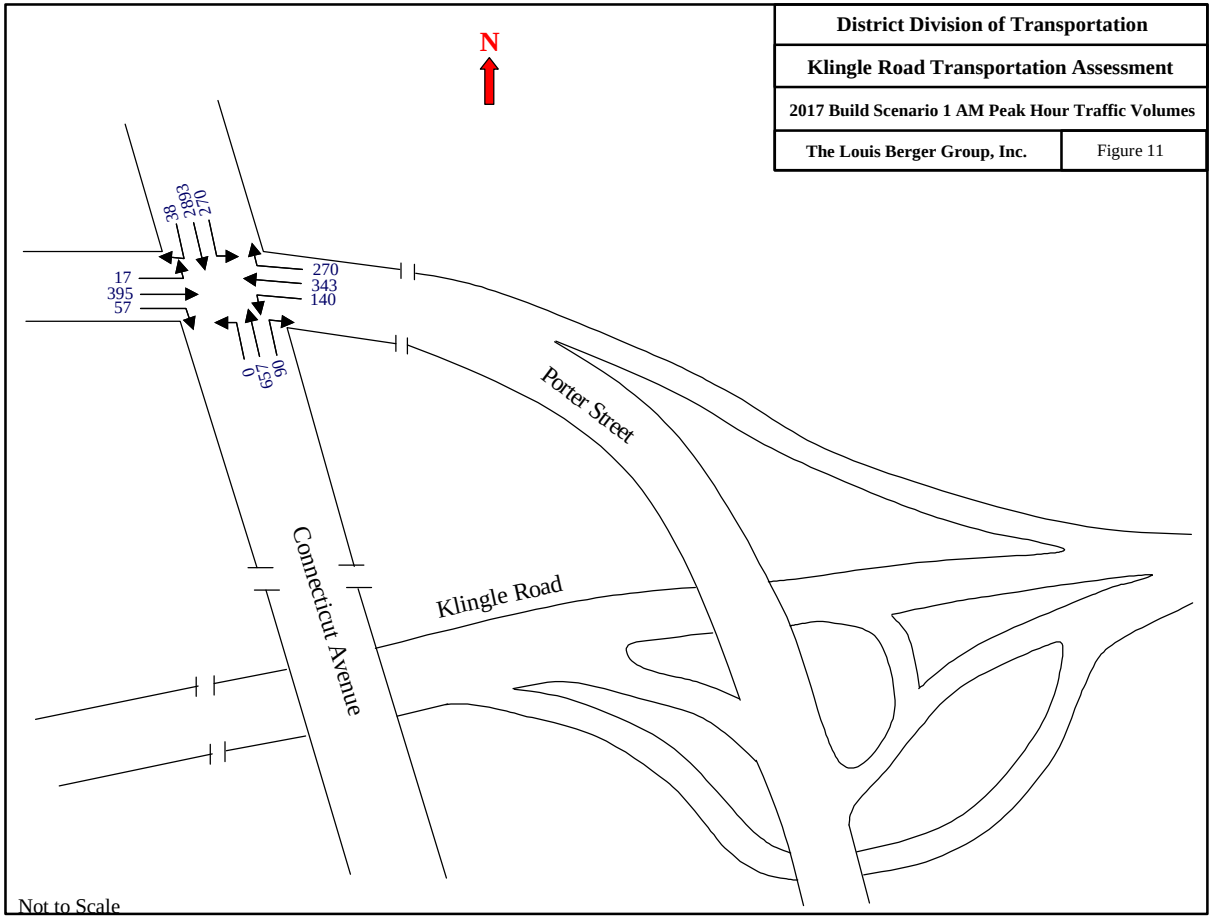

District Division of Transportation
Klingle Road Transportation Assessment
2017 No Build AM Peak Hour Traffic Volumes
The Louis Berger Group, Inc.
Figure 6
N
38
2683
270
17
486
57
270
548
140
0
657
90
Porter Street
Connecticut Avenue
Klingle Road
Not to Scale

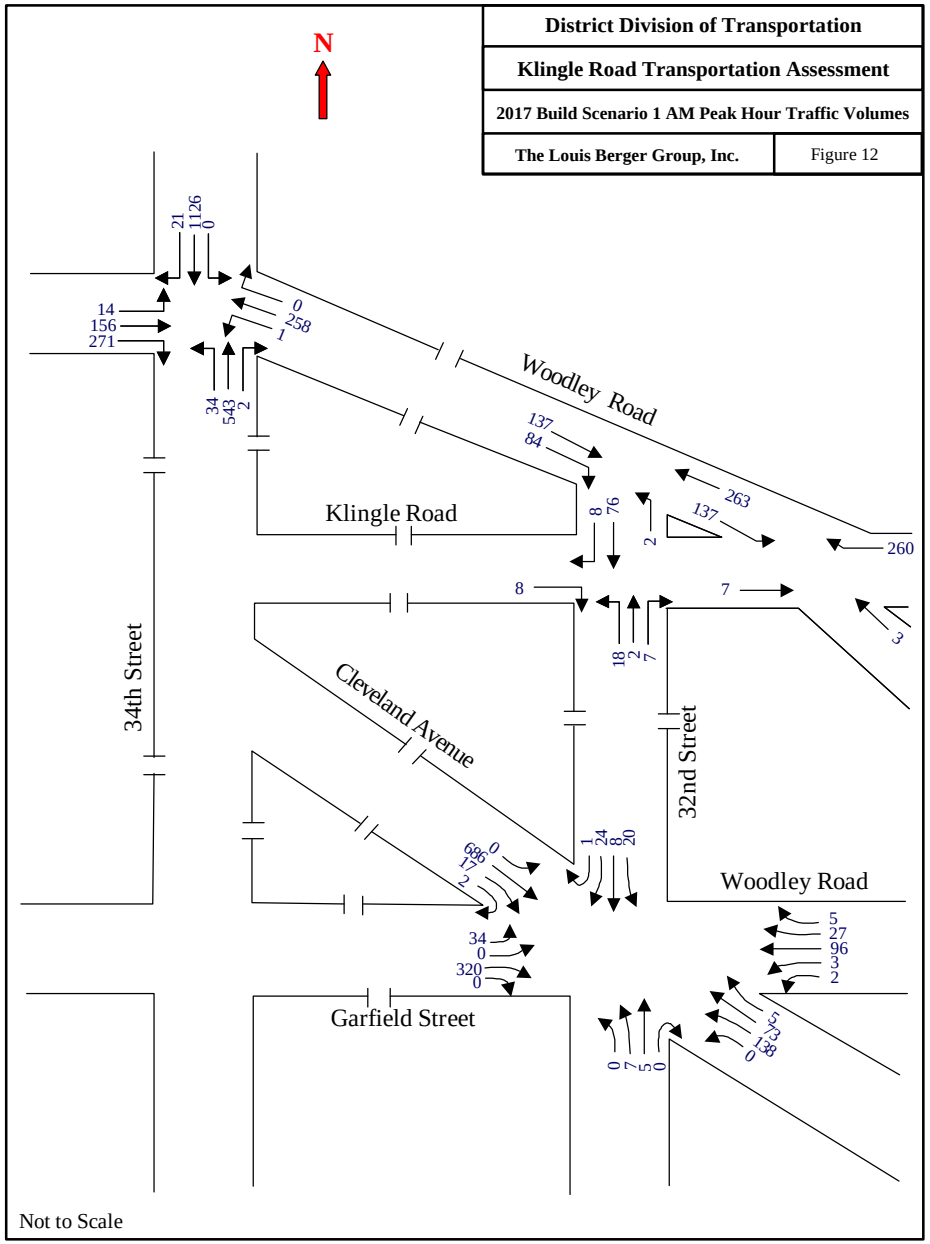

District Division of Transportation
Klingle Road Transportation Assessment
2017 No Build AM Peak Hour Traffic Volumes
The Louis Berger Group, Inc.
Figure 7
N
Woodley Road
Klingle Road
Cleveland Avenue
34th Street
32nd Street
Woodley Road
Garfield Street
21
1126
0
14
20
307
0
0
1
67
543
2
1
84
5
8
76
2
1
2
8
7
3
18
2
7
1
24
8
20
72
57
0
2
34
0
325
0
5
27
106
3
2
0
7
5
0
5
106
138
0
Not to Scale

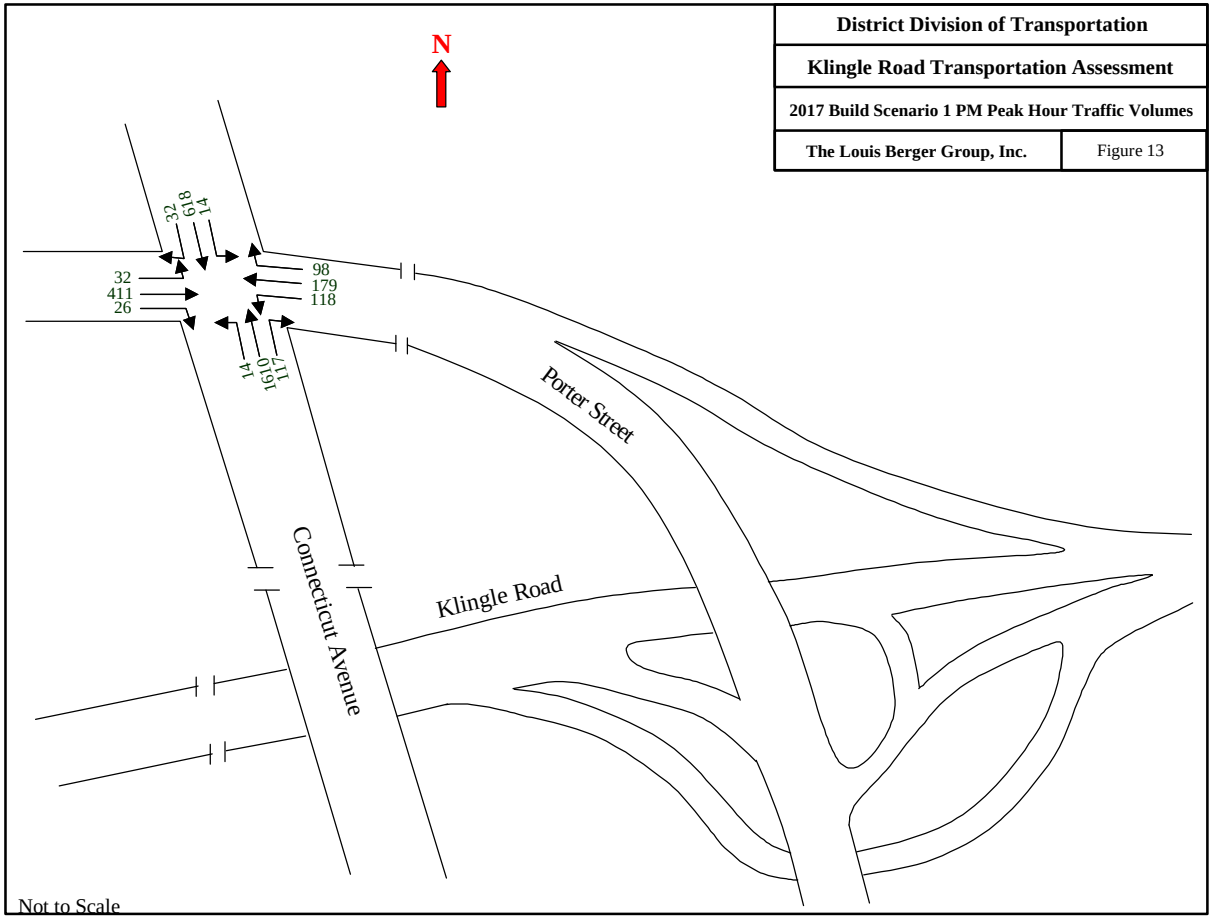

District Division of Transportation
Klingle Road Transportation Assessment
2017 No Build PM Peak Hour Traffic Volumes
The Louis Berger Group, Inc.
Figure 8
N
32
637
26
32
618
14
98
309
118
14
1610
117
Porter Street
Connecticut Avenue
Klingle Road
Not to Scale

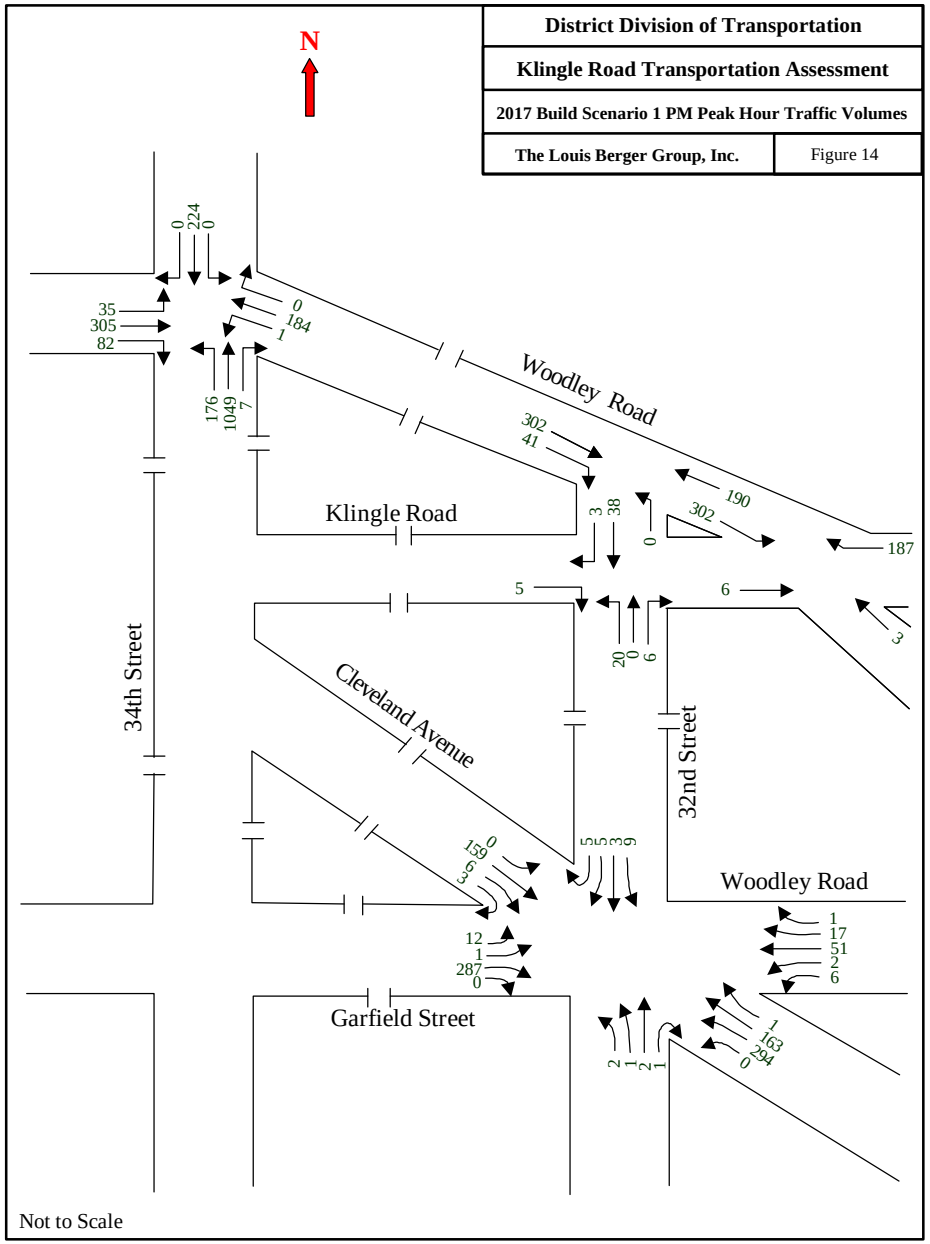

District Division of Transportation
Klingle Road Transportation Assessment
2017 No Build PM Peak Hour Traffic Volumes
The Louis Berger Group, Inc.
Figure 9
N
Woodley Road
Klingle Road
34th Street
Cleveland Avenue
32nd Street
Woodley Road
Garfield Street
Not to Scale

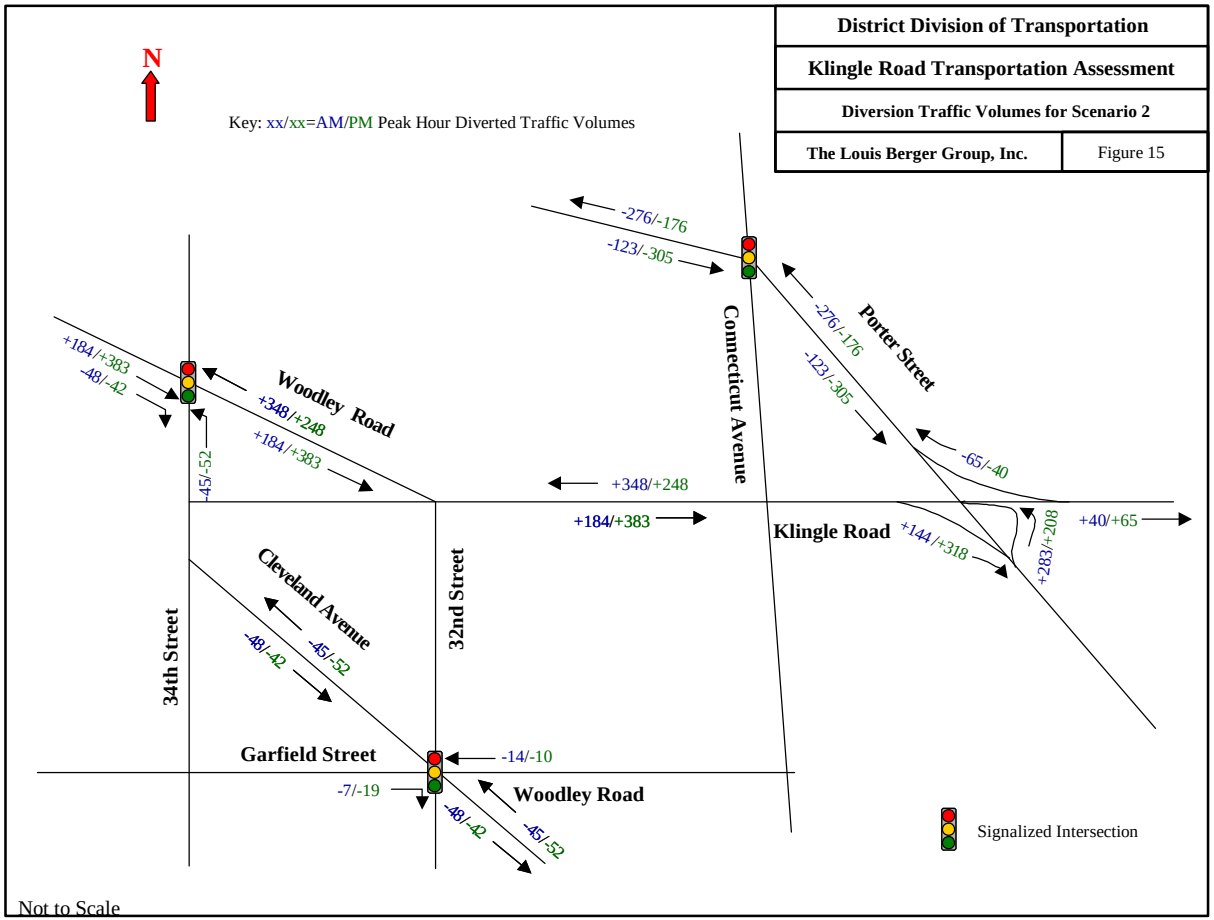

District Division of Transportation
Klingle Road Transportation Assessment
Diversion Traffic Volumes for Scenario 1
The Louis Berger Group, Inc.
Figure 10
N
Key: xx/xx=AM/PM Peak Hour Diverted Traffic Volumes
-205/-130
-91/-226
Porter Street
Connecticut Avenue
+136/+284
-36/-31
Woodley Road
+258/+184
+136/+284
-33/-39
+258/+184
+136/+284
Klingle Road
+106/+234
+208/+154
+30/+50
-50/-30
Cleveland Avenue
-36/-31
-33/-39
34th Street
32nd Street
Garfield Street
-10/-7
-5/-14
Woodley Road
-41/-45
-33/-39
Signalized Intersection
Not to Scale

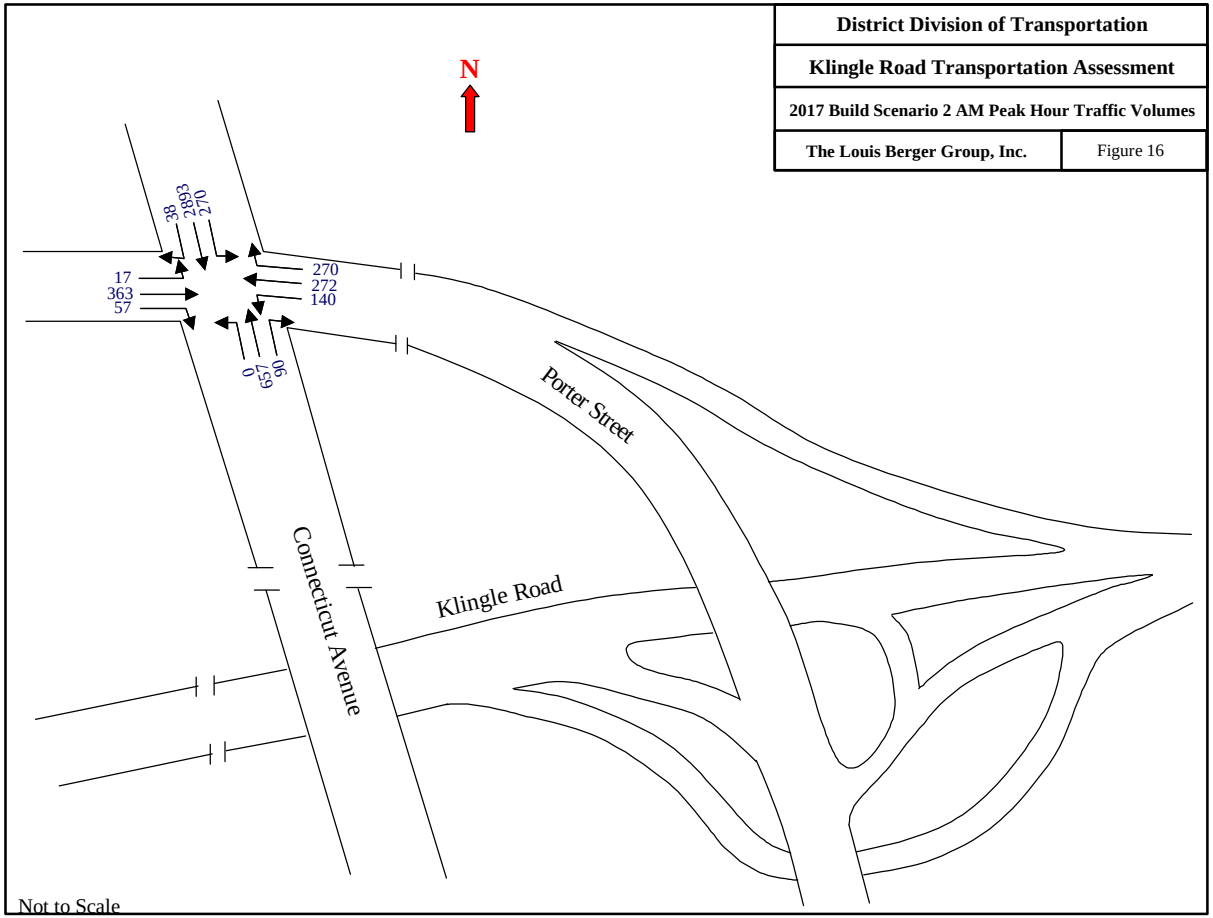

District Division of Transportation
Klingle Road Transportation Assessment
2017 Build Scenario 1 AM Peak Hour Traffic Volumes
The Louis Berger Group, Inc.
Figure 11
N
38
283
270
17
395
57
270
343
140
0
657
90
Porter Street
Connecticut Avenue
Klingle Road
Not to Scale

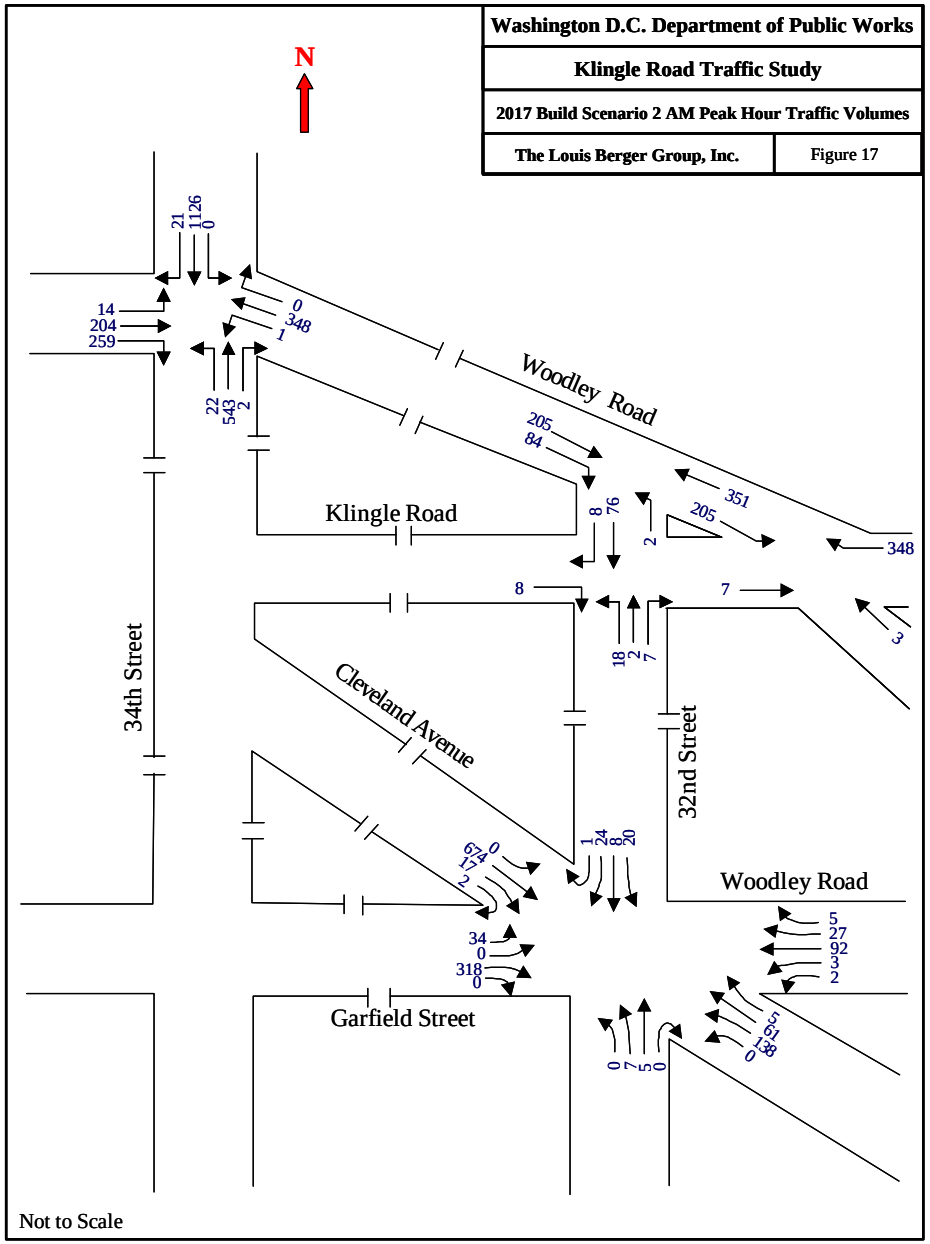

District Division of Transportation
Klingle Road Transportation Assessment
2017 Build Scenario 1 AM Peak Hour Traffic Volumes
The Louis Berger Group, Inc.
Figure 12
N
Woodley Road
Klingle Road
34th Street
Cleveland Avenue
32nd Street
Woodley Road
Garfield Street
Not to Scale

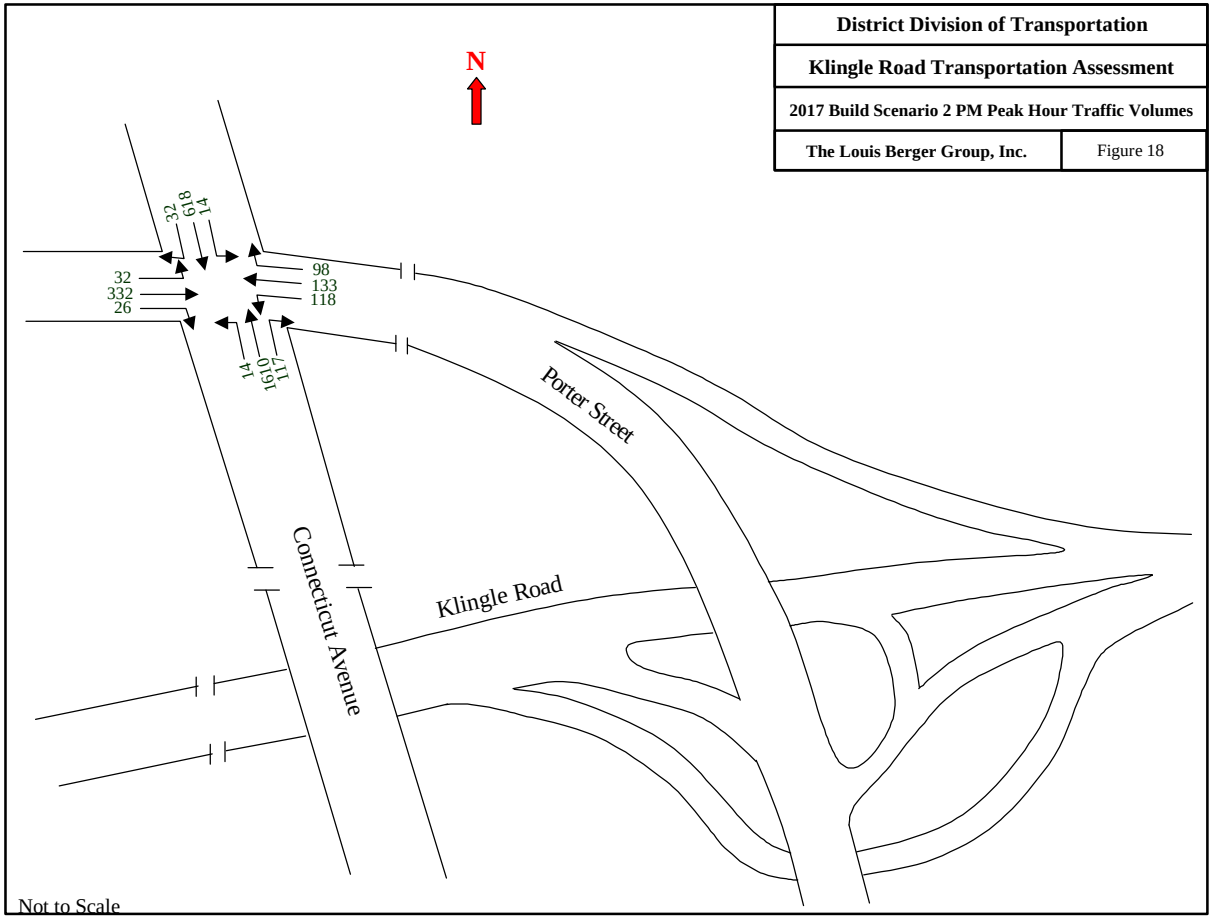

District Division of Transportation
Klingle Road Transportation Assessment
2017 Build Scenario 1 PM Peak Hour Traffic Volumes
The Louis Berger Group, Inc.
Figure 13
N
32
618
14
32
411
26
98
179
118
14
1610
117
Porter Street
Connecticut Avenue
Klingle Road
Not to Scale

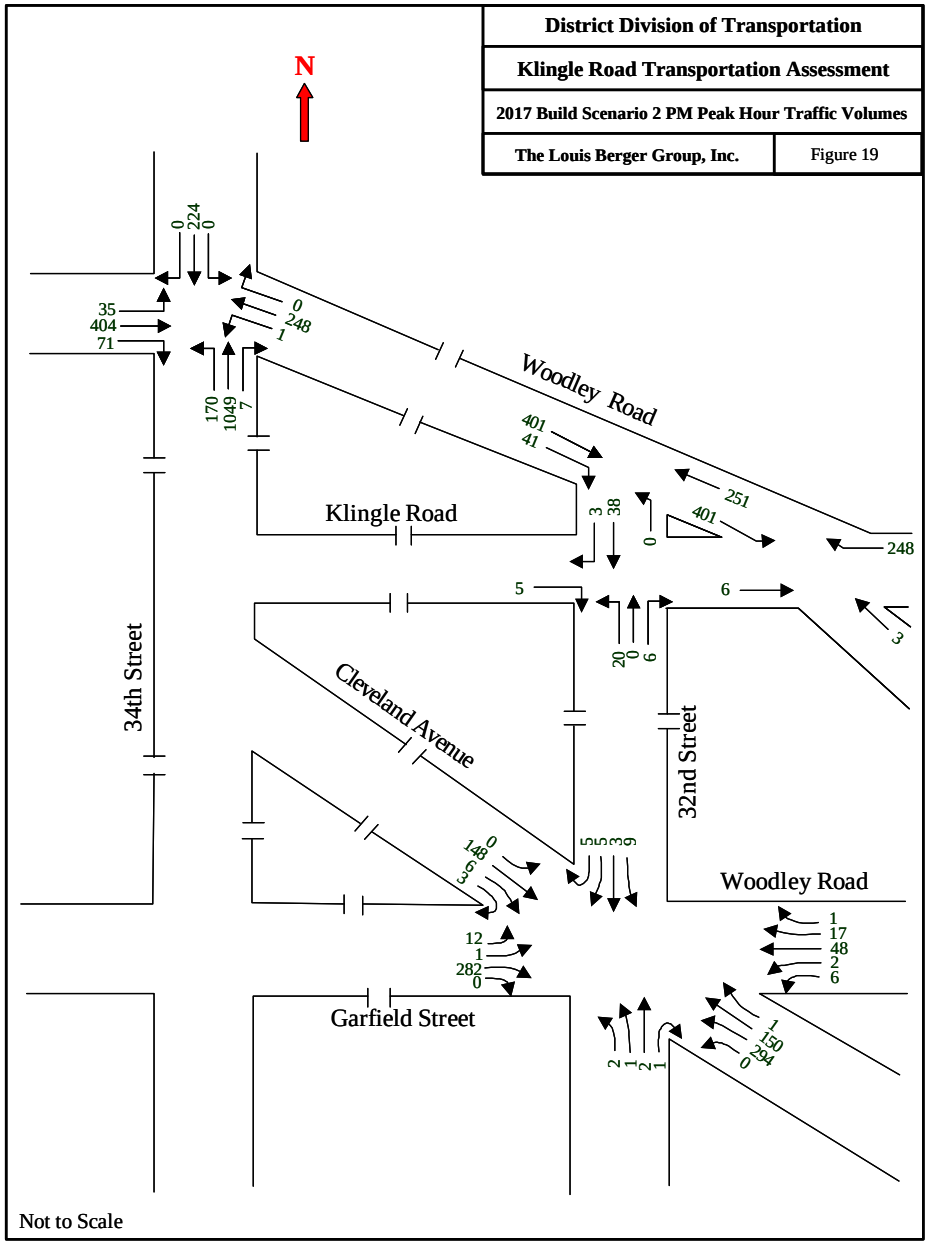

District Division of Transportation
Klingle Road Transportation Assessment
2017 Build Scenario 1 PM Peak Hour Traffic Volumes
The Louis Berger Group, Inc.
Figure 14
N
Woodley Road
Klingle Road
34th Street
Cleveland Avenue
32nd Street
Woodley Road
Garfield Street
0
224
0
35
305
82
0
184
1
176
1049
7
302
41
190
302
187
3
38
0
5
6
3
20
0
6
0
159
5
5
5
3
9
12
1
287
0
1
17
51
2
6
2
1
2
1
1
163
294
0
Not to Scale

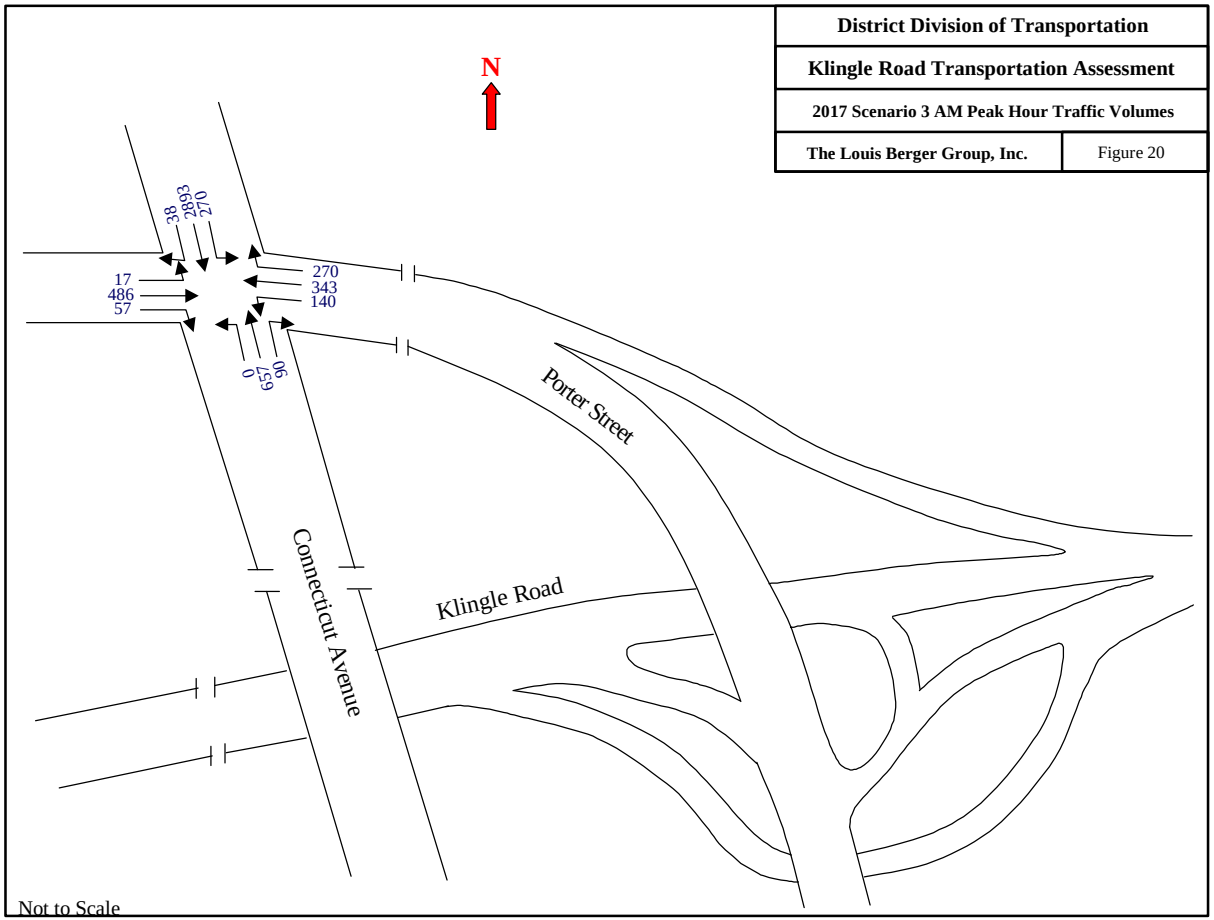

District Division of Transportation
Klingle Road Transportation Assessment
Diversion Traffic Volumes for Scenario 2
The Louis Berger Group, Inc.
Figure 15
N
Key: xx/xx=AM/PM Peak Hour Diverted Traffic Volumes
-276/-176
-123/-305
Connecticut Avenue
Porter Street
-276/-176
-123/-305
-65/-40
+184/+383
-48/-42
Woodley Road
+348/+248
+184/+383
-45/-52
+348/+248
+184/+383
Klingle Road
+144/+318
+283/+208
+40/+65
Cleveland Avenue
-48/-42
-45/-52
34th Street
32nd Street
Garfield Street
-14/-10
-7/-19
Woodley Road
-48/-42
-45/-52
Signalized Intersection
Not to Scale

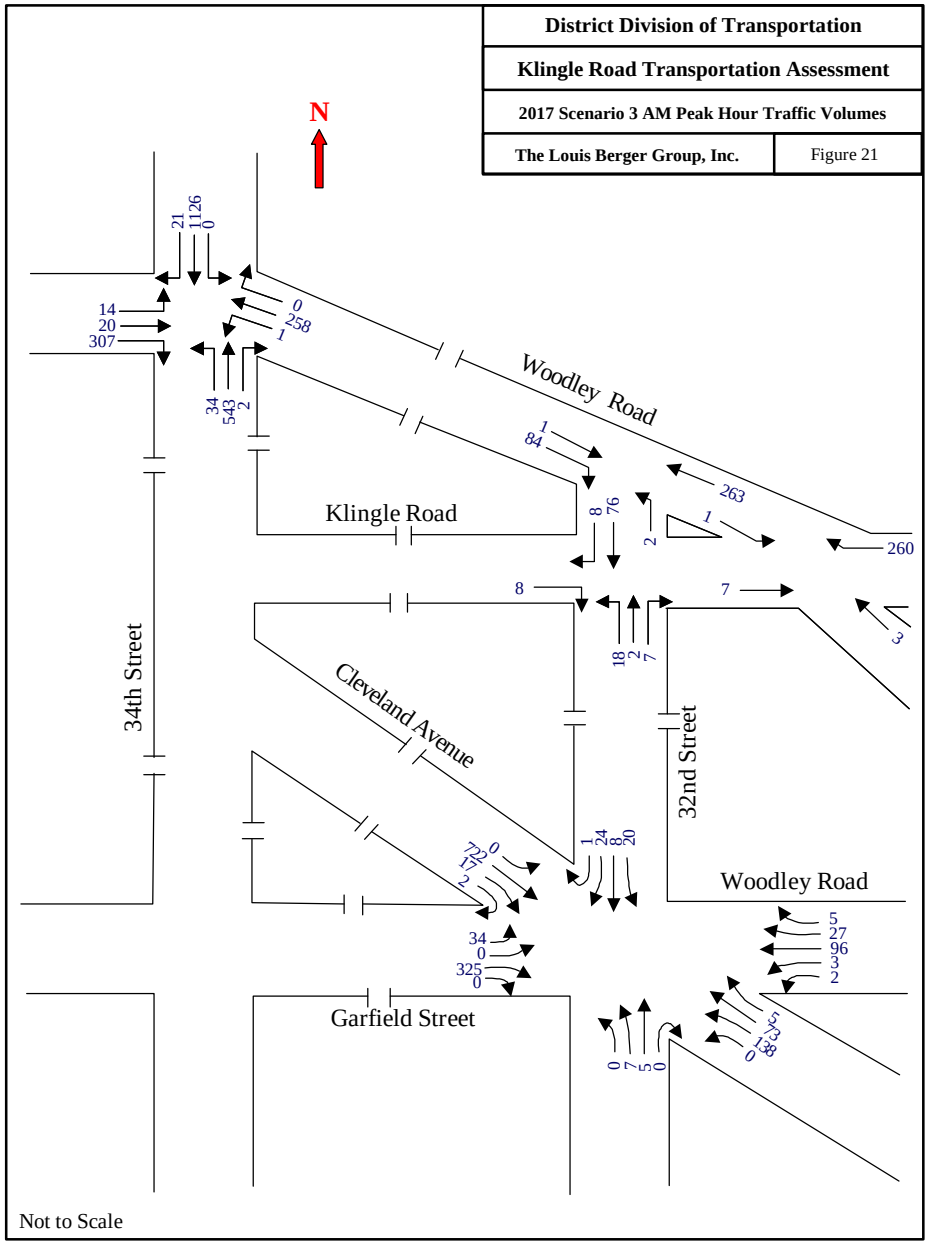

District Division of Transportation
Klingle Road Transportation Assessment
2017 Build Scenario 2 AM Peak Hour Traffic Volumes
The Louis Berger Group, Inc.
Figure 16
N
38
283
272
17
363
57
270
272
140
0
657
90
Porter Street
Connecticut Avenue
Klingle Road
Not to Scale

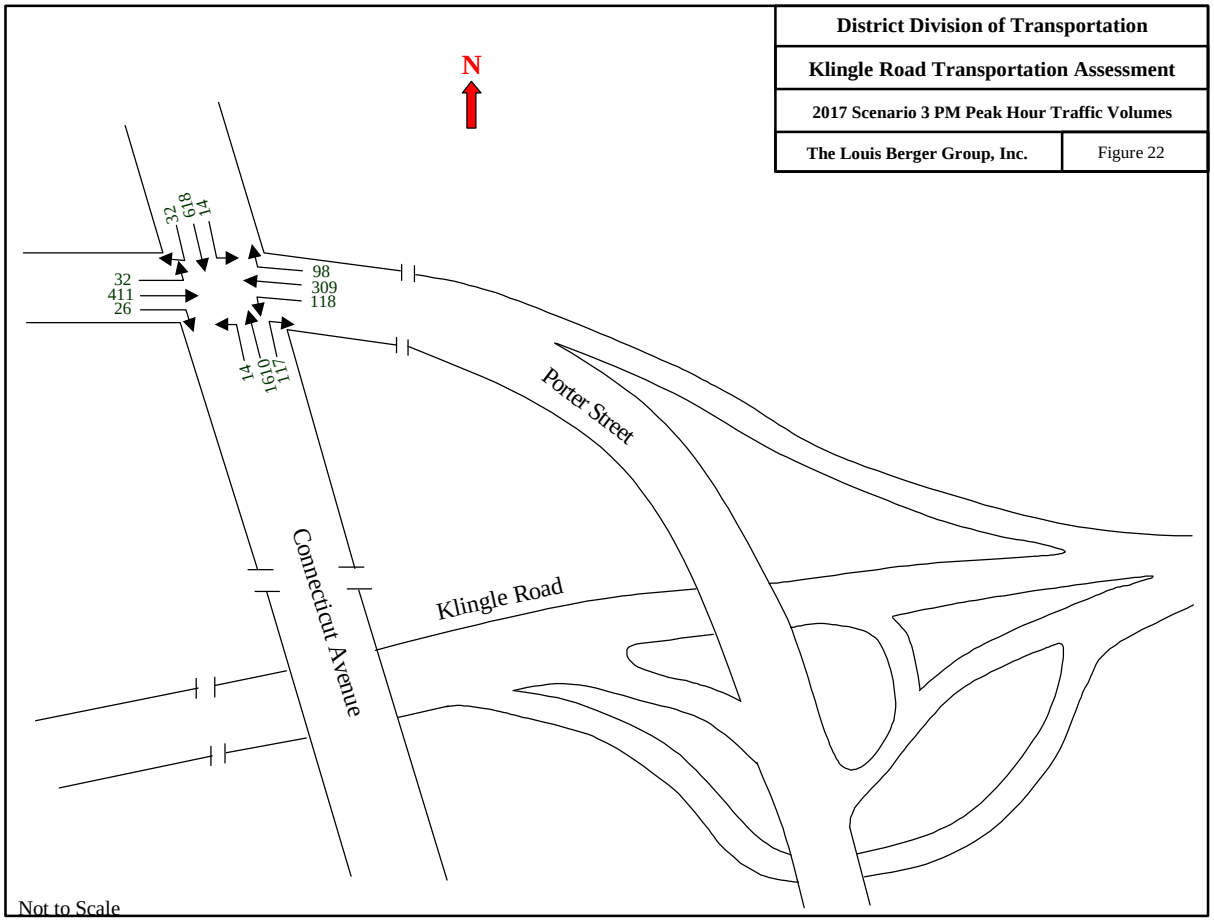

Washington D.C. Department of Public Works
Klingle Road Traffic Study
2017 Build Scenario 2 AM Peak Hour Traffic Volumes
The Louis Berger Group, Inc.
Figure 17
N
Woodley Road
Klingle Road
34th Street
Cleveland Avenue
32nd Street
Woodley Road
Garfield Street
Not to Scale

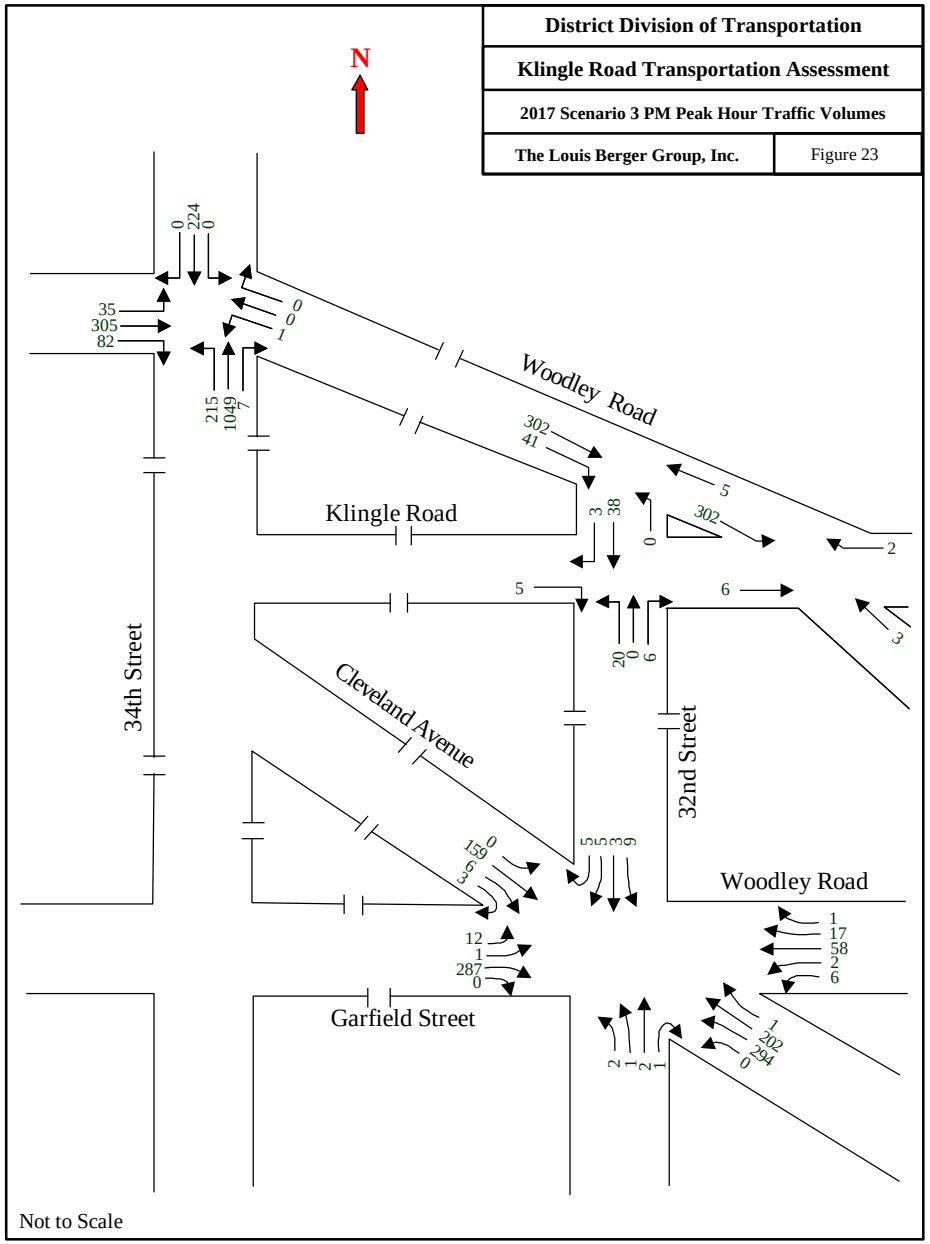

District Division of Transportation
Klingle Road Transportation Assessment
2017 Build Scenario 2 PM Peak Hour Traffic Volumes
The Louis Berger Group, Inc.
Figure 18
N
32
618
14
98
133
118
32
332
26
14
1610
117
Porter Street
Connecticut Avenue
Klingle Road
Not to Scale


District Division of Transportation
Klingle Road Transportation Assessment
2017 Build Scenario 2 PM Peak Hour Traffic Volumes
The Louis Berger Group, Inc.
Figure 19
N
Woodley Road
Klingle Road
Cleveland Avenue
34th Street
32nd Street
Garfield Street
Woodley Road
0
224
0
35
404
71
0
248
1
170
1049
7
401
41
251
401
248
3
38
0
5
6
20
0
6
3
5
5
3
9
0
148
35
12
1
282
0
1
17
48
2
6
2
1
2
1
1
150
294
0
Not to Scale


District Division of Transportation
Klingle Road Transportation Assessment
2017 Scenario 3 AM Peak Hour Traffic Volumes
The Louis Berger Group, Inc.
Figure 20
N
38
2683
270
17
486
57
270
343
140
0
657
90
Porter Street
Connecticut Avenue
Klingle Road
Not to Scale


District Division of Transportation
Klingle Road Transportation Assessment
2017 Scenario 3 AM Peak Hour Traffic Volumes
The Louis Berger Group, Inc.
Figure 21
N
Woodley Road
Klingle Road
34th Street
Cleveland Avenue
32nd Street
Woodley Road
Garfield Street
Not to Scale


District Division of Transportation
Klingle Road Transportation Assessment
2017 Scenario 3 PM Peak Hour Traffic Volumes
The Louis Berger Group, Inc.
Figure 22
N
32
618
14
98
309
118
32
411
26
14
1610
117
Porter Street
Connecticut Avenue
Klingle Road
Not to Scale


District Division of Transportation
Klingle Road Transportation Assessment
2017 Scenario 3 PM Peak Hour Traffic Volumes
The Louis Berger Group, Inc.
Figure 23
N
Woodley Road
Klingle Road
34th Street
Cleveland Avenue
32nd Street
Woodley Road
Garfield Street
Not to Scale