

Safety and usability of mandatory and advisory cycle lanes

Marcel Schreiber and Oliver Beyer

Keywords: cycle lane, cycling safety, cycling accidents, lateral distance, dooring, overtaking, parking

In recent years, more and more bicycle lanes have been marked in Germany. In a research project of the German Insurers Accident Research (UDV) the road safety of these facilities has now been comprehensively investigated. In a literature analysis and an online survey of 141 cities, the previous findings and experiences with bicycle lanes were compiled. Detailed accident analyses were carried out for 143 bicycle lanes. On 35 mandatory and 47 advisory bicycle lanes the behavior of drivers and cyclists was observed and 1,370 cyclists were interviewed. On 20 lanes the lateral distance of almost 7,700 road users overtaking cyclists were measured with a bicycle that was equipped with a laser-based distance measuring device.

Results

As the study shows, many cyclists do not feel safe in marked cycle lanes. Narrow cycle lanes in particular are more frequently avoided. Cyclists generally cycle in the center of the cycle lanes, a little further to the left in narrow lanes and a little further to the right when there is a high volume of motor traffic. Parked vehicles to the right of the cycle lane had no effect on the line taken by the cyclists. Many drivers use the cycle lanes to stop or park their vehicle. Almost 40 % of cyclists observed on advisory cycle lanes were hindered by this (10 % on mandatory cycle lanes). When overtaking cyclists on the cycle lanes, almost every second driver falls below a lateral distance of 150 cm. 15 percent of drivers maintained a clearance of less than 100 cm when overtaking, and almost 1 percent maintained a clearance of less than 50 cm. Overtaking drivers are mainly oriented to the markings on the road. Drivers often overtake cyclists without leaving their own lane. Even when the adjacent lane on the left-hand side or the lane for oncoming traffic was free, drivers still stayed very close to cyclists when overtaking.

At intersections in the course of marked cycle lanes, the typical turning-off, turning-into and crossing accidents occurred, above all. On the free stretches of road with the marked cycle lanes, many accidents occurred in connection with parking. Many were caused when vehicle doors were opened. The significant role played by parking in the cycling accidents that occurred in advisory cycle lanes was also evident in the accident statistics. A high risk of accidents was found, in particular, for narrow cycle lanes and for cycle lanes with adjacent parking spaces.

Recommendations

Due to the large number of related accidents it is recommended for both types of cycle lanes to mark a safety separation strip with a width of 0.75 m to parking areas next to the cycle lanes. Mandatory cycle lanes should also be given a safety strip of 0.75 m separating them from the part of the roadway used by motor vehicles. Furthermore mandatory and advisory cycle lanes should be at least 1.85 m wide. In fact, in order to enable cyclists in mandatory cycle lanes to overtake safely within the marking, widths of at least 2.25 m (including the marking on the left) are required. Given the high number of violations of the rule against parking or stopping in marked cycle lanes and the resulting hindrances and risks for cyclists, these violations must also be rigorously monitored and penalized.