

# CAPITOL HILL TRANSPORTATION STUDY

## Final Report

For:  
District Department of Transportation  
District of Columbia

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1.0 INTRODUCTION

The Capitol Hill Transportation Study is a year-long effort to document a full range of transportation characteristics, identify issues and problems, and propose short, medium, and long term improvements for the Capitol Hill area of the District of Columbia. The study spans all transportation modes—from pedestrian and bicycle access, to vehicular circulation, to truck and bus movements—and includes an evaluation of the impacts of proposed future development and projected regional growth on transportation infrastructure in the study area.

The study team consists of staff from the DDOT Policy and Planning Administration with DMJM Harris staff as consultants. During the course of the study, the team met regularly with other DDOT administrations and led extensive coordination with both public and agency stakeholders. Further, all proposed improvements contained in this report were developed in consideration of other transportation projects occurring in overlapping and adjacent areas.

As shown in **Figure 1-1**, the study area is bounded by G Street NE on the north, Southeast Freeway on the south, 1st Street NE/SE on the west, and 19th Street NE/SE on the east.

Proposed improvements should accomplish the following goals:

- § Improve safety for all modes, with particular focus on pedestrians and cyclists
- § Improve mobility overall for residents of the area and for non-residents who use or pass through the area
- § Reduce speed and congestion on neighborhood streets
- § Accommodate projected growth within and around the study area
- § Evaluate conversion of 1-way streets into 2-way streets
- § Implement changes in a context-sensitive manner

*This Report*

The purpose of this report is to present recommendations to address the numerous issues identified during the Capitol Hill Transportation Study and documented in the Existing Conditions Report (February 2006). Recommendations are based upon field observations, analysis and input from the residents, ANC’s and other stakeholders of Capitol Hill. The report concludes with a basic implementation plan that provides DDOT a target timeline for specified actions.

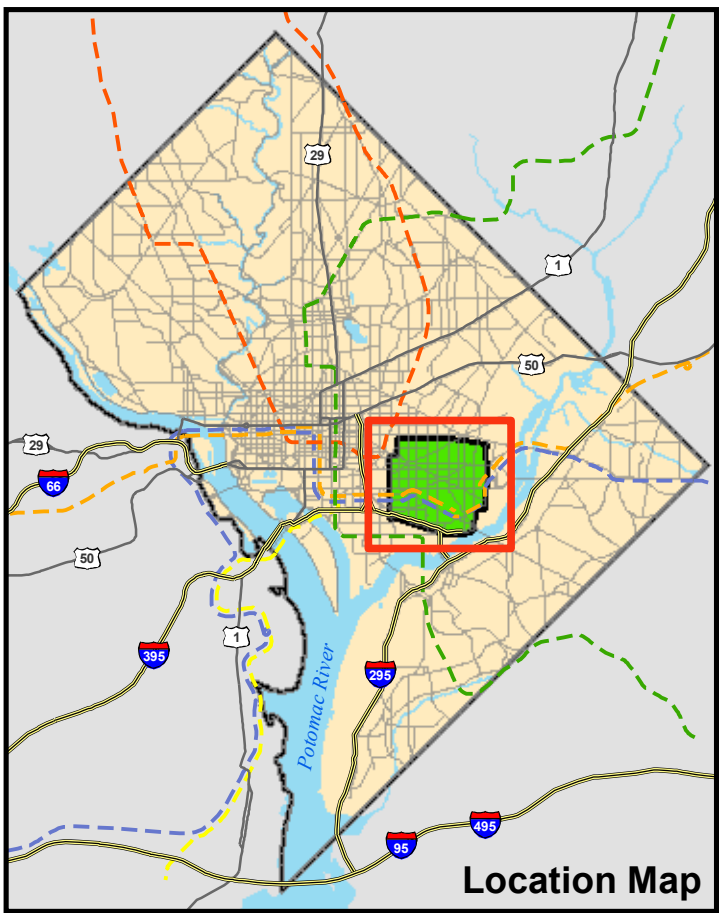
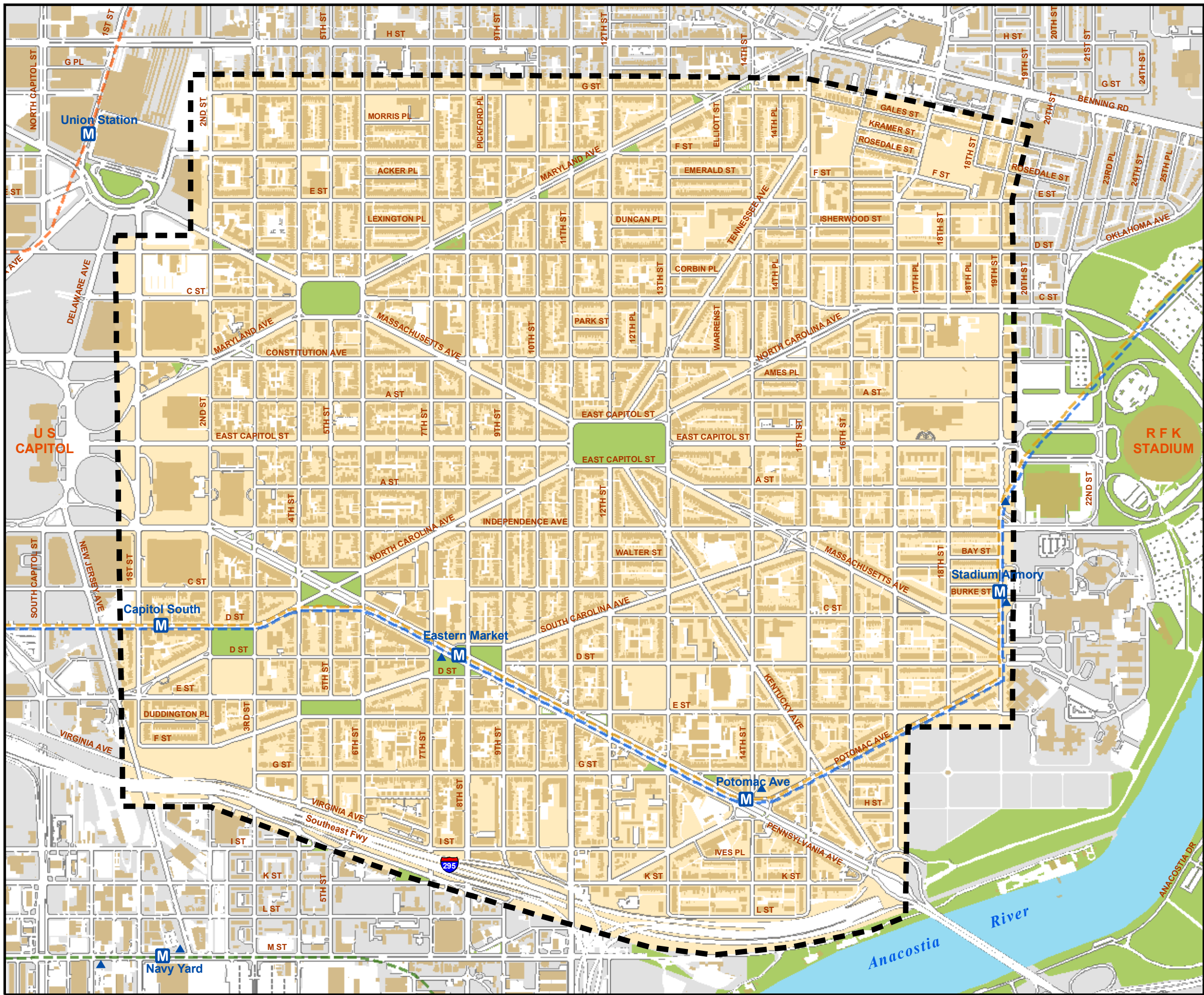
- Overall, the report aims to serve as a guide for promoting safety, sustainability, access, and livability in the Capitol Hill neighborhood.

This report is organized into the following sections:

- § **Section One: Introduction**
- § **Section Two: Project Background** – this section puts the Capitol Hill Transportation Study into the context of previous and on-going transportation projects within the study area, and summarizes the study progress to this point.
- § **Section Three: Methodology** – this section presents the methodology by which potential issues were identified and through which solutions were developed.

- § **Section Four: Existing Conditions** – this section presents a summary of the existing transportation conditions in the study area.
- § **Section Five: Future Conditions** – this section presents a summary of the anticipated future conditions in the study area, as determined through evaluating proposed new developments and modeling future traffic conditions.
- § **Section Six: Two-Way Street Conversions** – this section presents the analysis that accompanied the evaluation of conversion of Constitution and Independence Avenues and 17<sup>th</sup> and 19<sup>th</sup> Streets from 1-way to 2-way operation; and presents the team’s recommendations.
- § **Section Seven: Recommendations** – this section presents the team’s recommendations for solutions to the potential transportation issues identified through this study.
- § **Section Eight: Implementation Plan** – this section presents a phased implementation plan for the proposed solutions, and an estimate of the costs associated with each phase of the improvement program.
- § **Appendices:** The appendices to this study include an inventory of all potential issues identified in the study area as part of this study.





## 2.0 PROJECT BACKGROUND AND CONTEXT

The Capitol Hill area's unique history, geography, and position at the center of several current development and infrastructure projects place it at a key juncture for evaluation of transportation impacts and potential improvements. This section of the report describes the physical features of the Capitol Hill study area and pays special attention to the several planning and transportation related studies that are ongoing or recently completed.

The Capitol Hill Transportation Study was initiated in conjunction with other area studies and projects as described below. The study's heavy emphasis on community participation reflects the desire on the part of District government, and DDOT in particular, to preserve the Capitol Hill neighborhood as a unique and cohesive community. Ongoing coordination between the Capitol Hill Transportation Study and other efforts aim to ensure a coherent transportation policy and recommendations that are in harmony with both neighborhood and regional goals.

### 2.1 History and Physical Setting

The Capitol Hill neighborhood is a unique and identifiable place recognizable by its historic architecture, its many parks and squares, and its tree-lined streets. The Capitol Hill neighborhood was placed on the National Register of Historic Places in 1976. It is the largest historic residential neighborhood in Washington, D.C., and the largest historic district in the United States.

Prior to the selection of the Capitol site in 1790, the neighborhood was originally a small cluster of homes located between First and Second Streets along New Jersey Avenue and was called Jenkins Hill or Jenkins Heights. The neighborhood became known as Capitol Hill after the federal government became a major employer with the coming of the U.S. Capitol and the Washington Navy Yard. Capitol Hill's early neighborhoods comprised the permanent residences of craftsmen who were employed at the Navy Yard and workers involved with construction of the Capitol. In addition the neighborhood was the temporary home of members of Congress who chose not to permanently reside in the District of Columbia, and lived in boarding homes within walking distance of the Capitol.

With its location initially established along the banks of the Anacostia River, for what was hoped to become a significant shipping port, the Capitol Hill neighborhood has been consistently influenced by transportation decisions. One of the early streetcar lines in the District traversed Pennsylvania Avenue from Georgetown to Capitol Hill, and remnants of the District's streetcar system, such as the East Capitol Street Car Barn can still be found within the community. As a hub of regional travel, Union station has influenced the scale and type of development in the western portion of Capitol Hill.

During the last century, Capitol Hill has been increasingly affected by the automobile as a dominate mode of travel. Compared to any other of the Districts 10 planning areas, this neighborhood contains the most land space used for streets and street right of way. East-west avenues, such as Constitution, Independence, Pennsylvania, and Massachusetts provide good east-west circulation through the neighborhood and support local business districts. Most of the north-south streets are smaller and residential, but some support neighborhood business districts such as Eastern Market and Barracks Row on 7<sup>th</sup> Street and 8<sup>th</sup> Streets SE. Despite the prevalence of cars, Capitol Hill is well accessed by public transportation, served by numerous Metrobus routes and two Metrorail lines with 4 stations. DDOT is currently planning to add

streetcar service along H Street, NE. The neighborhood remains pedestrian friendly in its urban design and attractive to walking and bicycle travel because of its proximity to major destinations.

While much of the neighborhood has experienced redevelopment and increased investment in recent years, some parts of the study area, particularly in the east, could benefit from upgrades to the public infrastructure. Development pressures continue to occur on Capitol Hill and influence the dynamics of neighborhood activism. As part of the effort to guide appropriate and desired land uses, the District's Comprehensive Plan has identified Capitol Hill as underserved by retail stores and other services.

### 2.2 Transportation Planning Context

Several recent and ongoing studies and projects address transportation issues that affect Capitol Hill. The following planning efforts, described in greater detail below, contain elements that have been considered in development of recommendations for the Capitol Hill study.

- Mid-Anacostia River Crossings Study
- South Capitol Street EIS
- 11<sup>th</sup> Street Bridges EIS
- Kenilworth Avenue Study
- Pennsylvania Avenue SE Improvements
- H Street NE Corridor Transportation Study
- District of Columbia Motor Carrier Management and Threat Assessment Study
- The Mayor's Parking Task Force Report
- The Bicycle Master Plan
- The National Capital Medical Center (NCMC) Traffic Impacts and Mitigation Analysis
- The District of Columbia Tour Bus Management Initiative
- DC Alternatives Analysis

Specific projects related to the Capitol Hill neighborhood are found in the Transportation Improvement Program (TIP), which includes transit, highway, bikeway and pedestrian, and ridesharing improvement projects. The TIP is developed as the primary investment program for the District. The following projects from the 2005 TIP relate to the Capitol Hill study area:

- Rehabilitation of 11<sup>th</sup> Street Bridge,
- "Great Streets" improvements to Pennsylvania Avenue SE (east of the Anacostia River),
- Reconfiguration of Columbus Circle, and
- Reconstruction of 2<sup>nd</sup> Street NE, from F Street NE to L Street NE.

#### Mid-Anacostia River Crossing Study

This study was completed to determine near-term connectivity, and bridge improvements that might affect the ultimate goals of the Anacostia Waterfront Initiative. Existing traffic conditions and improvement options were assessed to enhance mobility in the area. This includes:

- Addressing missing interchange movements on the Anacostia Freeway (I-295) at Pennsylvania Avenue and the Southeast Freeway at Barney Circle.
- Investigating alternative use of existing lane capacity on the Southeast Freeway between 11th Street and Barney Circle.



- Investigating the potential for increased pedestrian and bicycle access within the study area and along the Anacostia River.

A number of short-term and long-term improvements have been developed in this study, including:

- Completion of the 11th Street Bridge ramps to I-295,
- Reestablishment of Barney Circle as a traffic circle,
- Separation of interstate (regional) traffic from the local traffic,
- Riverfront access improvements,
- Signage improvements, and
- Pedestrian improvements.

#### South Capitol Street EIS

This study recommends improvements to one of the District's frequently used gateways from both the transportation access and economic development perspectives. This study targets connectivity and bridge improvements that will influence regional travel patterns and trips through the Capitol Hill study area.

#### 11<sup>th</sup> Street Bridges EIS

A key project of the Anacostia Waterfront Initiative, this study focuses on bridge improvements that are expected to facilitate regional travel while easing commuter congestion through the neighborhood.

- New ramps east of the Anacostia River would connect both directions of the Anacostia Freeway with cross-river freeway bridges.
- Local traffic would be separated from freeway traffic either by dedicating one bridge to each use or by providing physical separation of uses on each bridge.
- The current freeway capacity of four lanes in each direction would remain unchanged. Two lanes in each direction would be provided for local traffic as would enhanced facilities for bicyclists and pedestrians adjacent to the local traffic lanes.

#### Kenilworth Avenue Study

The third of three projects to look at transportation issues in the context of the Anacostia Waterfront, the Kenilworth Avenue study looks at improving safety and accessibility along Kenilworth Avenue. This study aims to:

- Provide a safer, more pedestrian friendly, atmosphere,
- Create a more urban setting for Kenilworth Avenue, and
- Improve access for local neighborhoods.

#### Pennsylvania Avenue SE Improvements

The Pennsylvania Avenue study is focused on a corridor east of the Anacostia River. Recommended short-term improvements on Pennsylvania Avenue SE include:

- Improved signage for traffic regulations, parking, and wayfinding,
- Improved signal timing for vehicles and pedestrians, and
- Implementation of signed bicycle lanes (as defined by the Bicycle Master Plan).

Recommended long-term improvements on Pennsylvania Avenue SE include:

- Improved intersections for driver and pedestrian safety,
- Improved streetscapes along Pennsylvania Avenue SE, and
- Implementation of textured cross-walks for pedestrians.

#### H Street NE Corridor Transportation Study

This study, which borders the Capitol Hill neighborhood to the north, has prompted a major corridor rehabilitation project now in the final stages of design. The H Street study is directed toward improving the commercial and residential character of the corridor by focusing on transit and streetscape improvements. Improved connectivity and parking for vehicular traffic will be integrated with urban design treatments that enhance the sense of place along H Street.

#### District of Columbia Motor Carrier Management and Threat Assessment Study

This study provides a detailed analysis of current motor carrier activity in the District. In implementing the recommendations of the study, the goals for the District are to reduce truck traffic on residential streets, reduce congestion related to truck loading and unloading, provide better information to truckers and operators, and address truck-related security concerns. Key recommendations of the study include implementing designated truck routes which would assign the current five percent total truck traffic in the district to specific streets. The following designated truck routes affect the Capitol Hill neighborhood:

- East Capitol Street from Benning Road to the District Border,
- Massachusetts Avenue, from District Border to 3<sup>rd</sup> Street NE,
- North Capitol Street, from New Hampshire Avenue to Massachusetts Avenue,
- Pennsylvania Avenue SE from District border to 3<sup>rd</sup> Street SE,
- South Capitol Street from the Southeast Freeway to Interstate 295,
- All of Interstates 295 and 395, and
- H Street NE.

#### The Mayor's Parking Task Force Report

This report summarizes existing data on the District's parking supply, demand, and other issues identified by a task force consisting of members from D.C. wards and neighborhood associations. A primary recommendation of the study includes the "re-zoning" of parking areas by neighborhood rather than by ward. The Capitol Hill area would fall into the proposed parking zone 26. These recommendations would require adoption by the District for all areas before being implemented in the Capitol Hill neighborhood.

Recommendations related to the Capitol Hill study area:

- Develop a complete parking inventory. (The Capitol Hill Transportation Study includes a comprehensive inventory of neighborhood on-street parking.)
- Designate parking into four types: Residential 1 (light demand), Residential 2 (heavy demand), Mixed Residential/Commercial, and Commercial.
- Change "other" parking policies associated with residential parking permits, visitor parking, overall parking enforcement and fines, meters, and taxation.

### The Bicycle Master Plan

This report for the District provides an inventory of current bike facilities as well as planned bikeways. Within the Capitol Hill neighborhood study area, up to five percent of all commutes are via bicycle, so providing bikeways and signage is an important component of the Bicycle Master Plan and is a focus of the Capitol Hill Transportation Study. New bicycle lanes are proposed for D Street NE and 11<sup>th</sup> Street SE. A bicycle lane, as defined by the Bicycle Master Plan, is a portion of the roadway that has been designated by striping, signing, and pavement markings. Bicycle lanes are typically located on both sides of a street (with the exception of one-way streets) with minimum widths of five feet.

### Public Reservation 13/Hill East Waterfront/National Capital Medical Center

The Public Reservation 13 plan is a re-envisioning of this isolated site at the eastern fringe of the Capitol Hill study area, along the west bank of the Anacostia River and just south of the RFK Stadium site. This plan calls for mixed use development to be integrated with local public services, and an attractive public space that links the existing neighborhood to the waterfront. If built, the National Capital Medical Center or other medical facility would act as a significant part of the Public Reservation 13 site and plan, and would be a source of a large portion of trips in and out of the site. The plan seeks to integrate this site into the transportation infrastructure of the existing surrounding environment by providing an integrated street network with many connections to existing streets.

Related to the Reservation 13 plan, the National Capital Medical Center (NCMC) Traffic Impacts and Mitigation Analysis has recommended the following improvements related to the Capitol Hill study area:

- Add a third lane to Independence Avenue during peak hours.
- Add a direct connection from 22<sup>nd</sup> Street to the north to NCMC facility.
- Consider two-way operation of Independence Avenue from 22<sup>nd</sup> Street to 17<sup>th</sup> Street.
- Make improvements to Barney Circle with connection to Hill East Waterfront Park road.
- Install traffic calming measures in Hill East neighborhood.
- Install a traffic signal at intersection of Potomac Avenue and the 19<sup>th</sup> Street, SE.

### The District of Columbia Tour Bus Management Initiative

This project provides a plan to address long-standing issues related to District tour bus operations from the perspectives of both District residents and visitors. Tour buses operating on District streets lack adequate parking and thereby contribute to local traffic congestion and air quality concerns. The U.S. Capitol attracts a significant number of tour buses annually that, in many cases operate on Capitol Hill neighborhood streets. To help remove tour buses from neighborhoods while enhancing the visitor experience, the Tour Bus Management Initiative recommends providing parking for tour buses on the District periphery and providing additional opportunities for downtown parking where tour buses could dock either close to points of interest or near Downtown Circulator stops.

### DC Alternatives Analysis

From 2003 to 2006, the District of Columbia Department of Transportation, working with the Washington Metropolitan Area Transit Authority (WMATA), developed a phased, multimodal transit improvement plan called the DC Alternatives Analysis (DCAA). The DCAA study recommended implementation of light rail, bus rapid transit, and rapid bus corridors across the District of Columbia.



### 3.0 METHODOLOGY

The purpose of this section is to describe the process by which potential transportation issues were identified, by which possible solutions were proposed, and through which the phasing and implementation of any recommended solutions were determined.

Potential issues were identified through several methods of data collection, including:

- § Extensive Field Work
- § Public and Stakeholder Impact
- § Traffic Modeling

Once collected, data was analyzed to identify potential transportation issues (and screen out any non-issues). The Project Team then developed sets of potential solutions to those issues, which were presented to DDOT representatives and the public. This led to the creation of a recommended list of projects, which were then prioritized for implementation.

Each step of this process is described in more detail below.

#### 3.1 Data Collection

Data was collected via three primary methods. This aggregated data gives a detailed picture of the existing conditions in the study area, and was presented in the Existing Conditions Report (February 2006).

##### 3.1.1 Field Work

Project teams conducted extensive field work in the study area between May 2004 and December 2005. Field work included walking and driving trips through the area during different times of the day, as well as photographing key locations. Where there were high concentrations of issues and problems identified by the public, staff made repeat visits and studies locations in further detail. Issues suggested by members of the public were confirmed by field visits.

##### 3.1.2 Public Meetings

The public involvement process was intended to introduce members of the Capital Hill Community to the project and its processes; and to collect data on the transportation issues and concerns that were important to the people living in the area. The identification of potential transportation issues relied heavily on identification of these issues by members of the public and other stakeholders. Public comments were received at three open house meetings:

- § During Public Meeting #1 (June 7, 2005) the study team introduced the study goals and objectives and received comments on neighborhood and traveler concerns.
- § During Public Meeting #2 (January 24, 2006) the study team presented the findings of the Existing Conditions report, and collected additional comments.
- § During Public Meeting #3 (June 21, 2006) the study team presented preliminary recommendations for solutions to identified transportation issues. The team collected comments on the proposed solutions, and additional nominations of potential issues.

A fourth public meeting is scheduled for September 2006 to present the draft Final Findings and Recommendations (this report) and to receive citizen comments.

##### 3.1.3 Traffic Modeling

As a final component in the collection of data for the study area, the team collected traffic counts at selected intersections and modeled existing, 2015, and 2030 traffic characteristics. Data collection included collecting turning movements at 32 intersections during peak and off-peak periods and collecting daily traffic counts at 15 locations.

Using this data, the project team determined the existing (2005) level of service at 38 intersections.

In addition, the project team developed level of service estimates for 2015 and 2030. The 2015 estimate was developed to assess the impacts of anticipated development in the study area and the impacts of background traffic growth. The 2015 and 2030 projections were used to determine the impacts of conversion of selected streets from 1-way to 2-way operation.

#### 3.2 Categorizing Transportation Issues

The methodology presented in Section 3.1 identified more than 400 potential transportation issues. In order to present these to the public and to begin to develop potential solutions and to organize the issues by implementation period, the potential issues were categorized by the following methods:

##### *Locations of special concern ("Hot Spots")*

As the range of transportation issues was identified and mapped, there were concentrations of issues at several locations around the study area. The study team judged these locations worthy of focused study. Aerial photographs showing the specific recommendations for these locations are shown in Section 7.

##### *Issues categorized by transportation mode or topic*

For the purposes of this report, each identified transportation deficiency is also classified by the type of transportation mode. In this way, similar issues identified at different locations in the study area may be grouped together for analysis. The categorized issues are presented in Section 7, while the full list of issues sorted by type of issue is included as **Appendix B**.

##### *Area-wide issues*

Many of the transportation deficiencies identified by the study team and members of the community are not focused on a specific location, but rather concern the entire study area. These issues are grouped with the appropriate transportation mode or topic.

#### 3.3 Project Phasing

In addition to characterizing issues based on issue type, the potential issues were also divided into implementation phases. Most of the transportation deficiencies that were identified warranted some type of intervention, either as a way of correcting some existing problem in the transportation infrastructure, or as a way of improving conditions or refining the infrastructure and operations to function more safely or efficiently in the future. Recommendations devised to address identified issues, and depending upon the nature of the recommendation, grouped

according to the potential timeframe for implementing that recommendation. **Table 3-1** illustrates the timeframes associated with each recommendation category.

**Table 3-1: Timeframes for Project Phasing**

Category	Timeframe
Priority short term	as soon possible
Short term	0 to 12 months
Medium term	1 to 5 years
Long term	5+ years

*Short term*

Short term recommendations are categorized as those projects that could be executed within one day’s time with very little or no construction work. More recommendations fall within the “short term” category than in medium or long term.

Of the more than 400 short term recommendations, 80 are categorized as “priority.” Priority recommendations were selected by considering the accident rates and proximity to schools at the locations in question, and the degree to which community members have commented on the issue. These issues have been ranked to be addressed before other short term improvements, as their resolution would tend to have a greater effect on transportation safety at the most critical locations in the study area. A list of all priority short term recommendations is included as **Appendix A**.

*Medium term*

Medium term issues can be categorized as issues that can be addressed in 1 to 5 years. These issues generally require some form of significant construction work or replacement of infrastructure, or are tied together with additional issues which should all be addressed together.

*Long term*

Long term issues are issues that will be addressed in 5 or more years. These issues are usually associated with the involvement of other agencies or tied to larger more complicated issues in which a separate plan will be developed to mitigate these issues.

#### 4.0 EXISTING CONDITIONS

Existing conditions within the study area were presented in detail in the Existing Conditions Report (February 2006). This section summarizes the major findings of that report. The potential transportation issues identified in the report are presented in **Appendix C**. This section is divided into the following subsections:

- Existing Land Use and Planned Developments
- Characteristics of Roadways and Intersections
- Pedestrian Circulation and Facilities
- Parking Restrictions, Inventory, and Usage
- Bus and Truck Restrictions
- Public Transportation
- Bicycle Facilities

##### 4.1 Existing Land Use and Planned Developments

The most common land use within the Capitol Hill study area is residential of moderate density. The dominant housing type is attached rowhouses, generally two to three stories in height. There are limited areas of higher density housing such as apartment buildings, in the southern portion of the study area along and south of the Southeast Freeway (I-295).

Local public facilities and federal land uses are limited to the east and west edges of the study area and include facilities such as the Supreme Court, the Library of Congress, the U.S. Capitol Police Headquarters, several Senate and House Office Buildings, and the U.S. Capitol Complex. The area immediately east of the study area across 19<sup>th</sup> Street NE / SE is also primarily local public facility land uses. Existing facilities include RFK Stadium, the Armory, and the former site of the D.C. General Hospital. Many schools both public and private exist in Capitol Hill. Fourteen public schools alone are located through out the study area.

Small-scale commercial uses are scattered throughout the study area (small grocery stores, dry cleaners, etc.). Significant retail / restaurant land uses are limited to a small number of corridors. The largest concentrations of commercial (retail) land uses are located along Pennsylvania Avenue SE , 8<sup>th</sup> Street SE (“Barracks Row”), the area around Eastern Market, Massachusetts Avenue NE between Stanton Park and Union Station, and 2<sup>nd</sup> Street SE across from the Federal office complex.

##### 4.2 Characteristics of Roadways and Intersections

Several functional classifications of roadways exist in the study area as defined by the District DOT. The study area has a single Interstate Highway (I-295 / Southeast Freeway) and no other freeways or expressways. Two Principal Arterials exist, being Independence Avenue SE and Pennsylvania Avenue SE. The study area has ten Minor Arterials: Massachusetts Avenue NE, Maryland Avenue NE, C Street NE, Constitution Avenue NE, North Carolina Avenue NE, 8<sup>th</sup> Street SE, 11<sup>th</sup> Street SE, and 19<sup>th</sup> Street SE.

The study area is crossed by a larger number of Collector and Local roads which comprise the remaining roadways in Capitol Hill. The majority of these roadways within the study area are two-

way roads. However, fourteen streets are one way in directionality, either for their entirety or partially.

The vast majority of intersections in the Capitol Hill study area currently operate at levels of service greater than D during peak hours. The level of service (LOS) is a rating of an intersection’s ability to handle traffic, based on delay per vehicle. Three intersections in the Capitol Hill study area operate at LOS E or worse during the PM peak. These follow as:

- § Kentucky Avenue D Street and 14<sup>th</sup> Street,
- § Constitution Avenue and Massachusetts Avenue, and
- § Barney Circle and 17<sup>th</sup> Street.

During the AM peak, intersections that operate at LOS E or worse include:

- § East Capitol Street and 19<sup>th</sup> Street NE, and
- § Potomac Avenue and 17<sup>th</sup> Street.

##### 4.3 Pedestrian Circulation and Facilities

The Capitol Hill study area contains several significant pedestrian destinations which include:

- § Eastern Market
- § Barracks Row
- § Retail and services along Pennsylvania Avenue, especially in the vicinity of Eastern Market
- § Retail and services along H Street NE / Benning Road
- § Union Station
- § Federal offices within the Capitol Complex
- § Metrorail stations (Capitol South, Eastern Market, Potomac Avenue, and Stadium-Armory)

These locations are connected by a sidewalk network made up of different materials (i.e. brick and concrete pavers) in a range of conditions (between good and poor). With very few exceptions, sidewalks exist on both sides of the street on all blocks of the study area. Conditions of the sidewalks varied, with some sections being in very good condition, while others were in disrepair. In many cases, pedestrian crossing treatments (ramps, crosswalks, pedestrian signals) were lacking at intersections.

##### 4.4 Parking Restrictions, Inventory, and Usage

As part of the study, existing parking restrictions and an inventory of supply were mapped. Parking is regulated throughout most of the study area by the use of on-street residential parking restrictions and parking meters. There is also metered on-street parking, predominantly in the commercial districts along Pennsylvania Avenue SE, 8<sup>th</sup> Street SE, and along the western edge of the study area.

To better understand the on-street parking capacity of the study area, the Study Team took samples of typical curbside space throughout the study area. The existing midday and evening usage rates were estimated throughout the study area. Different parts of the study area have different parking demand and utilization characteristics. As a result the study area was divided into seven subzones.



Based on an assessment of the parking utilization in both periods, it appears that limited parking is not a major concern in the eastern part of the study area. There may be specific blocks where parking is limited (or parking may be limited during special events), but in general terms, there appears to be sufficient parking to meet demand.

In the western part of the study area, however, there are severe daytime parking constraints. The fact that parking demand is higher during the day than at night suggests that drivers are coming from outside of these subzones to park during the day. Residential permit restrictions are intended to prevent this, but the Zone 6 Permit area is very large, and some commuters may be coming from areas within Ward 6 that are further away from the western part of the study area. Other parkers may have illegally obtained permits or may simply be risking a ticket to park in the area.

**4.5 Truck and Bus Restrictions**

Truck and bus restrictions exist along selected roadway corridors in the study area. Restrictions are based on the capacity (gross weight) of the trucks and buses as well as number of axles, excluding transit vehicles. The majority of the restrictions are along major east-west roadways such as Constitution Avenue, East Capitol Street, and Independence Avenue SE. Restrictions also exist on portions of 17<sup>th</sup> Street NE, 6<sup>th</sup> Street, and G Street, as well as on other streets.

**4.6 Public Transportation**

The study area is well served by public transportation. Within the study area, service is provided by the Washington Metropolitan Area Transit Authority (WMATA) and by the Maryland Mass Transit Authority (MTA). WMATA operates 2 Metrorail lines and 12 Metrobus lines, while the MTA operates 7 commuter bus lines through the study area.

WMATA provides rail and bus service seven days a week for the vast majority of hours each day, with several bus routes in operation nearly 23 hours each weekday. MTA buses operate predominately during peak times, weekdays only.

**4.7 Bicycle Facilities**

Within the Capitol Hill neighborhood study area, up to five percent of all commutes are via bicycle. Bike facilities include dedicated striped bike lanes, and “Bike Route” signage along other roadways such as around Lincoln Park. Along most bike lanes the pavement is marked or striped to designate the lane for the exclusive use of bicyclists. Lane markings were observed to be inconsistent in the study area. Some lanes are marked with a diamond (<>) symbol, which according to the MUTCD designates an HOV lane. These markings should be replaced by the appropriate striping showing a silhouette of a cyclist.

Segments of nine streets are marked with bike lanes. These streets are as follows: East Capitol, 4<sup>th</sup> Street NE, 6<sup>th</sup> Street SE, North Carolina Avenue SE, Massachusetts Avenue NE, C Street NE, D Street NE, 14<sup>th</sup> Street SE, and 15<sup>th</sup> Street SE.

5.0 FUTURE CONDITIONS

The purpose of this section is to present the assumptions made in forecasting future leves of traffic and the results of the study team’s modeling efforts. The recommended of this study should be designed to serve not only existing needs, but also emerging needs. Other on-going studies have plans that will impact the study area, and the effects of those plans are included in the analysis. It is important to remember that computer traffic modeling is a tool intended to show an estimation of future conditions. It is not a flawless picture of traffic flow but rather a way to view trends related to expected changes in land use and transportation infrastructure.

Future conditions include the following elements:

- § Future development projects
- § Future traffic conditions
- § Transportation projects from other studies

All of these accumulated impacts are included (where appropriate) in the 2015 and 2030 traffic projections for the study area presented in this section and in Section 6.

5.1 Future Development Projects

With the assistance of area residents and the District of Columbia Office of Planning, the National Capital Planning Commission and the U.S. Department of State, the Study Team identified eleven new or proposed developments within the study area. **Table 5-1** shows the planned developments by location, size and type.

Table 5-1: Planned New Projects in the Study Area, March 2005

Number	Project	Address	Size		Type
			Residential Units	Non-Residential Sq Ft	
Under Construction					
1	Kentucky Courts	340 13 <sup>th</sup> Street SE	54		New Construction
2	Station Place Building One	100 F Street NE		650,000	New Construction
3	Station Place Building Two	600 2 <sup>nd</sup> Street NE		400,000	New Construction
4	Capitol Visitor's Center	East Capitol Street/ 1 <sup>st</sup> Street		580,000	New Construction
5	Lincoln Park Terrace	401 13 <sup>th</sup> Street NE	68		New Construction
6	Providence Square Town homes	600-606 Kentucky Ave SE	8		New Construction
7	1230 Pennsylvania Avenue	1230 Pennsylvania Avenue SE	47		New Construction
Proposed					
8	Medlink Hospital Conversion	7 <sup>th</sup> Street/ Massachusetts Avenue NE	275		Change of Use
9	Jenkins Row	1399 Pennsylvania Avenue SE	247		New Construction
10	Station Place Building Three	700 2 <sup>nd</sup> Street NE		525,000	New Construction
11	St. Coletta of Greater Washington	Independence Avenue / 19 <sup>th</sup> Street SE		96,000	New Construction

*Note: Trip distribution for Station Place Buildings is based on the Traffic Impact Analysis Report prepared by Wells and Associates, July 27, 2001.*

5.2 Future Traffic Conditions

Year 2015 was chosen as the future analysis year for Capitol Hill Transportation Study. Traffic volumes in 2015 were adjusted from their current volumes based on two changes:

- § “Background” traffic volumes were increased to account for growth in population region-wide, and its affect on the study area.
- § “Development Traffic” accounts for traffic generated specifically by the 11 projects identified in the study area, as presented in **Table 5-1**.

Using the Synchro traffic analysis software, the Study Team evaluated traffic conditions at the 46 intersections within the study area for 2015 conditions. The intersections of Constitution Avenue with 10<sup>th</sup> and 12<sup>th</sup> Streets and Independence Avenue and 12<sup>th</sup> Street have already been identified by District DOT as locations to receive traffic signals. These signals are reflected in the Synchro model for Future 2015 Conditions. In general, traffic generated by the proposed developments

has relatively minor effect on the levels of service of the study intersections. The intersection of Constitution Avenue with 4<sup>th</sup>, 6<sup>th</sup> and 12<sup>th</sup> Streets will be impacted the most by traffic due to proposed developments. At these locations, the impact is expected to be moderate with 9 to 14 percent of the overall volume caused by traffic generated by the proposed developments.

*Existing Traffic*

In order to evaluate existing traffic conditions throughout the study area, the Study Team collected turning movement counts at 32 intersections during both peak and off-peak periods. A detailed description on the existing traffic conditions in the study area can be obtained from the Final Existing Conditions Report, February 2006 for Capitol Hill Transportation Study. **Figure 5-1** below shows intersection levels of service (LOS) for the Year 2005.

*Background Growth*

Background traffic growth is considered the component of traffic that increases due to region-wide increases in population and development. Based on historical counts, the growth rate used for background traffic was 0.5 percent per year. All balanced traffic volumes were grown by this percentage to determine background growth in traffic volumes for ten years in the future. Level of Service (LOS) is not affected significantly in the future conditions considering only background volumes.

*Development Traffic*

The projects shown in **Table 5-1** were also included in the analysis. The Study Team evaluated the impacts of development traffic on the study area intersections. As with the existing conditions and background growth, the study team used the Synchro software results to calculate LOS for the intersections in the study area for the AM and PM peak hours.

To determine the impacts caused by the proposed developments, the study team divided the additional development generated traffic by the total forecast traffic at each intersection. **Table 5-2** shows the effects of development traffic generation on total intersection traffic for those intersections that would be impacted most significantly. This portion of the analysis assumes no changes to the existing roadway configuration.

Proposed development impacts of less than five percent of traffic are low and generally reflect negligible effects on traffic operations and delays. Proposed development impacts between five and 15 percent are moderate and have minor effects on traffic operations. Proposed development impacts of more than 15 percent are significant and generally result in significant degradation of traffic operations and increased delays. The intersections most affected by the proposed development traffic are those located in the immediate vicinity of the development sites. Impacts generally decrease with increased distance to the site that generates the trips.

The intersections of Constitution Avenue with 4<sup>th</sup> Street, 6<sup>th</sup> Street, and 12<sup>th</sup> Street will be impacted moderately with 9 to 14 percent of their overall volume caused by proposed developments. The intersection of Constitution Avenue with 8<sup>th</sup> Street, 10<sup>th</sup> Street, Massachusetts Avenue and 7<sup>th</sup> Street and Independence Avenue and 18<sup>th</sup> Street will be impacted between 7 and 9 percent. As mentioned before these changes will have minor effects on the traffic operations and delays in the study area. Most of the intersections in the study area experience minor traffic impacts due to proposed developments.

**Figure 5-2** shows that proposed development traffic has a relatively minor effect on the LOS of the studied intersections. Considering the AM and PM peak hours, several intersections experience minor degradation in LOS (from A to B or B to C, for example) due to proposed development traffic, but would continue to operate at acceptable LOS.. Intersections expected to operate at a poor level of service (LOS E or F) are; Massachusetts Avenue and Constitution Avenue, Independence Avenue and 8<sup>th</sup> Street, Kentucky Avenue at 14<sup>th</sup> Street, Potomac Avenue at 17<sup>th</sup> Street, 17<sup>th</sup> Street at Barney Circle and East Capitol Street at 19<sup>th</sup> Street.

**Table 5-2: Changes to Traffic Levels, 2005-2015**

Intersection	2005 Total Intersection Traffic		2015 Total Intersection Traffic		2015 AM Peak Hour Traffic Increase	2015 PM Peak Hour Traffic Increase
	AM	PM	AM	PM		
Constitution Avenue and 4th Street	1508	1276	1750	1536	9%	13%
Constitution Avenue and 6th Street	1569	1166	1815	1420	9%	14%
Constitution Avenue and 8th Street	1752	1437	1971	1655	7%	9%
Constitution Avenue and 10th Street	1274	1129	1444	1306	7%	9%
Constitution Avenue and 12th Street	1284	684	1455	838	7%	14%
C Street and 8th Street NE	1054	822	1154	915	-	6%
8th Street and D Street NE	818	1074	921	1180	7%	-
Massachusetts Avenue and Constitution Avenue NE and 7th Street	1838	1863	2097	2153	8%	9%
Independence Avenue and 18th Street SE	735	2222	835	2374	8%	-
Independence Avenue and 19th Street SE	1024	3334	1150	3554	6%	-
Potomac Avenue and 19 <sup>th</sup> Street SE	530	937	591	1005	6%	-
Pennsylvania Avenue and Barney Circle and K Street SE	2098	3055	2340	3330	6%	-



Figure 5-1: 2005 Intersection LOS

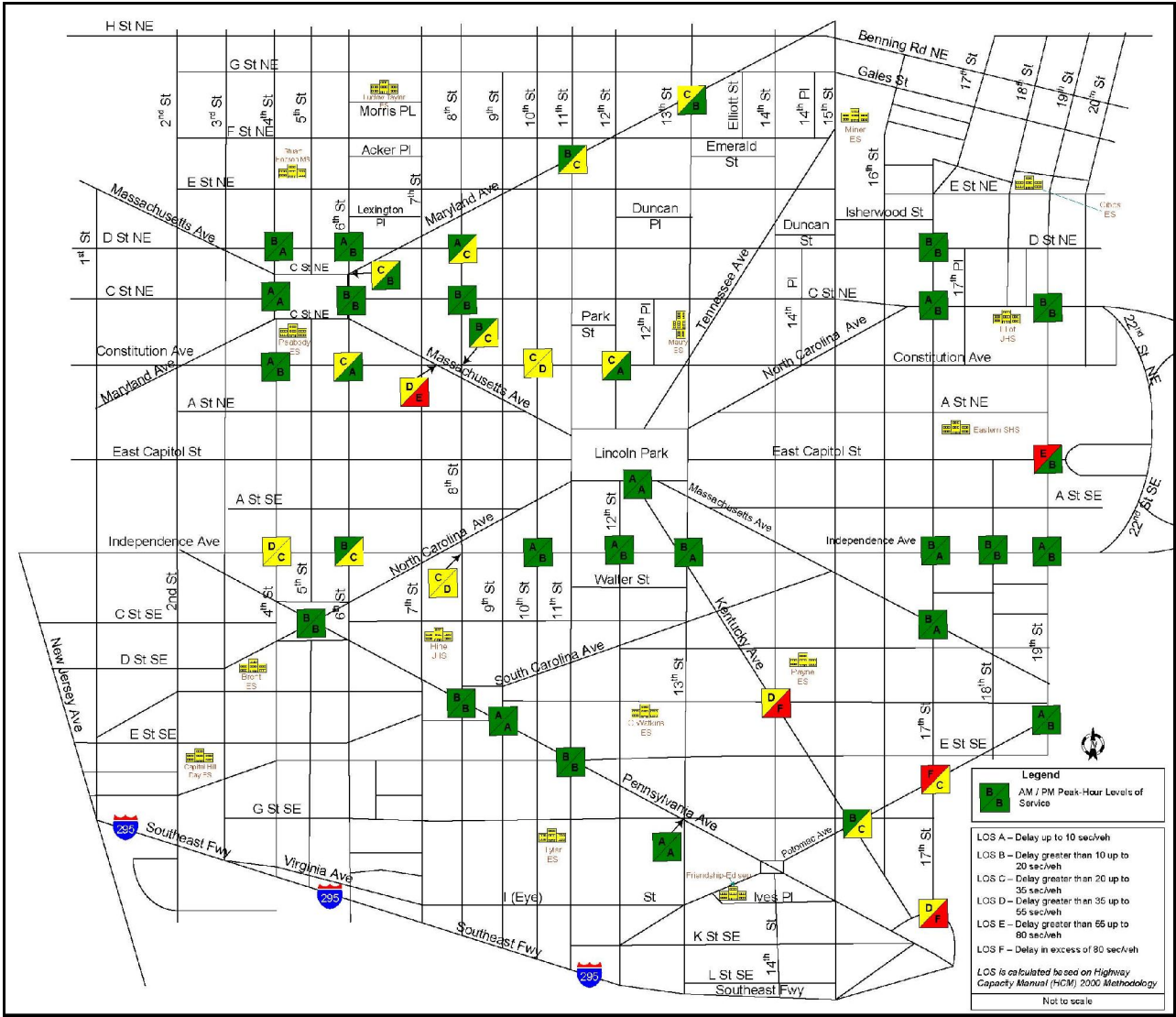
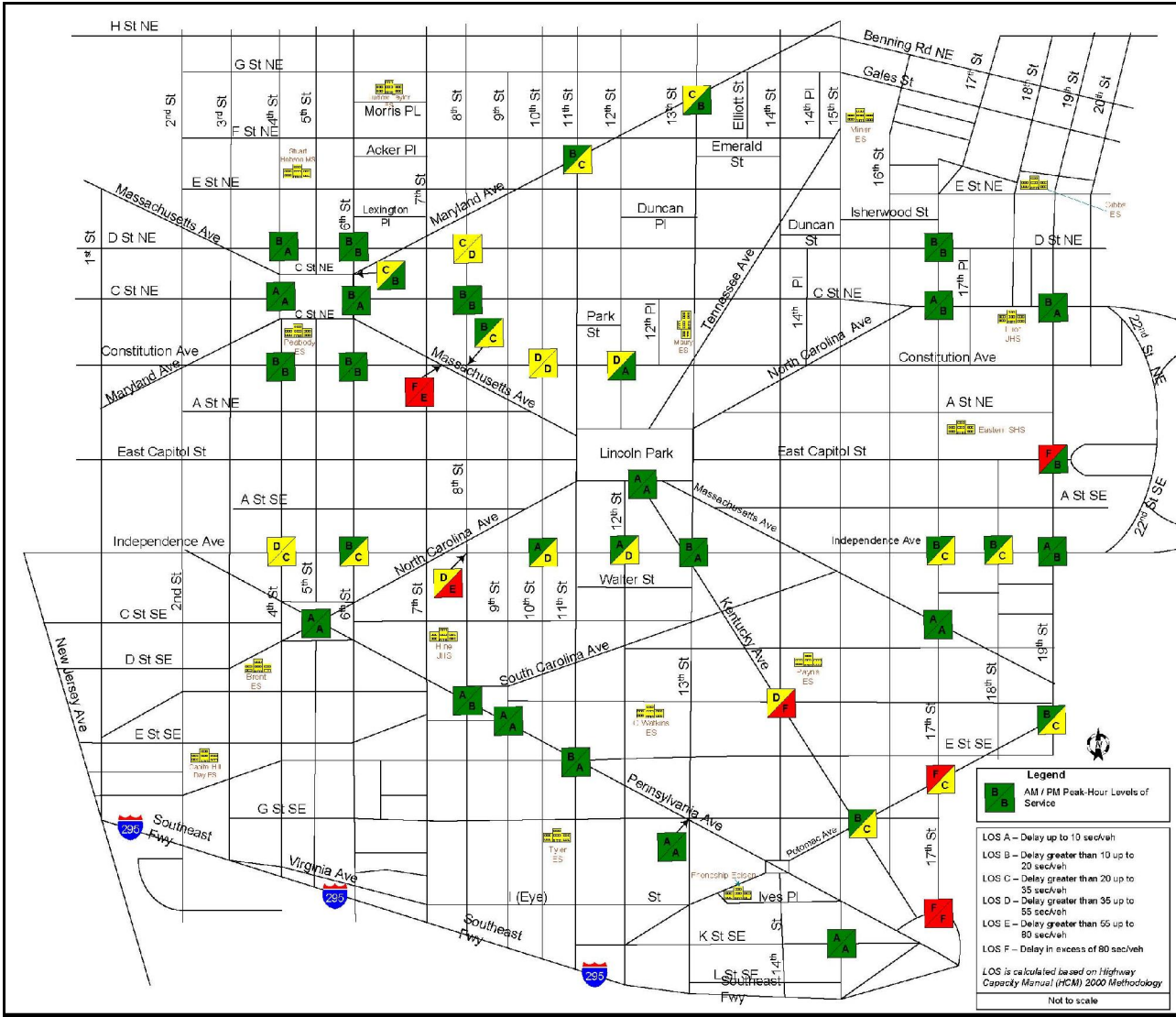


Figure 5-2: Projected 2015 Intersection LOS





5.3 Projects Recommended by Associated Studies

At the same time as this study is proceeding, several other transportation studies are underway which, if their recommendations are implemented, will impact the Capitol Hill area. These studies include both specific recommendations for changes to the Capitol Hill transportation infrastructure; and for changes to areas outside of Capitol Hill that will affect traffic conditions in the study area.

Other on-going studies are listed in Section 2 of this report. This section includes summaries only of those projects that affect traffic conditions within the study area, as reflected in the travel demand model.

*The National Capital Medical Center (NCMC) Traffic Impacts and Mitigation Analysis*  
This study evaluated the potential traffic impacts of a new medical facility to be constructed on Reservation 13 (roughly at the location of the existing DC General Hospital). Although the entire Reservation 13 site is outside of the study area, the study area lies immediately adjacent, and would be impacted by traffic generated by any uses of the Reservation 13 site.

The NCMC study included specific estimates of traffic generated by the site and streets on which the traffic will operate. These increases were included in the 2030 Travel Demand Model (see **Section 6**); however, they are not included in the 2015 transportation model.

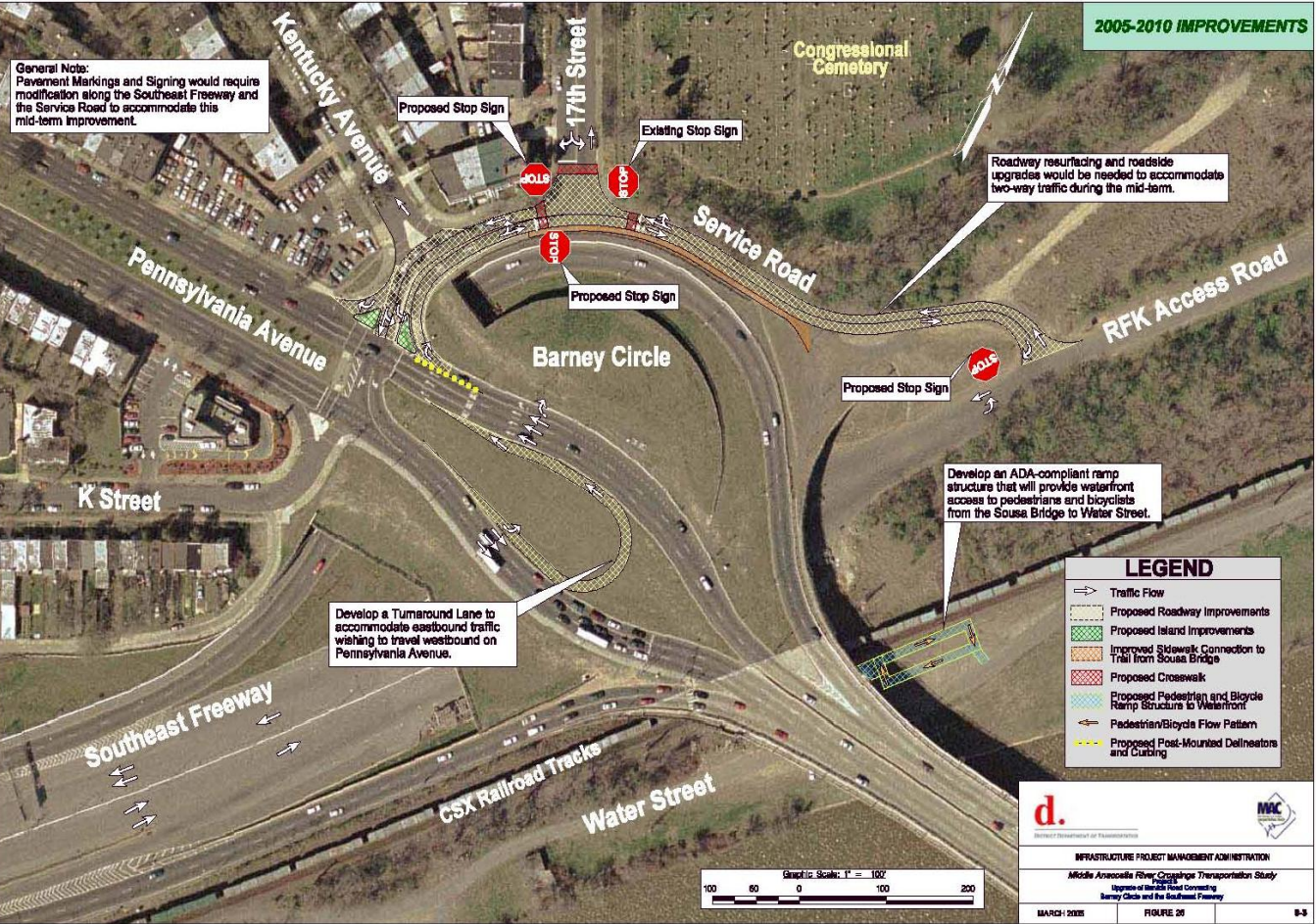
*The South Capitol Gateway and Corridor Improvement, Anacostia Access, and Middle Anacostia River Crossings Transportation Studies*  
These studies propose significant changes to the existing Anacostia River crossings at South Capitol Street and 11<sup>th</sup> Street. In addition to proposing new bridges, these projects suggest land use changes along the waterfront and changes to circulation throughout Southeast DC.

In the study area, these studies propose major changes at Barney Circle and the intersection of Pennsylvania Avenue and Potomac Avenue. These changes are taken as a given for the purposes of this study; therefore, recommendations for these two intersections are limited to short-term improvements that would not preclude the recommended changes from the Middle Anacostia Crossings study.

Barney Circle

At Barney Circle, the study proposes improvements to the intersection to allow access to a new RFK Access Road from Pennsylvania Avenue SE and improvements to signage. These improvements are shown in **Figure 5-3**.

Figure 5-3: Proposed Barney Circle Improvements



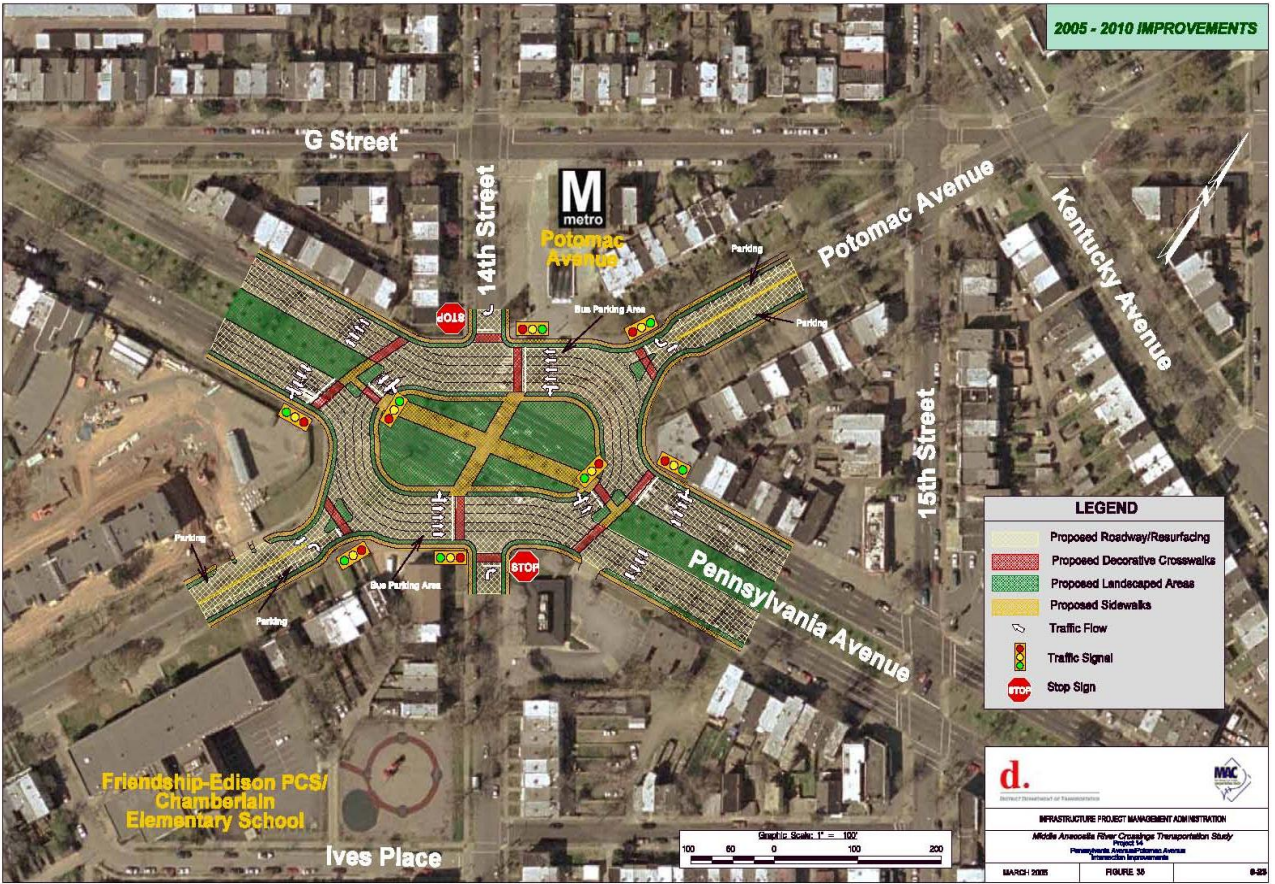
(Source: Middle Anacostia Crossings Study)

Pennsylvania Avenue / Potomac Avenue

The Middle Anacostia Crossings study proposes major changes to the intersection of Pennsylvania and Potomac Avenues to operate the intersection more like a traffic circle. These recommended changes are shown in **Figure 5-4**.



Figure 5-4: Proposed Improvements for the Intersection of Pennsylvania and Potomac Avenues SE



5.4 2030 Conditions

Elements of each of the projects described above are included in the approved 2030 Long Range Transportation Plan developed by the Metropolitan Washington Council of Governments (MWCOC).

The 2030 regional transportation model uses forecasts of population and employment as well as the planned improvements to transportation infrastructure throughout the region to produce a representation of future conditions. **Figure 5-5** is a representation of potential changes in projected traffic volumes for the forecast year of 2030 as compared to observed volumes in 2000, and **Table 5-3** shows selected average daily traffic (ADT) volumes for selected locations for the year 2000. As regional growth occurs, transportation within and across the Capitol Hill area is expected to increase. In terms of percentage growth, traffic will increase substantially along some corridors like Pennsylvania Avenue where considerable excess capacity exists today. Along other corridors, such as Constitution Avenue, traffic volumes will not increase significantly because the streets and intersections are currently operating closer to their capacity. In general trends for 2015 and 2030 indicate traffic increases but manageable congestion.

Figure 5-5: Projected Changes in Traffic Distribution, 2000 to 2030

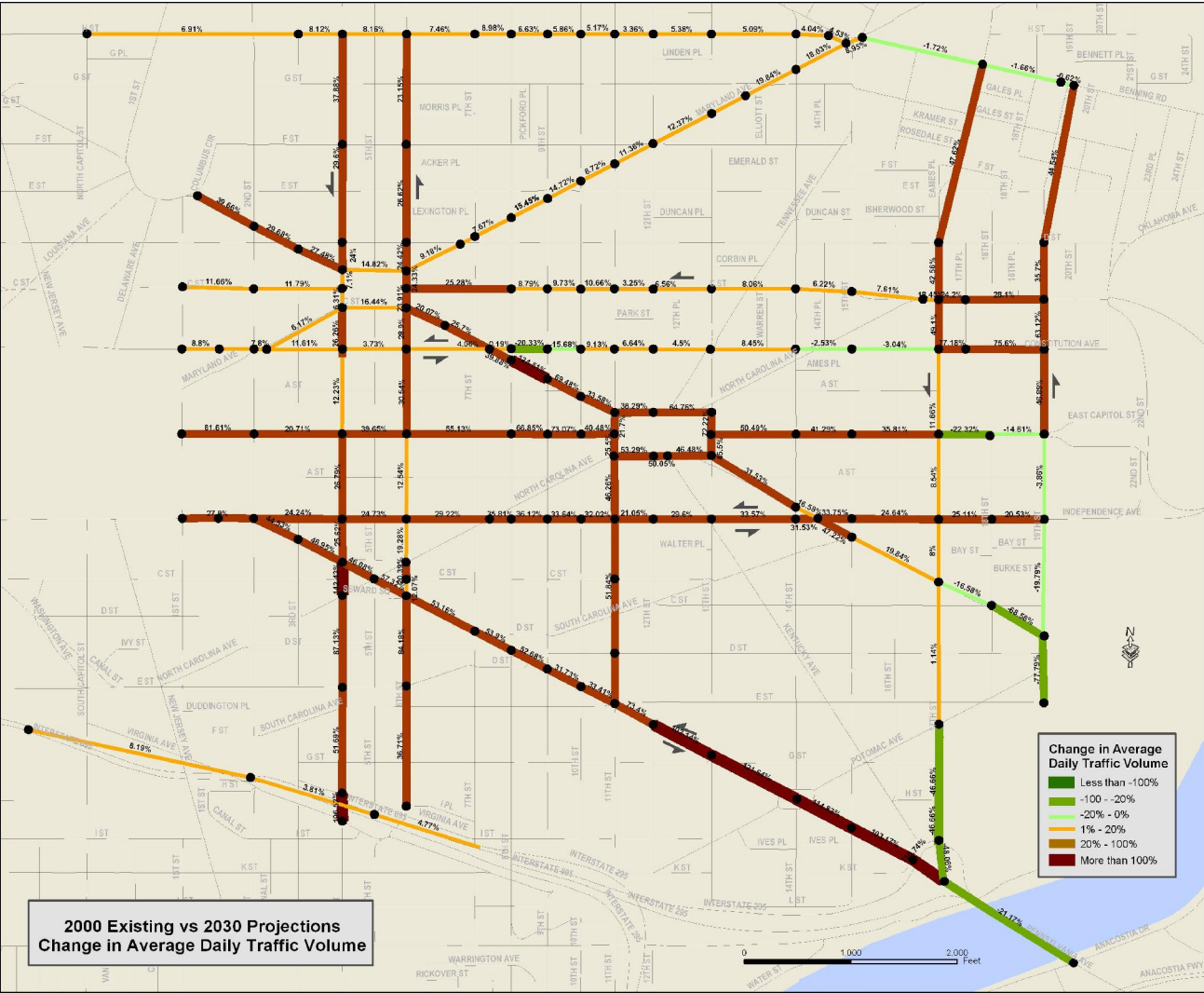


Table 5-3: Selected Traffic Volumes (ADT) for Year 2030

Location	Average Daily Traffic, 2030	Location	Average Daily Traffic, 2030
Mass. Ave. at 2 <sup>nd</sup> St. NE	20,800	C St. at 14 <sup>th</sup> St. NE	9,400
4 <sup>th</sup> St. at Constitution Ave. NE	5,400	Constitution Ave. at 14 <sup>th</sup> St. NE	11,800
6 <sup>th</sup> St. at Constitution Ave. NE	5,600	East Capitol St. at 14 <sup>th</sup> St.	5,700
Pennsylvania Ave. at 7 <sup>th</sup> St. SE	37,100	Independence Ave. at 14 <sup>th</sup> St. SE	11,900
11 <sup>th</sup> St. at D St. SE	11,900	17 <sup>th</sup> St. at C St. NE	7,700
H St. at 14 <sup>th</sup> St. NE	35,100	19 <sup>th</sup> St. at C St. NE	5,300
Maryland Ave. at 14 <sup>th</sup> St. NE	24,200	Pennsylvania Ave. at 15 <sup>th</sup> St. SE	32,200



## 6.0 PROPOSED TWO-WAY STREET CONVERSIONS

The purpose of this section is to present alternatives and findings related to potential conversion of some of the existing one-way streets within the Capitol Hill study area to two way streets. As one of the special objectives of the Capitol Hill Transportation Study, this topic lends itself to focused treatment separate from the other issues and recommendations developed throughout the study.

Motivations for converting one-way streets to two-way streets include the desire to improve access and circulation for motorists and cyclists within the neighborhood. Another driving factor is the desire to distribute through-traffic more evenly across the transportation network and between peak travel times. Combining both of these objectives can result in increased safety and livability within the study area because of reductions in traffic speeds and volumes.

Traffic analysis tools were employed to test two-way conversion of Constitution and Independence Avenues and 17<sup>th</sup> and 19<sup>th</sup> Streets. Results of the analysis show that, in general, these conversions would reduce average speeds and balance traffic volumes more evenly between morning and evening peak travel periods and across the study area street network.

### 6.1 Description of Existing Conditions

Currently, Constitution Avenue is operated as a one-way street in the westbound direction during the weekday morning peak period. One way traffic begins at the intersection of Constitution and North Carolina Avenue (14<sup>th</sup> Place NE) and extends to 3<sup>rd</sup> Street NE. During the remainder of the day and on weekends, Constitution Avenue's two lanes are used as a typical two-way street. Parking is limited to the north side of the street.

Independence Avenue is currently a one-way street in the eastbound direction from 3<sup>rd</sup> Street SE to the eastern boundary of the study area and beyond, to its transition onto the East Capitol Street bridge. Independence Avenue is two lanes throughout the study area, with parking on both sides along much of its length.

Seventeenth and Nineteenth Streets NE/SE constitute a one-way pair that carries traffic north and south across the study area and serves as a well-used connector between different east-west routes into and out of downtown Washington. Both streets are two lanes. While parking is allowed in general along both sides of 17<sup>th</sup> Street, parking is limited to the west side of 19<sup>th</sup> Street.

All four of the streets considered are designated by DDOT as minor arterials. Along segments of each of the streets, travel speeds were observed to be in excess of the posted speed limit of 25 mph. In general, the intersections studied along these streets perform within acceptable ranges. Exceptions are the intersection of Constitution and Massachusetts Avenues, 17<sup>th</sup> Street at Potomac Avenue and at Barney Circle, and 19<sup>th</sup> Street at East Capitol Street, where "E" levels of service are observed in either the a.m. or p.m. peak period (see Existing Conditions Report, pp. 10, 16-17, and 27).

### 6.2 Two-Way Scenarios

To evaluate the potential effects of converting streets from one-way to two-way, two scenarios were developed and evaluated based on future traffic conditions in 2015 and 2030.

Projected 2015 conditions, described above in Section 5.0, were developed to reflect the effects of ongoing growth in travel and proposed development projects on the transportation network. They shed light on the localized effects of development, including new trips generated and resulting impacts on traffic operations. Projected 2030 conditions are based on the COG regional projections for employment and population growth, and reflect a more regional view of the transportation network. The 2030 conditions account for proposed transportation and development projects on the regional scale, and describe general patterns of traffic distribution across the regional network of streets, highways, and transit services.

The two scenarios evaluated are as follows: Scenario 1 assumes that Independence and Constitution Avenues operate as two-way streets throughout the day, while Scenario 2 assumes that 17<sup>th</sup> and 19<sup>th</sup> Streets operate as 2-way south of H Street NE, in addition to all-day two-way operation of Constitution and Independence Avenues.

### 6.3 Analytical Process

As a first step in the analysis, models representing future conditions were developed and calibrated based on current traffic characteristics. To represent 2015 conditions, baseline growth, then the effects of development projects were added to existing traffic levels. For 2030, the approved COG regional model (Round 6.4, updated to include the effects of the South Capitol Street EIS and the 11<sup>th</sup> Street Bridges EIS) was edited to better approximate conditions in the Capitol Hill study area. This 2030 "base case" model includes local and regional development projects, and it includes planned transportation improvements that affect the study area, but it does not include changes to study area roadway configurations.

The projected 2030 distribution of automobile traffic was generated for the base case, then compared against potential traffic patterns generated for each two-way conversion scenario. Projected 2015 effects of the two-way conversions were developed by making use of the traffic distribution patterns generated by the regional model, and applying appropriate factors to the projected intersection turning movements.

The analysis is intended as a decision making tool, and results are to be used to identify general effects of potential two-way conversions. The main limitation of the analysis for the 2030 model is that it does not take into account many of the traffic control and environmental features that impact distribution of traffic across the study area. The 2015 model is limited to projected intersection levels of service at a relatively small number of intersections. It relies on the 2030 regional model for traffic distribution, and does not reflect an evenly balanced interdependence of intersections.

### 6.4 Results

Analysis of the two-way conversion scenarios indicates a range of potential effects on specific study area intersections and area wide circulation patterns. Summary results of the analysis for Scenarios 1 and 2 for projected 2015 intersection LOS are shown in **Figure 6-1** and **6-2**, while summary results of the analysis for both scenarios with projected 2030 traffic volumes are shown in **Figure 6-3** and **6-4**. *In general, the two-way conversions would have the effect of increasing access, spreading traffic more evenly across the Capitol Hill street network, and reducing speeds on the subject streets. On the other hand, the conversions would result in increased traffic congestion and intersection delays at a handful of locations.*

Figure 6-1: Scenario 1 – 2015 Projections

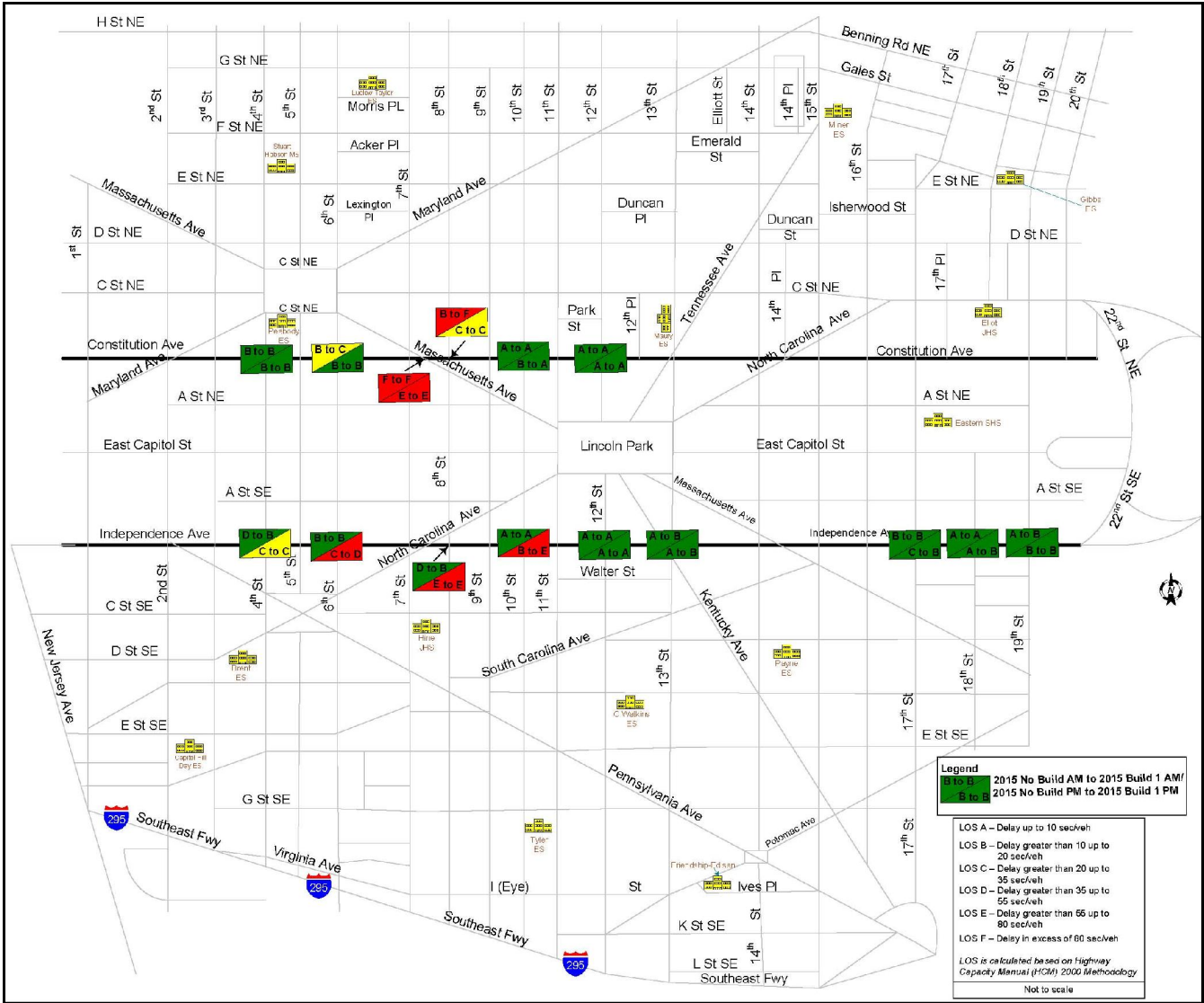
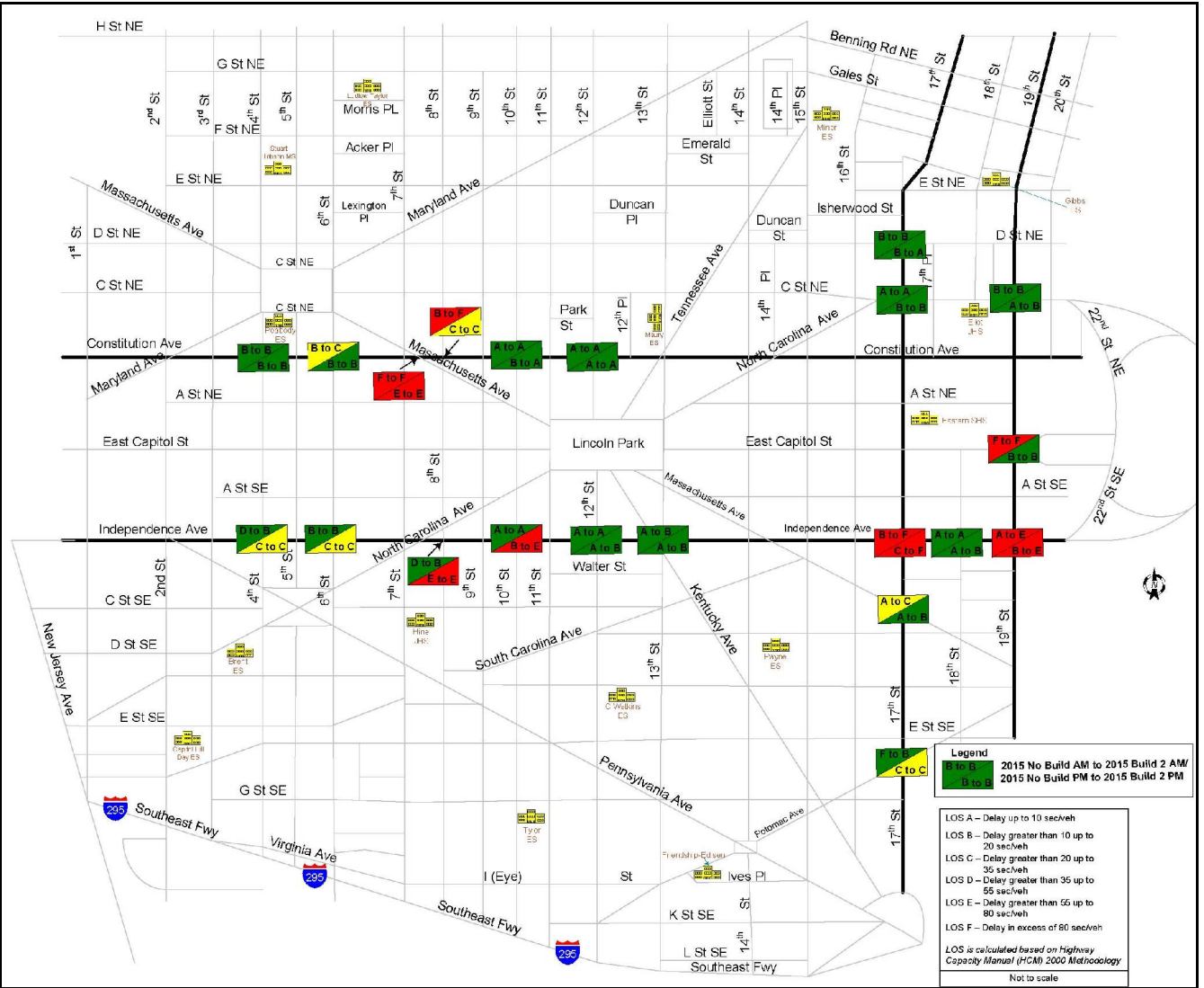
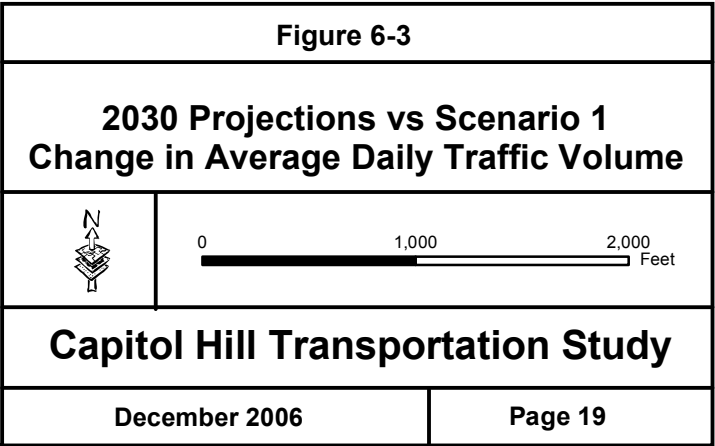
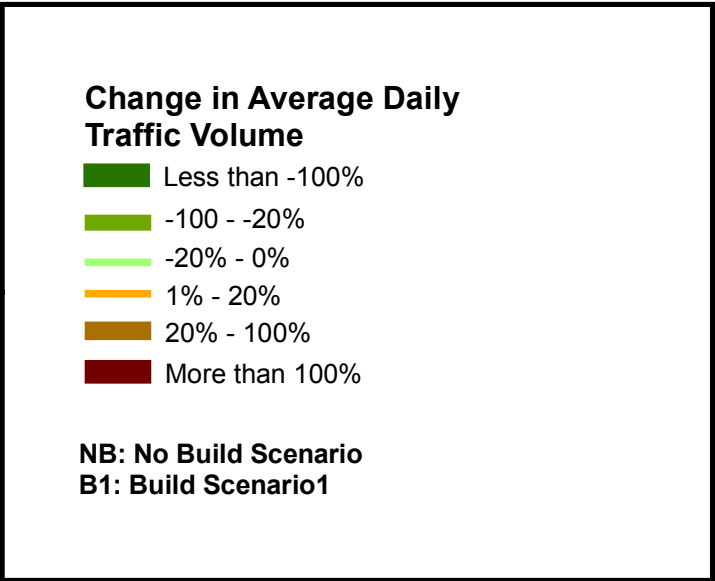
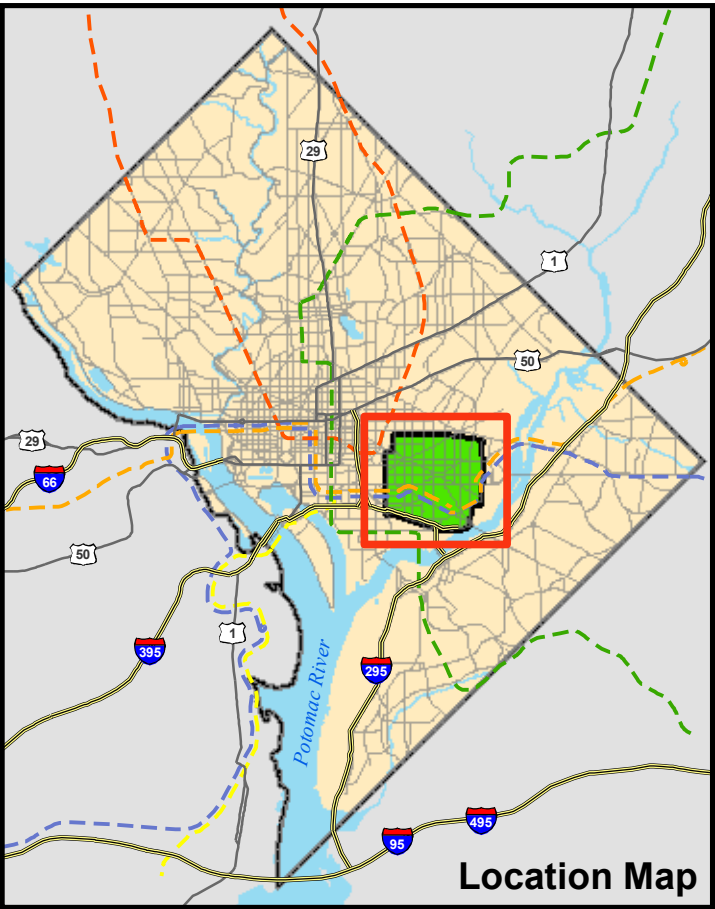
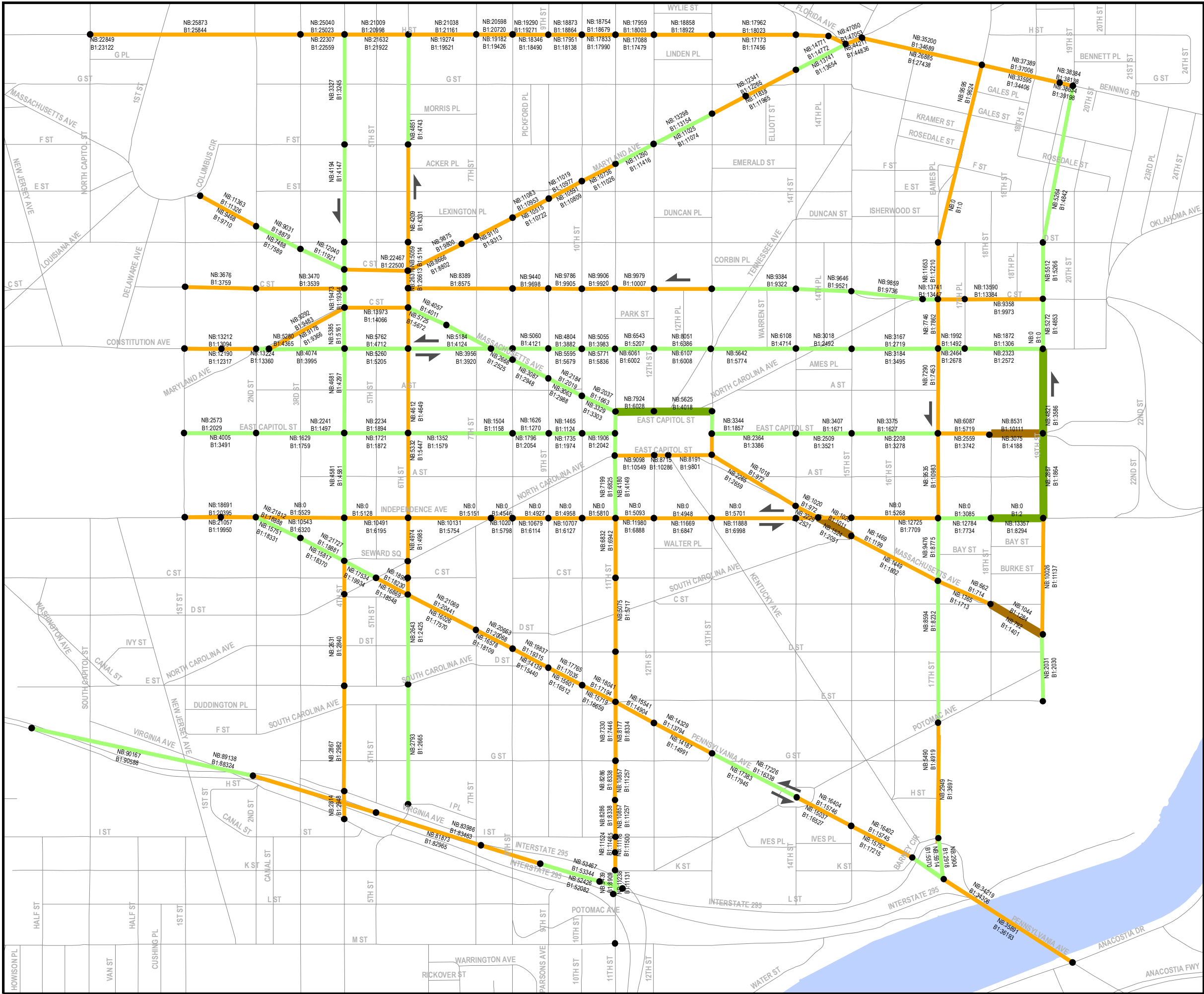
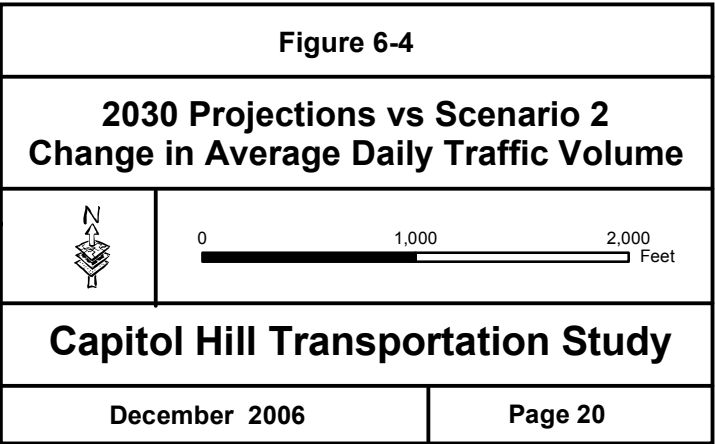
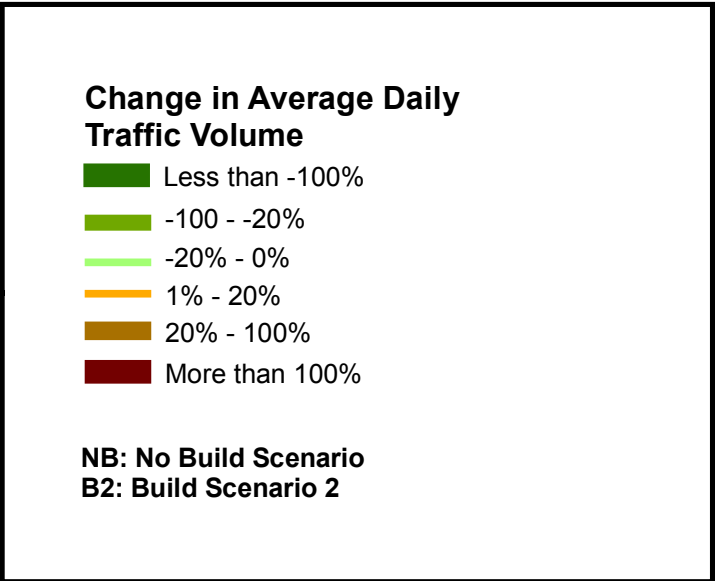
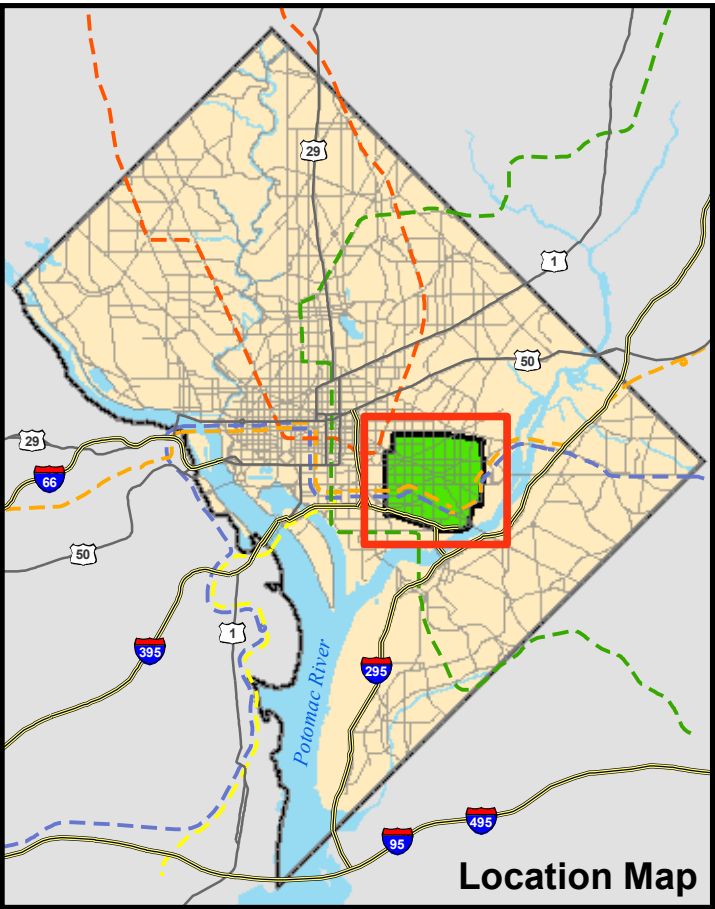
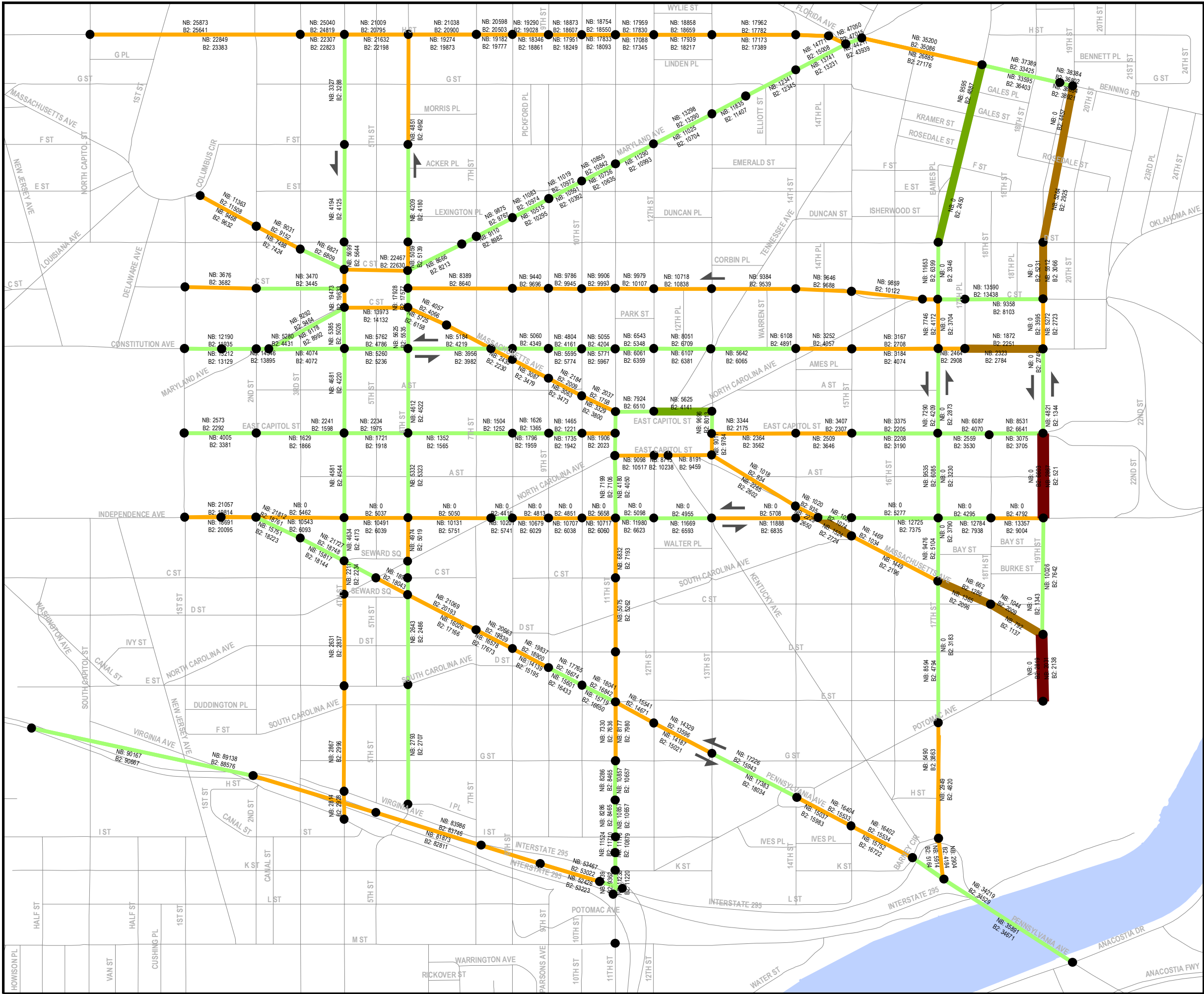


Figure 6-2: Scenario 2 – 2015 Projections











6.4.1 2015 Intersection Analysis

This subsection describes the results of analysis specific to the 2015 forecast year related to potential intersection performance. This analysis assumes that existing lanes are reconfigured to reflect two-way operation, but includes no other major changes such as removal of on-street parking, addition of left turn pockets, or other geometric modifications. For this preliminary analysis, the intersection signal cycle lengths were assumed constant; therefore when new directions and phases are added, green time on the other phases may be reduced.

Future refinements to the analysis of intersection effects could use traffic volumes generated by the COG model for 2015. That approach would yield more details on distribution of travel across the street network, allowing volumes, LOS, and delays on neighboring streets and intersections to be evaluated.

Scenario 1

The expected effects of converting Constitution and Independence Avenues to two-way facilities would be unchanged or slightly degraded LOS at the majority of intersections. Constitution Avenue at 8<sup>th</sup> Street NE and Independence Avenue at 10<sup>th</sup> Street SE are the only intersections where a significant increase in delay was projected due to the two-way conversions. The intersections of Independence Avenue at 4<sup>th</sup> and 8<sup>th</sup> Streets show improved LOS in the AM peak period.

Scenario 2

With two-way operation of 17<sup>th</sup> and 19<sup>th</sup> Streets added to Constitution and Independence Avenues, the majority of intersections along the east-west streets would operate largely the same as with Scenario 1: Constitution Avenue at 8<sup>th</sup> Street NE and Independence Avenue at 10<sup>th</sup> Street SE would see significant increases in delay due to the two-way conversions. In addition, at the intersections of Independence Avenue with 17<sup>th</sup> and 19<sup>th</sup> Streets, LOS is projected to degrade to F and E, respectively. The intersections of Independence Avenue at 4<sup>th</sup> and 8<sup>th</sup> Streets, and the intersection of Potomac Avenue and 17<sup>th</sup> Street show improved LOS in the AM peak period.

6.4.2 2030 Traffic Distribution Analysis

Scenario 1

The cumulative effect of the proposed two-way conversions of Constitution and Independence Avenue would be a moderate decrease in overall daily trips on Constitution Avenue. Traffic along Constitution would decrease by between 10 and 40 percent in the AM peak period, and would be relatively unchanged in the PM peak period.

The cumulative effect on Independence Avenue would be a moderate increase in overall daily trips. Due to the newly introduced direction, traffic along Independence Avenue would increase, particularly westbound in the morning peak. Traffic would decrease by about 15 percent in the PM peak period.

In general, during the AM peak period two-way conversion would spread inbound traffic more evenly between Constitution and Independence Avenues and other roadways. Portions of H Street NE, C Street NE, and Pennsylvania Avenue SE would see minor increases in traffic volumes.

In the PM peak, fewer streets would be affected. Volumes would increase on segments of H Street NE and along SE Freeway, but decrease along portions of Pennsylvania Avenue and Maryland Avenue.

Travel times along Constitution and Independence Avenues would get slightly longer and vehicle speeds would be reduced under this scenario. Sample travel times are shown in **Table 6-1**. For example, a morning westbound trip along Constitution between 14th and 4th Streets NE that would take 4 minutes and 20 seconds without any changes to the neighborhood traffic network, and take about 6 minutes and 30 seconds after two-way conversion. An evening eastbound trip along Independence between 4th and 14th Streets that would take 6 minutes and 10 seconds without changes to the traffic network, could take 8 minutes and 50 seconds after conversion. Longer travel times may mean slower vehicle speeds and improved safety.

Scenario 2

Adding two-way conversion of 17th Street and 19th Street to the conversion of Constitution and Independence Avenues would have effects similar to those of Scenario 1 on overall traffic and travel times along Constitution and Independence. The majority of blocks along Constitution Avenue would see a modest decrease in daily traffic, while the majority of blocks along Independence Avenue would see a modest increase in daily traffic.

With two-way conversion, cumulative traffic volumes along 17th Street would decrease by approximately 15-20 percent in the AM and PM peak periods. More precise analysis of the traffic model shows that *southbound* traffic on 17th Street would decline by more than 40 percent in the AM and PM peak periods. *Northbound* traffic, on the other hand, would necessarily increase because the introduction of a new northbound lane would permit traffic flow where it had not existed before. In sum, the reduction in southbound traffic would outpace the addition of new northbound traffic. It appears that morning southbound traffic, in particular, would divert to other roads or other modes.

With two-way conversion of 19th Street, the traffic impacts seem to be more complicated and vary according to street segment. Trends suggest that blocks north of C Street and south of East Capitol Street may experience considerable increases in traffic, as seen in Figure 6-4. Primarily as a result of introducing a new southbound lane, morning peak volumes would grow 15-90 percent all along 19th Street. This phenomenon would likely comprise the majority of the total volume increases.

It is important to remember that elevated traffic volumes are not necessarily problematic when capacity is available or when reduction in speed is a primary goal.

Travel times on 17th Street would not change significantly as a result of a two-way conversion. However, travel times on 19th Street would increase slightly in the PM peak. Sample travel times are shown in **Table 6-2**. For example, an evening northbound trip on 19th Street between E street SE and D street NE would increase from about 3 minutes 50 seconds to 5 minutes. Longer travel times may mean lower vehicle speeds and improved safety.

**Tables 6-3 and 6-4** contain a general list of costs and benefits associated with the two scenarios.

Table 6-1: Estimated Travel Times for Scenario 1

AM Peak Period	2030 Base	2030 Scen. 1	2030 Base	2030 Scen. 1
	Eastbound		Westbound	
Constitution Avenue (4th Street to 14th Street)	n/a	2:44	4:20	6:26
Independence Avenue (4th Street to 14th Street)	2:38	2:45	n/a	5:17
	Southbound		Northbound	
17th Street (Barney Circle to D Street NE)	4:19	4:19	n/a	n/a
19th Street (E Street SE to D Street NE)	n/a	n/a	2:43	2:43
PM Peak Period	2030 Base	2030 Scen. 1	2030 Base	2030 Scen. 1
	Eastbound		Westbound	
Constitution Avenue (4th Street to 14th Street)	8:45	7:58	3:17	3:08
Independence Avenue (4th Street to 14th Street)	6:10	8:52	n/a	n/a
	Southbound		Northbound	
17th Street (Barney Circle to D Street NE)	4:44	4:55	n/a	n/a
19th Street (E Street SE to D Street NE)	n/a	n/a	3:47	4:01

Table 6-2: Estimated Travel Times for Scenario 2

AM Peak Period	2030 Base	2030 Scen. 2	2030 Base	2030 Scen. 2
	Eastbound		Westbound	
Constitution Avenue (4th Street to 14th Street)	n/a	2:44	4:20	7:28
Independence Avenue (4th Street to 14th Street)	2:38	2:45	n/a	4:37
	Southbound		Northbound	
17th Street (Barney Circle to D Street NE)	4:19	4:27	n/a	2:33
19th Street (E Street SE to D Street NE)	n/a	3:17	2:43	2:47
PM Peak Period	2030 Base	2030 Scen. 2	2030 Base	2030 Scen. 2
	Eastbound		Westbound	
Constitution Avenue (4th Street to 14th Street)	8:45	9:09	3:17	3:13
Independence Avenue (4th Street to 14th Street)	6:10	7:53	n/a	n/a
	Southbound		Northbound	
17th Street (Barney Circle to D Street NE)	4:44	4:56	n/a	5:04
19th Street (E Street SE to D Street NE)	n/a	3:33	3:47	5:02



Table 6-3: Costs and Benefits Summary, Scenario 1

Scenario 1 Constitution Ave. and Independence Ave.		
	Benefits	Costs
1	Reduction in all-day traffic along Constitution	Increase in all-day traffic along Independence
2	Lower vehicle speeds along both streets	Increased delay: Constitution up to 24% longer in the AM between 4th and 14th Streets Independence up to 30% longer in the PM between 4th and 14th Streets
3	Pedestrian safety improved due to lower speeds	
4	Improved accessibility for residential trips, opposed to commuter traffic throughput	
5	Distributes traffic more evenly across network and between peak hour times	
6	2 Improved Intersections	5 Degraded Intersections
7	2 Significantly improved Intersections	2 Significantly degraded Intersections
		7 Potential conflicts requiring changes in intersection regulations or configuration.
8	Maintain parking regulations	
9	Minimal effects on transit service performace	
10		Capital costs associated with conversion: Constitution Ave = \$25,000 Independence Ave = \$2,500,000
11	8 specific supportive citizen comments	1 specific non-supportive citizen comment
12	5 general supportive citizen comments	None

Potential Conflicts and Solutions

The conversion to two-way streets will create vehicle conflicts at particular intersections for the two scenarios. These potential conflicts consist of inappropriate sight distances for particular turning movements. To mitigate these potential conflicts, changes in traffic patterns will be appropriate as listed below:

Constitution Avenue

- Massachusetts Avenue
  - Left turns from SB Massachusetts Ave. onto WB Constitution Ave
  - Left turns from WB Constitution Ave. onto SB Massachusetts Ave
    - ✓ Prohibit these left turns due to poor sight distance.

Table 6-4: Costs and Benefits Summary, Scenario 2

Scenario 2 17th St. and 19th St. with Constitution Ave. and Independence Ave.		
	Benefits	Costs
1	Reduction in all-day traffic along Constitution and much of 17th Street	Increase in all-day traffic along Independence and much of 19th Street
2	Lower vehicle speeds along four streets	Increased delay: Same as Scenario 1 for Constitution and Independence 17th up to 3% longer in the AM between Barney Circle and D St. NE 19th up to 25% longer in the PM between E St. SE and D St. NE
3	Pedestrian safety improved due to lower speeds	
4	Improved accessibility for residential trips, opposed to commuter traffic throughput	Increased through-trips along 19th Street NE
5	Distributes traffic more evenly across network and between peak hour times	
6	2 Improved Intersections	5 Degraded Intersections
7	3 Significantly improved Intersections	6 Significantly degraded Intersections
		Same as Scenario 1. No Potential conflicts for 17th and 19th Streets
8		Likely removal of parking along 19th St.
9	Transit route structure more understandable	Potential effects on transit travel time
10		Capital Costs associated with conversion: (in addition to costs for Constitution and Independence Ave.) 17th St. = \$1,520,000 19th St. = \$1,600,000
11	12 specific supportive citizen comments	2 specific non-supportive citizen comments
12	5 general supportive citizen comments	None

Independence Avenue

- North Carolina Avenue
  - Left turns from SB North Carolina to EB Independence
    - ✓ Prohibit left turns due to poor sight distance
- Pennsylvania Avenue
  - Geometrics to improve at intersection.
    - ✓ Restripe WB approach at Independence Avenue and 2<sup>nd</sup> Street to accommodate WB traffic. Maintain EB Independence Avenue via Pennsylvania Avenue.
- Massachusetts Avenue
  - Left turns from EB Independence Ave. onto NB Massachusetts Ave
  - Left turns from WB Constitution Ave. onto SB Massachusetts Ave
    - ✓ Prohibit these left turns due to poor sight distance
- South Carolina Avenue
  - Left turns from WB Independence Ave. onto SB South Carolina
    - ✓ Prohibit left turns due to poor sight distance

## 6.5 Summary of Traffic Network Recommendations

The final study evaluation recommends a hybrid of Scenarios 1 and 2, or in other words, a phased approach to the two-way conversion of all four corridors under investigation.

This decision is based strongly on three factors: detailed traffic modeling and analysis conducted during the Capitol Hill Transportation Study; consideration of community feedback during nearly 18 months of study, and final review and input from DDOT leadership.

The conversion of Constitution and Independence Avenues (Scenario 1) will only degrade the performance of a small number of intersections, while providing traffic calming benefits along the length of these corridors. In addition, the change would not impact public transit operations along either of the roadways because WMATA buses travel on neither Constitution nor Independence Avenue. The two-way conversion would necessitate almost no removal of residential parking and would improve circulation around the Capitol Hill neighborhood.

The conversion of 17<sup>th</sup> and 19 Streets, in addition to Constitution and Independence Avenues, (Scenario 2) introduces more “costs” that alter the balance of the equation relative to the “benefits.” First, mobility may suffer in the form of more congestion at six specific intersections. 19th Street, in particular, would see an increase in average daily traffic due to links from Benning Road on the north and to the Hill East Waterfront / Reservation 13 redevelopment on the south. In addition, the loss of one northbound lane on 19<sup>th</sup> Street could yield minor delays on three bus routes that utilize this roadway. However, despite these impacts, DDOT feels that decreased vehicle speeds, enhanced pedestrian safety, and improved (bi-directional) access for private and public vehicles still favor two-way conversion on 17<sup>th</sup> and 19<sup>th</sup> Streets.

The study recommends that the changes to the traffic network proceed in phases. According to this scenario, Constitution Avenue could undergo conversion as early as 2007 since it already operates as a two-way road during most times of the day. Conversion of Independence Avenue requires significant engineering design to reconfigure traffic signals and channelization at select intersections, and would therefore involve financial programming yielding implementation in year 2008 or 2009. Finally, the conversion of 17<sup>th</sup> and 19<sup>th</sup> Streets also requires significant engineering design, but may entail additional changes to parking lanes and curb lines along segments of the roadways. Therefore implementation would likely occur later, in approximately year 2010.

The conversion of 17<sup>th</sup> and 19<sup>th</sup> Streets could occur in conjunction with Independence Avenue should this be deemed desirable. However, conducting the corridor conversions in a step-by-step fashion provides the opportunity to monitor the incremental effects on traffic as the projects progress.



7.0 RECOMMENDATIONS

Section 7.0 presents the recommendations for addressing the potential transportation issues identified within the study area. Hundreds of potential issues were identified (see **Appendix B and C**), and this section does not list the remedies for each. Rather, it focuses on the following categories of recommendations:

- § Section 7.1 presents an overview of the categories of transportation issues identified in the study and presents the guiding principles under which remedies were developed for each
- § Section 7.2 presents an inventory of those issues that were identified at selected “Hot Spots,” which are subareas of the study area that are of potential concern, and for which analysis was conducted at a higher level of detail than in the study area as a whole.

7.1 Issue Types and Guiding Principles

Some 400 potential transportation issues were identified throughout the study area. These issues were sorted into a smaller number of general categories of issues. These categories are presented in this section, along with the guiding principles under which solutions were developed.

The following categories were developed to organize the issues:

- Roadway and intersections
- Pedestrian facilities
- Bicycle facilities
- Public transportation
- Bus and truck restrictions
- Parking

7.1.1 Roadways and Intersections

The most obvious elements of the transportation infrastructure of Capitol Hill are the neighborhood’s many roadways and intersections. Issues related to automobile travel were the most common among those raised by the public, and represented a mix of challenges to motorists, pedestrians, and bicyclists.

One of the primary issues facing Capitol Hill is balancing the interests of residents and those who need to move around or through the study area. Throughout the study process, residents have consistently expressed a desire for slower vehicle speeds and less traffic. Commuters, on the other hand, typically seek the fastest passage through a network of roadways, which often leads to the use of residential streets.

The study recommendations strive to minimize traffic impacts on quality of life in Capitol Hill while encouraging fluid movement on the appropriate streets. The following bullets represent our fundamental guiding principles:

- § Safety takes priority above other concerns
- § Streets should function appropriately in relation to their position in the roadway classification system; thus, measures to increase capacity and traffic flow are appropriate on arterials, while traffic calming is appropriate on neighborhood streets

- § Recommendations should balance the needs of motorists with those of other travelers, including pedestrians, cyclists, and transit users

Intersection geometry also poses common problems throughout the study area. Due to the overlay of diagonal avenues atop the grid of streets in the neighborhood, there are several locations where more than two streets intersect at a single location. Where these streets carry significant traffic, this phenomenon can cause traffic conflicts and safety concerns. Even at intersections that are not busy, intersection geometry can pose a challenge for signage.

The most problematic locations with diagonal avenues include the following intersections and activity centers:

- § 3<sup>rd</sup> Street / D Street / Massachusetts Avenue NE
- § 7<sup>th</sup> Street / 8<sup>th</sup> Street / Constitution Avenue / Massachusetts Avenue NE
- § 7<sup>th</sup> Street / 8<sup>th</sup> Street / North Carolina Avenue / Independence Avenue SE
- § 14<sup>th</sup> Street / 15<sup>th</sup> Street / South Carolina Avenue / Massachusetts Avenue / Independence Avenue SE
- § Stanton Park (4<sup>th</sup>, 5<sup>th</sup>, 6<sup>th</sup>, C, Massachusetts, Maryland)
- § Lincoln Park (11<sup>th</sup>, 12<sup>th</sup>, 13<sup>th</sup>, East Capitol, Kentucky, Tennessee, Massachusetts, North Carolina)
- § Potomac Avenue Metro
- § Eastern Market Metro

Again, wherever possible, recommendations are designed foremost to improve safety for all users of the intersection, including pedestrians and bicyclists. Additional goals include enhancing signage and clarifying vehicle operations, as well as increases accessibility across conflict points and between destinations.

7.1.2 Pedestrian Facilities

Improving pedestrian safety and access is a crucial component of the study recommendations. Pedestrian safety issues have consistently been stressed by members of the public and Advisory Neighborhood Commission representatives in the public meetings. Although the Capitol Hill neighborhood boasts excellent pedestrian facilities overall, there are several key challenges:

- § Many major roadway crossings lack adequate pedestrian infrastructure, including crosswalk signals, countdown timers, high-visibility pavement markings, and ADA-compliant ramps.
- § In some places, intersection geometries and traffic conditions create crossing situations that are either confusing, dangerous, or both.
- § In some places, sidewalks are in poor condition.
- § Access to and around Stanton Park and Lincoln Park conflicts with vehicle traffic.

Based on the nature of the potential pedestrian facility challenges, the project team proposed the following principles to prioritize needs:

- § All signalized intersections must have the complete set of pedestrian crossing infrastructure, including at a minimum:
  - High visibility, ladder-style pavement markings at crosswalks,

- ADA-compliant ramps leading from the sidewalk to ALL crosswalks, and
- Pedestrian crossing signals with countdown timers.
- § Damaged sidewalks should be repaired in order of priority (according to condition and need)
- § Pedestrian conditions have been considered in conjunction with proposed changes to roadway operations and signage at selected high-activity crossings, including:
  - The area around Eastern Market and Barracks Row,
  - The area around the Potomac Avenue Metro,
  - The intersection of Constitution Avenue, Massachusetts Avenue, 7<sup>th</sup> Street and 8<sup>th</sup> Street NE,
  - The intersection of Pennsylvania Avenue / Independence Avenue, and 2<sup>nd</sup> Street SE,
  - The intersection of Massachusetts Avenue, 3<sup>rd</sup> Street, and D Street NE, and
  - The intersection of Massachusetts Avenue, South Carolina Avenue, Independence Avenue, 14<sup>th</sup> Street and 15<sup>th</sup> Street SE.
- § Pedestrian crossings should be given the highest priority at all signalized intersections around Stanton Park and Lincoln Park.
- § High traffic pedestrian crossings at uncontrolled intersections should be clearly marked with signage and high-visibility pavement markings; where feasible, such crossings should be downstream from traffic calming measures such as speed tables.

Because not all of these improvements can be made immediately, the study team has prioritized actions to take place at the locations where they can have the greatest safety impact. This prioritization was used to identify the 80 “Priority” short term recommendations (see **Section 8**). Prioritization criteria included:

- § Locations within school zones,
- § Locations where there is a high incident of traffic accidents,
- § Locations nominated by members of the public, and
- § Locations where potentially dangerous conditions were observed during field visits.

### 7.1.3 **Bicycle Facilities**

Bicycles represent an important, if often-overlooked component in a multimodal transportation plan. The geography of Capitol Hill is well-suited to bicycle use, due to its relatively level elevations (no steep slopes), small scale, and proximity to major activity centers. This study recommends that the existing bicycle network be maintained, and that the recommendations of the DC Bicycle Master Plan be implemented.

In general, potential transportation issues related to bicycle transportation included the following:

- § In many cases, bike lane signage is not MUTCD compliant.
- § In many cases, there are discontinuities in bike lanes; these generally take place where streets are resurfaced and lanes are not repainted; and where bike routes cross squares and parks, as at Stanton Park and Lincoln Park.
- § In some cases, streets that function as bike routes also carry heavy, and often high-speed auto traffic.

In general, this study recommends the following:

- § All discontinuities in the bike network due to street resurfacing should be repaired.
- § All bike routes should be clearly marked with pavement markings and signs; these markings must be MUTCD compliant.
- § On non-arterials, traffic calming should be considered to slow traffic along bike routes where speeding is an issue; in the case of major arterials, lane narrowing or more visible bike route signage may enhance cyclist safety.
- § At Stanton Park and Lincoln Park, improvements to pedestrian infrastructure around the parks should be designed to accommodate cyclists who wish to cross into the parks. Signage around both parks should be made to clearly warn motorists to expect cyclists riding on roadways around the parks.

In addition to the above recommendations, the new bike lanes proposed in the DC Bicycle Master Plan should be implemented. These include new facilities on the following roadways:

- § Maryland Avenue NE
- § 4<sup>th</sup> Street and 6<sup>th</sup> Street NE north of Stanton Park
- § D Street NE
- § C Street NE east of 15<sup>th</sup> Street NE
- § 11<sup>th</sup> Street SE
- § Pennsylvania Avenue SE

Note that some of these bike facilities may have already been implemented during the time since the Master Plan was published.

### 7.1.4 **Public Transportation**

Public transportation is a crucial component of the transportation network in the Capitol Hill neighborhood. Capitol Hill enjoys a robust transit network, which includes two Metrorail lines and three stations and several bus routes. The bus routes serving 8<sup>th</sup> Street, Pennsylvania Avenue, and H Street are all among the top twenty routes in the Metrobus network (ranked by ridership). It is the recommendation of this study that the transit network be maintained in the future, and that additional resources be invested in the system where necessary to account for the anticipated changes in traffic levels and congestion.

Specific recommendations for changes to bus routes and other transit services are not included in this study. Because bus service in the area is provided solely by WMATA, that agency is responsible for monitoring bus service and ridership. The primary recommendations with regard to transit service relate to access to the transit network. Although bus service is available to the entire study area, there are two barriers to accessing the system:

- In some places, sidewalks and street crossings are inadequate, and can hinder access to bus stops and Metro stations, especially for those with mobility-related disabilities. In all cases, this study recommends installation of ADA-compliant sidewalks, ramps, and crosswalks. Where necessary, signalization of intersections should be considered to make crossings safer and easier
- Many major boarding and transferring locations lack adequate passenger shelters and other passenger infrastructure. This is most evident in the area around the Eastern

Market and Potomac Avenue Metro stations, where the existing stations are overcrowded, and where it is difficult to cross the streets between shelters to allow for transfers between bus lines. This study recommends installation of shelters at all major boarding locations, and where necessary, installation of multiple shelters. In addition, passenger pathways between bus routes should be evaluated for improvements in sidewalks, road crossing infrastructure, and wayfinding signage.

A key area of concern for bus transit service is access to the area near the Capitol Building Complex. Recent road closures due to security concerns have forced re-routings of several bus routes. This has negatively impacted ridership, operating efficiency, and rider comfort, as the detours are poorly marked and the new alignments lack passenger infrastructure. This study urges the elimination of bus route detours around the Capitol Building Complex, which would require the agreement of the appropriate law enforcement and national security agencies. Furthermore, the reopening of First Street NE to transit services is critical to north-south connection through Capitol Hill. The intense development of areas such as NOMA to the north and the Ballpark District to the south necessitates a logical continuous link for transit. Presuming security remains a concern in the near future, the roadway could be opened to public vehicles only.

The Capitol Hill Transportation Study recommends finalizing routings in the area so that passenger information and amenities can be updated to reflect a single alignment. This potentially affects Routes A11, J11-13, and N22.

A second area of concern is the impacts of roadway changes suggested in this study on bus operations. Conversion of Constitution and Independence Avenues and 17<sup>th</sup> and 19<sup>th</sup> Streets to two-way operation may result in slower traffic speeds and bus operations on those and on some parallel roadways. The study team recommends paying special attention to turning radii and signal timings at constricted intersections. The goal is to ensure that any intersection designs incorporate modifications to maintain buses' level of service and ability to maneuver safely. In order to maintain current levels of service given lower speeds, additional buses may need to be added to these routes. This potentially affects Routes 96-97, B2, and D6.

The Capitol Hill Transportation Study also strongly supports further study on the transportation improvements proposed in the District of Columbia Alternatives Analysis (DCAA), several of which impact the study area, including:

- Streetcar service connecting Anacostia, L'Enfant Plaza, and the M Street SE / Navy Yard area with Union Station and downtown via 8<sup>th</sup> Street SE, Pennsylvania Avenue SE, 2<sup>nd</sup> Street SE, 2nd Street NE, and Massachusetts Avenue NE
- Streetcar service connecting Minnesota Avenue Metro with Union Station via H Street NE
- Bus Rapid Transit service connecting L'Enfant Plaza and the M Street SE / Navy Yard area with the U Street Corridor and Northwest Washington via 8<sup>th</sup> Street SE and 8<sup>th</sup> Street NE
- Rapid Bus (limited stop bus) service on Pennsylvania Avenue SE between downtown Washington and Forestville, Maryland
- Rapid Bus (limited stop bus) service between Minnesota Avenue and L'Enfant Plaza Metro, with service on 17<sup>th</sup> and 19<sup>th</sup> Streets and Potomac Avenue in the study area.

All of these projects are recommended in the DCAA for implementation by 2030. Rapid Bus service on Pennsylvania Avenue SE and streetcar service along H Street and Benning Road are currently being studied for implementation.

#### **7.1.5 Bus and Truck Restrictions**

Members of the public consistently requested relief from the impacts of trucks and buses on the Capitol Hill neighborhood. Truck and bus impacts are caused both by through traffic and by trips generated by local businesses. Through-traffic impacts have become much worse since new security restrictions took effect in 2001, which forced some trucks off of their previous routes and onto neighborhood streets.

The primary complaint about through truck traffic is that many trucks operate on local neighborhood streets, which were not designed to accommodate heavy truck traffic. To relieve these impacts, it is recommended that a network of major arterial streets like Pennsylvania Avenue SE and H Street NE be designated as through truck routes; at the same time, other streets need to be clearly marked to prohibit through truck traffic. Law enforcement officials and trucking companies must also be notified about these truck routes so they know where to send trucks.

On the other hand, many truck trips are generated by businesses in the study area. These impacts are felt most clearly along Pennsylvania Avenue SE, where delivery trucks often double park during deliveries. Outside of peak periods, Pennsylvania Avenue SE has sufficient capacity to allow this practice; therefore, moving more delivery times to the mid-day period should address this concern.

Finally, many tour buses dropping off passengers at the Capitol or other area attractions also lay over in the Capitol Hill neighborhood. This practice needs to be clearly forbidden on signage in layover locations (such as on 2<sup>nd</sup> Street SE and around Lincoln Park). There is an existing bus layover facility at Union Station, and buses need to be directed to it. Additional facilities at the old convention center site and RFK stadium also serve short-term parking needs.

#### **7.1.6 Parking**

Parking is a sensitive issue in the Capitol Hill neighborhood. On-street parking is a scarce resource, and both full time residents and daytime visitors to the neighborhood encounter parking shortages in some areas. These shortages are exacerbated by a lack of concentrated off-street parking.

Field work carried out as part of this study found that midday parking was most limited in the western portion of the study area, where typically 90 to 100 percent of on-street spaces were taken during the day despite limitations imposed by the residential permit program. This suggests that either daytime workers are parking illegally in the area, or residents of Ward 6 are driving from the eastern part of the ward and parking in the western part. During the day, parking utilization is less than 80 percent in the eastern part of the study area.

In the evening, parking utilization in the western portion of the study area dropped to between 80 and 90 percent, and increased to between 70 and 80 percent in most of the remaining study area. At an 80 to 90 percent occupancy rate, spaces are widely available on most blocks, if not directly in front of every building.



The review of parking conditions suggests that parking is not a severe problem for most residents, as parking is generally available during outside-of-work hours. However, many businesses that rely on parking may be impacted by commuters occupying spaces all day.

The Mayors Parking Task Force addressed these problems by recommending different parking policies based on land use mixes; by recommending smaller parking permit zones; and by limiting the number of permits provided in each zone. Although parking does not currently represent a severe problem in the study area, recommendations such as those in the Task Force may help address a problem that will worsen as more development comes to the area.

7.2 Locations by Quadrants

Transportation issues were identified throughout the study area. In an effort to organize the issues geographically, the study area was divided into four quadrants and a central hub: Northeast, Northwest, Southwest, and Lincoln Park (Central). This division is shown in Figure 7-1.

The following subsections summarize the existing conditions, issues, and recommendations by quadrant. Special attention is paid to the “Hot Spot” locations where a concentration of problems exists. This does not imply that the issues at these intersections are more important than those at other locations; rather, the concentration of issues dramatically increases the complexity of developing potential remedies, as changes made in one area will impact conditions elsewhere. As a result, remedies at the “hot spots” had to be developed for several problems in a more integrated and comprehensive fashion.

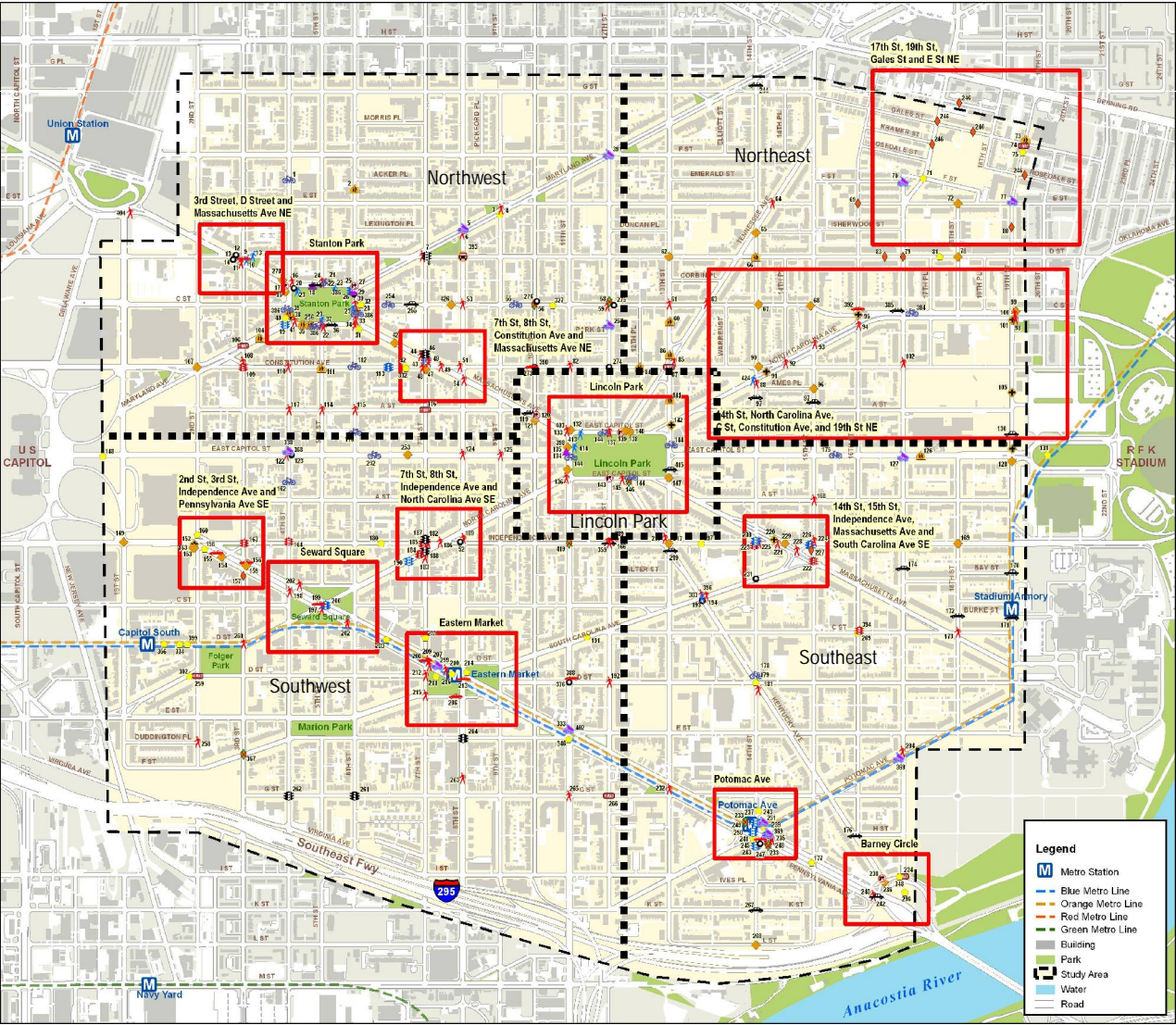
At the same time, the “hot spots” tend to be areas with a lot of pedestrian and or automobile traffic. Therefore, investing in remedies at these locations potentially has a higher, and more visible impact, than at other locations.

This section presents the potential issues and proposed remedies at the following 13 “hot spot” locations:

- § Northwest Quadrant
  - 3<sup>rd</sup> Street / D Street / Massachusetts Avenue NE
- Stanton Park
  - 7<sup>th</sup> Street / 8<sup>th</sup> Street / Massachusetts Avenue / Constitution Avenue NE
- § Southwest Quadrant
  - 2<sup>nd</sup> Street / 3<sup>rd</sup> Street / Pennsylvania Avenue / Independence Avenue SE
  - Seward Square
  - 7<sup>th</sup> Street / 8<sup>th</sup> Street / North Carolina Avenue / Independence Avenue SE
  - Eastern Market
- § Northeast Quadrant
  - 17<sup>th</sup> Street / 19<sup>th</sup> Street / Gales Street / E Street NE
  - 14<sup>th</sup> Street / North Carolina Avenue / C Street NE / Constitution Avenue/ 19<sup>th</sup> Street NE
- § Southeast Quadrant
  - 14<sup>th</sup> Street / 15<sup>th</sup> Street / Massachusetts Avenue / South Carolina Avenue / Independence Avenue SE
  - Potomac Avenue Metro

- Barney Circle
- § Lincoln Park (Central Quadrant)
- Lincoln Park

Figure 7-1: Quadrant Map





7.2.1 Northwest Quadrant

The Northwest Quadrant abuts Union Station and the Capitol Hill federal office complex immediately west of the study area. Along with the Southwest Quadrant, it is one of the most densely built areas. There are major office buildings along the western edge of the study area and there is a commercial area located around the intersection of Massachusetts Avenue, 3<sup>rd</sup> Street, and D Street NE. The Northwest Quadrant is shown in **Figure 7-2**.

Figure 7-2: Northwest Quadrant



Major areas of concern within the Northwest Quadrant include:

- § One-way traffic operations on Constitution Avenue NE
- § High speed, high volume traffic on C Street NE
- § Traffic operations and pedestrian safety at the intersections of Massachusetts Avenue, Constitution Avenue, 7<sup>th</sup> Street and 8<sup>th</sup> Street NE
- § Automobile and pedestrians safety at the intersections of 3<sup>rd</sup> Street, D Street and Massachusetts Avenue NE

- § Pedestrian and bicycle safety around Stanton Park
- § Parking enforcement area-wide

Hot spot related recommendations are presented below for the following locations:

- § 3<sup>rd</sup> Street / D Street / Massachusetts Avenue NE (**Figures 7-3 to 7-4**)
- § Stanton Park (**Figures 7-5 to 7-6**)
- § 7<sup>th</sup> Street / 8<sup>th</sup> Street / Constitution Avenue / Massachusetts Avenue NE (**Figures 7-7 to 7-8**)

In general, recommended improvements include:

- § To de-emphasize Constitution Avenue NE as a commuter street and return it to neighborhood use, discontinue the peak period one-way operation; instead, operate Constitution as a 2-way street at all times. This improvement is tested in Scenarios 1 and 2.
- § To improve pedestrian safety in the area around Stanton Park, upgrade all pedestrian infrastructure: improve signage, re-paint crosswalks for higher visibility, install countdown-timers at all crossings, and ensure MUTCD-compliant school zone signs throughout the area.
- § To address traffic conflicts and safety concerns, reconfigure the intersection of Massachusetts Avenue NE, D Street NE, and 3<sup>rd</sup> Street NE by extending the island at the north side of Massachusetts at 3<sup>rd</sup> and clearly designating lanes. This will help to eliminate vehicular conflicts, simplify intersection operations, and enhance pedestrian safety.
- § Conduct a signal warrant study for the intersection of 7<sup>th</sup> Street and Constitution Avenue NE; improve pedestrian signage and signals at the intersections of Constitution Avenue NE, Massachusetts Avenue NE, 7<sup>th</sup> Street NE and 8<sup>th</sup> Street NE.
- § Consider improvements to C Street NE to improve pedestrian and bicycle safety, such as extending the bike lane and narrowing travel lanes to decrease vehicular speeds.
- § Improve pedestrian facilities area-wide: ensure pedestrian countdown timers at all signalized intersections; re-paint all crosswalks with ladder-stripe patterns; ensure all crosswalks have ADA-compliant ramps.