

## Enhancing road safety with in-vehicle telematics

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### Abstract

Telematics based insurance provides an opportunity to achieve further reductions in road trauma. In particular, it has the potential to reduce road trauma among young drivers, who are over-represented in crash statistics. This study investigates the largest collection of telematics data from Australian roads. We discuss the type of data that is available and show how driving behaviour differs between groups of drivers and changes in the early stages of licensing. Finally, we will discuss how this extensive database can be used in future research to significantly improve road safety in Australia.

### Background

Studies and statistics consistently demonstrate that young drivers face higher than average risks of involvement in a transport-related crash, leading to higher injury and fatality rates (e.g., Australian Transport Safety Bureau (ATSB), 2004; Toroyan & Peden, 2007). Some initiatives have brought crash rates down, such as the successful introduction of the Graduated Licensing Systems (GLS) which targets drivers in the first six to twelve months of licensure when they are at highest risk (Russell, Vandermeer, & Hartling, 2011). Despite these initiatives, road trauma in Australia is still substantial (Bureau of Infrastructure, 2013) and young drivers remain over-represented in Australian crash statistics. To achieve further reductions in road trauma new strategies need to be developed and trialled (Stevenson & Thompson, 2014).

With changing technologies, new methods of influencing driving behaviour are emerging from the insurance industry in the form of telematics based incentives. For example, Bolderdijk, Knockaert, Steg, and Verhoef (2011) showed that Pay-As-You-Drive (PAYD) insurance incentives for young drivers significantly reduced speed limit violations. As the financial incentive offered by this PAYD insurance product is the largest for young drivers (e.g., 18 – 25 years), many PAYD customers belong to this age group. As part of an Australian car insurance product (Insurance Box Pty Ltd), in-vehicle telematics devices are now being fitted to vehicles that record usage data (i.e., location data transmitted via GPRS) for each customer, with this information stored in a large telematics database. Currently, this database contains data for over 5.5 million kilometres of driving and is the first of its kind in Australia. Hence, it provides a unique opportunity to understand driving patterns and model driving behaviour on Australian roads to find innovative solutions to reduce road trauma, especially for young drivers.

### Method, Results & Discussion

In this study, the telematics database will be analysed using several mathematical techniques. The focus of this analysis will be to discover patterns in driving behaviour that are important with respect to road safety. First, we will look at the differences in driving behaviour between groups of young and older drivers. Furthermore, it will be investigated how quickly driving behaviour of

young drivers converges to a stable level after gaining their provisional license. We also intend to investigate the relationship between behaviour stabilisation and the GLS. This will provide a better understanding of driving behaviour on Australian roads and will provide an indication of the time-frame and form of interventions to improve road safety.

Beyond this, we will use telematics data as part of a randomised controlled trial with our partner organisations Insurance Box Pty Ltd. and the Transport Accident Commission, where we will investigate the effects of driving performance feedback and financial incentives on safer driving behaviour. Data recorded by the in-vehicle telematics devices of participants will provide objective outcome measurements for understanding the effects of such an intervention.

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