



Road layout design standards and driver behaviour

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The research carried out seems to have been aimed predominately at the behaviour of car drivers in relation to other cars on the road. On the whole most drivers are used to meeting other cars and can anticipate their behaviour. Many of the problems occur when drivers encounter other road users—cyclists, pedestrians, children, etc. They have less experience of meeting these groups and have a poorer appreciation of their behaviour and safety needs.

Did the authors consider testing driver behaviour towards vulnerable road users and if not, would they consider it a necessary extension to their work to date? Specific examples might be as follows.

- Overtaking cyclists—similar to the road test used for cars but with additional information such as speed of vehicle and clearance given.
- Emergency stop and anticipation—using a simulator to assess driver behaviour as they approach potentially hazardous situations, for example children on the pavement, and reaction to sudden emergencies such as a child running out from behind a parked car.

Authors' reply

I write on behalf of the joint authors of the above paper—myself, Peter Brocklebank and Richard Hall—in response to the comments by Mr Alasdair Massie. Mr Massie asked whether we considered testing driver behaviour in relation to vulnerable road users—in particular overtaking cyclists, and emergency stops for children.

I think it is fair to say at the outset that our study was a pioneering one. The techniques used were novel, and we decided that we should begin by seeing whether these methods could give useful results in the context of the most common road user group, namely car drivers. Although we were

satisfied that the simulations provided reasonably realistic scenarios for car drivers meeting other car drivers, it is less clear that they would be equally realistic in the context of a car interacting with either a cyclist or a pedestrian.

In the case of a car overtaking a cyclist, the overtaking task is very different from that of overtaking another car. The cyclist is slower than a car, and does not take up the same amount of room on the road. In these respects overtaking another car is a much more demanding task—although admittedly when overtaking a cyclist additional factors such as visibility and the stability of the cyclist also need to be taken into account. The experimental approach used with cars—in which all the observers were in the vehicle being overtaken—could not conveniently be used with cyclists, and roadside observers would have to be used. There would, however, be value in extending this work to cover the more testing task of overtaking goods vehicles of various sizes.

As regards the emergency stopping times required by a car driver meeting a child pedestrian, the simulation technique used in the reported study could in principle be extended to study this case. However, a child running out from the kerb, or from behind a parked car, or even an adult pedestrian stepping out from the kerb, would be an event with a very rapid onset time compared to a vehicle emerging from a side road. Assuming that the driver recognised the potential hazard immediately, the emergency braking times in these cases would be hardly longer than those obtained from the STOP stimuli used in the reported experiments. The critical consideration in this case is that of hazard detection. Hazards involving vulnerable road users, particularly child pedestrians, have lower expectancies than vehicle-related hazards and are probably less easily—and therefore less rapidly—detected. These factors were not specifically studied in the experiments reported in the published paper, but are being examined in the context of devising an effective hazard perception test.