




Bicycle & Trail Advisory Group

Prince George's County ⇨ Founded January 1998

October 26, 2011

MEMORANDUM:

TO: Haitham A. Hijazi, Director, Department of Public Works and Transportation

FROM:  Prince George's County Bicycle and Trails Advisory Group (BTAG)

RE: Supplemental guidance/standards for bicycle lane striping, shared lane markings, and *Bicycles May Use Full Lane* signs.

Prince Georges County is on the cusp of substantially increasing the mileage of on-road bicycle facilities. Several major road improvement projects will have bicycle lanes; county policies now require new and rebuilt roads to include bicycle lanes or shared-lane facilities; and both transit-oriented development and the completion of several major trails will increase the demand for on-road facilities. For our bicycle infrastructure to meet the needs of the 21st century, they must be well-designed based on a state of the art understanding of bicycle safety. The American Association of State Highway Officials (AASHTO) and other national organizations have published standards and guidance for bicycle lanes and other bicycle facilities. In most cases, the existing standards are *minimum* standards that were viewed as generally appropriate. But there has always been a recognition that it will be necessary for some facilities to exceed those minimum standards, depending on variations in state law, speed limits, available space, and whether the facility is meant solely for skilled adult cyclists or the general recreational cyclist.

This memorandum adapts existing national standards for the conditions and opportunities within Prince Georges County. At a BTAG subcommittee meeting on May 10, 2011, BTAG members discussed current AASHTO and MUTCD guidance, as well as some of the newer treatments being utilized in cities across the country. BTAG also considered the experience of area cyclists and the available literature on hazards to cyclists and the potential for well-designed facilities to mitigate those hazards. BTAG respectfully submits this additional guidance for the consideration of DPW&T as bicycle lanes, signage, and other on-road bicycle improvements are made throughout the county. In summary, these guidelines address the safe use and placement of bicycle lanes, the placement of shared lane markings, and the use of *Bicycles May Use Full Lane* (Regulatory Sign R4-11) signs where other treatments are not feasible.

Existing National Standards

The most commonly used source for design of bicycle facilities are the 1999 AASHTO Guide for the Development of Bicycle Facilities and the Manual on Uniform Traffic Control Devices (MUTCD). AASHTO is currently in the process of reviewing and updating the *Guide for the Development of Bicycle Facilities* to incorporate updated standards and practices that have proven effective throughout the United States. The 2009 Edition of the MUTCD incorporates many new ideas and treatments that can be used to

better accommodate bicycle movement. Part 9 of the MUTCD includes guidance regarding the placement of regulatory signs for bicycle facilities, bicycle warning signs, bicycle guide signs, and pavement markings for designated bicycle lanes and shared lane markings. Maryland has adopted those traffic control devices in the Maryland MUTCD. In addition, the National Association of City Transportation Officials (NACTO) has developed the *Urban Bikeway Design Guide* (dated April 2011). The NACTO guide includes examples of treatments that have been successfully used across the United States and many of the best cycling cities from around the world. Many of the treatments discussed by NACTO are not currently included in either AASHTO or the MUTCD, although certain elements may be. However, the NACTO guide is important because it compiles many new and innovative treatments that have been successfully implemented in cities throughout the world. These treatments may shape future updates and amendments to AASHTO and the MUTCD.

Supplemental guidelines and standards:

Designated Bicycle Lanes

1. Bicycle lanes should be striped onto existing roadways where there is room for a quality lane, as described below:
 - a. If there is no parking along the street, then the bicycle lane must be at least as wide as provided by the applicable AASHTO standard (4 feet of pavement with open section road and 5 feet from stripe to curb for closed section roads). The combined width of the bicycle lane and the general travel lane immediately to the left of the bicycle lane must be at least 16 feet.
 - b. If there is parallel parking along the street, then no portion of the bicycle lane may be in the door hazard zone unless there is also a pavement marking warning cyclists and drivers of the door zone. (For our purposes, "door zone" means any place within 15" of where an open car door could reach, that is, the area outside of which the bicycle tire must ride to ensure that a cyclist would not strike an open car door).
 - c. Higher speed roads. If the road has actual traffic speeds greater than 40 mph, the minimum standard is one foot wider than for a slower speed road. Such a bicycle lane must have at least 5 feet of pavement with open section roads or 6 feet from stripe to curb for closed section roads. The combined width of the bicycle lane and the general travel lane immediately to the left of the bicycle lane must be at least 17 feet. In general, this standard would apply to roads with speed limits of 35 mph or greater, unless traffic calming is in place to keep speeds within 5 mph of the speed limit.
 - d. Other hazards to the right of the bicycle lane. If telephone poles, mailboxes, or other structures are along the right side of the roadway, the left stripe of the bicycle lane must be at least 6.5 feet to the left of any such structure.
 - e. Sight Distances. Bicycle lanes should be designed for vehicular traffic proceeding at 25 mph. If site-specific conditions make such sight lines impracticable, then warning signs stating the maximum safe speed of the bicycle lane must be posted or the bicycle lane should give way to sharrows along the stretch of roadway where the minimum sight distance cannot be maintained.
2. Within 200 feet of an intersection, bicycle lanes stripes should be dashed rather than solid, to encourage drivers intending to make a right turn to merge right into the bicycle lane before turning.

Shared Lane Markings (Sharrows)

If a quality bicycle lane is not feasible, but the lane is wide enough for a bicycle and a motor vehicle to safely share the lane side-by-side, then shared lane markings (sharrows) should be painted on the lanes, if safe.

- a. For side-by-side lane sharing, the point of the sharrow must normally be at least 11 feet to the right of the line that marks the left side of the lane.
 - i. If there are two or more lanes in the same direction, a sharrow in the right lane need only be 10 feet from the left edge of the right lane.
 - ii. If the left edge of the lane has a wall or Jersey barrier, or is adjacent to an oncoming lane with heavy truck traffic, then the center of the sharrow should be at least 12 feet to the right of the centerline.
- b. Along the right side of the road,
 - i. If there is no parking along the road, the sharrow must normally be at least 4 feet from the right side curb or pavement edge. But it could be reduced to as little as 3 feet if there is only 14 feet of pavement between the left edge of the lane and the curb or pavement edge, *provided that* there are few driveways, no vegetation to obstruct the view along the right side of the road, and no mailboxes or telephone poles within 2 feet of the pavement edge..
 - ii. If there is parking along the road, the sharrow must be 5 feet to the left of the edge of the parking lane (or 12 feet from the curb if the parking lane is not painted).
- c. If the lane is too narrow to meet both conditions (a) and (b), then the road is too narrow for bicycles and motor vehicles to safely share a lane side by side. Under such circumstances, the principals of safe cycling would generally advise a cyclist to either use the full lane or seek an alternative road.

Bicycles May Use Full Lane (R4-11) Signs - If neither bicycle lanes nor side-by-side road sharing are feasible, then adult cyclists would generally be advised to use the full lane. Traffic control devices are necessary to warn motorists that bicycles may be riding in the middle of a lane. Although the *Maryland Driver Manual* clearly states that in some circumstances, the center of the lane is the safest place for a cyclist to ride, many drivers are unaware of this key principal of safe cycling and may become hostile toward cyclists who are merely attempting to ride safely. As a result, signs stating that "Bicycles May Use Full Lane" are sometimes necessary to mitigate the potential for conflict between road users, especially 2-lane roads where opportunities to pass may be limited.

- a. An R4-11 sign should be installed after each major intersection or with the same frequency as speed limit signs.
- b. Sharrows should be painted in the center of lanes of major bicycle routes, such as the Potomac Heritage Trail, or whenever the R4-11 signs prove to be insufficient to alert cyclists or motorists of the need for cyclists to use full lane.
- c. On 2-lane roads with speed limits above 30 mph, where the Director of DPW&T believes that most cyclists would (or should) use an alternate route, a yellow diamond warning sign with the words "Bicycles May Use Full Lane" may be a preferable alternative to the R4-11 white rectangular sign in the MUTCD.
- d. The "Share the Road" sign should generally not be used in urban and suburban roads because they convey an ambiguous message that is not clearly understood by many drivers. (Many drivers believe that the sign commands side-by-side sharing within the lane, which is an unsafe message to communicate wherever roads are too narrow for side-by-side sharing) Existing "Share the Road" signs should eventually be replaced with R4-11 signs on roadways too narrow for side-by-side lane sharing.

