



Florida Department of Transportation Research

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, BDK-82-977-01

Cyclists have become a standard feature of most urban settings; however, in many cases, dedicated bike lanes are not available. In such cases, motorists and cyclists must share the outside lane, and overtaking drivers must decide how best to pass. The driver's choice has important implications for the cyclist's safety.

A potential solution on some roads is restriping so that the outer lane becomes wider, borrowing space from inner lanes. Some Florida sites where this has been tried were studied in this project, in which researchers from the University of North Florida and Florida State University analyzed what drivers did when they encountered cyclists on asymmetrically striped, multi-lane roads.

The researchers, working with staff from the Florida Department of Transportation (FDOT), two metropolitan planning organizations (MPOs), and one city, cycled on urban roadways at peak traffic periods and videotaped more than 2000 passing events at 19 sites in 10 Florida cities. Sites varied in number of total lanes, lane widths, and median types. Measures used to characterize driver behavior included lateral separation between motor vehicle and cyclist, motor vehicle lateral shift to the inside lane, outside lane usage, and motor vehicle speeds before, during, and after passing. Also, cyclist gender and manner of dress and passing vehicle class were recorded.

Statistical analysis of these data showed clearly that lateral spacing between motor vehicles and cyclists was strongly influenced by the width of the outside lane. Motorists passed closer to cyclists when the outside lane was narrower, the inside lane was occupied by other vehicles, the passing vehicle was smaller, and the cyclist was male. Study findings suggested that passing vehicles were more likely to move into an inside lane when the outside lane was narrower, when lane changing conditions were unrestricted, or when the cyclist was female. Motorists tended to move from the outside to the inside lane when



Where there is no bike lane, this driver gives a cyclist as wide a berth as possible while staying in lane.

they noticed a cyclist downstream. Generally, drivers reduced speeds while passing cyclists and accelerated afterward.

Crash modification factors (CMF) were developed to measure the effectiveness of asymmetric striping for curb and gutter four-lane roadways with either a flush, two-way left-turn lane or a raised median. On four-lane roadways with raised medians, inside lane width was insignificant in determining CMF. The research showed that all types of crashes (fatal, with injury, and property damage only) decreased as the outside lane width increased from 12 feet.

On four-lane roadways with a flush two-way left turn lane, results were mixed. Crashes (fatal or with injury) increased slightly for 11' inside lanes and 12.5' outside lanes and decreased on roadways with 11.5' inside lanes and 13' outside lanes. Property-damage-only crashes declined in both scenarios. CMFs for property-damage-only crashes were independent of inside lane width, but dependent on outside lane width. Variation in crash frequency might be more attributable to median type (raised vs. flush) and less to inside lane width.