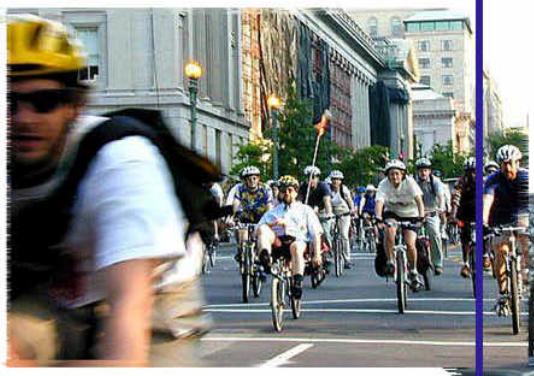
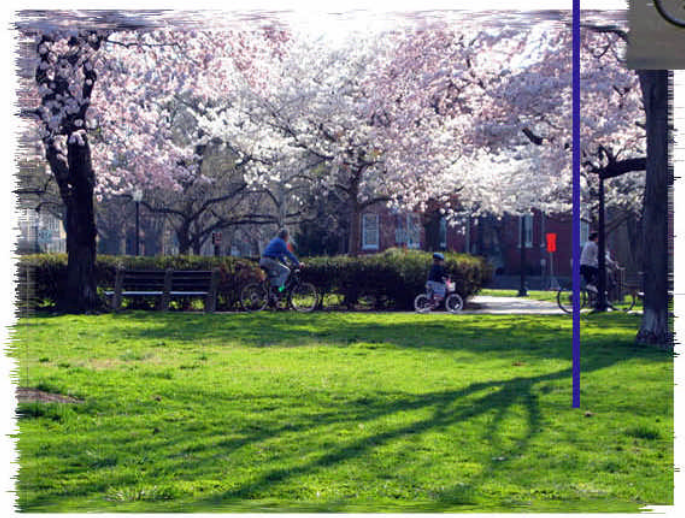
District of Columbia
Bicycle Master Plan





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District Department of Transportation
April 2005

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SECTION I. INTRODUCTION

Bicycling makes Washington, DC one of the most livable cities in the country. The District's population density, interconnected grid of streets, and renowned park system have long contributed to a favorable environment for bicycling.

Mayor Anthony A. Williams at Bike-To-Work Day

The *Bicycle Master Plan* will move the District to the next level, creating an even more bicycle-friendly city. This Plan is a guide to establishing high-quality bicycle facilities and programs over the next 10 years. Safe and convenient bicycle transportation is part of a broader initiative to create a sustainable, multi-modal transportation system in the nation's capital.

Implementing this Plan supports broader city goals. Mayor Williams has set a goal to increase the District's population by 100,000 residents in the next decade. Because there is little room to accommodate future growth with more automobile lanes, the city's transportation system must respond to this growth with other mode choices. The improvements outlined in this Plan will help accommodate the transportation needs of the city's growing population. Providing better conditions for bicycling will also help reduce automobile emissions, which will improve air quality in the DC region. This Plan also complements efforts to provide mobility along the Anacostia Waterfront and other revitalizing neighborhoods.

History of Bicycling in the District

Bicycling has long been a part of the transportation mix in the District of Columbia. In the late 19th Century and early 20th Century, bicyclists, pedestrians, buggies, and streetcars all shared District streets. The District of Columbia's interest in bicycling as an alternative to motorized transportation grew in the 1970s in response to the energy crisis. The first bicycle plan was adopted in 1976. Like most bike plans of the 1970s, it was not fully implemented.

The 1976 Bicycle Plan called for approximately 16 miles of bike lanes, 17 miles of trails, and 38 miles of signed bike routes. Some of these bikeways were completed in the 1980s, but due to budget cuts, the District was without a Bicycle Coordinator between 1992 and 2001. Today, the DC Bicycle Program has two full-time staff positions within the newly established Department of Transportation.

22nd St. N.W. Bike Rental, 1950s
(Photo: Library of Congress)

Bicycling Today

The use of bicycles for transportation and recreation is increasing within the District. Between 1990 and 2000, bicycle commuting grew by 55 percent, from a 0.75 percent share to a 1.16 percent share of all DC-based work trips[1]. More than 5 percent of work trips are made by bike in parts of the Mount Pleasant, Logan Circle, and Capitol Hill neighborhoods (see Map 1. Census Bicycle Commute Map). Thirty percent of all bike trips are for work[2]. The rest are for non-work purposes, such as shopping, school, and social/recreational trips.

More than 5% of workers commute by bicycle in several District of Columbia Neighborhoods.

Enthusiasm and interest in bicycling is also increasing. Between 1999 and 2002 the annual, non-competitive BikeDC tour grew from 1,500 to 10,000 participants. Regionally, membership in the Washington Area Bicyclist Association increased from less than 1000 in 1992 to more than 5,000 today. The annual Bike to Work day has increased from 300 participants at one location in the 1990s to 3,000 commuters at a dozen locations throughout the region.

Percent of households that do not own an auto:

District of Columbia: 37%
United States: 10%

There is great potential for increasing bicycle ridership in the District. The city's population contains a large pool of potential bicycle users. Almost thirty-seven percent of DC households do not have access to a motor vehicle[3]. Approximately 275,000 District residents live in households without an automobile or are too young for a driver's license. Bicycling is an inexpensive, flexible mode of transportation. Bicycle mobility helps people find and keep jobs, access health care services, and take advantage of shopping, education, and recreational opportunities.

DDOT has striped 15 miles of bicycle lanes since 2001.

Currently, the District has 17 miles of bike lanes, 50 miles of bike paths, and 64 miles of bicycle routes (see Map 2. Existing Facilities Map). Recent improvements to the bicycle system include:

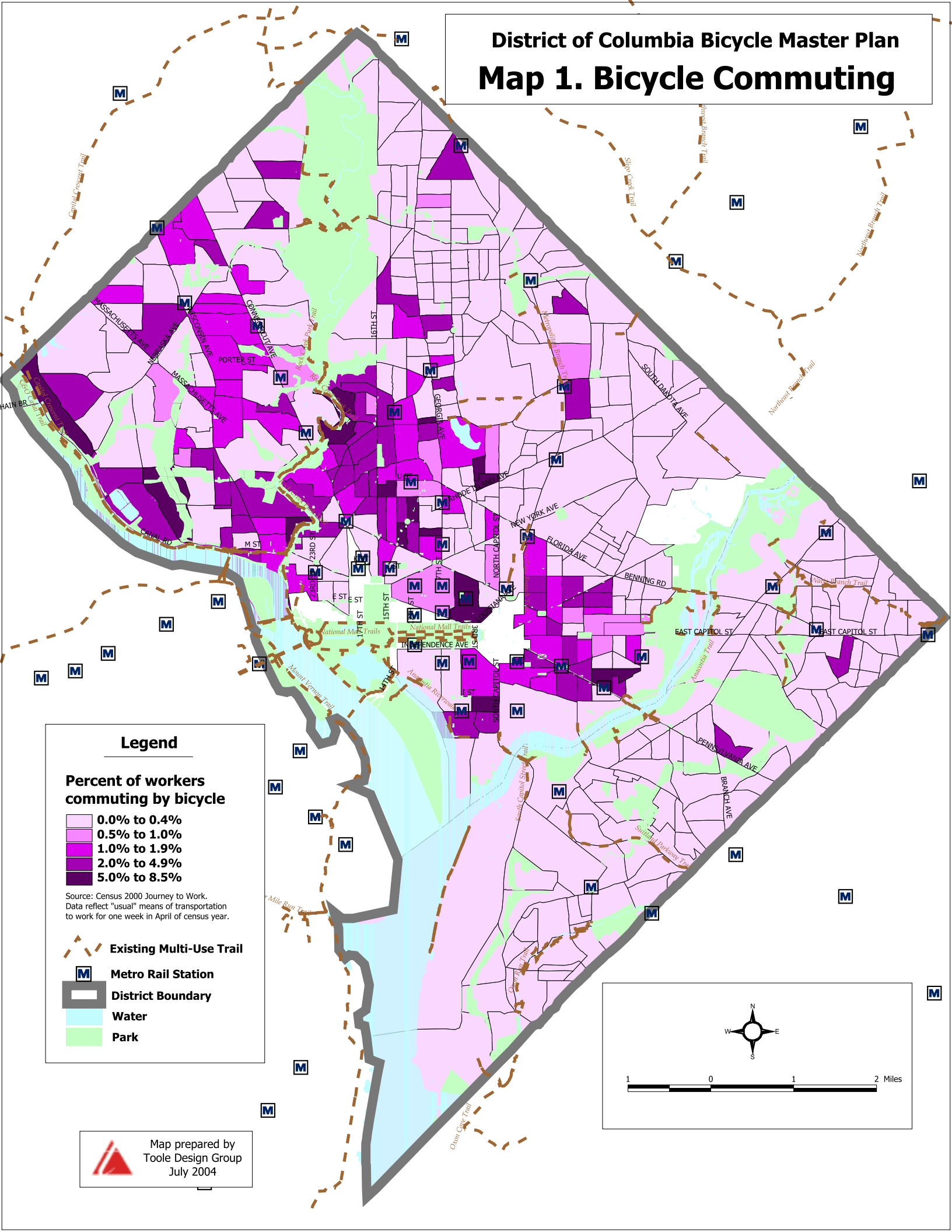
- 15 miles of bike lanes have been added since 2001.
- 20 miles of additional bike path are under design and will be constructed by 2007.
- More than 400 bike racks have been installed in the Downtown area, at District government offices and public libraries, and at retail locations since 2001.
- Metrorail eliminated the permit required for bringing bikes on trains and expanded bike access hours in 2000[4]. More than 8,000 bicycle trips were made on Metro trains in a two week period in August 2001[5].
- All Metro buses were equipped with bicycle racks in 2002.

[1] U.S. Census Bureau. *State and County Quickfacts*, Online: http://quickfacts.census.gov/qfd/states/11000.html, 2004.
[2] Metropolitan Washington Council of Governments. *Metropolitan Washington Regional Household Travel Surveys*, 1988, 1994, 1999.
[3] U.S. Census Bureau. State and County Quickfacts, Online: http://factfinder.census.gov/servlet/DTGeoSearchByListServlet?ds_name=DEC_2000_SF3_U&_lang=en&_ts=93199688005, 2004.

[4] Bicycles are not allowed on Metrorail during the 7 a.m. to 10 a.m. and 4 p.m. to 7 p.m. peak ridership periods.
[5] Washington Metropolitan Transit Authority. Bicycle on Bus Survey, August 9 to August 23, 2001.

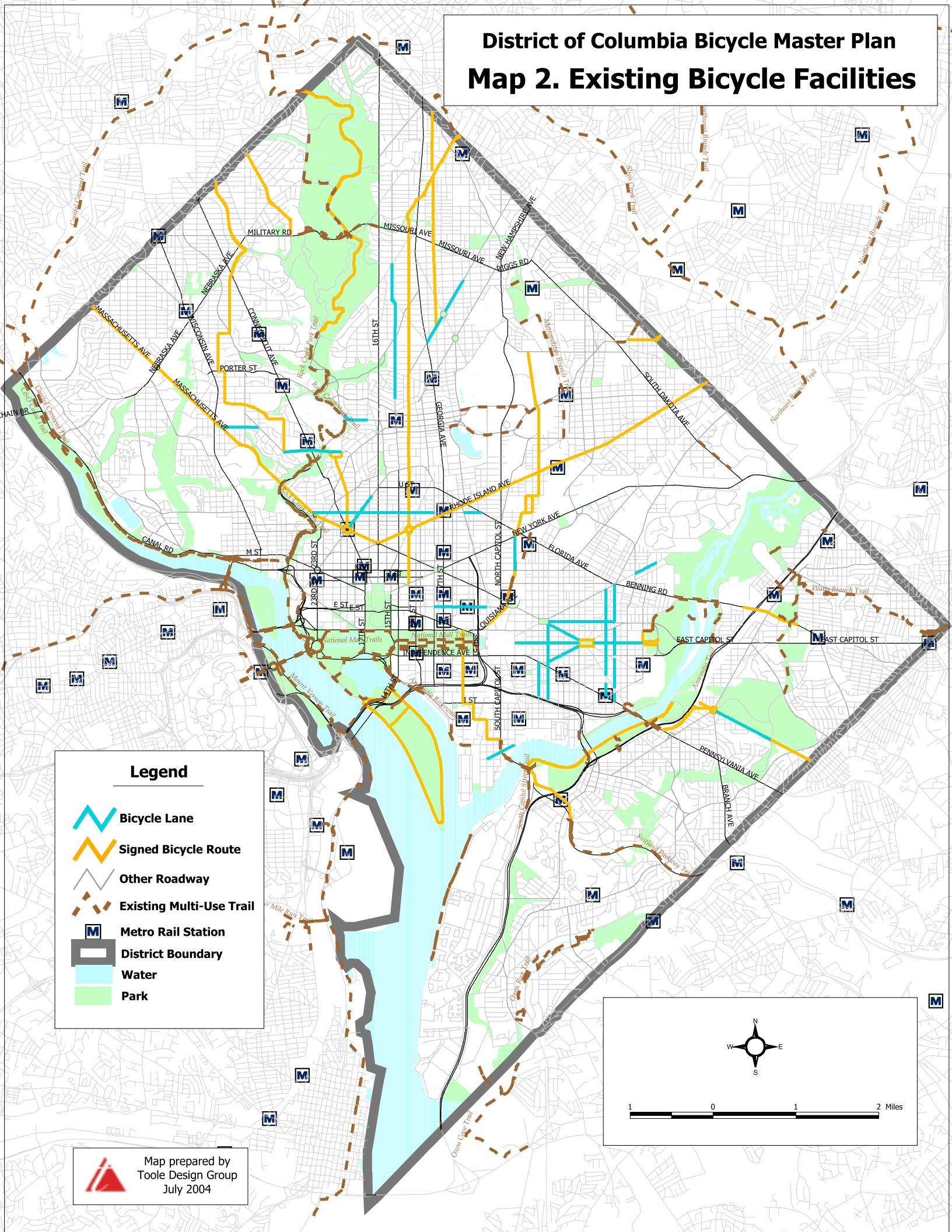
District of Columbia Bicycle Master Plan

Map 1. Bicycle Commuting



District of Columbia Bicycle Master Plan

Map 2. Existing Bicycle Facilities



Map prepared by
Toole Design Group
July 2004

The high-density land use development pattern in the District can support higher levels of bicycle transportation. More than 570,000 residents live on only 61 square miles of land in the District—more than 9,000 people per square mile[6]. There are more than 650,000 payroll jobs in DC, and most are located in the central business district[7]. The downtown office, commercial, and residential buildings are spread over a wide area. Approximately 500,000 jobs are distributed from Foggy Bottom to the Southwest Waterfront and from L'Enfant Plaza to the Convention Center, covering an area of approximately six square miles. Trips in the downtown area are often too far to walk and difficult to drive due to traffic congestion and scarce parking. Bicycling is often the fastest way to travel downtown.

National statistics show that bicycle commuting in the District is higher than most major cities in the United States (see Table 1. Bicycle Commuting in Selected U.S. Cities), but still much lower than other capital cities in the world (see Table 2. Bicycle Commuting in Selected World Capitals). The new bicycle facilities and programs recommended in this plan can help the District achieve even higher levels of bicycling.

Table 1. Bicycle Commuting in Selected U.S. Cities[8]

City	Bicycle Mode Share
Madison, WI	3.19%
San Francisco, CA	1.98%
Seattle, WA	1.88%
Portland, OR	1.76%
Washington, DC	**1.16%**
Philadelphia, PA	0.86%
Los Angeles, CA	0.61%
Chicago, IL	0.50%
New York, NY	0.47%
Houston, TX	0.46%
Baltimore, MD	0.33%
Nationwide Average (includes suburban and rural)	0.38%

Table 2. Bicycle Commuting in Selected World Capitals[9,10]

City	Bicycle Mode Share
Amsterdam, Netherlands	50%+
Beijing, China	48%
Tokyo, Japan	25%
Moscow, Russia	24%
Copenhagen, Denmark	20%
London, United Kingdom	3%
Ottawa, Canada	1.92%

[6] U.S. Census Bureau. State and County Quickfacts, Online: http://quickfacts.census.gov/qfd/states/11000.html, 2004.
[7] Bureau of Labor Statistics, 2000.

[8] U.S. Census Bureau. State and County Quickfacts, Online: http://factfinder.census.gov/servlet/DTGeoSearchByListServlet?ds_name=DEC_2000_SF3_U&_lang=en&_ts=93199688005, 2004.
[9] International Bicycle Fund. Online: www.ibike.org/statistics.
[10] Transport for London. *Transport Statistics for London, 2001.* Online: www.transportforlondon.gov.uk/tfl/pdfdocs/stats2001.pdf

While these conditions provide a firm foundation for bicycling, bicycle transportation improvements are needed in many parts of the District. According to District bicyclists, building bikeways is the most effective way to encourage bicycling in the District. (This was chosen by 59 percent of 258 respondents to an informal survey; no other response had more than 10 percent.) According to one District resident, "Traffic is too heavy, pavement is too rough, and there is no space for bikes." An average of 270 bicycle crashes is reported to police every year. Though crash reports tend to underestimate the total number of bicycle crashes, this still represents approximately two percent of all reported crashes in the District.

There is an average of 270 crashes involving bicyclists every year in the District. Bicycling accounts for about 1 percent of trips, but 2 percent of all crashes in the District.

Additional barriers to bicycling include:

- Inadequate space for bicycling on downtown streets
- Busy arterial roadways with high-speed traffic
- No visible bike facilities on most roadways
- Curbside management issues (double-parking, tour bus parking, trucks loading in bike lanes, etc.)
- Complex intersections with vehicles turning in many directions
- Freeway ramp crossings
- Potholes, roadway debris and other road surface problems
- Narrow, crumbling, and/or debris-filled bicycle trails
- Poor access to bridge sidewalks
- Conflicts with buses
- Deteriorating bike route signs
- Unmarked bike routes
- Scarce bicycle parking in some areas, especially near schools and universities
- Limited understanding and respect for bicyclists among taxi, bus, and other drivers
- Limited awareness of potential bicycle opportunities among residents and visitors

Benefits of Bicycling

Encouraging greater bicycle travel in the District will bring many benefits to residents and visitors. These benefits are summarized below.

Traffic Relief

Increasing bicycle travel reduces the number of motor vehicles on District of Columbia roadways. Improving intersections, completing bicycle paths, and providing more paved shoulder space and bike lanes will provide convenient transportation options for the growing DC population.

A bicycle takes up ¼ of the space of a car and is faster for most urban trips than driving or transit.

A motor vehicle is the second-highest household expense. Bicycling provides a cost-efficient means of travel for residents and visitors.

Environmental Benefits

The primary source of air pollution in the metropolitan Washington region is auto emissions. Motor vehicles are also a source of pollution in the Anacostia River, one of the most polluted rivers in the United States. Substituting bicycling trips for short auto trips will reduce the amount of pollutants generated by automobiles in the District.

The District and surrounding metropolitan region is classified as a severe non-attainment area for ground level ozone by the U.S. Environmental Protection Agency. Cycling 8 miles prevents 15 lbs. of air pollutants from contaminating the air. Bike travel already reduces automotive pollution by 1 percent nationally and saves an estimated 700 million gallons of fuel annually.

Economic Benefits

A motor vehicle is the second-highest household expense, after housing itself[11]. The option of bicycling can improve the mobility of the 275,000 District residents without access to a car and allow some households to own one vehicle instead of two. Pairing bike facility improvements with programs such as car-sharing gives residents more transportation choices.

Bicycling can also help bring tourist dollars into the city. Active vacations are one of the fastest growing sectors of the tourist industry. Bicycling also allows tourists to travel more quickly between sites and enables the District to better tap into the buying power of the 18 million tourists who often limit their DC visit to the National Mall and monuments.

Approximately 18 million tourists visit the District of Columbia each year. Bicycling allows tourists to explore the National Mall and beyond without having to walk long distances or be tied to a bus schedule.

Health Benefits

Increased levels of bicycling will improve the health of District residents. Biking to the store, school or work provides a time-efficient, low-cost way of attaining the U S Surgeon General's recommended daily allowance of physical activity. Bicycle exercise can help reduce heart disease, diabetes, and other chronic illnesses among District residents.

[11] Surface Transportation Policy Project. "Housing and Transportation," Online, www.transact.org/library/factsheets/housing.asp#_ednref1, February 23, 2004.

Master Planning Process

District residents played a significant role in the development of the Bicycle Master Plan. The Bicycle Advisory Council, appointed by the District Council, provided guidance throughout the process at bi-monthly meetings. The BAC established the vision and goals and worked with DDOT to create and refine the Plan. More than 150 citizens were involved in ward-based bicycle rides and workshops. They provided comments on survey forms, on maps, through the Plan website, and at BAC meetings. Citizens suggested bike facility, route, and policy recommendations for the Plan. Over the course of this study, more than 1,000 citizen comments were considered in the preparation of this Plan.

Participants at one of the 2003 public workshops.

The following is a timeline of public input opportunities for this Plan:

November 2002 to January 2005:
Bicycle Advisory Council meetings, bi-monthly

December 2002 to January 2005:
Website online with Plan information and feedback opportunities

May 2003:
Survey forms distributed at Bike to Work Day

April 2003 to July 2003:
Series of public rides in each Ward, followed by public workshops

March 2004:
Draft Plan posted on website for public review

May 2004:
Public Open House to review Draft Plan

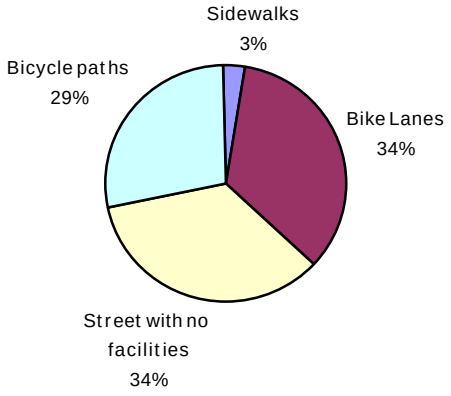
Survey Results

Informal surveys were given to interested District residents online, at Bike to Work Day, and at ward-based workshops in Summer 2003. 258 were completed. Most survey respondents were experienced with bicycling in the District*.

- Preferred facilities for bicycling:
  - Bike lanes: 34 percent
  - Street with no facilities: 34 percent
  - Bicycle paths: 29 percent
  - Sidewalks: 3 percent
- 59 percent recommended providing bikeway facilities as the best way to encourage bicycling in the District. The second and third most popular recommendations were enforcing laws applying to motorists (8 percent) and reducing street traffic (8 percent).
- 152 out of the 258 respondents (59 percent) had been involved in some type of crash.

*47% of surveys were submitted online, 38% at Bike to Work Day, 13% at ward meetings, and 2% by mail. The most common characteristics of survey respondents were: male (66%), between 30 and 39 years old (40%), and used their bike at least 5 days per week (40%).

Preferred Facilities for Bicycling



Workshop and survey feedback

Public feedback was obtained through ward-based workshops, e-mail comments, and an informal survey. The survey was distributed online, at Bike to Work Day, and at the ward-based workshops. A total of 258 survey responses were received.

In general, survey and workshop participants felt that streets with bike lanes, neighborhood streets with light traffic, and bridges with wide sidewalks are good places to bicycle. Poor places to bicycle are downtown streets, major thoroughfares between downtown and the neighborhoods, and streets with poor pavement quality.

Many participants felt that streets without bike facilities are difficult places to bicycle. Approximately 60 percent of respondents recommended providing more facilities, such as bike lanes and bike paths. Others emphasized improving access to trails, posting better bicycle signage, increasing education for motor vehicle drivers and bicyclists, and providing more stringent enforcement of traffic laws.

See Appendix A for a more detailed summary of the Bicycle Master Plan public review process, and Appendix B for an example survey form.

Geographic Information Systems Data

Objective data were also collected to inform Plan recommendations. The following data were analyzed with Geographic Information Systems (GIS):

- Bicycle crash locations from 1997 to 2002
- Bicycle-oriented destinations, such as parks, Metrorail stations, community centers, schools, universities, and tourist destinations.
- Roadway locations and characteristics

Roadway Inventory and Bicycle Level of Service Analysis

Conducting a comprehensive roadway inventory was an important component of the background analysis. Field measurements were taken on 406 miles of major collector and arterial streets in the District in early 2003. This accounts for about 45 percent of all DC streets. Roadway lane and shoulder width, speed limit, pavement condition, and on-street parking data were collected and used in the scientifically-calibrated Bicycle Level of Service (Bicycle LOS) Model to evaluate the comfort of bicyclists on roadway segments. The results are shown in Map 3.

Analysis found that about 32 percent of the study network received above average grades of A, B, or C on an A (best) to F (worst) grading scale. Streets with lower traffic volumes and bicycle lanes tended to have the highest Bicycle LOS grades. Most of the downtown streets and major arteries between downtown and the suburbs had grades of D or lower. Roughly 700 miles of streets were not evaluated. These were either local streets where conditions tend to already be good for bicycling (Bicycle LOS A or B) or limited access roads (freeways). See Appendix C for a more detailed description of the Bicycle LOS methodology and analysis results.

Bicycle Level of Service Summary

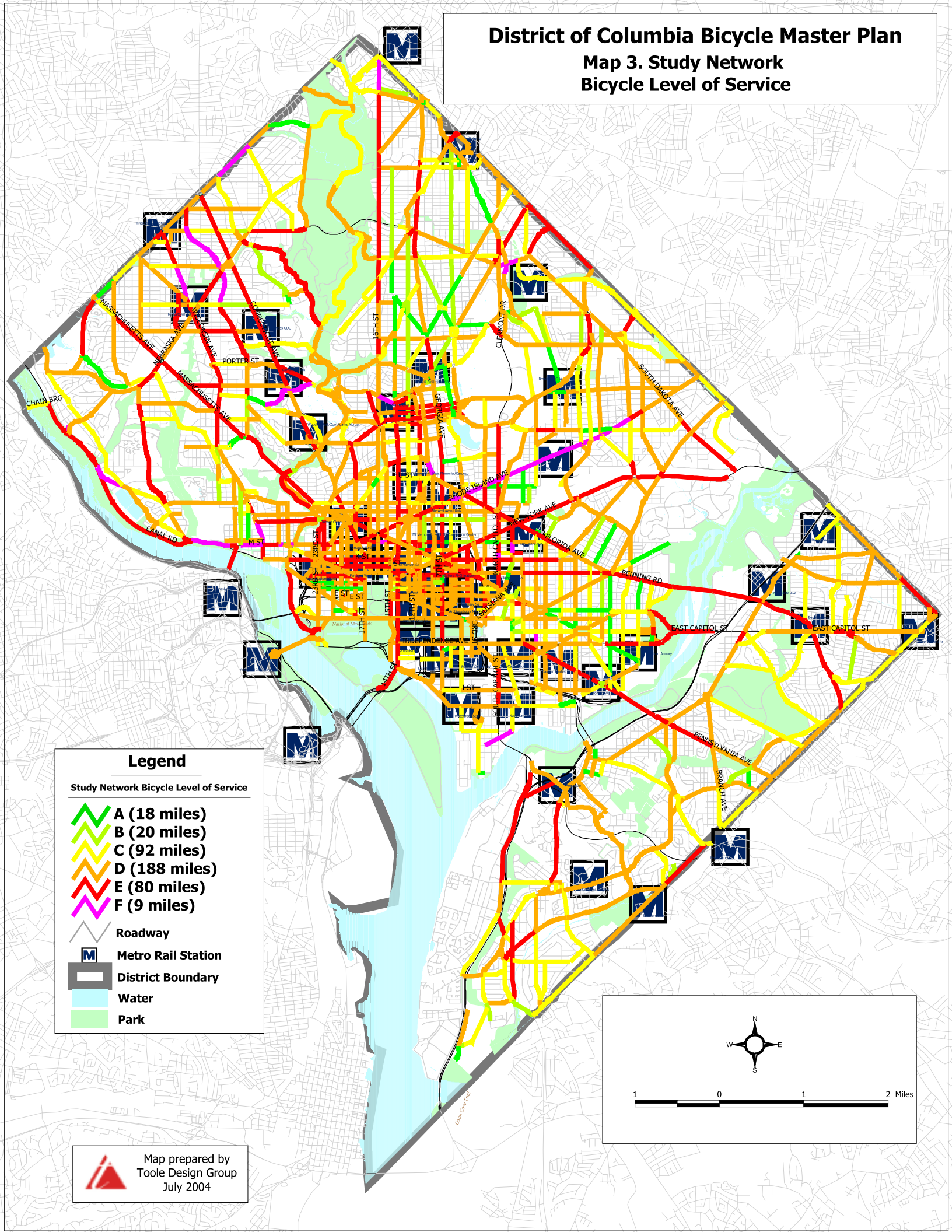
Bicycle Level of Service	Miles	% of Miles with BLOS
A	17.8	4.4%
B	19.9	4.9%
C	91.7	22.5%
D	188.1	46.2%
E	80.5	19.8%
F	8.9	2.2%
Total	**406.9**	**100.0%**
Not Evaluated	745.4	

NOTE: 745 miles of DC roadways were not evaluated. These were either local streets where conditions tend to already be good for bicycling or limited access roads (freeways).

Bicycle Level of Service results were one of several sources of information used to select the bicycle route network. Specifically, routes with a Level of Service D or above, or with the potential to be improved to this level, were selected. The Bicycle Level of Service model and associated roadway inventory were also used to prioritize street improvements and identify potential for striping bike lanes and making other bicycle improvements.

District of Columbia Bicycle Master Plan

Map 3. Study Network
Bicycle Level of Service



Goals and Core Recommendations

Fourteen core recommendations and other supporting recommendations will be pursued to improve bicycle transportation in the District of Columbia. The core recommendations are listed in three goal areas:

Goal 1: More and Better Bicycle Facilities

Recommendation 1.1.
Improve and expand the bike route system and provide functional and distinctive signs for the system.

Recommendation 1.2.
Provide bike facilities on roadways.

Recommendation 1.3. Complete ongoing trail development and improvement projects.

Recommendation 1.4.
Improve bridge access for bicyclists.

Recommendation 1.5.
Provide bicycle parking in public space.

Recommendation 1.6.
Encourage bicycle parking in private space.

Goal 2: More Bicycle-Friendly Policies

Recommendation 2.1.
Update District of Columbia laws, regulations and policy documents to address bicycle accommodation.

Recommendation 2.2.
Provide training to District staff.

Recommendation 2.3.
Review District of Columbia projects to ensure they provide bicycle accommodation.

Vision Statement

"The District of Columbia will be a world-class bicycling city that offers a safe and convenient network of bikeways for all types of trips."

Goal 3: More Bicycle-related Education, Promotion, and Enforcement

Recommendation 3.1.
Educate motorists about safe operating behavior around bicyclists.

Recommendation 3.2.
Educate bicyclists about safe bicycling.

Recommendation 3.3. Enforce traffic laws related to bicycling.

Recommendation 3.4.
Establish a Youth Bicycle and Pedestrian Safety Education Program.

Recommendation 3.5.
Distribute the District of Columbia Bicycle Map to a wide audience.

Section II provides additional details about the goals, core recommendations and supporting recommendations. Section III includes a table with the partners, timeframe, and milestones for implementation of the recommendations.

Bicycle Route Network

The Proposed Bicycle Facilities Map (see folded insert) identifies the arterial network for bicycling in the city, the Bicycle Route Network. This Network includes routes where facilities can be added within the next five to ten years.

While some streets in the Bicycle Route Network have poor bicycling conditions today, they can be converted to high quality bike facilities through a stand-alone project or as part of a future road reconstruction project. All routes in the network should have facilities that provide a visible indication that they are a bikeway.

Background information used to select the Bicycle Route Network included:

- Existing and planned bike lanes
- Existing and proposed bike path locations
- Existing signed bike routes
- Historic bike routes (1975 District of Columbia Bikeway Planning Study, 1987 Bike Route Network, 1995 Metropolitan Washington Council of Governments (MWCOG) Bicycle Plan, 1998 ADC Washington D.C. Regional Bike Map)
- Bicycle Level of Service (BLOS) analysis
- Locations of major destinations for bicycling, such as parks and Metro stations
- Extensive fieldwork
- Public input from website, survey, and workshop maps and comments
- BAC and DDOT staff input

Basic Principles of the Bicycle Route Network

- All streets in the District of Columbia should accommodate bicyclists; however, the bicycle network will provide an arterial network for cycling in the city.
- All bicycle network routes should be developed with facilities that provide a visible indication that they are a bikeway (bike lanes or signs).
- All District residents will live within ½ mile of a bicycle route or trail.
- The bicycle route network will provide connectivity within and between:
  - downtown and other employment centers
  - residential neighborhoods
  - parks and recreational facilities
  - schools and universities
  - adjacent jurisdictions
  - transit

Milestones for Implementation

There are three major milestones for measuring long-term progress on the Plan:

1) 50 miles of DC streets will have better Bicycle Level of Service ratings by 2010 and 100 miles will have better Bicycle Level of Service ratings by 2015.

2) The proportion of bicycle trips will increase from about 1 percent of all trips in 2000 to at least 3 percent in 2010 and 5 percent of all trips in the District of Columbia by 2015.

3) The rate of bicycle collisions with motor vehicles will decrease from 26 reported bike crashes per 1 million bike trips in 2000 to 20 per 1 million in 2010 to 15 per 1 million in 2020.

District of Columbia Planning Context

The recommendations of this Bicycle Master Plan help achieve the goals set forth in a variety of other District of Columbia and regional plans. The following plans either lend support to the objectives of this Plan, or otherwise relate to the goals and objectives herein. Coordination with the development and implementation of these plans is important.

National Capital and Regional Plans

- *Extending the Legacy: Planning America's Capital for the 21st Century* (National Capital Planning Commission, 1997): The Legacy Plan calls for Washington to become a "national model of enlightened urban transportation." Obtrusive highways and bridges should be removed, pedestrian and bicycle access should be provided on major bridges, and the District's waterfront should be developed.

- *Transportation Improvement Program (TIP)* (National Capital Region Transportation Planning Board, updated annually): This is a listing of the federally funded transportation projects, including bicycle and trail projects. A project must be in the TIP to receive federal funding.

- *Constrained Long Range Plan (CLRP)* (Metropolitan Washington Council of Governments, updated every 3 years): The CLRP identifies major capital improvements, studies, actions and strategies that the region proposes to carry out in a 20-year period. Specific regional bicycle projects are recommended.

District of Columbia Plans

- *District of Columbia Comprehensive Plan* (1999): Transportation is specifically referenced in Chapter 5, the Transportation Element, Chapter 9, the Downtown Plan Element, and Chapters 11 through 19, the Ward Plan Elements. The current document is limited in its guidance and support for non-motorized modes of travel. At present, the DC Office of Planning is leading a process to revise and update the Comprehensive Plan. This process offers an opportunity to strengthen the Comprehensive Plan with regard to bicycle transportation.

- *Strategic Transportation Plan for District of Columbia/State Long Range Transportation Plan (LRTP)* (1997): This plan emphasizes providing a multi-modal transportation system, including a "world-class bicycle transportation network". The Action Plan (Action Item 7.17) calls for the development of District-wide "bicycle spine network," to connect existing, dedicated bicycle paths with one another and with new paths and dedicated bicycle lanes. The District is currently updating the LRTP, which includes a multi-modal analysis of 27 roadway corridors. The LRTP update provides an opportunity to update and expand upon the recommendations for bicycle facilities and policies.

- *Capital Improvement Plan (CIP)* (updated annually): The CIP is a comprehensive, six-year plan for the development, modernization or replacement of city-owned facilities and infrastructure. It includes street and bridge projects.

SECTION II. RECOMMENDATIONS

This section lists core and supporting recommendations that will establish a world-class bicycle transportation system in the District of Columbia. The recommendations are listed in the three goal areas: Goal 1, Facilities, Goal 2, Policies, and Goal 3, Education, Promotion, and Enforcement.

The strategies below will increase bicyclist safety and security while improving the connectivity and accessibility of destinations and activity centers within the District of Columbia and adjacent jurisdictions.

Goal 1: More and Better Bicycle Facilities

Facilities are the physical improvements to the city's bicycle infrastructure such as trails, bike lanes, bike route signs and bicycle parking.

Core Recommendations

Recommendation 1.1. Improve and expand the bike route system and provide functional and distinctive signs for the system.

DDOT will post bike route signs along key bike network routes. These bicycle routes will have signs posted frequently and have arrows that show every turn clearly. The signs will have sub-plates showing the direction and distance to significant destinations on and near the route. This plan calls for 150 miles of signed bicycle routes (see enclosed map).

DDOT will conduct a field inventory of the signs on an annual basis and replace missing and damaged signs.

Recommendation 1.2. Provide bike facilities on roadways.

The District's existing system of bike lanes and bike routes will be expanded to create a comprehensive, interconnected network of bicycle facilities. Bicycle facilities will be improved and maintained whenever streets are repaved or reconstructed. Special attention should be given to accommodating bicycles on streets that are designated as a part of the Bicycle Route Network.

DDOT will provide on-road bicycle facilities such as bike lanes, wide outside lanes, and on-road separated bike facilities. Roadway striping and geometric improvements will be made when streets are repaved. DDOT will publicize these bicycle improvements. This plan calls for 60 miles of bicycle lanes over the next 10 years (see enclosed map).

Recommendation 1.3. Complete ongoing trail development and improvement projects.

The District will build and maintain a high-quality system of shared-use paths. DDOT will continue to play a lead role in the development of two new trails that will fill major gaps in the District and regional trail systems (see Map 4. Trail Map):

- Metropolitan Branch Trail
- Anacostia Riverwalk and Trail

DDOT and NPS are planning a new trail along the Anacostia River

Completion of these projects will bring multi-use trails to Northeast and Southeast DC, areas of the city that are currently underserved by trails. These trails will also connect the city to extensive suburban trail networks in Prince George's and Montgomery counties. DDOT will continue to work with DPR, WMATA, NPS, Maryland-National Capital Park and Planning Commission (MNCPPC), Maryland DOT, and community-organizations to ensure that these trail systems realize their full potential.

DDOT will also improve existing DC and NPS trails. Projects planned and underway include such trails as Watts Branch, Oxon Run, and Rock Creek trails. This plan calls for building or improving 90 miles of trails.

Recommendation 1.4. Improve bridge access for bicyclists.

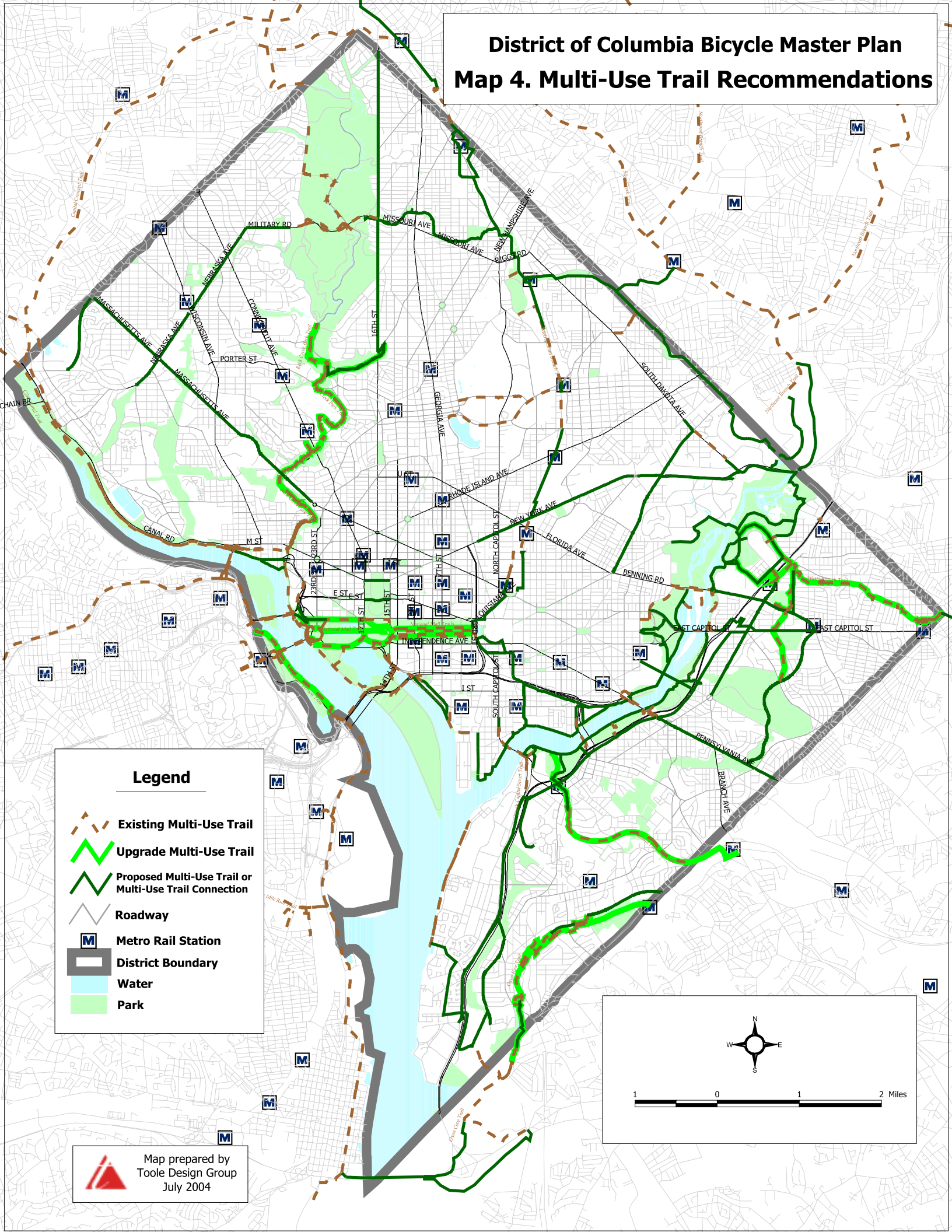
Access to many of the Potomac and Anacostia River Bridges is difficult and will be improved. Since most bridge access points are on NPS land, DDOT should work with NPS to provide these connections. Space for bicyclists must be provided on street and highway bridge structures and in the roadway corridors under the structures. Where the bridge replacement project impacts other roadways, bicycle access must be provided on these roadways. Top priority bridge access improvements include the following (see Map 5. Bridge Access Improvements Map):

The Benning Road Bridge was improved with wider sidewalks for bicyclists and pedestrians.

- 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 Mall
- East Capitol Street Bridge from Anacostia.
- Benning Road bridge over the railroad and freeway east of the Anacostia River
- 11th Street Bridge from Anacostia and Capitol Hill
- South Capitol Street Bridge from Anacostia and Capitol Hill
- Designated bicycle space on the Military Road Bridge through Rock Creek Park
- Access to and designated bicycle space on bridges in the Michigan Avenue/Irving Street area

District of Columbia Bicycle Master Plan

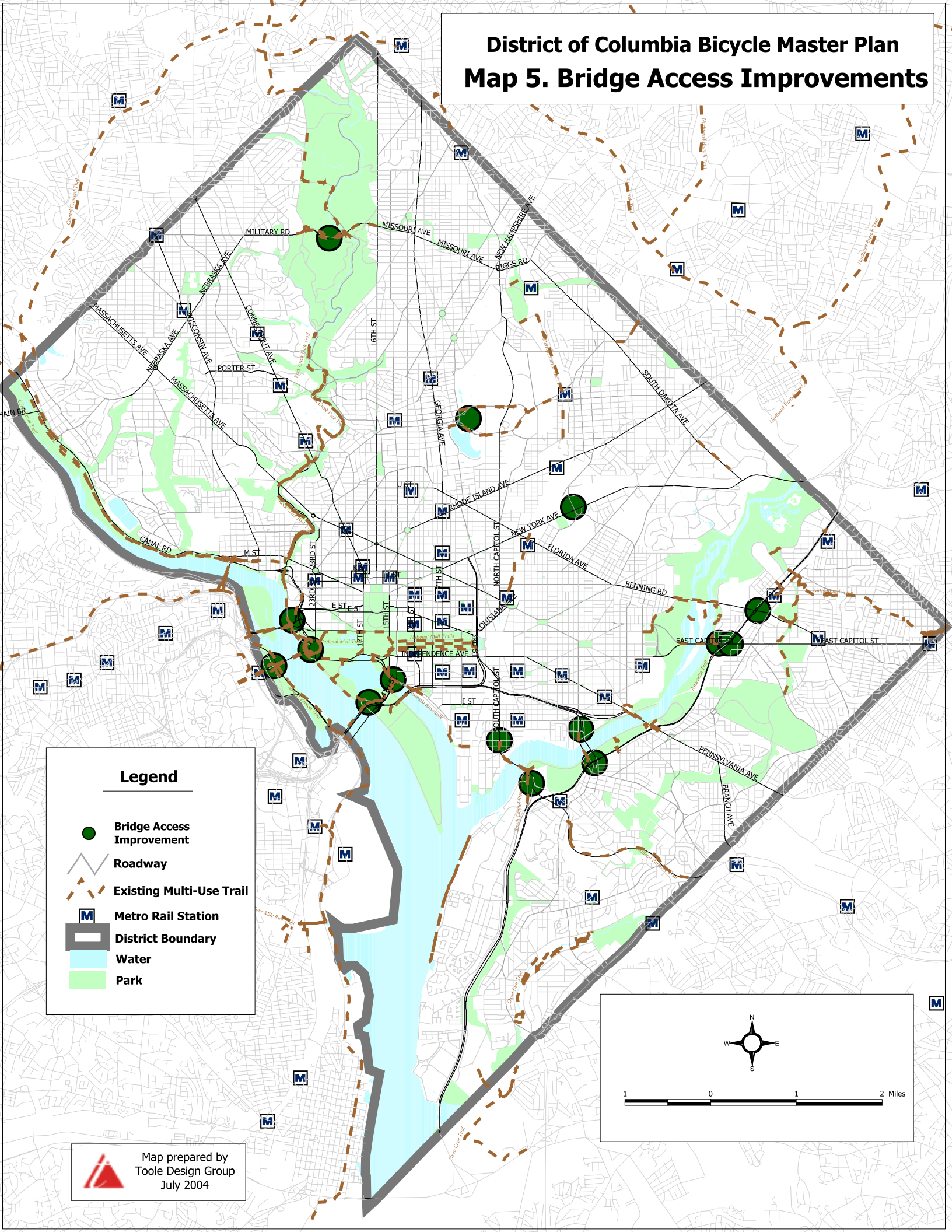
Map 4. Multi-Use Trail Recommendations



Map prepared by
Toole Design Group
July 2004

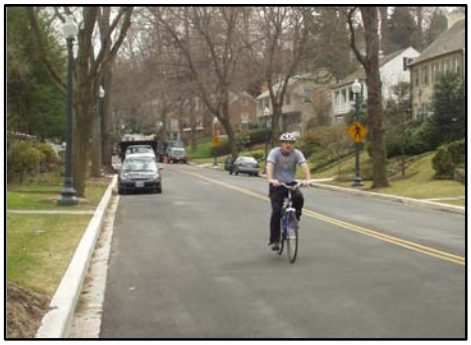
District of Columbia Bicycle Master Plan

Map 5. Bridge Access Improvements



Description of Common Bicycle Facilities

Different types of facilities will be needed to provide safe and comfortable accommodation for bicycles in the District of Columbia 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* document.



Shared Roadways

Shared roadways are streets and roads where bicyclists can be served by sharing 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 can also include streets with wide outside lanes (13 to 14 feet). Increasing the outside lane width increases comfort for bicyclists.

Signed-Shared Roadways

A signed-shared roadway is roadway which has been designated by signing as 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.

Bike Lanes

A bike lane is a portion of the roadway that has been designated by striping, signing and pavement markings for the preferential or exclusive use of bicyclists. Bike lanes are always 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.

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 ten-feet wide and paved. Their width may be reduced to eight feet if there are physical or right-of-way constraints. 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. Wide sidewalk facilities can also be designated as shared-use paths, with or without marked bicycle space. 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.

Description of Common Bicycle Facilities, continued

Bike-friendly traffic calming

Slowing motor vehicle speeds helps improve the Bicycle Level of Service 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.

Exclusive bus and bicycle lanes

Multi-lane streets that serve as bus routes have the potential to accommodate exclusive bus and bicycle lanes. On many bus routes with frequent bus stops, regular automobiles back up behind buses in the outside lane, significantly reducing the utility of the outside lane for non-transit use. Exclusive lanes ensure that regular vehicles do not get stuck behind buses, allow buses to avoid traffic congestion, and also provide a wide lane for bicyclists. These lanes should be used on streets with frequent bus service and with potential to serve large numbers of bicyclists. Exclusive bus and bicycle lanes were used in the District in the 1980s on Connecticut Avenue.

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 left 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.

Recommendation 1.5. Provide bicycle parking in public space.

DDOT will continue to provide bicycle parking in public spaces throughout the District. DDOT should work with the Metropolitan Police Department (MPD) and security companies to reduce bike theft and damage at bicycle racks.

Recommendation 1.6. Encourage bicycle parking in private space.

DDOT will encourage building managers and property owners to provide bicycle parking as required by DC regulations. Bicycle parking must be provided in parking garages, and it must be designated by prominent signage. Zoning requirements for bicycle parking will be enforced.

Supporting Recommendations

Recommendation 1.7. Establish a major bicycle station and an automated bicycle rental system.

DDOT should work with WMATA, NPS, and private vendors to establish a bicycle station at Union Station. The bike station should have bike retail, parking, storage, and rental opportunities. DDOT should also implement an automated bicycle rental system, with rental kiosks throughout the downtown area.

A Bike Station in Palo Alto, California provides free guarded parking, bike rentals and other bicycle commuting services.

Recommendation 1.8. Upgrade and extend key existing trails.

Upgrading old and sub-standard trails is critical to improving bicycle transportation and safety. Coordination between DDOT and NPS is essential for many of these projects. The following projects should be undertaken in future years (see Map 4. Trail Map):

Many of DC's older trails, like the Rock Creek Trail, are in need of improvement.

- Establish and upgrade two shared use path routes traversing the National Mall from the Theodore Roosevelt and Memorial Bridges to the Capitol

Grounds, one serving north side Mall destinations and one serving south side destinations.

- Upgrade portions of the Mount Vernon Trail, including George Washington Parkway crossings and Memorial Bridge access.
- Upgrade Rock Creek Trail between P Street and Broad Branch Road, including a new bridge south of the zoo tunnel.
- Upgrade the Suitland Parkway Trail and extend it to the Anacostia River Trail in the District and to the Naylor Road Metro Station and Andrews Air Force Base in Prince George's County.
- Upgrade the Watts Branch Trail.
- Upgrade the Oxon Run Trail and extend it to the Oxon Cove Trail.
- Pave and upgrade the Fort Circle Trail from Fort Dupont Park to the Watts Branch Trail near Fort Mahan.
- Construct a Piney Branch Parkway trail spur from Rock Creek Trail to Arkansas Avenue.
- Construct a sidepath and trail along M Street, SE and Virginia Avenue, SE connecting the Anacostia River Trail with "I" Street and Garfield Park.
- Construct a shared use path along Dalecarlia Parkway.

Recommendation 1.9. Initiate focused trail planning efforts to eliminate gaps in the Bicycle Route Network and trail network.

Through this and other planning efforts, key gaps in the bicycle network have been identified. Recent planning initiatives such as the Anacostia Waterfront Initiative, Fort Circle Parks General Management Plan, and the Potomac Heritage National Scenic Trail Plan have identified a number of new trail opportunities that could fill these missing links. 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 (see Map 4. Trail Map):

- Historic Anacostia: Utilize right-of-way along the abandoned railroad spur and/or adjacent street for a trail alongside the Light Rail Line planned for the same corridor. This trail will link residential neighborhoods, schools, and metro stations along the east side of the Anacostia River and could be extended to St. Elizabeth's.
- Georgetown Waterfront: Develop a plan for connecting the Capital Crescent Trail to the Rock Creek Trail along the Georgetown waterfront.
- South Capitol Street/I-295 Corridor: Identify an efficient trail and bikeway alignment from the Capitol to Oxon Cove and to the bicycle facilities on the new Woodrow Wilson Bridge.
- New York Avenue Corridor: Plan for a trail or bikeway 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 DC 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 or ferry crossing 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 8 a.m. to 5 p.m. hours.
- Massachusetts Avenue Bridge: Provide bicycle trail access on and to the proposed bridge across the Anacostia River.
- Beach Drive in Upper Rock Creek Park: Plan for an improved bicycle connection between the north end of the Rock Creek Trail at Broad Branch Road and the south end of the Rock Creek Trail in Maryland. Beach Drive is dedicated to non-motorized traffic on weekends but bicycles must share this narrow road with motor vehicles on weekdays.

Institutions

- U. S. Capitol Complex
- U. S. Soldiers and Airmens Home
- Walter Reed Army Medical Center
- 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
- Saint Elizabeth's

Redevelopment projects are excellent opportunities to remove these barriers. For example, bicycle access in the areas surrounding the intersection of New York Avenue, New Jersey Avenue, and the Interstate 395 tunnel can be improved with the North of Massachusetts Avenue (NoMa) redevelopment project. Bicycle access in the South Capitol Street Corridor can be provided on both sides of the Anacostia River with the South Capitol Street Corridor redevelopment project. In addition, the DC Office of Planning is planning an adaptive reuse of landmark buildings at Saint Elizabeth's in Southeast.

Recommendation 1.15. Provide innovative bicycle facilities to maintain the continuity of bike routes.

The designated bike routes in the District use roadways with a variety of cross-sections. Bike lanes and other pavement markings are appropriate bike facilities in some sections of these routes, while pathways are appropriate in other sections. Yet, there are considerable limitations to conventional bike facilities due to inadequate street width, intersection conflicts, high-frequency bus routes, high pedestrian use on sidewalks or other obstacles. The District should test a variety of different facility types along constrained streets. Many of the following innovative solutions have been successful in other U. S., European, and Canadian cities (see *District of Columbia Bicycle Facility Design Guidelines* document):

- Bike-in-arrow pavement markings
- Designated sidewalk space for bicycles
- Road surface bikeways (separated from motorized traffic by a physical barrier)

Part of the street can be used to create a separate trail, like this one in Montreal.

- Bike lane on one side, shared-use path on other side of the street
- Bike lane on one side, bike-and-arrow marking on other side of the street
- Exclusive bus and bicycle lanes
- Narrowing curb-to-curb width to provide more space for a separated bikeway
- Bike boxes at intersections
- Bicycle-activated signals
- Lifting rush-hour parking restrictions to provide lane space for bicyclists

In special situations, sidewalk space can be designated for bikes.

Bicycle Box at an intersection

Two-way road surface bikeways are one type of bicycle facility recommended for the District. These and other innovative facilities should initially be installed on a pilot test basis. If they don't work, it may be necessary to change the bicycle route.

Recommendation 1.16. Provide safe transitions between on-road and separated bicycle facilities.

DDOT should identify points on bike routes 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. All changes in grade should be continuous (i.e. not require the cyclist to climb a curb or steps). The design of transition points should not prevent more experienced bicyclists from riding the entire route along with motorized traffic.

Special markings can improve the transition between street and trail.

Recommendation 1.17. Provide bikeway connections into surrounding counties.

DDOT should work with Arlington, Montgomery, and Prince George's Counties to provide bicycle connectivity throughout the region. The Bicycle Program Manager should regularly communicate with neighboring governments about connecting and extending bike routes across jurisdictional boundaries (see Map 9. Connections to Maryland and Virginia).

Recommendation 1.18. Improve bicycle access to public transportation.

Most Metro stations have bicycle lockers and racks for bicyclists. However, as the Metro 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 must be provided at stations to direct cyclists to bike parking and nearby bikeways.

Bicycle racks and lockers at Metro station.

DDOT should work with WMATA to improve bicycle facilities on and near Metro station properties. Improving the quality of bicycling to Metro 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 light rail and bus rapid transit, should be compatible with bicycling.

Goal 3. More Bicycle-Related Education, Promotion, and Enforcement

The strategies in this goal area will help educate all roadway users about bicycle safety and increase public awareness of opportunities for bicycling in the District of Columbia.

Core Recommendations

Recommendation 3.1. Educate motorists about safe operating behavior around bicyclists.

DDOT will educate motorists about bicycle safety through media campaigns, driver's tests, and the distribution of written materials. DDOT will also target taxi cab, bus, and truck drivers about safe driving behavior around bicycles.

Recommendation 3.2. Educate bicyclists about safe bicycling.

DDOT will educate bicyclists about traffic safety. Materials should emphasize helmet use and obeying traffic laws. DDOT will work through bicycle groups like WABA to educate their members on bicycle safety.

Recommendation 3.3 Enforce traffic laws related to bicycling.

The Metropolitan Police Department will enforce laws related to bicyclist and motorist behavior. MPD will target unsafe bicycling practices such as red light running, wrong-way riding, and riding on the downtown sidewalks. They will also target motorists who speed, run red lights, and pass too close to bicyclists.

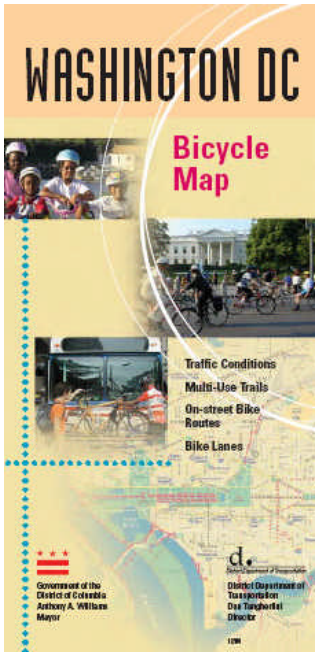
MPD and the Department of Public Works will ticket and tow vehicles that park in bicycle lanes. DDOT should reduce the impact of construction on bicycle facilities.

Recommendation 3.4. Establish a Youth Bicycle and Pedestrian Safety Education Program.

When educating cyclists, it's best to start young. DDOT is currently working with WABA on a youth Bicycle and Pedestrian Safety Education Program in DC Schools. This program will be evaluated and expanded. Supporting efforts can also be undertaken by the DC Department of Parks and Recreation. Over 50,000 students attend DC Public Schools (DCPS) and many more attend private schools. Efforts to encourage bicycling to school must be complemented by a program to improve the safety of the routes students take to school.

Recommendation 3.5. Distribute the District of Columbia Bicycle Map to a wide audience.

DDOT will produce a large number of DC Bicycle Maps for the general public. Maps will be easy for all residents and visitors to obtain. A press release will be issued when the Bicycle Map is first available. DDOT will update the bike map every five years to reflect improvements in bicycle facilities. The map will be distributed by DDOT with the help of WMATA, DPR, NPS, and tourism organizations at the following destinations for bicyclists:



- Metro stations
- Metro buses
- DC park and recreation centers
- Retail businesses
- Libraries
- Parks
- ANCs and other community groups

Supporting Recommendations

Recommendation 3.6. Increase the visibility of bicycling in the District government and encourage bicycle commuting.

DDOT should support Bike to Work Day, promote bicycle friendly DC government worksites, and encourage use of bicycle transportation among city service providers, such as police, parking enforcement agents, and building inspectors. DC Bicycle Program staff should develop a bi-monthly newsletter to share news about bicycle transportation successes and opportunities within the District government. It could provide agency staff with information about implementation of the Bicycle Master Plan and upcoming projects. These actions will set a positive example for residents of the District.

DDOT should encourage employees to bike to work. DDOT should make sure all DC offices have adequate bike parking. These efforts can be expanded to offer monetary incentives to employees who ride to work, making bicycles available during the day for bicycling to meetings, and providing shower facilities in buildings. Establishing a strong Bike to Work program at the District Government will 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 greatest number of employees bicycling to work would receive an award.

Recommendation 3.7. Establish a Safe Routes to Schools Program.

DDOT should establish a Safe Routes to Schools (SRTS) Program. This program will focus on making streets safer for bicycling and walking by adding sidewalks, making intersections safer, and calming traffic near the school. Secure bike parking should also be provided. The 2004 federal transportation reauthorization act contains funding for a safe routes program.

As part of the program, DDOT should encourage students to bike to school. Groups such as the Washington Area Bicyclist Association (WABA), universities, and health organizations can also become partners in this effort. Students at some of these schools are discouraged from riding to school because bicycle parking is prohibited or secure bike parking is not provided on school grounds. Classroom bicycling competitions, bicycle trip diaries, adult-led "bicycling school bus" groups, and visits from bicycle police are a few of the ways to encourage students to bicycle.

Recommendation 3.8. Maintain and expand the District Bicycle Program web page of the DDOT website.

DDOT should continue to maintain the District Bicycle Program web page on its website. Additions to this page should include:

- A comment form for people to submit maintenance requests and other ideas online
- A list of projects that have recently been implemented throughout the District
- A downloadable version of the Bicycle Master Plan
- A downloadable version of the District of Columbia Bicycle Map

DDOT has partnered with the Washington Area Bicyclist Association to provide bicycle and pedestrian safety training in DC elementary schools.

Recommendation 3.9. Inform residents about bicycle transportation opportunities on an individual basis.

DDOT should work with the Metropolitan Washington Council of Governments (COG), WABA, and WMATA to market alternative transportation, including bicycling, to individuals. Known as Travel Smart in some areas, the program works by sending letters to all homes in a specific neighborhood. 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. These representatives, possibly WABA members, would come to the resident's home or workplace to ride with the resident on the bicycle trip. This program could be an extension of COG's existing Commuter Connections program. Travel Smart has increased the number of people making trips by bicycle in Paris, London, and Portland.

Recommendation 3.10. Market the District as an "Active Vacation Destination."

DDOT should work with NPS and the DC Heritage Tourism Corporation, DC Convention and Tourism Corporation, and the Greater Washington Board of Trade to market the District as an "Active Vacation Destination." Outdoor recreation is the second most popular activity for leisure travelers, behind shopping. About 27 million travelers took bicycling vacations in the past five years, making bicycling one of the top three most popular outdoor vacation activities[2]. Eighteen million people visit DC each year, but tourists spend most of their time in the Mall area. Bike rental stations and a well-advertised bicycle system would increase the mobility of tourists. This would allow them to bicycle between sites and explore the historic and diverse neighborhoods of the District. "Bike the Sites" already promotes bicycle tourism in the Mall area, and they should be invited to participate in this effort.

Bicycle transportation for visitors can be promoted by:

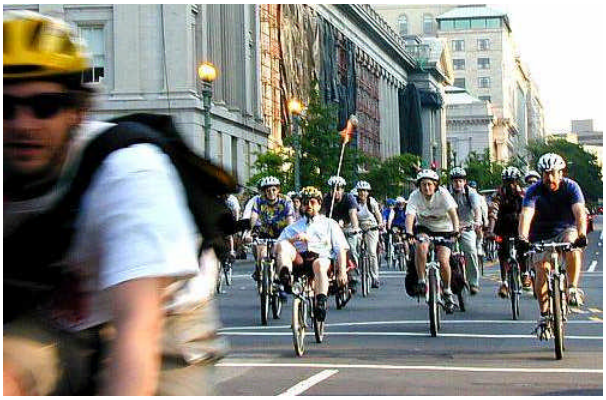
- Posting the DC Bike Map and information about bicycling.
- Distributing the DC Bike Map to all tourism organizations.
- Encouraging tourism organizations to distribute the DC Bike Map.

Recommendation 3.11. Establish partnerships with health care organizations to promote bicycling as a healthy activity.

DDOT should work with the DC Department of Health (DOH) and area hospitals to promote bicycling as part of the effort to prevent obesity, diabetes, heart disease, and cardio-vascular disease.

Recommendation 3.12. Support bicycling rides and events in the District of Columbia.

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 the MPD. The DC Sports and Entertainment Commission, DC Convention and Tourism Corporation, and Greater Washington Board of Trade can also help rally the business community behind these events.



[2] Travel Industry Association. Online: http://www.tia.org, February 20, 2004

Section III. Implementation, Coordination and Schedule

Overview

Implementation of the recommendations in this plan will take serious effort and commitment on the part of District agencies, federal agencies, business leaders, elected officials, bicycling advocates, community groups, and others. This section of the Plan describes the timeline for implementation and the key players necessary for success.

Milestones for Implementation

There are three major milestones for measuring long-term progress on the Plan:

1) 50 miles of DC streets will have better Bicycle Level of Service ratings by 2010 and 100 miles will have better Bicycle Level of Service ratings by 2015.

2) The proportion of bicycle trips will increase from about 1 percent of all trips in 2000 to at least 3 percent in 2010 and 5 percent of all trips in the District of Columbia by 2015.

3) The rate of bicycle collisions with motor vehicles will decrease from 26 reported bike crashes per 1 million bike trips in 2000 to 20 per 1 million in 2010 to 15 per 1 million in 2020.

The implementation table on the following pages provides a general timeframe for achieving the core recommendations (see Table 3).

Table 3. Implementation Timeline, Part 1

Physical Improvements								
Core Recommendation	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2015**	**Total Cost**
Recommendation 1.1. Establish signed bicycle routes.	50 miles of bicycle route signs will be in place (including pre-existing routes).	60 miles of signed bicycle routes will be in place.	70 miles of signed bicycle routes will be in place.	80 miles of signed bicycle routes will be in place.	90 miles of signed bicycle routes will be in place.	100 miles of signed bicycle routes will be in place.	150 miles of signed bicycle routes will be in place.	
Cost (assumes 40 miles in place in 2004)	$15,000	$15,000	$15,000	$15,000	$15,000	$15,000	$80,000	$170,000
Recommendation 1.2. Provide bicycle lanes.	20 miles of bicycle lanes will be in place.	30 miles of bike lanes will be in place.	40 miles of bike lanes will be in place.	50 miles of bike lanes will be in place.			60 miles of bike lanes will be in place.	
Cost (assumes 10 miles in place in 2004 and that half of the bike lane mileage will be completed as part of road resurfacing projects	$50,000	$50,000	$50,000	$50,000			$50,000	$250,000
Recommendation 1.3. Complete Metropolitan Branch Trail.	Complete construction of 50% of trail. Complete design of entire trail.	Complete construction of 75% of the trail.	Complete construction of 100% of the trail.					
Cost	$6,000,000	$6,000,000	$6,000,000					$18,000,000
Recommendation 1.3. Complete Anacostia Trail.	Design Trail	Complete construction of 50% of the trail	Complete construction of 75% of the trail.	Complete construction of 100% of the trail.				
Cost	$2,000,000	$7,000,000	$7,000,000	$7,000,000				$23,000,000
Recommendation 1.4. Improve bridge access for bicyclists.	Identify bridges needing better bicycle access.	Improvements at 1 bridge complete.	Improvements at 2 bridges complete.	Improvements at 3 bridges complete.	Improvements at 4 bridges complete.	Improvements at 5 bridges complete.	Improvements at all bridges complete.	
Recommendation 1.5. Provide bicycle parking in public space	500 bicycle parking racks in place.	600 bicycle parking racks in place.	700 bicycle parking racks in place.	800 bicycle parking racks in place.	900 bicycle parking racks in place.	1000 bicycle parking racks in place.	2000 bicycle parking racks in place.	
Cost (assumes 200 racks in place in 2004)	$100,000	$30,000	$30,000	$30,000	$30,000	$30,000	$300,000	$550,000
Recommendation 1.6. Encourage bicycle parking in private space.	Conduct outreach to building owners and garage operators.	Continue outreach and conduct enforcement against non-compliers.	Continue outreach and conduct enforcement against non-compliers.	Continue outreach and conduct enforcement against non-compliers.	Continue outreach and conduct enforcement against non-compliers.	All garage and other off-street parking in compliance.		

Implementation Timeline, Part 2

Policy Recommendations								
Core Recommendation	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2015**	**Total Cost**
Recommendation 2.1. Update District of Columbia planning and policy documents to address bicycle accommodation.	Ensure inclusion of bikes in Comprehensive Plan, and Long Range Transportation Plan, and Roadway Design guide.	Update bicycle regulations and laws concerning fines, registration, and courier licensing.	Expand bicycle-related recommendations in Zoning Ordinance, Traffic and Parking Regulations, Open Space and Safety Regulation.				Review and update laws and regulations.	
Cost	$10,000	$10,000	$10,000				$10,000	$40,000
Recommendation 2.2. Provide training to District staff and consultants.	Train staff about the Bike Plan and bike planning, design and engineering.		Conduct training.		Conduct training.		Ongoing	
Cost	$3,000		$3,000		$3,000		$9,000	$18,000
Recommendation 2.3. Review all District of Columbia projects to ensure they provide bicycle accommodation.	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing	
Cost	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	$50,000	$110,000

Implementation Timeline, Part 3

Program Recommendations								
Core Recommendation	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2015**	**Total Cost**
Recommendation 3.1. Educate motorists about safe operating behavior around bicyclists.	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing	
Cost	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000	$500,000	$1,100,000
Recommendation 3.2. Educate bicyclists about safe bicycling.	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing	
Cost	$25,000	$25,000	$25,000	$25,000	$25,000	$25,000	$250,000	$400,000
Recommendation 3.3. Enforce traffic laws related to bicycling.	Conduct enforcement wave targeted at bicyclists, pedestrians and motorists	Conduct enforcement wave targeted at bicyclists, pedestrians and motorists	Conduct enforcement wave targeted at bicyclists, pedestrians and motorists	Conduct enforcement wave targeted at bicyclists, pedestrians and motorists	Conduct enforcement wave targeted at bicyclists, pedestrians and motorists	Conduct enforcement wave targeted at bicyclists, pedestrians and motorists	Conduct enforcement wave targeted at bicyclists, pedestrians and motorists	
Cost	$25,000	$25,000	$25,000	$25,000	$25,000	$25,000	$250,000	$400,000
Recommendation 3.4. Establish a Youth Bicycle and Pedestrian Safety Education Program.	Launch bike/ped safety classes in 3 schools.	Conduct bike/ped safety classes in 6 schools.	Conduct bike/ped safety classes in 10 schools.	Conduct bike/ped safety classes in 20 schools.	Conduct bike/ped safety classes in 20 schools.	Conduct bike/ped safety classes in 20 schools.	Conduct bike ped safety classes in 20 schools.	
Cost	$80,000	$90,000	$100,000	$100,000	$100,000	$100,000	$500,000	$1,070,000
Recommendation 3.5. Distribute the District of Columbia Bicycle Map to a wide audience.	10,000 DC Bike Maps distributed.	20,000 DC Bike Maps distributed (cumulative).	30,000 DC Bike Maps distributed (cumulative). Revise Bike Map	40,000 DC Bike Maps distributed (cumulative).	50,000 DC Bike Maps distributed (cumulative).	100,000 DC Bike Maps distributed (cumulative). Revise bike map.	200,000 DC Bike Maps distributed (cumulative). Revise bike map.	
Cost	$60,000		$60,000			$100,000	$130,000	$350,000
Total Cost	**$8,478,000**	**$13,355,000**	**$13,428,000**	**$7,355,000**	**$308,000**	**$405,000**	**$2,129,000**	**$45,458,000**

Transportation and Land Development Review Process

The District Department of Transportation (DDOT) serves as the lead agency for bicycle transportation in the District. Yet other agencies and organizations both inside and outside District government influence bicycle transportation through transportation and land use development projects and policies. This section lists and describes agencies that address bicycling issues within the District, and it provides information to foster coordination and cooperation between these groups.

Key Agencies for Bicycling Issues

Implementing bicycle projects and programs within the District requires coordination between many agencies and stakeholders. These groups and their roles are listed in Table 4.

Table 4. Key Agencies for Bicycling Issues

Agency	Bicycle-Related Responsibilities
Federal	
National Park Service-National Capital Region (NPS)	Trails, bicycle access through parks, Mall area improvements
General Services Administration (GSA)	Bike parking and access in federal buildings
National Capital Planning Commission (NCPC)	Long-range vision for DC land use and transportation system
US Commission of Fine Arts (CFA)	Aesthetic approval of major projects
United States Department of Transportation (US DOT)	Funding transportation projects, transportation research
Federal Highway Administration (FHWA), DC Division	Approval of federally funded projects
Architect of the Capitol	Capitol grounds bike access
Union Station Redevelopment Corporation (USRC)	Union Station bike access, bike parking, bike station
Regional	
Washington Metropolitan Area Transit Authority (WMATA)	Bike access to transit, bike-on-bus, bike-on-rail, bike parking
Transportation Planning Board (TPB) at Metropolitan Washington Council of Governments (MWCOG)	Regional bicycle network coordination, federal funding approval, regional bicycle data, Commuter Connections, exchange of technical expertise; Regional transportation facility funding approval

Agency	Bicycle-Related Responsibilities
District of Columbia	
District Department of Transportation (DDOT)	Leadership on Bicycle Master Plan implementation and most transportation projects in the District
DC Office of Planning	Bicycle accommodation in comprehensive planning and neighborhood planning
Department of Public Works (DPW)	Parking enforcement, street cleaning
Zoning Commission	Land use, bicycle parking regulations
Board of Zoning Adjustments (BZA)	Land use, bicycle parking
Deputy Mayor for Planning and Economic Development	Oversight, leadership on bicycle initiatives
Department of Housing and Community Development (DHCD)	Bicycle access and parking in developments
Metropolitan Police Department (MPD)	Motorist education and enforcement, bicyclist education and enforcement
Department of Parks and Recreation (DPR)	Bicycle facilities (trails), safety education and other bike programs
District of Columbia Public Schools (DCPS)	Safety education, Safe Routes to Schools, bike parking
Advisory Neighborhood Commissions (ANCs)	Public input about bicycling issues, maintenance and new facility requests
Business Improvement Districts (BIDs)	Bike parking, bike facility maintenance, input on new projects
Office of Property Management	Bicycle parking in District owned and leased buildings
Department of Motor Vehicles (DMV)	Motorist education and testing
Private developers	Bicycle access and parking in developments

Ongoing Initiatives

Bicycle issues should be included in all federal, regional, and local initiatives planned and implemented in the District. Several ongoing initiatives offer opportunities to improve bicycle transportation facilities. The list below is just a snapshot of initiatives underway in 2004.

District Department of Transportation Initiatives

- Anacostia Gateway
- Anacostia Access
- Brentwood Road
- Brookland Transportation Study
- Columbia Heights—Mount Pleasant
- Connecticut Avenue
- District of Columbia Scenic Byways Program
- Fourth Street, SW
- Friendship Heights
- H Street, NE Corridor
- Klingle Road Implementation
- L'Enfant Promenade Environmental Assessment
- L'Enfant Promenade Urban Planning

- Light Rail System Development
- Maglev Train Service
- Military Road/Missouri Avenue
- Motor Carrier Management and Threat Assessment
- New York Avenue Corridor
- Palisades Traffic Study
- Pennsylvania Avenue, SE Transportation Study
- South Capital Street Corridor
- Takoma Transportation Study
- Tour Bus Management Initiative
- Transit Studies
- K Street Corridor
- Long Range Transportation Plan

Organization of Key Agencies

DDOT, DC Office of Planning, DCDPW, and NPS are key organizations for implementing many recommendations in this Plan. The branches of each of these agencies are described below.

District Department of Transportation

The DDOT Bicycle Program is within the Transportation Policy and Planning Administration (see Figure 1). Other divisions within DDOT must also provide support for bicycling. Project scopes that are developed in all of DDOT's administrations should be reviewed by Bicycle Program Staff to ensure that bicycle needs have been accommodated.

The five administrations of DDOT play a variety of roles that affect a range of bicycle transportation issues. Following are some examples:

Public Space Management Administration (PSMA)

- Permitting bicycle racks in public space

Other District Initiatives

- Anacostia Waterfront Initiative (AWI)
- Downtown Action Agenda Project
- East of the River Project
- Georgia Avenue Revitalization Project
- H Street Corridor Revitalization
- McMillan Reservoir Project
- North of Massachusetts Avenue (NoMA)
- Reservation 13 Draft Master Plan
- Takoma Central District Plan Project
- Kennedy Center Redevelopment
- New York Avenue Corridor
- Anacostia Riverwalk
- Friendship Heights
- Columbia Heights
- Ivy City
- Trinidad
- Carver Terrace
- Poplar Point
- St. Elizabeth's
- Anacostia Gateway
- Minnesota-Benning
- American University, Georgetown University, and George Washington University Campus Plans (DC Office of Planning review)
- City Living, DC Style

Regional Initiatives

- Transit-Oriented Development near Metro stations (WMATA)
- Streetsmart: Pedestrian and Bicycle Safety (MWCOG)

Federal Initiatives

- National Mall Improvement Study (NPS)
- Rock Creek Park General Management Plan

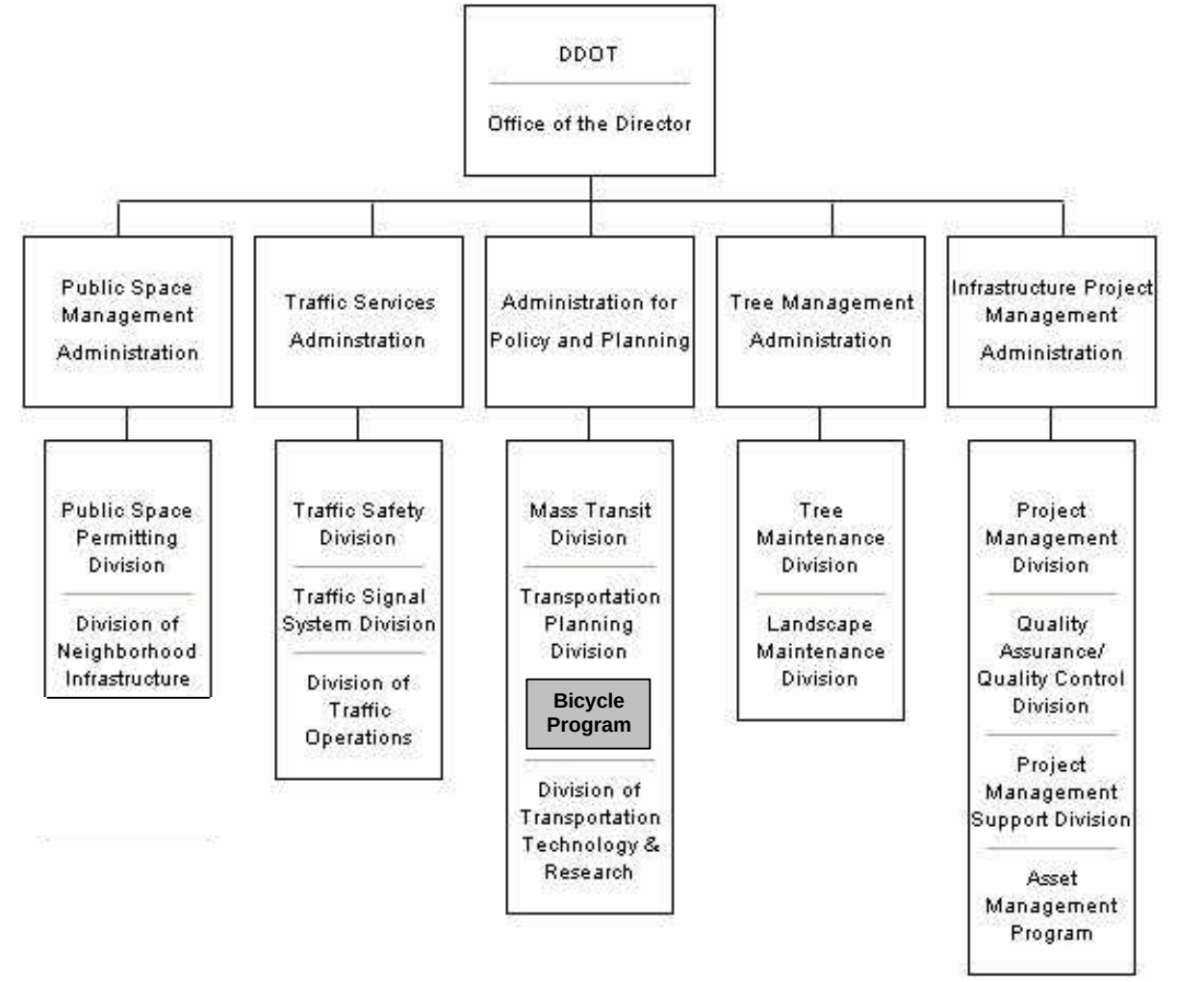


Figure 1. District Department of Transportation Organizational Chart

Traffic Services Administration (TSA)

- On-street parking changes
- Bike lane approval
- Bicycle-friendly signals
- Installing bicycle lanes and signs

Transportation Policy and Planning Administration

- Overall bike plan
- Transportation studies
- Public participation in all eight wards (each ward has a transportation planner)
- Transit program (transit funding and planning, WMATA relations)

Urban Forestry Administration (UFA)

- Tree planting and maintenance

Infrastructure Project Management Administration (IPMA)

- Integration of bikeways into road construction and reconstruction projects
- Technical support for trail design and construction projects
- Trail construction and maintenance

DC Office of Planning

DC Office of Planning plans most land use in the District of Columbia, including economic revitalization and neighborhood planning, and reviews zoning and historic preservation cases. Projects in the DC Office of Planning Long Range Planning Division, Revitalization Division, and Neighborhood Planning Division are likely to have an impact on bicycling in the District. The Bicycle Program Manager should be involved with these planning initiatives. All plans should be reviewed against the Bicycle Master Plan. All eight wards are assigned a planner in DC Office of Planning.

DC Office of Planning has helped create Strategic Neighborhood Action Plans (SNAPs) for each of the city's 39 neighborhood clusters. The SNAPs were released in Fall 2002. These short-term (two-year) plans detail the top priority issues in each neighborhood, as identified by residents working with the neighborhood planners from the Neighborhood Planning Initiative in the Office of Planning. The DC government uses SNAPs to inform and guide decisions on the city budget. DDOT, WABA, and Neighborhood Bicycle Advocates should be involved closely in the SNAP or other neighborhood planning efforts to take advantage of opportunities to extend the bicycle network.

DC Department of Public Works

The DC Department of Public Works (DCDPW) has the following responsibilities:

- Parking enforcement (ticketing and towing vehicles)
- Street cleaning
- Trash collection
- Fleet Management

DDOT should work with DCDPW to ensure that tickets are issued for parking in bike lanes and that bike lanes are cleared of debris and snow.

National Park Service, National Capital Region

Most of DC's bike trails are located in national parks. The National Park Service, National Capital Region consists of six NPS park units, each with their own Superintendent:

- National Capital Parks Central (National Mall)
- National Capital Parks East (Anacostia)
- Rock Creek Park
- C & O Canal National Historical Park
- George Washington Memorial Parkway
- Potomac Heritage National Scenic Trail

Example parks and facilities within these park units include the National Mall, Anacostia Park, Fort DuPont Park, Kenilworth Aquatic Gardens, Rock Creek Park and Trail, Mt. Vernon Trail, C & O Canal Towpath, and the Ft. Circle Parks. Recommendations of this Plan include bicycle access to and through these parks, so it is important for DDOT to work closely with NPS.

Within NPS, the Office of Lands, Resources, & Planning provides support for cultural and natural resource protection; planning, Geographic Information Systems (GIS), and environmental compliance; land acquisition, exchange and transfer; adjacent land use planning; right-of-way and special use permits; legislative proposals; and coordination of memorial proposals and major projects by state and local governments on park land.

The Geographic Information Systems (GIS) Regional Technical Support Center (RTSC) is located at the National Capital Region Office. This office has large amounts of GIS data covering the District of Columbia.

Appendices

Appendix A. DC Bicycle Master Plan Public Participation Process

Public participation was a critical component of the DC Bicycle Master Plan Process. District residents helped develop the vision, goals, and recommendations of this Plan. DDOT worked with the BAC at bi-monthly meetings throughout the planning process to create and refine the Plan. In addition, residents also made many other significant contributions during the two-year DC Bicycle Master Plan process. The following summarizes the public input opportunities for this Plan:

November 2002 to January 2005:	Bicycle Advisory Council meetings (bi-monthly)
December 2002 to January 2005:	Website online with Plan information and feedback opportunities
May 2003:	Survey forms distributed at Bike to Work Day
April 2003 to July 2003:	Series of public rides in each Ward, followed by public workshops
March 2004:	Draft Plan posted on website for public review
May 2004:	Public Open House on Draft Plan

Bike Rides and Public Workshops - Summary

April – June 2003

Between April and June of 2003, bike rides and public workshops were held in each of the District of Columbia's eight wards. (Note: Rides were not held in Wards 1 and 2 due to rain.) Approximately 100 people attended these rides and workshops the purpose of which was to gather public input regarding existing bicycling conditions and needed improvements. At each workshop, Jim Sebastian, the DC Bicycle Program Manager and DDOT's consultants gave a brief presentation on the scope of the bike plan and answered questions about the project. Workshop participants were also given the opportunity to mark up maps with origins, destinations and areas in need of improvement. The following summarizes some of the major issues that were raised by workshop participants.

Issues Raised in Multiple Ward Workshops

Connectivity and Accessibility

- Need more roads with Bicycle Level of Service C or better
- On-street parking/rush hour restrictions. May want to select a few routes where 24 hour parking is maintained to allow for better bike access
- Connections to adjacent jurisdictions are important
- Need better access to trails
- Improve bridge connections and maintenance
- More bike parking is needed
- Improve access to Metro stations and allow bicyclists on Metrorail during peak hours
- Bus/bike lanes should be considered

- New security measures have limited access to Capitol and other Federal facilities

Safety and Security

- Education needed for bicyclists and motorists.
- Enforcement of existing traffic laws affecting bicyclists is needed. Need to ensure laws exist to protect bicyclists, e.g. no parking or driving in bike lanes

Encouragement and Promotion

- Need better information for both visitors and residents
- Promote/market specific facilities and bicycling as transportation mode
- Provide better information about facilities through improved signage and maps
- Signage should provide more information such as destinations and mileage
- Better signage needed to indicate direction to parks/trails, Metro stations

Policies and Practices

- Bicyclists need to be accepted as a legitimate form of transportation by users of other modes
- Health benefits of bicycling should be emphasized. Outreach to health community needed
- Bike facilities should be a regular part of road planning

Issues Raised at Individual Ward Workshops

Ward 1- June 10, 2003:

- Education for both motorists and bicyclists is important
- Need more police enforcement
- Suitability map should be posted in metro stations or other places
- Need unique bicycle signage for the District's bikeways. Signs should show destinations, mileage and other useful information
- Connections to adjacent jurisdictions are important. These should be shown on suitability map.
- Bike plan recommendations should include recommendations for WMATA such as:
    - Improved bicycle racks
    - Bicyclist "cattle car" for Metro
- Should work with ADA community on issues of common concern, such as:
    - Metro elevator access, e.g. getting from blue line to green line at L'Enfant Plaza is difficult with a bike.
- Enforcement of traffic laws important. People who have been involved in incident have almost no recourse to report incidents
    - Create a hotline to report crashes as an informal way track incidents
    - Provide training for police officers
- Should consider closing some streets such as 18th Street to bikes/peds only
- Need more bicycle cops. In some parts of the city, this is the best way to patrol
- Health benefits of bicycling should be emphasized. Reach out to health community
- Should build on some of the things WABA has done. Should have car free days on certain streets.
- Provide bicycle education in the schools
- Need marketing budget to promote facilities
- Could use Bicycle Level of Service as a measure of whether goals are being met or not.

- Rush hour parking restrictions are important issue. Some routes are better for bikes when parking is allowed. May want to select a few routes where 24 hour parking is maintained for better bike access
- Need to look at continuity of BLOS for route planning. Need to match up roads with levels of service A and B
- Also, need to examine existing bike routes. May not be a good idea to have a bike route sign on a road with LOS D
- Education of non-bicyclists is important. There is an assumption in some parts of the city that bikes don't belong on the road
- Contra-flow interesting idea. On 17th Street when you go the wrong way, you still have signs and signals facing you
- Many people ride wrong way on 17th. This may be to avoid 14th, 16th, and 18th Streets
- Bike lanes on 15th Street may be good alternative
- Need taller barriers on bridges to keep debris off of bike/ped facilities
- Need better information for accessing trails, bridges. Seattle bike map is a good example. Cut-outs show you how to access bridge trails
- Yield to bike signs like the ones shown in the Portland photo of blue bike lanes are a good idea
- Bike parking should be coordinated with Zipcar. Put racks near Zipcar spots

Ward 2 – June 12, 2003:

- Need laws on the books to enforce no parking or driving in bike lanes
- Speeding vehicles are a bigger problem than narrow roadways
- Need more access for bikes on Metro during peak hours
    - This will be difficult, Metro has capacity problems currently during rush hour
    - Could implement a system where one can pay more during rush hour to bring a bike
- New convention center needs bike parking in front
- Motorist education is needed, hear lots of "get off the road" comments
- Need more share-the-road signs
- Need more education for motorists, bicyclists
- What routes are good?
    - Q/R Streets
    - E Street
- Biggest problems with bike lanes downtown are rush hour parking restrictions. Better for bicyclists when 24 hour parking is allowed. Remaining portion of lane can be used for bike facility.
- In Portland, few bike lanes downtown, instead signals timed for slow (12 mph) vehicular traffic
- Should try bus/bike lanes. Pennsylvania Avenue is a good candidate
- Buses, bikes and right turns are an uncomfortable mix
- Federal/mall area-security planters are very narrow. Difficult for bike to pass through. These should be made more passable
- Library of Congress is a good model. Has security bollards that bikes can pass through and bike parking at door
- Need to improve Bike DC route so that first time riders are left with a "good taste in their mouth" for bicycling in DC
- Until have LOS B & C on more of our arterials, won't have a truly bicycle friendly city
- 17th Street has lots of wrong-way riding, need innovative solution for this road
- Should try special bicycle traffic lights like those you see in places like Germany
    - May be possible to use these in places where have bicycle volumes heavy enough to support their use.
    - What about using at location where Capitol Crescent comes in to K Street?
    - What about using bike signals for circles?

- Contra-flow bike lane could be dangerous b/c vehicles not expecting someone to come from opposite direction
    - May be possible to convert some one-way streets to two-way
    - BUT, one-way streets are some of the best opportunities for bike lanes
    - K Street service road is good for bikes, but trucks double park there

Ward 3- April 29, 2003:

- Need access to Rock Creek Park – conflict areas, such as the entrance into the National Zoo
- Access to Capital Crescent Trail and connections from there into downtown
- Need access through Washington Harbor – access to waterfront
- Perhaps Whitehaven could be a possible route to the trail near the mosque? Doesn't go down to the trail. Only access is P Street and the Shoreham Drive access points. Could have some potential
- Garfield down to the Shoreham is a good way to avoid part of Mass Ave
- Nebraska – need access because you don't have a lot of alternatives. Traffic is very fast, and the sidewalk is very bad because of the driveways/entrances

- Connecticut Ave. going north from Dupont – 1000's of bikes, a lot of different bike routes going north. A lot of right turning traffic at the split off, straight bicyclists conflict with this movements
- Connecticut and Van Ness suffer from "side friction", a lot of pedestrians, bikes, parking cars
- Whole area north of Dupont is bad. Florida Avenue left turn onto T or S
- 19th Street is not a good alternative. It's very narrow, brutal uphill stretch. A lot of parked cars. Nowhere to go
- Contraflow lane needed on Woodley Road – something WABA has advocated for in the past
- Need additional bicycle parking: in commercial areas in vicinity in Mazza Gallery, Chevy Chase Pavilion – need parking in underground garages, should have been subject to the ordinance, commercial nodes on Connecticut. Movie theaters especially. "No bikes" sign at the entrance of the underground parking at Mazza Gallery
- Will there be bike parking on M Street in Georgetown? No, it will be on the side streets, to allow more room on the sidewalks for pedestrians
- Georgetown Park needs bike parking
- Are speed humps proposed on Cathedral Avenue? There is room for bikes lanes, working with Park Service (who own half) on this
- Bike parking at Metro improving, but one of problems is bike parking at Friendship Heights. It's overflowing at entrance of Western and Wisconsin. Across the street, there is no parking. Right on state line, need to make sure doesn't get forgotten
- Bike parking at Van Ness is hard to find—there are 2 hidden parking spaces

Ward 4 – May 8, 2003:

- Need signs identifying direction to park/trails
- Parking restrictions on 16th Street--help cyclists by allowing parked cars during commute times.
- 8th Street bike route appears not to be significant
- Some neighborhoods perceived as unsafe affect the usability of potential routes
- Need signs to indicate direction to metro stations
- Need tourist-oriented/recreational routes. Routes out of the city, connecting routes to surrounding communities and destinations
- Need good signage. Currently nothing draws tourists off the mall. Historic Routes, fort tours, etc.
- Need "You are here" signs for street locations/street finding for areas outside of downtown. Similar to WMATA signs

- Link trails to metro. Need signs to direct you to metro. Give trails/routes more prominence on Metro Map or have alternative map adjacent to Metro map
- Consider changes in transportation methods...i.e. Segway, other small motorized personal vehicles
- Need bike racks at police stations
- Livingston as a bike route to Friendship Heights
- Need signs from Webster, Joyce, Blagden into park
- McKinley is bad for bicyclists

Ward 5 – June 3, 2003:

- Bike parking at Metro should be covered and well lit
- Need to conduct outreach to local schools and high schools for input into the bike plan
- Also conduct outreach to recreation centers. Currently there is a disconnect between exercise, health, transportation and education
    - Turkey Thicket recreation center is being rebuilt—opportunity to work on accommodating bikes

- What should be done about roads like New York Avenue? Should they just be written off? This will be explored in planning process. We'll need to decide if we will be able to improve these roads for bicyclists or just show them as red on bike map
- Connectivity to surrounding jurisdictions is important. Map should show that you can get all the way to Mt. Vernon, Wheaton, etc. from the District
- Is Bladensburg Road a bike route on the MD side? This road is a problem. East-West routes needed
- What is the best way to connect Columbia Heights and Brookland? Columbia Rd? Ramps at Irving Street are confusing, not clear what drivers are going to do
- Is it okay for bicyclists to be on the sidewalk? Except for downtown, this is allowed. Areas with numerous driveways need special attention to ensure the safety of bicyclists who use the sidewalk
- Need to ensure roads have bicycle friendly drainage grates

Ward 6 – June 5, 2003

- Plan should aim to increase overall number of bicycle trips, not just improve conditions for people who already bike
- This plan should be integrated with other plans like crime prevention, schools, health. Is crime a constraint to bike usage?
- In the Netherlands they have signs with the number of miles to the next destination. This would be a good idea for DC
- Need a procedure for abandoned bikes at bike racks
- The largest numbers of bicyclists are on separate paths (not on street). Need longer term goal; when big development projects are underway should take the opportunity to make a bike path instead of just striping the street
- Roosevelt Bridge is a problem. There is a bike lane on one side but it is not wide enough. Need higher retaining walls for bridges to keep debris off path
- 19th St. at Constitution. Bikes have to cross lanes of traffic – this is dangerous. Might be a good location for a colored crossing
- Need more intermodal options. WABA has done well with bikes on rail, but we need them on MARC also. No training for how to use bikes on Metrobus. Should have practice racks at key locations?
    - WABA had them at bike-to-work day. Need a bus to come to fairs, Capitol Hill day, etc.
- Education is needed for non-cyclists. Blue cards are a good start
- Need better signage for tourists. A map for bike tours, education for the non-cyclist

    - "Bike the Sites" organization at the old post office pavilion on 12th St and Penn
- Bikeways should be built as part of roadway, shouldn't need separate funding for on-road facilities
- Need to collaborate with other agencies, particularly with Federal government regarding access to the Capitol
- Need access to the National Mall
- On more heavily used routes, bicyclists should be separated from pedestrians
- Don't forget about peds, strollers, those with disabilities. Need separate space for bikes and peds
- The more lanes we put in, the more aware motorists become, fewer accidents
- Need signs for racks and lockers
- Should look at opportunities related to Saint Elizabeth's rail spur

Ward 7 – May 15, 2003:

- Need better access across Anacostia River
- Bike parking is needed on Pennsylvania Avenue southeast of Anacostia Freeway
- Penn Branch area needs bike parking
- Benning Road Metro needs improved bike parking
- Need better access to Kenilworth Aquatic Gardens
- Area around Kenilworth Avenue and Benning Road difficult for bicyclists to negotiate
- Minnesota Avenue north and south of Benning needs improvement and bike parking

Ward 8 - May 14, 2003

- Anacostia Park has no sidewalk/path
- South Capitol Street Bridge needs improvement. Access on both sides of the bridge is poor
- Suitland Parkway trail is narrow and poorly maintained
- Need major improvements on South Capitol Street adjacent to Bolling Air Force Base. Particularly bad during rush hour
- Need connection to Oxon Run Trail near 13th Street
- Southern Avenue Metro is difficult to access by bike or foot
- Need path along 295 to Wilson Bridge. Space exists on Westside. Need to coordinate with MDOT and Prince George's County

Appendix B. DC Bicycle Master Plan Example Survey Form

(This survey was distributed at meetings, bike-to-work day and made available online.)

The District Department of Transportation is undertaking a comprehensive update of the city's 30-year-old bike plan. We want to know how we can make your trip safer and more convenient by bike. Please help us by answering the following questions. For more information on the bike plan or to fill out this survey on-line, visit www.bikemap.com/dcbikeplan.

1. Based on your experience, which DC streets are best for bicycling? (Be as specific as possible about location, for example: East Capitol, between 7th and 14th Streets.)

2. Which DC streets are worst for bicycling?

3. What are the best off-street routes (paved trails or sidewalks) in DC?

4. What are the worst off-street routes (paved trails or sidewalks) in DC?

5. On which streets would you like to see bicycle lanes or other bicycle facilities?

6. At which locations would you like to see additional bicycle parking (racks or lockers) provided? (Provide a neighborhood, address, intersection or business name.)

7. What was the primary purpose of your last bicycle trip? (Please circle only ONE reason.)

a. travel to work
b. travel to school
c. personal business / errands
d. visit friend / social / entertainment
e. travel to metrorail / metrobus
f. travel to carpool / vanpool
g. rode for exercise / recreational activity
h. other (please explain)_____

8. Which of the following factors plays a role in whether or not you ride your bike to your destination? (Circle as many as apply.)

a. travel time
b. availability of bicycle parking
c. safety of travel route for bicyclists
d. traffic
e. costs of other travel modes
f. need for exercise
g. availability of showers / changing facilities
h. weather
i. hills
j. other (please explain)_____

9. When making a bicycle trip, which of the following do you prefer to use? (Circle only ONE)

a. On-street
b. Bike lanes
c. Sidewalks
d. Off-street paved trails

10. How many days during the last week did you use the following forms of transportation? (Check as many as apply.)

a. Metrobus _____days
b. Metrorail ____days
c. Bicycle_____days
d. Walk _____days
e. Drive _____days

11. Did you take your bike on the following modes of public transportation in the last week?

a. Metrorail ____yes____no
b. Metrobus____yes____no

12. If you have been involved in a crash while riding your bike in the District, please answer the following two questions.

12a. Please indicate who else was involved in the crash (Circle as many as apply.)

a. Motorist
b. Bicyclist
c. Pedestrian
d. Other cause (i.e. slippery surface, uneven pavement, etc.)

12b. On what type of facility did the crash occur?

a. Street
b. Sidewalk
c. Trail

13. Which of the following factors do you think would do the most to encourage bicycling in the District? (Circle only ONE.)

a. Build bikeways
b. Safety outreach and education
c. Enforce laws applying to bicyclists
d. Enforce laws applying to motorists
e. Reduce street traffic
f. Increase police protection
g. Provide bicycle storage
h. Nothing
i. Other_____
j. All
k. Don't Know

14. What is the closest street intersection to your home? (If you live outside DC, please indicate your jurisdiction.)

15. What is your age?

16. What is your gender?

a. ____M
b. ____F

Thank you for helping with the DC Bike Plan!

Please return this survey to:
Toole Design Group
535 Main Street, Suite 211
Laurel, MD 20707

APPENDIX C. BICYCLE LEVEL OF SERVICE METHODOLOGY AND SUMMARY OF RESULTS

January 2004

Introduction

A comprehensive roadway inventory was an important component of the background analysis for the District of Columbia Bicycle Master Plan. Field measurements were taken on 406 miles of major collector and arterial streets in the District in early 2003. This accounts for about 45 percent of all DC streets. Roadway lane and shoulder width, speed limit, pavement condition, and on-street parking were collected and used in the scientifically-calibrated Bicycle Level of Service (Bicycle LOS) Model to evaluate the comfort of bicyclists on roadway segments. Bicycle Level of Service results were one of several sources of information used to select the bicycle route network. The Level of Service Methodology and a summary of the LOS analysis for DC streets are provided below.

Background

Level of Service (LOS) is a framework that transportation professionals use to describe existing conditions (or suitability) for a mode of travel in a transportation system. The traffic planning and engineering discipline has used LOS models for motor vehicles for several decades. Motor vehicle LOS is based on average speed and travel time for motorists traveling in a particular roadway corridor. In the 1990s, new thinking and research contributed to the development of methodologies for assessing levels of service for other travel modes, including bicycling, walking, and transit. Specific methodologies for bicycle level of service have been developed and used by a number of cities, counties, and states around the U.S. since the mid-1990s. This Plan adopts the Bicycle Level of Service (Bicycle LOS) Model assessment method.

When considering level of service in a multi-modal context, it is important to note that LOS measures for motor vehicles and bicycles are based on different criteria and are calculated on different inputs. Motor vehicle LOS is primarily a measure of speed, travel time, and intersection delay. Bicycle LOS is a more complex calculation, which represents the level of comfort a bicyclist experiences in relation to motor vehicle traffic.

Bicycle Level of Service Model

The *Bicycle Level of Service Model (Bicycle LOS Model)* is an evaluation of bicyclist perceived safety and comfort with respect to motor vehicle traffic while traveling in a roadway corridor. It identifies the quality of service for bicyclists or pedestrians that currently exists within the roadway environment.

The statistically calibrated mathematical equation entitled the *Bicycle LOS Model*[1] *(Version 2.0)* is used for the evaluation of bicycling conditions in shared roadway environments. It uses the same measurable traffic and roadway factors that transportation planners and engineers use for other travel modes. With statistical precision, the *Model* clearly reflects the effect on bicycling suitability or "compatibility" due to factors such as roadway width, bike lane widths and striping combinations, traffic volume, pavement surface condition, motor vehicle speed and type, and on-street parking.

The *Bicycle Level of Service Model* is based on the proven research documented in *Transportation Research Record 1578* published by the Transportation Research Board of the National Academy of Sciences. It was developed with a background of over 150,000 miles of evaluated urban, suburban, and rural roads and streets across North America. Many urban planning agencies and state highway departments are using this established method of evaluating their roadway networks. The Virginia Department of Transportation is using the *Bicycle LOS Model* in both the Richmond and Northern

[1]Landis, Bruce W. et.al. "Real-Time Human Perceptions: Toward a Bicycle Level of Service" *Transportation Research Record 1578*, Transportation Research Board, Washington, DC 1997.

Virginia regions. The model has also been applied in Anchorage AK, Baltimore MD, Birmingham AL, Buffalo NY, Gainesville FL, Houston TX, Lexington KY, Philadelphia PA, Sacramento CA, Springfield MA, Tampa FL, Washington, DC, and by the Delaware Department of Transportation (DelDOT), Florida Department of Transportation (FDOT), New York State Department of Transportation (NYDOT), Maryland Department of Transportation (MDOT) and many others.

Widespread application of the original form of the *Bicycle LOS Model* has provided several refinements. Application of the *Bicycle LOS Model* in the metropolitan area of Philadelphia resulted in the final definition of the three effective width cases for evaluating roadways with on-street parking. Application of the *Bicycle LOS Model* in the rural areas surrounding the greater Buffalo region resulted in refinements to the "low traffic volume roadway width adjustment". A 1997 statistical enhancement to the *Model* (during statewide application in Delaware) resulted in better quantification of the effects of high speed truck traffic [see the $SP_t(1+10.38HV)^2$ term]. As a result, *Version 2.0* has the highest correlation coefficient (R^2 = 0.77) of any form of the *Bicycle LOS Model*.

Version 2.0 of the *Bicycle Level of Service Model (Bicycle LOS Model)* has been employed to evaluate collector and arterial roadways in the District of Columbia. Its form is shown below.

$$\textbf{Bicycle LOS} = a_1 \ln (Vol_{15}/L_n) + a_2 SP_t(1+10.38HV)^2 + a_3(1/PR_5)^2 + a_4(W_e)^2 + C$$

Where:

Vol_{15} = Volume of directional traffic in 15 minute time period

$Vol_{15} = (ADT \times D \times K_d) / (4 \times PHF)$

where:

ADT	=	Average Daily Traffic on the segment or link
D	=	Directional Factor (assumed = 0.565)
K_d	=	Peak to Daily Factor (assumed = 0.1)
PHF	=	Peak Hour Factor (assumed = 1.0)

L_n = Total number of directional *through* lanes

SP_t = Effective speed limit

$SP_t = 1.1199 \ln(SP_p - 20) + 0.8103$

where:

SP_p = Posted speed limit (a surrogate for average running speed)

HV = percentage of heavy vehicles (as defined in the 1994 Highway Capacity Manual)

PR_5 = FHWA's five point pavement surface condition rating

W_e = Average effective width of outside through lane:

where:

$W_e = W_v$ - (10 ft x % OSPA)	and $W_l = 0$
$W_e = W_v + W_l$ (1 - 2 x % OSPA)	and $W_l > 0$ & $W_{ps} = 0$
$W_e = W_v + W_l$ - 2 (10 x % OSPA)	and $W_l > 0$ & $W_{ps} > 0$ and a bikelane exists

where:

W_t = total width of outside lane (and shoulder) pavement

OSPA = percentage of segment with occupied on-street parking

W_l = width of paving between the outside lane stripe and the edge of pavement

W_{ps} = width of pavement striped for on-street parking

W_v = Effective width as a function of traffic volume

and:

$W_v = W_t$ if ADT > 4,000veh/day

$W_v = W_t$ (2-0.00025 x ADT) if ADT ≤ 4,000veh/day,

and if the street/ road is undivided and unstriped

a_1: 0.507 a_2: 0.199 a_3: 7.066 a_4: - 0.005 C: 0.760

(a_1 - a_4) are coefficients established by the multi-variate regression analysis.

The Bicycle LOS score resulting from the final equation is pre-stratified into service categories "A", "B", "C", "D", "E", and F", according to the ranges shown in Table 1, reflecting users' perception of the road segments level of service for bicycle travel. This stratification is in accordance with the linear scale established during the referenced research (i.e., the research project bicycle participants' aggregate response to roadway and traffic stimuli). The *Model* is particularly responsive to the factors that are statistically significant. An example of its sensitivity to various roadway and traffic conditions is shown on the following page.

Bicycle Level-of-Service Categories

LEVEL-OF-SERVICE	Bicycle LOS Score
A	≤ 1.5
B	> 1.5 and ≤ 2.5
C	> 2.5 and ≤ 3.5
D	> 3.5 and ≤ 4.5
E	> 4.5 and ≤ 5.5
F	> 5.5

The Model represents the comfort level of a hypothetical "typical" bicyclist. Some bicyclists may feel more comfortable and others may feel less comfortable than the Bicycle LOS grade for a roadway. A poor Bicycle LOS grade does not mean that bikes should be prohibited on a roadway. It suggests to a transportation planner that the road may need other improvements (in addition to shoulders) to help more bicyclists feel comfortable using the corridor.

Application

The *Bicycle LOS Model* is used by planners, engineers, and designers throughout the US and Canada in a variety of planning and design applications. Applications include:

1) Conducting a benefits comparison among proposed bikeway/roadway cross-sections

2) Identifying roadway restriping or reconfiguration opportunities to improve bicycling conditions

3) Prioritizing and programming roadway corridors for bicycle improvements

4) Creating bicycle suitability maps

5) Documenting improvements in corridor or system-wide bicycling conditions over time

Bicycle LOS Model Sensitivity Analysis

Bicycle LOS = $a_1 \ln (Vol_{15}/Ln) + a_2 SP_t(1+10.38HV)^2 + a_3(1/PR_5)^2 + a_4 (W_e)^2 + C$

where: a_1: 0.507 a_2: 0.199 a_3: 7.066 a_4: -0.005 C: 0.760
T-statistics: (5.689) (3.844) (4.902) (-9.844)

Baseline inputs:

ADT	=	12,000 vpd	% HV	=	1	L	= 2 lanes
SP_p	=	40 mph	W_e	=	12 ft	PR_5	= 4 (good pavement)

	BLOS	% Change
Baseline BLOS Score (Bicycle LOS)	3.98	N/A

Lane Width and Lane striping changes

W_t	=	10 ft		4.20	6% increase
W_t	=	11 ft		4.09	3% increase
W_t	=	12 ft	- - (baseline average) - - - - - - -	3.98 - - - -	no change
W_t	=	13 ft		3.85	3% reduction
W_t	=	14 ft		3.72	7% reduction
W_t	=	15 ft	(W_l = 3 ft)	3.57 (3.08)	10%(23%) reduction
W_t	=	16 ft	(W_l = 4 ft)	3.42 (2.70)	14%(32%) reduction
W_t	=	17 ft	(W_l = 5 ft)	3.25 (2.28)	18%(43%) reduction

Traffic Volume (ADT) variations

ADT	=	1,000	Very Low	2.75	31% decrease
ADT	=	5,000	Low	3.54	11% decrease
ADT	=	12,000	Average - (baseline average) - -	3.98 - - - - -	no change
ADT	=	15,000	High	4.09	3% increase
ADT	=	25,000	Very High	4.35	9% increase

Pavement Surface conditions

PR_5	=	2	Poor	5.30	33% increase
PR_5	=	3	Fair	4.32	9% reduction
PR_5	=	4 - -	Good - (baseline average) - - -	3.98 - - - -	no change
PR_5	=	5	Very Good	3.82	4% reduction

Heavy Vehicles in percentages

HV	=	0	No Volume	3.80	5% decrease
HV	=	1 - - -	Very Low - (baseline average) - -	3.98 - - - - - -	no change
HV	=	2	Low	4.18	5% increase
HV	=	5	Moderate	4.88	23% increase[a]
HV	=	10	High	6.42	61% increase[a]
HV	=	15	Very High	8.39	111% increase[a]

[a]Outside the variable's range (see Reference *(1)*)

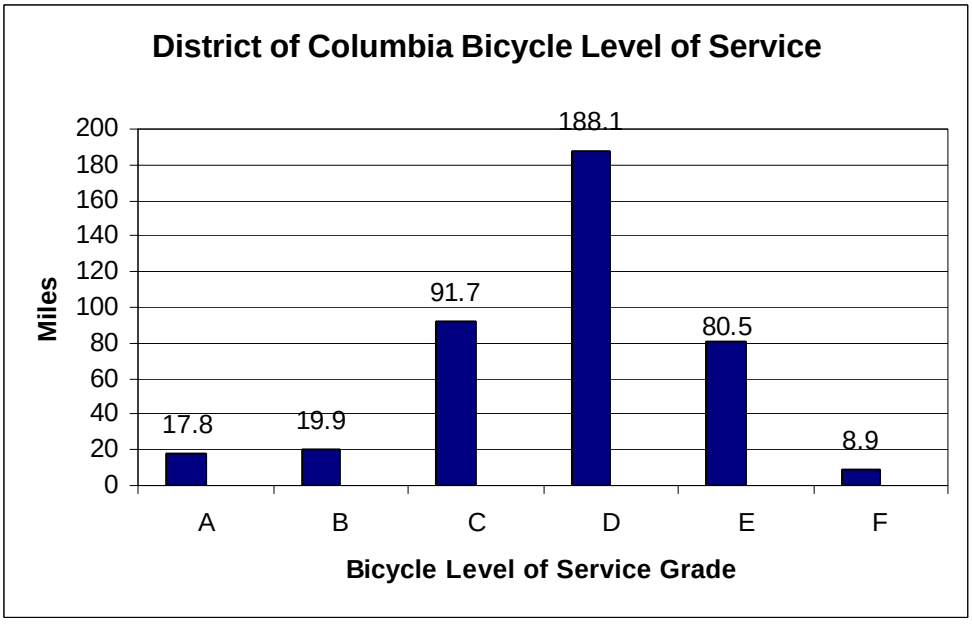
District of Columbia Bicycle LOS Results

Analysis of the major collector and arterial streets in the District of Columbia found that about 32 percent of the study network received above average grades of A, B, or C on an A (best) to F (worst) grading scale (see Exhibit 1). Streets with lower traffic volumes and bicycle lanes tended to have the highest Bicycle LOS grades. Most of the downtown streets and major arteries between downtown and the suburbs had grades of D or lower.

Exhibit 1. Bicycle Level of Service Results

Bicycle Level of Service	Miles	% of Miles with BLOS
A	17.8	4.4%
B	19.9	4.9%
C	91.7	22.5%
D	188.1	46.2%
E	80.5	19.8%
F	8.9	2.2%
Total	**406.9**	**100%**
Not evaluated	745.4	

Note: 745 miles of DC roadways were not evaluated. These were either limited access roads (freeways) or local streets where conditions tend to already be good for bicycling.



Appendix D. Bicycle Project Review Process

Routine Bicycle Projects

Below are the review processes for installation of bike route signs, bike lanes and bike racks.

Figure 1.

Installation of Signed Bicycle Routes

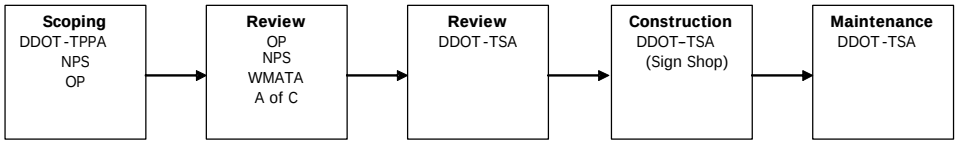


Figure 2.

Installation of Bike Lanes

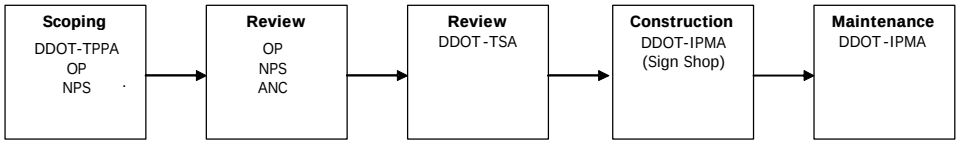


Figure 3.

Shared Use Path Projects

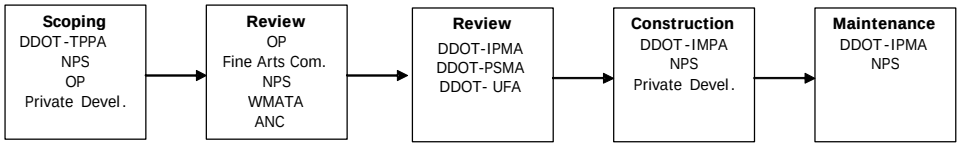


Figure 4.

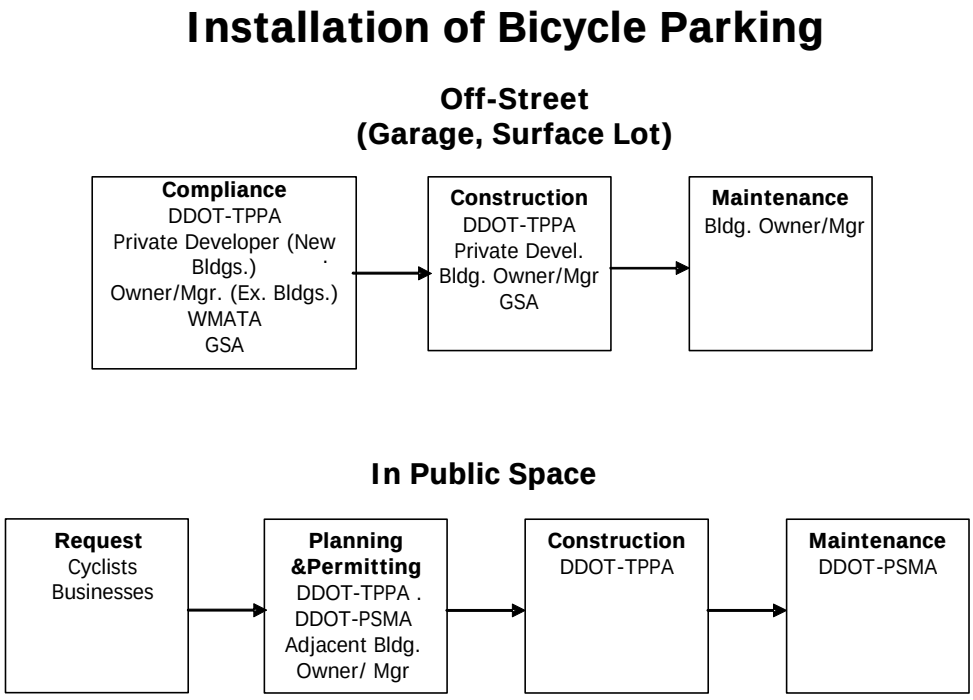
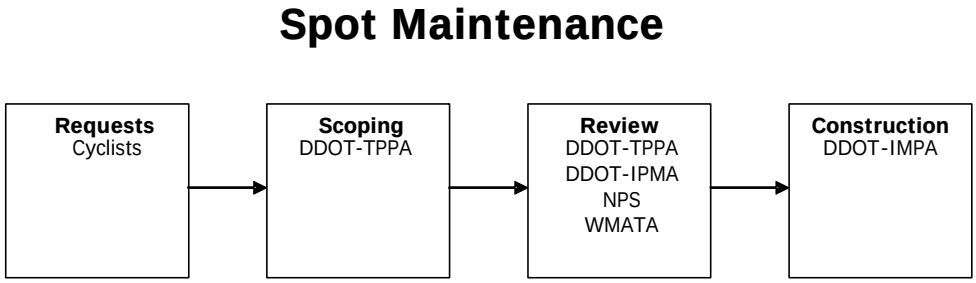


Figure 5.



Abbreviations:

A of C	Architect of the Capitol
Adjacent Jurisdictions	Arlington County, VA; Montgomery County, MD; Prince George's County, MD
ANCs	Advisory Neighborhood Commissions
BAC	DC Bicycle Advisory Committee
BOT	Greater Washington Board of Trade
CTC	DC Convention and Tourism Corporation
DCPS	DC Public Schools
DDOT IMPA	District Department of Transportation Infrastructure Project Management Administration
DDOT TPPA	DDOT Transportation Planning and Policy Administration
DDOT PSMA	DDOT Public Space Management Administration
DDOT TSA	DDOT Traffic Services Administration
DDOT UFA	DDOT Urban Forestry Administration
DMV	DC Department of Motor Vehicles
DOH	DC Department of Health
DPR	DC Department of Parks and Recreation
GSA	Federal General Services Administration
HCD	DC Department of Housing and Community Development
HTC	DC Heritage Tourism Corporation
MPD	Metropolitan Police Department
MWCOG	Metropolitan Washington Council of Governments
NCPC	National Capital Planning Commission
NPS	National Park Service
OP	DC Office of Planning
SEC	DC Sports and Entertainment Commission
WABA	Washington Area Bicyclist Association
WMATA	Washington Metropolitan Area Transit Authority

Appendix E. Policy Review

Introduction

Creating an urban environment that is conducive to safe cycling for both recreation and daily transportation requires thoughtful planning and decision-making at many different levels. Although bicycle use is a transportation function with DDOT serving as the lead agency, other District departments and other agencies outside District government have a role to play.

The District of Columbia government maintains a number of policy documents, municipal regulations, guidelines, and coordination activities between District agencies and with other jurisdictions that collectively have a substantial impact on the facilities and environment for bicycling in the District. This policy review for the District's Bicycle Master Plan includes the following policies, regulations, guidelines and activities:

- Comprehensive Plan (DCMR Title 10 - rev. 12/98)
- Zoning (DCMR Title 11 rev. - 2/03)
- Traffic & Parking (DCMR Title 18 rev. - 3/97)
- Public Space & Safety (DCMR Title 24 rev. 12/96)
- DDOT Design & Engineering Guidelines (Draft 4/03)
    - DC Long Range Transportation Plan
    - Policy Coordination With Other Agencies/Jurisdictions

Each of these areas is addressed in the following section starting with purpose and relationship to bicycle facilities and use, followed by a set of recommended changes to enhance conditions for bicycling.

DCMR Title 10: Comprehensive Plan

Purpose & Relationship to Bicycle Facilities & Use

The District's Comprehensive Plan establishes the policy framework that guides public sector decision-making on the part of the District government and federal agencies in the development and regulation of the District's environment. This document was last amended in February 1999. The current document is organized into 15 chapters as listed below:

- Chapter 1 - General Provisions Element
- Chapter 2 - Economic Development Element
- Chapter 3 - Housing Element
- Chapter 4 - Environmental Protection Element
- Chapter 5 - Transportation Element
- Chapter 6 - Public Facilities Element
- Chapter 7 - Urban Design Element
- Chapter 8 - Preservation and Historic Features Element
- Chapter 9 - Downtown Plan Element
- Chapter 10 - Human Services Element

- Chapter 11 - Land Use Element
- Chapter 12/- Ward Plans
  Chapter 19

Many of these chapters have a bearing on transportation facilities and use. A strategy for transportation should be a major feature of Chapter 1, the General Provision Element, since it underpins many of the elements of the Comprehensive Plan. Transportation is specifically referenced in Chapter 5, the Transportation Element, Chapter 9, the Downtown Plan Element, and Chapters 11 through 19, the Ward Plan Elements.

The current document is limited in its guidance and support for non-motorized modes of travel. At present, the District's Office of Planning is leading a process to revise and update the Comprehensive Plan. It should be noted that this review and update could lead to a significant restructuring of the Comprehensive Plan. This process offers an opportunity to strengthen the Comprehensive Plan with regard to intermodal and multimodal transportation with an emphasis on the importance of non-motorized forms of transportation.

Recommended Changes

The District of Columbia is a truly multi-modal urban environment where all modes of transportation can and do play a role. The District ranks in the top tier of cities with regard to use of public transit and walking, but has lagged substantially behind other cities with regard to policies and investments that promote non-motorized transportation.

Chapter 1 - General Provisions Element

Add a provision that calls for the development and management of a balanced transportation system that provides safe, attractive and convenient access for all modes of travel with an emphasis on walking, biking and transit.

Chapter 4 - Environmental Protection Element

Under the Air Quality section, add language that promotes the use of non-motorized transportation as an integral part of plans and programs to reduce mobile source emissions. The Greater Washington Region has been designated "Severe Non-Attainment" under the provisions of the Clean Air Act.

Chapter 5 - Transportation Element

Revise this chapter to strengthen multi-modal and intermodal transportation provisions.
Create new sections to address pedestrian and bicycle policies and facilities.

Chapter 6 - Public Facilities Element

Add text that supports the provision of multimodal access for all public facilities. This section should also establish planning requirements for the development and implementation of multi-modal transportation plans for all public facilities.

Chapter 9 - Downtown Element

Apply the same approach as in Chapter 5, but with far greater focus on the importance of balanced transportation facilities and systems management to the long-term health of the region's core. This section should also cover the transportation relationship between the core and adjacent neighborhoods.

Chapter 12 to 18 - Ward Elements

These sections should be revised to address the importance of non-motorized travel within the wards, to other destinations in the District, and surrounding jurisdictions. These sections should also address the specific facility needs within the wards.

DCMR Title 11: Zoning Ordinance

Purpose & Relationship to Bicycle Facilities & Use

The Zoning Ordinance regulates the development of land in the District of Columbia and establishes off-street parking requirements for development under the following sections.

- Chapter 21 - Off-Street Parking Requirements
- Chapter 23 - Garages & Parking Lots
- Chapter 24 - Planned Unit Development Procedures

To the extent that off-street bicycle requirements exist in the District's municipal regulations, it is in DCMR Title 11. The District of Columbia Department of Zoning is the government staff department responsible for zoning, and the 5-member Zoning Commission is responsible for review and approval of amendments to the Ordinance. The following section covers the existing bicycle parking requirements included in the Zoning Ordinance.

Chapter 21 - Off-Street Parking Requirements:

This section of the zoning ordinance establishes minimum provisions for off-street vehicle and bicycle parking. It also establishes the size, location, access, maintenance and operation of those required spaces. Section 2119 - bicycle Parking Spaces, specifically requires the following:

2119.1 "Bicycle parking spaces shall be provided for office, retail and service uses, except for retail and service uses in the C-3-C, C-4, and C-5 (PAD) Districts. For office uses in the C-4 and C-5 (PAD Districts, bicycle parking spaces shall be provided as if the building or structure were located in a C-3-C District.

2.119.2 "The number of bicycle parking spaces provided shall be at least equal to five percent (5%) of the number of automobile spaces required under 2101.1.

For general office uses in the C-3-C District (the bicycle parking requirement, which applies to C-4 and C-5), is very modest due to the linkage with vehicle parking. The minimum vehicle-parking requirement

for this District is 1 space for every 1,800 SF above the first 2,000 SF. Thus the bicycle-parking requirement works out to be one space for every 36,000 square feet of office development or one space for every 120 employees (assuming 300 SF per employee).

The current bicycle parking requirements also do not cover multi-family residential development in the District and it is unclear how university and medical campuses/facilities are treated in this ordinance.

Chapter 23 - Garages, Carports, Parking Lots and Gasoline Service Stations

This section of the zoning ordinance regulates both parking garages and parking lots that may be developed as either an ancillary or primary use. There is currently no specified bicycle-parking requirement in this section.

Chapter 24 - Planned Unit Development Procedures

The planned unit development (PUD) process is intended to encourage high quality developments in return for public benefits. The goal is to permit flexibility of development and other incentives such as increased building height and density, provided that the project offers a commendable number of public benefits and advances public health, safety and welfare. Section 2405.7 refers back to Chapter 21 for off-street parking requirements but states that the Zoning Commission may reduce or increase the parking requirement of such facilities depending on the uses and the location of the project.

Recommended Changes to the Zoning Ordinance

The existing requirements for bicycle parking in the Zoning Ordinance are limited in scope and will only yield a modest amount of off-street bicycle parking in the future. Multi-family residential development is not addressed in the ordinance and the ordinance is ambiguous as to whether university campuses and medical campuses are covered by the existing requirements. The intent of bicycle parking requirements is to provide cyclists with convenient and safe bicycle parking at a range of potential trip origins and destinations, the same approach that is taken for vehicle parking. Cyclists, like motorists, need convenient secure short-term parking for some service trips, while also needing secure, weather-protected locations for longer-term bicycle parking at home and at work.

As part of this assessment, the zoning ordinances and bicycle parking requirements of 11 jurisdictions around the country were reviewed. The jurisdictions that were selected for this review are at or near the center of a metropolitan area, are highly urbanized, and have implemented supportive bicycle plans, policies or programs over the last five-year period. These jurisdictions include the following:

- San Diego, California
- San Francisco, California
- Portland, Oregon
- Seattle, Washington
- Vancouver, British Columbia
- Boulder, Colorado
- Madison, Wisconsin
- Chicago, Illinois
- New York City, New York

- Boston, Massachusetts
- Cambridge, Massachusetts

These jurisdictions have diverse approaches to off-street bicycle parking requirements. These approaches ranged from a comprehensive requirement for bicycle parking for all uses (treating bicycle-parking requirements like minimum vehicle parking requirements). The Cities of San Diego, CA, Portland, OR and Vancouver, BC, fall into this category. In the case of Portland and Vancouver, these codes went further to specify different types of required bicycle parking. In Portland, this differentiation was made between short and long term spaces. Vancouver was similar but organized requirements based on level of security provided. Most of the jurisdictions reviewed have more modest requirements for a set of specified uses such as commercial office and/or multi-family residential. And finally, several jurisdictions such as Chicago and Boston have not yet adopted off-street bicycle parking requirements in their ordinances although recently developed bicycle master plans call for this.

Based on a review of the District's existing requirements as described in the Zoning Ordinance and the requirements of other cities, substantial revisions are required to promote conditions that are supportive of bicycle use District-wide. As stated at the beginning of this section, the intent of policies that require bicycle parking for a variety of developments is to make bicycle parking and use convenient for a range of trip purposes and for a wide range of origins and destinations. As such, the comprehensive approach to bicycle parking facility requirements that has been employed in the cities of San Diego, Portland, and Vancouver is recommended. Further, the approach of requiring two tiers of bicycle parking (both short and long term spaces) as in Portland and Vancouver is also recommended.

Second, it is recommended that bicycle-parking requirements be de-coupled from vehicle parking requirements and be described in a separate table. The District's minimum vehicle parking requirements are generally very modest and can be reduced further through the PUD process or through other provisions of the Zoning Ordinance listed in 2103 - Exceptions to the Schedule of Requirements. One example from this section applies to developments within 800 feet of a Metrorail Station where the parking requirement can be reduced by 25 percent.

Third, the proposed revisions should be linked to District transportation goals and a policy direction that supports bicycling as an essential mode of transportation that can accommodate a significant percentage of daily person trips. In Portland, the city's goal is for 10 percent of all daily person- trips to be made by bicycle. This policy objective is stated at the beginning of the bicycle requirements section of Portland's municipal regulations (the equivalent of the District's Zoning Ordinance).

The City of Portland's municipal regulations pertaining to bicycle parking, "Title 33: Planning and Zoning, Section 33.266.200," and the City of Vancouver's Development Bylaws, "Section 6 - Off-street Bicycle Space Regulations," are included as an attachment to this memorandum for your review.

DCMR Title 18: Traffic & Parking

Purpose & Relationship to Bicycle Facilities & Use

The purpose of this title is to regulate the use of the surface transportation system, focusing predominantly on drivers and motor vehicles. Use of bicycles and issues related to pedestrian movement are covered in this document. This title also establishes enforcement provisions.

The specific sections that are relevant to cycling are the following:

- Chapter 1 - Issuance of driver's license
- Chapter 12 - Bicycle use, registration and parking
- Chapter 22 - Moving violations
- Chapter 26 - Bicycle use infractions
- Chapter 40 - Traffic signs & restrictions at specific locations

Recommended Changes

Chapter 1 - Issuance of Driver's Licenses

Review driver testing requirements to assure that it reflects safe motor vehicle operations in an urban multi-modal environment with cyclists, pedestrians and transit vehicles.

Chapter 12 - Bicycles, Motorized Bicycles, and Miscellaneous Vehicles

This section lays out the regulations for lawful bicycle use, mandatory bicycle registration, bicycle safety equipment, installation of bicycle racks on public space, bicycle parking on public space, etc. This section is clearly written and no significant revisions are recommended at this time.

Chapter 21 - Traffic Signs, Signals, Symbols, and Devices

In Chapter 12, in 1200.3, it states that "operators of bicycles have the same rights as operators of motor vehicles." However, most of the interaction and potential conflicts between motor vehicles and cyclists occur at intersections. There is no mention of cyclists in this chapter. This section should be reviewed to clarify cyclist rights at controlled intersections particularly with regard to turning vehicles.

Chapter 22 - Moving Violations

This section needs to be strengthened regarding the rights of pedestrians and cyclists in the public right-of-way. As the most vulnerable users of the surface transportation system, these users should be afforded the maximum degree of protection by the regulations that govern right-of-way use. At present, most collisions involving pedestrians and cyclists with motor vehicles are assumed to be the fault of the pedestrians and cyclists unless there is conclusive proof to the contrary.

This section also establishes motor vehicle speed restrictions and the proper use of the roadway. Motor vehicle speeds have a tremendous impact on the safety and comfort of cyclists using public streets. Vehicle travel speeds of 25 mph or less are most conducive to safe cycling.

Chapter 40 - Traffic Signs and Restrictions at Specific Locations

Temporary vehicle parking/double parking on bicycle routes and in designated bicycle lanes creates a serious hazard for cyclists. Section 4033 specifically references a prohibition of motor vehicle use of bicycle lanes. This section needs to be clarified to prohibit temporary vehicle parking and loading in established bicycle lanes. There should also be set fines for this infraction to discourage this activity.

DCMR Title 24: Open Space & Safety

Purpose & Relationship to Bicycle Facilities & Use

This title regulates the use of public space in the District and establishes streetscape standards. While bicycle parking on the public right-of-way is covered under Title 18 Vehicles and Traffic, there are is no discussion of bicycle parking in this Title. The provision of well-designed short-term visible and accessible bicycle parking in the public right-of-way is important for encouraging bicycle use and should be thought of in the same way as short-term curbside vehicle parking.

Recommended Changes

Insert a section in Title 24 that specifically addresses bicycle parking as a legitimate use in the public right-of-way, consistent with Title 18, and incorporate appropriate bicycle rack designs in the in streetscape standards for Downtown and other districts.

DDOT Design & Engineering Manual

Purpose & Relationship to Bicycle Facilities & Use

The District's Department of Transportation (DDOT) Office Manual for Design and Engineering documents procedures that will enable DDOT staff, consultants, and private interests to develop projects that meet the District's policies and standards. Aspects of this manual that are relevant to bicycle facility and use include the following:

- Establishes procedures for transportation capital project management and guidelines for facility design
- Provides guidance for traffic management/maintenance
- Provides guidelines for pavement markings and signage
- Establishes requirements for traffic impact studies
- Provides guidelines for on-street parking
- Relies heavily on established industry standards and guidelines

The most recent draft of this manual reviewed for this study was issued 04/14/03. To date, this manual has not been formally adopted by the Department.

Recommended Changes

The recommended changes to this document are intended to address the fact that the District is a highly urbanized multi-modal environment where many different transportation system users need safe and convenient access to transportation facilities and services. As such, these standards should be aligned.

Chapter 3 - Project Management Checklist

3.2 Project Scoping - This section needs to emphasize up-front multimodal planning and coordination. Important objectives to guide projects going through the scoping process include the provision of multimodal access and balance, promoting safety for all users, and supporting the lawful use of transportation facilities.

Chapter 5 - Traffic

Add a section that includes the objectives stated above. Emphasize steps needed to protect the most vulnerable users - pedestrians and cyclists.

Chapter 30 - Roadway

Review the functional classification system for its appropriateness in an urban multi-modal context (30.4). Revise design speed for urban streets to equal posted speeds (30.5). Review standard roadway element widths (30.11).

Chapter 43 - Guidelines for Pavement Markings & Signage

Consider inclusion of a provision of bicycle boxes at intersections, use of yield triangles at intersections, color differentiation of bike facilities on major commercial streets.

Chapter 44 - Guidelines for Reviewing Traffic Conditions & Preparing Traffic Impact Studies

This section should focus on person travel by all modes and should address the issue of traffic speed and safety for all users.

Chapter 45 - Requirements for Traffic Impact Studies for Development Projects

Same note as in Chapter 44.

Chapter 46 - Parking (Table 46a)

Consider adding the option for a 7’-0” parking stall width.

District Long Range Transportation Plan

Purpose & Relationship to Bicycle Facilities & Use

The District developed its first State Long Range Transportation Plan (LRTP) in 1996. For the purpose of federal transportation funding programs, the District of Columbia is treated as a state. The creation of an LRTP is a planning requirement of the federal surface transportation legislation. The 1996 plan was noteworthy for its scenario-based planning approach. The plan is relevant to the Bicycle Master Plan

because the LRTP is intended to serve as a guiding document for the development, evaluation, selection and implementation of transportation projects in the District. The Transportation Strategy described in this plan included the following elements:

1. *Develop sufficient and consistent funding to sustain world-class infrastructure and an exemplary multi-modal transportation project planning and institutional coordination process. This will be accomplished by creating new revenue opportunities and innovative financing techniques.*
2. *Improve the efficiency, safety and attractiveness of the existing transportation system through improved maintenance, streetscaping and signage*
3. *Focus transit investment on internal circulation to provide City residents and visitors with improved alternatives to the automobile.*
4. *Reduce the impacts of suburb to City travel on District residents by intercepting automotive traffic at key locations and providing excellent alternatives to driving in the City.*
5. *Promote business in the District by addressing goods movement through improved loading facilities and by improving rail as an alternative to moving goods into and out of the City.*
6. *Develop non-traditional, "signature" transportation for the District, including a water-taxi system, light rail and a world class bicycle transportation network.*

The development of a viable bicycle facility network is explicitly supported in the last strategy element. However, other strategy elements also support improvements in cycling conditions. Strategy 1 calls for multi-modal transportation planning. Strategy 2 calls for improved maintenance. Strategy 4 recommends the provision of viable alternatives to traveling by auto within the District.

The Action Plan calls for the development of District-wide "bicycle spine network," to connect existing, dedicated bicycle paths with one another and with new paths and dedicated bicycle lanes. The detailed recommendations for this area are included under Action Item 7.17 - Bicycle Spine Network.

The District's LRTP is currently being updated. This provides an opportunity to update and expand upon the recommendations for bicycle facilities and policies.

Recommended Changes

A preferred bicycle route network and design standards are being developed as part of the Bicycle Master Plan. This work should be integrated into the LRTP. One of the main challenges presented in the LRTP update is providing the right balance of access and use by all modes (auto/truck, transit, walking and cycling) on major transportation corridors. Some corridors may be best suited for intensive transit use while others may be highly suitable for bicycle facilities. This analysis must be done within a context where the boundaries of public right-of-way are fixed.

A goal for the bicycle element of the LRTP is to identify a network of bicycle facilities and routes that provide reasonably direct and safe access to most of the desired destinations in the District. A second goal

would be to pursue the incorporation of reasonable bicycle and pedestrian accommodation in all new or substantially reconstructed segments of the District's street network as part of the routine project planning and development process.

Policy Coordination with Other Agencies

District Schools (public and private)

There are over 50,000 students that attend DC Public Schools and many more that attend the District's many private schools. Encouraging bicycle and pedestrian access to schools is good public policy from many vantage points: promotes physical activity among students, has no adverse environmental impacts, and requires only modest expenditures in pedestrian and bicycle facilities (compared to adding new road and/or transit capacity).

DC Public Schools has a written policy on the provision of reduced fare bus tokens and Metrorail passes for access to school but has no comparable written policies for non-motorized (bicycle and pedestrian) access to schools. However, individual schools have been found to discourage student bicycle use by prohibiting bicycle parking on school grounds or not providing secure bicycle parking facilities (due to concerns about liability).

DDOT staff should work with the DC Public Schools and other private schools to develop policies that are supportive of multi-modal access, and that encourage walking and bicycling.

Metropolitan Police Department

Promoting lawful use of public streets and sidewalks by all users is very important to providing an environment that is conducive to safe cycling. Cars and trucks, if driven with disregard for motor vehicle laws, are a serious hazard to others, particularly pedestrians and cyclists that do not have the protection of the vehicle with its many safety features. If the District is serious about promoting non-motorized travel, a minimal tolerance for motorist infractions is required, and travel speeds of 25 mph or under would need to be standard. The Metropolitan Police Department (MPD) is responsible for enforcing existing traffic laws. Improved communication and coordination between the MPD and DDOT will be required if progress is to be made in this area. It will also require staffing and financial resources.

Supporting education programs that promote shared use of the right-of-way is also important to promote safe cycling conditions.

WMATA

Substantial advances in bike access to transit have been implemented in the last five years. Bicycles are now permitted on Metrorail throughout the system outside of the peak hours of operation. Further, a majority of Metrobus's fleet has now been outfitted with bicycle racks. These actions have greatly expanded the range of cyclists in the region.

More work is required on the provision of visible, secure and user friendly long-term bicycle parking at Metrorail Stations.

Providing safe bicycle access from surrounding neighborhoods to the station entrance is also needed. Many Metrorail Stations, particularly on the east side of the District are dominated by auto and bus drop-off and parking areas with limited accommodation for pedestrians and cyclists.

National Park Service

The National Park Service has jurisdiction over much of the District's public open space system, particularly in the Monumental Core and along the river corridors. Much of the District's existing and proposed trail network is on NPS controlled land. As such, any plan for enhanced bicycle facilities and use will require ongoing coordination with the National Park Service.

Architect of the Capitol

A Similar coordination as discussed above is required between DDOT and the Architect of the Capitol regarding bicycle facilities and signage that fall within the Capitol grounds.

National Capital Planning Commission (NCPC)
& the General Services Administration (GSA)

NCPC is responsible for establishing planning guidelines for federal facilities in the District, including policies governing off-street parking for vehicles and bicycles. The DC Zoning Ordinance does not apply to federally owned facilities. GSA is the umbrella property manager for the federal government and sets the requirements for federal facilities in the District and numerous other locations. Incorporating bicycle parking and other bicycle supportive facilities will require coordination with both NCPC and GSA.

Transportation and Public Works Departments in Adjacent Jurisdictions

The District of Columbia lies at the center of a highly diverse region of over 5 million people. Many trips made by all modes of travel including cycling, cross-jurisdictional boundaries every day. The bicycle network should be seamless across these boundaries. Coordination regarding route location, treatments and signage are necessary. This will require ongoing communication with the local Departments of Transportation from adjacent jurisdictions including Arlington, Alexandria, Prince George's County and Montgomery County.