

Macrocategoria: Geometria e Sicurezza.

Titolo articolo: Studying the effects of an advanced driver-assistance system to improve safety of cyclists overtaking.

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Abstract: Among all crashes involving cyclists, a motorist approaching from behind a cyclist on a shared lane is particularly dangerous and likely to result in serious injuries and fatalities. Previous research has highlighted that inadequate lateral distance and high vehicle speed are among the main contributing factors of crashes involving cars overtaking cyclists. A new advanced driver assistance system (ADAS) which supports drivers as they overtake cyclists was designed to avoid or, at least, mitigate crashes. In human-machine interface (HMI) design, the information was presented via multiple modalities with a multistage warning system. A combination of lateral clearance (LC) and time-to-danger (TTD) parameters was used as ADAS activation criterion. Experimentation was carried out using the medium-fidelity driving simulator at the Transportation Research Institute (IMOB) of Hasselt University in Belgium. Forty-eight drivers drove the two-lane rural experimental route two times, in baseline condition and with the ADAS activated, testing three overtaking events. Statistical tests showed that the proposed in-vehicle driving assistance system had a significant effect in increasing 1) the length of the passing phase, 2) the LC in the overtaking passing phase, and 3) the TTD along the overtaking maneuver. No effect of the ADAS system on vehicle speed was observed. Overall, the designed system is effective in improving car-cyclist overtaking behaviour in terms of both safety and cyclists' mobility.

Keywords: ADAS system; Lateral clearance; Multilevel warning; Multimodal warning; Overtaking.