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**Operational and Safety Impacts of Restriping Inside Lanes of Urban  
Multilane Curbed Roadways To 11 Feet or Less to Create Wider Outside  
Curb Lanes for Bicyclists**  
**DBK82 977-01**  
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**Review by John Forester**

## **1 Introduction**

This study measures and compares the lateral placement of motor and bicycle traffic using multi-lane urban roads with medium-speed traffic, in which the inside lanes are narrower than standard and the outside lanes are wider, as compared to roads in which all lanes are of standard width. The purpose of widening the outside lane is to provide more width for bicycle traffic.

The study then attempts to calculate the difference in probable car-car collision rates produced by this change, using Crash Modification Factors developed in other studies. There was no attempt to predict changes in car-bike collision rates.

The lateral measurements consist of the distance of the cyclist from the curb and the clearance between the cyclist and the overtaking motor vehicle. Some other observations were made: whether the motor vehicle encroached on the adjacent lane; the speed change of the motor vehicle; the type of motor vehicle; the apparent gender of the cyclist; whether the cyclist was wearing conventional or cycling clothing.

It appeared that the greatest attention was paid to the clearance distance between cyclist and overtaking motor vehicle. Clearance distance also appears to have attracted the most attention from cyclists who have seen the report.

## **2 Summary of Official Results**

### **2.1 Least Important Results**

The greatest average clearance occurred when the cyclist rode 4 to 5 feet from the curb. The motor-vehicles reduced speed about 2 mph (from about 35) before overtaking, regained speed and position afterwards. The probable change in car-car crashes (based on calculated CMFs) was negative but insignificant. Motorists gave more clearance to those cyclists they probably judged to be less competent: women and those casually clothed.

### **2.2 More Important Results**

The most important traffic-operational result to be derived from a study of this nature apparently never entered the investigators' minds, for they never measured it. The authors, one must presume, are qualified traffic engineers or similar, yet when they design a study involving bicycle traffic they don't understand the subject.

The most important consideration is the distance between the cyclist and the lane line on his left that changes typical motorist behavior from overtaking within the lane to overtaking using space in the adjacent lane. This could have been derived from the data of each overtaking event, because that provided width of the outside lane and distance of cyclist from curb, but it cannot be

derived from the averages and deviations provided in the data tables.

However, there is some indirect evidence. The authors note that some smallest clearance distances occurred when a private-car driver attempted to squeeze past the cyclist while remaining entirely in the same lane. For these events, the lane width was about 12 feet. The authors provide a graph (Fig 7) that plots average clearance distance against width of the outside lane. The advantage is that this graph plots averages for those events in which the motorist remained within the outside lane and those in which the motorist used space in the adjacent lane. The two plots show increasing average clearances with increasing lane width, with greater clearances for those events in which the motor vehicle used space in the adjacent lane. However, when the motor vehicle uses the adjacent lane, the clearances remain about equal for outside lane widths of 14 feet and greater. In a way, this is indirect confirmation of the 14-foot width established decades ago for overtaking within the lane with medium-speed urban traffic.

### **3 Useful Conclusions**

Had the study been done properly, there could have been useful conclusions. However, there is some confirmation that motorists have a much greater propensity to safely overtake cyclists with least change to the traffic flow when the outside lane is wider than standard. For medium-speed urban traffic the width of the outside lane required to do this is about 15 feet. This safe overtaking may be accomplished when the cyclist rides reasonably close to the outside edge of that lane, say 11 or 12 feet from the lane line to his left.

For outside lane widths less than this, in particular the typical standard of 12 feet, for medium-speed traffic, safe overtaking cannot be accomplished within the lane. Therefore, the cyclist should ride sufficiently close to the lane line on his left that overtaking motorists are strongly persuaded to use space in the adjacent lane. Since they are prohibited from using space in that lane unless it is clear of traffic, they might as well change lanes to overtake; it costs them no more than a little more movement of the steering wheel.