

Prevalence and Perception of Following Too Close in Queensland

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Abstract

This paper reports on a three year multidisciplinary research project for Motor Accident Insurance Commission investigating the relationship between rear-end crashes and unsafe car-following behaviours in Queensland. The methodology combined on-road data collection, crash data and self-report behavioural data. On-road measurements (3 million data-points) confirmed that tailgating is a major contributor to rear-end crashes. Results from the community survey ($N = 495$) indicated that most drivers expressed the belief that they are keeping safe distances. However, objective measurements from the larger on-road analysis showed that this is generally not the case. Our findings and the policy implications will be discussed in detail.

Background

Rear-end crashes account for a large part of road casualties and road safety-associated costs. In Queensland, they accounted for 21% of police-reported collisions and 36% of claims in the state's compulsory third party scheme over 2000-2010 (Schramm, McKenzie, & Williamson, 2012), for a social cost of \$1.7 billion (e.g. medical treatments associated with whiplash). Tailgating has been reported as a contributing factor to rear-end crashes: for example it was reported as the principal circumstance in 11.4% of crashes in Queensland (Schramm et al., 2012; Austroads, 2015). However, no previous study had provided empirical evidence to support the hypothesised link between tailgating behaviour and rear-end crashes.

Method

The methodology combined crash and offender data analysis, on-road data collection, and data from a community survey of Queensland drivers. Crash and offender data were used to profile drivers involved in rear-end crashes and identify rear-end hotspots in South East Queensland. Comparisons were made between rear-end crash characteristics and other crashes; the same was done for driver characteristics. We identified rear-end crash hotspots and used Safety Performance Functions to classify them as black-spots where observed crashes exceeded predicted crashes. Ten locations were shortlisted for objective data collection (including both black-spots and locations with less than expected crashes); three million headway observations were taken using TMR induction loops and CCTV cameras. Drivers recruited from a list of MAIC rear-end claimants and general media releases were surveyed online ($N = 495$) on their perception regarding safe following distances, rear-end crash involvement, and awareness of enforcement practices.

Results

Crash profiling showed that compared to “other multi-vehicle” crashes, rear-end crashes were more likely to occur along roads with a posted speed limit of 70-90 km/hr. They were also more likely to result in less serious injuries. In terms of drivers' characteristics, compared to other multi-vehicle crash-involved drivers, rear-end crash-involved drivers were more likely to be aged 30-59 years. They were less likely to be aged 60+, be learners, or motorcyclists.

Community survey results revealed that most drivers believed that they were keeping safe distances, using seconds as their favoured measurement method (40%). Most drivers reported keeping the same gap regardless of traffic flow or road type. The majority of the sample (85%) perceived that there is an extremely low chance of being caught by police if tailgating.

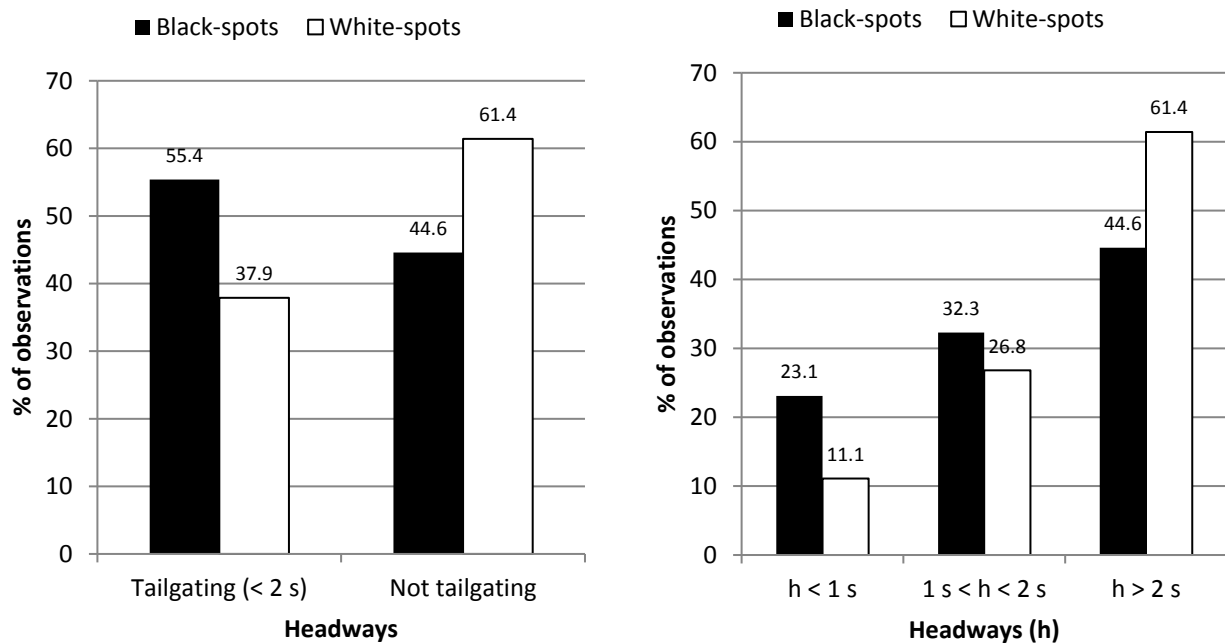


Figure 1. Distribution of headway measurements at black and white-spots; tailgating vs. non tailgating (left), detailed measurements (right). N.B. white-spots are defined as locations where the observed amount of rear-end crashes was lower than the predicted one

At black-spots, 55.4% of observations were identified as tailgating (less than 2 seconds), compared to only 38.6% at other sites. For all observations, tailgating was identified at 49.2%. These objective results seem to contradict surveyed drivers’ subjective assessment of their behaviour if this assessment can be generalised to the whole population (no direct assessment of the surveyed drivers’ actual following behaviour could be made in this study). Higher levels of tailgating were associated with higher crash rates even when characteristics such as traffic volume, average speeds, and vehicle mix were taken into account. We also showed that relative speed is a key behaviour associated with both tailgating and high rear-end crash rates.

Conclusion

Our results support the hypothesis that tailgating is a major contributor to rear-end crashes, which had not previously been empirically confirmed. Contributing factors to unsafe following behaviour were identified from both the objective and subjective analyses. This research suggests that efficacy of existing interventions on rear-end crashes need to be re-evaluated, in particular the need for consistent education and messaging (including a standardised definition of “safe following distance”) around the importance of safe following distances.

References

Schramm, A., McKenzie, K., Williamson, A., 2012. Rear-end collisions: review of literature. CARRS-Q report for MAIC.

Austrroads, 2015. Investigation of Key Crash Types: rear-end crashes in Urban and rural environments. Austrroads report AP-R480-15