

Anacostia Waterfront

Kenilworth Avenue Corridor Study

PREPARED FOR

District Department of Transportation



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Executive Summary



Kenilworth Avenue is an important part of the District's transportation network. To some users, it serves as an essential commuter route, while to others it is a key link to their neighborhoods. At the same time, it is also an obstacle, where it prevents easy movement between residents on either side from such destination points as the Anacostia River, a park or recreation area, a school, or a place to shop.

This study examined these conflicting functions, and explored options for improving Kenilworth Avenue (between Pennsylvania Avenue and Eastern Avenue) within the context of three major goals:

- Providing a safer, more pedestrian friendly, environment;
- Creating a more pleasing urban setting for Kenilworth Avenue; and
- Improving access for local neighborhoods.

These overarching goals form the basis for identifying a vision that lead to individual projects that, when implemented, can result in significant improvements to the corridor. The vision for Kenilworth Avenue addresses issues related to access, safety, and transportation for drivers, pedestrians, bicyclists, and people using public transit.

The individual projects focus on: increasing safety for travelers driving the avenue, and for pedestrians and bicyclist crossing it; improving access to and from local neighborhoods while still preserving the Avenue's role as an important route for commuters; and, helping transform Kenilworth Avenue into an urban roadway with an enhanced visual quality for all users.

Vision Statement

Kenilworth Avenue will be transformed into an urban roadway that is more pedestrian friendly and more accessible to the adjoining communities and neighborhoods, and improves community access to public transit, open space, and the Anacostia riverfront. Pedestrians, bicyclists, motorists, and people using public transit will be accommodated within a safer environment. The avenue will

be enhanced with reduced visual clutter and improved connections and interchange geometry, enhanced and clearly-identified pedestrian crossings, attractively landscaped medians, and an improved signage system to identify the entrances to the nation's capital, adjacent neighborhoods, and nearby tourist attractions and sports facilities, including Kenilworth Aquatic Gardens, RFK Stadium, and Anacostia Park.

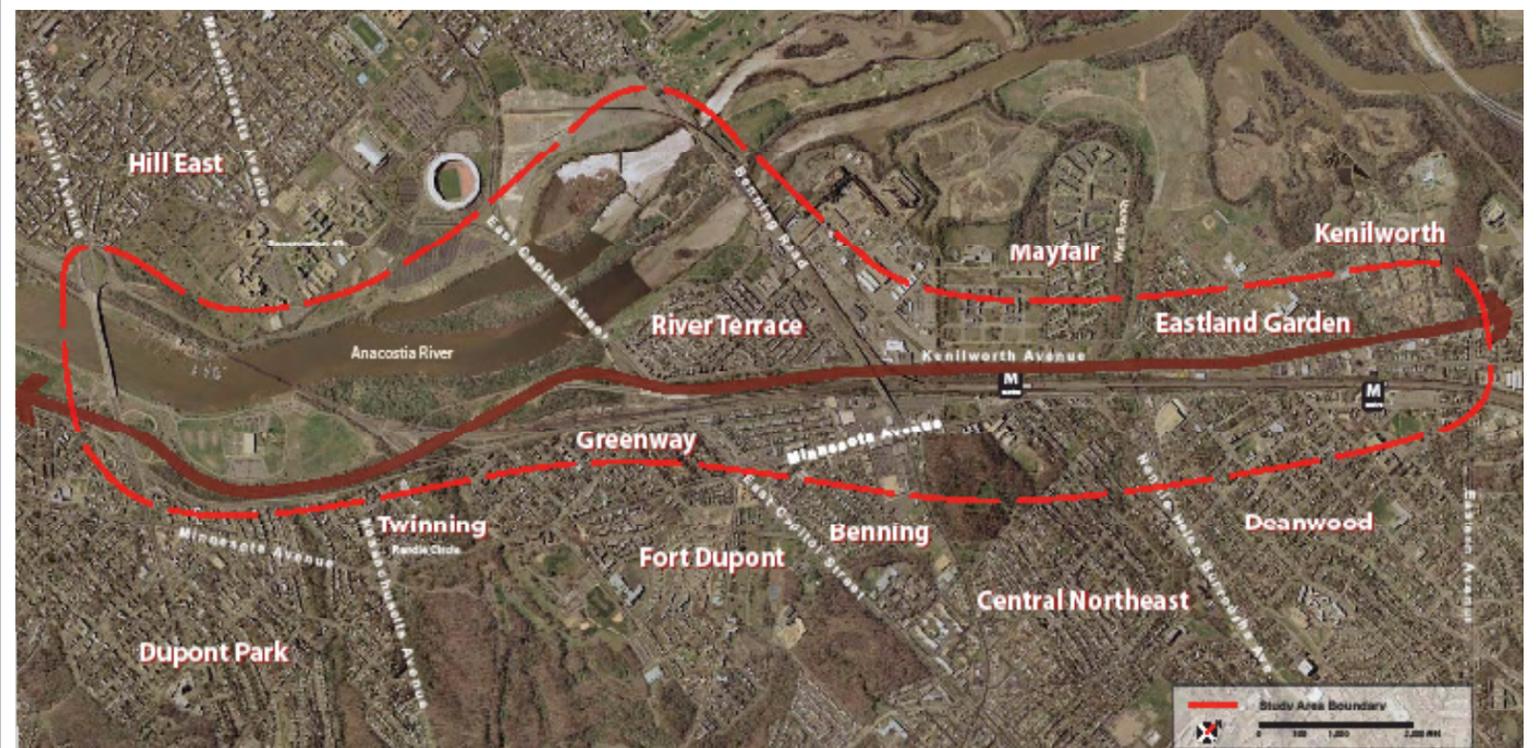


Figure ES.1: Study Area

STUDY FINDINGS

Regional Context and Function

- Kenilworth Avenue is located within the Anacostia River watershed, one of the most densely populated sub-watersheds in the Chesapeake Bay Regional Watershed.
- Kenilworth Avenue is a limited access freeway that serves as a community access route; an extension of the ceremonial entrance route to the nation's capital; and a commuter route to the central business core.

Local Context

- The transportation system will be influenced in the future by the proposed Government Center, the new Parkside community, and potential transit-oriented redevelopments adjacent to the Minnesota Avenue and Deanwood Metrorail Stations.
- Along Kenilworth Avenue, the dominant land use affecting mobility is the CSX Railroad and Metrorail lines which create significant barriers to east-west travel.

Urban Design

- Visual quality of the freeway varies from that of a roadway bordered by trees and parks, creating an open parkway-like setting in the south, to a more urban corridor in the north bordered by access roads and a built environment.
- The corridor does not provide a sense of orientation to the adjacent neighborhoods for both the visitor and the local community.

Pedestrian and Bicycle Experience

- Walking and bicycling are important modes of travel within the corridor.
- Access to Metrorail Stations is difficult and the local communities view the routes as unsafe.

- Besides Kenilworth Avenue itself, adjacent service roads are barriers to mobility and create a significant obstacle to travel between adjacent neighborhoods, parks, and other attractions.
- The Anacostia River adds to these obstacles, by limiting movement between neighborhoods and open space to its east and west to a few existing bridges.

Existing Infrastructure and Traffic Conditions

- Design features of the existing roadway do not meet current design criteria and will not support the future needs of the area.
- Kenilworth Avenue exhibits a high accident rate between Benning Road and Eastern Avenue.

- Interchanges are primarily designed to serve the daily commuter, and do not serve local communities well.
- The majority of freeway components and intersections studied in the corridor are operating at an unacceptable Level of Service (LOS).
- There are many sections of the roadway with inadequate lighting and guide signage.

Public Transportation

- While the area is served well by transit, rail and transit upgrades could improve system capacity and attractiveness and, thus, reduce dependence on automobile trips in the corridor.

Project Objectives



Urban Design / Quality of Life

GOAL
Transform Kenilworth Avenue into an urban roadway, more appropriate to its context

OBJECTIVES

- Improve interchange connectivity to neighborhoods at key locations
- Enhance neighborhood identity with a unified system of signage
- Introduce parkway setting or parkway elements to the roadway corridor
- Introduce landscaped medians and shoulders
- Incorporate Low Impact Development into roadway design
- Upgrade streetscape treatment
- Minimize or reduce the roadway footprint



Pedestrian Connectivity

GOAL
Create a safer and more pedestrian-friendly environment

OBJECTIVES

- Upgrade quality of existing pedestrian crossings
- Introduce new crossings over or under Kenilworth Avenue
- Complete or close gaps at missing connections
- Create new connections to destination points
- Add and clearly mark pedestrian crossings
- Add pedestrian-scale lighting where appropriate
- Enhance informational and directional signage
- Add neighborhood identity signage



Public Transit Access

GOAL
Improve access to public transit from both sides of Kenilworth Avenue

OBJECTIVES

- Create safe routes to existing transit stations/stops
- Upgrade quality of existing routes (paving, lighting, signage and landscape treatment)
- Replace or improve existing pedestrian bridges connecting to transit stations/stops
- Enhance transit facilities to accommodate bicyclists



Open Space / Waterfront Connections

GOAL
Strengthen connections to open space and the riverfront

OBJECTIVES

- Upgrade existing, and complete pedestrian paths
- Add way-finding and interpretative signage
- Enhance natural drainage ways between Anacostia Hills and the riverfront
- Enhance park landscape setting south of East Capital Street
- Create new open space when feasible
- Reduce infrastructure footprint



Visual Quality

GOAL
Improve visual quality of Kenilworth Avenue for all users

OBJECTIVES

- Reduce visual clutter throughout the corridor
- Create a parkway setting and landscaping where appropriate
- Upgrade roadway signage
- Introduce a consistent streetscape treatment
- Introduce consistent color scheme for highway elements
- Bury overhead utility lines where possible
- Provide landscaped screening along the CSX railroad and WMATA Metrorail corridors



Safety

GOAL
Improve vehicular and pedestrian safety throughout the corridor.

OBJECTIVES

- Improve functionality of key intersections
- Improve shoulder conditions for emergency stopping and emergency vehicle access
- Improve lighting for vehicles and pedestrians
- Improve functionality of service road on- and off-ramps
- Provide clearly-marked bicycle road facilities
- Improve pedestrian crosswalks with clearly-marked signage and signalization
- Provide traffic calming measures where appropriate

OVERVIEW OF IMPROVEMENTS

The Kenilworth Avenue Corridor Study identified three types of improvements:

- Near-term (five proposed projects),
- Mid-term (seven proposed projects), and
- Long-term (five proposed projects).

Each project is unique and will raise its own challenges, whether it is funding, design or construction phasing. For example, many of the near-term improvements can be implemented through existing programs or projects already underway in the Study Area. This is also true of some of the mid-term improvements; others, however, are complex projects that require extensive coordination with the public and other agencies. They and all of the recommended long-term improvements will require more extensive environmental evaluation through preparation of an Environmental Assessment or Environmental Impact Statement.

The near-term, mid-term, and long-term improvements are summarized on the following pages.

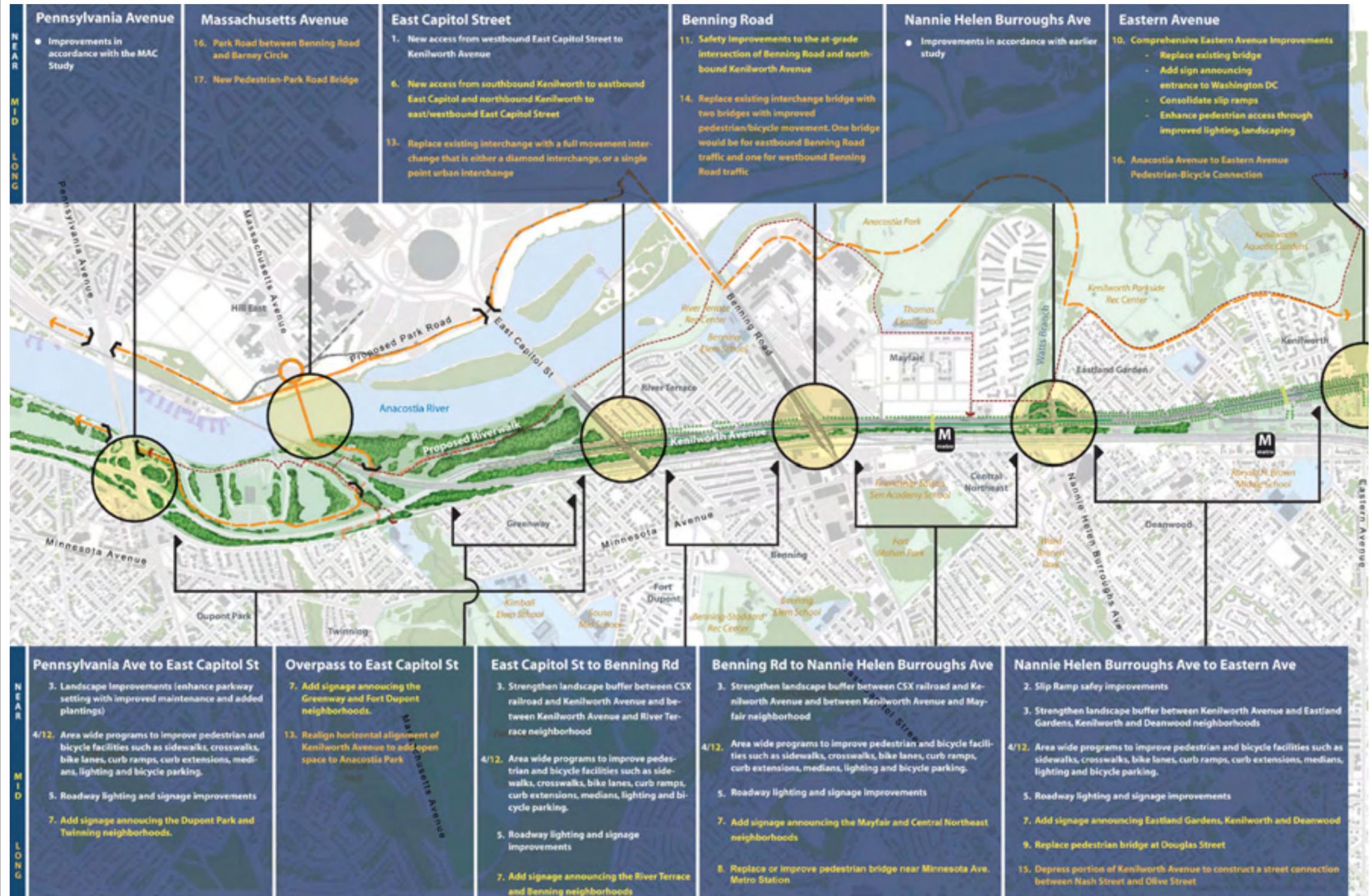


Figure ES.2: Summary of Improvements

Near-Term Improvements

Five near-term improvements, defined as projects that can be implemented immediately or within three to five years, were identified. Generally, these improvements are expected to have minimal environmental impacts, require minimal design effort, and have a low cost.

The near-term improvements primarily address the visual quality of the corridor, and the pedestrian and bicycle travel conditions. Additionally, some connectivity improvements are made at East Capitol Street, and safety issues related to the on- and off-ramps north of Nannie Helen Burroughs Avenue are addressed.

These projects may be implemented in conjunction with each other or independently, depending on availability of funding.

Project No.	Title	Description	Benefits	Estimated Cost (2005)
1	East Capitol Street Scenario EC-1	A new connection is made to allow traffic on westbound East Capitol Street to exit southbound and northbound onto Kenilworth Avenue.	<ul style="list-style-type: none"> Urban Design 	\$2,500,000
2	Kenilworth Avenue Slip Ramps Safety Improvements	The slip ramps between Kenilworth Avenue and the parallel service road north of Nannie Helen Burroughs Avenue are consolidated and realigned to improve safety in the corridor and improve traffic operations on Kenilworth Avenue.	<ul style="list-style-type: none"> Safety Visual Quality 	\$1,000,000
3	Corridor Landscaping	Generally improves visual quality of the corridor through implementation of a corridor wide landscaping, signage, and street furniture program.	<ul style="list-style-type: none"> Urban Design Open Space and Waterfront Connections Visual Quality 	\$3,000,000
4	Pedestrian and Bicycle Improvements	Generally improves the pedestrian and bicycle throughway, curb ramps, pedestrian roadway, lighting and signal, and bicycle parking through specific projects and as part of area wide programs.	<ul style="list-style-type: none"> Pedestrian Connectivity Public Transit Access Safety 	\$1,200,000
5	Kenilworth Avenue Lighting and Signage Improvements	Additional lighting is installed throughout the corridor in locations where lighting is lacking and where levels were found to be inadequate. Similarly, signing is upgraded to meet FHWA Standards and to effectively communicate major exits.	<ul style="list-style-type: none"> Urban Design Visual Quality Safety 	\$1,500,000

Table ES-1: Near-Term Projects

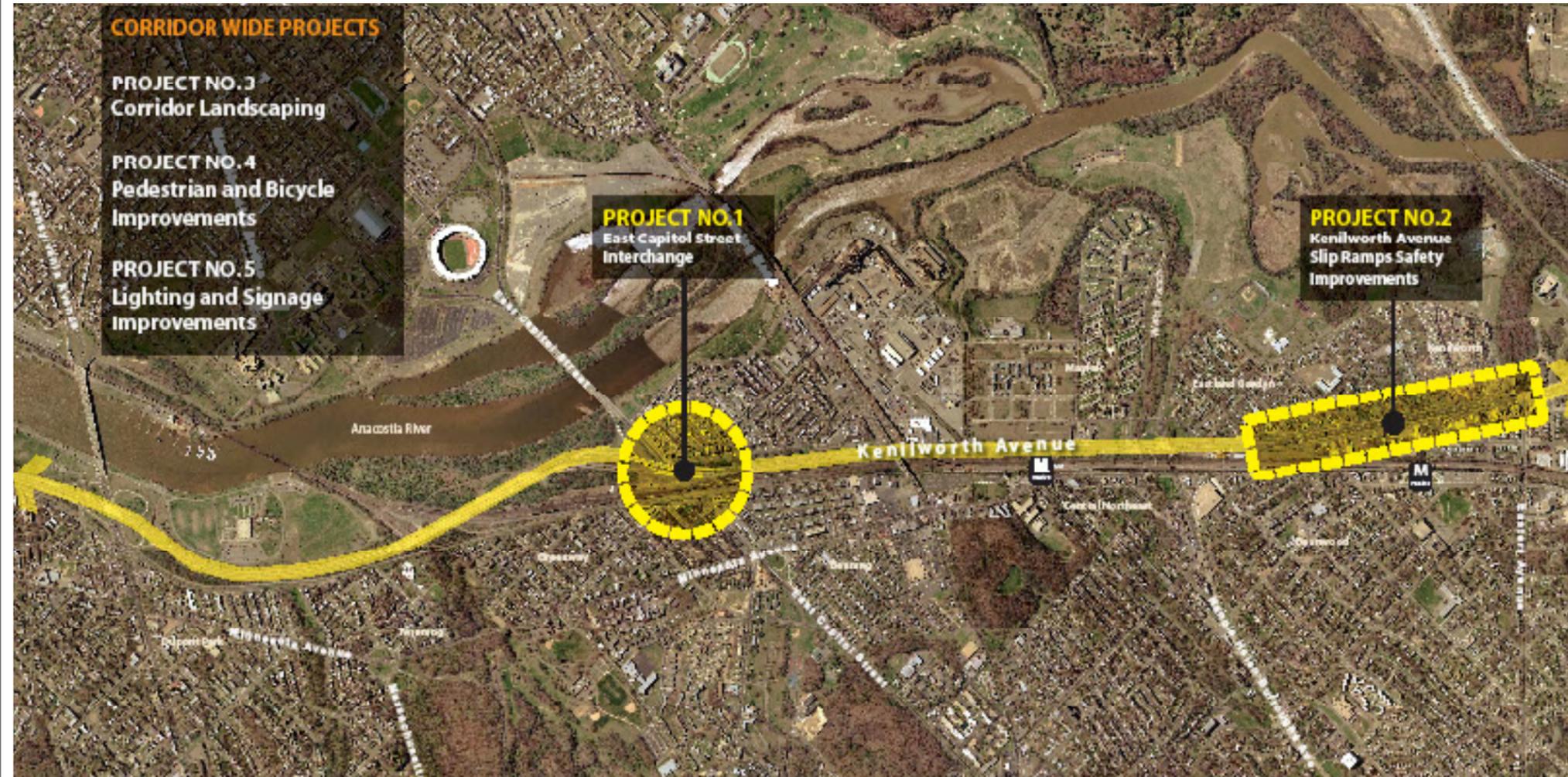


Figure ES.3: Near-Term Projects

Mid-Term Improvements

Generally, the seven recommended mid-term improvements build on the proposed near-term improvements. They address some of the missing vehicular connections, upgrade existing pedestrian connections, and enhance neighborhood identity. These projects are intermediate steps in achieving the full connections desired, which are generally addressed in the long-term improvements.

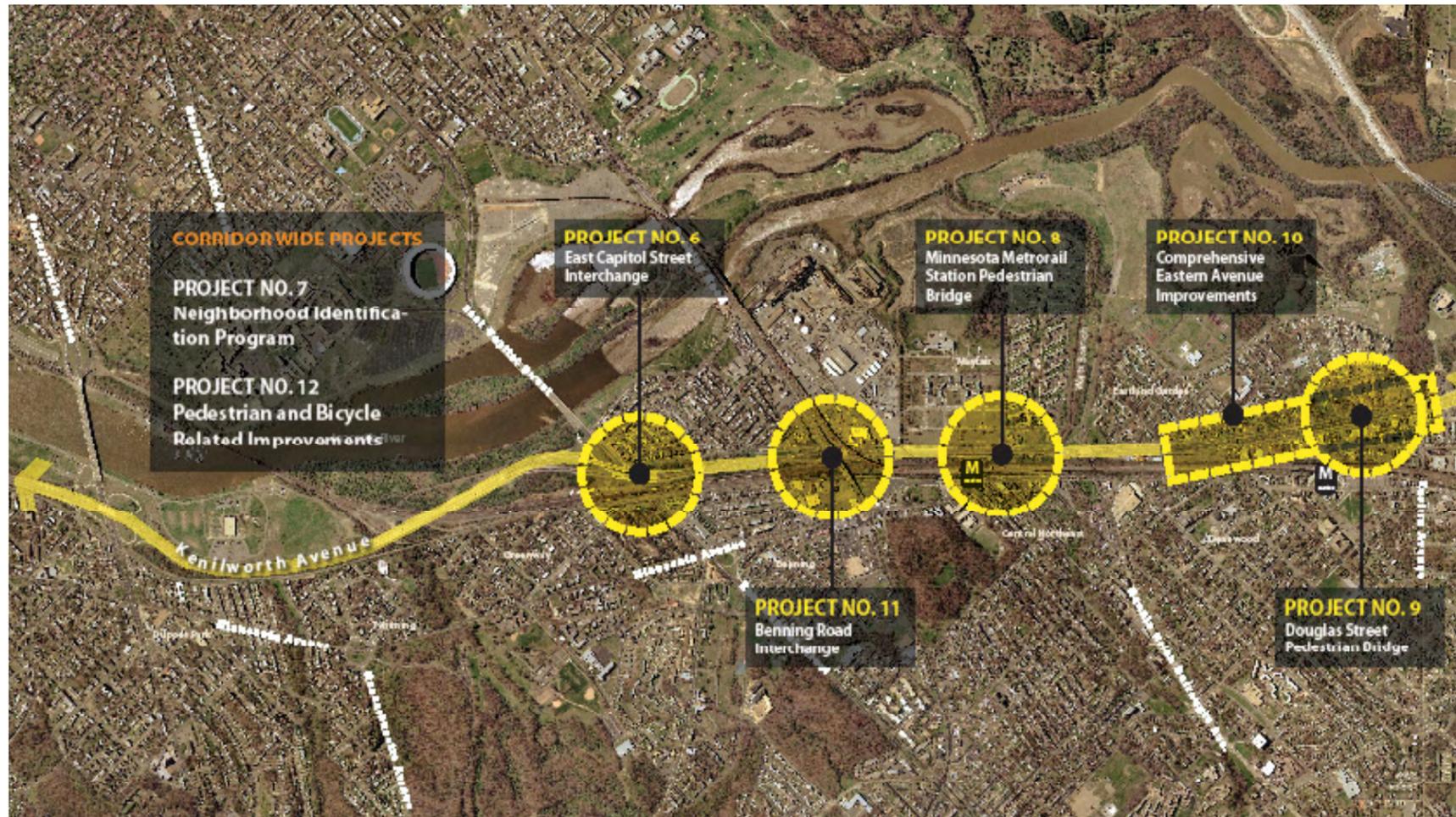


Figure ES.4: Mid-Term Projects

Proj. No.	Title	Description	Benefits	Estimated Cost (2005)
6	East Capitol Street Scenario EC-2	This scenario builds on Scenario EC-1, a near-term improvement, and adds the three missing movements; southbound Kenilworth Avenue to eastbound East Capitol Street and northbound Kenilworth Avenue to east- and westbound East Capitol Street.	<ul style="list-style-type: none"> Urban Design 	\$30,000,000
7	Neighborhood Identification Program	Generally improves wayfinding in the corridor and contributes to a sense of place by implementing a corridor-wide neighborhood identification and signage program	<ul style="list-style-type: none"> Urban Design Visual Quality 	\$500,000
8	Replace or improve Pedestrian Bridge at Minnesota Avenue Metrorail Station	The existing pedestrian bridge to the Minnesota Avenue Metrorail Station is replaced.	<ul style="list-style-type: none"> Pedestrian Connectivity Public Transit Access Open Space and Waterfront Connections Visual Quality Safety 	\$2,500,000
9	Replace Pedestrian Bridge at Douglas Street	The existing pedestrian bridge at Douglas Street that leads to the Deanwood Metrorail Station is replaced.	<ul style="list-style-type: none"> Pedestrian Connectivity Public Transit Access Open Space and Waterfront Connections Visual Quality Safety 	\$2,500,000
10	Comprehensive Eastern Avenue Improvements	This project implements a number of improvements north of Nannie Helen Burroughs Avenue interchange, including the Eastern Avenue Scenario EA-2.	<ul style="list-style-type: none"> Urban Design Pedestrian Connectivity Public Transit Access Open Space and Waterfront Connections Visual Quality Safety 	\$22,500,000
11	Benning Road Scenario BR-1	Scenario BR-1 provides for safety improvements to the at grade intersection of Benning Road and northbound Kenilworth Avenue.	<ul style="list-style-type: none"> Urban Design Safety 	\$20,000,000
12	Pedestrian and Bicycle Related Improvements	Recommendations to improve the pedestrian and bicycle network during the mid term build on the improvements that were undertaken in the short term.	<ul style="list-style-type: none"> Pedestrian Connectivity Public Transit Access Safety 	\$750,000

Table ES-2 - Mid-Term Projects

Long-Term Improvements

Long-term improvements are those improvements that can be implemented between ten and twenty years of the final date of this report. These improvements typically require a major expenditure of funds and are contingent on successfully acquiring the proper environmental permits and completing Environmental Assessments or Environmental Impact Statements.

These projects implement the full vision for the corridor, address remaining connectivity and safety issues, and improve the visual quality of the entire corridor.

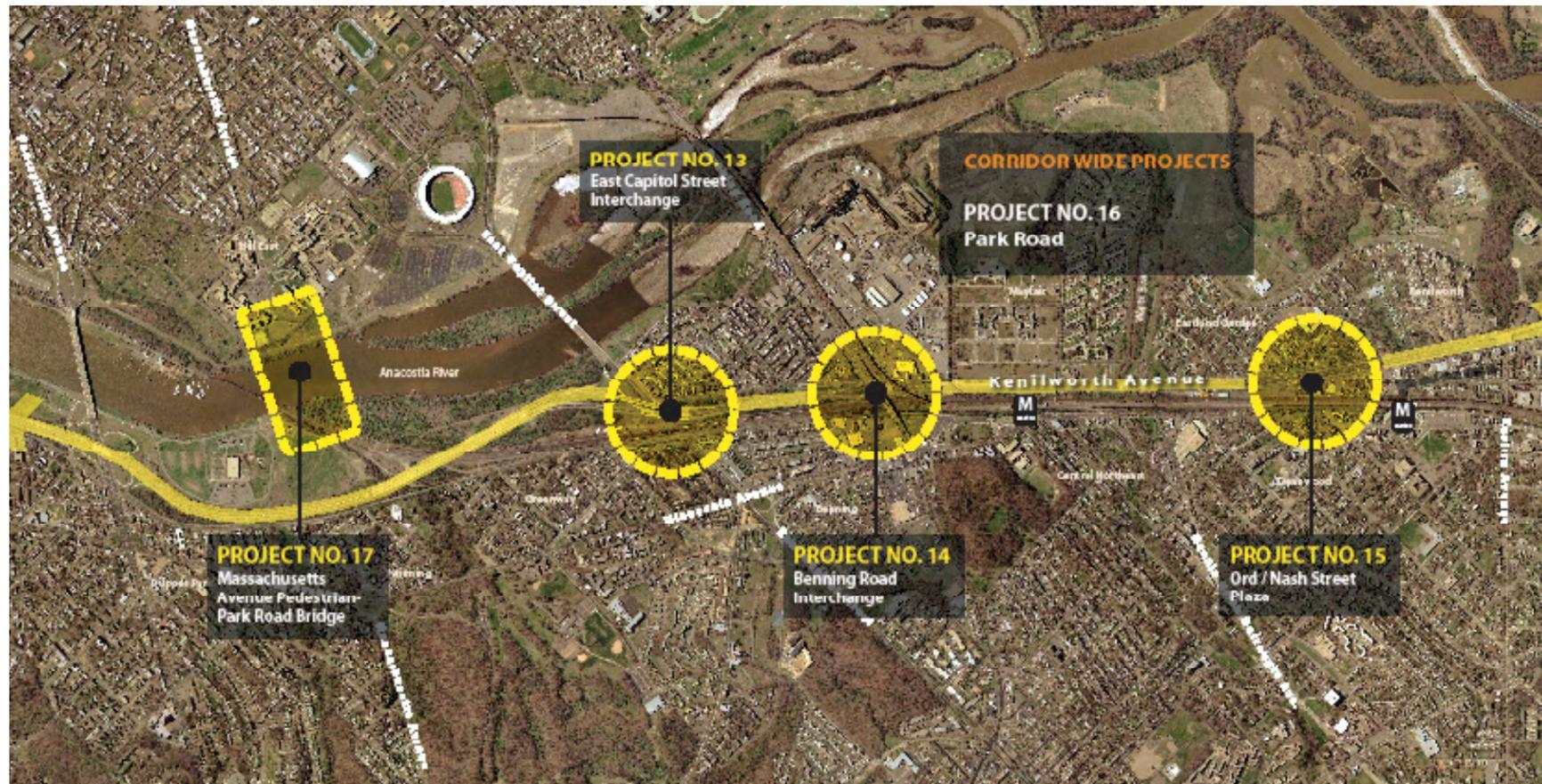


Figure ES.5: Long-Term Projects

Proj. No.	Title	Description	Benefits	Estimated Cost (2005)
13	East Capitol Street Scenario EC-4 or EC-5	Either a diamond interchange (EC-4) or a single point urban interchange (EC-5) is built to replace the existing interchange, providing for vehicular, pedestrian and bicycle movement on, off and across Kenilworth Avenue.	<ul style="list-style-type: none"> Urban Design Pedestrian Connectivity Open Space and Waterfront Connections Safety 	EC-4 \$89,500,000 EC-5 \$94,000,000
14	Benning Road Scenario BR-5	This scenario rebuilds the existing Benning Road bridge into two structures, one for east- and one for westbound traffic, allowing pedestrian and bicycle traffic to move over Kenilworth Avenue in a safer manner and improving traffic operations on and off Kenilworth Avenue.	<ul style="list-style-type: none"> Urban Design Pedestrian Connectivity Public Transit Access Open Space and Waterfront Connections Safety 	\$52,750,000
15	Extend Olive Street to Ord or Nash Street	Depress Kenilworth Avenue to allow construction of a new connector at either Ord Street or Nash Street that will accommodate vehicles, pedestrians and bicyclist.	<ul style="list-style-type: none"> Urban Design Pedestrian Connectivity Public Transit Access Open Space and Waterfront Connections Visual Quality Safety 	\$72,500,000
16	Park Road	A new Park Road unifies the many parks and recreational areas along the Anacostia River, linking major destinations and neighborhoods from Eastern Avenue with points south.	<ul style="list-style-type: none"> Urban Design Pedestrian Connectivity Open Space and Waterfront Connections Visual Quality 	\$10,000,000
17	Massachusetts Avenue Park Road Bridge	This project provides a new connection for pedestrians, bicyclist, and possibly vehicles using the new Park Road across the Anacostia River.	<ul style="list-style-type: none"> Urban Design Pedestrian Connectivity Open Space and Waterfront Connections Visual Quality 	\$15,000,000

Table ES-3 - Long-Term Projects

IMPLEMENTATION TIMELINE

While the near-term improvements can be initiated immediately and completed within five years or less, it is expected that the major transportation improvements recommended by this study will be implemented over the next 20 to 30 years. Some of these improvements are very complex and will require detailed analysis of the environmental impacts and careful construction staging.

Generally, the process for implementing any project will consist of the following steps:

- Establish of a purpose and need for the project;
- Identify funding to pay for the improvement;
- Conduct environmental evaluation (Categorical Exclusion, Environmental Assessment, or Environmental Impact Statement);
- Prepare engineering plans;
- Acquire right-of-way (if required);
- Acquire permits and approvals, and
- Undertake the actual construction.

A tentative project timeline is shown in Table ES-4. It is one scenario for implementing improvements within the Kenilworth Avenue Corridor.

		2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	
Near-Term Projects	Identify Funding																						
	Environmental Evaluation																						
	Engineering Plans																						
	Acquire Right-of-Way																						
	Permits and Approvals																						
	Construction of Projects																						
Mid-Term Projects	Identify Funding																						
	Environmental Evaluation																						
	Engineering Plans																						
	Acquire Right-of-Way																						
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Long-Term Projects	Identify Funding																						
	Environmental Evaluation																						
	Engineering Plans																						
	Acquire Right-of-Way																						
	Permits and Approvals																						
	Construction of Projects																						

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Introduction

1.1 Background

Kenilworth Avenue is an important national highway providing a link between Interstate 395, Interstate 295, and the Baltimore-Washington Parkway (see Figure 1.1). It serves as a major commuter route, carrying over 100,000 vehicles daily between Washington, DC and its Maryland suburbs.

The corridor, important as it is, has been neglected and is a barrier between adjacent communities, and between communities and the river. It is in need of improvement, including repair and redesign, to support the current and future transportation needs of the area. Current concerns include lack of connectivity with adjacent neighborhoods, poor and unsafe roadway geometry, limited horizontal clearances, inadequate and

substandard pedestrian crossings, deteriorated service road conditions, and an overall unappealing visual character.

This study, the third transportation study along the Anacostia River, is a major component of the District of Columbia's Anacostia Waterfront Initiative (AWI). The AWI's primary focus is to revitalize the Anacostia River waterfront and its surrounding neighborhoods, and envisions an energized waterfront that unifies diverse neighborhoods with one of the city's greatest natural assets, the Anacostia River. Major goals of the AWI include revitalization of neglected areas, enhancement and protection of local parks, improvement of water quality, and better accessibility to waterfront destinations.

1.2 Study Area

The Kenilworth Avenue Corridor Study area is located in the northeast and southeast quadrants of Washington, DC (see Figure 1.2). The Avenue lies east of, and roughly parallel to the Anacostia River.

The study area includes the Kenilworth Avenue mainline between Pennsylvania Avenue to the south and the District boundary, at Eastern Avenue, to the north. Access between Pennsylvania Avenue and Kenilworth Avenue are not included since the interchange was studied in a previous study. The ramps connecting Eastern Avenue and Kenilworth Avenue are addressed in this study, which also addresses coordination with the State of Maryland to facilitate improvements to the corridor.

The western boundary of the study area is parallel to the western bank of the Anacostia River, between Pennsylvania Avenue and Benning Road, and approximately one-third of a mile west of Kenilworth Avenue between Benning Road and Eastern Avenue. The eastern boundary follows Minnesota Avenue and extends approximately one-third of a mile east of Kenilworth Avenue.

Also included in this study is a corridor for the potential crossing of the Anacostia River at Massachusetts Avenue, between Reservation 13 at the western bank of the river and Randle Circle to the east.

Communities

Communities along Kenilworth Avenue within the study area include:

- Dupont Park;
- Twinning;
- Greenway;
- Fort Dupont;
- Benning;
- River Terrace;
- Mayfair;
- Central Northeast;
- Eastland Gardens;
- Deanwood; and
- Kenilworth.

Hill East on the east end of Capitol Hill, near the proposed Reservation 13 development is also included.

Major Roads

Major roads included in the study area are:

- Kenilworth Avenue;
- Minnesota Avenue;
- Massachusetts Avenue;
- East Capitol Street;
- Benning Road;
- Nannie Helen Burroughs Avenue; and
- Eastern Avenue.



Figure 1.1: Regional Context

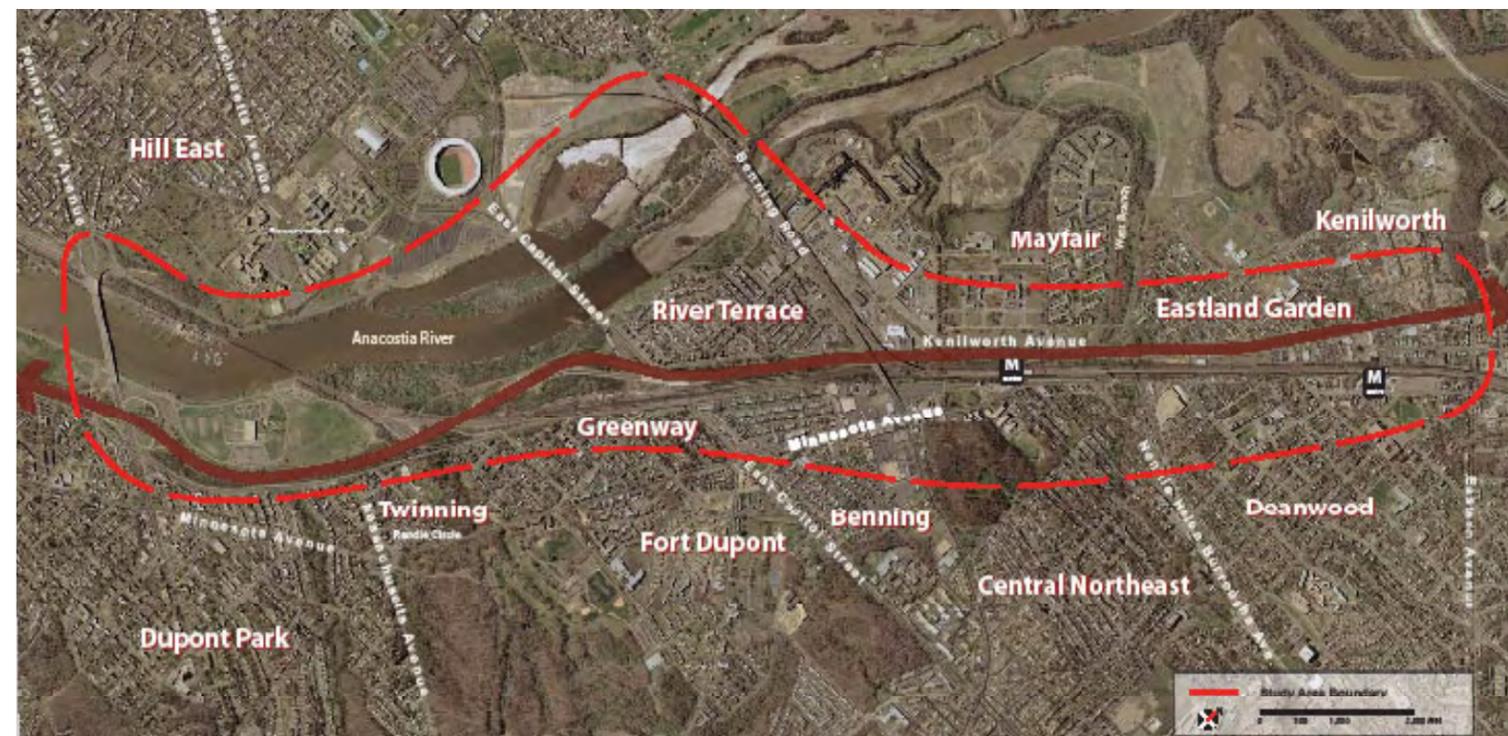


Figure 1.2: Study Area Neighborhoods

1.3 Goals and Objectives

The Kenilworth Avenue corridor within the study area was examined with three overall goals in mind:

- To provide a safer, more pedestrian-friendly, environment;
- To create a more urban setting for Kenilworth Avenue; and
- To improve access to and from local neighborhoods.

To further guide this study, a Vision Statement and specific thematic goals and objectives were developed through coordination with stakeholders, other Anacostia area studies, and meetings with community representatives from the study area.

Vision Statement

Kenilworth Avenue will be transformed into an urban roadway that is more pedestrian friendly and more accessible to the adjoining communities and neighborhoods, and improves community access to public transit, open space, and the Anacostia riverfront. Pedestrians, bicyclists, motorists, and people using public transit will be accommodated within a safer environment. The avenue will

be enhanced with reduced visual clutter and improved connections and interchange geometry, enhanced and clearly-identified pedestrian crossings, attractively landscaped medians, and an improved signage system to identify the entrances to the nation's capital, adjacent neighborhoods, and nearby tourist attractions and sports facilities, including Kenilworth Aquatic Gardens, RFK Stadium, and Anacostia Park.



Urban Design / Quality of Life

GOAL
Transform Kenilworth Avenue into an urban roadway, more appropriate to its context

- OBJECTIVES**
- Improve interchange connectivity to neighborhoods at key locations
 - Enhance neighborhood identity with a unified system of signage
 - Introduce parkway setting or parkway elements to the roadway corridor
 - Introduce landscaped medians and shoulders
 - Incorporate Low Impact Development into roadway design
 - Upgrade streetscape treatment
 - Minimize or reduce the roadway footprint



Pedestrian Connectivity

GOAL
Create a safer and more pedestrian-friendly environment

- OBJECTIVES**
- Upgrade quality of existing pedestrian crossings
 - Introduce new crossings over or under Kenilworth Avenue
 - Complete or close gaps at missing connections
 - Create new connections to destination points
 - Add and clearly mark pedestrian crossings
 - Add pedestrian-scale lighting where appropriate
 - Enhance informational and directional signage
 - Add neighborhood identity signage



Public Transit Access

GOAL
Improve access to public transit from both sides of Kenilworth Avenue

- OBJECTIVES**
- Create safe routes to existing transit stations/stops
 - Upgrade quality of existing routes (paving, lighting, signage and landscape treatment)
 - Replace or improve existing pedestrian bridges connecting to transit stations/stops
 - Enhance transit facilities to accommodate bicyclists



Open Space / Waterfront Connections

GOAL
Strengthen connections to open space and the riverfront

- OBJECTIVES**
- Upgrade existing, and complete pedestrian paths
 - Add way-finding and interpretative signage
 - Enhance natural drainage ways between Anacostia Hills and the riverfront
 - Enhance park landscape setting south of East Capital Street
 - Create new open space when feasible
 - Reduce infrastructure footprint



Visual Quality

GOAL
Improve visual quality of Kenilworth Avenue for all users

- OBJECTIVES**
- Reduce visual clutter throughout the corridor
 - Create a parkway setting and landscaping where appropriate
 - Upgrade roadway signage
 - Introduce a consistent streetscape treatment
 - Introduce consistent color scheme for highway elements
 - Bury overhead utility lines where possible
 - Provide landscaped screening along the CSX railroad and WMATA Metrorail corridors



Safety

GOAL
Improve vehicular and pedestrian safety throughout the corridor.

- OBJECTIVES**
- Improve functionality of key intersections
 - Improve shoulder conditions for emergency stopping and emergency vehicle access
 - Improve lighting for vehicles and pedestrians
 - Improve functionality of service road on- and off-ramps
 - Provide clearly-marked bicycle road facilities
 - Improve pedestrian crosswalks with clearly-marked signage and signalization
 - Provide traffic calming measures where appropriate



1.4 Study Process

The study was conducted in three sequential phases. The first phase, data collection and analysis, was initiated through an intense community involvement program that reached out to civic associations, Advisory Neighborhood Commissions, and individuals residing in the study area. Resource areas documented included land use and zoning conditions in neighborhoods bordering the corridor, pedestrian movements along and across Kenilworth Avenue, safety and functionality of Kenilworth Avenue, and its connectivity with the regional transportation network. Data from existing sources was supplemented and refined for the study area through site visits, interviews with District officials, pedestrian surveys, and traffic counts. These existing conditions were then analyzed to identify deficiencies in several modes of the transportation system, as well as the physical conditions along the corridor. These are discussed in Chapter 2 of this document.

Following a documentation of key issues, three options for improving the corridor were developed, as follows:

- Transform Kenilworth Avenue into a Boulevard. Integrate the roadway into adjoining neighborhoods, landscape the corridor, and provide at-grade signalized crossings for pedestrians, bicyclists, and vehicles.
- Transform Kenilworth Avenue into a four-lane limited access roadway. Reduce the existing footprint north of East Capitol Street by eliminating one through-lane in each direction; improve safety and functionality of the corridor.
- Improve Kenilworth Avenue. Maintain the existing roadway width while improving safety, infrastructure, and appearance. Depress portions of the corridor to improve connectivity to adjacent neighborhoods.

The preferred alternative is the third option. This option was then developed further to improve connectivity at three major interchanges along Kenilworth Avenue (East

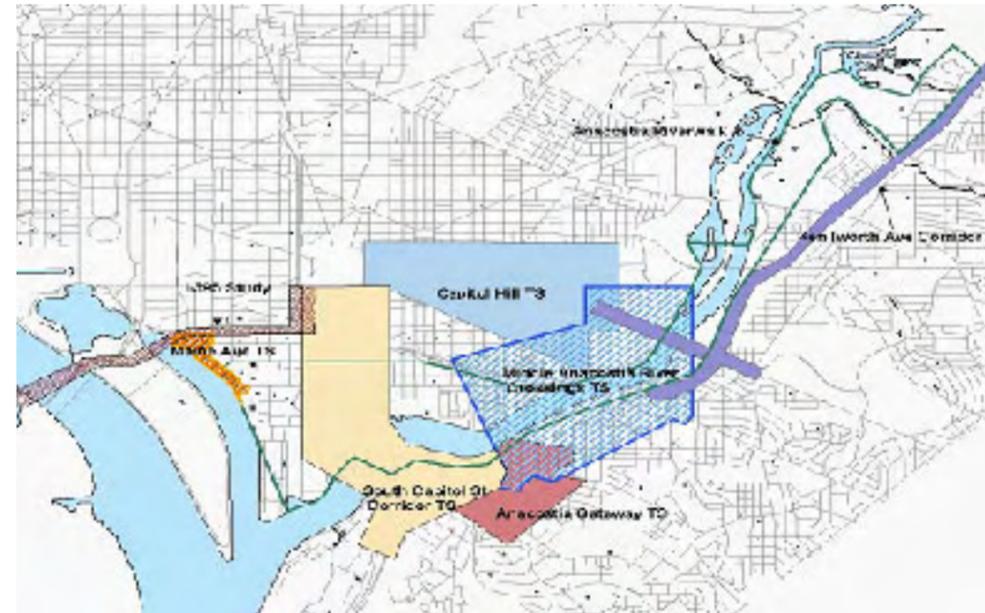


Figure 1.3: DC Department of Transportation Studies

Capitol Street, Benning Road, and Eastern Avenue). Computer-modeling analyzed delays, travel times, number of stops, and levels of service (LOS). Travel demand analysis using the Metropolitan Washington Council of Government (MWCOC) regional transportation model was used to project traffic volumes for year 2030 to assess the long-term performance of Kenilworth Avenue under this option. These are discussed in Chapter 3 of this document.

The final phase of the study was to develop broad strategy recommendations and identify individual projects to implement the preferred option. These are discussed in Chapters 4, 5, 6, 7, and 8. Chapter 4 describes the broad corridor-wide strategies, while Chapters 5, 6, 7, and 8 identify the short-term, mid-term, and long-term improvement projects, the timeline for their implementation, and the construction cost estimates.

1.5 Other Studies and Projects

Two related studies, the *South Capitol Street and Anacostia Gateway Transportation Study*, and the *Middle Anacostia Crossing Study*, were completed within the past year (the project areas for these two studies are illustrated in Figure 1.3). The *Kenilworth Avenue Corridor Study* builds on the findings of these studies.

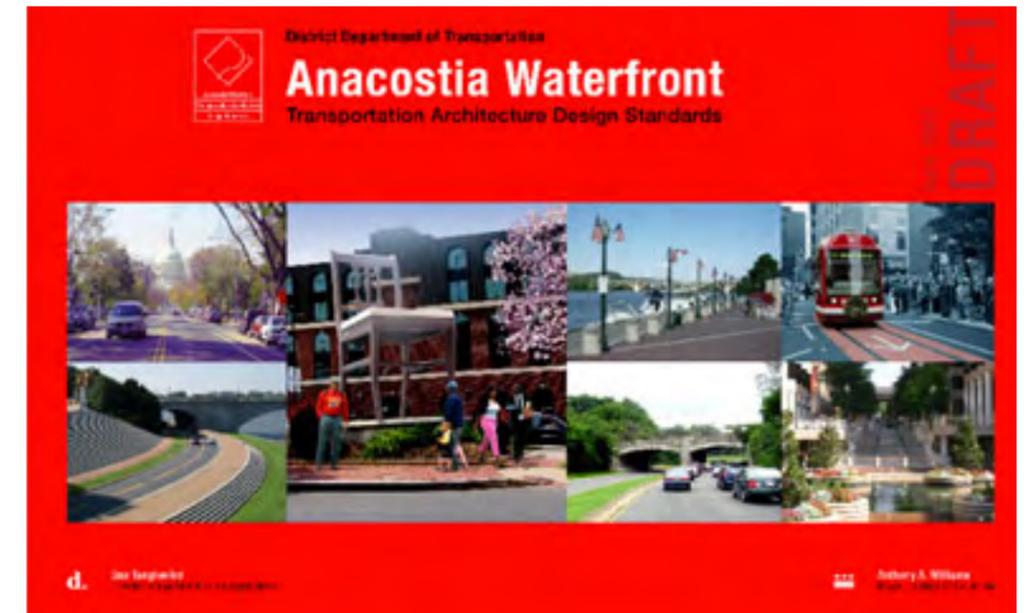
Several other important projects and studies that strive to improve the neighborhoods along the Anacostia River also contributed to this study. Each of these studies was coordinated with the current study and their findings will be referenced where appropriate. They include:

Anacostia Riverwalk Trail (ARW Trail)

The ARW Trail will provide a safe and convenient means for visitors to access the Anacostia waterfront and enjoy Anacostia Park. This 16-mile trail will extend from the Potomac River to the Maryland border; a large portion of the trail lies within the study area.

Reconstruction of Kenilworth Avenue, NE from Foote Street to Lane Place

The interchange of Nannie Helen Burroughs Avenue with Kenilworth Avenue is scheduled



to be rebuilt in 2006. Improvements include rebuilding the bridge to accommodate a wider Nannie Helen Burroughs Avenue, better pedestrian access, realignment of roads to the west of Kenilworth Avenue to improve safety at difficult intersections near the entrance to the Kenilworth Aquatic Gardens, and street light upgrades between Hayes and Lane Streets.

AWI Transportation Architecture Design Standards

The *AWI Transportation Architecture Design Standards* provide guidelines to unify transportation architecture for roadway and transportation-related construction projects in the Anacostia River area, help preserve and enhance the unique public realm of the Anacostia River area, and integrate the Anacostia River area with the District's monumental and historic character.

The urban design standards provide guidelines for improving pedestrian underpasses and overpasses, lighting, signage, architectural treatment of medians, curbs, gutters, ramps, and bridges, and landscape treatments.

DC Bicycle Master Plan

The goal of the *DC Bicycle Master Plan* is to increase the number of trips made by bicycle by improving bicycling conditions throughout

the District of Columbia. The final plan includes a network of bicycle routes, a map showing bike facilities and streets that are suitable for bicycling, bicycle facility design guidelines, and recommended policies for improving the bicycling climate in the District.

Great Streets Initiative

The *Great Streets Initiative* is designed to implement completed and approved plans that comprehensively highlight new opportunities to invest strategically in physical development and public realm improvements along the District's major corridors. Streets within the Kenilworth Avenue Corridor that are part of the Great Streets Initiative include Minnesota Avenue, Benning Road, and Nannie Helen Burroughs Avenue.

Capitol Hill Transportation Study

This study was initiated in response to citizen concerns about the speed and volume of vehicular traffic on streets in the Capitol Hill area. The study examines existing and projected transportation conditions and develops recommendations to enhance mobility, traffic safety, pedestrian safety, and bicycle safety.



Figure 1.4: Public Meetings

Replacement of Kenilworth Avenue Bridge over AMTRAK and Beaver Dam Branch

The Maryland State Highway Administration will advertise a project to reconstruct the Kenilworth Avenue Bridge over AMTRAK and Beaver Dam Branch immediately north of Eastern Avenue. Construction is expected to begin in 2006 and will include replacing the existing bridges and adding an acceleration lane for traffic entering southbound Kenilworth Avenue from eastbound New York Avenue.

Extension of Minnesota Avenue

This project connects the two portions of Minnesota Avenue that terminate at Sheriff Road and Meade Street. There is currently no schedule for construction.

Eastern Avenue Bridge

DDOT is currently investigating how to address the vertical clearance issues at the Eastern Avenue Bridge.

Anacostia Streetcar Project/Transit Alternative Analysis

These initiatives identify transit needs in Anacostia, explore how transit can better serve Anacostia neighborhoods and businesses, and develop a transit system that provides flexible, efficient service while supporting neighborhood economic development initiatives.

Minnesota Avenue Station Access Improvement Study

WMATA completed a study for the Minnesota Avenue Metrorail Station that developed concepts for improving pedestrian access and bus access that would enhance the pedestrian environment while meeting future bus demands.

Combined Sewer System Long-Term Control Plan (LTCP)

The LTCP focuses on controlling Combined Sewer Overflow (CSO) discharges to the area waterways. The LTCP planning effort began in 1998 and a draft of the LTCP was made available to the public and submitted to EPA and the District of Columbia Department of Health in June 2001.

Anacostia Park General Management Plan

This plan will guide management of Anacostia Park, identify future recreational opportunities for visitors, guide rehabilitation and development of facilities, and set the course for protecting and managing the Park's natural and cultural resources.

Reservation 13 Master Plan

The Draft Master Plan for Reservation 13 envisions the Reservation as a beautiful edge to the Hill East neighborhood, linking it to the waterfront and meeting both District-wide and neighborhood needs. The plan combines health, science, recreation, education, civic, and housing uses. A village square, a neighborhood park, and tree-lined streets connect the site to a new waterfront park on the

Anacostia River totaling more than 16 acres of new public parkland.

1.6 Public Involvement

Public Involvement Plan

The public outreach effort for this study was designed to reach as many stakeholders as possible. The study was introduced to the community through meetings with the Advisory Neighborhood Commissions (ANCs) and civic associations within the study area prior to a series of public meetings.

A Technical Assistance Group (TAG) was formed, comprised of area residents recognized as leaders within the community through their election to public office (chairpersons of ANCs) or as heads of local civic associations. Beginning with the TAG kickoff meeting held in February 2005, TAG meetings to provide guidance to the study team were held periodically during the planning process, generally two weeks prior to public workshops and corridor-wide meetings.

Meeting dates and times were advertised through newsletters, electronically and regularly mailed informational flyers, and local newspapers. A project website provided comprehensive information including project mapping, technical data, project schedule, contact list, and meeting schedules. It also provided a forum for public comments and

questions. The web site was updated regularly.

A newsletter was published prior to each public meeting. The mailing list, which included area residents, Federal and local agency representatives, and neighborhood and civic associations, was updated as the project progressed based on registrants at meetings or on the website. The newsletter advertised upcoming meeting times and locations, and provided advance information to help increase the public's awareness and understanding of the study.

In addition, young adult residents of Ward 7 were trained by the study team and participated as data collectors for the pedestrian and bicycle survey conducted as part of the study. The information gathered from the survey was used in the field analysis that formed recommendations for specific pedestrian and bicycle improvements in the corridor. The survey served as another public involvement tool to gather input from corridor stakeholders who may not have been reached through the other outreach efforts.

Community Meetings

Between November 2004 and January 2005, representatives of the study team visited ANCs within Ward 6 and Ward 7 to introduce the project to the local community and its leaders (ANCs 6B, 7A, 7B, 7C and 7C were visited). In addition, team representatives attended regularly scheduled meetings with the Fort Dupont Civic Association, Kenilworth Resident Council, Eastland Gardens Civic Association, Marshall Heights Community Development Corporation, and the River Terrace Civic Association.

Workshops

Public workshops were held at several locations across the corridor during March 2005. Due to the size of the study area and the diversity of transportation issues, the workshops were held throughout the corridor.

The first workshop was held on March 8, 2005 at Kenilworth Elementary School; the second on March 10, 2005 at the Fort Dupont Ice Arena; and the last one on March 12, 2005 at

River Terrace Elementary School. To maximize the number of attendees who could participate, two of the workshops were held during the weekday evenings and one during a Saturday morning. Approximately 60 citizens from most of the study area neighborhoods attended the workshops.

The workshops were designed to familiarize participants with the purpose of the study, its context within the AWI, the existing conditions and issues identified by the design team, and the project goals and objectives. Most importantly, the workshop format was designed to provide a forum for interaction in small groups to solicit the public's concerns and issues and identify possible solutions.

Corridor-Wide Public Meetings

The first corridor-wide public meeting was held on May 5, 2005. At this meeting, three preliminary options for the Kenilworth Avenue corridor, along with options for a Massachusetts Avenue crossing and for Park Road, were presented.

Following the May meeting, the options were further developed based on public comments, engineering parameters, and other data. A second corridor-wide meeting was held on June 21, 2005, where these refined options were presented and discussed.

On June 19, 2006, the Draft Plan was circulated to various agencies, ANCs, and Civic Associations within the study area for comments. On November 4, 2006, a third public meeting to review the proposed recommendations for Kenilworth Avenue was held at River Terrace Elementary School. Approximately 30 citizens attended the meeting. The public meeting was designed to showcase the seventeen projects proposed for the corridor and to elicit feedback from participants through interaction with the study team and through written comments.

Existing Characteristics



Photos 1 and 2: Kenilworth Avenue is a commuter route that borders the Anacostia Park, residential neighborhoods, and the CSX and Metrorail corridors.

This chapter focuses on understanding the existing characteristics of the Kenilworth Avenue Corridor within the study area. These characteristics influence how the corridor currently functions, and affect future improvements. Characteristics addressed include: regional context and function; local context including the natural environment and land use; urban design; pedestrian and bicycle experience; existing infrastructure and traffic conditions; and public transportation.

Summary of Existing Characteristics

Regional Context and Function

- Kenilworth Avenue is a commuter route, an extension of the ceremonial entrance routes to the nation's capital, and a community access route.
- Kenilworth Avenue is located within the Anacostia River watershed, one of the most densely populated sub-watersheds in the Chesapeake Bay Regional Watershed.

Local Context

- Within the study area, the roadway borders residential neighborhoods, some commercial and industrial uses, the CSX Railroad/Metrorail corridors, and the Anacostia Park (see Photos 1 and 2).
- Two Metrorail Stations are located within the study area. The transportation system will be influenced in the future by proposed transit-oriented developments adjacent to these stations, including the Government Center and the new Parkside community near the Minnesota Avenue Station.

Urban Design

- Visual quality along the corridor varies from an open parkway-like setting in the south to an urban corridor in the north.
- The corridor does not provide a sense of orientation to the adjacent neighborhoods for both the visitor and the local community.

Pedestrian and Bicycle Experience

- Kenilworth Avenue, and the CSX Railroad and Metrorail lines, create a significant obstacle to all modes of travel, especially for east-west movement between adjacent neighborhoods, schools, parks, and other attractions. The Anacostia River further adds to these obstacles, restricting movement between neighborhoods and open space to its east and west.
- Safety is a concern when accessing Metrorail stations and the waterfront from the adjacent neighborhoods.

Existing Infrastructure and Traffic Conditions

- Local community connections are poor as the infrastructure focuses on serving the commuter population; however, public input showed that safety is a concern and increased connectivity may be detrimental.
- The level of service (LOS) is unacceptable for the majority of intersections within the corridor. A high accident rate was observed between Benning Road and Eastern Avenue.

Public Transport

- While the area is served well by transit, rail and transit upgrades could improve system capacity and attractiveness, thus reducing dependence on automobile trips in the corridor.

2.1 Regional Context and Function

Kenilworth Avenue serves three principal functions:

- a major commuter route, carrying thousands of vehicles daily between Washington, DC and its Maryland suburbs;
- an extension of the northern entrance routes for visitors to the nation's capital; and
- an access route for the adjacent communities.

Kenilworth Avenue, also known as DC 295, is part of a system of expressways on the east side of the Anacostia River that links Indian Head Highway (MD 210), Interstate 395 (I-395), and Interstate 295 (I-295) to the south, and the Baltimore-Washington Parkway (MD 295) and US Route 50 (US 50) to the north (Figure 2.1).

The corridor within the study area is the southern extension of the Baltimore-Washington Parkway, the ceremonial entrance route from the north to the nation's capital, and a designated scenic byway in the State of Maryland. Like the parkway, Kenilworth Avenue is a limited-access roadway.

Kenilworth Avenue connects to Pennsylvania Avenue and East Capitol Street, two of Washington DC's major thoroughfares connecting to the U.S. Capitol and the White House. The Kenilworth Avenue corridor provides links between neighborhoods via Benning Road, Nannie Helen Burroughs Avenue, and Minnesota Avenue, all of which are part of the Great Streets Initiative, and Eastern Avenue, which also serves as the DC-Maryland boundary.

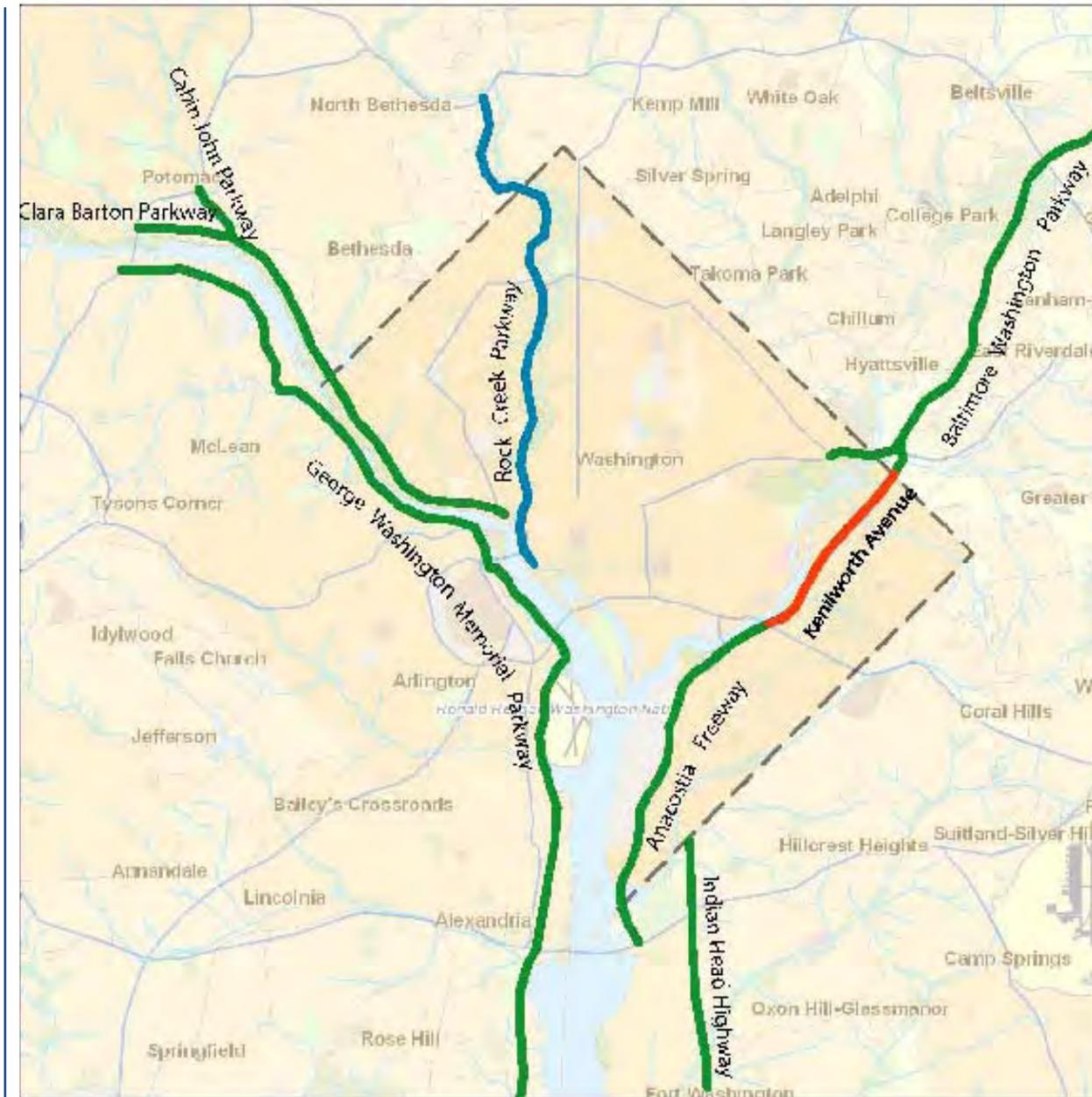


Figure 2.1: Kenilworth Avenue is a major commuter route between Washington, DC and its Maryland suburbs.

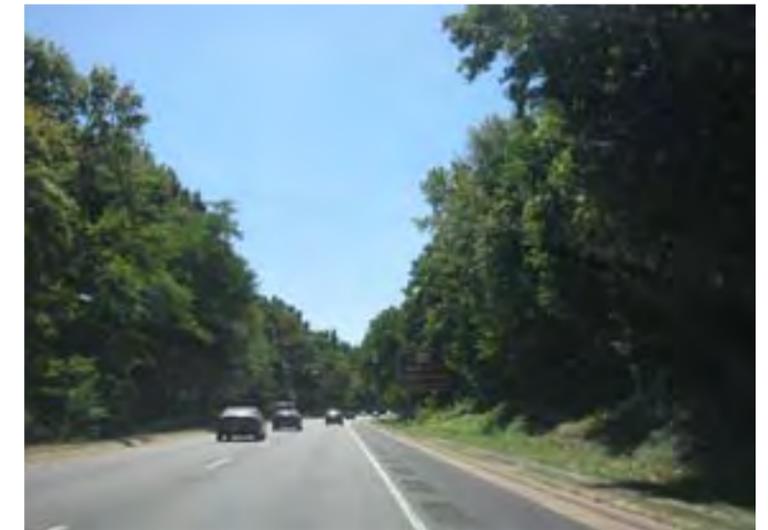


Photo 3: Kenilworth Avenue is an extension of the BW Parkway, a designated scenic byway in Maryland.



Photo 4: Eastern Avenue serves as the DC-Maryland boundary and provides the northern gateway into the District along Kenilworth Avenue.

2.2 Local Context

2.2.1 Environmental Features

The Kenilworth Avenue Corridor is part of the urban system that affects the health of the Anacostia River watershed.

The study area includes several wetland areas adjacent to the roadway, especially in the vicinity of Eastern Avenue, that will influence future changes along the corridor.

The corridor is somewhat aligned parallel to the Anacostia River and below the Anacostia Hills, that provide a sense of orientation to commuters.

Anacostia River Watershed

The watershed covers approximately 176 square miles within Maryland and Washington, DC. The Anacostia River is a tributary of the Potomac River, which flows into the Chesapeake Bay approximately 108 miles downstream from the study area.

The watershed has been altered considerably through the years, mainly due to agriculture and urbanization. The Nacotchtank Indians, a semi-agricultural tribe, settled in the juncture of the Potomac and Anacostia rivers in what is now Washington, DC. From the first European settlement to the Civil War, the Anacostia watershed was progressively deforested for agricultural uses (i.e., tobacco, corn and cotton). Continuous, heavy agriculture caused soil erosion and sedimentation, which led to the creation of “mud flats” that interfered with natural hydrology and shipping.

Today, 70-percent of the Anacostia watershed is urbanized. It is the most densely populated sub-watershed in the Chesapeake Bay regional watershed. Water quality in the watershed is severely degraded due to stormwater pollution from point and non-point sources in Montgomery and Prince George’s Counties, as well as the combined sewer system in Washington, DC that overflows into the river during heavy rains.

Water quality in the District of Columbia is monitored by the Water Quality Division of the Department of Health, Environmental

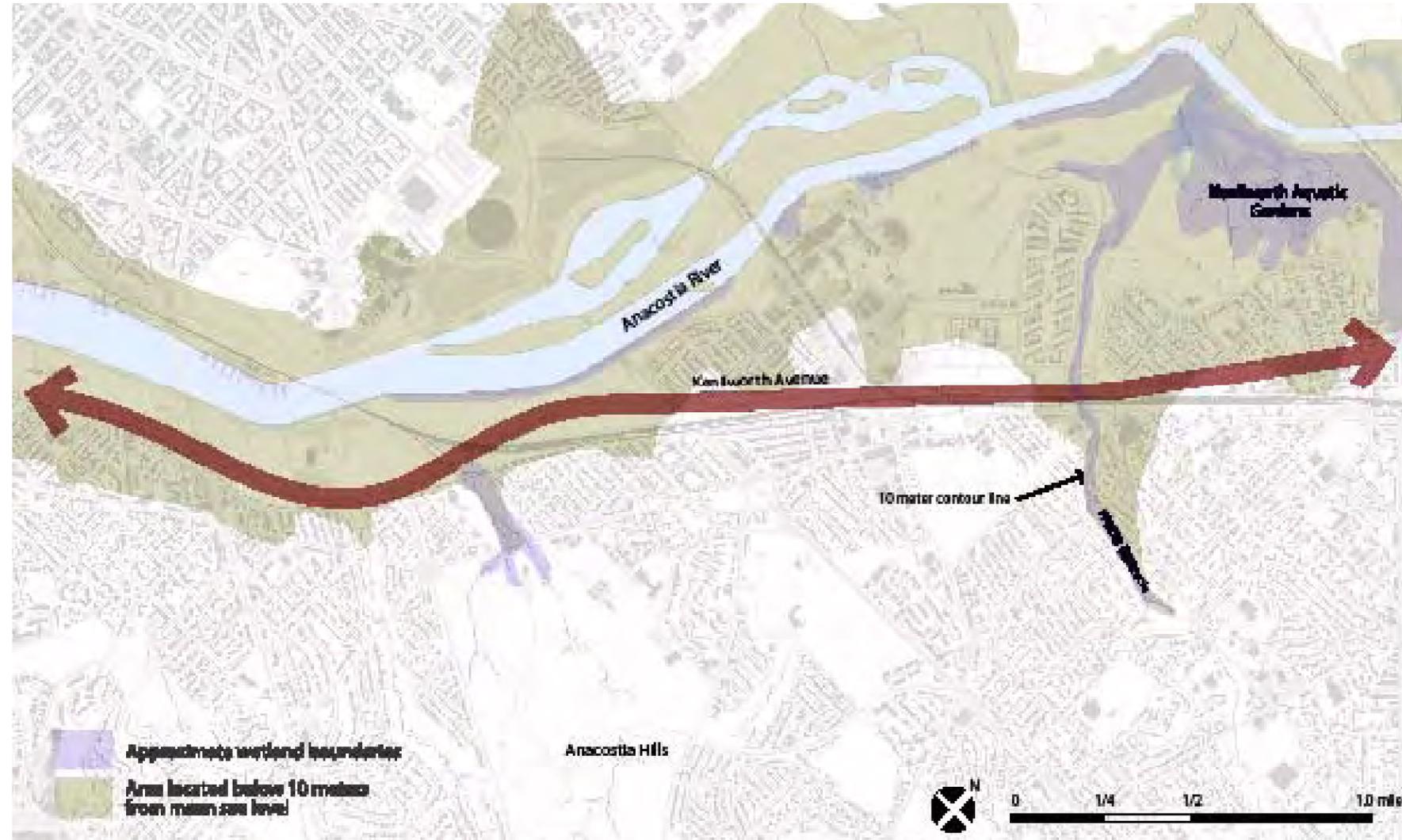


Figure 2.2: Environmental features adjacent to Kenilworth Avenue.

Health Administration, and is reported to the US Environmental Protection Agency and Congress every two years. According to recent reports for the District of Columbia, the water quality of the Potomac and Anacostia Rivers is not deemed safe for primary contact recreation (i.e., swimming) or for human consumption of fish or shellfish.

The Chesapeake Bay Agreement and the Anacostia Waterfront Initiative are two legislative efforts aimed at making the watershed safe for aquatic life and human activity.

Wetlands

The DC Department of Health has identified 13 wetland areas within the Kenilworth Avenue Corridor. Most of these areas are concentrated along the eastern banks of the Anacostia River, and include the Kenilworth Aquatic Gardens and Beaverdam Creek. Several wetland areas are also located along the Watts Branch within Watts Branch Park, and within Fort Dupont Park (see Figure 2.2).

Topography

Kenilworth Avenue is located within the Anacostia River valley between the river and the Anacostia Hills. To the east, the neighborhoods slope up from the corridor, while to the west, the land generally falls away towards the river. This difference in elevation helps to provide a sense of orientation along the corridor and contributes to a scenic quality that offers views of the Anacostia Hills, the Anacostia River, and portions of Washington, DC to the west of the river.



Photos 5 and 6: The Anacostia River Watershed includes urbanized areas (such as Kenilworth Avenue and adjacent built areas) and open space.

2.2.2 Land Use

There are 12 adjacent neighborhoods served by Kenilworth Avenue. These neighborhoods consist primarily of low-density residences.

Other uses include neighborhood-serving retail and a regional commercial center located at the intersection of Benning Road and Minnesota Avenue. A PEPCO plant is one notable industrial use within the study area.

Open space, consisting of District and Federal parks, is a dominant land use adjacent to the Kenilworth Avenue Corridor.

The area has a predominantly African-American population, and is generally economically mixed.

The area has seen development since pre-colonial times and includes several properties listed on the National Register of Historic Places.

Planning policies, including the Comprehensive Plan and District Zoning, foresee the study area land uses to predominantly remain similar to existing conditions. The significant land use changes anticipated would be higher-density nodes adjacent to the two Metrorail Stations: Minnesota Avenue and Deanwood. Therefore, no substantial changes to the traffic volumes are anticipated from the adjacent neighborhoods.

Neighborhoods

Sources used to identify the neighborhood characteristic within the study area include the District of Columbia Existing and Generalized Land Use Maps (Office of Planning, 2005), 1998 and 1999 Comprehensive Plan Update, District of Columbia Strategic Neighborhood Action Plans (DC Office of Planning, 2003), and *A Vision for Growing an Inclusive City – A Framework Plan for the Washington, DC Comprehensive Plan* (Office of Planning 2004). In addition, site visits to the various neighborhoods were conducted to better understand neighborhood characteristics.

The study area includes 12 neighborhoods. Eleven of these neighborhoods are located in Ward 7 (Dupont Park, Twinning, Greenway, Fort Dupont, River Terrace, Benning, Central Northeast, Mayfair, Eastland Garden and Deanwood). The remaining neighborhood,

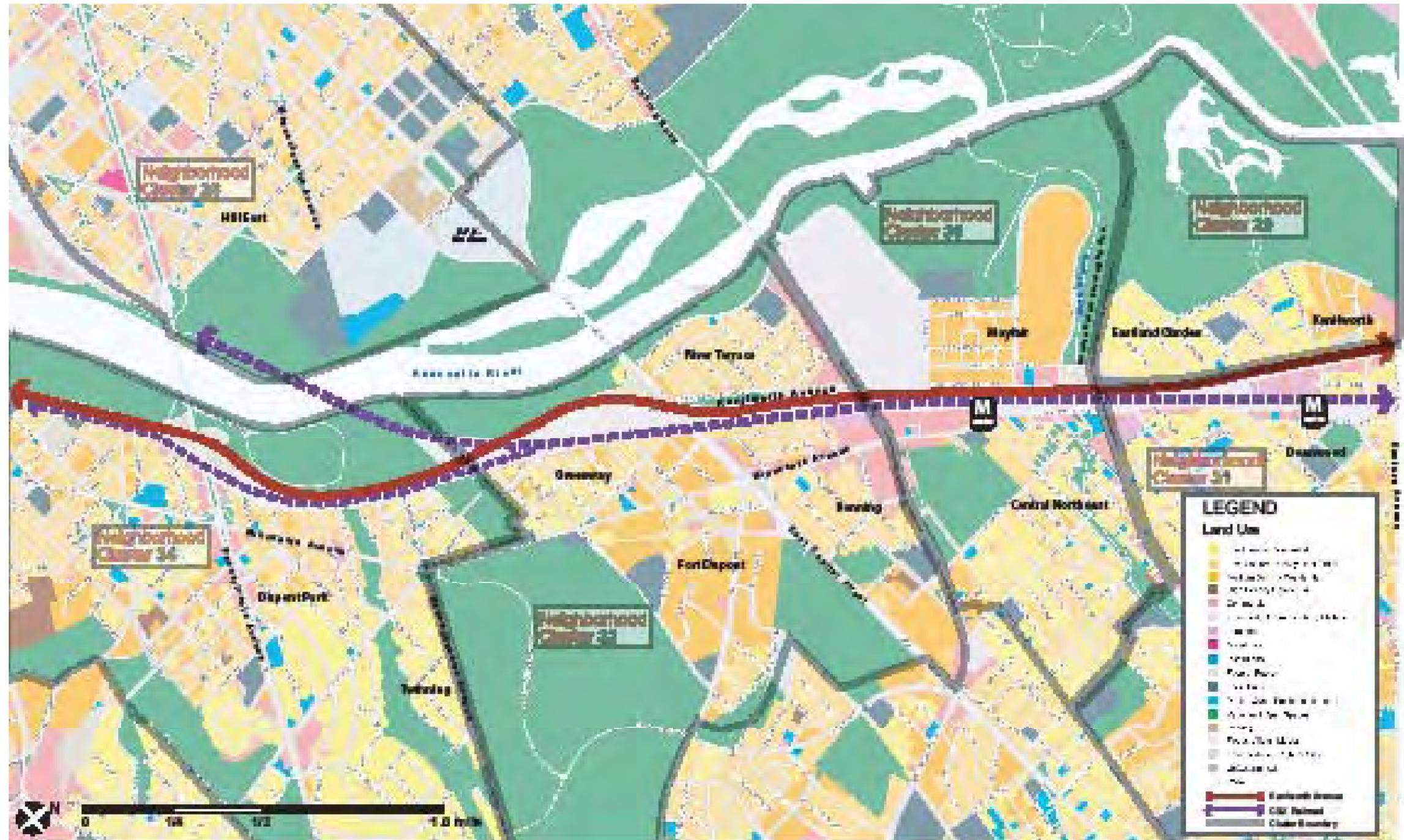


Figure 2.3: Generalized Land Use within the Study Area (Source: DCOP)

Hill East, is in Ward 6 (see Figure 2.3). These neighborhoods are covered under six neighborhood clusters as identified by the Office of Planning.

These neighborhoods predominantly consist of low-density residential uses including single- and multi-family homes (see Photo 7). The Kenilworth Avenue roadway is generally separated from the adjacent neighborhoods

by either the CSX Railroad tracks, Metrorail tracks, or service roads that run adjacent to the mainline.

Commercial and Industrial uses

The area includes neighborhood-serving commercial uses and one regional commercial center. Retail uses are spread throughout the area. The regional commercial center is located at the intersection of Benning Road and Minnesota Avenue. The one notable

Cluster	Low/Moderate Density Residential	Commercial	Commercial/Light Manufacturing	Industrial	Federal
Cluster 26 (Includes Hill East)	70%	9%	5%	-	16%
Cluster 29 (Includes Eastland Gardens and Kenilworth)	33%	-	-	-	67%
Cluster 30 (Includes Mavfair and Central Northeast)	40%	10%	13%	4%	33%
Cluster 31 (Includes Deanwood)	88%	5%	7%	-	-
Cluster 32 (Includes Benning, Fort Dupont, Greenway and River Terrace)	43%	4%	5%	-	48%
Cluster 34 (Includes Dupont Park, Fairlawn, Fort Davis, Penn Branch, Randle Highlands, Twinning)	67%	4%	1%	-	28%

Map study area (Source: DCPL 2007).



Photo 7: Single-family residences within the study area

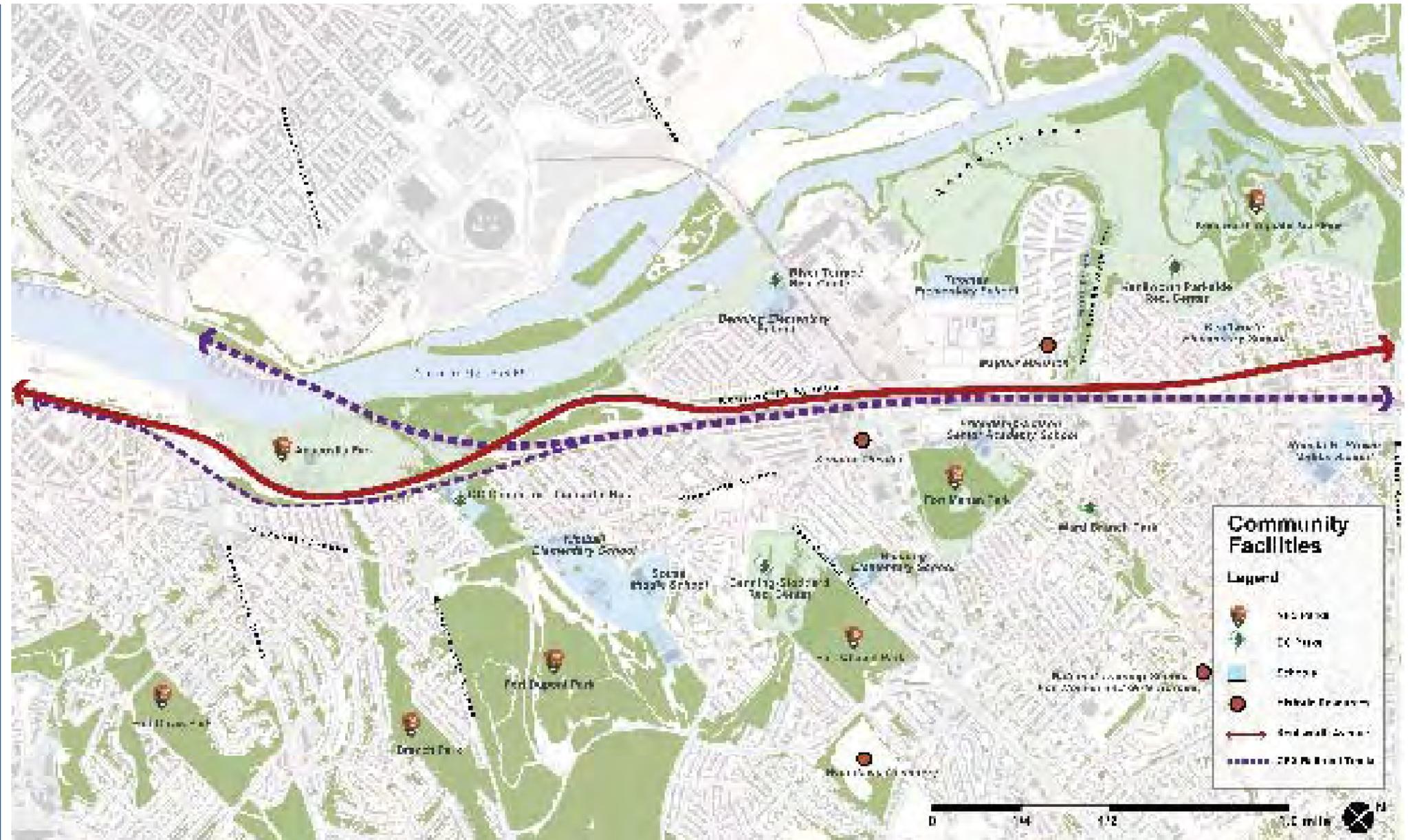


Figure 2.4: Community Amenities and Attractions

industrial use within the study area is the PEPCO plant located northwest of the intersection of Kenilworth Avenue and Benning Road. A solid waste transfer station is located to the west of the PEPCO plant.

Transportation Facilities

In addition to Kenilworth Avenue, the dominant transportation land uses within the corridor are the CSX Railroad and Metrorail corridor. The CSX main line track alignment originates to the west of the study area. It crosses the Anacostia River north of Pennsylvania Avenue, traverses Anacostia Park and passes beneath Kenilworth Avenue just south of East Capitol Street at the Benning

Road Switching Yard. At that point, it turns northward and is aligned between Kenilworth Avenue to the west and the Minnesota and Deanwood Metrorail Stations to the east. A branch line, that originates at the Benning Road Switching Yard, runs southwards to the east of and parallel to Kenilworth Avenue.

Community Amenities Including Open Space

Neighborhood residents and visitors from the larger region have access to a number of community resources within the study area, including recreational resources such as parks, trails, recreation centers, and schools. These resources are located on either side of Kenilworth Avenue within the study area (Figure 2.4).

Open space is a significant land use in the study area. Among the 11 parks within the study area, six are Federally controlled (under the administration of the National Park Service) and the remaining are District properties. Parks such as Anacostia Park (including Kenilworth Aquatic Gardens) and Dupont Park are regional draws and attract visitors from adjacent neighborhoods as well as from the District, the region, and beyond. The Anacostia Park provides continuous open space along this segment of the Anacostia River. On the higher elevations of the Anacostia Hills, several Fort Circle parks, as well as District parks, provide a ribbon of linked open spaces.

Recreation centers, such as the River Terrace Recreation Center and the Benning-Stoddard Recreation Center, and schools, such as the Kenilworth Elementary School, primarily draw residents from the adjacent neighborhoods.

Connections between riverside and hillside open spaces are limited. For example, an urban stream, the Watts Branch, flows from the Anacostia Hills to the river and extends a 'green finger' across Kenilworth Avenue. The Watts Branch is a tributary of the Anacostia River and extends to the northeastern boundary of the District and beyond. Within the District, the stream is accompanied by a 1.5 mile trail within the Marvin Gaye Park. After years of neglect, the park is undergoing improvements aimed to re-establish it as an amenity for adjacent neighborhoods.

Several smaller streams to the east of Kenilworth Avenue and the CSX Railroad tracks have been channelized through culverts that discharge directly to the Anacostia River.

A proposed trail system, the Anacostia Riverwalk is proposed to improve connectivity to the various parks along the river.

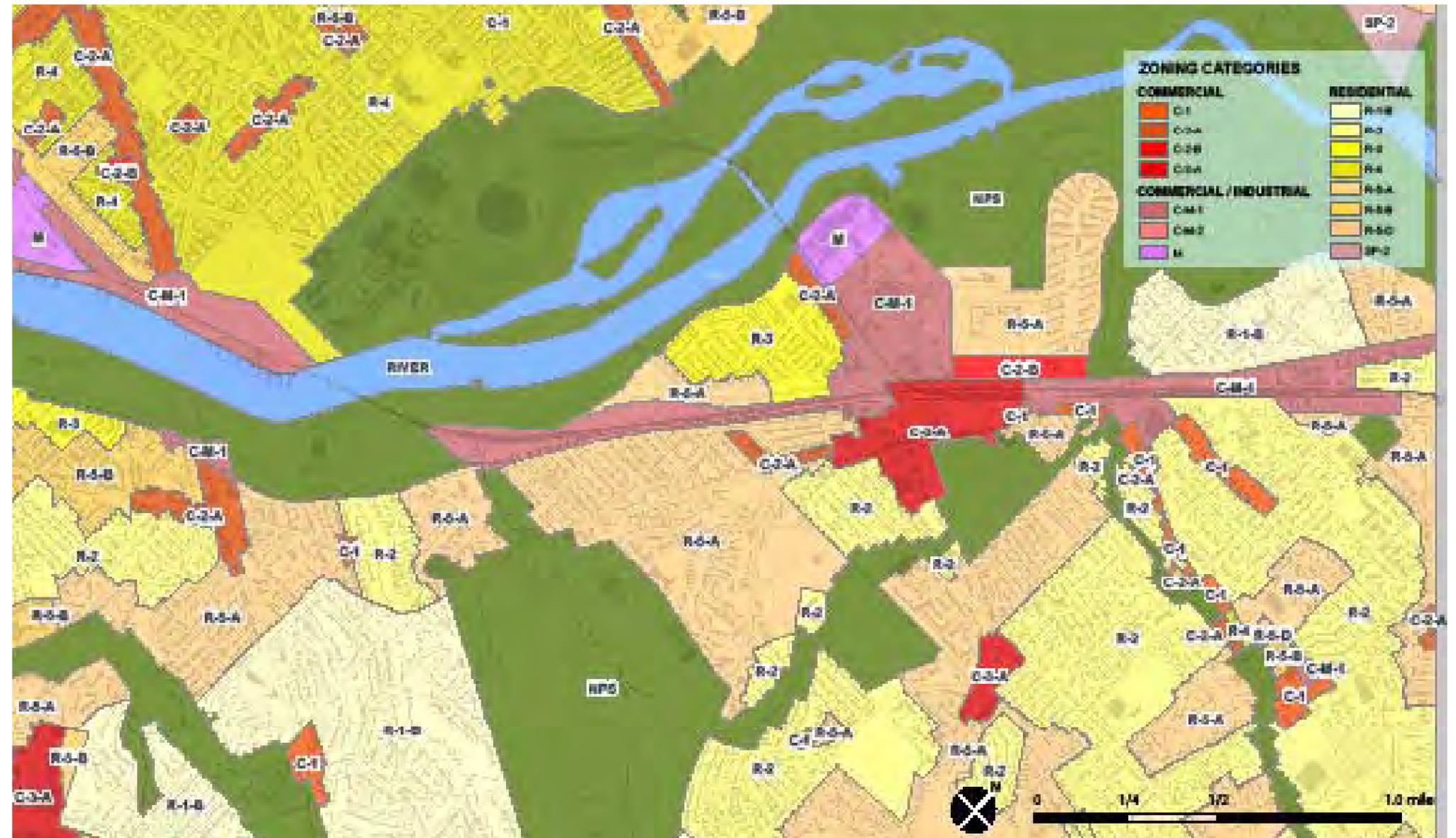


Figure 2.5: Existing Zoning

Comprehensive Plan

The Comprehensive Plan for the District was updated in 1998 and 1999 and is in the process of being updated again. An interim document that provides direction for the comprehensive plan amendments called, *A Vision for Growing an Inclusive City*, was recently developed by the District. Both the existing Comprehensive Plan and the Vision plan indicate that land uses along the Kenilworth Avenue will remain

largely similar to the current uses as described above, with a few exceptions.

Consistent with the recommendations of the Vision plan, a new high-density node is currently under development near the Minnesota Avenue Metrorail Station. This node includes a new government center that will house the headquarters of the DC Department of Employment Services, which is currently under construction to the south of the station. Another development (called

Parkside), that would include a mix of high-density offices and residences, is proposed in the Mayfair neighborhood across Kenilworth Avenue from the station.

Finally, the Vision plan recommends the area around the Deanwood Metro Station be redeveloped as a high-density transit-oriented neighborhood.

Zoning

Several zoning districts encompass the area adjacent to Kenilworth Avenue (see Figure 2.5). These include four residential zones (R-5-A, R-1-B, R-2, and R-3) and four commercial zones (C-M-1, C-3-A, C-2-B, and C-2-A). In addition, several large tracts of land are under Federal ownership and are not subject to Washington, DC's zoning regulations.

Each of the residential zones permits low-density housing, including single-family detached, semi-detached, rowhouses, flats and apartments with a maximum height of three stories (forty feet).

The commercial zones permit a variety of density and uses. The C-M-1 zone located in several areas along the corridor, including the Deanwood Metrorail Station, and the PEPCO plant, allows medium density bulk commercial and light manufacturing uses restricted to 40 feet in height.

The C-2-A zone, located along the intersection of Minnesota Avenue and East Capitol Street and portion of Benning Road, allows low-density retail, office and residential, up to the height of 50 feet. The C-3-A zone, concentrated near the intersection of Benning Road and Minnesota Avenue, allows a higher density and permits retail, office and residential uses up to a maximum height of 65 feet. The C-2-B zone, located adjacent to Kenilworth Avenue in the Mayfair neighborhood, allows medium-density development, including office, retail, housing, and mixed use up to a maximum height of 65 feet.

Generally, current land uses are consistent with the existing zoning within the study area.

Socioeconomic Profile Within the Clusters

The study area overlaps with six neighborhood clusters adjacent to Kenilworth Avenue (as shown in Figure 2.3 and Table 2.2). With the exception of Cluster 26, all of these clusters have a predominantly African-American population.

The study area is economically mixed. Median incomes in Cluster 26 and 29, which include Hill East, Eastland Gardens, and Kenilworth, are significantly higher compared to the entire city, whereas the median income in Clusters 30, 31, and 32, (Mayfair, Central Northeast, Deanwood, Benning, Fort Dupont, Greenway, and River Terrace) is significantly lower. Median income in Cluster 34 is comparable to the city as a whole.

	Population	% of District Population	Race (%)	Median Household Income	Owner Occupied Housing
District	572,059	100	African American = 60% White = 31% Hispanic = 0%	\$43,001	41%
Cluster 26 (Includes Hill East)	18,479	3.2	African American = 46% White = 49% Hispanic* = 3%	\$67,835	51.5%
Cluster 29 (Includes Eastland Gardens and Kenilworth)	2,343	0.4	African American = 98% White = 0% Hispanic = 0%	\$58,409	44%
Cluster 30 (Includes Mayfair and Central Northeast)	6,114	1.1	African American = 99% White = 1% Hispanic = 0%	\$24,022	44%
Cluster 31 (Includes Deanwood)	14,113	2.5	African American = 98% White = 1% Hispanic = 1%	\$28,729	46%
Cluster 32 (Includes Benning, Fort Dupont, Greenway and River Terrace)	12,319	2.2	African American = 97% White = 2% Hispanic = 0%	\$33,771	32%
Cluster 34 (Includes Dupont Park, Fairlawn, Fort Davis, Penn Branch, Randle Highlands, Twining)	14,587	2.5	African American = 96% White = 2% Hispanic = 1%	\$42,493	48%

Table 2.2: Socioeconomic profile of neighborhood Clusters that include the study area (Source: DCOP 2003).

The percentage of owner-occupied housing in Clusters 29 and 30 is in line with overall rates in Washington, DC. In Cluster 32, the percentage is significantly lower, while in Clusters 26, 31 and 34, it is greater.

Historic Features

A goal of the Anacostia Waterfront Transportation Architecture Design Standards is to emphasize the history and uniqueness of the Anacostia watershed area by implementing customized design standards within designated Special Areas, including the Kenilworth Avenue Corridor, and integrating public art in public works projects. The study area encompasses several historically significant resources that lend themselves to interpretation through customized signs and public art.

The earliest known residents along the Anacostia River were the Nacotchtank Indians. Their agricultural economy focused on flatlands along the Anacostia and Potomac Rivers. Subsequently, the area became a part of Maryland's Prince Georges County under a 1632 land grant from King Charles I to George Calvert, the first Lord Baltimore. The area, which was mainly rural, saw increasing development in the late 1800s, which accelerated in the early 1940s with the onset of World War II.

Three historic forts located within the study area were part of the defenses that surrounded Washington, DC during the Civil War. The fort system was built between 1861 and 1865 when Washington, DC functioned as a training ground, arsenal, supply depot, and center for the Union cause. The three forts

(within the study area), Fort Mahan, Fort Chaplin and Fort Dupont, currently serve as public parks (see Figure 2.4). These sites are listed on the National Register of Historic Places as well as on the DC Inventory of Historic Sites.

Following the Civil War, freed African-Americans began to move into the area and established DePriest Village (Capital View), Burrville, Bloomingdale, and Lincoln. Deanwood began as a conglomeration of three subdivisions: Whittingham, Lincoln (today known as Lincoln Heights), and Burrville.

By 1910, Deanwood had been developed into a stable neighborhood of blue- and white-collar African-American families in the building trades. They collaborated to increase employment with a focus on design, construction, and repair of houses. Deanwood's African-American community was also large enough to establish its own public school system beginning with Deanwood Elementary School and the National Training School for Women and Girls; the latter founded by Nannie Helen Burroughs in 1909. The National Training School offered academic classes, religious instruction, and training in domestic arts and vocations to young black women and girls. The original school building was replaced in 1926. The property, which today serves as the headquarters of the Progressive National Baptist Convention, and is listed on the National Register of Historic Places (see Figure 2.4).

Due to its distance from the city center, Deanwood remained a semi-rural area until after World War II. It was not until the 1950s that the city government provided vital infrastructure such as paved streets, sewers, and minimal sidewalks.

Benning Heights grew slowly (from 25 structures in 1927 to 50 in 1936) prior to the 1940s, after which it blossomed as a direct result of new government jobs created by World War II. Despite opposition, a low-income housing complex was built in the early 1940s at Ridge Road. Development continued in the form of single-family detached units in Garden Greenway, Central NE areas, and the Benning Road area.

DESIGNATED HISTORIC SITES WITHIN THE STUDY AREA

In addition to the sites already identified, the study area includes several properties that are listed on the National Register of Historic Places. These include Woodlawn Cemetery, a non-denominational, integrated burial ground established in 1895. It contains monuments to many notable African-Americans and re-interments from earlier cemeteries dating from 1798. The cemetery was listed on the DC Inventory of Historic Sites in 1991 and on the National Register of Historic Places in 1996.

Also listed on the National Register and the DC Inventory is the Mayfair Mansion Apartments, one of the city's earliest garden apartment complexes. The 500-unit apartment complex was constructed between 1942 and 1946 and reflected an early effort to provide a first class affordable housing complex for the District's African-American residents during an era of strict segregation and discrimination in the housing industry. As stated in the National Register Listing, "Mayfair Mansions was the first housing development for African-Americans that met Federal Housing Administration (FHA) construction standards and insurance underwriting criteria."

Howard University Professor of Architecture Albert I. Cassell purchased the former Benning Race Track in 1942 in order to build the colonial style project he conceived of and designed. It was listed on the DC Inventory of Historic Sites and the National Register of Historic Places in 1989.

The entrance pavilion of the Senator Theater, located on Minnesota Avenue and designed by noted theater architect John Jacob Zink, is listed on the DC Inventory of Historic Sites.

Listed on the National Register and the DC Inventory, the Kenilworth Aquatic Gardens, formerly known as the Shaw Lily Gardens, occupy 14 acres within the 1,200-acre Anacostia Park. The gardens have been under the management of the National Park Service since their transfer to public ownership in 1938.

2.3 Urban Design

The Kenilworth Avenue Corridor has an inconsistent edge within the study area that varies from an open and green setting south of East Capitol Street to a more urban character to the north.

Elements that can contribute to creating a parkway include the following:

- the variety of adjacent land uses, including buildings, rail corridors, and open space;
- the landscape treatment within the corridor, including lighting, signage, and planting;
- the amount of paved surface areas of the roadway, shoulders, and service lanes; and
- the architectural treatment of bridges, walls, and railings.

These are discussed in detail below.

2.3.1 Visual Experience of Motorists

Urban Character

Motorists traveling along Kenilworth Avenue experience a corridor that has a varied urban character and inconsistent land use edge. From a more open and green setting between Pennsylvania Avenue and East Capitol Street, the corridor transitions into a more urban character from East Capitol Street to Eastern Avenue (see Figure 2.6).

The urban character in the northern portion is further emphasized by the number of overhead structures that traverse Kenilworth Avenue. Between Benning Road and Eastern Avenue, a 1.5 mile-long segment, motorists pass under two vehicular bridges, two rail bridges, and four pedestrian bridges. Conversely, there are no overhead structures for the two mile distance between Pennsylvania Avenue and Benning Road (see Figure 2.9).

These overhead structures vary in design, their relationship with the roadway, and condition. Several of these structures are in need of repair or replacement and add to the visual clutter experienced by motorists.

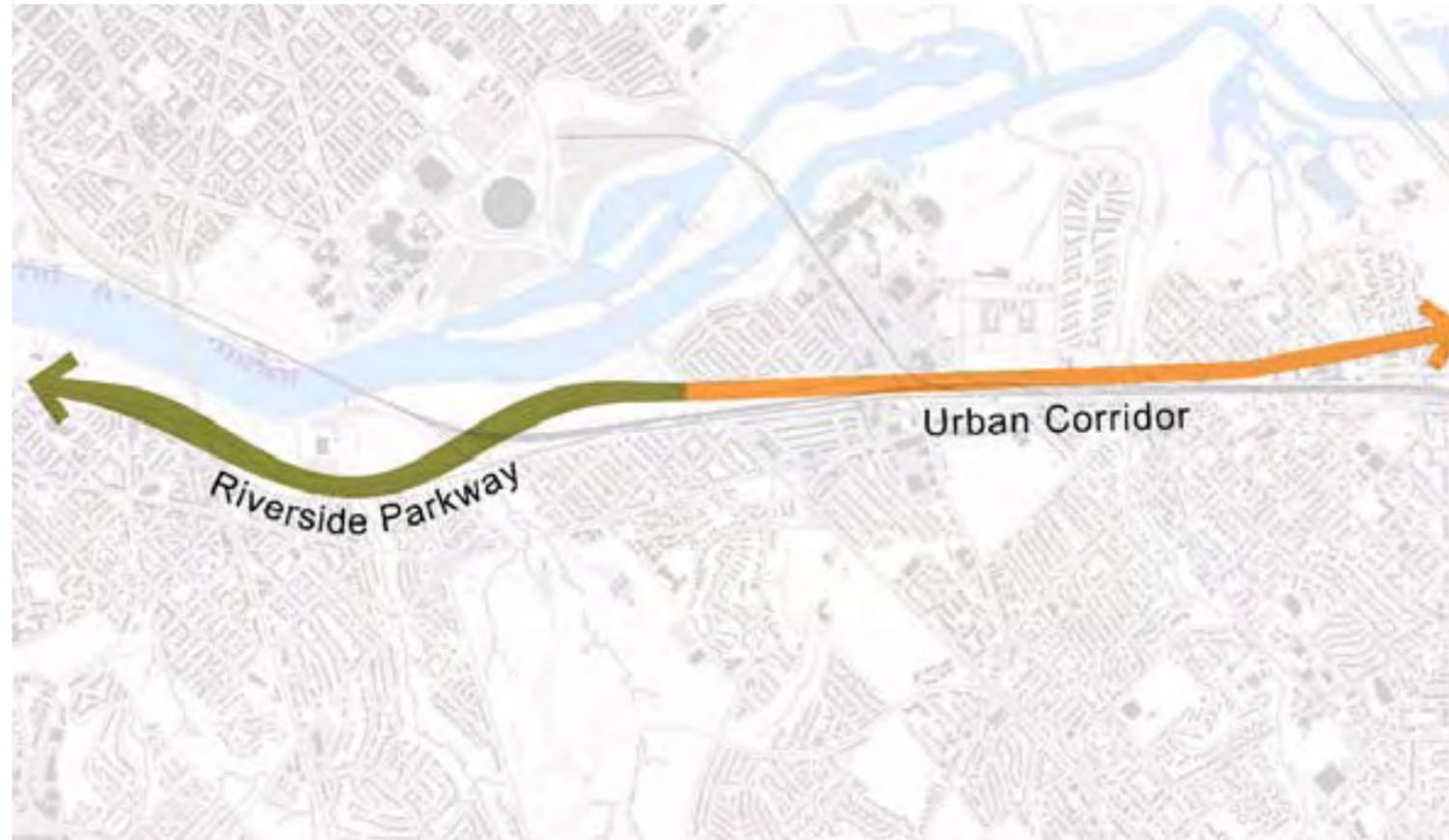
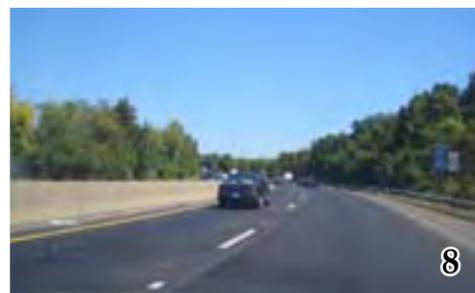


Figure 2.6: From an open and green setting to the south, Kenilworth Avenue transitions into a more urban character to the north of East Capitol Street.



Figure 2.7: Visual character along Kenilworth Avenue (see images below)



Northbound Kenilworth Avenue (Photos 8 to 11)



Southbound Kenilworth Avenue (Photos 12 to 15)



The neighborhoods adjacent to Kenilworth Avenue are mostly organized on an orthogonal grid of east-west and north-south streets (see Figure 2.8). This grid is consistent with the typical street pattern found throughout Washington, DC. The alignment of Kenilworth Avenue and the adjacent railroad corridors preceded the neighborhood streets and was based on existing natural resources (see Figure 2.9). The avenue is parallel to the Anacostia River, and is in an alignment that is roughly diagonal to the local street grid.

Landscape Character

Between Pennsylvania Avenue and East Capitol Street, Kenilworth Avenue's open space setting reflects the presence of the adjacent Anacostia Park and landscaped buffers along the CSX Railroad tracks. The avenue is flanked by large wooded areas, interspersed with open lawns used for recreation purposes along the river.

North of East Capitol Street, Kenilworth Avenue is paralleled by service roads with ramps that provide access to and from the avenue. Tapered medians incorporating planting areas are located between the avenue and the ramps. Additional planting areas are located at the outer edge of the ramps.

Existing vegetation includes occasional street trees and deciduous shade trees, as well as overgrown shrubs masses within open lawn areas. The groundcover is typically turf grass. Based on the condition of the planting and the presence of weedy areas, including invasive exotic species such as Tree-of-Heaven (*Ailanthus altissima*), the current level of landscape maintenance appears to be minimal.

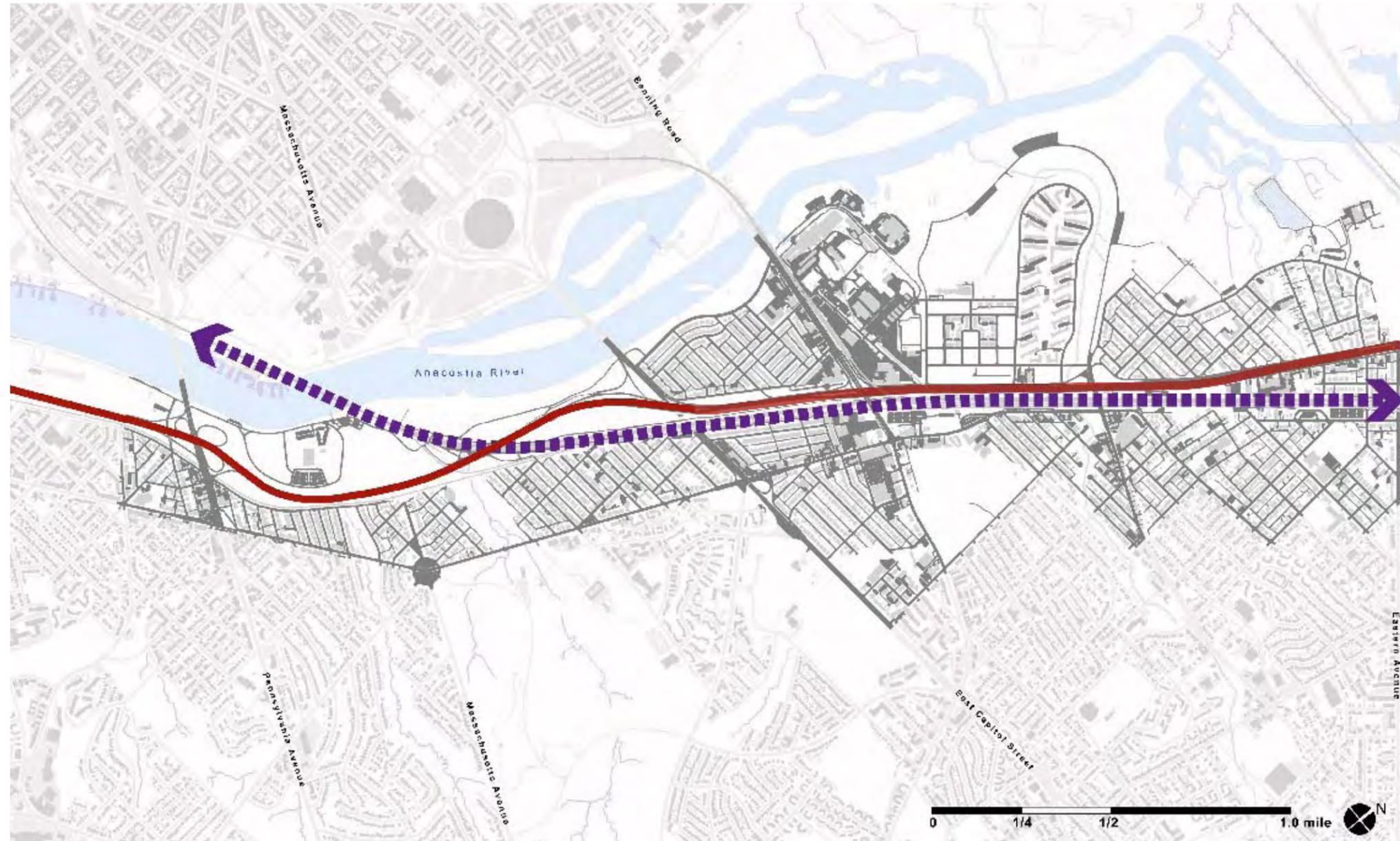


Figure 2.8: Kenilworth Avenue is in an alignment that is diagonal to the adjacent local street pattern.



Figure 2.9: Historic Roadway Alignments in the Area (1822, 1865 and 1885)

2.4 Overview of Pedestrian, Bicycle, and Vehicular Connectivity

Currently there are nine locations along the 3.5-mile long corridor where pedestrians, bicyclists and/or motorists can cross Kenilworth Avenue.

Access to Anacostia Park

Between Pennsylvania Avenue and East Capitol Street, nearly a 1.5-mile stretch, the only access across Kenilworth Avenue is an informal pedestrian underpass that connects the neighborhood of Fort Dupont Park and Twinning with Anacostia Park.

East Capitol Street

East Capitol Street is primarily a vehicular route that passes underneath Kenilworth Avenue and the CSX Railroad tracks (Figure 2.10). To the west, it passes adjacent to the River Terrace neighborhood and across the Anacostia River on the Whitney Young Memorial Bridge to connect to Capitol Hill and Washington, DC's Monumental Core. To the east, it passes through the Greenway, Fort Dupont, and Benning neighborhoods.

Currently, there is no pedestrian access across Kenilworth Avenue along East Capitol Street. East Capitol Street is one of the primary axial streets that extend outwards from the US Capitol Building, as specified by the L'Enfant Plan. The National Capital Planning Commission's Legacy Plan recommends strengthening East Capitol Street as a link between central Washington, DC and communities across the Anacostia River.

Benning Road

Benning Road crosses over Kenilworth Avenue and the CSX Railroad tracks. To the west, the road passes adjacent to the River Terrace neighborhood and extends across the Anacostia River to connect to downtown Washington, DC. To the east, the road intersects with Minnesota Avenue and extends beyond through the Benning and Central Northeast neighborhoods.

At Kenilworth Avenue, the Benning Road bridge provides access for two lanes of traffic in either direction along with a narrow

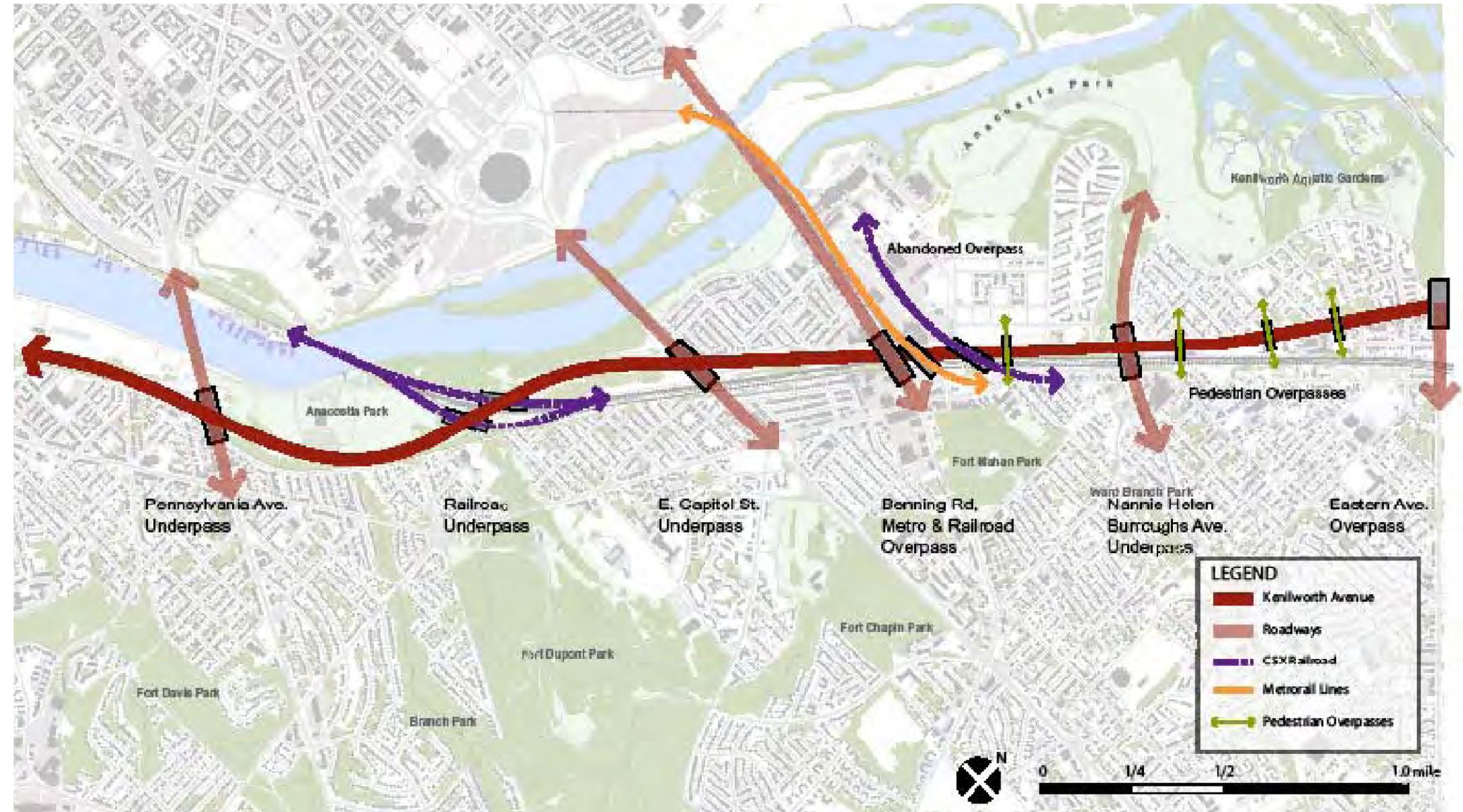


Figure 2.10: Kenilworth Avenue traverses four underpasses and eight overpasses.

sidewalk for pedestrians and bicyclists on the south side of the bridge.

Pedestrian Crossings

There are four pedestrian bridges that cross Kenilworth Avenue. These are located between Benning Road and Eastern Avenue. The bridges were built in the 1960s and show signs of wear and tear. In each case, pedestrians pass through a narrow structure that is enclosed by an overarching chain link fence. The bridges are best used during the daytime

since there are no lights on the bridge and approaches to allow night use.

Nannie Helen Burroughs Avenue

Nannie Helen Burroughs Avenue passes underneath Kenilworth Avenue and the adjacent CSX Railroad tracks. Access for pedestrians and bicyclists is constrained due to the narrowness of the underpasses. In addition, there is no night lighting or clear demarcation of pedestrian paths at street intersections to encourage walking. This

interchange is programmed for improvement and reconstruction in 2007.

Eastern Avenue

Eastern Avenue is a grade-separated crossing that allows pedestrians, bicyclists, and motorists to cross over Kenilworth Avenue. To the west, the street terminates at the Kenilworth Avenue southbound service road. To the east, it extends past the Deanwood neighborhood. The bridge is dominated by the roadway and provides two lanes for traffic in either direc-

tion, as well as U-turn lanes at the northern and southern end. There is no vegetation on the bridge and pedestrian paths, while demarcated with ladder crosswalk markings, terminate at median islands or are otherwise difficult to use. The primary limitation of the existing interchange is the poor and unsafe pedestrian environment and lack of landscaping and streetscape features. Pedestrians are forced to cross the corridor on a narrow concrete median that separates the turning

traffic on Eastern Avenue from the Kenilworth Avenue traffic using the U-turns.

2.5 Pedestrian and Bicycle Experience

Walking and bicycling are common forms of travel in the Kenilworth Avenue Corridor. Residents and visitors walk and bicycle for many reasons, including accessing transit, going to work and school, shopping, visiting friends, and exercising.

The fieldwork conducted for this study found that non-motorized trips were made in all of the neighborhoods surrounding Kenilworth Avenue. Particularly high volumes were observed in the commercial area on Minnesota Avenue between Benning Road and East Capitol Street and near the Minnesota Avenue Metrorail Station.

Many pedestrians also cross Kenilworth Avenue, CSX Railroad, and Metrorail lines to access the Minnesota Avenue and Deanwood Metrorail Stations. Bicyclists frequently ride along Benning Road because it is one of the few roads that cross the Anacostia River, CSX Railroad, and Kenilworth Avenue.

2.5.1 Pedestrian and Bicycle Counts

Pedestrian and bicycle counts and intercept surveys were collected during Fall 2004 to help quantify non-motorized travel in the Kenilworth Avenue Corridor. With the exception of a few intersection pedestrian counts taken by DDOT between 1999 and 2003, there was little existing documentation on the overall amount and patterns of non-motorized travel in the Corridor (see Appendix B for more detail).

The information gathered in the fall of 2004 was used to conduct an analysis and suggest recommendations for pedestrian and bicycle improvements at specific locations that have the greatest need for better non-motorized transportation facilities.

Pedestrians and bicyclists were counted manually at five locations in the Kenilworth Avenue Corridor (see Figure 2.11):

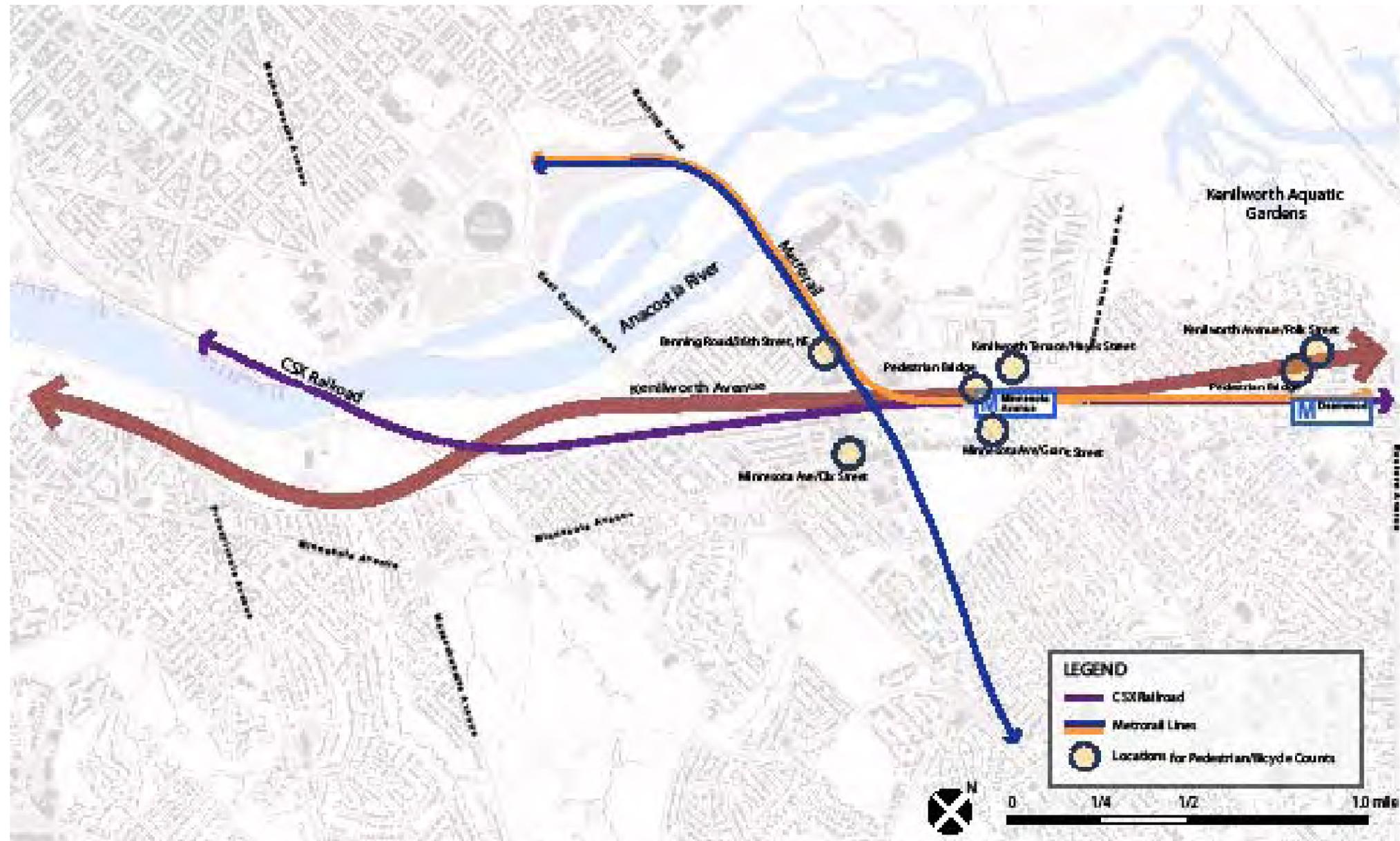


Figure 2.11: Location of Pedestrian and Bicycle Counts Conducted

- Minnesota Avenue and Dix Street, NE;
- Kenilworth Terrace and Hayes Street, NE;
- Minnesota Avenue and Grant Street, NE;
- Benning Road and 36th Street, NE; and
- Kenilworth Avenue and Polk Street, NE.

Counts were taken near two of the four pedestrian bridges over Kenilworth Avenue. Counts were not taken at the remaining two pedestrian bridges, at Lane Place and at Nash Street, because they were observed to have

minimal pedestrian activity during the field observation periods.

The data collectors counted a total of 6,675 pedestrians and bicyclists crossing the aforementioned intersections between October 20 and October 29, 2004. Observations were made for a total of 90 hours among the five sites. Considering nearby land uses, there

were consistently high pedestrian volumes at all of the count locations.

The greatest flows of pedestrians and bicyclists occurred at the intersection of Minnesota Avenue and Dix Street (92.5 pedestrians/bicyclists per hour, on average). This location is close to a major grocery store, small shoe and clothing stores, several restaurants, and several one- and two-story office buildings.

The next highest pedestrian and bicycle volumes were at the intersections of Minnesota Avenue and Grant Street and at the intersection of Kenilworth Terrace and Hayes Street (see photo 17). Both intersections are located close to the Minnesota Avenue Metrorail Station, the former immediately east and north of the Friendship-Edison Senior Academy School, and the latter west of the station and across Kenilworth Avenue.



Photo 16: Manual counts for pedestrian and bicycle activity were taken with the paid assistance of local Ward 7 residents.

Pedestrians and bicyclists can reach the station by crossing a pedestrian bridge over Kenilworth Avenue.

The Benning Road location is near a bus stop and several retail establishments. To reach this location, the 111 people counted at this site needed to cross the on- and off-access ramps to Kenilworth Avenue. This count is particularly high, given the uncomfortable pedestrian and bicycle conditions at this crossing due to the fast-moving traffic accessing Kenilworth Avenue. In spite of this, pedestrians and bicyclists must rely on the Benning Road bridge as it is the only connection across Kenilworth Avenue for the one-mile section between East Capitol Street and the pedestrian bridge at Hayes Street.

The intersection of Kenilworth Avenue and Polk Street is located at the east side of a pedestrian bridge that connects the Eastland Gardens neighborhood with the Deanwood Metrorail Station. Nearly all of the pedestrians and bicyclists at this location crossed the north and east sides of the intersection because they were traveling between the Deanwood Metrorail Station and the pedestrian bridge.

Peak-Hour Pedestrian and Bicycle Observations

It was observed that locations with the highest peak-hour counts corresponded generally with the locations with the highest overall pedestrian and bicycle flows. However, even



Photo 17: View of Minnesota Avenue at Grant Street; the Minnesota Avenue Metrorail Station is to the right.

in locations with fewer pedestrians, such as Kenilworth Avenue and Polk Street, approximately one pedestrian crossed the intersection per minute during weekday peak periods.

The highest numbers of pedestrians and bicyclists were observed between 8:00 AM and 9:00 AM at Minnesota Avenue and Grant Street, where many groups of students cross near the intersection on their way to school. It is also likely that students who are walking and biking after school helped bring counts to their highest levels between 3:00 PM and 4:00 PM at Minnesota Avenue and Dix Street and Kenilworth Avenue and Polk Street.

Fewer pedestrians and bicyclists were observed at Minnesota Avenue and Dix Street and Kenilworth Terrace and Hayes Street on Saturday than on the weekdays, but there were still between one and two people per minute crossing these intersections during the peak hour. Pedestrian and bicycle activity was highest during the last Saturday count period at the Minnesota Avenue and Dix Street and Benning Road and 36th Street intersections.

Age

People of all ages were observed walking and bicycling in the Kenilworth Avenue Corridor. Approximately 5% of the people crossing these streets were estimated to be under age 10 and approximately 6% were age 60 or older.

Though all ages were represented, teenagers (ages 10-19) were the most common group of pedestrians and bicyclists. This age group



Photo 18: Teenagers are the most common group of pedestrians and bicyclists identified in the corridor.

was especially common near the intersections of Kenilworth Terrace and Hayes Street and Kenilworth Avenue and Polk Street. Both of these intersections are on routes commonly used by students to go to and from school. Extra consideration should be given to pedestrian facilities and traffic calming near these intersections to provide these students with safe routes to school.

Packages and Assistive Devices

Nearly half (45%) of all pedestrians and bicyclists observed were carrying packages (backpacks, briefcases, groceries, bags of merchandise, etc.). Many of these people were school children, shoppers, and workers. This observation suggests that people who travel in the corridor are not only walking for exercise or to social activities, but that they rely on non-motorized transportation for their daily business activities and errands.

During the data collection periods, 115 people (approximately 2% of pedestrians) were noted as using a wheelchair, walker, cane, or other assistive device (see Photo 20). These observations show that pedestrians with disabilities are a component of the pedestrian traffic in the Kenilworth Avenue Corridor.

Bicyclists

Bicyclists were observed in different parts of the Kenilworth Avenue Corridor, but were especially common at the intersection of



Photo 19: Exit ramps on the west approach to the Benning Road bridge make a safe crossing for pedestrians difficult.



Photo 20: People of all abilities use the corridor.

Benning Road and 36th Street, where they represented 18% of the non-motorized traffic. This location was observed on a Saturday, which is a common day for recreational bike rides. The high count numbers show that Benning Road is a common route used by bicyclists to cross the Anacostia River, Kenilworth Avenue, and the CSX railroad tracks.

Bicyclists use this route despite the following conditions:

- high traffic volumes on Benning Road between 34th and 36th Streets;
- the need to cross on and off ramps to and from Kenilworth Avenue;

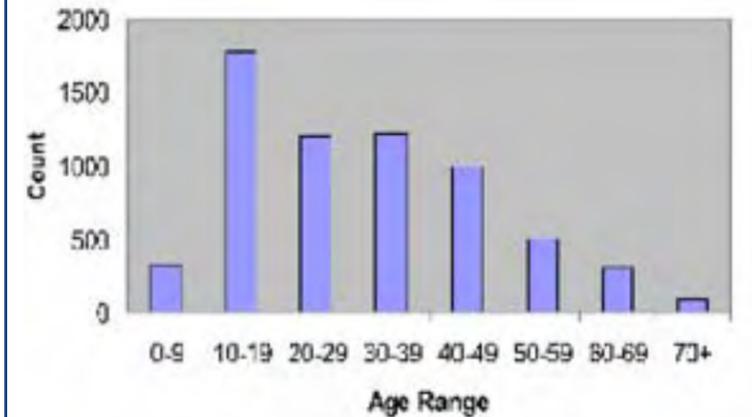


Table 2.3 Distribution by age of pedestrians and bicyclists surveyed



Photo 21: Benning Road bridge presents a narrow sidewalk and an unwelcome experience for pedestrians and bicyclists.

- narrow sidewalks and traffic lanes on the bridge; and
- large numbers of turning vehicles and multiple lanes at the intersection of Benning Road and Minnesota Avenue.

It is likely that bicycle volumes would increase in this corridor if conditions were more suitable for bicycling. Heavy traffic and large numbers of vehicles turning into side streets and driveways may also be keeping more bicyclists from using Minnesota Avenue. In order to improve conditions, bicycles should be given better separation from vehicles on the road and conflicts with turning vehicles should be reduced through intersection improvements. This will make it possible for more people to bicycle to reach key destinations on this roadway, such as Fort Dupont

Park, the Watts Branch Trail, the businesses and offices near Dix Street, and the Minnesota Avenue and Deanwood Metrorail Stations.

2.6 Existing Infrastructure and Traffic Conditions

2.6.1 Functional Classification and Importance

Kenilworth Avenue is classified as a freeway or expressway. Within the study area, it is a 3.5-mile long limited-access highway with entry to and from the main route generally restricted to five main interchanges.

South of Pennsylvania Avenue, Kenilworth Avenue becomes the Anacostia Freeway.

The five main interchanges that access Kenilworth Avenue within the study area are located at the following arterials:

- Pennsylvania Avenue
- East Capitol Street
- Benning Road
- Nannie Helen Burroughs Avenue
- Eastern Avenue

Anacostia Freeway extends southwards to the 11th Street Bridge and I-295. To the north, Kenilworth Avenue connects to the Baltimore-Washington Parkway and US. Route 50, both of which are limited access highways. Access to northbound Kenilworth Avenue in Maryland (MD 201) is also provided.

Together with the Anacostia Freeway, Kenilworth Avenue is known as DC 295 and is the only numbered route within the District of Columbia that is not an Interstate Highway or a US Highway. It is part of the National Highway System (NHS), a system of highways throughout the United States considered important to the nations' economy, defense and mobility. This highway is also a design-



Figure 2.12: Roadway Classification

nated E-Route, one of twenty-five corridors radiating from downtown Washington, DC that serve as emergency event/evacuation routes.

Throughout the study area, the posted speed limit is 45 mph. On the north end, the speed limit on the Baltimore-Washington Parkway is also 45 mph. On the south end, the Anacostia Freeway is posted for a speed limit of 50 mph.

Of the other major roads in the Study Area, Pennsylvania Avenue, East Capitol Street, and Benning Road are classified as Principal Arterials; Nannie Helen Burroughs Avenue, Eastern Avenue and Minnesota Avenue are classified as Minor Arterials. Massachusetts Avenue west of the proposed Reservation

13 development and east of Randle Circle is classified as a Collector.

Figure 2.12 shows the complete roadway network and corresponding functional classifications.

2.6.2 Description of Infrastructure

Within the study area, the roadway pavement conditions vary. Between Pennsylvania Avenue and East Capitol Street, motorists drive through a two-lane roadway with a paved shoulder and a wide median. North of East Capitol Street, motorists drive through a three-lane roadway, with a narrow median and limited or no shoulders. Parallel service roads north of East Capitol Street provide access to adjacent neighborhoods.

Within the study area, the roadway pavement conditions vary, affecting the motorists' visual and driving experience along the corridor.

Between Pennsylvania Avenue and East Capitol Street, motorists drive through a two-lane roadway, with a paved shoulder, and a wide median that separates traffic and reduces the amount of pavement visible to motorists. It is an open highway section with 12-foot travel lanes, a 4-foot left shoulder, and a 10-foot right shoulder. Northbound and southbound traffic are separated by a concrete barrier (see Photo 22). To the driver's right, beyond the shoulder, is typically a grass area protected by a steel rail barrier.

As the driver approaches the East Capitol Street interchange, however, there are locations with wide shoulders and excess pavement (see Photo 23). This additional pavement area was originally constructed to accommodate a future ramp from the Barney Circle Freeway and is no longer needed.

North of East Capitol Street, motorists drive through a three-lane roadway, with a narrow median. In addition, service lanes, merge areas, and breakdown lanes are located along one or either side of the corridor.

In this section, the roadway narrows into a closed roadway with concrete curb and gutter and 11-foot travel lanes. There are limited or



Photo 22: Typical cross-section of Kenilworth Avenue between Pennsylvania Avenue and East Capitol Street



Photo 23: Wide shoulder pavement near East Capitol Street originally built for additional roadway connections; those plans have long since been abandoned

Beginning at	Ending at	Right-of-Way Width	Number of Travel Lanes	Shoulders	Median Treatment
Pennsylvania Avenue	East Capitol Street	120 feet	4	4' left; 10' right	Barrier
E. Capitol Street	Benning Road	150 feet	6		Barrier
Benning Road	NHB Avenue	160 feet	6	None	Barrier
NHB Avenue	Eastern Avenue	190 feet	6	None	Barrier
Eastern Avenue	Maryland State Line	190 feet	7	None	Barrier

Table 2.4: Kenilworth Avenue Roadway Characteristics by Segments

no shoulders, and numerous slip ramps in sections where there are parallel service roads. There is also a concrete barrier median with fencing along the top to discourage pedestrian crossings (see Photo 24).

The parallel service roads north of East Capitol Street provide access to the residential communities on the east and west sides of Kenilworth Avenue (see Photo 25). Generally, the service roads are one lane one-way facilities; however, at several locations, the facilities function more as two lane roads in order to facilitate merging movements onto and off of Kenilworth Avenue. There is often little or no acceleration or deceleration distance provided for these slip ramps.

2.6.3 Roadway Lighting

There are three lighting conditions within the corridor: locations of adequate lighting; locations where existing lighting is inadequate; and, areas where there is no lighting.

AASHTO's *Informational Guide for Roadway Lighting* was referenced to determine lighting levels and uniformity of luminance along the corridor and at the interchanges within the study area. According to AASHTO, the average maintained horizontal illuminance should be in the range of 0.6 to 0.8 footcandles for both mainline portions of the roadway and all ramps.

A review of the lighting fixtures in the corridor was conducted to determine structure height, luminaire wattage, locations and lighting arm lengths (see Photo 26). Based on a review of these factors, there are three lighting conditions within the corridor:

- Locations of adequate lighting;



Photo 24: Typical slip ramp entrance between Nannie Helen Burroughs Avenue and Eastern Avenue



Photo 26: Typical median lighting throughout the Kenilworth Avenue Corridor

- Locations where lighting does not meet AASHTO's criteria and additional lighting may be required (see Photo 27); and
- Locations where there is no lighting.

2.6.4 Guide Signage

Many of the signs along the corridor are in poor condition.

There is a mix of guide signage in the corridor that includes bridge-mounted, overhead, and ground-mounted signs. Many of the signs are in poor condition and do not effectively communicate major exits within the corridor (see Photo 28).

The FHWA's Manual on Uniform Traffic Control Devices (MUTCD) prescribes the use of multiple advance signs within a corridor.



Photo 25: Typical cross-section of Kenilworth Avenue between Nannie Helen Burroughs Avenue and Eastern Avenue



Photo 27: Substandard lighting condition at Eastern Avenue overpass

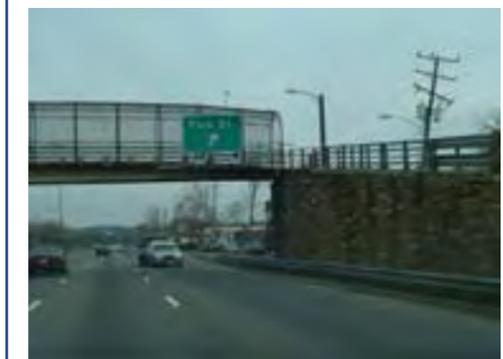


Photo 28: Polk Street guide signing illustrates substandard use of pedestrian bridge; also, motorist using this exit must follow a circuitous route to reach their destination

Along Kenilworth Avenue, there is often only one sign at any individual exit. It was also found that in some cases, supplemental signage has been added to overhead structures that do not meet MUTCD standards for distance legibility.

2.6.5 Operational Characteristics

Kenilworth Avenue serves as a major commuter route into Washington, DC with over 140,000 vehicles crossing the Maryland State Line at Eastern Avenue daily. At the southern limits of the study area, just under 110,000 vehicles per day (vpd) were measured immediately north of Pennsylvania Avenue. Between these two points, the majority of vehicles entering and leaving the corridor do so at East Capitol Street and Benning Road.

Generally, the configuration of these interchanges is designed to accommodate the demand; however, all five interchanges within the corridor provide varying degrees of access (see Figure 2.13).

Pennsylvania Avenue Interchange

Pennsylvania Avenue has been analyzed as part of the *Middle Anacostia Crossing Study*. It provides full interconnectivity between Pennsylvania Avenue and Kenilworth Avenue, except for one missing movement: there is no provision for southbound Kenilworth Avenue traffic to exit to westbound Pennsylvania Avenue. For the movements provided, all are free-flowing except for the eastbound Pennsylvania Avenue movement to northbound Kenilworth Avenue, which requires a left turn at a signalized intersection.

East Capitol Street Interchange

East Capitol Street is classified as a Principal Arterial; it extends from downtown Washington, DC eastward into Maryland. Within Maryland, the roadway continues as Maryland Route 214 that continues east to the Capitol Beltway (Interstate 495). The roadway is 48 feet wide, divided, with three travel lanes in each direction. The posted speed limit is 40 mph. The roadway is straight and forms the eastern axis with the US Capitol per the L'Enfant Plan.

In terms of traffic volumes, two primary movements occur at this interchange: south-

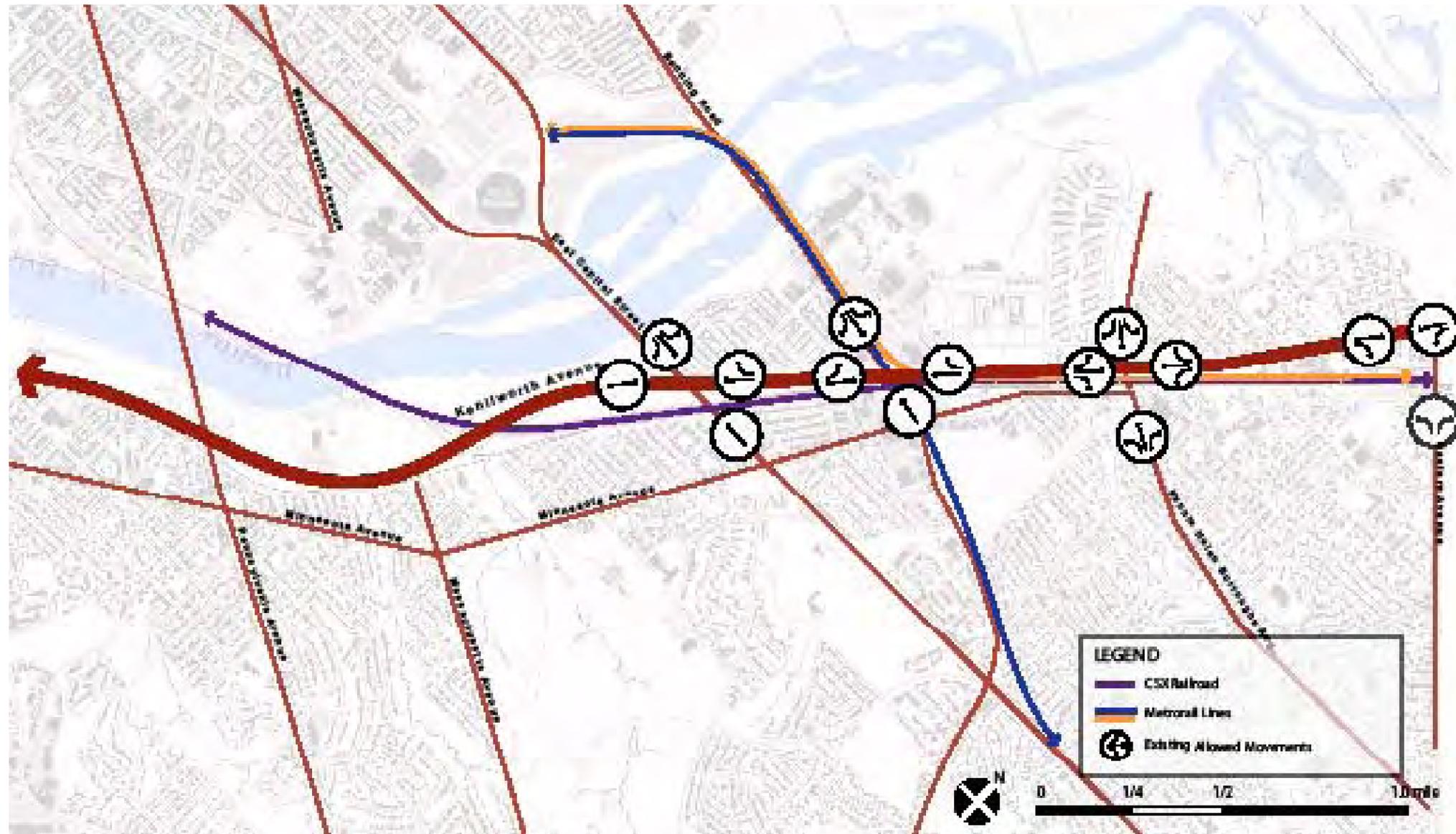


Figure 2.13: Existing Allowed Movements at Intersections along Kenilworth Avenue

bound Kenilworth Avenue to westbound East Capitol Street, and eastbound East Capitol Street to northbound Kenilworth Avenue (see Figure 2.13). To accommodate these movements, high-speed ramps are provided in both directions. These ramps are directly related to the significant change in cross-section that occurs in Kenilworth Avenue at this interchange as a southbound lane is dropped and northbound lane added to accommodate the ramp movements.

In addition to these two movements, through movement is provided in both directions on East Capitol Street. Eastbound East Capitol Street traffic may also exit southbound onto Kenilworth Avenue.

There are five missing movements at this interchange. Southbound traffic on Kenilworth Avenue cannot exit to eastbound East Capitol Street, northbound traffic cannot exit westbound or eastbound onto East Capitol Street, and westbound traffic on East

Capitol Street cannot exit either southbound or northbound onto Kenilworth Avenue.

Another significant aspect of this interchange is its overall geometric relationship to Kenilworth Avenue and the adjacent CSX Railroad tracks. This interchange was designed to accommodate the now abandoned Barney Circle Freeway, a proposed crossing of the Anacostia River that would have connected Kenilworth Avenue with the Southeast-Southwest Freeway (I-395). As a result, the horizontal alignment for

Kenilworth Avenue south of East Capitol Street lies further to the west than would otherwise be required, and there is excess land isolated between the existing alignment and the CSX Railroad and excess pavement on northbound Kenilworth Avenue.

As East Capitol Street passes beneath Kenilworth Avenue, the right-of-way narrows to a concrete canyon oriented to automobiles. This underpass extends beyond Minnesota Avenue.



Photo 29: Benning Road exit weaving section



Photo 30: Cross Section of Nannie Helen Burroughs Avenue under Kenilworth Avenue



Photo 31: Eastern Avenue above Kenilworth Avenue

Benning Road Interchange

Benning Road is a Principal Arterial highway that extends from northeast Washington, DC to East Capitol Street. It is part of the Great Streets Initiative. Benning Road traverses Kenilworth Avenue on a 68-foot wide bridge with two travel lanes in each direction. The bridge is high enough to provide adequate clearance not only for Kenilworth Avenue but also for the CSX Railroad to the east. The posted speed limit is 30 mph.

The interchange itself is a complex three-level facility, as southbound Kenilworth Avenue is depressed relative to northbound Kenilworth Avenue to permit an at-grade intersection with Benning Road. It is substandard in many respects. Movements are limited and those that do exist are unsafe.

For example, the exit and entrance ramps along northbound Kenilworth Avenue are on the left side. This allows vehicles on northbound Kenilworth Avenue to exit to westbound Benning Road and for eastbound traffic on Benning Road to exit to northbound Kenilworth Avenue. However, there are often conflicts between vehicles exiting Kenilworth Avenue and those entering from Benning Road due to limited acceleration and decelera-

tion distance and the requirement for them to cross paths in order to reach their desired lane (See Photo 29).

Southbound traffic on Kenilworth Avenue is able to exit to westbound Benning Road and also make use of a U-turn at the at-grade intersection to return to northbound Kenilworth Avenue. Eastbound traffic on Benning Road can exit to southbound Kenilworth Avenue or use the at-grade intersection to go northbound.

Four movements are missing at this interchange: southbound and northbound Kenilworth Avenue traffic cannot exit to eastbound Benning Road, and westbound Benning Road traffic cannot exit to northbound and southbound Kenilworth Avenue.

Nannie Helen Burroughs Avenue

Nannie Helen Burroughs Avenue is classified as a Minor Arterial. To the west, it connects to the main entrance of the Kenilworth Aquatic Gardens. To the east, it extends as far as Eastern Avenue. It is one of the designated streets in the Great Streets Initiative. The roadway is typically 44 feet wide, undivided, and generally provides two travel lanes in each direction.

At Kenilworth Avenue, Nannie Helen Burroughs Avenue is divided and the posted speed limit is 35 mph. At its intersection with Kenilworth Avenue, the roadway travels under the avenue and the adjacent CSX Railroad bridge. As a result, the cross-section for Nannie Helen Burroughs Avenue is narrow at this point (see Photo 30).

This interchange is scheduled to be reconstructed in 2007. It currently allows for full movement in all directions to and from Kenilworth Avenue and Nannie Helen Burroughs Avenue. The reconstruction will improve traffic safety and provide for better access through the interchange for pedestrians and bicyclists.

Eastern Avenue

Eastern Avenue is a Minor Arterial; it forms the northeastern boundary between Washington, DC and Maryland. Traveling west, Eastern Avenue terminates at the exit ramp to the southbound service road for Kenilworth Avenue. To the east, it extends as far as Southern Avenue, connecting to Martin Luther King, Jr. Highway (MD 704). The roadway is typically 40 feet wide, undivided, and it generally provides two travel lanes in

each direction. The posted speed limit is 30 mph.

A gateway portal to the District of Columbia, the Eastern Avenue interchange is the first impression many visitors have of the city as they drive southbound to Kenilworth Avenue from the Baltimore-Washington Parkway. Eastern Avenue provides important access to the Deanwood Metrorail Station, the Kenilworth Aquatic Gardens, and the Kenilworth, Eastland Gardens, and Deanwood neighborhoods. The interchange is three legged with no western leg; it provides all movements, including the ability for southbound and northbound traffic on Kenilworth Avenue to make a U-turn (see Photo 31). This is a particularly important function for southbound traffic, as it allows vehicles to return north onto an access road to an industrial park located in the northeast quadrant of the interchange.

The Eastern Avenue bridge was constructed in the 1950s. It is unattractive and, due to low clearance over Kenilworth Avenue, has been repeatedly struck by trucks and damaged.

2.6.6 Other Major Roadways in the Study Area

Massachusetts Avenue

Massachusetts Avenue is classified as a Collector; it traverses the study area in a generally east-west direction. The roadway is discontinuous at the Anacostia River, terminating at 17th Street, NE in Ward 6 and beginning again just west of Randle Circle in Ward 7. The roadway is 36 feet wide, generally undivided, and it provides two travel lanes in each direction. On-street parking is permitted in certain locations at selected times of the day. The posted speed limit is 30 mph.

Minnesota Avenue

Minnesota Avenue, a Minor Arterial, parallels Kenilworth Avenue to the east. The roadway is 40 feet wide, generally undivided, and it provides two travel lanes in each direction. Minnesota Avenue is discontinuous north of Nannie Helen Burroughs Avenue. The posted speed limit is 30 mph.

With the exception of East Capitol Street, Minnesota Avenue intersects all of the discussed roadways as an at-grade intersection. At East Capitol Street, however, Minnesota Avenue is grade separated on an overpass.

2.6.7 Traffic Counts

At the Maryland state line, Kenilworth Avenue carries over 140,000 vpd (see Figure 2.14). At the southern end of the corridor, just north of Pennsylvania Avenue, the volume is just under 110,000 vpd.

Of the four major arterial highways intersecting Kenilworth Avenue, the highest daily volumes were observed on the two main commuter routes, East Capitol Street and Benning Road.

The majority of traffic in the study corridor consists of passenger cars, followed by recreational vehicles and trucks. The daily vehicle composition is fairly consistent throughout the corridor.

The service roads experience a substantial increase in traffic volumes during the peak hours.

Vehicle Classifications

At each end of the corridor, vehicle classification data was collected over a 72-hour period. The classification data documents the mix of vehicles in the traffic stream including passenger cars, buses, and trucks (see Table 2.5).

When considering the 24-hour, three-day average, the majority of traffic in the study corridor consists of passenger cars (74% - 79% for the three-day average). See Table 2.5. Recreational vehicles (pickups, panels, vans, and other vehicles such as campers, and motor homes) make up approximately 15% of the traffic.

The combined volume and corresponding percentage of trucks (Classifications 5 through 13) range between 4.9% and 6.3%. Single unit



Figure 2.14: Average Daily Traffic Volumes on Major Roadways that connect to Kenilworth Avenue

Class	Type	South Portal (at Pennsylvania Avenue)		North Portal (at Eastern Avenue)	
		Northbound	Southbound	Northbound	Southbound
		1	MC	0.1%	0.1%
2	P	78.0%	79.8%	79.1%	74.1%
3	RV	15.2%	14.4%	14.8%	18.9%
4	Bus	1.0%	0.7%	1.2%	0.6%
5	SU (2)	2.6%	2.6%	2.7%	3.2%
6	SU (3)	0.6%	0.5%	0.4%	0.5%
7	SU (4)	0.1%	0.3%	0.0%	0.0%
8	WB (4)	1.2%	0.8%	0.9%	2.0%
9	WB (5)	0.6%	0.7%	0.6%	0.4%
10	WB (6)	0.2%	0.1%	0.1%	0.1%
11	WB (5)(2)	0.0%	0.0%	0.0%	0.0%
12	WB (6)(2)	0.1%	0.0%	0.0%	0.0%
13	WB (7)(2)	0.2%	0.1%	0.1%	0.1%
5-13	All Trucks	5.7%	5.0%	4.9%	6.3%

MC = Motorcycles
P = Passenger Cars
RV = Recreational Vehicle (pickups, panels, vans, and vehicles such as campers, and motor homes)
Bus = Buses
SU (X) = Single Unit Trucks (Number of Axles)
WB (X) = Wheel Base Trucks (Number of Axles)
WB (X) (X) = Wheel Base Trucks (Number of Axles)(Number of Trailers)

Table 2.5: 24-Hour Vehicle Classification Summary, Three-Day Average

Class	Type	South Portal (at Pennsylvania Avenue)				North Portal (at Eastern Avenue)			
		Northbound		Southbound		Northbound		Southbound	
		AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
1	MC	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
2	P	77.3%	76.2%	77.0%	80.8%	80.0%	82.1%	75.2%	77.2%
3	RV	17.7%	15.6%	16.5%	14.6%	14.7%	12.1%	16.9%	17.2%
4	Bus	0.5%	1.0%	0.7%	0.7%	0.9%	1.6%	0.8%	0.4%
5	SU (2)	2.4%	2.9%	3.1%	2.1%	2.8%	2.0%	3.5%	2.4%
6	SU (3)	0.7%	0.5%	0.6%	0.4%	0.3%	0.2%	0.4%	0.3%
7	SU (4)	0.1%	0.0%	0.3%	0.1%	0.0%	0.0%	0.0%	0.0%
8	WB (4)	0.8%	2.3%	0.8%	0.9%	0.7%	1.2%	2.5%	2.0%
9	WB (5)	0.4%	0.5%	0.7%	0.3%	0.5%	0.4%	0.6%	0.2%
10	WB (6)	0.1%	0.5%	0.1%	0.0%	0.1%	0.1%	0.1%	0.0%
11	WB (5)(2)	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
12	WB (6)(2)	0.0%	0.1%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%
13	WB (7)(2)	0.0%	0.4%	0.2%	0.0%	0.0%	0.1%	0.1%	0.1%
5-13	All Trucks	4.5%	7.2%	5.7%	3.8%	4.4%	4.1%	7.1%	5.1%

MC = Motorcycles
P = Passenger Cars
RV = Recreational Vehicle (pickups, panels, vans, and vehicles such as campers, and motor homes)
Bus = Buses
SU (X) = Single Unit Trucks (Number of Axles)
WB (X) = Wheel Base Trucks (Number of Axles)
WB (X) (X) = Wheel Base Trucks (Number of Axles)(Number of Trailers)

Table 2.6 - Peak-Hour Vehicle Classification Summary, Three-Day Average

trucks (delivery vans, dump trucks, concrete trucks, etc.) make up approximately 3% of the vehicle mix.

The remaining vehicles are tractor-trailer type trucks. The majority of the tractor-trailer trucks are single trailer vehicles and only a small percentage were multi-trailer trucks.

Table 2.6 summarizes the peak hour vehicle classification at the south and north portals of the corridor. The data is based on a three-day average.

- At Pennsylvania Avenue during the AM peak hour, more trucks exit than enter the corridor. At Pennsylvania Avenue during the PM peak hour, more enter than exit the corridor.
- At Eastern Avenue, during the AM and PM peak hours, more trucks enter the corridor than leave it.

The daily vehicle composition is fairly consistent throughout the corridor (Table 2.5). However, on a daily basis, the total volume of trucks decreases as one progresses through the corridor in either direction. For example,

in the northbound direction, 5.7 percent of the vehicles entering the corridor at Pennsylvania Avenue daily are trucks, while trucks make up only 4.9% of the vehicles exiting at Eastern Avenue. The majority of truck traffic also occurs during off-peak hours.

There is a substantial increase in traffic volumes along the service roads during



the peak hours. This can be attributed to commuters bypassing congestion or choosing to exit earlier because they perceive this to be safer. The locations of the slip ramps encourage commuter travelers to divert from Kenilworth Avenue onto the service roads when there is congestion.

2.6.8 Traffic Operations

Kenilworth Avenue operates at LOS F in the southbound direction during the AM peak hour. During the PM peak hour, the Avenue functions at LOS F between Pennsylvania Avenue and Benning Road, and LOS E between Benning Road and Eastern Avenue, in the northbound direction.

Capacity Analysis

A Level of Service (LOS) capacity study was conducted for Kenilworth Avenue. LOS describes the ability of a roadway or intersection to accommodate prevailing traffic volumes. There are six LOS ratings, ranging from A to F, with A representing the optimum operating conditions and F representing congestion (see Table 2.7).

The methodologies for measuring level of service vary depending on the type of facility under evaluation. For this study Kenilworth Avenue was divided into segments, including the following:

- Basic freeway segments of highway not influenced by ramp or weaving segments.
- Ramp segments including on-ramps (ramp merges) and off-ramps (ramp diverges).

Level of Service	Basic Freeway Segments (pc/mi/ln)	Merge and Diverge Areas (pc/mi/ln)	Weaving Areas (pc/mi/ln)	Signalized Intersections (sec/veh)	Unsignalized Intersections (sec/veh)
A	0 - 11	≤ 10	≤ 10	≤ 10	0 - 10
B	> 11 - 18	> 10 - 20	> 10 - 20	> 10 - 20	> 10 - 15
C	> 18 - 26	> 20 - 28	> 20 - 28	> 20 - 35	> 15 - 25
D	> 26 - 35	> 28 - 35	> 28 - 35	> 35 - 55	> 25 - 35
E	> 35 - 45	> 35	> 35 - 43	> 55 - 80	> 35 - 50
F	> 45	Exceeds Capacity	> 43	> 80	> 50

pc/mi/ln = Density in Passenger Cars per Mile per Lane
sec/veh = Delay in Seconds per Vehicle

Table 2.7: Level of Service Criteria

Freeway Segments	Northbound		Southbound	
	AM Peak	PM Peak	AM Peak	PM Peak
Pennsylvania Avenue to East Capitol Street	D	F	F	F
East Capitol Street to Benning Road	C	F	F	D
Benning Road to Nannie Helen Burroughs Avenue	C	E	F	D
Nannie Helen Burroughs Avenue to Eastern Avenue	C	E	F	D
Eastern Avenue to Maryland State Line	D	F	F	E

Table 2.8: Levels of Service for Freeway Segments Along Kenilworth Avenue

- Weaving segments created when two or more traffic streams cross in the same general direction.

Traffic operations along adjacent or intersecting arterial highways were analyzed with the signalized or unsignalized intersection methodologies in the HCM.

Analysis of Kenilworth Avenue

Level of Service for basic freeway segments along Kenilworth Avenue are shown in Table 2.8. Kenilworth Avenue operates at LOS F throughout the corridor during the AM peak hour in the southbound direction.

During the PM peak hour in the northbound direction, Kenilworth Avenue operates at LOS F between Pennsylvania Avenue and Benning

Road and north of Eastern Avenue. However, between Benning Road and Eastern Avenue, the roadway operates at LOS E.

Most of the north- and southbound ramp merges and diverges operate at LOS E or LOS F in the peak direction. Similarly, the peak direction weaving sections operate at LOS E or LOS F.

Synchro/SimTraffic Operations Model

Average speeds were observed across the corridor at various times and days. During the

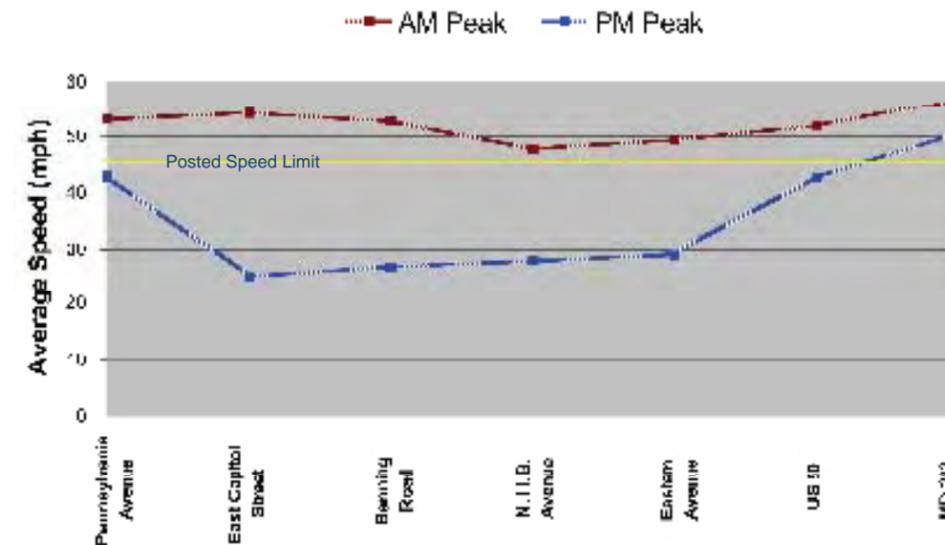


Figure 2.15: Average speed along northbound Kenilworth Avenue

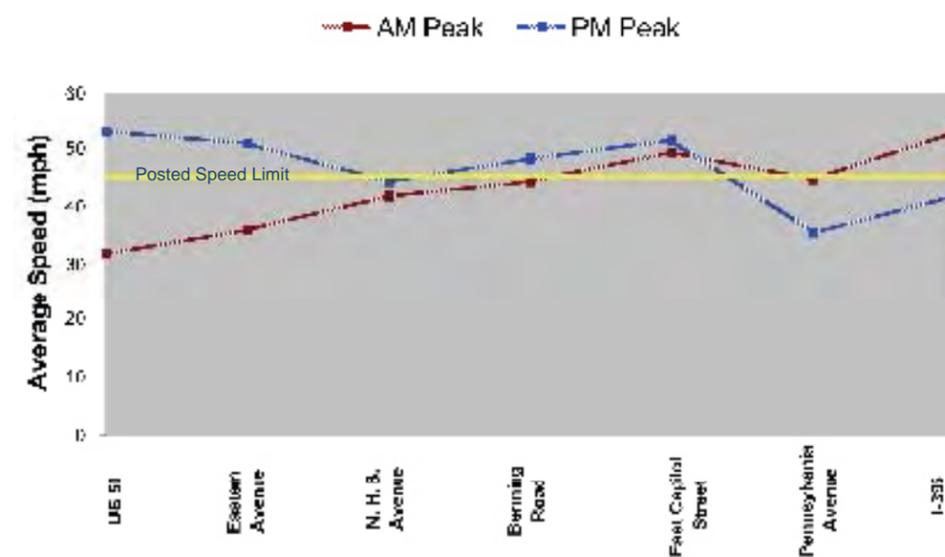


Figure 2.16: Average speed along southbound Kenilworth Avenue

AM peak hour, vehicle speeds are low at the northern end of the corridor and increase as vehicles travel south (see Figure 2.15). During the PM peak hour, vehicle speeds tended to decrease as vehicles traveled south to north (see Figure 2.16). Note that the posted speed limit (shown by the yellow line) is 45 miles per hour. Average speeds are high in the non-peak directions.

2.6.9 Traffic Safety

Crash data for Kenilworth Avenue and five signalized intersections were collected and analyzed for a three year period (2001 to 2003). Nearly 65% of crashes along the corridor occur between the Benning Road and Eastern Avenue interchanges.

Analysis of Kenilworth Avenue

For this study, Kenilworth Avenue crash data for the three most recently available years were reviewed. Over this period, 485 crashes occurred along the corridor :

- 129 crashes occurred in 2001;
- 141 crashes occurred in 2002; and
- 215 crashes occurred in 2003.

This represents a 67% increase in crashes between 2001 and 2003.

Crash rates are an effective tool for measuring safety hazards at a particular location, as they combine crash frequency with traffic volume. Crash rates are expressed in “crash per Million Vehicle Miles Traveled” (MVMT) for highway locations or “crash per Million Entering Vehicles” (MEV) for intersection locations.

The highest crash rates occur north of East Capitol Street, and particularly north of Benning Road. Figure 2.17 shows the distribution of crashes between the interchanges along Kenilworth Avenue.

Nearly 65% of the crashes occurred between Benning Road and Eastern Avenue. Crash locations remained relatively constant over the three year period.



Figure 2.17: Crash data for years 2001, 2002 and 2003, between Kenilworth Avenue interchanges and at five signalized intersections adjacent to the corridor.

Analysis of Intersections

During the three-year period, there were a total of 292 crashes at the five following signalized intersections:

- Benning Road and Minnesota Avenue (117);
- Benning Road and 34th Street (43);
- Nannie Helen Burroughs Avenue and Minnesota Avenue (51);
- Nannie Helen Burroughs Avenue and Kenilworth Avenue (28);
- Eastern Avenue and Kenilworth Avenue service road (53);

Intersection	No. of Crashes				Percent of Total Crashes Involving Injury	Most Common Types of Crashes	Times Most Crashes Occur	Days Most Crashes Occur
	Year 2001	Year 2002	Year 2003	Total				
Benning Road and Minnesota Avenue	53	36	28	117	60%	rear-end side swiped left turn hit vehicle head on	6:30 PM and 7:30 AM 8% in AM peak hour 26% in the PM peak hour	Weekdays
Benning Road and 34th Street	18	10	15	43	60%	rear-end side swiped	6:30 PM and 7:30 AM 12% in AM peak hour 23% in PM peak hour	Weekdays
Nannie Helen Burroughs Avenue and Minnesota Avenue	15	18	18	51	84%	rear-end right angle left turn hit vehicle	6:30 PM and 7:30 AM 9% in the AM peak hour 12% in the PM peak hour.	Weekdays
Nannie Helen Burroughs Avenue and Kenilworth Avenue	7	15	6	28	46%	rear-end right angle side swiped	6:30 PM and 7:30 AM 11% in the AM peak hour 18% in the PM peak hour.	Weekdays
Eastern Avenue and Kenilworth Avenue service road	23	13	17	53	42%	rear-end side swiped	6:30 PM and 7:30 AM 10% in the AM peak hour 13% in the PM peak hour 20% between 1:30 and 4:00 PM	Weekends

Table 2.9: Summary of Intersection Crash Data

- Nannie Helen Burroughs Avenue and Kenilworth Avenue (28); and
- Eastern Avenue and Kenilworth Avenue service road (53).

A review of the crash data is summarized in Table 2.9.

2.7 Transit Service

There appear to be few transit deficiencies in the vicinity of the Kenilworth Avenue Corridor Study Area. Excellent neighborhood-based collector routes are in place, serving as feeder/distributor functions to Metrorail stations, including Deanwood, Minnesota Avenue, and Benning Road.

Residents of some neighborhoods such as Central Northeast, that lies between Nannie Helen Burroughs Avenue and Benning Road/Central Avenue, must walk about 0.4 mile to one of the above roads to access transit service. Transit service on these roads is quite frequent with 10 minute peak headways on Route U8. In addition, the Benning Road Metrorail Station on the Blue Line serves the neighborhood. Also, some residents of the western-most portions of the neighborhood between Minnesota Avenue and Anacostia Park, south of East Capitol Street may experience three or four block walks to reach transit routes on Minnesota Avenue. All other neighborhoods are served by a bus route or Metrorail station within a 1/4 mile radius.

2.7.1 Metrorail

The Metrorail Orange Line extends from the New Carrollton Metrorail Station in Prince George's County, Maryland to the Vienna/Fairfax-GMU Metrorail Station in Fairfax County, Virginia. Within the study area, the Orange Line operates at-grade, parallel and adjacent to Kenilworth Avenue with stops at Deanwood Metrorail Station, which is near Eastern Avenue, and Minnesota Avenue Metrorail Station near Benning Road.

South of the Minnesota Avenue Metrorail Station, adjacent to Benning Road, the Orange



Photo 31: Deanwood Metrorail Station

Line is joined by the Blue Line before crossing the Anacostia River.

Deanwood Metrorail Station

The Deanwood Metrorail Station is located at ground level along the north side of Minnesota Avenue, NE, between 48th Street and Nash Street (see Photo 32). The station has two elevators and two escalators that connect the street, mezzanine and platform levels.

Minnesota Avenue Metrorail Station

The Minnesota Avenue Metrorail Station is located at ground level adjacent to the Amtrak Northeast Corridor right-of-way between Minnesota Avenue and Kenilworth Avenue. The entrance is at Grant Street, NE. The station has two elevators and two escalators which connect the street, mezzanine and platform levels.

2.7.2 Metrobus

Metrobus routes serve the Kenilworth Avenue Corridor mostly along arterial roads such as Minnesota Avenue, Benning Road, East Capitol Street, and Pennsylvania Avenue. A majority of this service is oriented toward downtown, mostly along Pennsylvania Avenue.

Some of the neighborhoods in the study area, such as Eastland Gardens and Dupont Park,

have limited access to the bus routes due to natural or man-made impediments, including Kenilworth Avenue, the CSX and Metrorail tracks, parks, or the Anacostia River.

Other neighborhoods, like Mayfair Parkside, Greenway and River Terrace, however, are well-served by buses: where many destinations can be reached without a transfer, those that cannot can usually be reached by connecting to Metrorail. The local network has excellent interconnectivity with the Metrorail system, making the entire region accessible by transit. Generally, there is good local collector/distributor feeder service in the vicinity of the corridor and adjoining neighborhoods.

2.7.3 Streetcar and Trolley Service

Though no BRT or streetcar route is in operation in DC or the region today, both are being considered as part of the *District of Columbia Transit Alternatives Analysis (DCAA)*. In addition to the Anacostia Streetcar line, proposed for southeast Washington, nine route alternatives, which could be streetcar or BRT routes but likely will start as Rapid Bus routes, are recommended by the DCAA. Five of these have direct impact on the Kenilworth Avenue Corridor.

The proposed Anacostia Streetcar starter-line will operate wholly on city streets from a



Photo 32: Metrobus transfer station at Minnesota Avenue Metrorail Station

southern terminus at Bolling Air Force Base near South Capitol Street and Firth Stirling Avenue to the Anacostia Metrorail Station.

Several extensions and segments of other routes operating in common alignment with the Anacostia Streetcar line are also under study. As part of the DCAA, the following routes, which would operate in the vicinity of the Kenilworth Avenue Corridor, are being studied and evaluated:

- Minnesota Avenue Metrorail Station to Bolling AFB
- Georgetown/Crosstown to Minnesota Avenue Metrorail Station
- Friendship Heights Metrorail Station via Georgetown/Crosstown to Minnesota Avenue Metrorail Station
- Georgetown/SW Waterfront to Minnesota Avenue Metrorail Station
- Friendship Heights Metrorail Station via Georgetown/SW Waterfront to Minnesota Avenue Metrorail Station

2.7.4 Bus Rapid Transit/Other Transit Plans

In addition to these routes, one Rapid Bus route is under study as part of the DCAA.

This route would operate between Forestville and Downtown. This rapid bus route would operate through the Kenilworth Avenue Corridor study area on Pennsylvania Avenue, SE, intersecting at Minnesota Avenue.

Alignments, station locations and modes have not yet been finalized. Future extension of the Anacostia Streetcar to Deanwood Metrorail Station could be implemented when the two discontinuous segments of Minnesota Avenue are connected. This would provide transit service along the Anacostia River corridor from Eastern Avenue to Bolling Air Force Base. Radial connections would be at Benning Road, East Capitol Street, and Pennsylvania Avenue within the Kenilworth Avenue Corridor study area, and Good Hope Road, Martin Luther King Jr. Avenue, the Anacostia Metrorail Station, and South Capitol Street beyond.

Such service would likely increase north-south mobility in the corridor, as well as provide opportunities for Transit-Oriented Development (TOD) at important transfer points and commercial centers. Continuous transit service in the Anacostia River corridor has not previously been provided; transit has been oriented radially to and from downtown. Improved transit service would likely reduce dependence on the automobile and alleviate congestion in the corridor.

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Options to Enhance the Corridor

How can Kenilworth Avenue be transformed to function better as a roadway and be an asset to the surrounding neighborhoods?

Sections 3.1, 3.2 and 3.3 of this chapter describes three options that were explored to address this question.

Section 3.4 discusses how each option would affect the transportation system in the corridor and recommends a preferred option. Section 3.5 provides more detailed discussion of the preferred option.

In addition, this chapter discusses two potential connections within the study area that are aimed to improve connectivity across the Anacostia River: a new crossing aligned with Massachusetts Avenue, and a new River Road. Several options that explore alternative connections for Massachusetts Avenue and River Road are discussed in Section 3.6.

Three Options to Enhance the Kenilworth Avenue Corridor



Example of a Boulevard



Example of a Four-Lane Limited Access Roadway



Example of Kenilworth Avenue Depressed

Option 1 Kenilworth Avenue as a Boulevard

This option explores transforming Kenilworth Avenue from a freeway to a Boulevard between East Capitol Street and Eastern Avenue. South of East Capitol Street, Kenilworth Avenue remains a freeway with enhancements to its appearance and infrastructure.

Option 2 Kenilworth Avenue as a Four-Lane, Limited Access Roadway

This option explores maintaining Kenilworth Avenue as a limited access roadway, but with a reduced footprint north of East Capitol Street: four lanes (two in each direction) versus the six existing lanes (three in each direction). South of East Capitol Street, Kenilworth Avenue remains a freeway with enhancements to its appearance and infrastructure.

Option 3 Kenilworth Avenue with Improved Infrastructure

This option explores maintaining Kenilworth Avenue as freeway with enhancements to safety conditions, infrastructure and its appearance. This option also explores depressing portions of the corridor to improve connectivity across the roadway and between neighborhoods.

Additional Studies to Enhance Connectivity Across the Anacostia River Areas



Illustration of Massachusetts Avenue Crossing



Example of Park Road

Massachusetts Avenue Crossing

Three options for a new Anacostia River crossing, aligned with Massachusetts Avenue, are explored:

- Vehicular bridge between Reservation 13 and Randle Circle,
- Pedestrian and bicycle bridge between waterfront parks, and
- Vehicular bridge between waterfront parks.

Park Road

Three connections that would link waterfront parks on both sides of the river are explored:

- Anacostia Avenue to Eastern Avenue,
- Benning Road to Barney Circle, and
- Park Road bridge connection at Massachusetts Avenue.

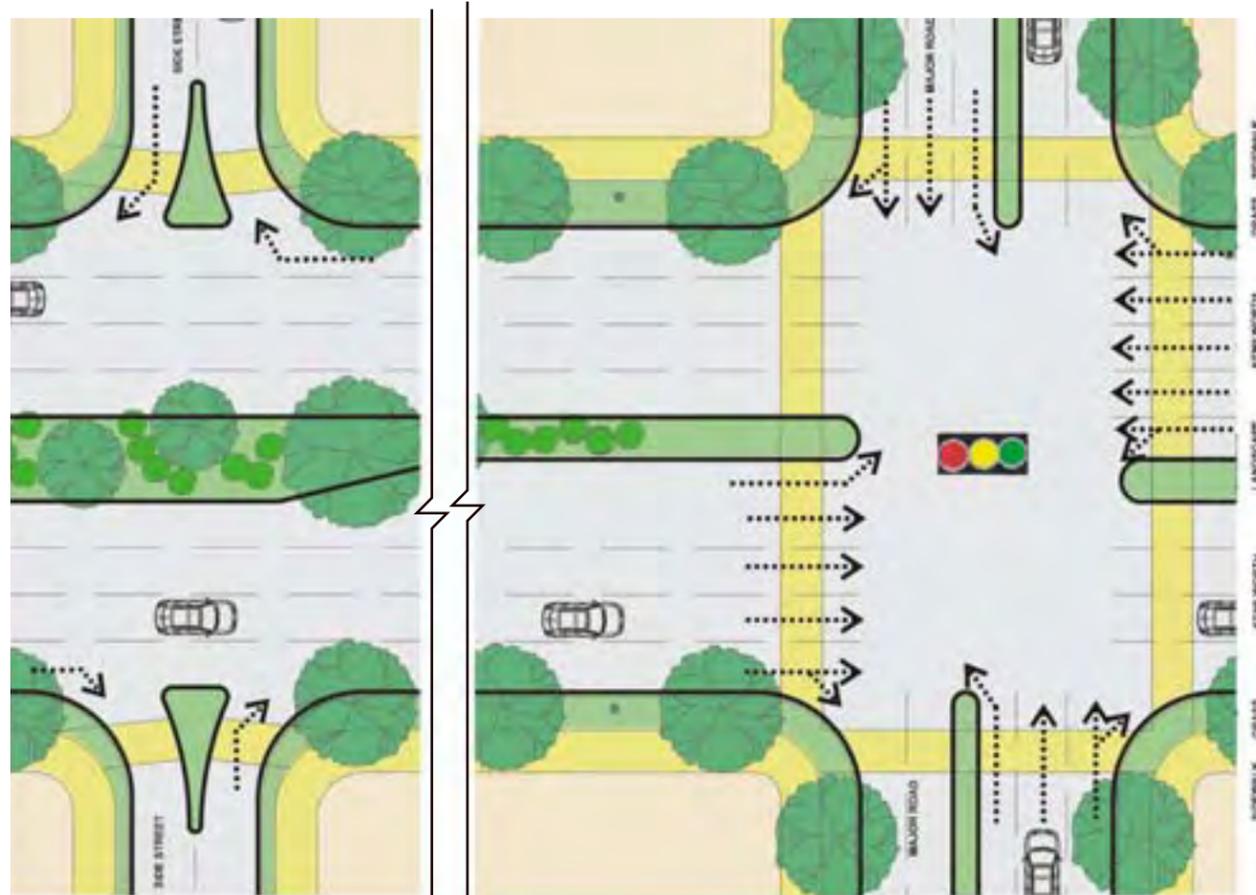


Figure 3.2: Typical Plan for a boulevard (tree-lined shoulders and median)

Existing Interchanges

The interchanges at East Capitol Street, Benning Road, Nannie Helen Burroughs Avenue and Eastern Avenue function as follows:

- East Capitol Street: Through-traffic on East Capitol Street remains below grade as it is today. A new signalized, at-grade intersection west of Kenilworth Avenue allows traffic on Kenilworth Avenue full access to East Capitol Street.
- Benning Road: At Benning Road, through traffic to Minnesota Avenue remains elevated over Kenilworth Avenue and the railroad as it is today. The existing bridges, however, are divided to allow an at-grade intersection with Kenilworth Avenue to be built between them, improving conditions for pedestrians and bicyclists.

- Nannie Helen Burroughs Avenue: At Nannie Helen Burroughs Avenue, a new signalized at-grade intersection replaces the existing bridge. Nannie Helen Burroughs Avenue remains grade-separated at the intersection with the CSX Railroad tracks.
- Eastern Avenue: At Eastern Avenue, a new signalized, at-grade intersection replaces the existing bridge. A potential new pedestrian path connects the intersection with Anacostia Avenue, improving access to the Kenilworth Aquatic Gardens.

New Intersection

A new signalized intersection is introduced either at Ord Street or Nash Street, connecting to Olive Street near the Deanwood Metrorail station.

Between these signalized intersections, additional intersections could occur right-in and right-out turns (see Figure 3.2). To turn left onto Kenilworth Avenue from a local street, a driver would use a signalized intersection.

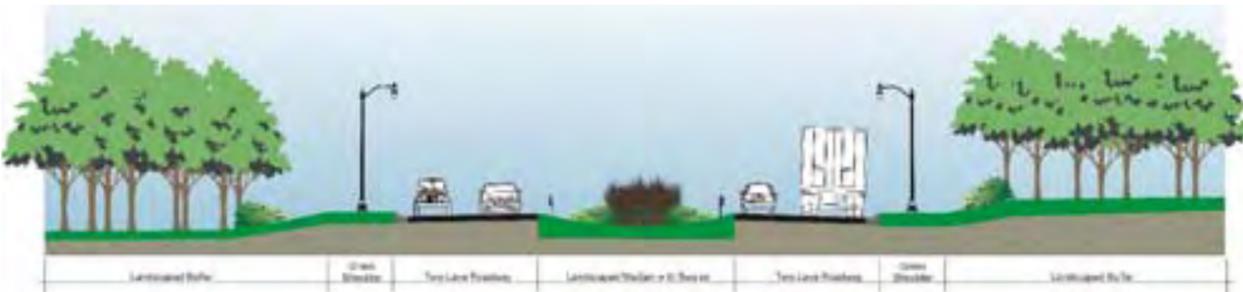


Figure 3.3: Typical Cross-Section Between Pennsylvania Avenue and East Capitol Street



Figure 3.4: Typical Cross-Section Between East Capitol Street and Eastern Avenue

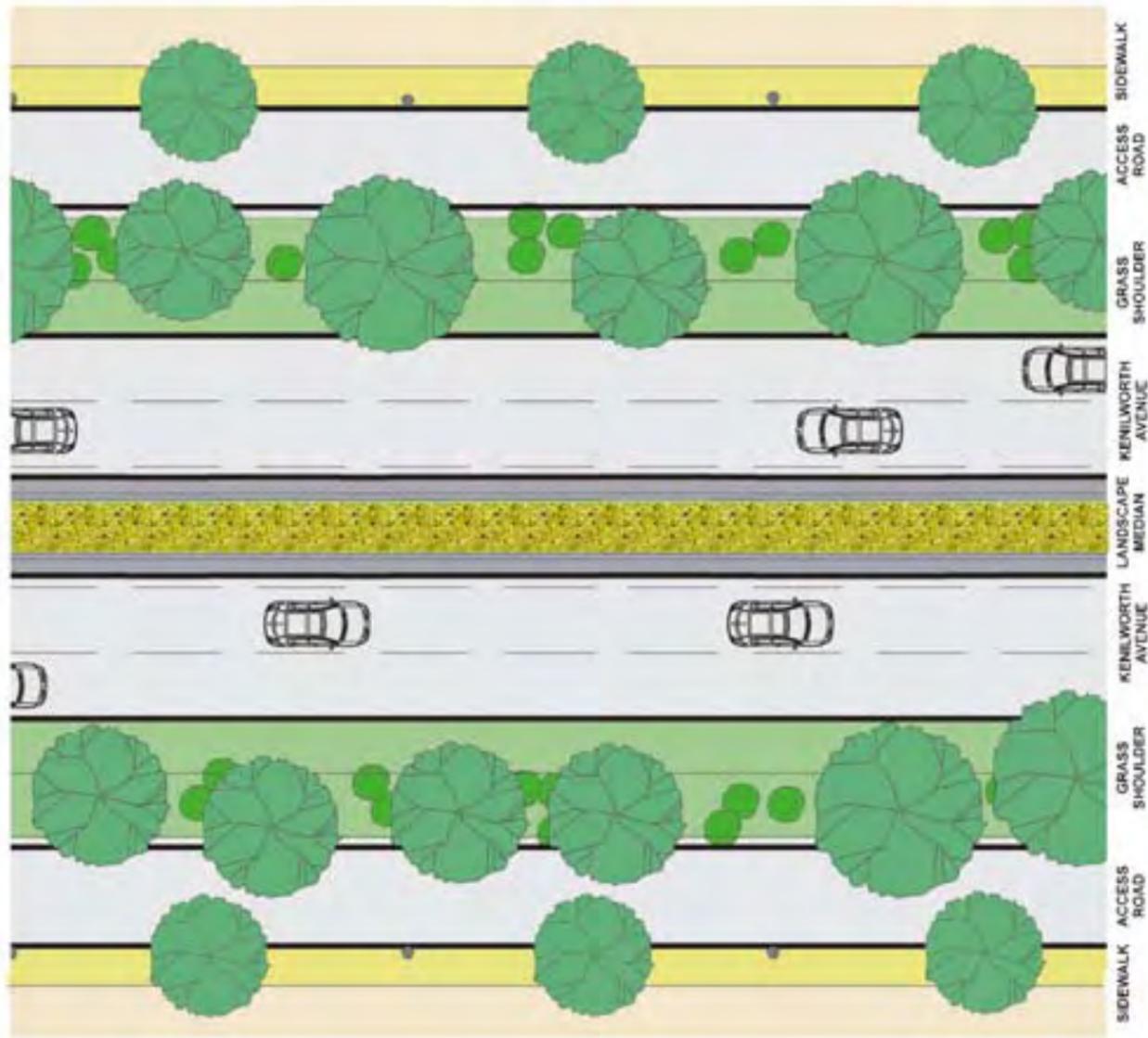


Figure 3.6: Typical Plan for a four-lane roadway (landscaped medians and reinforced green shoulders)

The on- and off-ramps north of Nannie Helen Burroughs Avenue are either eliminated or consolidated. The service roads north of Nannie Helen Burroughs Avenue are made narrower and curb extensions are added to delineate parking areas and to provide refuge for pedestrians crossing the street.

The reduced roadway cross-section provides space for a wider, landscaped median and additional green space between Kenilworth Avenue and the service roads (see Figure 3.8).

Under this option, the existing pedestrian bridges at Hayes Street leading to the Minnesota Avenue Metrorail Station and at Douglas Street leading to the Deanwood Metrorail Station are upgraded and improved. The pedestrian bridges at Lane Place and Nash Street are removed.

Existing Interchanges

The interchanges at East Capitol Street, Benning Road, Nannie Helen Burroughs Avenue and Eastern Avenue function are reconstructed as described under Section 3.4.

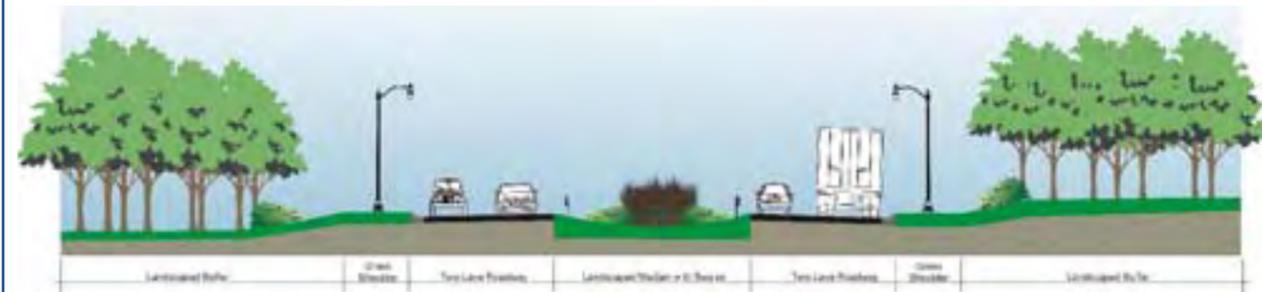


Figure 3.7: Typical Cross-Section Between Pennsylvania Avenue and East Capitol Street (landscaped median and reinforced grass shoulders)

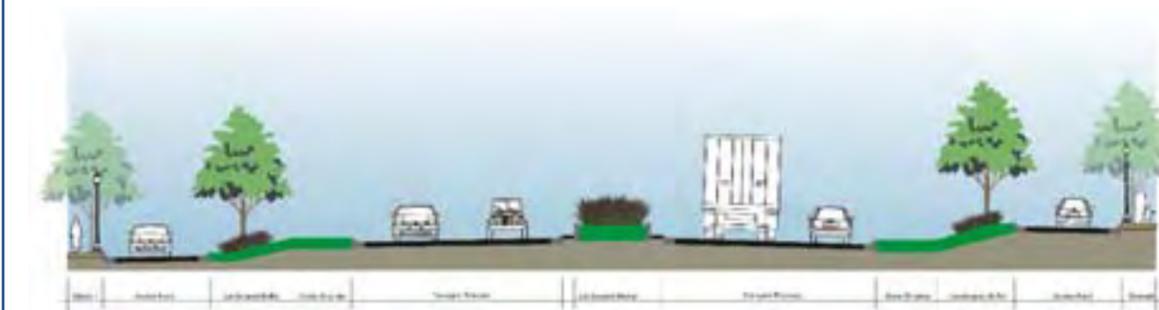


Figure 3.8: Typical Cross-Section Between East Capitol Street and Eastern Avenue (Four-lane roadway with landscaped median and reinforced grass shoulders)

3.3 Option No. 3 – Kenilworth Avenue with Improved Infrastructure

This option explores maintaining Kenilworth Avenue as freeway with enhancements to safety conditions, infrastructure and its appearance. This option also explores depressing portions of the corridor to improve connectivity across the roadway and between neighborhoods. Infrastructure improvements are made in two distinct segments, as described below and illustrated in Figure 3.9:

Pennsylvania Avenue to East Capitol Street

Similar to Options 1 and 2, between Pennsylvania Avenue and East Capitol Street, the corridor remains a four-lane roadway. The corridor's appearance is improved through the introduction of a landscaped median, and

replacement of the paved shoulders with reinforced grass shoulders (as illustrated in Figure 3.11). In this option, as well as in Options 1 and 2, a portion of Kenilworth Avenue, to the south of East Capitol Street, could be realigned to the east to provide additional parkland adjacent to the river.

East Capitol Street to Eastern Avenue

Between East Capitol Street and Eastern Avenue, the existing infrastructure is improved and portions of Kenilworth Avenue are depressed to create opportunities for local street connections between neighborhoods on either side (see Figure 3.12). Six lanes of traffic, three in each direction, are maintained (as it is

today); however, the existing on- and off-ramps are either eliminated or consolidated.

In this option, the service roads on either side of Kenilworth Avenue remain, but mostly function as local roads between the neighborhoods. This option includes upgrading the two existing pedestrian bridges at Hayes Street (leading to Minnesota Avenue Metrorail Station) and at Douglas Street (leading to the Deanwood Metrorail Station). The pedestrian bridge at Lane Place and Nash Street are removed.



Example of a Kenilworth Avenue Depressed

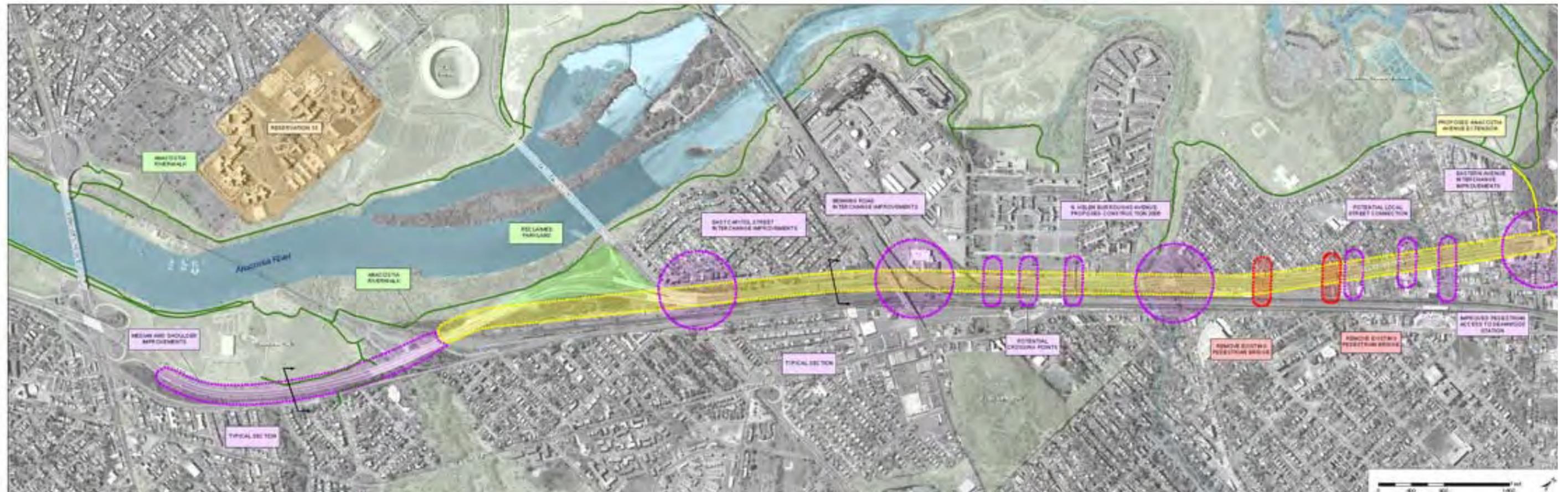


Figure 3.9: Option 3 - Maintain Kenilworth Avenue as a freeway with enhancements and depressing portions to allow connections across the corridor.

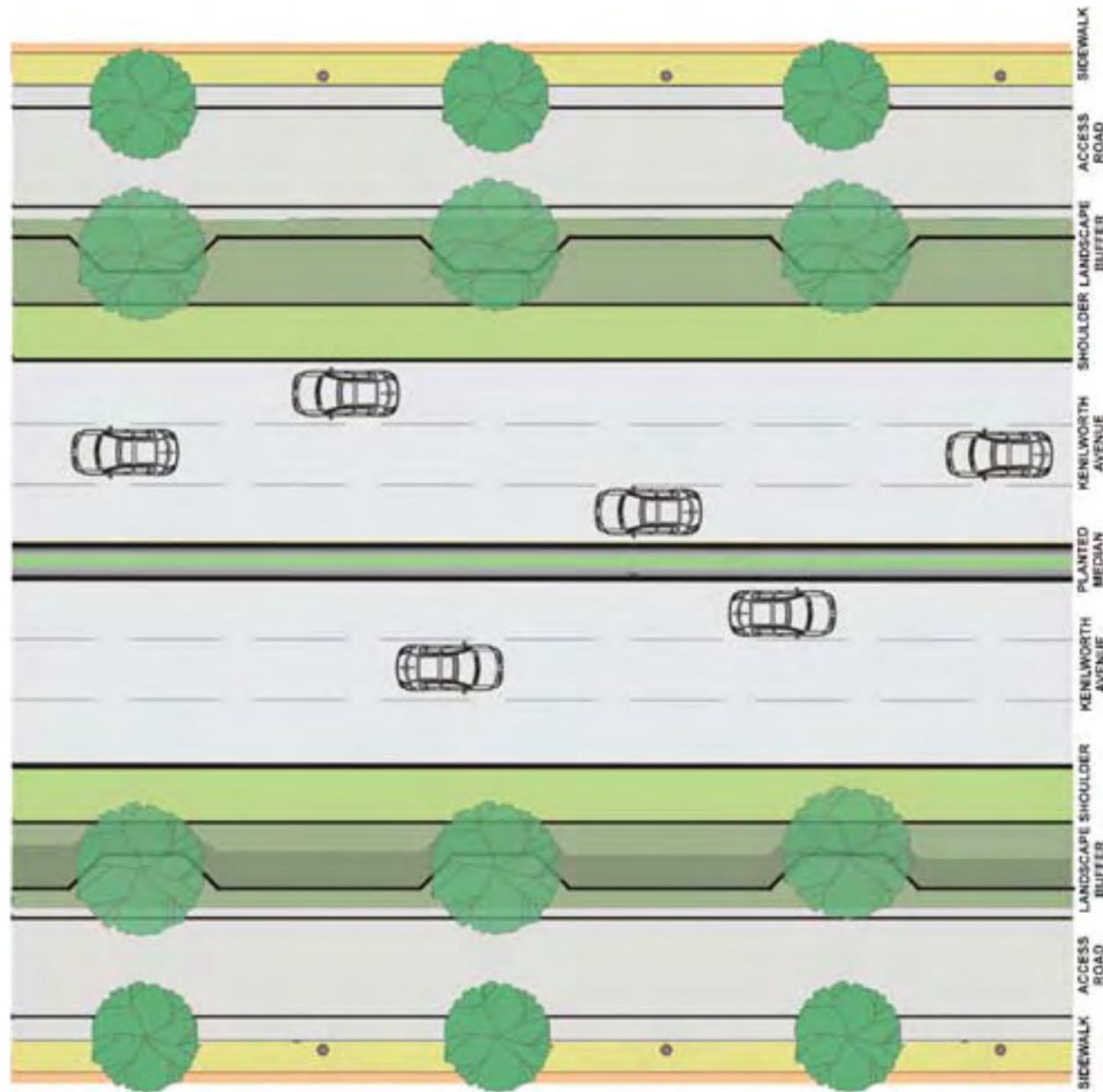


Figure 3.10: Typical Plan (Option 3 - Depressing portions of Kenilworth Avenue)

Existing Interchanges

The interchanges at East Capitol Street, Benning Road, Nannie Helen Burroughs Avenue and Eastern Avenue are reconstructed as described under Section 3.4.

New Connections

Lowering Kenilworth Avenue allows for a new vehicular, pedestrian, and bicycle crossing at either Ord Street or Nash Street, permitting the removal of two existing pedestrian bridges immediately south of Ord Street, and improving access to the Deanwood Metrorail Station.

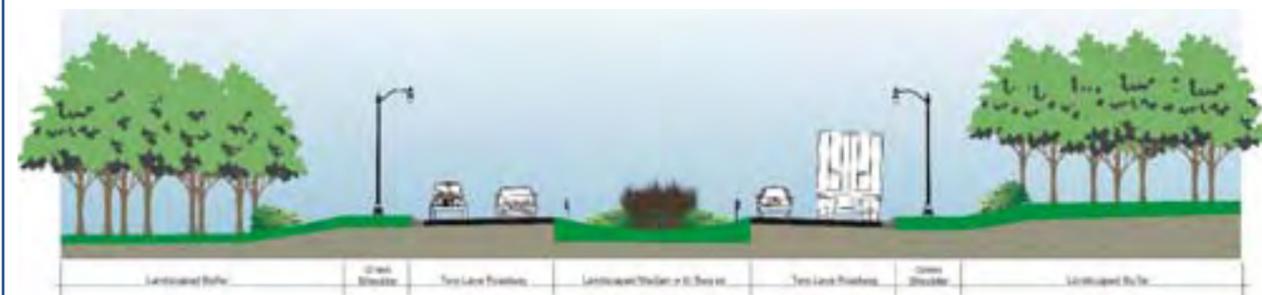


Figure 3.11: Typical Cross-Section Between Pennsylvania Avenue and East Capitol Street

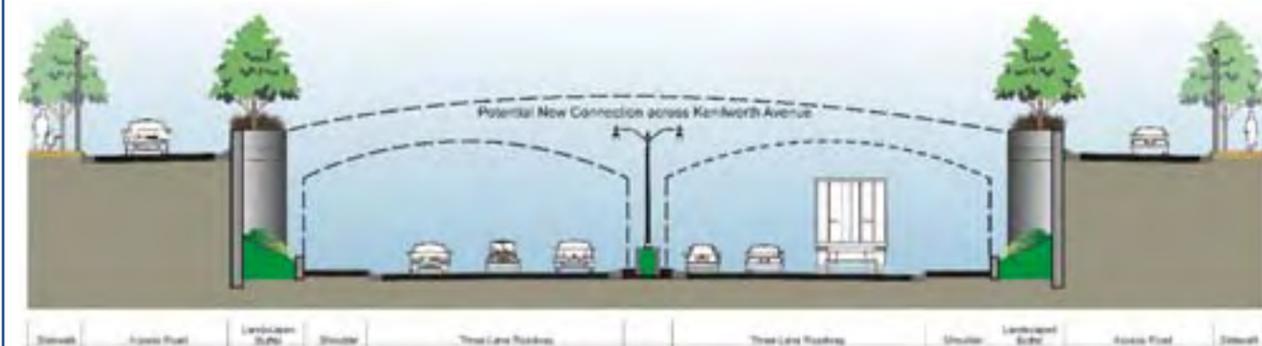


Figure 3.12: Cross-Section Between East Capitol Street and Eastern Avenue (Kenilworth Avenue depressed to provide new connection)

3.4 Screening Analysis of Options 1, 2 and 3

An analysis of existing and future conditions was performed for each of the options. This evaluation of the mainline portion of Kenilworth Avenue was completed independent of individual intersections along the corridor. Each option was first tested with year 2004 traffic volumes. Next, future year 2030 traffic volumes were developed and each option was evaluated using those projections.

Summary of Analysis

This corridor study first evaluated existing conditions using Year 2004 volumes. A Synchro model was developed for the corridor and calibrated with field-observed travel times. An examination of the three options with year 2004 traffic volumes indicated:

- **Option 1** is not feasible due to potential queuing and unacceptable LOS; therefore, it was eliminated from further consideration.
- **Option 2** is feasible to implement in the near-term; this option would improve current safety issues but will impact traffic operations. This option is not feasible following improvements along southbound MD 295 in Maryland, which will shift congestion from the north into the study area.
- **Option 3** was found to be feasible and was considered for year 2030.

3.4.1 Overview of Analysis

The three mainline options described in Sections 3.1, 3.2 and 3.3 were first evaluated using Year 2004 traffic data.

Analysis of Option 1 - Boulevard

Option 1 was analyzed as a roadway with signalized intersections at East Capitol Street, Benning Road, Nannie Helen Burroughs Avenue and Eastern Avenue. This type of roadway is typically analyzed for a Level of Service (LOS) based on the traffic delay measured in seconds that occurs at each signal. To accomplish this, peak hour traffic

volumes under Option 1 were determined and an analysis was conducted using Synchro and SimTraffic.

Table 3.1 shows the results of the analysis at the four proposed intersections along Kenilworth Avenue. Under this option, with current traffic volumes, all of the signalized intersections would operate at LOS F.

SimTraffic was also used to determine north- and southbound travel times throughout the corridor. Under Option 1, average travel speeds are low throughout the corridor. During the AM peak hour, southbound vehicles average less than 12 mph between Eastern Avenue and East Capitol Street. In the PM peak hour, northbound vehicles typically travel slower than 15 mph. This is a significant degradation in travel time compared to existing conditions (see Figures 2.14 and 2.15).

The analysis also showed southbound queues on Kenilworth Avenue extending over one mile into Maryland during the AM peak hour. These queues would impact the operations not only at the Baltimore-Washington Parkway, MD 201, and US 50 interchange, but adjacent interchanges as well. PM peak hour queues are also long but do not extend to or beyond Pennsylvania Avenue.

Option 1 creates a section of highway with traffic signals between two freeway sections. This generates safety hazards as vehicles at either end of the study area enter a lower-speed roadway with queued vehicles at freeway speed.

Even though Option 1 provides for pedestrian movements at the four intersections considered, the width of Kenilworth Avenue under this option has to be more than 100 feet because of the number of lanes required to carry the traffic volumes. To cross Kenilworth Avenue, pedestrians must seek refuge on the median and most likely need two traffic signal cycles to complete the crossing.

Intersection	AM Peak Hour		PM Peak Hour	
	LOS	Delay	LOS	Delay
East Capitol Street	F	204	F	254
Benning Road	F	214	F	230
Nannie Helen Burroughs Avenue	F	367	F	374
Eastern Avenue	F	354	F	726

Note: Delay measured in seconds.

Table 3.1: Intersection LOS Analysis for Option 1

Improvement Scenario	AM Peak Hour		PM Peak Hour	
	Southbound	Northbound	Southbound	Northbound
Existing 2004 Condition	360	312	349	502
Option 2 + Scenario 1	1,051	342	424	1,088
Option 2 + Scenario 2	1,440	330	586	1,000
Option 2 + Scenario 3	1,099	341	401	1,023
Option 2 + Scenario 4	1,478	339	591	1,007

Note: Travel Times measured in seconds.

Table 3.2: Travel Times for Option 2 under the Four Scenarios

Analysis of Option 2 - A Four-Lane Avenue

Under Option 2, Kenilworth Avenue functions much as it does today, as a limited access freeway with interchanges at East Capitol Street, Benning Road, Nannie Helen Burroughs Avenue and Eastern Avenue. The analysis for this type of roadway is very different than that performed for the signalized roadway analyzed under Option 1. For freeways, travel times and speeds, combined with the capacity of the freeway measured by the density of vehicles in the travel lanes, are used to measure effectiveness.

Because Option 2 reduces the number of through lanes on Kenilworth Avenue north of East Capitol Street, and because of the large volume of traffic that enters and leaves the study area at the Maryland state line, it was important for the analysis to take into consideration the improvements proposed by the Maryland State Highway Administration immediately north of Eastern Avenue.

These improvements, the reconstruction of the Kenilworth Avenue bridge over AMTRAK and

Beaver Creek, will have an affect on the flow of vehicles along the freeway. SimTraffic was used to determine travel times through the corridor for four scenarios, all related to the proposed improvements. These scenarios are:

- Scenario 1: the proposed SHA improvements are not implemented;
- Scenario 2: the proposed SHA improvements are implemented as planned;
- Scenario 3: the proposed SHA improvements are not implemented; however, improvements are made to the northbound Kenilworth Avenue ramp to eastbound US 50; and
- Scenario 4: the proposed SHA improvements and improvements to the northbound Kenilworth Avenue ramp to eastbound US 50 are implemented.

The results of the SimTraffic analysis for Option 2 and the different scenarios are shown in Table 3.2. The travel time shown is the time required to travel Kenilworth Avenue

between US 50 and Pennsylvania Avenue in either the southbound or northbound direction.

Under all scenarios, travel time in the peak direction (southbound in the AM peak hour and northbound in the PM peak hour) is increased considerably when compared to existing conditions. In the non-peak direction, there is little or no impact on travel times.

Typically, in the AM peak hour, southbound travel speeds are low at the north end of the corridor (beginning at US 50 in Maryland) and increase as vehicles travel south along the corridor. South of East Capitol Street, speeds return to existing averages which can be expected as Kenilworth Avenue south of East Capitol Street has two lanes and a significant number of vehicles exit at Benning Road and East Capitol Street.

The analysis shows that the proposed improvements by SHA to the southbound Kenilworth Avenue ramp from eastbound US 50 (Scenario 2) cause the greatest increase in congestion and travel time along Kenilworth Avenue. These impacts to traffic extend as far south as Nannie Helen Burroughs Avenue before dissipating.

During the PM peak hour, travel times north of East Capitol Street increase under all scenarios, although the deterioration is not as significant as experienced by southbound traffic in the AM peak hour.

With the improvement assumed in Scenarios 3 and 4, speeds are still slow entering the corridor from either direction; however, during the PM peak hour, speed and queuing improvements are observed in the northbound direction north of Nannie Helen Burroughs Avenue.

In general, Option 2 leads to a substantial increase in peak direction travel time in both the AM and PM peak hours, and a small travel time increase in the non-peak directions. A small improvement takes place if SHA improves the northbound Kenilworth Avenue exit ramp to eastbound US 50, as this move-



ment currently backs up from Maryland into Washington, DC.

The freeway LOS was also evaluated for Option 2. With the removal of a through-lane in both directions north of East Capitol Street, the majority of basic freeway, weaving and ramp segments operate at a LOS F.

Given the above analysis, Option 2 should only be considered for implementation after discussions with the Maryland State Highway Administration regarding their planned improvements.

NEAR-TERM IMPLEMENTATION OF OPTION 2

The planned re-construction of the Nannie Helen Burroughs Avenue interchange requires a long-term lane closure of Kenilworth Avenue in both directions. This provides an opportunity to evaluate whether or not Option 2 can be implemented as a near-term improvement through observation of real-time traffic conditions during reconstruction of the bridge. Conditions can then be compared to the modeled analysis described above.

As part of the reconstruction project, a Smart Work Zone is proposed. As part of the Smart Work Zone, portable data collection systems will collect speed, volume and lane occupancy information, which can be uploaded from the field via a cellular connection to a website that will summarize the raw data (by minute) as well as hourly data throughout the course of the project. An analysis of the data will determine queuing time and distance prior to the work zone in both the north- and southbound directions.

The final recommendation as to whether Option 2 can be implemented is contingent upon the evaluation of traffic conditions resulting from the temporary lane closures at Nannie Helen Burroughs Avenue after analysis of the Smart Work Zone data.

The reconstruction of the Nannie Helen Burroughs Avenue interchange is being coordinated with the Maryland State Highway Administration's project to reconstruct the

Improvement Scenario	AM Peak Hour		PM Peak Hour	
	Southbound	Northbound	Southbound	Northbound
Existing 2004 Condition	357	311	346	588
Option 3 + Scenario 1	675	311	428	917
Option 3 + Scenario 2	643	319	374	611

Note: Travel Times measured in seconds.

Table 3.3: Travel Times for Option 3 under the Two Scenarios

Beginning at	Ending at	Observed 2004 Volumes	Modeled 2004 Volumes	Volume Difference	Percent Difference
Pennsylvania Avenue	East Capitol Street	109,336	107,560	(1,776)	(1.6%)
East Capitol Street	Benning Road	122,147	122,863	716	0.6%
Benning Road	NHB Avenue	121,740	129,349	7,609	6.3%
NHB Avenue	Eastern Avenue	125,990	134,086	8,096	6.4%
Eastern Avenue	Maryland State Line	141,268	159,803	18,535	13.1%

Table 3.4: Kenilworth Avenue Traffic Characteristics by Segment

MD 201 (Kenilworth Avenue) bridge over the AMTRAK railroad in order to minimize construction activity.

Furthermore, Option 2 should not be considered suitable for year 2030 conditions.

Analysis of Option 3 - Improve Existing Infrastructure

The analysis methods for Option 3 are the same as those used for Option 2. Under Option 3, Kenilworth Avenue continues to function as a limited access freeway with interchanges at East Capitol Street, Benning Road, Nannie Helen Burroughs Avenue and Eastern Avenue and travel times and speeds, combined with the capacity of the freeway measured by the density of vehicles in the travel lanes, are used to measure effectiveness.

For Option 3, the improvements proposed by the Maryland State Highway Administration immediately north of Eastern Avenue are assumed implemented. SimTraffic was then

used to determine travel times through the corridor for two scenarios:

used to determine travel times through the corridor for two scenarios:

- Scenario 1: safety improvements are implemented along Kenilworth Avenue to consolidate the existing on- and off-ramps and improve acceleration and deceleration distances; and
- Scenario 2: the safety improvements in Scenario 1 are combined with improvements to the northbound Kenilworth Avenue ramp to eastbound US 50.

SimTraffic was used to determine travel times for Option 3 under both scenarios. The results are presented in Table 3.3 which shows the time required to travel Kenilworth Avenue between US 50 and Pennsylvania Avenue in either the southbound or northbound direction. In both scenarios, peak period average travel times for the north- and southbound directions increase, however, not as substantially as in Option 2. In the non-peak direction

there is little or no difference compared to existing conditions. Under Option 2, improving the northbound Kenilworth Avenue to eastbound US 50 merging movement (Option 2, Scenario 3) did not result in significant operational advantages; however, under Option 3, this improvement (Option 3, Scenario 2) makes a significant improvement when compared to Option 3, Scenario 1 (see Table 3.3).

Option 3 results in a moderate increase in peak direction travel time during both peak hours. There is also a relatively small travel time increase in the non-peak directions during both peak hours.

3.5 Summary of Options

An analysis of the three options indicates that Option 1 should not be considered further for implementation. Unacceptable intersection LOS, queuing, and impacts to travel time throughout the corridor make it an unfeasible option.

The evaluation of Option 2, Scenario 1 or Option 2, Scenario 3 indicates that there would be an immediate improvement to safety within the corridor. However, this option under either scenario will have an adverse impact on peak period travel times. This option is only viable prior to the planned Maryland State Highway Administration's implementing improvements to the bridge north of Eastern Avenue. After those improvements are made, under this option, there would be significant increases in congestion and travel times throughout the corridor.

Option 3, however, is a practical long-term improvement. Under this option, improvements planned by Maryland, together with safety improvements within the corridor, can be implemented. If northbound improvements at the ramp to eastbound US 50 are also built (Option 3, Scenario 2), there would be minimal impacts on travel times in the corridor.

The following section further develops this option and evaluates it and the No Build condition using projected 2030 traffic volumes.

3.6 Further Development of Option 3

The analysis of Option 3 for Year 2004 indicates that this option has the greatest potential for achieving the goals and objectives discussed in Chapter 1. With this in mind, further study and evaluation was undertaken that would help achieve the following objectives:

- Improve interchange connectivity to neighborhoods at key locations
- Improve functionality of key intersections
- Introduce parkway setting or parkway elements to the roadway corridor
- Introduce landscaped median and shoulders
- Upgrade quality of existing pedestrian crossings
- Introduce new crossings over or under Kenilworth Avenue
- Complete or close gaps at missing connections
- Create new connections to destinations points
- Create safe routes to existing transit stations/stops
- Improve functionality of service road on- and off-ramps

3.6.1 Interchange Concepts for Option 3

Under Options 3, the existing interchanges were studied to improve safety and access to adjoining neighborhoods for vehicular traffic, pedestrians and bicyclists. The interchanges that are proposed for improvement are:

- East Capitol Street;
- Benning Road; and
- Eastern Avenue.

Current plans to improve the Nannie Helen Burroughs Avenue interchange remain unchanged. A discussion of these improvements is included for information only; no other modifications were considered.

3.6.2 East Capitol Street Interchange

Five scenarios were developed for the East Capitol Street Interchange under Option 3. Each scenario provides varying degrees of improvements to safety, access to and from adjoining neighborhoods, and pedestrian and bicycle movements through the interchange and across Kenilworth Avenue.

Each scenario differs in cost. The more advanced scenarios provide the greatest benefits, require the greatest amount of new construction, and are the most expensive.

Each scenario includes variations to provide additional access to points east for south- and northbound Kenilworth Avenue traffic, and to points west for northbound Kenilworth Avenue traffic. Also explored are improvements that allow westbound traffic on East Capitol Street to go north or south on Kenilworth Avenue.

Scenarios EC-1, EC-2 and EC-3 maintain the existing Kenilworth Avenue alignment. Scenario EC-1 and EC-3 do not require modifying the existing bridges over East Capitol Street. EC-2 requires modifying the northbound bridge. Scenarios EC-4 and EC-5 require realignment of Kenilworth Avenue to the east to make it parallel to the CSX Railroad and recapture approximately 15 acres of open space.

Existing Conditions

The existing interchange is difficult to use. It only provides access from southbound Kenilworth Avenue to westbound East Capitol Street and from eastbound East Capitol Street to northbound or southbound Kenilworth Avenue. The interchange has excess pavement on northbound Kenilworth Avenue that was provided to accommodate a future connection to the Barney Circle Freeway, a connection that will not be built. The alignment of Kenilworth Avenue immediately south of East Capitol Street was also built westward to accommodate this future freeway connection, resulting in excess land isolated between the existing alignment and the CSX Railroad (see Figure 3.13).

As East Capitol Street passes beneath Kenilworth Avenue, the right-of-way narrows and there are no sidewalks for pedestrians or bicyclists; the passageway is like a concrete canyon that is oriented to automobiles. This canyon-like underpass extends past Minnesota Avenue.

Scenario EC-1

In this scenario, a new connection is made to allow traffic on westbound East Capitol Street to exit southbound and northbound onto Kenilworth Avenue by building a new connector just west of Kenilworth Avenue, perpendicular to East Capitol Street. This new connector intersects and crosses the existing exit ramp for eastbound East Capitol Street to northbound Kenilworth Avenue. After crossing the exit ramp, the new connector merges with the southbound ramp from eastbound East Capitol Street (see Figure 3.14).

This scenario requires the widening of East Capitol Street just west of Kenilworth Avenue to accommodate two left turn lanes onto the new connector. It also requires new traffic signals at the connector's intersection with East Capitol Street and its intersection with the existing northbound exit ramp from eastbound East Capitol Street. Minor modifications are required to the existing southbound and northbound ramps to accommodate the new connector.

This scenario does not provide for full movement at the interchange. Northbound Kenilworth Avenue traffic would not have access to East Capitol Street and southbound Kenilworth Avenue traffic would only be able to exit to westbound East Capitol Street. No pedestrian or bicycle improvements are included in this scenario.

Scenario EC-2

This scenario is similar to Scenario EC-1; however, three additional movements are provided: southbound Kenilworth Avenue to eastbound East Capitol Street, and northbound Kenilworth Avenue to east- and westbound East Capitol Street.

To achieve this, a new northbound ramp for Kenilworth Avenue is constructed between the existing bridge over East Capitol Street and

the CSX Railroad bridge. At the base of the ramp, traffic is permitted to turn left (westbound) or right (eastbound) onto East Capitol Street. The new ramp requires modifying the existing bridge and removing the excess pavement along the eastern edge of Kenilworth Avenue (see Figure 3.15). It also requires lowering approximately 1,100 feet of a 15 foot by 10 foot storm sewer on the south side of East Capitol Street.

To connect southbound Kenilworth Avenue to eastbound East Capitol Street, a new ramp is built to connect the existing southbound ramp to westbound East Capitol Street. At the base of the ramp, traffic is permitted to turn left (eastbound) onto East Capitol Street.

In addition to the two new signals required for the new connector as under Scenario EC-1, this scenario requires signals at the base of the two new ramps from Kenilworth Avenue where they intersect East Capitol Street. This scenario may require modifying the existing abutments to gain additional sight distance for traffic using the new ramps. It may also require taking right-of-way from CSX Railroad to accommodate the new northbound ramp.

This scenario allows full movement at this interchange; however, no pedestrian or bicycle improvements are included.

Scenario EC-3

This scenario is a variation on Scenario EC-2. Instead of building a new northbound ramp allowing a right exit to East Capitol Street, this scenario has a left exit ramp from northbound Kenilworth Avenue that passes underneath southbound Kenilworth Avenue to the new connector for westbound traffic on East Capitol Street (see Figure 3.16).

Under this scenario, the new connector ramp is a two-way road with a four-leg intersection at the northbound ramp from eastbound East Capitol Street to northbound Kenilworth Avenue, and a T-intersection at East Capitol Street.

This scenario requires building a new bridge to allow the new northbound exit ramp to pass underneath southbound Kenilworth



Figure 3.13: Existing Conditions at the East Capitol Street Interchange



Figure 3.14: Scenario EC-1 (Completes all movement for traffic on East Capitol Street)



Figure 3.15: Scenario EC-2 (Permits full movement at the East Capitol Street interchange)



Figure 3.16: Scenario EC-3 (Permits full movement at the East Capitol Street interchange)

Avenue. Signal timing at the two new intersections will have to accommodate the new movements introduced by adding the northbound ramp.

This scenario allows for all vehicular movements; however, no pedestrian or bicycle improvements are included.

Scenario EC-4

This scenario involves a complete reconstruction of the existing interchange. Kenilworth Avenue is realigned and a new diamond interchange is constructed to replace the existing bridge (see Figure 3.17).

The new diamond interchange allows full movement in all directions for traffic on East Capitol Street and Kenilworth Avenue. As part of the reconstruction, East Capitol Street is widened and sidewalks and dedicated bicycle ways are added through the interchange.

Pedestrians and bicyclist are able to cross the on- and off-ramps to Kenilworth Avenue at

a perpendicular crossing, which improves safety and introduces a shorter and friendlier crossing experience (see Figure 3.17)

This scenario requires two new bridges carrying Kenilworth Avenue and the CSX Railroad over a widened East Capitol Street. It also requires relocating a storm sewer by approximately 1,500 feet along the south side of East Capitol Street. It requires new signals at the intersection of the on- and off-ramps to Kenilworth Avenue with East Capitol Street.

This scenario allows for all vehicular movements to occur and pedestrian and bicycle traffic to safely cross underneath Kenilworth Avenue and the CSX Railroad; a movement not possible today. The new alignment for Kenilworth Avenue creates approximately 15 acres of additional open space and parkland to the west of Kenilworth Avenue along the Anacostia River.

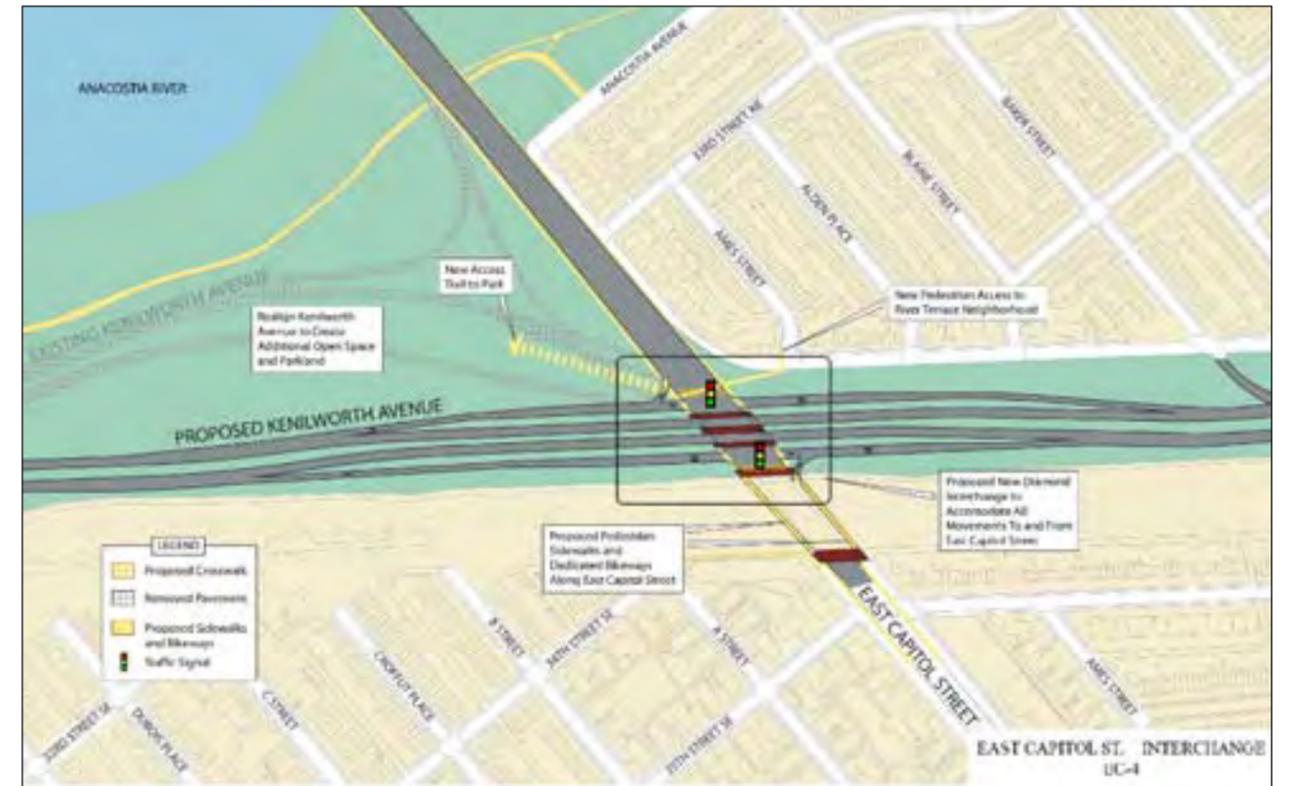


Figure 3.17: Scenario EC-4 (Provides for all traffic movements and for east and west pedestrian and bicycle movements beneath Kenilworth Avenue)



Figure 3.18: Scenario EC-5 (This SPUI scenario provides for all traffic movements and for east and west pedestrian and bicycle movements beneath Kenilworth Avenue)

Scenario EC-5

This scenario is similar to Scenario EC-4, but instead of a diamond interchange, a Single Point Urban Interchange (SPUI) is built. A SPUI handles turning movements differently from a diamond interchange. In a SPUI, opposing left turning movements (for example, east- and westbound East Capitol Street to north- and southbound Kenilworth Avenue, respectively) are allowed to occur simultaneously, whereas in a diamond interchange, they occur separately (see Figure 3.18).

A SPUI requires a longer bridge span across East Capitol Street to accommodate turning movements. This scenario allows for all vehicular movements to occur and pedestrian and bicycle traffic to safely cross underneath Kenilworth Avenue and the CSX Railroad, a movement not possible today. The new alignment for Kenilworth Avenue creates approximately 15 acres of additional open space and parkland to the west of Kenilworth Avenue along the Anacostia River.

3.6.3 Benning Road Interchange

Five scenarios for the Benning Road interchange are considered. All maintain through traffic to Minnesota Avenue on an elevated structure over Kenilworth Avenue and the CSX Railroad, as it is today. However, the various scenarios explore how southbound and northbound traffic on Kenilworth Avenue can access points to the east and west on Benning Road and how traffic on Benning Road can go north or south on Kenilworth Avenue.

Safety improvements at the intersection of Benning Road and Kenilworth Avenue and access improvements to River Terrace are important elements of each of these scenarios. Improvements to pedestrian and bicycle safety and movement are also explored since this is an important crossing point for non-vehicular traffic.

The existing vertical clearance between southbound Kenilworth Avenue and the at-grade Benning Road intersection with northbound Kenilworth Avenue is substandard; only 14'-3". The existing clearance for Benning Road over the CSX Railroad is 25'-0".

Existing conditions

The Benning Road-Kenilworth Avenue interchange is constrained by the CSX Railroad to the east of Kenilworth Avenue and the WMATA tracks on the north side of Benning Road. These constraints make it difficult to provide the southbound Kenilworth Avenue to eastbound Benning Road movement without taking property in the southwest quadrant. Further constraining this intersection are the CSX Railroad tracks connecting to the PEPCO power plant just north of the interchange (see Figure 3.19).



Figure 3.19: Benning Road Existing Conditions Along Kenilworth Avenue (below Benning Road Bridge)

The Benning Road interchange with Kenilworth Avenue is substandard in many respects. Movements are limited and those that do exist are unsafe given the volume of traffic that passes through the interchange. It is a three-level interchange as southbound Kenilworth Avenue is depressed lower than northbound Kenilworth Avenue to permit an at-grade intersection with traffic to and from Benning Road. Through traffic on Benning Road crosses over Kenilworth Avenue on a bridge high enough to provide adequate clearance not only for Kenilworth Avenue but also to clear the CSX Railroad to the east.

Southbound traffic on Kenilworth Avenue can exit to westbound Benning Road and also make use of a U-turn at the at-grade intersection to return to northbound Kenilworth Avenue. Eastbound traffic on Benning Road can exit to southbound Kenilworth Avenue or use the at-grade intersection to go northbound.

The intersection allows vehicles on northbound Kenilworth Avenue to exit to westbound Benning Road and eastbound traffic on Benning Road to exit to northbound Kenilworth Avenue. The exit and entrance ramps along northbound Kenilworth Avenue

are on the left side. There are often conflicts between vehicles exiting Kenilworth Avenue and those entering from Benning Road due to limited acceleration and deceleration distance.

Pedestrians are able to cross Kenilworth Avenue along the south side of the Benning Road bridge using a narrow sidewalk. To access the sidewalk, pedestrians must cross the non-signalized exit ramp from Benning Road to southbound Kenilworth Avenue. Many bicyclist use Benning Road to cross Kenilworth Avenue, typically within the travel lanes.

Scenario BR-1

This scenario improves the safety of the at-grade intersection of Benning Road and northbound Kenilworth Avenue by lengthening the exit ramp for northbound Kenilworth Avenue and providing a traffic signal.

The alignment of northbound Kenilworth Avenue is maintained as it is today; however, to accommodate the lengthened exit ramp, southbound Kenilworth Avenue is shifted to the west. This scenario requires that the existing bridge deck over southbound Kenilworth Avenue, which partially supports the at-grade intersection with northbound Kenilworth Avenue, be replaced (see Figure 3.20).

This concept does not add any new movements to the existing interchange, nor does it improve pedestrian and bicycle access to or across the Benning Road bridge.

Scenario BR-2

This scenario is similar to Scenario BR-1 except that a new connection is made between the southbound Kenilworth Avenue ramp to eastbound Benning Road and the westbound Benning Road ramp to southbound Kenilworth Avenue. This new connection allows southbound traffic coming from the Kenilworth Avenue service road to exit to southbound Kenilworth Avenue (see Figure 3.21). Currently, to make this movement, vehicles make an illegal U-turn on Benning Road at 34th Street to access the eastbound Benning Road ramp.

Two alignments for the service roads were considered. The first alignment squeezes the service road through the extension between the existing Benning Road bridge abutment and the existing southbound Kenilworth Avenue lanes. The second alignment is behind the bridge abutment. Both alignments require lowering the existing southbound lanes of Kenilworth Avenue by approximately eight feet to allow for the required vertical clearance between the service road and the existing Benning Road bridge.

This concept does not add any new movements to the existing interchange, nor does it improve pedestrian and bicycle access to or

across the Benning Road bridge. However, it does allow traffic on the southbound service road to access southbound Kenilworth Avenue.

Scenario BR-3

This scenario addresses some of the missing movements at Benning Road and Kenilworth Avenue. A new center-leg ramp connects Kenilworth Avenue and the Benning Road bridge, replacing the existing at-grade intersection. This new connection is situated south of the Benning Road bridge between the southbound and northbound lanes of Kenilworth Avenue. It allows traffic to exit from northbound Kenilworth Avenue to either east- or westbound Benning Road, and allows traffic traveling east- or westbound on Benning Road to exit to southbound Kenilworth Avenue (see Figure 3.22).

This scenario requires widening the Benning Road bridge to allow for the turning movements at the intersection of the new ramp with the existing bridge. It also requires realigning both the south- and northbound lanes of Kenilworth Avenue in order to accommodate the new ramp south of the bridge.

This scenario allows all movements except from southbound Kenilworth Avenue to eastbound Benning Road, and from westbound Benning Road to northbound Kenilworth Avenue. Minor improvements in pedestrian and bicycle access to or across the Benning Road Bridge are made as movements on some of the ramps on the west approach are moved to a signalized intersection on the bridge.

Scenario BR-4

This scenario focuses on improving safety for vehicular traffic, pedestrians, and bicyclists. The existing Benning Road bridge is rebuilt into two structures, one for eastbound and one for westbound traffic. The exit ramps to Kenilworth Avenue are realigned between the two bridges (see Figure 3.23). This allows pedestrian and bicycle traffic to move over Kenilworth Avenue between 34th Street and Minnesota Avenue on new sidewalks and an uninterrupted path with no need to cross exit ramps to Kenilworth Avenue as is the case today.

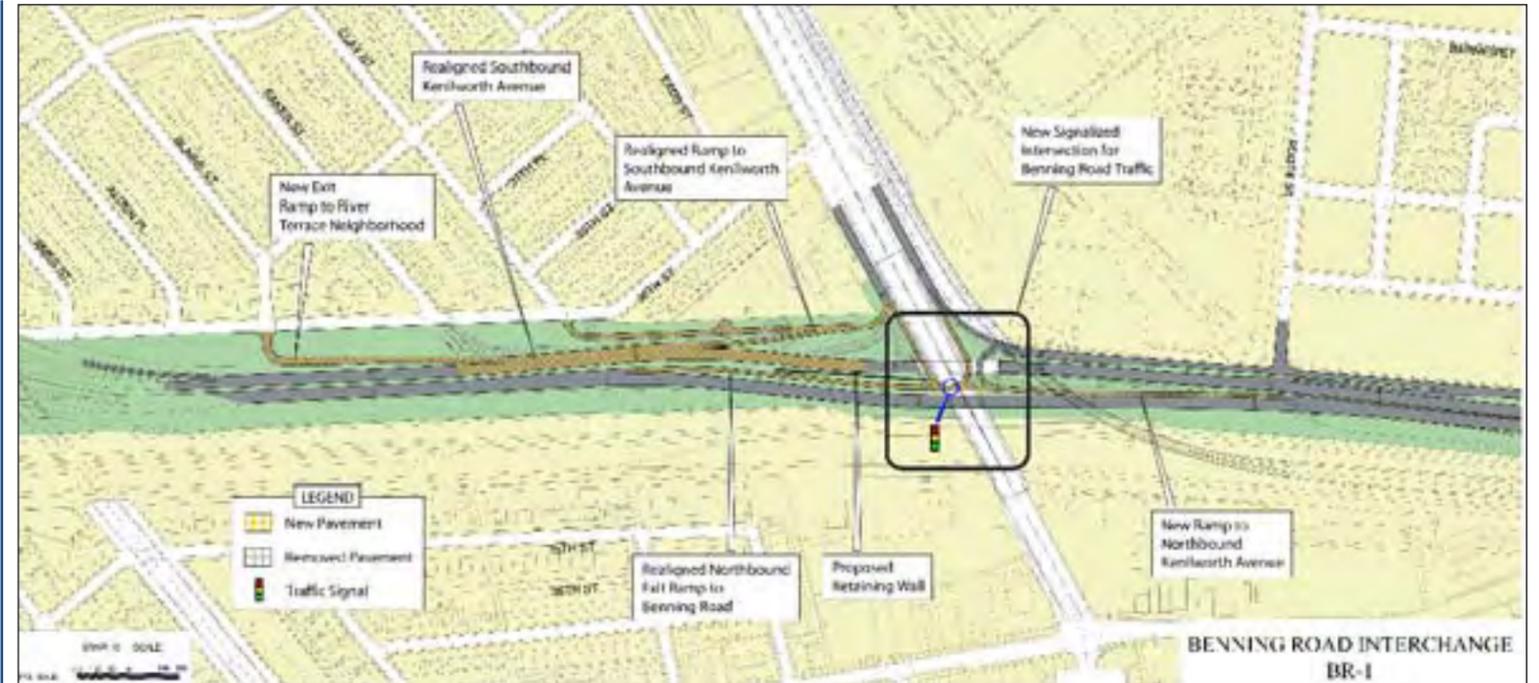


Figure 3.20: Scenario BR-1 (Provides for safety improvements at the eastbound Benning Road at-grade intersection with northbound Kenilworth Avenue)

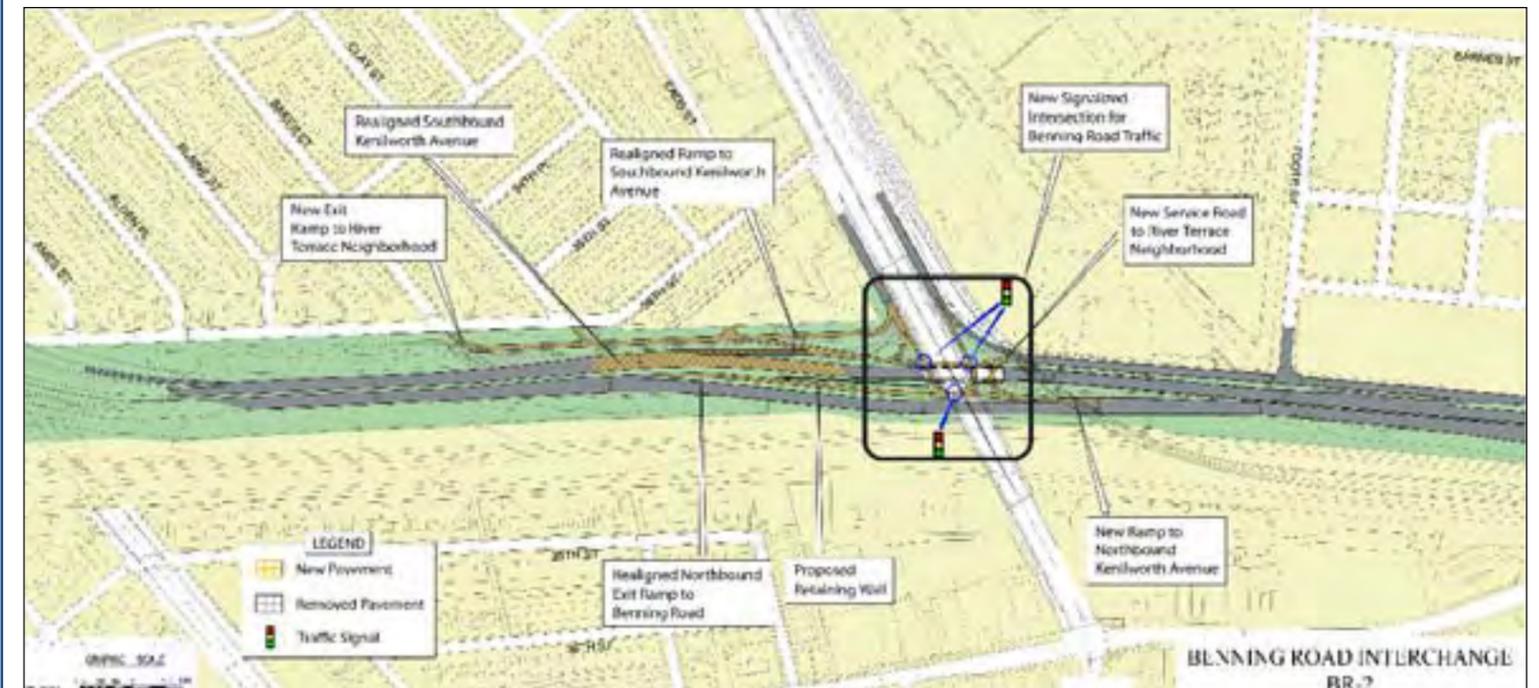


Figure 3.21: Scenario BR-2 (New connection from southbound Kenilworth Avenue to eastbound Benning Road, and westbound Benning Road to southbound Kenilworth Avenue)

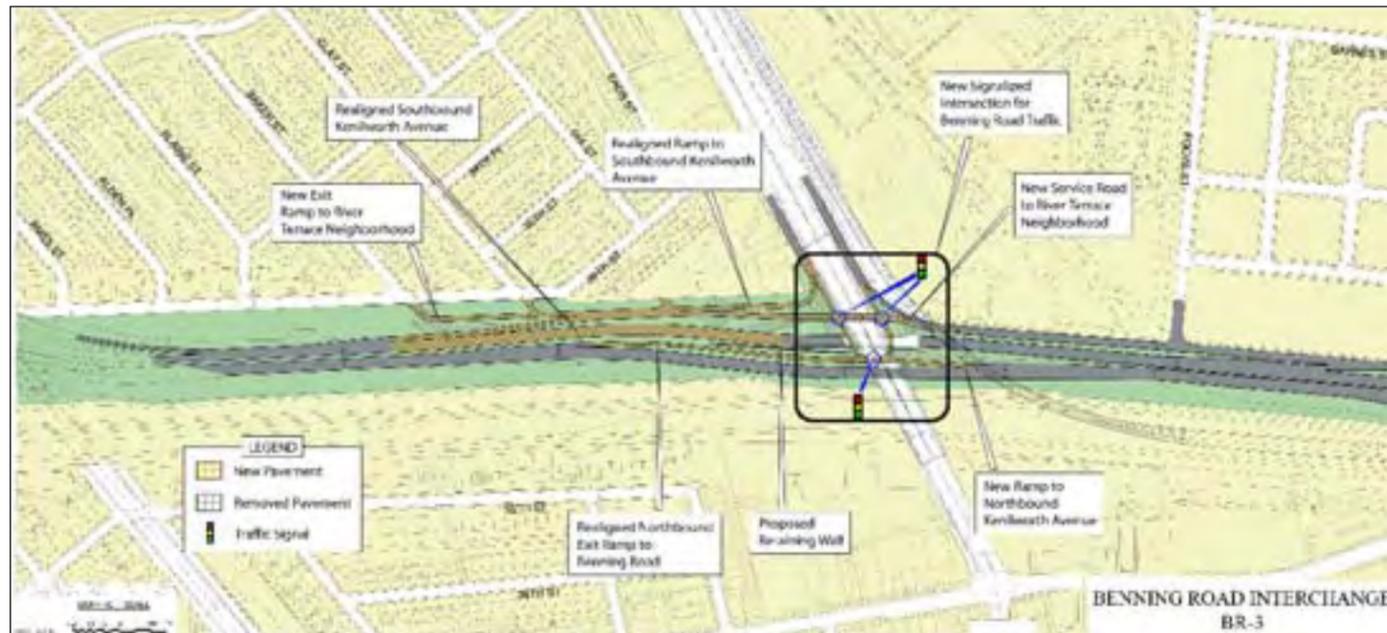


Figure 3.22: Scenario BR-3 (New center-leg ramp to the south of the Benning Road bridge)

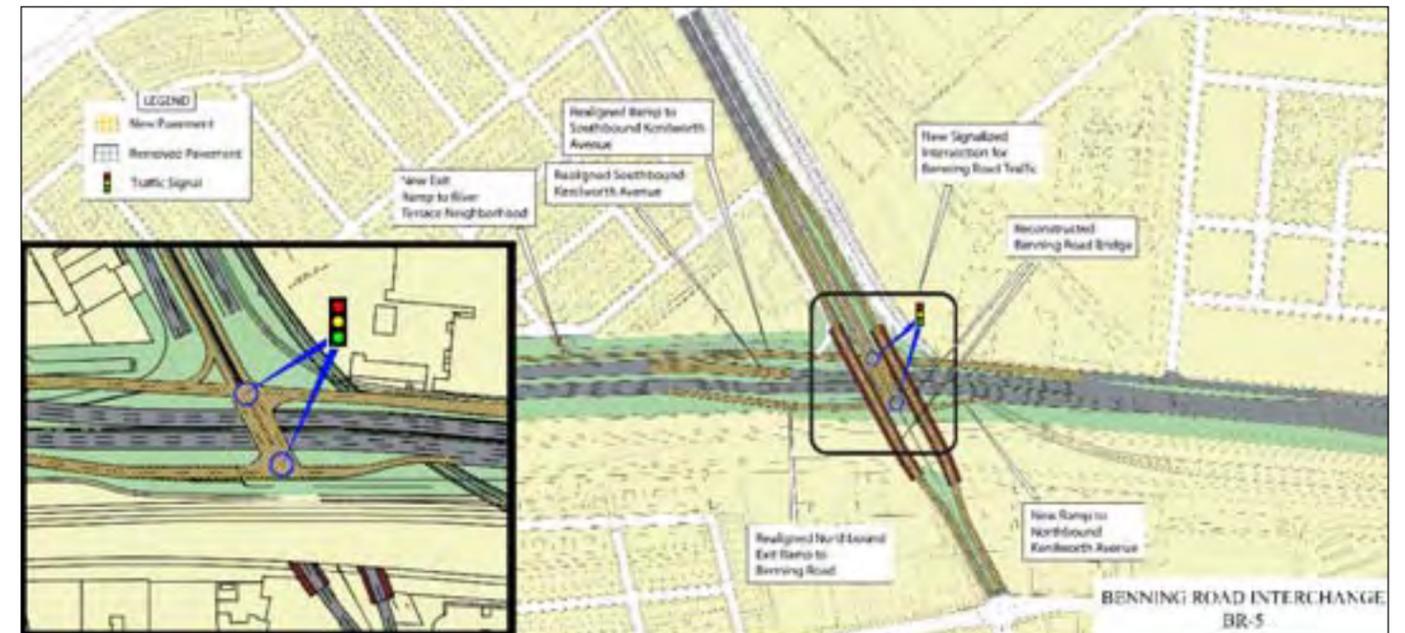


Figure 3.24: Scenario BR-5 (Allows for all movements through a new interchange located south of the existing bridge)

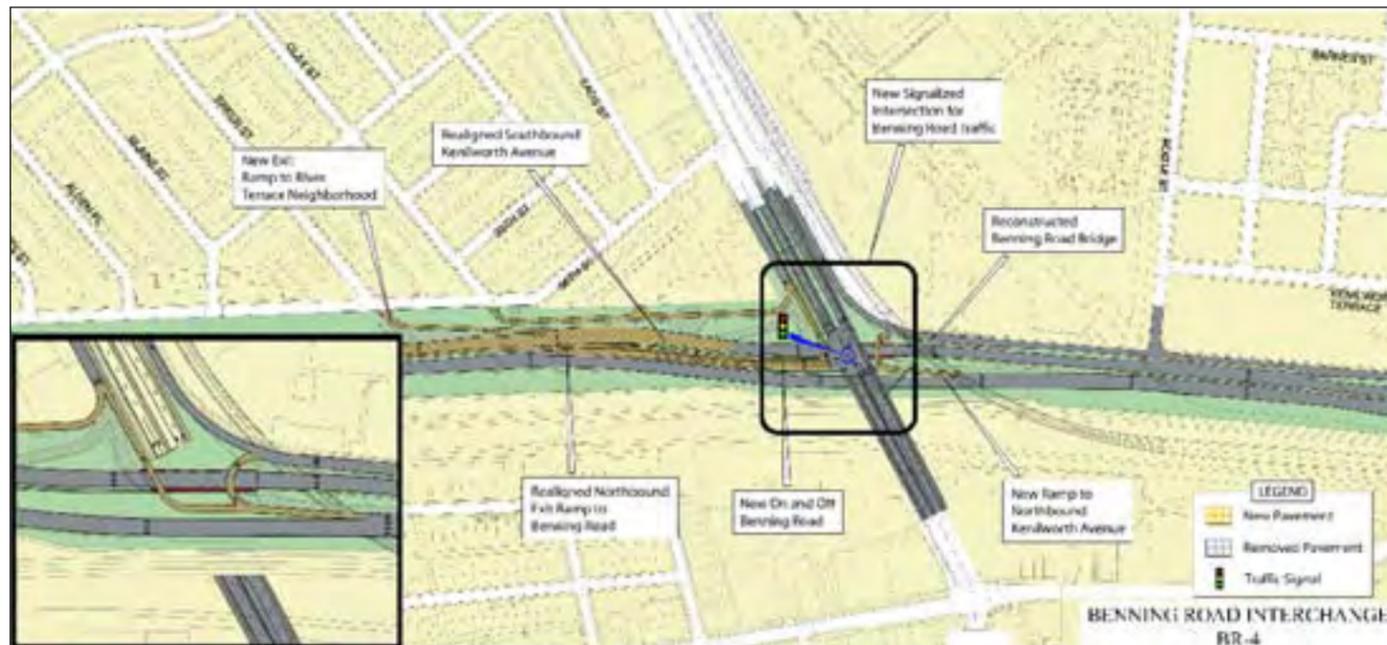


Figure 3.23: Scenario BR-4 (Benning Road Bridge reconstructed as a split structure to improve vehicular, pedestrian and bicycle safety)

Safety improvements to the at-grade intersection of Benning Road and northbound Kenilworth Avenue are similar to those described in Scenario BR-1; however, the exit ramp from northbound Kenilworth Avenue is from the right lane rather than the left lane. This requires depressing the northbound lanes of Kenilworth Avenue. A traffic signal at the top of the ramp with Benning Road controls movement at the new intersection.

This concept does not add any new movements to the existing interchange; however, it makes major improvements to vehicle safety and to pedestrian and bicycle access to and across the Benning Road bridge.

Scenario BR-5

Scenario BR-5 provides for all currently missing movements at Benning Road and Kenilworth Avenue. This is accomplished by introducing a new interchange south of the existing Benning Road bridge. This new interchange is built over the depressed lanes

of southbound and northbound Kenilworth Avenue and makes a new connection to Benning Road west of the existing bridge. This new connection requires additional right-of-way, and calls for the acquisition of approximately 12 houses and commercial property in the southwest quadrant of the existing interchange (see Figure 3.24).

The new interchange allows movement from east- and westbound Benning Road to southbound and northbound Kenilworth Avenue. The existing at-grade intersection beneath the Benning Road bridge is no longer needed.

This scenario provides full movement between Benning Road and Kenilworth Avenue. Minor improvements in pedestrian and bicycle access to or across the Benning Road are made as the existing ramp movements are moved to signalized intersections.

3.6.4 Nannie Helen Burroughs Avenue Interchange

The reconstruction of the Nannie Helen Burroughs Avenue interchange (see Figure 3.25) includes the following improvements.

- Reconstructing the bridge providing a wider section for Nannie Helen Burroughs Avenue beneath Kenilworth Avenue that allows for an additional lane and wider sidewalks for pedestrians and bicyclist.
- Making safety improvements for the exit ramp to Nannie Helen Burroughs Avenue and reconfiguring the exit ramp and service road on southbound Kenilworth Avenue, north of Nannie Helen Burroughs Avenue.
- Eliminating the exit ramp immediately before Benning Road and reconfiguring the remaining on- and off-ramps to improve safety on southbound Kenilworth Avenue, south of Nannie Helen Burroughs Avenue.
- Signalizing the new ramp connection and service road where they intersect with Nannie Helen Burroughs Avenue, and providing traffic signal systemization along Nannie Helen Burroughs Avenue to Minnesota Avenue.
- Improving lighting along Kenilworth Avenue between Foote Street and Lane Place.

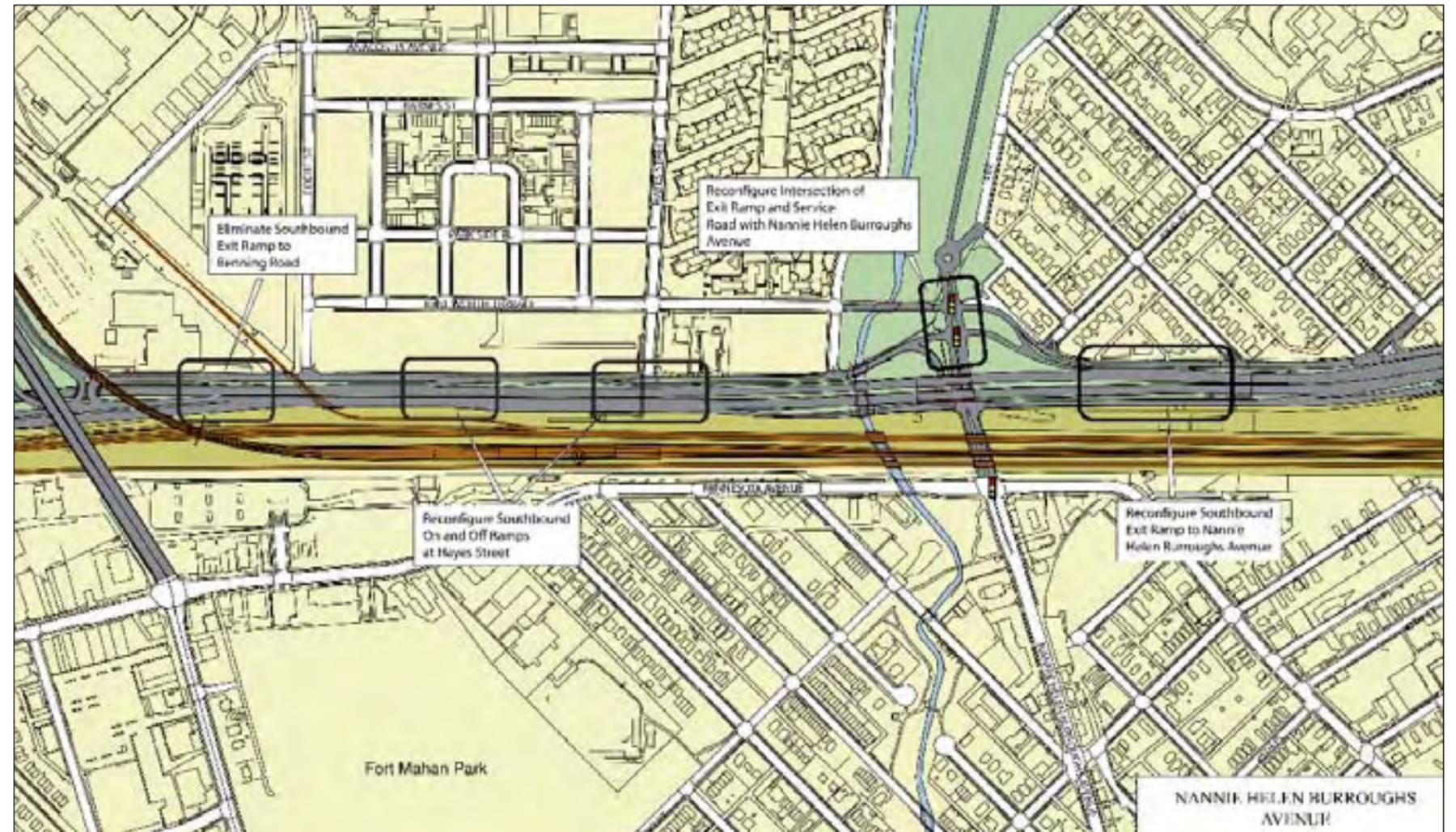


Figure 3.25: Proposed interchange at Nannie Helen Burroughs Avenue

3.6.5 Eastern Avenue Interchange

Two scenarios are considered for improving the gateway interchange at Eastern Avenue, the border between Washington, DC and Maryland. Important elements of each include:

- creating a visual gateway into Washington, DC for southbound drivers on Kenilworth Avenue;
- adding a connection between Anacostia Avenue and Eastern Avenue to provide a new link to Kenilworth Aquatic Gardens, Anacostia Park, and the waterfront;
- eliminating the existing U-turns; and
- redesigning the intersection to better accommodate pedestrian traffic.

Existing Conditions

A gateway portal to the District of Columbia, the Eastern Avenue interchange may be the first impression many visitors have of the city as they drive southbound to Kenilworth Avenue from the Baltimore-Washington Parkway. Eastern Avenue also provides access to the Deanwood Metrorail Station, the Kenilworth Aquatic Gardens, and the Kenilworth, Eastland Gardens and Deanwood neighborhoods. The interchange has three-legs with no western leg; it provides all movements including a U-turn for southbound and northbound traffic on Kenilworth Avenue (see Figure 3.26).

The primary limitation of the existing interchange is the poor pedestrian environment and lack of landscaping and streetscape features. Pedestrians are forced to cross the corridor on a narrow concrete median that separates the turning traffic on Eastern Avenue from the Kenilworth Avenue traffic using the U-turns.

The bridge itself is visually unappealing with a design that dates to the 1950s. Because of substandard clearances over Kenilworth Avenue, the Eastern Avenue bridge has been repeatedly hit by over-height vehicles.



Figure 3.26: Eastern Avenue Existing Conditions

Scenario EA-1

This scenario eliminates both U-turn ramps and reuses the space for landscape improvements, including new crosswalks and pedestrian-level lighting. Reconstruction of the bridge is not required (see Figure 3.27).

A new pedestrian/bicycle connection between the end of Anacostia Avenue and Eastern Avenue provides additional access to the Kenilworth Aquatic Gardens, the Anacostia Park, and the Anacostia waterfront for neighborhoods to the east of Kenilworth Avenue.

Scenario EA-2

This scenario maintains both U-turn ramps, but relocates them further from the intersection to provide space for pedestrian and landscape improvements, including pedestrian lighting. This scenario requires reconstruction of the bridge to create a wider bridge deck (see Figure 3.28).

As in Scenario EA-1, a new pedestrian/bicycle connection between the end of Anacostia Avenue and Eastern Avenue provides additional access to the Anacostia waterfront and the surrounding neighborhoods and attractions.



Figure 3.27: Scenario EA-1 (Existing U-turn ramps are removed and replaced with landscaped areas and improved pedestrian amenities)



Figure 3.28: Scenario EA-2 (U-turn ramps moved further out from the intersection)

3.6.6 Analysis of Option 3 for Year 2030

Travel demand analysis was performed using the MWCOG regional transportation model to project 2030 traffic volumes. Several scenarios for Option 3 were evaluated:

- No-Build (includes MAC improvements and refinements)
- Scenario S: No-Build + safety improvements
- Scenario 1: No-Build + full movement at East Capitol Street Interchange
- Scenario 2: No-Build + full movement at Benning Road Interchange
- Scenario 3: Maximum improvement including full movement at East Capitol Street and Benning Road, a new Massachusetts Avenue River Crossing, and a new Park Road between Barney Circle and Benning Road on the west side of the Anacostia River

A traffic analysis of year 2030 conditions found that demands on Kenilworth Avenue are growing as a result of traffic into and out of Maryland, and that under the various scenarios evaluated, operations will degrade substantially in the future. Implementing a full movement interchange at East Capitol Street provides the lowest increase in travel time throughout the corridor as demands to enter/exit Kenilworth Avenue become more dispersed. If the year 2030 traffic projections are realized and DDOT does not provide additional capacity on Kenilworth Avenue, DDOT must pursue travel demand management options to reduce peak hour traffic.

Programmed Capital Improvements

There are several programmed improvements within the study area that were included in the future condition analysis (year 2030). Each is described below.

- Nannie Helen Burroughs Avenue Interchange: The reconstruction of the Kenilworth Avenue bridge over Nannie Helen Burroughs Avenue is anticipated to be complete by 2009. These improvements are described in Section 3.6.4.

- Replacement of Kenilworth Avenue Bridge over AMTRAK and Beaver Dam Branch: The Maryland State Highway Administration will advertise a project to reconstruct the Kenilworth Avenue bridge over AMTRAK and Beaver Dam Branch immediately north of Eastern Avenue. Construction is expected to begin in 2006. As part of this project, the following improvements will be implemented: The existing bridges in both directions will be replaced, with the southbound structure widened; and an acceleration lane will be constructed for the eastbound New York Avenue to southbound Kenilworth Avenue ramp and extended to Eastern Avenue. This acceleration lane will improve operations along the ramp and improve queuing along eastbound New York Avenue.

- Minnesota Avenue: Minnesota Avenue terminates north of Nannie Helen Burroughs Avenue where it becomes Sheriff Road. A portion of Minnesota Avenue also exists between Meade Street and Eastern Avenue. The project connects these two pieces of Minnesota Avenue. There is no schedule for construction.

- Eastern Avenue Bridge Replacement: Design of the reconstruction of the Eastern Avenue bridge over Kenilworth Avenue is currently underway. As part of this improvement, the intersection will be replaced and upgraded for pedestrian and traffic safety improvements and Kenilworth Avenue lowered to improve vertical clearance beneath the new structure.

2030 Travel Demand Forecasting for Option 3

REGIONAL TRAVEL DEMAND MODEL

A travel demand analysis was performed for Option 3 using the Metropolitan Washington Council of Government (MWCOG) regional transportation model. The model is subdivided into about 2,900 Traffic Analysis Zones (TAZs), estimates the number trips between TAZs, and distributes the trips over the transportation network.

The analysis is a four-step process:

- Trip Generation – estimating the number of trips produced by and attracted to each TAZ;
- Trip Distribution – estimating the numbers of trips traveling between each TAZ;
- Mode Choice – splitting these trips into their respective modes of travel; and
- Network Assignment – assigning the generated trips to the transportation network and estimating the traffic volumes on network segments.

BASE YEAR (2004) MODEL VALIDATION AND ADJUSTMENT

To investigate the performance of the MWCOG model within the context of the study area, a base year (2004) model run was performed and validated against observed data. Validation of the base year model involved:

- Reviewing network coding in the study corridor;
- Examining zoning and land use data in the study area; and
- Comparing the traffic assignment results with observed traffic count data on major arterials.

Based on the validation of the base model results, a number of corrections and refinements were made to the model network. These included:

- Adding the service roads and the associated slip ramps on both sides of Kenilworth Avenue between Nannie Helen Burroughs Avenue and Eastern Avenue;
- Correcting turning movements at the Benning Road and East Capitol Street interchanges on Kenilworth Avenue to reflect actual conditions;

Improvement Scenario	AM Peak Hour		PM Peak Hour	
	Southbound	Northbound	Southbound	Northbound
Existing 2004 Condition	357	311	346	588
No-Build 2030	1,298	332	395	1,286
Option 3 + Scenario S	1,364	309	939	917
Option 3 + Scenario 1	1,268	311	667	732
Option 3 + Scenario 2	1,392	324	556	984
Option 3 + Scenario 3	1,500	328	490	822

Note: Travel Times measured in minutes.

Table 3.5: Travel Times for the No-Build and Option 3 Scenarios

- Adding turn penalties for some movements at the intersection of Minnesota Avenue and Massachusetts Avenue; and
- Refining the network coding at the intersection of East Capitol Street and Minnesota Avenue.

In addition, the link attributes of some highway segments were adjusted to reflect the actual conditions as well as to obtain assignment results reasonably close to observed data.

TRAFFIC FORECASTS FOR 2030

In order to develop traffic forecasts consistent with the results from the Middle Anacostia River Crossing (MAC) Study, this study included the highway improvement proposed in the MAC Study including:

- 11th Street Bridge improvements;
- Barney Circle improvements; and
- Elimination of the Southeast-Southwest Freeway segment between the 11th Street Bridge and the John Phillip Sousa Bridge.

EVALUATION OF THE NO BUILD CONDITION

The No Build condition consists of the current geometry, including programmed roadway improvements. Analysis of the No Build condition aims to understand potential future operations if no other additional improvements are made by 2030.

SimTraffic was used to determine travel times and speeds throughout the corridor. Travel speeds are low and typically increase as vehicles travel through the corridor in the southbound direction. Travel speeds increase as vehicles travel north during the AM peak hour, however, the northbound movement is near gridlock between Pennsylvania Avenue and Benning Road during the PM peak hour.

LOS were also determined for the No Build condition. Without additional improvements, the majority of basic freeway, weaving and ramp segments operate at an unacceptable LOS F.

EVALUATION OF THE BUILD CONDITION

The Build Condition was analyzed using several variations in order to determine the best combination of improvements that might be implemented. The variants are based on the interchange layouts discussed above and consist of:

- Safety Improvements
- East Capitol Street Interchange Improvements
- Benning Road Interchange Improvements
- East Capitol Street and Benning Road Interchange Improvements

The Eastern Avenue Interchange was not included in the analysis as the proposed improvements for that interchange do not impact the traffic analysis.



As discussed above, for each interchange studied (East Capitol Street, Benning Road; and Eastern Avenue), multiple layouts were developed. For the analysis of the Build Condition, however, only the layout that provided full interchange movements was considered. This simplified the analysis and provided the worse-case condition for Year 2030. Each is described in more detail below.

SAFETY IMPROVEMENTS

Various safety improvements are incorporated into Option 3 throughout the corridor. These safety improvements do not involve any improvements to the interchanges that would add new movements. They consist of consolidating on- and off-ramps and providing adequate acceleration and deceleration distances for existing ramps to improve the safety for traffic entering and exiting Kenilworth Avenue (see Figure 3.29). For the Benning Road interchange, the analysis also considered right entrance/exits.

EAST CAPITOL STREET INTERCHANGE IMPROVEMENTS

These improvements incorporated a full-movement interchange at East Capitol Street. The full movement interchange is provided via right entrance and exit ramps.

BENNING ROAD INTERCHANGE IMPROVEMENTS

This improvement provides for a full-movement interchange at Benning Road. The full movement interchange is via right entrance and exit ramps.

EAST CAPITOL STREET AND BENNING ROAD INTERCHANGE IMPROVEMENTS

This improvement incorporates a full movement interchange at both East Capitol Street and Benning Road as discussed above.

The proposed safety and interchange improvements were coded in the model network and an analysis was performed, the results of which were compared to the No-Build Option.



Figure 3.29: Proposed Safety Improvements

3.6.7 Evaluation of Option 3 with Safety and Interchange Improvements

An analysis of the safety and interchange improvements was completed using SimTraffic. Table 3.5 compares the travel times under each combination of improvements evaluated.

There is no major reduction in travel time when implementing any of the combination of safety or interchange improvements as compared to the future No-Build condition. Travel times are high and speeds low throughout the corridor under all of the 2030 Build conditions.

A close analysis of the results indicates a preference for the full-movement interchange at East Capitol Street without any improvements at Benning Road. There is no appreciable difference in travel times between the future No Build condition and Option 3 built with the East Capitol Street Interchange improvement. However, that improvement combined with a full-movement interchange at Benning Road results in significant increases in travel time within the corridor.

Based on the Year 2030 analysis of the various improvements identified, operations will degrade substantially in the future. Implementing a full movement interchange at

East Capitol Street provides the lowest travel time throughout the corridor as demands to enter and exit Kenilworth Avenue become more dispersed.

If the year 2030 traffic projections are realized and additional capacity on Kenilworth Avenue is not provided, travel demand management options to reduce peak hour traffic volumes will be needed.

3.6.8 Traffic Management Alternatives

The analysis indicates that demand on Kenilworth Avenue is growing as a result of traffic into and out of Maryland. Coordination with the Maryland Department of Transportation and its various modal administrations should continue to pursue the following opportunities:

- Extend Metrorail and provide additional Metrorail parking capacity for rail lines into and out of Maryland;
- Coordinate with the Maryland State Highway Administration for the construction of additional park-and-ride lots and/or additional capacity at existing lots along US 50 and the Baltimore-Washington Parkway.
- Pursue potential commuter rail connections with existing MARC lines and/or new lines into Maryland.
- Consider re-constructing Kenilworth Avenue with a reversible lane system that would provide four lanes for the peak direction.
- Consider re-constructing Kenilworth Avenue and I-295 between both Maryland State lines to provide two lanes in each direction, as well as reversible managed lanes to encourage carpools and travel outside of the traditional peak hours.
- Implement High Occupancy Vehicle (HOV) lanes in one of the three lanes in the northbound and southbound directions.

The least expensive and most readily implemented travel demand management option is to designate one northbound and one southbound lane as High Occupancy Vehicle (HOV) lanes. Concurrent HOV lanes exist on several major arteries as well as several streets in the District of Columbia. Because of their widespread use in the area, HOV lanes can be implemented quickly on Kenilworth Avenue

with limited need for a public awareness or education campaign.

Implementation of HOV lanes on Kenilworth Avenue, however, will be challenging due to the absence of adjacent facilities to the north and south of the corridor. Complicating implementation of HOV on Kenilworth Avenue are frequent left and right entrance and exit ramps. In addition, HOV could not be supported on the reduced four-lane cross section south of East Capitol Street.

Two HOV options are feasible in the near-term:

- HOV Option 1, Left-Lane HOV: The left-most lane in both directions is converted to an HOV lane between Eastern Avenue and East Capitol Street. This configuration is typical of expressways or freeways, and could be striped with a wider lane line and/or with diamond pavement markings. Regulatory signs can be installed on the median barrier. Weaving from the HOV lane to certain exits may be a problem in certain directions due to the high peak hour volumes, such as the southbound exit to East Capitol Street (AM peak) and the northbound exit to eastbound US 50 (PM peak). The lack of shoulders would make enforcement challenging.
- HOV Option 2, Right-Lane HOV: The right-most lane is converted to HOV in both directions between Eastern Avenue and East Capitol Street. This configuration is not typical, but would simplify the weaving between the HOV lanes and key exits; however, more weaving may be introduced for traffic from on- and off-ramps which must make two lane changes to enter or exit Kenilworth Avenue.

HOV Option 1 provides the best operation. However, in order to eliminate the resultant weaving, directional ramps will have to be constructed. Reconstructing Kenilworth Avenue with a reversible HOV lane system that provides up to four lanes for the peak

direction along the entire corridor is another possibility. A five-lane section would provide three lanes in the peak direction.

It may be worthwhile to consider re-constructing Kenilworth Avenue and I-295 between both Maryland State lines to provide HOV lanes for the entire corridor. This would require additional capacity in both directions of I-295. Since the Maryland State Highway Administration and the Virginia Department of Transportation are both investigating the use of managed lanes, DDOT could also consider reversible managed lanes to encourage carpools and travel outside of the traditional peak hours.

3.6.9 ITS Alternatives

There are a number of ITS (Intelligent Transportation System) initiatives that DDOT is implementing throughout the city. Several of these should be considered for the Kenilworth Avenue corridor as they have the potential for improving traffic operations and providing useful information to travelers. These alternatives are discussed below. It should be noted that these alternatives are not exclusive and may be combined with any of the projects planned for short-, near- and long-term implementation.

- Dynamic Message System (DMS): A permanent Dynamic Message system should be considered for the corridor that would extend to points north and south in order to provide adequate real-time information for travelers. A DMS, used in conjunction with a Highway Advisory Radio System, would greatly enhance capabilities for communicating with the traveling public and provide information related to incidents (crashes), construction activities, congestion, travel times, and road conditions.
- Highway Advisory Radio (HAR): Highway Advisory Radio transmitters currently have limited use in the city. Given the critical aspect of this corridor as a commuter route and the high incidence crashes that occur (in some locations up to three times the national average), a dedicated HAR system for this corridor should be implemented and extended into Maryland along the BW Parkway, New York Avenue and Route 50. A dedicated HAR would provide travelers with incident information and construction-related impacts.
- Closed-Circuit Television (CCTV) System: A CCTV system installed along the corridor would provide real-time information on traffic conditions and aid in incident management. Currently, CCTV is installed at major signalized intersections on either side of the corridor but none are oriented along the Kenilworth Avenue mainline.

- Road Weather Information System (RWIS): This provides critical information regarding real-time road temperatures and is useful during cold weather months for anticipating freezing conditions that lead to ice accumulation on bridges and roadway pavement. This system should be used in conjunction with a HAR and DMS to convey information to travelers.
- SpeedInfo Speed Sensor System: SpeedInfo provides real-time information on traffic speeds. As a supplement to a CCTV system, SpeedInfo can provide data over a navigation system, cell phone, HD radio, satellite radio, or on the web.

3.7 Additional Study Areas

In addition, to the interchange improvements discussed above, two additional improvements within the corridor were studied and analyzed.

- a new Park Road between Barney Circle and Benning Road on the west side of the Anacostia River; and
- a new Massachusetts Avenue crossing of the Anacostia River.

3.7.1 A New Park Road

In keeping with the Anacostia Framework Plan and the intent of unifying the many parks and recreational areas along the Anacostia River, a Park Road is proposed that links major destinations and neighborhoods from Eastern Avenue with points south.

The Park Road will connect all of the waterfront's major destinations: the National Arboretum, Kenilworth Aquatic Gardens, RFK Stadium, Hill East Meadows, the Kingman Island Nature Center, the new Recreation Center in Twining Park, the playing fields in the Fairlawn section of the Anacostia Park, and the Poplar Point Cultural Park. The Park Road will be twenty feet wide, with parallel parking lanes along selected portions.

This is a park-type road, not a commuter road, intended to enhance access to parkland and the river front. Within the context of the Kenilworth Avenue Corridor Study, three areas were studied and options developed to address linkages and missing connections.

Anacostia Avenue to Eastern Avenue Connection

A new connection between the terminus of existing Anacostia Avenue and Eastern Avenue is built, providing a new access point to the park for pedestrians, bicyclists and vehicles. This new connection completes the Eastern Avenue intersection, creates a new entrance to Kenilworth Aquatic Gardens, and provides an opportunity to define a gateway to the city. It is also the northernmost gateway to a new Park Road, a contiguous route through the park to points south.

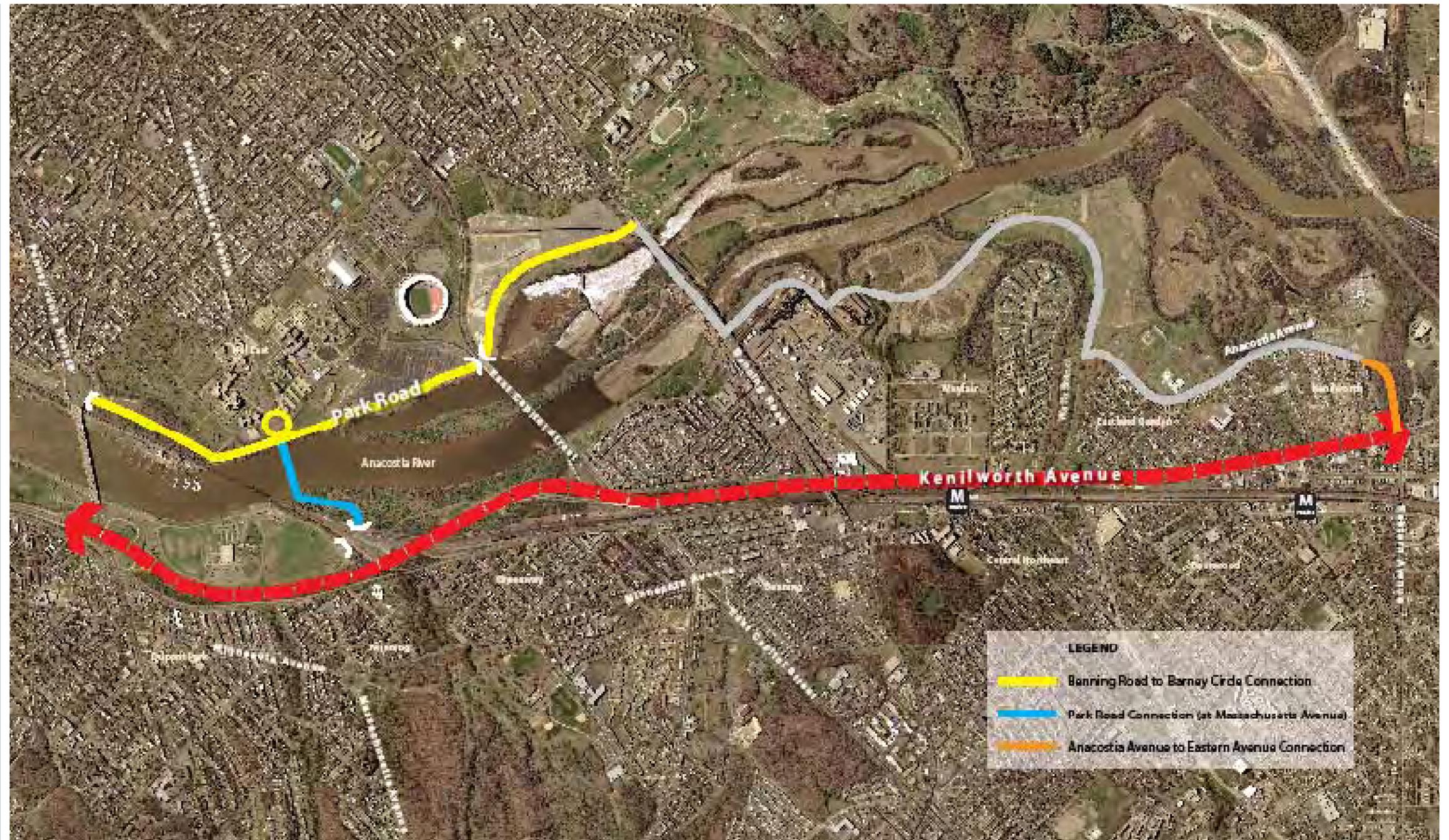


Figure 3.30: Park Road Alignment

Benning Road to Barney Circle Connection

To continue Park Road, a new connection is proposed at Benning Road on the west bank that follows the river to the proposed Reservation 13 Circle and continues to Barney Circle. This new connection provides access to the west bank park for pedestrians and vehicles, and a continuation of the road through the park.

Park Road Connection (at Massachusetts Avenue)

The new Park Road makes a connection across the river to join the segment from Benning Road and Barney Circle on the west bank with the parkland on the east bank.

The new connection, the proposed Massachusetts Avenue Park Road bridge, connects the proposed and existing Park Road system but does not connect to local streets. It serves as a connection for pedestrians, bicyclists, and vehicles using the new Park Road. This would also provide access for National Park Service maintenance vehicles.

3.7.2 Analysis of Park Road Options

The three options for Park Road are not mutually exclusive. Each of these options may be implemented independently of the other with the goal that a new Park Road link major destinations and neighborhoods from Eastern Avenue with points south. The basis for this evaluation is discussed below.

Urban Design

All three options establish new connections. The most important connections are created by the Anacostia Avenue to Eastern Avenue connection and the Park Road connection.

The Anacostia Avenue to Eastern Avenue connection completes the fourth leg of the interchange at Eastern Avenue and provides for a new entrance to Kenilworth Aquatic Gardens and the opportunity to create a true gateway setting for the city.

The Benning Road to Barney Circle connection, at Benning Road, creates a less prominent connection to the waterfront that is more functional in purpose.

While all three options contribute to establishing an enhanced street grid, the Park Road connection (at Massachusetts Avenue) is rated higher in this regard as it extends a significant avenue, that currently lacks continuity both visually and physically. This option is also rated higher for both the experience it provides to pedestrians and bicyclist using the facility and for the connectivity it provides between two neighborhoods.

Land Use

The Anacostia Avenue to Eastern Avenue connection enhances connectivity between neighborhoods and completes the fourth leg of an important intersection in the city. Surrounding land use would be enhanced by this option, particularly given the proximity of the Deanwood Metrorail Station. The other two connections have no significant impact on surrounding land use.

Pedestrian/Bicycle Conditions

The quality of existing pedestrian and bicycle conditions improves under all options, primarily because of the creation of new connections.

The Benning Road to Barney Circle connection and the Park Road connection (at Massachusetts Avenue) are rated higher than the Eastern Avenue connection owing to the direct connection to parkland. These two connections are also rated higher for the experience they provide to pedestrians and bicyclist using the facility, with the Benning Road to Barney Circle connection better in this respect than the Park Road connection (at Massachusetts Avenue). All options reduce the number of conflicts with vehicles.

Compatibility with Great Streets

None of the options make a gesture to, or detract from, the Great Streets Initiative.

Connectivity to Neighborhoods

All options enhance connectivity to neighborhoods. All three provide access between neighborhoods for pedestrians and bicyclists, with the Eastern Avenue connection being slightly better owing to the direct connection provided. The other two options enhance connectivity to open space.

Access to River

All options enhance access to the Anacostia River for pedestrians, and bicyclists.

Access to Transit

Access to transit facilities and transit routes for vehicles, pedestrians, bicyclists, and transit users is unchanged in each of the three options.

Traffic

None of the options affects traffic in any significant way.

Safety

Traffic safety remains unchanged under all three options.

Construction Costs

In gross order of magnitude, the Eastern Avenue connection is the least expensive to

implement. The Benning Road to Barney Circle connection and the Park Road connection (at Massachusetts Avenue) are more expensive as they require construction of significant infrastructure.

Construction Impacts

The Eastern Avenue connection potentially impacts designated wetlands and possibly requires occupying parkland.

The Benning Road to Barney Circle connection and the Park Road connection (at Massachusetts Avenue) require occupying parkland, with the latter having an impact within the Anacostia River.

Potential Environmental Impacts

The Eastern Avenue connection may have significant impacts on designated wetlands and requires careful design to minimize such impacts. It might also reduce parkland and open space and may affect natural resources, land uses and neighborhood character. Community services, such as fire and police response, are not affected.

The Benning Road to Barney Circle connection and the Park Road connection (at Massachusetts Avenue) occur directly in parkland and open space but are intended to enhance park access. They may affect natural resources. Community services, such as fire and police response, remain unchanged under these options.

All options have minimal impact on community and recreational facilities, and on historic and cultural resources.

Both the National Park Service and the neighboring community have expressed concern that any of these options may have adverse impacts on accessibility to the park and the potential for increased commuter traffic.

Recommendations

A vehicle connection between Anacostia Avenue and Eastern Avenue is problematic due to the presence of designated wetlands west of the Eastern Avenue intersection.

However, a pedestrian or bicycle connection at this location greatly enhances connectivity for park users and those wishing to access the Deanwood Metrorail Station. Options for making a multi-use trail connection between Anacostia Avenue and Eastern Avenue, that is sensitive to the natural environment, could be explored further.

The Benning Road to Barney Circle connection enhances access on the west bank of the Anacostia River, and, in conjunction with the Park Road connection (at Massachusetts Avenue), provides continuity to the existing Park Road system. The Park Road connection (at Massachusetts Avenue), which provides a new connection for pedestrians and bicyclists and a limited connection for vehicles using the park, together with the Benning Road to Barney Circle connection, could be studied further because of this improved connectivity.

Any of these options will only be possible with support and approval of the National Park Service which has jurisdiction over the land required to make the access improvements.

3.7.3 A New Massachusetts Avenue Crossing

Massachusetts Avenue is a grand boulevard that is interrupted by Reservation 13 prior to the Anacostia River in Ward 6, and by the CSX railroad spur and Kenilworth Avenue in Ward 7.

Due in part to the historical location of the D.C. General Hospital and the District Jail at Reservation 13, Massachusetts Avenue has long terminated at 19th Street. A preliminary study of this area, now referred to as the Hill East waterfront, recommends extending a neighborhood-scale street grid to the Anacostia River and creating a vibrant, mixed-use waterfront neighborhood. Massachusetts Avenue will provide a vital lifeline to this new mixed-use development, the success of which depends on strong connections to the rest of the city.

The extension of Massachusetts Avenue across the river via Park Road bridge can provide an excellent pedestrian and bicycle route between parks and neighborhoods on both sides of the river. According to the Hill East plan, Massachusetts Avenue will extend through the site to end in a traffic circle at the waterfront, connecting to the Park Road system. From there, travelers along the Riverwalk or the Park Road will have the option of heading southwest towards the Near Southeast neighborhoods and more urban portions of the waterfront, northeast towards the upper reaches of the Anacostia River, or across the river on the new Massachusetts Avenue Park Road bridge.

The proposed Massachusetts Avenue Park Road bridge will create a much needed connection across the river for pedestrians and cyclists who seek to travel through the park system on either bank of the river. This study explores three options that either physically, or symbolically, connect the two end of Massachusetts Avenue.

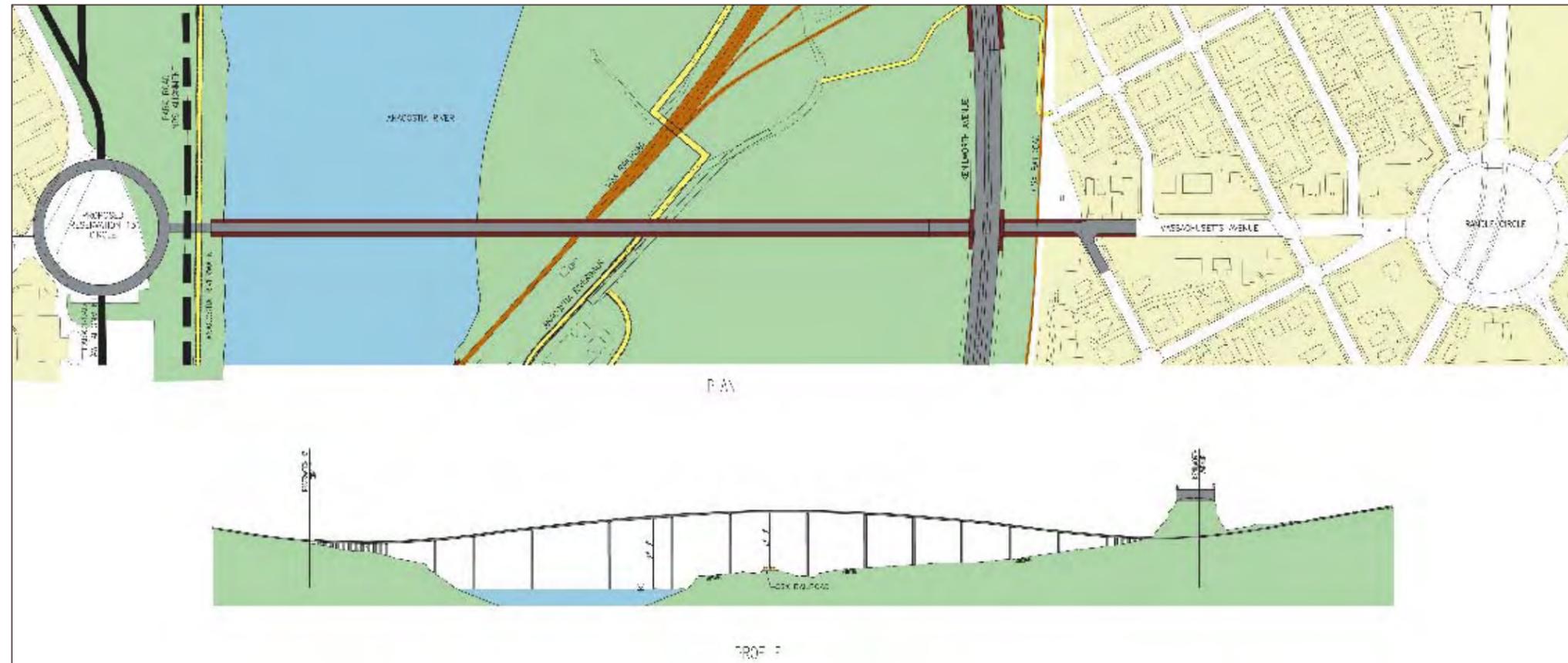


Figure 3.31: Reservation 13 to Randle Circle Connection

- Under one option, a two-lane bridge connects Reservation 13 in Ward 6 to Randle Circle in Ward 7;
- Under another, a pedestrian and bicycle crossing, aligned with Massachusetts Avenue, connects the two waterfront parks on either bank of the Anacostia River; and
- Finally, a two-lane vehicular, pedestrian and bicycle crossing was considered that connects the two waterfront parks on either bank of the Anacostia River.

Reservation 13 to Randle Circle Connection

Under this option, a new bridge connects Massachusetts Avenue at Reservation 13 in Ward 6 with Massachusetts Avenue at Randle Circle in Ward 7. This bridge spans the Anacostia River, the parkland on either bank,

the CSX Railroad tracks on the east bank, and Kenilworth Avenue (see Figure 3.31).

This bridge provides the required vertical clearances over the railroad tracks. Under this option, there is no connection to Kenilworth Avenue as the purpose of this option is primarily to serve local traffic.

Park-to-Park Pedestrian Connection

This option provides a new connection across the Anacostia River that is restricted to pedestrians and bicyclists. It is aligned with Massachusetts Avenue and connects the federal parkland on either bank of the Anacostia River.

Open space connectivity is enhanced due to new connections to existing or proposed trails for pedestrians and bicyclists. National Park Service vehicle could use the bridge for main-

tenance purposes. There is no public vehicular connection to local streets (Figure 3.32).

Park Road Connection

The Anacostia Waterfront Initiative Framework Plan proposes a new Park Road that crosses the Anacostia River at Massachusetts Avenue. As described in the Framework Plan, a new Massachusetts Avenue would extend through proposed redevelopment at the Reservation 13 site to end in a traffic circle at the waterfront.

The proposed Massachusetts Avenue crossing connects to the proposed and existing Park Road system only, and not to local streets, thus preventing regional traffic from using the bridge as a shortcut. The bridge would also serve as a connection for pedestrians and bicyclists and for National Park Service maintenance vehicles.

3.7.4 Analysis of Massachusetts Avenue Crossing Options

The three options for a new Massachusetts Avenue crossing of the Anacostia River were evaluated as discussed below.

Urban Design

Due to the need to span across Kenilworth Avenue and the CSX railroad tracks, a bridge as described in the Reservation 13 to Randle Circle connection establishes a substantial presence along the waterfront. This is a deviation from existing bridges that cross the Anacostia River within the District of Columbia. This option also creates a substantial barrier at the eastern end, where the bridge connects to Massachusetts Avenue in the Randle Circle neighborhood.

By comparison, the bridges in the Park-to-Park Pedestrian connection and the Park Road connection only connect the existing banks of the Anacostia River. A bridge under these options could be designed to fit into the typology established by existing river crossings.

Land Use

The bridge considered under the Reservation 13 to Randle Circle connection would include structural elements, such as support piers, that could have a significant impact on existing parkland. The bridge and a new road connection creates a through connection in a location where the avenue currently dead-ends and increases traffic in the Randle Circle neighborhood.

The Park-to-Park Pedestrian connection and the Park Road connection are not anticipated to result in a significant impact on surrounding land uses.

Pedestrian/Bicycle Connectivity

All options improve the quality of pedestrian and bicycle connections, and create a new connection across the river.

The Park-to-Park Pedestrian connection and the Park Road connection provide a direct connection between parkland on either bank of the river. The Reservation 13 to Randle Circle connection provides a connection between neighborhoods along Massachusetts Avenue on either side of the river, but not between the waterfront parks.

The experience of pedestrians and bicyclists is anticipated to be best under the Park-to-Park Pedestrian connection, where the crossing is designed specifically for them. Under the Park Road connection, the connection is designed for low speed and single lane vehicular traffic, as well as for pedestrians and bicyclists. This connection is also anticipated to provide a positive experience for pedestrians and bicyclists. Both the Park-to-Park Pedestrian connection and the Park Road connection reduce the number of conflicts with vehicles relative to the Reservation 13 to Randle Circle connection.



Figure 3.32: Park-to-Park Connection

Vehicular Movement and Connectivity

The Reservation 13 to Randle Circle connection enhances vehicular connectivity between neighborhoods across the Anacostia River. This is not the case under the Park-to-Park Pedestrian connection and the Park Road connection, since access is limited between the waterfront parks.

Under the Reservation 13 to Randle Circle connection, new traffic movements are added; however, Level of Service measurements at key intersections are expected to deteriorate on both approaches to the bridge, partially negating this enhancement. The Park-to-Park Pedestrian connection and the Park Road connection do not provide for any significant new traffic movements.

Construction Costs and Impacts

In gross order of magnitude, the Reservation 13 to Randle Circle connection results in a substantial bridge structure and is the most expensive to implement. The Park-to-Park

Pedestrian connection, which consists of a shorter pedestrian bridge, is the least expensive. The Park Road connection, is designed to carry two lanes of park traffic, is moderately expensive.

The Reservation 13 to Randle Circle connection results in the most construction-related impact, since it can only be implemented by occupying parkland and taking property in the Randle Circle neighborhood. The Park-to-Park Pedestrian connection and the Park Road connection have relatively minimal construction impacts; however, parkland will be required to build both structures.

Potential Environmental Impacts

The Reservation 13 to Randle Circle connection significantly affects parkland and open space, and may have an impact on natural resources, land uses, and neighborhood characteristics. Community services, such as fire and police response, are enhanced owing to a new connection across the river.

The Park-to-Park Pedestrian connection and the Park Road connection have minimal impact on parkland and open space; however, there may be an impact on natural resources due to new construction. No impacts on land uses and neighborhood characteristics are expected. Community services, such as fire and police response, are anticipated to be unaffected.

All options are anticipated to have minimal impact on community and recreational facilities, and historic and cultural resources.

The Reservation 13 to Randle Circle connection may impact air quality and noise. This would occur to a lesser extent under the Park-to-Park Pedestrian connection and the Park Road connection.

Recommendations

Both the Park-to-Park Pedestrian connection and the Park Road connection, where a new connection for pedestrians and bicyclists, and a limited connection for vehicles (under the Reservation 13 to Randle Circle connection) should be studied further because they improve connectivity between communities and the waterfront.

The Reservation 13 to Randle Circle connection should be eliminated from further consideration because it would likely result in negative affects on the viewshed and adjacent neighborhoods.

The construction of the proposed Massachusetts Avenue Park Road bridge could only be possible with support and approval of the National Park Service which owns or has jurisdiction over the land required to build the crossing.

Kenilworth Avenue Corridor Plan

As discussed in Chapter 3, recommendations under Option 3 would be pursued to improve the corridor; where, Kenilworth Avenue would remain a limited access highway. Safety improvements would be made to portions of the corridor, and some portions would be depressed to improve connectivity across the roadway. Infrastructure improvements would be made across the corridor including at the key interchanges at East Capitol Street, Benning Road and Eastern Avenue, to improve the aging infrastructure, its visual character, and the vehicular, pedestrian and bicycle circulation systems (see Figure 4.1)

Once the improvements are in place, the Kenilworth Avenue corridor will continue to function as a limited-access roadway, the character of which will vary between a parkway and a tree-lined expressway.

This chapter describes a corridor plan, which consists of three parts - the overall corridor design, the proposed vehicular circulation system, and the proposed pedestrian and bicycle circulation system. The corridor plan provides the broad policies and recommendations that are aimed to improve the Kenilworth Avenue Corridor. These policies and recommendations translate into individual projects that are summarized at the end of this chapter, and are discussed in further detail in Chapters 5 through 8 of this document.



Figure 4.1: Corridor Plan

4.1 Urban Design

The aim of this plan is to establish Kenilworth Avenue as an attractive urban corridor that threads through several of the District's distinct neighborhoods east of the Anacostia River, and extends the visual character established by the Baltimore Washington Parkway to the north to connect with the Anacostia Freeway to the south. The design decisions and implementing strategies that provide a framework to achieve the beautification of the corridor are described below.

Strengthen the Parkway Setting between Pennsylvania Avenue and East Capitol Street

Between Pennsylvania Avenue and East Capitol Street, Kenilworth Avenue borders a park on one side and a wide vegetated buffer area on the other. The corridor itself is a two-lane roadway with paved shoulders, landscaped edges and a median that varies from a narrow jersey barrier to wider vegetated areas. Also, nearly one-third of the corridor consists of an elevated structure. There is no pedestrian access along this segment of the roadway.

The following strategies are recommended to emphasize the parkway setting along this portion of the corridor:

- Improve maintenance of existing vegetation including removal of exotic and invasive species;
- Plant new vegetation at strategic locations to reinforce the landscape buffer, and to provide openings that frame views, including those of the Anacostia Park, the Anacostia Hills and portions of the City that are visible to the west of the river.



Figure 4.2: Corridor Beautification Framework Plan

- Replace the paved shoulder on the outside of the roadway with a grass shoulder and a mountable curb, and replace the paved shoulder on the inside with a green median to reduce the amount of visible pavement along the corridor and to improve the environmental footprint of the roadway.
- Continue the architectural treatment, such as embossed concrete walls, along the elevated or narrow portions of the corridor, similar to the recently improved New York Avenue crossings.

Revitalize the Corridor between East Capitol Street and Eastern Avenue with Streetscape Improvements

This stretch of the corridor has a more urban and inconsistent character. Neighborhoods about the roadway on one side, with CSX railroad tracks and a buffer area, as well as some commercial development, on the other. The corridor is a three-lane roadway with limited shoulders and includes service lanes on either side for a significant portion of this stretch. This stretch of the corridor is also traversed by several bridge structures. Also, there are sidewalks that line the service lanes along this segment of the corridor.

The following strategies are recommended to establish a more consistent and aesthetically pleasing streetscape along this portion of the corridor:

- Add turf, shrubbery, and trees (where appropriate) between the service lanes and the mainline where the service lane width is reduced for traffic calming or safety purposes. This would reduce the amount of visible pavement and impervious surfaces along the corridor. Where there is space within the road right-of-way, add a green shoulder with a mountable curb at the outside of the mainline.

- Add new street trees at the outer edge of the road right-of-way to establish a consistent edge along the corridor. Extend the character/type of street trees that currently exists along the adjacent neighborhood streets to the new plantings.
- Introduce a planted median on the inside of the roadway to reduce the amount of visible pavement.
- Extend the existing landscaping character (or that proposed under the Great Streets Initiative) of roads crossing Kenilworth Avenue.

Establish a Unified Theme along the Corridor

While the corridor currently has two distinct segments within the study area, a unified theme of plantings and structural materials should be pursued throughout the corridor. These include the following strategies:

- Adopt a unified pattern of plantings, median design, shoulder design, lighting, signage, cross bridges, and elements, such as walls at the edge of elevated structures, that is carried through the entire corridor. Work with Maryland to extend this pattern to the Route 50 interchange to the north.
- At interchanges with cross streets, as well as along the corridor, introduce unique design elements or signage that promotes community identity by highlighting adjacent neighborhoods.
- Explore opportunities for public art throughout the corridor. Encourage school-age children and area residents to participate in creating art pieces that highlight the character and history of the area.



Figure 4.3: Proposed Kenilworth Avenue between Pennsylvania Avenue and South Capitol Street (Two-lane roadway with green shoulder and landscaped median. The green shoulders could be designed to retain stormwater during storm events.)



Figure 4.4: Proposed Kenilworth Avenue between East Capitol Street and Eastern Avenue (Three-lane roadway with landscaping between the mainline and service lanes, and a landscaped median.)

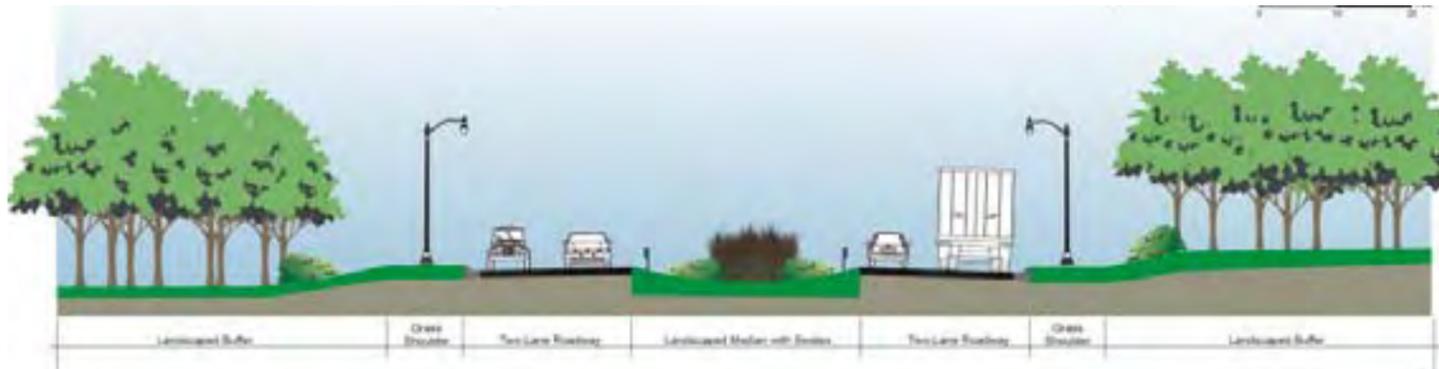


Figure 4.5: Cross-Section located between Pennsylvania Avenue and East Capitol Street (Two lane Kenilworth Avenue with green shoulder and landscaped median. The median and green shoulders could be designed to retain stormwater during storm events.)

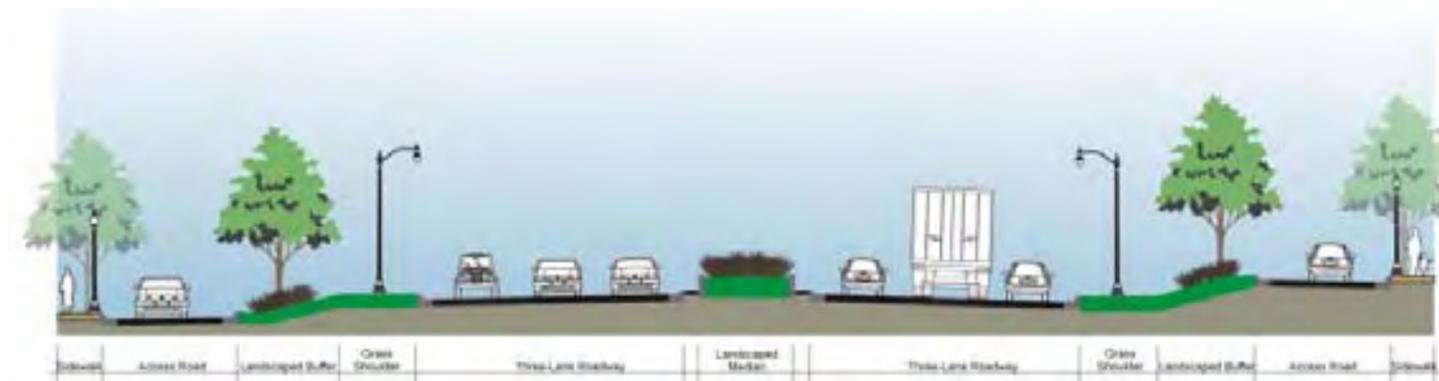


Figure 4.6: Cross-Section located between South Capitol Street and Eastern Avenue (Three lane Kenilworth Avenue with landscaping between the mainline and service lanes, and a landscaped median.)

4.2 Vehicular Circulation

Kenilworth serves an important role as a commuter link between the Maryland suburbs and the Washington, DC business core. However, the corridor does not serve the adjacent communities well. Neighborhoods on either side are isolated by the roadway which provides only limited access to or from them. Reflected in the age of the facility are substandard features which make driving the roadway and navigating some of the interchanges and ramps unsafe.

Improve Safety along the Corridor

The corridor, and in particular, those sections between East Capitol Street and Eastern Avenue, have higher-than-average accident rates owing in part to the large number of vehicles entering and exiting Kenilworth Avenue combined with the large volume of through commuter traffic. Merge and diverge distances are inadequate and do not meet current design standards. Acceleration and deceleration lanes are too short and average speeds are in excess of the posted limits, contributing to unsafe conditions.

Reducing the infrastructure footprint of Kenilworth Avenue to two lanes in each direction will allow the above deficiencies to be corrected and will have a calming affect on traffic. However, this could substantially increase travel times through he corridor. The re-construction of the Nannie Helen Burroughs interchange requires a long-term lane closure in both directions of Kenilworth Avenue and provides a unique opportunity to evaluate whether or not a two-lane solution can be implemented as a near-term improvement through observation of real-time traffic conditions during reconstruction of this bridge.

Kenilworth Avenue was designed with a number of short on- and off-ramps not necessarily associated with a particular interchange but used to access the parallel service roads. To improve safety, these ramps will be consolidated or combined with traffic move-

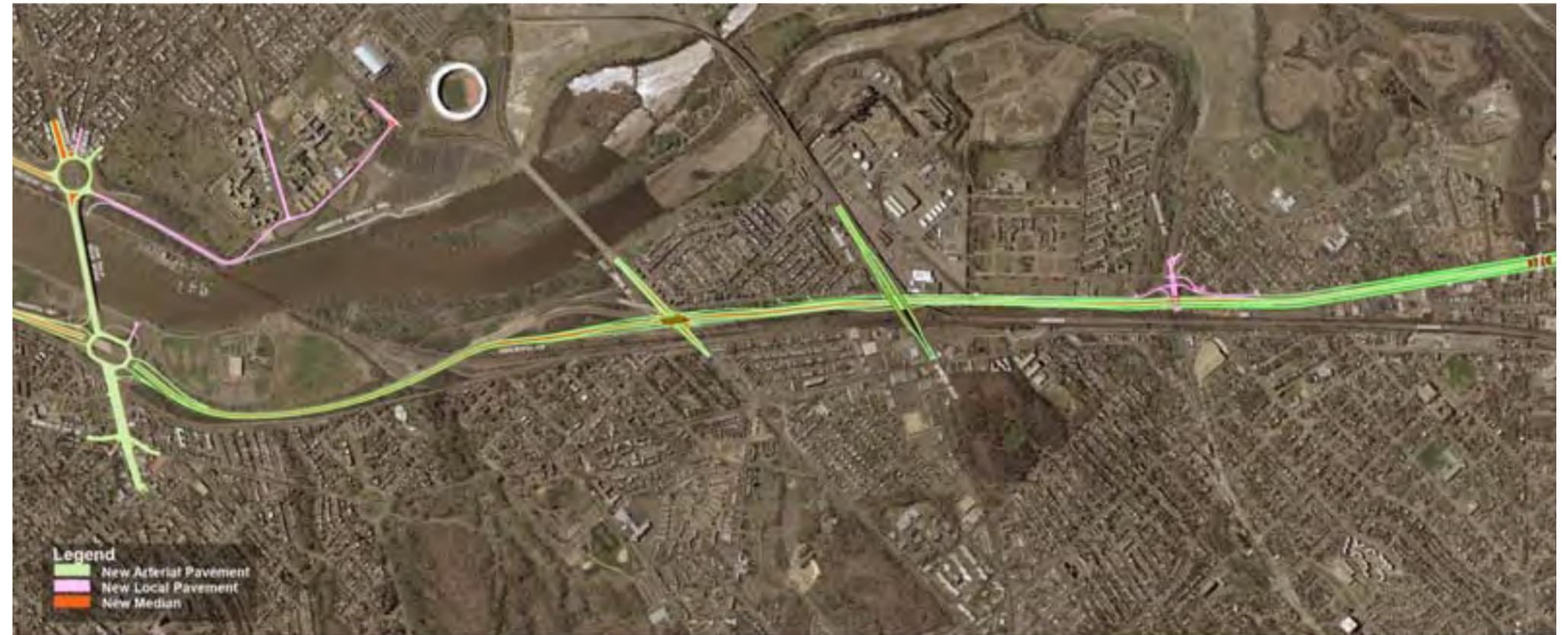


Figure 4.7: Vehicular Circulation Framework Plan

ments to and from the existing interchanges. The adjacent service roads will be narrowed and bulb-outs, or curb extensions, introduced to reduce the roadway width, protect on-street parking, and reduce crossing distances for pedestrians. Improving signage will also improve safety.

At Benning Road, major safety improvements will be undertaken in two phases. Interchange modifications will improve safety for vehicles exiting Kenilworth Avenue to westbound Benning Road and for eastbound Benning Road traffic entering northbound on Kenilworth Avenue.

The ultimate configuration for Benning Road will divide the existing structure into two independent bridges, and depress the northbound lanes of Kenilworth Avenue similar to the way the southbound lanes are depressed. This will allow Benning Road to pass over the northbound lanes before intersecting with the on- and off-ramps from Kenilworth Avenue. These ramps would become right-lane movements, thereby creating a safer condition for drivers exiting or entering the corridor from Benning Road.

Dividing the bridge will allow traffic movements to and from Benning Road to move to the interior lanes and allow a safer crossing for pedestrians and bicyclists using the bridges to travel from 34th Street to Minnesota Avenue.

Improve Accessibility to Neighborhoods along the Corridor

There is limited access along the corridor to and from adjacent neighborhoods and to destinations beyond. Access across the corridor is also limited. Where access is provided, the ability to access directions northbound and southbound on Kenilworth Avenue is not always available and from the east, very limited. Where access is provided, it is primarily focused on moving vehicles between points to the west and points to the north. Several interchange improvements are proposed in this plan to enhance connectivity.

At East Capitol Street and Kenilworth Avenue, movements are limited to and from Kenilworth Avenue to eastbound and southbound traffic. Several improvements will gradually enhance access for westbound and northbound traffic which can be implemented through three projects.

For westbound traffic, interchange improvements will allow vehicles to enter Kenilworth Avenue and go southbound or northbound. With implementation of additional enhancements which build on the previous effort, northbound traffic will have the ability to go eastbound or westbound and southbound traffic will be able to go eastbound.

With implementation of the third improvement, all of the above movements will be implemented and enhanced accessibility for pedestrians and bicyclist will be added to the interchange.

Beginning in the vicinity of Benning Road, Kenilworth Avenue will be depressed to allow for improved connections across the corridor. The ultimate build-out for the Benning Road interchange will include a depressed northbound Kenilworth Avenue and new cross corridor connections for Benning Road.

Kenilworth Avenue will be depressed just north of Nannie Helen Burroughs Avenue as far north as Douglas Street to allow for a new cross-corridor connection at Nash Street. The new Nash Street crossing will initially connect the two service roads and improve access to and from the neighborhoods west of Kenilworth Avenue. As part of any transit oriented development between Polk Street, the CSX Railroad, and Kenilworth Avenue, extend Olive Street south and complete the connection to the new Nash Street crossing.

Improve Accessibility to the Anacostia Parks and Riverfront

There is limited access throughout the corridor to parkland west of Kenilworth Avenue. Enhancements throughout the corridor will improve access to these recreational areas and a new Park Road will allow drivers to traverse the parkland from north to south.

At Eastern Avenue, there is potential for a new pedestrian and bicycle access point at the western leg of the intersection. This new connection could extend west from the intersection and connect to Anacostia Avenue.

West of the river, a new Park Road could connect Benning Road and Barney Circle and provide new access to parkland along the west bank of the Anacostia. This new Park Road would be parallel to the riverfront and also connect to the JFK Access Road and, depending on the final alignment, connect to the Reservation 13 Circle.

A new connection across the river could be built along an extended Massachusetts Avenue alignment. The new bridge could provide access across the river for pedestrians, bicyclist, and National Park Service vehicles used to maintain the park. It might also provide access for public vehicles using the new Park Road.

4.3 Pedestrian and Bicycle Circulation

Several factors play a key role in determining how well an area functions for pedestrians and bicyclists. These include the location of destinations, quality of sidewalks and other facilities, safety and comfort relative to motor vehicles, security from crime, and physical barriers to pedestrian and bicycle access. To influence and improve the pedestrian and bicycle circulation system within the Kenilworth Avenue Corridor study area, the following strategies are recommended:

Improve Pedestrian and Bicycle Connectivity Across Kenilworth Avenue

Kenilworth Avenue is a significant obstacle to east-west pedestrian and bicycle movement, with access limited to five locations along the 4.5 mile corridor. Improving pedestrian and bicycle circulation in the area requires upgrading the quality of existing crossings and adding new connections across Kenilworth Avenue.

Under the current plan, the existing crossings at East Capitol Street, at Benning Road, at Hayes Street adjacent to the Minnesota Avenue Metrorail Station, at Nannie Helen Burroughs Avenue, and at Eastern Avenue, are proposed to be improved. In addition, three new pedestrian crossings are proposed across Kenilworth Avenue: a new connection is proposed below Kenilworth Avenue to connect the Twinning neighborhood and Anacostia Park; a new interchange design is recommended between East Capitol Street and Kenilworth Avenue that will provide pedestrian access below Kenilworth Avenue; and, a new street connection is proposed at Nash or Ord Street, where Kenilworth Avenue would be depressed, to allow an at-grade pedestrian, bicycle and vehicular crossing.

Of the three pedestrian bridges located between Nannie Helen Burroughs and Eastern Avenue, the two southern bridges do not get much use and need further study to determine whether these should be replaced or removed. The third pedestrian bridge, at Douglas Street



Figure 4.8: Pedestrian and Bicycle Circulation Framework Plan

adjacent to the Deanwood Metrorail Station, is proposed to be replaced with an improved crossing.

Improve Pedestrian and Bicycle Safety, Security, and Access to Key Destinations

The study area includes several key destinations that are located near the Kenilworth Avenue Corridor. These include the Anacostia waterfront, including the Anacostia Park and Kenilworth Aquatic Gardens; the Minnesota Avenue and Deanwood Metrorail Stations; elementary, middle and high schools; federal

and city managed parks; and the commercial area along Minnesota Avenue.

A survey of current pedestrians and bicyclists established that heavy traffic, fast moving traffic, and difficult street crossings were the most significant barriers to walking and bicycling in the corridor. Maintenance issues such as pot holes, sidewalk cracks, faded street lines and crosswalks, were also cited as obstacles to pedestrian/bicycle circulation.

To improve these conditions, the following recommendations are proposed within the study area:

- Construct the Anacostia Riverwalk Trail and provide safe and convenient pedestrian and bicycle access to the trail by making connections, such as extending the Watts Branch Trail under Kenilworth Avenue to meet the Riverwalk Trail.
- Provide continuous pedestrian and bicycle access through neighborhoods and along major streets by improving sidewalks, adding bicycle lanes on key roadways, and improving bike route signage.

- Improve the safety and convenience of roadway crossings by marking crosswalks clearly, installing and reconstructing curb ramps, providing pedestrian signal heads and push buttons, and adding traffic calming measures, such as curb extensions and median crossing islands.
- Improve the security of pedestrians and bicyclists by adding more lights and providing a greater law enforcement presence around bridges and tunnels.

4.4 Summary of Projects

Improvements to the Kenilworth Avenue Corridor will take place over time through the implementation of a series of projects aimed to achieve the policies and actions described in this chapter. A summary of these projects is illustrated on Figure 4.4 and categorized based on the anticipated time, planning and budget that will be required to undertake these. Chapters 5, 6 and 7 provide a detailed explanation of these projects.

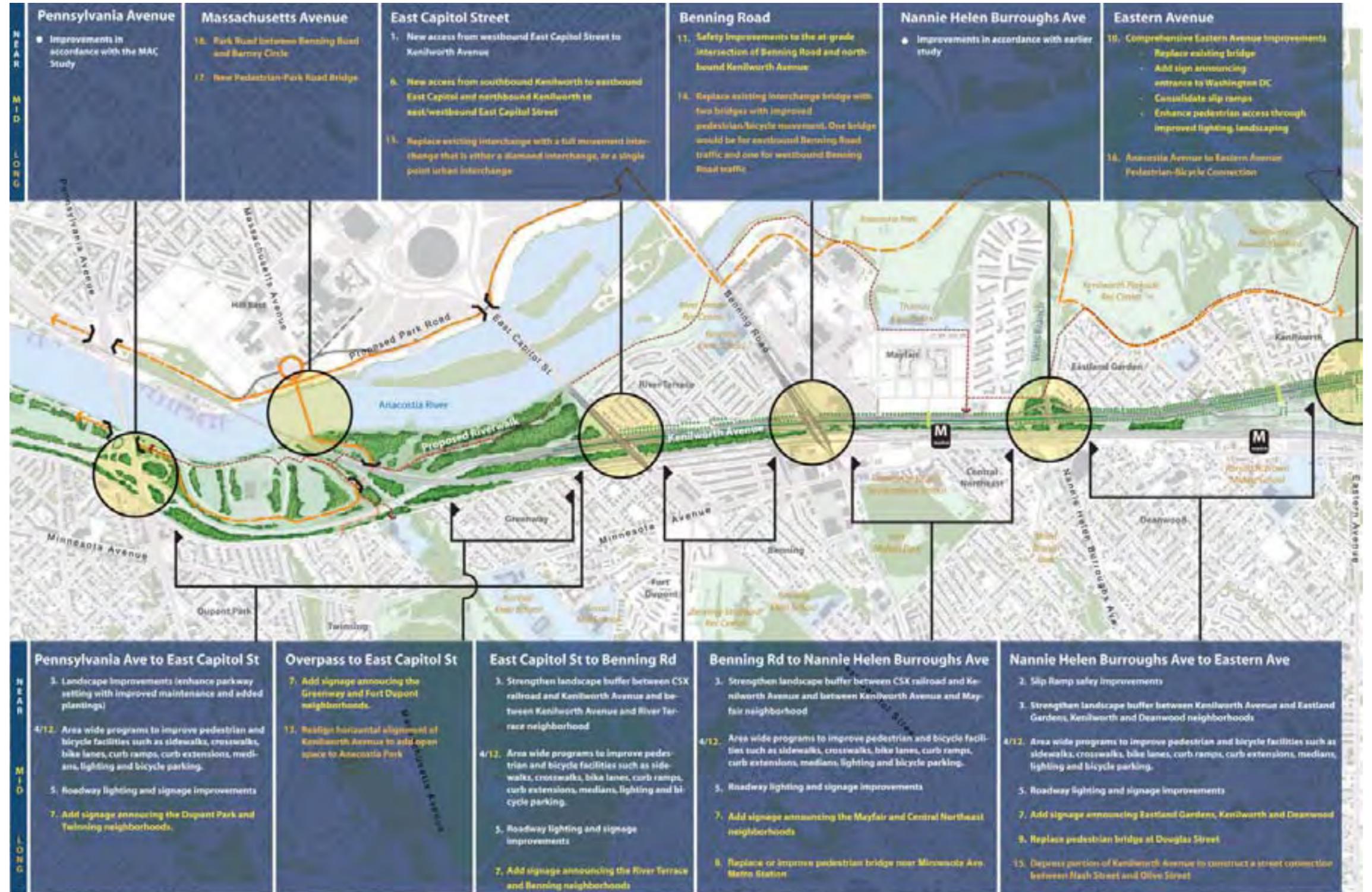


Figure 4.9: Summary of Projects (Short-term - white; Mid-term - yellow; Long-term - orange)
 Note: Project numbers correspond to projects discussed in Chapters 5, 6 and 7.

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Near-Term Improvements

5.1 Introduction

Near-term improvements are generally those that can be funded through existing departmental programs, do not require NEPA documentation, and cost less than 5 million dollars.

A central goal of the Kenilworth Avenue Corridor Study is to provide safe and convenient pedestrian and bicycle access throughout the neighborhoods of the Kenilworth Avenue Corridor. Since these types of improvements can be implemented quickly at little cost, they tend to be the predominant recommendations for near-term improvements in the corridor.

This chapter, therefore, recommends several different types of physical changes to improve the quality of the local environment for pedestrian and bicycle travel.

The near-term improvement projects may be implemented in conjunction with each other or independently, depending on availability of funding. Projects are summarized in Table 5.1 and discussed in detail on the following pages.



Figure 5.1: Near-term Improvements

Proj. No.	Title	Description	Benefits	Estimated Cost (2005)
1	East Capitol Street Scenario EC-1	A new connection is made to allow traffic on westbound East Capitol Street to exit southbound and northbound onto Kenilworth Avenue.	<ul style="list-style-type: none"> Urban Design 	\$2,500,000
2	Kenilworth Avenue Slip Ramps Safety Improvements	The slip ramps between Kenilworth Avenue and the parallel service road north of Nannie Helen Burroughs Avenue are consolidated and realigned to improve safety in the corridor and improve traffic operations on Kenilworth Avenue.	<ul style="list-style-type: none"> Safety Visual Quality 	\$1,000,000
3	Corridor Landscaping	Generally improves visual quality of the corridor through implementation of a corridor wide landscaping, signage, and street furniture program.	<ul style="list-style-type: none"> Urban Design Open Space and Waterfront Connections Visual Quality 	\$3,000,000
4	Pedestrian and Bicycle Improvements	Generally improves the pedestrian and bicycle throughway, curb ramps, pedestrian roadway, lighting and signal, and bicycle parking through specific projects and as part of area wide programs.	<ul style="list-style-type: none"> Pedestrian Connectivity Public Transit Access Safety 	\$1,200,000
5	Kenilworth Avenue Lighting and Signage Improvements	Additional lighting is installed throughout the corridor in locations where lighting is lacking and where levels were found to be inadequate. Similarly, signing is upgraded to meet FHWA Standards and to effectively communicate major exits.	<ul style="list-style-type: none"> Urban Design Visual Quality Safety 	\$1,500,000

Table 5.1: Summary of Near-Term Improvements

5.2 Improvement Projects

Project No. 1: East Capitol Street Scenario EC-1

Categories of Improvement

- Urban Design

Description

A new connection is made to allow traffic on westbound East Capitol Street to exit southbound and northbound onto Kenilworth Avenue. A new connector is constructed just west of Kenilworth Avenue at a 90° angle to East Capitol Street. This new connector intersects and crosses the existing exit ramp for eastbound East Capitol Street to northbound Kenilworth Avenue. After it crosses the northbound exit ramp, it merges with the southbound ramp from eastbound East Capitol Street.

This project requires that East Capitol Street be widened just west of Kenilworth Avenue to allow construction of two left-turn lanes onto the new connector. It also requires new traffic signals at the connector intersection with East Capitol Street, and at the intersection of the new connector with the exiting northbound exit ramp from eastbound East Capitol Street. Minor modifications are required to the existing southbound and northbound ramps to accommodate the new connector.

This project is an intermediate step to providing full movement at this interchange. After Scenario EC-1 is complete, building Scenario EC-2 completes the interchange to allow all movements. No pedestrian or bicycle improvements are included.

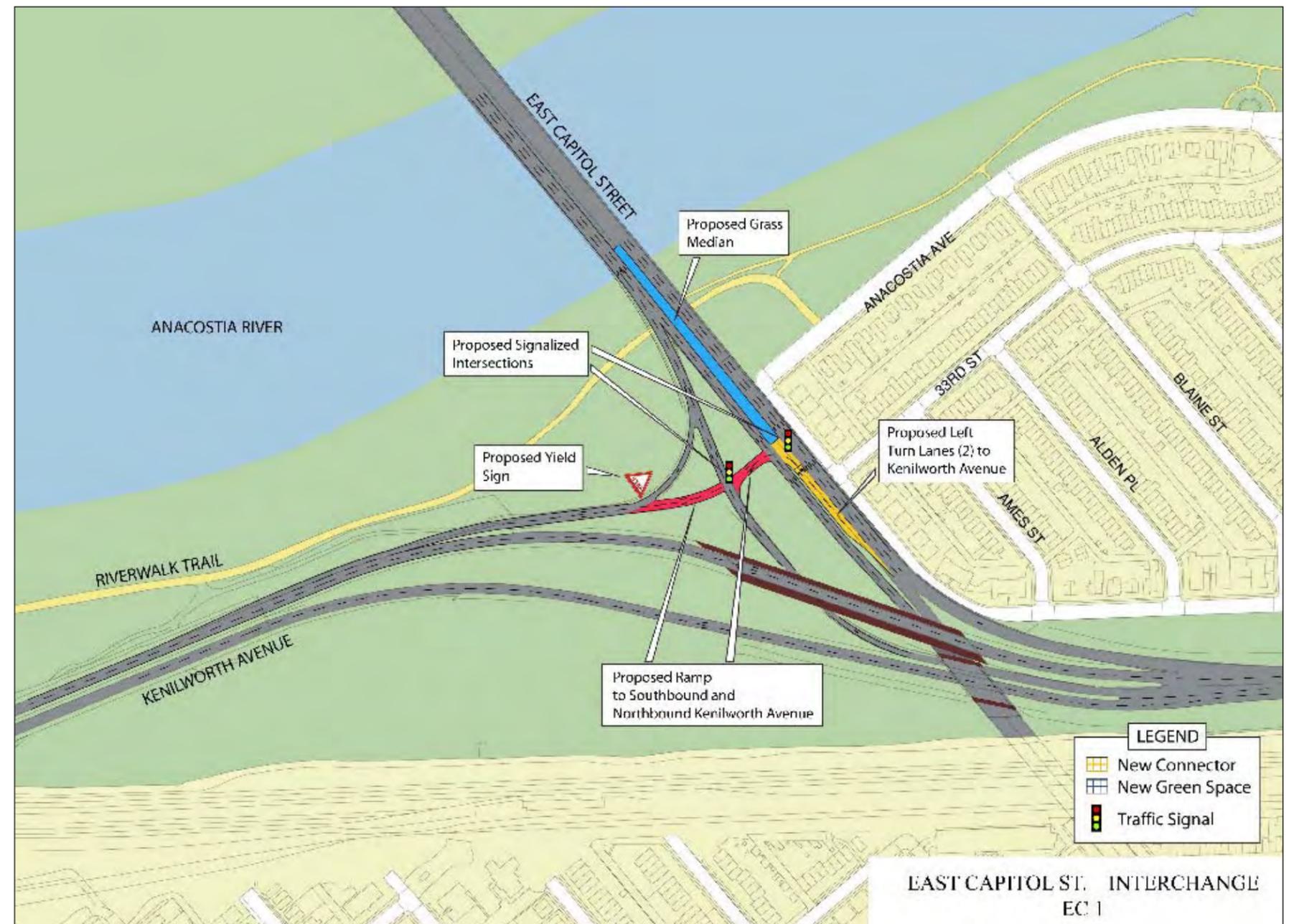
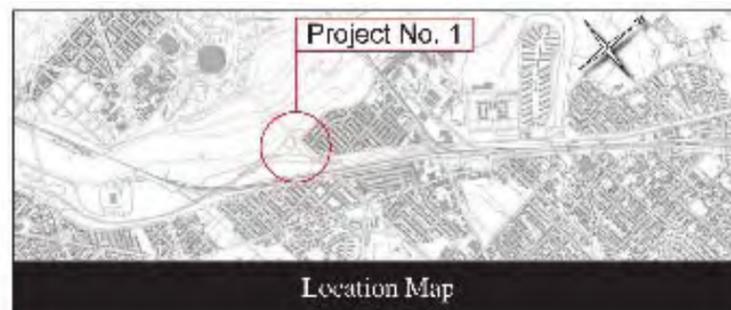


Figure 5.2: East Capitol Street Scenario EC-1

Project No. 2: Kenilworth Avenue Slip Ramps Safety Improvements

Categories of Improvement

- Safety
- Visual Quality

Description

The on- and off-ramps between Kenilworth Avenue and the parallel service road north of Nannie Helen Burroughs Avenue are consolidated and realigned to improve safety in the corridor and improve traffic operations on Kenilworth Avenue.

Concurrent with this project, a program to monitor traffic conditions during the reconstruction of the Nannie Helen Burroughs interchange which require a long-term lane closure in both directions of Kenilworth Avenue will be implemented. This provides a unique opportunity to evaluate whether or not a two-lane reconstruction of Kenilworth Avenue is a viable option through observation of real-time traffic conditions. The final recommendation as to whether or not Option 2 (as discussed in the study) can be implemented will be contingent upon that analysis.

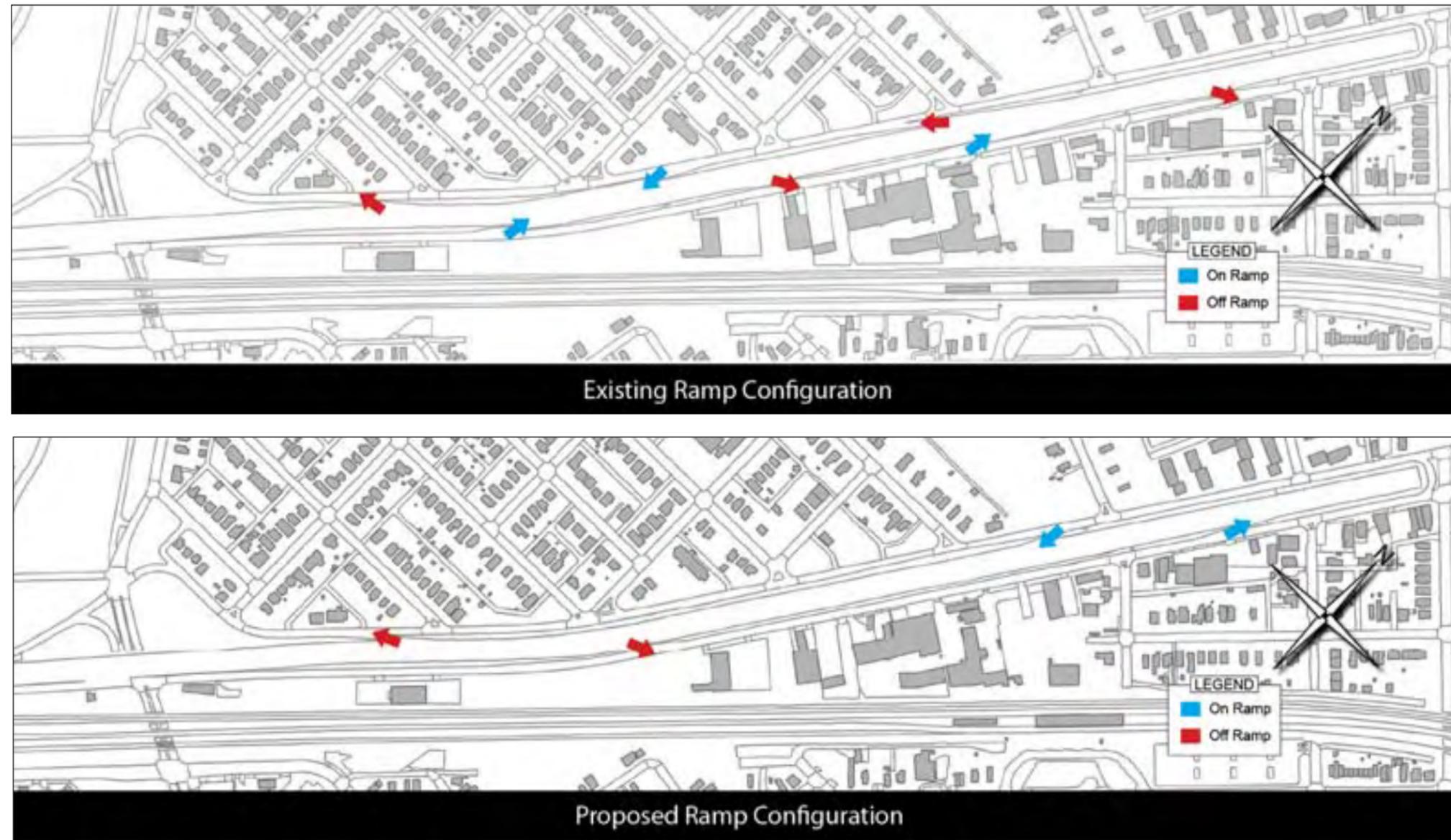
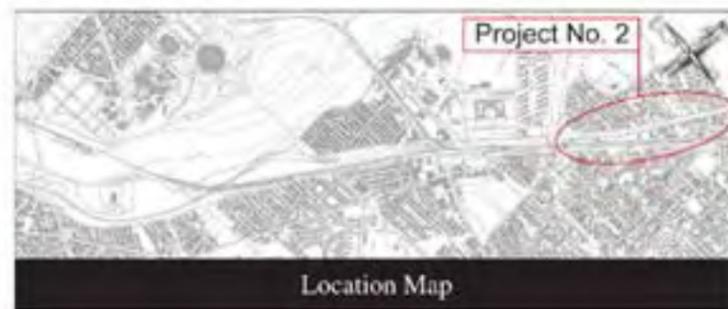


Figure 5.3: Plan between Nannie Helen Burroughs Avenue and Eastern Avenue



Project No. 3: Corridor Landscaping

Categories of Improvement

- Urban Design
- Open Space and Waterfront Connections
- Visual Quality

Description

This project meets the long-term goal of improving the visual experience along the corridor. The landscape improvements unify the corridor and visually link the various areas and land uses. A consistent style and pattern of landscaping, signage, and street furniture shall be implemented along the entire corridor consistent with the Anacostia Waterfront Transportation Architectural Design Standards. In addition, distinct character areas shall be identified and developed with additional design treatments that will highlight the corridor's unique areas.

This project will strengthen the existing landscape buffers along the corridor by improving maintenance and installing additional plantings that are consistent with the overall landscape vision for the corridor. This project also provides buffers between areas of conflicting use or character, such as between Pennsylvania Avenue and East Capitol Street and between the CSX Railroad and Kenilworth Avenue.

The landscape improvement program should focus on the following areas along the Kenilworth Avenue Corridor:

- **Landscape Treatment and Maintenance:** Planting areas currently include wooded areas, park-like expanses of lawn with shade trees, buffer planting strips, grassy medians with minimal if any trees or shrubs, and sidewalk tree boxes for street trees. In addition, there are areas where street trees conflict with overhead utility lines, as well as some poorly-maintained areas where invasive exotic species, such as tree-of-heaven (*Ailanthus altissima*), have been allowed to grow. Current maintenance appears to be limited primarily to mowing. Landscaping projects should focus on developing an overall landscape



Figure 5.4: Cross Section A
Two lane Kenilworth Avenue with green shoulder and landscaped median. The median and green shoulders could be designed to retain stormwater during storm events.

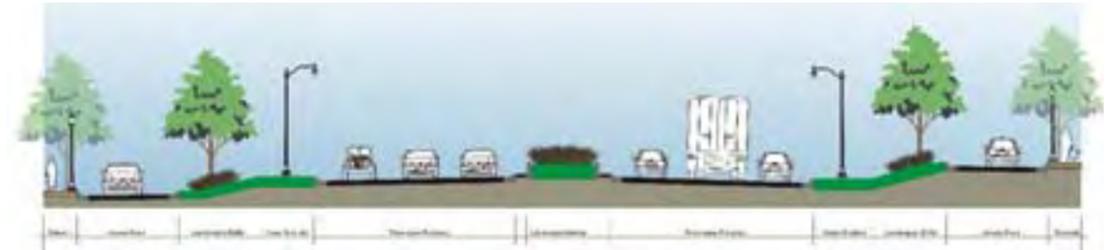


Figure 5.5: Cross Section B
Three lane Kenilworth Avenue with landscaping between the mainline and service lanes, and a landscaped median.

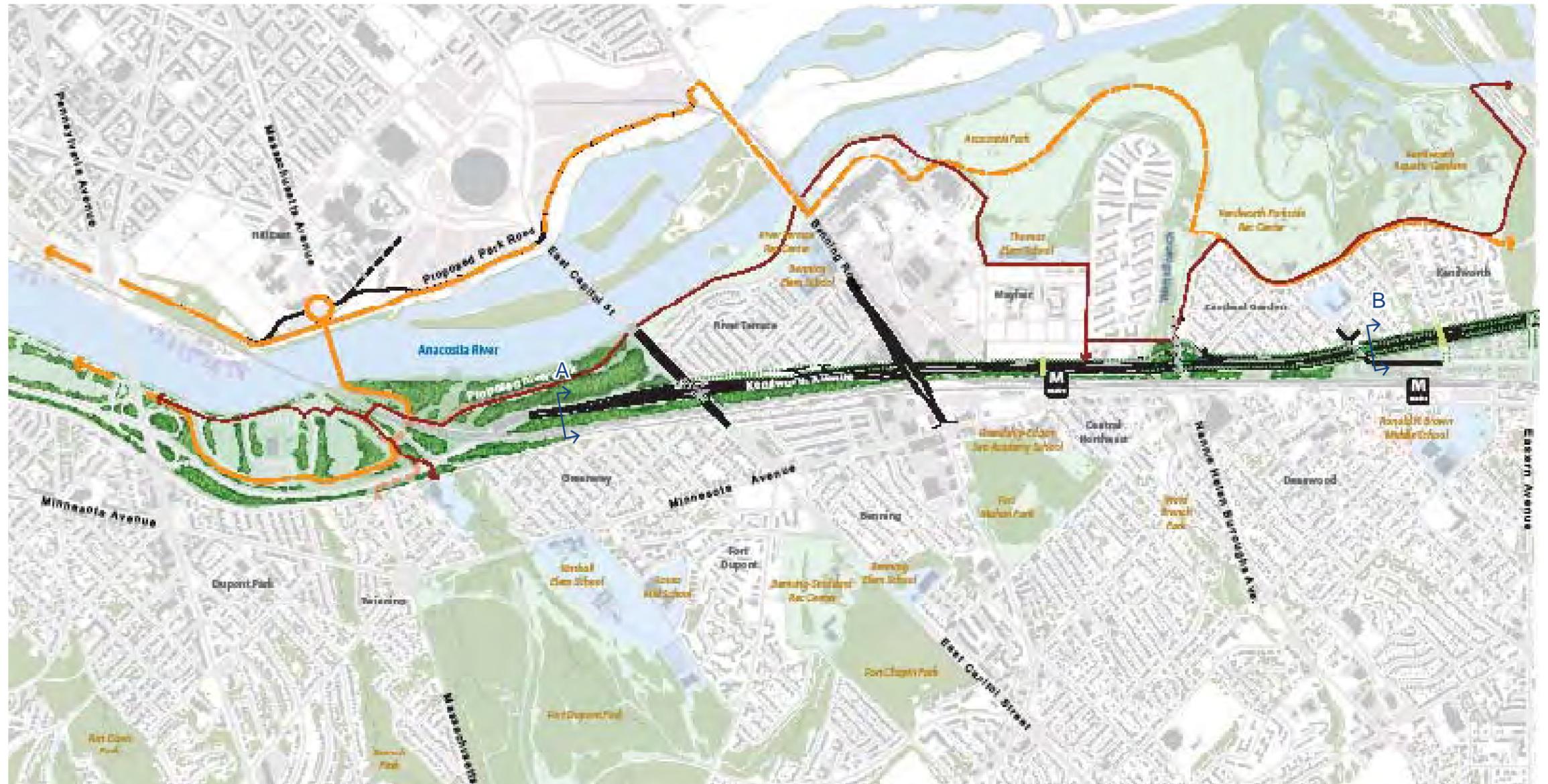


Figure 5.6: Landscape Improvements

concept to enhance the park-like setting, streetscape, and gateway areas along Kenilworth Avenue. Maintenance will be reduced by replacing turf with appropriate low-maintenance groundcover where possible.

- **Lighting:** The Kenilworth Avenue Corridor has multiple types of single- and double-fixture pole and fixture types. Poles are located either on the perimeter of the roadway or in the median barrier. In order to unify the corridor and provide adequate lighting that is appropriate to the segment, consistent pole and fixture types should be chosen in accordance with the Anacostia Waterfront Transportation Architectural Design Standards. In addition, it should be determined if the number of poles can be reduced by relocating and replacing single-fixture poles with double-fixture poles.
- **Public Art:** At select locations, public art that highlights the character of the local area should be introduced, either as individual improvements or as part of a larger project.
- **Barriers and Guard Rails:** Metal and concrete barriers of various types and sizes installed on medians, retaining walls, and overhead structures contribute to the visual clutter along the Kenilworth Avenue corridor. A system of railings and barriers consistent with the Anacostia Waterfront Transportation Architectural Design Standards will streamline and simplify the corridor.
- **Bridges:** Existing vehicular, railway, and Metrorail bridges are of inconsistent materials, colors, and design, and are in poor condition, and contribute to a cluttered, confusing, and intimidating feeling for motorists and pedestrians. Improvements should focus on developing a consistent system of aesthetic treatment for railings and lighting with similar materials, colors, and fixtures to the George Washington Memorial Parkway, New York Avenue,

Pennsylvania Avenue, or the Baltimore-Washington Parkway.

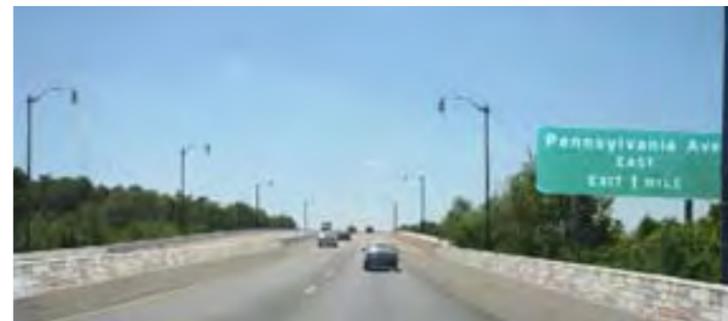
- **Signage:** Existing signage is poorly located, inappropriately sized, and poorly distributed. Commercial signage adds to the visual clutter and makes wayfinding difficult. Improvements should focus on developing a consistent system of signs to identify gateways, neighborhoods, and local destinations. The number of signs should be reduced by integrating information in highway sign system and use median planting to screen commercial signs where appropriate.
- **Gateways:** There are three major gateways to the District of Columbia along Kenilworth Avenue within the study area: East Capitol Street, Pennsylvania Avenue and Eastern Avenue. Currently, these are not identified or celebrated as gateways. Improvements should create a welcoming and greener look by enhancing the gateways with attractive landscaping, lighting, signage, and railing finishes similar to the treatments of the New York Avenue and Pennsylvania Avenue bridges over the Anacostia River.
- **Overhead Utilities:** Overhead power and telecommunication lines clutter the views and the public sidewalk areas on the eastern edge of the corridor north of East Capitol Street. Overhead powerlines often conflict with street trees, which have been inappropriately pruned to accommodate the wires. Overhead utility lines should ideally be buried and street trees and medians replanted.



Existing View to the north of Benning Road



Simulated view after proposed improvements



Existing View to the south of East Capitol Street



Simulated view after proposed improvements



Existing View at Eastern Avenue



Simulated view after proposed improvements

Project No. 4: Pedestrian and Bicycle Improvements

Categories of Improvement

- Pedestrian Connectivity
- Public Transit Access
- Safety

The pedestrian and bicycle improvement recommendations aim to improve the pedestrian and bicycle throughways, curb ramps, pedestrian roadways, lighting, signaling, and bicycle parking as described under general guidelines below. These improvements have been identified by location, as illustrated in Figure 5.7 on the following page and summarized under project locations. Additional details are provided in Appendix F. Where appropriate, these improvements will be coordinated with the Great Streets Initiative.

General Guidelines

PEDESTRIAN AND BICYCLE THOROUGHFARES

The pedestrian and bicycle throughways include sidewalks, marked crosswalks, shared-use paths, and bicycle pavement markings such as bike lanes. These facilities help separate non-motorized users from the cars, trucks, and buses that use the roadway, and to remind drivers that they must yield to pedestrians and bicyclists. Improvements are recommended in six categories:

- **Sidewalks:** Sidewalks should be provided on both sides of streets within the corridor, unless pedestrians are prohibited or the street does not provide a logical connection to any destination. Eliminate gaps to provide continuous pedestrian access through neighborhoods. Sidewalks are not meant for primary bicycle use due to the number of driveways, which are a hazard to bicyclists.
- **Marked Crosswalks:** Safe and convenient roadway crossings are essential to pedestrian circulation. Special pavers or bricks could be used to mark the crosswalks and enhance the character of the main pedestrian areas.



Crosswalks should be marked with high-visibility thermoplastic markings like those striped across 44th Street at Gault Street, NE.

- **Bike Lanes:** Bike lanes designated are parts of the roadway that are designated by striping, signing, and pavement markings for the preferential or exclusive use of bicyclists. They shall be a minimum of five-foot wide and be provided on both sides of the roadway (except one-way streets). Install bicycle lanes in accordance with the DC Bicycle Master Plan.
- **Shared-Use Paths:** Shared-use paths, such as the Watts Branch Trail and future Anacostia Riverwalk Trail, are an important component of the bicycle and pedestrian transportation system in the corridor and need improvement.
- **Wide Sidewalks:** Wide sidewalks provide additional comfort for pedestrians and can provide bicyclists with the opportunity to ride along a road without being in traffic. These facilities are typically installed within the roadway right-of-way.

CURB RAMPS

Two types of curb ramp improvements are recommended to provide access between sidewalks and the crosswalks in the Kenilworth Avenue Corridor:



Adding median islands at several important crosswalks can reduce motor vehicle speeds and make it easier for pedestrians to cross one direction of traffic at a time (right).

- **Construct New Curb Ramps:** Accessible curb ramps should be provided at every intersection, however, a number of intersections in the corridor are missing one or more curb ramps. Provide a curb ramp for each crosswalk extending from a corner rather than a single curb ramp pointing into the center of the intersection.
- **Reconstruct Existing Curb Ramps:** Curb ramps are present at most crosswalks in the corridor, however, a large number of these ramps do not meet ADA Accessibility Guidelines.

PEDESTRIAN ROADWAY

Roadway design improvements include modifications to roadways between the curbs. Recommended roadway design improvements in the corridor include

- **Curb Extensions:** Curb extensions increase the visibility of pedestrians waiting to cross the roadway, reduce pedestrian crossing distances, reduce motor vehicle speeds, and improve pedestrian safety.



Intersection lights should be of a pedestrian scale and illuminate all crosswalks at an intersection.

- **Pedestrian Crossing (Median) Islands:** Pedestrian crossing islands allow pedestrians to cross one direction of motor vehicle traffic at a time.

LIGHTING AND SIGNAL

Lighting improvements make walking safer between important destination points within the corridor. Properly designed pedestrian countdown signals help in crossing busy roadways and make for a safer experience. Improvements include:

- **Roadway Lighting:** Improving roadway lighting reduces nighttime pedestrian crashes and shall illuminate all pedestrian crosswalks and be of a pedestrian scale.
- **Pedestrian Signals:** Provide pedestrian signals heads at all intersections that have traffic signals so as to indicate clearance time for pedestrians to complete crossing the street.



U-shaped bicycle racks provide short-term bicycle parking at train stations, bus stops, stores, parks, schools, and other locations.

BICYCLE PARKING

Improvements to accommodate bicycle transportation needs include:

- **Bicycle Racks:** Bicycle racks provide short-term bicycle parking in locations that are convenient to stores, parks, bus stops, and transit stations. Bike racks are currently provided at the Minnesota Avenue and Deanwood Metrorail Stations; however, they are not within view of the station manager. Coordinate with WMATA to study relocating bicycle racks inside both of the stations to help deter bicycle theft. Install small bicycle racks at bus stops, schools, parks, and store entrances in the corridor (requires coordination with WMATA, the National Park Service, and retail businesses).
- **Bicycle Lockers:** Bicycle lockers are used for longer-term bicycle parking and provide greater protection for bicycles. Currently, there are several lockers available at the Minnesota Avenue Metrorail Station. Coordinate with WMATA to evaluate the demand for additional bike lockers at the Minnesota Avenue and Deanwood Metrorail Stations. Study the need for bike lockers at select schools within the corridor.

Project Locations

See Appendix for more details on the following projects

Benning Road Reconstruction

- At the intersection of Minnesota Avenue and Benning Road, add pedestrian signals, new crosswalks, reduce turning radii, add and median islands.
- At the crossings of 36th Street and Kenilworth Avenue Freeway service roads, make geometric improvements, traffic signal improvements, and stripe new crosswalks to provide safer crossings.
- At the Fort Circle Trail at Benning Road (Benning Road and 42nd Street), improve pedestrian and bicycle crossings, including trail crossing warning signs and directional signage, for trail users.

Nannie Helen Burroughs Bridge Reconstruction

- At the Nannie Helen Burroughs Avenue and Kenilworth Avenue Interchange, provide pedestrian/bicycle access under freeway; connect Watts Branch Trail to Kenilworth Aquatic Gardens; add crosswalks and curb ramps at intersection of NHB and Kenilworth Terrace; stripe crosswalks at intersection of NHB and Minnesota Avenue.

Anacostia Trail, Phase I

- At the Anacostia Road crossings between River Terrace and Anacostia Trail, add new crosswalks and curb ramps between River Terrace and the trail.

Minnesota Avenue Safety Improvements, Phase I

- At the Minnesota Avenue Crossing on the east side of Minnesota Avenue Metro Station, provide median islands, new crosswalk, and possibly new pedestrian signals between school and Metro Station.

Pedestrian Bridge and Tunnel Rehabilitation

- Work with WMATA/private developer at Parkside to improve pedestrian bridge across from Minnesota Avenue Metrorail Station. Improve bridge and tunnel lighting.

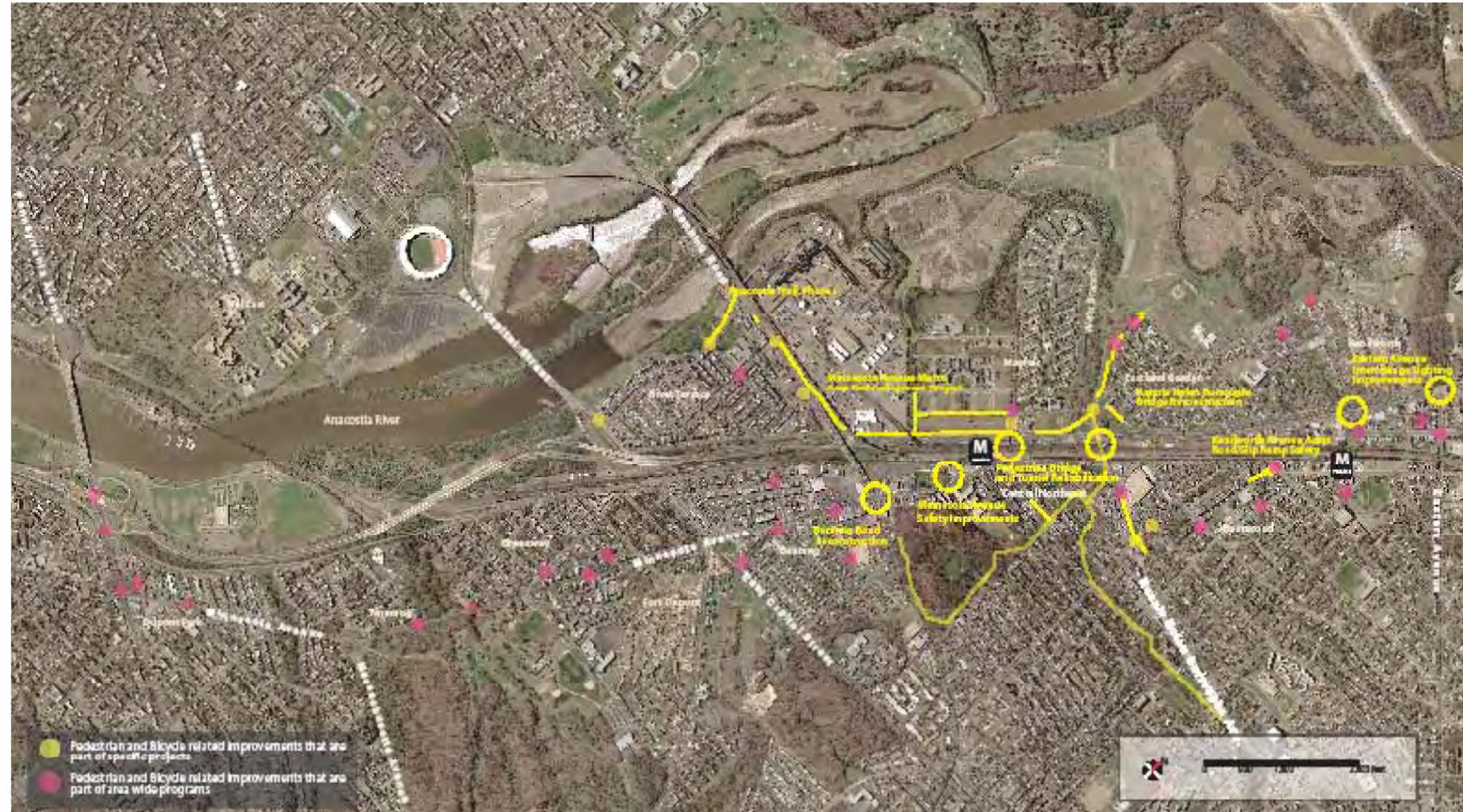


Figure 5.7: Pedestrian and Bicycle Related Improvements

Pedestrian Bridge and Tunnel Rehabilitation

- Work with WMATA to improve pedestrian bridge structure along Douglas Street, and improve lighting on bridge and in tunnel.

Kenilworth Avenue Access Road/Slip Ramp Safety Improvement Project*

- Along the Kenilworth Avenue Access Roads, stripe 11- to 12-foot wide travel lane to slow traffic and make driver movements more predictable, improve pedestrian crossings, and add traffic calming measures such as curb extensions to reduce traffic speeds.

Sidewalk, Curb, and Alley Maintenance Program

- Establish a program to maintain sidewalks, curbs, and alleys throughout the corridor. Provide missing sidewalks, add curb ramps, and meet ADA requirements for all sidewalks and curb ramps. Improve sidewalks near the Deanwood Avenue Metro Station and curb ramps at the Pennsylvania Avenue interchange, as well as areas with high levels of pedestrian activity

Crosswalk Striping Maintenance Program

- Establish a program to maintain crosswalk striping throughout the corridor. Stripe crosswalks at intersections where necessary, especially along Nannie Helen Burroughs Avenue and 44th Street, in areas with high levels of pedestrian activity.

Pedestrian Signal Maintenance Program

- Establish a program to add and maintain pedestrian signals along the corridor. Add pedestrian countdown signals at Sheriff Road at 45th Street and in areas with high levels of pedestrian activity.

Lighting Improvement Maintenance Program

- Establish a program to add and maintain pedestrian scale lighting at all intersections, especially in areas with high levels of pedestrian activity.

Project No. 5: Roadway Lighting and Signage Improvements

Categories of Improvement

- Urban Design
- Visual Quality
- Safety

Lighting

AASHTO's *An Informational Guide for Roadway Lighting* was referenced to determine lighting levels and uniformity of luminance along the corridor and at the interchanges within the study area. According to AASHTO, the average maintained horizontal illuminance should be in the range of 0.6 to 0.8 footcandles for both mainline portions of the roadway and all ramps. A review of the lighting fixtures in the corridor was conducted to determine structure height, luminaire wattage, locations and lighting arm lengths. Based on these factors, three lighting conditions were determined within the corridor:

- locations of adequate lighting;
- locations where additional lighting is required; and
- locations where there is no lighting.

In the Near-Term, additional lighting will be installed throughout the corridor in the locations where lighting is lacking and where levels were found to be inadequate. This includes providing lighting under Kenilworth Avenue at Nannie Helen Burroughs Avenue. Lighting would also be installed for the weaving section under Benning Road. The proposed light pole locations are shown on Figure 5.8.

Signing

There is a mix of guide signing in the corridor that includes bridge-mounted, overhead and ground-mounted signs. Many of the signs are in poor condition and do not effectively communicate major exits within the corridor. Signing upgrades are proposed throughout the corridor as a Near Term Improvement. All signing will be upgraded to meet FHWA's Manual on Uniform Traffic Control Devices (MUTCD) standards. New overhead guide



signs will be installed and consolidated where necessary for all exits to Pennsylvania Avenue, East Capitol Street, Benning Road, Nannie Helen Burroughs Avenue, and Eastern Avenue. All existing exit signs for minor streets (i.e., Hayes Street) will be removed. Bridge mounted signs will be removed and

replaced with overhead structures. Additional speed limit and lane merge warning signs are proposed throughout the corridor. At Benning Road the yield sign on the southbound Service Road will be removed. The existing R2-1 Yield sign at Benning Road will be replaced with a R1-1 STOP sign to control vehicles desiring to

enter northbound Kenilworth Avenue at the Benning Road weaving section. Near Term signing improvements are shown in Figure 5.8.