

Testing infrastructure layout for cyclists: a combined examination in car and cycling simulation

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Keywords: cycling infrastructure, cycling simulator, driving simulator, distance to parking cars, overtaking cyclists

Background: Infrastructure layout has often been shown to influence cyclists' as well as car drivers' behaviour towards cyclists in direct ways in traffic observations (Chapman & Noyce, 2014; Chuang et al., 2013; Dozza et al., 2016; Harkey & Stewart, 1997; Love et al., 2012; Morrison et al., 2019; Metha et al., 2015; Parkin & Meyers, 2010; Pulugurtha & Thakur, 2014; Shackel & Parkin, 2014; Stewart & McHale, 2014) as well as in the driving simulator (Huemer et al., 2018), showing that on-street markings for cyclists in some circumstances reduce overtaking distances by car drivers. On the other hand, subjective data of cyclists show that more separation indicated by on-street markings is preferred by them (Hagemeister & Kropp, 2019). In order to inform planning authorities, the present studies examine the effects of different on-street markings on cyclists' as well as car-drivers' behaviour.

Aim: These two studies test different infrastructure layouts for cyclists in (a) regard to cyclists' lateral positioning on the street, i.e. their lateral distance to parking cars on the right kerbside, as well as cyclists' judgements about these layouts concerning subjective safety and perspicuity in a cycling simulator study, as well as (b) car drivers' behavior and towards cyclists on these infrastructure layouts as well as their opinions about the layouts in a subsequent driving simulator study and (c) car drivers' behavioral influence on subsequent traffic flow in the second experiment.

Method: In the first study N=50 cyclists will be riding 300m of 18 different infrastructure layouts in the cycling simulator in randomized order in a within subject design. For cyclists, lateral distance to parking cars on the right kerb as well as subjective ratings concerning safety and perspicuity is recorded. Data collection of this first part has just started and is expected to be over at the end of February.

In the second study N=50 car drivers will be driving each infrastructure layout in randomized order in a within subject design as well, but in the driving simulator with simulated cyclists that may or may not be overtaken by these drivers. Data collection for the second study will start at the end of the first one as cyclists' positions there will inform the simulated cyclists' lateral position in the second study aiming it to be realistic. For car drivers, driving behaviour, it will be recorded regarding if and when they overtake cyclists, their lateral distance and speed when overtaking the cyclists as well as subjects' behavioural consequences on subsequent traffic flow in the simulation. Car drivers' subjective ratings concerning safety and perspicuity will be recorded as well.

Results: none yet

Conclusions: none yet