

Kumar Neppalli

From: Wayne Pein [wpein@nc.rr.com]
Sent: Tuesday, May 11, 2004 2:29 PM
To: Kevin Foy; hillcc@nc.rr.com; dverkerk@nc.rr.com; sally@ibiblio.org; mark@cdpl.org; edithwiggins@nc.rr.com; billstrom@nc.rr.com; ed.harrison@mindspring.com; windsorcircle@mindspring.com; Roger Waldon; George Small; Manager; Kumar Neppalli
Subject: Cameron_Again

Dear Everyone,

Please don't put bike lanes on Cameron Ave. My wife and I bicycle on Cameron everyday. It is a very easy road to ride on and works better now than in the past when bicyclists were confined by bike lanes to the side of the road. I have many pictures of beginner bicyclists happily riding on Cameron under the current situation of no bike lanes. There is plenty of room for motorists to easily pass even with on-street parking.

I voted against the Bicycle and Pedestrian Board's recommendation for changing the striping and parking on Cameron because it was, and is, a bad idea. The staff's recommendation to leave Cameron alone is sound and based on science, not politics. There was a time when I was a bike lane supporter, but upon exposure to existing bike lanes and similar non-bike lane roads in Chapel Hill it quickly became clear that the space without the stripe was far better for bicyclists of all abilities.

Our roads, traffic theory, and traffic laws are a two party system: drivers of vehicles and pedestrians. Bicyclists are drivers of vehicles. The system for all drivers is based on destination positioning: left, straight, and right turning. By artificially attempting to implement a 3 party system and segregating one class of drivers, bicyclists, the system is upset.

Consider the implications if, instead of bike lanes, the call was for minivan or elderly-people lanes. Some minivan drivers would feel privileged to have their own lane, while others would rue the fact that they now have less right to use the remainder of the road and are stuck to the side of the road in a more hazardous, narrow, debris filled area. S.U.V., Volvo, and other drivers would be jealous that they don't have their own lane, and would resent minivan drivers who came out of the minivan lane.

Consider also that, currently, bicyclists can use as much or as little of the full lane width as the situation requires, though usually they use just a small fraction. How can confining minority bicyclists to the narrow rightmost portion of the road be a benefit to bicyclists?

Historical experience has shown that "separate but equal" does not work out that way for minority groups.

Once one wades through the hyperbole of bike lane supporters who distort or misrepresent the issues, research, and empirical evidence, and profess their supposed victim status and anti-motorist ideology, it is evident that wide lanes without a separate bike lane striped area are a superior facility for all road users. Leaving Cameron as is adheres to the principle of First Do No Harm.

Finally, the vast majority of roads do not have bike lanes and will not have bike lanes for one reason or another. By creating a schizophrenic system of sparse and disconnected bike lanes, motorists and bicyclists have alternating expectations of their roadway positions. Sometimes bicycle drivers are to the right of a stripe, sometimes they are using the standard travel lane, often along the same corridor. There are no bike lanes directly leading to either end of Cameron for example. If bike lanes were eliminated in general, the expectations of all road users would be consistent. Bicyclists would be using normal travel lanes, some of which are narrow, some standard, and others wide. Some narrow lanes would be considered for widening where it is deemed beneficial. Uniformity would be established and bicyclists would be treated as equal, not super-equal or sub-equal, users of the road as the law dictates.

Regards,
 Wayne Pein

Kumar Neppalli

From: Wayne Pein [wpein@nc.rr.com]
Sent: Tuesday, May 18, 2004 2:37 PM
To: windsorcircle@mindspring.com; Roger Waldon; George Small; Manager; Kumar Neppalli; Gordon Sutherland
Subject: AASHTO, DZBLs, and Cameron



AASHTO_DZBL.pdf
(143 KB)



cameron_analysis.p
df (131 KB)

Gentleman,

Attached are two papers. In one I critique the AASHTO specifications for bike lanes next to parking (Door Zone Bike Lanes; DZBLs). It's bloody. This paper will be put online at: www.humantransport.org

These standards have long been held as irresponsible by many in the bicycling community. I decided it was time to put a paper to it. There are many useful links in the paper.

The other paper provides a brief analysis of Cameron Ave, before and after bike lanes.

Regards,
Wayne

AASHTO and Door Zone Bike Lanes

Wayne Pein wpein@nc.rr.com



May 2004

AASHTO and Door Zone Bike Lanes.

Introduction

The standards for bike lane placement next to on-street parking in both the AASHTO *Guide for the Development of Bicycle Facilities* and AASHTO's *A Policy on Geometric Design of Highways and Streets* are in error and create dangerous door zone bike lanes (DZBL).

Instructive is an excerpt from an article about DZBLs that mentions the infamous Dana Laird fatality that occurred in Cambridge, MA due to a "Dooring" incident:

"Of interest to people in the world of bureaucracy is that the Cambridge bike lane met the guidelines of the American Association of State Highway and Transportation Officials (AASHTO) with five inches to spare. The lesson there is that the AASHTO guidelines need some work with a red pen. Nowhere else in traffic engineering would someone dream of posting a traffic control device that road users would need to disobey to save their lives. When we stop crying, let's laugh this one off the table."

John Schubert, bicycling author and expert witness.

See: <http://www.bikexpert.com/massfacil/cambridge/doorzone/laird1.htm> for analysis of the Laird fatality and additional pictures of the DZBL at:

<http://www.bikexpert.com/massfacil/cambridge/massave/massave.htm>

Background

The AASHTO *Guide for the Development of Bicycle Facilities*, the "Guide" says:

"For roadways with no curb and gutter, the minimum width of a bike lane should be 1.2 m (4 feet). If parking is permitted, as in Figure 6(1), the bike lane should be placed between the parking area and the travel lane and have a minimum width of 1.5 m (5 feet). Where parking is permitted but a parking stripe or stalls are not utilized, the shared area [parking plus bike lane] should be a minimum of 3.3 m (11 feet) without a curb face and 3.6 m (12 feet) adjacent to a curb face as shown in Figure 6(2). If the parking volume is substantial or turnover is high, an additional 0.3 to 0.6 m (1 to 2 feet) of width is desirable."

AASHTO's *A Policy on Geometric Design of Highways and Streets*, the "Green Book" says:

"...the desirable minimum width of a parking lane is 2.4 m [8 ft]. However to provide better clearance from the traveled way and to accommodate use of the parking lane during peak periods as a through-travel lane, a parking lane width of 3.0 to 3.6 m [10 to 12 ft] is desirable. This width is also sufficient to accommodate delivery vehicles and serve as a bicycle route, allowing a bicyclist to maneuver around an open door on a motor vehicle."

Discussion

The *Guide* specifies that the leftmost bike lane stripe be 12 feet from curb face, and the *Green Book* 10-12 feet. Parked vehicles with open doors occupy approximately 10 feet of space from curb face (trucks and some cars can be wider), leaving only 2 ft of operating clear zone. <http://www.bikexpert.com/bikepol/facil/lanes/doorwidth.htm> provides vehicle parking widths. Bicycles are 2 feet wide, or wider with accessories. Thus, a bicyclist just to the right of the line as depicted in Figure 1 will not have any shy buffer to an extended door. A bicyclist further right is directly in the door zone. With such a bike lane placement, bicyclists should ride to the left of the line, not to its right as intended by design.

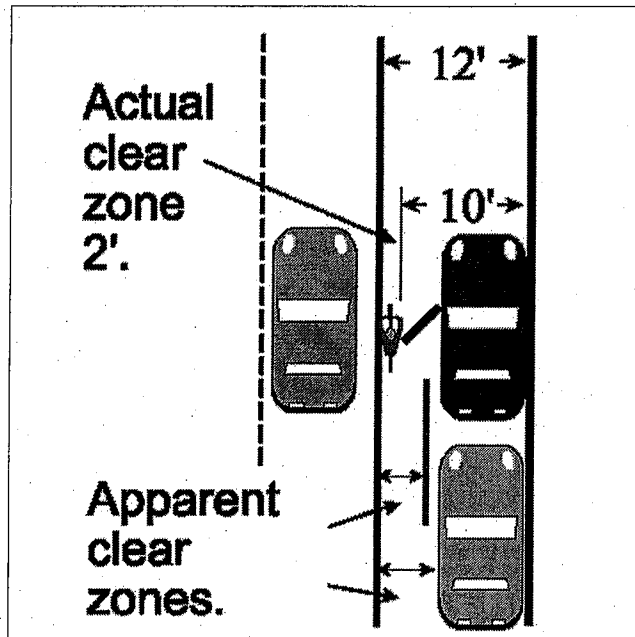


Figure 1. AASHTO's specifications are dangerous.

With an increase in lane placement to 13 or 14 feet as the *Guide* allows, the bicyclist would have a 3 or 4 foot wide operating clear zone (4 feet is the minimum width of no-parking type bike lanes), yet still without shy buffer from the door zone. A bicyclist tracking along the centerline of the *apparent* clear zone is at risk of a "Dooring" collision. In order to safely operate to the right of the line, bicyclists would need to use, and know that they needed to use, only the leftmost quarter of the apparent clear zone (side of vehicle, door closed).

If a bike lane right-side/parking lane stripe is used (shown as a red line in Figure 1), the apparent clear zone is the width of the channelized bike lane. With this design, a bicyclist is strongly lured into tracking along the centerline of the bike lane. To provide adequate clearance, the bike lane right-side stripe should be at 12 feet from curb face.

It is abundantly clear that the AASHTO specifications are misleadingly hazardous. Simply put, the provisions of AASHTO design manuals place bicyclists where they are at risk of collision with suddenly opening parked vehicle doors. How are bicyclists expected to "maneuver around," as the *Green Book* states, a door that may abruptly open, affording near zero reaction time and stopping distance? Motorists are not expected to be able to stop or swerve under similar conditions, and it is unfathomable to expect this of bicycle drivers. "Dooring" has long been a recognized hazard to bicyclists. For statistics on the incidence see: <http://www.bikexpert.com/bikepol/facil/lanes/dooring.htm>

Typical bicycling education programs, whether taught formally or briefly described on maps or elsewhere, have long instructed bicyclists to ride more than a door's width from parked cars. Bicyclists should be instructed and lead to track a minimum of 5 feet from the side of parked vehicles to provide minimal clearance from potentially opening doors; additional clearance is desirable, particularly as bicyclist speed increases. Wider bicyclists should track further left. Moreover, ample spacing from parked vehicles improves sight triangles, and increases bicyclists' conspicuousness, reducing the likelihood of other collision types, including, counterintuitively, Overtaking type collisions.

“Parking Cross” obstruction marking can be used to mark a parking lane, delineate individual stalls if desired, and visually and tactically communicate to bicyclists, and motorists, the necessary 5 feet of clearance from parked vehicles. If thermoplastic is used, the 5 foot lateral extensions create a rumble strip effect, further deterring operation in the Door Zone. For a paper discussing on-street parking, door widths, and “Parking Crosses” see:
http://www.humantransport.org/bicycledriving/library/door_zone.pdf

An emerging treatment that enables full flexibility in bicyclist lateral position, in contrast to a restrictive bike lane, is a bicycle chevron stencil on pavement, which has been shown to improve bicyclist lateral position next to parking. In contrast to the San Francisco study placement of 11 feet from curb face, the chevron should be placed 13 ft from curb face to ensure that those bicyclists who may ride to its immediate right adequately clear potentially opening doors.

See: <http://www.bicycle.sfgov.org>

[/site/uploadedfiles/dpt/bike/Bike_Plan/SF_SharedLaneMarkingReport-Feb04.pdf](http://www.bicycle.sfgov.org/site/uploadedfiles/dpt/bike/Bike_Plan/SF_SharedLaneMarkingReport-Feb04.pdf)

Conclusions

AASHTO’s standards for bike lanes with on-street parking are poorly conceived pseudoscience, are at odds with its own lateral clearance specifications for vehicles, result in benighted policies regarding bicycling, and should be abolished. The specifications are misleading and dangerous even at their most liberal width. They fail the principle of First Do No Harm. Prudent practice and the Engineers Code of Ethics require maintaining a margin for safety: “Engineers shall hold paramount the safety, health, and welfare of the public.”

Bicycle drivers should expect an obstacle-free travel way, as do motor vehicle operators. Bike Lanes that invite and constrain bicyclists to ride in the Door Zone create an unacceptable hazard with a potentially suddenly-appearing fixed object. Bicyclist safety is more important than motorist overtaking convenience.

Marking BLs within the Door Zone is either a breach of safety by the unaware, or a negligent act by those who are mindful of the hazard. Educational interventions and engineering practice must be targeted in concert to result in bicyclists operating outside of the Door Zone.

It must again be strongly emphasized that bike lanes are non-standard structures that are inconsistent with standard roadway design practice and traffic theory for drivers of vehicles. Attempting to draw lines between motorized and non-motorized traffic simply based on the type of engine used is guaranteed to result in operational, logistical, fiscal, educational, and social difficulties.

Listing of Links.

1. Width occupied by parked motor vehicles.

<http://www.bikexpert.com/bikepol/facil/lanes/doorwidth.htm>

2. Analysis of Dana Laird fatality in DZBL.

<http://www.bikexpert.com/massfacil/cambridge/doorzone/laird1.htm>

3. Pictures of Massachusetts Ave., Cambridge, MA DZBL.

<http://www.bikexpert.com/massfacil/cambridge/massave/massave.htm>

4. Dooring statistics.

<http://www.bikexpert.com/bikepol/facil/lanes/dooring.htm>

5. Discussion of bicycling with on-street parking, Dooring, and "Parking Crosses."

http://www.humantransport.org/bicycledriving/library/door_zone.pdf

6. Report of bicycle chevron stencil for use on roads with on-street parking. The San Francisco Department of Parking and Traffic also found that the 85th percentile of cars doors observed opened to 9'6" from the curb.

<http://www.bicycle.sfgov.org>

[/site/uploadedfiles/dpt/bike/Bike_Plan/SF_SharedLaneMarkingReport-Feb04.pdf](http://www.bicycle.sfgov.org/site/uploadedfiles/dpt/bike/Bike_Plan/SF_SharedLaneMarkingReport-Feb04.pdf)

Article Excerpt.

Quote by John Schubert taken from, "Pretending to accommodate bicyclists is no solution. Don't sweep known safety hazards under the rug." This article first appeared in Southwest Cycling News of Austin Texas. Copyright 2002 by John Schubert.

Analysis of Cameron Ave.

by Wayne Pein

5/18/04

Cameron Ave. has 22.5 foot lanes. The paper "AASHTO and Door Zone Bike Lanes" describes that AASHTO's specifications are misleading and dangerous. With a 12 foot bike/parking lane, the 2 foot wide bicyclist has a mere two foot clear zone and zero buffer. Motorists have a 10.5 foot lane. This is extremely dangerous. Figure 1.

If AASHTO's most liberal bike lane placement is used, it would still be dangerous as I describe, and leave a substandard "motor vehicle" lane of 8.5 feet. A 13 ft specification would leave a substandard 9.5 feet.

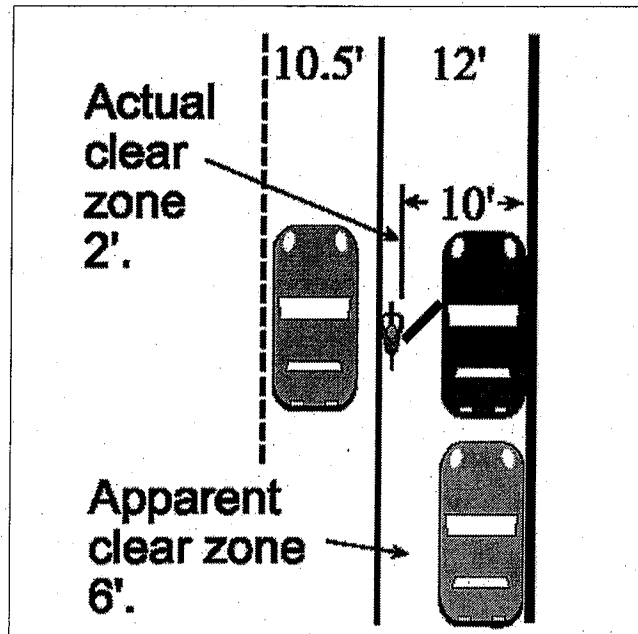


Figure 1. Cameron with a 12 ft bike/parking lane.

Discussion

The likelihood of a bicyclist getting struck from behind on Cameron Ave. is near zero. The likelihood of a lawfully operating bicyclist getting struck from behind on any Chapel Hill street is near zero. Analysis of Chapel Hill bicycling collisions for a 7 year period shows that getting hit from behind, the Overtaking type crash, is very low probability.

<http://www.humantransport.org/bicycledriving/library/collisions/ch2000.pdf>

0.3 MB

This is because of Chapel Hill's relatively low speeds and the fact that roads are designed so that motorists can come to a complete stop prior to striking a stationary object, like a bus or a left turning vehicle waiting for a gap in traffic. Bicyclists moving in the same direction provide a large margin for error.

There is no rationale for a bike lane on Cameron, speed limit 25 mph, or elsewhere. Placing a bike lane next to on-street parking creates more problems than the alleged, yet low probability, problem of Overtaking collisions that it is intended to address.

Why are there less bicyclists on Cameron?

Bike lane proponents cite declining bicycling on Cameron and attribute it to the removal of the bike lanes. This is the classic pseudoscience mistake of "correlation does not mean causation."

Bicycling on Cameron is much easier overall now than when bike lanes existed.

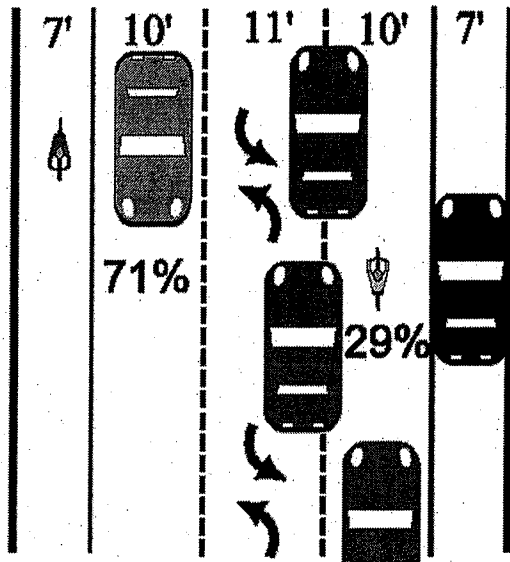


Figure 2. Cameron Then. Green car and bicyclist have 17' combined space. Red cars must move laterally to overtake bicyclists. Novice bicyclists are less comfortable in a 10 foot lane next to parking.

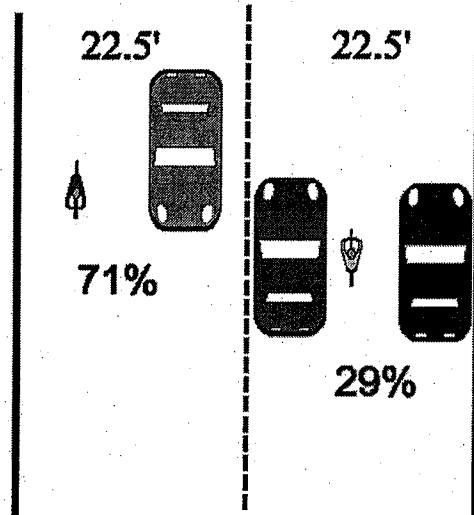


Figure 3. Cameron Now. Green car and bicyclist have 22.5' combined space. Red cars already track left, more easily overtaking bicyclists who have a real and perceived wide operating area even with on-street parking.

Figure 2 shows the conditions before the BLs were removed. When a BL was not used as a parking lane, bicyclists had 7 feet and the green car 10 feet, a total of 17 feet. When Cameron was reconfigured as in Figure 3, bicyclists and green motorists had 22.5 ft. This is better for both, though BL proponents say it causes bicyclists to not ride, a specious argument.

When a BL was used as a parking lane by blue cars, Figure 2 shows that the bicyclist used the 10 ft travel lane and red motorists had to overtake by moving far left. This was not good for beginning bicyclists who would be intimidated by such conditions, nor for motorists. 29% of bicyclists faced these conditions. How did all the beginners who supposedly stopped riding when BLs were removed manage to ride their bikes then under these more difficult conditions?

Figure 3 shows that when riding next to parked blue cars, bicyclists now have about 15.5 feet of available apparent clear space, and overtaking red motorists would largely already be tracking left and could overtake with minimal adjustment and without encroaching into the center turn lane. This situation is far better for both parties.

Plausible explanations for decline of bicyclists on Cameron.

It is unknown why there is less bicycling on Cameron. Below are some possible reasons.

1. Statistics show bicycling is declining in spite of increased spending on bicycle facilities. Since 1991, bicycle sales are slightly up according to the Bicycle Manufacturers Association, spending on facilities is up exponentially, but participation is down 18.3 million according to a nationwide survey of 10,000 households performed by the National Sporting Goods Association (NSGA). In the 20 years before 1991, an average of less than \$2 million per year was spent by all 50 states combined on bicycle and pedestrian projects. Since 1991, the federal budget has provided more than \$2.5 billion for bicycling and pedestrian projects. Yet, bicycling is down.

2. The internet has reduced the need for travel by college associated bicyclists. Cell phone and text messaging usage could also result in reduced bicycle trips.

3. The survey distorted the figures.

Bicycling is largely dependent on weather. It's possible the weather in 2001 when 872 bicyclists were counted was worse than in 1994 and 1996. It is also worth noting that bicycling on Cameron had dropped from 2093 trips in 1994 to 1606 in 1996 when bike lanes still existed.

4. Motor vehicle traffic has declined on Cameron also.

In 1992 there were 11,100 trips, and in 2001 9820 trips. How could motor trips decline? Perhaps some shift reduced the need for all travel, including bicycling, on Cameron.

5. Parking increased 9.5% on UNC from 1987-2000.

Greater parking results in easier driving. Also, as people become more affluent, they turn to motor vehicles. Greater carpooling could have reduced bicycling.

Bike Lanes Do Not Calm Traffic.

Opposition to and indictment of wide lanes has also come from those who believe that this pavement width increases speed, and assert that creating narrower "motor vehicle" lanes with BL stripes will slow motor traffic. This myth is not the case.

"In theory, the perceived narrowing could cause a modest speed reduction, just as a real narrowing causes a modest speed reduction. The theory is not borne out by empirical studies. Results from Howard County, MD, Beaverton, OR, and San Antonio, TX, suggest that vehicle operating speeds are as likely to increase as decrease with striping. One explanation is that centerlines and edgelines define the vehicle travel path more clearly, creating a gun barrel effect."

Institute of Transportation Engineers. *Traffic Calming: State of the Practice*. August 1999. <http://www.ite.org/traffic/tcstate.htm#tcsop>

Moreover, it is well established that bicyclists in the normal shared travel lane act as traffic calming. The most extreme evidence of this is found on a narrow road in which motorists must wait to safely overtake. It is worth noting that motorists also pass bicyclists with greater clearance than when a BL is present, exhibiting increased caution and courtesy.