## Overview

The Washington region has excellent long-distance separated facilities for bicyclists and pedestrians, and an urban core and certain regional activity centers that have good pedestrian and bicycle facilities. On the other hand, many activity centers, not originally designed with pedestrians in mind, have grown dense enough to generate significant pedestrian traffic, and face challenges in terms of providing safe facilities and crossing locations for pedestrians and bicyclists. Other parts of the region have developed at low densities, with separated land uses and indirect routes, which increase pedestrian and bicycle travel time. Pedestrian and bicycle accommodations are not always provided.[1]

**Figure 1: Informal foot path**

*Informal Foot-Paths Show where People Walk*

Bicycle connections with transit are generally good, with bicycle parking, bus bicycle racks, and bikes permitted on Metrorail at most hours. Walking is the primary mode of access to transit. Conditions for pedestrian access are excellent at many rail stations, though at some rail stations, originally designed primarily with auto and transit access in mind, pedestrian access could be improved. Bus stops in places originally designed primarily for automobiles often have access and safety problems.

Pedestrians are found throughout the region, and pedestrian traffic is increasingly found in places that were not built for it. This section highlights some of the region's successes in providing for bicycling and walking. These successes can serve as examples of what the region needs to serve its pedestrians and bicyclists.

[1] Photo of Informal Path, Southern Avenue, Prince George's County, MD: COG/TPB, Michael Farrell

## Shared-Use Paths[2]

**Figure 2: Mount Vernon Trail**

The Washington region is renowned for the quality and extent of its major shared-use paths. Shared-use paths are typically located in their own right-of-way, such as a canal, railway, or stream valley, or in the right-of-way of a limited-access highway or parkway, such as the George Washington Memorial Parkway. Shared-use paths are eight to twelve feet in width. The region has approximately 200 miles of major shared-use paths, either paved or level packed gravel surface suitable for road bikes. Well-known trails include the W&OD and Mount Vernon Trails in Virginia, and the C&O Canal, Capital Crescent, and Rock Creek Trails connecting the District of Columbia and Maryland. Many of the region's shared-use paths go through heavily populated areas, connect major employment centers, and get significant commuter traffic. More information on trails in the Washington region can be found at http://www.commuterconnections.org/commuting-resources/bicycling-resources.

The region continues to build new trails along stream valleys and in conjunction with major highway projects, but the remaining inventory of disused rail lines, which often provide the best opportunities for shared-use paths, is fairly small.

**Figure 3: Side Path on Fairfax County Parkway**

## Side-Paths[3]

Side-paths differ from shared-use paths in that they do not have their own right of way, but are closely adjacent to a non-limited access roadway and thus subject to more

[2] Photo of Mt. Vernon Trail, Arlington, VA: COG/TPB, Michael Farrell
[3] Photo of Sidepath on the Fairfax County Parkway: Photographer Unknown

frequent conflict with driveways, side streets, and turning traffic. Side-paths differ from sidewalks in that they must be at least eight feet wide and are designed to meet the needs of bicyclists.

The Washington region has approximately 300 miles of side-paths, and there are plans to expand that mileage considerably.

Side-paths meet the need for a separated pedestrian facility and provide separation from traffic that is valued by child and slow-moving cyclists, especially in places where the road has speeds of 40 mph or more and high traffic volumes. However, the AASHTO (American Association of State Highway and Transportation Officials) Guide for the Development of Bicycle Facilities offers a number of cautions regarding the use of side-paths or wide sidewalks for bicycles. Frequent driveways, especially with poor sightlines, are hazardous to bicyclists on side-paths. Side-paths remove bicyclists from the motorists' line of sight and allow travel against the flow of traffic, so they may increase the potential for conflicts with motor vehicles at intersections. Since the facility is shared with pedestrians, there is also a potential for cyclist-pedestrian crashes. Side-paths are most suitable where driveways and intersections are few and sight-lines are good. Intersection crossings should be designed carefully, with a protected signal phase providing the best level of protection.

## Bicycle Lanes

Bicycle lanes are marked lanes in the public right-of-way that are by law exclusively or preferentially for use by bicyclists. Bike lanes are one-way, with a bicycle symbol or arrow indicating the correct direction of travel. The minimum width is 4 feet for roadways with no curb or gutter; next to a curb or parked cars 5 feet. Six feet is preferred where there is a curb or on-street parking. Bike lanes are provided on both sides of the street, except for one-way streets, and allow travel only in the same direction as adjacent motor vehicle traffic. On-street bicycle lanes are generally much less expensive than separated paths. Bike lanes

**Figure 4: Colored Bike Lane**

decrease wrong-way riding, define the road space that cyclists are expected to use, increase cyclists' comfort level, and call attention to the presence of cyclists on the roadway. Bicycle lanes are not generally considered safe or adequate for pedestrians, though in rural areas without sidewalks the roadway shoulder serves as both a bicycle lane and as a pedestrian facility.[4]

**Figure 5: Bike Lane**

Bike lanes may be colored green for conspicuity.

The number of bicycle lanes is growing rapidly. The District of Columbia currently has 60 miles of bicycle lanes, up from 19 miles in 2006, and three in 1995, Arlington County has 24 miles, up from three in 1995, and Montgomery County has 17 miles.[5] The regional mileage of bicycle lanes can be expected to expand significantly in the future as the District of Columbia, Arlington County, and Montgomery County all have ambitious plans to build more. Google maps shows bicycle paths, lanes, and on-road routes.

**Figure 4: Buffered Bike Lane**

### Buffered Bicycle Lanes

A buffered bicycle lane is a bicycle lane with a spatial buffer to increase the distance between the bicycle travel lane and the automobile travel lane or the parking zone. The buffer zone is usually marked with striped paint. Buffered bike lanes are sometimes used where there is higher than normal speeds, traffic volumes or truck volumes, or high-turnover parking. It allows additional space to be provided for bicyclists without creating something that looks like a travel lane to motorists. The example above is from Arlington.

[4] Bike lane photo: www.pedbikeimages.org / Dan Burden

[5] *Countywide Bikeways Functional Master Plan*, March 2005. Maryland-National Capital Park and Planning Commission. Page 12.

## Cycle Tracks

**Figure 5: 15th Street NW Cycle Track**

A cycle track is a bicycle-only facility that provides physical separation within the right of way from vehicle travel lanes. Cycle tracks can be either one-way or two-way, on one or both sides of a street, and are separated from vehicles by wands, bollards, curbs/medians, parked cars, or a combination of these elements. Cycle tracks can either incorporate bicycle-only signal phases at intersections (for 100% separation) or utilize "mixing zones" to merge bicycle and motor vehicle traffic.[6]

Cycle tracks have long been viewed skeptically in the United States, and notably in the AASHTO Guide for the Development of Bicycle Facilities, due to the potential conflicts with turning vehicles, and lack of visibility of cyclists to turning vehicles when separated by parked cars. However, these facilities are generating interest.

**Figure 6: 1st Street NE Cycle Track**


Cycle tracks have been used in numerous cities in Europe with mixed results.[7] Installation of cycle tracks was found to result in an increase in collisions at intersections in Copenhagen, which more than offset a decrease in motorist-overtaking collisions and collisions with parked cars, for a net increase in the number of collisions of 9%. However,

*The 15th Street Cycle Track has increased Ridership by more than 200%*

[6] Nactional Association of City Transportation Officials. http://www.nacto.org/cycletracks.html

[7] Jensen, Søren Underlien, Claus Rosenkilde and Niels Jensen. Road safety and perceived risk of cycle facilities in Copenhagen. *Available at* http://www.ecf.com/files/2/12/16/070503_Cycle_Tracks_Copenhagen.pdf

the same study showed that installing cycle tracks increased bicycle (and moped) ridership 18 to 20 percent.[8] Installing bike lanes resulted in a 5 to 7% increase in ridership, and a 5% increase in crashes. For both cycle tracks and bike lanes the number of riders can be expected to increase more than the number of crashes.

Riders perceive cycle tracks as safer, and it should be noted that motorist-overtaking collisions, while relatively rare, account for a disproportionate number of serious and fatal injuries.

Following New York City, and Cambridge, MA, the District of Columbia is actively installing cycle track, towards an eventual planned network of 72 miles.

The first segment of cycle track in the District of Columbia was installed in 2009 on 15th Street NW. In terms of ridership, the 15th Street Cycle Track, which has been in operation the longest, has been a success. After the two-way cycle track was installed, there was a 205 percent increase in bicycle volumes during the p.m. peak hour.[9]
More recent projects include one-way couplet of cycle tracks on L Street and M Street NW (not yet complete) in downtown, ,and the 1st Street NE cycle track, which connects the Metropolitan Branch Trail to Union Station.

To help prevent turning conflicts, cycle tracks may be equipped with separate signals for bicycles.

## Dual Facilities

In recognition of the fact that fast-moving cyclists may be better off with an on-road facility, Montgomery County is planning many of its bicycle routes as dual facilities, with both an on-road bike lane and a side-path for pedestrians and slow bicyclists. VDOT's *Northern Virginia Bikeway and Regional Trail Study* recommends that both on- and off-road accommodation be provided.[10] Under the new routine accommodation policy, VDOT is to provide adequate facilities for pedestrians and bicyclists even if not called for in the local plan.

Where bicycle and pedestrian volume warrant it, and right of way permits, multi-use paths may be split into parallel pedestrian and bicycle paths. This separation allows cyclists and rollerbladers to maintain speed without risk to pedestrians. The Washington & Old Dominion Trail in Northern Virginia includes several sections with gravel pedestrian paths that parallel the paved shared-use path.

[8] *Cycle Tracks: Lessons Learned.* February 2009. Alta Planning and Design. Page 1.
[9] *Bicycle Facility Evaluation, Final Report.* April, 2012, p. 12.
[10] *Northern Virginia Regional Bikeway and Trail Network Study.* November, 2003. Virginia Department of Transporation, Northern District Office. Page 19.

## Signed Bicycle Routes

The region has hundreds of miles of signed bicycle routes. Signed routes have the advantage of being inexpensive and informative for cyclists. A signed route has not necessarily had any bicycle-related improvements apart from signing. However, bicycle-friendly features such as paved shoulders, a wide curb lane, or low traffic volumes or speeds *may* be present. The trend with bicycle route signs is to include information on distances to destinations.


**Figure 7: DC Bike Route Sign**

## Long-Distance Bicycle Routes

Several notable long-distance routes promoted by national-level organizations pass through the Washington region. These include the East Coast Greenway, Bicycle Route 1, and the American Discovery Trail. The East Coast Greenway Alliance is promoting what will eventually be a mostly off-road path connecting all the major cities of the East Coast. Currently 20% open for public use, it will span 2,600 miles from Calais, Maine to Key West, Florida. With the exception of the National Capital Mall, the proposed route through the Washington region is not yet signed. Bicycle Route 1 is part of a national network of low-traffic road routes promoted by the Adventure Cycling Association. The American Discovery Trail is a coast-to-coast, recreational, non-motorized trail, which follows the C&O Canal Towpath and the Anacostia River Tributary Trails. All organizations promoting long-distance routes rely on local agencies and organizations to realize their vision.


**Figure 8: East Coast Greenway in DC**

### Exclusive Bus/Bicycle Lanes

Exclusive bus lanes are sometimes used on streets with heavy bus traffic. Bicycles are sometimes permitted to use those lanes. Bus/Bike Lanes can be found in the District of Columbia. Conflicts can occur due to differences in speed between buses and bicyclists.

### Bridges

With the completion of the Woodrow Wilson Bridge trail 2009, cyclists were able cross the Potomac River on the capital beltway at Alexandria.

**Figure 9: Woodrow Wilson Bridge Trail**

This multi-use path allows riders on the Mt. Vernon Trail to access the National Harborplace development in Prince George's County without going on street. Connections are also provided an on-street network of bicycle routes in Prince George's County.

The 14th Street Bridge, the Memorial Bridge, the Theodore Roosevelt Bridge, the Key Bridge, and the Chain Bridge all have bicycle and pedestrian facilities. In the north, cyclists and pedestrians may use the ferry at White's Ferry, which connects Montgomery County and Loudoun County. Cyclists may use the US 15 bridge at Point of Rocks and the MD 17 bridge at Brunswick to get across Frederick County and Loudoun County, though they have no separated facilities.

With the completion of the 11th Street Bridge in 2013, bicyclists and pedestrian now have a first rate multi-use path connection from Anacostia to the Navy Yard area of SE DC. The District of Columbia is in the process of upgrading the remaining Anacostia River separated bicycle and pedestrian river crossings, which are of uneven quality, as these aging bridges are replaced and rebuilt.

### On-Line Bicycle and Pedestrian Routing

The last few years have seen a flowering of on-line resources that enable cyclists and pedestrians to locate facilities and plan their routes. Google maps offers the most familiar interface, but other options include bbbike.org, and RidetheCity, which allow cyclists to point and click their proposed origins and destinations, and choose various routing alternatives.

Google maps also provides walking and bicycling directions. The bicycling directions show paths, bike lanes, and on-street bike routes, but offer no options for selecting more direct or safer routes.

Accessed via smart phone, these and other on-line applications can replace paper maps for most purposes.

## Bicycles and Public Transit

The region has made tremendous progress integrating bicycling and public transit, with secure bike parking available at most rail stations, bicycles permitted on Metrorail at most times, and most of the buses in the region now equipped with bicycle racks. Specific agency policies and facilities are described below.

### Metrorail Guidelines

- Bicycles are permitted on Metrorail (limited to two bicycles per car) weekdays except 7-10 a.m. and 4-7 p.m. Bicycles are permitted all day Saturday and Sunday as well as most holidays (limited to four bicycles per car). Bicycles are not permitted on Metrorail on July 4th or other special events or holidays when large crowds use the system.
- Folding bikes are permitted on Metrorail during rush hours if fully enclosed in a carrying bag.
- No tricycles, training wheels, tandem bicycles or recumbent bicycles are allowed on Metrorail.
- For other Bike on Rail guidelines see: http://www.wmata.com/getting_around/bike_ride/bikes_rail.cfm

### Metrorail Facilities

- **Bike & Ride** is a secure, enclosed bicycle parking facility with card access and space for over 100 bikes, on the first floor of the Metro garage at College Park-U of MD station. Bike & Ride is more flexible, secure, and space efficient than racks or individual lockers.

- For the most up to date information on bicycle parking at Metrorail, go to the WMATA web site and click on the stations tab. You can see which stations have bike racks and lockers. Or go to http://www.wmata.com/getting_around/bike_ride/ for a list of stations with bike racks and lockers, and information on how to rent a bike locker.

- Systemwide, WMATA maintains about 1,280 single bike lockers and about 1,700 bike racks. Racks are first come, first served. At many downtown stations, local jurisdictions provide additional bike parking near stations. WMATA continues to add and upgrade racks.

**Figure 10: New Bike Racks (WMATA photo)**


**Metrobus**

- **All** Metrobuses have racks on the front that carry **up to** two bicycles. No permit is required. Instructions for how to use bus bike racks is available at http://www.wmata.com/getting_around/bike_ride/bikes_bus.cfm

- Metro has adopted guidelines for the design and placement of bus stops to improve their safety, comfort, accessibility, and efficiency.

**Park and Ride**

Of the 175 park and ride lots in the Washington DC-MD-VA Metropolitan Statistical Area, about 50 have bike lockers or racks. Commuter Connections lists information on Park and Ride lots.

### Commuter Rail

Collapsible bicycles are permitted on all VRE trains. Full size bicycles will only be allowed on the last three northbound, the mid-day, and the last three southbound trains on each line.

Collapsible bicycles are permitted on MARC, but not full-size bicycles. No bag or case is required.

## Pedestrian Access to Transit

82% of Metrobus passengers walk to transit, and 62% of all Metrorail trips start with the passenger walking to the rail station. However, the a.m. peak walk mode of access, which is the best measure of how people originally get into the system, is 37%.

The quality of pedestrian access to Metrorail and Metrobus is uneven. Many suburban rail stations were built with an emphasis on automobile and bus access. Bus stops are often placed in areas with no sidewalks or available crosswalks. Inventorying conditions and making recommendations for specific locations is beyond the scope of this plan, but there have been a number of efforts to do so, such as MTA's Access 2000 Study, COG/TPB's Walkable Communities Workshops, and efforts in Fairfax County and Montgomery County to improve bus stop safety.

WMATA has developed a set of *Guidelines for Station Site and Access Planning*, and WMATA has plans to upgrade pedestrian access at Metrorail stations and carry out station-area development. WMATA also finished an inventory of conditions at all its bus stops in 2008. The inventory included information on the presence of bus shelters, sidewalks, and location at a controlled intersection.[11] Suburban bus stops often lack a nearby controlled intersection for safe street crossing, and may also be missing sidewalks. A study on bicycle and pedestrian access to Metrorail provides details on pedestrian access.

**Figure 11: Bike Parking Demand is Growing**

## Bike Parking

The District of Columbia, Arlington,

[11] *WMATA Bus Stop Inventory Projec*
November 2008.

Alexandria, and other jurisdictions provide bike racks on public property for short-term bicycle parking. They also require secure long-term bicycle parking to be provided as part of new development.

- **Bike Corrals**

As demand grows in congested areas, DC has added bike corrals, which are bike racks placed in the street, and protected by flexi-wands tire stops. Twelve bicycles can be parked in the space required to park one automobile. And because bicycles do not block motorists' sight lines, they can be placed near the intersection where parking is not permitted, result in no loss of car parking.

Tire stops are necessary to prevent cars from backing into the racks.

**Figure 12: Corner Bike Corral**


- **DC Bike Station**

In response to demand for secure bicycle parking at Union Station, in 2009 the District of Columbia opened a Bike Station. The facility houses over 100 bicycles in 1,600 sq. ft. of free-standing ultra-modern glass and steel design. It is staffed 66 hours per week and available to members 24/7 for self-service parking. In addition to secure bike parking, the


**Figure 13: DC Bike Station at Union Station**
**Photo Credit: COG/TPB**

**Figure 14: DC Bike Station Interior**

facility also provides a changing room, lockers, bike rental, bike repair, bike rental, and retail sales. The Bikestation location at Union Station allows commuters to take public transportation to the station, pick up their bicycles and go to work, shopping or entertainment.

The DC bike station is a unique structure designed for a particular site. It required an unusual degree of architectural review due to its location on the National Mall. Far less expensive, modular self-service bike parking structures are available.

**Figure 15: Capital Bikeshare Station**


## Capital Bikeshare

Bike sharing is self-service public bicycle rental. It is similar to a car-sharing system, such as ZipCar, where members pay a fee and have access to any available bike throughout the regional system. Unlike earlier "public bicycle" or "yellow bike" programs, which failed due to lack of means of preventing theft, modern bicycle sharing links rentals to a user's credit card, which can be charged if the bicycle is not returned. Bike sharing became common and popular first in Europe and then the United States, with programs in dozens of cities.

*Capital Bikeshare has over 2500 bicycles and 300 stations*

Since it opened in 2010, the regional bike sharing program, Capital Bikeshare has grown to include 2500 bicycles at over 300 stations across Washington, D.C., Arlington and Alexandria, VA and Montgomery County, MD. Capital Bikeshare is one of the largest and most successful bike share systems in the United States. Its' solar-powered semi-mobile bike stations require no utility hook-up, which expedites installation. It operates year-round, with winter ridership a little more than one third the level of the warm weather months. It attracts many tourists as well as residents.

## Outlook

Facilities for bicycling and walking in the Washington region are likely to improve significantly in the future. Federal, regional, state and local policies and transit agency initiatives all call for better and more complete facilities. Bicycle lanes, cycle tracks, and dual facilities for pedestrians and bicyclists will become more common, and bike sharing will continue to expand in the urban core and beyond.