CRIT-UK: A tool to understand contributory factors involved in current cyclist incidents

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SUMMARY

Collisions between motorised vehicles and cyclists remain a persistent road safety issue worldwide, however the nature of these collisions remain poorly understood as there are currently few mechanisms available for cyclists to report sufficient detail about their collisions and near-miss incidents. Originally developed in Australia, this paper will describe the expansion of the Cyclists Report of Incidents Tool (CRIT) app to the UK road system, to understand the contributory factors involved in current cyclist collisions and near-miss incidents in the UK. Furthermore, it will explore how these factors may change with the introduction of Levels 2 and 3 Automated Vehicles.

KEYWORDS

Cycling, Collisions, Near-Miss Incidents, Contributory Factors, Automated Vehicles

Introduction

Private vehicle travel is one of the biggest contributors of greenhouse gas emissions worldwide, including in the UK (Department for Transport (DfT), 2021a). As concerns over climate change grow, there is a need to shift towards more sustainable and active transport modes such as cycling. However, collisions between cars and cyclists remain a persistent road safety issue worldwide. Despite the greater number of cars on the road, in the UK in 2020, cyclists had a higher fatality rate per billion vehicle miles compared to car occupants (27 vs 3: DfT, 2021b). This could deter people from cycling, which may prevent the sustainability and health benefits that cycling offers from being realised. Additionally, with the introduction of Levels 2 and 3 Automated Vehicles (AVs) which have systems that control some or all of the driving tasks (Society for Automotive Engineers, 2021), the interactions between cyclists and motorised vehicles will change, so the characteristics of these incidents may change. As such, an understanding of the contributory factors involved in current cyclist incidents is needed in order to develop interventions to prevent them and gain an understanding of how these incidents may change with the introduction of Levels 2 and 3 AVs.

A recognised approach for enhancing our understanding and prevention of incidents is the use of an appropriate incident reporting and learning system (Goode, et al., 2018). However, there are few mechanisms available for cyclists to report sufficient detail about their collisions and near-miss incidents. For example, the STATS19 system is used in the UK to record road accident details. However, this is completed by the police and does not capture near-miss or no injury incidents. Furthermore, it only focusses on the immediate surroundings, vehicles and road users involved, rather than taking a broader systems perspective to capture higher level factors e.g. local councils, legislation and government (McIlroy, et al., 2021). This paper will describe the expansion of the Cyclists Report of Incidents Tool (CRIT) app originally developed in Australia, to the UK (CRIT-UK). This tool enables the reporting and analysis of cyclist collisions and near-miss incidents, which may enhance our understanding of the contributory factors involved and inform the development of interventions to enhance future cycling safety. Regulatory and government

agencies, such as the DfT, will be able to use the findings to make evidence-based decisions and recommendations (e.g. infrastructure improvements, law changes) based on real, as opposed to the perceived risks, associated with cyclist collisions and near-miss incidents. This work will describe the app, present initial findings from a UK trial and explore how these incidents may change with the introduction of Levels 2 and 3 AVs.

CRIT-UK App

The CRIT-UK app can be downloaded onto a smart phone device. When a collision or near-miss incident occurs, cyclists are asked to report the incident on the app. The app records the date and time of the incident, form of activity (on-road, off-road), type of incident (collision or near-miss), location, an incident description, contributory factors involved (selected from a list), severity and treatment (none, immediate first-aid, hospital). The list of contributory factors allows cyclists to select high-level factors (e.g. other road users, environment, equipment, cyclist, local councils) and sub-factors (e.g. driver behaviour, road rules, surface, obstacles and debris, cycling infrastructure) which they believe contributed to the incident. Once a week, cyclists are also asked to report the number of hours that they have cycled in the past week, to enable the calculation of incident rates.

The data is self-reported and is not being correlated to more objective data sources (e.g. CCTV, dashcam footage), so there is an element of subjectivity and bias which may influence the accuracy of the reports and the recommendations that are made. The CRIT-UK app is reliant on cyclists being able to remember and accurately report all contributory factors involved, it does not include fatal incidents and only analyses the incidents which have been reported on the app. However, a mechanism to report fatal incidents does exist (e.g. STATS19, see above), so the findings from the CRIT-UK app relating to collisions and near-miss incidents can be compared to these fatal incidents to highlight where interventions are needed. The details are coming from the cyclists themselves and their perceptions of safety, rather than interpreted by a third party. Aggregated analyses from multiple incidents over time can highlight the most frequently reported contributory factors which should be given the greatest focus in future interventions to prevent similar incidents from occurring.

Preliminary Findings from Australia

A six-month trial has been conducted in Australia (Cox, et al., 2022). Between December 2021 and June 2022, 316 cyclists (248 males) used the app and 109 incidents were reported (92 near misses). Most incidents occurred on the road (92%) and in the morning (73%) and were perceived to be minor (44% for collisions, 55% for near misses). For both types of incidents, cyclists frequently reported the driver's behaviour as a contributory factor, with the sub-factors of "pulling out in front of cyclist" and "non-compliance with road rules" (near-miss only) being the most frequently reported. The road infrastructure (roundabouts, intersection/junction) and cyclist infrastructure (bicycle lane and lack of bicycle lane) were frequently reported contributory factors. Cyclists also reported factors beyond the equipment, road environment and road users including factors relating to vehicle and infrastructure maintenance and repairs, driver education and training and media and social media. These initial findings demonstrate that useful data is being gathered about the contributory factors involved in current cyclist collisions and near-miss incidents in Australia. This app is being deployed in the UK in early 2023, and this work will present initial findings from this trial and consider how these incidents may change with the introduction of Levels 2 and 3 AVs.

Conclusion

The CRIT-UK app allows cyclists to report collisions and near-miss incidents. This can enhance our understanding of the contributory factors involved and inform the development of interventions to enhance cycling safety now and when Levels 2 and 3 AVs are introduced into the road network.

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