



The District of Columbia's
Multimodal Long-Range Transportation Plan

Modal and Support Elements



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The District of Columbia's
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Pedestrian Element





The District of Columbia's Multimodal Long-Range Transportation Plan

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Policy, Planning & Sustainability Administration
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Washington, DC 20003



moveDC Vision

The District of Columbia will have a world-class transportation system serving the people who live, work, and visit the city. The transportation system will make the city more livable, sustainable, prosperous, and attractive. It will offer everyone in the District exceptional travel choices. As the transportation system evolves over time, the District will:

- *Be more competitive and attractive locally, regionally, nationally, and internationally*
- *Have safer and more vibrant streets and neighborhoods*
- *Have cleaner air, streams, and rivers, and be more responsive to climate change*
- *Accommodate the travel needs of all residents, workers, and visitors regardless of age or ability*
- *Integrate the District's transportation system with the region's transportation network*

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A safe and vibrant walking environment is the foundation of a diverse transportation network

Pedestrian

I. Everyone is a Pedestrian

Every trip—whether by bus, bike, car, or train—begins and ends with a walk. The pedestrian network is the very foundation of our transportation system. Increasing walking for any type of trip has the potential to reduce traffic congestion, add to the city's livability, and improve the environment and public health. The pedestrian network needs to work for people of all ages and abilities.

Washington, D.C. has a long history of investing in innovative technologies, treatments, and policies to encourage and support walking. The District is a city of walkers—1 in 8 of the city's residents walks to work, while the majority make one or more walking trips a day, whether out to lunch, to school and back, or home from the bus stop.¹ More than 880 miles of District streets have sidewalks on both sides, 150 miles of D.C. streets have sidewalks on one side, and the District has more than 150 miles of recreational paths and trails.

Strengthening the appeal and performance of the District's pedestrian system can reduce vehicle traffic and bolster the city's economy. Nationally, roughly 20% of auto trips taken are less than 1 mile in length—a distance most individuals can travel by foot if the pedestrian route is available, complete, safe, and appealing.² If the District can successfully convert even some of these short-distance vehicle trips to walk trips, congestion reduction benefits could be substantial.

This could happen in places as diverse as Forest Hills in upper northwest and Lincoln Heights in far northeast. Both communities lack complete sidewalk networks, limiting local access to schools, recreation facilities, and bus and transit stops—vital connections for residents. People with vehicles often find it easier to hop in the car to travel across Connecticut Avenue or East Capitol Street than cross those corridors on foot.

Improving pedestrian connectivity and safety means that more trips can be accomplished on foot for education, employment, and local shopping. More trips on foot could contribute to less traffic, relief for neighborhood streets, and more vibrant communities.

¹ U.S. Census, American Community Survey, 2012

² U.S. Department of Transportation, Federal Highway Administration, Office of Highway Policy Information, National Household Travel Survey. www.fhwa.dot.gov/policyinformation/pubs/pl08021/fig4_5.cfm



Improving pedestrian infrastructure and safety for the most vulnerable users, including children and aging residents, remains a priority

II. Existing Conditions

Walking is the most fundamental form of transportation and is part of every trip.

A. CORE FACTS

- The **District ranks #7 on the list of walkable cities in the United States.**³
- The District has the second highest percent of walking commute trips of U.S. cities at 11.9%.⁴
- The **District has too many pedestrian deaths and injuries.** In 2012, there were 12 pedestrian fatalities—roughly 2 for every 100,000 D.C. residents. This is much more than Seattle (0.32) but about the same as New York City (1.9).⁵
- The walking infrastructure in the form of sidewalks encourages the District's high percentage of pedestrians. In general, **downtown is well-covered by sidewalks, while neighborhoods to the northwest and southeast lack sidewalks** on one or both sides of the street. Overall 24% of the District's streets are missing sidewalks on one of both sides of the street. **Figure P.1** shows the existing pedestrian network, including sidewalks and gaps, existing trails, pedestrian corridors under study, and locations for sidewalk improvements.

³ Levels of Bicycling and Walking, 2012 Benchmarking Report, www.portlandfoot.org/documents/mode%20share%20by%20city.pdf

⁴ U.S. Census, American Community Survey, 2012

⁵ U.S. Department of Transportation, National Highway Traffic Safety Administration, Traffic Safety Facts, 2012

Notes on This Element

- Data used and referenced throughout this element was current as of December 2013, unless otherwise noted.
- Recommendations cited in this element will require further development as outlined in **Chapter 5**.
- Policies in this element are in addition to or augment current DDOT policies identified in the DDOT Policy Compendium.
- The District offers nearly **160 miles of pedestrian infrastructure within the recreation network**, which includes shared use paths, trails, and foot paths. The western half of the city has many green fingers with paths, including along the Potomac River, Glover Park, and Rock Creek Park. The eastern half of the city has fewer paths and trails.
- As of 2013, more than **1,600 traffic signals** exist within the District along more than 1,100 miles of non-freeway or interstate roads. While not all of these signalized intersections include complete pedestrian accommodations, they **represent opportunities for pedestrian integration and safer passage** for crossing walkers.

Table P.1: Block Length and Intersection Density by Ward

Ward	Area (Square Miles)	Total Roads (Miles)	Average Road Segment Length (Feet)	Total Intersections	Overall Intersection Density (Intersection/Square Mile)
1	2.5	59	412	476	190
6	6.2	135	392	1,040	168
4	9	170	427	1,222	136
7	8.8	147	426	1,089	124
5	10.4	162	440	1,195	115
3	10.9	174	467	1,118	103
2	8.7	121	451	838	96
8	12	137	482	922	77

Note: Area includes parks and water

- The District has dozens of unsignalized intersections on major arterial streets. In many cases, crossing an arterial street at an unsignalized intersection is difficult for pedestrians. As speed, volumes, and road widths increase, treatments at pedestrian crossings must be more robust.
- Intersection density (per square mile) and average block length (linear feet) are indicators of walkability. Intersection density speaks to the connectivity of the transportation network while block length influences crossing opportunities. **The efficiency and experience of the walking trip increases when there is a high degree of connectivity combined with a short block length.**⁶ Table P.1 summarizes these metrics by ward.
- Since 2005, DDOT's Safe Routes to School program has received federal funding to increase safety for District students who walk to school. Efforts to date have included participating in International Walk to School Day, conducting pedestrian and bicycle safety education and

training programs for kids, providing overtime enforcement funding for the Metropolitan Police Department (MPD), and hiring a full-time Safe Routes to School coordinator in January 2008.

- DDOT's School Crossing Guard Program works to improve the safety for students who walk, bicycle, or take transit to school. School crossing guards help students safely cross hazardous intersections and provide a safe and walkable environment for students to get to school.



The District's sidewalks encourage pedestrian activity

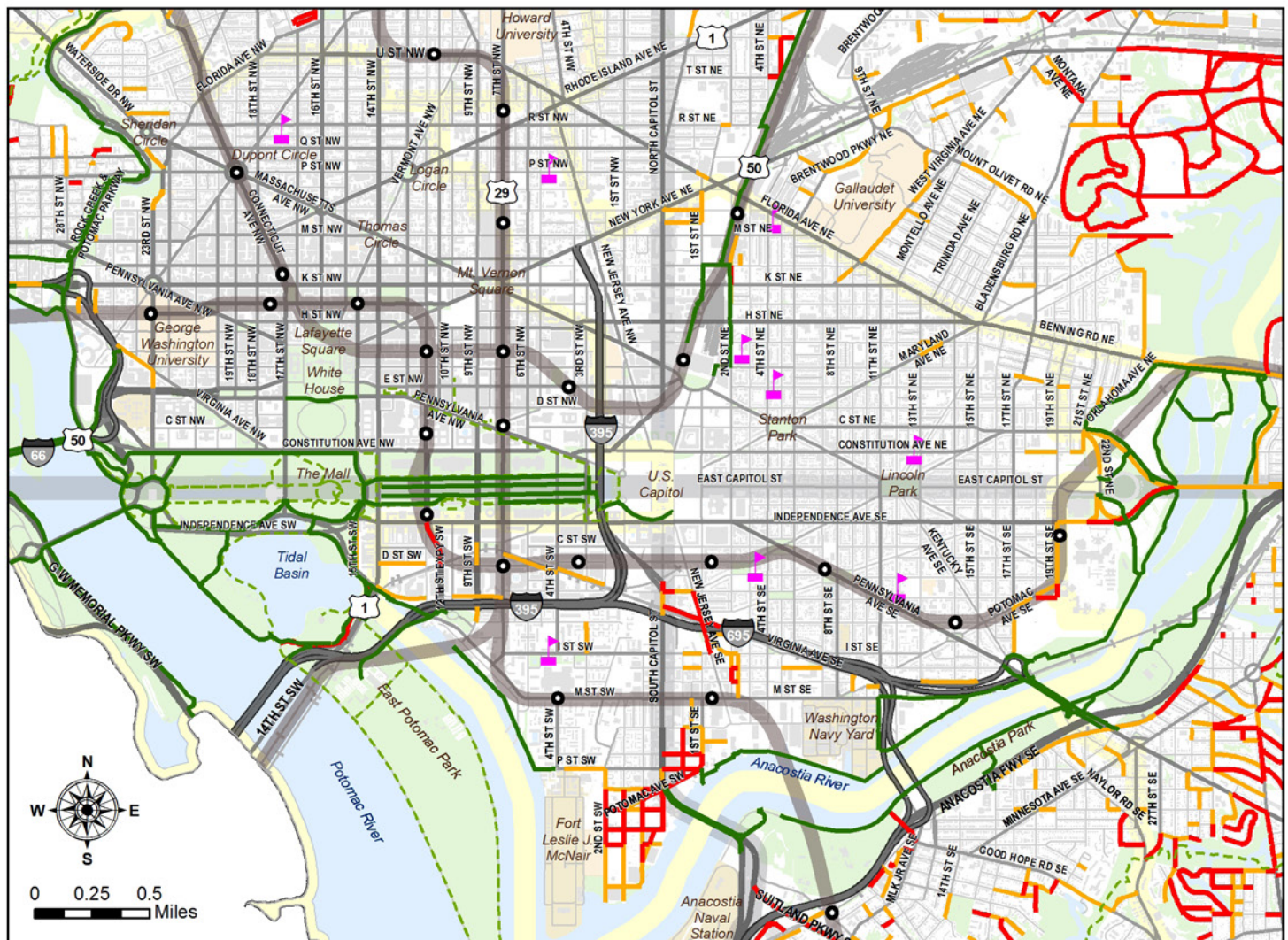
⁶ Congress for New Urbanism recommends block density of 150 intersections per square mile (www.cnu.org/connectedstreetnetworks). Block length averages range from 200–400 feet. Some communities use a maximum intersection spacing of 600 feet. See the range of examples at www.vtpi.org/tdm/tdm116.htm

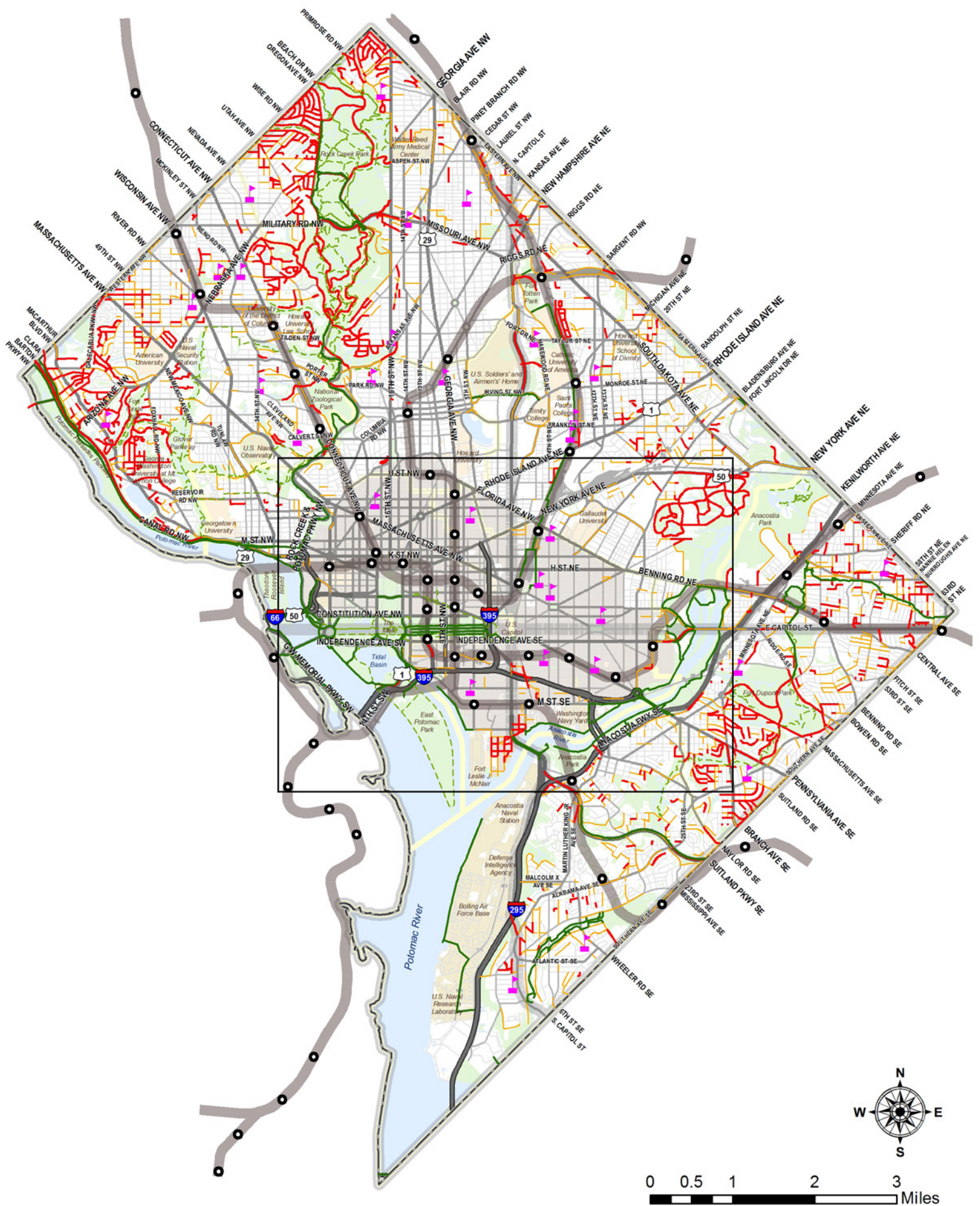
FIGURE P.1 – EXISTING PEDESTRIAN NETWORK

This figure shows the existing pedestrian network including trails and gaps in the sidewalk network. The District has an extensive sidewalk and trail network; however, many gaps remain.

Legend

	Washington D.C. Boundary		Road		Trail
	Quadrant Boundary		Railroad		Foot Path
	Ward Boundary		Metrorail		Sidewalk on One Side Only
	Water		Station		No Sidewalk
	Park		Line		Safe Routes to School Program
	University				
	Military				





B. NOTABLE SYSTEM ACHIEVEMENTS

D.C. has been awarded gold status as part of the Pedestrian and Bicycling Information Center's Walk Friendly Communities program.⁷ Several factors support this accolade:

- **Great mix of land uses.** The District enjoys a rich and diverse mix of land uses that creates convenient walking opportunities in many parts of the District.
- **Generally continuous network.** 75% of District streets have sidewalks on both sides, which is a notable accomplishment.
- **Master plan highlights excellent changes.** The 2009 Pedestrian Master Plan tackles the physical network and local policies [including issuing policy positions on crosswalk innovations, such as Leading Pedestrian Intervals (LPI), High-intensity Activated crossWALK (HAWK) signals, and rapid flashing beacons] that have resulted in improvements to roadway design. The shift in policy direction is contributing to the creation of better quality streets for walking.
- Since 2008, **the D.C. Safe Routes to School program has provided planning assistance and significant implementation resources to more than 30 schools**, with more on the way. One school received the National Center for Safe Routes to School's James L. Oberstar Safe Routes to School Award in 2008.
- **In recent years, DDOT has systematically updated pedestrian signals and installed pedestrian countdown signals** at signalized intersections throughout the city. DDOT has installed LPIs at more than 120 intersections and the signal timing at all locations is based on a slower walk speed. In addition, "Turning Vehicles Stop for Peds" signs have been installed at selected intersections. In 2010, DDOT installed a "Barnes Dance" (all-red pedestrian signal phase) at the 7th and H Streets NW intersection and

also five Rectangular Rapid Flashing Beacons in other locations. In 2013, DDOT installed six HAWK signals at intersections in the city.

How does DC compare to other regions?

The District ranks **#7** on Walk Score's list of **walkable cities** in the United States (2014)

D.C. has the **second highest percentage** of walking commute trips of U.S. cities at 11.9%*

The District has been **awarded gold status** as part of the Pedestrian and Bicycling Information Center's Walk Friendly Communities program (2013)

* U.S. Census, American Community Survey, 2012

C. FUTURE DEMAND

D.C.'s population is growing every day, with a projected 170,000 additional residents expected to live in the District by 2040. 200,000 more jobs are projected to locate in the city by 2040. The District will see more than 2 million trips each day in 2040, accommodated by every mode. An increase of 110,000 more walking trips than occur today are projected in the **moveDC** plan, spread throughout the District but especially prominent where residential population will grow—in Columbia Heights, NoMa, Farragut Square, Navy Yard, Southwest Waterfront, and Anacostia—and where employment will grow, in the downtown core and the NoMa, Navy Yard, and Anacostia neighborhoods. For the District to function at its best, walking will need to be a large component, especially for trips less than 1 mile in length. To keep making D.C. a city of walkers, the District will need to continue to expand the pedestrian network, provide safe and convenient crossings, and, most importantly, design transportation infrastructure to reduce instances of pedestrian injuries and fatalities.

⁷ The Daily Green. "The 15 Most Walkable Cities in America." www.thedailygreen.com/environmental-news/latest/most-walkable-cities-460708#slide-1 "Walking in Washington, D.C." www.godcgo.com/home/get-me-there/getting-around/walking.aspx

D. OPPORTUNITIES FOR IMPROVEMENT

While the District has achieved national recognition for its walkability, several opportunities for improvement remain, including:

- **Enhancing accessibility.** The District has dozens of uncontrolled crosswalks on high-speed, multilane streets. Using DDOT and Federal Highway Administration (FHWA) guidelines, DDOT should evaluate and improve these crossings. DDOT should improve existing signalized intersections with high pedestrian crash rates. DDOT should continue to invest in intersection improvements such as curb ramps, high-visibility crosswalks, and sidewalks that ensure the transportation system meets the needs of pedestrians of all abilities.
- **Improving the network outside of downtown.** Neighborhoods in northeast and southeast generally have longer block lengths and fewer sidewalks. These conditions negatively impact walking opportunities. DDOT should seek to provide pedestrian facility enhancements in these and other neighborhoods to improve the walking experience and accessibility.
- **Making priority investments.** DDOT should take a strategic approach to prioritizing the District's pedestrian needs to coordinate investments with critical locations such as areas near schools and transit stations or high-hazard locations. DDOT should consider geographic distribution of projects to ensure that the needs of downtown do not overshadow those of surrounding neighborhoods.
- **Promoting enforcement.** Changes to existing enforcement policies could increase motorist and pedestrian compliance in the District. In the 3-year period following the District's implementation of speed cameras to monitor vehicle speeds at 295 locations, the number of crashes at these locations has reduced by 17% and the number of injuries by 20%. Pedestrian-focused enforcement began in 2013 (data was not available at the time of this report). The District has the most robust automated enforcement in the country; however, it could benefit from a dedicated traffic enforcement



DDOT's Traffic Control Officers assist pedestrians crossing at busy intersections like 14th and U Streets NW

unit within the MPD. This unit would have the potential to contribute to further improvements in vehicular, bicycle, and pedestrian safety.

- **Improving intersection designs.** Closing gaps in the pedestrian network is important. Numerous intersections in the District are in need of enhanced pedestrian accommodations. DDOT should continue to invest in projects that improve intersection lighting, crosswalks, signage, pedestrian refuge islands, and pedestrian signalization and phasing.

III. Recommendations

The District has a strong tradition of walking and pleasant pedestrian experiences starting with the *L'Enfant Plan* of grand boulevards and a street grid. moveDC builds on that tradition to ensure safe and welcoming walk environments through every Ward and neighborhood. The **Pedestrian Element** presents recommendations that will help achieve the goals of a fully multimodal transportation system that:

- Reduces the number of pedestrian injuries and fatalities
- Prioritizes pedestrians in transportation projects
- Creates a pedestrian environment that accommodates people of all ages and abilities
- Creates a fully-connected pedestrian network

The recommendations of moveDC are presented in three sections:

- Facilities
- Policies
- Education, promotion, and enforcement

Figure P.3 shows the recommended pedestrian network including sidewalks and trails. The **Pedestrian Element** of the District's Multimodal Long-Range Transportation Plan serves as the update to the District's **2009 Pedestrian Master Plan**.⁸

A. MORE AND BETTER PEDESTRIAN FACILITY INFRASTRUCTURE

Recommendation A.1: Ensure all roadway reconstruction and real estate development projects include safe and convenient pedestrian facilities.

Hundreds of blocks of public space are reconstructed each year. The most cost-effective strategy for improving the pedestrian environment is for all new construction to include sidewalks that are standard width and that minimize curb cuts to avoid potential pedestrian and automobile conflict points. **Figure P.2** presents the zones to be considered when designing sidewalks. Proactively eliminating gaps in the sidewalk network also should

Figure P.2: Public Space Zones



Source: District of Columbia Public Realm Design Manual, 2011



⁸ **Appendix P.1** presents the status of recommendations from the 2009 Pedestrian Master Plan as of December 2013

be included in all new or reconstruction projects. In 2010, the D.C. Council passed the **Priority Sidewalk Assurance Act**, requiring DDOT to include sidewalks in reconstruction projects.

In addition to conditions after new projects open, safe and convenient pedestrian access should be provided during all construction activities. This includes providing a fully-functioning, clearly-signed pedestrian route safe from modal conflicts without requiring a significant detour.

Recommendation A.2: Implement corridor-level pedestrian improvements in key areas.

The **2009 Pedestrian Master Plan** analyzed street segments throughout the District based on two broad factors: "pedestrian potential" (how much pedestrian activity is expected in particular locations) and "pedestrian deficiency" (how challenging it is for pedestrians to travel along or cross particular streets). Pedestrian crashes were then overlaid to identify an initial set of priority corridors. All street segments with high potential for pedestrian activity and high deficiency were considered to be priorities for further evaluation and recommendations.

DDOT should continue to implement pedestrian safety and access improvements for these corridors, including sidewalk repair and construction, relocation of bus stops, signalization changes, reduced crossing distances at intersections, and a wide variety of other pedestrian safety improvements. DDOT should continue to evaluate and identify key corridors using this methodology.

Recommendation A.3: Create a pedestrian environment that accommodates people of all ages and abilities.

All sidewalks should be constructed in conformance with the latest **Americans with Disabilities Act** (ADA) accessibility guidelines, but should also strive to meet the more standards of universal design—designs meant to produce environments that are accessible to people of all abilities—and the Architectural and Transportation Barriers Compliance Board's **Proposed Guidelines for Pedestrian Facilities in the Public Right-of-Way**.⁹



Pedestrians are all ages and ability levels

Where sidewalks are not possible, street design should ensure the environment is safe for walking. In addition to providing a complete network of sidewalks, pedestrian crossings should be established at all legs of an intersection unless a special exception can be clearly justified. Consideration also should be given to the benefits of street trees to enhance the walking environment, as well as signal timing for pedestrians to ensure a safe walking environment.

Recommendation A.4: Install new sidewalks.

Creating a pedestrian environment that accommodates people of all ages and abilities starts with providing a sidewalk on at least one side of every street throughout the District. Approximately 10% of the blocks in the District have missing sidewalks on one or both sides of the street. The presence of sidewalks is critical to the safety of pedestrians.

The District should seek to have sidewalks on at least one side of every street and preferably on both sides of every street. On streets without sidewalks where no reconstruction is planned, DDOT should build sidewalks in accordance with the **2010 Priority Sidewalk Assurance Act** which lists the following priority areas: schools, parks and recreation facilities, transit stops, areas with pedestrian safety risks, and streets where residents have petitioned for new sidewalks.

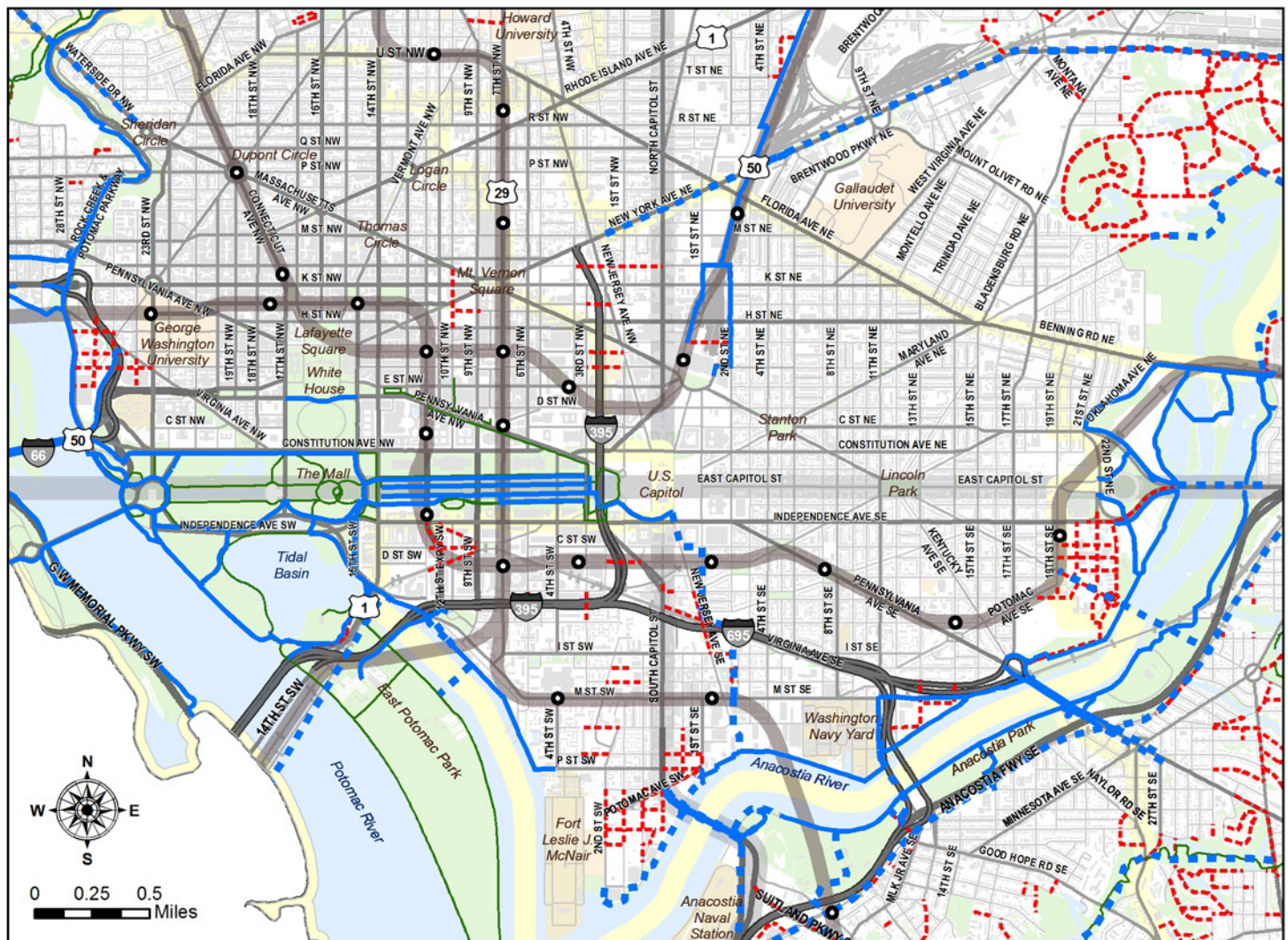
⁹ www.access-board.gov/guidelines-and-standards/streets-sidewalks/public-rights-of-way/proposed-rights-of-way-guidelines

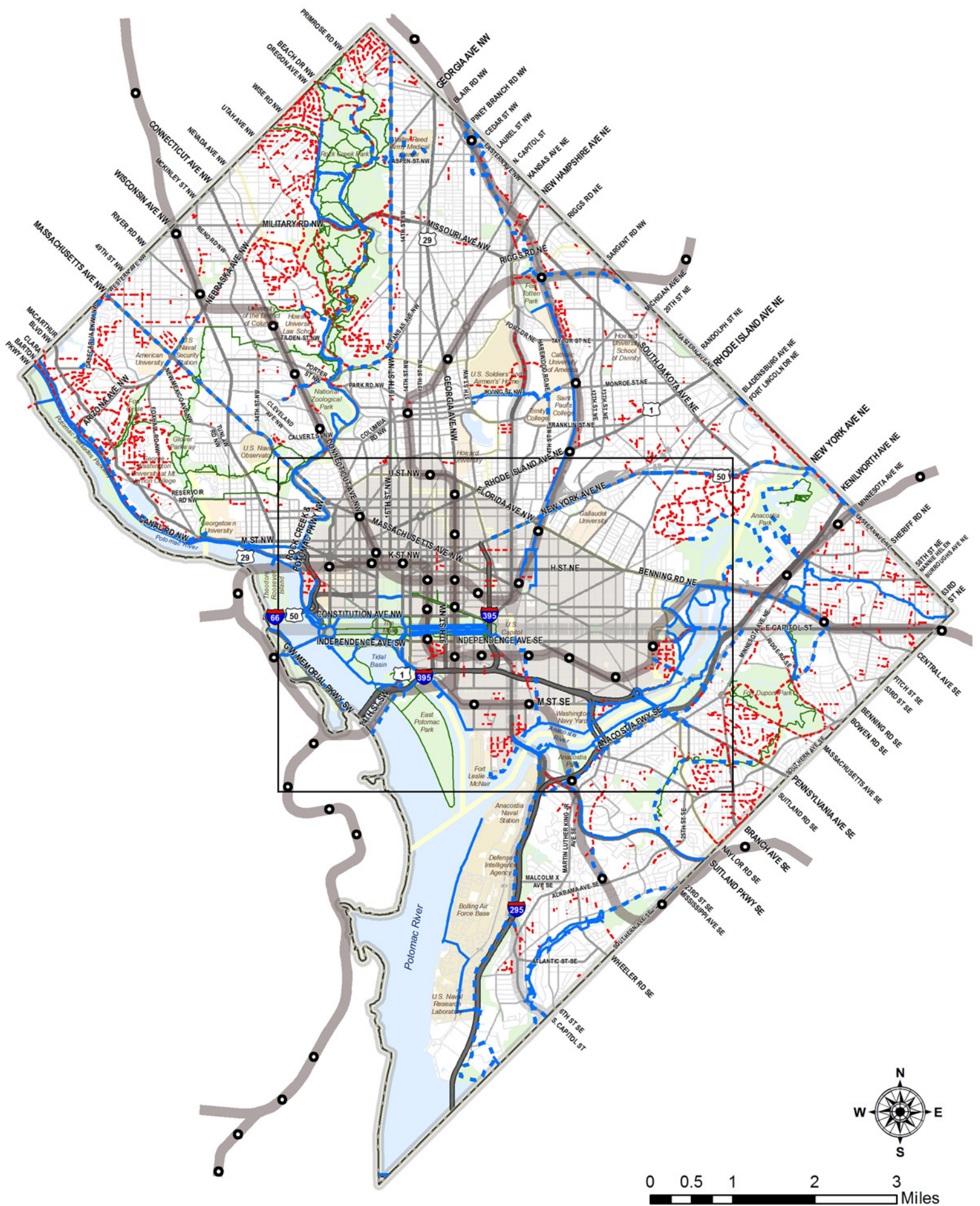
FIGURE P.3 – RECOMMENDED PEDESTRIAN NETWORK

This map shows the recommended trail network as well as locations for new sidewalks.

Legend

	Washington D.C. Boundary	<u>Existing Infrastructure</u>	<u>moveDC Plan Elements - Future</u>
	Quadrant Boundary		 Trail
	Ward Boundary		 Sidewalk
	Water		Metrorail Station
	Park		Metrorail Line
	University		Road
	Military		Railroad
	Monumental Core		







Recommendation A.5: Improve the system for prioritizing sidewalk maintenance and repair.

DDOT should refine the system for inspecting sidewalks and identifying and cataloging needed repairs for sidewalks that fall within the maintenance responsibility of the District. The system should include a method for residents and visitors to make requests for specific locations in need of repair. Sidewalk repairs and reconstruction should be prioritized based on high pedestrian demand and poor walking conditions, requests, and meeting ADA guidelines.

Recommendation A.6: Improve pedestrian access and safety at controlled crossings and intersections.

DDOT should make safety improvements at signalized intersections throughout the District where there is significant pedestrian activity (such as in the Central Employment Area and adjacent to Metrorail stations and schools), where there are conflicts between turning motorists and pedestrians, and where there are higher frequencies of pedestrian crashes. Pedestrian crossings should be provided across all legs of an intersection unless a special exception can be clearly justified. In addition, as intersections are redesigned, turning radii should be as tight as possible to slow turning vehicles and improve the visibility of pedestrians at intersections.

In locations with high pedestrian activity (pedestrians present at least 50% of the cycle at peak hour), particularly around transit stations, pedestrian actuated signals should not be used. In these cases, signal timing should be modified to provide a walk phase during each cycle. Sufficient time for pedestrians to safely cross intersections should be included in all signal timings.



Recommendation A.7: Improve pedestrian access and safety at uncontrolled crossings and intersections.

The decision regarding where to mark crosswalks and what types of engineering treatments to use is complex. The most recent national research on pedestrian safety indicates that on multi-lane arterials with higher traffic volumes (more than 12,000 average daily traffic), uncontrolled crossings with marked crosswalks alone were associated with higher rates of pedestrian crashes.¹⁰ In addition to marked crosswalks, these types of uncontrolled crossing locations require other engineering treatments, such as median refuge islands and pedestrian signals in order to improve the safety of pedestrians crossing the roadway. DDOT should continue to improve uncontrolled crossings throughout the city.



¹⁰ Safety Effects of Marked vs. Unmarked Crosswalks at Uncontrolled Locations. Federal Highway Administration, 2005 available at www.fhwa.dot.gov/publications/research/safety/04100

Recommendation A.8: Improve pedestrian access and safety at bus stops while maximizing transit efficiency.

Bus stops throughout the District are primarily located on the near-side of intersections. When bus stops are on the near-side of an intersection, pedestrians often cross in front of the bus, which blocks sight lines to adjacent traffic. Where possible, bus stops should be located on the far-side of intersections and at controlled crossings when located on higher volume multi-lane arterials. Far-side bus stops encourage pedestrians to cross behind the bus which improves visibility to other motorists. Bus stops located on the far side of signalized intersections also improve transit efficiency and minimize parking loss to neighborhoods.

In conjunction with Recommendations A.5 and A.6, intersections with bus stops should be a first priority for further safety studies, aligning stops with signals and shifting to far-side stops when appropriate.

Recommendation A.9: Create new street connections to maximize connectivity.

When possible, DDOT should seek to reestablish street connectivity, increase intersection density, and maximize the functionality of the pedestrian network. This could take the form of new streets as part of development or connections that reestablish access along a historic right-of-way for some or all modes (such as the recent City Center project). Connectivity within the pedestrian network can be added as part of the general right-of-way or with pedestrian plazas.¹¹

The District should prioritize connections that can reduce walking distances to and from transit stations or activity centers. Potential currently exists to establish new street grids through large campuses and institutions that are currently being considered for redevelopment, like the Walter Reed Medical Center. These new street connections do not need to be owned by the District to be successful as long as public access is provided.



Facilitating the connection between public transit and pedestrian safety means being intentional about bus stop design and placement

Recommendation A.10: Establish a consistent policy towards traffic calming in neighborhoods.

Traffic calming is effective in reducing negative impacts of vehicular traffic (especially speed, accident rates, and through-traffic volume on neighborhood streets). Achieving successful outcomes and sustained community support will be accomplished by using a broad palette of physical designs for traffic calming treatments as well as a consistent policy on the conditions in which each can be used.

The District has implemented traffic calming in many of its neighborhoods, including a program of Traffic Calming Assessments intended to observe traffic conditions and to identify opportunities. This program was designed to respond to neighborhood concerns and to evaluate a focused area of neighborhoods for ways that traffic calming approaches might be implemented. DDOT also has created the **Livability Program** to conduct neighborhood transportation planning studies and advance small-scale improvements to the public realm and safety.

As this program expands, it should shift from a policy of neighborhood-requested traffic calming to include standard assessments of where traffic calming is appropriate. These should lead to place-appropriate traffic calming techniques to ensure that design interventions are well coordinated with their neighborhood context. DDOT already permits a wide range of traffic calming design options, representing a sophisticated understanding of the practice.¹²

¹¹ Refer to Recommendations B.6 and B.9 in the Sustainability and Livability Element of this plan.

¹² Refer to the traffic calming page on DDOT's website (<http://ddot.dc.gov/service/traffic-calming>) for allowable traffic calming designs.

In addition to site-specific traffic calming, DDOT should establish a neighborhood-based approach to traffic calming that includes pairing a reduction of vehicle speeds with safety measures within a select area in order to create wider areas of improved safety and livability.

B. ENACT MORE PEDESTRIAN-PRIORITIZING POLICIES

Recommendation B.1: Incorporate pedestrian priority into planning, policy, and programming.

The District should adopt formal policy statements to confirm that pedestrians are the District's highest transportation priority. Ongoing DDOT policies, standards, and design guidelines also can reinforce this priority.



Changes to standard design guidelines can improve how pedestrian safety is integrated into normal street construction and maintenance

Recommendation B.2: Revise the DDOT Design and Engineering Manual to better address pedestrian safety.

DDOT already has established many policies and standards with respect to pedestrian facility design. For example, the **DDOT Design and Engineering Manual** (the Manual) already addresses ADA guidelines, sidewalks, and traffic calming. Pedestrian issues are incorporated into many pieces of the Manual that address various aspects of roadway design.

A number of additions and adjustments are needed to address the safety and comfort of pedestrians—for example, there is a critical need to address the design of uncontrolled pedestrian crossings (those that occur at mid-block locations and at intersections where vehicle traffic is not controlled with a stop sign or traffic signal). Uncontrolled intersections exist throughout the District and represent a significant safety issue for pedestrians (also see Recommendations A.5, A. 6, and A.9).

The Manual included some recommendations from the **2009 Pedestrian Master Plan**. To supplement the Manual, DDOT developed **Pedestrian Design Guidelines** to highlight pedestrian engineering topics and depict detailed engineering guidance. The next update of the Manual, planned for 2014, should incorporate the prioritization of pedestrian safety and accessibility with leading-edge techniques.



DDOT completes the restoration of Old Market House Square in Anacostia

Recommendation B.3: Continue to provide adequate agency training and staff to implement pedestrian infrastructure.

Ongoing education is needed to ensure that project consultants, DDOT planners, inspectors, engineers, and staff that oversee transportation studies and construction projects that impact the public right-of-way are aware of new pedestrian design policies and have the necessary information to carry them out. DDOT has hosted multiple training sessions and webinars since 2009 and should continue this practice.

Recommendation B.4: Evaluate progress on implementing the pedestrian design policies recommended in this plan.

It will be important to evaluate progress in implementing policy changes over time, as well as to reassess next steps and priorities as new issues arise. DDOT should assess progress on policy changes and develop a plan for implementing policy changes and any factors limiting implementation. DDOT should identify interim policy statements that address key pedestrian safety and accessibility issues. **Appendix P.1** presents the status of recommendations from the **2009 Pedestrian Master Plan** as of December 2013.



Policy changes can help shape the pedestrian experience

C. PROVIDE MORE PEDESTRIAN-RELATED EDUCATION, PROMOTION, AND ENFORCEMENT

Recommendation C.1: Provide educational campaign programs for new pedestrian facilities.

Educational campaigns should be developed to alert residents, employees, and visitors of new pedestrian facilities within the District. As an example, DDOT developed an educational brochure for the pilot HAWK and the Barnes Dance (pedestrian scramble) so that all users would become aware of how to use these facilities.

Recommendation C.2: Expand the District's Photo Radar Speeding Reduction Program.

Decreased motor vehicle speeds are essential to improving pedestrian safety in the District. Motorists exceeding posted speed limits are significant hazards for pedestrians. Higher vehicle speeds on non-freeway corridors tend to increase the frequency and severity of pedestrian crashes and reduce the comfort of pedestrians walking along the street.

MPD has been successfully operating an **Automated Red-Light Enforcement Program** since 199 and **Photo Radar Speeding Reduction Program** since 2001. Mobile photo radar units and fixed-location cameras are used in enforcement zones selected by MPD based on speeding history, speed-related incidents, and proximity to locations with vulnerable populations.

In November 2013, MPD expanded automated enforcement to include 16 stop signs and eight uncontrolled crosswalks. If successful, these new enforcement techniques should be expanded and evolve as technology improves.

Recommendation C.3: Expand the DDOT Pedestrian Program website.

DDOT should continue to maintain the District **Pedestrian Program** web page. Additions to this page could include:

- Online tools for residents to evaluate and report conditions of the pedestrian environment
- Checklist of projects that have recently been implemented throughout the District
- Updates on status of the pedestrian elements of the **moveDC** plan



Wide crosswalks can improve conditions, increase driver awareness of pedestrian crossings, and improve safety conditions for all users

Recommendation C.4: Expand DDOT's Pedestrian Safety Campaign efforts.

The District should continue and expand its current safety education program. Safety messages specifically related to pedestrians should be broadcast year round through media outlets including radio, TV, online and printed material only in targeted locations (such as the D.C. Department of Motor Vehicles [DMV], schools, and the DDOT website). Particular attention should be paid to revising driver education and testing standards.

The twice-annual regional **Street Smart Safety Campaign** continues to be DDOT's principal outreach tool for pedestrian safety education with award-winning new visual materials debuting in spring 2014.

Recommendation C.5: Expand the Safe Routes to School program.

Through a combination of engineering, education, encouragement, and enforcement strategies, Safe Routes to School programs have the ability to impact traffic safety, traffic congestion, pollution, and air quality issues. They also present a unique opportunity to address personal safety concerns and significant child health problems while enhancing livability within the District.

It is important to note that the Safe Routes to School program does not encourage students to walk or bike alone in unsafe locations. It provides a method for improving conditions and encourages parents to walk and bike with students to school.

DDOT should increase coordination with the District of Columbia Public Schools, Deputy Mayor for Education, Office of the State Superintendent for Education, and the D.C. Public Charter School Board to identify schools to initiate Safe Routes to School programs that address all five “E’s” (education, enforcement, encouragement, engineering, and evaluation). Involvement from other key community partners (health organizations, neighborhood groups, parent-teacher associations, advocacy groups, and others) should be sought in order to create sustainable programs that do not rely on continuous federal funding.

The goal is to offer a Safe Routes to School program to every District school interested in participating and to address pedestrian safety at all schools. The program currently serves public and private schools with kindergarten through 8th grade (per the original legislation), but should be expanded to cover public and private schools at all levels (preschool through high school).

DDOT should develop partnerships to ensure that comprehensive pedestrian and bicycle safety education is available to every District student. DDOT also should identify capital funding to implement recommendations stemming from school safety studies.

Recommendation C.6: Educate motorists about safe operating behavior around pedestrians.

The District should educate motorists about pedestrian safety through media campaigns, driver's tests, and the distribution of written materials. DDOT also should directly engage taxi cab, bus, and truck drivers about safe driving behavior around pedestrians. DDOT should work with the DMV to incorporate safe driving behavior around pedestrians on the knowledge and road skills tests for obtaining a driver's license.

IV. Performance

The plan's recommendations are intended to result in a safer, better connected, more attractive, and more appealing walking environment for everyone. The recommendations address policy, education, projects, and programs. The **moveDC** plan goals (described in **Chapter 1**) were used in the evaluation of the **Pedestrian Element's** performance, similar to the other **Modal Elements** of the **moveDC** plan.

The Districtwide Travel Demand Model, the project's spatial analysis model, and qualitative reviews were used to develop the metrics for each pedestrian-related performance measure. The **Pedestrian Element's** overall performance—by relevant goal category—is summarized in **Table P.2**.

Table P.2: moveDC Pedestrian Element Performance

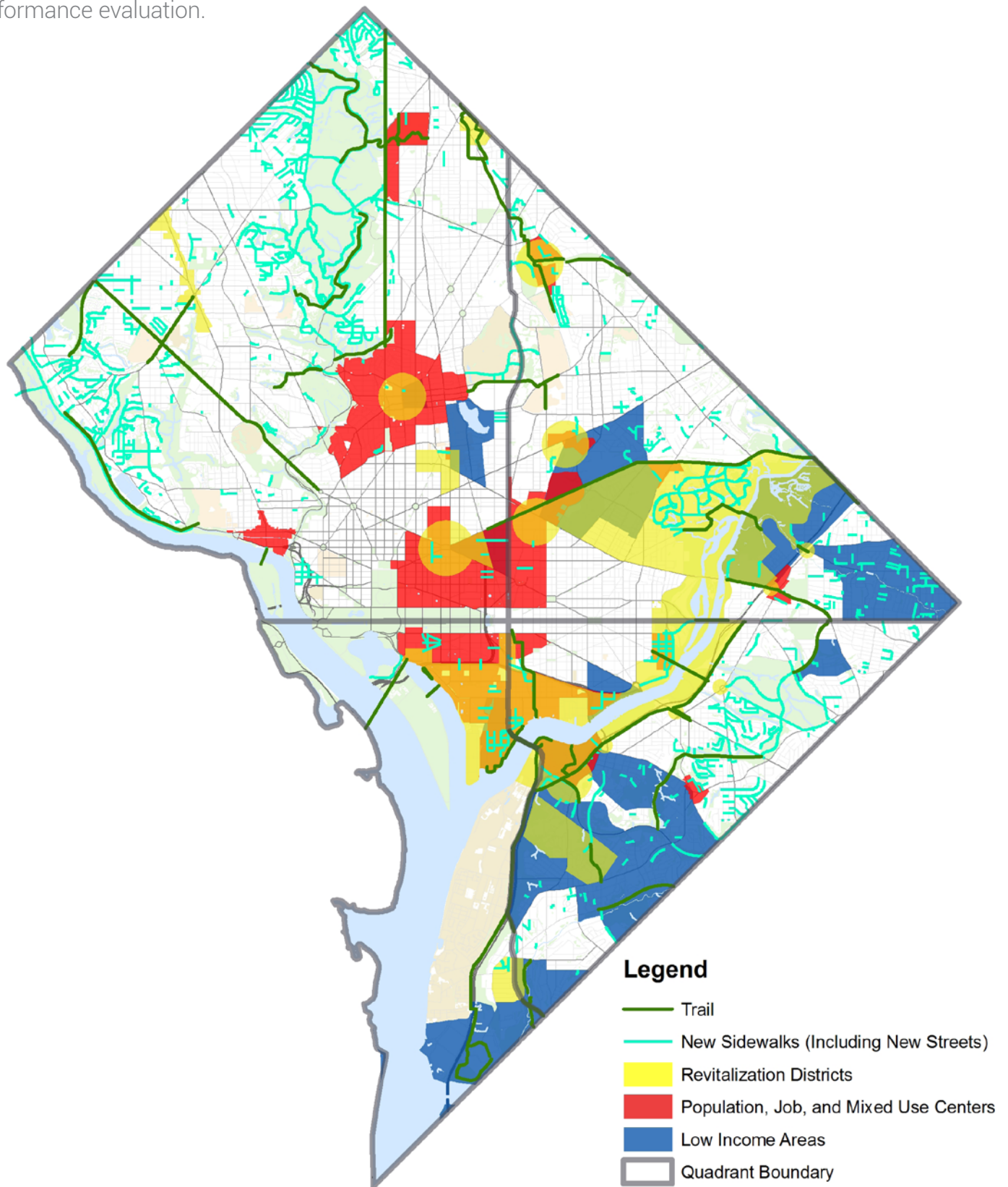
Goal	Metric	Performance
Sustainability & Health	Increase non-auto mode split	• A 29% pedestrian mode share is forecast for trips that start and end in the District
	Increase access to parks and green space	• Create new trails accessing 39 parks
	Encourage active transportation for health benefits	• Accommodate people of all ages and abilities with sidewalk on at least one side of every street and safer street crossings • Education on new pedestrian facilities • Expanded Pedestrian Program website • Expanded implementation of the Safe Routes to School program
	Reduce air and water quality impacts of transportation	• Increase in non-auto trips has the potential to reduce air and water quality impacts
	Prepare the transportation system for changing environmental and climatological conditions	• Not applicable for this element
Citywide Accessibility & Mobility	Increase the person-carrying capacity of the transportation system	• Plan recommendations result in increased pedestrian capacity Districtwide compared to the existing (2013) network
	Improve system reliability	• Not applicable for this element
	Reduce financial barriers to the lowest-income transportation system users	• Not applicable for this element
	Accommodate the movement and management of freight and goods	• Not applicable for this element
	Integrate the District's transportation system with the region's transportation network	• Connect with many regional trail facilities or regional trail initiatives including: • Anacostia Park Trail/Prince George's County's Colmar Manor Park Trail • Gallatin Street NE Trail/Prince George's County Trail Connection to West Hyattsville Metrorail Station • Long Bridge Trail/Mount Vernon Trail in Arlington County • New York Avenue NE trail/Prince George's County's Colmar Manor Park Trail • Oxon Run Trail/Prince George's County's Oxon Run Trail • Pennsylvania Avenue SE Trail/Prince George's County's Pennsylvania Avenue bicycle lane/trail • Rock Creek Park (Beach Drive NW) Trail/Montgomery County's Rock Creek Trail

Table P.2: moveDC Pedestrian Element Performance (continued)

GOAL	METRIC	PERFORMANCE
Neighborhood Accessibility & Connectivity	Increase the coverage of all modal networks throughout the District	• Provide 100% of the forecast District population and employment with access to a sidewalk on every block by 2040
	Increase the number of transportation choices for travel between city neighborhoods	• Increased ability to walk between city neighborhoods
	Increase transportation availability to population centers and jobs, schools, amenities, and services	• Create new trails or sidewalks accessing four population centers, eight employment centers, and 13 mixed-use centers. (See Figure P.4.)
	Increase transportation availability to economically challenged or targeted redevelopment areas	• New trails or sidewalks accessing 30 out of 33 low-income Census Tracts and 17 designated redevelopment areas. (See Figure P.4.)
Safety & Security	Improve safety for all users	• Increase pedestrian safety by: • Accommodating pedestrians of all ages and abilities with a sidewalk on at least one side of every street • Improving access and safety at crossings and intersections • Expanding the District's Photo Radar Speeding Reduction Program • Continuing DDOT's Pedestrian Safety Campaign efforts • Expanding the implementation of the Safe Routes to School program
	Improve redundancy of transportation networks to handle emergencies	• Not applicable for this element
	Expand sidewalk network	• Create at least 127 new miles of sidewalk by locating sidewalks on at least one side of every street in the District
	Maintain ability to evacuate District in case of emergency	• Not applicable for this element
	Preserve key functions without impacting the transportation system	• Not applicable for this element
Public Space	Protect and enhance important corridors and urban landscapes	• Not applicable for this element
	Make streets functional, beautiful, and walkable	• Accommodate pedestrians of all ages and abilities by providing a sidewalk on at least one side of every street • Ensure all transportation and real estate development projects include safe, convenient, and functional pedestrian facilities • Use the District's Public Realm Design Guidelines to incorporate landscaping and other visual improvements
	Increase tree coverage	• DDOT sidewalk standards include tree box space
Preservation	Maximize reliability for all District transportation infrastructure by investing in maintenance and asset management	• New sidewalks and trails will require maintenance; create a revolving cycle of improving each segment within the District on a 25-year repair and replacement schedule

FIGURE P.4 – MOVEDC PEDESTRIAN ELEMENT ACCESSIBILITY MAP

This figure shows District-designated revitalization districts; population, job, and mixed-use centers identified for **moveDC** planning purposes; and low-income areas based on U.S. Census data in the context of **moveDC** pedestrian network recommendations. This information was used in plan performance evaluation.





Pedestrian activity around the Navy Yard Metrorail Station after a Washington Nationals baseball game

V. Vision to Reality

moveDC is a long-term plan for a reason—achieving its full vision will require decades of investment and continued commitment from city leaders and support from innumerable local and regional partners. The return on the city's investment of time and funds spent implementing the **moveDC** plan's recommendations will be creating stronger, more vital neighborhoods; sharing prosperity among all of the city's residents; meeting our responsibility to the environment; and making the District more competitive among its peers.

This section provides guidance for prioritizing and implementing **Pedestrian Element** infrastructure recommendations. Additional information on implementation can be found in **Chapter 5** of the **moveDC** plan.

A. USING THIS ELEMENT

The **Pedestrian Element** is a starting point for investments in the pedestrian system for the District in the next 25 years. It presents needed and realistic pedestrian network investments and policy concepts that, together, support the **moveDC** plan's other elements in achieving the goals established as a part of the planning process.

The **moveDC** plan does not present specific and final pedestrian system design solutions, nor has the plan analyzed all of the pedestrian project-level trade-offs for individual components of the plan. The **Pedestrian Element** of **moveDC** will need to be updated periodically to take into account the many changes the future will bring that cannot be anticipated today. The need for updates is the recognition that some things always change in a city as dynamic as Washington, D.C.

Finally, some recommendations of **moveDC**, as with the **1997 Transportation Plan for the District of Columbia**, may not become reality. Regular updates to the **Pedestrian Element** in coordination with the overall **moveDC** plan will help ensure the **Pedestrian Element**'s recommendations continues to make sense in the context of changing demands on the system.

B. PROJECT DEVELOPMENT PROCESS

Some of the pedestrian infrastructure recommendations included in the **moveDC** plan are already in the design process or ready for construction; however, the vast majority of **moveDC**'s recommendations will need to undergo additional evaluation and further development—consistent with established city processes prior to their implementation.

The DDOT **Environmental Policy and Process Manual, 2nd Edition** (2012) further describes DDOT's Project Development Process. The additional evaluation and development processes are likely to adjust the character, location, and other elements of some recommendations as they move toward implementation.

C. IMPLEMENTATION THROUGH PARTNERSHIP

While the implementation of most capital infrastructure recommendations will be led by DDOT, some are likely to occur through partnership among DDOT and other agencies or organizations, or with DDOT in a support role to other agencies or organizations.

D. INFRASTRUCTURE COSTS

The planning-level cost for identified **Pedestrian Element** infrastructure recommendations is \$57 million and was developed in current year (2014) dollars at a long-range planning level of detail and accuracy. Due to the nature of long-range planning, all costs should be reevaluated in future project development activities. With respect to the planning-level cost estimates shown, the following were generally assumed:

- *Wherever possible, the cost estimates utilized project-specific costs, including costs from the Metropolitan Washington Council of Governments (MWCOC) **FY13-19 Transportation Improvement Program** (TIP), the FY14-20 District budget and other project-specific estimates*
- *Additional costs for **moveDC** recommendations were estimated using a generalized unit cost related to project type. The unit costs were derived from existing District project costs.*

Programs

In the context of implementation for **moveDC**, the term “program” is used to describe ongoing funding commitments for operations, education, maintenance, regular infrastructure improvements that are not defined as projects, or other items, such as debt service on Grant Anticipation Revenue Vehicle (GARVEE) bonds. Pedestrian program costs are estimated to be \$70 million. Additional information on costs for programs are presented in **Chapter 5**.

Asset Management

Costs within this area of **moveDC** include ongoing assessments, maintenance, and repairs of transportation infrastructure. Estimated costs for pedestrian asset management are \$160 million and are presented in **Chapter 5**.

E. BUDGETING PROCESS

moveDC was developed in a fiscally unconstrained environment, but DDOT recognizes that it operates in an environment constrained by available funding. While the financial plan in **Chapter 5**, identifies new sources of revenue to help close the cost/revenue gap, an annual gap is likely to remain throughout the plan’s implementation horizon.

Because of this fiscal reality, **moveDC** has developed a methodology for prioritizing recommendations that can assist in the process of making annual budget decisions. This approach is described in **Chapter 5**. From a broad prioritization perspective, DDOT should take the following approach:

- *Fund basic state of good repair (SOGR) and maintenance for existing programs*
- *Allocate additional resources that accelerate the pace of reaching SOGR for all infrastructure*
- *Fund critical transportation infrastructure investments to address deficiencies, safety, or capacity needs*

Critical investments in transportation infrastructure have been prioritized in the **moveDC** plan, but many will still need to go through DDOT’s Project Development Process prior to implementation. DDOT should only seek to advance investments that have the most merit to meet **moveDC**’s goals.

It should be noted that capital programs and asset management—both of which are related to ensuring safe and reliable operations and adequate maintenance of existing system assets—were not prioritized. The level at which each of these are funded is established through normal annual District budget processes.

F. PRIORITIZATION PROCESS

In addition to ongoing programs that develop and improve pedestrian infrastructure, specific Districtwide sidewalk improvement projects are identified and prioritized based on an understanding of community and stakeholder support, the District’s **Priority Sidewalk Assurance Act of 2010**, and pedestrian safety. Section 2.b of the **Sidewalk Assurance Act** states that for roadways that are missing sidewalks, but are not undergoing major construction, sidewalk installation priority will include:

- *Missing sidewalks in school areas*
- *Routes that provide access to parks and recreational facilities*
- *Transit stops*

Prioritization criteria for safety consider whether sidewalks are missing on one or both sides of a street and roadway classification. Sidewalks along streets with a higher classification and corresponding higher vehicular volumes and/or speeds, receive a higher priority for sidewalk installation than local streets with lower traffic volumes and speeds.

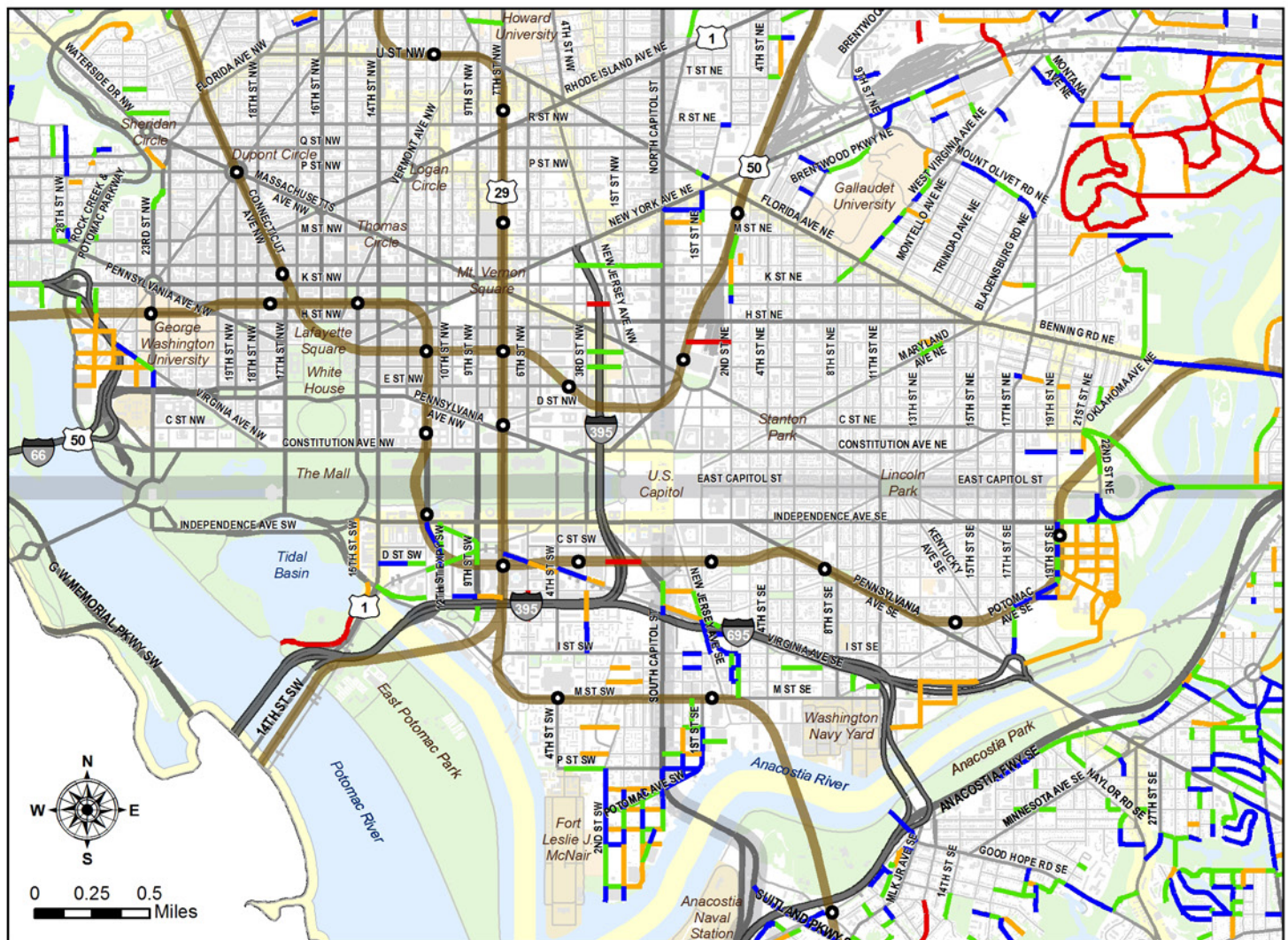
Sidewalk recommendations were evaluated using each criterion and then processed into four tiers. The tiers were then used to rank and organize priorities. Generally, investments within Tier 1 are assumed to be the highest priorities for implementation, whereas those in Tier 4 projects are lower priorities. **Figure P.5** shows tiered sidewalk priorities.

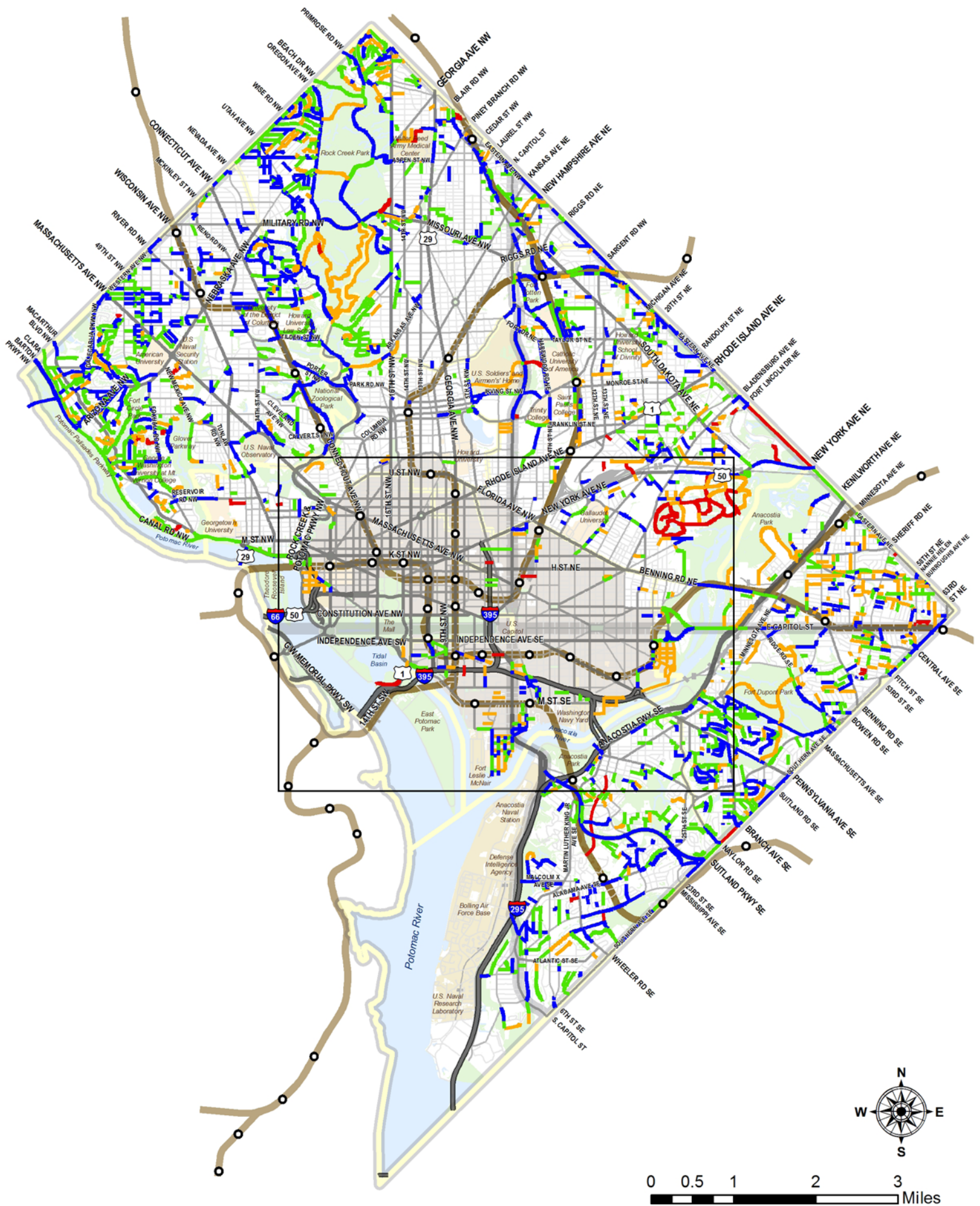
FIGURE P.5 – SIDEWALK PRIORITIES

This figure shows sidewalk recommendations by tier.

Legend

	Quadrant Boundary	<u>Existing Infrastructure</u>	<u>Tier</u>
	Ward Boundary		1
	Water		2
	Park		3
	University		4
	Military		
	Monumental Core		





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The District of Columbia's
Multimodal Long-Range Transportation Plan

B Bicycle Element





The District of Columbia's Multimodal Long-Range Transportation Plan

October 2014

District Department of Transportation
Policy, Planning & Sustainability Administration
55 M Street SE
Suite 400
Washington, DC 20003



moveDC Vision

The District of Columbia will have a world-class transportation system serving the people who live, work, and visit the city. The transportation system will make the city more livable, sustainable, prosperous, and attractive. It will offer everyone in the District exceptional travel choices. As the transportation system evolves over time, the District will:

- *Be more competitive and attractive locally, regionally, nationally, and internationally*
- *Have safer and more vibrant streets and neighborhoods*
- *Have cleaner air, streams, and rivers, and be more responsive to climate change*
- *Accommodate the travel needs of all residents, workers, and visitors regardless of age or ability*
- *Integrate the District's transportation system with the region's transportation network*

Photography Credits

Many of the photographic images throughout this plan—in addition to those taken by the project team and DDOT—were freely contributed by people involved in the planning process through the project's Flickr site (www.flickr.com/groups/wemoveDC) and through DDOT's photo sharing site (www.flickr.com/photos/ddotphotos/sets/). DDOT appreciates the generosity of contributors of photography in the plan.

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Cyclists ride in the Pennsylvania Avenue NW bike lanes

Bicycle

I. Expanding the Bicycle Network

For more than a decade, the District has been building a citywide network of on-street bicycle lanes, signed routes, and other bicycle facilities. In that time, commute trips by bicycle in D.C. have quadrupled. These efforts are successful in not only attracting a rapidly-growing number of cyclists, but also making streets safer for all users—drivers, pedestrians, transit riders, and cyclists. Continued expansion of the bike network, bike parking, and the bikeshare program are moveDC priorities that will help ensure a safe and convenient bicycling environment in the District for cyclists of all ages and abilities.

As bicycling has become more accessible and more visible, the city has seen a dramatic increase in the number of bicyclists. Peak hour cycling has increased by more than 200 percent citywide and bicycle commute trips by District residents have risen from just roughly 1% in 2000 to more than 4% in 2012.¹

People of all ages, abilities, and incomes are discovering or rediscovering bicycling. For many, it is a purely utilitarian decision. Bicycling costs a fraction of transit fares and is negligible when compared to the cost of driving. The compact size of the District means that many destinations are within a comfortable bicycling distance. Accessibility to bike facilities could help combat rising obesity levels and related public health issues.

Bicycles extend the transit network and, in some cases, trips by bicycle can replace transit trips altogether. This can save travelers money and free up system capacity. D.C. is ahead of most peer cities in integrating the bicycle network with its transit system. The District has installed bicycle racks on all buses, allows bikes on rail transit, has established the BikeStation at Union Station, and provides secure bike lockers and covered bike racks at Metrorail stations. Capital Bikeshare (CaBi) is the newest form of public transit, serving shorter distance local trips that might otherwise increase demand for local transit service.

Continuing to create networks that support bicycles, pedestrians, autos, and transit will benefit everyone. The bicycle system becomes a viable alternative that reduces frustration for transit riders when interruptions occur. Safe and convenient bicycle routes can relieve overcrowding on peak transit lines in peak hours in addition to extending the reach and efficiencies of those systems. The increasing opportunity to complete daily needs by bike means less need for short-distance driving trips that congest D.C. roadways and degrade local air quality.

Bicycle options could be further enhanced throughout the city on corridors such as Rhode Island Avenue and Massachusetts Avenue. Better bicycling facilities on these corridors will connect residents to jobs and enhance affordable, reliable, and efficient transportation options. Reliable transportation can improve employment prospects, reduce transportation expenses, and allow for spending on other needs such as housing and education.

¹ American Community Survey 2012



Capital Bikeshare has introduced biking as a viable means of transportation around the city for many

II. Existing Conditions

The District has a strong foundation for bicycle transportation, with bicycle demand encouraging the provision of facilities and facilities generating additional bicycle demand. This cycle encourages a healthy lifestyle, reduces auto trips, and contributes to improved air quality in the city.

A. CORE FACTS

In 2000, less than 3 miles of bike lanes existed in the District. Since then, the District has constructed 57 miles of bike lanes, 3 miles of cycle tracks, and 10 miles of multi-use trails. The District also has installed more than 3,000 bike racks.

Figure B.1 shows the existing bike network.²

The District's investment in bicycle infrastructure has translated into significant improvements in the quality of the network [measured as Bicycle Level of Service (BLOS)].³ From 2005 to 2013, 37 percent of arterials and collectors improved by at least one letter grade. As shown in **Table B.1** and **Figure B.2**, 88 percent of the District's collector and arterial streets now function at BLOS A to D, compared to 78 % in 2005. Fewer than 2% of collectors and arterials have a BLOS of F.

The results of the District's investment in bicycling have been significant. Bicycling rates have increased considerably and

Notes on This Element

- Data used and referenced throughout this element was current as of December 2013, unless otherwise noted.
- Recommendations cited in this element will require further development as outlined in **Chapter 5**.
- Policies in this element are in addition to or augment current DDOT policies identified in the DDOT Policy Compendium.

peak hour cycling volumes have nearly quadrupled since 2004, when fewer than 15 miles of bike lanes were available.⁴ **Table B.2** shows the growth in the bicycle network and the volume of riders.

Recent U.S. Census data shows that the District's average bicycle commute mode share has risen to 4.1% and Census Tracts in some neighborhoods like Logan Circle, Mt. Pleasant, and Capitol Hill have bicycle commute shares of up to 14%.^{5,6} Cycling is most popular in neighborhoods closest to downtown and in the northwest quadrant of the city. D.C. ranks third in the nation for bicycle commuting among large cities—it ranks first on the East Coast.⁷

² DDOT, December 2013

³ Bicycle Level of Service (BLOS) assesses bicyclists' perceived safety and comfort with respect to motor vehicle traffic while traveling along collector and arterial streets, rated on a scale of A (excellent) to F (poor). The BLOS model evaluates bicycling suitability based on roadway width, bicycle lane widths, traffic volume, pavement surface conditions, vehicle speeds, and on-street parking. For additional information, see Appendix B-2.

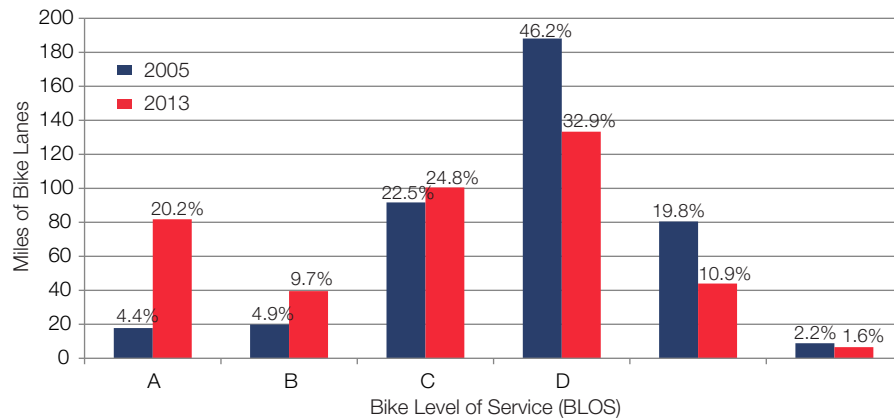
⁴ DDOT data from volumes taken at 30 consistent annual count locations since 2004

⁵ American Community Survey 2012

⁶ MWCOC Household Travel Survey 2012

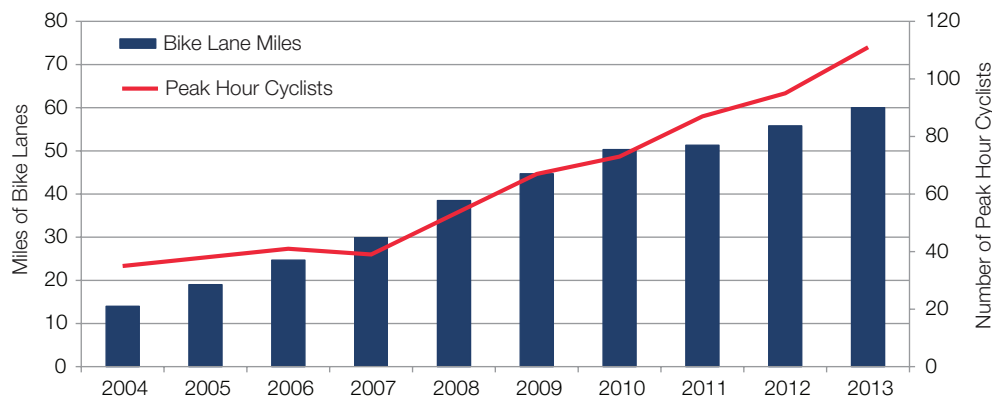
⁷ American Community Survey 2012

Table B.1: Districtwide Bicycle Level of Service (2005 and 2013)



Note: Percentages for each BLOS correspond to the portion of the entire system for the year noted

Table B.2: Bike Lane Miles and Peak Hour Cyclists



Source: DDOT, 2014

In September 2010, D.C. and Arlington launched CaBi. Now the second largest system in the United States, CaBi has grown to more than 300 stations with 3,000 bikes in four jurisdictions. **Figure B.3** shows CaBi usage. An additional 50 stations were installed in the District in 2014. More than 6 million CaBi trips have been taken in 3 years. This commitment to enhance bicycle accommodations throughout the city coupled with recent infrastructure investments has helped DC achieve national recognition as the fourth most bike-friendly city in the nation as of 2012.⁸ As of 2014, 41% of District residents lived within a quarter-mile walking distance of a CaBi station.

B. NOTABLE SYSTEM ACHIEVEMENTS

A 2012 bicycle-friendly city ranking by Bicycling.com stated, "There is no clearer evidence of the urban-cycling revolution sweeping the United States than in the nation's capital, where ridership jumped 80% from 2007 to 2010."⁹ Results of D.C.'s dedication to cycling are evident in several successes:

- *DDOT has set specific, ambitious goals and is on the path to achieving them. The goal from the **Bicycle Master Plan** of achieving 3% commute mode share by 2010 was successful and the city is on track to meet the goal of 5% by 2015.*
- *CaBi's success has had indirect impacts on bike culture and more widespread adoption of cycling. Beyond the direct impact of 5,000 to 10,000 daily CaBi users, the presence of and enthusiasm for CaBi reaches beyond city boundaries and*

8 www.bicycling.com/ride-maps/featured-rides/4-washington-dc-0

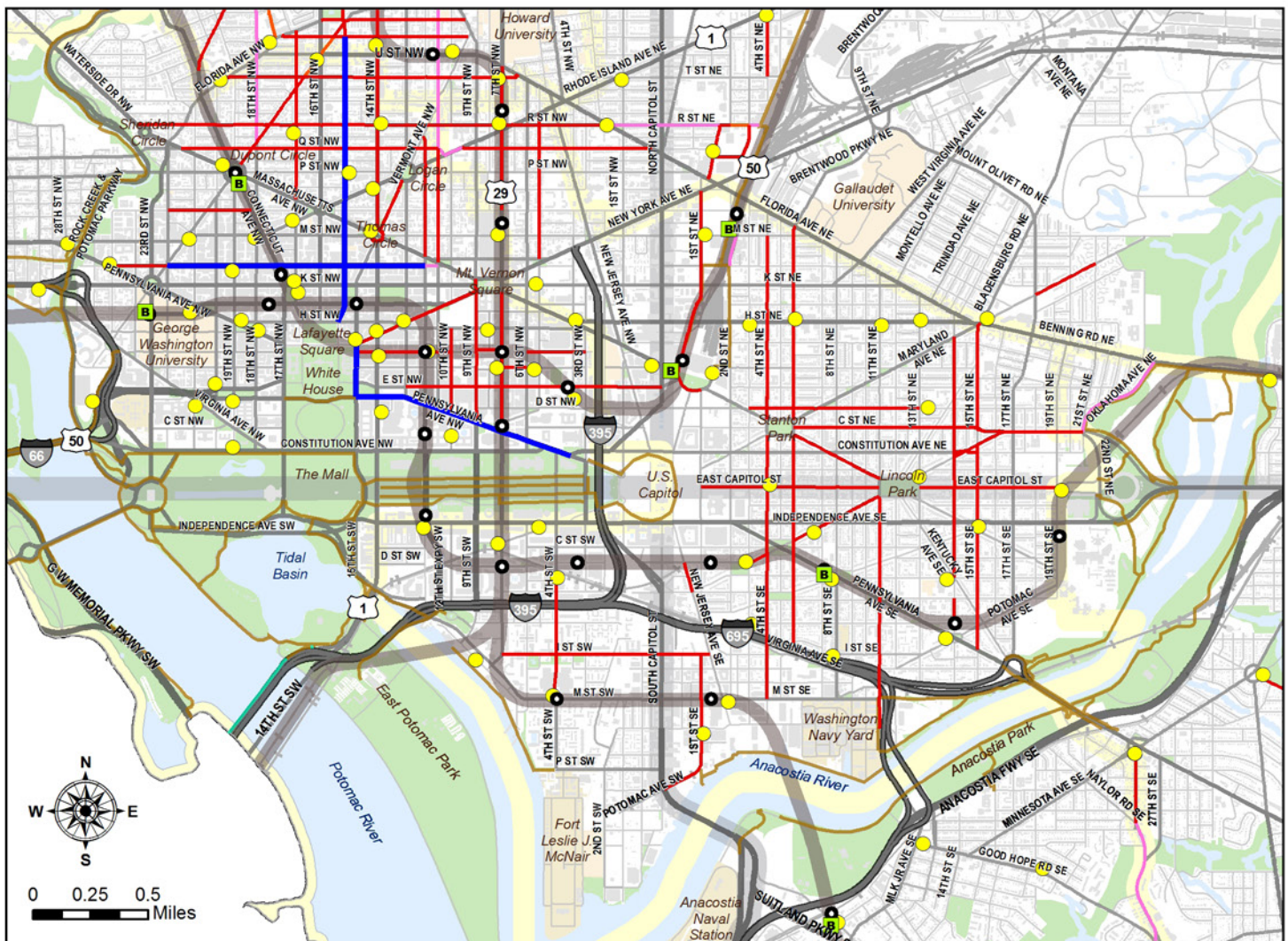
9 www.bicycling.com/ride-maps/featured-rides/4-washington-dc-0

FIGURE B.1 – EXISTING BICYCLE NETWORK

This figure shows the existing bicycle network, CaBi stations (2012), and bicycle lockers. In the last decade, DDOT has made significant investments in implementing bicycle infrastructure and adopting bicycle-supportive policies.

Legend

	Washington D.C. Boundary	<u>Existing Bicycle Facility</u>
	Quadrant Boundary	 Cycle Track
	Ward Boundary	 Bike Lane
	Water	 Climbing Lane
	Park	 Contraflow Bike Lane
	University	 Shared Lane
	Military	 Sidewalk Bike Route
	Monumental Core	 Off-Street Trail
<u>Metrorail</u>		 Capital Bikeshare Location
 Station		 Bike Locker at Metrorail Station
	Line	



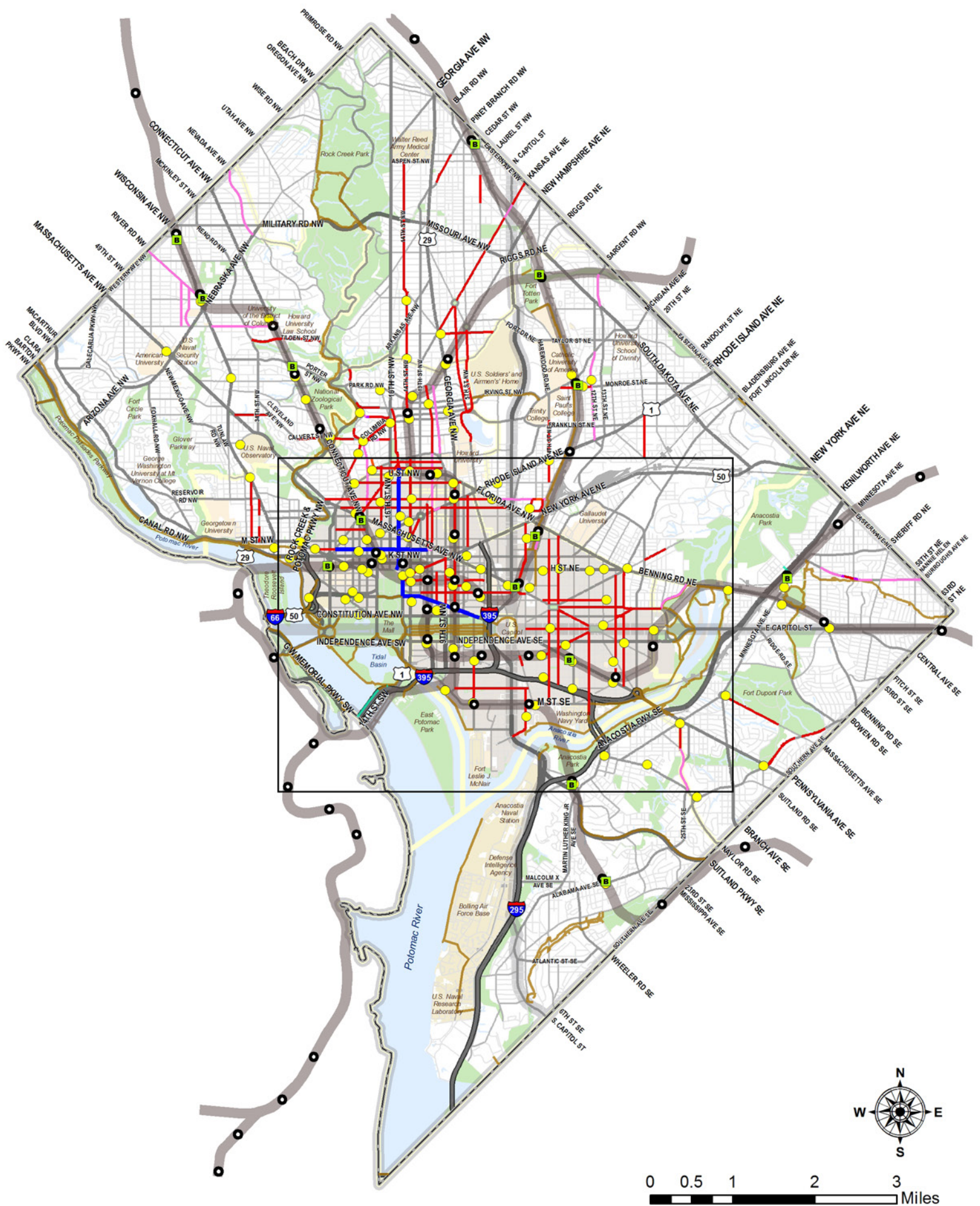
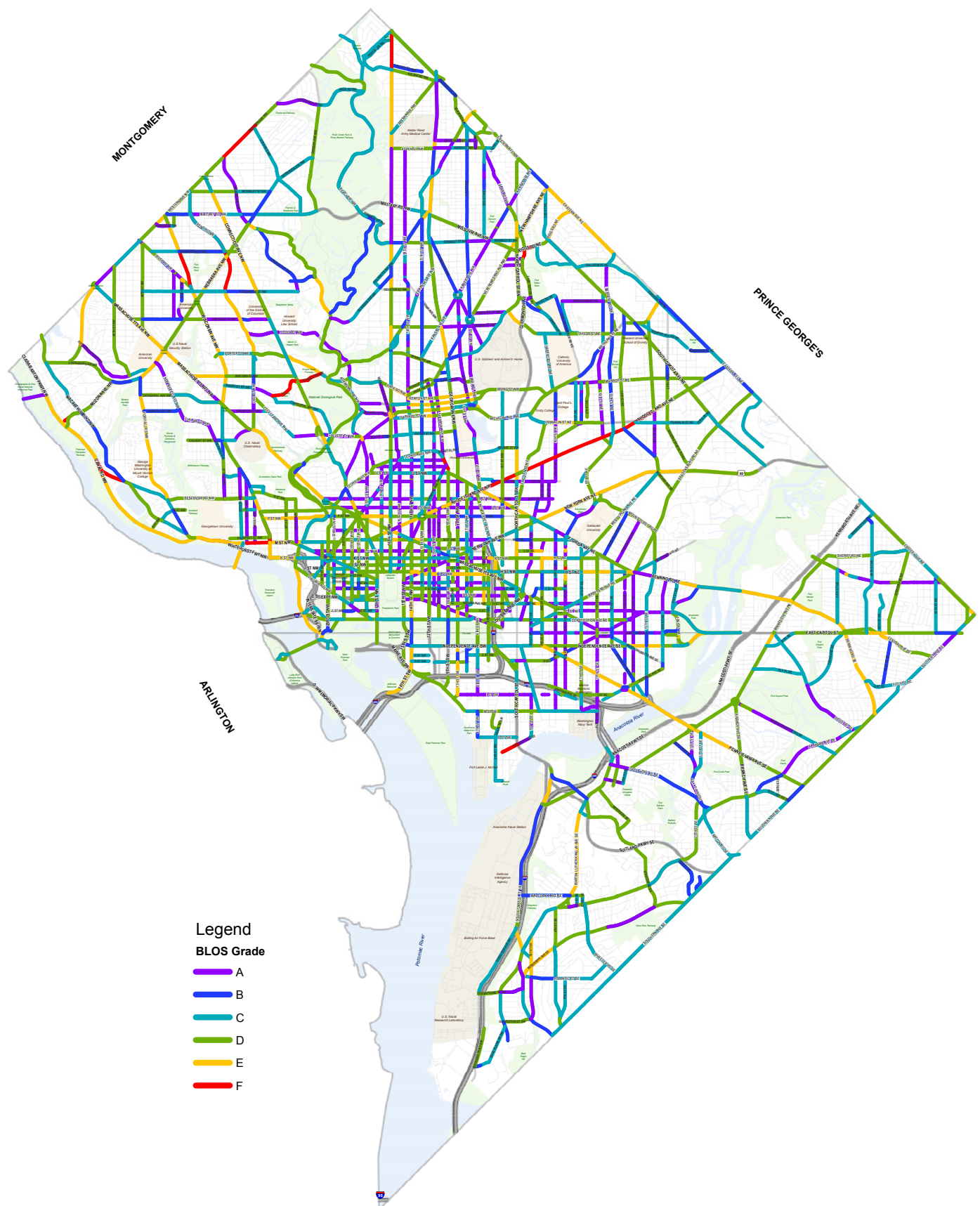


FIGURE B.2 – 2013 BICYCLE LEVEL OF SERVICE





Cyclists of all ages and abilities take bike trips throughout the District

has firmly established the District's status as a progressive cycling city.

- *Successful partnerships with advocates have advanced the District's goals. Advocacy organizations have demonstrated their ability to provide complementary support to DDOT. Numerous groups support outreach and research reinforcing cycling as a positive contributor to the vitality of the city.*

C. FUTURE DEMAND

Bicycling is the mode with the greatest potential to accommodate more demand. While the District's bicycle commute mode share has risen appreciably in the last decade to 4.1%, neighborhoods like Logan Circle, Mt. Pleasant, and Capitol Hill show bicycle commute shares of up to 14%.¹⁰ With the District projected growth in jobs and population by 2040, about 230,000 more bicycle trips are expected. This includes trips made within the District and those crossing over into Virginia or Maryland. Bicycling best serves trips between 0.5 and 5 miles long, which are often the trips between nearby neighborhoods as well as to school or work. Being able to accommodate trips of that length by bicycling has the potential to free up space on key transit corridors—without the long-term operating costs of running transit service—and reduce shorter vehicle trips, alleviating roadway and parking demand.

D. OPPORTUNITIES FOR IMPROVEMENT

While there are more bikeways and cyclists in and around downtown, the transportation system can still be improved for cyclists. Opportunities for improving the District's cycling network include:

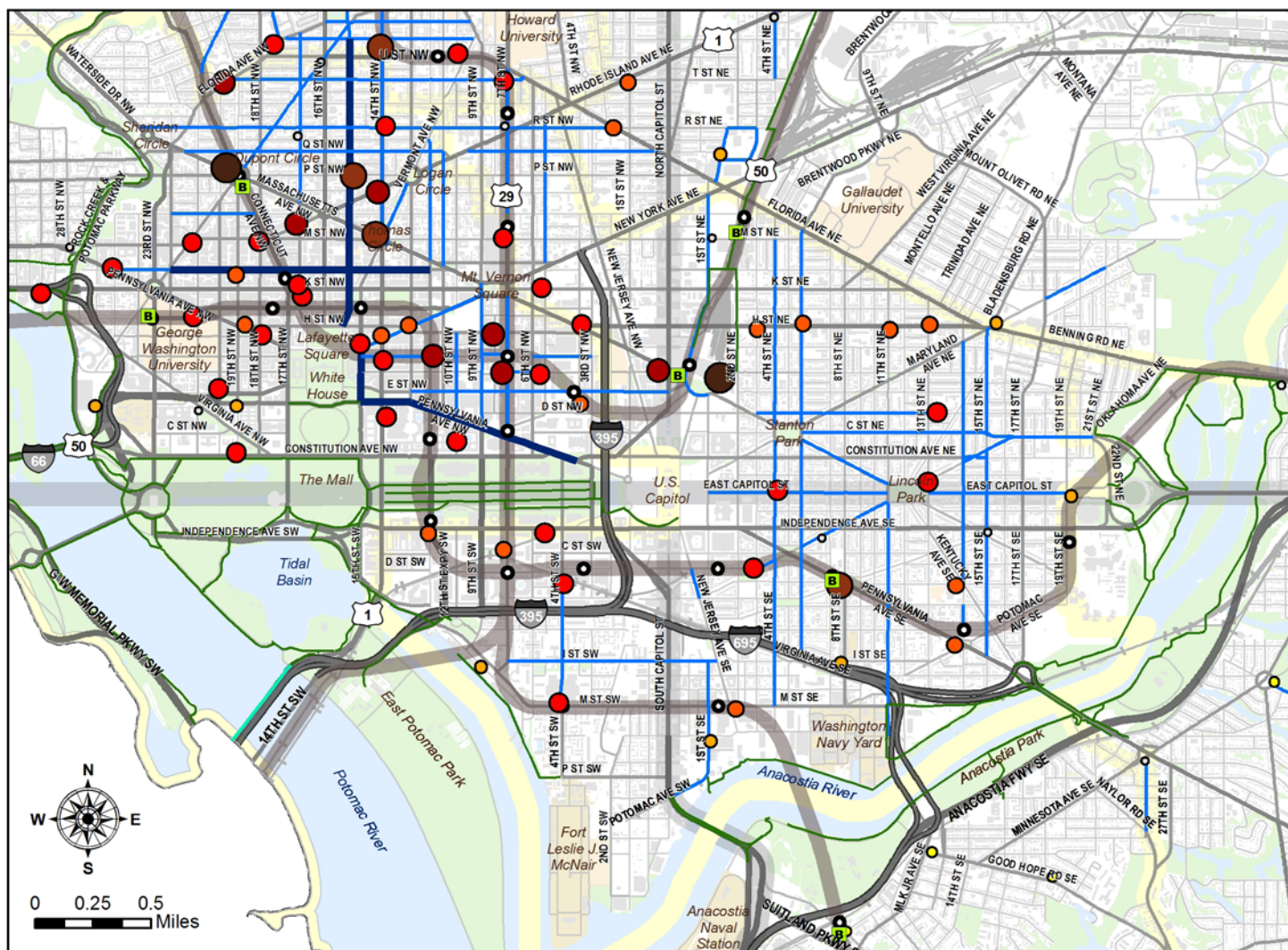
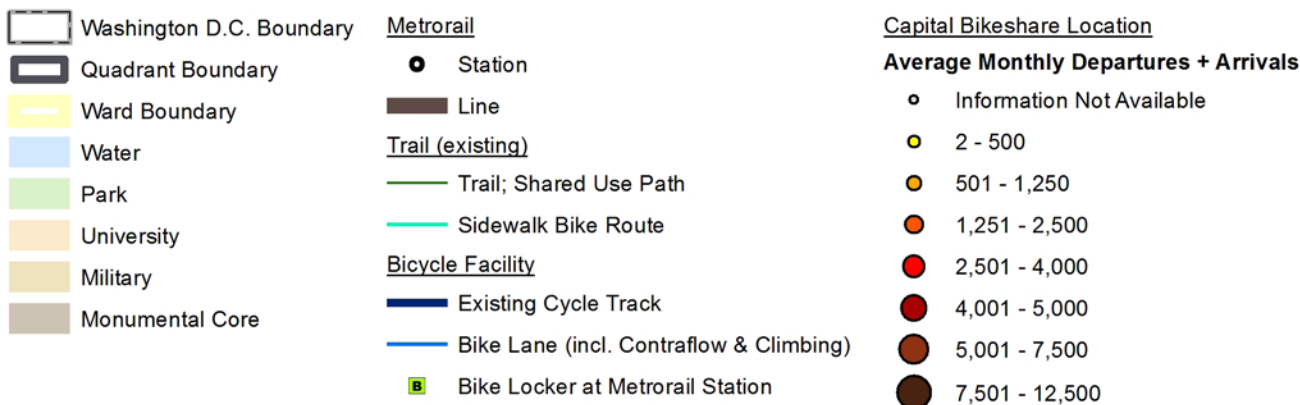
- **Bridge improvements.** Many approaches to bridges and facilities on the bridges themselves are uncomfortable or challenging for many cyclists (for example, the 14th Street Bridge connects to the Mount Vernon Trail, but no northbound path exists for cyclists to access downtown; access to many of the Anacostia River bridges is difficult). Improving the quality of access to, and on bridges would significantly improve bicycle network quality.
- **Barrier and conflict reduction.** The street network is interrupted by complex intersections, security barriers, freeway ramps, and driveways. To the extent possible, these types of barriers and conflicts should be minimized.
- **Expand investments beyond downtown.** While the highest rates of cycling occur in the downtown, the transportation system would benefit from comprehensive and consistent investments citywide. Expanding the bicycle network throughout the city and connecting to the region would have a tremendous benefit.
- **Improve safety.** Education for all roadway users about bicycle rules and increased public awareness are essential to reducing crashes and creating a safer environment for bicycling.

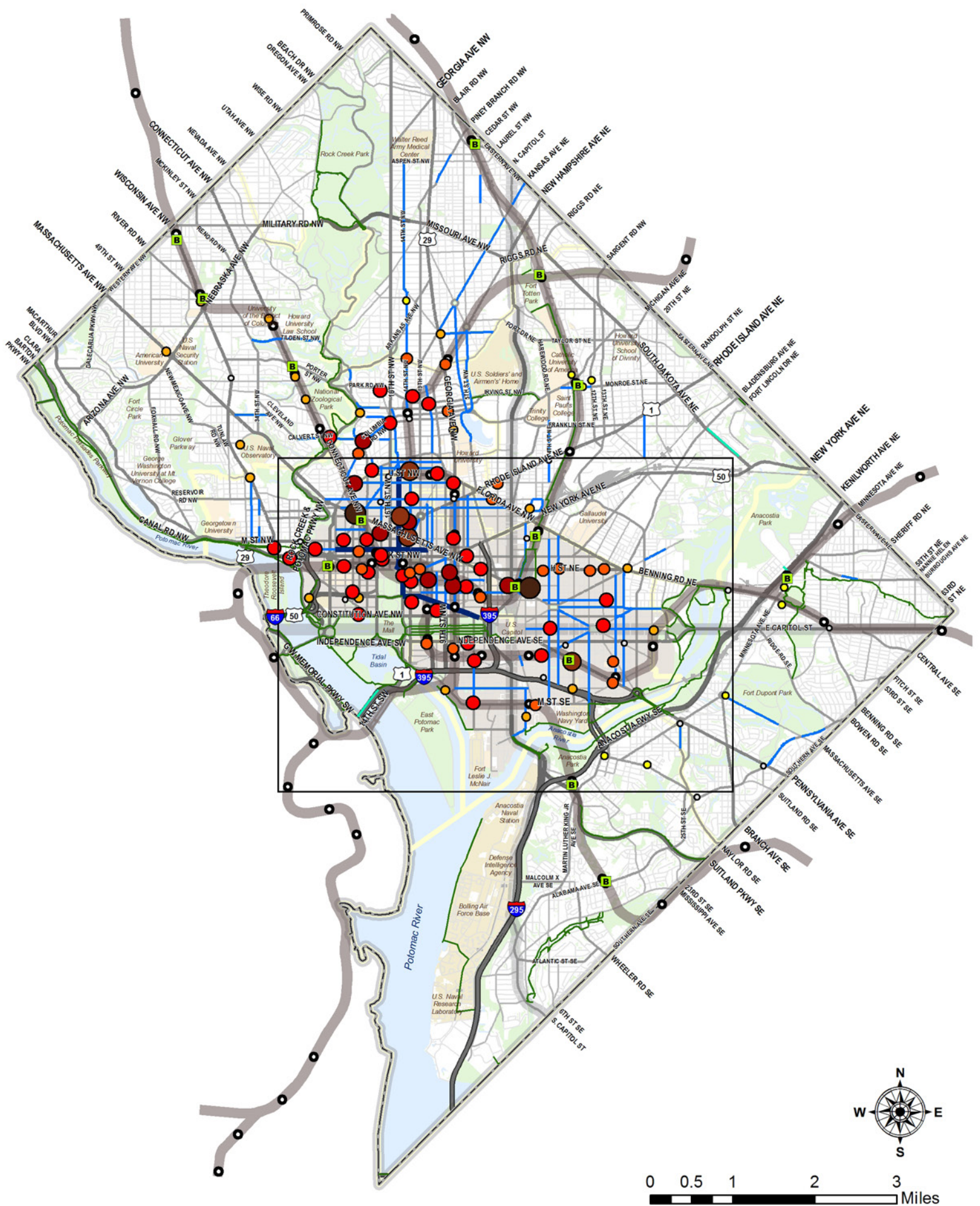
¹⁰ Metropolitan Washington Council of Governments (MWCOC) Household Travel Survey 2012

FIGURE B.3 – CAPITAL BIKESHARE USAGE

This figure shows average monthly CaBi station departures and arrivals (2012). As shown in the figure, the highest density of use is generally in the greater downtown area.

Legend







Connecting trails to the larger, regional bike network could greatly increase access to the District's natural gems

III. Recommendations

This chapter serves as both the **Bicycle Element** of the District's Multimodal Long-Range Transportation Plan and the update to the District's **2005 Bicycle Master Plan**. In addition to meeting the **moveDC** plan's bicycle ambitions, these recommendations address the four major goals of the city's Bicycle Program:

1. Reduction in the number of bicyclist injuries and fatalities
2. More and better bicycle facilities
3. More bicycle-friendly policies
4. More bicycle-related education, promotion, and enforcement

Even with all of the improvements in the District's bicycle network during the past decade, more can be accomplished, including continuing the work outlined in the **2005 Bicycle Master Plan**. The feedback from the **moveDC** public process was clear: DDOT's bicycle efforts have been appreciated. The direction for the future is more facilities, more policies, and more education, promotion, and enforcement. Each of these will be important in expanding the comfort level across the District and broadening the cyclist population.

The following section outlines recommendations from the **2005 Bicycle Master Plan** to be continued, as well as additional **moveDC** recommendations. A complete report on the status of efforts on the **2005 Bicycle Master Plan** recommendations is presented in **Appendix B.1**.

A. MORE AND BETTER BICYCLE FACILITIES

Facilities are the physical improvements to the city's bicycle infrastructure such as trails, bike lanes, and bicycle parking. **Figures B.4** through **B.9** present **moveDC**'s plan for the District's bicycle network. This plan calls for a bicycle network totaling 136 miles of bike lanes, 72 miles of protected bike lanes (cycle tracks), and 135 miles of trails during the next 25 years.

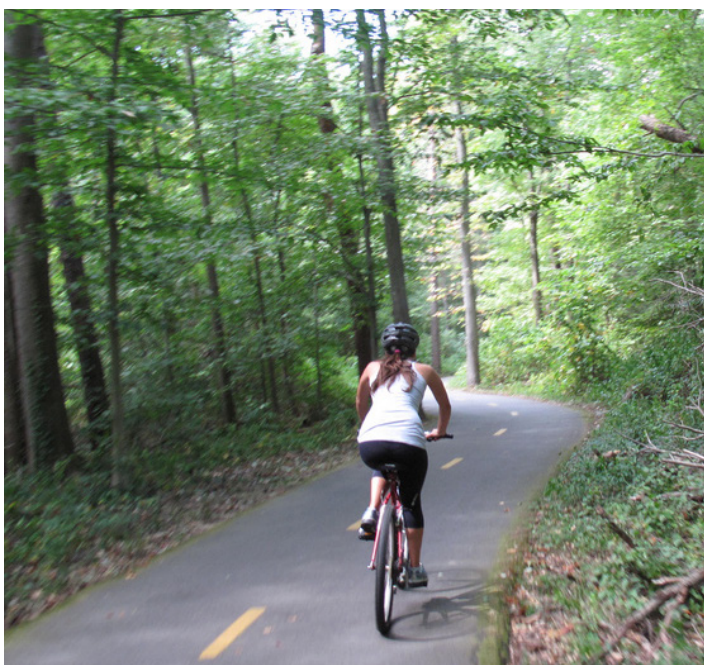
Recommendation A.1: Expand and upgrade the network of bike facilities on roadways.

The District's existing system of bike lanes should be expanded to create a comprehensive interconnected network. Continued investments in expanding and improving the District's bicycle infrastructure should focus on improving the comfort and safety of the bike network, while incorporating best practices in bicycle infrastructure (including protected bike lanes, climbing lanes, bike boxes, and bicycle signals). In addition to adding new bike facilities as stand-alone projects, bicycle facilities should be improved and maintained whenever appropriate, as streets or sidewalks are repaved or reconstructed. Bicycle projects should incorporate actuated bicycle signalization and special bicycle signals at key locations.

Recommendation A.2: Expand and upgrade the network of shared-use paths.

The District should build, upgrade, and maintain a high-quality system of off-street shared-use paths. Improvement of shared-use paths should fill the gaps in the trail system including:

- Metropolitan Branch Trail
- Anacostia River Trail
- South Capitol Street Trail
- Oxon Run Trail (upgrade and extension to the Oxon Cove Trail)
- Prince George's Connector
- Suitland Parkway Trail (upgrade and extend to the Anacostia River Trail in the District and to the Naylor Road Metrorail station)
- Rock Creek Trail between P Street and Broad Branch Road (upgrade and construct a new bridge south of the zoo tunnel)
- Mount Vernon Trail, including George Washington Parkway crossings and Memorial Bridge access
- Piney Branch Parkway Trail (construct a spur from Rock Creek Trail to Arkansas Avenue)



Biking is a beautiful way to experience trails and parks in the D.C. area

DDOT should continue to work with the D.C. Department of Parks and Recreation (DPR), Washington Metropolitan Area Transit Authority (WMATA), National Park Service (NPS), Maryland-National Capital Park and Planning Commission (M-NCPPC), Maryland Department of Transportation (MDOT), and community organizations to ensure that these trail systems realize their full potential.

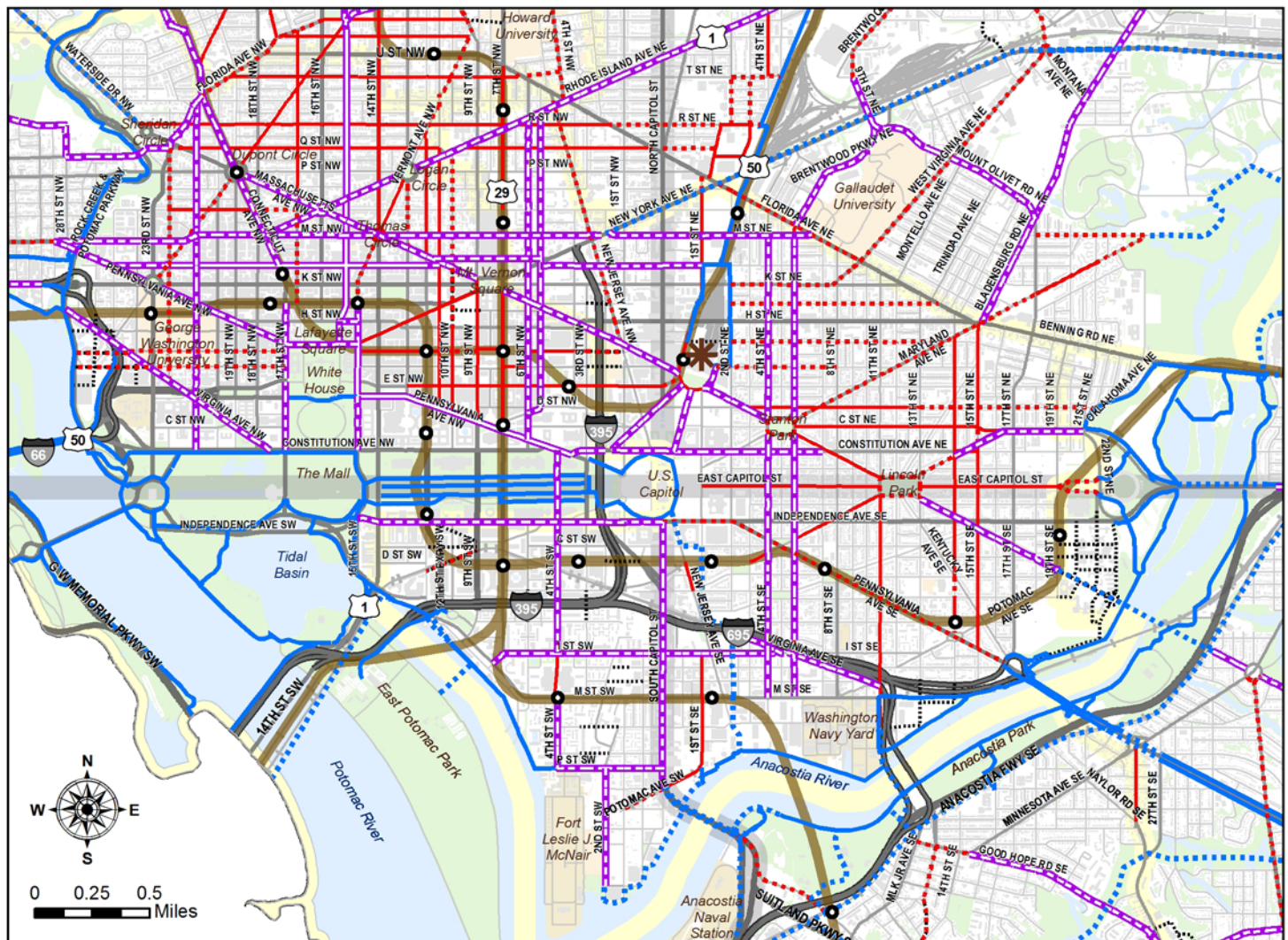
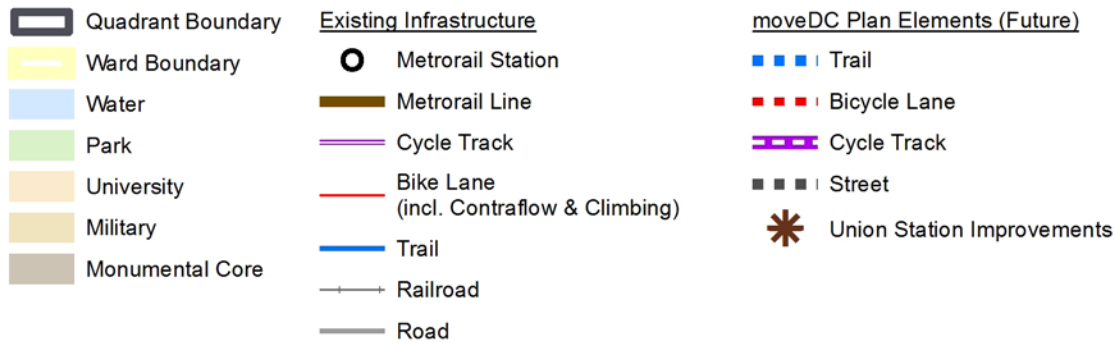
Ongoing transportation and park planning projects in the following locations should include planning for trails and bikeways to ensure that bicycle network gaps are eliminated and trail system access is enhanced:

- **Historic Anacostia:** Use right-of-way along the railroad spur and/or adjacent street for a trail to link residential neighborhoods, schools, and Metrorail stations along the east side of the Anacostia River and could be extended to St. Elizabeths
- **Georgetown Waterfront:** Develop a plan for connecting the Capital Crescent Trail to the Rock Creek Trail along the Georgetown waterfront
- **New York Avenue Corridor:** Plan for a trail connecting Mt. Vernon Square to the National Arboretum, Fort Lincoln area, and Anacostia River Trail System in Prince George's County
- **Kennedy Center/Theodore Roosevelt Bridge:** Improve trail and bicycle access around and to the Kennedy Center and the Theodore Roosevelt Bridge as part of the reconstruction projects for both entities
- **NE/NW D.C. and Military Road Crossing of Rock Creek Park:** Develop the portion of the planned Fort Circle Parks Trail between Fort Lincoln and Fort Reno as a shared use path for bicycles and pedestrians
- **Kenilworth Park/Arboretum:** Plan for a bridge and associated trails between Kenilworth Park and the National Arboretum connecting the Deanwood and Kingman Park neighborhoods. Seek an alignment and design that can be kept open beyond the Arboretum's operating hours
- **Massachusetts Avenue Bridge:** Provide bicycle access on and to the proposed bridge across the Anacostia River

FIGURE B.4 – RECOMMENDED BICYCLE NETWORK

This figure shows the recommended network of trails, cycle tracks, and bike lanes.

Legend



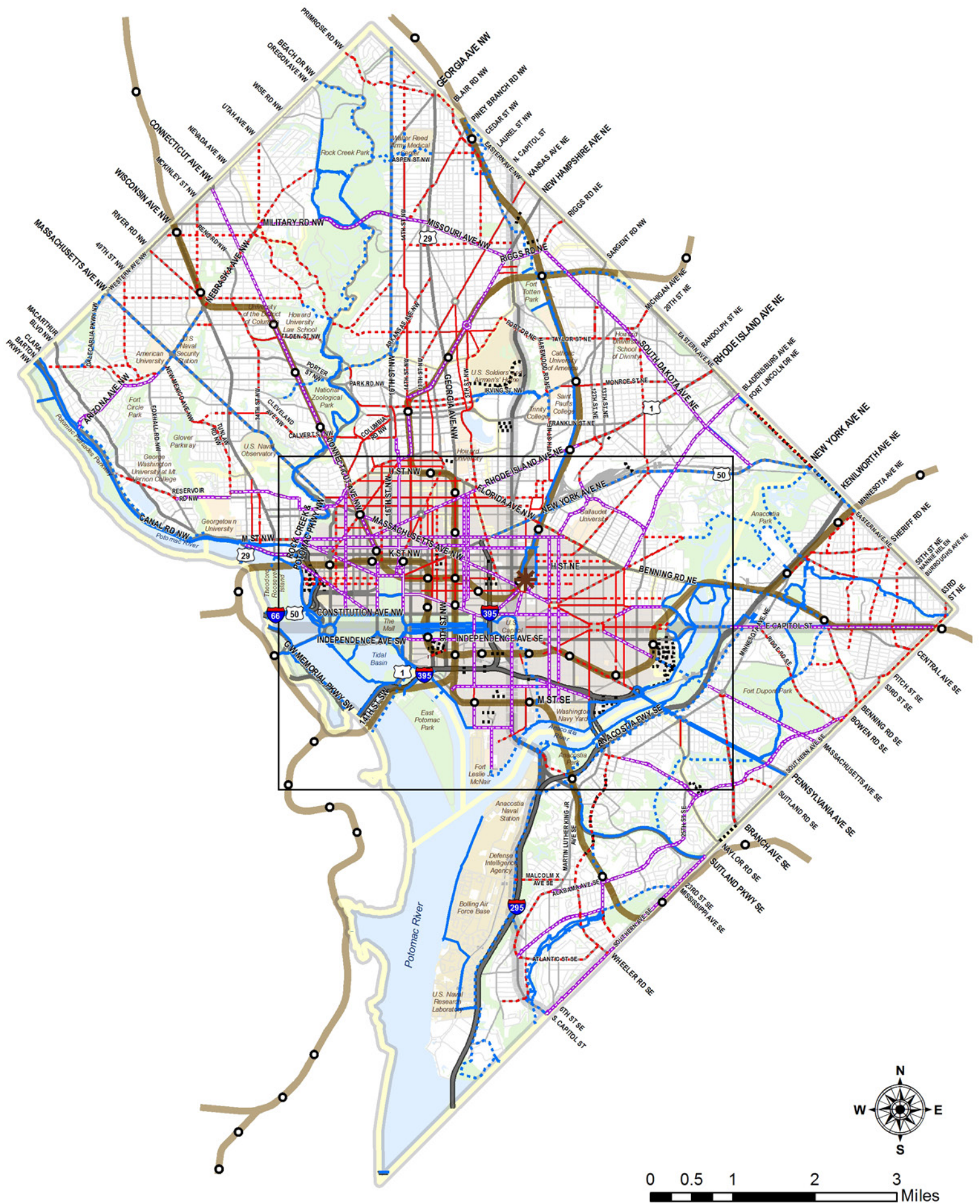
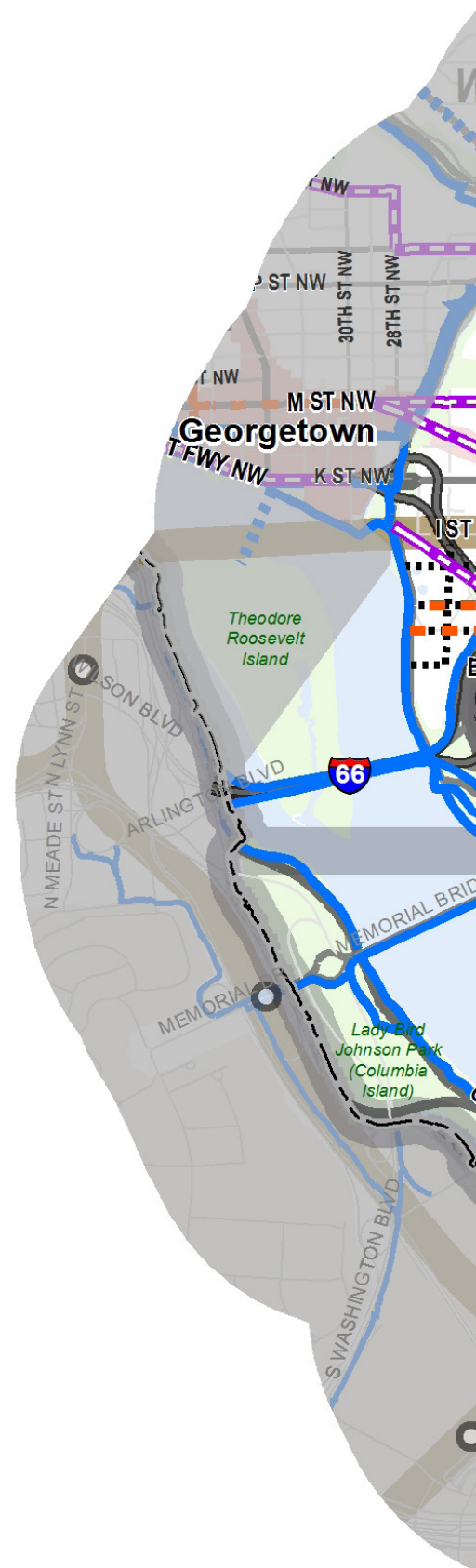


FIGURE B.5 – DOWNTOWN PLANNING AREA BICYCLE NETWORK

The **moveDC** bicycle network for the Downtown planning area includes:

- A trail connection from the Capitol to Virginia Avenue SE
- A trail along New York Avenue NW
- Trail connection along planned Long Bridge
- Crossings of I-395 (cycle tracks and new local street connections)
- Cycle tracks on a number of major routes including:
 - Portions of Constitution Avenue and Independence Avenue NW
 - Massachusetts Avenue NW
 - Pennsylvania Avenue NW, west of the White House
 - Rhode Island Avenue NW
 - Virginia Avenue NW
- North-south and east-west routes through downtown
- Special treatments for bicycle facilities at traffic circles and squares
- Additional CaBi stations throughout downtown



Legend

Existing Infrastructure

- Metrorail Station
- Metrorail Line
- Trail
- Cycle Track
- Bike Lane (incl. Contraflow & Climbing)
- Railroad
- Street



Ward Boundaries



Central Employment Area



Land Use Change Area



Mixed Use or Neighborhood Center



Multi-Neighborhood or Regional Center

moveDC Plan Elements (Future)

- Trail
- Bicycle Lane
- Cycle Track
- New Street
- ✱ Union Station Improvements

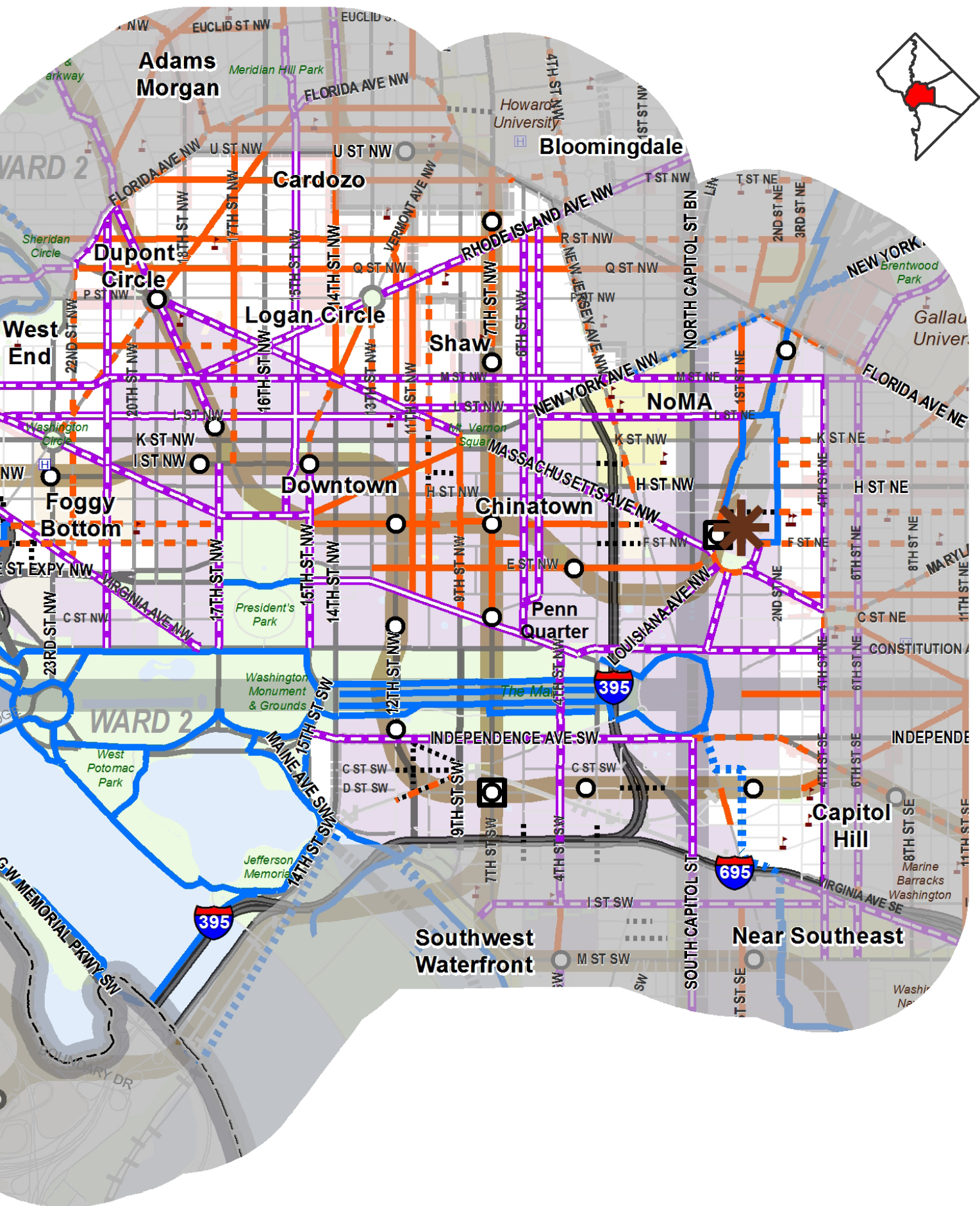
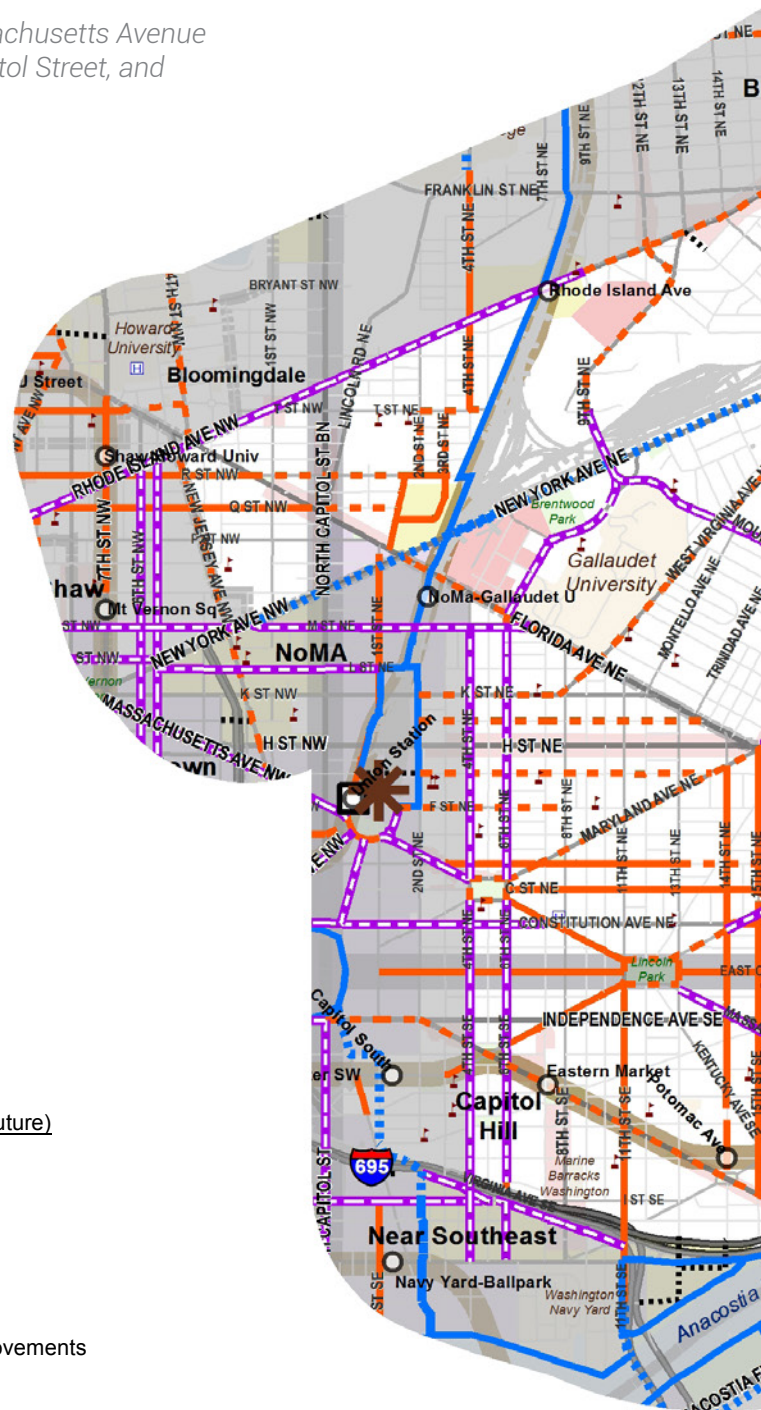


FIGURE B.6 – EASTERN PLANNING AREA BICYCLE NETWORK

The **moveDC** bicycle network for the Eastern planning area includes:

- A new bicycle and pedestrian bridge connection on Massachusetts Avenue
- Improved bicycle facilities on the Benning Road, East Capitol Street, and Pennsylvania Avenue bridges
- A new Anacostia Rail Trail along the railroad right-of-way (parallel to the Anacostia Freeway) with an on-street route extending from the end of the rail trail (East Capitol Street) to the Minnesota Avenue Metrorail station
- Improved local connectivity with reconfiguration of the Anacostia Freeway
- New trails in the vicinity of Anacostia Park including a connection to Nannie Helen Burroughs Avenue NE
- A trail along New York Avenue NW/NE
- Rhode Island Avenue NW/NE bicycle facilities
- Crossings of I-395 (cycle tracks and new local street connections)
- Cycle tracks on a number of major routes including:
 - Alabama Avenue SE
 - Bladensburg Road NE
 - East Capitol Street east of the Anacostia River
 - Massachusetts Avenue SE
 - South Dakota Avenue NE
- A number of new bicycle lanes
- Additional CaBi stations throughout the area



Legend

Existing Infrastructure

- Metrorail Station
- Metrorail Line
- Trail
- Cycle Track
- Bike Lane (incl. Contraflow & Climbing)
- Railroad
- Street

moveDC Plan Elements (Future)

- Trail
- Bicycle Lane
- Cycle Track
- New Street
- ✱ Union Station Improvements

- Ward Boundaries
- Central Employment Area
- Land Use Change Area
- Mixed Use or Neighborhood Center
- Multi-Neighborhood or Regional Center

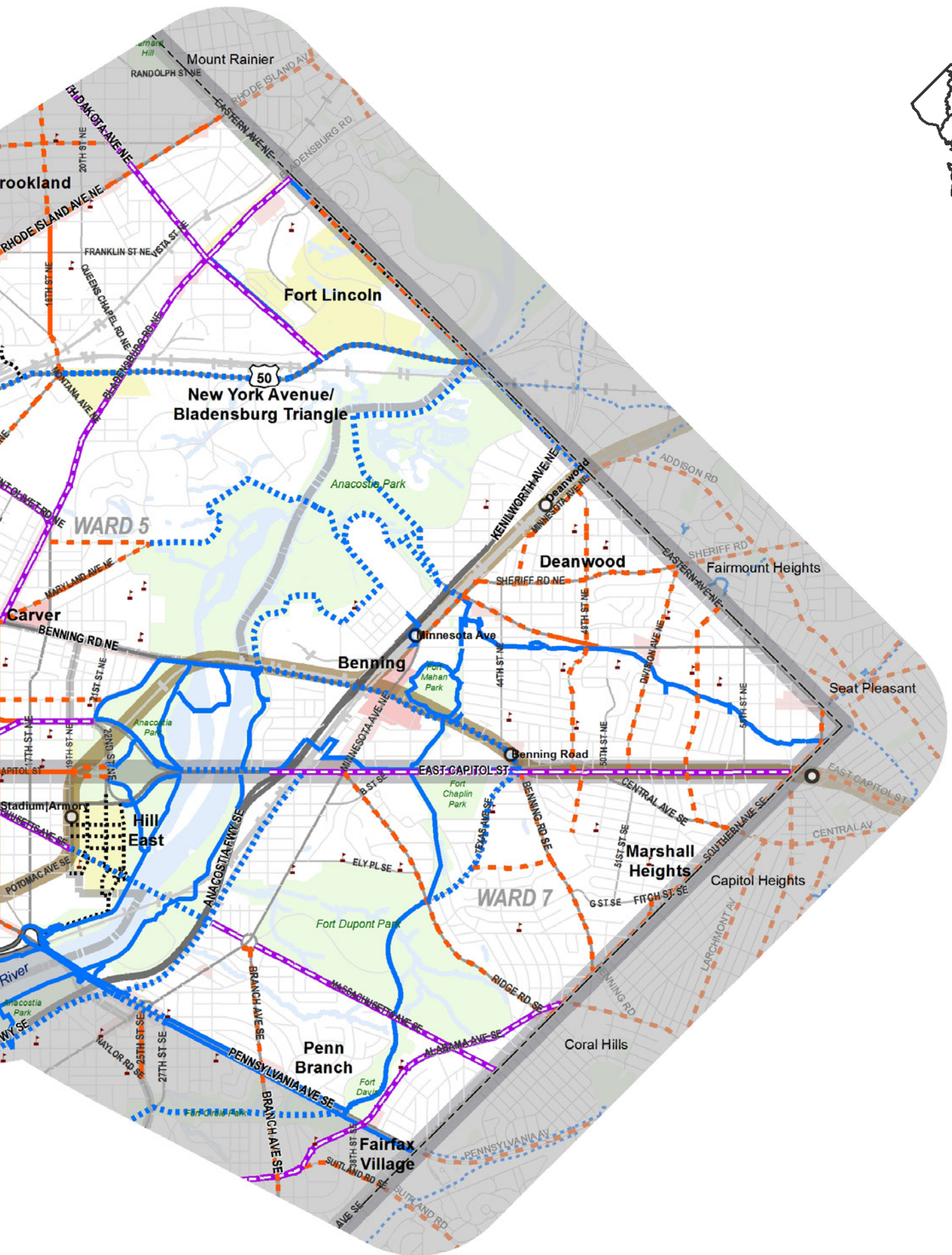


FIGURE B.7 – NORTHERN PLANNING AREA BICYCLE NETWORK

The **moveDC** bicycle network for the Northern planning area includes:

- Completion of the Metropolitan Branch Trail
- New crossings of the Rock Creek Park via a cycle track on Military Road and trails
- Rhode Island Avenue NW/NE bicycle facilities
- A trail along 16th Street NW
- A bicycle connection between Brookland and Columbia Heights
- Cycle tracks on a number of major routes including:
 - Missouri Avenue NW
 - New Hampshire Avenue NW
 - South Dakota Avenue NE
- A number of new bicycle lanes
- Additional CaBi stations throughout the area

Legend

Existing Infrastructure

- Metrorail Station
- Metrorail Line
- Trail
- Cycle Track
- Bike Lane (incl. Contraflow & Climbing)
- Railroad
- Street



Ward Boundaries



Central Employment Area



Land Use Change Area



Mixed Use or Neighborhood Center



Multi-Neighborhood or Regional Center

moveDC Plan Elements (Future)

- Trail
- Bicycle Lane
- Cycle Track
- New Street
- ✱ Union Station Improvements



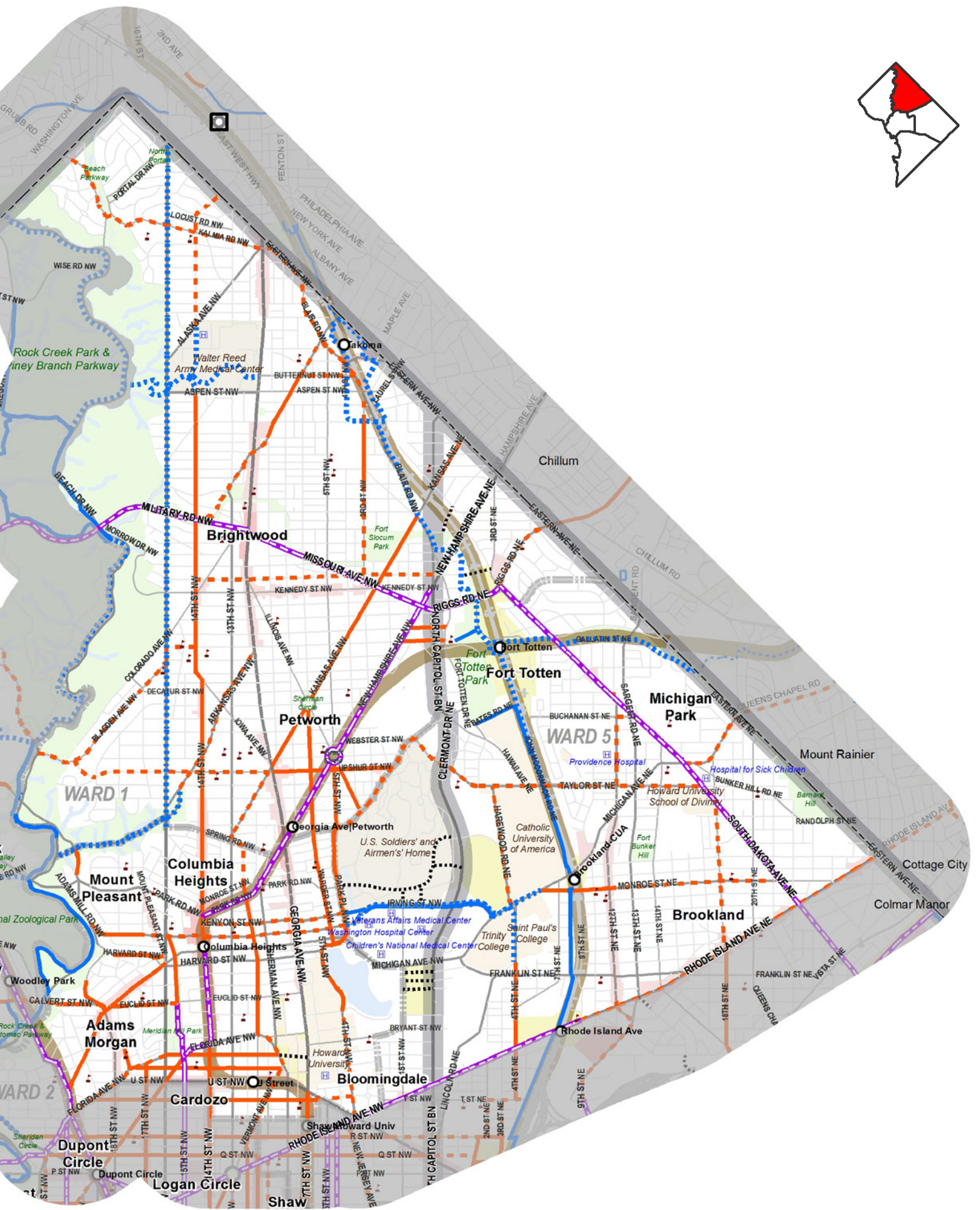


FIGURE B.8 – SOUTHERN PLANNING AREA BICYCLE NETWORK

The **moveDC** bicycle network for the Southern planning area includes:

- Improved local connectivity with reconfigurations of the Anacostia and Southeast Freeways
- Improved north-south connectivity through Fort Stanton Park and Fort Circle Park
- New crossings of the Anacostia River on the South Capitol Street Bridge and the 11th Street Bridge
- Bicycle connection from Anacostia to St. Elizabeths on 13th Street SE extension
- A trail along South Capitol Street and the Anacostia Freeway
- Trail connection along planned Long Bridge
- Cycle tracks on a number of major routes including:
 - Alabama Avenue SE
 - Good Hope Road SE
 - Mississippi Avenue SE
- A number of new bicycle lanes
- Additional CaBi stations throughout the area

Legend

Existing Infrastructure

- Metrorail Station
- Metrorail Line
- Trail
- Cycle Track
- Bike Lane (incl. Contraflow & Climbing)
- Railroad
- Street



Ward Boundaries



Central Employment Area



Land Use Change Area



Mixed Use or Neighborhood Center



Multi-Neighborhood or Regional Center

moveDC Plan Elements (Future)

- Trail
- Bicycle Lane
- Cycle Track
- New Street
- ✱ Union Station Improvements



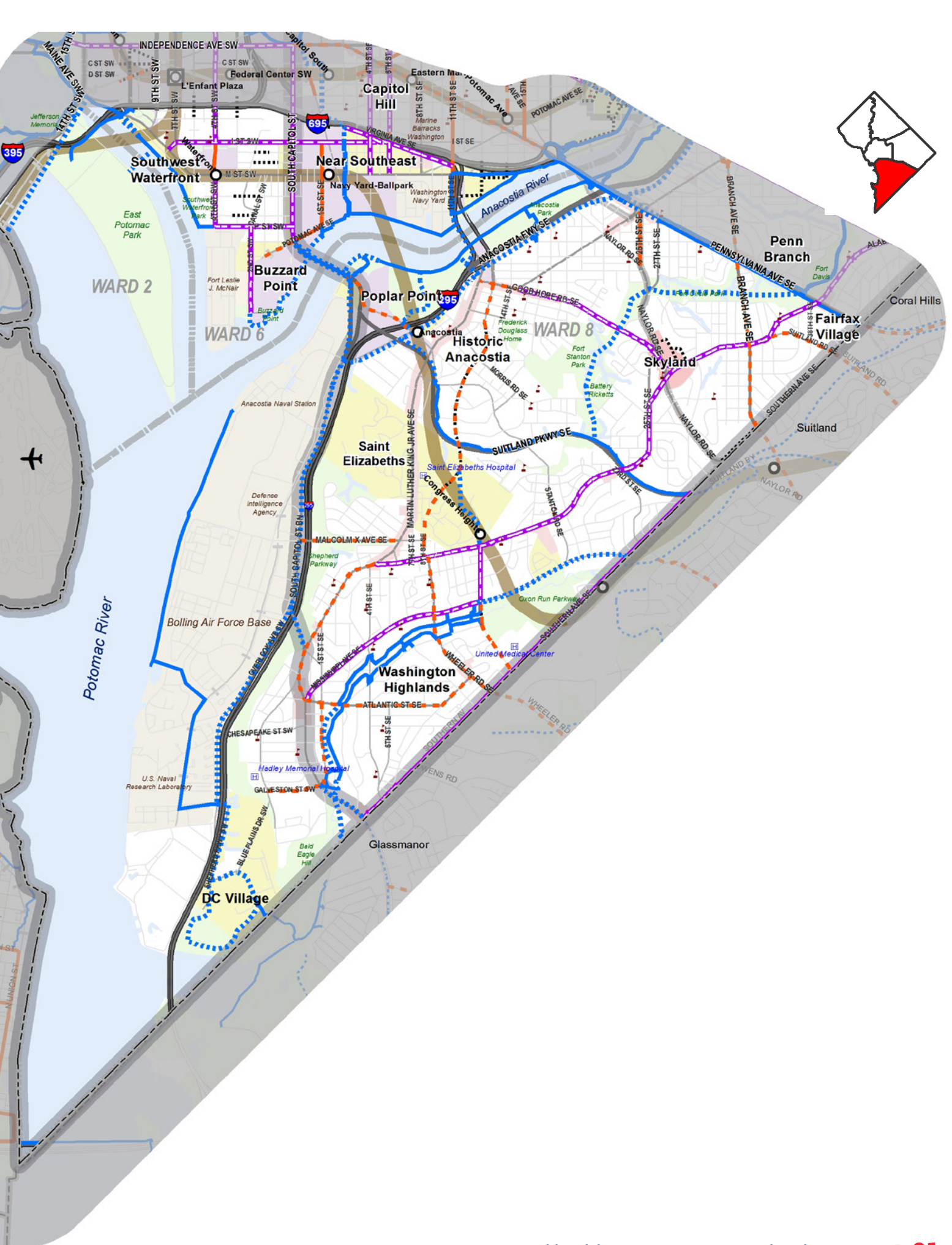


FIGURE B.9 – WESTERN PLANNING AREA BICYCLE NETWORK

The **moveDC** bicycle network for the western planning area includes:

- Improved east-west connectivity through Rock Creek Park via Military Road cycle track
- Improved north-south connectivity via bicycle facilities on Arizona Avenue and Nebraska Avenue
- Trail connection between Georgetown and Theodore Roosevelt Island
- Trails along major routes including:
 - Massachusetts Avenue NW
 - Canal Road NW
 - Beach Drive NW
- Cycle tracks on a number of major routes including:
 - Connecticut Avenue NW
 - Reservoir Road/R Street NW
 - Arizona Avenue NW
 - K Street NW in Georgetown
- A number of new bicycle lanes
- Additional CaBi stations throughout the area

Legend

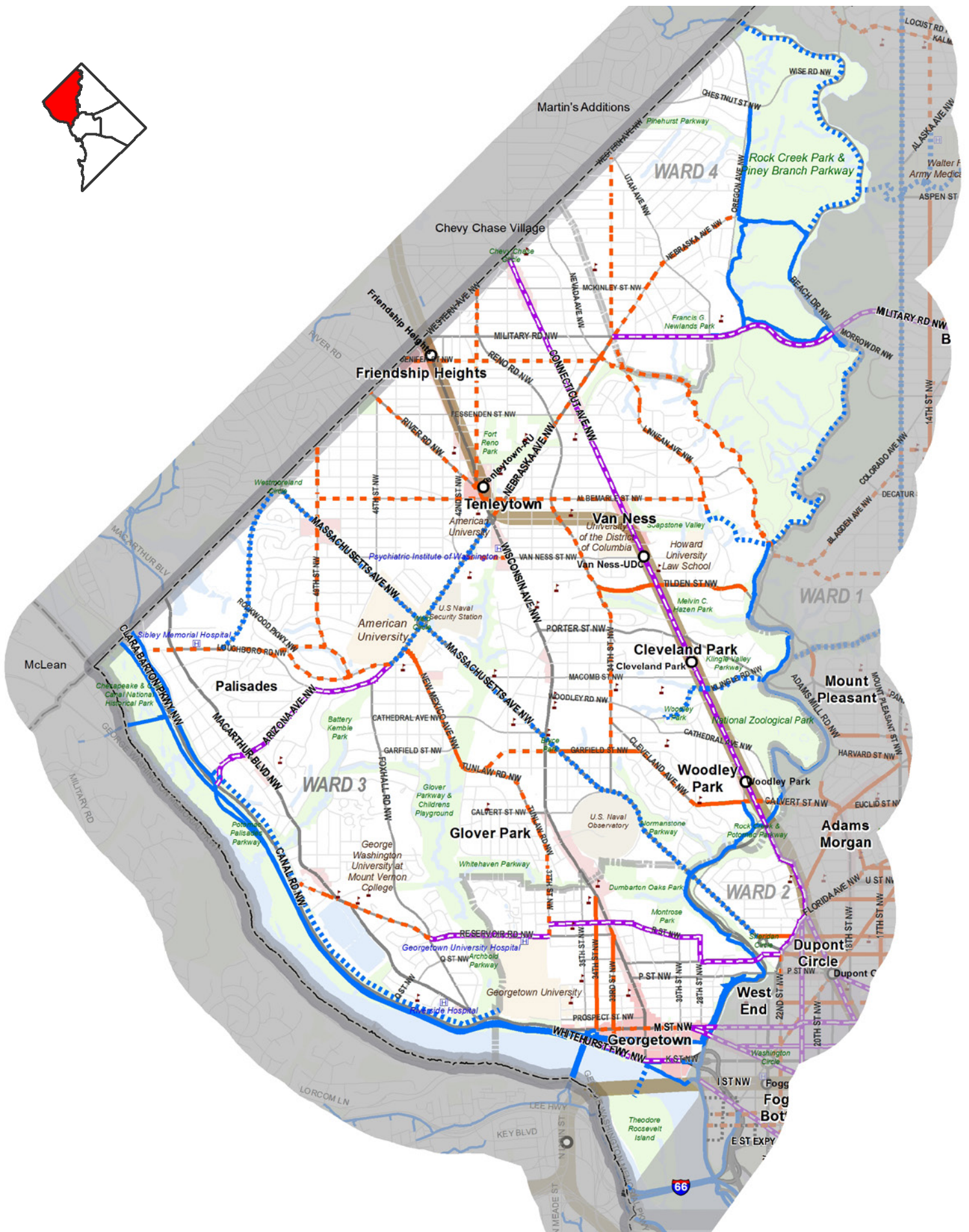
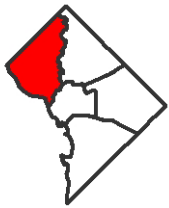
Existing Infrastructure

- Metrorail Station
- Metrorail Line
- Trail
- Cycle Track
- Bike Lane (incl. Contraflow & Climbing)
- Railroad
- Street

moveDC Plan Elements (Future)

- Trail
- Bicycle Lane
- Cycle Track
- New Street
- ✱ Union Station Improvements

- Ward Boundaries
- Central Employment Area
- Land Use Change Area
- Mixed Use or Neighborhood Center
- Multi-Neighborhood or Regional Center



Recommendation A.3: Facilitate and support development of regional and national trail routes through the District of Columbia.

DDOT and other agencies should support the D.C. sections of the following regional trails:

- *East Coast Greenway routes through the District:*
 - *Along the Metropolitan Branch Trail and Anacostia River Trail*
 - *Through the National Mall*
- *Potomac Heritage National Scenic Trail routes:*
 - *Along the Potomac River waterfront*
 - *Through the historic waterfront settlements*
 - *Along the Ft. Circle Parks route (along portions of this route hiking and bicycling paths will follow different alignments)*
- *American Discovery Trail:*
 - *Along the C&O Canal, Rock Creek Trail, and District streets*
- *U.S. Bike Routes 50 and 1*

In addition, DDOT should work with Arlington, Montgomery, and Prince George's Counties to provide bicycle connectivity throughout the region. DDOT should regularly communicate with neighboring governments about connecting and extending bike routes and facilities across jurisdictional boundaries. Signage also should reflect destinations in neighboring jurisdictions.

Recommendation A.4: Improve bridge access for bicyclists.

Access to many of the Potomac and Anacostia River bridges is difficult and should be improved. Since some bridge access points are on NPS land, DDOT should work with NPS to provide these connections. Space for bicyclists must be provided on bridge structures in protected facilities and in the roadway corridors under the structures. Where a bridge replacement project impacts other roadways, alternate bicycle access must be provided. Top priority bridge access improvements include the following:

- *Theodore Roosevelt Bridge from the Kennedy Center area and Virginia*
- *Memorial Bridge from both sides of the Potomac River*

- *14th Street Bridge from L'Enfant Plaza and the National Mall*
- *East Capitol Street Bridge from Fort Dupont*
- *Benning Road Bridge over the railroad and freeway east of the Anacostia River*
- *South Capitol Street Bridge from Historic Anacostia and Buzzard Point*

Recommendation A.5: Improve and expand signage for the bike network.

DDOT should post bike route signs along key bike network routes. These bicycle routes should have signs posted frequently and arrows that show each turn in the route clearly. The signs should have sub-plates showing the direction and distance to significant destinations on and near the route. DDOT also should explore ways to improve signage and the visibility of bike networks, including on cross streets.

Recommendation A.6: Add bicycle parking in public spaces.

DDOT should continue to add bicycle parking in public spaces. DDOT should partner with developers and Business Improvement Districts (BIDs) to increase bicycle parking facilities in public spaces throughout the District.



Bridges serve as necessary connections and should support all users



Bicycling offers a convenient way to visit the White House and the National Mall area

Recommendation A.7: Enforce bicycle parking requirements in private space.

Under District law, 5% of parking constructed for commercial buildings must be dedicated to bicycle parking.¹¹ DDOT also has advanced regulations to require multifamily housing to include off-street bicycle parking. DDOT should continue to encourage building managers and property owners to provide bicycle parking as required by these regulations.

Recommendation A.8: Expand the CaBi system.

The end state of CaBi station coverage should ensure that 75% of D.C. residents and 90% of D.C. employees are within a quarter-mile of a CaBi station. DDOT should develop standards for siting future bikeshare stations with consideration given to the following factors: accessibility, equity, environment, efficiency, economic development, and promoting bicycling as a convenient and safe travel choice.

11 DCMR 11-2119



Making neighborhoods bike friendly is a foundational step to making the city bike friendly

Recommendation A.9: Improve bicycling in the National Mall area.

DDOT should work with NPS to increase the convenience and visibility of bicycling in the National Mall area. Designating space for bicyclists is a critical part of this effort. The existing trails on the north and south sides of the Mall should be upgraded and then maintained. Upgrading these trails would allow faster-moving bicyclists to travel on the edge of the mall and avoid central areas where there are significant numbers of slow-moving pedestrians.

Important connections in the Mall area also include:

- *Trail and road crossing improvements along each side of the Tidal Basin (between the Mall and the Southwest Waterfront and between the Mall and Hains Point)*
- *Improved connections from the Rock Creek Trail and National Mall trails to the Memorial and 14th Street bridges*

These parallel trails should be complemented by other high-quality bike facilities that connect tourist destinations in the Mall area and connect the Mall to downtown, the Kennedy Center, and surrounding neighborhoods.

DDOT should work with NPS to designate major bicycle routes in the Mall area with distinctive signs and pavement markings. The signs are essential for helping direct residents and tourists to destinations in the Mall area and identifying through-routes. They also can serve to advertise bicycling as a useful mode of transportation.

Additional bike parking also is needed on the Mall. Increasing bicycling in the Mall area would extend the distance tourists could travel, allowing them to visit more sites and to access more historic and diverse neighborhoods of the District.

Recommendation A.10: Evaluate and enhance safety at sites of high concentrations of bicycle crashes.

DDOT should use its report on bicycle crashes in the District to select crash evaluation sites. Ten intersections had four or more bicycle crashes during the 3-year crash analysis period between 2010 and 2012. DDOT should choose one to three locations per year to evaluate, starting with the following (locations of most crashes in the 3-year period that are not under construction):

- 14th Street and Columbia Road NW
- 14th Street and V Street NW
- 16th Street and New Hampshire Avenue NW (design complete)

This list of intersections should be revised and reprioritized periodically as locations are improved, intersection audits are completed, and crash reports are analyzed.

Recommendation A.11: Improve bicycle access through complex intersections.

The District should improve bicycle access at complex intersections, such as traffic circles and six-way intersections. While all intersections should be safe and convenient for bicyclists, the following intersections have complicated traffic patterns and are key locations on the recommended network:

- New York Avenue intersections with Florida Avenue, Montana Avenue, and Bladensburg Road NE
- L'Enfant Square SE (intersection of Pennsylvania and Minnesota Avenues SE)
- Tenley Circle NW

Recommendation A.12: Provide neighborhood bikeways to facilitate bicycle access within neighborhoods.

DDOT should expand neighborhood bikeways. These bikeways are intended to expand and connect the citywide bicycle network along low-volume and low-speed streets that have been optimized for bicycle travel within neighborhoods, connecting to neighborhood destinations and to higher level bicycle facilities. Neighborhood bikeways are routes that are welcoming to cyclists of all levels (from children to families to bicycle commuters). They use treatments such as traffic calming, wayfinding signage, and pavement markings to enhance the cycling experience and reinforce their status as bicycle-friendly corridors with motorists.

Recommendation A.13: Increase bike access through areas with limited connections.

DDOT should provide safe and convenient bike connections through areas that are barriers to cyclists. Barriers include freeways, railroad and highway grade separations, roads with heavy vehicle traffic, and other impediments to bicycle travel. Potential solutions include new street connections, bridges, or underpasses.

Several institutions in the District are not open to public traffic. There may be opportunities to provide bikeway connections through and across some of these institutions if and when they undergo change. Beyond bicycle infrastructure proposed in earlier recommendations, DDOT should concentrate on improving accommodation for bicyclists in the following barrier areas as opportunities arise:

- Corridors
 - Anacostia Freeway and railroad corridor
 - South Capitol Street corridor
 - I-395 corridor
 - North Capitol Street corridor
- Areas
 - Kennedy Center

- Washington Hospital Center
- Rock Creek Park
- New York Avenue/New Jersey Avenue/I-395 Tunnel
- Columbia Heights Metrorail station
- Cleveland Park Metrorail station
- Minnesota Avenue Metrorail station
- Benning Road Metrorail station
- Fort Totten Metrorail station
- Anacostia Metrorail station
- Lincoln Memorial
- L'Enfant Plaza
- Union Station/Columbus Circle area
- Institutions
 - U. S. Capitol Complex
 - U. S. Soldiers and Airmens Home
 - Naval Observatory and Dumbarton Oaks Park
 - National Arboretum (streets are closed before 8 a.m. and after 5 p.m.)
 - Bolling Air Force Base and Anacostia Naval Station
 - St. Elizabeths campus
 - Navy Yard
 - Yards Park



Bike-friendly public transit can improve the viability of biking as a transportation option

Typical Bicycle Treatments and Signals

Different types of facilities will be needed to provide safe and comfortable accommodation for bicyclists in the District's bicycle network. This is a short list of common types of bike facilities. Specific design guidelines for these and other bike facilities are provided in the District of Columbia *Bicycle Facility Design Guidelines*. When designing these facilities, it is important to make accommodations for emergency vehicles to operate safely and efficiently.

- **1. Shared Roadways:** Shared roadways are streets and roads where bicyclists share the travel lanes with motor vehicles. Usually, these are streets with low traffic volumes and/or low speeds, which do not need special bicycle accommodations in order to be bicycle friendly. Shared roadways also can include streets with wide outside lanes (13 to 14 feet). Increasing the outside lane width increases comfort for bicyclists and allows for passing. In the District, all streets are shared roadways, except freeways.



- **2. Signed-Shared Roadways and Neighborhood Bikeways:** A signed-shared roadway is a roadway that uses sign to show the roadway is a preferred route for bicycle use. Bike route signs can be posted on key routes to indicate to bicyclists that particular advantages exist to using these routes compared with alternative routes. This type of facility may also include pavement symbols to help direct bicyclists. An example of a signed-shared roadway is a neighborhood bikeway, specifically a low-volume and low-speed street that has been optimized for bicycle travel through treatments such as traffic calming, wayfinding signage, and pavement markings.



- **3. Shared Lane Markings:** A shared lane marking ("sharrow") is a pavement marking installed on streets too narrow for conventional bike lanes.¹ The sharrow is usually installed 11 feet from the curb, or approximately 4 feet from parked cars. It is intended to alert motorists to share the road with bicyclists, and conveys that the street is a preferred bike route.



- **4. Bike Lanes:** A bike lane is a portion of the roadway that has been designated by pavement markings for the use of bicyclists. In most cases, bike lanes are located on both sides of the road (except one-way streets), and carry bicyclists in the same direction as adjacent motor vehicle traffic. The minimum width for a bicycle lane is 5 feet.



- **5. Protected Bicycle Lanes/Cycle Tracks:** A protected bike lane (or a cycle track) is an exclusive bike facility that is physically separated from motor traffic and is distinct from the sidewalk for the exclusive use of bicycles, which provides an extra sense of security for both cyclists and drivers.² Cycle tracks are not all the same and can have a variety of characteristics in different combinations. Cycle tracks may be one-way or two, at street level, sidewalk level or somewhere



¹ www.sfmta.com/cms/uploadedfiles/dpt/bike/Bike_Plan/Shared%20Lane%20Marking%20Full%20Report-052404.pdf

² National Association of City Transportation Officials (NACTO), "Cycle Tracks". Urban Bikeway Design Guide

in between. When at street level, cyclists are protected by physical structures such as curbs, bollards or medians. In situations where on-street parking is allowed, cycle tracks are located to the curb-side of the parking (in contrast to bike lanes), with the parked vehicles acting as a buffer.

- **6. Shared-Use Pathways/Multi-Use Trails:** Shared-use pathways (multi-use trails) provide a high-quality walking and bicycling experience in an environment that provides separation from traffic. Shared-use paths should be a minimum of 10 feet wide and paved. These types of paths can be constructed within a roadway corridor right-of-way, in their own corridor (such as a greenway trail or rail-trail), or be a combination of both. In some cases, there is a need for shared-use paths in addition to bike lanes on busy streets. Shared-use paths should not be used to preclude on-road bicycling but rather to supplement a system of on-road bicycle facilities for less experienced cyclists.



- **7. Bike-Friendly Traffic Calming:** Slowing motor vehicle speeds helps improve the BLOS of a road. Traffic circles and landscape medians are examples of facilities that can be added to a roadway to slow motor vehicles. Bike lanes and shoulders can also calm traffic when outside edge-lines are used to narrow the motor vehicle lanes.



- **8. Bike Boxes at Intersections:** Bike boxes are installed to allow bicyclists to move in front of cars waiting at an intersection to increase their visibility and reduce conflicts with turning vehicles. They are typically used at intersections with left-turning cyclists and/or right-turning vehicles. It employs an advanced stop bar at a signalized intersection, creating a 10-foot to 15-foot long area between the crosswalk and the stop bar. During a red signal phase, bicyclists are able to better position themselves for a turn by moving left across the bike box. This device is profiled in the Institute of Transportation Engineers *Innovative Bicycle Treatments* report, and has been tested in several cities around the country.



- **9. Two-Stage Turn Queue Boxes:** Two-stage turn queue boxes consist of a bike box at the far side of an intersection (and perpendicular vehicle lanes), where bicyclists may then turn and then be travelling in the same direction as vehicle traffic.³ Two-stage turn queue boxes eliminate the need for bicyclists to turn across moving general purpose lanes and offer bicyclists a safe way to make left turns at multilane signalized intersections from a right-side cycle track or bike lane, or right turns from a left-side cycle track or bike lane.



- **10. Bicycle Signals:** Bicycle signals are traditional three-lens signal heads with green, yellow, and red bicycle stenciled lenses that can be employed at standard signalized intersections and Hybrid Signal crossings.⁴ Flashing amber warning beacons are used at unsignalized intersection crossings. Push buttons, signage, and pavement markings may be used to highlight these facilities for both bicyclists and motorists.



³ www.nacto.org/cities-for-cycling/design-guide/intersection-treatments/two-stage-turn-queue-boxes/

⁴ www.nacto.org/cities-for-cycling/design-guide/bicycle-signals/

Recommendation A.14: Provide safe transitions between on-road and separated bicycle facilities.

DDOT should identify points where safe transitions are needed to move bicyclists from on-road to separated bike facilities. These points should have prominent pavement markings that direct cyclists through the transition and alert drivers to an approaching change in the travelway.

Recommendation A.15: Improve bicycle access to public transportation.

Most Metrorail stations have bicycle lockers and/or racks for bicyclists. As the Metrorail system and bicycle network expand, more and better bike parking should be provided. Providing lighted bicycle parking along with a canopy over the parking to protect bikes from the elements can help achieve this. In addition, clear signage should be provided at stations to direct cyclists to bike parking and nearby bikeways.

DDOT should work with WMATA to improve bicycle facilities on and near Metrorail station properties. Improving the quality of bicycling to Metrorail stations increases the catchment area for attracting riders and decreases the need for automobile pick-up, drop-off, and parking. All future public transportation improvements in the District, such as streetcar and bus rapid transit, must be designed to be compatible with bicycling.

Recommendation A.16: Develop a procedure for maintaining all bicycle facilities.

DDOT, the Department of Public Works (DPW), and other agencies should create a schedule for street and trail sweeping, landscape maintenance, repaving, restriping, and snow removal. DDOT also should ensure that the schedule is followed by the agency or group of agencies responsible for maintenance. DDOT should work with DPW on street sweeping for the bicycle network. DDOT should work with NPS to ensure that all NPS trails are maintained. DDOT should work with existing BIDs on bicycle facility maintenance.

B. ENACT MORE BICYCLE-FRIENDLY POLICIES**Recommendation B.1: Use BLOS as a way to measure and prioritize bicycle investments on District streets.**

DDOT should seek to improve at least one letter grade of BLOS for 1% of District lane miles per year, prioritizing streets currently operating at BLOS E or F.¹²

Recommendation B.2: Update District laws, regulations, and policy documents to address bicycle accommodation.

Some current laws, regulations, and policies regarding bicycles are outdated and do not reflect current bicycle safety requirements or needs. One example of an update to be considered is the Idaho Stop, a law under which cyclists are permitted to treat a stop sign as a yield sign and a red light as a stop sign. Changes should be made to the District's **Comprehensive Plan** (District of Columbia Municipal Regulations [DCMR] Title 10), **Zoning Ordinance** (DCMR Title 11), **Traffic and Parking Regulations** (DCMR Title 18), **Open Space and Safety Regulations** (DCMR Title 24), and the DDOT **Design and Engineering Manual**. Coordination of all bicycle planning should occur throughout relevant District agencies, including the Office of Planning (OP), Department of Parks and Recreation (DPR), District Department of the Environment (DDOE), Department of General Services (DGS), and Metropolitan Police Department (MPD).

Recommendation B.3: Provide training to District staff and consultants.

Implementing the recommendations in the **moveDC** plan requires that District staff and consultants be familiar with bicycle issues and the plan's recommendations. The Bicycle Program office should hold regular trainings on **moveDC** and on bicycle facility planning, design, operations and maintenance. Training sessions should be conducted for DDOT, DDOT consultants, OP, DPW, NPS, and MPD, as necessary.

¹² Bicycle Level of Service (BLOS) assesses bicyclists' perceived safety and comfort with respect to motor vehicle traffic. The BLOS model evaluates bicycling suitability based on roadway width, bicycle lane widths, traffic volume, pavement surface conditions, vehicle speeds, and on-street parking. For additional information, see Appendix B-2.



Part of Union Station's multimodal hub, Bikestation Washington D.C. offers bike parking, rentals, and repairs

Recommendation B.4: Review all District of Columbia projects to ensure that they provide bicycle accommodation.

DDOT should review land development and transportation projects and studies to ensure that bicycles are accommodated. These projects can provide key bicycle connections or create significant barriers to bicycle travel. For common bicycle facility projects, DDOT should streamline the design and review process. Bicycle Program staff should review projects early in the process to increase understanding of bicycle issues among different groups working on all stages of each project.

DDOT should adopt a standard Bicycle Checklist to ensure that all transportation projects in the District accommodate bicycle transportation. This Bicycle Checklist could be included in the forthcoming (2014) update of the DDOT **Design and Engineering Manual**. Bicycle considerations should be included from the planning and scoping to design and construction of all projects.

In addition, all agencies and consultants of the District government should consider bicycle issues in the scoping and review of all projects. Distributing responsibility to address bicycle needs throughout all District agencies will allow the Bicycle Program manager to influence projects during their initial conception and to consider long-range bicycle planning needs. This can be achieved by educating other agency staff and consultants about the **Bicycle Element** of the **moveDC** plan and about the principles of bicycle planning and design.

Recommendation B.5: Report regularly on Bicycle Master Plan implementation.

DDOT should prepare annual reports on bicycle crashes and bicycle facility mileage in the District. Bicycle trips should be included when census data is available, and should be included if DDOT or another agency implements a travel survey in the District. The Bicycle Advisory Council may help establish milestones for progress on **moveDC** recommendations, which

also may be addressed in the annual reports.¹³ These reports should be available on the Bicycle Program web page.

Recommendation B.6: Improve bicycle crash reporting procedures.

DDOT should work with MPD and the U.S. Park Police to report bicycle crashes more accurately. National studies show that less than half of all bicycle collisions with vehicles are reported to the police or in another official manner. Underreporting causes crash trends to be missed by the police and not included in DDOT safety initiatives. DDOT should assist MPD in improving the process for reporting bicycle crashes.

Recommendation B.7: Collect more data on bicycle use and bicycle facilities.

DDOT should collect more data on bicycle use and facilities in the District. Better data can be used in annual reports, demonstrate the effects of the Bicycle Program, and justify budget allocations for bicycle transportation. The following types of data should be considered:

- *Bicycle counts on trails and streets (manual and automated)*
- *On- and off-road bicycle facility characteristics*
- *Counts and behavioral observations before and after a bike facility is installed*
- *Neighborhood travel diaries or Districtwide surveys to find information about all types of bicycle trips*

DDOT should conduct research (including surveys) to determine opinions of bicycling in the District.

¹³ The District of Columbia Bicycle Advisory Council (BAC) is a body established by law (D.C. Code Section 50-1604) to advise the Mayor and District agencies on matters pertaining to bicycling in the District, and to make recommendations to the District's Bicycle Coordinator on the budget and focus and implementation of the District's Comprehensive Bicycle Transportation and Safety Program

Recommendation B.8: Continue to provide adequate agency training and staff to implement bicycling.

DDOT should continue to support the Bicycle Program Office.¹⁴ DDOT should explore assigning a designated bicycle specialist in each administration.

Recommendation B.9: Reevaluate regulations on sidewalk riding to address conflicts in high-volume pedestrian corridors.

DDOT should reevaluate where the use of sidewalks by bicycles can be permitted. In evaluating where to allow the use of sidewalks by bicyclists, the following should be considered:

- Low BLOS on adjacent streets (BLOS of D, E, or F)
- Sidewalk width of at least 6 feet in residential districts or 8 feet in commercial districts
- Limited right-of-way, especially in the traveled way of the street
- Limited (or non-existent) cross street and driveway cuts
- High degree of visibility of sidewalks, especially from intersecting streets and median breaks

Even when bicycles are permitted to be ridden on sidewalks, bicyclists should observe a 5 mph speed limit, yield right-of-way to any pedestrian, and give an audible signal (such as ringing a

bell) before overtaking and passing a pedestrian. Appropriate signage should indicate where bicycles are permitted to ride on sidewalks.

Recommendation B.10: Allow bicycles to travel in some separated bus lanes where service runs at medium headways and the roadway is of a moderate grade.

The moveDC plan recommends many miles of dedicated transit lanes. While not ideal as bike facilities, the accommodation of cyclists should be considered when designing transit priority streets and dedicated transit lanes. Whenever possible, physically separated transit lanes should be at least 14 feet wide to accommodate buses and bicyclists passing each other. While these streets and lanes will have high-frequency transit service, there will still be additional capacity which can be used by bicycles.

The highest priority for dedicated transit lanes should be transit. Bicycles should not be able to use these lanes when transit frequency increases to more than one bus every 3 minutes or when the street has a grade (hill) of enough significance and/or length to slow bicyclists considerably, negatively impacting the transit operation.

C. PROVIDE MORE BICYCLE-RELATED EDUCATION, PROMOTION, AND ENFORCEMENT

Recommendation C.1: Educate bicyclists about safe bicycling.

The District should educate bicyclists about traffic safety and compliance with applicable laws. Materials should emphasize helmet use and obeying traffic laws. DDOT should partner with advocacy groups and MPD to expand messaging and better educate members on bicycle safety.

Recommendation C.2: Educate motorists about safe operating behavior around bicyclists.

The District should educate motorists about bicycle safety through media campaigns, driver's tests, and the distribution of written materials. DDOT also should directly engage taxi cab, bus, and truck drivers about safe driving behavior around bicycles. DDOT should work with the D.C. Department of Motor Vehicles (DMV) to incorporate safe driving behavior around

¹⁴ The Office of Bicycle Transportation and Safety must have at least three staff members (D.C. Code, Section 50-1603)



bicyclists on the knowledge and road skills tests for obtaining a driver's license.

Recommendation C.3: Enforce traffic laws related to bicycling.

DDOT should assist MPD with the enforcement of laws related to bicyclist and motorist behavior. MPD should target unsafe bicycling practices such as red light running, wrong-way riding, and riding on downtown sidewalks. They also should target motorists who speed, run red lights, and pass too close to bicyclists. MPD, DDOT, and DPW should ticket and tow vehicles that park in bicycle lanes.

Recommendation C.4: Continue the District's Safe Routes to Schools program.

In 2002, DDOT launched a youth pedestrian and bicycle safety project that became the education piece of the Safe Routes to School program. The program now reaches thousands of children in about 20 schools every year. The DDOT contractor maintains a cargo van containing bikes, helmets, and all materials necessary for delivery of the program. Contractor staff schedule and teach classes in District elementary and middle schools during the school year and at community events in the summer months.

This program should be evaluated and expanded. Supporting efforts also should be undertaken by DPR. Efforts to encourage bicycling to school should continue to be complemented by a program to improve the safety of the routes students take to school.

Recommendation C.5: Expand distribution of the Washington, D.C. Bicycle Map.

DDOT should expand distribution of the Washington, D.C. Bicycle Map to a wider audience and ensure the map is easily available for residents and visitors to obtain. DDOT should expand distribution of the bicycle maps with the help of local partners, tourism organizations, and bicycle-friendly retailers or destinations. The bicycle map should be made available in public locations citywide, including public libraries and recreation centers. It should also be included in the multimodal transportation resources made available to District visitors, retailers, universities, and employers.

Recommendation C.6: Incorporate bicycling into the District's Transportation Demand Management (TDM) program.

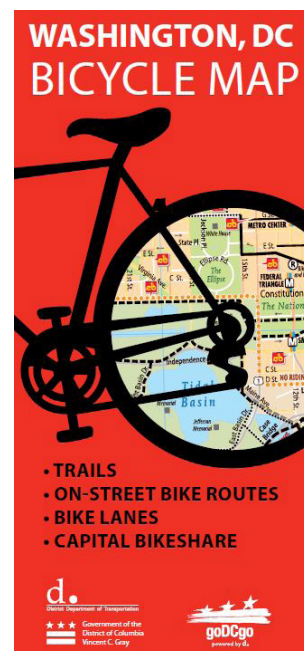
In 2006, DDOT launched **goDCgo**, a comprehensive marketing program aimed at employers and employees to encourage sustainable commuting and to help meet the region's air quality goals. Bicycle transportation is a key part of the program, which has now expanded to residential properties and universities. DDOT should continue to expand the **goDCgo** program and its bicycle message, including conducting targeted outreach on bicycling.

Recommendation C.7: Increase the visibility of bicycling in the District government and encourage bicycle commuting.

DDOT should continue to support Bike to Work Day, promote bicycle-friendly D.C. government worksites, and encourage use of bicycle transportation among city service providers, such as police, parking enforcement agents, and building inspectors. These actions will set a positive example for District residents.

DDOT should continue to encourage District employees to bike to work. DDOT and DGS should make sure all D.C. government offices have adequate bike parking. Encouragement efforts could be expanded to offer monetary incentives to employees who ride to work, provide a financial benefit for District employees who bicycle to work, making bicycles available during the day for bicycling to meetings, and providing shower facilities in buildings.

Expanding the **Bike to Work** program for District government would make the program easier to market to other employers. District agencies could boost their efforts by creating a Bike to Work Day competition. The agency with the highest number of employees bicycling to work could receive an award.



DDOT also should explore providing CaBi membership to all District employees and incentivize use of CaBi instead of the District vehicle fleet.

DDOT should also continue to maintain the District **Bicycle Program** web page on its website. Additions to this page should include up to date information on plans and activities.

Recommendation C.8: Inform residents about bicycle transportation opportunities on an individual basis.

DDOT should work with MWCOC and WMATA to provide tailored marketing of alternative transportation, including bicycling, to individuals.

Known as **TravelSmart** the program works by sending letters to all homes in a specific neighborhood.¹⁵ These letters would ask residents to respond if they were interested in having a specially-trained representative show them how to make one of their typical trips by bicycle. Program representatives or bicycling advocacy group members would come to the resident's home or workplace to ride with the resident on their bicycle trip. This program could be an extension of MWCOC's existing **Commuter Connections** program.

Recommendation C.9: Continue to market the District as an "Active Vacation Destination."

DDOT should continue to work with local tourism and hospitality stakeholders to market the District as an "Active Vacation Destination." Bicycle transportation for visitors can be promoted by:

- *Distributing the Washington, D.C. Bicycle Map to all tourism organizations*
- *Encouraging tourism organizations to distribute the Washington, D.C. Bicycle Map*
- *Offering CaBi information and passes*

Bicycling offers a wide range of personal and societal benefits that go far beyond transportation. These include individual health, economic development, and community security. DDOT should partner with colleague agencies and organizations to

maximize awareness of these benefits. DDOT should work with the following agencies:

- *D.C. Department of Health (DOH) and area hospitals to promote bicycling as part of the effort to prevent obesity, diabetes, heart disease, and cardiovascular disease.*
- *Office of the Deputy Mayor for Planning and Economic Development and the D.C. Chamber of Commerce to quantify the value of bicycle accessibility as an economic advantage for D.C. businesses.*
- *MPD to promote bicyclists as "eyes on the street" to increase neighborhood security.*

Recommendation C.10: Support bike rides and events in the District.

The District currently has several major bicycle events, including Bike DC and Bike to Work Day. Each of these events draws thousands of participants.

The District government should continue to support these and other bicycling events in the city. Support can be provided through DDOT and MPD. Advocacy groups and business organizations also can help rally the community behind these events.

¹⁵ www.transport.vic.gov.au/projects/travelsmart

IV. Performance

The **moveDC** plan's recommendations are intended to support and accelerate the bicycle success the District has begun to enjoy in the last decade. The recommendations address policy, education, projects, and programs. **moveDC** plan goals (described in **Chapter 1**) were used in the evaluation of the **Bicycle Element's** performance, similar to the evaluation of the other **Modal Elements**.

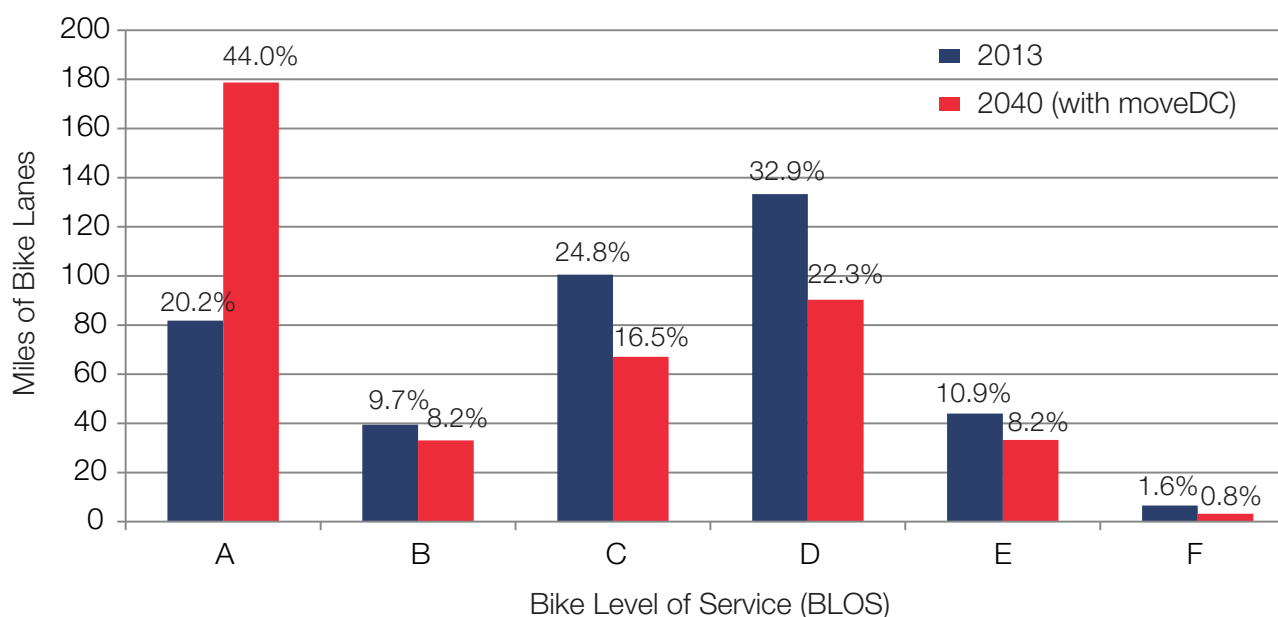
moveDC recommends 213 additional miles of bicycle infrastructure. The objective of the ultimate system is to provide a significant network so that bicycling is not a secondary mode, but a principal and preferred mode for travel. **Figure B.10** shows coverage to population of the network Districtwide. The recommended bicycle network was analyzed to determine anticipated BLOS. **Figure B.11** shows the anticipated BLOS with implementation of the recommended bicycle network. Implementation of the **moveDC** bicycle network will improve 25% of arterial and collector centerline miles by at least one letter grade, resulting in 92% of centerline miles operating at BLOS A to D, and less than 1% operating at BLOS F (**Table B.3**).

The Districtwide Travel Demand Model, the project's spatial analysis model, and qualitative reviews were used to develop the metrics for the performance measures relevant to the **Bicycle Element**. The **Bicycle Element's** overall performance—by relevant goal category—is summarized in **Table B.4**

What is BLOS?

Bicycle Level of Service (BLOS) assesses bicyclists' perceived safety and comfort with respect to motor vehicle traffic while traveling along collector and arterial streets in the District. The BLOS model evaluates bicycling suitability, based on roadway width, bicycle lane widths, traffic volume, pavement surface conditions, vehicle speeds, and on-street parking, and assigns a letter grade ranging from A (excellent) to F (poor). See **Appendix B-2** for more information.

Table B.3: Districtwide Bicycle Level of Service (2013 and 2040 with moveDC)



Note: Percentages for each BLOS correspond to the portion of the entire system for the year noted

FIGURE B.10 — COVERAGE OF THE RECOMMENDED BICYCLE NETWORK WITHIN A 2-MINUTE BIKE RIDE

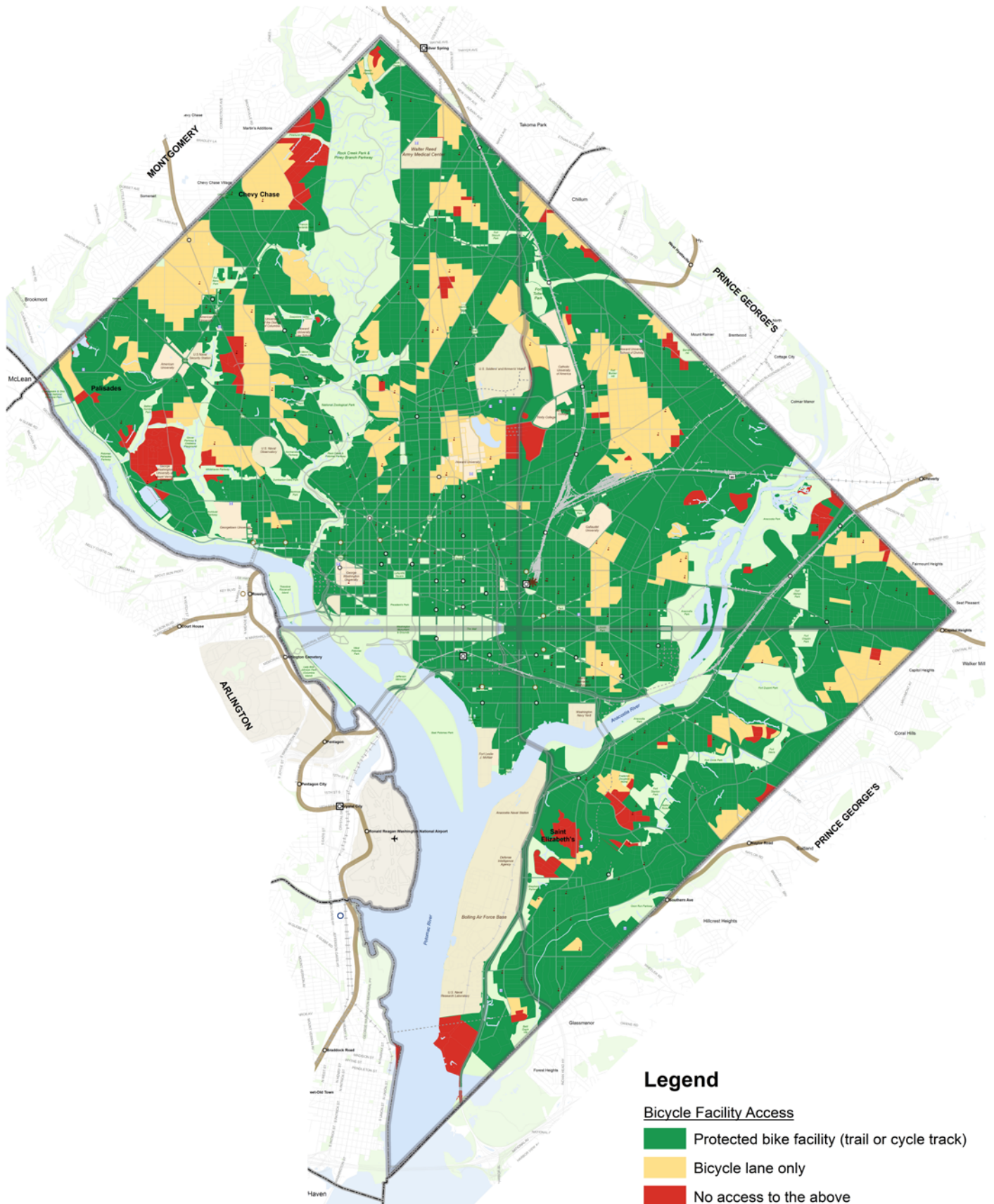
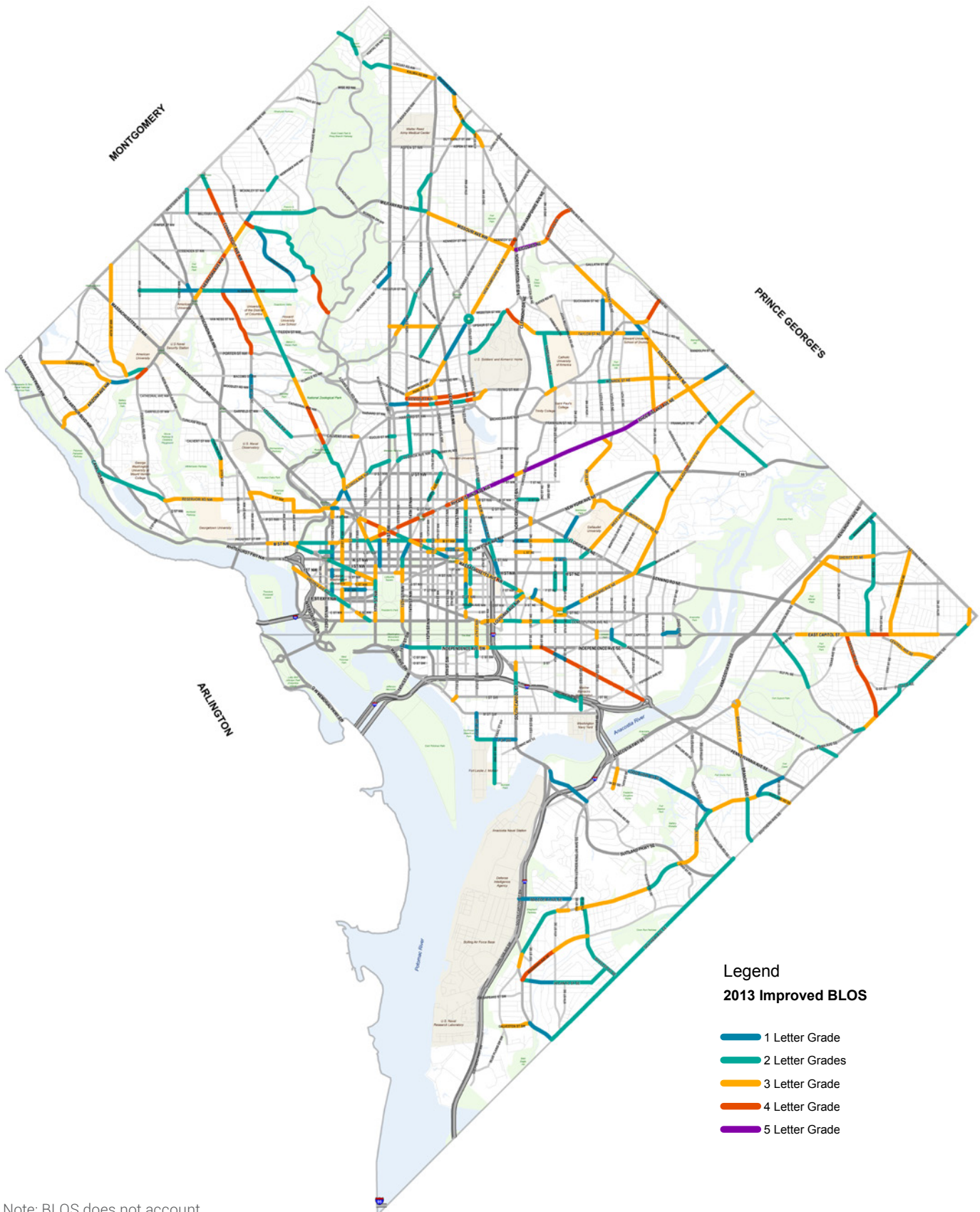


FIGURE B.11 – ANTICIPATED 2040 BICYCLE LEVEL OF SERVICE AND IMPROVEMENT VERSUS 2013 CONDITION



Note: BLOS does not account for trails that parallel a street.

Table B.4: *moveDC* Bicycle Element Performance

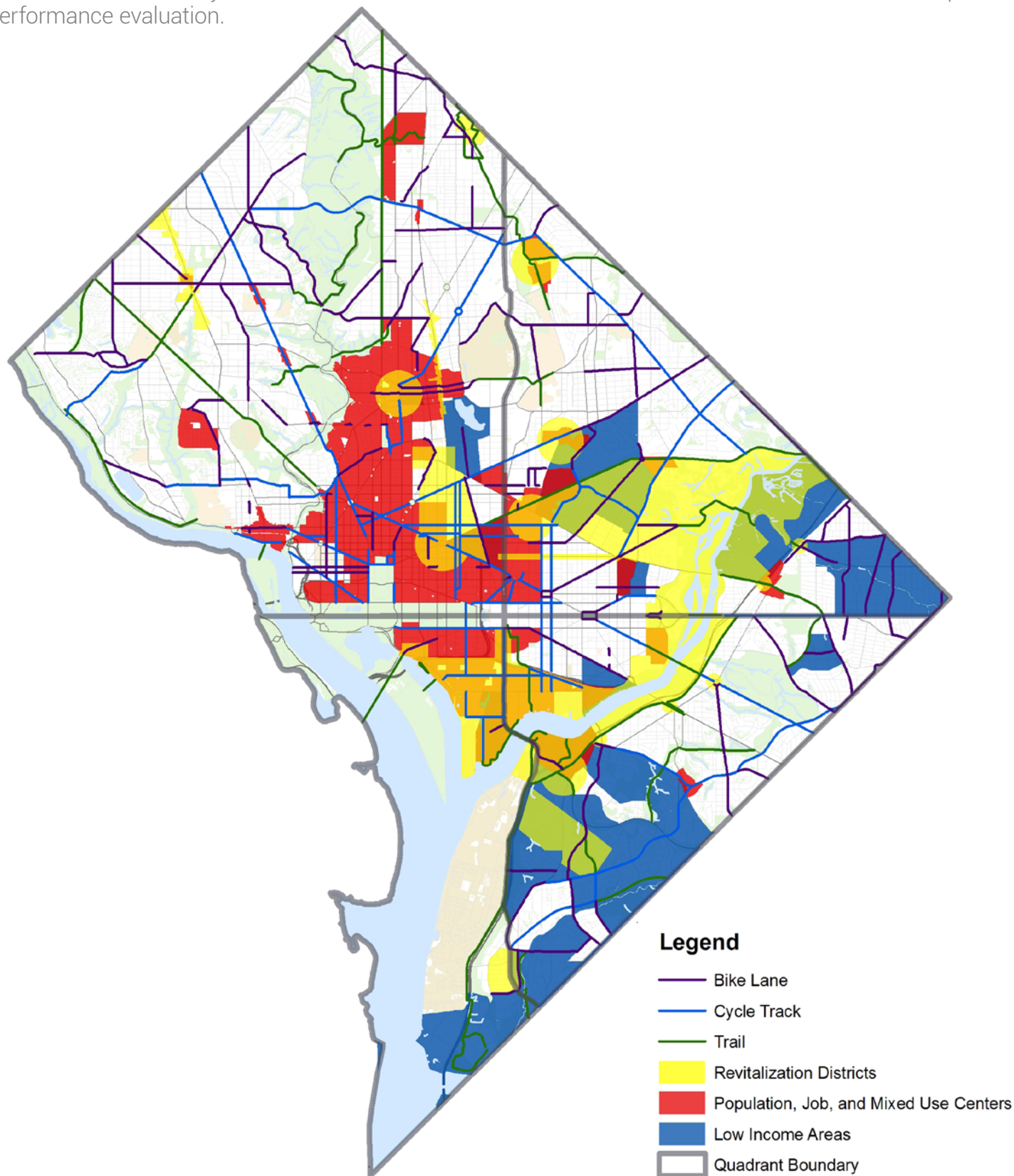
Goal	Metric	Performance
Sustainability & Health	Increase non-auto mode split	• A 12% bicycle mode share is forecast for all trips that start and end in the District
	Increase access to parks and green space	• Create new trails, cycle tracks, and bicycle lanes accessing 73 parks
	Encourage active transportation for health benefits	• Expand and upgrade the network of bike facilities on roadways and trails, within neighborhoods, and on bridges • Expand the CaBi system • Provide bike access through areas with limited connections • Continue the District's Safe Routes to School program • Keep residents and District employees informed about bicycling • Expand the Bicycle Program website • Support bicycle rides and events
	Reduce air and water quality impacts of transportation	• Increase in non-auto trips has the potential to reduce air and water quality impacts
	Prepare the transportation system for changing environmental and climatological conditions	• Not applicable for this element
Citywide Accessibility & Mobility	Increase the person-carrying capacity of the transportation system	• Plan recommendations result in a 186% increase in bicycle facility capacity Districtwide compared to the existing (2013) network
	Improve system reliability	• Not applicable for this element
	Reduce financial barriers to the lowest-income transportation system users	• Reduce barriers to CaBi membership
	Accommodate the movement and management of freight and goods	• Not applicable for this element
	Integrate the District's transportation system with the region's transportation network	• Connect with many regional bicycle facilities and ensure the trail network is compatible with regional initiatives including: • Anacostia Park Trail/Prince George's County's Colmar Manor Park Trail • Gallatin Street NE Trail/Prince George's County Trail Connection to West Hyattsville Metrorail Station • Long Bridge Trail/Mount Vernon Trail in Arlington County • New York Avenue NE Trail/Prince George's County's Colmar Manor Park Trail • Oxon Run Trail/Prince George's County's Oxon Run Trail • Pennsylvania Avenue SE Trail/Prince George's County's Pennsylvania Avenue bicycle lane/trail • Rock Creek Park (Beach Drive NW) trail/Montgomery County's Rock Creek Trail • Suitland Parkway Trail into Prince George's County

Table B.4: moveDC Bicycle Element Performance (continued)

Goal	Metric	Performance
Neighborhood Accessibility & Connectivity	Increase the coverage of all modal networks throughout the District	• Provide 80% of the forecast 2040 District population with access to a protected bicycle facility (trail or cycle track) within a 2-minute ride of their residence • Provide 97% of the forecast 2040 population access to a facility (trail, cycle track, or bike lane) within a 2-minute ride
	Increase the number of transportation choices for travel between city neighborhoods	• Increase the ability to bicycle between neighborhoods
	Increase transportation availability to population centers and jobs, schools, amenities, and services	• New trails or on-street bicycle facilities accessing all eight population centers, seven out of nine employment centers, and 19 out of 20 mixed-use centers (See Figure B.12)
	Increase transportation availability to economically challenged or targeted redevelopment areas	• Create new trails accessing all 33 low-income Census Tracts and all 26 designated redevelopment areas (See Figure B.12)
Safety & Security	Improve safety for all users	• Increase bicyclist safety by: • Expanding and upgrading the bike facilities network • Evaluating/enhancing safety at sites with high bicycle crashes • Improving access through complex intersections and areas with limited connections • Providing safe transitions between on-road and separated bike facilities • Educating motorists and bicyclists about safe operations • Enforcing traffic laws related to bicycling for all users • Continuing the District's Safe Routes to School Program
	Improve redundancy of transportation networks to handle emergencies	• A 479% increase in bicycle facility capacity on designated evacuation routes is projected
	Expand sidewalk network	• Not applicable for this element
	Maintain ability to evacuate District in case of emergency	• Not applicable for this element
	Preserve key functions without impacting the transportation system	• Not applicable for this element
Public Space	Protect and enhance important corridors and urban landscapes	• Not applicable for this element
	Make streets functional, beautiful, and walkable	• Not applicable for this element
	Increase tree coverage	• Not applicable for this element
Preservation	Maximize reliability for all District transportation infrastructure by investing in maintenance and asset management	• More than 150 miles of new on-street bicycle facilities (cycle tracks and bicycle lanes) and 60 miles of trails will require maintenance. The plan recommends appropriate resources and programs be available to maintain trail facilities

FIGURE B.12 – MOVEDC BICYCLE ELEMENT ACCESSIBILITY MAP

This figure shows District-designated revitalization districts; population, job, and mixed-use centers identified for **moveDC** planning purposes; and low-income areas based on U.S. Census data in the context of **moveDC** bicycle network recommendations. This information was used in the **moveDC** plan's performance evaluation.



V. Vision to Reality

moveDC is a long-term plan for a reason—achieving its full vision will require decades of investment and continued commitment from city leaders and support from innumerable local and regional partners. The return on the city's investment of time and funds spent implementing the **moveDC** plan's recommendations will be creating stronger, more vital neighborhoods; sharing prosperity among all of the city's residents; meeting our responsibility to the environment; and making the District more competitive among its domestic and global peers.

This section provides guidance for prioritizing and implementing **Bicycle Element** infrastructure recommendations. Additional information on implementation can be found in **Chapter 5**.

A. USING THIS ELEMENT

The **Bicycle Element** is a starting point for investments in the bicycle system for the District in the next 25 years. It presents needed and realistic bicycle network investments and policy concepts that, together, support **moveDC**'s other **Modal Elements** in achieving the goals established as a part of the planning process.

The **moveDC** plan does not present specific and final bicycle system design solutions, nor has **moveDC** analyzed all of the bicycle project-level trade-offs for individual components of the **moveDC** plan. The **Bicycle Element** of **moveDC** will need to be updated periodically to take into account the many changes the future will bring that cannot be anticipated today. The need for updates is the recognition that some things always change in a city as dynamic as Washington, D.C.

Finally, some recommendations of the **moveDC** plan, as with the **1997 Transportation Plan for the District of Columbia**, may not become reality. Regular updates to the **Bicycle Element** in coordination with the overall **moveDC** plan will help ensure the **Bicycle Element** continues to make sense in the context of changing demands on the system.

B. PROJECT DEVELOPMENT PROCESS

Some of the bicycle infrastructure recommendations included in the **moveDC** plan are already in the design process or ready for construction; however, the vast majority of **moveDC**'s recommendations will need to undergo additional evaluation

and further development consistent with established city processes prior to their implementation.

The DDOT **Environmental Policy and Process Manual, 2nd Edition** (2012) further describes DDOT's Project Development Process. The additional evaluation and development processes are likely to adjust the character, location, and other elements of some recommendations. This is a natural evolution of long-range plan identified recommendations as they move toward implementation.

C. IMPLEMENTATION THROUGH PARTNERSHIP

While the implementation of most capital infrastructure recommendations will be led by DDOT, some are likely to occur through partnership among DDOT and other agencies or organizations, or with DDOT in a support role to other agencies or organizations.

D. INFRASTRUCTURE COSTS

The planning-level costs for identified **Bicycle Element** infrastructure recommendations are \$293 million and were developed in current year (2014) dollars at a long-range planning level of detail and accuracy. Because of the nature of long-range planning, all costs should be reevaluated in future project development activities. Cost by infrastructure recommendation is presented in **Tables B.5** through **B.8**.

With respect to the planning-level cost estimates shown, the following were generally assumed:

- *Wherever possible, the cost estimates utilized project-specific costs, including costs from MWCOC's **FY13-19 Transportation Improvement Program** (TIP), the FY14-20 District budget, and other project-specific estimates.*
- *Additional costs for **moveDC** recommendations were estimated using a generalized unit cost related to project type. The unit costs were derived from existing District project costs.*

Programs

In the context of implementation for **moveDC**, the term “program” is used to describe ongoing funding commitments for operations, education, maintenance, regular infrastructure improvements that are not defined as projects, or other items, such as debt service on Grant Anticipation Revenue Vehicle (GARVEE) bonds. The total estimated program costs associated with bicycle and trail recommendations are \$15 million. Additional information on costs for programs are presented in **Chapter 5**.

Asset Management

Costs within this area of the **moveDC** plan include ongoing assessments, maintenance, and repairs of transportation infrastructure. Estimated costs for bicycle and trail asset management, presented in **Chapter 5**, are \$87 million.

E. BUDGETING PROCESS

moveDC was developed in a fiscally unconstrained environment, but DDOT recognizes that it operates in an environment constrained by available funding. While the financial plan in **Chapter 5** identifies potential new sources of revenue to help close the cost/revenue gap, an annual gap is likely to remain throughout **moveDC**'s implementation horizon.

Because of this fiscal reality, **moveDC** has developed a methodology for prioritizing recommendations that can assist in the process of making annual budget decisions. This approach is described in **Chapter 5**. From a broad prioritization perspective, DDOT should take the following approach:

- *Fund basic state of good repair (SOGR) and maintenance for existing programs*
- *Allocate additional resources that accelerate the pace of reaching SOGR for all infrastructure*
- *Fund critical transportation infrastructure investments to address deficiencies, safety, or capacity needs*

Critical investments in transportation infrastructure have been prioritized in the **moveDC** plan, but many will still need to go through DDOT's Project Development Process prior to implementation. DDOT should only seek to advance investments that have the most merit to meet **moveDC**'s goals.

It should be noted that programs and asset management—both of which are related to ensuring safe and reliable operations and adequate maintenance of existing system assets—were not prioritized. The level at which each of these are funded is established through normal annual District budget processes.

F. PRIORITIZATION PROCESS

moveDC capital improvements were prioritized based on an understanding of community and stakeholder support, existing commitments, and goals of ensuring transportation investments are distributed across the District in the service of current and future residents. They also were prioritized based on criteria developed for each of **moveDC**'s goals. Cost was not a criteria used in prioritization, but will need to be a factor in individual budget decisions.

Individual capital investment recommendations were measured within each criterion and then processed into four tiers within project groupings (generally by transportation mode). The tiers were then used to rank and organize priorities.

Generally, investments within Tier 1 are assumed to be the highest priorities for implementation, whereas those in Tier 4 projects are lower priorities, relative to projects within their group. It is worth noting that in many cases, Tier 1 recommendations—due to size, scale, cost, and complexity—cannot be immediately constructed and will require investment in refinement, definition, and development through DDOT's Project Development Process. Similarly, most recommendations in other tiers are likely to require some level of proactive investment in further development, prior to them becoming the District's highest implementation priorities.

G. OUTCOMES

The full results of the prioritization process for the Bicycle Element are shown by tier in **Tables B.5** through **B.8** and **Figure B.13**. In addition to each infrastructure recommendation's rating (tier), **Tables B.5** through **B.8** describe project limits, identify potential implementation responsibility, and provide a planning-level cost estimate, where it is possible to do so based on information currently available.

Table B.5: Tier 1 Bicycle and Trail Capital Investments

Name of Facility	From	To	Length (miles)	Ward(s)	DDOT Role	TIP Project	Cost (\$ Millions)
10TH ST NW	H ST NW	MASSACHUSETTS AVE NW	0.3	2	LEAD	NO	\$0.03
14TH ST NW	FLORIDA AVE NW	COLUMBIA RD NW	0.5	1	LEAD	NO	\$1.1
15TH ST NE (GAP)	NORTH CAROLINA AVE NE	C ST NE	0.1	6	LEAD	NO	\$0.01
15TH ST NW	V ST NW	EUCLID ST NW	0.4	1	LEAD	NO	\$0.8
15TH ST NW	E ST NW & PENNSYLVANIA AVE NW	CONSTITUTION AVE NW	0.2	2	LEAD	NO	\$0.5
15TH ST NW	I ST NW	NEW YORK AVE NW & PENNSYLVANIA AVE NW	0.2	2	LEAD	NO	\$0.4
16TH ST NW	SPRING RD NW	MARYLAND LINE	3.8	1, 4	LEAD	NO	\$4.8
4TH ST SW	P ST SW	M ST SW	0.3	6	LEAD	NO	\$0.7
BENNING RD	ANACOSTIA AVE NE	EAST CAPITOL AVE	1.7	2, 7	LEAD	NO	\$2.2
C ST NE	21ST ST NE & 22ND ST NE	NORTH CAROLINA AVE NE	0.3	6, 7	LEAD	NO	\$0.7
CALVERT ST NW	WOODLEY PL NW	24TH ST NW & SHOREHAM DR NW	0.1	3	LEAD	NO	\$0.01
CAPITOL SOUTH TRAIL	SOUTHWEST DR SE	M ST SE	1.5	6	LEAD	NO	\$1.90
DC VILLAGE CONNECTOR	SHEPHERD PKWY SW	SUCCESS AVE SW	0.8	8	LEAD	NO	\$1.10
E ST NE (GAP)	COLUMBUS CIR NE	E ST NW & NORTH CAPITOL ST	0.1	6	LEAD	NO	\$0.01
EAST CAPITOL CROSSING	C ST NE	33RD ST NE	0.4	7	LEAD	NO	\$0.50
EASTERN AVE	ANACOSTIA AVE NE	MINNESOTA AVE NE	0.8	7	LEAD	NO	\$1.00
EUCLID ST NW (GAPS)	15TH ST NW	ONTARIO RD NW	0.1	1	LEAD	NO	\$0.01
FLORIDA AVE NW	14TH ST NW	15TH ST NW & NEW HAMPSHIRE AVE NW & W ST NW	0.2	1	LEAD	NO	\$0.4
GALVESTON ST SW	1ST ST SE & SOUTH CAPITOL ST	MARTIN LUTHER KING JR AVE SW	0.3	8	LEAD	NO	\$0.03
IRVING RDNW/NE (UPGRADE)	MONROE ST NE	PARK PL NW	1.2	1, 5	LEAD	NO	\$1.5
KLINGLE VALLEY TRAIL	COUTLAND PL NW	KLINGLE RD NW	0.7	3	LEAD	YES	\$8
LONG BRIDGE CROSSING	MAINE AVE SW	VIRGINIA LINE	1.0	2, 6	LEAD	STUDY	SEE LONG BRIDGE COST
M ST NW/NE	FLORIDA AVE NE	THOMAS CIRCLE NW	1.8	2, 5, 6	LEAD	NO	\$3.6

Table B.5: Tier 1 Bicycle and Trail Capital Investments (continued)

Name of Facility	From	To	Length (miles)	Ward(s)	DDOT Role	TIP Project	Cost (\$ Millions)
MASSACHUSETTS AVE NW	MARYLAND LINE	R ST NW	3.6	2, 3	LEAD	NO	\$4.6
MET BRANCH TRAIL	FORT TOTTEN	MARYLAND LINE	3.9	4, 5	LEAD	YES	\$9
NEBRASKA AVE NW	ROCKWOOD PKWY NW	WISCONSIN AVE NW	1.0	3	LEAD	NO	\$1.2
NEW YORK AVE	KIRBY ST NW	MARYLAND LINE	4.6	5, 6, 7	LEAD	NO	\$6
OXON RUN TRAIL EAST	13TH ST SE	MARYLAND LINE	1.0	8	LEAD	YES	\$9
OXON RUN TRAIL WEST (UPGRADE)	ATLANTIC ST SE	FORRESTER ST SW	0.4	8	LEAD	YES	\$3.1
P ST SW	SOUTH CAPITOL ST	4TH ST SW	0.5	6	LEAD	NO	\$1.0
PENNSYLVANIA AVE SE	ANACOSTIA FREEWAY	27TH ST SE	0.5	7	LEAD	NO	\$0.7
PENNSYLVANIA AVE NW	17TH ST NW	29TH ST NW & M ST NW	1.3	2	LEAD	NO	\$3.0
RENO RD NW	34TH ST NW & QUEBEC PL NW & QUEBEC ST NW	SPRINGLAND LN NW	0.2	3	LEAD	NO	\$0.02
ROCK CREEK PARK TRAIL	MARYLAND LINE	BINGHAM DR NW	3.6	3, 4	LEAD	NO	\$8
SOUTH CAPITOL ST	SOUTHERN AVE SE	GALVESTON ST SW	0.3	8	LEAD	NO	\$0.4
SOUTH CAPITOL ST BRIDGE CROSSING	POTOMAC AVE SE	FIRTH STERLING AVE SE	1.4	6, 8	LEAD	NO	\$3.2
SOUTH CAPITOL ST TRAIL	FIRTH STERLING AVE SE	SHEPHERD PKWY SW	3.1	8	LEAD	YES	\$10
SUITLAND PARKWAY	FIRTH STERLING AVE SE	STANTON RD SE	0.4	8	LEAD	NO	\$0.5
VIRGINIA AVE SE	11TH ST SE & POTOMAC AVE SE	2ND ST SE & H ST SE	0.7	6	LEAD	NO	\$1.5
WATTS BRANCH TRAIL	KENILWORTH TERRACE NE	SHERIFF RD NE	0.1	7	LEAD	NO	\$0.3

Table B.6: Tier 2 Bicycle and Trail Capital Investments

Name of Facility	From	To	Length (miles)	Ward(s)	DDOT Role	TIP Project	Cost (\$ Millions)
12TH ST NE/ BUCHANAN ST NE	SARGENT RD NE	TAYLOR ST NE	0.5	5	LEAD	NO	\$0.05
13TH PL NW/FORT STEVENS DR NW	13TH ST NW	PEABODY ST NW	0.2	4	LEAD	NO	\$0.02
13TH ST SE	MISSISSIPPI AVE SE	ALABAMA AVE SE	0.3	8	LEAD	NO	\$0.7
13TH ST SE	GOOD HOPE RD SE	PLEASANT ST SE	0.2	8	LEAD	NO	\$0.02
14TH ST SE (GAPS)	POTOMAC AVE SE	D ST SE & KENTUCKY AVE SE	0.1	6	LEAD	NO	\$0.01
17TH ST NW	MASSACHUSETTS AVE NW	CONNECTICUT AVE NW & I ST NW	0.5	2	LEAD	NO	\$0.05
1ST ST NE (GAP)	FLORIDA AVE NE	NEW YORK AVE NE & O ST NE	0.1	5, 6	LEAD	NO	\$0.01
1ST ST SE	ATLANTIC ST SE	GALVESTON ST SW & SOUTH CAPITOL ST	0.5	8	LEAD	NO	\$0.05
33RD ST NW	PINEHURST CIR NW	BROAD BRANCH RD NW	1.0	3, 4	LEAD	NO	\$0.10
33RD ST NW/ WISCONSIN AVE NW (GAPS)	GEORGETOWN CANAL	R ST NW	0.3	2	LEAD	NO	\$0.03
49TH ST NE	MINNESOTA AVE NE	EAST CAPITOL ST	1.4	7	LEAD	NO	\$0.14
49TH ST SE	EAST CAPITOL ST & SYCAMORE RD NE	C ST SE & ST LOUIS ST SE	0.3	7	LEAD	NO	\$0.03
4TH ST NW/SW	I ST SW	PENNSYLVANIA AVE NW	0.9	2, 6	LEAD	NO	\$2.0
5TH ST NW & 6TH ST NW	RHODE ISLAND AVE NW	6TH ST NW & INDIANA AVE NW	1.4	2, 6	LEAD	NO	\$1.5
6TH ST NE / BRENTWOOD PKWY NE/ 9TH ST NE	T ST NE	FLORIDA AVE NE	0.8	5, 6	LEAD	NO	\$1.8
ALBEMARLE ST NW	LINNEAN AVE NW	49TH ST NW	2.2	3	LEAD	NO	\$0.20
ANACOSTIA RAIL TRAIL	SOUTH CAPITOL ST	E CAPITOL ST	3.4	7, 8	LEAD	NO	\$8
ANACOSTIA RIVER TRAIL	ANACOSTIA DR SE	MARTIN LUTHER KING JR AVE SE	0.5	8	LEAD	NO	\$1.2
ATLANTIC ST SE	BARNABY ST SE	ATLANTIC ST SW & MISSISSIPPI AVE SE & SOUTH CAPITOL ST	0.8	8	LEAD	NO	\$0.08
BARNABY ST SE	WHEELER RD SE	ATLANTIC ST SE	0.2	8	LEAD	NO	\$0.03
BENNING RD SE	SOUTHERN AVE SE	BENNING RD NE & EAST CAPITOL ST	1.0	7	LEAD	NO	\$0.10
BROAD BRANCH RD/ NEVADA AVE NW	BEACH DR NW	NEBRASKA AVE NW	1.6	3, 4	LEAD	NO	\$0.17

Table B.6: Tier 2 Bicycle and Trail Capital Investments (continued)

Name of Facility	From	To	Length (miles)	Ward(s)	DDOT Role	TIP Project	Cost (\$ Millions)
D ST NE	OKLAHOMA AVE NE	13TH ST NE	0.8	6, 7	LEAD	NO	\$0.08
DIVISION AVE NE	EASTERN AVE NE & SHERIFF RD NE	EAST CAPITOL ST	1.0	7	LEAD	NO	\$0.10
E ST SE	BENNING RD SE	TEXAS AVE SE	0.4	7	LEAD	NO	\$0.04
EAST CAPITOL ST	61ST ST NE	ANACOSTIA FREEWAY	2.5	7	LEAD	NO	\$6
EAST CAPITOL ST	22ND ST NE	22ND ST SE	0.4	6,7	LEAD	NO	\$0.04
EAST CAPITOL ST/ 11TH ST NE/13TH ST NE (LINCOLN PARK)	MASSACHUSETTS AVE NE/SE	NORTH CAROLINA AVE NE/SE	0.5	6	LEAD	NO	\$0.05
FLORIDA AVE NW	VERMONT AVE NW	11TH ST NW	0.2	1,	LEAD	NO	\$0.02
FLORIDA AVE NW	16TH ST NW & W ST NW	CONNECTICUT AVE NW	0.6	1,2	LEAD	NO	\$0.06
G ST NW	VIRGINIA AVE NW	ROCK CREEK & POTOMAC PKWY NW	0.2	2	LEAD	NO	\$0.02
G ST NW	NEW JERSEY AVE NW	3RD ST NW	0.2	2,6	LEAD	NO	\$0.02
G ST NW	9TH ST NW	10TH ST NW	0.1	2	LEAD	NO	\$0.01
GARFIELD ST NW	36TH PL NW	39TH ST NW & WATSON PL NW	0.3	3	LEAD	NO	\$0.03
H ST NW	15TH ST NW	MADISON PL NW & VERMONT AVE NW	0.1	2	LEAD	NO	\$0.2
HAINS POINT BRIDGE	WATER ST SW	OHIO DR SW	0.2	2,6	LEAD	NO	\$6
HAREWOOD RD NE	MICHIGAN AVE NE	TAYLOR ST NE	0.7	5	LEAD	NO	\$0.07
HOWARD RD SE/ SOUTH CAPITOL ST	FIRTH STERLING AVE SE	SOUTH CAPITOL ST BRIDGE	0.6	8	LEAD	NO	\$0.06
INDEPENDENCE AVE SE	2ND ST SE & PENNSYLVANIA AVE SE	SOUTH CAPITOL ST	0.3	2,6	LEAD	NO	\$0.03
L ST NW	22ND ST NW & NEW HAMPSHIRE AVE NW	25TH ST NW & PENNSYLVANIA AVE NW	0.2	2	LEAD	NO	\$0.3
LINNEAN AVE NW	ALBEMARLE ST NW	NEBRASKA AVE NW/ MILITARY RD NW	1.2	3,4	LEAD	NO	\$0.12
LONGFELLOW ST NW	LONGFELLOW ST NE & NORTH CAPITOL ST	14TH ST NW	1.3	4	LEAD	NO	\$0.13
LOUISIANA AVE NW/ NE	COLUMBUS CIR NE	CONSTITUTION AVE NW	0.4	2,6	LEAD	NO	\$0.90
M ST NE	MARYLAND AVE NE	17TH ST NE	0.5	5	LEAD	NO	\$0.05

Table B.6: Tier 2 Bicycle and Trail Capital Investments (continued)

Name of Facility	From	To	Length (miles)	Ward(s)	DDOT Role	TIP Project	Cost (\$ Millions)
MALCOLM X AVE SE	MARTIN LUTHER KING JR AVE SE	MALCOLM X AVE SW & SOUTH CAPITOL ST	0.6	8	LEAD	NO	\$0.06
MARTIN LUTHER KING JR AVE SE	ALABAMA AVE SE	SOUTH CAPITOL ST	0.7	8	LEAD	NO	\$0.07
MARYLAND AVE NE	M ST NE	6TH ST NE & C ST NE	1.7	5,6	LEAD	NO	\$0.17
MISSISSIPPI AVE SE	13TH ST SE	ATLANTIC ST SE & ATLANTIC ST SW & SOUTH CAPITOL ST	1.2	8	LEAD	NO	\$2.7
MONTANA AVE NE	NEW YORK AVE NE	18TH ST NE & W ST NE	0.2	5	LEAD	NO	\$0.02
MONTANA AVE NE	NEW YORK AVE NE	TERMINUS	0.1	5	LEAD	NO	\$0.01
N ST NW	17TH ST NW	CONNECTICUT AVE NW	0.2	2	LEAD	NO	\$0.02
NORTH CAROLINA AVE NE	14TH ST NE	EAST CAPITOL ST	0.2	6	LEAD	NO	\$0.02
OXON COVE TRAIL	SHEPHERD PKWY SW	FORRESTER ST SW	1.4	8	LEAD	NO	\$3.2
PENNSYLVANIA AVE SE	BARNEY CIR SE	2ND ST SE & INDEPENDENCE AVE SE	1.3	6	LEAD	NO	\$0.13
PINEY BRANCH RD NW	9TH ST NW	FORT STEVENS DR NW	0.4	4	LEAD	NO	\$0.04
POTOMAC AVE SW	POTOMAC AVE SE & Q ST SW & SOUTH CAPITOL ST	1ST ST SW & R ST SW	0.2	6	LEAD	NO	\$0.02
RHODE ISLAND AVE NE	MARYLAND LINE	REED ST NE	1.9	5	LEAD	NO	\$0.19
RHODE ISLAND AVE NW/NE	REED ST NE	CONNECTICUT AVE NW & M ST NW	2.8	1,2,5,6	LEAD	NO	\$6
RIDGE RD SE	SOUTHERN AVE SE	EAST CAPITOL ST & MINNESOTA AVE NE/ SE	1.5	7	LEAD	NO	\$0.16
RIGGS RD NE	EASTERN AVE NE	3RD ST NE & SOUTH DAKOTA AVE NE	0.5	4,5	LEAD	NO	\$0.05
ROCK CREEK CHURCH RD NW	HAREWOOD RD NW	5TH ST NW & PARK PL NW	0.7	1,4,5	LEAD	NO	\$0.07
ROCKWOOD PKWY NW	NEBRASKA AVE NW & NEWARK ST NW	GLENBROOK RD NW	0.7	3	LEAD	NO	\$0.07
ROOSEVELT ISLAND BRIDGE	30TH ST NW	ROOSEVELT ISLAND	0.2	2	LEAD	NO	\$6
SOUTH CAPITOL ST	ATLANTIC ST SE/SW & MISSISSIPPI AVE SE	HALLEY PL SE & MARTIN LUTHER KING JR AVE SE	0.3	8	LEAD	NO	\$0.03
SOUTHERN AVE SE	SUITLAND PKWY SE	SOUTH CAPITOL ST	2.7	8	LEAD	NO	\$6
SOUTHERN AVE SE	FITCH ST SE	RIDGE RD SE	0.7	7	LEAD	NO	\$0.08
TAYLOR ST NE	13TH ST NE	2ND ST NE & FORT DR NE	0.9	5	LEAD	NO	\$0.09

Table B.6: Tier 2 Bicycle and Trail Capital Investments (continued)

Name of Facility	From	To	Length (miles)	Ward(s)	DDOT Role	TIP Project	Cost (\$ Millions)
VERMONT AVE NW	V ST NW	12TH ST NW	0.5	1,2,6	LEAD	NO	\$0.05
VERMONT AVE NW/15TH ST NW	THOMAS CIR NW	I ST NW	0.3	2	LEAD	NO	\$0.03
VIRGINIA AVE NW	CONSTITUTION AVE NW	ROCK CREEK & POTOMAC PKWY NW	1.1	2	LEAD	NO	\$2.4
WATSON PL NW	39TH ST NW & GARFIELD ST NW	TUNLAW RD NW	0.2	3	LEAD	NO	\$0.02
WHEELER RD SE	SOUTHERN AVE SE	ALABAMA AVE SE	0.9	8	LEAD	NO	\$0.10

Table B.7: Tier 3 Bicycle and Trail Capital Investments

Name of Facility	From	To	Length (miles)	Ward(s)	DDOT Role	TIP Project	Cost (\$ Millions)
11TH ST NW	MONROE ST NW	SPRING RD NW	0.2	1, 4	LEAD	NO	\$0.02
13TH ST SE	SOUTHERN AVE SE	MISSISSIPPI AVE SE	0.5	8	LEAD	NO	\$0.05
14TH ST NW	EASTERN AVE NW & NEWELL ST NW	ALASKA AVE NW	0.8	4	LEAD	NO	\$0.08
17TH ST NW	I ST NW	CONSTITUTION AVE NW	0.6	2	LEAD	NO	\$1.4
18TH ST NE	HAMLIN ST NE	SHEPHERD ST NE & SOUTH DAKOTA AVE NE	0.8	5	LEAD	NO	\$0.08
21ST ST NW	S ST NW	CONSTITUTION AVE NW	1.5	2	LEAD	NO	\$3.4
22ND ST NW	Q ST NW & MASSACHUSETTS AVE NW	VIRGINIA AVE NW	1.1	2	LEAD	NO	\$0.11
2ND ST NE	T ST NE	R ST NE	0.2	5	LEAD	NO	\$0.02
2ND ST SW	V ST SW	CANAL ST SW & P ST SW	0.5	6	LEAD	NO	\$1.1
34TH ST NW	QUEBEC PL NW & QUEBEC ST NW & RENO RD NW	GARFIELD ST NW	0.7	3	LEAD	NO	\$0.07
37TH ST NW	RESERVOIR RD NW & WINFIELD LN NW	TUNLAW RD NW	0.5	2, 3	LEAD	NO	\$0.05
3RD ST NE/R ST NE	T ST NE	3RD ST NE & HARRY THOMAS WAY NE	0.2	5	LEAD	NO	\$0.03
3RD ST NW	RITTENHOUSE ST NW	LONGFELLOW ST NW	0.5	4	LEAD	NO	\$0.05
45TH ST NE/MEADE ST NE	MINNESOTA AVE NE	SHERIFF RD NE	0.3	7	LEAD	NO	\$0.03
49TH ST NW	GLENBROOK RD NW	DAVENPORT ST NW & WESTERN AVE NW	1.1	3	LEAD	NO	\$0.11

Table B.7: Tier 3 Bicycle and Trail Capital Investments (continued)

Name of Facility	From	To	Length (miles)	Ward(s)	DDOT Role	TIP Project	Cost (\$ Millions)
55TH ST NE	EASTERN AVE NE	55TH ST SE & EAST CAPITOL ST	0.8	7	LEAD	NO	\$0.08
55TH ST SE	CENTRAL AVE SE	55TH ST NE & EAST CAPITOL ST	0.2	7	LEAD	NO	\$0.02
63RD ST NE	EASTERN AVE NE	SOUTHERN AVE NE	0.2	7	LEAD	NO	\$0.02
8TH ST SE	MALCOLM X AVE SE	ALABAMA AVE SE	0.1	8	LEAD	NO	\$0.01
ALABAMA AVE SE	BOWEN RD SE & BURNS ST SE & STANLEY ST SE	MARTIN LUTHER KING JR AVE SE	4.2	7, 8	LEAD	NO	\$9
ANACOSTIA CROSSING AT M ST NE	M ST NE	DEANE AVE NE	1.4	5, 7	LEAD	NO	\$6
ANACOSTIA RIVER - 14TH ST BRIDGE CONNECTION	SOUTHWEST FREEWAY	9TH ST NW	0.3	6	LEAD	NO	\$0.8
ANACOSTIA RIVERWALK AT POPLAR PT	11TH STREET BRIDGE	ANACOSTIA DR SE	0.3	8	LEAD	NO	\$0.7
ANACOSTIA RIVERWALK AT BUZZARD PT	D ST SW	POTOMAC AVE SE	0.8	6	LEAD	NO	\$2.0
ARIZONA AVE NW	LOUGHBORO RD NW	CANAL RD NW	0.8	3	LEAD	NO	\$1.8
ARKANSAS AVE NW	GEORGIA AVE NW	PINEY BRANCH PKWY NW	0.9	4	LEAD	NO	\$0.09
BLADENSBURG RD NE	EASTERN AVE NE	15TH ST, BENNING RD, H ST & MARYLAND AVE NE	2.6	5	LEAD	NO	\$6
BLAGDEN AVE NW	16TH ST NW	BEACH DR NW	1.0	4	LEAD	NO	\$0.10
BLAIR RD/3RD ST NW	VAN BUREN ST NW	EASTERN AVE NW	0.9	4	LEAD	NO	\$0.09
BOWEN RD SE	46TH ST SE & SOUTHERN AVE SE	ALABAMA AVE, BURNS ST & STANLEY ST SE	0.3	7	LEAD	NO	\$0.60
BRANCH AVE SE	SOUTHERN AVE SE	RANDLE CIR SE	1.6	7	LEAD	NO	\$0.17
BUTTERNUT ST NW	BLAIR RD NW	PINEY BRANCH RD NW	0.3	4	LEAD	NO	\$0.03
CALVERT ST NW/ ADAMS MILL RD NW	LANIER PLACE	CLIFFBOURNE PL NW	0.1	1	LEAD	NO	\$0.01
CLEVELAND AVE NW	29TH ST, CALVERT ST & MCGILL TER NW	32ND ST NW & GARFIELD ST NW	0.4	3	LEAD	NO	\$0.04
COLUMBUS CIR NE	F ST NE	MASSACHUSETTS AVE NE	0.1	6	LEAD	NO	\$0.30
CONNECTICUT AVE NW	R ST NW	CHEVY CHASE CIR NW	4.8	1, 2, 3	LEAD	NO	\$11.00
DALECARLIA PKWY	MASSACHUSETTS AVE NW	LOUGHBORO RD NW	1.0	3	LEAD	NO	\$1.2
DELAWARE AVE NE	COLUMBUS CIR NE	CONSTITUTION AVE NE	0.3	6	LEAD	NO	\$0.60

Table B.7: Tier 3 Bicycle and Trail Capital Investments (continued)

Name of Facility	From	To	Length (miles)	Ward(s)	DDOT Role	TIP Project	Cost (\$ Millions)
EASTERN AVE NW	BLAIR RD NW	KALMIA RD NW	0.3	4	LEAD	NO	\$0.03
F ST NW	23RD ST NW	ROCK CREEK & POTOMAC PKWY NW	0.3	2	LEAD	NO	\$0.03
F ST NW	17TH ST NW	23RD ST NW	0.6	2	LEAD	NO	\$0.06
FLORIDA AVE NW/Q ST NW	CONNECTICUT AVE NW	22ND ST NW & Q ST NW	0.7	1, 2	LEAD	NO	\$1.6
FORT CIRCLE TRAIL	PENNSYLVANIA AVE SE	SUITLAND PKWY SE	2.0	7, 8	LEAD	NO	\$6
G ST NW	17TH ST NW	VIRGINIA AVE NW	0.7	2	LEAD	NO	\$0.07
GLENBROOK RD NW	ROCKWOOD PKWY NW	LOUGHBORO RD NW	0.5	3	LEAD	NO	\$0.05
GOOD HOPE RD SE	ALABAMA AVE SE	MINNESOTA AVE SE	1.1	7, 8	LEAD	NO	\$2.4
GOOD HOPE RD SE	MINNESOTA AVE SE	MARTIN LUTHER KING JR AVE SE	0.2	8	LEAD	NO	\$0.02
I ST SE	7TH ST SW & MAINE AVE SW	VIRGINIA AVE SE	1.3	6	LEAD	NO	\$2.8
INDEPENDENCE AVE SW	SOUTH CAPITOL ST	15TH ST SW & RAOUL WALLENBERG PL SW	1.3	2, 6	LEAD	NO	\$3.0
IRVING ST NW	KENYON ST NW	17TH ST NW	1.3	1, 5	LEAD	NO	\$0.13
K ST NE	WEST VIRGINIA AVE NE	2ND ST NE	0.4	6	LEAD	NO	\$0.04
KALMIA RD NW	EASTERN AVE NW	WEST BEACH DR NW	1.0	4	LEAD	NO	\$0.10
KANSAS AVE NW	UPSHUR ST NW	13TH ST NW & QUEBEC PL NW	0.4	4	LEAD	NO	\$0.04
KENYON ST NW	PARK PL NW	14TH ST NW & PARK RD NW	0.8	1, 5	LEAD	NO	\$0.08
L ST NW/NE	12TH ST NW	1ST ST NE	1.2	2, 6	LEAD	NO	\$1.4
LOUGHBORO RD NW	GLENBROOK RD NW	POTOMAC AVE NW	0.7	3	LEAD	NO	\$0.07
MARYLAND AVE SW	MAINE AVE SW	9TH ST SW	0.5	6	LEAD	NO	\$0.05
MASSACHUSETTS AVE NW/NE	1ST ST NE & COLUMBUS CIR NE	DUPONT CIR NW	2.2	2, 6	LEAD	NO	\$5
MASSACHUSETTS AVE SE	SOUTHERN AVE SE	30TH ST SE	1.4	7	LEAD	NO	\$3.3
MASSACHUSETTS AVE SE	19TH ST SE	13TH ST SE	0.7	6, 7	LEAD	NO	\$1.5
MICHIGAN AVE NE	EASTERN AVE NE	SOUTH DAKOTA AVE NE	0.4	5	LEAD	NO	\$0.04

Table B.7: Tier 3 Bicycle and Trail Capital Investments (continued)

Name of Facility	From	To	Length (miles)	Ward(s)	DDOT Role	TIP Project	Cost (\$ Millions)
MINNESOTA AVE NE	SHERIFF RD NE	GAULT PL NE	0.4	7	LEAD	NO	\$0.04
MINNESOTA AVE NE	ADDISON RD NE & EASTERN AVE NE	MEADE ST NE	0.4	7	LEAD	NO	\$0.04
MONROE ST NE	22ND ST NE	12TH ST NE	0.9	5	LEAD	NO	\$0.09
MOUNT OLIVET RD NE	CAPITOL AVE NE	9TH ST NE	0.8	5	LEAD	NO	\$1.8
NANNIE HELEN BURROUGHS AVE NE	GAULT PL NE	MINNESOTA AVE NE	0.5	7	LEAD	NO	\$0.05
NEBRASKA AVE NW	TENLEY CIR NW	OREGON AVE NW	2.2	3, 4	LEAD	NO	\$0.20
NEBRASKA AVE NW / LOUGHBORO RD NW	ARIZONA AVE NW	ROCKWOOD PKWY NW	0.5	3	LEAD	NO	\$1.1
NEW HAMPSHIRE AVE NW	PARK RD NW	KENNEDY ST NW	2.1	1, 4	LEAD	NO	\$4.7
NEW JERSEY AVE NW	MASSACHUSETTS AVE NW	S ST NW	1.1	5, 6	LEAD	NO	\$0.11
NEW STREET	MALCOLM X AVE SE	13TH ST SE & PLEASANT ST SE	1.4	8	LEAD	NO	\$0.14
NORTH CAROLINA AVE NE	C ST NE	14TH ST NE	0.3	6	LEAD	NO	\$0.60
PARK RD NW	NEW HAMPSHIRE AVE NW	14TH ST NW & KENYON ST NW	0.3	1	LEAD	NO	\$0.70
PINEY BRANCH PKWY	BEACH DR NW	ARKANSAS AVE NW	0.8	1, 4	LEAD	NO	\$1.9
PINEY BRANCH RD NW	BLAIR RD NW	BUTTERNUT ST NW	0.2	4	LEAD	NO	\$0.02
PRINCE GEORGE'S CONNECTOR	MET BRANCH TRAIL	MARYLAND LINE	1.2	5	LEAD	NO	\$2.7
Q ST NE	ECKINGTON PL NE	LINCOLN RD NE & NORTH CAPITOL ST	0.2	5	LEAD	NO	\$0.02
R ST NE	ECKINGTON PL NE	NORTH CAPITOL ST & R ST NW	0.3	5	LEAD	NO	\$0.03
R ST NW	NORTH CAPITOL ST & R ST NE	FLORIDA AVE NW	0.2	5	LEAD	NO	\$0.02
R ST NW/28TH ST NW	Q ST NW	37TH ST NW	1.0	2	LEAD	NO	\$1.9
RENO RD NW	TILDEN ST NW	ALBEMARLE ST NW	0.6	3	LEAD	NO	\$0.06
RESERVOIR RD NW	37TH ST NW & WINFIELD LN NW	FOXHALL RD NW & SALEM LN NW	0.7	2, 3	LEAD	NO	\$1.5
RESERVOIR RD NW/ MACARTHUR BLVD NW	FOXHALL RD & SALEM LN NW	CANAL ROAD	0.8	3	LEAD	NO	\$0.08

Table B.7: Tier 3 Bicycle and Trail Capital Investments (continued)

Name of Facility	From	To	Length (miles)	Ward(s)	DDOT Role	TIP Project	Cost (\$ Millions)
RIVER RD NW	WISCONSIN AVE NW	WESTERN AVE NW	0.8	3	LEAD	NO	\$0.08
SARATOGA ST/ BRENTWOOD RD/ 9TH ST NE	RHODE ISLAND AVE NE	T ST NE	0.7	5	LEAD	NO	\$0.07
SHERIFF RD NE	DIVISION AVE NE & EASTERN AVE NE	MINNESOTA AVE NE	0.9	7	LEAD	NO	\$0.10
SOAPSTONE VALLEY TRAIL	BROAD BRANCH RD NW	CONNECTICUT AVE NW	0.5	3	LEAD	NO	\$1.1
SOUTH CAPITOL ST	INDEPENDENCE AVE SW	POTOMAC AVE SE	1.2	2, 6	LEAD	NO	\$2.6
SOUTH DAKOTA AVE NE	NEW YORK AVE NE	3RD ST NE & RIGGS RD NE	3.7	4, 5	LEAD	NO	\$8
SOUTHERN AVE NE	63RD ST NE	EAST CAPITOL ST & SOUTHERN AVE SE	0.2	7	LEAD	NO	\$0.02
SOUTHERN AVE SE/ FITCH ST SE	EAST CAPITOL ST	53RD ST SE	0.9	7	LEAD	NO	\$0.09
SPRING RD NW/13TH ST NW	11TH ST NW	KANSAS AVE NW & QUEBEC PL NW	0.1	1, 4	LEAD	NO	\$0.01
ST. ELIZABETH'S TRAIL	MARTIN LUTHER KING JR AVE SE	ALABAMA AVE SE	0.5	8	LEAD	NO	\$1.1
SUITLAND RD SE	SOUTHERN AVE SE	36TH ST SE & ALABAMA AVE SE	0.4	7	LEAD	NO	\$0.04
T ST NE	5TH ST NE	2ND ST NE	0.2	5	LEAD	NO	\$0.02
TAYLOR ST NE	SOUTH DAKOTA AVE NE	MICHIGAN AVE NE	0.4	5	LEAD	NO	\$0.04
TEXAS AVENUE	EAST CAPITOL ST	RIDGE RD SE	0.8	7	LEAD	NO	\$1.0
UPSHUR ST NW	KANSAS AVE NW	ARGYLE TER NW & MATHEWSON DR NW	1.0	4	LEAD	NO	\$0.10
WEST BEACH DR/ PRIMROSE RD NW	KALMIA RD NW	WESTERN AVE NW	0.4	4	LEAD	NO	\$0.04
WEST VIRGINIA AVE NE	MONTANA AVE NE	K ST NE	1.4	5, 6	LEAD	NO	\$0.14

Table B.8: Tier 4 Bicycle and Trail Capital Investments

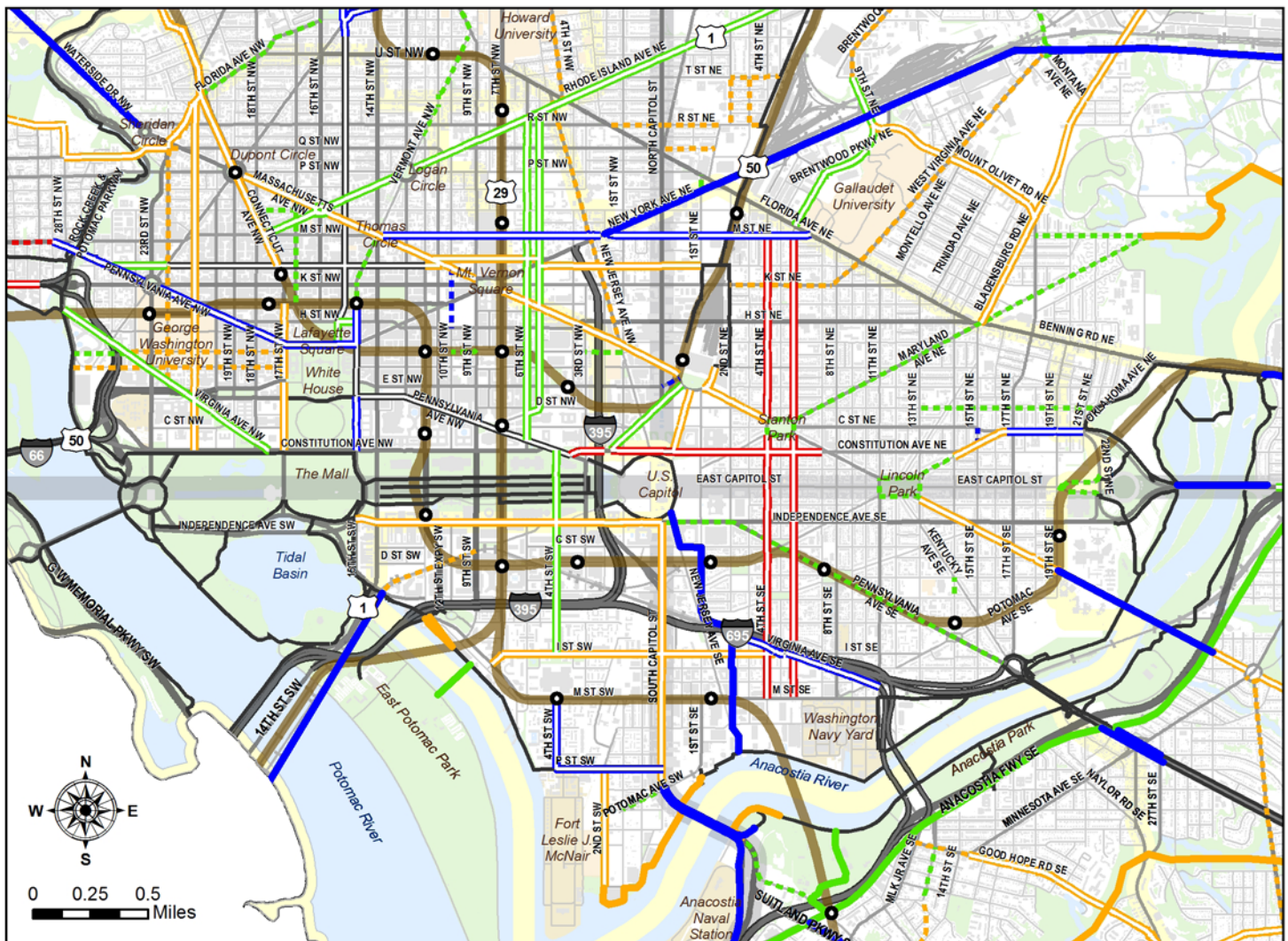
Name of Facility	From	To	Length (miles)	Ward(s)	DDOT Role	TIP Project	Cost (\$ Millions)
4TH ST NE	MICHIGAN AVE NE	LINCOLN RD NE	0.3	5	LEAD	NO	\$0.4
4TH ST SW/SE & 6TH ST SW/SE	M ST NE	M ST SE	1.9	6	LEAD	NO	\$2.1
CENTRAL AVE SE	SOUTHERN AVE SE	55TH ST SE	0.2	7	LEAD	NO	\$0.02
CONSTITUTION AVE NW/NE	7TH ST NE	PENNSYLVANIA AVE NW	1.1	2, 6	LEAD	NO	\$2.4
FORT DR NE	2ND ST NE & TAYLOR ST NE	CLERMONT DR NE & HAREWOOD RD NW & NORTH CAPITOL ST	0.2	5	LEAD	NO	\$0.02
GALLATIN ST NW	14TH ST NW	16TH ST NW	0.2	4	LEAD	NO	\$0.02
HAREWOOD RD NW	CLERMONT DR NE & FORT DR NE & NORTH CAPITOL ST	ROCK CREEK CHURCH RD NW	0.2	4, 5	LEAD	NO	\$0.02
M ST NW	29TH ST NW & PENNSYLVANIA AVE NW	34TH ST NW	0.5	2	LEAD	NO	\$0.05
MATHEWSON DR NW	ARGYLE TER NW & UPSHUR ST NW	BLAGDEN AVE NW	0.2	4	LEAD	NO	\$0.02
MISSOURI AVE NW	NORTH CAPITOL ST & RIGGS RD NE	MILITARY RD NW	1.3	4, 5	LEAD	NO	\$3.0
TROLLEY TRAIL	ARIZONA AVE NW	MACARTHER BLVD NW	2.3	2, 3	LEAD	NO	\$5
WALTER REED TRAILS	16TH ST NE	GEORGIA AVE NW	1.4	4	LEAD	NO	\$3.3
WHITEHURST FWY NW	30TH ST NW & K ST NW	KEY BRIDGE	0.6	2	LEAD	NO	\$1.3

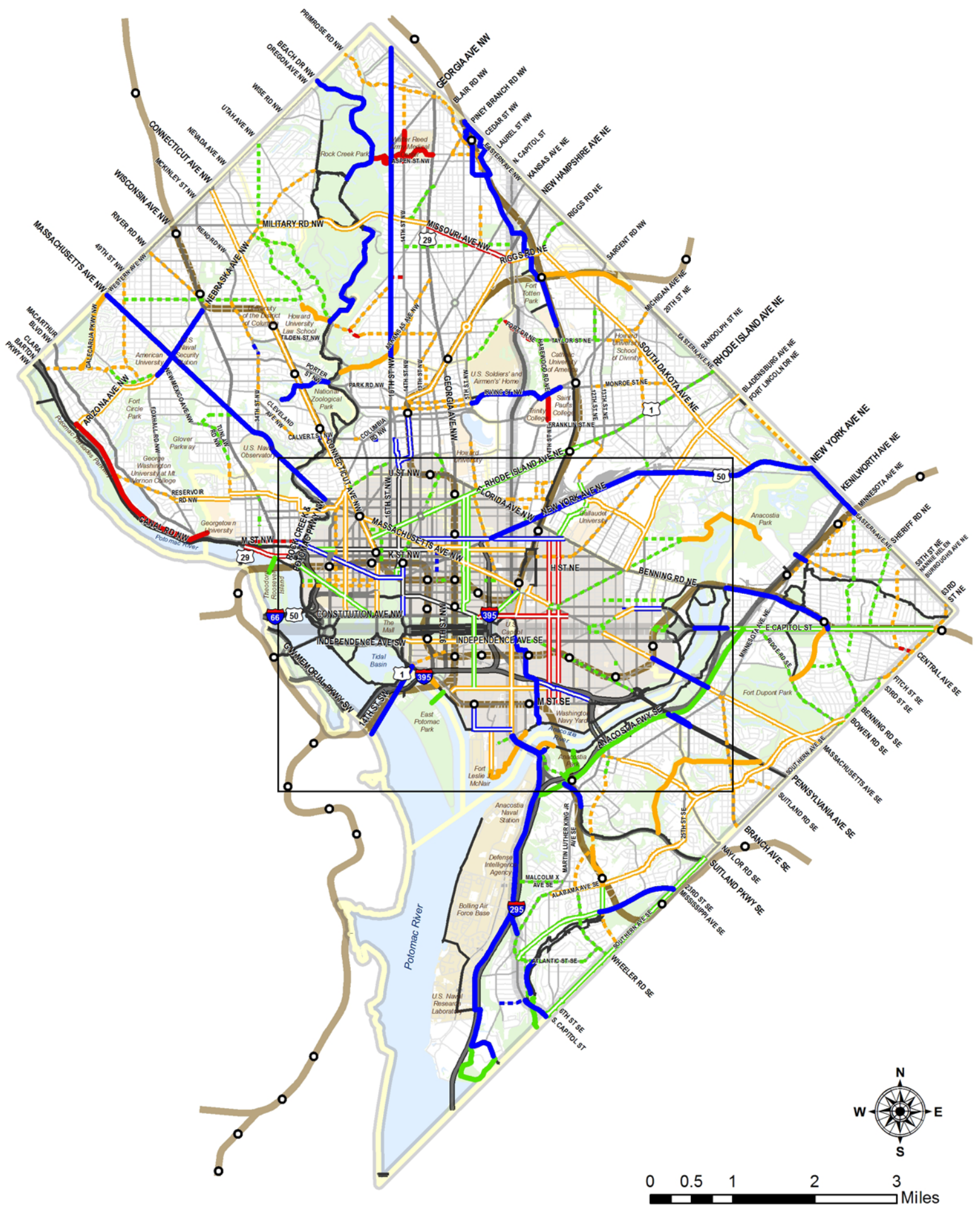
FIGURE B.13 – BICYCLE INFRASTRUCTURE PRIORITIES

This figure shows bicycle infrastructure recommendations by tier. The map shows trails, cycle tracks, and bike lanes.

Legend

Quadrant Boundary	Existing Infrastructure	Trail Tier	Cycle Track Tier	Bike Lane Tier
Ward Boundary	Metrorail Station	1	1	1
Water	Metrorail Line	2	2	2
Park	Existing Trail	3	3	3
University	Existing Cycle Track	4	4	4
Military	Railroad			
Monumental Core	Road			





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The District of Columbia's
Multimodal Long-Range Transportation Plan

Transit Element





The District of Columbia's Multimodal Long-Range Transportation Plan

October 2014

District Department of Transportation
Policy, Planning & Sustainability Administration
55 M Street SE
Suite 400
Washington, DC 20003



moveDC Vision

The District of Columbia will have a world-class transportation system serving the people who live, work, and visit the city. The transportation system will make the city more livable, sustainable, prosperous, and attractive. It will offer everyone in the District exceptional travel choices. As the transportation system evolves over time, the District will:

- *Be more competitive and attractive locally, regionally, nationally, and internationally*
- *Have safer and more vibrant streets and neighborhoods*
- *Have cleaner air, streams, and rivers, and be more responsive to climate change*
- *Accommodate the travel needs of all residents, workers, and visitors regardless of age or ability*
- *Integrate the District's transportation system with the region's transportation network*

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D.C. Streetcar at the commissioning yard

Transit

I. Transit Moves a City and Region

The Washington, D.C. region has a long history of investing in its transit system. Circulator, Metrorail, Metrobus, commuter rail, Capital Bikeshare, and other bus operators move millions of people every year, playing a vital role in the transportation system. Soon, streetcar will add to the transit options in the region. The continued development of this world-class transit system is a strategy to accommodate the region's rapidly increasing population while reducing the impacts of growth on land, air, and water quality. While DDOT has direct purview over Circulator and streetcar, it also makes significant contributions into funding the vision for Metro and regional transit.

The District has an extensive transit system and is planning for enhancements that will extend the coverage and efficiency of the network. The **moveDC** plan envisions the Metrorail network augmented to ease crowding and congestion, enhance access, improve reliability, and free buses from bottlenecks through dedicated bus lanes, transit signal priority, and queue jump lanes on key corridors. **moveDC** envisions transit becoming more accessible and efficient for trips to work as well as journeys out to dinner, shopping, entertainment, and everyday errands.

By 2040, with **moveDC**'s recommended investments, residents, workers, and visitors in the District will experience enhanced transit on key travel spines. Minnesota Avenue SE/SW will connect residents along the Anacostia River while Pennsylvania Avenue SE and Benning Road NE will efficiently carry them into downtown. Reliable cross-town connections will be established from the eastern border of the city to west of Rock Creek Park.

More transit means room to move more people and more ways for travelers to save money. Transit lanes can transport up to 10 times the number of people as vehicle lanes. Transit, with an average out-of-pocket cost of less than one-third the price of owning, operating, and maintaining a private vehicle, reduces household transportation expenses.¹ Improving the ability to competitively and conveniently substitute auto trips for transit trips means more money in resident's pockets, more access to employment opportunities, and more reliability for area employers.

moveDC consolidates all of the transit initiatives underway throughout the region, overlays an additional vision of how the different services can work best together, and recommends supportive efforts on city streets to maximize the effectiveness of the transit system. The result will be a District of Columbia where transit is an easy, natural choice for most trips throughout, to, and from the District, providing access while reducing demand on the roadway system.

¹ www.vtapi.org

II. Existing Conditions

The District has the second largest transit mode share in the nation. The city's rich mix of transit services offers residents, employees, and visitors a range of options when it comes to travel by transit—from national passenger rail to the D.C. Circulator. The primary transit options in D.C. include:

- **Amtrak.** Connects to the nation's passenger rail network with high speed (Acela Express) service in the Northeast Corridor (the District to Boston) and regional service to Virginia and points south
- **Intercity bus services.** Connects D.C. to major cities on the East Coast and across the nation
- **Virginia Railway Express (VRE) and Maryland Area Regional Commuter (MARC).** Provide commuter rail service in the Baltimore and Washington metropolitan areas
- **Commuter bus service.** Provided in key travel corridors and markets of the metropolitan area
- **Metrorail.** Provides rapid service within the District and urbanized areas of neighboring Virginia and Maryland
- **Local and express bus services (Metrobus, MetroExtra, and Circulator).** Serve primary travel corridors, neighborhoods, and major destinations in the District and the metropolitan area
- **MetroAccess.** Provides door-to-door shared rides for people with disabilities
- **Capital Bikeshare (CaBi).** Provides on-demand service ideal for the connections between transit hubs and destinations
- **Private and destination-specific shuttles.** Links local workers and visitors to business and tourism destinations
- **Water taxi.** Seasonal service connects waterside stops throughout the District and the region

A. CORE FACTS

Transit is a critical element of the District's and region's transportation network, providing access to neighborhoods, job centers, and national treasures. With a system of rail, bus, ferries, and shared bicycles, the District's transit network carries more than 40% of the District's commute trips every weekday. Without these transit options, many trips would be redistributed onto the already congested roadway network.

Notes on This Element

- Data used and referenced throughout this element was current as of December 2013, unless otherwise noted.
- Recommendations cited in this element will require further development as outlined in **Chapter 5**.
- Policies in this element are in addition to or augment current DDOT policies identified in the DDOT Policy Compendium.

Components of the transit network already are acutely crowded during peak hours and are reaching capacity. This includes Metrorail stations downtown (Union Station, Metro Center, Farragut North, Farragut West, and Gallery Place-Chinatown) and bus services operating along the Pennsylvania Avenue SE, 16th Street NW, Georgia Avenue NW/7th Street NW, Benning Road NE/H Street NE, 14th Street NW, and Anacostia/Congress Heights corridors. The following briefly summarizes the existing transit services in D.C.

Washington Metropolitan Area Transit Authority

WMATA serves approximately 5 million people within a 1,500-square-mile service area across the Washington region. WMATA operates three major services—Metrorail, Metrobus, and MetroAccess.

As shown in **Table T.1**, WMATA's services carry more than 343 million trips annually. Of these trips, 62% (217 million) are carried on Metrorail, 37% (129 million) on Metrobus, and less than 1% on MetroAccess. While Metrorail ridership declined slightly between 2010 and 2012, Metrobus ridership grew, and the overall use of WMATA services increased by approximately 1% during the same period.

Table T.1: Total WMATA or Metro Annual Ridership by Transit Type (in thousands)

	2010		2011			2012		
	Ridership	Share	Ridership	Share	Change	Ridership	Share	Change
Metrorail	217,219	63%	217,053	63%	0.0%	216,570	62%	-0.1%
Metrobus	123,670	36%	125,089	36%	0.4%	128,793	37%	1.1%
MetroAccess	2,377	1%	2,336	1%	0.0%	2,285	1%	0.0%
Totals	343,266	100%	344,478	100%	0.4%	347,648	100%	0.9%

Note: Data represents the entire WMATA system, which includes, but is not limited to, the District of Columbia.

Metrorail

Metrorail is the region's heavy rail transit system. In terms of ridership, it is the second busiest in the nation. Service begins at 5:00 a.m. on weekdays and 7:00 a.m. on weekends. Service ends at midnight Sunday through Thursday and 3:00 a.m. Friday through Saturday.² Five lines make up Metrorail—Red, Blue, Orange, Green, and Yellow—serving 86 different stations in D.C., Virginia, and Maryland. The new Silver line serving Virginia suburbs will open in 2014.

Since Metrorail's construction in 1976, ridership has risen steadily, with average weekday boardings of about 750,000 in 2012. Boardings within the District accounted for about 425,000 (57%), as shown in **Figure T.1**.

Figure T.2 shows the existing Metrorail system and a summary of boardings by station. Currently, the busiest stations in the system are downtown—Union Station, Metro Center, Farragut North, Farragut West, and Gallery Place-Chinatown. These stations are crowded during peak hours and reaching capacity. Increased ridership has led to core capacity issues on Metrorail.

In addition to station-oriented challenges, passenger loads on trains also are becoming a challenge in segments between stations during the system's busiest periods. **Figure T.3** shows the peak number of passengers traveling between each station.

Figure T.1: Metrorail Average Weekday Passenger Boardings

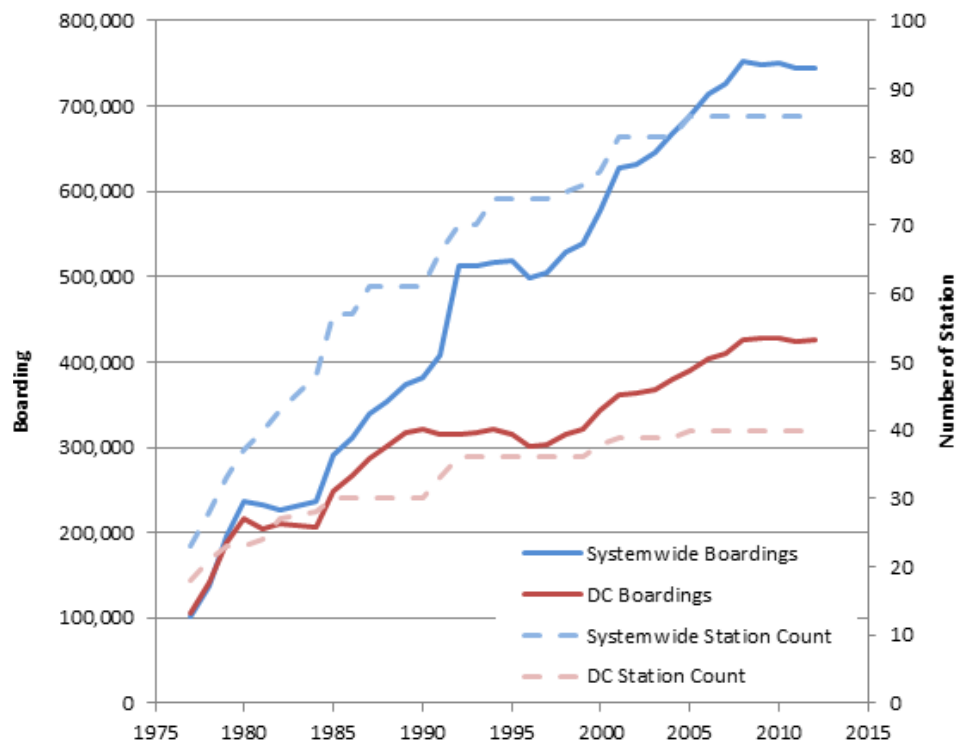


FIGURE T.2 – METRORAIL SYSTEM AND SUMMARY OF BOARDINGS BY STATION

This figure shows Metrorail boardings in the District. Increased ridership has led to core capacity issues on Metrorail. Downtown stations are acutely crowded during peak hours and reaching capacity; according to WMATA, even with planned improvements, the system will be highly congested by 2015 and over capacity by 2020.

Legend

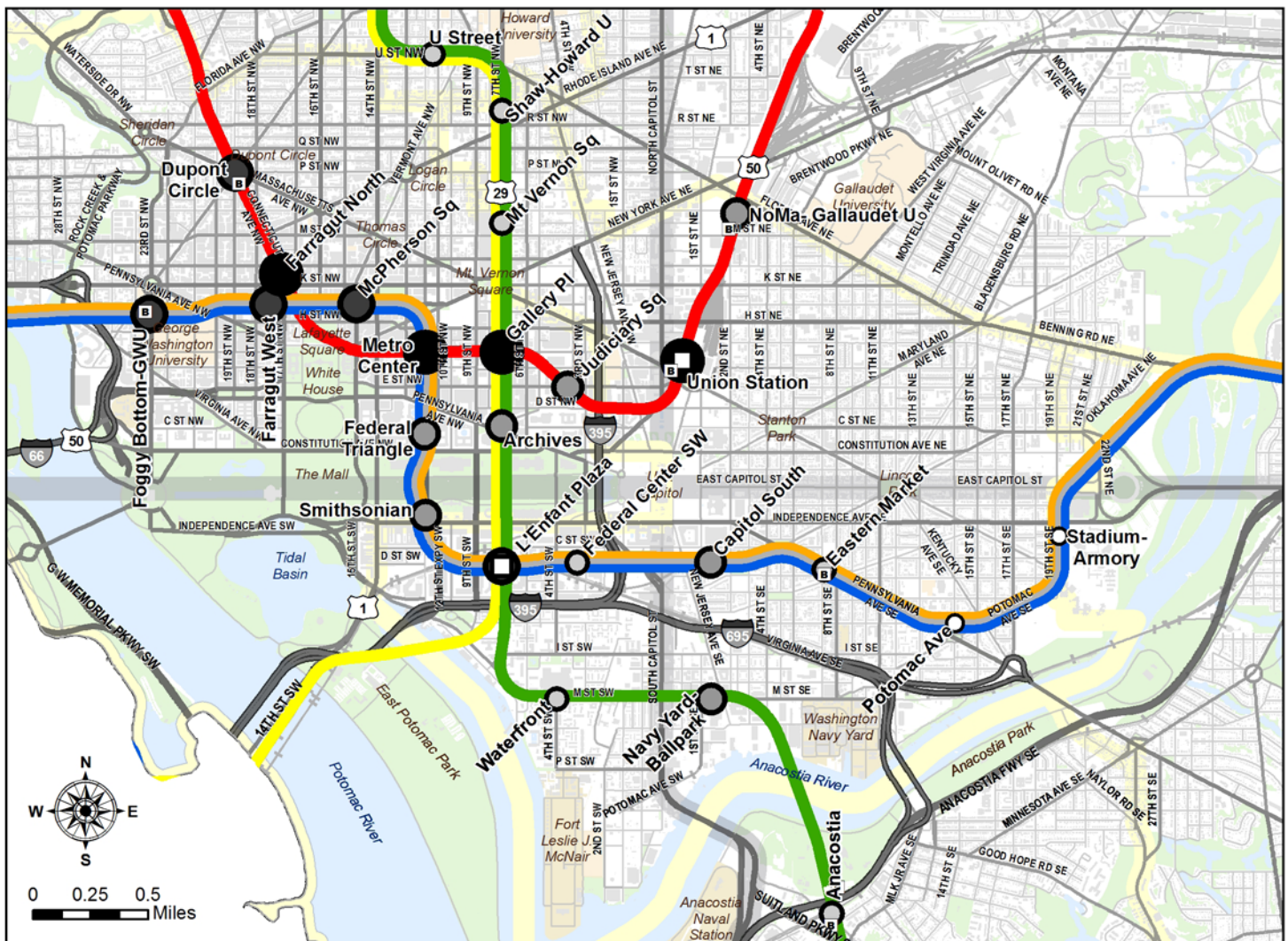
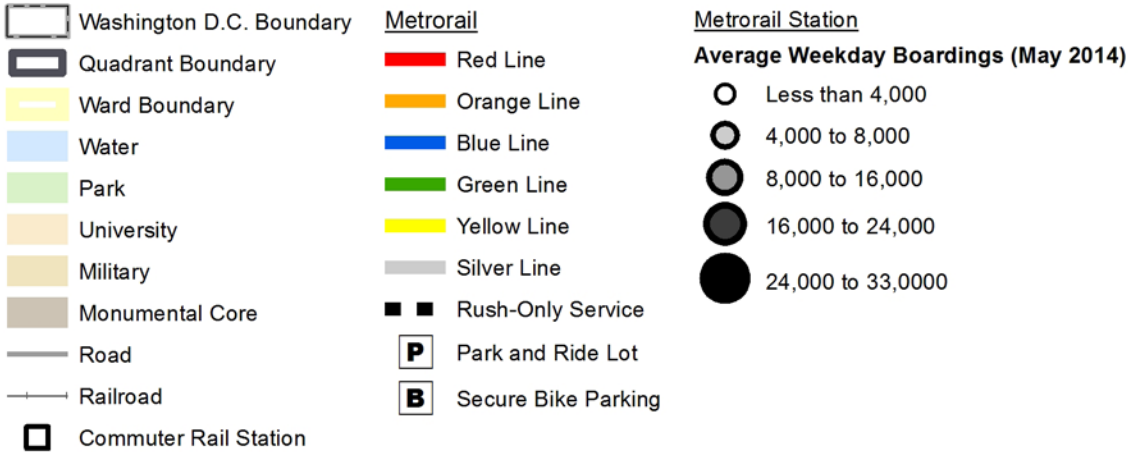
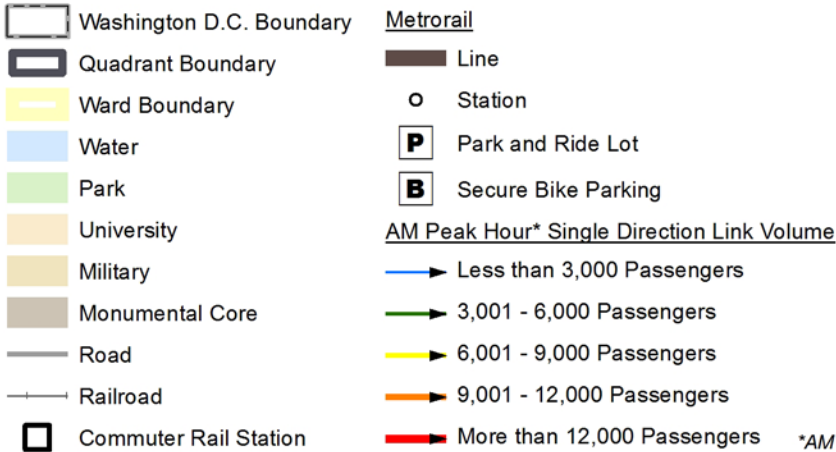


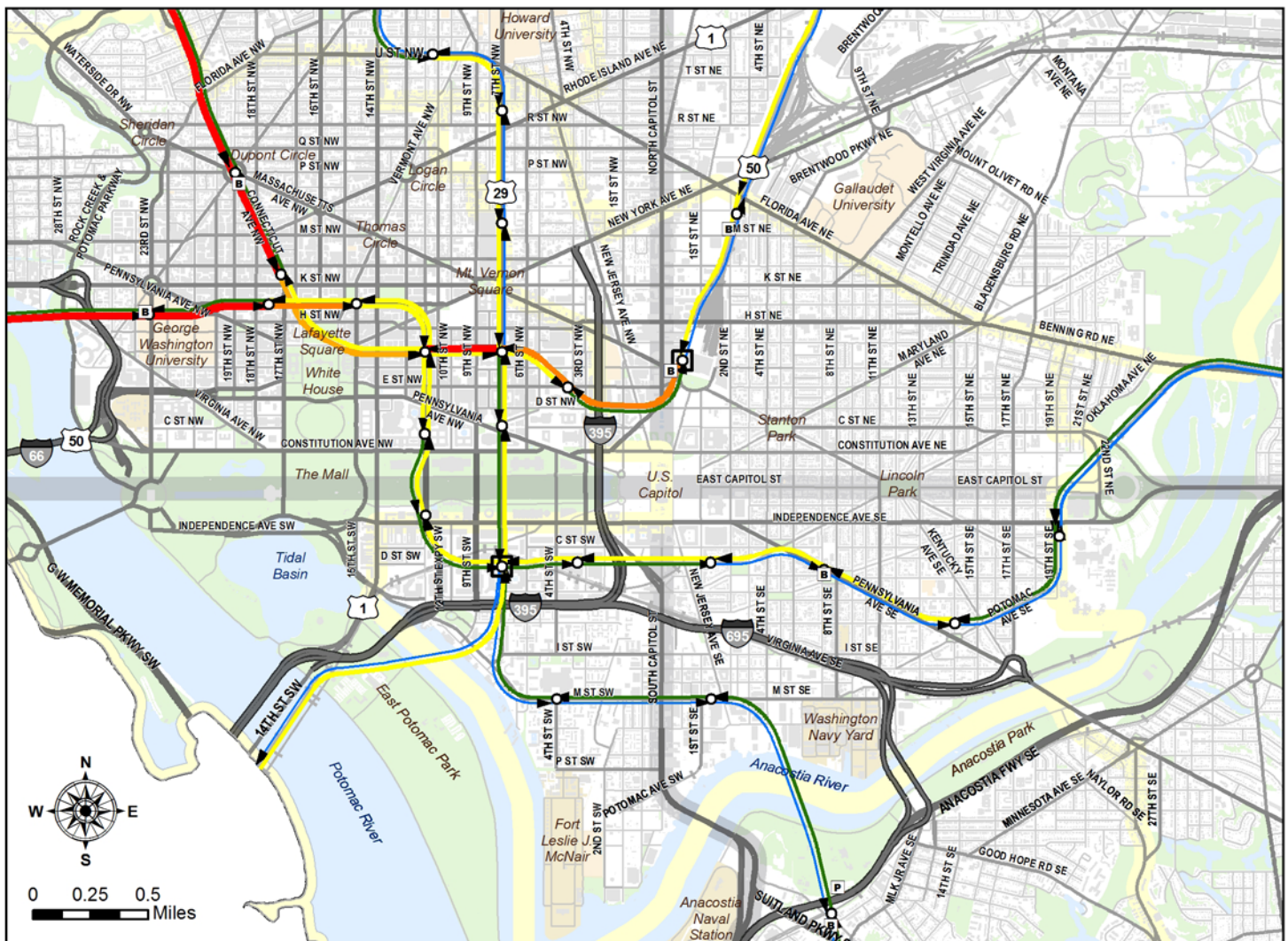
FIGURE T.3 – PEAK PERIOD PASSENGER LOADS BETWEEN STATIONS

This figure shows a.m. peak hour directional Metrorail link volumes. Based on current Metrorail ridership information, the a.m. peak hour is the daily system peak. There is substantial crowding on Metrorail in the inbound (toward D.C.) direction on the Red Line and on the Orange Line as well as on the Red Line downtown.

Legend



*AM peak hour represents peak loads for Metrorail. Data Source: WMATA



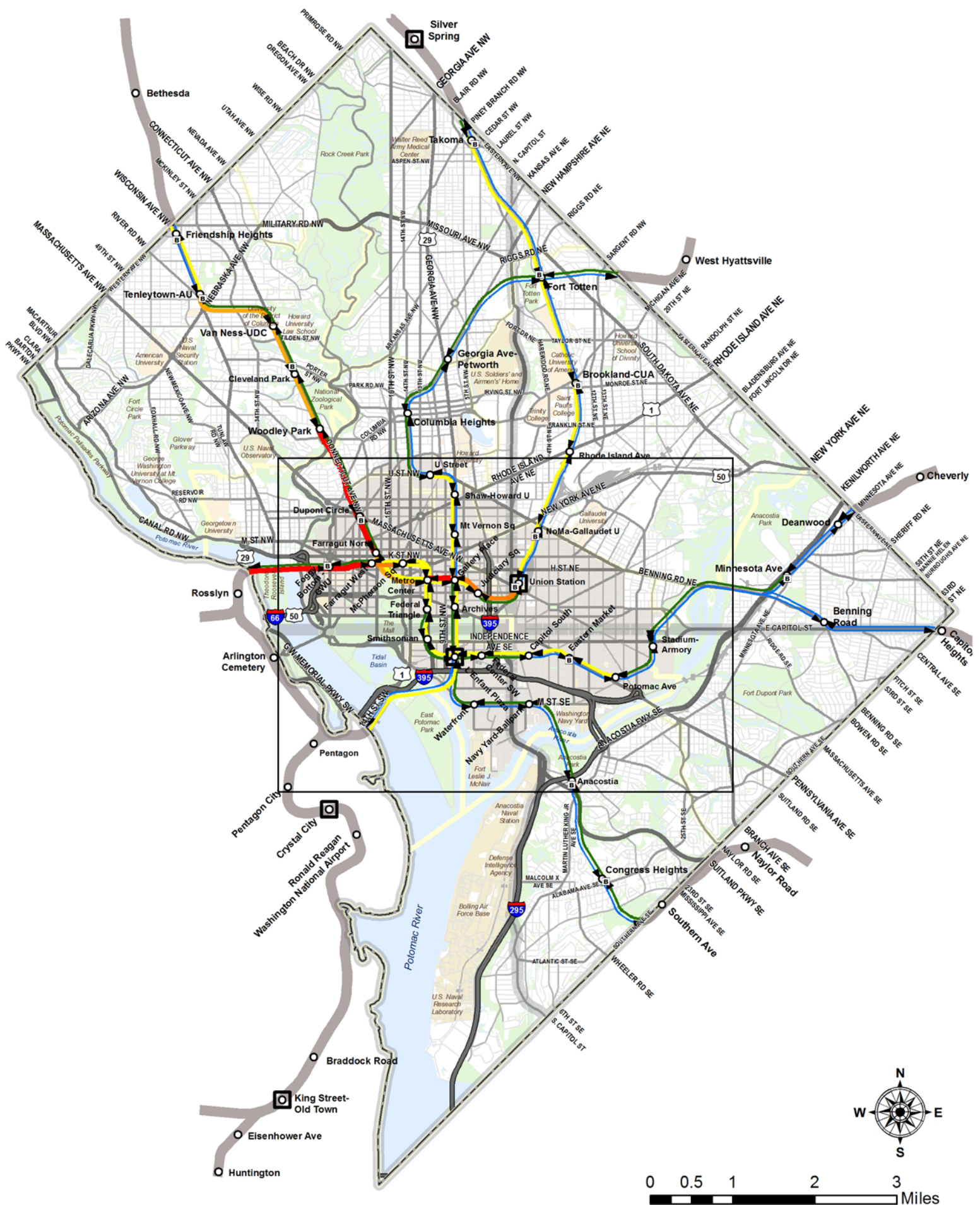
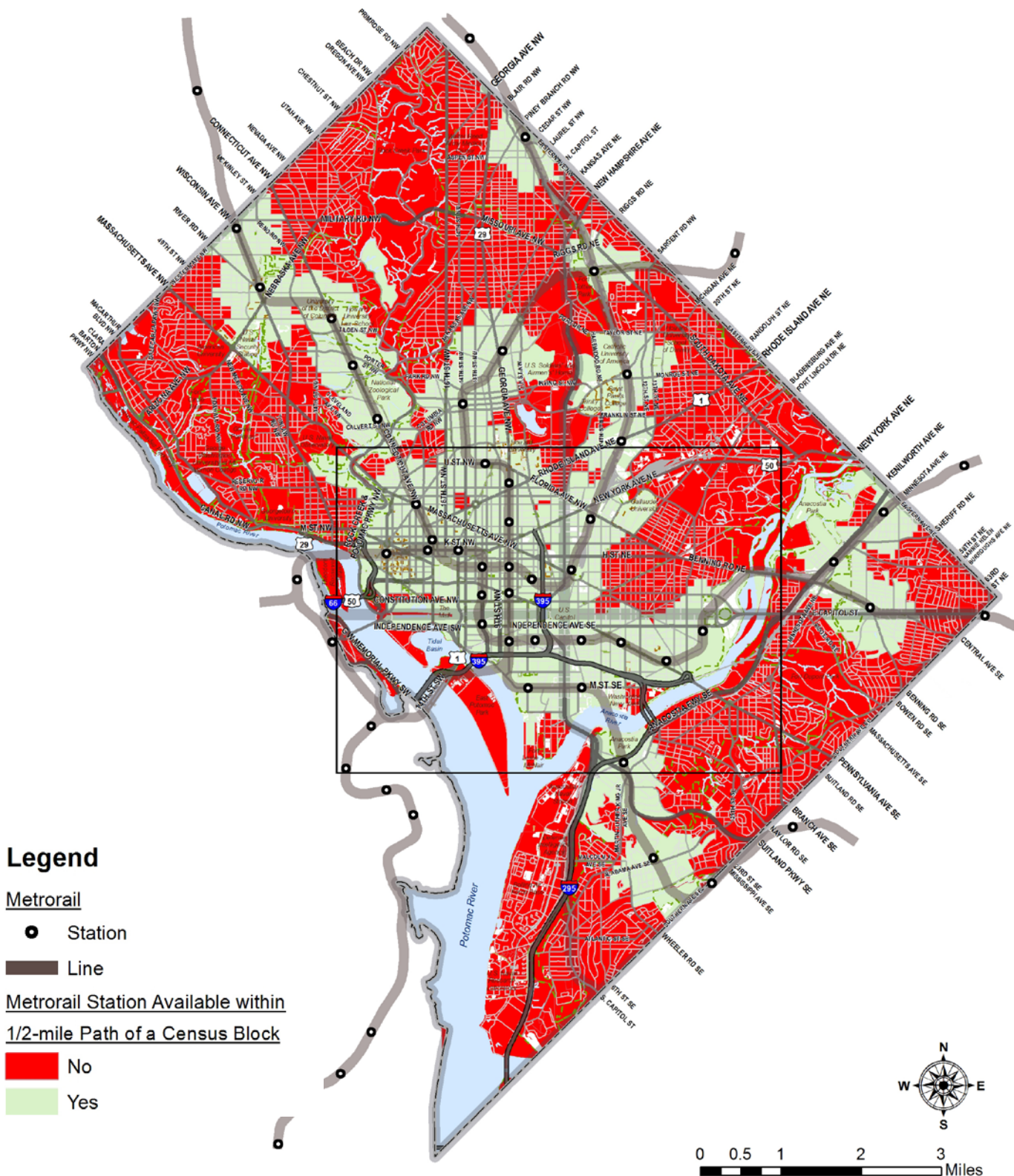


FIGURE T.4 – METRORAIL STATION ACCESSIBILITY MAP

This figure shows census blocks within a 0.5-mile path of a Metrorail station. Many areas of the District are not conveniently accessible to Metrorail on foot.





D.C.'s distinctive bus shelters feature wayfinding maps, advertising panels, and benches for riders



Metrobus provides more than 400,000 trips each weekday in D.C., Maryland, and Virginia

Although Metrorail serves a large portion of the District's population, **Figure T.4** shows how many areas of the District are more than a half-mile from a Metrorail station, which is considered a convenient walk.

Metrobus

Metrobus carries more than 400,000 passengers each weekday. Metrobus is the sixth busiest bus operation in the nation. The fleet is made up of more than 1,500 buses operating on 325 routes. More than 53% of Metrobus trips occur within the District of Columbia. WMATA divides Metrobus routes into five categories:

1. **Major routes** provide frequent service 7 days per week, with the exception of core route branches
2. **Local routes** are less frequent than major routes, but provide some evening and weekend service
3. **Commuter routes** provide weekday, peak-hour-only service between neighborhoods and employment areas as well as Metrorail stations
4. **MetroExtra routes** operate with limited stops and spans vary by route. Routes previously known as Express or Limited have been rebranded under the single name MetroExtra
5. **Airport express service** offers limited stop service to Dulles International Airport and Baltimore-Washington International Airport

MetroAccess

MetroAccess is WMATA's **Americans with Disabilities Act** (ADA) paratransit service, providing door-to-door shared rides for people with disabilities.

D.C. Circulator

Circulator is a DDOT-operated high-frequency bus service operating on five routes in downtown D.C. and adjacent neighborhoods. The Circulator system links cultural institutions, entertainment venues, and employment centers in the city's downtown and nearby neighborhoods.

Buses are operated through a partnership between DDOT, WMATA, and a contract operator. Buses have a distinct color and branding and operate so frequently (every 10 minutes) that passengers do not need a schedule. Fares are \$1 and SmarTrip cards are accepted. Together, the Circulator's five routes have about 15,000 daily boardings, as shown in **Table T.2**.

According to DDOT's **Circulator Transit Development Plan** (2011), the Circulator would benefit from changes including:

- An increase of the cash fare to \$2, which would generate more than \$1 million in additional revenue
- More consistent service schedules among the different routes
- Bus priority treatments along Circulator corridors in the long term
- New and improved vehicles
- Service on new corridors in the future

Commuter Rail and Bus

VRE and MARC offer commuter rail service to Washington, D.C. from communities in Virginia and Maryland, respectively. MARC and VRE primarily operate service on weekdays; however, MARC began weekend service on the Penn line in December 2013. Approximately 16,000 passengers ride VRE routes daily

and more than 30,000 ride MARC. The longest routes for the two services extend more than 50 miles from D.C. VRE has two stations in the District—Union Station and L'Enfant Plaza; L'Enfant Plaza serves approximately two-thirds of the VRE passengers. MARC has one station in D.C.—Union Station.

More than nine commuter bus operators run more than three dozen routes into D.C. from Maryland and Virginia. An equal number of intercity bus companies serve D.C. and connect to other cities in the Northeast and Mid-Atlantic regions. **Figure T.5** shows commuter rail and bus routes.

Passenger Rail

Amtrak offers passenger rail service to and from Washington, D.C. at Union Station. Amtrak operates approximately 85 trains daily into and out of Union Station—the second busiest station in the entire Amtrak network. In 2012, Union Station hosted more than 5 million annual boardings and alightings.

Union Station hosts a mixture of different passenger rail routes and service types. The most significant volume of passenger rail service is oriented along the Northeast Corridor (Washington, D.C. to Boston, MA). Within the Northeast Corridor, Amtrak operates regional and Acela Express services. Amtrak also operates commuter rail service between Union Station and Manassas and Fredericksburg, Virginia, and has a Cross Honor

Table T.2: Ridership on Circulator Routes

Route	Weekday Daily Ridership	Monthly Ridership
Dupont Circle – Rosslyn	2,600	76,000
Georgetown – Union Station	6,700	187,000
Potomac Ave Metro – Skyland	1,600	40,000
Union Station – Navy Yard Metro	1,400	31,000
Woodley Park – Adams Morgan – McPherson Square Metro	4,100	130,000
Total	16,400	464,000

Source: Circulator Dashboard, October 2013



Circulator links the city's core with nearby neighborhoods

agreement to allow VRE riders to use Amtrak trains. In addition to these services, Union Station hosts major national routes connecting to cities and towns across the country.

Long Bridge is a two-track railroad bridge. It is the only railroad bridge that connects the District of Columbia and the Commonwealth of Virginia. As such, it currently carries all commuter and passenger rail services entering the District from Virginia. This rail traffic must share space with freight rail traffic that also uses Long Bridge.

Due to the demand of the many different commuter, passenger, and freight rail operations, Long Bridge currently operates near capacity. This condition results in limitations on the frequency and time periods in which trains that can travel into and out of the District. DDOT, in cooperation with the Federal Railroad Administration, is completing a study on Long Bridge to determine future operating requirements of high-speed, intercity passenger, and commuter rail, as well as transit, bike and pedestrian, and freight rail.

Water Taxis

Despite the fact that the District has access to the Potomac and Anacostia Rivers, only two waterborne transit services serve D.C. The American River Taxi connects Gangplank Marina, Washington Harbor in Georgetown, and Diamond Teague Terminal at Nationals Park. Service is available on weekdays



MARC offers commuter rail and bus service between Washington, D.C. and Maryland

How Does D.C. Transit Compare to Other Regions?

- *Metrorail has the **2nd largest ridership** in the nation*
- *Metrobus is the **6th busiest bus operator** in the U.S.*
- *The District has the **2nd largest transit commute mode share** in the nation*

*All rankings from 2012

and Saturdays seasonally. No service is available in the winter. The National Harbor Water Taxi connects Alexandria to the National Harbor in Maryland. Schedules vary by time of year, but most service is focused on Saturdays and Sundays during the spring and summer.

B. NOTABLE SYSTEM ACHIEVEMENTS

D.C. benefits from a popular and multilayered transit network. To address the population and employment growth anticipated in the next decade, D.C. has undertaken plans for even more diversification and expansion in the network.

D.C. Circulator

The Circulator is a success on many levels—demand, which has resulted in the expansion of the system from three to five routes (a sixth route is planned to start in 2015); ridership, with more than 15,000 daily boardings on five routes; and interagency cooperation, as the buses are operated through a partnership between DDOT, WMATA, and the non-profit organization D.C. Surface Transit.

Capital Bikeshare

CaBi is a new layer of the District's transit system. While CaBi's vehicles are bicycles, the system functions as an extension of the transit network, since it provides a publicly-available travel option. CaBi offers its trips on the user's schedule and need—the traveler determines when and where the trip takes place.

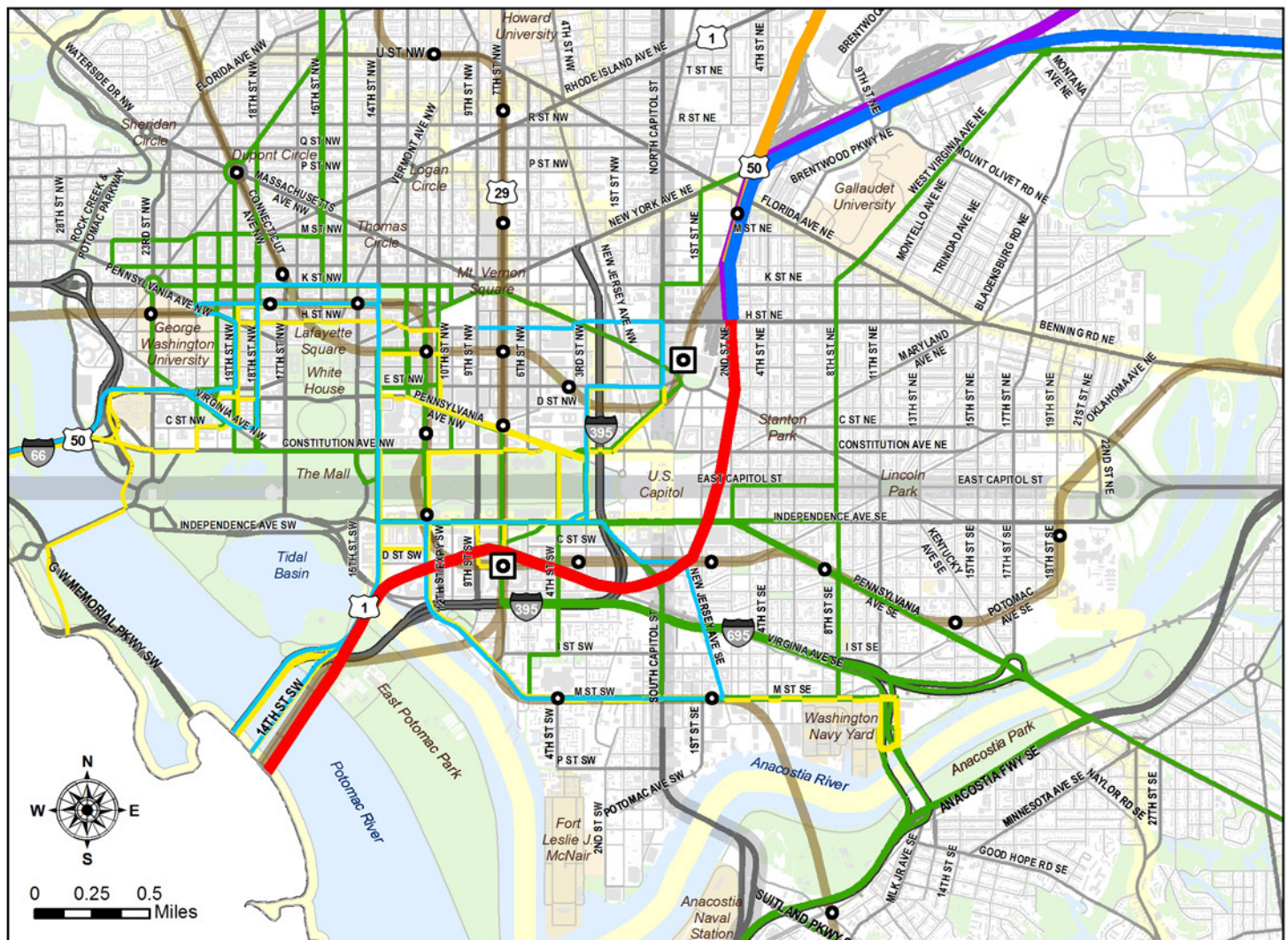
This flexibility has translated into success. During CaBi's first year, 18,000 annual members joined and the system supported

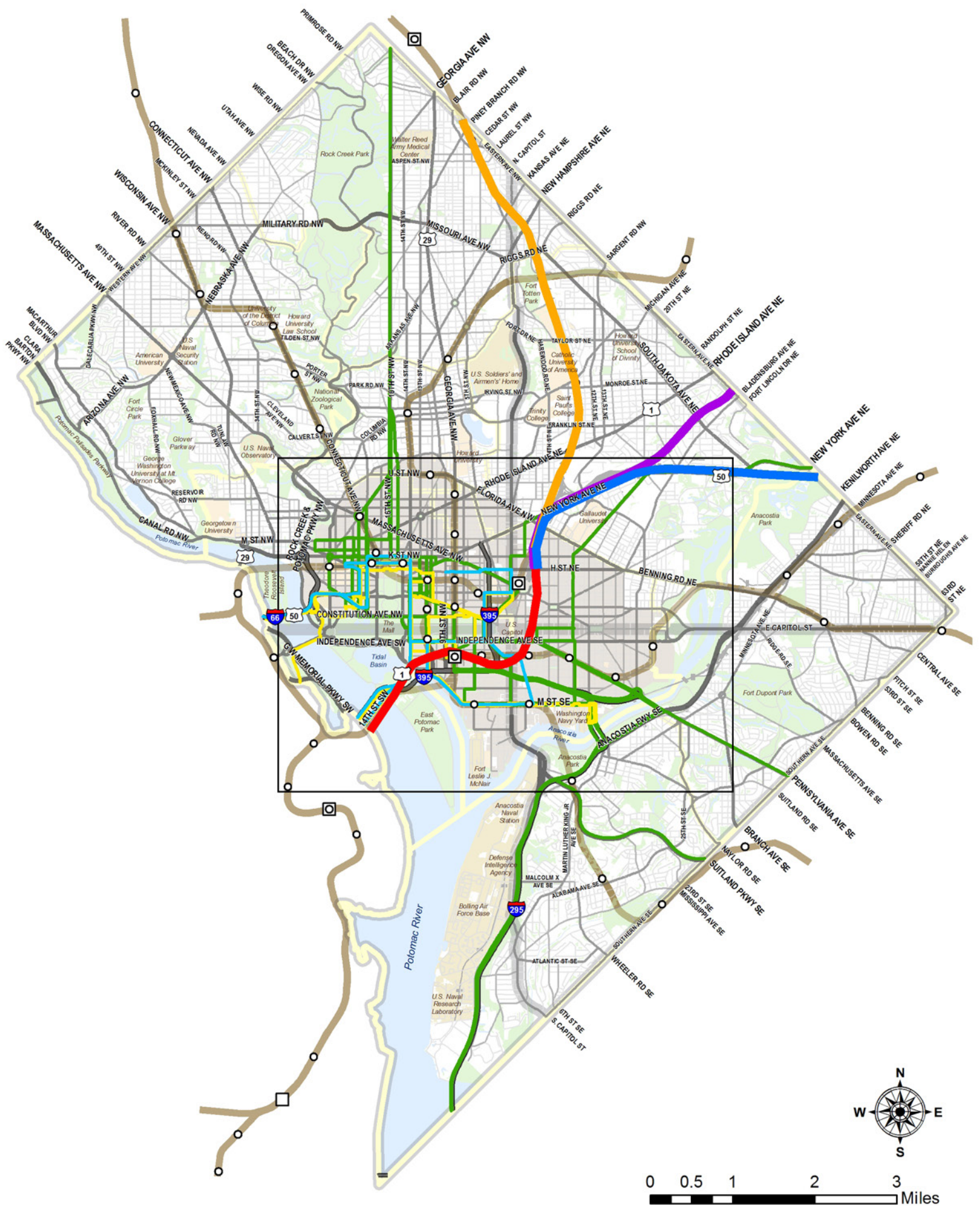
FIGURE T.5 – EXISTING COMMUTER RAIL AND BUS

This map shows VRE, MARC, and major commuter bus services in the District.

Legend

	Quadrant Boundary		Metrorail Station	<u>Commuter Rail Line</u>	
	Ward Boundary		Metrorail Line		VRE - Fredericksburg/Manassas Lines
	Water		Railroad		MARC - Brunswick Line
	Park		Road		MARC - Camden Line
	University		Commuter Rail Station		MARC - Penn Line
	Military			<u>Commuter Bus Services</u>	
	Monumental Core				Loudoun County Transit
					PRTC OmniRide
					MTA Commuter Bus





1 million rides—more than double the initial projections. In April 2013, annual memberships surpassed 33,000 riders. By 2014, CaBi grew to more than 300 stations with 3,000 bikes in four jurisdictions; an additional 50 stations will be installed in the District in 2014. To date, there have been more than 6 million CaBi trips.

D.C. Streetcar

D.C. Streetcar will begin serving the public in 2014 along H Street NE. The H Street NE/Benning Road NE segment is the first of the planned 22-mile priority system in the District. In general, D.C. Streetcar is planned to connect existing and potential growth areas, diversify the city's transit system, and increase transit access.

Bus routes along planned streetcar corridors are already crowded and will benefit from capacity added by the streetcar system. Two-thirds of the currently proposed routes will operate along historic streetcar corridors in travel lanes shared with vehicles. Stops are planned to be located every quarter- to half-mile along the routes and will include shelters and real-time service information.

MetroExtra

MetroExtra originally launched in 2007 with four routes, but as of December 2013 has expanded to 12 routes. MetroExtra bus routes are designed to offer bus riders higher speed and frequency service during specific periods of the day. In general, MetroExtra routes operate at a high frequency (relative to other Metrobus routes) and employ distinct vehicles. To increase service efficiency, stop spacing is generally a quarter- to

half-mile. Some corridors offer transit signal priority. NextBus technology—real-time arrival information—is being installed at some bus shelters.

Intermodal Centers

Due to the multitiered nature of the District's transit system, some stations serve multiple transit modes.

Union Station

In recent years, Union Station has emerged as one of the nation's busiest transportation hubs. A busy tourist, retail, and transportation destination, more than 32 million visitors pass through Union Station annually. Union Station is served by Metrorail, Metrobus, CaBi, Circulator, Amtrak, VRE, MARC, intercity buses, and commuter buses. It also is home to Bikestation Washington D.C. at Union Station. This facility provides secure bicycle storage, as well as bicycle repairs and rentals.

As of 2013, the Amtrak station alone hosted approximately 100,000 passenger trips each day. Adding to passenger rail activity, commuter and intercity rail services operate more than 200 trains through the station each day and Union Station is among the busiest in the Metrorail system.

The Union Station parking garage has 2,000 public parking spaces and also serves as a bus terminal for intercity buses. Annually, more than 2.4 million bus travelers travel to and from D.C. by way of Union Station's bus deck.³

Recognizing existing and anticipated challenges, Amtrak published the **Washington Union Station Master Plan** in July 2012. The plan provides recommendations to address short- and long-term multimodal facility needs and improve connections between the many travel modes operating out of Union Station. When implemented, the Master Plan's recommendations are intended to better support efficient and seamless connections between all transportation modes operating at Union Station, in addition to new services such as D.C. Streetcar.

Among the station's challenges today and likely in the future, passenger queues begin to form as early as 30 minutes before Amtrak boarding begins. Frequently, these queues extend into the public concourse and block the flow of passengers hoping to access other connections in the station. While intermodal access reaches its height at Union Station, the intermingling of activities concentrated at the same end of platforms creates circulation bottlenecks that will worsen as passenger volumes increase.



The streetcar is designed to connect D.C. neighborhoods and provide an additional alternative for dense residential communities

³ Union Station Redevelopment Corporation, 2013



In addition to challenges such as queuing, circulation, and functional accommodation inside the station, tracks and platforms at the station need renovation. Renovations are needed to address current design standards for overall function and passenger comfort, in addition to ADA compliance and emergency egress.

The Union Station Metrorail Station also needs investment. As of December 2013, access and capacity improvements to the Union Station Metrorail station were in design and funded through WMATA's six-year **Capital Improvement Program**.

L'Enfant Plaza

Situated between 6th and 7th Streets SW, L'Enfant Plaza hosts connections to VRE; Metrorail Orange, Blue, Yellow, and Green lines; Metrobus; and Amtrak trains serving Virginia and points south. L'Enfant Plaza is VRE's busiest station, with nearly two-thirds of the system's riders disembarking to access Metrorail and nearby employers.

WMATA's **2008 Metrorail Station Access and Capacity Study** notes that future transfer activity at L'Enfant Plaza could double by 2030.⁴ A doubling of transfer activity would exacerbate platform and vertical circulation crowding and raise concerns about station capacity. It also would increase the volume of

people making the lengthy walk to transfer between multiple transit services. **Metro 2025**—WMATA's strategic plan for 2013 to 2025—identifies L'Enfant Plaza among a group of stations that urgently need substantial capacity expansions to alleviate current and anticipated congestion and support a strong economy and sustainable development in the region.



Approximately two-thirds of VRE riders access job centers or Metrorail connections at L'Enfant Plaza station

⁴ www.wmata.com/pdfs/planning/Final%20Report_Station%20Access%20&%20Capacity%20Study%202008%20Apr.pdf

C. FUTURE DEMAND

Demand for all transportation options will grow over the next 25 years. By 2040, 170,000 more residents and 200,000 more jobs will locate in the District, generating more than 2 million new trips each day—200,000 of which are projected to be on transit crossing the District's border from Maryland and Virginia.

The Columbia Heights, NoMA, Farragut Square, Navy Yard, Southwest Waterfront, and Anacostia neighborhoods will experience the greatest increases in population density. The downtown core, NoMA, Navy Yard, and Anacostia neighborhoods will experience the greatest increase in employment density. Simply accommodating the same 42% of residents' commute trips by transit in the future will require expanding the transit network, especially these aforementioned neighborhoods.



Circulator will continue to increase transit access for DC residents

D. OPPORTUNITIES FOR IMPROVEMENT

- **Fill gaps in the high-capacity transit network.** More than half of District residents lack access to a Metrorail station within a half-mile walk from their home. WMATA is working to expand the services to these areas that are further from the high-capacity network through strategic modifications and the addition of new premium bus services.
- **Increase quality transit accessibility.** Access to efficient transit varies widely across the District. For example, only 12% of District residents can reach Georgetown using bus, rail, or a combination in less

than 1 hour. The **D.C. Transit Future System Plan** (DDOT, April 2010) identified significant swaths of the city that could not reach major employment destinations within 40 minutes using transit, particularly in Northeast and Southeast.

- **Address Metrorail and Metrobus crowding.** WMATA has taken steps to reduce crowding on Metrorail with the implementation of Rush+ and expansion of MetroExtra service, both of which are expected to relieve some transit crowding. While this short-term fix will offer a measure of relief in some areas, in the future, crowding on transit is likely to become an even more pressing issue. In addition, WMATA's **Metrobus Priority Corridor Network (PCN) Plan** is a strategy for improving bus service by improving travel times, reliability, and capacity on 24 regional corridors, which serve half of Metrobus' ridership. The PCN, shown in **Figure T.6**, is planned to offer:

- Operational enhancements such as transit signal priority and exclusive bus lanes
- Increased frequency and span of service
- Improved customer information
- MetroExtra service
- Expanded fare payment options
- Added safety, security, and incident response measures
- Enhanced bus stops and facilities

Coupled with the **PCN Plan**, DDOT is implementing or studying the feasibility of lanes for exclusive use by buses. These projects include Georgia Avenue NW, 16th Street NW, and H and I Streets NW. Georgia Avenue NW between Florida Avenue NW and Barry Street NW is currently under design with financial support from a United States Department of Transportation (U.S. DOT) **Transportation Investment Generating Economic Recovery (TIGER)** grant via the Metropolitan Washington Council of Governments (MWCOC). The implementation of services along this alignment would involve displacing curbside parking with bus-only lanes. An initial planning study by DDOT along 16th Street NW has identified some of the

FIGURE T.6 – WMATA PRIORITY CORRIDOR NETWORK

WMATA's proposed PCN is a strategy to improve bus service on 24 regional corridors



Source: www.wmata.com/about_metro/bus_planning/110728_PCN_Map.pdf

challenges to exclusive transit lanes. DDOT and WMATA have studied near-term operational improvements that may be possible for H Street NW/I Street NW between New York Avenue and Pennsylvania Avenue; dedicated bus lanes along these corridors would require further analysis. Implementation of bus-only lanes would improve person throughput, but would involve challenges to existing vehicle throughput and require modifications to curbside parking.

- **Improve Metrobus reliability.** Long travel times, indirect routes, and delays create a perception of unreliability. WMATA has worked hard to address this through real-time arrivals information and better on-time performance. The **D.C. Transit Future System Plan** (DDOT, April 2010) states that nearly 20% of trips on some of the busiest Metrobus routes operate more than 5 minutes behind schedule. According to WMATA's **Vital Signs Report** (2012), on-time performance has improved an average of 3% per year since 2010 due to the adjustment of schedules to reflect actual traffic conditions, appropriate deployment of service operation managers, and operator coordination.
- **Maintain excellent communication with passengers.** Changes in the many layers of the transit network lead to a complex and dynamic system—for example, the Rush+ system was fairly complex for commuters to understand during its implementation in June 2012. Recent innovations with technology such as mobile applications provide convenient and customizable opportunities to inform passengers of complex systemwide changes.
- **Maximize transit coverage and efficiency.** Though each element of D.C.'s diverse transit network serves a different market, there is still potential for service duplication among all of the moving parts. Some streetcar and premium bus routes are targeted to underserved areas, but, in some cases, their presence may affect other transit types. Further, Circulator expansion plans are likely to duplicate the premium bus service or streetcar, despite the different markets each service is intended to serve. There is significant overlap between the streetcar routes and planned changes to Circulator and MetroExtra—in fact, 77% of the 22-Mile Priority

Streetcar System will overlap with these planned changes. Of the 37-mile system envisioned in the **D.C. Transit Future System Plan**, 85% overlap with these planned changes. Similarly, the planned Circulator and MetroExtra routes have 14 miles of overlap, which is about one-third of the planned Circulator system and one-fifth of the planned MetroExtra routes. Streetcar, Circulator, and non-regional WMATA buses should be integrated into an efficient surface transit system to serve different transportation needs and cover various markets.

- **Expand commuter rail.** Limitations exist throughout the commuter rail network, including access (via Long Bridge, the only railroad bridge that connects D.C. and Virginia), station capacity (at L'Enfant Plaza and Union Station), and ease of intermodal connections (primarily at L'Enfant Plaza). Expansion of these facilities could facilitate increased commuter rail service between the District and the region, providing additional travel options to encourage some drive commute trips to shift to rail. MARC's **2007 Growth & Investment Plan** projects approximately three times the daily seating capacity in 2035 compared with 2010 capacity on its three lines. VRE's **2040 System Plan** estimates that ridership could double by 2040.
- **Invest in state of good repair.** Large parts of the Metrorail system have reached a point where much of the useful life of the initial capital investment has been fulfilled. While WMATA's current capital improvement program is making progress in eliminating deferred maintenance elements in the system, deferring maintenance further is likely to increase the rate of decay of system elements and the ultimate cost of repair, rehabilitation, or replacement. State of good repair needs to remain a priority for the system, while adequate funds also are allocated for service and facility expansion.
- **Accommodate reverse commuting.** While employment is growing within the District, it is also growing in the communities surrounding the District. Accommodating bidirectional commuting will increase service efficiency and operational productivity.

Ongoing Regional Transit Investments

Washington, D.C.'s transit services are part of a coordinated regional network—District system assets work in coordination with elements outside of the District's boundaries for a system that is more than the sum of its parts. Beyond the transit projects described in **moveDC**, the following are major regional transit investments that will benefit the region and District:

-
- ➔ **Silver Line:** The Silver Line is a 23-mile extension of the existing Metrorail system.¹ When its two phases are complete—Phase I in 2014 and Phase II in 2019—it will extend the Metrorail system to provide high-capacity transit service between D.C. and Loudoun County, Virginia. The Silver Line will serve Tysons Corner, the Dulles Corridor (Herndon and Reston), Dulles International Airport, and planned growth areas in eastern Loudoun County.
-
- ➔ **Crystal City/Potomac Yard Corridor Transit Improvements Project:** The Crystal City/Potomac Yard Corridor Transit Improvement Project is a planned high-capacity and high-quality transit service in the 5-mile corridor between the Pentagon and Pentagon City in Arlington County and the Braddock Road Metrorail station in the City of Alexandria.² The project is jointly sponsored by Arlington County and the City of Alexandria in cooperation with WMATA and the Virginia Department of Rail and Public Transportation.
-
- ➔ **Columbia Pike:** Arlington County is planning a joint land use and transportation effort along Columbia Pike and through Crystal City.³ These projects will include an investment in a modern streetcar system and pedestrian and bicycle facility enhancements in coordination with a planned transition in land use, public space, and art.
-
- ➔ **Purple Line:** The Purple Line is a planned 16-mile east-west light rail transit line that will connect New Carrollton and Bethesda in Maryland.⁴ When complete, the Purple Line will connect major regional business districts and activity centers such as Bethesda, Silver Spring, Takoma/Langley Park, College Park, and the University of Maryland. The Purple Line is planned to have 21 stations and will directly connect to branches of Metrorail's Red, Green, and Orange Lines as well as three MARC lines, Amtrak, and many local bus routes.
-
- ➔ **Corridor Cities Transitway:** The Corridor Cities Transitway is a 15-mile, two-phase project in Montgomery County, Maryland, from the COMSAT facility near Clarksburg, Maryland, to the Shady Grove Metrorail station.⁵ Phase I, 9 miles from Metropolitan Grove to Shady Grove, is actively underway; it currently is proceeding with engineering and environmental analysis and is funded for formal environmental documentation, final design, and right-of-way acquisition. Phase II would be a future extension from Metropolitan Grove to the COMSAT facility, and would be developed as land use matures and additional transportation funding becomes available.

1 www.dullesmetro.com

2 www.ccpytransit.com

3 www.columbiapikeva.us

4 www.purplelinemd.com

5 www.cctmaryland.com

III. Recommendations

The vision for the District's transit future is to deliver an improved *total transit system*. This system would offer people the highest level of flexibility, access, and connectivity to quality transit services, independent of the transit vehicle type or operator. Achieving an improved total transit system will require the provision of attractive, safe, comfortable, and reliable service that is appealing to both existing patrons and people not currently using the system. It also will involve making strategic investments in capacity for systems operating today as well as those yet to be developed.

Each component of the envisioned transit system will offer different benefits and meet different people's needs for different trips. The components working in coordination are what will provide the District the robust network it needs to grow and people the experience that they desire. The District's transit network will allow residents, workers, and visitors the ability to travel anywhere in the District by transit in a convenient and reliable manner. It will be reliable and predictable for trips downtown and also between city neighborhoods and important nearby destinations. Service will be available when people want and need it. For much of the city, this means that service needs to operate at least 18 hours a day, 7 days a week.

A diversity of transit mode technologies—commuter rail, Metrorail, bus, and streetcar—will be needed to help the District achieve an exceptional level of transit service and quality. This section provides recommendations for improving transit with an awareness that many operators will need to be involved in the delivery of facilities, infrastructure, and services.

This is the **Transit Element** of the District's **Multimodal Long-Range Transportation Plan** and seeks to the help achieve the following transit-specific goals:

- *More and better coordinated transit facilities*
- *More transit-supportive policies*
- *Encourage transit use and effectiveness through education, promotion, and enforcement*

A. MORE AND BETTER COORDINATED TRANSIT FACILITIES

Facilities are the physical improvements to the city's diverse transit infrastructure. **Figures T.7 through T.13** show the recommended transit plan for the District. The **moveDC** plan calls for a 26-mile streetcar network, a 47-mile high-capacity transit (HCT) network, 7.5 miles of Metrorail, and supporting high-frequency and local bus services in the next 25 years. All of these elements will be coordinated to each support different types and distances of trips, while working together to provide a complete transit network.

Recommendation A.1: Integrate transit services to efficiently support existing demand and connect future growth nodes.

For transit to be most effective, different modes and services must be matched to the correct markets. Appropriate balance must be achieved among demand and coverage-based services, commuter and frequent-traveler services, urban and suburban services, and other service types. The best approach for creating balance is to define a "family of services." Most areas already have an ad-hoc family of services that has developed over time, but the family of services often is not coordinated or organized consistently.

For the traveler, the type of transit that best fits their travel need is more important than the operator or even the vehicle. DDOT should work with all of the transit operators serving the District of Columbia to make sure that services complement one another. Each member of the transit family should be geared toward serving the following trip types:

- **Commuter trips.** *As commute trips are about 20% of all transit trips, commuting should be among the focuses of all transit modes.*
- **Long-distance trips.** *These trips across the District and throughout the region will be served by heavy rail rapid transit, commuter rail, express bus in managed lanes, and water taxis.*
- **District trips.** *These work, service, and recreational trips between District neighborhoods will be served principally by HCT—streetcar or bus-based transit—and high-frequency bus services. Peak period trips of these types can also be supported along the high-frequency*

local and regional bus corridors through targeted enhancements to provide travel time improvements and higher frequency service specifically tailored to peak period needs.

- **Local trips.** These trips, primarily between adjacent and within neighborhoods, would be principally served by local bus services.

DDOT should work with other regional transit operators to better coordinate service, improve legibility of the system, minimize service duplication, and accommodate demand for bidirectional commuting.

Recommendation A.2: Establish a surface HCT network.

moveDC incorporates all of the strategies above into a transit network to increase transit effectiveness, quality, and reliability, increasing capacity and mobility to downtown as well as city neighborhoods. **Figure T.7** shows the recommended major network for the District's HCT surface system. **Table T.3** summarizes substantive HCT and high-frequency bus characteristics. The major components of the surface HCT system include:

- 22-Mile Priority Streetcar System with potential extensions
- 25 miles of HCT in dedicated lanes

Table T.3: High-Capacity Transit and High-Frequency Transit Characteristics

Element	High-Capacity Transit	High-Frequency Bus
Goal	To provide a substantially higher level of passenger capacity, speed, and service frequency for customers.	To improve the overall quality of service for customers on key transit corridors by reducing trip times; enhancing customer comfort, convenience, safety and accessibility and making transit service more reliable and cost-effective.
Definition	Transit service that can operate in exclusive right of way (dedicated lanes) in mixed traffic, or a combination of both. Service operates at frequent intervals along a fixed route.	Transit service that operates at high frequencies on heavily-traveled corridors in mixed traffic, and is enhanced with physical and operational modifications to improve service.
Operational Characteristics*		
Frequency	10 min or less	10 min all day
Transit Technology	rail, bus	bus
Vehicle Capacity	High-capacity vehicles (>100 people/vehicle) with level boarding.	Standard vehicles (~60 people/vehicle)
Runningway	May operate in dedicated lanes/right-of-way for all or a portion of the route	Operates in mixed traffic
Intersection Treatments	Intersection improvements and signal prioritization. Sometimes dedicated signal phasing.	Intersection improvements and signal prioritization
Stop Spacing	>1/3 mile	>1/4 mile
Stop Design	Potential off-board fare collection, specialized signage and increased visibility.	Standard stop design.

*Operational characteristics may include, but are not limited to, this list.

FIGURE T.7 – PLANNED MAJOR TRANSIT NETWORK

Legend

	Quadrant Boundary		Existing Infrastructure		moveDC Plan Elements (Future)
	Ward Boundary		Metrorail Station		Metrorail Line
	Water		Metrorail Line		High-Capacity Transit
	Park		Railroad		Streetcar (22-Mile System)
	University		Road		Streetcar Extension
	Military				Street
	Monumental Core				Water Transit
					Metrorail Station
					Union Station Improvements

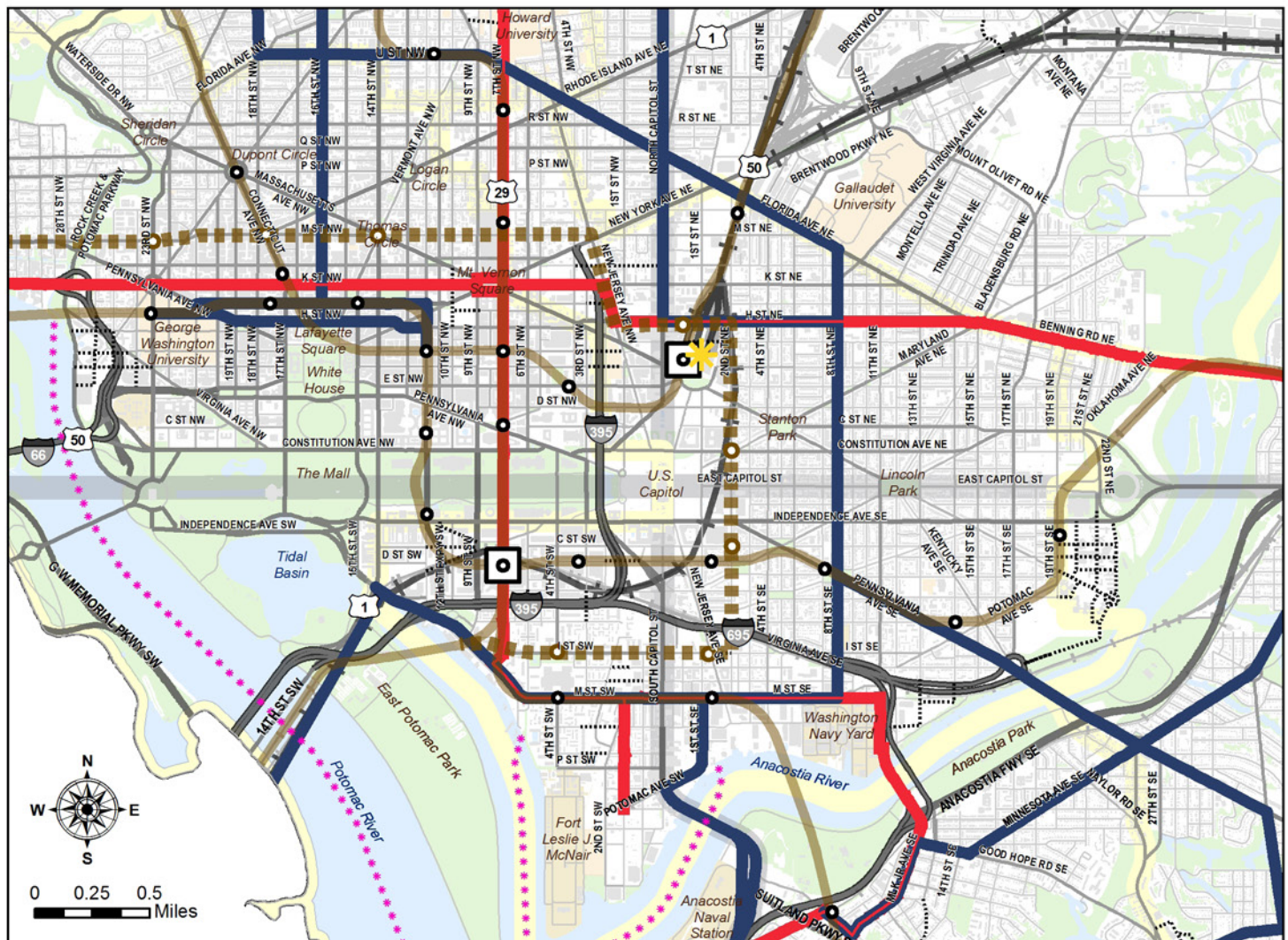
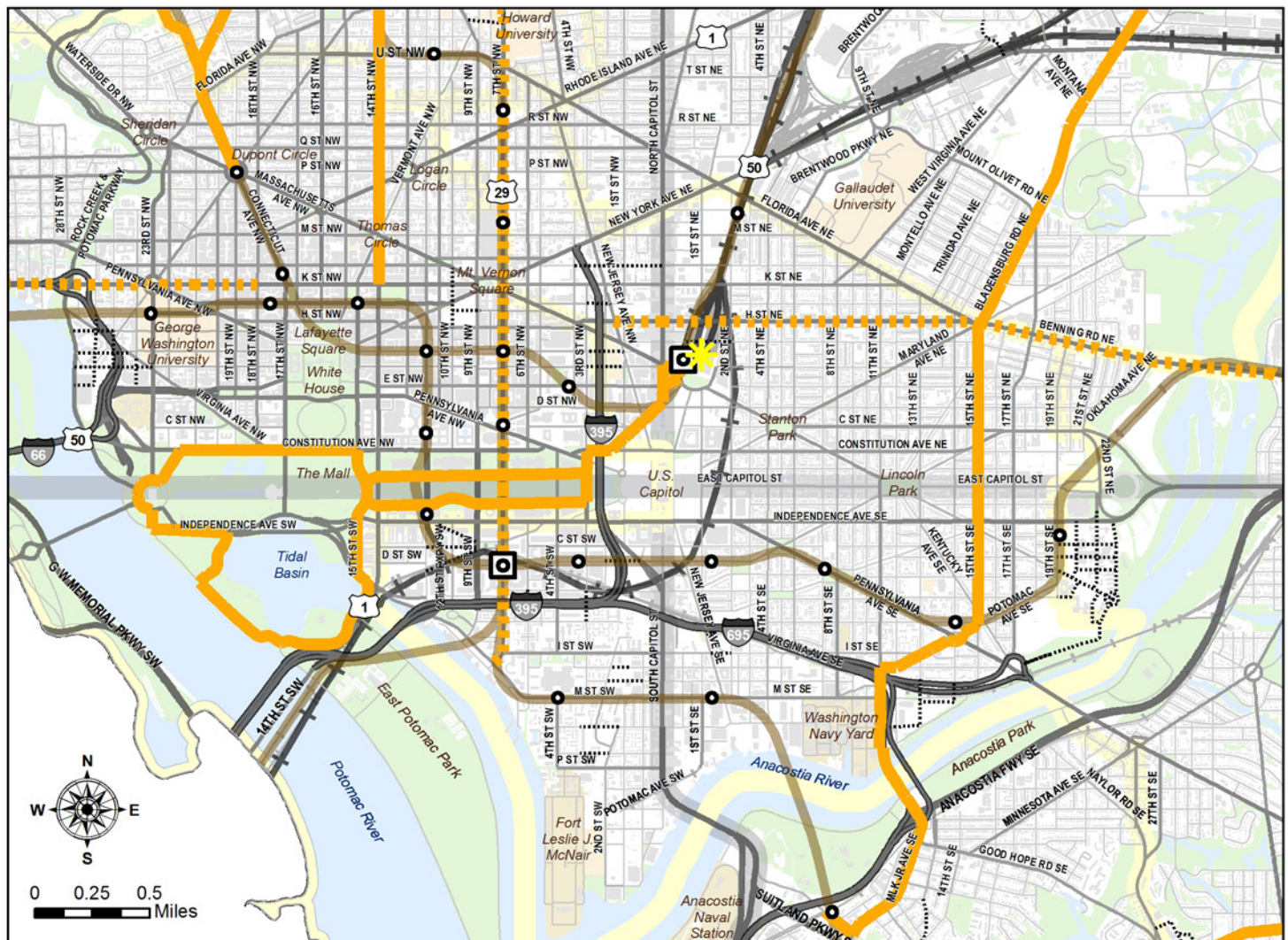




FIGURE T.8 – PLANNED HIGH-FREQUENCY LOCAL AND REGIONAL BUS CORRIDORS

Legend

 Quadrant Boundary	<u>Existing Infrastructure</u>	<u>moveDC Plan Elements (Future)</u>
 Ward Boundary	 Metrorail Station	High Frequency Local & Regional Bus Corridor
 Water	 Metrorail Line	 moveDC Plan Network
 Park	 Commuter Rail Station	 Preliminary Corridor In Advance of Streetcar
 University	 Commuter Rail	 Street
 Military	 Railroad	 Union Station Improvements
 Monumental Core	 Road	



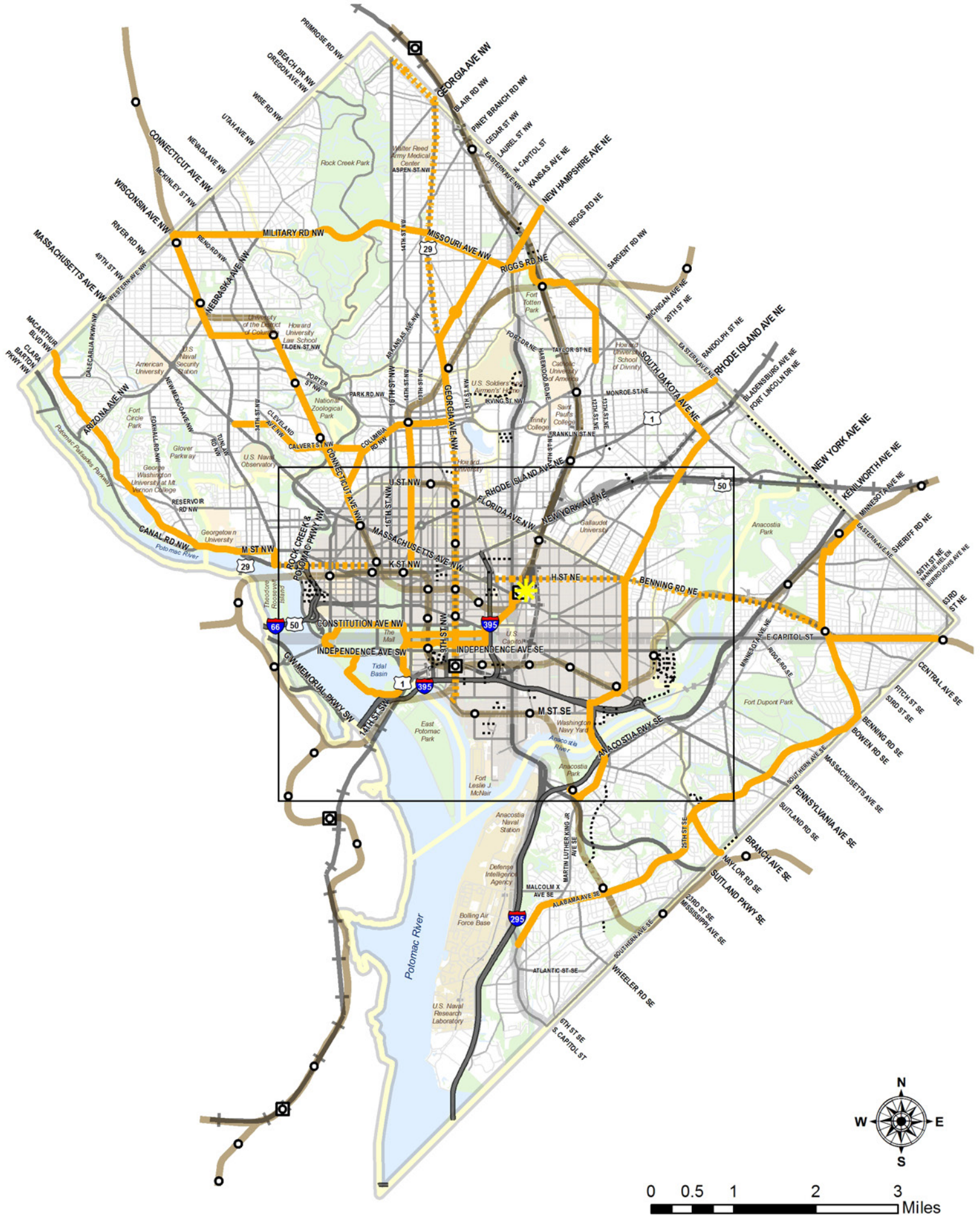


FIGURE T.9 – DOWNTOWN PLANNING AREA TRANSIT NETWORK

The **moveDC** transit network for the Downtown planning area includes:

- Support for:
 - MARC and VRE for commuter rail service expansion
 - Union Station enhancements
 - WMATA in implementation of its **Momentum Plan**
 - WMATA in implementing a new Potomac River Metrorail tunnel between Rosslyn and Georgetown and a new downtown Metrorail loop that separates the Orange/Blue lines and the Yellow/Green lines
- Streetcar
 - Southeast-Southwest Line (Anacostia - M Street - Maine Avenue - Southwest Waterfront)
 - North-South Corridor connecting Buzzard Point and Takoma/Silver Spring, MD
 - One City Line (east-west) along K Street NW and H Street NW/NE connecting Georgetown and Benning Road via Union Station
- HCT
 - 16th Street connecting downtown and Silver Spring (dedicated space)
 - Maine Avenue SW/M Street SW/SE connecting the 14th Street Bridge and Navy Yard (dedicated space and shared lanes)
 - North Capitol Street connecting NoMa and Stronghold/McMillan (dedicated space)
 - Calvert Street NW/U Street NW/Florida Avenue NW/NE/8th Street NE/SE connecting Woodley Park to Navy Yard (shared lanes)
- Dedicated bus lanes on H Street NW and I Street NW
- Transit connection in dedicated lanes across the Potomac River along the planned Long Bridge as rail with a potential trail connection
- Water transit service within the District and between D.C. and neighboring jurisdictions with stops in Georgetown, Southwest Waterfront, and Navy Yard
- High-frequency local and regional bus corridor
 - 14th Street NW connecting downtown and Columbia Heights
 - Columbia Road NW connecting Dupont Circle, Adams Morgan, and Petworth
 - Connecticut Avenue NW connecting Dupont Circle and Friendship Heights

Legend

Existing Infrastructure

- Metrorail Station
- Metrorail Line
- Railroad
- Commuter Rail
- Road

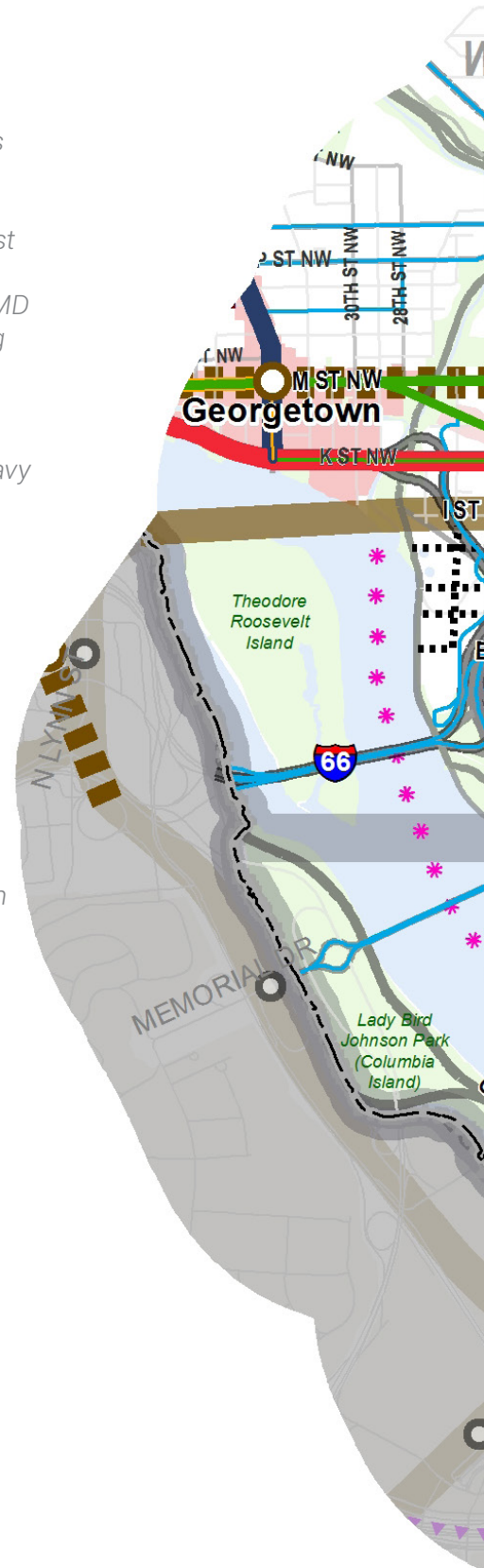
Existing Bus Service

- DC Circulator
- Metrobus

- Ward Boundary
- Central Employment Area
- Land Use Change Area
- Mixed Use or Neighborhood Center
- Multi-Neighborhood or Regional Center

moveDC Plan Elements (Future)

- Metrorail Station
- Metrorail Line
- High-Capacity Transit
- Streetcar
- High Frequency Local & Regional Bus Corridor
- Water Transit
- Street
- Union Station Improvements



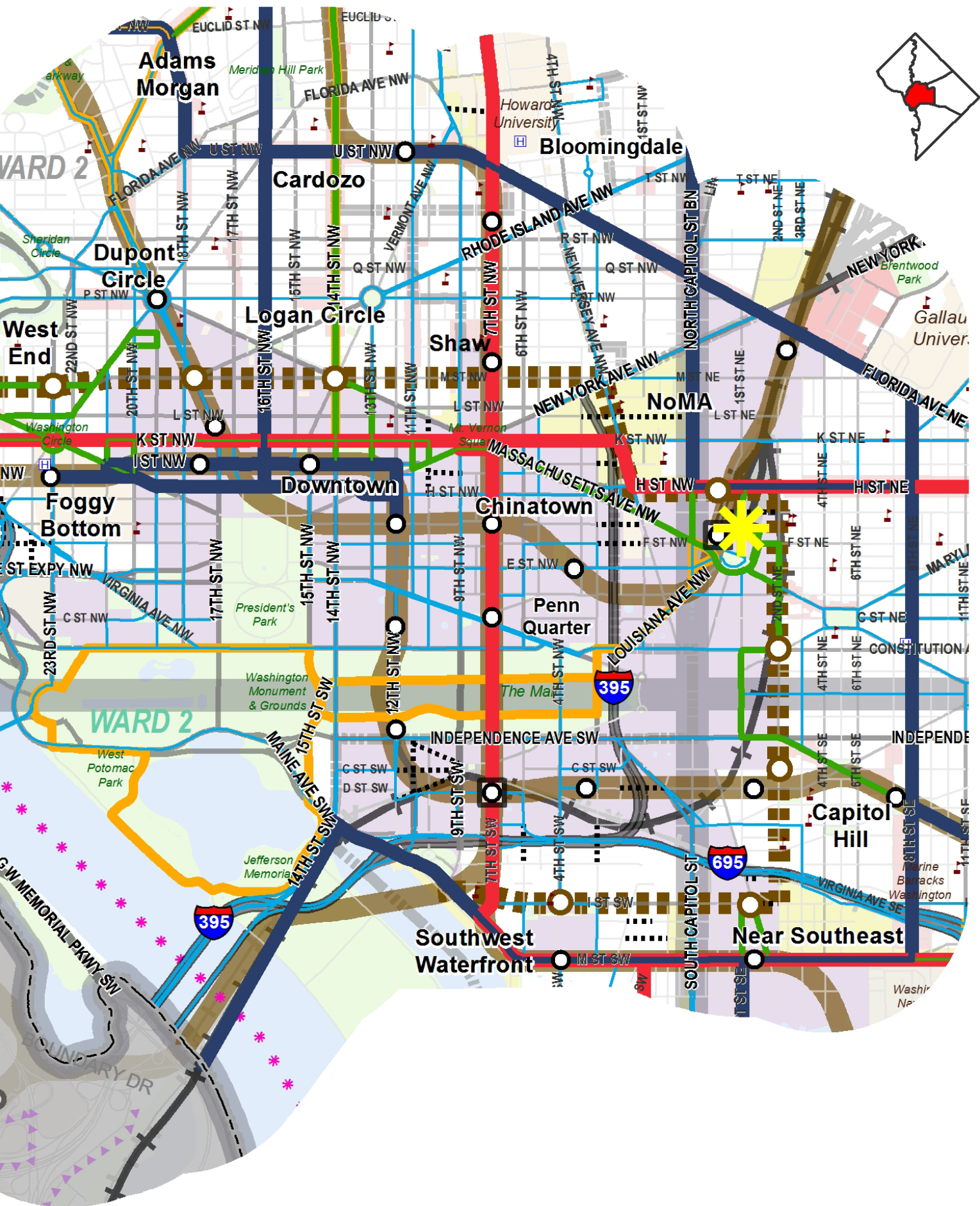
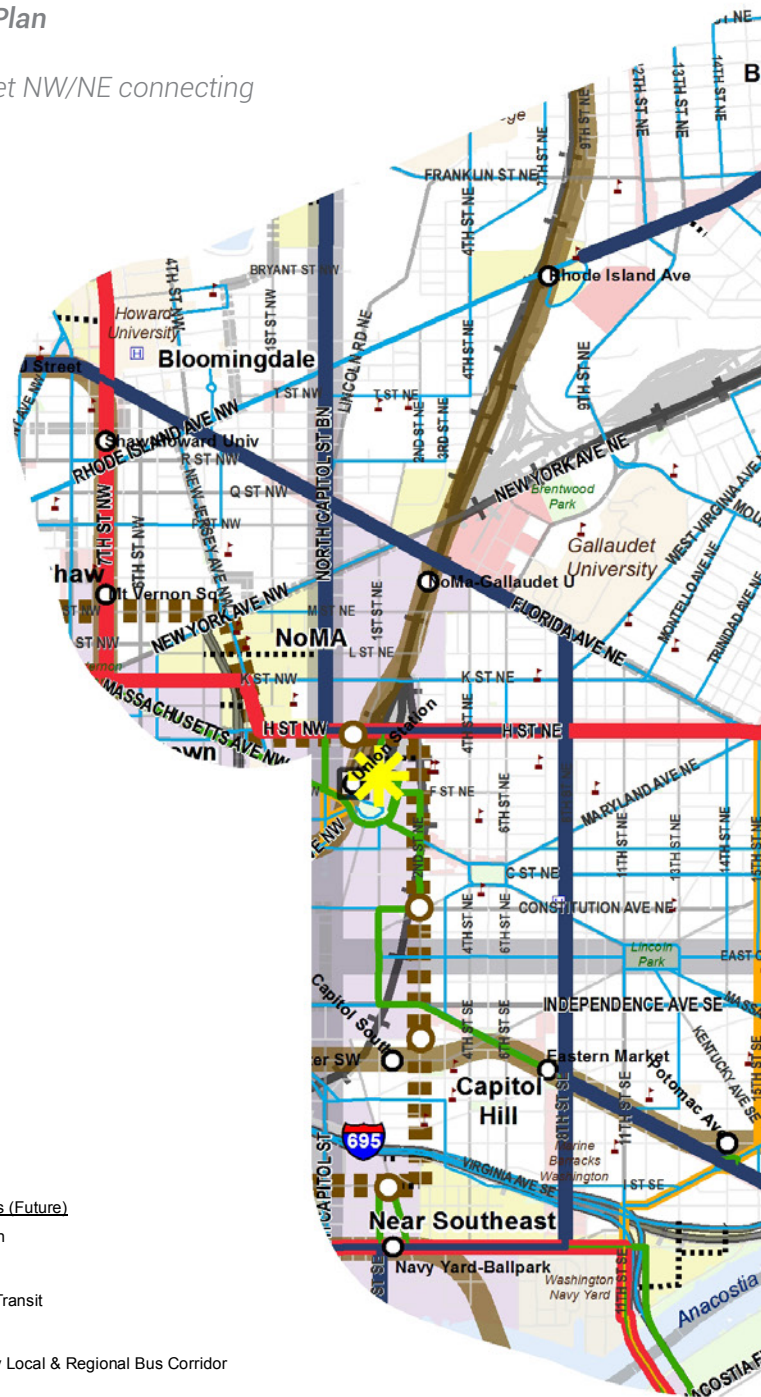


FIGURE T.10 – EASTERN PLANNING AREA TRANSIT NETWORK

The **moveDC** transit network for the Eastern planning area includes:

- Support for WMATA in implementation of its **Momentum Plan**
- Streetcar
 - One City Line (east-west) along K Street NW and H Street NW/NE connecting Georgetown and Benning Road via Union Station
- HCT
 - Calvert Street NW/U Street NW/Florida Avenue NW/NE/ 8th Street NE/SE connecting Woodley Park to Navy Yard (shared lanes)
 - Minnesota Avenue NE connecting Benning and Anacostia
 - North Capitol Street connecting NoMa and Stronghold/ McMillan (dedicated space)
 - Pennsylvania Avenue SE connecting Capitol Hill and Skyland
- High-frequency local and regional bus corridor
 - Alabama Avenue SE/Benning Road SE/4th Street NE connecting Congress Heights and Deanwood
 - Bladensburg Road NE/15th Street NE/SE connecting Anacostia, Navy Yard, and Mt. Ranier/Colmar Manor, MD
 - East Capitol Street extending transit from Benning to Capitol Heights, MD



Legend

Existing Infrastructure

- Metrorail Station
- Metrorail Line
- Railroad
- Commuter Rail
- Road

Existing Bus Service

- DC Circulator
- Metrobus

- Ward Boundary
- Central Employment Area
- Land Use Change Area
- Mixed Use or Neighborhood Center
- Multi-Neighborhood or Regional Center

moveDC Plan Elements (Future)

- Metrorail Station
- Metrorail Line
- High-Capacity Transit
- Streetcar
- High Frequency Local & Regional Bus Corridor
- Water Transit
- Street
- ★ Union Station Improvements

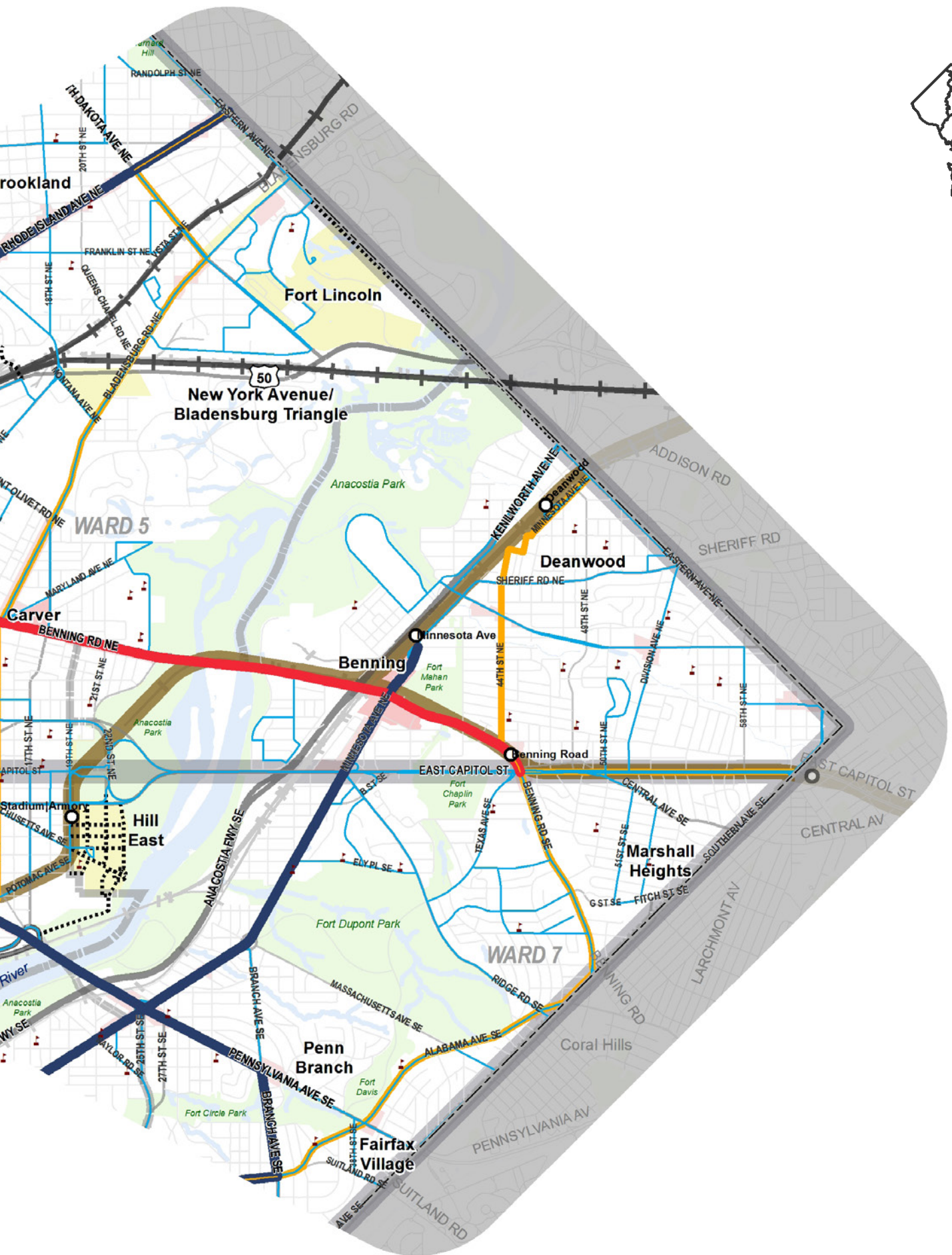


FIGURE T.11 – NORTHERN PLANNING AREA TRANSIT NETWORK

The **moveDC** transit network for the Northern planning area includes:

- Support for WMATA in implementation of its **Momentum Plan**
- Streetcar
 - North-South Corridor connecting Buzzard Point and Takoma/Silver Spring, MD
- HCT
 - 16th Street NW connecting downtown and Silver Spring (dedicated space)
 - North Capitol Street connecting NoMa and Stronghold/McMillan (dedicated space)
 - Calvert Street NW/U Street NW/Florida Avenue NW/NE/8th Street NE/SE connecting Woodley Park to Navy Yard (shared lanes)
 - Van Ness Street NW/Park Drive NW/Michigan Avenue NW/NE connecting Michigan Park/Brookland and Tenleytown via Mount Pleasant/Columbia Heights
- High-frequency local and regional bus corridor
 - 14th Street NW connecting downtown and Columbia Heights
 - Cleveland Avenue NW/Cleveland Avenue NW/Columbia Road NW connecting Columbia Heights and Glover Park
 - Columbia Road NW/Kansas Avenue NW connecting Dupont Circle, Adams Morgan, and Petworth
 - Military Road NW/Missouri Avenue NW/South Dakota Avenue NE connecting Friendship Heights and Fort Totten

Legend

Existing Infrastructure

- Metrorail Station
- Metrorail Line
- +— Railroad
- +— Commuter Rail
- Road

Existing Bus Service

- DC Circulator
- Metrobus

- Ward Boundary
- Central Employment Area
- Land Use Change Area
- Mixed Use or Neighborhood Center
- Multi-Neighborhood or Regional Center

moveDC Plan Elements (Future)

- Metrorail Station
- Metrorail Line
- High-Capacity Transit
- Streetcar
- High Frequency Local & Regional Bus Corridor
- Water Transit
- Street
- ✱ Union Station Improvements





FIGURE T.12 – SOUTHERN PLANNING AREA TRANSIT NETWORK

The **moveDC** transit network for the Northern planning area includes:

- Support for:
 - WMATA in implementation of its **Momentum Plan**
 - WMATA in implementing a new Potomac River Metrorail tunnel between Rosslyn and Georgetown and a new downtown Metrorail loop that separates the Orange/Blue lines and the Yellow/Green lines
- Streetcar
 - Anacostia Initial Line – M Street SE connecting Southwest Waterfront and Anacostia
 - Anacostia Line extension to Congress Heights via Martin Luther King, Jr. Avenue SE and Wheeler Road SE
 - North-South Corridor connecting Buzzard Point and Takoma/Silver Spring, MD
- HCT
 - Minnesota Avenue NE connecting Benning Road and Anacostia
 - South Capitol Street connecting Southwest Waterfront/Navy Yard and National Harbor, MD
 - Pennsylvania Avenue SE connecting Capitol Hill and Skyland
- Water transit service within the District and between D.C. and neighboring jurisdictions; stops in Southwest Waterfront and Navy Yard
- High-frequency local and regional bus corridor
 - Alabama Avenue SE/Benning Road SE/4th Street NE connecting Congress Heights and Deanwood
 - Bladensburg Road NE/15th Street SE/NE connecting Anacostia, Navy Yard, and Mt. Ranier/Colmar Manor, MD
 - Naylor Road SE connecting Skyland and Green Line Metrorail stations (Southern Avenue and Naylor Road)

Legend

Existing Infrastructure

- Metrorail Station
- Metrorail Line
- Railroad
- Commuter Rail
- Road

Existing Bus Service

- DC Circulator
- Metrobus

- Ward Boundary
- Central Employment Area
- Land Use Change Area
- Mixed Use or Neighborhood Center
- Multi-Neighborhood or Regional Center

moveDC Plan Elements (Future)

- Metrorail Station
- Metrorail Line
- High-Capacity Transit
- Streetcar
- High Frequency Local & Regional Bus Corridor
- Water Transit
- Street
- ✱ Union Station Improvements



FIGURE T.13 – WESTERN PLANNING AREA TRANSIT NETWORK

The **moveDC** transit network for the Western planning area includes:

- Support for:
 - WMATA in implementation of its **Momentum Plan**
 - WMATA in implementing a new Potomac River Metrorail tunnel between Rosslyn and Georgetown and a new downtown Metrorail loop that separates the Orange/Blue lines and the Yellow/Green lines
- Streetcar
 - One City Line (east-west) along K Street NW and H Street NE connecting Georgetown and Benning Road via Union Station
- HCT
 - Calvert Street NW/U Street NW/Florida Avenue NW/NE/8th Street NE/SE connecting Woodley Park to Navy Yard (shared lanes)
 - Van Ness Street NW/Park Drive NW/Michigan Avenue NE/NW connecting Michigan Park/Brookland and Tenleytown via Mount Pleasant/Columbia Heights
 - Wisconsin Avenue connecting Georgetown and Tenleytown
- Water transit service within the District and between D.C. and neighboring jurisdictions; stop in Georgetown
- High-frequency local and regional bus corridor
 - MacArthur Boulevard NW connecting Georgetown and Sibley Memorial Hospital
 - Cleveland Avenue NW/Cleveland Avenue NW/Columbia Road NW connecting Columbia Heights and Glover Park
 - Connecticut Avenue NW connecting Dupont Circle and Friendship Heights
 - Military Road NW/Missouri Avenue NW/South Dakota Avenue NE connecting Friendship Heights and Fort Totten

Legend

Existing Infrastructure

-  Metrorail Station
-  Metrorail Line
-  Railroad
-  Commuter Rail
-  Road

Existing Bus Service

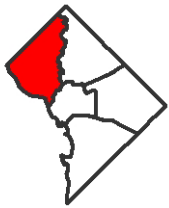
-  DC Circulator
-  Metrobus

Ward Boundary

-  Central Employment Area
-  Land Use Change Area
-  Mixed Use or Neighborhood Center
-  Multi-Neighborhood or Regional Center

moveDC Plan Elements (Future)

-  Metrorail Station
-  Metrorail Line
-  High-Capacity Transit
-  Streetcar
-  High Frequency Local & Regional Bus Corridor
-  Water Transit
-  Street
-  Union Station Improvements



- 22 miles of HCT in shared lanes
- Water transit service within the District and between D.C. and neighboring jurisdictions with six boats per peak hour and stops in Georgetown, Southwest Waterfront, and Navy Yard

With the exception of the District's identified Priority Streetcar Network, the **moveDC** plan does not specifically identify the transit mode technology—bus or rail—or the details for the runningway configuration (median, center, or side) for the additional HCT corridors. **moveDC** makes a preliminary identification of the type of runningway—shared versus dedicated—for the priority streetcar and HCT system based on vehicular traffic levels, existing transit demand, and right-of-way. These are primarily for analysis purposes, and detailed studies will be needed to assess trade-offs of runningway configurations and transit mode technology in detail. The **moveDC** plan assumes that dedicated lane sections of the system would have a high degree—more than 80%—of exclusive transit lanes. Shared lane sections of the system would have service operating mostly in mixed flow (with vehicular traffic); however, some sections would be dedicated to improve service quality.

Each of the HCT corridors and proposed streetcar system extensions will require further study to determine the exact runningway configuration, route, operational and service profile, alignment, and transit mode technology. **Figure T.15** shows the potential configuration for the recommended high-capacity surface transit network.

Recommendation A.3: Invest in operational enhancements along significant bus corridors.

In addition to the HCT corridor network and other infrastructure-intensive transit services, investments in physical and operational modifications along significant regional and local bus corridors in the District and region will be needed. Along many of D.C.'s major travel corridors, it isn't the contribution of a single service that warrants investment, but the collective impact of all of the services operating along parts or the entirety of corridors. WMATA's **Priority Corridor Network Plan** is designed to promote this pattern of investment already and it is recommended that DDOT consider a similar approach for local and regional bus corridors of significance in the District.

General strategies that should be employed in these corridors are those identified in "Transit Operational Improvement Strategies" on pages 42 to 43. The implementation of these types of measures has the ability to decrease transit travel times and delay, increase vehicle running speeds, reduce vehicular delays, and improve service reliability. Based on a preliminary analysis, **Figure T.8** shows corridors that should be considered for these types of measures. DDOT should work in coordination with WMATA to periodically review ridership and operations in these and other corridors to prioritize physical and operational investments to benefit local and regional bus operations.

Recommendation A.4: Increase transit speeds and reliability systemwide.

For transit to be a reasonable choice, it must offer reliable and reasonable travel times. Transit travel time may be greater than a comparable driving trip; however, offering reliable travel time for each and every trip is often the difference for people to choose transit over driving. DDOT should strategically implement infrastructure and operational enhancements to improve service reliability related to travel speed and delay. In keeping with industry best practices, DDOT should work with the region's transit operators to establish a goal of 85% of all transit trips operating on schedule.

Recommendation A.5: Maintain the District's transit system at a state of good repair to maximize reliability.

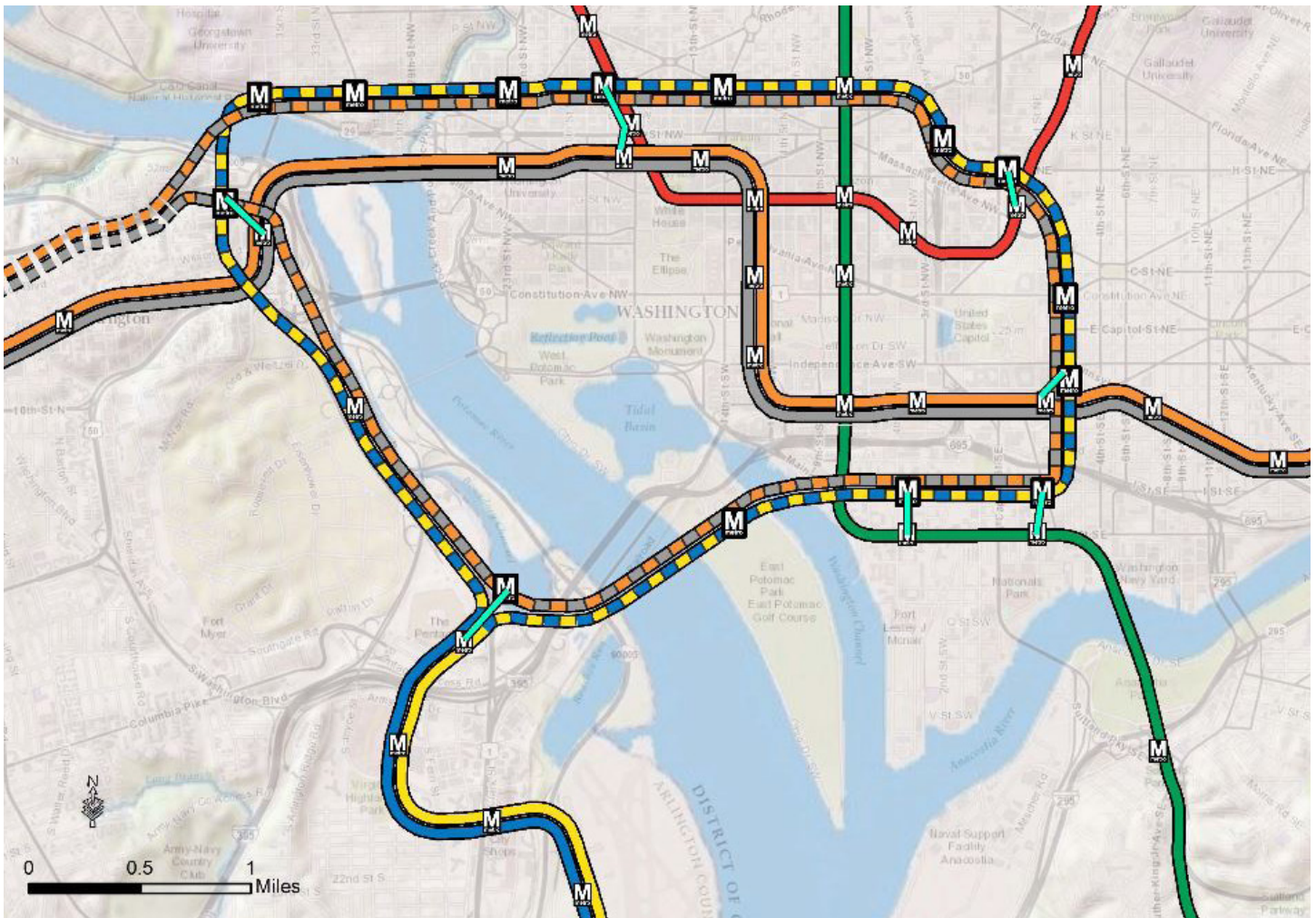
The District's transit system and its facilities should be maintained at a state of good repair. Maintaining transit facilities (storage, maintenance, shelters, runningways, and vehicles) in this manner will improve system reliability, safety, and availability. WMATA and other regional transit operators also should work to achieve a state of good repair for transit system assets.

Recommendation A.6: Invest in Metrorail core capacity and long-term expansion.

The mid- and long-term capacity issues on the Metrorail system require long-term investment approaches. DDOT should begin working with WMATA and regional partners to invest in mid-term capacity improvements outlined in WMATA's **Momentum 2025** plan, as well as long-term capacity improvements outlined in WMATA's **Regional Transportation System Plan**, including a new Potomac River Metrorail tunnel and a new downtown

Figure T.14: WMATA's proposed core Metrorail network in the Regional Transit System Plan

Source: WMATA



Metrorail loop separating the Orange/Blue lines and the Green/Yellow Lines (Figure T.14). DDOT will not be able to implement this recommendation alone, but can have a key role in planning and identifying funding approaches from public and potentially private partners.

Recommendation A.7: Invest in Metrorail station access improvements

DDOT should look for opportunities to improve access to existing Metrorail stations. This could include new station entrances or access points as well as improved pedestrian or bicycle facilities connecting to Metrorail stations. Opportunities for new station access points could come through private development projects or through public investments in access improvements. Stations with high volumes of riders with limited access or stations where new access points would improve the accessibility of a station as shown in Figure T.2 should be priorities.



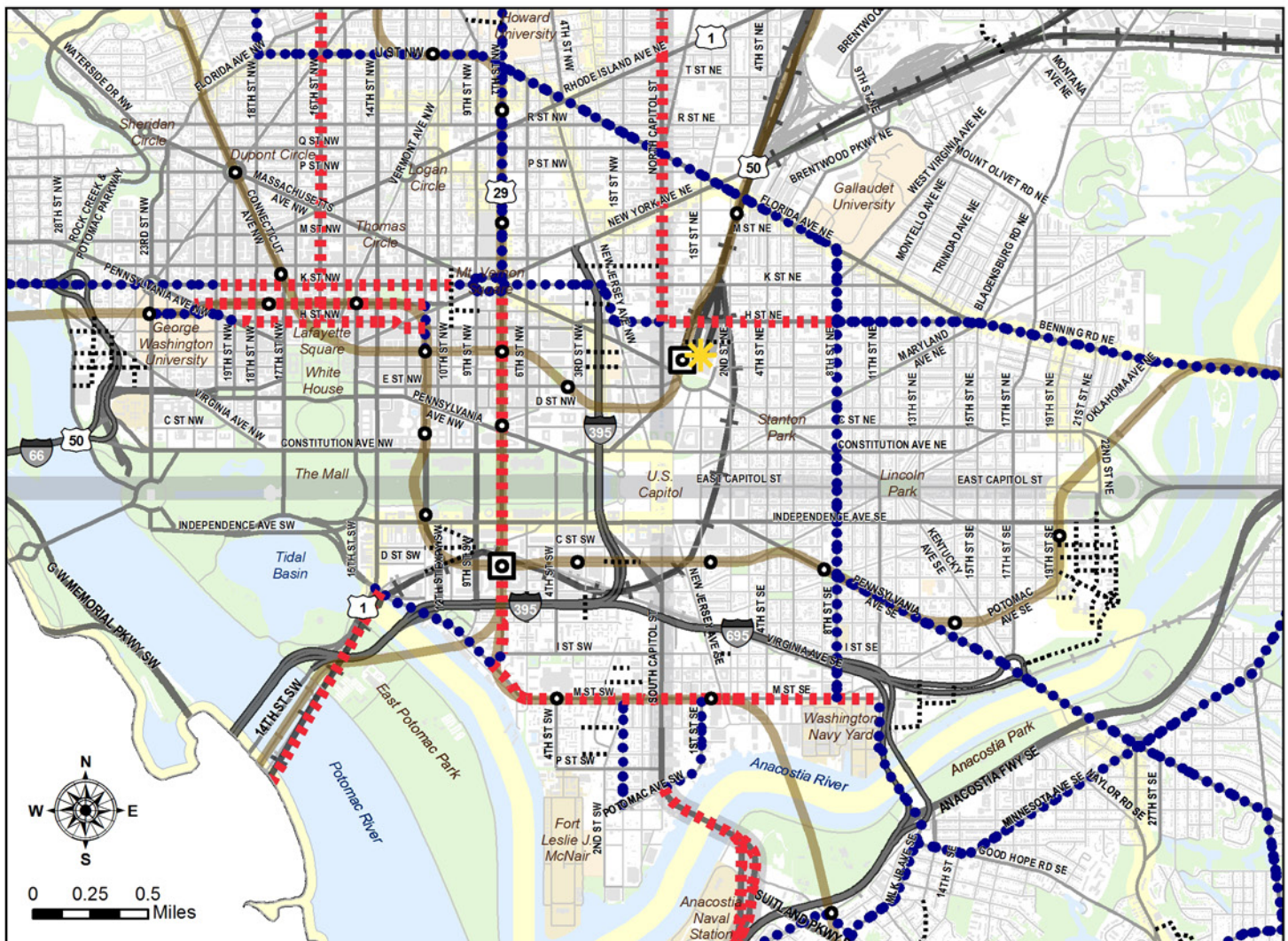
Heavy rail rapid transit and commuter rail serve higher speed and longer distance transit connections from the District as well as the surrounding region

FIGURE T.15 – PLANNED HIGH-CAPACITY SURFACE TRANSIT NETWORK (RUNNINGWAY CONFIGURATION)

A runningway is the configuration of the transit line. Runningways can either be shared, where transit operates in the same lanes as all vehicles, or dedicated, where transit operates in its own space. This figure shows the potential runningway configuration for streetcar and HCT lines.

Legend

 Quadrant Boundary	<u>Existing Infrastructure</u>	<u>moveDC Plan Elements (Future)</u>
 Ward Boundary	 Metrorail Station	 High-Capacity Surface Transit (Shared Lanes)
 Water	 Metrorail Line	 High-Capacity Surface Transit (Dedicated Space)
 Park	 Commuter Rail Station	 Street
 University	 Commuter Rail	 Union Station Improvements
 Military	 Railroad	
 Monumental Core	 Road	





Transit Operational Improvement Strategies

Operating speeds and reliability are generally a function of the type of runningway (e.g., exclusive or mixed traffic), stop or station spacing, and character of service. DDOT has a tremendous opportunity to offer benefits to transit operations Districtwide, whether or not DDOT operates the service. This is due to the fact that DDOT controls the physical street space and the traffic operations within that space. Physical and operational tactics DDOT could employ are described below.

→ **Traffic Signal Operations Enhancements:** Traffic signals have a significant impact on bus travel time. Adjusting signals to benefit transit, either passively or actively, can offer a great benefit for transit users. From a passive perspective, coordinating signals to average bus speed instead of the average automobile speed also can allow transit vehicles to travel with fewer delays.¹



From an active perspective, employing transit signal priority (TSP) can further increase speeds. The general logic of TSP is organized around a brief extension of the green phase or an early truncation of the red phase to permit the progression of the approaching transit vehicle. Ideally, the system is linked with the overall service schedule and automated vehicle location system to help better manage on-time performance of the route. Transit signal priority is relatively simple to implement and operate. It involves minor retiming of traffic signals, some communications equipment within the signal system, the installation of detection devices at signals, and installation of emitters (or the use of GPS technology) on the transit vehicles.

→ **Queue Jump and Bypass Lanes:** Transit signal priority can be combined with transit vehicles using right-turn lanes or short transit-only lanes to enable buses to "jump out" of queued traffic. Often called queue jump lanes, these allow buses to bypass some traffic back-ups and advance to the front of the line at a signal.



In some systems, the queue jump lane also serves right-turn traffic, while in others, an additional lane is provided for general vehicle traffic. Queue jump lanes can be used to help buses better navigate difficult intersections or make left turns. A variation of a queue jump lane is a queue bypass lane where a bus would access a right-turn or short bus-only lane and go through an intersection into a far-side stop.

→ **Transit Stop Consolidation:** The number of stops (or stations) and their location is a significant factor in transit travel time and can contribute to undue general vehicular delay as well. As routes are restructured or studied in detail, transit stop location and spacing should be carefully considered. Strategic relocation and consolidation of stops, where practical, can dramatically improve operational efficiency, reduce traffic delays for all traffic, and result in only limited negative impacts on transit patrons. The principal impact on patrons when stops are consolidated is the potential for people's walk to transit to increase.



¹ Federal Transit Administration, Bus Rapid Transit (BRT) Demonstration Program Signal Prioritization Reference Guide, www.fta.dot.gov/2340_7260_ENG_HTML.htm.

Along future high-capacity routes, stops should be spaced at a frequency not less than a quarter- to half-mile. Along local routes, stop spacing of approximately a quarter to third of a mile is ideal. There is a direct relationship between access and operating speed. Lines with fewer stops have less delay from passenger boardings.

- **Bus Bulb-outs:** Where appropriate, bulb-outs should be provided in locations with on-street parking or wide curb lane conditions. By extending the curb out to the travel lane, the bus is able to stop where it can easily return to its route and passengers are able to more easily and safely board and alight. Stopping in the travel lane can have an impact on traffic delay, but helps reduce bus stop dwell time, provides a more comfortable waiting experience for passengers, and reduces conflicts between waiting passengers and passing pedestrians. Often, where buses are required to pull to the curb to stop, the presence of on-street parking or concern by a bus driver of getting trapped by traffic at a stop prevents the bus from pulling full against a curb, typically resulting in the back of the bus blocking a travel lane. This often has a cascading series of impacts such as erratic lane changes by passing vehicles (causing sideswipe crashes), queuing of following vehicles (delay), and uncertainty in bus movement for cyclists. In many cases, the service and experiential improvements created by the bus bulb-out outweigh the concerns about traffic delay.



- **Prepayment of Bus Fares:** Prepayment of fares can significantly decrease passenger loading time. Persons who have paid in advance can enter through any door, and special vehicles with multiple doors can be used to reduce the amount of time it takes passengers to board and alight. In some cities—such as San Francisco, California; San Diego, California; Budapest, Hungary; and Curitiba, Brazil—in order to stand on the platform, passengers must have proof of payment. Riders must either purchase tickets as they enter a station or hold a proof-of-payment stub that must be surrendered to fare-enforcement officials upon request. In many European cities, riders are required to purchase their transit ticket before boarding a bus, and then can validate their ticket at a ticket validation machine once on board, allowing the bus to begin moving before fares have even been validated. Prepayment of bus fares has no negative impact on the overall transportation network, but it may require travelers to become familiar with a new payment system and where it is in use.



Recommendation A.8: Support rail capacity expansion.

Commuter rail is a critical element of the major regional transit network. Freight and passenger rail share the same infrastructure in many locations in the District. The capacity of the rail network limits the ability for freight and passenger rail to increase service.

moveDC expects that the region's commuter rail system will continue to be operated by VRE and MARC. The communities served by MARC and VRE are home to many people who work in D.C., many of whom currently drive to the District each day. Additional service by the commuter railroads and support facilities will be needed to optimize these commuter resources and reduce commuting demand on the region's and District's street network.

DDOT should continue to work with VRE, MARC, Amtrak, and freight railroads to implement projects needed to alleviate mid-day train storage issues at Union Station, create the opportunity for run-through (between Maryland and Virginia) service, and create the opportunity for off-peak direction (during peak periods) and off-peak period service. DDOT's current study of Long Bridge is a prime opportunity to help increase capacity and improve operations for VRE. DDOT should work with regional partners to plan for and invest in capacity improvements, such as those outlined in MARC's *Growth and Investment Plan* and VRE's *2040 System Plan*.

Recommendation A.9: Enhance commuter transit, including bus and water taxi.

Commuter bus is another critical element of the major regional transit network. **moveDC** expects that commuter buses will be operated by a number of different companies based on market demand. Additional bus service and support facilities will be needed to optimize these commuter resources and reduce commuting demand on the region's and District's street network. Coordination among commuter bus operators and the District will be important to ensuring that adequate storage and staging are accommodated with minimal negative impacts on transit patrons, operators, and the District. This means identifying long-term commuter bus volumes and schedules, and coordinating between the operators and DDOT to use curbspace efficiently while balancing all the other demands also served by the same curbs.

The existing water taxi operations that serve D.C. offer a starting point to expand waterborne transit; options for additional routes and/or expanded schedules should be investigated.

B. MORE TRANSIT-SUPPORTIVE POLICIES

Recommendation B.1: Provide "go anywhere, all day" transit.

The District's transit network should allow residents, workers, and visitors the ability to travel anywhere in the District by transit in a convenient and reliable manner. By expanding and upgrading the District's public transport network over the next 30 years, the system will provide excellent accessibility throughout much of the city, not just downtown. With this degree of accessibility, users will be able to use the transit system as much as they would use their car and be able to go anywhere in the District. For most places, this means at least 18 hours of service in a day. On some key corridors, it may mean around-the-clock service.

Recommendation B.2: Establish minimum performance metrics for evaluating dedicated transitways.

DDOT should adopt minimum performance metrics for evaluating the creation of dedicated lanes for transit. Future conversion of shared travel lanes to dedicated transitways should be based on the transit ridership on a corridor compared to the delay of transit vehicles due to mixed traffic. In general, when the number of people riding transit along a corridor is equal to the number in vehicles in a general traffic lane, a lane should be converted to exclusive transit use, or examined for such conversion where it is clear that significant trade-offs may be untenable or difficult to manage. According to research from the Transit Cooperative Research Program, "Generally, at least 25 buses should use the lanes during the peak hour. (Ideally, there should be at least one bus per signal cycle to give buses a steady presence in the bus lane.)"⁵

5 TCRP Synthesis 83, Bus and Rail Transit Preferential Treatments in Mixed Traffic, Federal Transit Administration, 2010



Coordination among transit operators in the District and region will be important to delivering effective transit services

Recommendation B.3: Connect different modes to each other and across jurisdictional boundaries.

DDOT should work internally and with its regional partners to ensure that projects connecting across the District boundary align with adjoining jurisdictions' plans and multimodal facilities provide easy transfers between both modes and operators. Investments in the transportation system in larger parts of the region should support the capacity and functionality of the District of Columbia's transportation system. Non-motorized and transit modes should be prioritized in support of the overall **moveDC** plan, though roadway improvement projects should also be coordinated.

The **moveDC** plan recommends high-capacity surface rapid transit compatible and/or coordinated with the following regional initiatives:

- Long Bridge HCT line and Arlington County's planned Columbia Pike and Crystal City-Potomac Yard transitways
- South Capitol Street HCT line and Prince George's County's National Harbor transitway
- North-South D.C. Streetcar line and Montgomery County's Georgia Avenue bus rapid transit (BRT) line and the Purple Line
- Rhode Island Avenue NE HCT line and Prince George's County's Bladensburg-Takoma-Langley Park transitway
- Pennsylvania Avenue SE HCT line and Prince George's County's Pennsylvania Avenue transitway
- Wisconsin Avenue NW HCT line and Montgomery County's MD 355 South (Wisconsin Avenue) BRT line
- Tenleytown-Brookland HCT line and Montgomery County's MD 355 South (Wisconsin Avenue) BRT line
- 16th Street NW HCT line and Montgomery County's Georgia Avenue BRT line and the Purple Line

Using the same approach, all transit stations should be opportunities for multimodal connections, with walking and biking serving as easy starts or finishes of any transit trip.

Recommendation B.4: Continue to support agency partners in implementing various plans that serve District needs and support District goals.

This recommendation highlights the desire and necessity for DDOT to collaborate with partner agencies to deliver seamless transit service for residents, workers, and visitors traveling to, from and within the District. Such activities include:

- Support for WMATA's **Momentum Plan**
- Support to WMATA in implementing parts of the **Regional Transit System Plan** including the new Potomac River Metrorail tunnel and a new downtown Metrorail loop separating the Orange/Blue lines and the Yellow/Green lines
- Support to VRE and MARC as they expand service
- Support enhancements to Union Station and L'Enfant Plaza

Recommendation B.5: Emphasize cooperation among the region's planners and operators.

As the District changes, transit service must evolve to meet shifting needs. Led by DDOT, more proactive service planning among jurisdictional partners—not just operators—will help to improve coordination among modes as well. Such coordination can help to improve the transfer experience and also to improve other types of feeder services beyond the transit system. Improving pedestrian and bike access to transit can not only improve connectivity to the transit network, but also can enhance safety, comfort, and attractiveness of the system. Changes that are championed and supported by DDOT and WMATA may have a stronger chance of implementation.

In the future, it is likely that transit services in the District will continue to be operated by many different agencies and private companies. Deliberate and purposeful cooperation and coordination will be needed to ensure the delivery of efficient and effective services.

The District should take a leadership role in increasing partnerships among the area's transit operators. This partnership could be used to develop a defined family of services around which future planning and implementation efforts are focused. It also could be used to conduct planning for services on an area-wide basis (Districtwide or sub-area)

to achieve the most effective use of each service in the family of services. Last, the partnership could help in the pursuit of joint and cross-jurisdiction beneficial initiatives in high-capacity surface transit (streetcar, BRT, light rail, and rapid bus), Metrorail, and commuter rail, so that all services support each other, maximizing the efficiency of each individual element.

Recommendation B.6: Implement standards for frequency and span by transit function.

Many systems establish a cascading set of service frequencies (how often each route runs) and span of service (how early and late, and which days each route runs), according to how various service types complement the overall transit system. There are many ways to organize a service framework and it must be customized to suit the needs of those traveling within the system or network. DDOT should work with the region's transit operators to establish consistent frequencies and spans for different service functions. An example service framework from the San Francisco Municipal Transit Agency (SFMTA) is shown in **Table T.4**.

The starting point should be the region's core routes and services operating in downtown, such as Circulator, streetcar, and high-frequency bus lines. Services operating in the core and Downtown should operate at least 18 hours a day, 7 days a week at 15-minute or shorter frequencies. A span and frequency of service such as this would offer most people service when they need it without the need for a schedule. A minimum service frequency of 15 minutes also is recommended for HCT in off-peak periods. During peak periods, HCT service is recommended to operate with greater frequency.

Some parts of the District are unlikely to support fixed-route transit service due to their density, land use mix, and street network density. In many of these areas, people would still benefit from reliable transit services; however, the services may need to be destination-specific and/or responsive to demand. Service standards should help identify where demand responsive and destination-specific (or trip purpose-specific) services would be efficient and effective than fixed route services.

DDOT should provide an appropriate level of transit service to lower demand areas through point or route deviation transit services. Point and route deviation services generally operate

along a route and have a range of allowable deviation to enable them to more directly pick-up or drop-off passengers based on demand.

With this type of service, operators may define zones and average or maximum distances for deviation from the route based on travel times and distance to/from established fixed route services. Generally, system operators tend to examine moving fixed route services to flexible services where route productivity falls below 30 to 50 passengers per hour. Flexible services generally operate in the range of 5 to 20 passengers per hour.⁶ Flexible services can be delivered directly by a single operator, through partnership between operators or through cooperation among public and private entities.

Recommendation B.7: Implement standards for setting transit fares.

DDOT should establish a clear and transparent fare-setting approach for District-run transit service that balances operating support and farebox recovery in terms of meeting goals of the **moveDC** plan.

⁶ Best Practices in Transit Service Planning, prepared for the Florida Department of Transportation Research Center. University of South Florida Center for Urban Transportation Research, March 2009

Promoting Reliable Service

The SFMTA established a maximum headway/minimum frequency of scheduled service, noting that basic services would be available to those in the coverage area at no more than 30-minute intervals. In Southern California, Los Angeles County Metropolitan Transit Authority (LACMTA) branded a network where service operates at least every 12 minutes with a “12-minute map.”

Whatever the direction, it should be clearly understood and communicated to customers so that there is a reasonable expectation of accessibility and quality service.

Table T.4: Example of SFMTA's Systemwide Service Framework

	Purpose	Headway	Span of Service
Rapid/High-Capacity Transit	Highest ridership and frequency, schedule-free service	5-10 minutes	At least 18 hours per day
Local network	Extend reach of rapid/high-capacity network, provide feeder services	10-15 minutes	All operating hours
Community and specialized/paratransit services	Fill gaps in fixed route services	15-30 minutes	Demand-specific, includes minimum/core service hours
Targeted services	Commuter and/or express services	Demand-specific, but no more than 30-60 minutes	Weekday, focus on peak-hours

Source: SFMTA 2009 Transit Effectiveness Project Framework

Recommendation B.8: Develop a statewide rail plan.

DDOT should develop and regularly update a statewide rail plan that integrates planning for freight and passenger rail in the District. The plan should comprehensively consider rail infrastructure, operations, and safety.

C. ENCOURAGE TRANSIT USE AND EFFECTIVENESS THROUGH EDUCATION, PROMOTION, AND ENFORCEMENT**Recommendation C.1: Provide transportation education at all levels.**

Lack of information should not be a barrier to people's full use of the transportation system. DDOT should support transportation training to help people learn how to use the different components of the multimodal transportation system. This may include basic education on navigating the system, but also should include detailed information on access to and availability of subsidies and special services. Other educational materials may include information comparing one mode choice versus another in terms of out-of-pocket cost, impact, convenience, travel time, route, and other benefits. This can help to educate travelers and customers on how best to use the system, as well as to educate them on the impact of their choices.

DDOT should coordinate with its governmental and agency partners along with private organizations to facilitate implementation of this recommendation. One primary opportunity is to provide education and encouragement to federal employees who live outside of the District to commute via the regional rail, bus, and water taxi network.

Recommendation C.2: Eliminate the transfer penalty between transit modes.

Currently, passengers traveling between Metrorail, Metrobus, and the Circulator must pay the fare for each service when making transfers, which can result in an additional cost of at least \$2 per trip during peak hours. Though additional fare payments are reduced by \$0.50 when patrons use SmarTrip—WMATA's electronic fare card—any additional payment is often viewed as a penalty by passengers whose trip simply requires several services.

The District should work with WMATA to remove the additional fare. This would reduce people's out-of-pocket cost of taking transit and reinforce a message of an integrated transit system to patrons. Removing this barrier between services could help people perceive the system as seamless and coordinated, which have the potential to encourage increased use. To implement this recommendation, DDOT and its partners should consider charging no more than the difference between bus and rail trips, much like how transfers between local and express buses are addressed. Fully eliminating the transfer penalty could cost as much as \$85 million per year. This cost has not been factored into the **moveDC** financial plan at this time, so funding for this would need to be balanced against other priorities in the plan.

Recommendation C.3: Further reduce the barriers to transit access in low-income neighborhoods.

When people opt to pay less to ride a slower transit service, they are sacrificing their time and ultimately the District's potential for economic productivity. This is especially prevalent in low-income neighborhoods further outside of downtown where travel times into education and job centers require significantly longer travel times by bus than by train. To further increase transit access, the District should continue to reduce the cost of rail trips starting or ending at stations in low-income neighborhoods. Precedent programs to achieve this objective already exist, including the **Anacostia Special Bus Fare**, where the District funds discounted transfer for WMATA riders transferring from bus to rail using SmarTrip cards at the Anacostia Metrorail station, and SmartTrip cards reduced from \$5 to \$2 are made accessible at local retailers in low-income neighborhoods.

Recommendation C.4: No special farecard should be needed to pay for District transportation services (WMATA, Circulator, CaBi, commuter rail, carshare, and parking).

Paying for transportation in the District should be simple for everyone, regardless of their transit trip. A passenger on any transit mode should be able to use a bank-issued payment card, credit card, ID card, or mobile phone to pay their fare. This would be a shift from making every traveler use a common fare payment option and require a shift in current technology for most of the District's existing transportation network.

DDOT is working with other transit agencies in the region to test and install the next generation fare collection system for the region. New Electronic Payment Program (NEPP) is an advanced transit fare collection and validation system built on open architecture. The region will migrate from the current proprietary SmarTrip system to NEPP in the near future.

Recommendation C.5: Require employers to provide access to pre-tax non-auto transportation benefits.

Across the United States, many municipalities promote prepayment of transit fares for individual users where bulk purchases (as described in Recommendation C.6) are not economically feasible or where there is not sufficient interest. The most common approach to this is through payroll deductions that are exempt from taxes. The next step is to require employers of a certain size to offer this benefit. A bill requiring employers with 50 or more employees to offer pretax payroll deductions for non-auto transportation benefits has been introduced to the D.C. Council.

Recommendation C.6: Offer transit bulk fare media purchases for organizations.

DDOT should work with the area's transit operators to offer bulk purchases of transit fare media for organizations. This would allow an individual end user to pay a lower price for transit fares, even beyond any discounts realized by purchasing passes over individual fares. This has the potential to increase employee incentive to use transit as an alternative to driving. Bulk fare media purchases also provide transit agencies up front funds at a lower marginal cost than individual fares paid on the day of travel.

Bulk fare purchase programs work best with large population bases, including large employers and universities purchasing fares for students. Pricing and management of these bulk fares are typically organized by the service providers and not a local government.

Recommendation C.7: Brand the family of transit services.

Each part of the family of services should be uniquely branded based on purpose instead of operator. DDOT should work with the region's transit operators to develop and implement consistent branding based on function within the family of services. Transit services provided by DDOT—Circulator, CaBi, and streetcar—should share a coordinated visual identity (logos, websites, vehicle design, color palettes, and marketing materials) and complementary messaging.

IV. Performance

moveDC's recommendations are intended to result in a transit network that reaches more people and places at more times of the day. The network is designed to offer people more choices and, in some cases, the opportunity to choose a higher-speed transit option. The recommended transit network connects to D.C.'s neighbors and supports regional transit systems and their planned initiatives. **moveDC** goals (described in **Chapter 1**) were used in the evaluation of the performance of the **Transit Element**, similar to other elements.

The Districtwide Travel Demand Model, the project's spatial analysis model, and qualitative reviews were used to develop the metrics for each performance measure relevant to the **Transit Element**. The **Transit Element's** overall performance—by relevant goal category—is summarized in **Table T.5**.

Table T.5 moveDC Transit Element Performance

Goal	Metric	Performance
Sustainability & Health	Increase non-auto mode split	A 23% transit mode share is forecasted for all weekday trips that start and end in the District
	Increase access to parks and green space	Not applicable for this element
	Encourage active transportation for health benefits	Not applicable for this element
	Reduce air and water quality impacts of transportation	Increase in non-auto trips has the potential to reduce air and water quality impacts
	Prepare the transportation system for changing environmental and climatological conditions	Not applicable for this element
Citywide Accessibility & Mobility	Increase the person-carrying capacity of the transportation system	Results in a 105% increase in weekday peak period transit capacity Districtwide compared to the existing (2013) network
	Improve system reliability	Not applicable for this element
	Reduce financial barriers to the lowest-income transportation system users	Reduces barriers to transit in low-income neighborhoods
	Accommodate the movement and management of freight and goods	Not applicable for this element
	Integrate the District's transportation system with the region's transportation network	Supports WMATA's Momentum and Regional Transit System Plan as well as VRE's and MARC's long-range plans and planned Union Station enhancements
Neighborhood Accessibility & Connectivity	Increase the coverage of all modal networks throughout the District	- Provide 22% of the forecast 2040 District population with access to a Metrorail station within a 7.5-minute walk of their residence (see Figure T.16) - Provide 45% of the future population with access to a high-capacity surface transit stop (streetcar or high-capacity transit) within a 7.5-minute walk of their residence (see Figure T.16)
	Increase the number of transportation choices for travel between city neighborhoods	Increased ability to take transit between neighborhoods
	Increase transportation availability to population centers and jobs, schools, amenities, and services	New Metrorail, streetcar, or high-capacity transit accessing all eight population centers, six of nine population centers, and 16 out of 20 mixed-use centers (see Figure T.17)
	Increase transportation availability to economically challenged or targeted redevelopment areas	Create new Metrorail, streetcar, or high-capacity transit accessing 20 out of 33 low-income Census Tracts and 23 out of 26 designated redevelopment areas (see Figure T.17)

Table T.5: *moveDC Transit Element Performance (continued)*

Goal	Metric	Performance
Safety & Security	Improve safety for all users	• <i>Not applicable for this element</i>
	Improve redundancy of transportation networks to handle emergencies	• <i>A 99% increase in weekday peak period transit capacity on designated evacuation routes</i>
	Expand sidewalk network	• <i>Not applicable for this element</i>
	Maintain ability to evacuate District in case of emergency	• <i>Not applicable for this element</i>
	Preserve key functions without impacting the transportation system	• <i>Not applicable for this element</i>
Public Space	Protect and enhance important corridors and urban landscapes	• <i>Not applicable for this element</i>
	Make streets functional, beautiful, and walkable	• <i>Not applicable for this element</i>
	Increase tree coverage	• <i>Not applicable for this element</i>
Preservation	Maximize reliability for all District transportation infrastructure by investing in maintenance and asset management	• <i>A minimum of 22 miles of streetcar and 47 miles of HCT will require maintenance; appropriate resources and programs should be made available to ensure that assets are appropriately maintained</i>

FIGURE T.16 — COVERAGE OF THE RECOMMENDED HIGH-CAPACITY SURFACE TRANSIT AND METRORAIL NETWORKS WITHIN A 7.5-MINUTE WALK

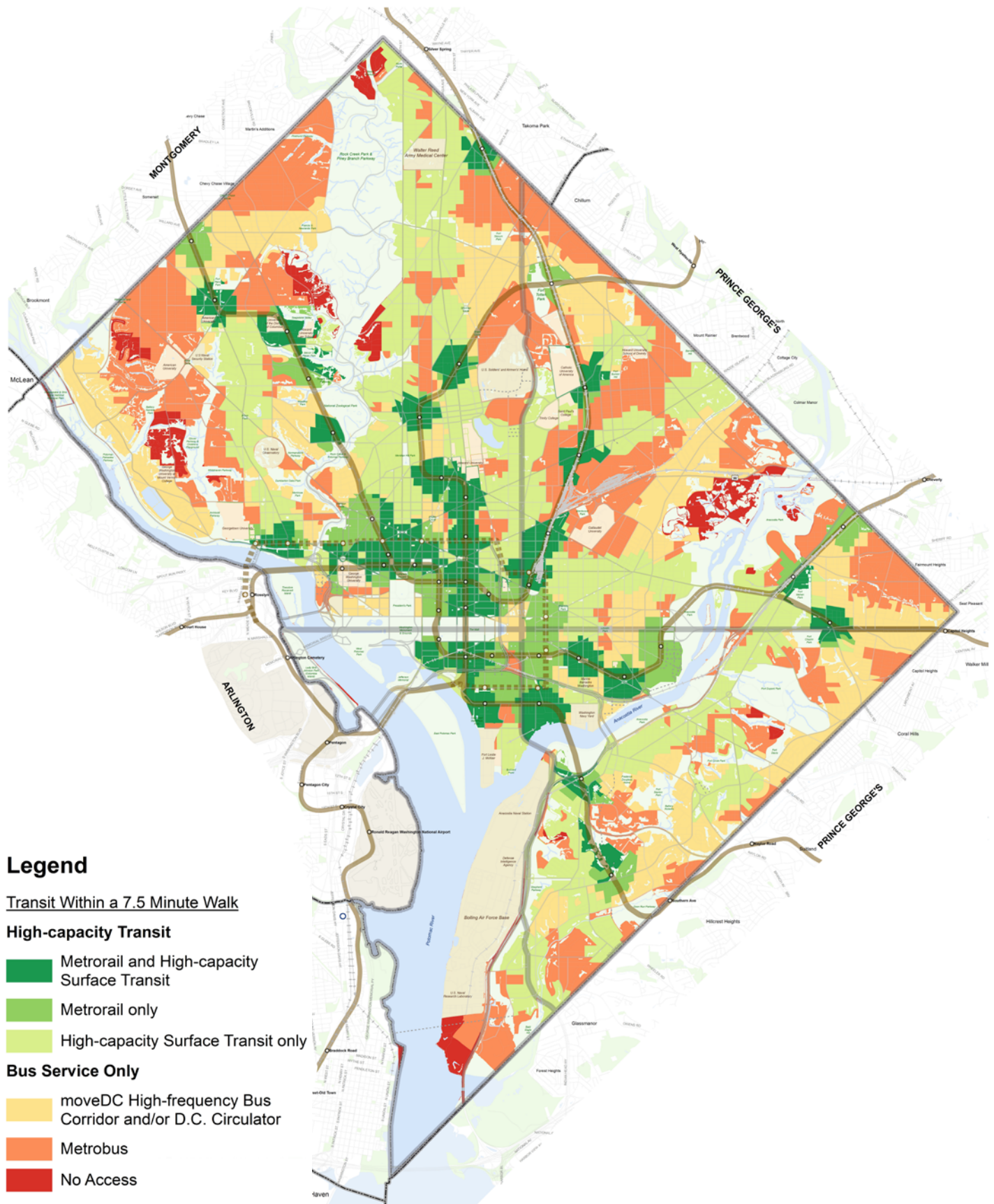
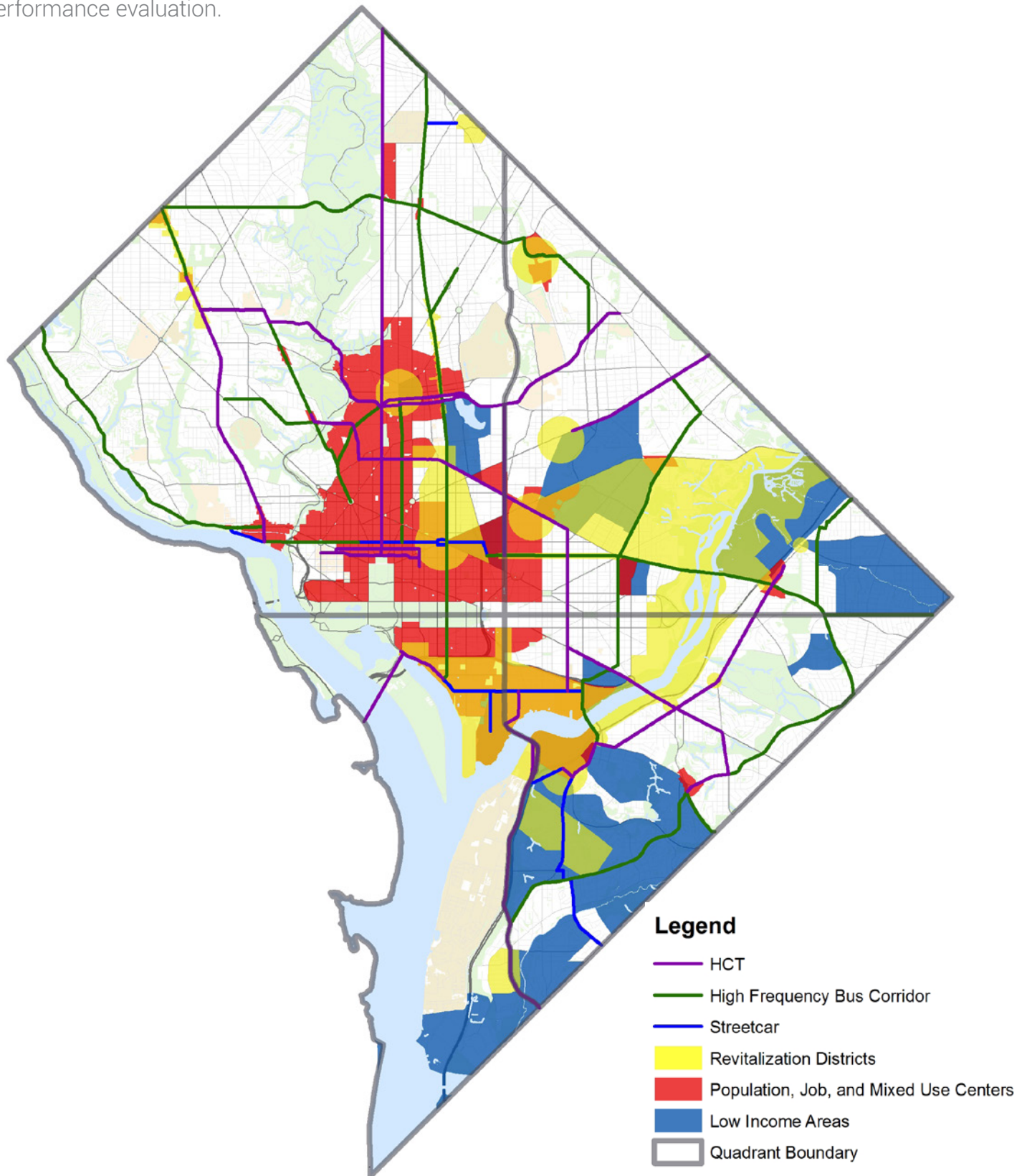


FIGURE T.17 — MOVEDC TRANSIT ELEMENT ACCESSIBILITY MAP

This figure shows District-designated revitalization districts; population, job, and mixed-use centers identified for **moveDC** planning purposes; and low-income areas based on U.S. Census data in the context of **moveDC** transit network recommendations. This information was used in **moveDC** plan performance evaluation.



V. Vision to Reality

moveDC is a long-term plan for a reason—achieving its full vision will require decades of investment and continued commitment from city leaders and support from innumerable local and regional partners. The return on the city's investment of time and funds spent implementing the **moveDC plan** will be creating stronger, more vital neighborhoods; sharing prosperity among all of the city's residents; meeting our responsibility to the environment; and making the District more competitive among its domestic and global peers.

The **Transit Element** provides guidance for prioritizing and implementing transit infrastructure recommendations. Additional information can be found in **Chapter 5**.

A. USING THIS ELEMENT

The **Transit Element** is a starting point for investments in the transit system for the District in the next 25 years. It presents needed and realistic transit network investments and policy concepts that, together, support **moveDC** in achieving the goals established as a part of the planning process.

The **moveDC** plan does not present specific and final transit system design solutions, nor has **moveDC** analyzed all of the transit project-level trade-offs for individual components of the **moveDC** plan. The **Transit Element** of **moveDC** will need to be updated periodically to take into account the many changes the future will bring that cannot be anticipated today. The need for updates is the recognition that some things always change in a city as dynamic as Washington, D.C.

Finally, some recommendations of **moveDC**, as with the **1997 Transportation Plan for the District of Columbia**, may not become reality. Regular updates to the **Transit Element** in coordination with the overall **moveDC** plan will help ensure the **Transit Element** continues to make sense in the context of changing demands on the system.

B. PROJECT DEVELOPMENT PROCESS

Some of the transit infrastructure recommendations included in the **moveDC** plan are already in the design process or ready for construction; however, the vast majority of **moveDC**'s recommendations will need to undergo additional evaluation and further development consistent with established city processes prior to their implementation. The DDOT

Environmental Manual, 2nd Edition (2012) further describes DDOT's Project Development Process. The additional evaluation and development processes are likely to adjust the character, location, and other elements of some recommendations. This is a natural evolution of long-range plan recommendations as they move toward implementation.

C. IMPLEMENTATION THROUGH PARTNERSHIP

While the implementation of most capital infrastructure recommendations will be led by DDOT, some are likely to occur through partnership among DDOT and other agencies or organizations, or with DDOT in a support role.

D. INFRASTRUCTURE COSTS

The following planning-level costs for identified **Transit Element** infrastructure recommendations were developed in current year (2014) dollars at a long-range planning level of detail and accuracy:

- DDOT: \$3.3 billion
- WMATA: \$10.0 billion (D.C. share)

Because of the nature of long-range planning, all costs should be reevaluated in future project development activities. Cost by infrastructure recommendation is presented in **Tables T.6** through **T.9**. With respect to the planning-level cost estimates shown, the following were generally assumed:

- Wherever possible, the cost estimates utilized project-specific costs, including costs from MWCOG's FY13-19 **Transportation Improvement Program**, the FY14-20 District budget, and other project-specific estimates.
- Additional costs for **moveDC** recommendations were estimated using a generalized unit cost related to project type. The unit costs were derived from existing District project costs.
- The District's financial responsibility to WMATA's capital projects was taken from WMATA's draft November 2013 MWCOG **Financially Constrained Long-Range Transportation Plan (CLRP)** submission, which included a similar level of investment to that contained in **moveDC**

Programs

In the context of implementation for the **moveDC** plan, the term “program” is used to describe ongoing funding commitments for operations, education, maintenance, regular infrastructure improvements that are not defined as projects, or other items, such as debt service on Grant Anticipation Revenue Vehicle (GARVEE) bonds. Transit program costs, which include operations and some maintenance costs, are estimated to be \$5.5 billion for DDOT and \$14.0 billion for WMATA (D.C. share). Additional information on programs and costs for programs are presented in **Chapter 5**.

Asset Management

Costs within this area of **moveDC** include ongoing assessments, maintenance, and repairs of transportation infrastructure. Costs for transit asset management are \$0.5 billion for DDOT and \$5.2 billion for WMATA (D.C. share) are presented in **Chapter 5**.

E. BUDGETING PROCESS

The **moveDC** plan was developed in a fiscally unconstrained environment, but DDOT recognizes that it operates in an environment constrained by available funding. While the financial plan in **Chapter 5** identifies new sources of revenue to help close the cost/revenue gap, an annual gap is likely to remain throughout **moveDC**'s implementation horizon.

Because of this fiscal reality, **moveDC** has developed a methodology for prioritizing recommendations that can assist in the process of making annual budget decisions. This approach is described in **Chapter 5**. From a broad prioritization perspective, DDOT should take the following approach:

- *Fund basic state of good repair (SOGR) and maintenance for existing programs*
- *Allocate additional resources that accelerate the pace of reaching SOGR for all infrastructure*
- *Fund critical transportation infrastructure investments to address deficiencies, safety, or capacity needs*

Critical investments in transportation infrastructure have been prioritized in the **moveDC** plan, but many will still need to go through DDOT's Project Development Process prior to implementation. DDOT should only seek to advance investments that have the most merit to meet **moveDC**'s goals.

It should be noted that, capital programs and asset management—both of which are related to ensuring safe and reliable operations and adequate maintenance of existing system assets—were not prioritized. The level at which each of these are funded is established through normal annual District budget processes.

F. PRIORITIZATION PROCESS

moveDC capital improvements were prioritized based on an understanding of community and stakeholder support, existing commitments, and goals of ensuring transportation investments are distributed across the District in the service of current and future residents. They also were prioritized based on criteria developed for each of **moveDC**'s goals. Cost was not a criteria used in prioritization, but will need to be a factor in individual budget decisions.

Individual capital investment recommendations were measured within each criterion and then processed into four tiers within project groupings (generally by transportation mode). The tiers were then used to rank and organize priorities.

Generally, investments within Tier 1 are assumed to be the highest priorities for implementation, whereas those in Tier 4 projects are lower priorities, relative to projects within their group. It is worth noting that in many cases, Tier 1 recommendations—due to size, scale, cost, and complexity—cannot be immediately constructed and will require investment in refinement, definition, and development through DDOT's Project Development process. Similarly, most recommendations in other tiers are likely to require some level of proactive investment in further development, prior to them becoming the District's highest implementation priorities.

G. OUTCOMES

The full results of the prioritization process for the Transit Element are shown by tier in **Tables T.6** through **T.9** and **Figure T.18**. In addition to each infrastructure recommendation's rating (tier), **Tables T.6** through **T.9** describe project limits, identify potential implementation responsibility, and provide a planning-level cost estimate, where it is possible to do so based on information currently available.

Table T.6: Tier 1 Transit Capital Investments

Investment Type	Name of Facility	From	To	Length (miles)	Ward(s)	DDOT Role	TIP Project	Cost (Millions)
HIGH-CAPACITY TRANSIT (HCT)	16TH STREET NW	SILVER SPRING	DOWNTOWN	6.4	1, 2, 4	LEAD	NO	\$159
STREETCAR	ANACOSTIA STREETCAR EXTENSION	HOWARD RD/FIRTH STERLING	11TH ST BRIDGE	0.7	6, 8	LEAD	YES	\$55
STREETCAR	BENNING RD STREETCAR EXTENSION	OKLAHOMA AVE NE	BENNING ROAD METRORAIL STATION	1.9	5, 7	LEAD	YES	\$85
STREETCAR	M STREET SOUTHEAST/SOUTHWEST	11TH ST BRIDGE	MAINE AVE SW	3.0	6, 8	LEAD	YES	\$125
STREETCAR	NORTH-SOUTH STREETCAR LINE	TAKOMA METRORAIL STATION	BUZZARD POINT	9.2	1, 2, 4, 6	LEAD	YES	\$460
STREETCAR	UNION STATION TO GEORGETOWN STREETCAR	UNION STATION	GEORGETOWN WATERFRONT	3.1	2, 6	LEAD	YES	\$155
HIGH-FREQUENCY BUS	WISCONSIN/CONNECTICUT AVE NW	FRIENDSHIP HEIGHTS	DUPONT CIRCLE	4.6	1, 2, 3	PARTNER	NO	\$15

Table T.7 Tier 2 Transit Capital Investments

Investment Type	Name of Facility	From	To	Length (miles)	Ward(s)	DDOT Role	TIP Project	Cost (Millions)
HIGH-FREQUENCY BUS	BLADENSBURG AVE NE/15TH ST SE/ MLK JR. DR SE	ANACOSTIA	BROOKLAND	6.3	5, 6, 8	PARTNER	NO	\$18
HIGH-CAPACITY TRANSIT (HCT)	LONG BRIDGE/MAINE AVENUE SW	ARLINGTON	SOUTHWEST WATERFRONT	1.6	2, 6	LEAD	NO	\$31
HIGH-CAPACITY TRANSIT (HCT)	MID-CITY/NORTHERN CROSSTOWN HCT	TENLEYTOWN	MICHIGAN PARK	6.8	1, 3, 4, 5	LEAD	NO	\$93
HIGH-FREQUENCY BUS	MILITARY ROAD/ MISSOURI AVE NW/S. DAKOTA AVE NE	FORT TOTTEN	FRIENDSHIP HEIGHTS	6.7	3, 4, 5	PARTNER	NO	\$31
METRORAIL	NEW DOWNTOWN METRORAIL LINE	GEORGETOWN	SOUTHWEST WATERFRONT	7.6	2, 3, 5, 6	SUPPORT	NO	\$7,787
STREETCAR	NORTH-SOUTH STREETCAR LINE EXTENSION	TAKOMA METRORAIL STATION	SILVER SPRING	1.4	4	LEAD	NO	\$98
HIGH-CAPACITY TRANSIT (HCT)	PENNSYLVANIA AVE SE	EASTERN MARKET	SKYLAND	3.2	6, 7, 8	LEAD	NO	\$35

Table T.8: Tier 3 Transit Capital Investments

Investment Type	Name of Facility	From	To	Length (miles)	Ward(s)	DDOT Role	TIP Project	Cost (Millions)
HIGH-FREQUENCY BUS	14TH ST NW	MCPHERSON SQUARE	COLUMBIA HEIGHTS	1.7	1, 2	PARTNER	NO	\$8
HIGH-FREQUENCY BUS	ALABAMA AVE SE/ MINNESOTA AVE NE	MINNESOTA AVE METRORAIL	SAINT ELIZABETHS	7.4	7, 8	PARTNER	NO	\$31
STREETCAR	ANACOSTIA SOUTH STREETCAR EXTENSION	SOUTH CAPITOL ST	MARYLAND	2.5	8	LEAD	NO	\$181
HIGH-FREQUENCY BUS	CLEVELAND AVE NW/ CALVERT ST NW/ COLUMBIA RD NW	MCMILLAN	GLOVER PARK	2.5	1, 3	PARTNER	NO	\$7
HIGH-FREQUENCY BUS	MACARTHUR BLVD NW/K ST NW	FARRAGUT WEST	PALISADES	5.3	2, 3	PARTNER	NO	\$19
HIGH-CAPACITY TRANSIT (HCT)	MINNESOTA AVE NE/SE	NAVY YARD	ANACOSTIA	4.0	7, 8	LEAD	NO	\$44
HIGH-CAPACITY TRANSIT (HCT)	RHODE ISLAND AVE NE	MT. RANIER	BRENTWOOD	1.9	5	LEAD	NO	\$21
HIGH-CAPACITY TRANSIT (HCT)	U ST NW/FLORIDA AVE NE/NW/8TH ST NE	WOODLEY PARK	NAVY YARD	5.7	1, 2, 3, 5, 6	LEAD	NO	\$62
STREETCAR	UNIVERSITY STREETCAR EXTENSION	GEORGETOWN	GEORGETOWN UNIVERSITY	1.2	2	LEAD	NO	\$89
HIGH-CAPACITY TRANSIT (HCT)	WISCONSIN AVE NW	TENLEYTOWN	GEORGETOWN	3.4	2, 3	LEAD	NO	\$58

Table T.9 Tier 4 Transit Capital Investments

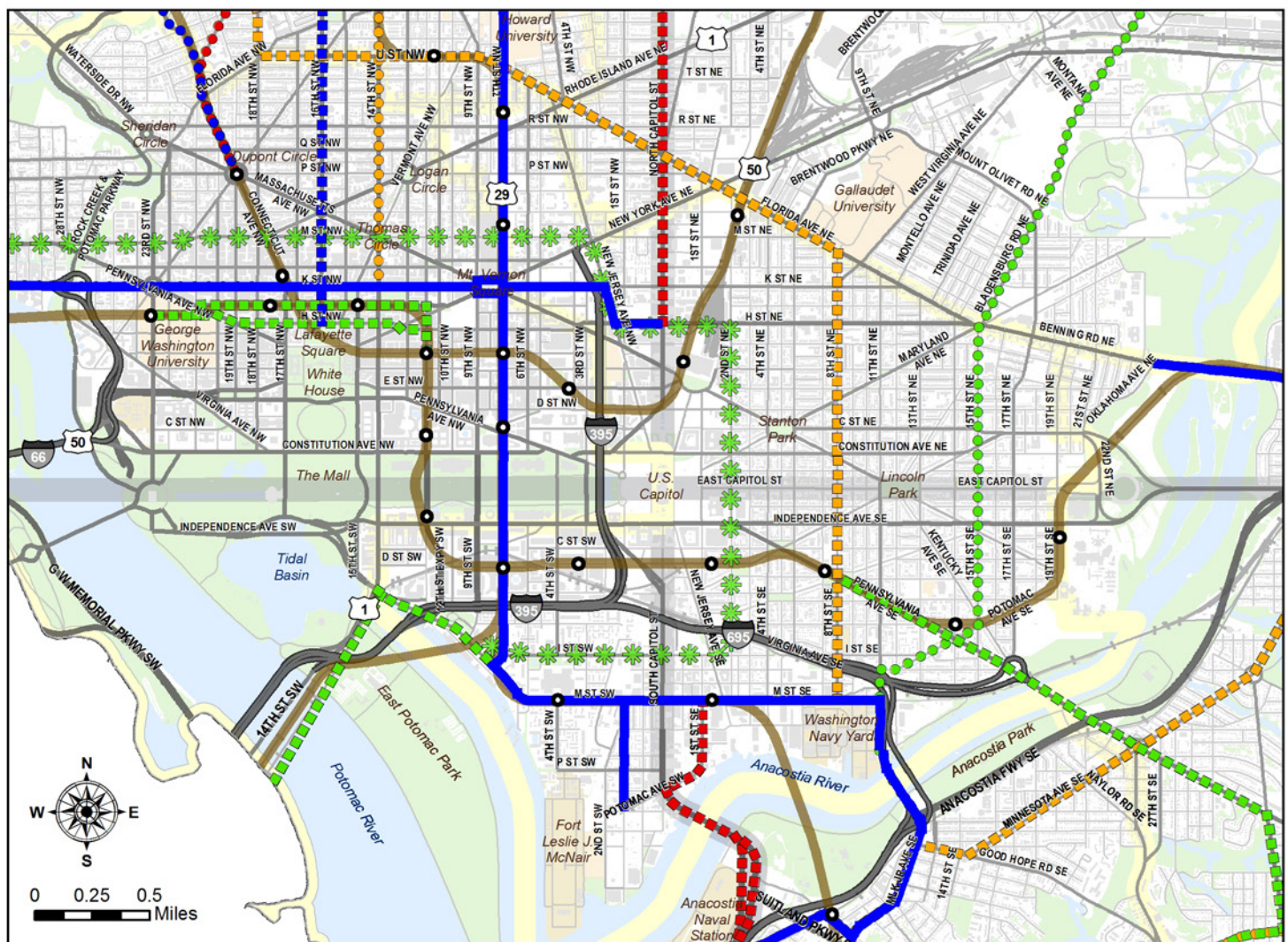
Investment Type	Name of Facility	From	To	Length (miles)	Ward(s)	DDOT Role	TIP Project	Cost (Millions)
HIGH-FREQUENCY BUS	ALABAMA AVE SE	CONGRESS HEIGHTS	MARYLAND LINE	3.5	7, 8	PARTNER	NO	\$16
HIGH-FREQUENCY BUS	COLUMBIA ROAD/ GEORGIA AVE NW	DUPONT CIRCLE	PETWORTH	3.3	1, 2, 4	PARTNER	NO	\$8
HIGH-FREQUENCY BUS	H & I STREET BUS LANES	FOGGY BOTTOM	METRO CENTER	1.4	2	PARTNER	YES	MINOR
HIGH-CAPACITY TRANSIT (HCT)	NORTH CAPITOL STREET	MCMILLAN	UNION STATION	1.8	5, 6	LEAD	NO	\$45
HIGH-CAPACITY TRANSIT (HCT)	SOUTH CAPITOL STREET	NAVY YARD	ST. ELIZABETHS	4.4	6, 8	LEAD	NO	\$102

FIGURE T.18 – TRANSIT INFRASTRUCTURE PRIORITIES

This figure shows transit infrastructure recommendations by tier. The map shows Metrorail, streetcar, HCT, and high-frequency bus corridors.

Legend

Quadrant Boundary	Existing Infrastructure	Metrorail Tier	High-Capacity Transit Tier	High-Frequency Bus Corridor Tier
Ward Boundary	Metrorail Station	Streetcar Tier		
Water	Metrorail Line	1	1	1
Park	Railroad	2	2	2
University	Road	3	3	3
Military		4	4	4
Monumental Core				





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The District of Columbia's
Multimodal Long-Range Transportation Plan

Vehicle Element





The District of Columbia's Multimodal Long-Range Transportation Plan

October 2014

District Department of Transportation
Policy, Planning & Sustainability Administration
55 M Street SE
Suite 400
Washington, DC 20003



moveDC Vision

The District of Columbia will have a world-class transportation system serving the people who live, work, and visit the city. The transportation system will make the city more livable, sustainable, prosperous, and attractive. It will offer everyone in the District exceptional travel choices. As the transportation system evolves over time, the District will:

- *Be more competitive and attractive locally, regionally, nationally, and internationally*
- *Have safer and more vibrant streets and neighborhoods*
- *Have cleaner air, streams, and rivers, and be more responsive to climate change*
- *Accommodate the travel needs of all residents, workers, and visitors regardless of age or ability*
- *Integrate the District's transportation system with the region's transportation network*

Photography Credits

Many of the photographic images throughout this plan—in addition to those taken by the project team and DDOT—were freely contributed by people involved in the planning process through the project's Flickr site (www.flickr.com/groups/wemoveDC) and through DDOT's photo sharing site (www.flickr.com/photos/ddotphotos/sets/). DDOT appreciates the generosity of contributors of photography in the plan.

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11th Street Bridge project provides long-missing connectivity of D.C.'s interstate system and the local street network

Vehicle

I. Safety and Efficiency

Investing in the District's street system to move traffic efficiently is—and will remain—critical to the function of the city. Strategic investments have the potential to maximize the value of the District's roadway assets, improve people's driving experience, support efficient movement of goods and services, improve air quality, and protect the system's reliability. Investments in the vehicle network also are frequently investments in better conditions for other modes of travel.

DDOT maintains more than \$44 billion in roadway infrastructure. Comprised principally of streets, tunnels, bridges, traffic signals, and streetlights, this infrastructure facilitates access to virtually all land in the city and enables the efficient movement of people and goods as well as the delivery of public services.

DDOT remains committed to and bears a substantial and core responsibility for the construction, maintenance, and effective management of its vehicular network. DDOT is increasingly supportive of all modes and seeking creative ways to diversify what has historically been a roadway system primarily for vehicles. The vehicular network must create safe and complementary interaction between the many transportation modes, preserve and protect space to permit efficient movement of goods and services, and facilitate the movement of automobile traffic efficiently and effectively.

Protecting the safety of travelers must be a central goal of the transportation system. The District already has made strides to make the transportation system safer and will need to continue to retain its priority on providing a safe environment.

Investing in state of good repair (SOGR) and system efficiency is critical. Recognizing this, DDOT is continuously engaged in major infrastructure rehabilitation and replacement, addressing both SOGR and changing transportation demand. As the city grows, reliability and efficiency of the transportation system will be even more important.

In the future, goods will continue to need to be moved and delivered, often by truck. Whether or not other travel options are available, many people will still choose to drive for personal and professional purposes.

II. Existing Conditions

The District's roadway network serves many purposes in the transportation system. It carries vehicles—private and commercial vehicles—as well as surface transit; is the location of the majority of bicycle infrastructure; and is the largest interconnected open space system in the city. In addition to the street network, traffic operations and intelligent transportation systems (ITS) are integral components of vehicular travel.

Traffic congestion is frequent on primary routes leading into and out of the city during peak periods and can extend for long periods of time. Although largely continuous, the city's network of streets is interrupted by natural and man-made barriers, which contribute to the difficulty of making some trips. Several streets, particularly in the Monumental Core, are closed or have some restriction on use due to security requirements.

A. CORE FACTS

The District's street network is a product of years and many layers of planning, policy, trends, and incremental implementation. The L'Enfant city—the center city laid out according to the **L'Enfant Plan**—is organized around a largely rectilinear grid of streets intentionally interrupted by long diagonal avenues intersecting at public squares and circles. Outside the L'Enfant city, the street pattern varies. In many neighborhoods adjacent to the Monumental Core, the street pattern is a natural extension of the pattern of the core. Further away, development patterns, prominent natural land forms, water bodies, and substantial man-made features contribute to other, irregular street patterns.

Functional Classification

The functional classification system is a tool developed by the Federal Highway Administration (FHWA) and used by state, regional, and local public agencies to help describe and generally assign the vehicular transportation purpose of a street within the street network. In the District, street functional classifications include interstates, non-interstate freeways, principal arterials, minor arterials, collectors, and local streets. DDOT updates the **Functional Classification Plan** on a 2-year cycle.

Roadways designated as interstates and non-interstate freeways are intended to provide mobility within the system and carry longer-distance trips. The primary purpose of collector and local streets is to provide access to land and support local

Notes on This Element

- *Data used and referenced throughout this element was current as of December 2013, unless otherwise noted.*
- *Recommendations cited in this element will require further development as outlined in **Chapter 5**.*
- *Policies in this element are in addition to or augment current DDOT policies identified in the DDOT Policy Compendium.*

circulation. Principal and minor arterials provide a high level of mobility for medium-distance trips while also providing some support to local circulation and limited land access.

The **moveDC** plan identifies modal priorities on each of the District's transportation corridors that are designated collector or higher. The District's functional classification of streets is shown in **Figure V.1**.

Control

The vast majority of the District's streets are controlled by DDOT; however, several significant corridors are under the control of another entity. **Figure V.1** highlights the control of major streets throughout the District.

The quantity of streets under the control of other entities is small relative to those under DDOT's control. Despite this, many non-DDOT streets have a pivotal role in the transportation system in serving commuter and visitor vehicular traffic and bicycle, pedestrian, and transit trips.

Constitution Avenue NW, Independence Avenue SW, and Rock Creek Parkway carry substantial commuter traffic and are controlled by the National Park Service (NPS). Streets surrounding the Capitol that are under control of the Architect of the Capitol (AOC) play an important role in serving multimodal

operations and provide access to critical transportation facilities such as Union Station. DDOT has a limited ability to affect significant change to these and other non-DDOT corridors, despite the critical role they play in the city's transportation system. This plan identifies potential modifications to some streets not controlled by DDOT which will need further study.

Operations and Management

With the many demands of the transportation system in the District, efficient and appropriate use of the vehicular transportation network is essential. The city has designated evacuation and snow emergency routes (**Figure V.2**) and a designated freight network (**Figure V.3**).

The District is in the process of making major modifications to the city's traffic signal system, adding needed functionality and features to meet short- and long-term traffic operations needs. Recognizing the need for short- and long-term traffic flow improvements, DDOT is optimizing traffic signal operations on major roadway corridors throughout the District. The many and complex unconventional intersections—at squares, circles, and starbursts—complicate traffic signal operations and often disrupt flows.

In addition to traffic signals at intersections, several key commuter corridors—such as Canal Road, Connecticut Avenue, and 16th Street—are operated with reversible lane functionality and/or rush hour parking restrictions. Depending on the time of day, the number of lanes in each direction of the roadway varies based on peak-direction traffic flow. Roadways with reversible lanes and time-of-day parking restrictions are shown in **Figure V.4**.



Reversible Lanes

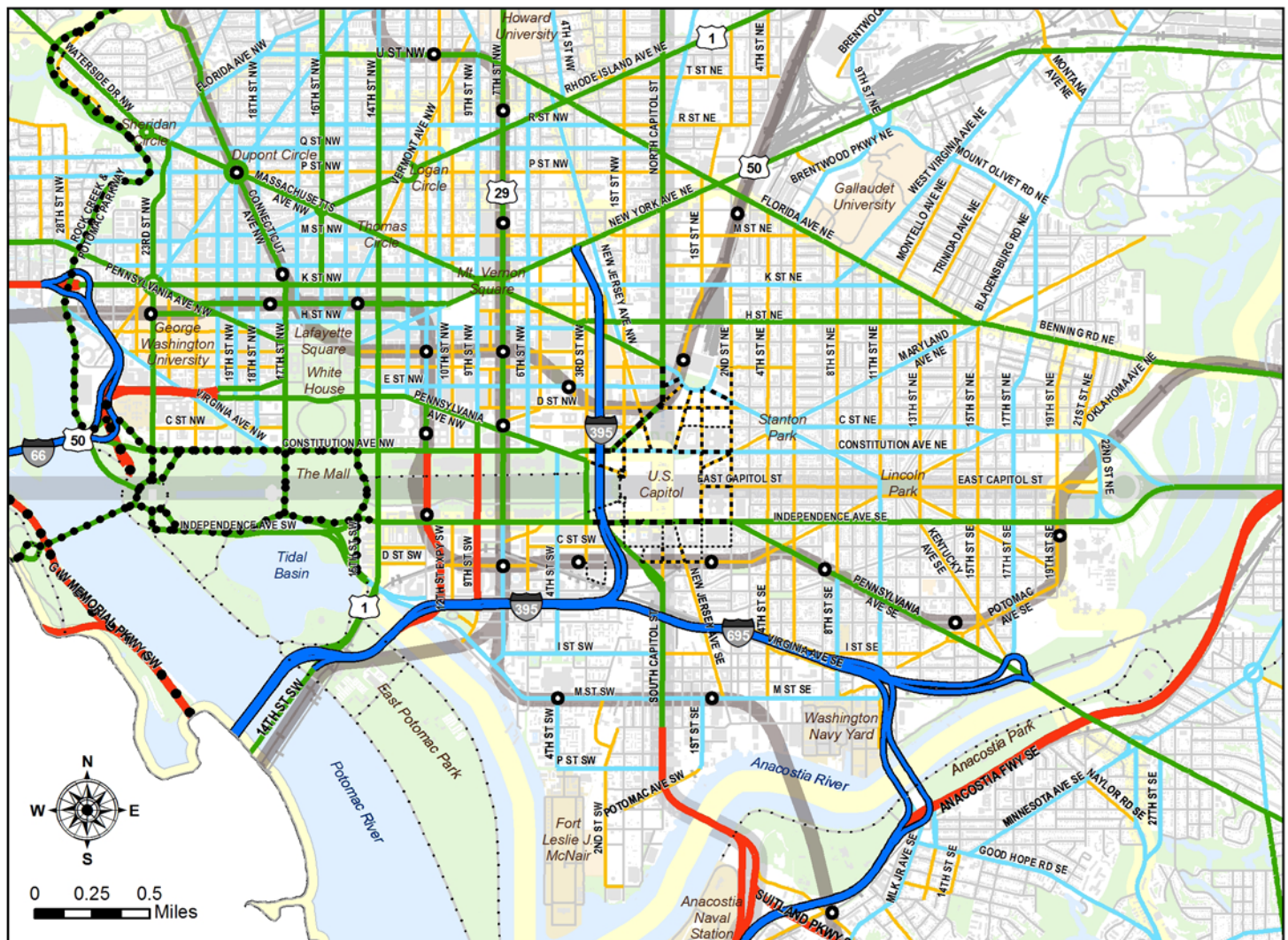
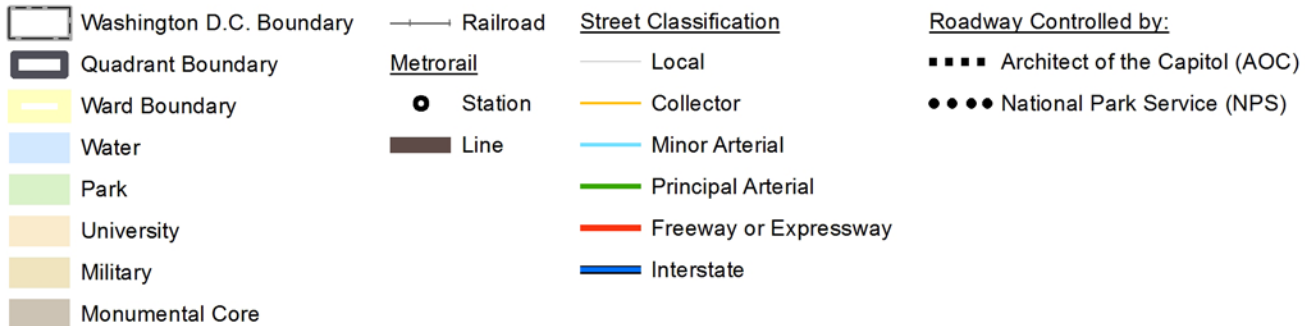
Reversible lane facilities offer benefits to peak direction traffic by increasing capacity during peak periods to better serve demand. At the same time, drawbacks to the use of reversible lanes, particularly along arterials, include:

- **Driver confusion.** *For those unfamiliar with the operation and termini of a reversible lane facility, they can be confusing. Even for those who are familiar, the change in position of left- and/or right-turn lanes, prohibitions on turning, and the lanes currently in use to serve a directional flow can be confusing. In the District, the prohibition on overhead signs and signals further complicates matters.*
- **End of facility transitions.** *Often, reversible lane facilities operate well between termini, but poorly at locations where operations transition back to a "normal" lane condition. This is attributed to situations such as "lane drops" and through lanes that abruptly transition to turn or "trap" lanes.*
- **Safety.** *Driver confusion can lead to vehicles traveling the wrong-way in a peak-direction travel lane, turning left from the wrong lane, or improperly using a lane with a turn prohibition to make a turn. This confusion can lead to near-misses, head-on collisions, sideswipe crashes, rear-end crashes, and angle crashes.*
- **Loss of off-peak direction mobility.** *Depending on the reversible lane condition, peak direction mobility can be significantly limited or lost, negatively impacting local streets and mobility.*

FIGURE V.1 – EXISTING ROADWAY CONTROL AND FUNCTIONAL CLASSES

This figure shows the federal functional classifications and control of streets in the District. Within the District, some critical infrastructure is controlled and operated by non-District agencies.

Legend



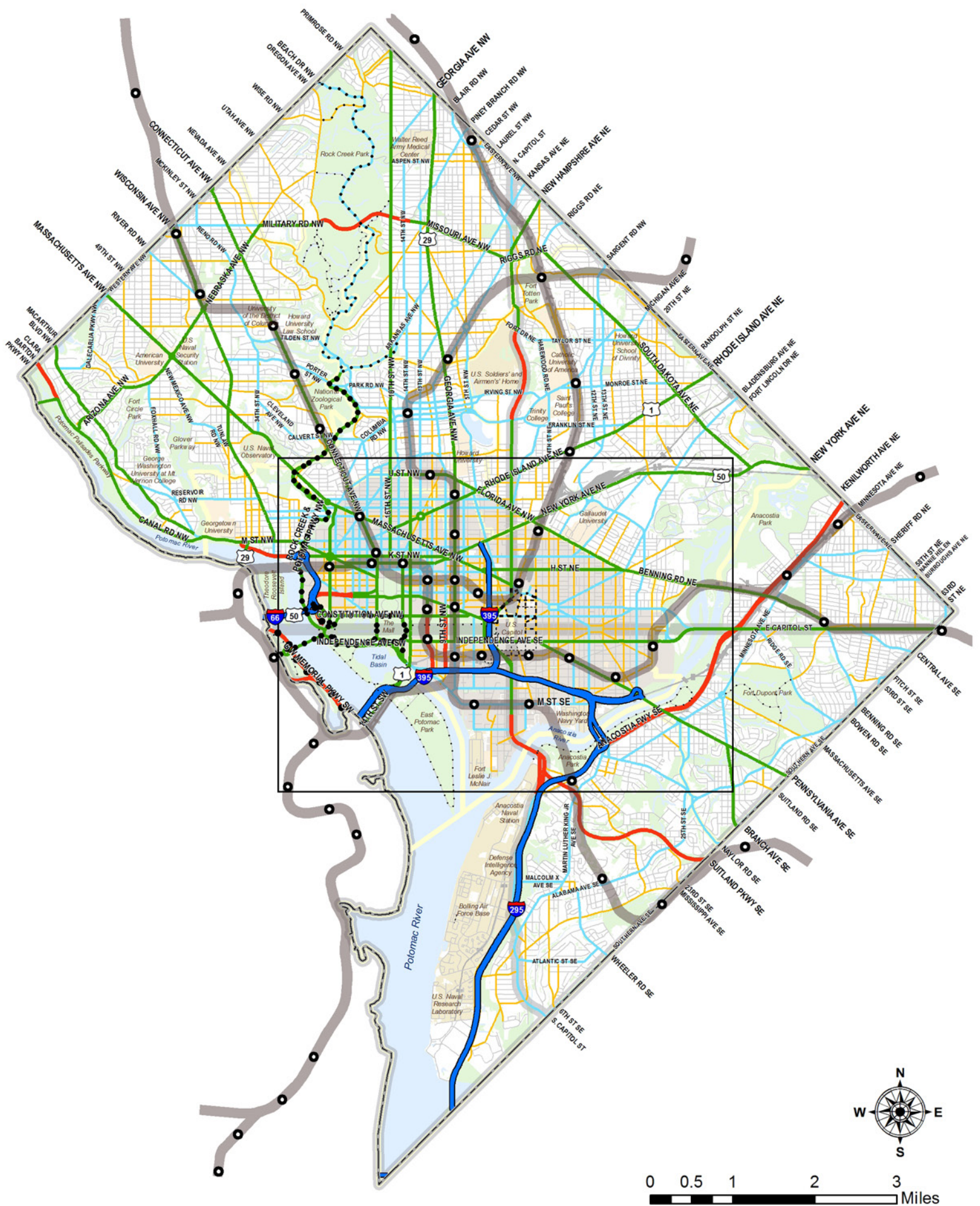
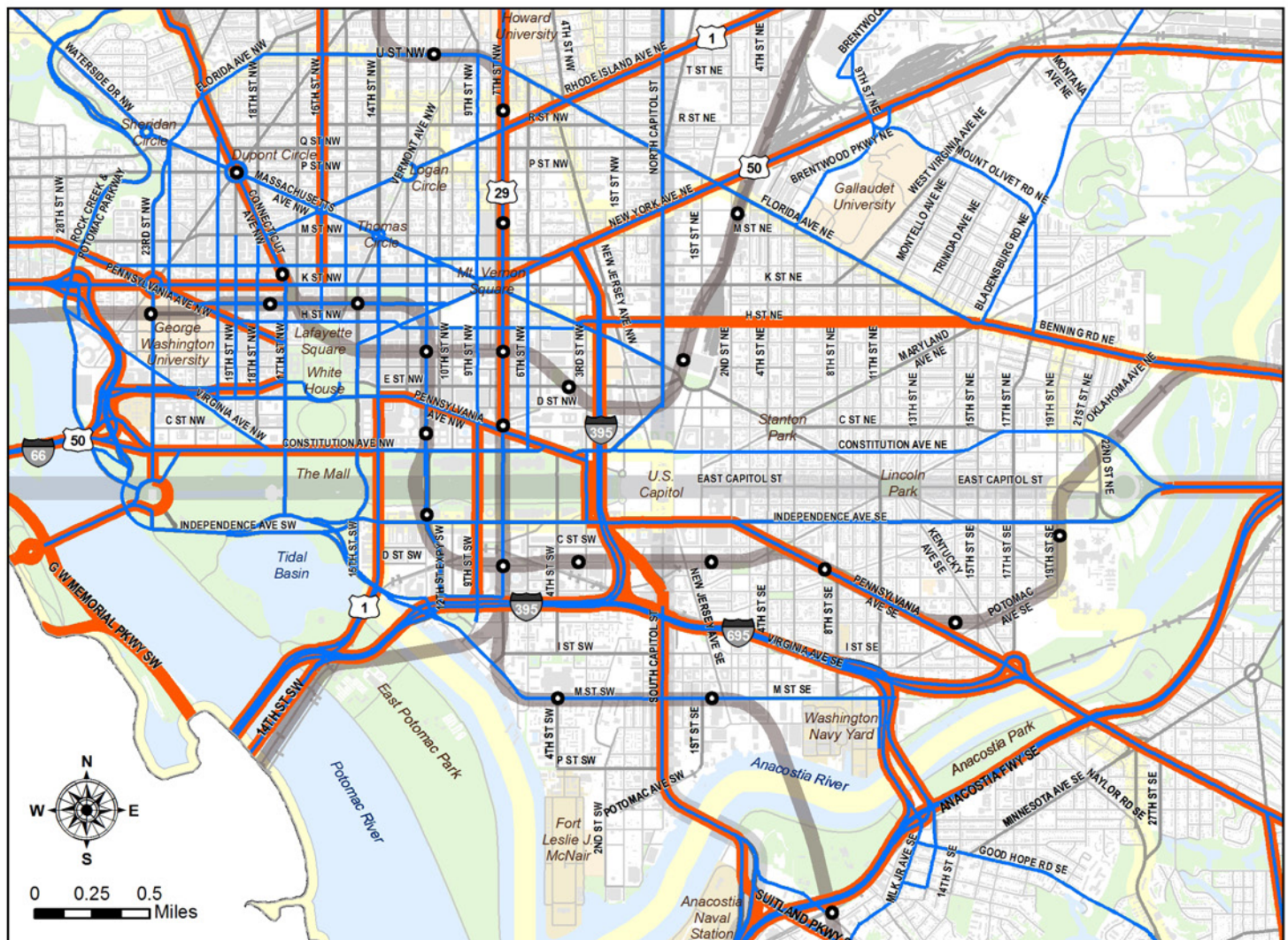
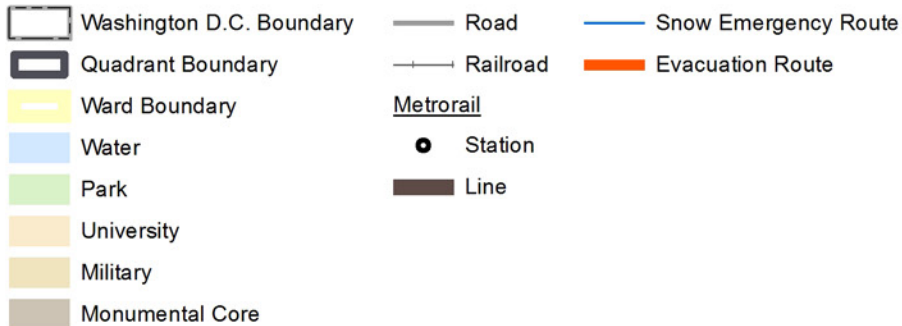


FIGURE V.2 – DESIGNATED EVACUATION AND SNOW EMERGENCY ROUTES

This figure shows designated evacuation and snow emergency routes in the District.

Legend



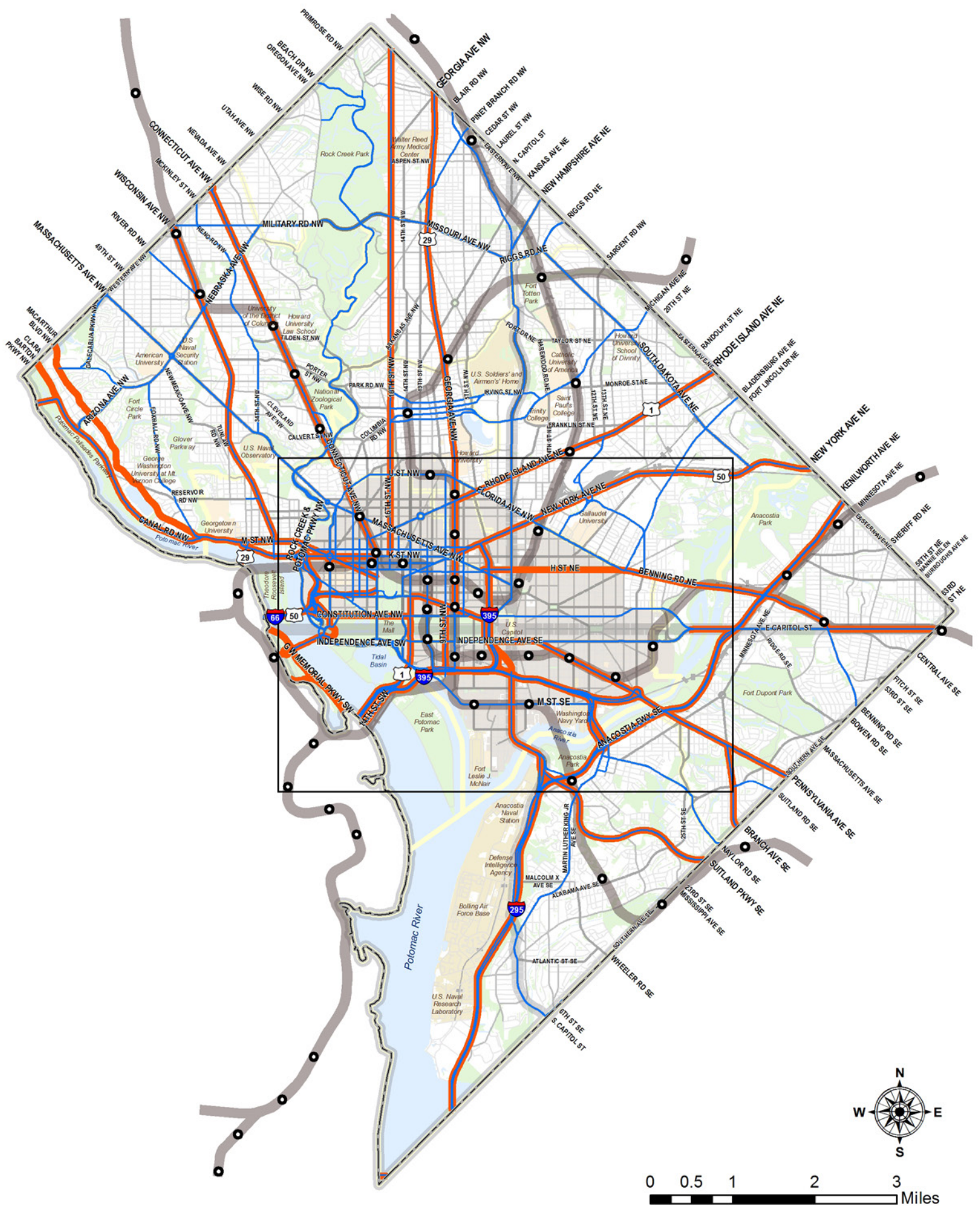
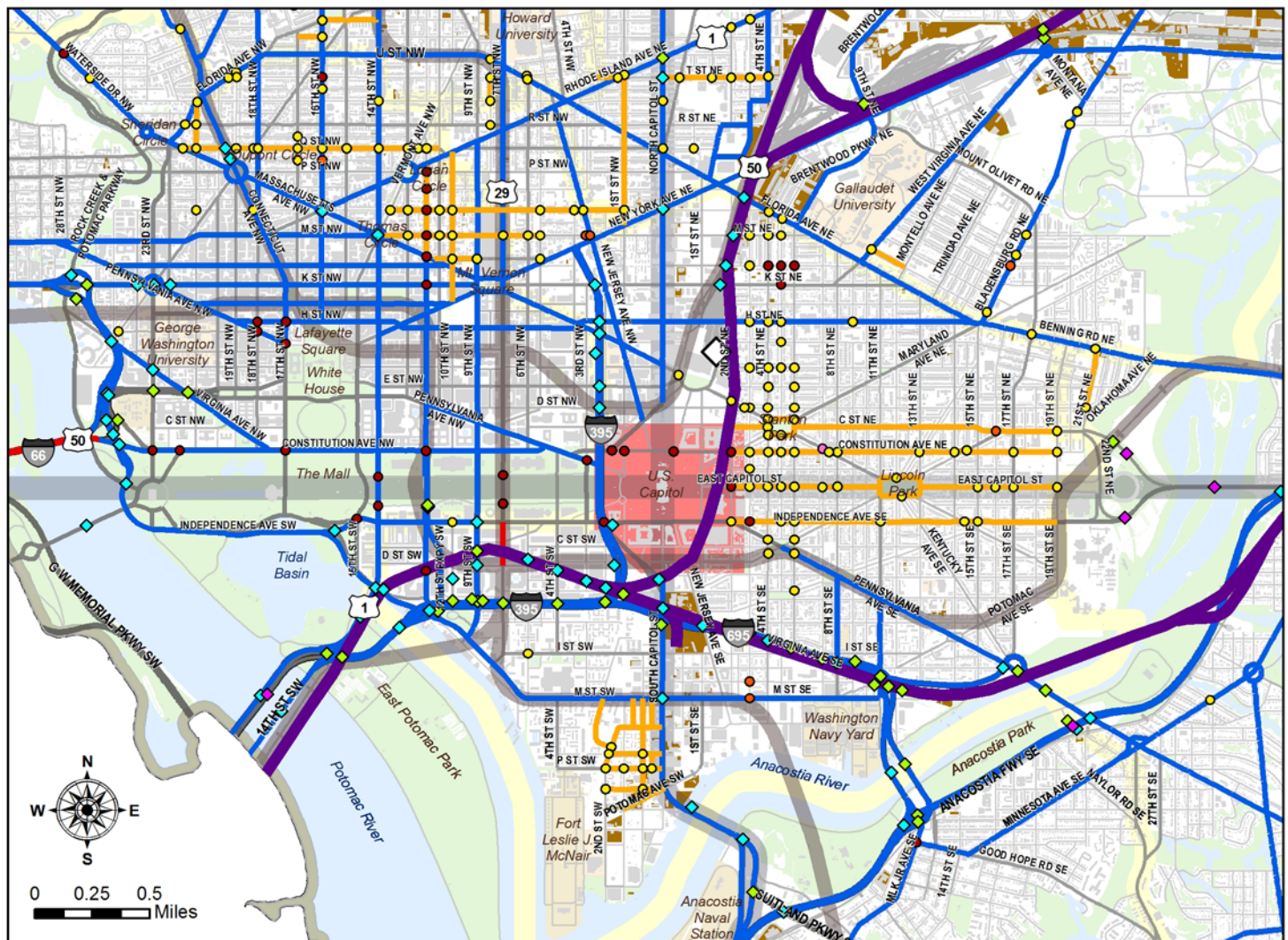


FIGURE V.3 – DESIGNATED TRUCK ROUTES AND FREIGHT NETWORK

This figure shows the District's existing (2013) freight network and facilities.

Legend

	Washington D.C. Boundary		Railroad	Truck Restriction Sign	
	Quadrant Boundary		Industrially Zoned Land		No Thru Trucks Ahead
	Ward Boundary		Restricted Truck Area		No Thru Trucks Over 1 1/4 Ton Capacity
	Water		Rail Yard		No Thru Trucks
	Park		Freight Rail Line		No Trucks
	University	Truck Route		Restricted Height Bridge (clearance)	
	Military		Primary Truck Route		Less than 12 feet
	Monumental Core		Restricted, Deliveries Only		Between 12 and less than 14 feet
	Road		Restricted, No Trucks Anytime		Between 14 and 16 feet



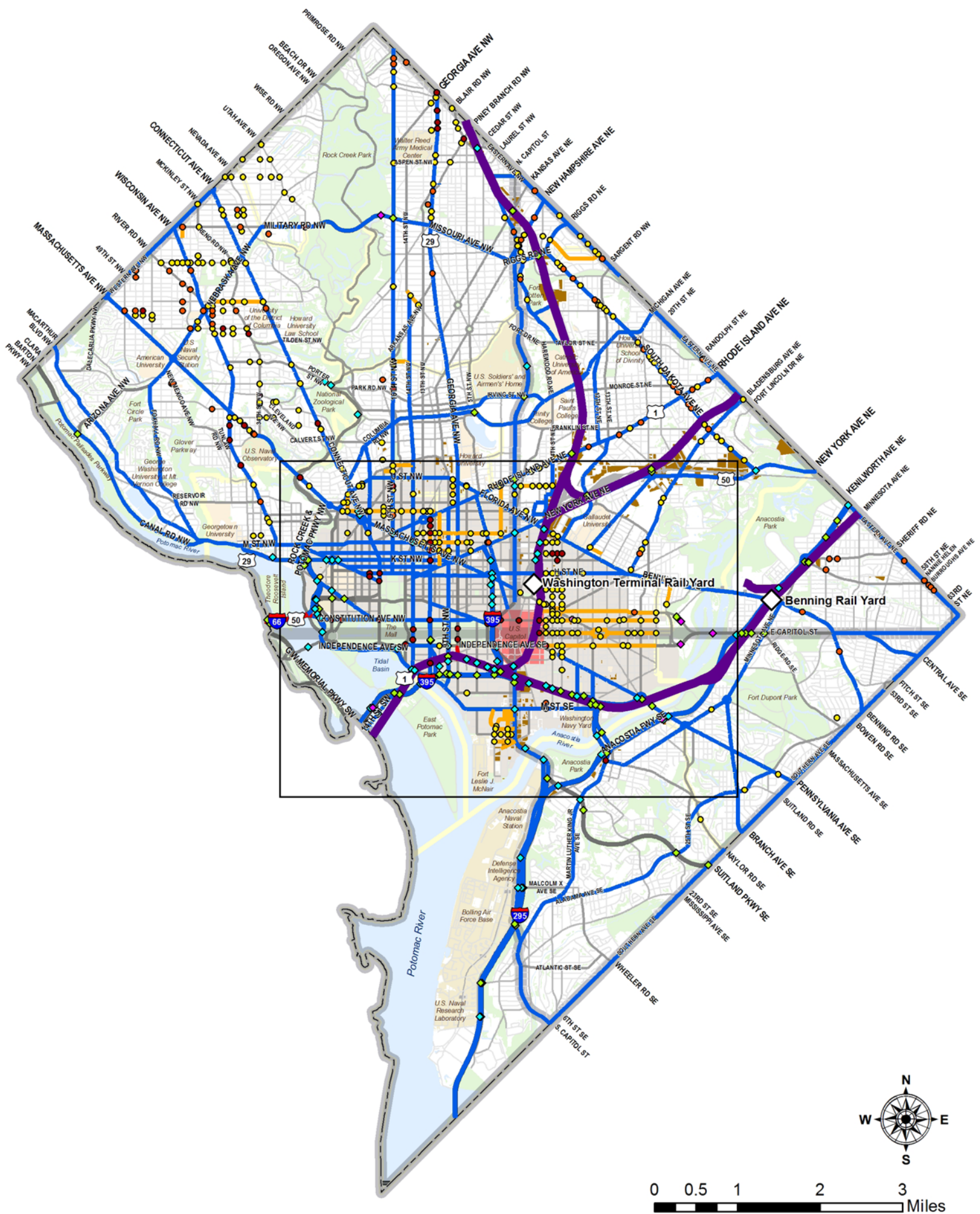
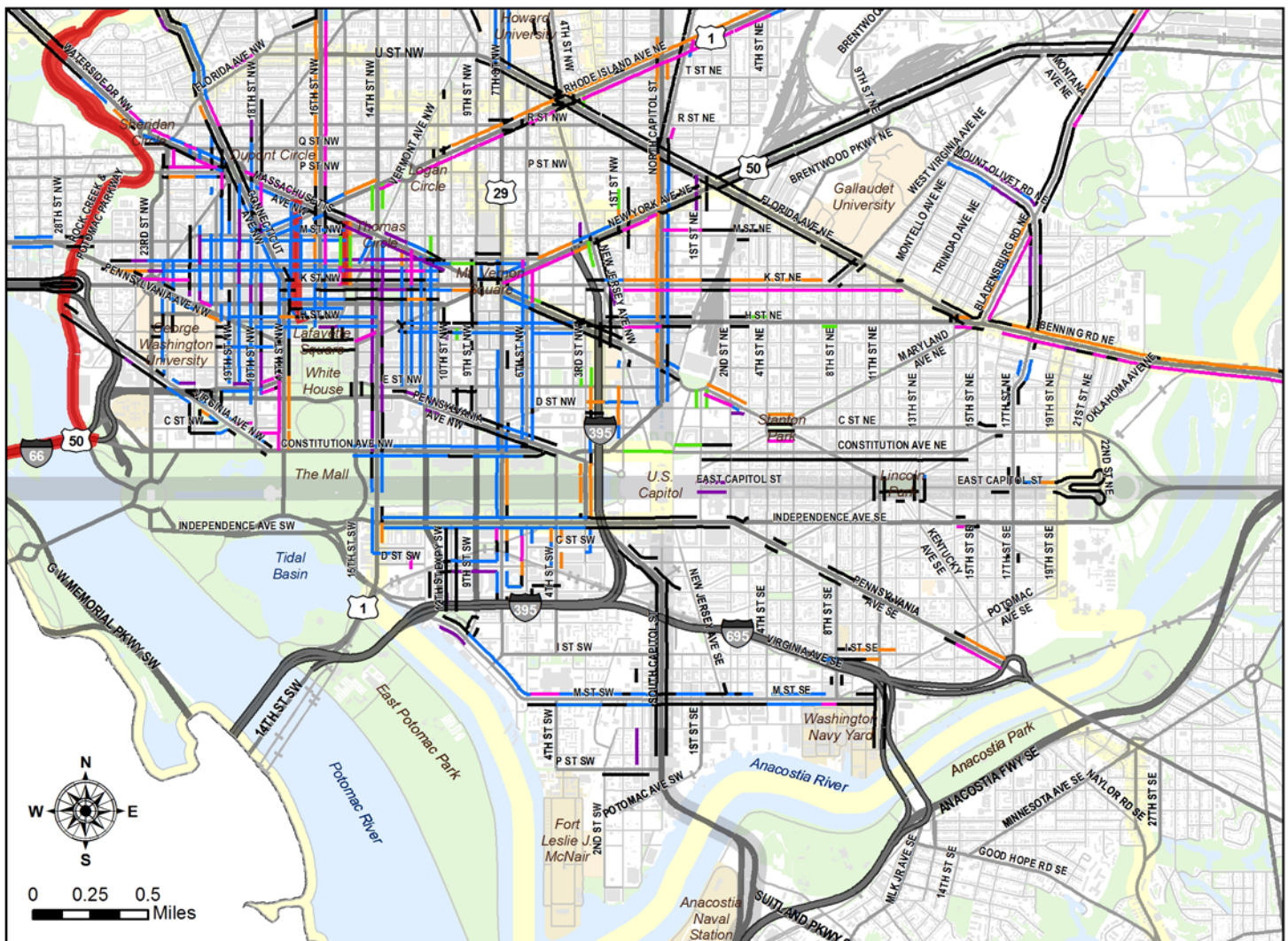
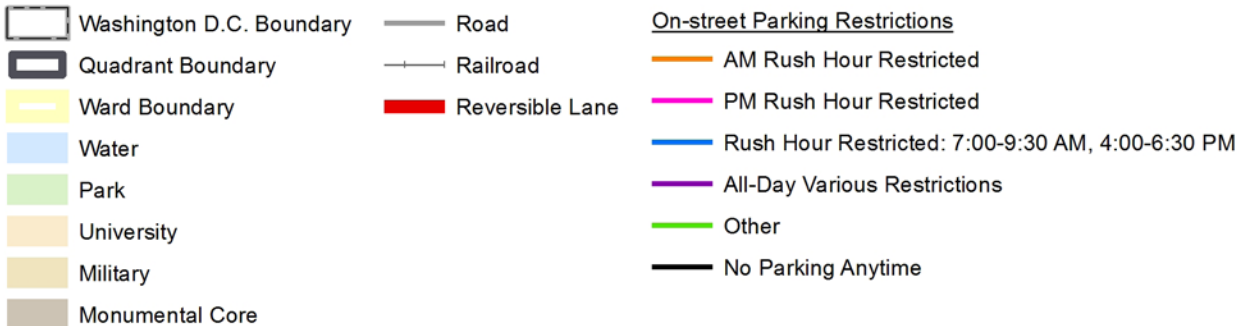
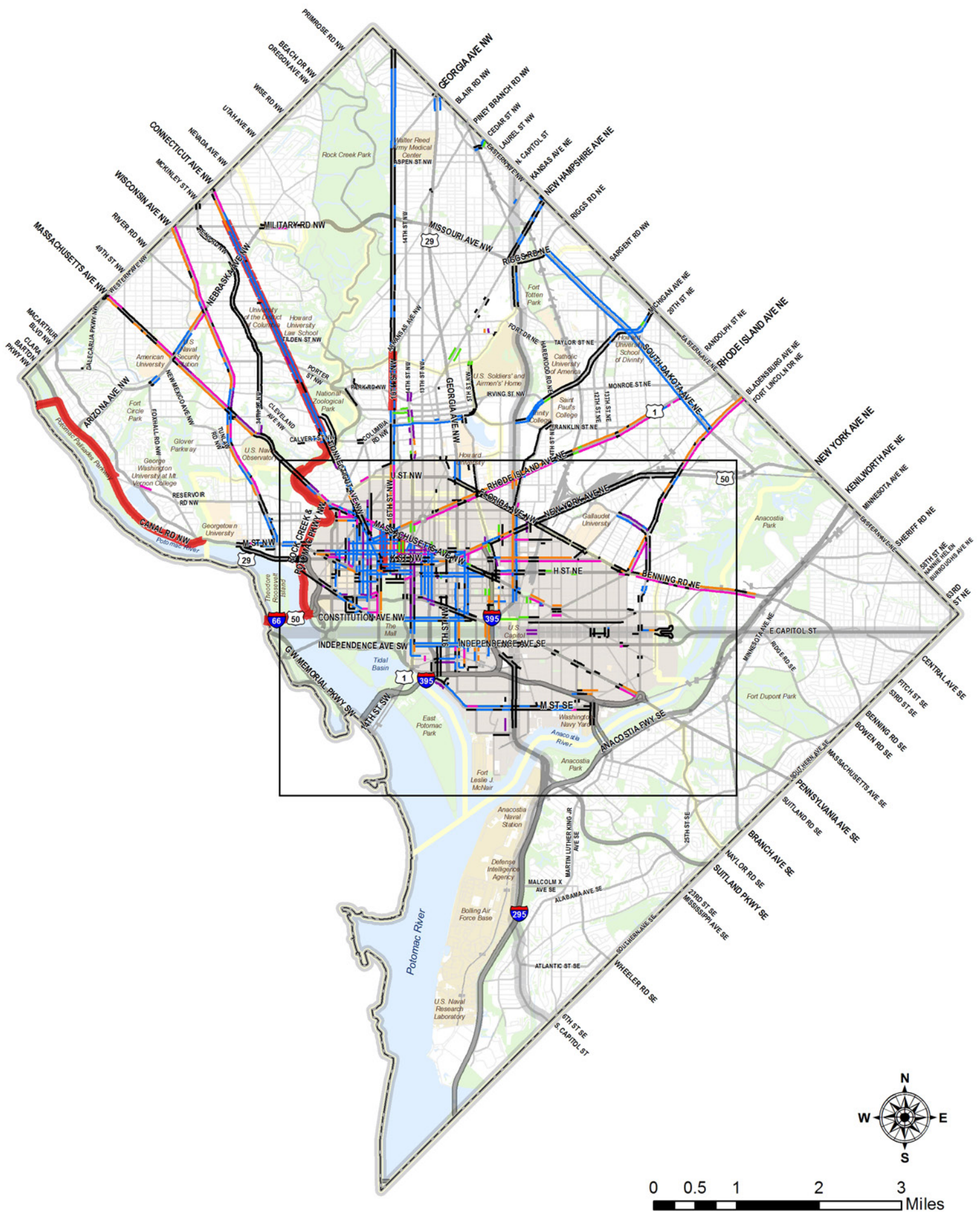


FIGURE V.4 – REVERSIBLE LANES AND ON-STREET PARKING RESTRICTIONS

This figure shows accommodations for rush hour traffic including reversible lanes and on-street parking restrictions. As shown in the figure, the majority of these restrictions are in downtown and on corridors serving significant vehicular volumes of commuter traffic in a.m. and p.m. peak periods.

Legend





Safety

Safety is central to DDOT's mission and the **moveDC** plan sets high goals for safety. **Table V.1** shows the top 20 hazardous intersections in the District based on reported crash data between 2009 and 2011. **Figure V.5** shows the most hazardous corridors and intersections in the District. The District has numerous programs targeted toward improving motorized and non-motorized conditions for users.

D.C. Highway Safety Program

The District conducts many safety education and enforcement programs through the D.C. Highway Safety Office within DDOT. The District's Highway Safety Program is funded by a grant from the United States Department of Transportation (U.S. DOT) National Highway Traffic Safety Administration (NHTSA), with a primary mission to shift user behaviors. The funds support community programs to reduce injuries and fatalities in the District, and are used for a variety of safety initiatives including conducting data analysis, developing safety education programs, and conducting community wide pedestrian and bicycle safety campaigns. Eligible programs focus on promoting seat belts use, preventing impaired or distracted driving, and supporting child passenger safety. To implement these programs, the D.C. Highway Safety Office regularly partners with D.C. agencies such as the Metropolitan Police Department (MPD), the Department of Motor Vehicles (DMV), and the Fire and EMS Department on education and enforcement programs, as well as with the Metropolitan Washington Council of Governments (MWCOC) on regional safety campaigns such as the **Street Smart** pedestrian safety campaign.

Photo Enforcement

The District's photo-enforcement efforts, including new technologies aimed at enforcing pedestrian laws, help to reinforce the overall culture of safety. Since 2001, Washington, D.C. has deployed a successful traffic safety camera program aimed at reducing red-light running, slowing speeders and improving driver behavior, which has reduced traffic fatalities in the District by 76%. The District recently expanded photo enforcement capabilities to include infractions such as stop sign running, blocking the box, and failing to yield to pedestrians in crosswalks.

To maximize the program's flexibility and impact, MPD uses both mobile photo radar units and fixed-location cameras.

Table V.1: Top 20 Hazardous Intersections in the District

Rank	Intersection
1	Minnesota Avenue NE & Benning Road NE
1	14th Street NW & U Street NW
3	Wisconsin Avenue NW & M Street NW
4	7th Street NW & Florida Avenue NW
5	Stanton Road SE & Suitland Parkway SE
6	New York Avenue NE & Bladensburg Road NE
7	Firth Sterling Avenue SE & Suitland Parkway SE
8	New York Avenue NE & North Capitol Street NE
9	Alabama Avenue SE & Stanton Road SE
10	K Street NE & North Capitol Street NE
11	Minnesota Avenue SE & Pennsylvania Avenue SE
12	Florida Avenue NE & New York Avenue NE
13	H Street NW & North Capitol Street NE
14	14th Street NW & K Street NW
15	South Dakota Avenue NE & Bladensburg Road NE
16	4th Street NE & New York Avenue NE
17	W Virginia Avenue NE & Mt Olivet Road NE
18	14th Street NW & Irving Street NW
19	Martin Luther King, Jr. Avenue SE & Howard Road SE
19	Brentwood Parkway NE & Mt. Olivet Road NE

Note: Intersections identified are based on crash history as evaluated in terms of crash rate, severity, and frequency.
Source: Traffic safety statistics for 2009 - 2011 (DDOT)



D.C. uses variable message signs to alert drivers of roadway conditions and promote safe driving

MPD selects locations throughout the District based on recent incidents of speeding-related crashes and fatalities, their proximity to school zones and other places where children or other vulnerable populations are present, and known sites of chronic speeding. DDOT regularly coordinates with MPD and can request photo enforcement units. Deployment of the units is at the discretion of the MPD.

Road Safety Audits

Road Safety Audits (RSAs) are a proactive approach to improving transportation safety. An RSA is a safety performance examination of an existing or future road or intersection by a multidisciplinary review team. It qualitatively estimates and reports on potential road safety issues and identifies opportunities for improvements in safety for all road users. DDOT can use RSAs to improve safety and communicate to the public how DDOT is proactively working towards crash reduction. DDOT staff identifies projects, existing roadways, or intersections for road safety audits per FHWA requirements.

Traffic Control Officers

DDOT's traffic control officers (TCOs) ensure the safe flow and operation of vehicular, pedestrian, and bicycle traffic throughout the city. With coverage on the weekend, DDOT ensures that special events such as parades, demonstrations, and marathons can be convened more safely and efficiently. This heightened coverage also allows the agency to readily respond to unanticipated emergencies where traffic control

assistance is required. TCOs also have the ability to issue citations for parking infractions and minor moving violations.

Traffic Calming

DDOT is committed to improving the quality of life in neighborhoods and addressing traffic-related safety issues throughout the District. Traffic calming and system management refers to a balanced operation of the District's street system which fosters fluid, safe, and managed movement of traffic flows on the network. In particular, this means developing ways to tame traffic and protect neighborhood quality of life while also maintaining operational efficiency for all modes.

Vehicular Accessibility

From 2010 to 2013, The District grew by approximately 1,100 residents per month. With more residents comes the need for new and expanded services, ultimately bringing additional workers and deliveries not only into downtown but also into neighborhoods.

Accessibility to and between some District neighborhoods is limited due to existing natural barriers and river crossings. Throughout the public engagement process, community stakeholders talked about the challenges of travel between neighborhoods to access schools, recreation centers, and local destinations, while balancing the variety of users and needs on the roadway. As activity centers outside of central Washington continue to grow and change, vehicular demand will no longer be as focused on the core of the District.

Already in the District, some "circumferential" streets, such as Military Road NW or Alabama Avenue SE, experience high levels of vehicular traffic and some peak hour congestion. **Figures V.6** and **V.7** show a summary of existing (2013) a.m. and p.m. peak hour vehicular traffic volumes on District roadways where traffic count data was available. Components of the vehicular network such as signal timing, local street connections, and new street segments will need to respond to continued growth in the District during the next 25 years.

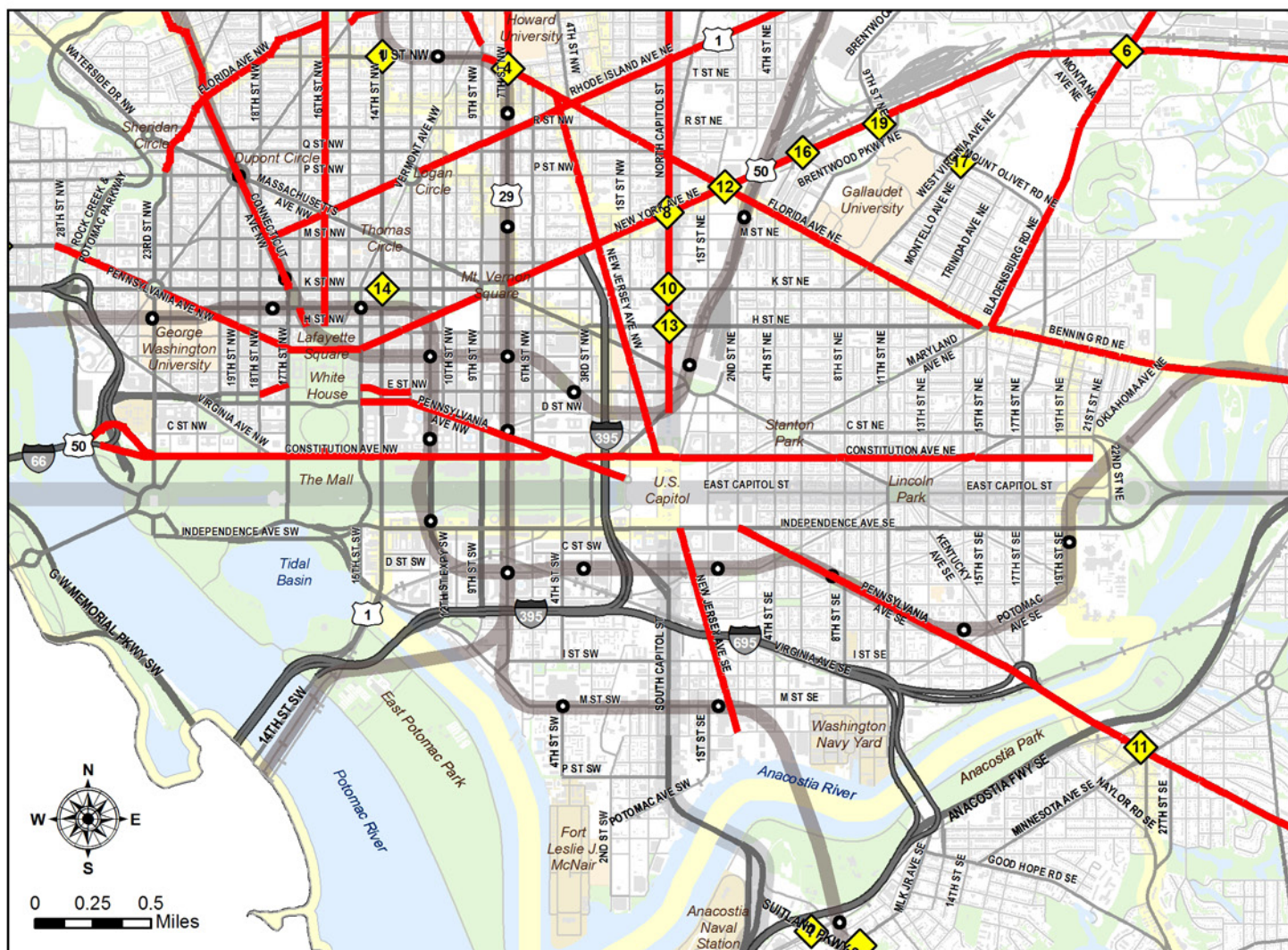
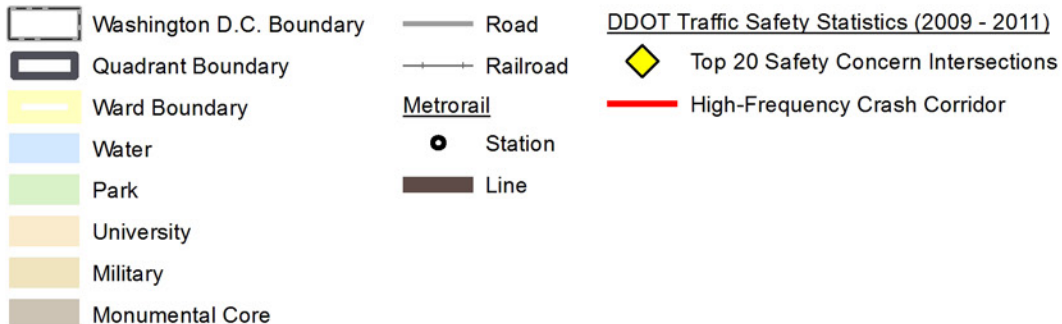
Figures V.8 and **V.9** show travel speeds on the District's major roadways during weekday morning and evening rush hours. These maps indicate both congested corridors, where travel speeds are low compared to the posted speed limit, and areas of the District that do not experience significant congestion.

FIGURE V.5 – HIGH-CRASH CORRIDORS AND INTERSECTIONS

This figure shows the most corridors with the highest crash frequency in the District. Generally, the highest crash frequency corridors also are those with the highest traffic volumes.

Source: DDOT Traffic Safety Data (2009-2011).

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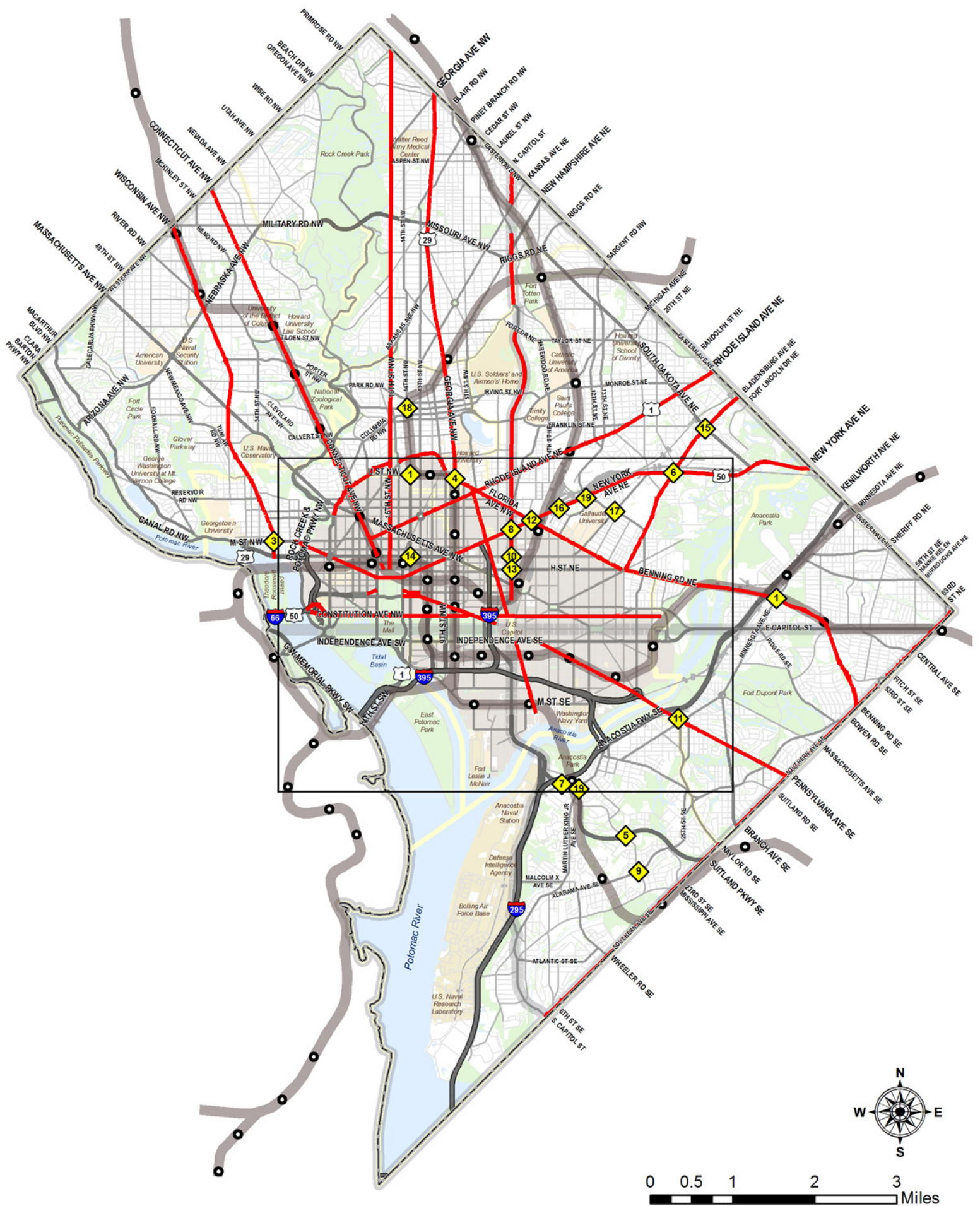


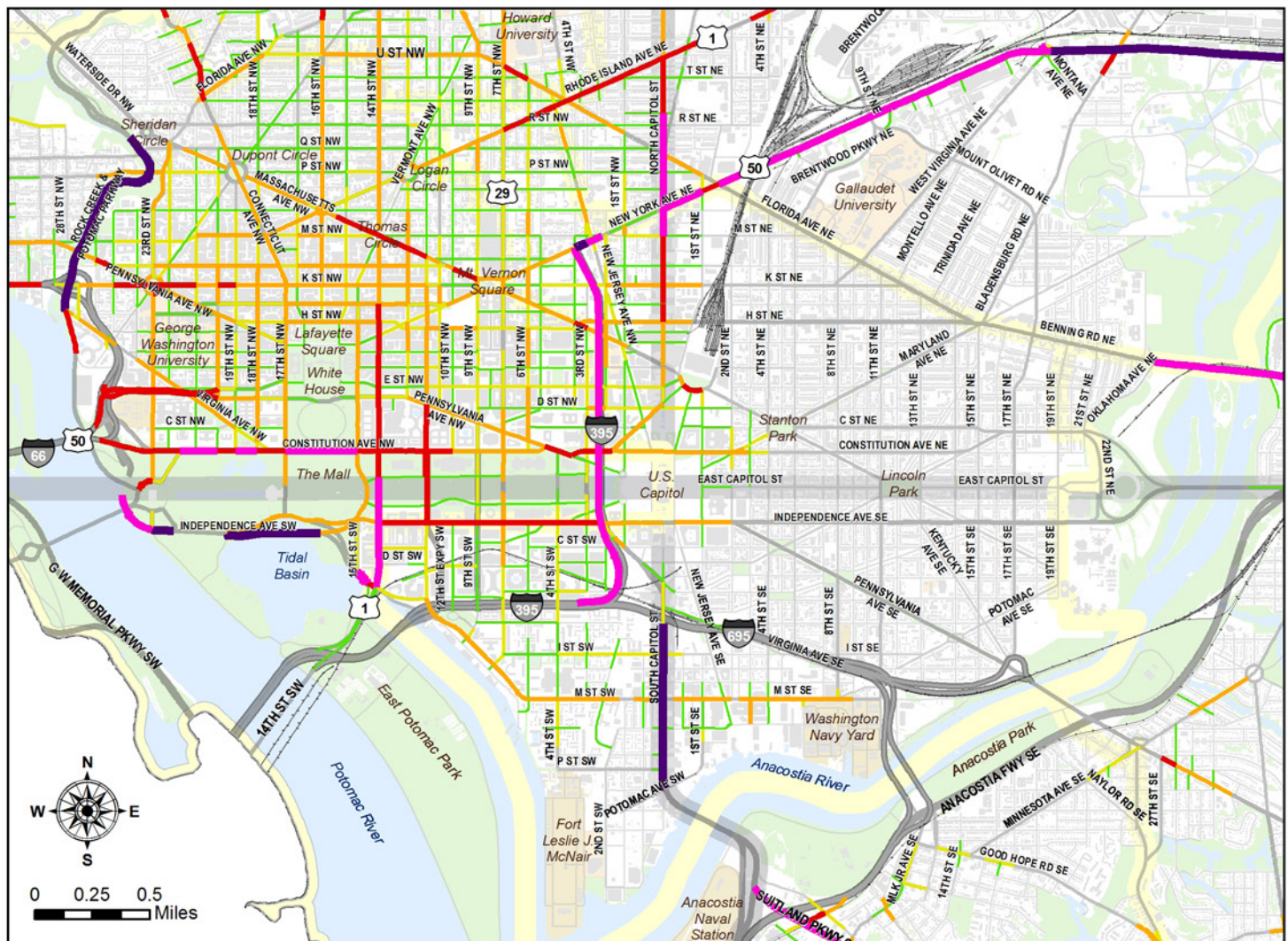
FIGURE V.6 – 2013 AM PEAK HOUR VOLUMES

This figure shows a.m. peak hour volumes where data is available.

Source: DDOT, 2013.

Legend

	<u>Existing Infrastructure</u>	<u>AM Peak Hour Volumes</u>
	Railroad	Less than 250 vehicles
	Road	251 to 500 vehicles
		501 to 1,000 vehicles
		1,001 to 1,500 vehicles
		1,501 to 2,000 vehicles
		More than 2,000 vehicles



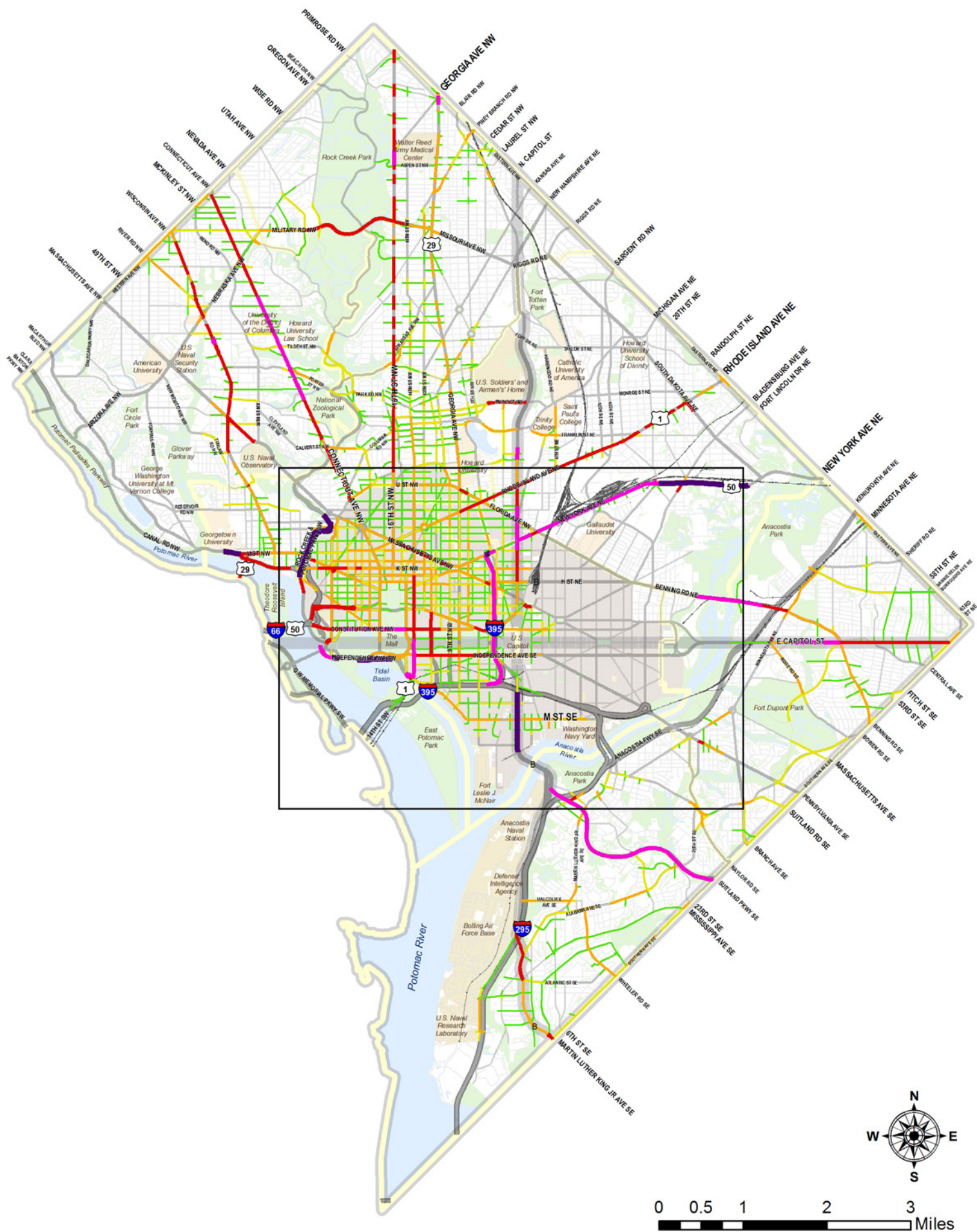


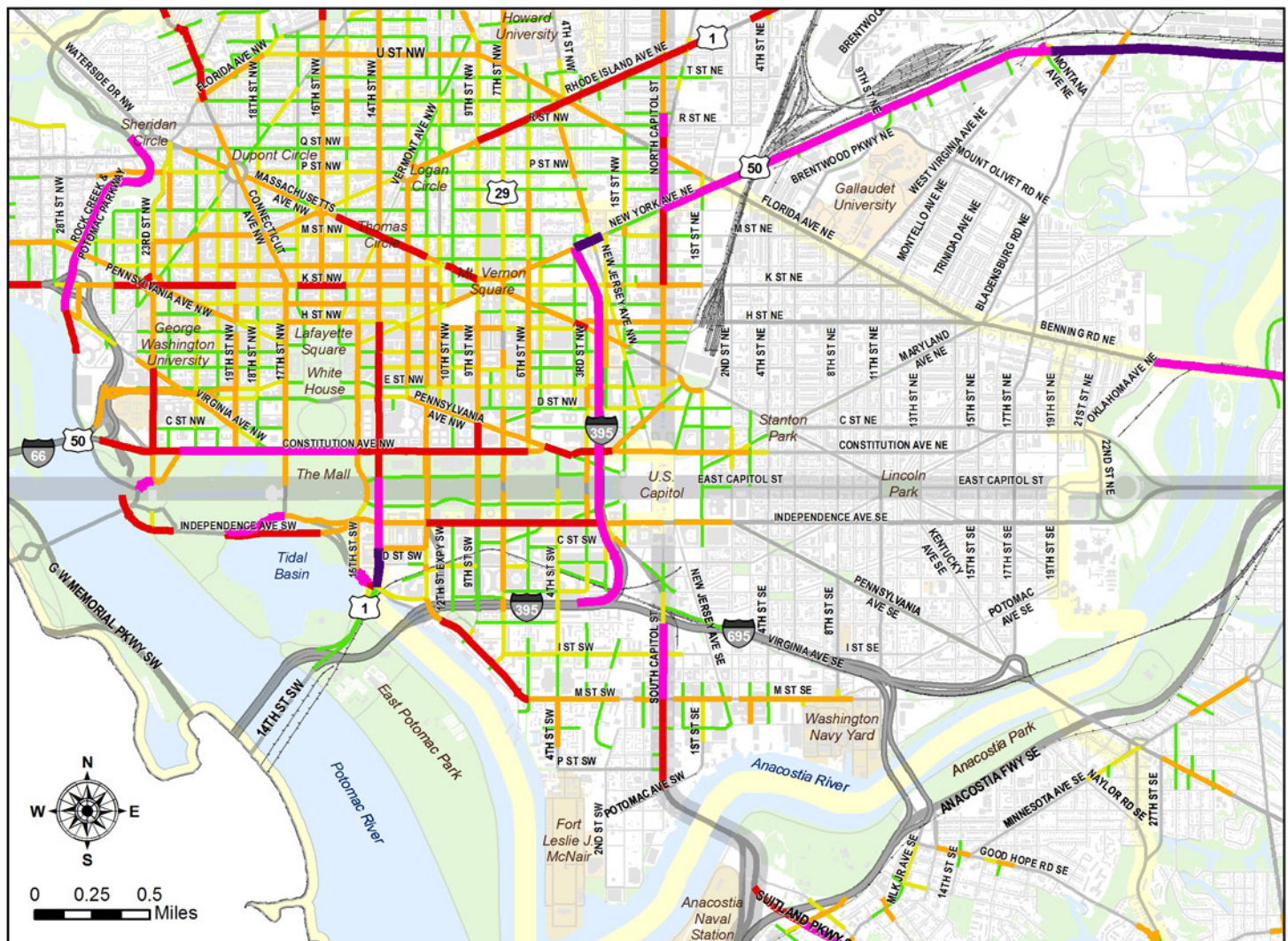
FIGURE V.7 – 2013 PM PEAK HOUR VOLUMES

This figure shows p.m. peak hour volumes where data is available.

Source: DDOT, 2013.

Legend

	<u>Existing Infrastructure</u>	<u>PM Peak Hour Volumes</u>
	Railroad	Less than 250 vehicles
	Road	251 to 500 vehicles
		501 to 1,000 vehicles
		1,001 to 1,500 vehicles
		1,501 to 2,000 vehicles
		More than 2,000 vehicles



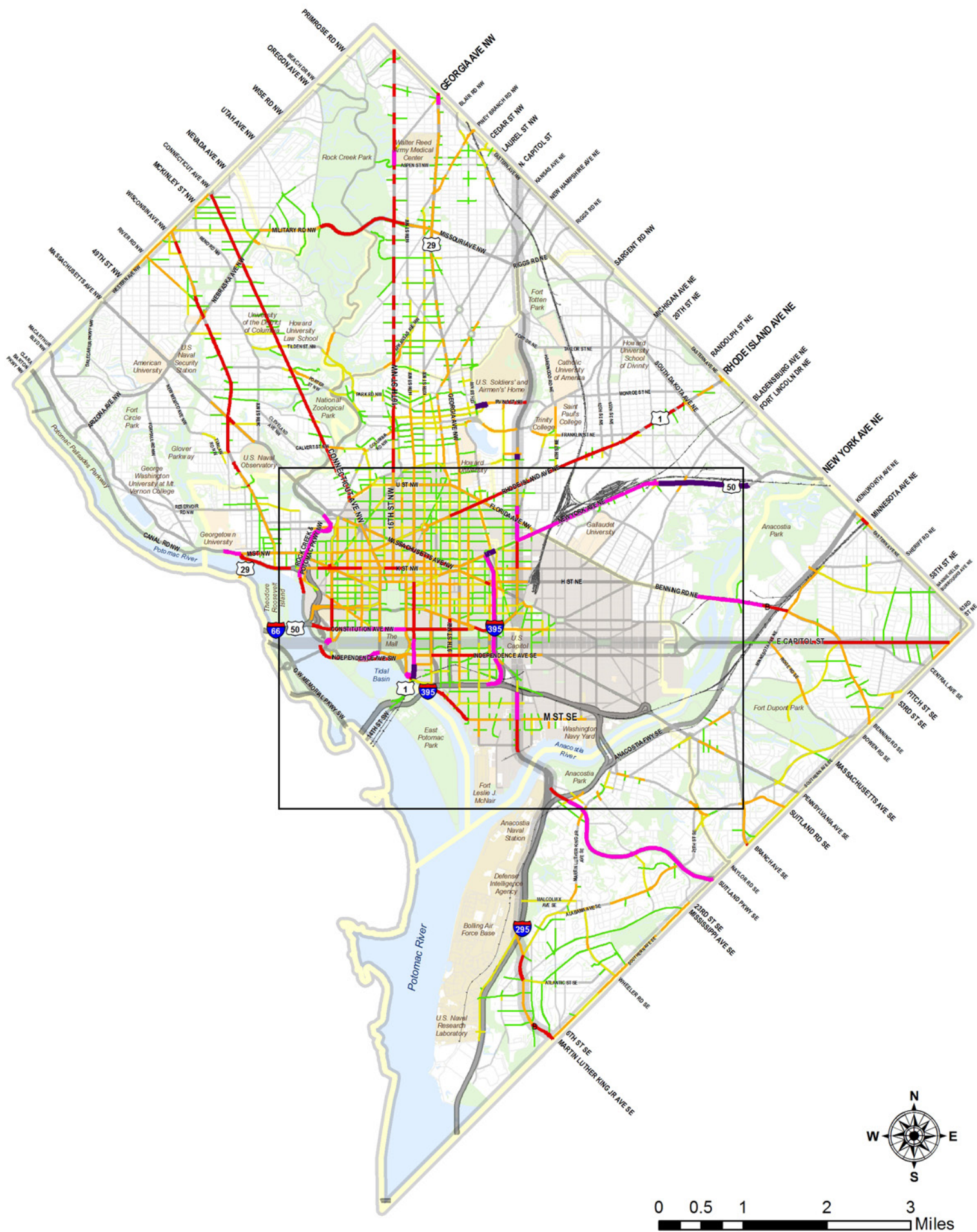


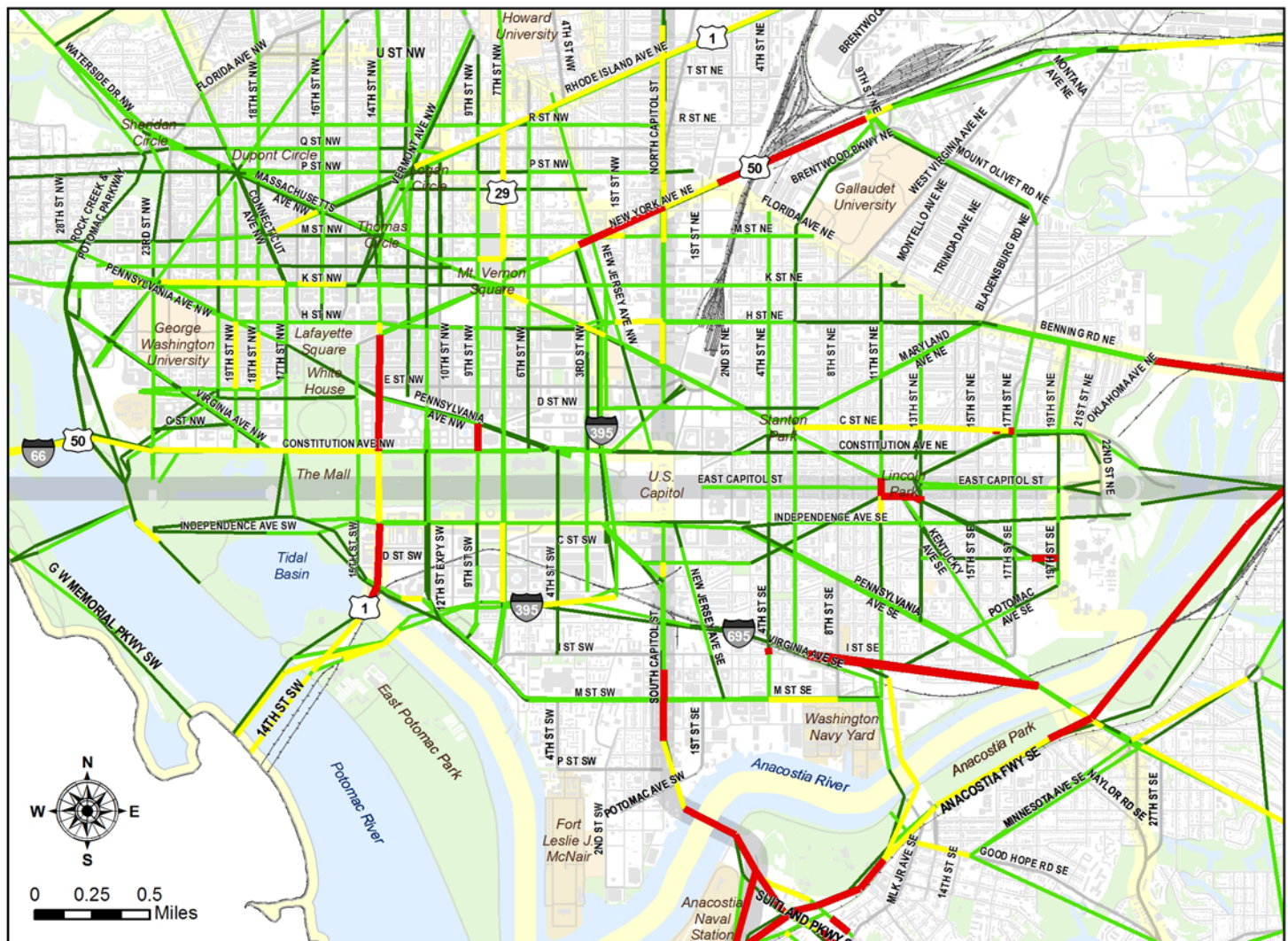
FIGURE V.8 – AM PEAK PERIOD TRAVEL SPEEDS

This figure shows travel speeds on major corridors in the District during an average weekday a.m. peak period.

Source: INRIX, 2013.

Legend

Quadrant Boundary	Existing Infrastructure	Average AM Peak Speed
Ward Boundary	Railroad	Higher than 90% of average "free-flow" speed
Water	Road	70% to 90% of average "free-flow" speed
Park		50% to 70% of average "free-flow" speed
University		Lower than 50% of average "free-flow" speed
Military		
Monumental Core		



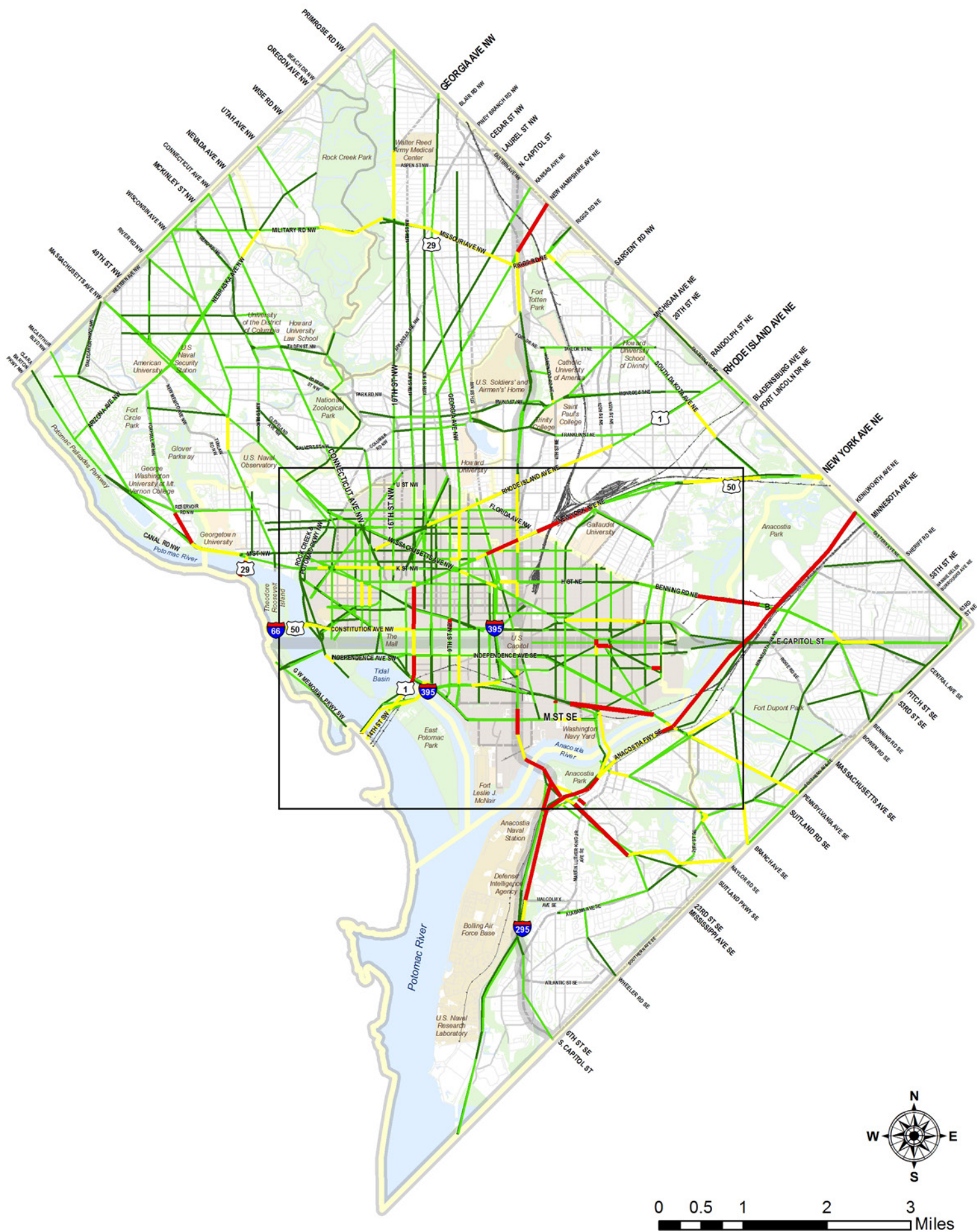


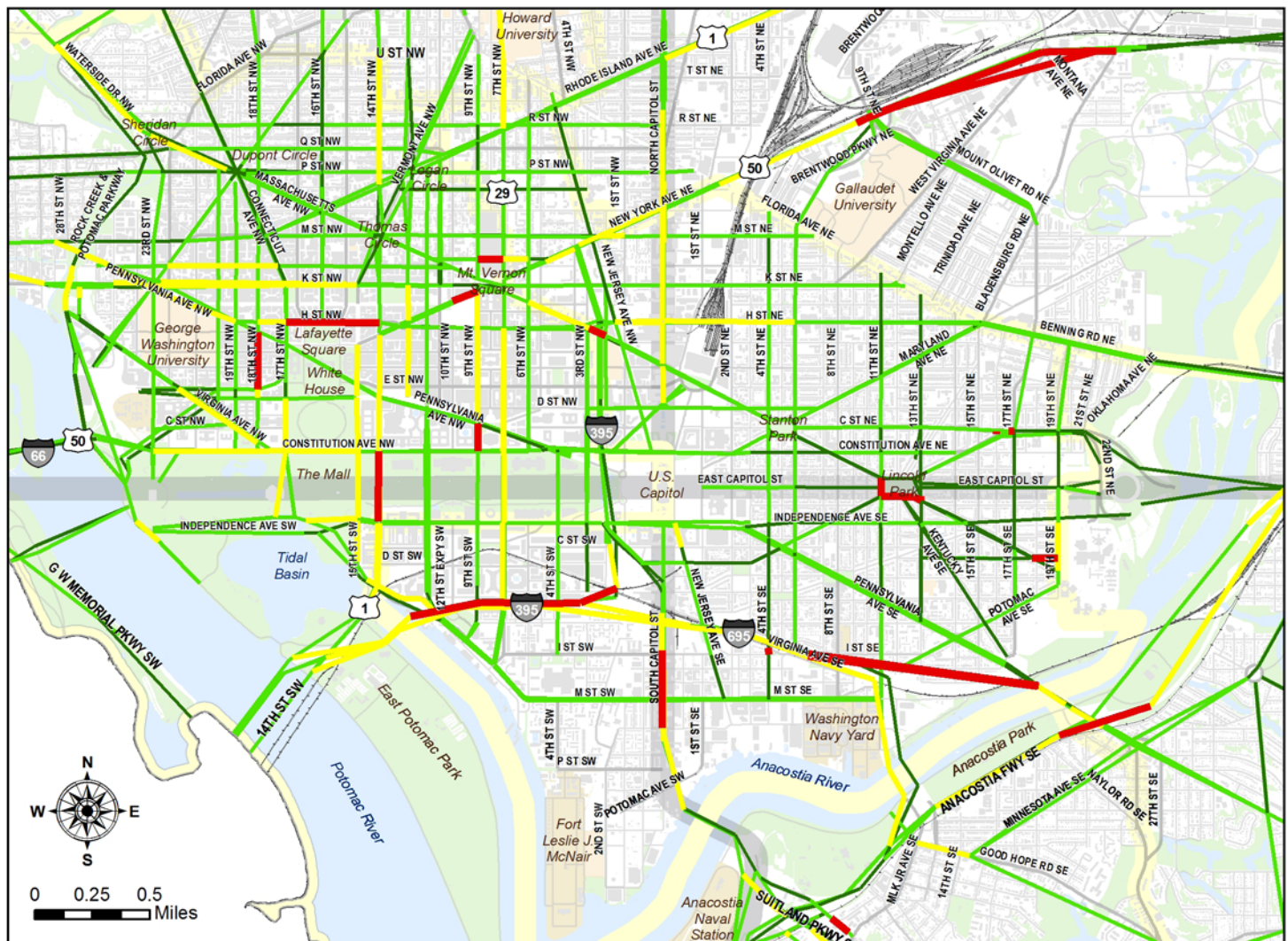
FIGURE V.9 – PM PEAK PERIOD TRAVEL SPEEDS

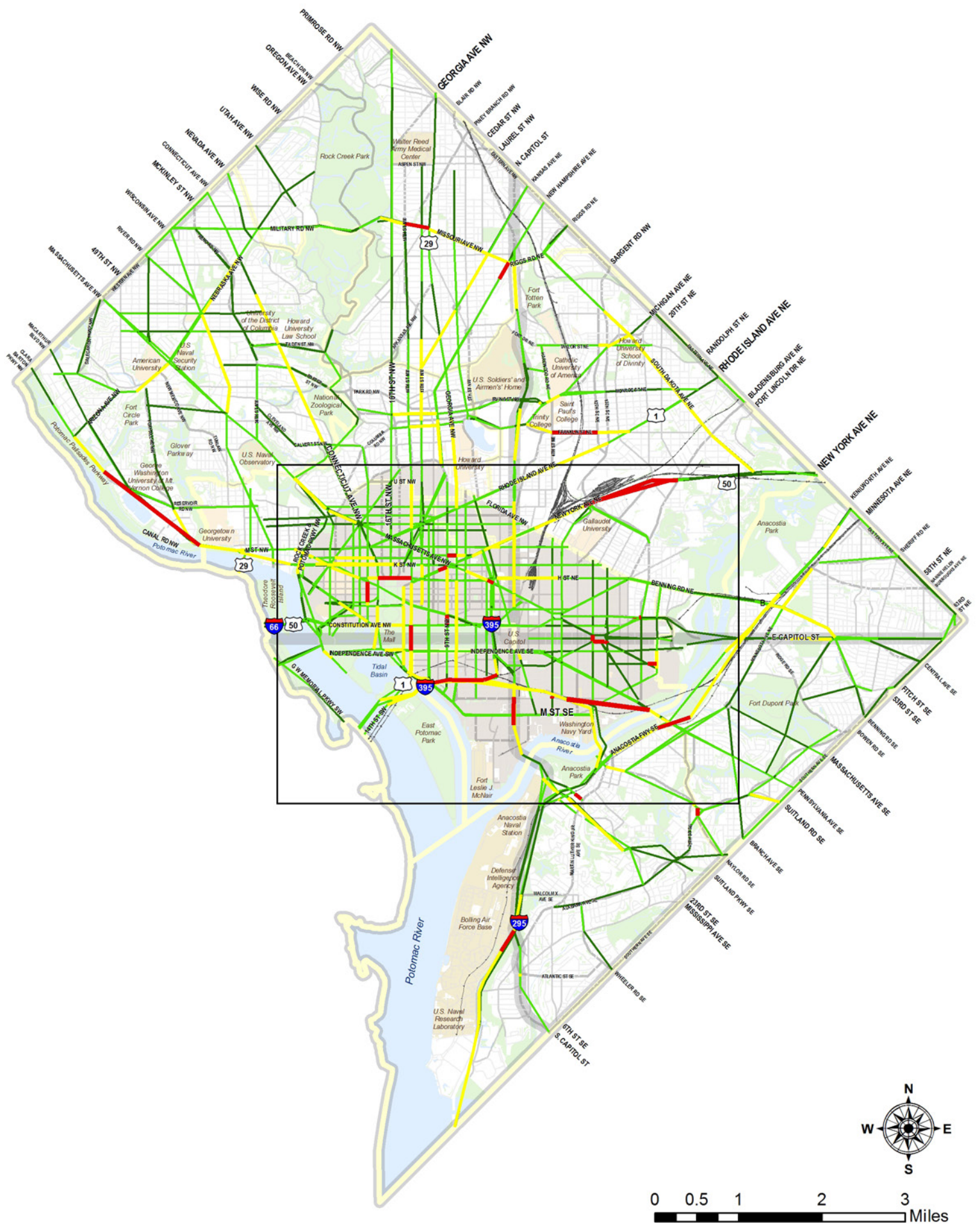
This figure shows travel speeds on major corridors in the District during an average weekday p.m. peak period.

Source: INRIX, 2013.

Legend

Quadrant Boundary	Existing Infrastructure	Average PM Peak Speed
Ward Boundary	Railroad	Higher than 90% of average "free-flow" speed
Water	Road	70% to 90% of average "free-flow" speed
Park		50% to 70% of average "free-flow" speed
University		Lower than 50% of average "free-flow" speed
Military		
Monumental Core		





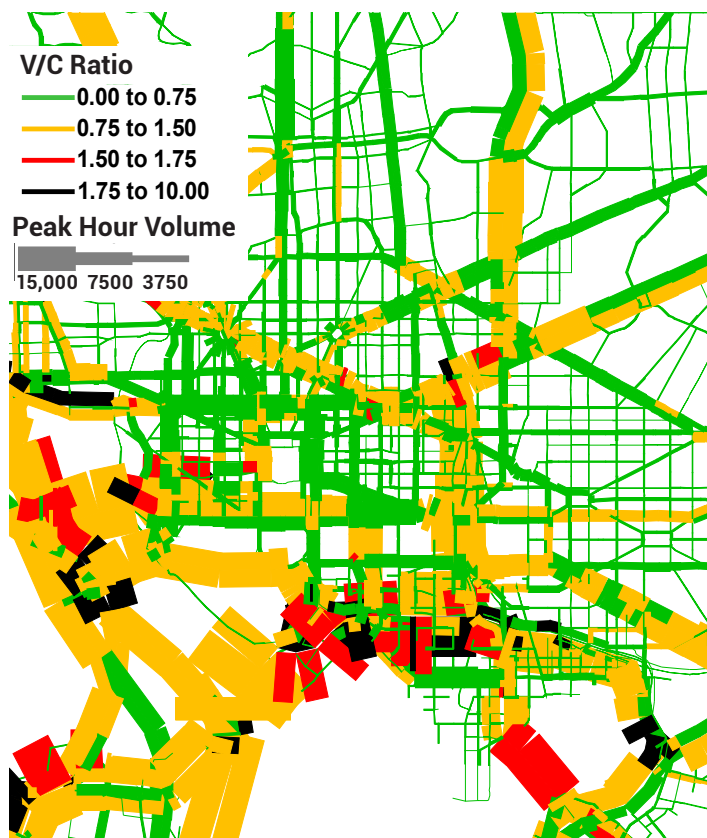
Evaluating volume to capacity (V/C) ratios is another way to understand where congestion may exist on streets under existing and future travel conditions. In theory, when a V/C ratio exceeds 1.0 it means the roadway is over capacity—there is more demand (traffic) than capacity (space for that traffic).

Figure V.10 shows existing p.m. peak hour roadway conditions, based on 2010 modeled baseline data from the District's Travel Demand Model. The darker reds and blacks in the map indicate locations where congestion is likely. Green and yellow indicates areas where congestion is less likely.

Intelligent Transportation Systems

DDOT owns, operates, and maintains a wide array of technologies to support arterial and freeway traffic management. The ITS system helps DDOT identify and manage incidents, and provides useful traffic data.

Figure V.10: 2010 p.m. Peak Hour V/C Ratios



Communications Network

DDOT's communications network allows it to connect with ITS devices Districtwide and for those devices to connect with each other. Among DDOT's largest technology assets is a communications network in excess of 270 miles of twisted pair copper cable. Most of this cable is more than 25 years old and some is in ducts more than 100 years old with many collapsed sections.

The communications system is augmented with some "last mile" wireless links, cellular and General Packet Radio System (GPRS) communications, and connections between Traffic Management Centers (TMCs) that are provided by D.C. NET, the telecommunications provider of the District's Office of the Chief Technology Officer (OCTO).

The communications network is essential transportation infrastructure. It is a critical component of the District's freeway management system, citywide signal system, and emergency management system. The data carried across the communications network enables DDOT to efficiently operate and monitor many elements within the transportation system. The communications network is functional today; however, it has limited capacity to carry more devices and functions. It will need to be significantly upgraded to meet future system needs.

Traffic Management Centers

DDOT has multiple transportation management centers that serve different purposes. The Reeves Center Municipal Office Building on 14th and U Street is the main communications and central hardware hub for DDOT's copper network and is the former site of the main TMC. The TMC at the Reeves Center contains the racks and servers for all ITS subsystems. The building also houses a Snow Management Center.

The primary TMC is located at the Unified Communications Center (UCC). This location is staffed by multiple agencies with representatives from DDOT, MPD, District of Columbia Public Schools (DCPS), and the Homeland Security and Emergency Management Agency (HSEMA). Other control centers include the Special Operations Center (SOC) and the Emergency Management Agency (EMA) and Signal System Rooms at 55 M Street.

The city's TMCs are critical to the day-to-day and emergency operations of the city's transportation system. TMC staff gather and disseminate traffic and emergency information using DDOT's network of cameras and other ITS devices.

Software

CapTOP is DDOT's freeway management system software. Developed in-house, CapTOP has been enhanced to add functionality over time. As of December 2013, DDOT was in the process of procuring a replacement system.

The new CapTOP will be an important piece of DDOT's ITS enterprise for many years. It will serve as the centralized management system for traffic management activities including real-time data collection and data sharing, management of planned events, and real-time management of incidents impacting traffic in the District. CapTOP will facilitate the exchange of transportation-related information across a variety of agencies within the region and will provide an integrated interface to a number of traffic management related systems.

Roadway Operations Patrol

DDOT operates a Roadway Operations Patrol (ROP) out of its TMC. The ROP responds to traffic incidents and emergencies on the District's roadways to quickly and efficiently address accidents and restore normal traffic flow.

According to the **2011 DDOT Annual Report**, ROP vehicles were dispatched more than 5,500 times during 2011. Of these incidents, 44% involved disabled vehicles, 27% involved minor crashes, and 8% involved traffic control. The other 20% included incidents such as pedestrian injuries, abandoned vehicles, and special events.

Signals and Signal System

The District has more than 1,600 traffic signals, which are interconnected through signal system software. DDOT is currently upgrading its signal communications system from analog serial to Internet Protocol (IP) based communications. The transition from analog to digital will enable DDOT to more efficiently use available bandwidth of the copper network which will allow DDOT add functionality to its signal system and to signal operations.

To improve traffic flow under uncertain conditions, DDOT is piloting an adaptive traffic control system starting on New York Avenue. This system will update traffic signal timing in the corridor in real-time in response to prevailing traffic conditions. Based on the outcome of the pilot, DDOT will decide whether to expand the program to other corridors in the city.

Dynamic Signage

To manage peak period traffic, the District operates a number of reversible lanes on its network. The dynamic lane indications on Clara Barton Parkway/Canal Road are controlled from traffic signal controllers on a time-of-day clock.

Detection Technologies and Permanent Count Stations

In the past several years, DDOT has invested heavily in vehicle and bicycle detection. Establishing permanent count stations and increasing the coverage within the system of vehicle detection system increases the amount of historic and real-time data DDOT and other agencies have at their disposal. This data can be used to evaluate historic and current system performance and make decisions about the future.

DDOT recently deployed in-pavement wireless magnetometer sensors and permanent traffic count stations across the District. Five different technologies will be implemented to collect the traffic data under the latter project, including inductive loops and acoustic, microwave, infrared, and video base detectors.

Dynamic Message Signs and Portable Changeable Message Signs

The District has portable changeable message signs (PCMS) that are used to alert motorists of work zones, special events, and incidents. In addition, DDOT uses permanently installed dynamic message signs (DMS) units. The permanent DMS are either on freeways or major arterials. Based on sight line and other aesthetic concerns, DDOT has found PCMS to be easier to deploy on arterials than permanent DMS.

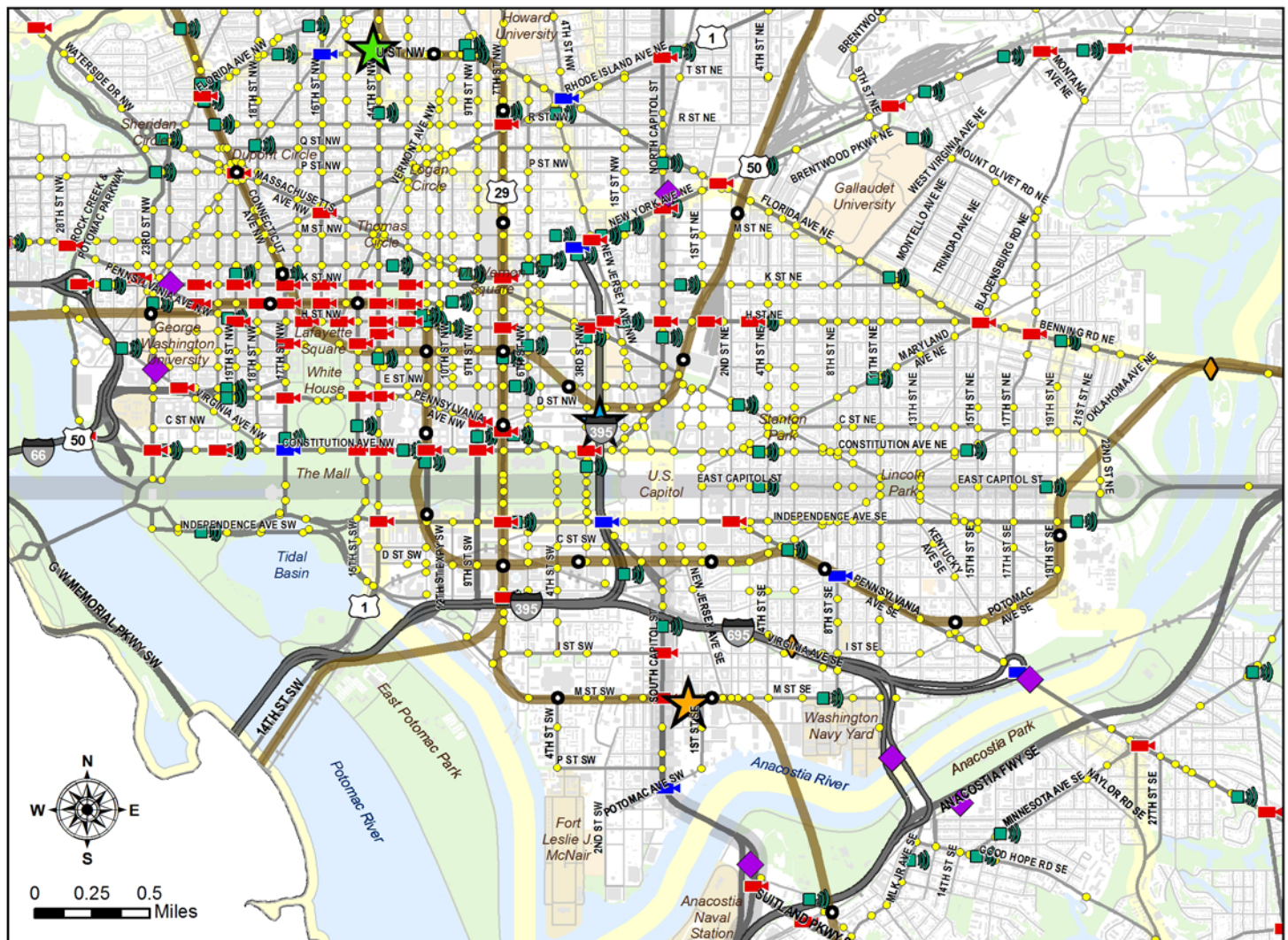
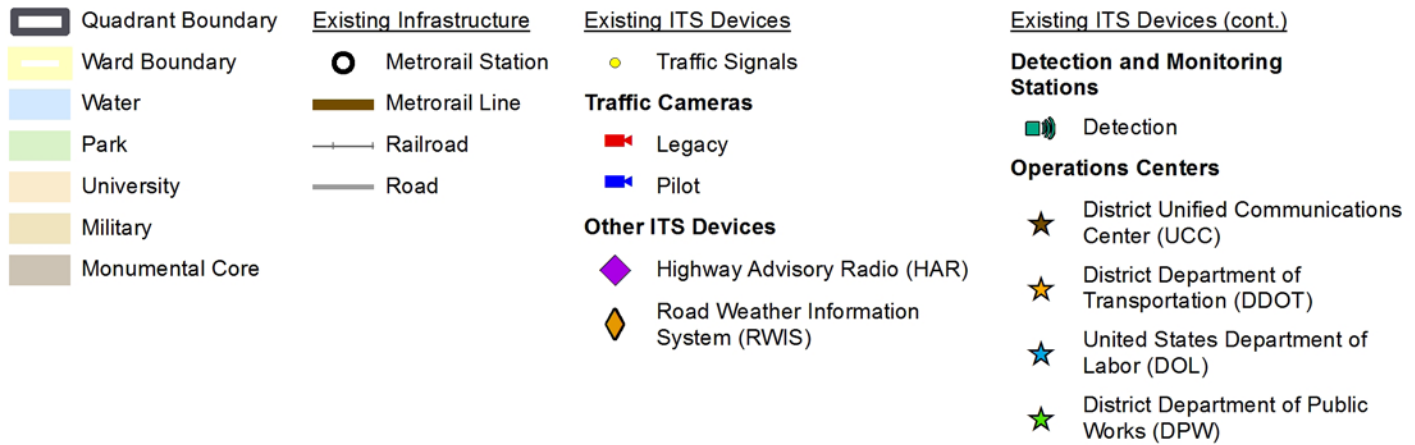
CCTV Camera and Video Distribution System

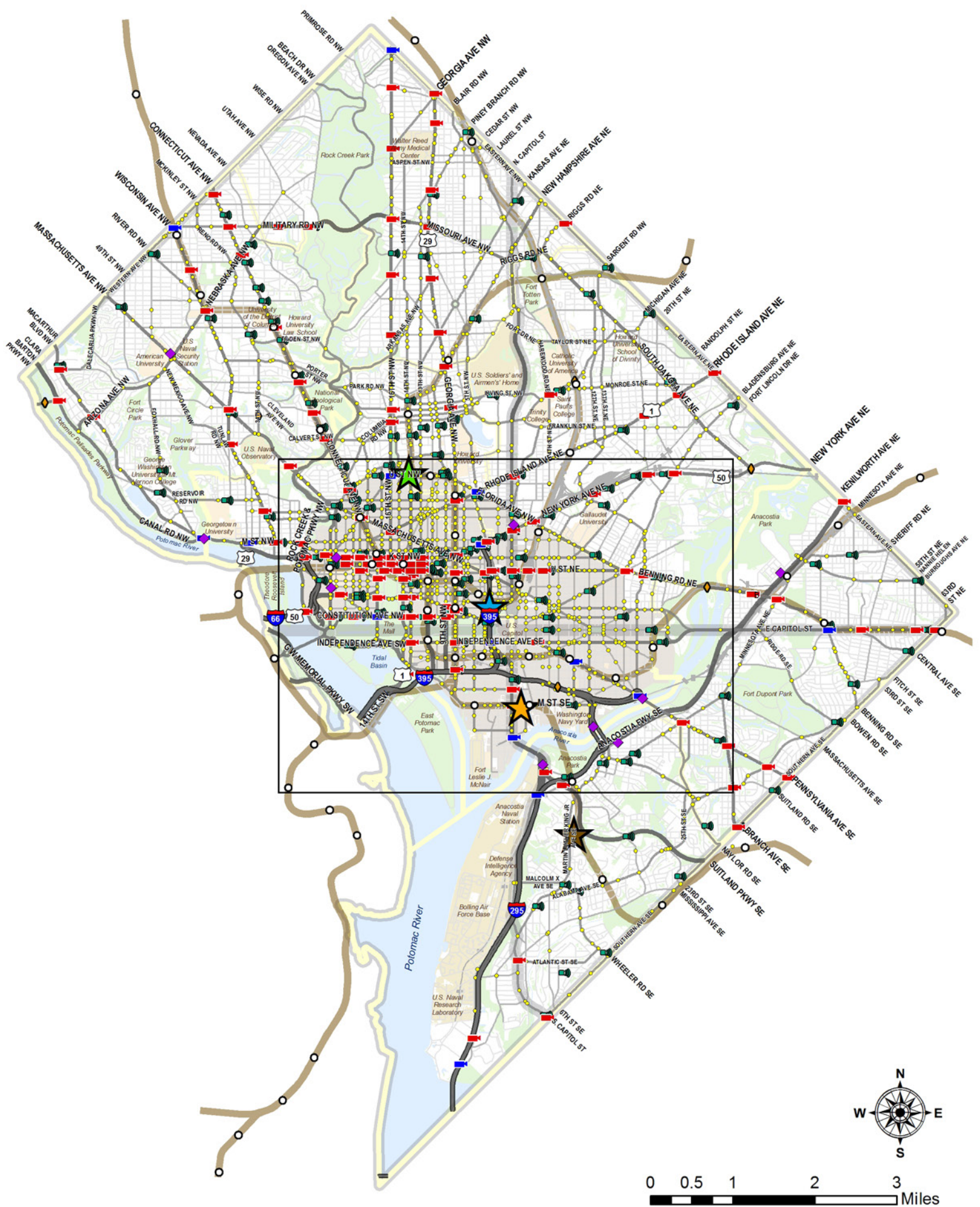
DDOT currently uses CCTV cameras at intersections, red light cameras, cameras in tunnels, and speed enforcement cameras. The video is used by the TMC to monitor traffic conditions and traffic incidents. **Figure V.11** depicts the location of DDOT's existing ITS devices.

FIGURE V.11 – EXISTING ITS DEVICES AND OPERATIONS CENTERS

This figure shows the locations of DDOT's existing (2013) ITS devices and operations centers.

Legend





Congestion in Greater Downtown D.C.

In 2012, the Washington metropolitan area was ranked as the most congested area in the nation based on traffic congestion and delay.¹ Within the District, users can feel the strain of daily travel conditions. About half of survey respondents contacted through the **moveDC** process expressed a belief that it is getting more difficult to travel in the District. The delays and uncertainty associated with congestion represent a loss of time, productivity, and resources for the city and region's economy, and are a source of frustration for drivers and businesses.

Growth and Activity

In addition to population growth in recent years, growing employment and visitor activity brings more people and vehicles into the District, especially the central areas which have high concentrations of jobs and visitor destinations.

- *In 2012, approximately 18.5 million people visited the District, primarily from other parts of the United States.*
- *Each weekday, D.C.'s population swells by 79% to over 1 million people, the largest surge of commuters in the nation.*

While residents, visitors, and workers arrive by transit, bike, or on foot, many others drive and park in the District. Congestion is also a sign of economic vitality, so the District needs to strike a balance between encouraging activity and access, while addressing critical congested areas.

System Management

Without proactive management, growth and congestion could threaten the economic viability of the District. DDOT invests significant capital and operational resources to manage the vehicular system in the downtown area, including TCOs at key intersections, traffic signal optimization, parking and freight management; however, the limited entry points into the District and persistent congestion along key routes result in vehicular congestion at peak hours in locations across the downtown area.

Unplanned Events

Traffic disruptions are common, if not daily, occurrences in the District, causing significant and sudden impacts to the city's transportation network. Both scheduled events such as marathons, and unscheduled events such as demonstrations or motorcades, require street closures that create challenges for the network in downtown as well as in neighborhoods. Adding to these challenges are streets adjacent to the Capitol or White House that have limited access or have been fully closed to traffic for security measures. These unplanned events strain the system management tools available to DDOT to manage downtown congestion.

Solutions for the Future

The District will need to manage its resources and use new technologies to improve future travel conditions and help manage congestion. A range of potential tools will be needed to address projected future congestion, including:

- *Additional TCOs at key intersections*
- *Ongoing citywide signal optimization*
- *Dynamic signage and real-time information for users*
- *Incident detection and management*
- *Parking management*
- *Freight management*
- *High-occupancy vehicle (HOV) or high-occupancy toll (HOT) lanes on major corridors accessing the Central Employment Area*
- *Limited-area cordon charge to price access to specific areas at congested times*

These tools range from staff intensive to more technology-based, and each has trade-offs that must be evaluated. Ultimately, multiple tools will be needed to manage congestion over time.

¹ Texas Transportation Institute's 2012 Urban Mobility Report

B. NOTABLE SYSTEM ACHIEVEMENTS

Citywide Signal Optimization Project

DDOT is in the midst of a 5-year project to facilitate a comprehensive signal optimization of the District's 1,600 traffic signals. The first phase of the signal optimization project was completed in late 2013. This initial phase of the project included upgrading signal software and updating signals and pedestrian clearance times to be compliant with the **Manual on Uniform Traffic Control Devices** (MUTCD). Following phases will include signal and software optimization, data collection and inventory, and performance evaluations throughout the District. The goal of the signal optimization project is to make District traffic signals safer for pedestrians, reduce delays and improve overall traffic flow, and reduce vehicular emissions. It also will help mitigate conflicts between different modes, and address regional growth and changes in travel patterns.

Increasing Street Network and Connectivity

The District's street grid is largely well connected, although the street pattern varies outside the L'Enfant city and adjacent neighborhoods. Connected streets provide greater mobility and access, and provide redundant routes in the event of emergencies. The relative amount of connectivity in the District can be measured by intersection density. **Table V.2** summarizes existing intersection density by ward.

In recent years, the District has added or reopened blocks and streets into the transportation network, adding capacity and connectivity to the system. Many of these additions have been the result of large-scale redevelopment projects, which have offered the opportunity to reconnect the street grid both in downtown and in neighborhoods. Recent street segment additions include 10th Street NW and I Street NW in the City Center development; 3rd Street SE, 4th Street SE, and Water Street SE in The Yards development; and 4th Street SW in the Waterfront Mall redevelopment.

These additions to the District's street network provide shorter, more direct routes between destinations and help spread out concentrations of traffic. They also offer new routes and accessibility which help mitigate delays in congested areas or during peak hours. Opportunities to continue to add local street connections with major development projects exist into the future as well.

Table V.2: Intersection Density by Ward

Ward	Total Intersections	Overall Intersection Density (Intersections/Square Mile)
1	476	190
6	1,040	168
4	1,222	136
7	1,089	124
5	1,195	115
3	1,118	103
2	838	96
8	922	77

Note: Area includes parks and water

Major Bridge Projects

Due to age, many of the District's bridges are in need of major rehabilitation or replacement. DDOT has proven successful in meeting this challenge during recent projects.

DDOT participated in FHWA's **Highways for LIFE** (HfL) pilot program to accelerate innovation in the highway community. DDOT used innovative engineering to complete the reconstruction of the Eastern Avenue Bridge over Kenilworth Avenue in less than 10 months. The project's key innovations included rapid construction of the bridge through the use of prefabricated elements, innovative application of maintenance-of-traffic methods and technology to decrease traffic congestion and increase safety in the construction zone, and use of a no-excuse clause with relation to inclement weather. As a result of DDOT's innovative approach, the project schedule was reduced by more than 1 year compared to traditional estimates.

DDOT is scheduled to complete the 11th Street Bridge—an **Anacostia Waterfront Initiative** project—in 2015. This is the largest single DDOT project underway at a cost of approximately \$390 million. It includes three new bridges separating local and freeway traffic in addition to multimodal access improvements and is critical to improving travel by completing a missing interstate connection between I-695 and D.C. 295 and improving local access. The new 11th Street bridges replace two bridges built in 1960.



Crossing the city's many natural and man-made barriers is often a significant expense with tremendous benefits

C. FUTURE DEMAND

Growth in the District and region will increase the overall number of trips made within, to, from, and through the District. Without sustained investment to diversify the District's transportation system, the number of vehicular trips will increase significantly as will vehicular delay. Future traffic demand was modeled using the Districtwide Travel Demand Model.

The future (2040) baseline scenario is the existing transportation network with committed transportation projects. Committed transportation projects include those in DDOT's **Transportation Improvement Plan (TIP)** and the MWCOG **Fiscally Constrained Long-Range Transportation Plan (CLRPP)**.

Table V.3 shows a summary of daily trips under existing (2010) modeled and future (2040) baseline conditions. **Table V.4** shows a summary of modeled existing (2010) and future (2040) baseline vehicular system performance data. As shown in the two tables, the number of trips to, from, within, and

through the District will increase significantly between 2010 and 2040, resulting in a considerable increase in vehicular delay—approximately 40%. The increase in delay and trips on the vehicular network, unless supported by a proportional investment in vehicular system capacity or the multimodal system, will result in additional congestion on the District's roadway network.

Figure V.12 shows modeled future baseline (2040) roadway conditions in the p.m. peak hour. The darker reds and black in the map indicate locations where congestion is likely. Lighter colors (green and yellow) are areas where congestion is less likely. As shown in the figure, investing only in the projects that DDOT is already committed to funding will not address the city's mobility needs or eliminate traffic congestion on city streets. A coordinated plan for investment will be essential in support of the city's continued growth.

Table V.3: Existing Model (2010) and Future Baseline (2040) Daily Trips

Travel Mode	District-District Trips		To/From District Trips	
	Model Base Year (2010)	Future Baseline (2040)	Model Base Year (2010)	Future Baseline (2040)
Motorized (drive)	639,000	756,000	1,305,000	1,480,000
Transit	314,000	384,000	486,000	615,000
Non-Motorized (walk and bike)	450,000	698,000	200,000	229,000

Notes:

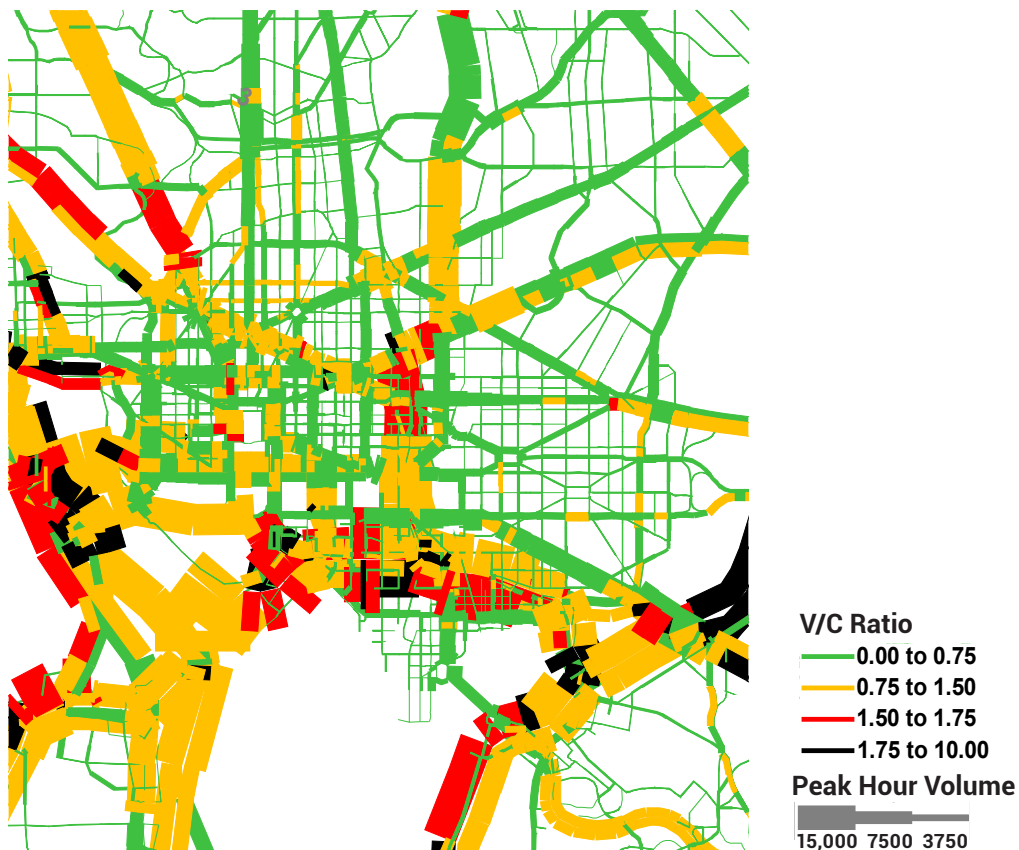
1. Motorized includes private vehicle (driver and passenger) and commercial vehicles
2. Transit is bus, streetcar, high-capacity transit, Metrorail, commuter rail, and water taxi

Table V.4: Existing Model (2010) and Future Baseline (2040) Vehicular System Performance

Measure	Model Base Year	Future Baseline
	2010	2040
Vehicle Miles Traveled (VMT)	9.13 million	10.45 million
Vehicle Hours Traveled (VHT)	335,000	389,000
Delay (Hours)	21,000	30,000

Note: These values are for the District of Columbia only

Figure V.12: 2040 p.m. Peak Hour V/C Ratios (existing network with committed projects)



D. OPPORTUNITIES FOR IMPROVEMENT

Safety

Between 2009 and 2011, approximately 17,500 crashes were reported in the District each year. These crashes contributed to more than 30 fatalities annually. Reducing the rate, frequency, and severity of crashes in conjunction with reducing instances of crashes between vehicles and pedestrians and bicyclists must remain a priority for DDOT.

Persistent Congestion

Two-thirds of traffic on the city's streets during morning and evening peak periods is from neighboring states.¹ This traffic is comprised of people traveling to jobs in the District as well as traveling through D.C. for other purposes. Corridors such as New York Avenue, Constitution Avenue, Independence Avenue, D.C. 295, I-395/695, Rhode Island Avenue, the city's many parkways, and Wisconsin Avenue are substantially affected by traffic from outside the District. Congested travel speeds are shown on **Figures V.8** and **V.9**. This congestion will continue to worsen without investments in the multimodal system.

Management of the freeway system could help improve the predictability and person-carrying capacity of District roads. Management could include occupancy restrictions and/or pricing strategies. Management of vehicular access to the Central Employment Area could provide similar improvements. In addition, enhancements in multimodal accommodations such as transit and bicycle facilities and transportation demand management (TDM) strategies could indirectly result in improved vehicular conditions if fewer people travel by automobile in the future. Other opportunities to address congestion include technological and operational improvements.

Aging Infrastructure

Aging infrastructure is a maintenance challenge and a system reliability concern in the District. Key transportation infrastructure is typically needed 24 hours a day, 7 days a week. When a bridge, tunnel, street, or intersection must be closed, parallel facilities are significantly impacted, causing cascading impacts throughout the system.

The District uses its **Capital Improvement Program** to schedule the ongoing maintenance and reconstruction of infrastructure assets throughout the District to preserve the system and improve system reliability. Investments in this program extend from minor repairs to substantial replacement or reconstruction of major transportation assets. The District can lessen the impact of major repairs by accelerating and prioritizing maintenance of bridges and streets.

Technology

DDOT has a tremendous opportunity to leverage technology and data to shift the transportation landscape for people, build stronger communities, and create a highly-responsive transportation system. Investment opportunities include open data, ITS, and autonomous vehicles.

Aging Signal System

The functionality of the District's signal system limits the opportunities available to the city to respond to changing traffic conditions, modal demands, and special circumstances. A modern and expandable citywide signal system is needed to support the city's increasingly multimodal transportation network and demands. The system needs to have functionality to better support changing traffic conditions, bicycle and pedestrian mobility, transit priority and pre-emption, and emergency operations. The city is actively investing in the replacement of the existing system to meet current and future demand.

Air Quality

Vehicles are a large source of contaminants such as carbon monoxide, nitrogen oxide, and other volatile compounds that negatively impact the District's air quality. District asthma and respiratory disease rates are high. The pollutants also deteriorate buildings and infrastructure.² Adopting renewable and cleaner fuels, using more low-emissions vehicles, and shifting to cleaner forms of transportation will improve our ability to manage air quality. Other strategies include offering incentives to reduce driving on days when the level of air pollution is highest.

¹ DDOT, 2013.

² Sustainable DC, 2013



Many District streets are unique and require a tailored approach to rehabilitation

Climate Adaptation

Historically, transportation infrastructure has been developed under the assumption that climate and weather patterns remain constant through its service life. DDOT's capacity to adapt to the impacts of extreme weather conditions on the transportation system depends on its ability to respond to the physical needs of the system and to plan for future contingencies. Assets should be maintained at a state of good repair so that they are better able to withstand strains caused by extreme weather events.

DDOT's *Climate Change Adaptation Plan* (2013) identified and developed potential adaptation strategies to ensure DDOT's transportation infrastructure can withstand climate change and to reduce the vulnerability of its assets to the effects of extreme weather conditions. With respect to the vehicular network, strategies include:

- Considering climate change in planning and design, such as evaluating vertical clearance for bridges on waterways and impact of wind
- Evaluating bridge expansion joints and design
- Evaluating pavement design and monitor pavement conditions
- Improving stormwater management practices

Barriers

The connectivity of the street system within the city and between the District and Virginia and Maryland is influenced by the Anacostia and Potomac Rivers. In addition, the significant system of local and national parks in the District, including Rock Creek Park and the National Mall, create additional challenges to connectivity. Lastly, though limited, D.C.'s freeway system and railroad corridors are barriers to connectivity and continuity of the street network in some areas and neighborhoods. Investments in street connectivity could alleviate some choke points.

III. Recommendations

The **Vehicle Element** presents recommendations for the District's vehicular transportation system. In addition to meeting the goals and vision for the overall plan, the **Vehicle Element** of the **moveDC** plan seeks to:

- Create an environment where demand can be managed and where capacity is available to those who need to drive
- Improve traveler safety by reducing crash frequency, rate, and severity
- Increase system reliability and efficiency
- Maintain the transportation system at a full state of good repair

The District continues to make significant investments in infrastructure modernization, maintenance, and management and will need to continue to do so in the future. The recommendations in the **Vehicle Element** are presented as infrastructure investments, policies, and educational or enforcement programs.

A. INFRASTRUCTURE INVESTMENTS

The **moveDC** recommended vehicular network is shown in **Figures V.13** through **V.18**. Generalized numbers of lanes and roadway cross sections are shown in **Figure V.19**. The specific roadway configurations and trade-offs between elements like parking and travel lanes will need to be assessed on a capital investment by capital investment basis.

Recommendation A.1: Maximize the District's federal maintenance contribution.

The District should retain its opportunity to receive the maximum available federal maintenance contribution. This entails maintaining an optimum inventory of streets functionally classified as interstate, freeway/expressway, and principal arterial, as well as staying current and compliant with federal rules and regulations. Preserving the mileage of streets in these functional classes will ensure eligibility for federal maintenance funds.

Recommendation A.2: Bring the District's bridges to a state of good repair.

The District's bridges should be maintained at a state of good repair. The District should perform routine preservation activities to maximize the useful life of bridges and complete major bridge

repairs, rehabilitation, and replacement, as needed. Major bridge rehabilitation projects include:

- **Benning Road Bridge (over Kenilworth Avenue NE).** The Benning Road Bridge should be replaced or rehabilitated. Preliminary engineering for the project is scheduled for Fiscal Year 2015.
- **East Capitol Street Bridge.** The East Capitol Street Bridge should be rehabilitated to eliminate structural deficiencies. The rehabilitation work is scheduled for Fiscal Year 2014.
- **Hopscotch Bridge (H Street).** The Hopscotch Bridge should be replaced or rehabilitated. Preliminary engineering is scheduled for Fiscal Year 2017.
- **Key Bridge.** In Fiscal Year 2014, deteriorated structural elements will be replaced and drainage and utility deficiencies will be corrected.
- **South Capitol Street Bridge (Frederick Douglass Memorial Bridge).** The bridge will be replaced and adjoining sections of limited access roadway will be transformed into a scenic boulevard to better serve pedestrians, bicycles, and vehicles. The project will increase multimodal capacity across the Anacostia River and remove existing infrastructure-related barriers on both sides of the river. Preliminary engineering and right-of-way acquisition have been underway since January 2012, but the final federal environmental approval and construction funding are pending. A contract for constructing the initial phases of the project is anticipated in 2015.
- **Theodore Roosevelt Memorial Bridge (I-66).** The bridge superstructure and substructure and other bridge damage will be repaired. In addition, pedestrian and bicycle access will be improved. Construction is scheduled for Fiscal Year 2015.

Beyond these structures, DDOT will continue to monitor the condition of bridges, and DDOT's capital planning should emphasize state of good repair investments. Over the life of the plan, nearly all bridges will need some degree of rehabilitation, and this should be accounted for in financial planning.

Modal Priorities on Existing Roadways

As the District grows, existing streets will increasingly need to support more and different transportation users and will still have a role to play in conveying a mixture of vehicular traffic for many different purposes.

To achieve this end of supporting a mixture of uses while also being able to accommodate vehicular trip purposes, the framework in which non-local street recommendations were developed was the following:

Every non-local street should prioritize pedestrians,



accommodate driving and local deliveries, and support one of the following modes:

- B** Protected bicycle facilities
- T** Dedicated high-capacity surface transit lane(s)
- F** Dedicated freight routes
- or
-  A combination of these modes in simpler accommodation

The framework establishes rules for sharing existing limited street space among the system's diverse transportation users while maintaining vehicular accommodation and access. In applying this approach to the network, some streets will have vehicular capacity reductions, while experiencing an increase in person-carrying capacity. A high-capacity transit corridor where a general purpose vehicular lane is removed to permit the operation of transit in exclusive accommodation is an example of this condition.

Major Vehicular Network Elements

Major recommended components within the vehicular transportation network include the following:

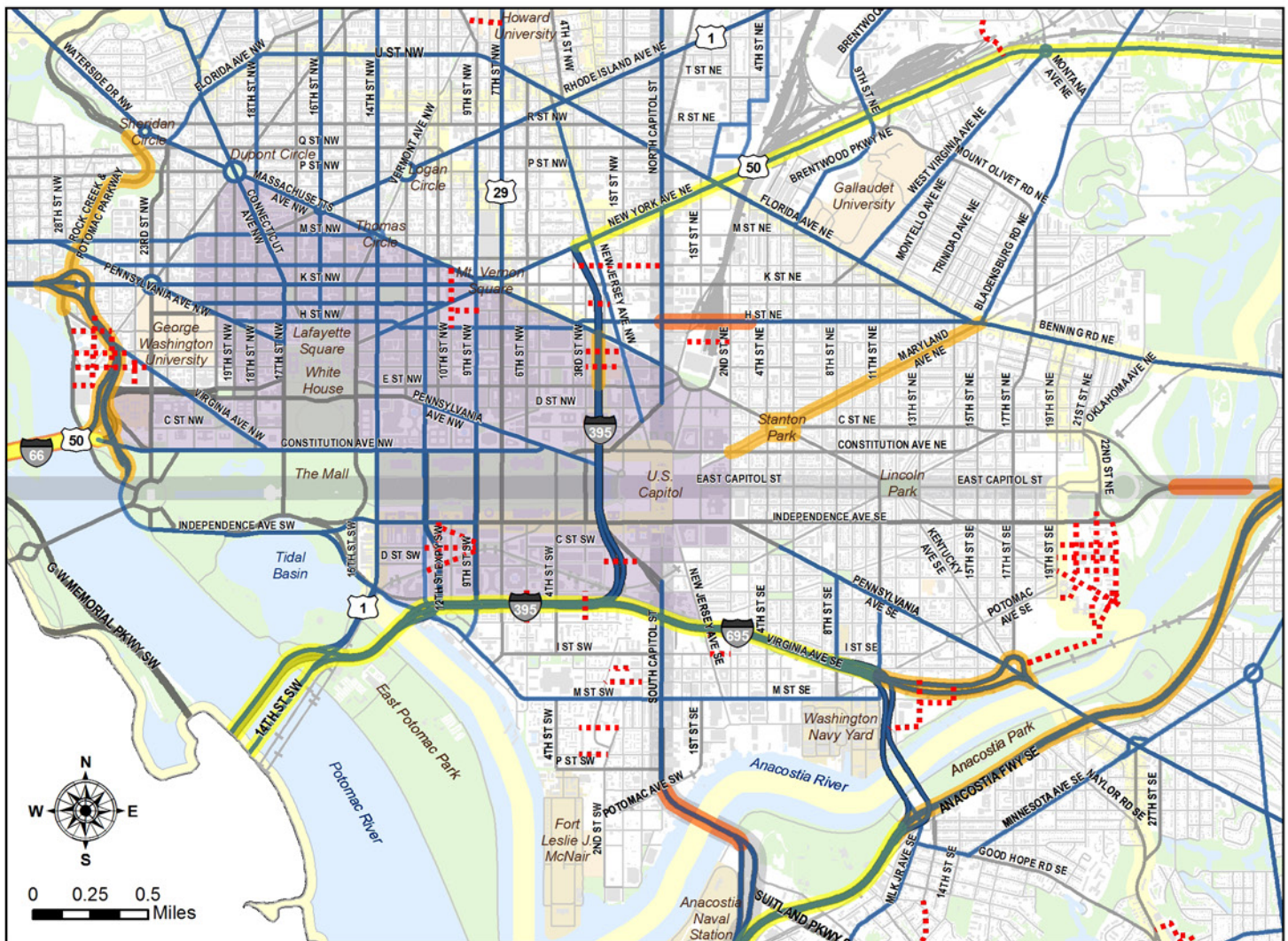
- **Major bridge rehabilitation and replacements.** *South Capitol Street Bridge, Theodore Roosevelt Memorial Bridge, and other major bridges to address state of good repair and better accommodate multimodal demand*
- **System operations optimization.** *Traffic signal system and field equipment replacement and optimization and investment in intelligent transportation systems to optimize operations, reliability, and infrastructure capacity*
- **Goods movement.** *Preservation of and enhancement to designated freight routes to increase goods movement efficiency and reduce negative impacts*
- **Transportation facility management.** *Use of occupancy and entry requirements in combination with user fees in some locations to increase the person-carrying capacity of facilities and manage vehicular demand*
- **Street connections.** *Restoration of historic street segments and streets on new alignment in planned land use change areas and across barriers such as I-395 to improve overall multimodal network connectivity*

FIGURE V.13 – PLANNED VEHICULAR NETWORK

This figure shows the planned vehicular network. Major network elements include system management, preservation of freight routes, safety and efficiency measures, and new local street connections.

Legend

	Quadrant Boundary		Existing Infrastructure		moveDC Plan Elements - Future
	Ward Boundary		Railroad		Managed Lane
	Water		Road		Roadway Reconfiguration
	Park		Primary Freight Route		Bridge Replacement or Rehabilitation
	University		New Street		Central Employment Area Cordon Charge
	Military				
	Monumental Core				



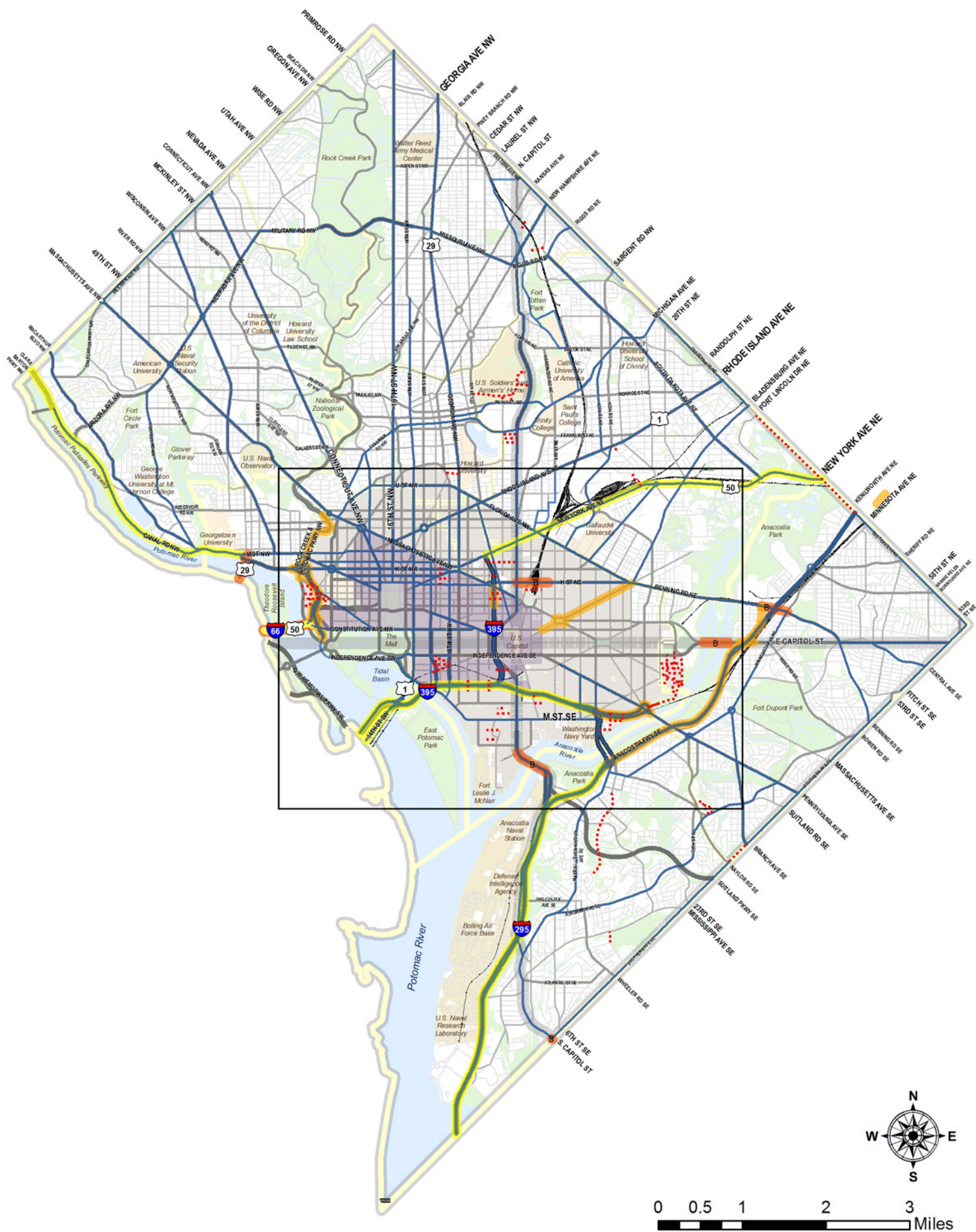


FIGURE V.14 – DOWNTOWN PLANNING AREA VEHICULAR NETWORK

The **moveDC** vehicular network for the Downtown planning area includes:

- A downtown congestion pricing cordon around the Central Employment Area
- Managed lanes on some of the major facilities entering downtown including
 - I-395 and 14th Street Bridges
 - I-395/I-695 between the 11th and 14th Street Bridges
 - New York Avenue NE, northeast of the I-395 tunnel
 - Theodore Roosevelt Memorial Bridge (I-66/US 50)
- Reconfiguration of the I-66 freeway between the Constitution Avenue and K Street NW and replacement with a connected local street grid
- Reconfiguration of the Rock Creek and Potomac Parkway to accommodate two-way travel all day
- Replacement or rehabilitation of the Hopscotch Bridge (H Street NE over railroad tracks)
- Rehabilitation of the Theodore Roosevelt Bridge
- New local street connections across I-395
- Maryland Avenue SW Plan potential street connections
- Preservation of key citywide freight routes

Legend

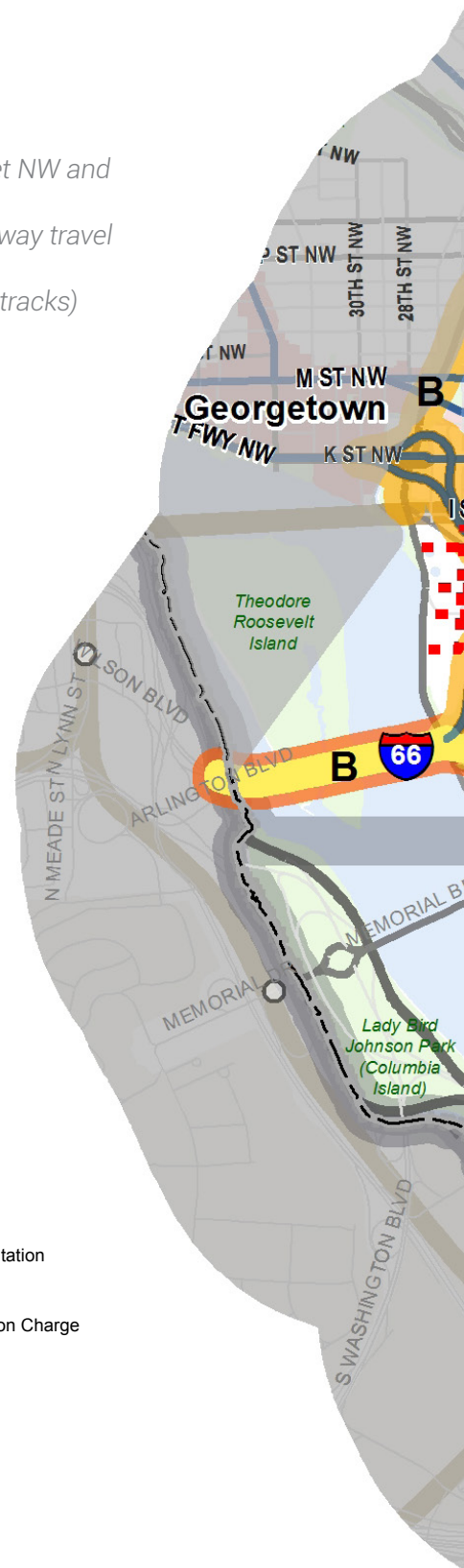
Existing Infrastructure

- Metrorail Station
- Metrorail Line
- Street
- Railroad
- Primary Freight Route

- Ward Boundaries
- Land Use Change Area
- Mixed Use or Neighborhood Center
- Multi-Neighborhood or Regional Center

moveDC Plan Elements (Future)

- Managed Lane
- Roadway Reconfiguration
- Bridge Replacement or Rehabilitation
- New Street
- Central Employment Area Cordon Charge



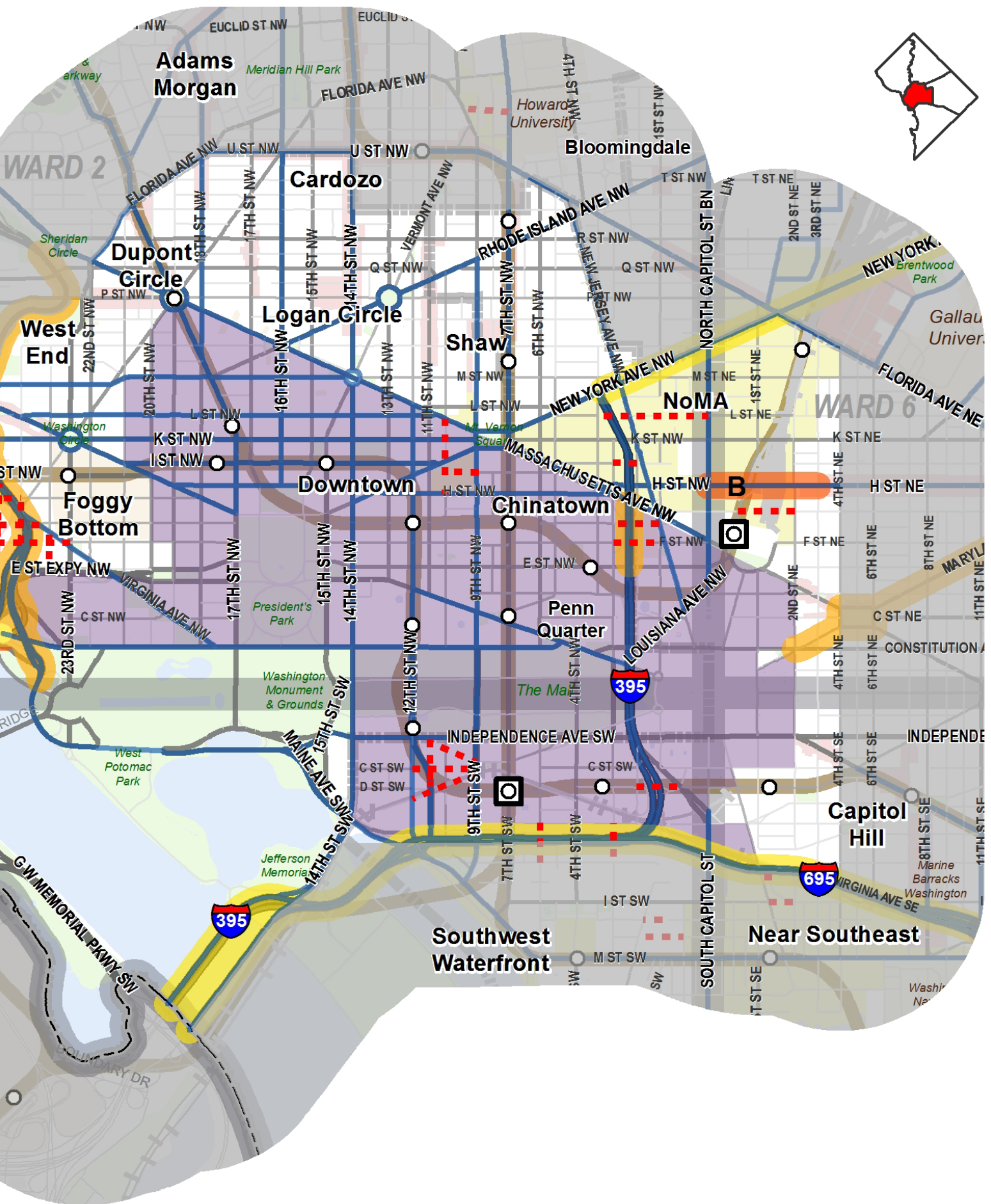


FIGURE V.15 — EASTERN PLANNING AREA VEHICULAR NETWORK

The **moveDC** vehicular network for the Eastern planning area includes:

- Managed lanes on New York Avenue NE
- Improvement/reconfiguration of the Anacostia Freeway SE (D.C. 295) and the Old Southeast Freeway to improve connectivity and safety
- Rehabilitation of the East Capitol Street Bridge
- Rehabilitation of the Benning Road Bridge over Kenilworth Avenue NE
- New street grid network in Reservation 13 (Hill East)
- Extension of Eastern Avenue between Bladensburg Road NE and Kenilworth Avenue NE
- Preservation of key citywide freight routes

Legend

Existing Infrastructure

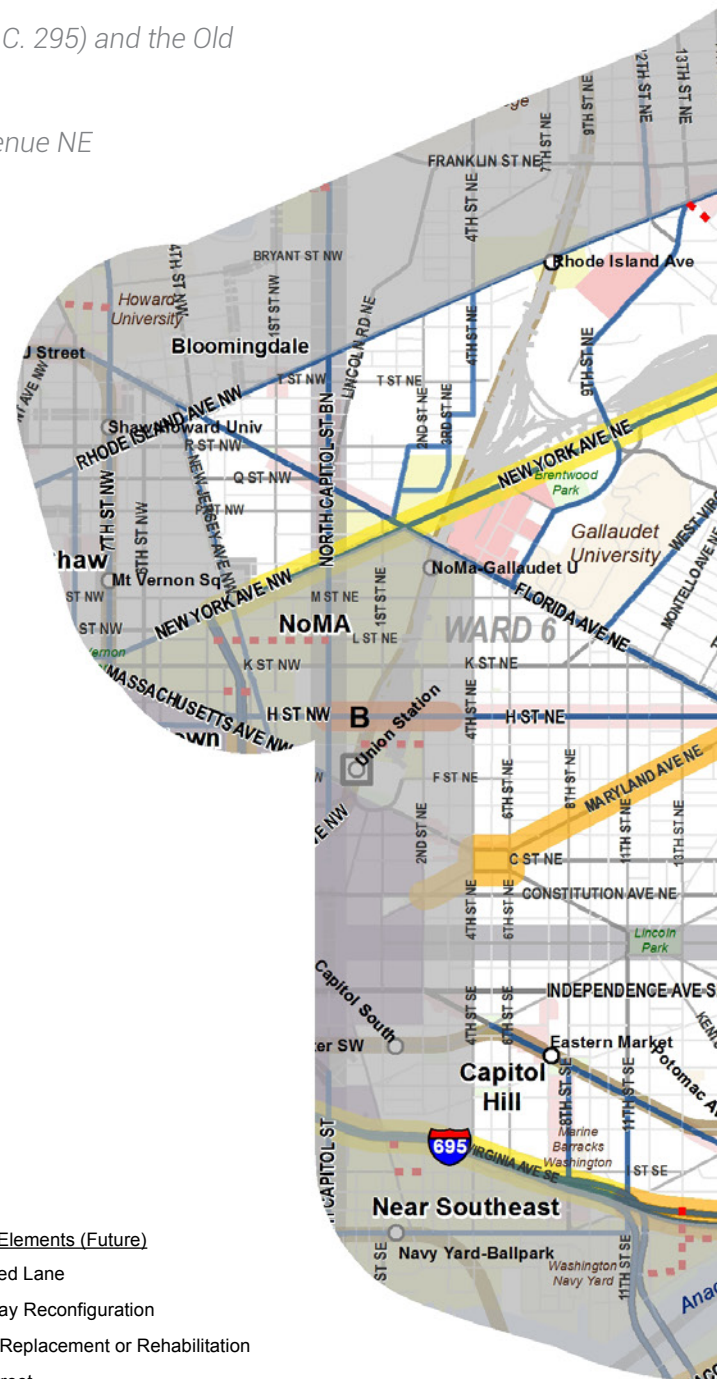
- Metrorail Station
- Metrorail Line
- Street
- Railroad
- Primary Freight Route

Ward Boundaries

- Land Use Change Area
- Mixed Use or Neighborhood Center
- Multi-Neighborhood or Regional Center

moveDC Plan Elements (Future)

- Managed Lane
- Roadway Reconfiguration
- Bridge Replacement or Rehabilitation
- New Street
- Central Employment Area Cordon Charge



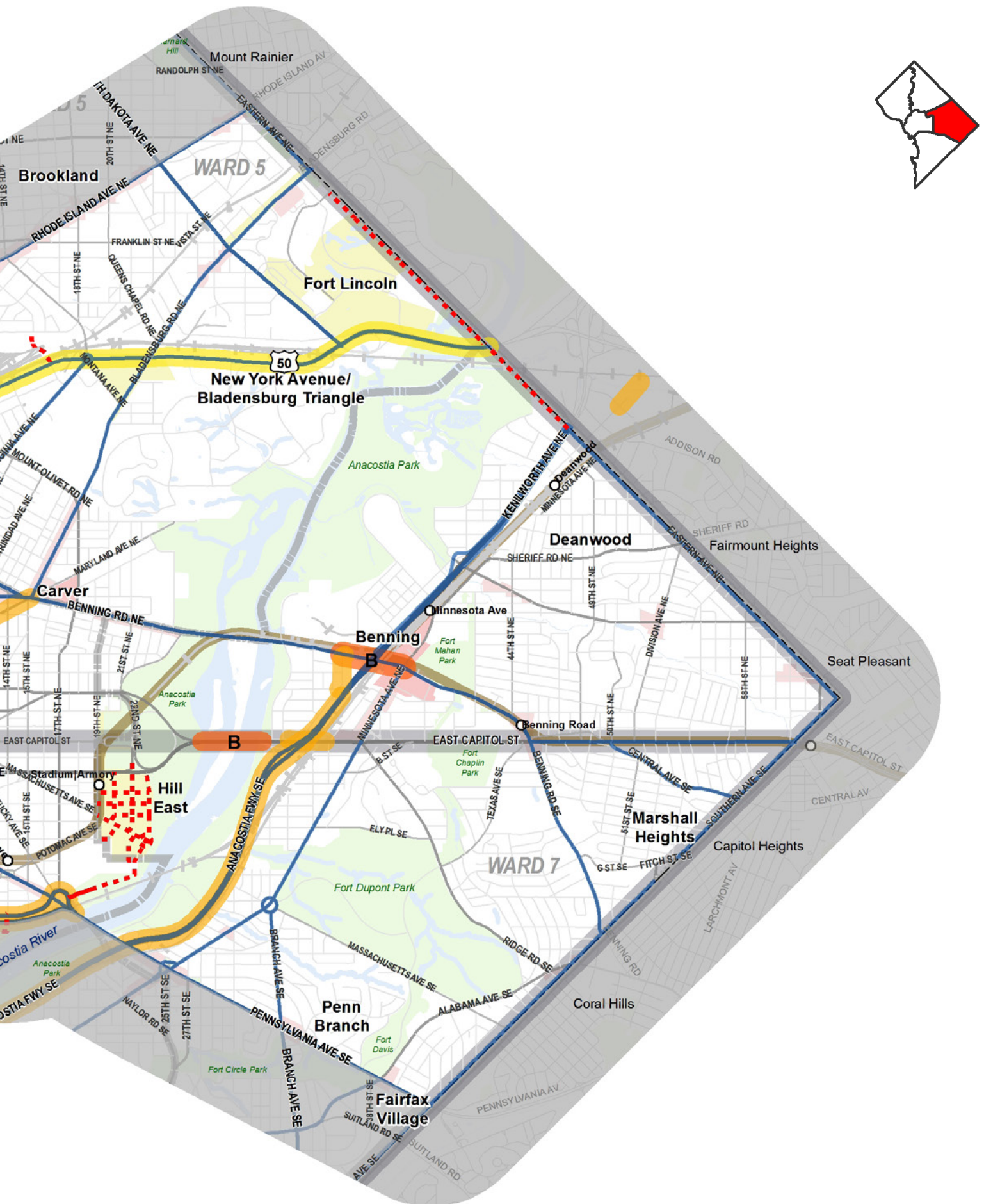


FIGURE V.16 — NORTHERN PLANNING AREA VEHICULAR NETWORK

The **moveDC** vehicular network for the Northern planning area includes:

- New street grid network at the McMillan site
- New street network in the U.S. Soldiers' and Airmen's Home area
- W Street NW extension from Florida Avenue NW to Georgia Avenue NW
- New street crossings of the railroad tracks north of the Fort Totten neighborhood
- Preservation of key citywide freight routes

Legend

Existing Infrastructure

- Metrorail Station
- Metrorail Line
- Street
- +— Railroad
- Primary Freight Route



Ward Boundaries



Land Use Change Area



Mixed Use or Neighborhood Center



Multi-Neighborhood or Regional Center

moveDC Plan Elements (Future)

- Managed Lane
- Roadway Reconfiguration
- Bridge Replacement or Rehabilitation
- ... New Street
- Central Employment Area Cordon Charge



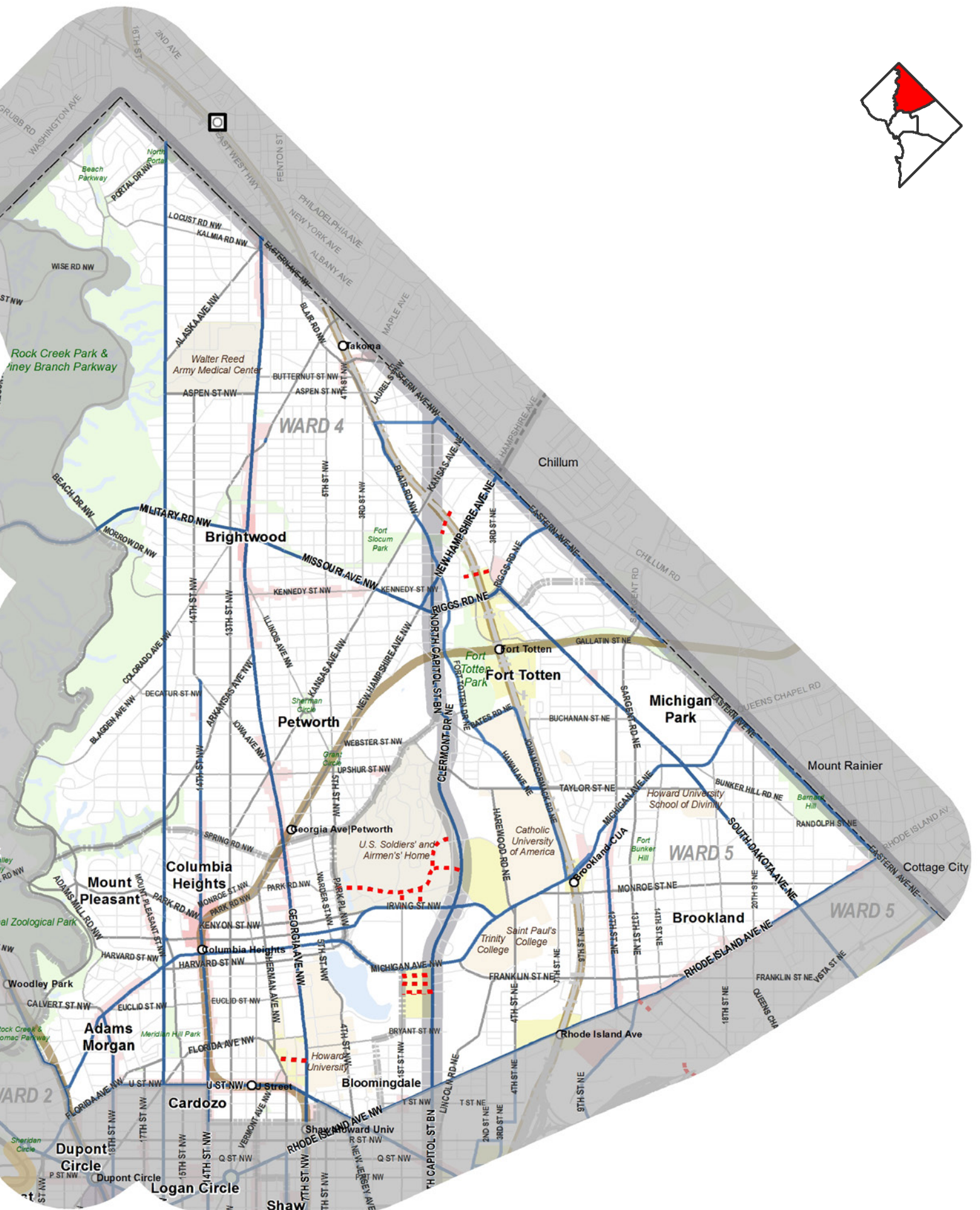


FIGURE V.17 – SOUTHERN PLANNING AREA VEHICULAR NETWORK

The **moveDC** vehicular network for the Southern planning area includes:

- Managed lanes on the Anacostia Freeway (I-395)
- Improvement/reconfiguration of the Anacostia Freeway SE (D.C. 295) and the Old Southeast Freeway to improve connectivity and safety
- Replacement or rehabilitation of the South Capitol Street Bridge
- Replacement or rehabilitation of the Winkle Doodle Branch Bridge
- New street grid network in the Skyland area
- New street connection between 13th Street SE and St. Elizabeths redevelopment area
- L Street SW and K Street SW extensions in the Southwest Waterfront area
- Extension of Southern Avenue SE between Naylor Road SE and Branch Avenue SE
- Preservation of key citywide freight routes

Legend

Existing Infrastructure

- Metrorail Station
- Metrorail Line
- Street
- +— Railroad
- Primary Freight Route

- Ward Boundaries
- Land Use Change Area
- Mixed Use or Neighborhood Center
- Multi-Neighborhood or Regional Center

moveDC Plan Elements (Future)

- Managed Lane
- Roadway Reconfiguration
- Bridge Replacement or Rehabilitation
- ... New Street
- Central Employment Area Cordon Charge



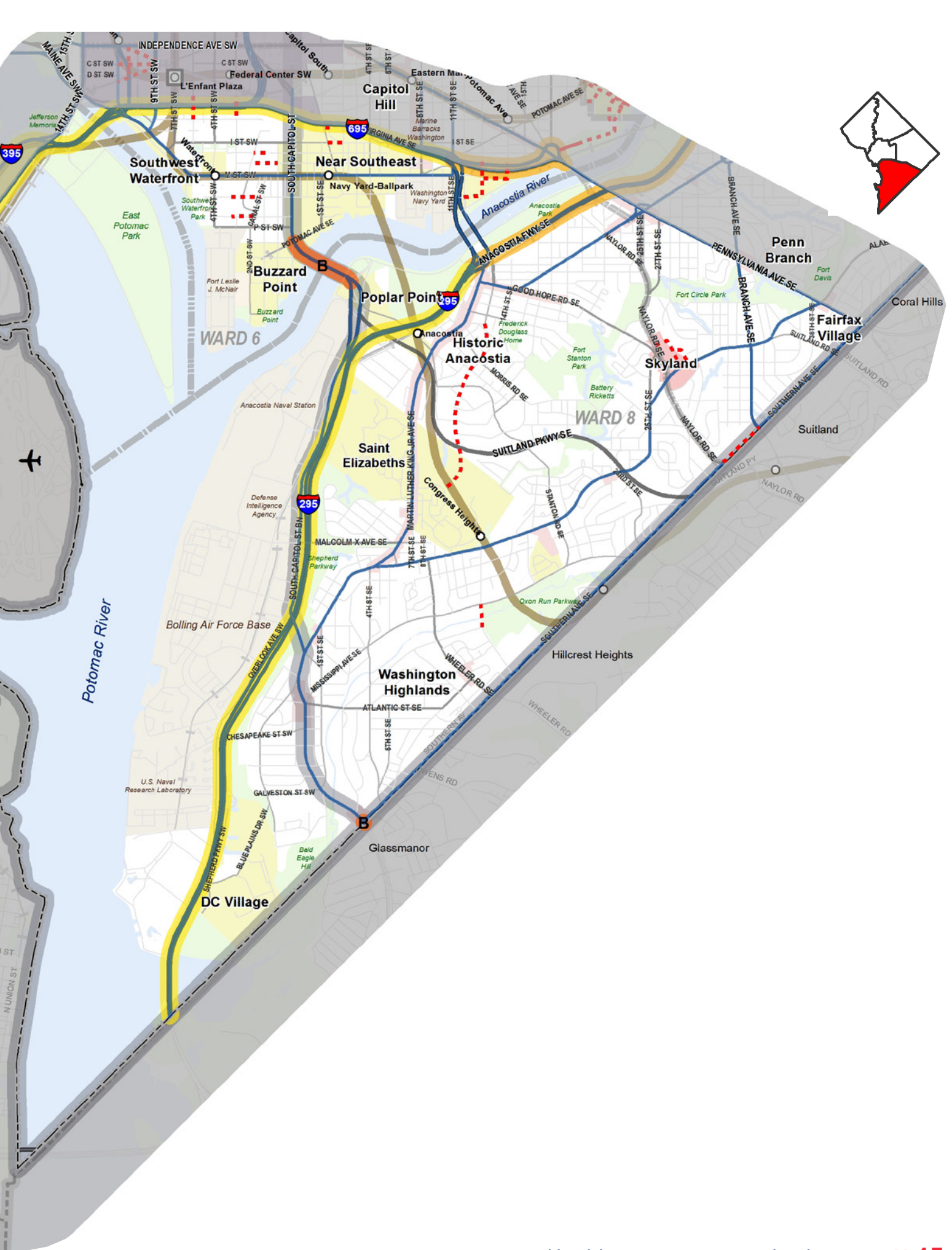


FIGURE V.18 — WESTERN PLANNING AREA VEHICULAR NETWORK

The **moveDC** vehicular network for the Western planning area includes:

- *Reconfiguration of the Rock Creek and Potomac Parkway between K Street and Q Streets NW to accommodate two-way travel all day*
- *Replacement or rehabilitation of the Key Bridge from Rosslyn to Georgetown*
- *Preservation of key citywide freight routes*
- *Managed lanes on Canal Road from the District line to Georgetown*

Legend

Existing Infrastructure

- Metrorail Station
- Metrorail Line
- Street
- +—+— Railroad
- Primary Freight Route

- Ward Boundaries
- Land Use Change Area
- Mixed Use or Neighborhood Center
- Multi-Neighborhood or Regional Center

moveDC Plan Elements (Future)

- Managed Lane
- Roadway Reconfiguration
- Bridge Replacement or Rehabilitation
- · · · · New Street
- Central Employment Area Cordon Charge

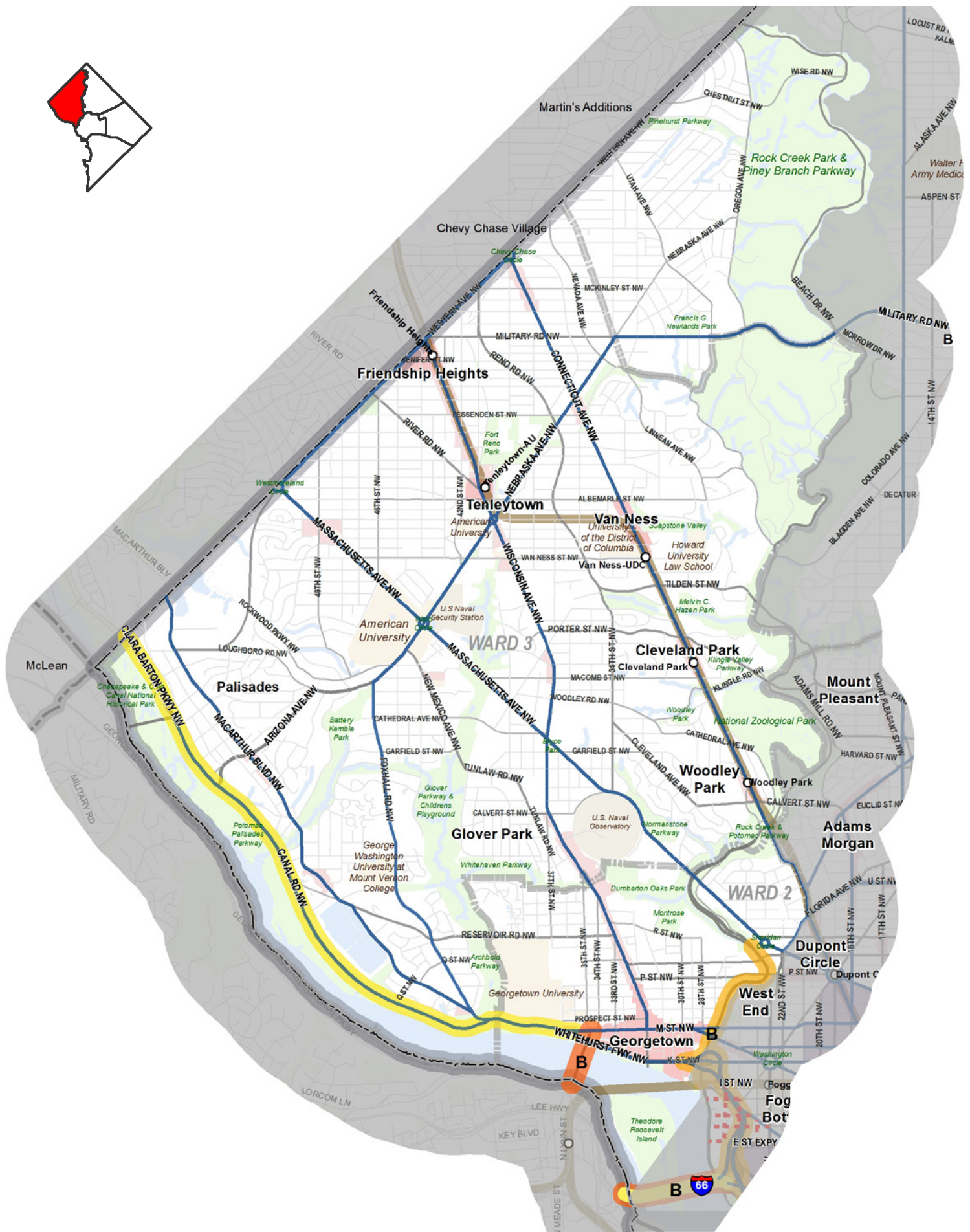
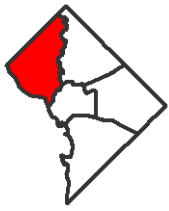
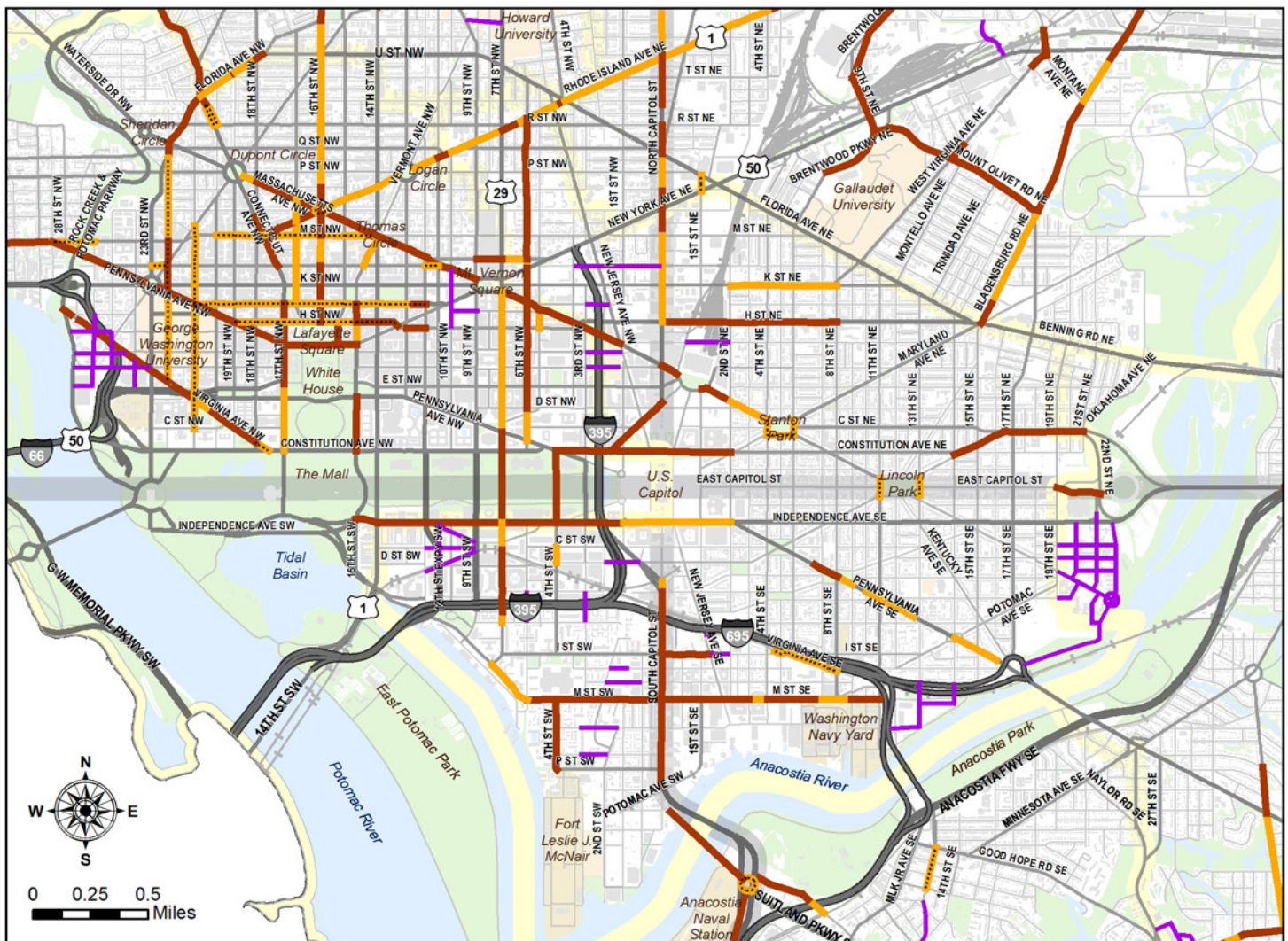


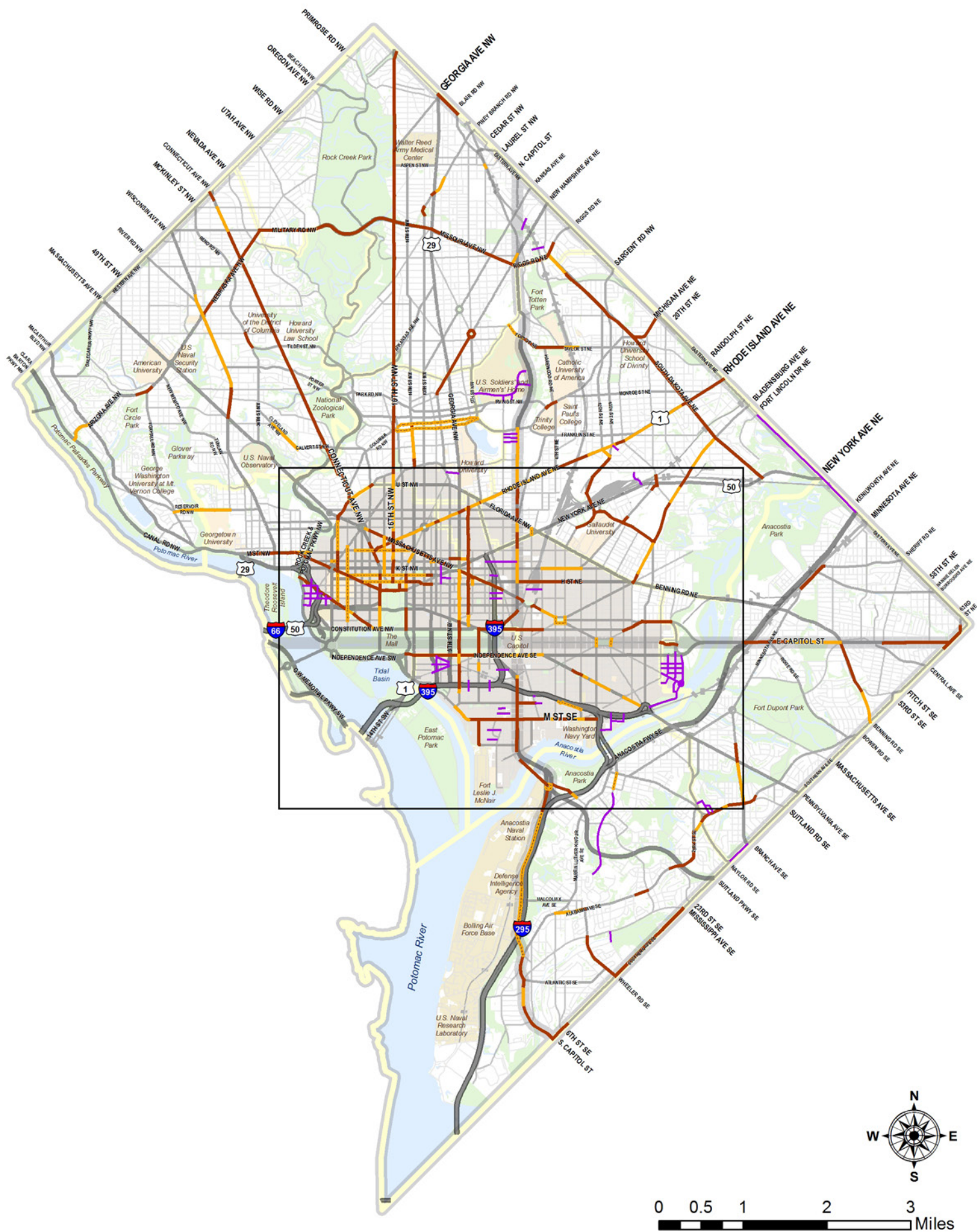
FIGURE V.19 – MODELED POTENTIAL CHANGE IN 2040 NUMBER OF VEHICULAR LANES

This figure shows the potential change (2013 to 2040) in number of lanes on District streets in the p.m. peak period with **moveDC** recommendations. As a result of the desire to expand bicycle and transit networks within existing District roadways, the number of vehicular lane-miles on some corridors could decrease. The reduction in vehicular lane-miles results in an increase in capacity on corridors and within the system as a whole. Each roadway reconfiguration will need to be studied in further detail to determine the potential trade-offs between roadway capacity changes and other components like on-street parking.

Legend

	Quadrant Boundary		2040 PM Peak Model
	Ward Boundary		One way link
	Water		New Street
	Park		Potential Lane Reduction (Total Lanes)
	University		1 Lane
	Military		2 Lanes
	Monumental Core		





Recommendation A.3: Designate modal priorities for arterial streets and implement appropriate facility modifications for the modal improvements.

Figure V.20 describes **moveDC** modal priorities in addition to vehicular traffic for major arterial corridors. Priorities were established so that every mode does not compete for space on every major street. As projects are implemented along these corridors, modal improvements should be made. Bicycle facilities should be added as designated in the **moveDC** plan as streets are repaved or reconstructed. **Chapter 4** describes the full multimodal transportation network.

Recommendation A.4: Move traffic efficiently and safely by optimizing traffic signal operations on all major roadway corridors and updating corridor traffic signal timing on a regular basis.

Beginning in 2011, DDOT began to modernize the District's traffic signal system. In coordination with the system modernization, a 5-year traffic signal timing optimization project began. The traffic signal optimization project includes replacing outdated traffic control software and equipment at intersections and re-timing traffic signals. When complete, more than 1,600 signals will have been upgraded. Current plans are for traffic signal timing to be evaluated and reassessed on a 5-year rotating basis.

The modernization of the citywide signal system will add critical new features to support the increasingly complex multimodal needs of the District's transportation system. The system should include transit beneficial features such as transit signal priority and pre-emption. It also should include features that enable better active and real-time management of the system during events and special situations. Emergency vehicle pre-emption should be considered as the system is modernized. Actuated bicycle signalization and special bicycle signals should be incorporated at key locations. Sufficient time for pedestrians to safely cross intersections should be included in all signal timings.

Continuous signal system modernization should be conducted beyond the scope of the current project. Future modernization should stay up to date on state of the practice elements and should consider coordination of all traffic signals citywide and interfacing with autonomous and connected vehicles.



Recommendation A.5: Manage capacity on major commuting routes by implementing HOV and/or HOV with toll lanes.

To expand the person-carrying capacity of the system, the District should consider managed lanes on the limited access roadway system and major bridges at the District boundary. DDOT should consider pricing and/or occupancy as a means of facility management. The goals of managed facilities should include improving travel reliability and optimizing person-carrying capacity (e.g., HOV requirement). The following facilities are recommended for these improvements:

- I-66 on the Theodore Roosevelt Memorial Bridge
- I-295 between the District line and the 11th Street Bridge
- I-395 on the 14th Street Bridge
- I-395/I-695 between the 11th and 14th Street Bridges
- Canal Road between Chain Bridge and the Whitehurst Freeway
- New York Avenue between I-395 and the District line

Any priced management practice should preserve a no-cost option to avoid creating a mandatory fee for commuters.

Recommendation A.6: Reconfigure roadways to improve local access and connectivity or to improve safety.

District roadways should be reconfigured to improve local and multimodal access, connectivity, and safety. Recommended roadway reconfiguration projects include:

- **Anacostia Freeway SE between the 11th Street Bridge and Benning Road.** *The Anacostia Waterfront Initiative (AWI) reflects a commitment by the District to restore and revitalize the Anacostia River and its waterfront. A primary goal of AWI's transportation agenda was redesigning highways and freeways to reduce transportation barriers between neighborhoods and the water. DDOT subsequently developed the Anacostia Waterfront Transportation Master Plan, updated in 2007, which recommended improvements to the Anacostia Freeway corridor to address pedestrian and bicycle accessibility, short merging zones, and weaving patterns. The master plan proposed a variety of alternatives such as reconstruction as an urban boulevard, reconstruction to a limited access roadway flanked by access roads, or a combination that includes a depressed roadway. While further study is needed to identify a specific solution, the Anacostia Freeway is envisioned to be improved and reconfigured to include multimodal crossings and safe vehicular operations.*
- **Rock Creek and Potomac Parkway from K Street NW to Q Street NW.** *These parkways are envisioned to be reconfigured to provide two-way access throughout the day and improved local circulation.*
- **Old Southeast Freeway between 11th Street SE and Pennsylvania Avenue SE.** *This former freeway should be transformed to an urban boulevard with appropriate connections to the local street network. In addition, Barney Circle should be reconstructed.*

This list of roadway reconfigurations does not include capital investments that are recommended in other **moveDC Modal Elements**.

Recommendation A.7: Maintain the District's streets at a state of good repair.

The District's streets should be maintained at a state of good repair. Maintaining streets in this manner has the potential to improve system reliability, safety, and availability.

Recommendation A.8: Improve street connectivity.

Land use transition as well as potential changes to major transportation facilities offer opportunities to reconnect streets that were once connected and in some cases, create entirely new street connections. Recommended street connection locations and specific street connections (new location and historic) are identified in **Figure V.21**. Continued changes in the city may offer the ability to identify additional new street connections.

Recommendation A.9: Implement safety improvements at high-rate and high-frequency locations and at locations with a history of severe crashes.

DDOT should continue to monitor crash rate, frequency, and severity, which should be evaluated as a part of ongoing monitoring and assessment. Based on the assessment, appropriate countermeasures should be identified and implemented at locations with a high crash rate (taking into account total user exposure) and/or crash severity. Projects addressing identified safety issues should be implemented expediently. Countermeasures should address multimodal transportation conditions and needs.

Recommendation A.10: Upgrade DDOT's communications system.

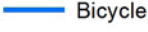
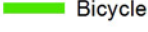
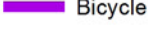
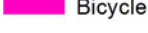
The current copper communications network limits DDOT's ability to deploy state-of-the-art technology applications. It is costly to maintain and modify to support new applications.

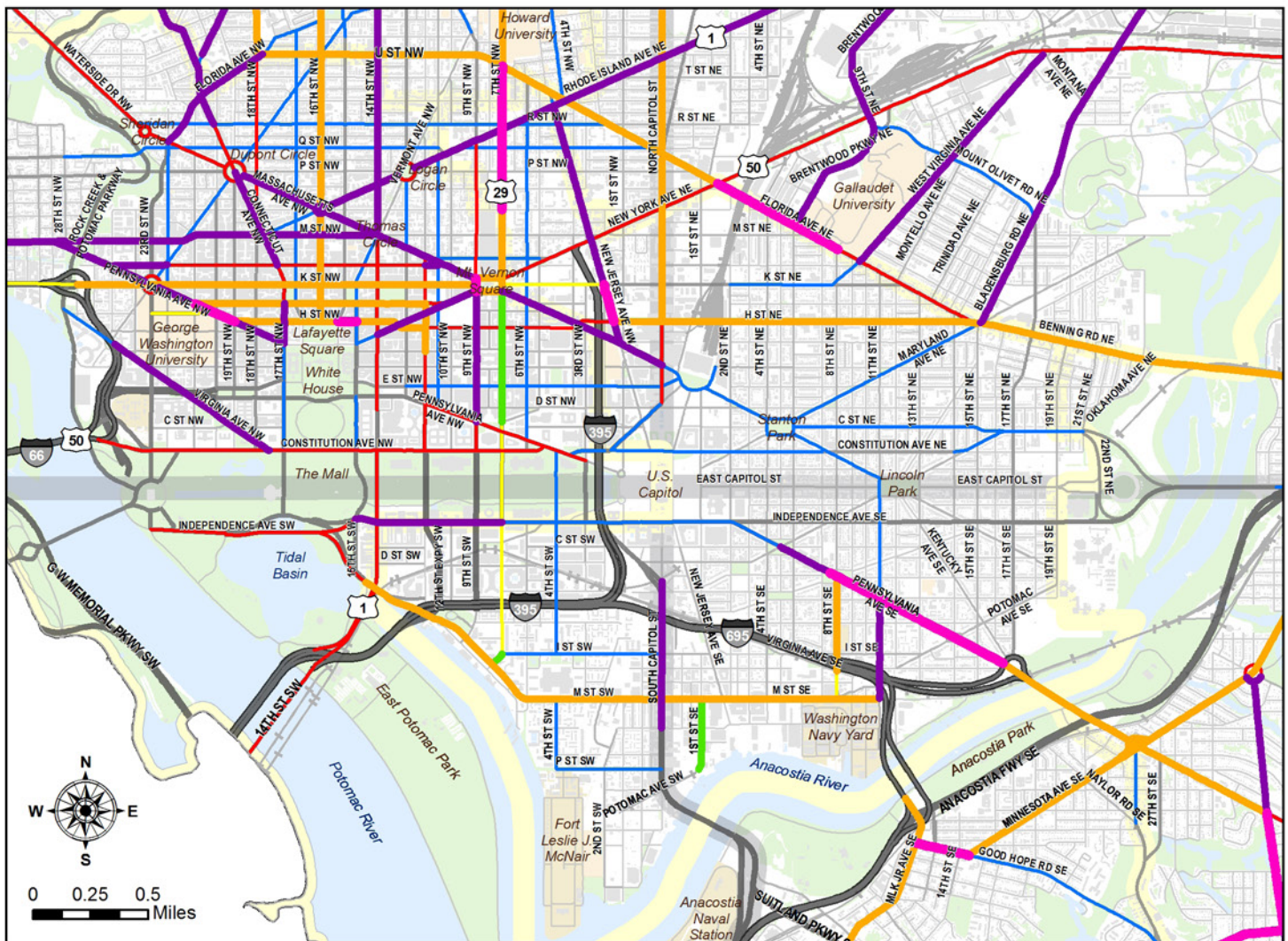
To support the applications outlined in this plan, the communications system must be upgraded. The recently-completed **ITS Communications Master Plan** outlines a phased migration from copper to Ethernet over fiber optics, adding redundancy for the network core.

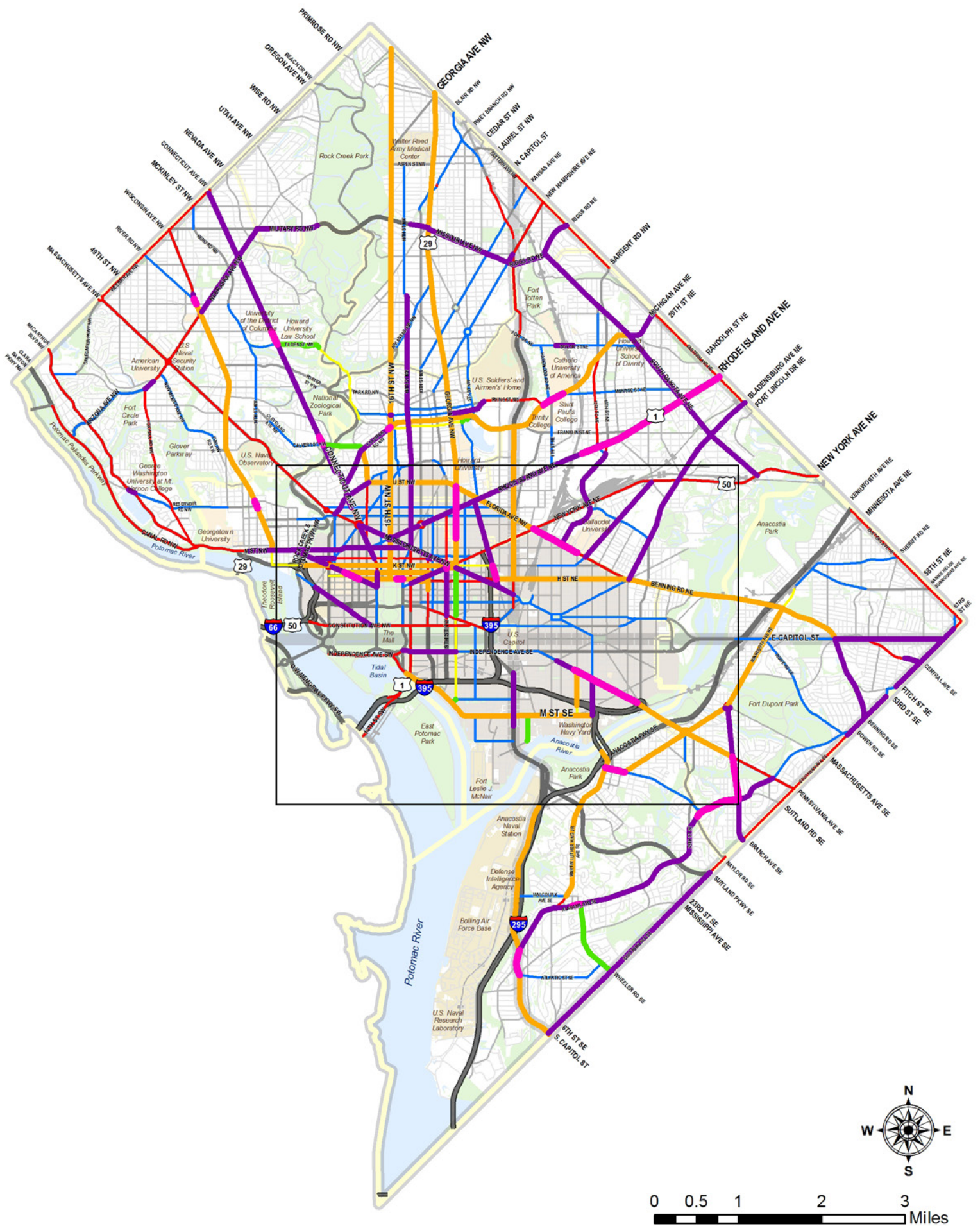
FIGURE V.20 – MODAL PRIORITIES FOR MAJOR CORRIDORS

As the District grows, its existing streets will increasingly need to support more and different transportation users while also conveying a mixture of vehicular traffic for many different purposes. To achieve this end of supporting a mixture of uses including vehicular trips, modal priorities were assigned for each major District corridor as shown in the figure.

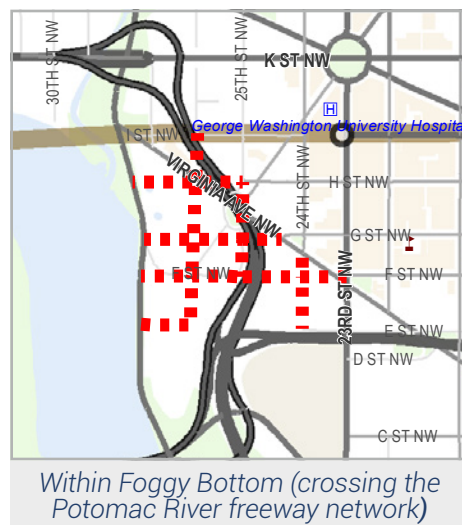
Legend

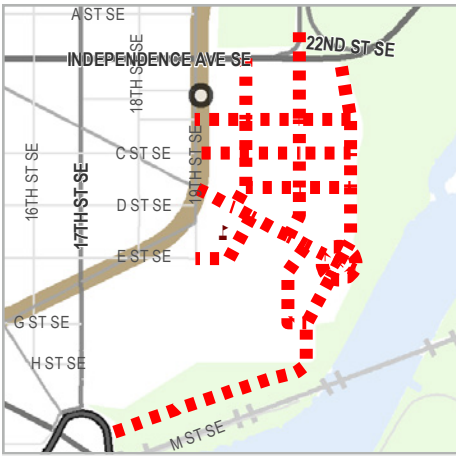
	Quadrant Boundary	<u>Modal Priorities (In Addition to Vehicular Traffic)</u>
	Ward Boundary	 Bicycle
	Water	 Transit
	Park	 Freight
	University	 Bicycle & Transit
	Military	 Transit & Freight
	Monumental Core	 Bicycle & Freight
		 Bicycle, Transit & Freight



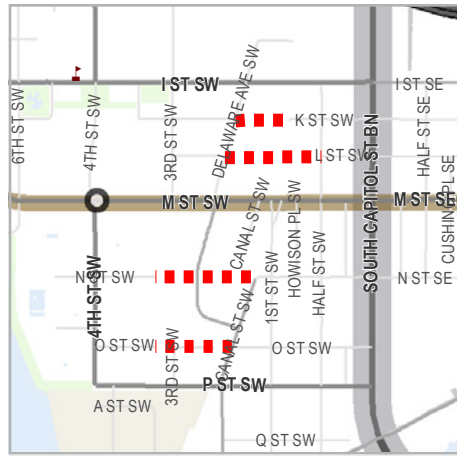


This figure shows locations where future street connections have been identified. These changes may be possible with redevelopment of existing properties or through DDOT initiatives, and continued changes in the city may offer the ability to identify additional new street connections.

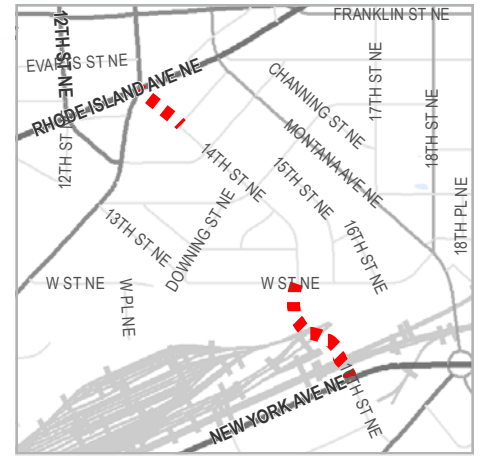




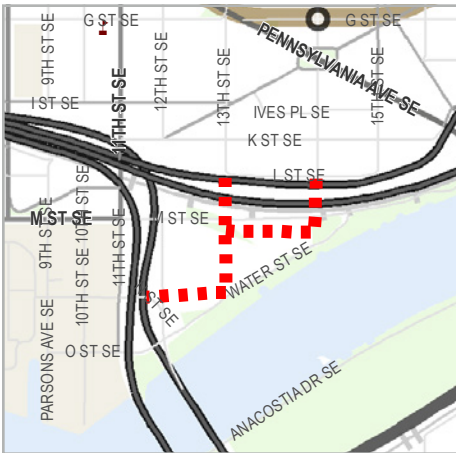
Within and connecting to
Reservation 13 (Hill East)



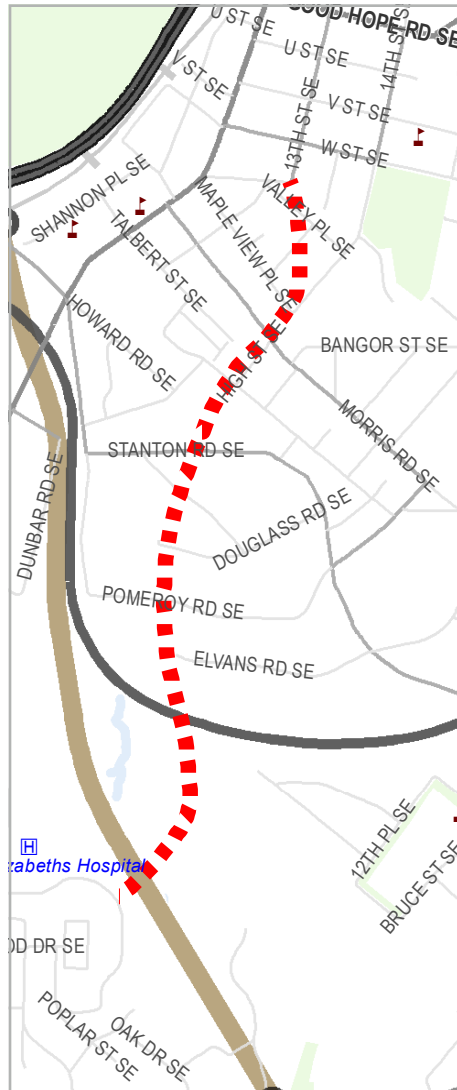
L Street SW and K Street SW between
Half Street SW and Delaware Ave SW



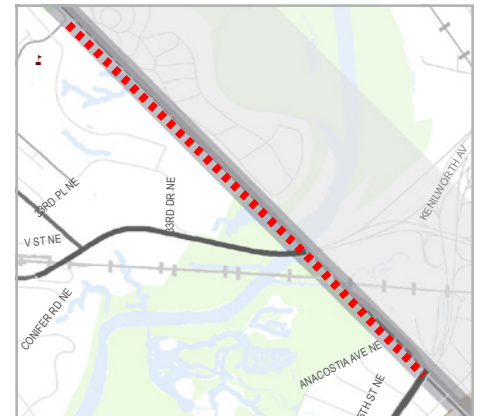
14th Street between Rhode Island
Avenue NE and New York Avenue NE



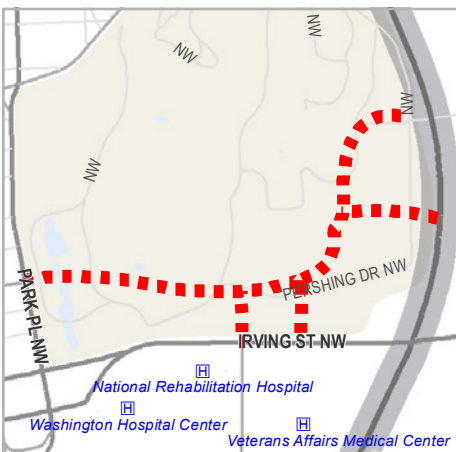
Along and crossing the
Southeast Freeway



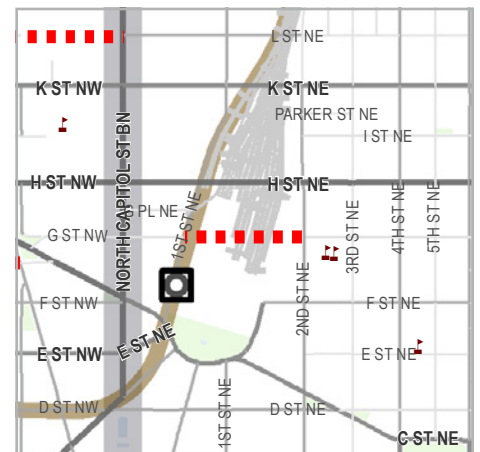
13th Street SE between High Street and
the St. Elizabeths campus



Eastern Avenue NE between
Bladensburg Road NE and
Kenilworth Avenue NE

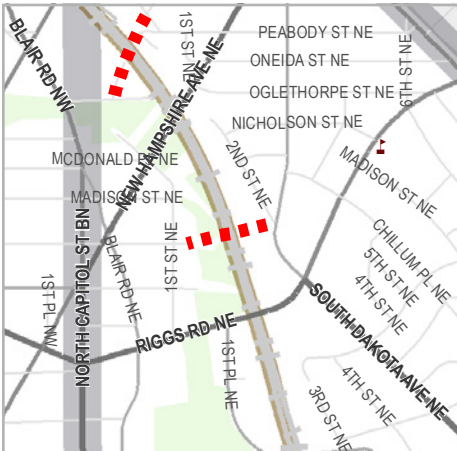


Within the U.S. Soldiers' and Airmen's
Home as a part of development



G Street NE north of Union Station
(part of Union Station redevelopment)

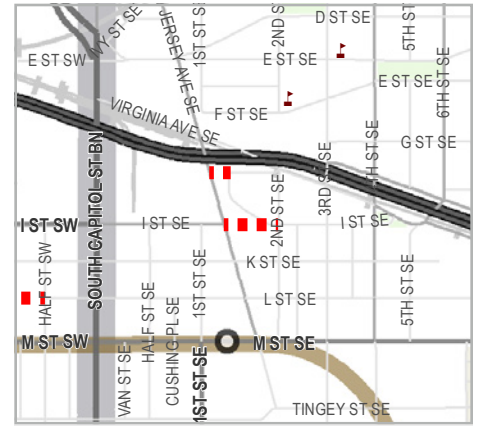
FIGURE V.21 – RECOMMENDED STREET CONNECTIONS (CONTINUED)



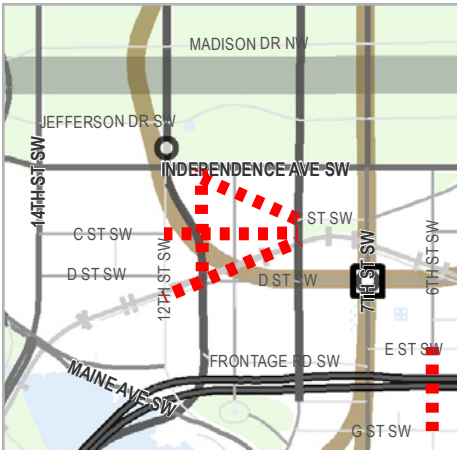
Longfellow Street NE between
1st Street NE and 3rd Street NE



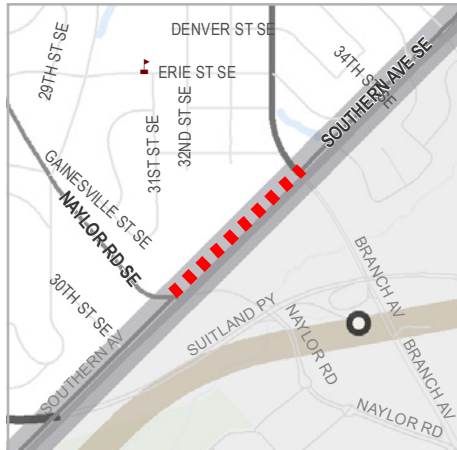
Sligo Mill Road between
Oglethorpe Place NW and
Chillum Place NE



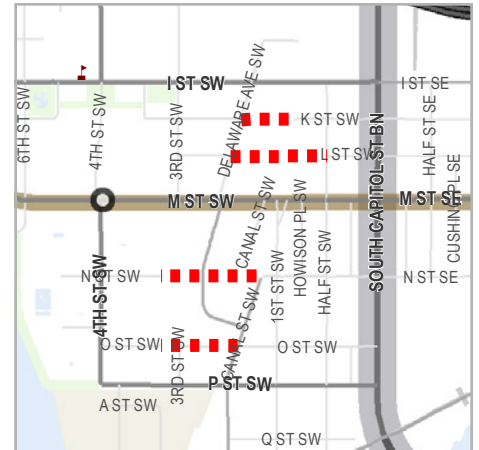
*I Street SE and H Street SE between
New Jersey Avenue SE and
2nd Street SE (in progress)*



Potential Maryland Avenue SW Plan
street connections



Southern Avenue SW between
Naylor Road SE and Branch Avenue SE



K, L, N, and O Streets SW between
3rd Street SW and Half Street SW

Recommendation A.11: Upgrade analog video system to digital video.

The current traffic monitoring system uses a combination of analog and digital video to distribute streams within the District and to external partners. Incompatibilities have led the District to digitally decode and re-encode for different third parties. Standards are improving and the recent widespread adoption of the H.264 standard, for example, has improved interoperability and made digital video sharing easier. As digital video improves at a rapid rate in the industry, further improvements and standardization are expected. DDOT should seek to keep its system up to date to support current standards, which are not driven by the ITS market, but the broader security and digital entertainment arenas which promise rapid change.

Recommendation A.12: Actively manage performance of operations and maintenance.

U.S. DOT has been increasing its emphasis on performance measures, particularly with the *Moving Ahead for Progress in the 21st Century* (MAP-21) **Act** which requires states to adopt maintenance and mobility performance measures.

DDOT should seek to identify key performance targets that align with its mission and chart its performance over time. DDOT also should improve its asset management processes. With millions of dollars of technology assets and limited budgets, DDOT must develop and follow processes to closely track its inventory and plan for replacement of aging assets.

Recommendation A.13: Continue to adopt technologies that improve safety and system operations.

As electronics and communications get smaller, cheaper, and less energy consuming, DDOT should expect to see a convergence of static and dynamic signage and pavement markings. Crosswalk lighting systems are one example of this today. In the future, similar applications could become feasible for reversible lanes. DDOT should continue to evaluate and use—as they become economically- and technically-feasible and sound—new technology to improve safety and operations.

B. POLICIES

For the vehicular network to reach its full potential, it will need to be supported by appropriate policies. The following are policies recommended to support network recommendations.

Policies that apply to multiple modes are repeated throughout moveDC's **Modal Elements**.

Recommendation B.1: Prioritize the needs of trips that start and/or end in the District over those that use D.C. as a through route.

The District needs to preserve space within the transportation system to fully accommodate District-to-District driving, walking, bicycling, and transit trips along with trips that start or end in the District. These trip types should be given priority over trips that travel through D.C.

The District's Interstate highways, although designed primarily to offer access to and from central Washington, nonetheless carry traffic through the District and serve an important regional function. This function should be maintained and the Interstate highway system in the District should be kept in a state of good repair.

Recommendation B.2: Allow flexible use of rights-of-way during non-peak periods.

Vehicular traffic volumes in the District are highest during weekday commute times. On weekends and during off-peak weekday periods (middays and evenings), traffic volumes are considerably lower and many streets have available capacity that can be repurposed for other uses including pedestrians, bicycles, and recreational space.

In addition to the many special events that use the District's roads on a yearly basis, the District should work with local groups to identify locations and time periods where rights-of-way can be used for purposes other than vehicular travel. Weekend closures of Beach Drive in Rock Creek Park and neighborhood festival-related street closures are good existing examples of this type of flexible use.

Recommendation B.3: Create new or reestablish historic street segments to maximize connectivity.

When possible, the District should seek to restore street connectivity to maximize the functionality of the street network in providing local access. Recommendation A.8 describes specific locations for potential new street connections.

Additional street connections should be implemented where possible. These connections could take the form of new streets as part of development projects or could occur independently along a historic right-of-way. The District should prioritize connections that can reduce walking distances to and from transit stations or activity centers. While the District will seek to create new street connections, it should not generally seek to add vehicle lanes or vehicle capacity in the street system by moving curbs and reducing the quality of the pedestrian environment.

Recommendation B.4: Improve multimodal travel reliability and reduce congestion through area and corridor management strategies.

As the District continues to grow, managing vehicle access on key corridors and to key destinations through price or minimum vehicle occupancy may become an important approach to providing reliable access to activity centers. The District's congested entry routes, including freeways and bridges as well as the Central Employment Area, are areas to explore occupancy and pricing as ways to manage congestion, as referenced in Recommendation A.5.

Lane management typically uses price and/or occupancy requirements to manage vehicular demand in designated lanes or on roadway facilities. Typically, HOVs and transit vehicles are permitted to use managed facilities at a discounted rate or for free.

In addition to corridor-specific pricing and vehicle occupancy strategies, area management strategies should be considered. The best known examples of area pricing are based on a cordon area and typically involve center cities and the places and times of day with the highest concentrations of travel demand. A cordon area in the District could be implemented for weekday trips into the Central Employment Area at a rate approximately equivalent to a round-trip peak period Metrorail fare. Revenues from the zone should be dedicated to operations and maintenance of the managed facility (or area) and toward projects that expand the person-moving capacity of the transportation system, including those providing greater access to the priced areas or corridors.

Demand management also would help to manage the reliability and accessibility of goods movement and delivery in the District.

In addition, they would help to improve the District's air quality by reducing the amount of delay per vehicle throughout the transportation network.

Recommendation B.5: Manage vehicular speed for safety and efficiency.

The District should emphasize safety and vehicle speed management in the design of all streets. Street design elements should help self-enforce the posted speed limit. The District also should evaluate speed limits to assess the trade-offs between time and safety.

In addition to traffic operational benefits of a steady vehicle speed profile, lower vehicle speeds tend to result in fewer and less severe crashes for all modal users. In the case of pedestrians and bicycles, vehicular speeds of less than 20 mph result in significant safety benefits in terms of crashes resulting in fatality or severe injury.

Many people believe that the regulation of the transportation network to promote low vehicular speeds results in longer travel time and more congestion along a given street. While this can certainly be the case, in most instances it is not. The stop-and-go nature of urban driving, combined with the practical matter of intersection capacity, results in an optimum urban street capacity at a speed of approximately 25 mph.

Recommendation B.6: Preserve key freight corridors for goods movement.

Goods movement and delivery needs must be coordinated with multimodal system demands to allow goods to be moved efficiently and safely, without impeding overall system balance or endangering other modal travelers (especially bicycles and pedestrians).

Urban areas around the world have had to address dramatic increases in freight movement in the last 20 years. Globalized production models and supply chains have meant that goods manufactured overseas must be distributed back to markets where they are consumed. This has been increasingly through low-cost container shipping, which has resulted in significant truck traffic on major and minor travel routes. Challenging globalized production are just-in-time delivery models and reduced on-site inventories at supply locations. These models and inventory management approaches have created demand



DDOT improved the H Street NE streetscape as part of the installation of streetcar tracks

for more frequent deliveries by more services and have resulted in less-coordinated deliveries.

The District should provide adequate freight movement infrastructure in designated freight corridors while also improving safety for all users in these corridors. Preserving these corridors means maintaining design standards compatible with larger vehicles, while also seeking to implement treatments that reduce conflicts between large vehicles and other users. One example is the current standard's limitation on commercial vehicles reversing in public spaces.

Recommendation B.7: Support reduced emissions for consumer and commercial vehicles.

The transportation sector is one of the most significant emitters of air pollution. Zero and low emission engines are an area where transportation policy can have a direct impact on improving the environment.

Electric vehicles and hybrid vehicles that use batteries charged from an external source or charged by other means are a significant opportunity to maintain current personal mobility

while reducing auto emissions. DDOT's **Electric Vehicle Fleet Program** is working to bring hundreds of electric cars and charging stations to the District. DDOT should continue to explore opportunities to increase the inventory and citywide distribution of publicly-accessible electric vehicle charging stations in public spaces throughout the District.

Natural gas is another alternative to gasoline. It produces less carbon dioxide when combusted. As of 2009, approximately 12% of DDOT's vehicle fleet was fueled by natural gas. DDOT should support technologies that help reduce emissions for consumer and commercial vehicles.

Recommendation B.8: All transportation investments should also be state of good repair projects.

DDOT should seek to align project programming and funding between projects intended to bring the transportation system to a state of good repair (SOGR) and new construction and enhancement projects. This not only can combine funding sources and realize efficiency in project delivery, but also can demonstrate an agency commitment to showing that repair and maintenance of the transportation system are just as important as major changes to it.

SOGR refers to maintenance and rehabilitation projects that keep infrastructure in a sound and functional condition and offset the need for more costly, extensive maintenance into the future. For DDOT, the logistical needs of these projects—such as maintenance of traffic, mobilization of work crews and equipment, and potential temporary impacts on parallel infrastructure systems like utilities—represent project costs. To the extent that other adjacent or connected projects can be integrated into the SOGR project, an overall cost savings may be achieved by reducing the outlay of resources needed for these functions of project delivery. This may require additional environmental analysis.

Recommendation B.9: Further formalize the data collection, evaluation, sharing, and monitoring program within DDOT.

Unified data collection and monitoring programs help:

- *Identify where changes to the transportation system are needed*
- *Create universal application of policies and standards*
- *Provide informed evaluation as to what is most effective after implementation*

DDOT should establish a program across its different administrations to allow consistent data formats, regular updates, and systematic means of evaluation and monitoring transportation system performance. This policy also includes providing public access to as much non-personal or non-proprietary data as possible in real time or close to it.

Recommendation B.10: Establish a consistent policy towards traffic calming in neighborhoods.

Traffic calming is effective in reducing negative impacts of vehicular traffic (especially speed, accident rates, and through-traffic volume on neighborhood streets). Achieving successful outcomes and sustained community support will be accomplished by using a variety of physical designs for traffic calming treatments as well as a consistent policy on the conditions in which each treatment can be used.

The District has implemented traffic calming in many of its neighborhoods. A program of traffic calming assessments was designed to respond to neighborhood concerns and evaluate

a focused area of neighborhoods for ways that traffic calming approaches might be implemented. DDOT has created the **Livability Program** to conduct neighborhood transportation planning studies and advance small-scale safety improvements.

Further expansion of this program should shift from a policy of neighborhood-requested traffic calming to include standard assessments of where traffic calming is appropriate. These should lead to place-appropriate traffic calming techniques to ensure that design interventions that are well coordinated with their neighborhood context. DDOT already permits a wide range of traffic calming design options, representing a sophisticated understanding of the practice.

Recommendation B.11: Support autonomous vehicle implementation and connected vehicle research, using D.C. as a test bed for the nation.

Autonomous (self-driving) and connected vehicles have the potential to improve safety, efficiency, and mobility while also reducing parking challenges and improving air quality. Successfully implemented, autonomous vehicles can offer people the convenience of driving, without many of its negative impacts and challenges. Like any new technology, additional study of autonomous vehicles is needed to evaluate things like safety in a complex urban environment.

With or without autonomous vehicles, connected vehicle technology can offer people a safer, more efficient, and more predictable driving experience while, at the same time, allowing the transportation system to perform better. Connected vehicles manage traffic by communicating through vehicle-to-vehicle and vehicle-to-infrastructure data transmission.

Successfully implemented, connected vehicle technologies could transform operations for the District by:

- *Helping to reduce crash frequency and severity*
- *Providing data to traffic managers in real-time to optimize system performance*
- *Providing travelers better information to make informed travel choices and to understand the impact of those choices*
- *Permitting vehicles to talk to the system to increase vehicle energy efficiency and system operational efficiency*



Pennsylvania Avenue anti-U-turn campaign

The District could become an urban test bed for both autonomous vehicles and connected vehicles through policy and legal support.

Recommendation B.12: Develop Integrated Corridor Management applications.

Integrated Corridor Management (ICM) is a comprehensive set of strategies deployed to gain operational efficiencies and provide travelers with better information along transportation corridors. Strategies include multimodal applications in traveler information and corridor technology applications to create better mobility and improved operations. Successful ICM implementation in D.C. and neighboring states could result in better utilization of available multimodal system capacity by

serving key travel routes, improving system operations, reducing the severity and duration of congestion, and increasing travel time reliability.

Scheduled and unscheduled events affect the District each day. When weather and security concerns severely disrupt travel throughout the city, 511 services can be used to direct messages to a wide audience. By directing travelers to 511 website, mobile application, and phone systems, critical messages can be distributed using one tool to help people make informed decisions about travel. 511 technology has been used for decades in some states and remains a viable communication mechanism.



State of good repair for infrastructure is a core focus for DDOT (Benning Road reconstruction)

C. EDUCATION AND ENFORCEMENT

Education and enforcement will help make all users of the vehicular network safer and make the network work more efficiently.

Recommendation C.1: Enhance transportation education at all levels.

Safer streets require more than physical improvements—they also require users to understand their own responsibility to use the system safely. A key approach to achieving this is safety education for the public and for owners, managers, and operators of the system.

For the public, educational materials should be integrated into school curricula and day-to-day communication. In addition, information should be shared through regular programs and materials hosted and developed by the DMV. DDOT currently develops educational and awareness campaigns through NHTSA grants and through the region's **Street Smart** campaign. DDOT should continue to support the promotion of transportation education into D.C. school curricula to help further educate people on transportation.

For owners, managers, and operators, new information related to standard operating procedures, agency standards, laws, regulations, policies, and guidelines should be incorporated into regular and/or mandated training programs.

Recommendation C.2: Enforce the rules of the road for all users.

Safety is the most basic standard for a transportation network. The District supports a culture of safety for all modes throughout the District, and encourages respect for all users by all users. DDOT should assist MPD in providing effective enforcement of the laws for all users throughout the District.

DDOT should continue to work with MPD, DMV, and Department of Public Works (DPW) to provide effective education and outreach regarding the rules of the road. Education related to newer laws pertaining to bicycles, pedestrians, or new facilities should also be provided to those enforcing laws to ensure greater consistency and effectiveness.

Recommendation C.3: Use technology to support enforcement of transportation rules and regulations.

The District's photo-enforcement efforts, including new technologies aimed at enforcing pedestrian laws, help to reinforce the overall culture of safety. The District should continue to use and explore new ways technology can expand the District's culture of safety and enforcement of transportation rules and regulations. In the future, the District should explore the ways in which technology can improve enforcement of transit-only facilities, enhance safety in bicycle facilities, and support the management of transportation facilities and areas.

Recommendation C.4: Enhance strategies for engaging with the public through mobile computing, social media, and crowdsourcing.

Interpersonal connectivity has implications for any group or agency with customers or constituents. Companies are increasingly building relationships with their customers to elicit customer service and feedback—they are actively mining customer sentiment to rapidly fix problems before they “go viral.” DDOT should find ways to engage its road users, both as a source of crowdsourced information on topics such as current conditions and maintenance issues, and as taxpayers that will increasingly expect transparency from their public servants. Traveler information is a service that DOTs are expected to provide; social media is the next logical extension.

DDOT manages valuable construction and road condition information. The low barriers to entry in application development are leading to the proliferation of mobile applications to take advantage of this sort of data. DDOT should adopt an “open data” model for this information, particularly construction and planned event information. This would involve creating portals to make these data available to the public and developers to incorporate them into mobile applications.

Recommendation C.5: Use TCOs to proactively manage conflicts between vehicles and other transportation modes.

Conflicts between vehicles and other transportation modes such as pedestrians and bicyclists exist when there is a high volume of such traffic. DDOT should continue to work with MPD to provide TCOs to manage the flow and conflicts between modes at highly trafficked locations such as high-volume Metrorail station entrances and cultural or sporting events.

IV. Performance

The **moveDC** plan's vehicular system recommendations are intended to support efficient vehicular movement, increase safety, and improve reliability. They also are intended to allow other transportation modes to function efficiently and safely. The **moveDC** plan's recommendations address policy, education, projects, and programs. The plan goals (described in **Chapter 1**) were used in the evaluation of the **Vehicle Element's** performance, similar to the other **Modal Elements**.

If future District residents, employees, and visitors were to continue driving at the same rate they do today, there would not be room to accommodate everyone on city streets. In the limited investment scenario studied—future (2040) baseline, which best represents a scenario with a similar rate of driving as today among those evaluated for **moveDC**—vehicle delay would increase by more than 41% and vehicle hours traveled would increase by about 16%. Congestion on major and minor streets would increase significantly and transit services that travel with traffic would become less effective.

However, with the scenario recommended in **moveDC**, the total number of driving trips would remain approximately equal to existing (2010) modeled conditions—1.944 million trips (existing) versus 1.994 million trips (recommended plan). Amid increasing population (49% between 2010 and 2040) and jobs (28% between 2010 and 2040), vehicle delay would increase minimally (9.5%) from existing (2010) modeled conditions as the District's transit, bicycle, and pedestrian networks would see a dramatic increase in use.

Investments in other transportation modes will allow the city to continue to grow, while vehicular conditions in 2040 remain similar to existing conditions.

State of Good Repair

The **moveDC** plan recommends infrastructure investments and system maintenance to bring the District's roads and bridges to a state of good repair. It also recommends facility and area management strategies and technological investments to increase efficiency and reliability of system assets. The objective of the ultimate system is to manage vehicular demand, optimize operations, and improve safety so people and goods can move efficiently Districtwide.

Travel Demand

The Districtwide Travel Demand Model, the project's spatial analysis model, and qualitative reviews were used to develop the metrics for each performance measure relevant to the **Vehicle Element**.

Mode Share

The **moveDC** plan's recommendations reduce demand for motorized trips—those that stay within the District and those traveling to or from the District—as shown in **Table V.5** and **V.6**.

Person-Carrying Capacity

The **moveDC** plan reduces vehicular capacity on some corridors and reallocates space for other modes to expand the person-carrying capacity of the network 24% from existing (2010) modeled conditions (**Table V.7**). The combination of strategic improvements in the vehicular transportation network coupled with robust investments in other modal infrastructure and services has the dramatic effect of moderating the increase in vehicular trips and delay between 2010 and 2040, amid the substantial forecasted increase in population and jobs.

Vehicular Measures of Effectiveness

As shown in **Table V.8**, when compared to existing (2010) modeled conditions, the **moveDC** plan results in potentially fewer vehicle miles traveled and only a slight increase in vehicle

hours traveled (5.5%) and delay (9.5%) for District-to-District trips. When compared to future (2040) baseline conditions, the recommended plan results in approximately 13%(1.38 million) fewer vehicle miles traveled and 23%(7,000) fewer hours of delay. This performance is attributed to strategic investments in vehicular network efficiency and transit, pedestrian, and bicycling infrastructure, programs, and services. The performance noted above is in the context of the forecasted increase in population of nearly 50% in the District and an increase in jobs in the District by more than 27%.

Volume to Capacity

V/C ratios provide a way to understand where congestion may occur on streets under future conditions. A visual comparison of performance between the future (2040) baseline (**Figures V.22** and **V.24**) and recommended plan scenario (**Figure V.23** and **V.25**) yields subtle differences, quantitatively, the difference in performance between the future (2040) baseline scenario and recommended plan is substantial.

The **Vehicle Element**'s overall performance—by relevant goal category—is summarized in **Table V.9**.

Table V.5: Daily Mode Share for District-to-District Trips

Travel Mode		Base Year (2010)	Future Baseline (2040)	moveDC Plan (2040)
Motorized (Drive)	Trips	639,000	756,000	654,000
	Mode Share	45.5%	41.1%	35.8%
Transit	Trips	314,000	384,000	427,000
	Mode Share	22.4%	20.9%	23.3%
Non-Motorized (Walk/Bike)	Trips	450,000	698,000	747,000
	Mode Share	32.1%	38.0%	40.9%

- Notes:
- 1. Mode share shown in the above table is for weekday (all-day) trips that start and end in the District
 - 2. Mode share is forecast using the Districtwide Travel Demand Model
 - 3. Transit is bus, streetcar, high-capacity transit, Metrorail, commuter rail, and water transit
 - 4. Table does not account for carpool trips by passengers
 - 5. Columns may not total 100% due to rounding

Table V.6: Daily Mode Share for Trips to or from the District

Travel Mode		Base Year (2010)	Future Baseline (2040)	moveDC Plan (2040)
Motorized (Drive)	Trips	1,305,000	1,480,000	1,340,000
	Mode Share	65.6%	63.7%	58.8%
Transit	Trips	486,000	615,000	694,000
	Mode Share	24.4%	26.4%	30.5%
Non-Motorized (Walk/Bike)	Trips	200,000	229,000	244,000
	Mode Share	10.0%	9.9%	10.7%

Notes:

1. Mode share shown in the above table is for weekday (all-day) trips that start or end in the District
2. Mode share is forecast using the Districtwide Travel Demand Model
3. Transit is bus, streetcar, high-capacity transit, Metrorail, commuter rail, and water transit
4. Table does not account for carpool trips by passengers
5. Columns may not total 100% due to rounding

Table V.7: Network Person-Carrying Capacity

Facility Type	Change in Capacity from Existing Network (2013)	
	Future Baseline (2040)	moveDC Plan (2040)
Roadway Change in Capacity	0%	-7%
Transit Change in Capacity	54%	105%
Bicycle Facilities	N/A	186%
Total (All Facilities)	9.5%	24%

Notes:

1. Capacities shown are for peak period weekday conditions
2. Transit is streetcar, high-capacity transit, and Metrorail
3. Bicycle facilities are trails, cycle tracks, and bicycle lanes
4. Roadway capacities do not take into account increases in capacity that may result from signalization upgrades or other technologies

Table V.8: System-level Vehicular Measures of Effectiveness

Travel Mode		Base Year (2010)	Future Baseline (2040)	moveDC Plan (2040)
Vehicle Miles Traveled	VMT	9.12 million	10.45 million	9.07 million
	Change	—	15% increase from base year	13% reduction from future baseline
Vehicle Hours Traveled	VHT	335,000	389,000	355,000
	Change	—	16% increase from base year	9% reduction from future baseline
Delay	Hours	21,000	30,000	23,000
	Change	—	41% increase from base year	22% reduction from future baseline

Notes:

1. Forecasts shown are for weekday (all-day) trips within the Districtwide Travel Demand Model area (inside the Capital Beltway)
2. Measures of effectiveness are forecast using the Districtwide Travel Demand Model

FIGURE V.22 – 2040 AM PEAK HOUR V/C RATIOS FOR FUTURE BASELINE SCENARIO

This map shows 2040 baseline scenario V/C ratios for major corridors in D.C.

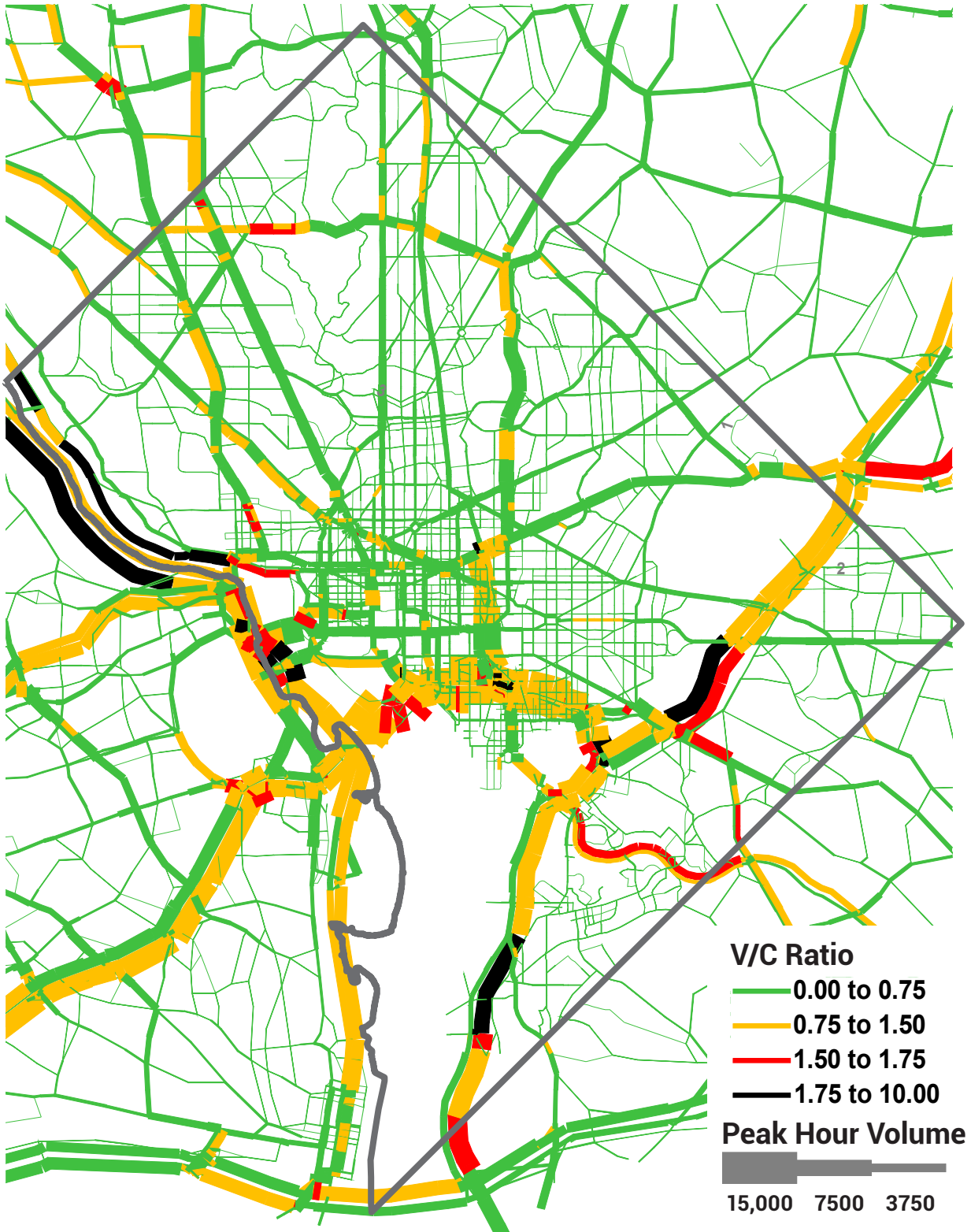


FIGURE V.23 – 2040 AM PEAK HOUR V/C RATIOS FOR THE RECOMMENDED PLAN

This map shows 2040 recommended plan V/C ratios for major corridors in D.C., with the **moveDC** plan recommendations fully implemented.

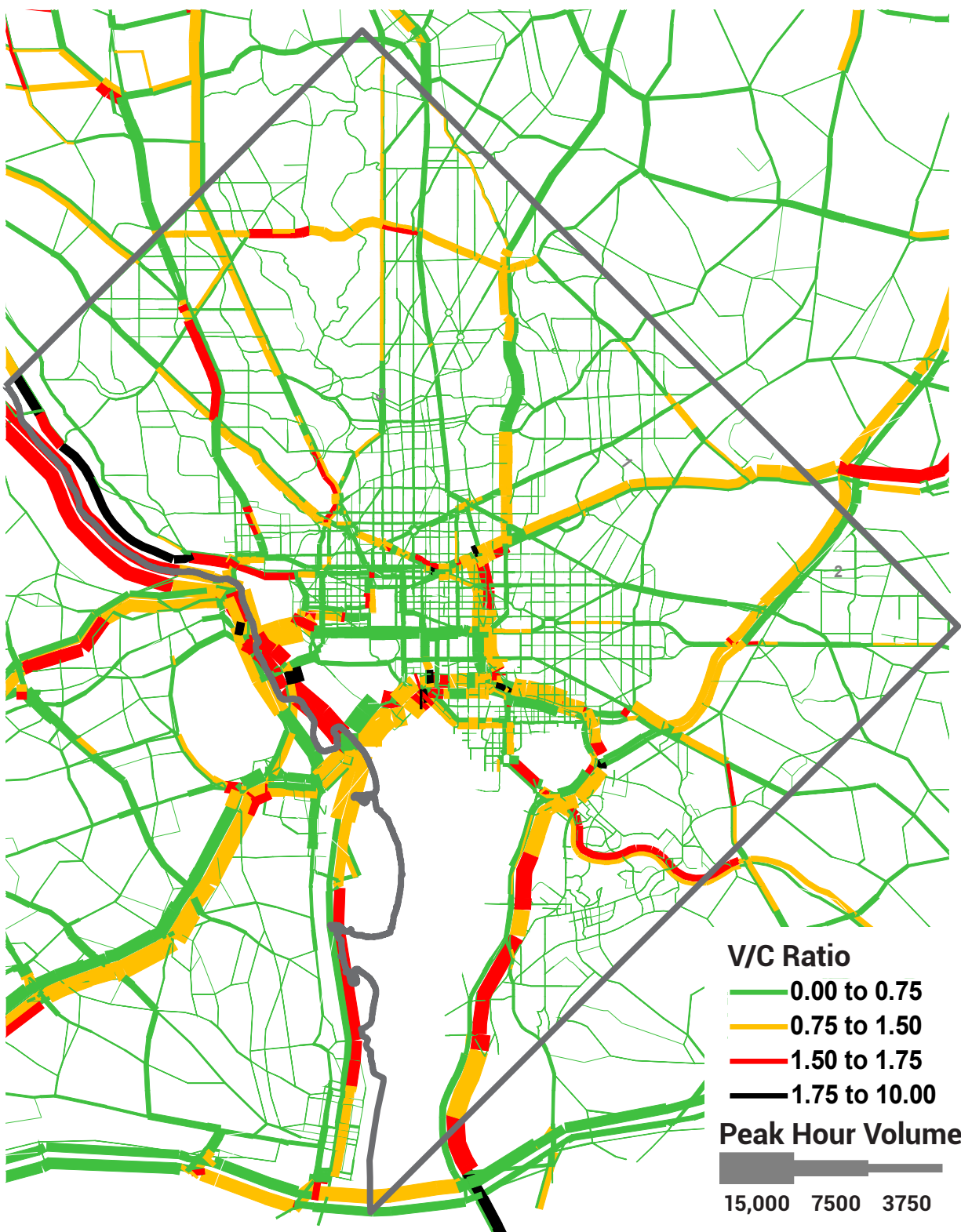


FIGURE V.24 – 2040 PM PEAK HOUR V/C RATIOS FOR FUTURE BASELINE SCENARIO

This map shows 2040 baseline scenario V/C ratios for major corridors in D.C.

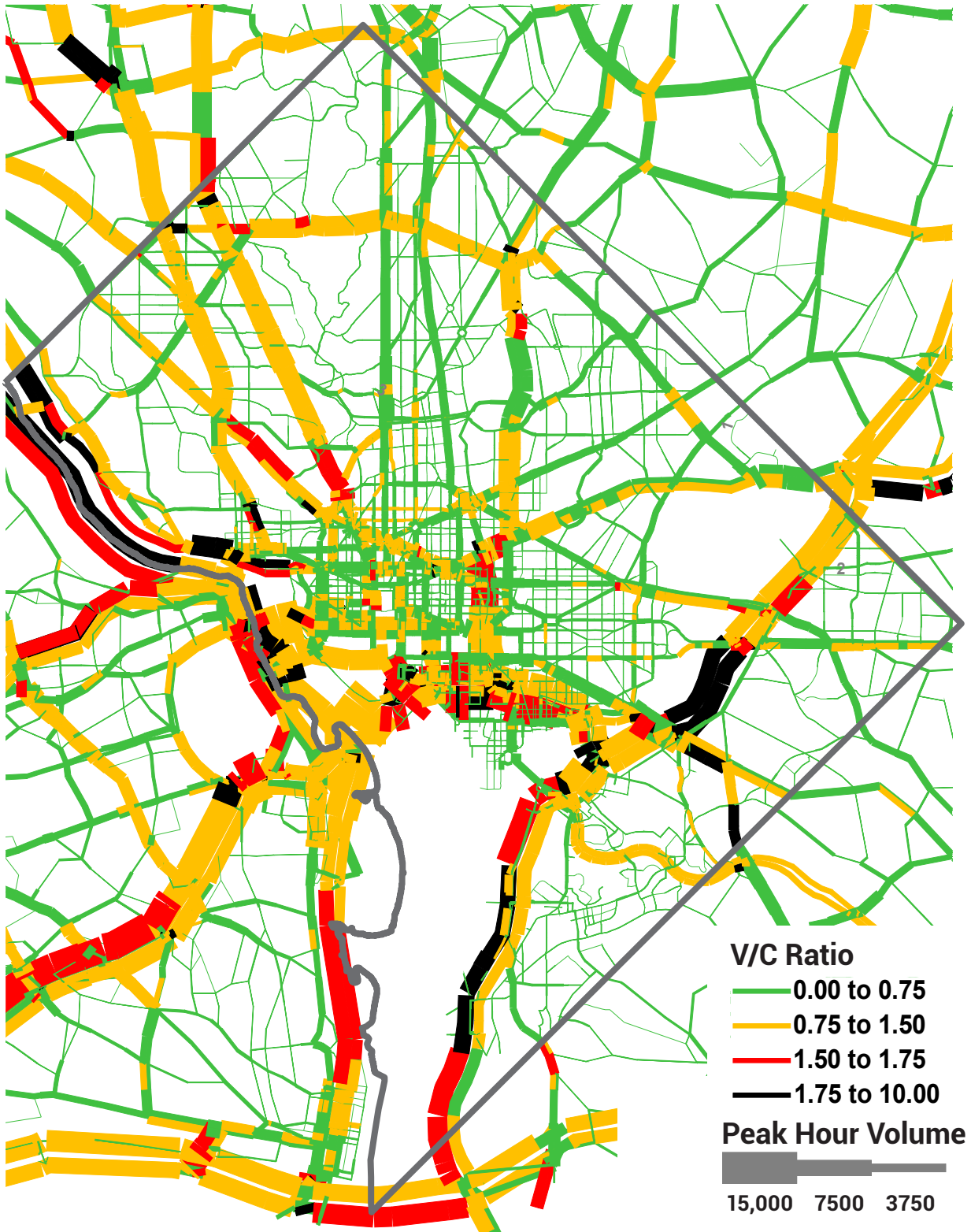


FIGURE V.25 – 2040 PM PEAK HOUR V/C RATIOS FOR THE RECOMMENDED PLAN

This map shows 2040 recommended plan V/C ratios for major corridors in D.C., with the **moveDC** plan recommendations fully implemented.

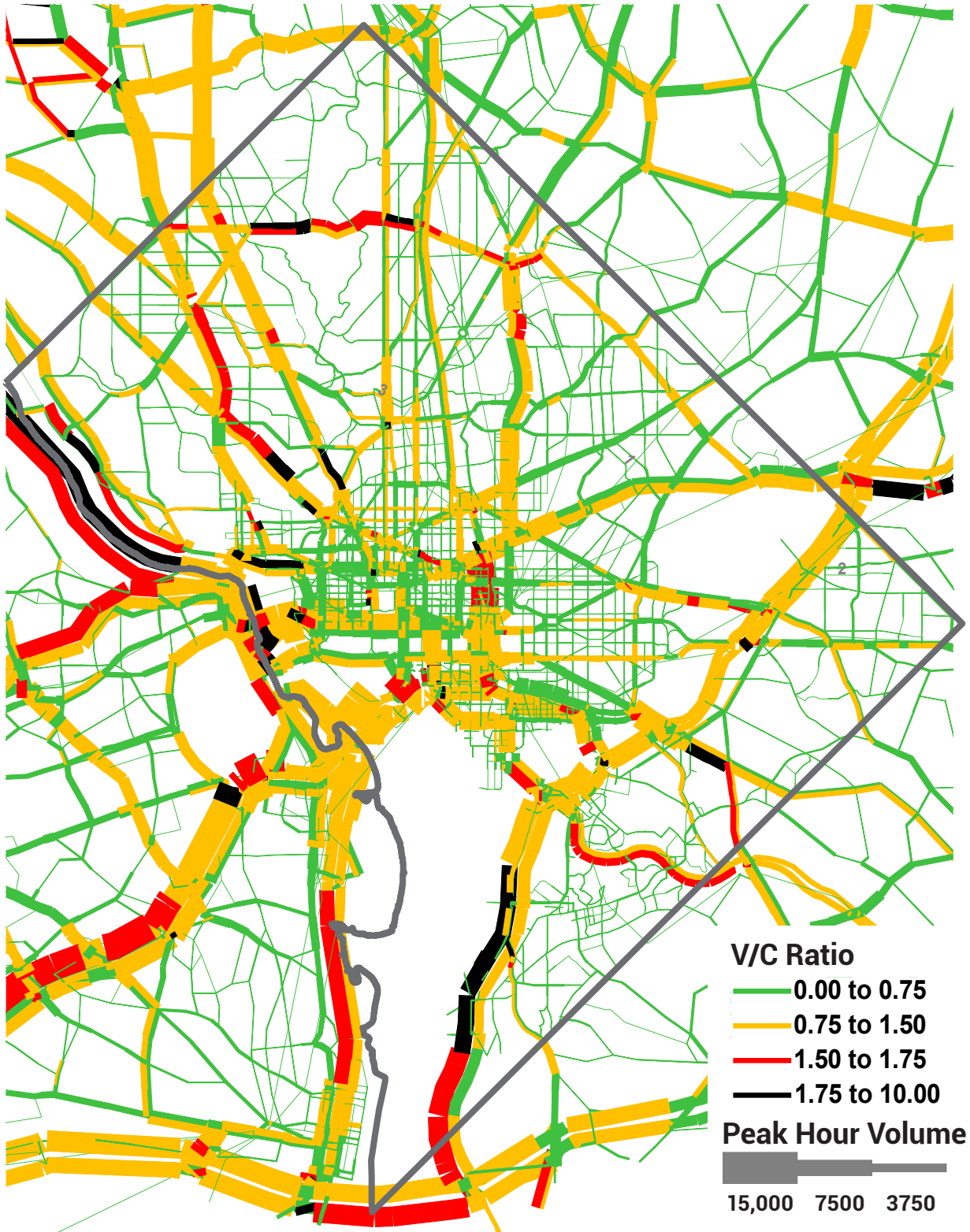


Table V.9: moveDC Vehicle Element Performance

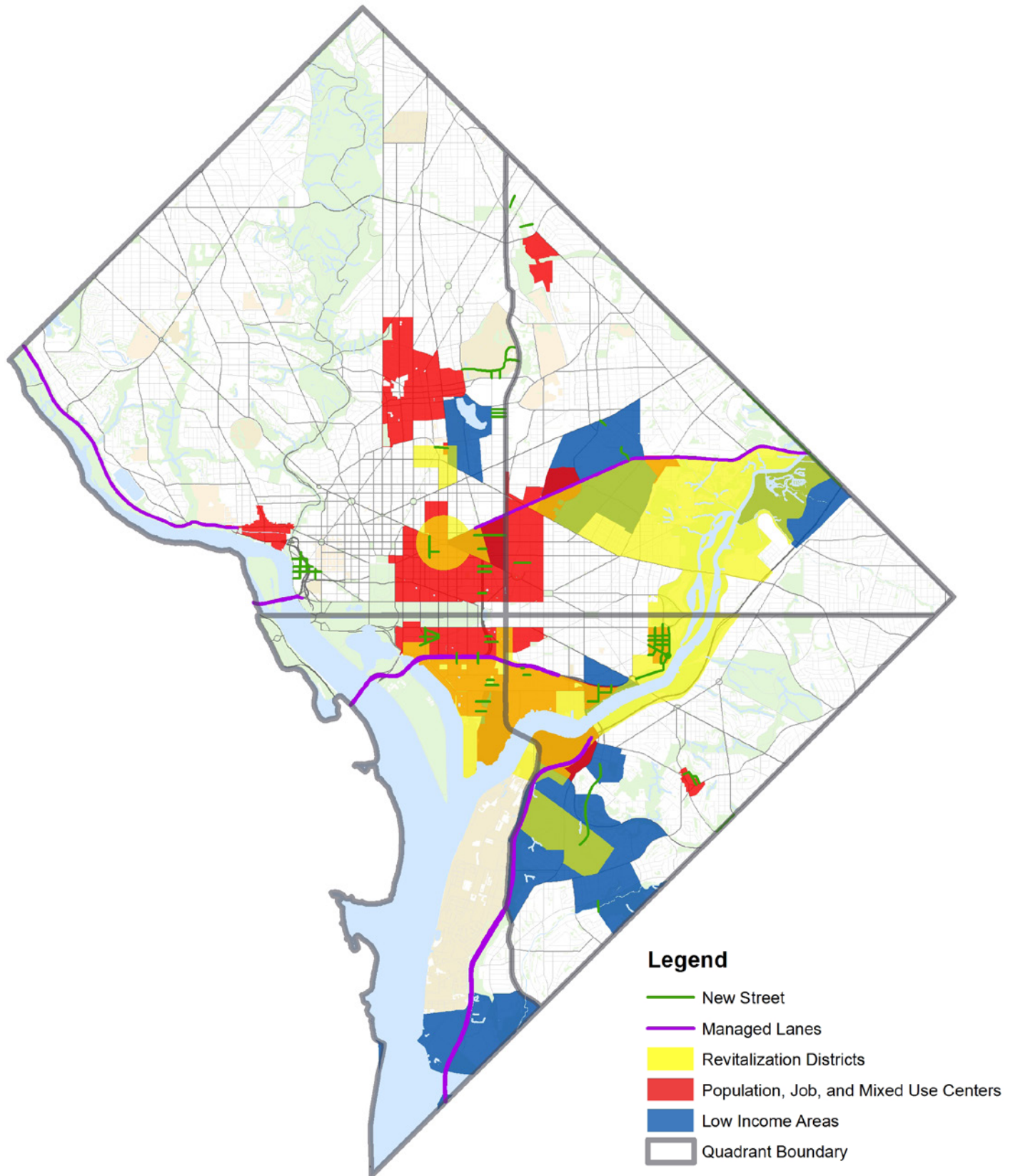
Goal	Metric	Performance
Sustainability & Health	Increase non-auto mode split	- A 64% non-auto mode share is forecasted for all trips that start and end in the District - A 51% non-auto mode share is forecasted for all trips that start or end in the District
	Increase access to parks and green space	Not applicable for this chapter
	Encourage active transportation for health benefits	Not applicable for this chapter
	Reduce air and water quality impacts of transportation	Reduce vehicular travels and emissions per capita
	Prepare the transportation system for changing environmental and climatological conditions	Not applicable for this chapter
Citywide Accessibility & Mobility	Increase the person-carrying capacity of the transportation system	- Plan recommendations result in a 7% decrease in peak period vehicular facility capacity Districtwide compared to the existing (2013) network as some vehicular space is reallocated for other travel modes - The overall transportation system capacity increase 24% compared to the existing (2013) network
	Improve system reliability	- Vehicular delay decreases 22% compared to the baseline future condition - Plan performs considerably better in both the a.m. and p.m. peak periods - Implement managed lanes, price private vehicle access to the Central Employment Area, optimize traffic signal operations on all major roadway corridors, and upgrade the ITS
	Reduce financial barriers to the lowest-income transportation system users	Not applicable for this chapter
	Accommodate the movement and management of freight and goods	Preserves key freight corridors for goods movement
	Integrate the District's transportation system with the region's transportation network	Compatible with Virginia's I-395 and I-66 HOV lanes
Neighborhood Accessibility & Connectivity	Increase the coverage of all modal networks throughout the District	Improve local street connectivity in specific locations as well as part of redevelopment projects or to reestablish access along historic rights-of-way
	Increase the number of transportation choices for travel between city neighborhoods	New streets and reconfiguration of some roadways can remove barriers for local access and connectivity
	Increase transportation availability to population centers and jobs, schools, amenities, and services	New streets or managed lanes access two of eight population centers, four of nine employment centers, and 10 out of 20 mixed-use centers (see Figure V.26)
	Increase transportation availability to economically challenged or targeted redevelopment areas	New streets and managed lanes access 16 of 33 low-income Census Tracts and 11 of 26 designated redevelopment areas (see Figure V.26)

Table V.9: moveDC Vehicle Element Performance (continued)

Goal	Metric	Performance
Safety & Security	Improve safety for all users	• Increase vehicular safety by: • Enforcing the rules of the road for all users • Providing transportation education at all levels • Implementing safety improvements at high-rate and high-frequency locations and at locations with a history of severe crashes • Upgrading the ITS system to facilitate more responsiveness to incidents • Adopting technologies that improve safety • Establishing a consistent policy towards traffic calming in neighborhoods • Reconfiguration of selected roadways to improve connectivity and improve safety • Traffic signal optimization on major roadway corridors to move traffic efficiently and safely
	Improve redundancy of transportation networks to handle emergencies	• While vehicular capacity will decrease by 8% in peak periods along designated evacuation routes, multimodal person-carrying capacity will increase by 44%
	Expand sidewalk network	• Not applicable for this chapter
	Maintain ability to evacuate District in case of emergency	• Not applicable for this chapter
	Preserve key functions without impacting the transportation system	• Not applicable for this chapter
Public Space	Protect and enhance important corridors and urban landscapes	• Not applicable for this chapter
	Make streets functional, beautiful, and walkable	• Making streets more efficient will include traffic signal optimization and managing vehicular speeds • Flexing the use of rights-of-way during non-peak periods will create uses for pedestrians, bicycles, and recreational or special event space
	Increase tree coverage	• Not applicable for this chapter
Preservation	Maximize reliability for all District transportation infrastructure by investing in maintenance and asset management	• Perform routine preservation activities on bridges to maximize the useful life along with needed repairs, rehabilitation, and replacement • Approximately 10 miles of new streets will require future maintenance in addition to maintaining existing streets; the District should retain its opportunity to receive the maximum available federal maintenance contribution

FIGURE V.26 – MOVEDC VEHICLE ELEMENT ACCESSIBILITY MAP

This figure shows increased vehicle accessibility in relation to District-designated revitalization districts; population, job, and mixed-use centers identified for **moveDC** planning purposes; and low-income areas based on U.S. Census data in the context of **moveDC** vehicle network recommendations.



V. Vision to Reality

moveDC is a long-term plan for a reason—achieving its full vision will require decades of investment and continued commitment from city leaders and support from innumerable local and regional partners. The return on the city's investment of time and funds spent implementing the **moveDC** plan's recommendations will be creating stronger, more vital neighborhoods; sharing prosperity among all of the city's residents; meeting our responsibility to the environment; and making the District more competitive among its domestic and global peers.

This section provides guidance for prioritizing and implementing **Vehicle Element** infrastructure recommendations in order to get from the present day to the future vision. Additional information on implementation can be found in **Chapter 5**.

A. USING THIS ELEMENT

The **Vehicle Element** is a starting point for investments in the vehicular system for the District in the next 25 years. It presents needed and realistic vehicular network investments and policy concepts that together, support the **moveDC** plan's other **Modal Elements** in achieving the goals established as a part of the planning process.

The **moveDC** plan does not present specific and final vehicular system design solutions, nor has **moveDC** analyzed all of the vehicle project-level trade-offs for individual components of the **moveDC** plan. The **Vehicle Element** of **moveDC** will need to be updated periodically to take into account the many changes the future will bring that cannot be anticipated today. The need for updates is the recognition that some things always change in a city as dynamic as Washington, D.C.

Finally, some recommendations of **moveDC**, as with the **1997 Transportation Plan for the District of Columbia**, may not become reality. Regular updates to the **Vehicle Element** in coordination with the overall **moveDC** plan will help ensure the **Vehicle Element** continues to make sense in the context of changing demands on the system.

B. PROJECT DEVELOPMENT PROCESS

Some of the vehicle infrastructure recommendations included in the **moveDC** plan are already in the design process or ready for construction; however, the vast majority of the **moveDC** plan's recommendations will need to undergo additional evaluation and further development—consistent with established city processes prior to their implementation.

The DDOT **Environmental Policy and Process Manual, 2nd Edition** (2012) further describes DDOT's Project Development Process. The additional evaluation and development processes are likely to adjust the character, location, and other elements of some recommendations. This is a natural evolution of long-range plan identified recommendations as they move toward implementation.

C. IMPLEMENTATION THROUGH PARTNERSHIP

While the implementation of most capital infrastructure recommendations will be led by DDOT, some are likely to occur through partnership among DDOT and other agencies or organizations or with DDOT in a support role to other agencies or organizations.

D. INFRASTRUCTURE COSTS

The planning-level costs for identified **Vehicle Element** infrastructure recommendations (including ITS, bridges, and tunnels) are \$5.4 billion and were developed in current year (2014) dollars at a long-range planning level of detail and accuracy. Because of the nature of long-range planning, all costs should be reevaluated in future project development activities. Cost by infrastructure recommendation is presented in **Table V.10** through **V.13**. With respect to the planning-level cost estimates shown, the following were generally assumed:

- *Wherever possible, the cost estimates utilized project-specific costs, including costs from MWCOC's FY13-19 **Transportation Improvement Program** (TIP), the FY14-20 District budget, and other project-specific estimates.*
- *Additional costs for **moveDC** recommendations were estimated using a generalized unit cost related to project type. The unit costs were derived from existing District project costs.*

Programs

In the context of implementation for **moveDC**, the term “program” is used to describe ongoing funding commitments for operations, education, maintenance, regular infrastructure improvements that are not defined as projects, or other items, such as debt service on Grant Anticipation Revenue Vehicle (GARVEE) bonds. Vehicular program costs are estimated to be \$4.1 billion. Additional information on costs for vehicular, ITS, and bridge and tunnel programs are presented in **Chapter 5**.

Asset Management

Costs within this area of the **moveDC** plan include ongoing assessments, maintenance, and repairs of transportation infrastructure. Costs for asset management \$4.2 million and are presented in **Chapter 5**.

E. BUDGETING PROCESS

moveDC was developed in a fiscally unconstrained environment, but DDOT recognizes that it operates in an environment constrained by available funding. While the financial plan in **Chapter 5** identifies new sources of revenue to help close the cost/revenue gap, an annual gap is likely to remain throughout **moveDC**'s implementation horizon.

Because of this fiscal reality, **moveDC** has developed a methodology for prioritizing recommendations that can assist in the process of making annual budget decisions. This approach is described in **Chapter 5**. From a broad prioritization perspective, DDOT should take the following approach:

- *Fund basic state of good repair (SOGR) and maintenance for existing programs*
- *Allocate additional resources that accelerate the pace of reaching SOGR for all infrastructure*
- *Fund critical transportation infrastructure investments to address deficiencies, safety, or capacity needs*

Critical investments in transportation infrastructure have been prioritized in the **moveDC** plan, but many will still need to go through DDOT's Project Development Process prior to implementation. DDOT should only seek to advance investments that have the most merit to meet **moveDC**'s goals.

It should be noted that capital programs and asset management—both of which are related to ensuring safe and reliable operations and adequate maintenance of existing system assets—were not prioritized. The level at which each of these are funded is established through normal annual District budget processes.

F. PRIORITIZATION PROCESS

moveDC capital improvements were prioritized based on an understanding of community and stakeholder support, existing commitments, and goals of ensuring transportation investments are distributed across the District in the service of current and future residents. They also were prioritized based on criteria developed for each of **moveDC**'s goals. Cost was not a criteria used in prioritization, but will need to be a factor in individual budget decisions.

Individual capital investment recommendations were measured within each criterion and then processed into four tiers within project groupings (generally by transportation mode). The tiers were then used to rank and organize priorities.

Generally, investments within Tier 1 are assumed to be the highest priorities for implementation, while those in Tier 4 projects are lower priorities, relative to projects within their group. It is worth noting that in many cases Tier 1 recommendations—due to size, scale, cost, and complexity—cannot be immediately constructed and will require investment in refinement, definition, and development through DDOT's Project Development Process. Similarly, most recommendations in other tiers are likely to require some level of proactive investment in further development, prior to them becoming the District's highest implementation priorities.

G. OUTCOMES

The full results of the prioritization process for the **Vehicle Element** are shown by tier in **Table V.10** through **V.13** and **Figure V.27**. In addition to each infrastructure recommendation's rating (tier), **Table V.10** through **V.13** describe project limits, identify potential implementation responsibility, and provide a planning-level cost estimate, where it is possible to do so based on information currently available.

Table V.10: Tier 1 Vehicular Capital Investments

Type	Name of Facility	From	To	Length (miles)	Ward(s)	DDOT Role	TIP Project	Cost (\$ Millions)
ROADWAY	ANACOSTIA FWY SE	EAST CAPITOL ST & KENILWORTH AVE NE	INTERSTATE 295	5.2	7, 8	LEAD	NO	\$794
BRIDGE	BENNING RD NE	36TH ST NE	MINNESOTA AVE NE	0.3	7	LEAD	TIP	\$20
BRIDGE	EAST CAPITOL ST	C ST NE	ANACOSTIA AVE NE	0.3	7	LEAD	TIP	\$16
BRIDGE	H ST NE	NORTH CAPITOL ST	3RD ST NE	0.4	6	LEAD	TIP	\$187
ROADWAY	INTERSTATE 295	M ST SE & PENNSYLVANIA AVE SE	11TH ST SE & INTERSTATE 695	1.5	6	LEAD	TIP	\$40
MANAGEMENT	INTERSTATE 295	ANACOSTIA FWY SE	MARYLAND LINE	9.9	8	LEAD	STUDY	REVENUE NEUTRAL
MANAGEMENT	INTERSTATE 395	VIRGINIA LINE	11TH ST BRIDGE	5.5	2, 6	LEAD	STUDY	REVENUE NEUTRAL
BRIDGE	INTERSTATE 66	CONSTITUTION AVE NW	VIRGINIA LINE	0.6	2	LEAD	TIP	\$29
ROADWAY	INTERSTATE 66	WHITEHURST FWY NW	CONSTITUTION AVE NW	2.7	2	LEAD	NO	\$566
BRIDGE	LONG BRIDGE	MAINE AVE SW	VIRGINIA LINE	1.0	2, 6	LEAD	STUDY	\$147
ROADWAY	MARYLAND AVE NE	2ND ST NE	15TH ST NE	1.2	6	LEAD	TIP	\$3
BRIDGE	SOUTH CAPITOL ST	POTOMAC AVE SE	ANACOSTIA DR SW	0.4	6, 8	LEAD	TIP	\$554

Table V.11: Tier 2 Vehicular Capital Investments

Type	Name of Facility	From	To	Length (miles)	Ward(s)	DDOT Role	TIP Project	Cost (\$ Millions)
MANAGEMENT	CANAL RD NW	MARYLAND LINE	KEY BRIDGE	3.7	2,3	LEAD	NO	NOT AVAILABLE
MANAGEMENT	CENTRAL EMPLOYMENT AREA CONGESTION PRICING CORDON	–	–	5.9	2, 6	PARTNER	NO	REVENUE EXCEEDS COST
NEW STREET	EASTERN AVE NE	KENILWORTH AVE NE	NEW YORK AVE NE	0.6	6	LEAD	NO	\$126
NEW STREET	F ST NW	3RD ST NW	1ST ST NW	0.1	2,6	SUPPORT	NO	PRIVATELY FUNDED
BRIDGE	FRANCIS SCOTT KEY BRIDGE	M ST NW	VIRGINIA LINE	0.3	2	LEAD	TIP	\$21
NEW STREET	G ST NW	3RD ST NW	NEW JERSEY AVE NW	0.2	6,7	SUPPORT	NO	PRIVATELY FUNDED
MANAGEMENT	INTERSTATE 66	CONSTITUTION AVE NW	VIRGINIA LINE	1.1	2	LEAD	STUDY	REVENUE NEUTRAL
NEW STREET	L ST NW	4TH ST NW	NORTH CAPITOL ST & L ST NE	0.4	6	LEAD	NO	\$12
NEW STREET	MARYLAND AVE SW (MULTIPLE STREETS)	–	–	0.8	6	PARTNER	NO	\$558
MANAGEMENT	NEW YORK AVE NW	MARYLAND LINE	INTERSTATE 395	4.2	5,6,7	LEAD	NO	NOT AVAILABLE
ROADWAY	ROCK CREEK & POTOMAC PKWY NW	VIRGINIA AVE NW	Q ST NW	1.0	2	LEAD	NO	MINOR
NEW STREET	W ST NW	FLORIDA AVE NW	MARYLAND LINE	0.2	1,	PARTNER	NO	\$5

Table V.12: Tier 3 Vehicular Capital Investments

Type	Name of Facility	From	To	Length (miles)	Ward(s)	DDOT Role	TIP Project	Cost (\$ Millions)
NEW STREET	13TH ST SE & N ST SE	12TH ST SE & N ST SE	13TH ST SE & L ST SE	0.3	6	LEAD	NO	\$10
NEW STREET	14TH ST SE	13TH ST SE	L ST SE	0.2	6	LEAD	NO	\$7
NEW STREET	3RD ST SW	E ST SW	G ST SW	0.1	5, 7	LEAD	NO	\$28
NEW STREET	FOGGY BOTTOM (MULTIPLE STREETS)	–	–	1.4	2	PARTNER	NO	\$45
NEW STREET	HILL EAST (MULTIPLE STREETS)	–	–	2.9	7	PARTNER	NO	\$91
NEW STREET	K ST SW	DELAWARE AVE SW	K ST SW EAST OF HALF ST SW	0.1	6	PARTNER	NO	\$3.0
NEW STREET	L ST SW	DELAWARE AVE SW	HALF ST SW	0.2	6	PARTNER	NO	\$5
NEW STREET	LONGFELLOW ST NE	1ST ST NE	2ND ST NE	0.2	6	LEAD	NO	\$31
NEW STREET	MCMILLAN (MULTIPLE STREETS)	–	–	0.5	1, 5	PARTNER	NO	\$16
NEW STREET	N ST SW	EAST OF 4TH ST SW	CANAL ST SW	0.2	6	PARTNER	NO	\$5
NEW STREET	O ST SW	EAST OF 4TH ST SW	CANAL ST SW	0.1	6	PARTNER	NO	\$4.0
NEW STREET	US SOLDIERS' AND AIRMEN'S HOME (MULTIPLE STREETS)	–	–	1.2	1, 5	PARTNER	NO	\$37

Table V.13: Tier 4 Vehicular Capital Investments

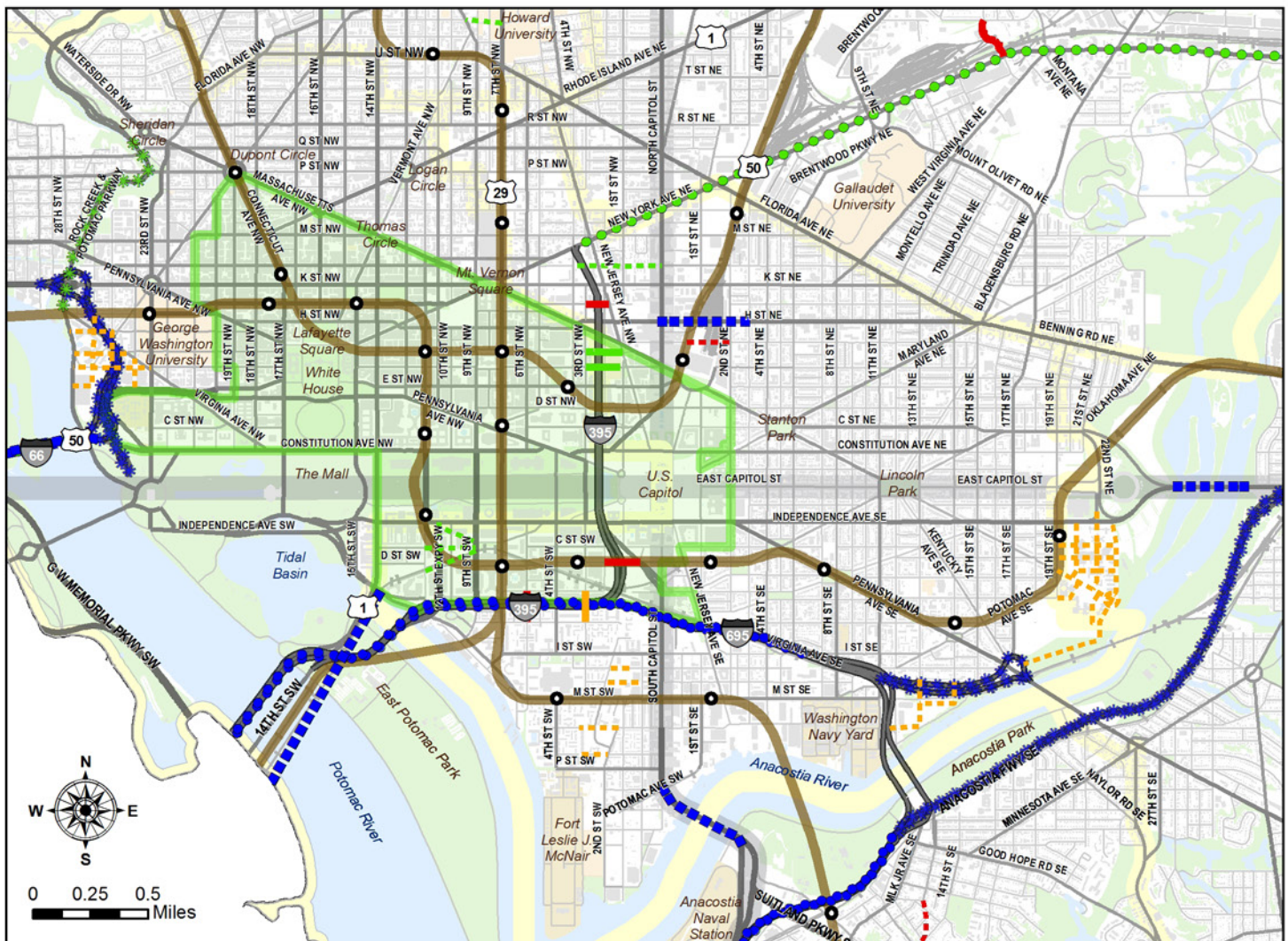
Type	Name of Facility	From	To	Length (miles)	Ward(s)	DDOT Role	TIP Project	Cost (\$ Millions)
NEW STREET	I ST NW	3RD ST NW	NEW JERSEY AVE NW	0.1	2, 6	LEAD	NO	\$23
NEW STREET	13TH ST SE	PLEASANT ST SE	PECAN ST SE	1.1	8	PARTNER	NO	\$33
NEW STREET	13TH ST SE	MISSISSIPPI AVE SE	VALLEY AVE SE	0.1	5	LEAD	NO	\$21
NEW STREET	14TH ST NE	14TH ST NE	RHODE ISLAND AVE NE	0.1	5	PARTNER	NO	\$3.0
NEW STREET	14TH ST NE	NEW YORK AVE NE	W ST NE	0.2	4, 5	LEAD	NO	\$67
NEW STREET	5TH ST SW	G ST SW	E ST SW	0.1	6	LEAD	NO	\$31
NEW STREET	D ST SW	2ND ST SW	WASHINGTON AVE SW & DELAWARE AVE SW	0.2	4	LEAD	NO	\$37
NEW STREET	EASTERN AVE NE	NEW YORK AVE NE	FORT LINCOLN DR NE	1.1	8	LEAD	NO	\$240
NEW STREET	G ST NE	1ST ST NE	2ND ST NE	0.2	6	PARTNER	NO	\$6
NEW STREET	SLIGO MILL RD	CHILLUM PL NE	OGETHORPE ST NW	0.2	6	LEAD	NO	\$26
NEW STREET	SOUTHERN AVE SE	NAYLOR RD SE	BRANCH AVE SE	0.3	7	LEAD	NO	\$9

FIGURE V.27 – VEHICULAR INFRASTRUCTURE PRIORITIES

This figure shows vehicular infrastructure recommendations by tier. The map shows bridge rehabilitations, the cordon area, managed lanes, new streets, new local bridges and tunnels, and roadway reconfigurations.

Legend

	Quadrant Boundary	<u>Existing Infrastructure</u>	<u>Bridge Rehabilitation Tier</u>	<u>Managed Lane Tier</u>	<u>New Local Bridge/Tunnel Tier</u>
	Ward Boundary	Metrorail Station	1	1	1
	Water	Metrorail Line	2	2	2
	Park	Railroad	3	3	3
	University	Road	4	4	4
	Military		<u>Cordon Charge Tier</u>	<u>New Street Tier</u>	<u>Roadway Reconfiguration Tier</u>
	Monumental Core		2	1	1
				2	2
				3	3
				4	4





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The District of Columbia's
Multimodal Long-Range Transportation Plan

F Freight Element



October 2014





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October 2014

District Department of Transportation
Policy, Planning & Sustainability Administration
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Washington, DC 20003



moveDC Vision

The District of Columbia will have a world-class transportation system serving the people who live, work, and visit the city. The transportation system will make the city more livable, sustainable, prosperous, and attractive. It will offer everyone in the District exceptional travel choices. As the transportation system evolves over time, the District will:

- *Be more competitive and attractive locally, regionally, nationally, and internationally*
- *Have safer and more vibrant streets and neighborhoods*
- *Have cleaner air, streams, and rivers, and be more responsive to climate change*
- *Accommodate the travel needs of all residents, workers, and visitors regardless of age or ability*
- *Integrate the District's transportation system with the region's transportation network*

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Railroad tracks north of Union Station serve both passengers and freight

Freight

I. Managing Safe and Efficient Deliveries

The efficient movement of goods supports a city's vital functions and helps maintain its competitiveness. Managing freight through and within the District of Columbia can help to mitigate traffic congestion, preserve critical infrastructure, and improve air and water quality, while also managing the cost of goods and services to District residents, visitors, and businesses.

Freight movement in D.C. is closely aligned with the needs of resident and workforce consumers. There are more than 170 significant freight generators in the District. More than 80% of the generators are within four sectors—health services, food stores, restaurants and bars, and the printing and publishing industry—however, compared with cities of similar size, the District has few traditionally-recognized freight generators such as heavy industry or large-scale warehousing.

The District's growing commercial and retail base, in conjunction with rising population, will increase consumer and business-driven freight demand. The **moveDC** plan recommends operational, management, technological, and infrastructure strategies to respond to existing and future needs. Responding to these needs will contribute to a thriving, well-managed freight network serving District residents and businesses in coordination with the region.

II. Existing Conditions

The following sections describe existing demand, infrastructure, and initiatives related to freight in the District.

A. CORE FACTS

Management of freight through and within the District of Columbia has an important role in congestion management and in improving safety and efficiency of freight transportation facilities. According to the Federal Highway Administration's (FHWA) **Freight Analysis Framework**, approximately 94% of the freight tonnage arriving in and departing from the District

in 2011 was transported by truck. Approximately \$3.2 billion of freight-intensive revenue is generated annually in the District. A recent analysis found that freight truck activity is directly responsible for 450 jobs in the District and leads to approximately 130,000 jobs.

Freight generally uses existing transportation infrastructure such as highways and railroads. Preservation of this infrastructure is important to the movement of freight—yet heavy truck and rail traffic contributes significantly to wear and tear on transportation infrastructure.

Congestion on streets and railroads contributes to inefficiency in goods movement. This inefficiency is borne out in additional monetary cost to freight haulers and to those consuming affected goods.

Roadway

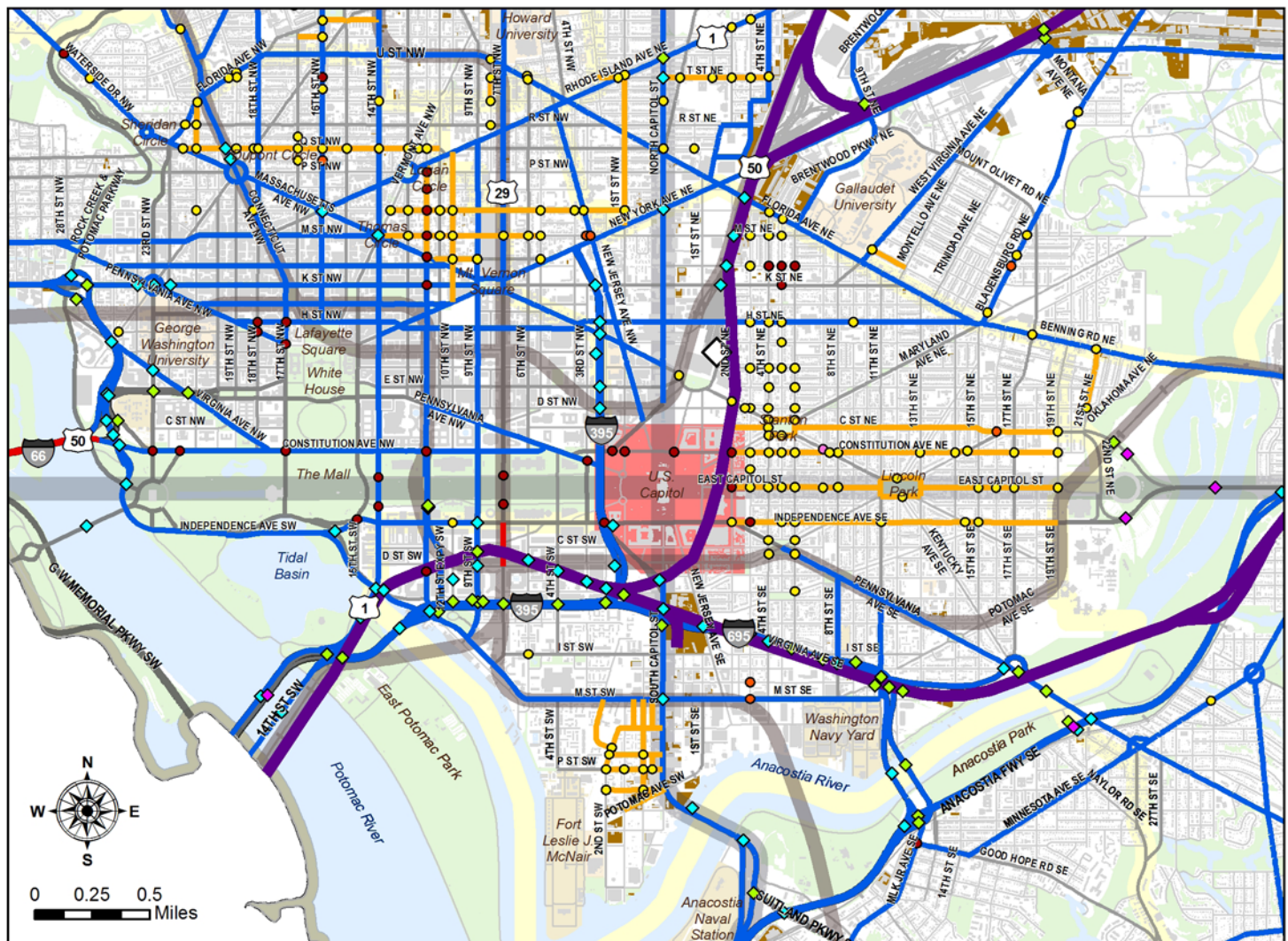
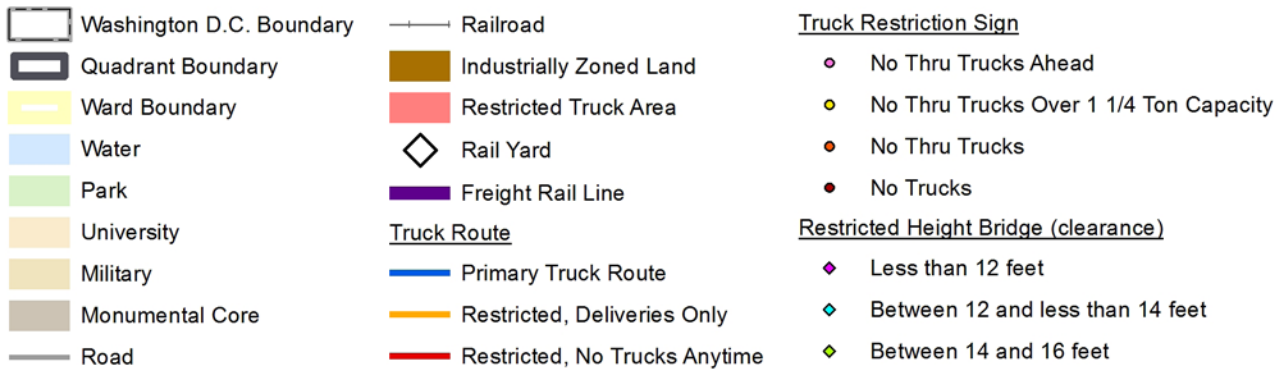
Nearly all trucks operating in the District have either an origin or a destination within the city. Inbound and outbound truck traffic is heavily concentrated to the east and south of the District. DDOT's truck route map designates specific routes for through truck traffic as well as truck restrictions on city streets, as shown in **Figure F.1**.

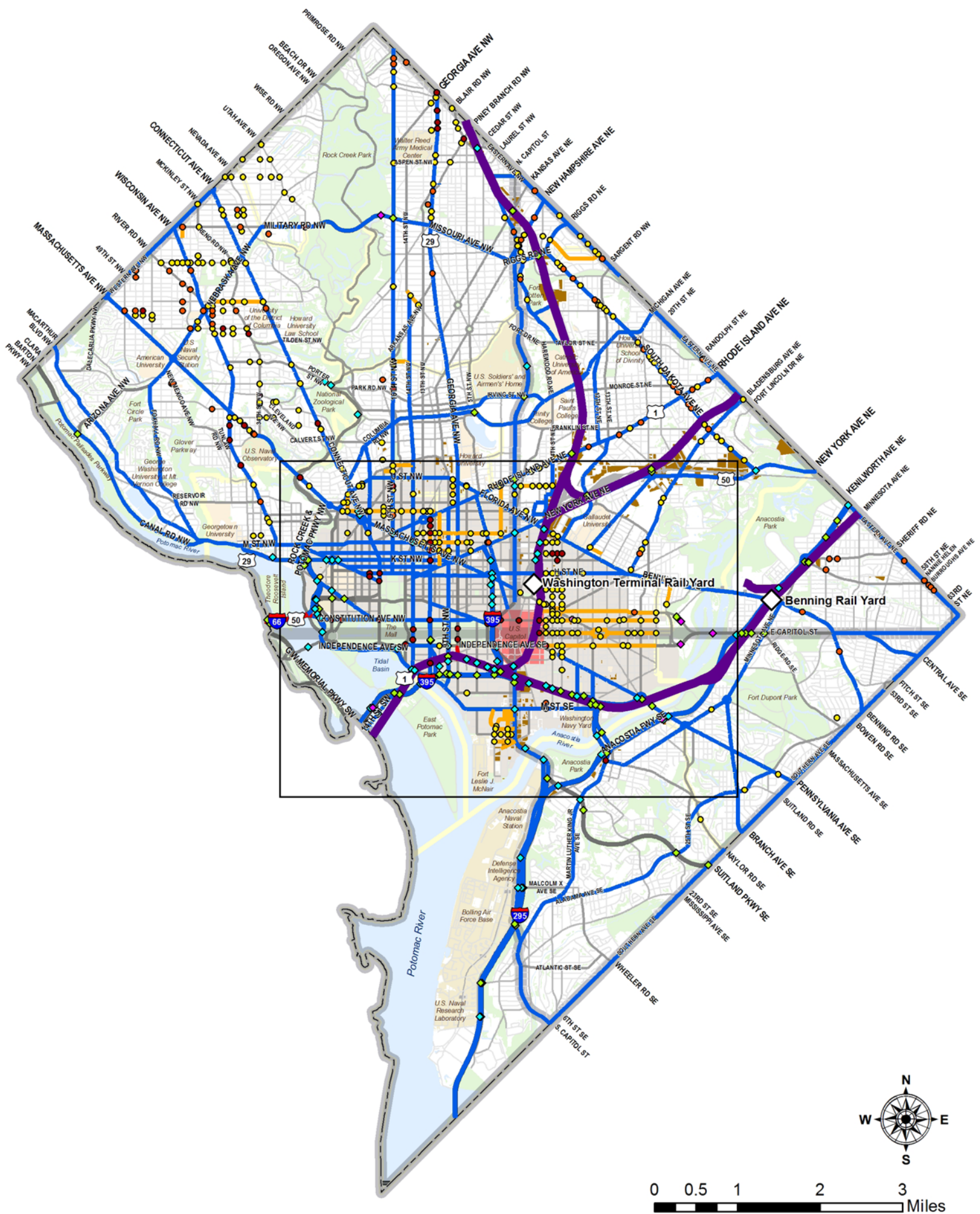
Truck routes in the District are generally assigned to corridors with large-vehicle-compatible roadway geometry, fair traffic conditions, and good network connectivity. Commercial vehicle routes are enforced in the District and non-compliance can result in fines.

FIGURE F.1 – EXISTING FREIGHT NETWORK

This figure shows the existing District freight network including truck routes, areas with freight restrictions, and freight rail infrastructure.

Legend





Two-axle trucks make up 90% of the total truck traffic in the District. Tractor trailers make up the remaining 10%. Industrial centers that generate commercial truck freight activity in the District exist along:

- Georgia Avenue (US 29) near Florida Avenue
- New York Avenue (US 50) east of North Capitol Street
- North Capitol Street north of Fort Circle Drive NE
- South Capitol Street north of the South Capitol Street Bridge

District roadways are primarily controlled and maintained by DDOT; however, some roads are controlled by the National Park Service (NPS) and the Architect of the Capitol (AOC). Street ownership is further discussed in the **Vehicle Element** of the **moveDC** plan. In the District, large infrastructure projects, such as bridge rehabilitation, major roadway repairs, and infrastructure replacements, are nearly always DDOT's responsibility.

District law sets a maximum weight for trucks by axle group to protect infrastructure. Overweight trucks have a significant negative impact on bridge and roadway pavement life.

To assess and ensure that the potential effects of overweight vehicles are accounted for, DDOT conducts additional inspections of structures and bridges. Depending on the outcomes of inspections, bridge and structure improvements may be programmed ahead of or out of normal maintenance cycles, and/or DDOT may put special weight and use restrictions of a structure in place.

For 2014, DDOT estimates that, annually, an additional \$80 million for 25 years is needed to return District roads to an excellent condition. The District's bridges also are aging and many costly bridge restoration projects are on the horizon. Some of this maintenance need is related to freight demand. Bridge retrofits could impact some truck routes during construction.

Rail

Freight rail in the District plays an important role in the regional freight network. It generates and attracts considerable demand related to consumer needs. The District does not own any railroads, but is served by two Class I and one Class III (switching

Notes on This Element

- Data used and referenced throughout this element was current as of December 2013, unless otherwise noted.
- Recommendations cited in this element will require further development as outlined in **Chapter 5**.
- Policies in this element are in addition to or augment current DDOT policies identified in the DDOT Policy Compendium.

or terminal) railroads including CSX's major north-south freight rail line. CSX and Norfolk Southern own, operate, and maintain nearly 70 miles of freight rail line and right-of-way in the District and carried approximately 370,000 carloads of freight in 2012.

The two freight rail yards located in the District—Washington Terminal Rail Yard, which is adjacent to Union Station, and the Benning Rail Yard—are shown in **Figure F.1**.

Washington, D.C. is a bottleneck for freight rail operations due to tunnel and overhead clearance restrictions. Sections of existing freight railroad in the District are undergoing a major rail infrastructure improvement program called the National Gateway project. The extent of this initiative is described later in the **Freight Element**.

The District's freight railroads also carry passenger and commuter rail service. This service operates on freight railroad corridors through operating agreements between the commuter railroads, Amtrak, and freight railroad owners. Passenger and commuter rail are discussed in **moveDC's Transit Element**.

Air

While there are no airports located within the District of Columbia, three major airports serve the Washington region: Ronald Reagan Washington National Airport (DCA), Baltimore Washington International Thurgood Marshall Airport (BWI), and

Figure F.2: Major Airports in the Greater Washington, D.C. Area



Washington Dulles International Airport (IAD). The locations of these airports are shown in **Figure F.2**. In addition to these airports, the following hubs facilitate cargo shipments into or out of the District:

- John F. Kennedy International (JFK) in New York
- Newark Liberty International (EWR) in New Jersey
- Philadelphia International (PHL) in Pennsylvania
- Chicago O'Hare International (ORD) in Illinois

As volume of freight increases at airports in the Washington region and along the East Coast, there will be a corresponding increase in truck traffic within and through the region. The rise in truck traffic will be attributed to an increase in goods delivered and consumed within the region as well as the region's strategic location at the intersection of several major interstate corridors and within the Northeast Corridor.

Maritime

D.C. has very limited maritime freight shipping. In 2011, official shipments were equivalent to 10 trucks per day. The only other maritime operation—debris collection along the Anacostia and Potomac Rivers—is conducted by the U.S. Army Corps of Engineers.

B. NOTABLE SYSTEM ACHIEVEMENTS

DDOT's Direct Emissions Reduction Program

DDOT's **Direct Emissions Reduction Program** is federally funded by the **Congestion Mitigation and Air Quality Improvement Program** (CMAQ). This program focuses on surface transportation improvements designed to improve air quality and mitigate congestion.

DDOT's current program funds and supports projects in the District that reduce emissions through measures including:

- Idle reduction
- Purchase of fuels that produce lower emissions
- Retrofit of existing diesel engines with catalysts or filters
- Repowering of vehicles with lower emission generating engines
- Vehicle replacement

Engines eligible for the program may be in on-road vehicles (trucks), off-road vehicles (construction equipment) used in construction of highway projects, or locomotives used within the non-attainment area.

Urban Freight Case Studies for Washington, D.C.

Developed by FHWA's Office of Freight Management and Operations, the **Urban Freight Case Studies** (2009) are a collection of studies that document best practices in urban goods movement. These studies are intended to be a reference for urban areas to use in developing solutions to mitigate traffic congestion and improve freight-related safety.

Downtown Curbspace Management Plan

The **Downtown Curbspace Management Plan** (2014) plans to reduce congestion in downtown D.C. by improving curbspace management. Tactics employed in this plan include:

- Reallocating existing curb space using regulatory signs to lengthen commercial vehicle loading spaces from 40 feet to 100 feet where possible
- Introducing new parking technology
- Establishing metered loading zones
- Enhancing parking enforcement

Following the adoption of the plan, increased enforcement of regulations has resulted in increased use of on- and off-street loading accommodations. A post-implementation study conducted on K Street NW revealed significant reductions in delays to automobiles and bicycles.

Washington Convention Center Transportation Operations and Parking Plan

The Washington Convention Center, which opened in April 2003, completed a transportation operations and parking plan in February 2004. The convention center is large enough that simultaneous set-up and breakdown of multiple conventions and major events needs to be accommodated. Efficient management of truck activity is critical to its operational success. The plan addresses intersection traffic control and truck circulation and routing to support event set-up and breakdown.

Convention-related trucks are not permitted to park on surrounding streets and all truck activity is contained within the Convention Center. Differing levels of truck activity are accommodated through strategic staging of truck arrivals and departures. To further assist with truck management, the Convention Center has an agreement for truck marshaling at RFK Stadium on an as-needed basis. Convention Center public safety personnel monitor truck activity and report restricted truck activity to the Metropolitan Police Department (MPD).

District of Columbia Motor Carrier Management and Threat Assessment Study (2004)

Following a study of truck activity in the District in August 2004, DDOT established a Motor Carrier Division to ensure efficient and safe mobility of commercial vehicles traveling in the District of Columbia, while mitigating community impacts and preserving transportation infrastructure.

C. FUTURE DEMAND

As part of the *District of Columbia Freight Plan* (2014), an analysis of current and future freight flows was conducted. The analysis forecasts a freight traffic increase in the District of 75% between 2011 and 2040 with a corresponding increase in freight value of 159%. The increase in freight traffic represents a 1.9% annual increase. Much of the traffic increase is from truck traffic. Anticipated growth in truck traffic is strongest along major truck routes such as US 50, I-295, and I-395.

D. OPPORTUNITIES FOR IMPROVEMENT

The goals and recommendations of several previously adopted, but not implemented plans, are summarized below.

District of Columbia Freight Plan

The *District of Columbia Freight Plan* (2014) provides recommendations related to management of freight operations. Since freight recommendations were developed within the same time frame as **moveDC**, they were coordinated with overall multimodal recommendations. At a high level, the freight plan recommends the following:

- **Expand freight rail capacity throughout the District.** Freight rail capacity can be improved by eliminating restrictions to double stacking of containers.
- **Reduce the rate of increase in truck traffic through the District.** Freight tonnage in the District is forecast to increase. Corresponding increases in truck traffic through the District can be mitigated using operational and technological strategies.
- **Enhance safety for commercial vehicles.** Safety improvements such as technology deployment and freight considerations in planning can lead to fewer crashes related to goods movement.
- **Reduce environmental impact of freight movement.** The District can benefit from deployment of technology and operational improvements to reduce emissions while freight volumes increase.
- **Encourage innovative practices to enhance efficiency/mitigate impacts of freight movement.** New technologies and real-time information can be used by the District to help monitor and operate the highway network. In-vehicle technology can help operators minimize delay and reduce congestion. Effective roadway design can help to improve freight movement while protecting and prolonging infrastructure life.

National Gateway

National Gateway is an ongoing infrastructure investment program intended to improve the flow of rail traffic and enhance freight connections from Mid-Atlantic seaports to the Midwest.

through a series of projects in the District of Columbia, Maryland, North Carolina, Ohio, Pennsylvania, Virginia, and West Virginia.

National Gateway projects include:

- **Virginia Avenue Tunnel.** *The existing CSX railway tunnel beneath Virginia Avenue is more than 100 years old. The tunnel is currently a major and critical freight rail bottleneck on the East Coast. CSX has proposed to reconstruct the existing tunnel to expand its vertical and horizontal clearances to permit the passage of trains transporting double-stacked standard cargo containers. The project also would restore a second track within the tunnel.*
- **Track lowering.** *The CSX north-south rail line currently travels beneath New Jersey Avenue, 10th Street, an I-395 ramp, and 12th Street SW. The elevation of the track is proposed to be lowered to provide additional vertical clearance at each of these four locations.*
- **Long Bridge.** *The Long Bridge (CSX rail line) project is proposed to modify or replace existing bracing members to increase railcar clearance on the bridge.*

Studies

Long Bridge Study

The Long Bridge is a two-track railroad bridge serving freight and passenger rail crossing the Potomac River between Virginia and Washington, D.C. Long Bridge is the only freight and passenger rail bridge connecting D.C. and Virginia and is a major choke point for freight and passenger rail movements.

DDOT and the Federal Railroad Administration (FRA), in cooperation with CSX and Amtrak, are studying short- and long-term bridge scenarios to identify a future course of action that will better serve the needs of passenger and freight railroads, as well as other multimodal users. The study is expected to conclude in 2014.

Maryland Avenue Southwest Small Area Plan and Southwest Ecodistrict Plan

The **Maryland Avenue SW Small Area Plan** (2012), led by the D.C. Office of Planning (OP), evaluated the feasibility of constructing a structure over the existing rail corridor that follows the alignment of Maryland Avenue SW. One of the goals of the study was to identify a preferred approach to permit Maryland Avenue SW and other connecting local streets to be restored to the city's network of streets. The study recommended that a four-track system along Maryland Avenue would be optimal for passenger and freight rail operations.

The National Capital Planning Commission (NCPC) completed the **Southwest Ecodistrict Plan** (2013) to envision how federal properties in the area could contribute to the same goals. DDOT is currently studying transportation improvements in more detail in the ongoing **Maryland Avenue SW Study**.



Existing Long Bridge

Roadways

Weight Restrictions

DDOT's **Truck Safety Enforcement Study** (2001) found that bridge impacts associated with overweight trucks operating on designated truck routes in the District costs approximately \$7 million annually. Weight enforcement currently is limited in the District and information on weight restrictions on bridges along truck routes is not easily accessible to the freight industry. Increased awareness of restrictions as well as increase enforcement could result in reduced maintenance costs for District roadways and bridges.

Geometric Design

Street or intersection designs that do not meet the needs of trucks, such as narrow lanes or small curb radii, can lead to safety hazards, property damage, and increased travel time. Physical or operational adjustments at identified intersections, could increase the efficiency of truck movement in the District, reduce potential property damage, and reduce truck emissions.

Congestion

The Texas Transportation Institute estimates that truck congestion in the District costs more than \$650 million or about 7% of total commodity value annually.¹ Increased cost of operation and delivery delays are inevitably passed on District businesses and residents through increased goods, service, and delivery costs. Reduced congestion resulting from operational, technological, and management strategies could benefit both the freight industry and District consumers.

Loading

Insufficient loading zone spaces, inconsistent enforcement of parking regulations—especially double parking—and low turnover of metered passenger-vehicle spaces are common parking problems faced by the trucking industry in the District. Programs to manage the existing parking inventory, encourage turnover, and increase enforcement will improve roadway conditions for both truck drivers and other travellers.



Increased enforcement of regulations such as double parking could reduce safety hazards for all road users

III. Recommendations

The recommendations in this element were developed through the **District of Columbia Freight Plan** (2014) and the **moveDC** planning process. These recommendations support the **moveDC** plan's overall goals and also seek to achieve:

- Increased efficiency of freight movement throughout the District
- Reduced impact of goods movement on traffic operations and curbspace management
- Safer and more secure environment for goods movement and related to other modal operations
- Opportunities for improved environmental quality

As the District continues to make investments in transportation infrastructure and operations to address existing issues and support future growth, strategic improvements for freight will be essential. An effective support system for goods movement can have many benefits on economics, neighborhoods, and transportation operations. Infrastructure, policies, and education or enforcement program recommendations for freight intended to address the above goals as well as the goals of the overall **moveDC** plan are summarized below.

¹ Texas Transportation Institute's (TTI) Urban Mobility Study (2012).



A variety of strategies can be used to improve loading

- *Creation of Eco Loading Zones for low emission delivery vehicles*
- *Modification of curbside signs so that loading zones are reserved for vehicles that are actively loading or unloading goods*

Recommendation A.3: Install weigh-in-motion sensors at key locations.

Weigh-in-motion (WIM) sensors provide commercial motor vehicle volume and weight data. DDOT should install additional stations at key entry points to the District to help with the identification and management of overweight vehicles.

Recommendation A.4: Support rail capacity expansion.

Freight and passenger rail share the same infrastructure in many locations in the District. The capacity of the rail network limits the ability for freight and passenger rail to increase service.

DDOT should continue to work with freight, passenger, and commuter rail operators to implement projects that alleviate bottlenecks and allow operators to increase service levels. DDOT's current study of Long Bridge is a good example of the District's ongoing commitment to rail capacity expansion.

Recommendation A.4: Study the feasibility of additional maritime freight shipping.

Diversion of truck freight to "marine highways" may be possible for some bulk commodity movements, if potential access through waterfront commercial and government property for freight loading and discharge are included in planning. Barges could be used for hauling bulk material to and from major construction sites and projects when there are significant commodity volumes or material sizes. The use of industrial waterfront areas to facilitate freight could reduce truck traffic through the city.

Recommendation A.5: Implement a dynamic commercial vehicle parking pricing and reservation system.

DDOT should implement a dynamic pricing and reservation system for commercial vehicle parking to manage metered curb parking in downtown and tourist areas. The goal of introducing pricing and reservations would be to encourage freight travel

A. INFRASTRUCTURE INVESTMENTS

Recommendation A.1: Move freight efficiently by optimizing traffic signalization along high-priority freight routes.

In coordination with the similar **Vehicle Element** recommendation, the District should optimize traffic signal timing along high-priority freight corridors. On these routes, the signal timing should take into account the longer acceleration and deceleration times required by trucks in an effort to decrease idling, improve truck progression, and reduce intersection blocking by trucks.

Traffic signal timing should be evaluated and reassessed on a 5-year basis. The overall modernization of the citywide signal system should include features that enable better active and real-time management of the system during events and special situations.

Recommendation A.2: Improve the existing loading zone program.

DDOT should improve the existing loading zone program using a variety of strategies which may include:

- *Color-designated loading zones to reinforce parking prohibitions and restrictions*
- *Expanded morning parking restrictions to 10:00 a.m. to improve accommodation for couriers and deliveries of perishable goods*

and delivery at off-peak times, minimize congestion, and increase curbside efficiency.

Recommendation A.6: Provide comprehensive truck route signage.

DDOT should implement a comprehensive signage program that easily identifies designated truck routes and minimizes illegal truck traffic. Signs should be easy to recognize, graphically consistent, and follow standards established in the **Manual on Uniform Traffic Control Devices** (MUTCD). Signs should be located at key decision points in the truck route network and have a standard placement to improve way finding for drivers.

Recommendation A.7: Review roadway design guidelines related to commercial motor vehicles.

DDOT's **Design and Engineering Manual** should be reviewed and/or revised to improve information related to bridge, roadway, and intersection design criteria and standards for major truck routes. Consideration also should be given to guidelines related to requirements based on truck traffic as a percentage of overall traffic on a roadway or bridge.

Recommendation A.8: Implement geometric adjustments for key freight route intersections.

DDOT's **District of Columbia Freight Plan** (2014) identified the following truck route intersections as difficult for trucks to travel:

- New York Avenue and Florida Avenue NE
- Georgia Avenue and Missouri Avenue NW
- Edwin Street and Montana Avenue NE
- K Street NW, L Street, I Street, Wisconsin Avenue, and Connecticut Avenue NW
- Numerous intersections in Georgetown
- Numerous intersections in Adams Morgan
- Traffic circles with insufficient approach and circulating lane widths such as Georgia Avenue, Thomas Circle, and Washington Circle

Physical or operational improvements at these intersections could increase the efficiency of freight movements in the District. Multimodal safety should be maintained with any intersection or roadway adjustments.

Recommendation A.9: Conduct a GPS-based pilot study of truck movements in the District.

Data scarcity is one of the most critical challenges for understanding truck freight vehicle activities in urban areas. Truck GPS can be used to gather information such as travel time, speed, delay and stop locations. Typically, this involves installing portable GPS devices in volunteer trucks. DDOT should work with the trucking industry to pilot a project for GPS-based truck movement data collection.

Recommendation A.10: Develop a freight village/intermodal facility.

To consolidate freight deliveries destined for the city, the District should consider working with the freight industry to develop a freight village, also known as an integrated logistics center or urban consolidation center. A potentially viable location for such a facility would be near the intersection of New York Avenue and Bladensburg Road NE.

Recommendation A.11: Implement truck corridor improvement projects.

DDOT should implement physical and operational improvements on high-demand truck routes to better manage traffic congestion and improve efficiency of freight movement. One type of freight corridor improvement project could convert the curb lanes into exclusive lanes for trucks, buses, and high-occupancy passenger vehicles during non-peak periods, retaining high-occupancy vehicle and bus operations only during peaks. Another type of freight corridor improvement could permit trucks to share use of exclusive bus lanes, where bus frequencies and truck volumes are compatible. Potential freight improvement corridor projects, which should be coordinated with other multimodal investments, are shown in **Figure F.3**.

Recommendation A.12: Upgrade existing I-295 southbound weight scale to automated enforcement.

Currently, the District conducts fixed site weight enforcement on southbound I-295. DDOT should upgrade the scale to an automated enforcement model as described by FHWA's **Smart Roadside Vision**. The **Smart Roadside Vision** is an emerging concept linking safety, security, and mobility building blocks into coordinated and comprehensive roadside programs. This improved integration and data sharing has the potential to

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Freight Management

COMMERCIAL VEHICLE OPERATIONS



The District Department of Transportation's mission is to ensure efficient and safe mobility of commercial vehicles traveling in the District of Columbia while mitigating community impacts and preserving transportation infrastructure. Commercial vehicles are essential to the District of Columbia, providing goods and services to thousands of District residents and businesses every day. The city's diverse mixture of land uses, dense urban environment, and extensive transportation infrastructure require a distinct set of rules

HELPFUL LINKS »
DC Driving 101
 Before driving around the District, read this [list of driving tips and road rules](#).

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increase effectiveness of all contributing programs and reduce implementation costs for all participating stakeholders by coordinating roadside enforcement operations.

Recommendation A.13: Develop a Collection/Delivery Point network.

A Collection/Delivery Point (CDP) network consists of designated, attended locations where packages can be delivered or picked up by a carrier. DDOT should work with other District agencies to identify and eliminate barriers to creating a CDP network.

Locker banks are unattended delivery points, where carriers leave packages. Customers are responsible for retrieving packages from the CDP or locker bank. These delivery strategies achieve economic benefits for carriers through the consolidation of parcel deliveries and the elimination of failed deliveries. This strategy also has the potential to improve environmental

sustainability of parcel delivery through reductions in vehicle miles traveled.

Recommendation A.14: Study the possibility of freight transportation via rail transit.

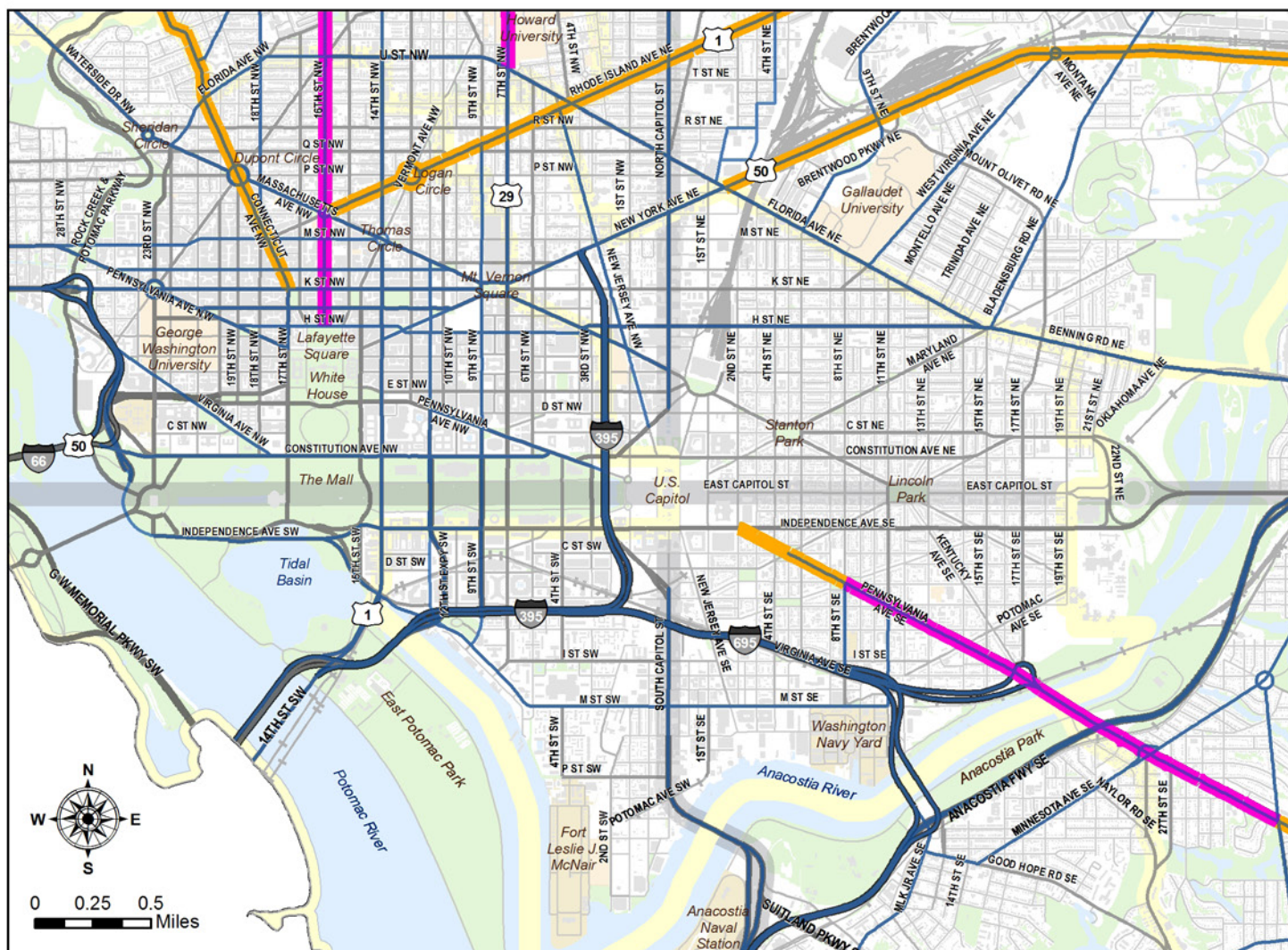
Metro-freight is the use of urban rail systems that coordinate with the freight network. DDOT should work with partner agencies, like the Washington Metropolitan Area Transit Authority (WMATA), Virginia Railway Express (VRE), and Maryland Area Regional Commuter (MARC), to study the feasibility of metro-freight in the District and the region. Metro-freight trains can be loaded with standard shipping containers at commercial loading facilities and then travel into the city to make deliveries to distribution centers or freight depots. From distribution centers, deliveries are made via small delivery vehicles or bicycles.

FIGURE F.3 – PROPOSED TRUCK IMPROVEMENT CORRIDOR PROJECTS

This figure shows corridors that are identified for truck improvement corridor projects by the **2014 District of Columbia Freight Plan** and the **moveDC** process. The **Freight Plan** recommends five corridors for potential truck improvements and four corridors for shared use of dedicated transit lanes.

Legend

	Quadrant Boundary		Existing Infrastructure		Truck Improvement Corridor Projects
	Ward Boundary		Railroad		Truck Only
	Water		Road		Shared Transit & Truck
	Park		Primary Freight Route		
	University				
	Military				
	Monumental Core				





B. POLICIES

Recommendation B.1: Preserve key citywide freight routes.

DDOT should work to preserve key citywide freight routes as defined in **Figure F.1**. Freight preservation can include improvements for other modes in the freight route, so long as other modes are accommodated in dedicated facilities such as transit-only lanes, protected bicycle facilities, and wide sidewalks.

Recommendation B.2: Encourage off-peak deliveries.

In the short-term, the District is planning to conduct a pilot program for off-peak deliveries (7:00 p.m. to 6:00 a.m.) to assess its impact on traffic congestion and delays, accommodation of parking for commercial vehicles, and impact on delivery travel times. The pilot program may entail monetary incentives and coordination with Advisory Neighborhood Commissions (ANCs).

Recommendation B.3: Support last-mile delivery/pick-up using bicycles.

The District should support bicycle freight operations by District businesses. Bicycle freight delivery can contribute significant benefits to the transportation system and improve livability. Last-mile delivery by bicycle can reduce the volume of trucks, vans, and other vehicles in areas such as the Central Employment Area, helping to reduce traffic congestion, improve air quality, and reduce noise.

Recommendation B.4: Preserve existing maritime freight infrastructure.

DDOT should participate in the preservation of existing Anacostia River and associated Potomac River navigation channel and dock access for the delivery by tug/barge of petroleum products and stone, sand, and gravel. DDOT should work with other District agencies to avoid encroachments related to waterfront development into berthing locations or navigation channels in rivers.

Recommendation B.5: Prioritize investments that improve integrated express service.

DDOT should prioritize investments that improve integrated express service to reduce overall truck demand. Integrated express operators (also known as couriers) move the customer's goods door-to-door, providing shipment collection and transport via truck and then by aircraft. Integrated express carriers commonly operate vans and trucks, mainly on arterial roadways, providing pickup and delivery of high value, lightweight, and time-sensitive commodities. Examples of investments that improve integrated express service include:

- *Providing defined freight zones on streets in office districts and retail centers within the city to allow for ample box truck and van parking*
- *Improving truck mobility on arterial roadways and expressways frequented by integrated express carriers*

Recommendation B.6: Support preservation and enhancement of rail throughput in the District of Columbia.

The District of Columbia is a major gateway for rail freight moving through the Mid-Atlantic region, but it is not a major generator of rail freight. The District should be a good steward of the portion of the regional freight rail network that is within its borders by supporting feasible rail system capacity expansion efforts. DDOT should work with Maryland, Virginia, and I-95 Corridor Coalition states to help assure that East Coast rail lines can be improved to permit greater use of freight rail.

Recommendation B.7: Improve truck movement data collection and forecasting.

DDOT should increase data collection related to truck operations and goods movement to improve understanding of freight operations. Examples of additional data collection efforts could include:

- *Requesting mobile phone based travel time and speed data that may be made available by FHWA*
- *Conducting surveys of shippers, carriers, and receivers to understand freight movement freight decision making with respect to choice of mode, routes, and time of day of goods movements*



"Do your part to be safe."

Our Mission
The Federal Motor Carrier Safety Administration (FMCSA) is focused on reducing crashes, injuries, and fatalities involving large trucks and buses.

AS A PROFESSIONAL DRIVER, you may have millions of miles of safe driving experience. Often you may think you are sharing the road with drivers who seem to have no driving experience at all.

In too many cases you may be right! Many commercial vehicle crashes occur due to errors in judgment by passenger car drivers operating around large trucks and buses. Unfortunately, when these crashes occur, they reflect poorly on the motor carrier industry, regardless of who caused the collision. We're counting on you to improve the situation by developing good safety practices.

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www.sharetheroadsafely.gov

Stakeholder safety and education campaigns

In addition, DDOT should support the Metropolitan Washington Council of Governments (MWCOC) in the development of a trip-based freight model, which would provide more detailed information about truck trip patterns, as well as impacts to District and the region.

Recommendation B.8: Develop a statewide rail plan.

DDOT should develop and regularly update a statewide rail plan that integrates planning for freight and passenger rail in the District. The plan should comprehensively consider rail infrastructure, operations, and safety.

C. EDUCATION AND ENFORCEMENT

Recommendation C.1: Improve outreach and technologies for integrating route and real-time information to freight carriers.

DDOT should work with commercial GPS providers and map companies to incorporate District truck route information into GPS devices. At the same time, DDOT should ensure up-to-date truck route information online is available for use in commercial GPS applications.

Recommendation C.2: Develop a dynamic truck routing web application.

DDOT should develop a dynamic truck routing application based on real-time traffic conditions. Dynamic routing systems route vehicles to their shortest-path destination, based on up-to-date speed and delay conditions. The application could be tied to DDOT's existing interactive online Truck and Bus Map, which provides information on truck and bus through routes and restrictions, loading zones, drop-off/pick-up locations, and tour bus parking.

Recommendation C.3: Establish a DDOT Freight Advisory Committee.

DDOT should establish a Freight Advisory Committee to facilitate a forum for freight-related topics and to advise on freight-related priorities, issues, projects, and funding needs. The committee should consist of a diverse group of freight stakeholders and would benefit both the freight industry and the District by providing a structured method for information exchange. It also could serve as a resource for sharing data and proposing future studies.

Recommendation C.4: Conduct periodic truck freight stakeholder surveys.

In coordination with MWCOG, Maryland, Virginia, and/or other freight system operators, DDOT should gather input from truck freight stakeholders through comprehensive periodic surveys (every 2 to 3 years) to identify bottleneck locations, parking concerns, and physical factors and conditions that may constrain the safe operation of commercial vehicles.

Recommendation C.5: Expand freight safety and education campaigns.

There is a need for a broad-based public understanding of the hazards associated with trucks, passenger vehicles, pedestrians, and bicycles circulating in dense urban areas. The District should take advantage of the resources provided by the Federal Motor Carrier Safety Administration (FMCSA) to help better educate both the public and freight stakeholders on these issues.

IV. Performance

Freight recommendations are designed to maintain an adequate level of mobility and accommodate population and employment growth in the District by increasing the efficiency, safety, condition, and performance of the freight network. The recommendations, developed through the *District of Columbia Freight Plan* (2014), include investments in infrastructure, advancements in technology, and increased intermodal coordination. Effective management of freight throughout the District will improve the travel and daily lives of residents, visitors, and businesses.

The **moveDC** plan's goals (described in **Chapter 1**) were used in the evaluation of the **Freight Element**'s performance, similar to other elements. The project's spatial analysis model, and qualitative reviews were used to develop the metrics for each performance measure relevant to the **Freight Element**. The **Freight Element**'s overall performance—by relevant goal category—is summarized in **Table F.1**.

Table F.1: moveDC Freight Element Performance

Goal	Metric	Performance
Sustainability & Health	Increase non-auto mode split	• <i>Not applicable for this element</i>
	Increase access to parks and green space	• <i>Not applicable for this element</i>
	Encourage active transportation for health benefits	• <i>Not applicable for this element</i>
	Reduce air and water quality impacts of transportation	• <i>Reducing freight congestion will reduce the amount of idling, emissions, and noise from freight carriers</i>
	Prepare the transportation system for changing environmental and climatological conditions	• <i>Not applicable for this element</i>
Citywide Accessibility & Mobility	Increase the person-carrying capacity of the transportation system	• <i>Not applicable for this element</i>
	Improve system reliability	• <i>Create infrastructure and policies that enhance the movement of goods and improve efficiency such as technology advancements (GPS tracking, dynamic web truck routing, and WIM sensors)</i>
	Reduce financial barriers to the lowest-income transportation system users	• <i>Not applicable for this element</i>
	Accommodate the movement and management of freight and goods	• <i>Support alternative freight movement strategies including off-peak deliveries, increased use of transit and waterways, and centralized delivery locations</i>
	Integrate the District's transportation system with the region's transportation network	• <i>Consider the preservation of primary freight routes a critical factor when determining the locations of new dedicated transit and bike facilities within existing streets</i>

Table F.1: moveDC Freight Element Performance (continued)

Goal	Metric	Performance
Neighborhood Accessibility & Connectivity	Increase the coverage of all modal networks throughout the District	• Not applicable for this element
	Increase the number of transportation choices for travel between city neighborhoods	• Not applicable for this element
	Increase transportation availability to population centers and jobs, schools, amenities, and services	• Not applicable for this element
	Increase transportation availability to economically challenged or targeted redevelopment areas	• Not applicable for this element
Safety & Security	Improve safety for all users	• Perform outreach to citizens to promote sharing the road safely with freight vehicles
	Improve redundancy of transportation networks to handle emergencies	• Not applicable for this element
	Expand sidewalk network	• Not applicable for this element
	Maintain ability to evacuate District in case of emergency	• Not applicable for this element
	Preserve key functions without impacting the transportation system	• Establish a freight village or a system of collection/delivery points to reduce the amount of local deliveries, minimizing potential conflicts for all users
Public Space	Protect and enhance important corridors and urban landscapes	• Not applicable for this element
	Make streets functional, beautiful, and walkable	• Reduce the time and number of trucks occupying the District's curbspace through strategies including a dynamic truck pricing and reservations system and improvement of the loading zone program. These efforts will preserve the curbspace for other modes, especially bicycles
	Increase tree coverage	• Not applicable for this element
Preservation	Maximize reliability for all District transportation infrastructure by investing in maintenance and asset management	• Policies and programs to decrease the vehicle-miles traveled for commercial vehicles on District roadways. These include consolidation of freight delivery locations through freight villages, centralized drop-off locations, and the potential for increased maritime freight • Continued inspection of bridges in the District; significant investment will be required to implement and maintain recommendations from major initiatives such as the Long Bridge Study and the Maryland Avenue SW Plan

V. Vision to Reality

moveDC is a long-term plan for a reason—achieving its full vision will require decades of investment and continued commitment from city leaders and support from innumerable local and regional partners. The return on the city's investment of time and funds spent implementing the **moveDC** plan's recommendations will be creating stronger, more vital neighborhoods; sharing prosperity among all of the city's residents; meeting our responsibility to the environment; and making the District more competitive among its domestic and global peers.

This section provides guidance for prioritizing and implementing **Freight Element** infrastructure recommendations. Additional information on implementation can be found in **Chapter 5** of the **moveDC** plan.

A. USING THIS ELEMENT

The **Freight Element** is a starting point for investments in the freight system for the District in the next 25 years. It presents needed and realistic freight network investments and policy concepts that, together, support **moveDC**'s other **Modal Elements** in achieving the goals established as a part of the planning process.

moveDC does not present specific and final freight system design solutions, nor has **moveDC** analyzed all of the freight project-level tradeoffs for individual components of the **moveDC** plan. The **Freight Element** of **moveDC** will need to be updated periodically to take into account the many changes the future will bring that cannot be anticipated today. The need for updates is the recognition that some things always change in a city as dynamic as Washington, D.C.

Finally, some recommendations of **moveDC**, as with the 1997 *Transportation Plan for the District of Columbia*, may not become reality. Regular updates to the **Freight Element** in coordination with the overall **moveDC** plan will help ensure the **Freight Element** continues to make sense in the context of changing demands on the system.

B. PROJECT DEVELOPMENT PROCESS

Some of the freight infrastructure recommendations included in the **moveDC** plan are already in the design process or ready for construction; however, the vast majority of the **moveDC** plan's

recommendations will need to undergo additional evaluation and further development—consistent with established city processes prior to their implementation.

The DDOT *Environmental Policy and Process Manual, 2nd Edition* (2012) further describes the Project Development Process. The additional evaluation and development processes are likely to adjust the character, location, and other elements of some recommendations. This is a natural evolution of long-range plan identified recommendations as they move toward implementation.

C. IMPLEMENTATION THROUGH PARTNERSHIP

While the implementation of most capital infrastructure recommendations will be led by DDOT, some are likely to occur through partnership among DDOT and other agencies or organizations, or with DDOT providing support to other agencies or organizations.

D. INFRASTRUCTURE COSTS

Planning-level costs for identified **Freight Element** infrastructure recommendations were not available. Because of the nature of long-range planning, all costs should be evaluated in future project development activities.

Programs

In the context of implementation for **moveDC**, the term “program” is used to describe ongoing funding commitments for operations, education, maintenance, regular infrastructure improvements that are not defined as projects, or other items, such as debt service on Grant Anticipation Revenue Vehicle (GARVEE) bonds. Freight program costs are estimated to be \$7 million. Additional information on costs for programs are presented in **Chapter 5**.

Asset Management

Costs within this area of the **moveDC** plan include ongoing assessments, maintenance, and repairs of transportation infrastructure. Costs for freight infrastructure are assumed to be captured by the vehicular network and are presented in **Chapter 5**.

E. BUDGETING PROCESS

moveDC was developed in a fiscally unconstrained environment, but DDOT recognizes that it operates in an environment constrained by available funding. While the financial plan in **Chapter 5** identifies new sources of revenue to help close the cost/revenue gap, an annual gap is likely to remain throughout the **moveDC** plan's implementation horizon.

Because of this fiscal reality, **moveDC** developed a methodology for prioritizing recommendations that can assist in the process of making annual budget decisions. This approach is described in **Chapter 5**. From a broad prioritization perspective, DDOT should take the following approach:

- *Fund basic state of good repair (SOGR) and maintenance for existing programs*
- *Allocate additional resources that accelerate the pace of reaching SOGR for all infrastructure*

- *Fund critical transportation infrastructure investments to address deficiencies, safety, or capacity needs*

Critical investments in transportation infrastructure have been prioritized in the **moveDC** plan, but many will still need to go through DDOT's Project Development Process prior to implementation. DDOT should only seek to advance investments that have the most merit to meet **moveDC**'s goals.

It should be noted that capital programs and asset management—both of which are related to ensuring safe and reliable operations and adequate maintenance of existing system assets—were not prioritized. The level at which each of these are funded is established through normal annual District budget processes.

Table F.2: Tier 1 Freight Corridor Capital Investments

Name of Facility	From	To	Length (miles)	Ward(s)	DDOT Role	TIP Project	Cost (\$ Millions)
16TH ST NW	H ST NW	MARYLAND LINE	6.4	1, 2, 4	LEAD	NO	NOT AVAILABLE
NEW YORK AVE NE	FLORIDA AVE NE	MARYLAND LINE	3.6	5, 6, 7	LEAD	NO	NOT AVAILABLE
PENNSYLVANIA AVE SE	6TH ST SE	BRANCH AVE SE	2.1	6, 7, 8	LEAD	NO	NOT AVAILABLE

Table F.3: Tier 2 Freight Corridor Capital Investments

Name of Facility	From	To	Length (miles)	Ward(s)	DDOT Role	TIP Project	Cost (\$ Millions)
CONNECTICUT AVE NW	K ST NW	MARYLAND LINE	4.9	1,2,3	LEAD	NO	NOT AVAILABLE
PENNSYLVANIA AVE SE	BRANCH AVE SE	MARYLAND LINE	0.8	7	LEAD	NO	NOT AVAILABLE
RHODE ISLAND AVE NE	REED ST NE	MARYLAND LINE	1.9	5	LEAD	NO	NOT AVAILABLE

F. PRIORITIZATION PROCESS

moveDC capital improvements were prioritized based on an understanding of community and stakeholder support, of existing commitments, and that goals of ensuring transportation investments are distributed across the District in the service of current and future residents. They also were prioritized based on criteria developed for each of the **moveDC** plan's goals. Cost was not a criterion used in prioritization, but will need to be a factor in individual budget decisions.

Individual capital investment recommendations were measured within each criterion and then processed into four tiers within project groupings (generally by transportation mode). The tiers were then used to rank and organize priorities. Generally, investments within Tier 1 are assumed to be the highest priorities for implementation, whereas those in Tier 4 projects are lower priorities, relative to projects within their group. It is worth noting that in many cases, Tier 1 recommendations—due

to size, scale, cost, and complexity—cannot be immediately constructed and will require investment in refinement, definition, and development through DDOT's Project Development Process. Similarly, most recommendations in other tiers are likely to require some level of proactive investment in further development prior to them becoming the District's highest implementation priorities.

G. OUTCOMES

The full results of the prioritization process for the **Freight Element** are shown by tier in **Tables F.2** through **F.5** and **Figure F.4**. In addition to each infrastructure recommendation's rating (tier), **Tables F.2** through **F.5** describe project limits, identify potential implementation responsibility, and provide a planning-level cost estimate, where it is possible to prepare a planning-level cost estimate based on information currently available.

Table F.4: Tier 3 Freight Corridor Capital Investment

Name of Facility	From	To	Length (miles)	Ward(s)	DDOT Role	TIP Project	Cost (\$ Millions)
PENNSYLVANIA AVE SE	2ND ST SE	6TH ST SE	0.5	6	LEAD	NO	NOT AVAILABLE

Table F.5: Tier 4 Freight Corridor Capital Investments

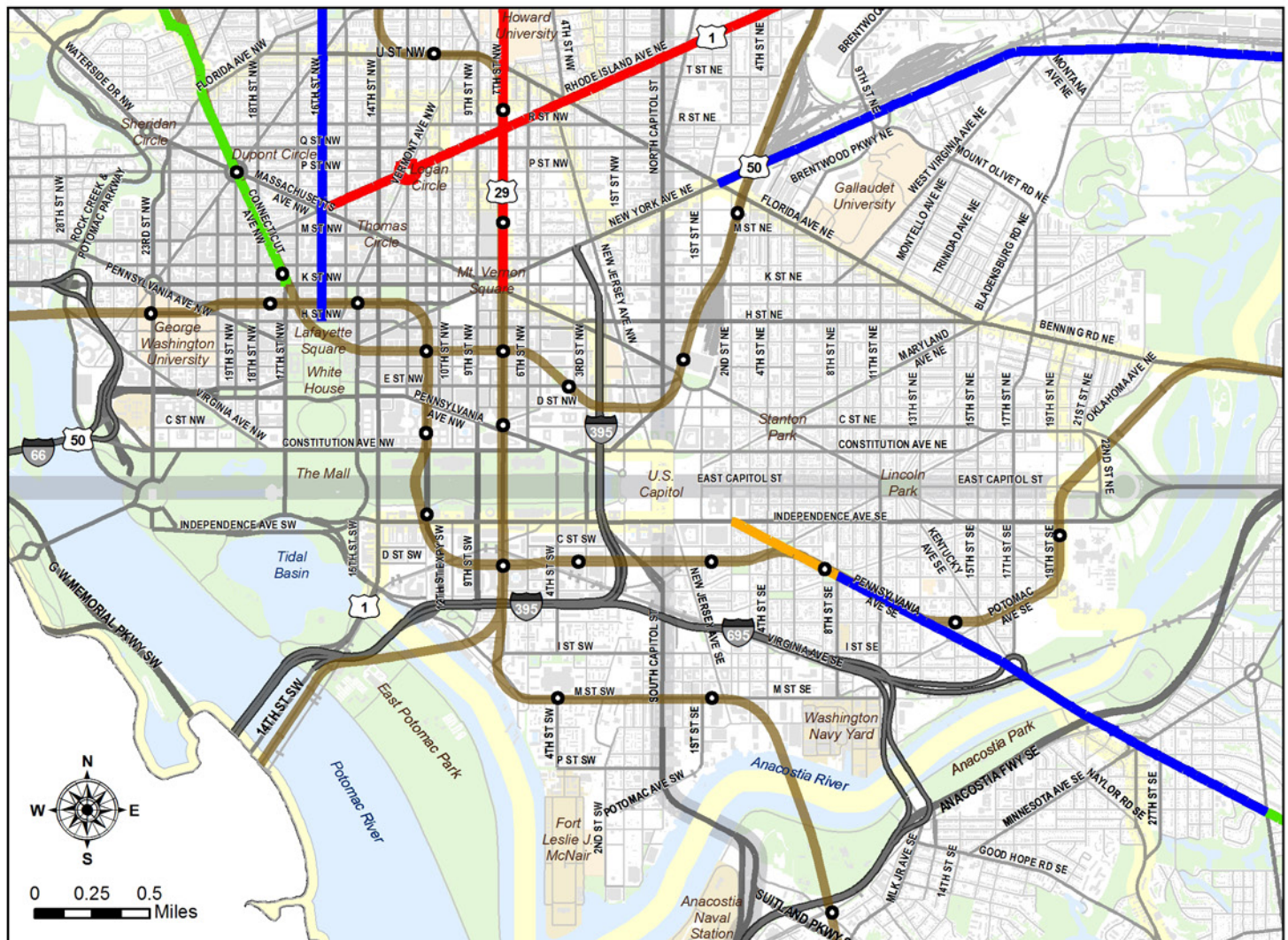
Name of Facility	From	To	Length (miles)	Ward(s)	DDOT Role	TIP Project	Cost (\$ Millions)
7TH STREET/GEORGIA AVE NW	MASSACHUSETTS AVE NW	BARRY PL NW	1.3	1, 2, 6	LEAD	NO	NOT AVAILABLE
RHODE ISLAND AVE	SCOTT CIRCLE NW	REED ST NE	2.7	1, 2, 5, 6	LEAD	NO	NOT AVAILABLE

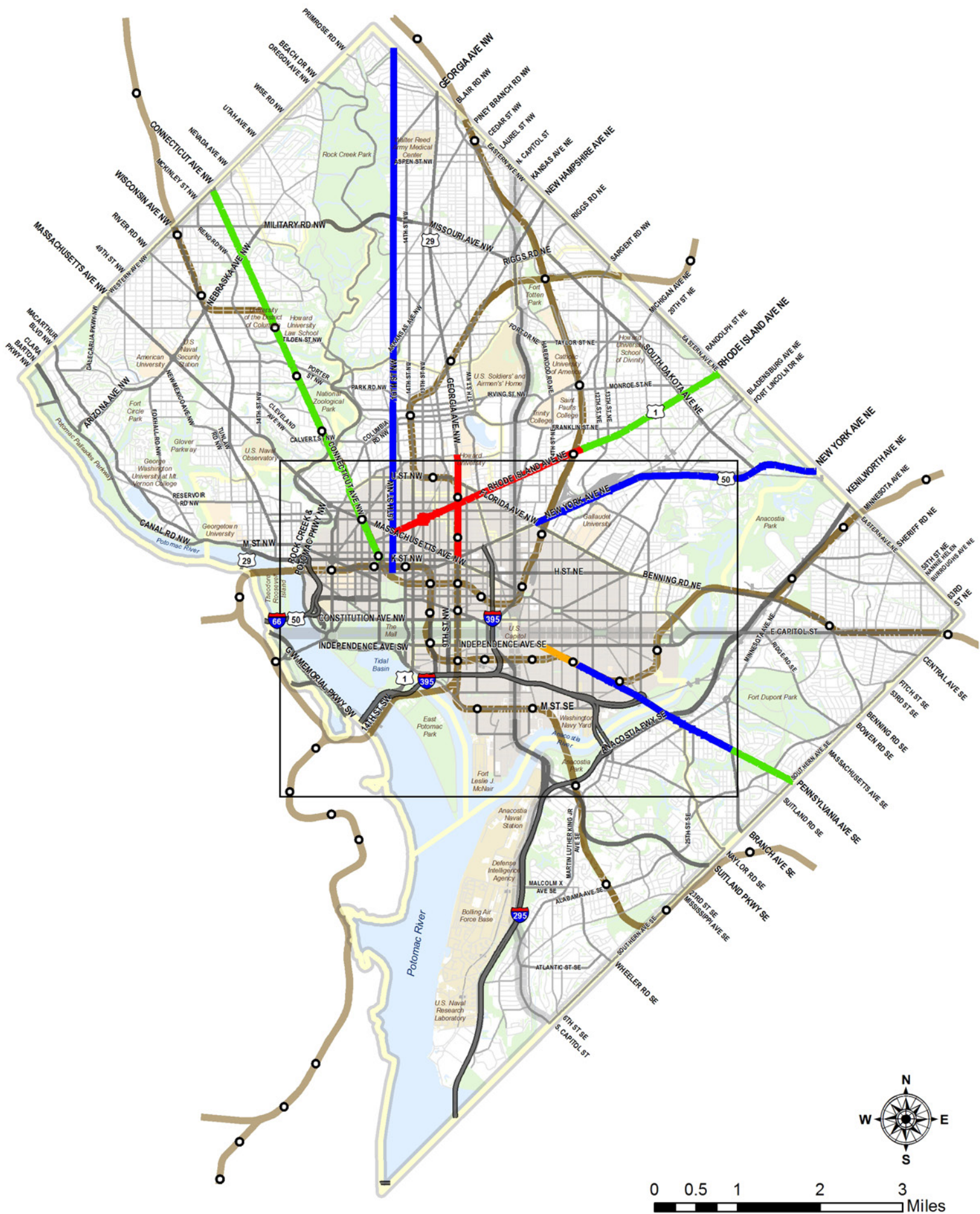
FIGURE F.4 – FREIGHT CORRIDOR INVESTMENT PRIORITIES

This figure shows freight corridor investment recommendations by tier.

Legend

Quadrant Boundary	Existing Infrastructure	Freight Improvement Corridor Tier
Ward Boundary	Metrorail Station	1
Water	Metrorail Line	2
Park	Railroad	3
University	Road	4
Military		
Monumental Core		





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The District of Columbia's
Multimodal Long-Range Transportation Plan



Transportation Demand Management Element





Your #1 resource for transportation
getting into and around the District

WAYS TO GET AROUND

TOOLS FOR GETTING AROUND

Stay Informed!

Sign up for goDCgo's
newsletter for the
latest in transit and
commuting news



WAYS TO GET AROUND

Find information and links on regional buses, DC Circulator and Metrobus and Metrorail, as well as, information on biking and walking in the city and much more!



TOOLS FOR GETTING AROUND

Plan your trip through Metro's Trip Planner. Use the Carbon Calculator to see how much carbon you emit, or use our Interactive Map to find your way around DC by way of biking, bus, metro and more!

COMMUNITY

goDCgo's Community
Employer Se
organization
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commuter b



Transportation Demand Management

I. Optimizing Transportation Investments

Transportation Demand Management (TDM) is not a mode, but an overarching approach critical to the successful movement of people and goods in the District. TDM is an approach to influence travel behavior by mode, frequency, time, route, or trip length to balance demand across all components of the transportation network, maximizing the efficiency of the system and improving mobility for all users.

A balanced transportation system is critical to effect meaningful travel behavior change and encourage the widespread use of all modes. For people to make the choices that allow the system to be balanced, they need to know what the many travel options are, how they work, how to use them, and the benefits each option offers. The shift toward multimodalism requires education, encouragement, and, often, incentives—a level of information and support that helps travelers view all options as equally rational and desirable as driving. TDM actively nurtures a sustainable city that embraces a diverse menu of multimodal travel options as a way of life.

TDM programs within Washington, D.C. and throughout the wider region include promotion of walking, biking, mass transit, carpooling, vanpooling, telecommuting, and other options that reduce the demand for vehicular travel, lessen congestion and air pollution, and improve accessibility. Through education and outreach, all users in the region benefit. With nearly 75% of the District's workers coming in from outside the city each day, roughly 2 of 3 vehicles on District streets originating outside of the city, and projections of ongoing growth in residents, jobs, and visitors, proactive TDM programs will shape the future of the District and the region.

The focus of TDM is to maximize the use of the city's transportation investments, increasing the financial efficiency of the systems and reducing the cost to the city's residents and businesses. In return, by lowering the financial burden, TDM enables the growth realized through additional economic development to be met by an effective transportation network.

II. Existing Conditions

The District uses TDM to maximize the efficiency of its transportation system through policies, incentives, and disincentives that shift user demand to different modes and times of day.

A. CORE FACTS

The District provides a variety of TDM resources for employees, residents, visitors, and area employers. This enables each user group to tailor a TDM approach to their lifestyle and/or work style. The two most prominent web portals providing TDM resources are DDOT's **goDCgo** program and website and the Metropolitan Washington Council of Governments (MWCOC) **Commuter Connections** program and website.

goDCgo

The **goDCgo** program is responsible for promoting the use of all sustainable transportation modes in the District through a coordinated outreach effort. **goDCgo** provides information on how employers can implement the following TDM programs:

- *Air Quality Action Days*
- *Alternative work schedules*
- *Best Workplaces for Commuters*
- *Biking and walking*
- *Carsharing*
- *Carpool and vanpool*
- *Customized marketing*
- *Guaranteed Ride Home*
- *Tax benefits*
- *Telework*

In 2013, **goDCgo** employer services staff worked with more than 136 local area employers to implement TDM programs and increase the number of businesses participating in their Transportation Program. The Transportation Program ranks businesses on levels ranging from Bronze (Level 1) to Platinum (Level 4), as shown in **Figure TDM.1**. In 2013, **goDCgo** recruited 11 new businesses in Levels 1 through Levels 4. One of the new businesses attained Gold (Level 3) status by offering transit benefits, increasing Level 3 participation to 524 businesses. Four new businesses reached Platinum (Level 4) status, resulting in a total of 83 Level 4 businesses.

goDCgo has extended beyond the District's employee population and has developed a university and a residential TDM program. These two new programs target the populations at District universities and District residents.

Through its efforts, **goDCgo** eliminates approximately 31,000 daily vehicle trips, 490,000 vehicle miles traveled, and 18,000 gallons of gas. That equates to a savings of roughly \$70,000 a day for Washington area commuters.¹

Commuter Connections

Through its **Commuter Connections** website, MWCOG has integrated D.C. area commuter transportation services and offers a thorough TDM information and services resource. **Commuter Connections** provides a comprehensive resource for commuters in the Washington, D.C. area including:

- Promotion of telework programs and other pollution reduction activities
- Use of geographic information system software to match commuters for ridesharing
- Operating a Guaranteed Ride Home program
- Vanpool and carpool incentives

Commuter Connections integrates commute services with educational web tools, such as the Commute Cost Calculator for calculating the costs of single-occupant vehicle (SOV) commuting tailored to individual commuters.

¹ goDCgo. (2012). "Annual Report (goDCgo, March 2011 - February 2012)." p.4-5. Retrieved April 22, 2013, www.godcgo.com/Portals/0/Content%20Images/goDCgo_YearEndReport2011interactive.pdf

Notes on This Element

- Data used and referenced throughout this element was current as of December 2013, unless otherwise noted.
- Recommendations cited in this element will require further development as outlined in **Chapter 5**.
- Policies in this element are in addition to or augment current DDOT policies identified in the DDOT Policy Compendium.

Carsharing

The District supports a carsharing system operated by private companies that provides access to shared vehicles for residents and visitors. Carsharing began in Washington, D.C. in 2001 when two private companies began operations in the region. In October 2005, DDOT implemented the first phase of curbside carsharing with the installation of 48 curbside parking spaces distributed throughout the city. In March 2006, DDOT added 38 curbside parking spaces in the second phase. Carshare companies operate in these on-street spaces located throughout the District as well as having carshare vehicles available in private space. These vehicles have specific "home" locations around the city and are referred to as "traditional" carsharing.

In March 2012, DDOT issued a permit to operate a new carshare service with free-floating vehicle fleets with one-way rentals. This is referred to as "point-to-point" car sharing. This system was launched with a fleet of 200 vehicles and currently operates a fleet of 450.

DDOT charges all carshare operators with vehicles parked in public space—either through the traditional or point-to-point programs—an annual permit fee of \$2,890/vehicle. There are more than 1,000 carshare vehicles in the District, counting both public and private spaces.

Figure TDM.1: goDCgo Employer Transportation Program Levels

Transportation Program Levels

Strategies for building a comprehensive transportation benefits program

PLATINUM – Level 4

(Implement two or more of the Level 2 & 3 strategies and actively promote programs)

GOLD – Level 3

(Implements at least one of the following in addition to two or more Level 2 strategies):

- ☐ Provide transit/vanpool benefits, SmartBenefits or a parking 'cash out' program
- ☐ Provide a carpool/bicycle/walk financial benefit
- ☐ Implement a Telework program (20%+ employee participation)
- ☐ Implement compressed work weeks (20%+ employee participation)
- ☐ Provide free or reduced fee parking for carpools and vanpools
- ☐ Implement a parking fee (for previously free parking)
- ☐ Provide employee shuttle service to transit stations
- ☐ Provide employee vanpools for commuting

SILVER – Level 2

(Implements two or more of the following):

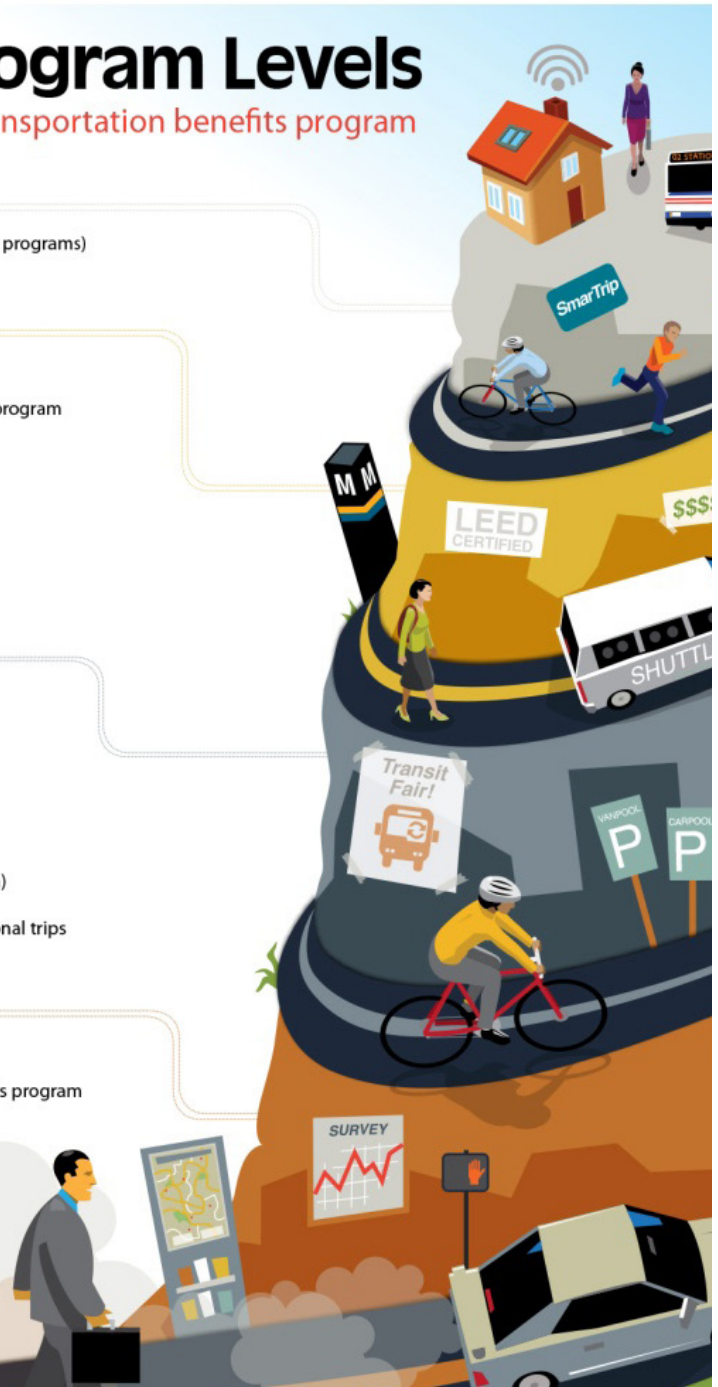
- ☐ Set up a permanent transportation information display
- ☐ Install bike racks, lockers and showers
- ☐ Host a transportation fair
- ☐ Support internal carpool/vanpool formation
- ☐ Provide preferential parking for carpools and vanpools
- ☐ Implement flex-time or staggered work schedules
- ☐ Implement a Telework program (1% – 20% employee participation)
- ☐ Implement compressed work weeks (1% – 20% employee participation)
- ☐ Promote Commuter Connections regional ridesharing program
- ☐ Supplement Guaranteed Ride Home program with payment for additional trips

BRONZE – Level 1

- ☐ Conduct a commuter survey
- ☐ Distribute commuter information to all new hires and employees
- ☐ Express interest in transit benefits, Telework or other commuter benefits program
- ☐ Post commute information on intranet, bulletin boards, etc.



www.goDCgo.com
Info@goDCgo.com
Contact Tarryn Lee
at 202.299.2186 for more info





DDOT's TDM efforts include supporting carsharing and bikesharing

Bikesharing

In September 2010, Washington, D.C. and Arlington County, VA, launched Capital Bikeshare (CaBi). Now the second largest system in the U.S., CaBi has grown to more than 400,000 members using 300 stations with 3,000 bikes in four jurisdictions including Alexandria, VA, and Montgomery County, MD. An additional 50 stations will be installed in the District in 2014. After 3 years, more than 6 million CaBi trips have been taken, with a high of nearly 300,000 monthly trips in August 2013. With CaBi, patrons can rent bicycles from stations across the District and nearby jurisdictions and return them to any station near their destination. With any annual CaBi membership, the first 30 minutes of each trip are free.

DDOT currently partners with **Bank on D.C.** to encourage community members to participate in the benefits of bikesharing. All **Bank on D.C.** account holders are eligible for a discounted CaBi annual membership of \$50.

Taxis, Black Cars, and Private Sedan Services

Approximately 6,000 taxis are licensed in the District, each of which is operated as a vehicle for hire for passenger transportation. Taxis can offer prearranged trips or be flagged down as they travel through the District. Black cars provide digitally dispatched trips through smart-phone applications, but do not provide street-hailed service. Private sedan services connect members of the public who need a ride with members of the public who will drive for payment. These systems are generally organized via a web or mobile application-based ride reservation system.

In January 2014, the District's Taxicab Commission published a report on public vehicles for hire, including both ridesharing (not for-hire services) and private sedan services (with a recommendation to determine a separate name for these services).² The report highlighted the need for the District to address concerns about liability insurance, risks of non-professional drivers, and other issues.

Slug Lines

In addition to formal carsharing programs, the Washington region is home to an informal ridesharing practice. Solo car commuters pick up riders to be able to use high-occupancy vehicle (HOV) lanes. The District has more than 25 informal ridesharing locations and several thousand participants daily.

B. OPPORTUNITIES FOR IMPROVEMENT

While the District has implemented many successful transportation demand management initiatives, there are opportunities to improve:

- **TDM can help the District achieve its transportation goals.** The District has established goals to achieve a 75% non-SOV mode share target, to maintain vehicles miles and trips within 5% of 2013 levels, and to shift 10% of peak hour

² Government of The District of Columbia Taxicab Commission, Report of The Panel on Industry Findings and Recommendations on "Ridesharing," January 24, 2014

trips to non-peak hours. The District should continue to provide substantial opportunities to engage residents, employees, and visitors in TDM initiatives and programs to use all elements of the District's growing transportation network.

- **Incorporate TDM into future developments.** The next significant opportunity is to incorporate TDM practices within new developments to provide TDM resources for all residents and employees. TDM measures are currently not required for new developments. Instead, DDOT recommends TDM measures for projects that require Zoning Commission or Board of Zoning Adjustment approval; the Commission or Board includes the TDM measures into Zoning Orders on an individual basis. This approach does not maximize TDM opportunities or provide a process for consistently applying TDM analyses, nor does it apply TDM expectations specific to the anticipated traffic impacts of various types and scales of proposed development.
- **Dedicate funding for TDM initiatives.** TDM is achieved through research, programs, and implementation techniques. While the direct benefit is often unrecognized by the public, TDM returns high yields in both trip reductions and cost efficiency of the overall transportation system. To accomplish this, the District will need a consistent resource commitment to TDM initiatives. A dedicated investment would result in reliable, long-term TDM programs, which would return significant financial, environmental, and quality-of-life benefits.

III. Recommendations

The District's TDM program should be the day-to-day playbook for transportation initiatives that:

- Maximize the efficiency of the transportation network
- Accommodate all demand for trips throughout the District

This section provides three types of recommendations—for TDM programs, policies, and education and support programs.

What is Mode Share?

Mode share is the percentage of travelers (or trips) that use a specific transportation option—for example, 42% of District work commute trips are made by public transportation and 35% by driving alone (modes shares of 42% and 35%, respectively) compared to 5% by public transportation and 76% by driving alone nationwide.¹

¹ American Community Survey 2012

A. PROGRAMS

Recommendation A.1: Improve multimodal travel reliability and reduce congestion through area and corridor management strategies.

As the District continues to grow, managing vehicle access on key corridors and to key destinations through price or minimum vehicle occupancy will be an important approach to providing reliable access to activity centers. The District's congested entry routes, including freeways and bridges as well as the Central Employment Area, are areas to explore occupancy and pricing as ways to manage congestion, as referenced in Recommendation A.5.

Lane management typically uses price and/or occupancy requirements to manage vehicular demand in designated lanes or on roadway facilities. Typically, HOVs and transit vehicles are permitted to use managed facilities at a discounted rate or for free. More localized demand can be managed via performance parking approaches, as discussed in the [Parking and Curbside Management Element](#) (Recommendation A.1) and the *DDOT Curbside Management Study*.

In addition to corridor-specific pricing and vehicle occupancy strategies, area pricing and vehicle occupancy strategies should be considered. The best known examples of area pricing are based on a cordon area and typically involve center cities and

the places and times of day with the highest concentrations of travel demand. Cordon pricing requires investment in vehicle detection and payment collection technology prior to it taking effect.

A cordon area in the District could be implemented for weekday trips into the Central Employment Area at a rate approximately equivalent to a round-trip peak period Metrorail fare. Revenues from the zone should be dedicated to operations and maintenance of the managed facility (or area) and toward projects that expand the person-moving capacity of the transportation system, including those providing greater access to the priced areas or corridors.

The aforementioned approaches to managing demand also would help to manage the reliability and accessibility of goods movement and delivery in the District. In addition, they would help to improve the District's air quality by reducing the amount of delay per vehicle throughout the transportation network.

Recommendation A.2: Partner with local community organizations to reduce financial barriers to transportation.

The Bank on D.C.-DDOT Partnership that provides discounted CaBi membership directly addresses concerns about residents unable to participate in CaBi due to lack of a credit card or the cost of membership. This program should be expanded in low-income neighborhoods by working with additional local businesses and community groups. The District also should pursue programs to expand access to carsharing programs and reduce cost burdens of the public transportation system.

Pricing and management of these bulk fares are typically organized by the service providers and not a local government, though some local government policies have committed public agencies to participate in these programs. Circulator and CaBi offer bulk fare purchase options today; this program should be expanded to include all D.C. transit agencies.

Recommendation A.3: Provide incentives and subsidies to support TDM practices.

Incentives and subsidies are important considerations in making all transportation options appealing. The incentives are a way to reward people who help to reduce traffic congestion and clean the air, but also are a necessary means of introducing travel

options to travelers unfamiliar with options beyond personal automobile travel. Participants can earn cash, promotional, or prize incentives for their use of non-SOV modes. These incentives accumulate each day travel is not completed by SOV, similar to the concept of "prize tickets" at amusement park games or mileage programs on domestic airlines. Points can then be applied to a select set of items, gift certificates, cash, or even time off of work. According to the lessons learned from programs across the country, points are as valuable as cash for motivating people to try something new and maintaining a regular, repeat customer base.

Recommendation A.4: No special farecard should be needed to pay for District transportation services (WMATA, Circulator, CaBi, commuter rail, carshare, parking).

Paying for transportation in the District should be simple for everyone, regardless of their transit trip. A passenger on any transit mode should be able to use a bank-issued payment card, credit card, ID card, or mobile phone to pay their fare. Implementing this recommendation would be a shift from making every traveler use a common fare payment and therefore would require new technology and infrastructure for most of the District's existing transportation network.

DDOT is working with other transit agencies in the Washington region to test and install the next generation fare collection system for the region. New Electronic Payment Program (NEPP) is an advanced transit fare collection and validation system built on open architecture. The region will migrate from the existing proprietary SmarTrip system to NEPP in the near future.

Recommendation A.5: Expand opportunities for organizations to purchase bulk transit fare media.

One common approach in TDM is the use of bulk purchases of transit passes, farecards, and other fare media for organizations. This allows an individual end user to pay a lower price for transit fares—even beyond any discounts realized by purchasing passes over individual fares—further increasing employee incentive to use transit as an option instead of driving. This also provides the transit agencies with up-front funds at a lower marginal cost than individual fares paid on the day of travel. The District should offer bulk fare media purchases to organizations with larger population bases, including large



A mobile commuter store, like this one in Arlington County, can bring multimodal travel information to the traveler

Expanding goDCgo Programming

DDOT's **goDCgo** TDM program could be expanded based on the model of Arlington County Community Services (ACCS). ACCS works with Arlington businesses, property managers, and hotel managers who work with their respective employees, tenants, and guests to advance travel options. ACCS also provides public information and education to end-users via countywide information campaigns, commuter websites, direct mail, and at bus stops and commuter retail stores. While these are separate initiatives, they work together to facilitate traveler awareness, appreciation, and selection of non-drive-alone modes for travel to and within the county.

Visible initiatives of ACCS include Arlington's Commuter Store, Mobile Commuter Store, and CommuterDirect.com. Each of these outlets provide one-stop shopping for Metrorail/Metrobus, Virginia Railway Express (VRE), Maryland Area Regional Commuter (MARC), Circulator, Arlington Transit (ART), and Alexandria Transit Company's DASH bus fares.

At Commuter Stores and the Mobile Commuter Store, ACCS staff members assist people in multimodal travel planning. CommuterDirect.com allows travelers to purchase transit tickets and passes online and have them delivered to their home or office. CommuterDirect.com account holders can set up renewable orders to automatically receive the tickets and passes they need for their commutes.



CaBi station in Adams Morgan

employers, universities, and large conventions and tourist events. This program also should include CaBi purchases and corporate memberships.

Recommendation A.6: Expand the District's Commuter Services program.

The District should expand **goDCgo** to a more extensive commuter services program that provides information and services that educate system users on existing transportation services and provides customized trip planning solutions. The program could facilitate delivery of transit fare media and travel incentives, such as transit fare discounts to residents, employees, and employers. Additionally, the program could open and staff a Commuter Store to provide a physical presence and face-to-face service in addition to online material.

Recommendation A.7: Dedicate District funding for long-term TDM benefits.

The District should continue and increase dedicated funding for TDM in future budgets. While the country has allocated the majority of its transportation funds to roadways, Washington D.C. also has invested in other modes by funding transit, pedestrian ways, and bikeways, and can most fully realize the benefits of those investments via TDM.

B. POLICIES

TDM services and programs need to be supported by policies. The following policies are recommended. Policies that apply to multiple modes are repeated in the other **Modal Elements** of the **moveDC** plan.

Recommendation B.1: Incorporate TDM programs in all development projects that impact the District's right-of-way.

The District should ensure TDM programs are provided for all development projects that impact the District's right-of-way. This would establish TDM as an important element for site and transportation access, with different quantities and types of TDM programming for different development intensities and in context with the transportation options available within any given neighborhood.

TDM programs do not need to be onerous; however, all developments have a role to play in reinforcing the District's commitment to vehicle trip reduction. There are design-based TDM measures that all developments can provide without requiring ongoing investment or operation. These include:

“Car-Lite” Living Case Study: Seattle

An example of an incentive program to support car-lite living is Seattle's **Way to Go, Seattle One-Less-Car Pilot Program**. This program offers families financial incentives and information to help them reduce automobile use, try other transportation options, and rethink the way they use their cars for commuting and errands or entertainment. The program quantitatively shows people that they can save money and simplify their lives by not owning a second or third, or even first, car.

Families participate in a short-term program (3 to 4 weeks), where they sign a contract to not use their “extra” car and keep a diary of their transit behavior and choices. In exchange, they receive a financial incentive equal to the amount of money the average second car costs to own and operate (including registration and insurance, maintenance, gas, and parking costs). This is the same amount of money they would have in their pocket if they didn't own that second car.

Upon completion of the pilot program, each family can measure the value of owning multiple cars against the money saved within that month.

- *Leaving space and providing WiFi in lobbies for information and connections to taxi/transit/ridesharing services*
- *Ensuring that designs reflect **moveDC** pedestrian and bicycle plans*
- *Ensuring adequate pedestrian and bicycle facilities under current codes as well as any anticipated requirements above and beyond the master plan*
- *Provide bikeshare/carshare facilities on site for use by the public*
- *Orienting development to the street and allowing for a clear path from the front door to transit facilities*
- *Managing parking in a way that reflects the urban nature of the District*
- *Participation in neighborhood programs/promotions*

Efforts could be as simple as acknowledging receipt of an information packet describing the District's multiple transportation programs when a building permit is approved (the person obtaining the permit would be responsible for supplying the materials to the building occupants). These and

other low- or no-cost options are items that all developments, regardless of size, could incorporate.

Recommendation B.2: Support DC law requiring employers with 20 or more employees to provide access to pre-tax non-auto transportation benefits.

Across the United States, many municipalities promote pre-payment of fare media for individual users where bulk transfers are not economically feasible or where there is not sufficient interest. The District requires employers of a certain size to offer non-auto transportation benefits through payroll deductions that are exempted from tax liability. This, in conjunction with TDM requirements in development review, should be explored as a way to actively reduce the number of drive-alone trips that new District developments generate.

Recommendation B.3: Require employers to provide a transportation allowance so employees base travel decisions based on their own priorities.

Employees could be provided a monthly stipend directly by their employers for use in offsetting commute travel expenses including transit passes, vanpool fees, parking passes, or

other expenses associated with carpooling, bicycling, and walking to work. The District should require employers to charge employees to park and property owners to unbundle the cost of parking from leases. Any surplus funds could be “cashed-out” by the employee or resident.

Recommendation B.4: Develop policies and incentives to “car-lite” living.

DDOT should investigate the feasibility of financial incentives for car-free living, including tax incentives, as households without a vehicle place fewer demands on the city’s roadway and curbspace networks, generate fewer environmental emissions, and generate less opportunity for crashes. The District should further support car-lite living by continuing to dedicate on-street parking spaces for carsharing vehicles and continuing to allow carsharing vehicles to use curbspace throughout the city.

Recommendation B.5: Coordinate with MWCOG to further regionwide TDM initiatives to reduce solo automobile trips into the District.

As almost 3 of 4 of the District’s workers live in other jurisdictions, and 2 of 3 vehicles being driven on District streets originate outside of the city, it is critical to work throughout the region to reduce auto demand within the District. The District should support regionwide TDM programs to reduce auto demand on District streets. As the regional transportation planning organization, MWCOG should lead these efforts with strong support from Washington, D.C. A first step in this effort could be to set a regionwide commute mode share target, so all regionwide municipalities can have a common goal to strive to attain. The District should work with MWCOG to institute a regionwide effort to implement adopted TDM policies, ensure regional coordination and consistency, and increase public awareness of transportation issues and options.

C. EDUCATION AND SUPPORT

Recommendation C.1: District government buildings should serve as a model for TDM efforts and compliance.

The best way to support the District’s TDM initiatives is to incorporate them into District operations. As a major tenant throughout the city, the District can help many buildings expand their TDM programs. DDOT will work with all District agencies to determine existing TDM programming available in buildings

where District staff are located, propose options for expanding TDM options in those buildings, and develop a model TDM program for when District departments move to new buildings.

Recommendation C.2: Encourage employers to support and utilize the public transit services.

Throughout the District, many employers provide shuttles for their employees. While these shuttles provide a valuable transit service, the private shuttle routes often duplicate public transit routes but restrict who can ride. This results in lower passenger efficiency per vehicle and increased congestion on the roadway. To improve roadway operations and simplify travel for all transit riders, the District should encourage employers to consolidate services and leverage funding to help improve the public transit system.

Recommendation C.3: Implement *TravelSmart* and individualized marketing to target transportation demand.

TravelSmart is an innovative way to encourage environmentally friendly ways to travel. The concept, used in more than 300 projects around the world, identifies individuals who want to change the way they travel and uses personal, individualized contact to motivate them to think about their travel options. *TravelSmart* provides customized information and training to help people take transit, bike, walk, or carpool for some of their trips. *TravelSmart* gives participants just the information they ask for to help them get started, or to keep on walking, biking, taking transit, or carpooling. Those who don’t want information are left alone.

TravelSmart includes a four-step program:

1. **Before Survey.** Initial survey to determine how household members currently travel.
2. **Individualized Marketing.** Personalized contact for those who expressed an interest in traveling using environmentally friendly modes. Those people who are not interested are left alone.
3. **After Survey.** One year after the initial survey, a random survey is conducted to measure changes in travel behavior.
4. **In-Depth Study.** Home interview with selected households determining the potential for travel behavior change. Interview aimed at collecting

information on the reasons behind their mode choice. Assessment of whether non-SOV mode actually could have been a viable option to the car. If there is a viable option, personalized information and assistance about traveling provided, including the option for a personal home visit from a "Travel Ambassador".

Implementation of the **TravelSmart** program in Portland, Oregon, resulted in a 44% increase in transit trips, plus additional increases in walking and biking trips. **goDCgo**'s extensive TDM information and staff support provide an ideal establishment for implementation of a **TravelSmart** program.

Recommendation C.4: Document transportation conditions in a commute report.

MWCOG's **State of the Commute** annual report provides valuable data on the travel patterns throughout the region. DDOT should offer additional funding for MWCOG to collect data for an expanded survey sample of District residents. This data will become the basis to determine whether District initiatives are effectively influencing travel characteristics, and can be analyzed for consistent patterns of place, time, and purpose of journey.

Recommendation C.5: Encourage data collection and sharing with private sector partners to monitor travel pattern and TDM effectiveness.

Districtwide travel data is valuable, but can be difficult to use to determine the effectiveness of specific TDM program. To learn what TDM programs work best, site-specific surveying is needed. As part of requiring TDM for all developments per Recommendation B.1, each development should also be encouraged to conduct an annual survey that asks residents and/or employees about their travel patterns, which TDM programs they use, and what additional programs they would use if provided. This data could be provided to DDOT for aggregation and analysis to benchmark TDM performance at the site-level and citywide.

Recommendation C.6: Encourage developers to adopt alternative transportation-related credits related to green building certification.

Green building certification represents an opportunity for nationwide TDM guidance. Leadership in Energy and Environmental Design (LEED) provides nationwide guidance while the District of Columbia's **D.C. Green Construction Code** provides local guidance.

The 2014 **D.C. Green Construction Code** demonstrates the city's commitment to being a leader in sustainability. Under the code, construction projects have several alternatives to satisfy green requirements including LEED Certification.

LEED certification is a green building program for which projects satisfy prerequisites to earn points toward different levels of certification. Fourteen points currently fall under the category of "sustainable sites," four of which are assigned to alternative transportation: public transportation access, bicycle storage and changing rooms, alternative fuel vehicles, and parking capacity and carpooling. DDOT and the District Office of Planning should encourage developers to seek the full alternative transportation credit for developments in suitable locations. LEED certification includes inspection after one year of occupancy to verify that programs are adopted.

Recommendation C.7: Support ways legislation to allow private funding to complement public investments.

Public-private partnerships (PPPs or P3s) are an increasingly popular method of financing major infrastructure projects. The combination of funding from public and private sectors can significantly expand government agencies' purchasing power for projects. DDOT should support District efforts to allow funding mechanisms like these partnerships so that public investment in public projects can be parlayed with private funds to increase the total funding available. P3s can range from coordinated operations and marketing, as with the D.C. Circulator, to design-build partnerships that include financial arrangements to accelerate project delivery.

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The District of Columbia's
Multimodal Long-Range Transportation Plan



Parking and Curbside Management Element



October 2014



District Department of Transportation





A dynamic city like Washington, D.C. has to make parking efficient and reliable to manage all transportation needs

Parking and Curbside Management

I. Managing a Shared Resource

Curbside parking occupies some of the most valuable public real estate within any thriving city. Managed well, parking can be a tremendous benefit to the transportation system, helping to make the system efficient, highly accessible, and functional; however, there are trade-offs between the fixed quantity of curbside space and the ability to meet the many different demands for that space.

Parking demand varies by time of day, day of week, and even season, and is generated by residents, employees, and visitors seeking a place to store their vehicles while accessing their homes, jobs, and other places of interest. In 2012, 81% of District households reportedly had zero or one vehicles, which limits parking demand and provides an opportunity for management to meet this local demand. At the same time, almost 3 out of 4 of the District's workers come from other jurisdictions, and 2 of 3 vehicles being driven on District streets originated outside of the city.¹ Daily drivers and recreational visitors seeking the lowest-priced parking contribute to congestion downtown by circulating to find an open on-street parking space.

Parking and curbside management must balance multiple competing needs, especially in the District's densest neighborhoods. Curbside space is used to accommodate loading and unloading, general parking, residential parking, visitor parking, bicycles, **Americans with Disabilities Act** (ADA) accessible parking, commercial parking, valet parking, vending, and motorcycle and motorscooter parking. Many transportation modes in the District depend on some level of curbside accommodation to function effectively, including buses, bikes, and taxis. The city uses parking enforcement and infrastructure, including parking meters and signage, to manage curbside space and strike a balance in preserving residential access, promoting and facilitating commerce, and ensuring safety among all transportation users.

A proactively managed parking supply offers the opportunity for users to drive if and when they choose, while balancing that decision against other available trip options such as walking, biking, and transit. Effective management of the parking supply—commonly using time and pricing mechanisms—encourages drivers to park for only as long as needed, increasing parking availability for other users.

Management of the District's curbside and parking resources is essential for achieving the city's wider transportation, land use, and economic development goals. Parking availability is a key contributor to the financial health of commercial corridors and parking management is a key tool for managing congestion, growing transit ridership, and balancing transportation demand. The **moveDC** plan will help manage demand through two approaches:

- *Using parking management techniques so that curbs are available for parking, loading, or vehicle movements based on local land use and travel patterns*
- *Creating a complete transportation network with many choices for every trip to minimize the demand for private vehicles and vehicle storage*

¹ U.S. Census Bureau's Longitudinal-Employer Household Dynamics (LEHD) Program



With managed parking, there is a better balance of transportation options available to all users

Notes on This Element

- Data used and referenced throughout this element was current as of December 2013, unless otherwise noted.
- Recommendations cited in this element will require further development as outlined in **Chapter 5**.
- Policies in this element are in addition to or augment current DDOT policies identified in the DDOT Policy Compendium.
- Additional detail about this topic can be found in DDOT's Curbside Management Study

II. Existing Conditions

Like roadways, transit service, sidewalks, and other transportation facilities, public parking is an infrastructure investment in one of the critical links between transportation and land use. DDOT manages and regulates public curbside parking assets in the District of Columbia (aside from those under the authority of the federal government). This includes approximately 18,000 metered parking spaces across the District and all of the public curbside parking in the city's residential neighborhoods.

In addition to vehicle storage, curbside space is dedicated to:

- Different transportation modes (vehicular travel lanes, transit lanes, and transit stops)
- Taxi stands
- Non-auto storage (bike corrals)
- Commercial vehicle loading
- Vehicle staging (including for tour buses accessing the District's historic sites)
- Mobile vendors
- Other uses

Given the high demand for curbside access, especially in the District's commercial corridors, DDOT has established several strategic management programs, including innovative pilot programs designed to provide consistent and equitable access to parking resources for the city's residents, workers, and visitors. These programs exist to achieve the following primary goals set forth in the 2013 **DDOT Parking Action Agenda**:

- Preserve access to residential areas for the use of residents
- Promote and facilitate commerce by prioritizing customer and commercial vehicle access in commercial areas
- Ensure the safety of all transportation users including pedestrians, cyclists, transit users, and motorists

A. CORE FACTS

The District has more than 400,000 parking spaces. **Figure PKG.1** shows the most prominent curbside uses. In the District:

What is a Smart Meter?

DDOT's smart parking meters are single- and multi-space meters that are solar powered (to work regardless of weather conditions) and offer two-way communication to immediately alert DDOT of any malfunctions, as well as capture parking data that the agency can use in its performance parking program. The face of the machine features a digital display that provides the user with transaction information, including the time of day, amount of time purchased, and expiration time. These meters accept coins and bank card transactions.



D.C.'s parking meters help manage curbside use while providing information and easy to use payment options

- About 65% of parking spaces are on-street
- About 6% of on-street spaces are metered
- Some on-street parking is on corridors with time-of-day parking restrictions. To accommodate additional vehicular traffic during peak periods, the curb lanes are converted to travel lanes, as shown in [Figure PKG.2](#)
- Residents with disabilities who live in a single-family dwelling and meet certain other requirements can apply to have an on-street parking space designated as reserved for ADA permit parking adjacent to their home
- Approximately 300 metered and 12 unmetered spaces have been designated for motorcycles and scooters
- Approximately 300 tour bus parking spaces are located at popular tourist destinations
- Tour buses also are permitted to use any available curbside space
- DDOT establishes "slug lanes" along the curb, to allow vehicles to stop and pick-up rideshare passengers in high-demand areas
- Most off-street spaces are located in privately owned and operated downtown parking garages

Many other uses also require curbside space and together generate significant demand—10,786 fire hydrants, more than 3,500 bus stops (WMATA and Circulator), 954 motorcoach-dedicated spaces, 34 taxi stands, 37 valet zones, 84 carshare locations (totaling 224 on-street spaces), 11 on-street bike corrals, 13 on-street Capital Bikeshare (CaBi) stations, 450

embassy-related parking spaces, 38 curbside hotel loading zones (plus 15 hotel lay-bys and 45 hotel-related curb cuts), 95 mobile vending sites, and six electric vehicle charging stations, in addition to building entrances and entertainment staging zones.

Metered Parking in Commercial Areas

DDOT seeks to regulate its commercial curbsides by ensuring that a percentage of spaces is available at any given time for short-term parking. This is vital for maintaining reasonable parking availability for customers of the District's retail and dining establishments. Consistent parking space availability in commercial areas also supports congestion management and improved traffic circulation.

Parking meters assist in limiting parking duration in commercial areas. The 18,000 metered spaces throughout the District are an important asset; DDOT constantly evaluates how to manage these spaces in a manner that reasonably balances the demands of motorists, business owners, residents, and other users. Several years ago, DDOT implemented a two-rate system to simplify parking rates across the city. Premium zones were designated based on higher demand conditions, and assigned a \$2.00 per hour rate. A base rate of \$0.75 per hour is in effect for all other areas outside of the premium zones and the District's Performance Parking zones.

Meter Technology

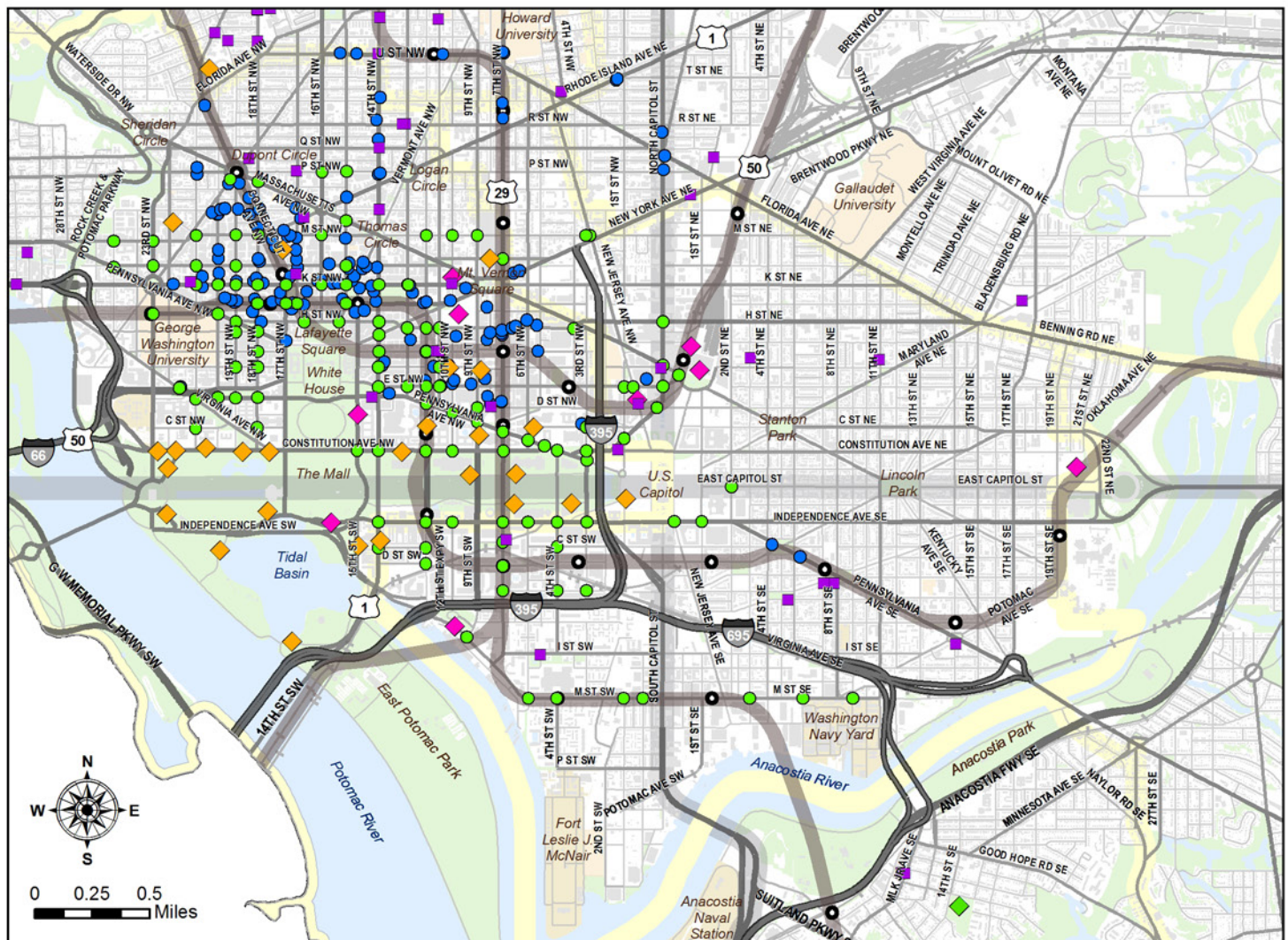
DDOT has upgraded its meter technology as part of its efforts to improve payment compliance, offer a variety of price and payment options, reduce system costs, and increase meter

FIGURE PKG.1 – CURBSIDE USES

This figure shows commercial loading zones, commuter bus stops, on-street car sharing locations, and tour bus parking and loading areas.

Legend

	Washington D.C. Boundary		Metrorail Station
	Quadrant Boundary		Metrorail Line
	Ward Boundary		Curbside Loading Zone
	Water		Commuter Bus Stop
	Park		Car Share Location (On-Street)
	University		Bus Parking (other)
	Military		Tour Bus Loading
	Monumental Core		Tour Bus Parking
	Road		
	Railroad		



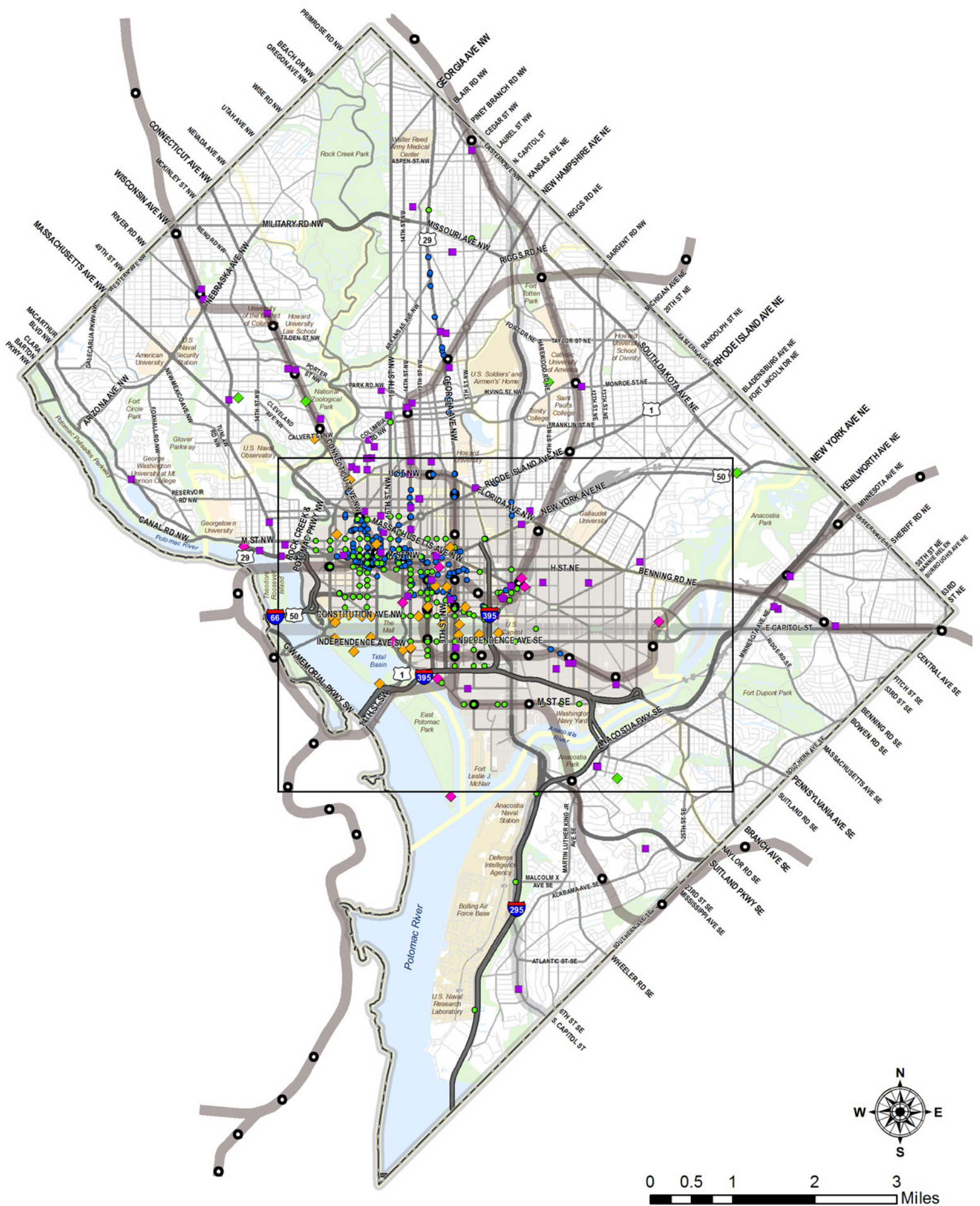
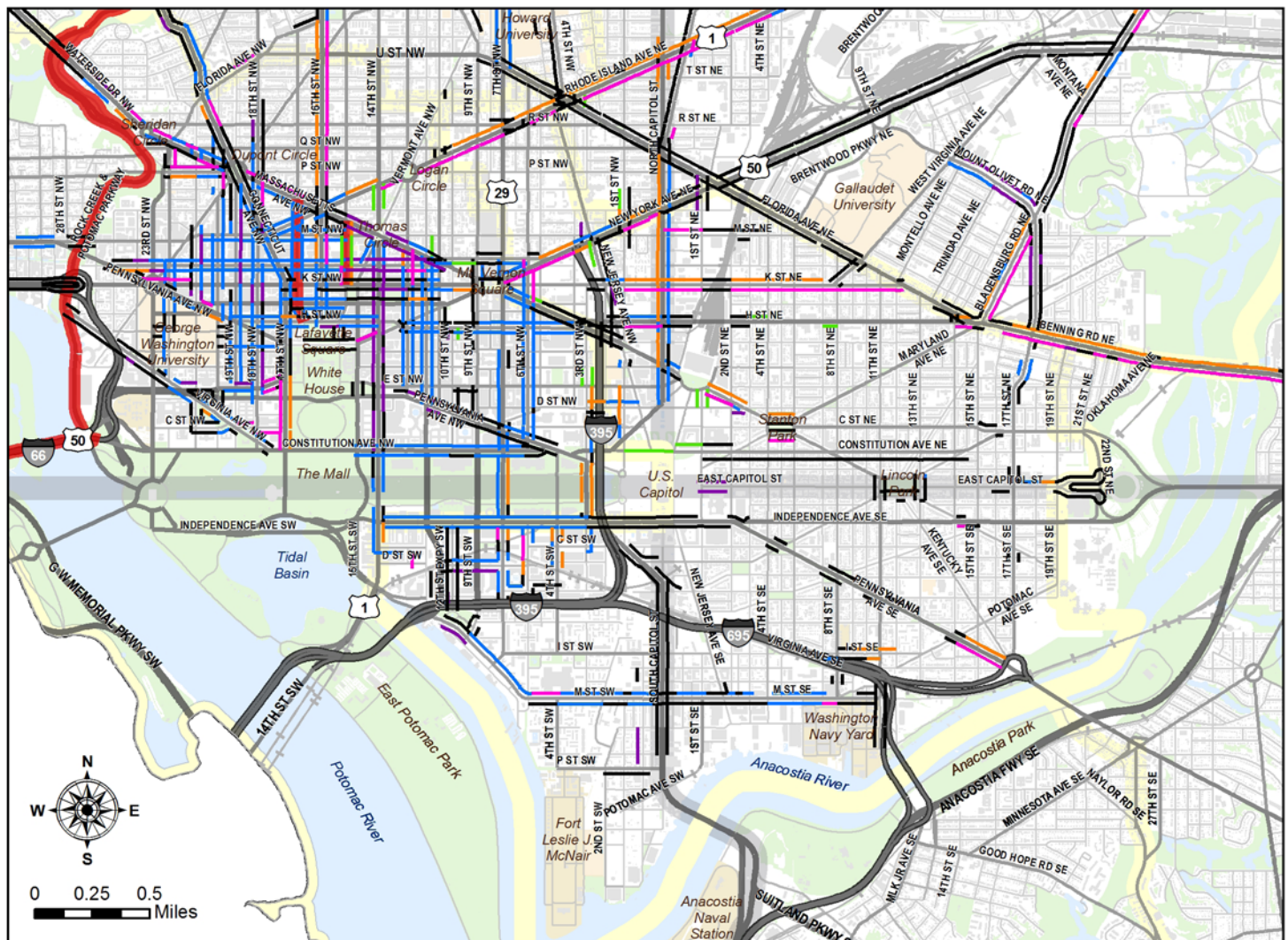
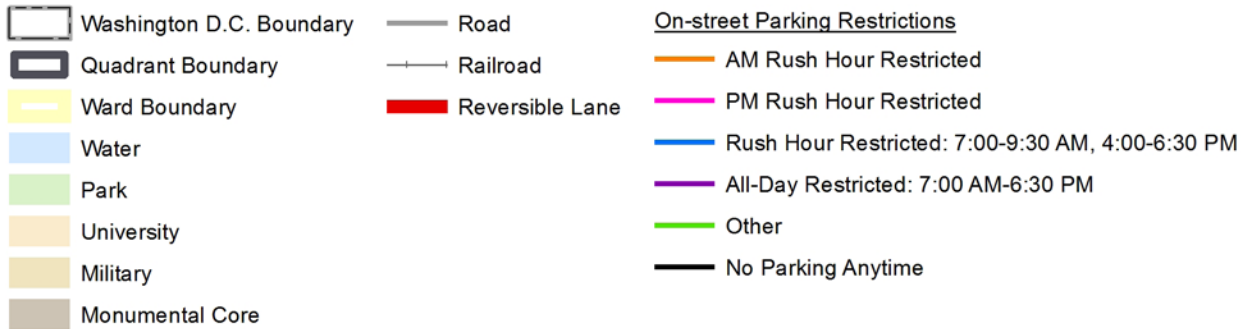
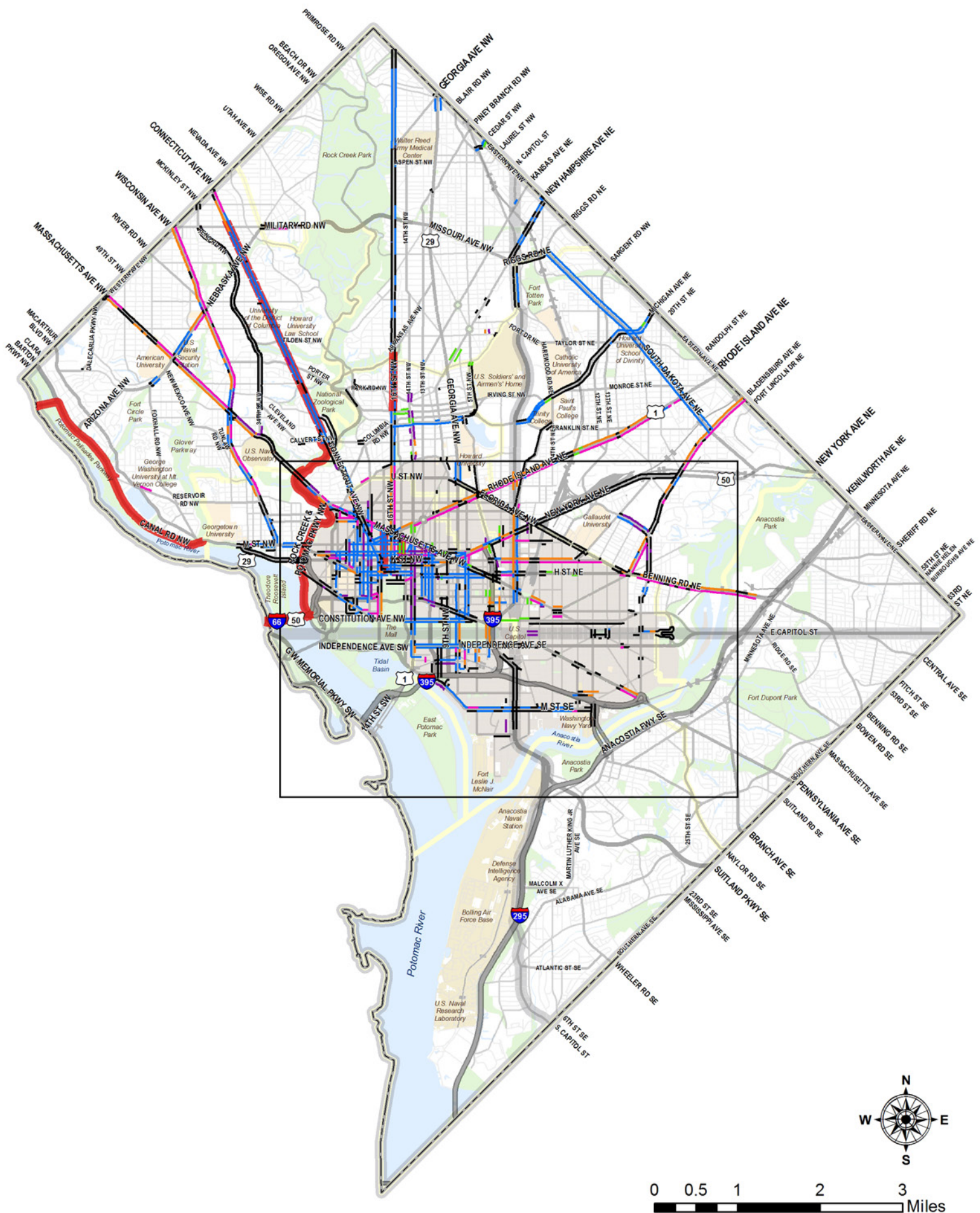


FIGURE PKG.2 – PARKING RESTRICTIONS ON MAJOR CORRIDORS

This figure illustrates existing parking regulations on major corridors and streets in the District.

Legend





reliability. Approximately 50% of D.C.'s meter inventory consists of smart (computerized rather than mechanical) meters.

In 2011, several parking meter pilot programs were implemented to assess various meter and payment technologies. Based on the results, DDOT accelerated investments in smart multi-space meters and "pay-by-phone" technologies. At present, 40% of all parking transactions are completed through pay-by-phone options which includes both a call-in system and a smartphone application.

Commercial Loading

DDOT strives to ensure that the District has adequate curbside loading capacity to meet demand, reduce loading and unloading times by encouraging more efficient use of commercial loading zone space, ensure that curbside space is allocated consistently with immediately adjacent land use, integrate commercial loading zones into the prioritization of competing uses of curbside space, and encourage the use of alternative modes of transportation to reduce curbside use conflicts. To do so, DDOT has established nearly 500 commercial loading zones throughout the District. Half of these loading zones are in commercial areas and focused along commercial corridors to serve businesses that deal in small consumer goods and perishables.

Commercial loading zones are intended for use by commercial vehicles to deliver and pick up freight merchandise or other commercial loads. In the District, a commercial vehicle (truck) is defined as any vehicle with more than three wheels that is greater than 22 feet in length, or that is used or maintained for transporting freight, merchandise, or other commercial loads or property. Commercial loading is primarily available between 9:30 a.m. and 4:30 p.m. (the period between rush hours on major corridors). Improving availability of loading zones will reduce double-parking for deliveries which impact multimodal travel and safety.

In 2014, DDOT will begin charging for commercial loading to improve turnover and availability. Annual commercial loading zone permits will cost \$325 per vehicle and allow the vehicle to park in a loading zone for no more than the maximum time indicated on the signs or parking meters. Day passes will be available for \$25.

Resident Permit Parking

Most curbside space along residential streets is regulated through the District's **Residential Parking Permit (RPP) Program**. The RPP program's goal is to ensure District residents have access to parking near their homes.

A residential parking program provides access to unlimited on-street parking to permit-holding residents of designated zones, while non-permit-holder parking is limited to 2 hours during designated RPP hours (usually 7:00 a.m. to 8:30 p.m.). Just as demand for parking varies throughout the District, the ratio of vehicles with RPPs to available curbside parking spaces varies greatly throughout the District, as shown in **Figure PKG.3**. With a low annual price for RPPs, in areas with high demand (as seen in **Figure PKG.3**), the system does not guarantee residents a curbside space will be available.

Visitor Parking Pass

DDOT's **Visitor Parking Pass (VPP) Program** offers each RPP-eligible household one unlimited use VPP that avoids the need for residents to actively procure temporary permits each time they have household guests or are expecting service providers (childcare, health aid, contractor, etc.) who need curbside parking. To implement the Fiscal Year 2014 VPP program, DDOT mailed more than 113,000 passes to households in Wards 1, 3, 4, 5 and parts of Ward 6. DDOT is exploring ways to expand the program to the remaining parts of the District within the next year.

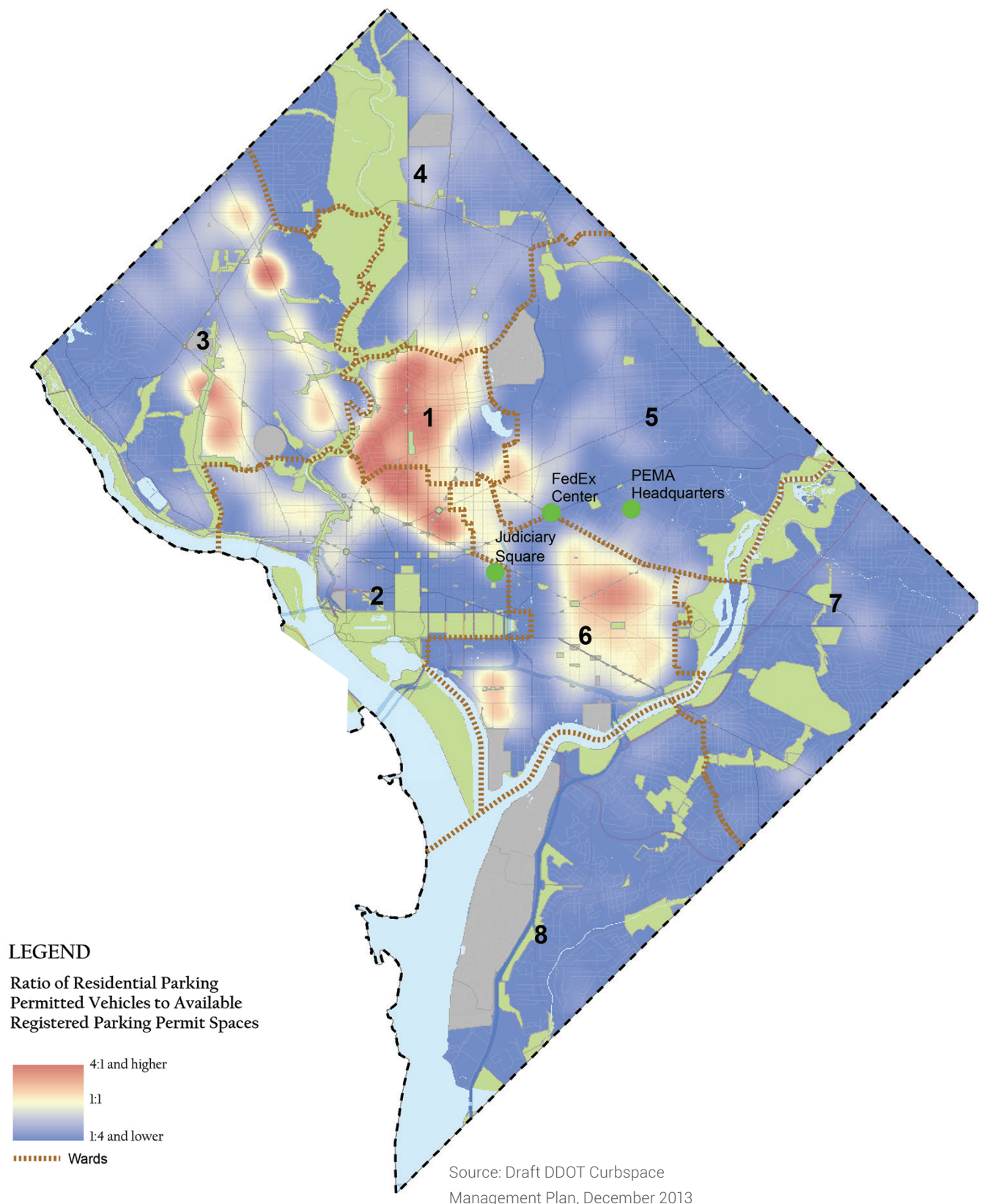
Embassy Parking

DDOT works with the U.S. Department of State to reserve curbside parking spaces for the exclusive use of foreign embassy staff. Each embassy is eligible to receive up to 60 feet of regulated space in front of their embassy, consulate, or mission.

In August 2012, DDOT inventoried all of the curbside restrictions related to embassy properties. The restrictions accommodate 456 reserved parking spaces (and 153 spaces designated as "No Parking"). DDOT is working with the State Department to identify unnecessary restrictions and to return curbside space to public use wherever possible. In addition, DDOT coordinates with relevant federal entities (including the Architect of the Capitol) for on-street parking around federal and Capitol buildings.

FIGURE PKG.3 – RESIDENTIAL PARKING DEMAND

This map shows the existing ratio of vehicles issued residential parking permits compared to available RPP designated parking spaces. The FedEx Center, Judiciary Square, and the Parking Enforcement Management Agency (PEMA) Headquarters have large numbers of registered, non-residential vehicles.



B. NOTABLE SYSTEM ACHIEVEMENTS

Performance Parking

Performance parking is a management strategy in which on-street parking rates and restrictions are adjusted based on the availability and demand of parking. DDOT actively has moved toward a price structure that links curbside rates to demand and “performance” (parking availability) to improve curbside access and traffic circulation. This market- and performance-based approach resulted in DDOT creating a premium meter rate for high demand areas and extending meter hours into evenings in areas where dining and entertainment activity is high.

DDOT’s **Performance-Based Parking Program** manages the demand for parking in order to achieve the following goals:

- **Protect resident parking.** *In areas where business or entertainment uses draw many visitors, variable curbside parking rates combined with more stringent parking restrictions on residential streets help preserve curbside parking for residents.*
- **Protect businesses.** *Performance-based rates and time limits are designed to encourage brief curbside parking with high turnover while discouraging long-term parking that is not oriented to business customers. Higher meter rates encourage visitors with long-term parking needs to use off-street parking facilities.*
- **Promote non-automotive transportation and reduce congestion.** *Higher curbside meter rates encourage walking, biking and transit use in lieu of auto travel, for those who are able to do so.*

DDOT began implementation of performance-based parking in three neighborhoods in 2008: Columbia Heights, the Capitol Hill/Ballpark District, and H Street NE. DDOT uses a variety of tools to manage the on-street parking resources in these designated pilot zones:

- Escalating or variable pricing parking meter rates
- Adjustable parking fines
- Adjusted days and hours of operation for curbside space management
- Expanded RPP plans

To support this increased focus on performance and strategic rate-setting, DDOT also has invested in innovative meter technology for monitoring, data collection, and payment.

These approaches have helped the District recognize that the key to successful parking management is to focus on availability rather than just supply. This is a lesson learned by many other cities (including New York and San Francisco), where pricing strategies encourage drivers to use a space for as long as needed, but vacate the space if not needed. As a result, the same parking supply is available to more parkers.

Loading Zone Strategies

In 2007, DDOT partnered with the Downtown DC and Golden Triangle Business Improvement Districts (BIDs) and the Department of Public Works (DPW) to develop strategies to reduce congestion in the downtown area. A primary focus of this effort was improving loading zone performance. Strategies identified for this include:

- Reallocating curbside loading through regulatory signage
- Lengthening loading zones to 100 feet wherever possible
- Introducing new technology such as real-time information
- Establishing metered loading zones
- Enhancing enforcement

DDOT has finalized regulations to begin metering commercial loading zones citywide. This program also will create a paid permit system for companies not wishing to pay for use of multiple individual commercial loading zones.

Parking Payment Technologies

The District has the largest and most successful implementation of pay-by-phone meter technology in the U.S. Approximately 40% of transactions are conducted by paying through smart phones. The **Pay-by-Phone Program** allows residents, workers, and visitors to use their mobile phones to pay for parking at all of the on-street metered spaces throughout the District, though either a phone call or use of a smart phone application (Parkmobile). This simplifies paying for parking, not even requiring a parker to stop at a meter. The data provided by the system also allows DDOT to track parking demand and adjust

meter rates in support of their parking management program. Pay-by-phone is an asset for both drivers as parking users and DDOT as parking managers.

Carshare Parking

Having long set aside curbside spaces known as "home sites" for traditional car share operations, DDOT developed new curbside access agreements in 2012 to facilitate "one-way" carsharing across the District and started providing universal parking passes for 200 vehicles. One-way carshare vehicles can park at any legal curbside space and are exempt from meter rates and time limits. An annual fee paid by the service provider to DDOT offsets lost parking revenues. Users find and reserve vehicles in real time through a website and a smart phone application. As opposed to other cities' carshare systems that require vehicles to be returned to their starting point, the District's one-way carsharing provides a user-controlled experience that is flexible on both the time and place of vehicle use anywhere across the District. This also can reduce vehicle

miles traveled per carshare vehicle; since travelers do not have to start and end at the same point, they may choose to make one segment of their trip using a different mode. Decoupling carshare rentals and return trip travel has greatly expanded the District's carsharing market. By supporting this service through strategic curbside regulations, DDOT has built upon the District's reputation for improving mobility and offering multimodal transportation options that enable residents to live car-free or car-lite in the District.

Mobile Roadway Vending in Public Space

In 2013, DDOT worked with the Department of Consumer and Regulatory Affairs (DCRA) to develop and implement regulations on where and how mobile roadway vendors (such as food trucks) can park and operate in the public space. Under this program, a total of 95 spaces in eight locations are reserved for the sole use of participating mobile vendors. These regulations and implementation brought predictability and certainty to consumers as well as the vendors.



C. OPPORTUNITIES FOR IMPROVEMENT

Parking Action Agenda

In 2012, DDOT engaged District residents at citywide meetings and through online activities to create the **2013 Parking Action Agenda**, which addresses parking management in the District. Its key initiatives to improve parking accessibility include:

- Evaluating and identifying ways to update the **RPP Program**
- Creating a new, more flexible **VPP Program**
- Enhancing parking opportunities for individuals with limited mobility through the **Red Top Meter Program**
- Improving access to and turnover of on-street parking in congested areas
- Improving communication with the public about parking challenges and opportunities
- Expanding motorcycle and motorscooter parking
- Increasing online parking services
- Clarifying agency responsibilities to enhance transparency

DDOT is working actively to integrate all of these action agenda items into a comprehensive approach to parking that provides an easy-to-use, easy-to-understand system for all users. When viewed as a whole, the initiatives establish parking as a key element of the transportation system that:

- Preserves access to residential areas for the use of residents
- Promotes and facilitates commerce by prioritizing customer and commercial vehicle access in commercial areas
- Ensures the safety of all transportation users including pedestrians, cyclists, transit users, and motorists

Dynamic Pricing Pilot for Metered Parking

DDOT will be initiating a multimodal dynamic pricing pilot in the Chinatown-Penn Quarter area in downtown D.C. Funded through an FHWA grant, this pilot will test the impacts of various curbside pricing strategies on roadway and curbside congestion. The goal of the pilot is to price the curbside such that there is one open parking space per block, reducing circling to find a parking space. The project will collect and provide

real-time information on parking availability. In addition, this pilot will evaluate the feasibility of strategies such as expanding pay-by-phone to reduce capital infrastructure costs of physical meters and collecting parking availability information through sensors or cameras.

Bicycle Parking and Motorcycle Parking

As bicycling becomes a more prominent mode throughout the District, additional bicycle parking also will be needed. DDOT will continue to seek opportunities to provide bicycle and motor-driven cycle (or motorscooter) parking, sometimes in curb lanes, with safe locking areas that do not conflict with pedestrian areas. Approaches to significantly increase the bicycle and motorscooter parking supply need to be balanced so as not to significantly impact access by other modes.

Space-efficient bicycle parking opportunities including installation of in-street bike corrals (10 bicycle parking spaces within the area of one on-street vehicle parking space), as well as converting decommissioned single-space parking meter poles into decorative bicycle racks. DDOT should also continue to emphasize the economic benefit of bicycling access and encourage developers, employers, and BIDs to install bicycle parking, especially in high-demand areas, while also listening to feedback about additional opportunities for DDOT to increase the overall supply of bicycle parking throughout the city.



Performance parking on H Street NE

III. Recommendations

DDOT currently is completing a comprehensive study of its curbside management practices, which will provide more detailed insight into potential areas of improvement while outlining an overall management approach and rationale. In addition to this study, several opportunities to improve current practices directly relate to **moveDC**'s long-term goals:

- *Ensure the safety of all transportation users including pedestrians, cyclists, transit users, and motorists*
- *Preserve access to residential area for the use of residents*
- *Promote and facilitate commerce by prioritizing customer and commercial vehicle access in commercial areas*
- *Balance competing needs for curbside uses*
- *Offer the opportunity for people to drive if and when they choose, while incentivizing drivers to park for only as long as needed so that parking is available for others*

The following outlines the **moveDC** plan's recommendations in terms of infrastructure investments, policies, and education and enforcement.

A. INFRASTRUCTURE INVESTMENTS

Recommendation A.1: Expand DDOT's Performance Parking program.

During the past decade, DDOT has linked curbside meter rates to demand for those curbs in select commercial areas. This approach helps drivers make rational decisions about how to travel and where to park. DDOT should enhance access to the District's commercial areas and other destinations by expanding the Performance parking management program (currently underway in Chinatown-Penn Quarter), based on dynamic pricing that responds to local demand for curbspace and aims to provide one open parking space per block. This also will help reduce the number of vehicles circling for parking spaces.

Recommendation A.2: Tailor parking management tools to local context.

Demand for curbside parking spaces varies based on both land uses and transportation options. The high-density



Public electric charging station at 14th and U Streets NW

downtown area should have a different approach to parking management than single-family residential neighborhoods. Parking management should ensure a curbside management framework that allows parking to support the District's overall goals while using tailored approaches. As part of this effort, curbside management should be linked to the land use and parking regulations included in the District's zoning code, so that the potential for spillover is addressed in both on- and off-street parking management.

Recommendation A.3: Implement new management and information technologies.

DDOT has been an early adopter of parking management technologies, including smart meters and pay-by-phone options. The next evolution of curbside management technology shifts the effort from managing parking to providing information about the availability and price of parking. DDOT could install real-time monitors for curbside parking spaces during all street reconstruction projects, which would transmit real-time data to DDOT's website and smart phone application. DDOT should offer private parking facility operators the opportunity to transmit availability and price from private parking facilities as part of one comprehensive parking information system.

Recommendation A.4: Collect and monitor parking utilization data.

DDOT should routinely collect parking utilization data for on-street spaces throughout the year and throughout the District. Data collected may include turnover rates, availability,

and utilization of parking by day of week or time of day. The collection and submission of similar data should be considered when developers consider off-street parking supply. These data sets will help the District determine whether its Transportation Demand Management (TDM) and parking initiatives are effectively influencing travel characteristics and enable decision-makers to make necessary modifications.

Recommendation A.5: Improve the Residential Parking Permit and Visitor Parking Pass systems.

RPP and VPP are existing curbside management tools that should be improved to accommodate curbside users while offering benefits and protections to District residents. Improvements to the RPP and VPP programs should be implemented in a way that achieves the District's overall goals of accommodating growth through a balanced transportation system. DDOT should continue to evaluate programmatic options for RPP and VPP to improve the ability and reliability of residents to find a curbside parking space when needed without overly constraining other demands placed on District curbs.

Recommendation A.6: Promote off-street commercial loading areas.

Emerging practices that could improve curbside loading access and reduce conflict with other curbside uses are being explored through the *DDOT Curbside Management Study* including:

- **Time of day strategies.** *Extend loading zones during off-hours and/or early morning periods, and reduce them and/or shift them to side streets during prime business hours. Alternatively, work with freight companies and their customers to develop overnight strategies similar to those recently piloted successfully in New York City*
- **Pricing strategies.** *Build upon DDOT's recent introduction of commercial loading meters by adding "progressive" rates (the hourly rate increases with duration or at certain times of day) and/or developing permit options that can be "right-sized" to each company's needs*
- **Support vehicle consolidation strategies.** *Ensure that District regulations support the use of electric trikes for deliveries and cargo-bike companies for certain municipal contracts (e.g., recycling, bikeshare rebalancing)*

B. POLICIES

Recommendation B.1: Capture and reinvest revenue for transportation improvements.

The District currently dedicates revenues from parking meters to pay for part of the annual WMATA operating budget. As is the case for most transportation investments, the cost of transportation improvements is frequently the biggest barrier to implementation. The District should continue to use revenues from parking to fund complementary multimodal strategies, such as transit improvements and CaBi expansion.

Recommendation B.2: Formalize curbside priorities/prioritization approach.

Demand for curbside access will continue to intensify as the District's resident, commuter, and visitor populations increase. Competing needs and desires for the use of curb lanes include not only public parking, but also multimodal investments or innovative projects in the curb lane such as bike parking corrals, CaBi stations, parklets, or pedestrian plazas.

For most of these uses to function effectively, all other uses must be prohibited from the same space; DDOT should develop standards that effectively formalize and prioritize the uses of the right-of-way during various times, conditions, and locations. Formalizing a set of curbside-use priorities also will make the decision-making process more transparent.

Recommendation B.3: Encourage a balance of parking demand between private parking facilities and on-street parking.

DDOT should work with off-street parking operators to implement strategies to better balance short- and long-term parking needs and accommodate additional demand in private facilities. Currently, rate structures in many private parking facilities disincentivize short-term parking, making low-cost public curbside spaces a more desirable option.

Offering parking rate structures that are reasonable for both short- and long-term parkers can help manage curbside parking demand and maximize the use of off-street facilities. Combining off-street parking rate strategies with the strategy of raising on-street parking rates with demand would help optimize the overall use of on-street and off-street parking. It also has the potential to increase the attractiveness of other travel modes for long- and short-distance trips.



Innovative new uses for curb lanes means a greater need for prioritization and appropriate regulation, like this Park(ing) Day event

When private garages close before local businesses, additional demand is placed on curbside parking. The District should encourage publicly-accessible parking garages within walking distance of commercial uses to consider aligning garage hours of operation with neighborhood activity.

Recommendation B.4: Maximize availability of on-street parking in commercial districts.

Curbspace in commercial districts is extremely limited and extremely valuable. To help people use these spaces, curbs should be managed with a structure that links curbside rates to demand. The result will be better access for all users who can find a space when needed. Accessible on-street parking should continue to be provided.

C. EDUCATION AND ENFORCEMENT

Recommendation C.1: Support “car-lite” living.

DDOT should continue to support and promote the benefits of car-lite living. The reduction in the rate of auto ownership during the past few years reflects national trends of diminished interest by younger persons to own a car, in addition to the District’s extensive options for walking, biking, and transit. The no-car households in the District has significant positive impact on the District’s transportation infrastructure.

To promote car-lite living without mandating any specific change, DDOT should educate the public about the benefits it provides. DDOT also should investigate whether financial or other incentives can be provided for car-free households, and, if so, educate the public about these incentives.

Recommendation C.2: Use data to understand trends in parking demand.

DDOT should expand data collection on parking use and vehicle ownership to understand parking demands and policy needs. For example, carshare access has consistently been found to reduce vehicle ownership rates among households, particularly in areas also offering first-rate transit connectivity. The District already supports carsharing (and reduced parking demand per household) by dedicating on-street parking spaces and establishing curb management policies for carsharing operations. Documenting the impact of curbside carshare vehicles on vehicle-availability rates among nearby households should inform discussions about RPP in the District.

DDOT also collects information on the usage of metered parking. This data should be used to engage stakeholders on parking management decisions and made available to the general public. DDOT should embed data collection and analysis within the design of new parking programs.

Recommendation C.3: Balance enforcement.

Curbside management is intended to maximize the benefit of this valuable resource for all users. When the District’s management approach is ignored, it degrades the effectiveness of the program for all. Enforcement is needed to maintain program effectiveness, and ultimately support the transportation network; however, the program must be enforced in a way that is easy to understand for all users. DDOT should work with its partner agencies to communicate the District’s curbside management strategy, providing the greatest number of ways for users to support the system including multiple payment options and a graduated fine structure that offers occasional amnesties to clear drivers’ records), and only use punitive measures (such as fines) as a last resort.

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The District of Columbia's
Multimodal Long-Range Transportation Plan



Sustainability and Livability Element





Well-designed streets can dramatically improve the livability of a city's neighborhoods

Sustainability and Livability

I. Quality of Place

Washington, D.C. has a notable history of using public space to define the city and create memorable spaces in neighborhoods. From views of the Capitol along Pennsylvania Avenue, to the neighborhood networks of parks, playgrounds, and recreation centers, to commercial corridors and new developments—defining characteristics and sense of place are crafted through careful planning, regulation, and a tradition of enhancing the public right-of-way for District residents. Well-designed public spaces balance the mobility and access needs for all users and contribute to the efficiency of the city as well as its sense of place.

The District's right-of-way—including streets and public spaces—is the city's largest infrastructure resource. In addition to hosting transportation functions, it also supports livability by offering green space, promenades, and meeting places.

Streets are both an environmental challenge and opportunity. Streets are home to nearly 150,000 street trees in the District, as well as the “public parking” area, which is the area between buildings and sidewalks that is public right-of-way under the care of private owners. Collectively, public parking areas make up the largest public park in the District. Streets in the District also make up more than 6,500 acres of impervious surface and contribute to stormwater runoff and pollutants in the area's water bodies. The District has and will continue to identify green design solutions and partnerships to help mitigate these impacts.

The **Sustainability and Livability Element** addresses sustainability and livability through three components:

- *Urban forestry*
- *Stormwater management*
- *Public space management*

It focuses on the relationship of the public right-of-way with the natural environments and quality of life for District residents. The **Sustainability and Livability Element** also addresses how the system should evolve over time to better serve the city's growing population and better preserve its natural systems. The District's right-of-way can—and should—continue to be developed and maintained through policies and projects that maximize sustainable stewardship of the environment and improve livability for District residents, workers, and visitors, and serve as a model for cities across the globe.

II. Existing Conditions

Urban Forestry

DDOT's Urban Forestry Administration (UFA) has a mission to manage and increase the District's urban canopy of street trees. Street trees contribute to improved air quality; increased ground water retention, minimizing runoff and flooding; temperature moderation; community aesthetics; and other community benefits. UFA, in coordination with other federal and local stakeholders, cares for and manages the urban tree canopy of the District of Columbia. Trees provide many economic, social, and health benefits that contribute to livability in urban municipalities. It is important that urban development be designed closely with urban forest health protection and management goals to maintain community livability.

Land ownership and geographic distribution play a critical role in maintaining and growing the urban canopy. The District's land ownership is divided among the District government, the federal government, and private property owners, which presents unique constraints and opportunities for addressing maintenance and expansion of the District's urban canopy, as DDOT only has direct control over the canopy within the transportation right-of-way.

Stormwater Management

Sustainable D.C., completed in 2013, sets long-range goals for making the District the greenest city in the nation. The plan calls for increasing green infrastructure in the public right-of-way and taking actions to improve the health of the city's waterways.

The District's stormwater regulations require stormwater volume retention on all major construction projects. Both public and private projects constructing in the right-of-way are required to retain stormwater to the maximum extent practicable. Designers must examine all uses of public space and place stormwater management where space and use allows.

DDOT is installing green infrastructure as part of construction projects and in retrofit projects to reduce stormwater runoff in more areas of the city. Green street and green alley projects use

green infrastructure techniques and may be constructed where watershed and infrastructure improvements are prioritized. Green infrastructure practices for streets include:

- *Bioretention (rain gardens)*
- *Street trees*
- *Landscape areas*
- *Permeable pavement*
- *Removing unnecessary paving*

When implemented, green infrastructure creates living green streets that capture, store, and filter stormwater to treat it as a resource and improve the urban environment.

Public Space

Public space is one of the most critical components of an urban environment, defining how areas look and feel and providing the backdrop for public interactions. As the District continues to grow and develop, standards are needed to achieve the vision for a well-balanced urban environment and to help shape the identity of the city. A well-designed public space balances the mobility and access needs for users and unifies key elements in the public right-of-way including roadways, sidewalks, tree box areas, intersections, plazas, and open spaces.

DDOT has management and oversight responsibility for the use and occupancy of the public space in the District. Public space is defined as all the publicly-owned property between the property lines on a street and includes the roadway, tree spaces, sidewalks, and alleys. In 2013, DDOT reviewed more than 39,000 public space permits to ensure that the interest of the public is protected, preserved, and enhanced. The **moveDC** plan puts forth recommendations for ensuring the District's public spaces are safe, sustainable, and vibrant destinations. The implementation of these recommendations, in conjunction with proposed improvements from other **moveDC Modal Elements** has the potential to create a dramatically more sustainable and livable District.



Georgia Avenue streetscape

A. CORE FACTS

Trees

D.C.'s urban tree canopy is currently approximately 14,600 acres and covers 37.2% of the District. More than 1.9 million total trees grow in the District, with 148,000 of those trees are growing in the city's rights-of-way. The District's trees:

- Remove 540 tons of pollution per year, valued at \$2.5 million
- Store 526,000 tons of carbon, valued at \$9.7 million
- Sequester 16,200 tons of carbon per year, valued at \$9.7 million
- Reduce building energy usage by \$2.6 million per year, which also results in \$96,000 in avoided carbon emissions
- Provide \$3.6 billion in structural value to the city¹

The most common tree species in the District are American beech, red maple, and boxelder.

Stormwater

43% of the District's land area is impervious surface. A single storm dropping 1.2 inches of rain falling on this area produces about 525 million gallons of stormwater runoff.

Streetlights

There are currently 67,957 streetlights in the District.

Permits

The District's public space under DDOT jurisdiction makes up approximately 26% of the city's land area. DDOT issued 92,873 permits during the past 3 fiscal years (FY 2011, FY 2012, FY 2013) for everything from construction to sidewalk cafes to moving vans—that's a 75% increase in permits issued from FY 2011 to FY 2013. These figures are sizeable, especially when compared to the amount of permits issued by similarly-sized cities: Baltimore issued 7,133 permits in FY 2012 while Denver issued 11,760.

¹ United States Department of Agriculture, Forest Service. "Assessing Urban Forest Effects and Values, Washington, D.C.'s Urban Forest." September 2006

Recent Sustainability and Livability Initiatives

DDOT INITIATIVES

-
- **Greening D.C. Streets (2014):** DDOT's guide to green infrastructure in the District is intended to be used with DDOT's **Green Infrastructure Standards** for projects in the District's public right-of-way. Green infrastructure design solutions are intended to be sustainable, attractive and cost effective. This guide illuminates design tools and strategies for greening the public space, including permeable pavement, bioretention and tree space, and also offers context-sensitive solutions for different areas of the District.
-
- **DDOT Climate Adaptation Plan (2013):** DDOT's capacity to adapt to the impacts of extreme weather conditions on the delivery of transportation services depends on its ability to respond to the physical needs of the system and to plan for future contingencies. Assets that are in a state of good repair are better able to withstand the strains caused by extreme weather events. Toward this effort, DDOT's **Climate Change Adaptation Plan** identified and developed potential adaptation strategies to ensure DDOT's transportation infrastructure can withstand climate change and to reduce the vulnerability of its assets to the effects of extreme weather conditions.
-
- **DDOT Sustainability Plan (2010):** DDOT's agency-specific sustainability plan outlines actionable and measurable goals that deepen and refine DDOT's dedication to sustainability. In the plan, DDOT identified eight priority areas which would enable the agency to help the District of Columbia remain and healthy and prosperous city. Each priority area set goals and recommended actions. Many of the priorities are shared directly or indirectly with those in the **moveDC** plan.
-
- **DDOT Action Agenda (2010):** DDOT's **Action Agenda** outlines a set of policies and corresponding plan to increase the livability of the city for the future while continuing to grow the District's transportation network. It focuses on core values and functions including safety, sustainability, maintenance and investment in capital assets, and identifying prosperous places in order to develop and maintain a cohesive, sustainable transportation system.
-
- **DDOT Public Realm Design Handbook (2008):** This DDOT handbook provides an introduction to the District's goals for public spaces as well as guidance on DDOT standards related to public realm materials and design components. It enables District agencies, developers, and the public to draft plans and evaluate proposals that are consistent with District policies and regulations. It also introduces a common vocabulary of design to be referenced for public realm improvements, helping enhance the development and overall quality of the public realm throughout the city.
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- **DDOT Environmental Management System (EMS) Structure & Implementation Guide (2008):** This guide book was developed to initiate the implementation of an EMS at DDOT. This guide provides a general structure of the EMS that will be implemented at DDOT along with instructions for implementation. The guidance given in the document can be used to develop annual EMS goals for the department along with monitoring and evaluation methods.
-
- **DDOT Environmental Policy and Process Manual (2008):** This manual was developed to provide instruction and guidance for performing the requisite environmental consultation and review at each step in the transportation project process. It helps ensure that planners, engineers, and other professionals develop transportation projects that are compliant with both local and federal environmental laws and regulations, while also helping DDOT achieve environmental excellence.
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DISTRICT-WIDE INITIATIVES

- **Sustainable D.C. Plan (2013):** *Sustainable D.C.* is a Districtwide initiative that aims to make the District of Columbia the healthiest, greenest, and most livable city in the United States over the course of 20 years. The plan lays out goals and targets for the year 2032. While transportation has a role to play in many of the *Sustainable D.C.* plan's initiatives such as using the landscape to capture rainwater, it also set specific goals and targets for transportation, which were taken into consideration during the development of **moveDC**.

- **District of Columbia Urban Tree Canopy Plan (2013):** The District's *Urban Tree Canopy Plan* is a framework for how residents, the private sector, and government agencies can work collectively toward achieving the District's tree canopy goal of increase the District's tree canopy cover from 35% to 40% by 2032. The plan provides historical context for the tree canopy goal, explains how a healthy tree canopy will benefit the District, and outlines planting targets for different landowner categories.

- **District of Columbia Stormwater Management Guidebook (2014):** The *District of Columbia Stormwater Management Guidebook* provides technical guidance required to comply with the District's current stormwater management regulations, including the criteria and specifications engineers and planners use to plan, design, and construct regulated sites and stormwater best management practices (BMPs).

- **District of Columbia Public Realm Design Manual (2011):** The District's *Public Realm Design Manual* is a reference manual is a comprehensive review of the District's public space policies and regulations. It aims to help business owners, developers, and residents better understand the appropriate use of public space, and assist government agencies that evaluate requests and applications related to public space regulations.

- **District of Columbia Municipal Separate Storm Sewer System Permit (2012):** The District's Municipal Separate Storm Sewer System (MS4) permit requires specific actions that are to be met that move the District towards the water quality target of fishable and swimmable streams and rivers. During the course of the current 5-year MS4 permit, DDOT is required to implement structural and non-structural practices that manage at least 1.5 million square feet of impervious area; sweep 641 acres of streets annually; and reduce the runoff of deicing, sand and salt to District water bodies.



Tree planting on H Street NE



DDOT is keeping beehives and producing honey within the public right-of-way

B. NOTABLE SYSTEM ACHIEVEMENTS

Urban Forestry

In 2013, the District was named one of the 10 best United States cities for urban forests by American Forests. The District was noted in this award for its healthy, extensive, and diverse tree canopy; tree inventory and regulatory ordinance programs; urban forestry goals, Urban Forest Management plan; and **Sustainable D.C.** initiatives.

The District has increased the tree canopy 2.1% since 2006, including 1.5% in the last 5 years alone (as of 2013). The District's urban tree canopy is currently 37.2%. In 2012, UFA planted more than 7,000 street trees and removed more than 3 acres of impervious surface near streets and schools, while responding to more than 14,700 service requests from residents.

In 2011, DDOT began keeping beehives and producing honey within the public right-of-way. There are currently nine hives throughout the District that produced 15 cups of honey in 2013. As production grows, DDOT will seek to partner with food banks and other organizations to utilize the honey.

Stormwater Management

DDOT's **Paving Removal Program** began in 2010, removing paving and adding treeboxes and grass to select locations in the District, including wide sidewalks and medians to increase the permeable surface in the city. This helps stormwater find a place to drain, instead of pooling on transportation infrastructure like roads and sidewalks.

In 2012, DDOT implemented green street projects on Pennsylvania Avenue SE and Nanny Helen Burroughs Ave NE,

which included the creation of bioretention areas, bioswales, vegetated filter strips, and adding street trees and permeable pavers to these corridors.

DDOT continued this trend with green alleys projects. Green alleys are designed to reduce the quantity and improve the quality of stormwater within the city's right-of-way. Although alleys constitute a significant portion of impervious surface, most do not have stormwater controls, such as water quality

"Washington, D.C. recognizes that trees don't just provide aesthetic value, they also help in a number of other ways, including increasing property values, reducing energy costs, and lowering medical costs by improving human health. For example, various studies have shown a correlation between trees and lower rates of crime, reduced levels of stress, and lower body mass. Washington's trees also provide \$3.6 billion in structural value to the city. The \$2.6 million they save in energy costs each year reduce carbon emissions by \$96,000 per year."

– American Forests Press Release

catch basins or grate inlets. Green alleys use sustainable design and low-impact development (LID) techniques to reduce the amount of stormwater and pollutants entering the sewer system by increasing water infiltration and treatment on site. In 2012, DDOT and DDOE unveiled the city's first three green alleys in the Watts Branch watershed in Ward 7. Gravel and impervious surfaces were replaced with permeable concrete to allow water absorption. DDOT completed four additional green alley projects in 2013, and has four projects planned for 2014.

Public Space

Transportation Online Permitting System

In 2013, DDOT redesigned its web-based permit application system, the **Transportation Online Permit System** (TOPS), which allows users to apply online for public space permits. The redesign offered public space permit applicants a more streamlined and easier-to-navigate experience while also allowing the agency to more efficiently process the influx of public space permits.

Public Space Permit Locator GIS Mapping Tool

DDOT's **Public Space Permit Locator** is an online application facilitated by DDOT's GIS system. This system gives the public the ability to view permits on an interactive map. A user can enter a specific address or area and pull up all the public space occupancy and construction permits issued for that location or within that area and see information including to whom the permits were issued and for how long. Pending permit applications and/or pending payments also can be viewed and exported into other formats.

Placemaking

DDOT has invested significantly in placemaking in public space. Many of the initiatives have been completed through successful partnerships among DDOT, other District agencies, and private partners such as Business Improvement Districts (BIDs). Recent successes in placemaking projects and partnerships are highlighted on the next page.

LED Lighting

DDOT is in the process of replacing all existing roadway and alley light fixtures with energy efficient light-emitting diode (LED) streetlight fixtures. There are currently 67,957 streetlights in the District, which are high-pressure sodium (HPS), traditional



Large area greening at P and North Capitol Streets NE



Green median renovation on Bladensburg Road NE

mercury vapor, or incandescent and metal halide. These streetlights are currently being converted to energy efficient LED streetlight fixtures. Sustainable energy solutions were recommended in the DDOT **Action Agenda**.

Placemaking in the District

In addition to the transportation function of streets, medians, curbsides, edges, and sidewalks are an opportunity to make the city more vibrant and livable. Some existing public right-of-way is in excess of what is needed for explicit transportation purposes. This space may be found on wide boulevards, or in triangular spaces where the grid is intersected by diagonal streets. Currently, more than 200 small non-transportation areas of land exist within the public right-of-way, offering opportunities to create vibrant public spaces in the District. Washington, D.C. boast many successful placemaking projects and partnerships, including:

→ **Columbia Heights Civic Plaza.**

DDOT constructed a civic plaza in a section of excess right-of-way in Columbia Heights at the 14th Street NW/Kenyon Street intersection in 2009. The plaza—now a cherished community resource—was integral to the larger neighborhood plan that reconstructed streetscapes throughout the area and coordinated with substantial redevelopment in the neighborhood. The plaza plays an important role in the community: it is a highly-visible gathering place, a reference point in the neighborhood, an area where children can play, and a space for civic events.



→ **Old Market Square, Anacostia.**

In partnership with the community, DDOT undertook a significant project to restore Old Market Square in Anacostia, a public space on 14th Street SE between U and V Streets SE. Historically, the square was a gathering place for the neighborhood. Prior to the project, time and inattention brought the square to a significant state of disrepair. Completing the project involved repaving streets surrounding the square, installation of new crosswalks, street lighting, decorative walls, square walkways, seating areas, and significant landscaping.



➔ **New York Avenue Art in the Median Partnership.** In 2010, DDOT worked with the Downtown BID to develop Phase I of an “art in the median” partnership. The partnership undertaken by DDOT, the National Museum of Women in the Arts (NMWA), and the Downtown BID focused redefining New York Avenue as a pedestrian-friendly corridor and strengthening its sense of place as an arts and cultural district. The physical project encompassed a reconstruction of the median of New York Avenue NW between 12th Street and 13th Street in order to provide the opportunity for enhanced landscaping, lighting, and sculpture installations.



➔ **Connecticut Avenue/Rhode Island Avenue/M Street NW Rain Garden.** In 2012, the Golden Triangle BID coordinated with DDOT and the District Department of the Environment (DDOE) to design and construct a rain garden at the intersection of Rhode Island Avenue and M Street NW. This project built on the successful landscape median project (3,000 square feet of green space) on Connecticut Avenue in 2011. The rain garden replaced a formerly concrete island at the intersection of Connecticut Avenue, M Street NW, and Rhode Island Avenue. It is intended to be a demonstration of how public space can be used effectively in treating stormwater and also an aesthetic enhancement for the neighborhood.



C. OPPORTUNITIES FOR IMPROVEMENT

While DDOT has made great strides in promoting sustainability and livability measures throughout the transportation system, opportunities for improvement remain:

- The public rights-of-way offer the opportunity to restore stormwater hydrology to a predevelopment condition and reduce water borne pollutant loads so that the District's receiving waters return to the **Clean Water Act's** goal of fishable and swimmable.
- As outlined in the One City Action Plan (July 2012), the Mayor's goal is that within 20 years "all District waterways [are] fishable and swimmable." Additionally, up to 75 percent of the District's landscape will be able to naturally filter or capture rainwater for reuse."
- The **One City Action Agenda** specifically calls out stormwater management and low impact development (LID) as a means to more effectively manage infrastructure
- Continue and expand DDOT's green streets program to address stormwater volume reduction and water quality treatment, to further implement LID, green infrastructure projects, and energy-efficient lighting, in coordination with existing plans, policies and guidelines.
- DDOT currently serves as an agency partner in the **RiverSmart Washington** initiative. This initiative is designed to measure whether installing attractive, low-cost, eco-friendly landscaping and innovative streetscaping in selected District neighborhoods can reduce polluted stormwater runoff into Rock Creek Park. If successful, techniques may be expanded throughout the District to benefit all streams and rivers.
- Repurposing public space traditionally thought of as part of the transportation network to other public uses and amenities can help create a greater sense of place, encourage all day use, generate pedestrian activity, and create vibrancy. These outcomes can improve public safety, strengthen neighborhoods, and contribute to economic prosperity at many different levels

III. Recommendations

A. INFRASTRUCTURE INVESTMENTS

Recommendation A.1: Continue and expand existing UFA services and programs.

UFA currently operates numerous services and programs to achieve its mission of keeping the District's street canopy healthy, safe, and growing. Some of these services include permitting, offering grants, planting and removal, maintenance, and enforcing regulations. Proper maintenance of the urban tree canopy reduces damage to power lines and other assets from weather-related events, and maximizes the lifespan of street trees. The District should continue to commit appropriate financial resources to UFA's tree canopy enhancement, management, and maintenance programs in order to maintain and expand the District's tree canopy.

Recommendation A.2: Increase the tree canopy and diversity of tree species in the District.

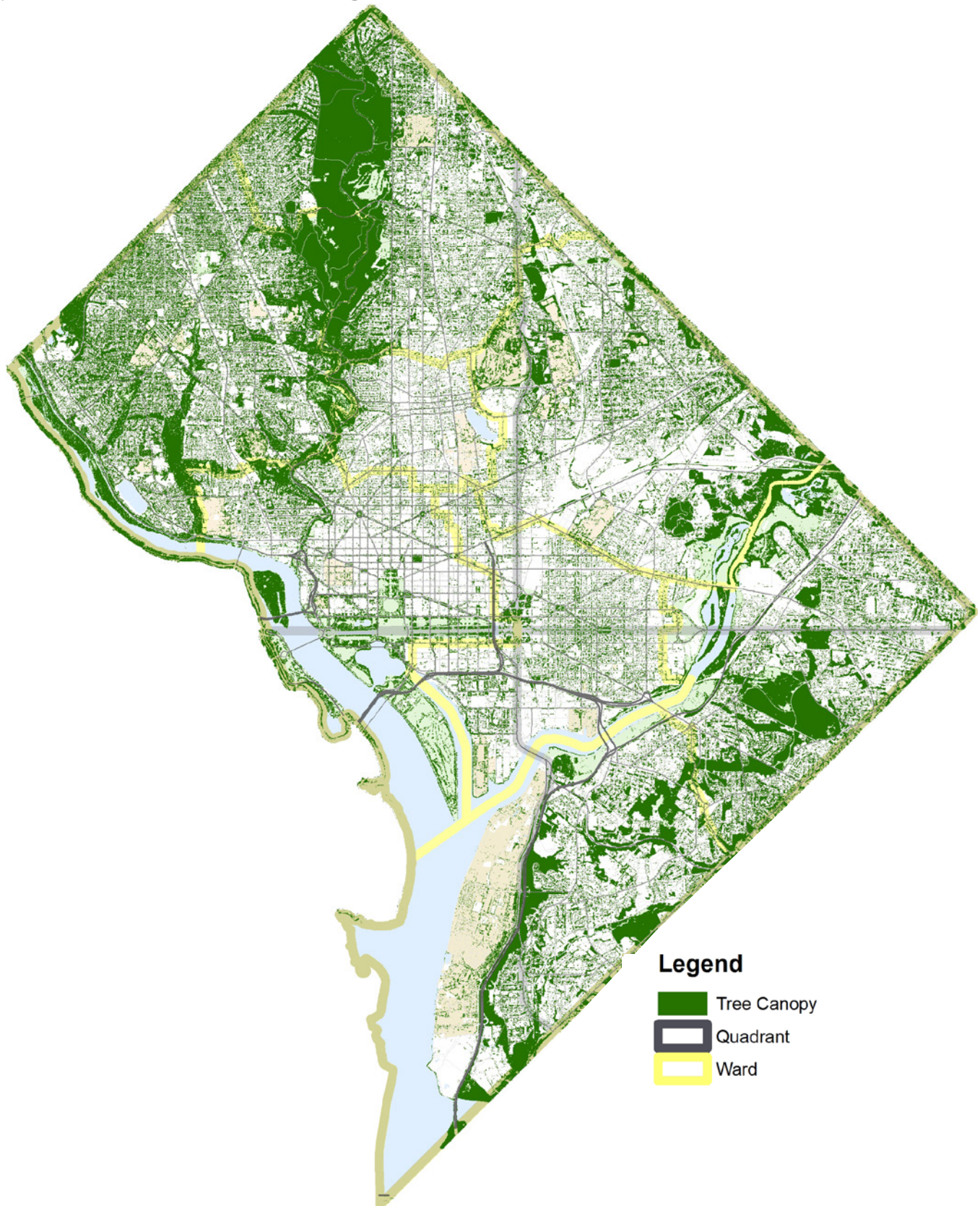
DDOT should increase the number of trees in public rights-of-way and the diversity of species. The District has estimated that it will need to plant approximately 8,600 new trees per year until 2032 to achieve the **Sustainable D.C.** goal of 40% tree cover within the city. UFA should work with public and private parties to continue identifying planting sites citywide to meet and exceed this goal. Increasing the tree canopy in the District also can lead to a reduction in the urban heat island effect, which is a rise in temperatures in areas with high concentrations of dry, exposed urban surfaces such as roofs or pavement. Reduction in the urban heat island effect can lead to lower energy usage and improved human health and comfort. **Figure S.1** shows the existing tree cover in the District. New plantings should comply with UFA's list of approved tree species.

Recommendation A.3: Increase permeable surfaces in public space.

Highways, streets, and parking lots are sources of water pollution due to substances such as oil, grease, and other chemicals being leaked onto their surface or existing within their structure. During rainfall, pollutants that lie on the surface or have absorbed into the pavement wash into adjacent soil, rivers, and streams. The transmission of these pollutants damages water quality and affects wildlife and people.

FIGURE S.1 – DISTRICT TREE CANOPY

This figure shows the existing tree canopy in the District. *Sustainable D.C.* set a goal of 40% tree cover in the District. Increasing the tree cover will require multiple strategies because the District only owns and maintains approximately one-third of the existing canopy. The remainder is owned and maintained by private landowners and the federal government.



Infrastructure that uses permeable materials, bioswales/ biofiltration, dense tree plantings, and other low impact development techniques can capture pollutants before they reach bodies of water and natural areas. Using infrastructure that improves water quality within and adjacent to public rights-of-way including streets, alleys, and sidewalks will help reduce damage caused by polluted stormwater runoff. New paving technologies continue to allow durable and accessible materials to also allow water percolation.

Recommendation A.4: Reduce connected impervious area.

Impervious areas prevent infiltration and increase stormwater runoff. Disconnecting impervious areas so that stormwater runs over vegetated and infiltrating areas can reduce the volume of runoff, particularly in areas where the total impervious area is less than 30%. This threshold may not be realistically attainable in many portions of the urban right-of-way, but DDOT should identify opportunities where feasible. DDOT should look to expand the applicability of this approach in coordination with policies that promote the use of adjacent lands. DDOT should work actively with landowners to develop guidance, standards, and incentives for mitigation techniques. DDOT also should identify options for reducing total impervious cover, including:

- **Installing green traffic calming measures.**
Bulb-outs, curbing, and special paving can calm traffic and provide stormwater management. DDOT should use bulb-outs containing vegetated infiltration areas as well as permeable pavement and pavers for on-street and off-street parking
- **Removing and reducing impervious area.**
DDOT should promote permeable surfaces to the maximum extent practicable (MEP). Permeable surfaces or "cool pavements" can reduce high surface temperatures. Vegetate or gravel topping can be used on medians, at streetcar sites, and in other non-traffic area.

Recommendation A.5: Reduce and prevent pollution.

DDOT should seek to reduce and prevent stormwater pollution through the use of stormwater pollution prevention plans, site inspections, maintenance, and improvements in technology and materials, including the following:

- **Trap pollutants on site.** *Capture sediments, trash, salt and deicers before they run off site*
 - *Install practices that trap sediments within the right-of-way such as filter strips or forebays in bioretention facilities*
 - *Include materials that retard the migration of infiltrating salt and use salt tolerant plantings*
 - *Maintain systems that trap pollutants before the pollutant loads exceed the water quality BMP holding capacity*
- **Reduce salt, sand, and deicer applications.**
Continually update deicer application and collection practices based on the latest body of knowledge:
 - *Use the latest weather technology to better time weather-related applications*
 - *Sweep roads after application events to collect salt and sand*
 - *Apply permeable surfaces that promote infiltration of snow melt thus reducing subsequent ice formation when temperatures drop below freezing*
 - *Install practices to capture sand and sediments on site and remove captured materials as needed*
 - *Use public outreach to promote land owner removal of snow promptly from sidewalks, driveways, parking lots, and other surfaces, and to reduce the use of salt, sand, and deicers*

Recommendation A.6: Implement stormwater treatment measures.

DDOT should require and implement stormwater treatment measures in the District's right-of-way. They should be of sufficient capacity to provide a high level of storage and pollutant retention. This will help achieve the **Sustainable D.C.** goal of making 100% of the District's waterways fishable and swimmable. Examples of these treatments include:

- **On-site treatment of stormwater.** *Capture and treat all stormwater on-site even if the drainage area expands beyond the right-of-way.*
 - *Compensate for areas with limited storage by increasing subsurface retention to exceed minimum requirements where practicable*



Sidewalk bioswale

- Partner with adjacent parcels to treat local runoff to the MEP
- **Promote vegetated systems.** Promote vegetated systems that reduce impervious area, heat island effects, air pollutants, volume of runoff, water pollutants, aesthetics and environmental justice such as
 - Filter strips. Sidewalks can be bordered by vegetated filters like grass, bioretention areas, or low meadows. Runoff can be directed toward green space such as parkland and stream buffers.
 - Tree cover
- **Treatment types.** Implement stormwater treatment measures that address the broad range of environmental impacts with an emphasis on the technical ability of the treatments to improve stormwater runoff to predevelopment conditions and with demonstrated operation and maintenance practices that retain the treatment design capabilities. Permeable pavement and pavers can be used along sidewalks, parking lots, roadside parking lots, and side streets. These locations must be accessible for vacuum treatment and other maintenance.
- **Treatment within the right-of-way outside of the road.** Systems under roads can be harder to maintain, require higher weight-bearing requirements, and conflict with more underground

utilities than systems installed within the sidewalk and roadside buffers and medians.

- Use existing green space (medians, turnabouts, triangular ends of roads, etc.).
- Consider treatment trains to meet broad goals: filter strips to pretreat runoff, rapid filters to manage large runoff volumes in limited space, biological treatment systems to enhance pollutant removal, and infiltrating measures to reduce the volume of runoff

Recommendation A.7: Protect the physical environment through LID.

DDOT should incorporate LID into streets to be consistent with the efforts of DDOE, which seeks to reduce stormwater runoff pollution and has in place a vigorous stormwater program and stringent citywide regulations. Major initiatives include significantly reducing stormwater pollution flowing into the area's water bodies by making the land "spongier" and creating financial incentives for the installation of stormwater retrofits.

Recommendation A.8: Prioritize and separate utility and stormwater management corridors within the right-of-way.

LID and stormwater management features can be limited in depth or type of treatment feasible due to the presence of underground utilities. DDOT should prioritize corridors for either utilities or stormwater management to avoid unproductive conflicts. This practice also should avoid the need for excavation of stormwater management facilities for utility repairs.

Recommendation A.9: Reduce light pollution in the public realm.

The District should continue to convert all alley and street lighting in the District—aside from those fixtures covered by Federal Highway Administration (FHWA) or historic preservation guidance—to high-efficiency LED fixtures. To reduce light pollution, existing lighting retrofit projects should be updated to require the use of full cut-off light fixtures for 75% of public lighting fixtures. Cut-off fixtures provide more controlled illumination within a specific area in keeping with guidance from the International Dark-Sky Association.

B. POLICIES**Recommendation B.1: Support biodiversity and remove invasive plant species.**

To conserve biodiversity and remove invasive species, the District should require the use of native and approved tree and plant varieties for all landscaping and plantings in the District's right-of-way, including parks and public spaces. The use of native species helps reduce the need for irrigation since native species are better adapted to the District's climate conditions. DDOT should also coordinate with the Department of General Services (DGS), DDOE, and the Department of Parks and Recreation (DPR) to expand this approach to other District-owned lands.

Recommendation B.2: Ensure coordination with utility companies to protect and preserve the tree canopy.

Construction and maintenance work associated with utility projects in the District often impact streets and frequently, street trees. UFA should require utility companies to protect and preserve existing healthy street trees whenever possible. In the event that an existing tree cannot be suitably protected during construction or as a result of the outcome of construction, the utility company should appropriately replace the tree (or trees) with an approved tree of the appropriate species and size.

Recommendation B.3: Continue to promote and identify opportunities for innovative stormwater design.

The District has 360 miles of alleys, most of which are covered by hard, impermeable surfaces that produce large volumes of stormwater runoff. Green alleys, on the other hand, use LID

techniques to keep stormwater and pollutants from entering the sewer system, streams, and rivers. DDOT should continue to promote and identify opportunities throughout the District for innovative stormwater design solutions.

Recommendation B.4: Support existing policies that capture and prevent stormwater discharge.

Existing policies such as *RiverSmart*, right-of-way standards, Green Streets, and tree planting are aimed at capturing and mitigating stormwater discharge into the District's right-of-way. DDOT should promote and support these policies so that they are implemented across the District, working towards more swimmable and fishable waterways.

Recommendation B.5: Promote and incentivize public-private partnerships (PPPs or P3s) for stormwater management.

DDOT should work with District agency partners to promote and incentivize P3s for the development of stormwater management facilities. A prime example of opportunities for P3 stormwater management initiatives are redevelopment projects.

Recommendation B.6: Improve accessibility to public spaces, amenities, and facilities in the public right-of-way.

To ensure that community spaces are providing the greatest benefit to the District, it is important that people of all ages and ability levels be able to access them. Amenities and facilities should be identified as high-priority destinations for multimodal access, so that the greatest range of residents can access them.

Recommendation B.7: Encourage and manage temporary use of public space.

Managed appropriately, public open space has the potential to flexibly accommodate many different uses and users under a wide range of circumstances. Some spaces that carry moving vehicles and people can often be partially or fully closed to accommodate special events. Similarly, space that stores vehicles (parking lots, on-street parking), can often be repurposed for short periods of time to allow its use for other appropriate uses.

Recommendation B.8: Improve attractiveness of public space.

Creating public places for people takes more than simply providing the space; it requires making it attractive, functional, and safe so that people are drawn in and comfortable spending time staying there. Well-designed spaces often become highly used and can meaningfully strengthen neighborhood character, safety, and economics. Where appropriate, DDOT should incorporate light, greenery, art, and human-scale design into public space to help it become a place that people are excited to use and proud to have in their neighborhood.

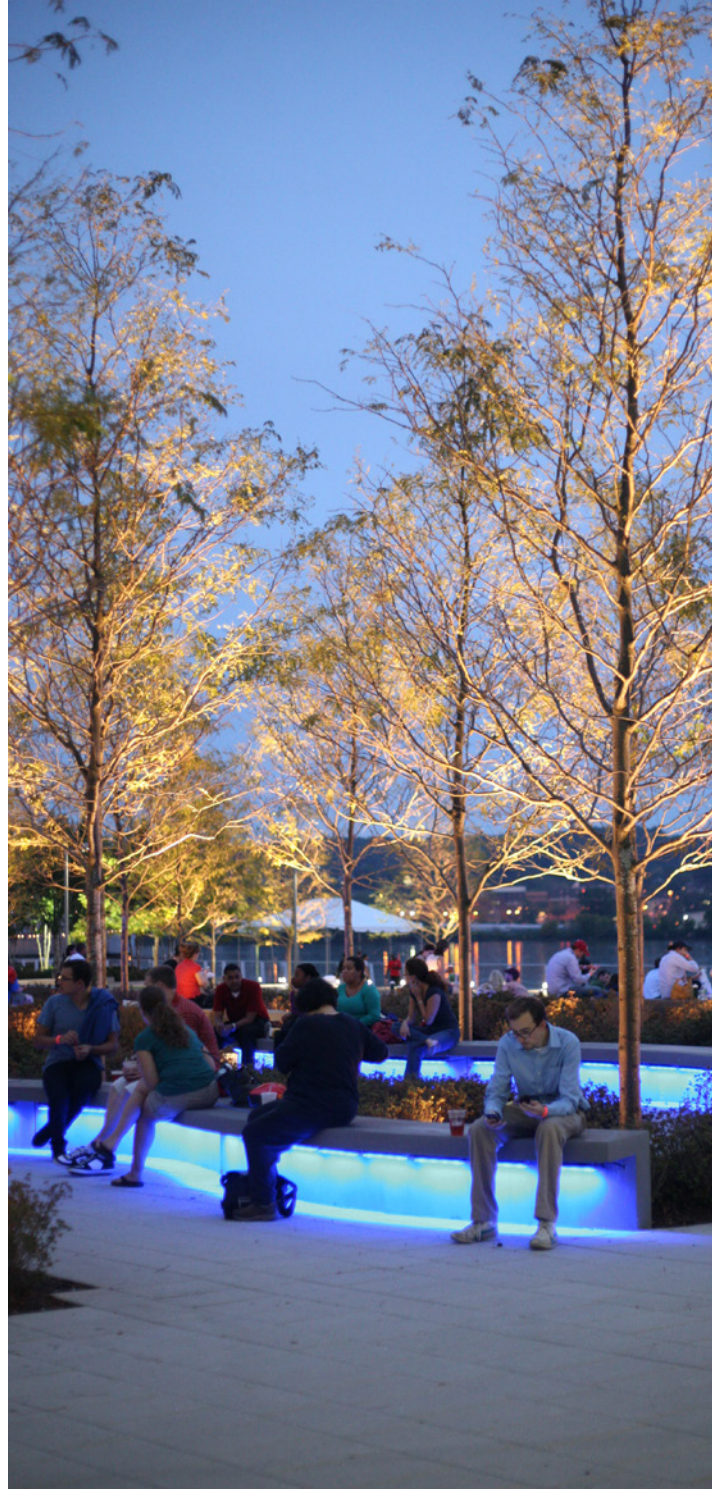
Recommendation B.9: Reevaluate value of underutilized right-of-way.

Streets and public right-of-way make up a significant portion of open space in the District. In some locations, these spaces are underutilized, unfriendly to pedestrians, and unsupportive of surrounding businesses and destinations. DDOT should identify and evaluate innovative opportunities to reclaim or transform underused rights-of-way through studies, public participation, and demonstration projects to create inviting public spaces in the District that support a multimodal transportation network. Examples of underused rights-of-way in the urban environment that have been transformed in other cities include slip lanes, service roads, curb cuts, and traffic islands.

Recommendation B.10: Incorporate considerations of health impacts into transportation investments.

Transportation is a key aspect of how a community moves, which can impact both individual and aggregate health outcomes. DDOT should incorporate considerations of health impacts into transportation investments.

Using sustainable modes of transportation such as walking, biking, carpooling, and public transportation helps to reduce negative impacts to air quality. DDOT should continue to promote these modes through supporting events such as “Bike to Work Day” and programs such as “Live Near Your Work.” Low- and zero-emissions vehicles are cleaner and result in significantly reduced levels of noxious gases expulsions into the atmosphere. DDOT should consider implementing incentives for drivers of low-emitting vehicles such as designated parking areas.



Yards Park in the Capitol Riverfront

C. EDUCATION, PROMOTION, AND ENFORCEMENT

Recommendation C.1: Enforce soil volume requirements.

DDOT should enforce soil volume requirements for the planting of new trees in the District. Soil volume requirements for urban trees help ensure root growth and prevent soil compaction. It also protects adjacent sidewalks and roadways from impacts due to root growth. Soil volumes can impact the longevity of a tree, as well as the likelihood that tree roots will be able to adequately access air and water in a constrained urban condition.

UFA has established the following soil volumes for street trees in the District:

- **Large Trees.** 1,500 cubic feet of soil within a 27-foot radius
- **Medium Trees.** 1,000 cubic feet of soil within a 22-foot radius
- **Small Trees.** 600 cubic feet of soil within a 16-foot radius

Recommendation C.2: Increase citizen stewardship of public trees through Canopy Keepers or other outreach activities programs.

DDOT should expand its outreach for Canopy Keepers and grant programs such as the **Green Grant Initiative**, which provides funding to organizations seeking to improve the District's urban canopy. The **Canopy Keeper Program** allows residents and businesses to adopt new trees. In agreeing to adopt a tree, a sponsor is then responsible for watering and maintaining the tree for 2 years after it is planted.

DDOT's UFA has set a goal to have 50% of the new trees planted annually adopted. Currently, of 7,000 trees planted each year, approximately 1,300 are adopted. Expansion of the program has the potential lead to greater engagement and awareness of District residents about sustainability initiatives and reduce tree maintenance costs for UFA.

Recommendation C.3: Increase participation in urban forestry advocacy.

DDOT should increase its participation in advocacy for protection, maintenance, enhancement, and expansion of its urban tree canopy. The District of Columbia Grove (DCGrove.org) is part of The American Grove, a national online community created to engage and encourage citizen to plant trees and protect the urban tree canopy. Additionally, UFA should use its existing partnership with Casey Trees, an active non-profit dedicated to restore, enhance, and protect the tree canopy of the District, to expand tree advocacy and education programs.

Recommendation C.4: Develop a Placemaking in Public Space program.

DDOT should encourage and actively promote opportunities for enhancement in ineffective and under-used spaces citywide. Any enhancements within the public realm should prioritize safety and functionality of the space and carefully consider the impacts of the change to the space prior to any modifications being made. Examples of placemaking include:

- Green infrastructure
- Public art
- Beautification projects
- Public plazas
- Café seating
- Parklets

IV. Shared Goals for the District's Future

The District's **Sustainable D.C. Plan** outlines goals, targets, and actions for creating a sustainable city that addresses the economic, social, and environmental needs of the city. Transportation plays a significant role in how the District will be able to meet these needs, now and in the future. The **moveDC** plan will work cooperatively with **Sustainable D.C.** to achieve the District's citywide goals. **moveDC** is a blueprint for investments and policies to create a transportation system that will make

the District more livable, sustainable, prosperous, and attractive for today's generation and future generations.

The recommendations of the **moveDC** Plan build on and augment the **Sustainable D.C. Plan's** goals and actions. Together, the **moveDC** plan and **Sustainable D.C. Plan** set the course for a sustainable transportation future in the District. Continuous monitoring and regular updates will be needed for both plans to achieve their visions.



Sustainable D.C. Plan Transportation Goals

- **Improve connectivity and accessibility through efficient, integrated, and affordable transit systems.** **Target:** By 2032 increase use of public transit to 50% of all commuter trips.
- **Expand provision of safe, secure infrastructure for cyclists and pedestrians.** **Target:** By 2032 increase biking and walking to 25% of all commuter trips.
- **Reduce traffic congestion to improve mobility.** **Target:** By 2032, reduce commuter trips made by car or taxi to 25%
- **Improve air quality among major transportation routes.** **Target:** By 2032, eliminate all "unhealthy" air quality index days, including "unhealthy for sensitive groups."



moveDC Plan Recommendations

- See the **Transit** and **TDM Elements** for more detail
- See the **Pedestrian, Bicycle, and TDM Elements** for more detail
- See the **Vehicle, TDM, and Parking and Curbside Management Elements** for more detail
- See this element (**Sustainability and Livability**), as well as the **Freight** and **Vehicle Elements** for more detail



The District of Columbia's
Multimodal Long-Range Transportation Plan

