

NSW Young Drivers Telematics Trial – methodology, results and potential implications for road safety

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Abstract

The NSW Young Drivers Telematics Trial is a randomised control trial which aims to explore whether, and the extent to which, telematics devices reduce risky driving behaviours among young drivers. Participants are randomly allocated into control and treatment groups, with the latter receiving feedback about their driving behaviour via a LED dashboard display and a mobile phone app. Preliminary results show that the treatment group have lower rates of harsh braking, turning and acceleration compared with the control group. The treatment group also have a lower average speed and are spending a lower proportion of their driving time exceeding the posted speed limit. These preliminary results suggest that the use of telematics to provide feedback to drivers can have a positive effect on driving behaviours.

Background

Young drivers (under 25 years old) are over-represented in road casualty statistics. According to the NSW Centre for Road Safety, NSW young drivers are up to 4.5 times more likely than other age groups to be involved in a motor vehicle crash (NSW Centre for Road Safety 2018). In light of these statistics, the NSW government is exploring whether telematics, which measures vehicle braking, acceleration, turning and speed, can assist in improving road safety outcomes for young drivers by correcting risky driving behaviours through the use of real time and post hoc driver feedback.

Method

Sampling

The sample consists of n=721 drivers under 25 years of age, primarily from Western Sydney, Regional NSW and Outer Sydney. Participants were made aware of the trial through Facebook banner ads and directed to complete an online application. To be selected for the trial, drivers had to own or have access to, an OBDII compliant vehicle. n=2398 applied to be part of the trial, with n=1600 deemed eligible. Of the n=1600 eligible, n=998 were provided with telematics devices, with n=721 activating their devices and logging kilometres.

Design

Participants were randomly assigned to receive either a feedback system – providing real time and retrospective feedback on driving behaviours (treatment group) – or a ‘dummy’ system – providing only general vehicle usage information such as fuel economy, distance and emissions (control group).

The treatment group system consists of:

- A LED dashboard display unit, which changes colour in real-time in response to behaviours such as harsh braking, rapid acceleration and hard turning (harsh manoeuvres) or speeding.
- A mobile phone app which provides post trip information about the user's driving including driver scores, performance rankings and route maps highlighting locations where drivers may have been speeding, or performing a harsh manoeuvre.

The control group system consists of:

- A LED dashboard display, which does **not** change colour in response to driving behaviours
- A mobile phone app which provides general vehicle usage, but no specific feedback about speeding or harsh manoeuvring.

An overview of the telematics system is at **Appendix 1**.

A random selection of 100 control group participants were reassigned into the treatment group and began to receive driving feedback after 3 months of participation.

Outcome measures

Treatment and control groups will be compared against the following safety surrogate measures, which were selected following an extensive literature review:

Speed (when travelling at free speed)

- Time spent speeding at <10km/h over the limit, 11km/h – <20km/h and ≥ 20 km/h as a proportion of driving time (Ellison et al., 2015a, Ellison et al., 2015b; and Wall et al., 2009) where speed limit is 40km/h or more
- Average positive delta speed i.e. the speed difference to the posted speed limit when above the speed limit (Jun et al., 2011; Jun 2006; Aarts 2006).
- Average speed when travelling at free speed (Elvik 2004, 2009; Wall et al., 2010)

Braking

- Number of x-axis g-force events $\leq -0.3g$, $\leq -0.45g$, $\leq -0.5g$, and $\leq 0.75g$ per 1000km driven (Klauer et al 2009; Simons-Morton et al., 2012; Dingus et al., 2006; Perez et al., 2017)

Acceleration

- Number of x-axis g-force events $\geq 0.35g$ and $\geq 0.58g$ per 1000km driven (Simons-Morton et al., 2012; Perez et al., 2017)

Turning

- The number of y-axis g-force events $\geq |0.5|g$ per 1000 km driven (Simons-Morton et al., 2012)

Preliminary results

Based on the recorded driving data of n=318 treatment group participants (361,476 km and 7714 driving hours) and n=306 control group participants (381,363 km and 8280 driving hours)¹, the treatment group is performing better than the control group in terms of the above mentioned measures.

¹ Results as of 15 October 2018. Not all participants had activated their telematics at this time.

Discussion

Preliminary results suggest that drivers who receive feedback about their driving behaviour perform better than those who do not, as measured by surrogate safety measures found in the broader literature. However, the results are based on data at a point in time where 90 percent of participants had completed less than 3 months of the trial. The trial will conclude in March 2019 and full results and analysis will be made available at the conference.

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Appendix 1 -

Figure 1 – telematics system overview

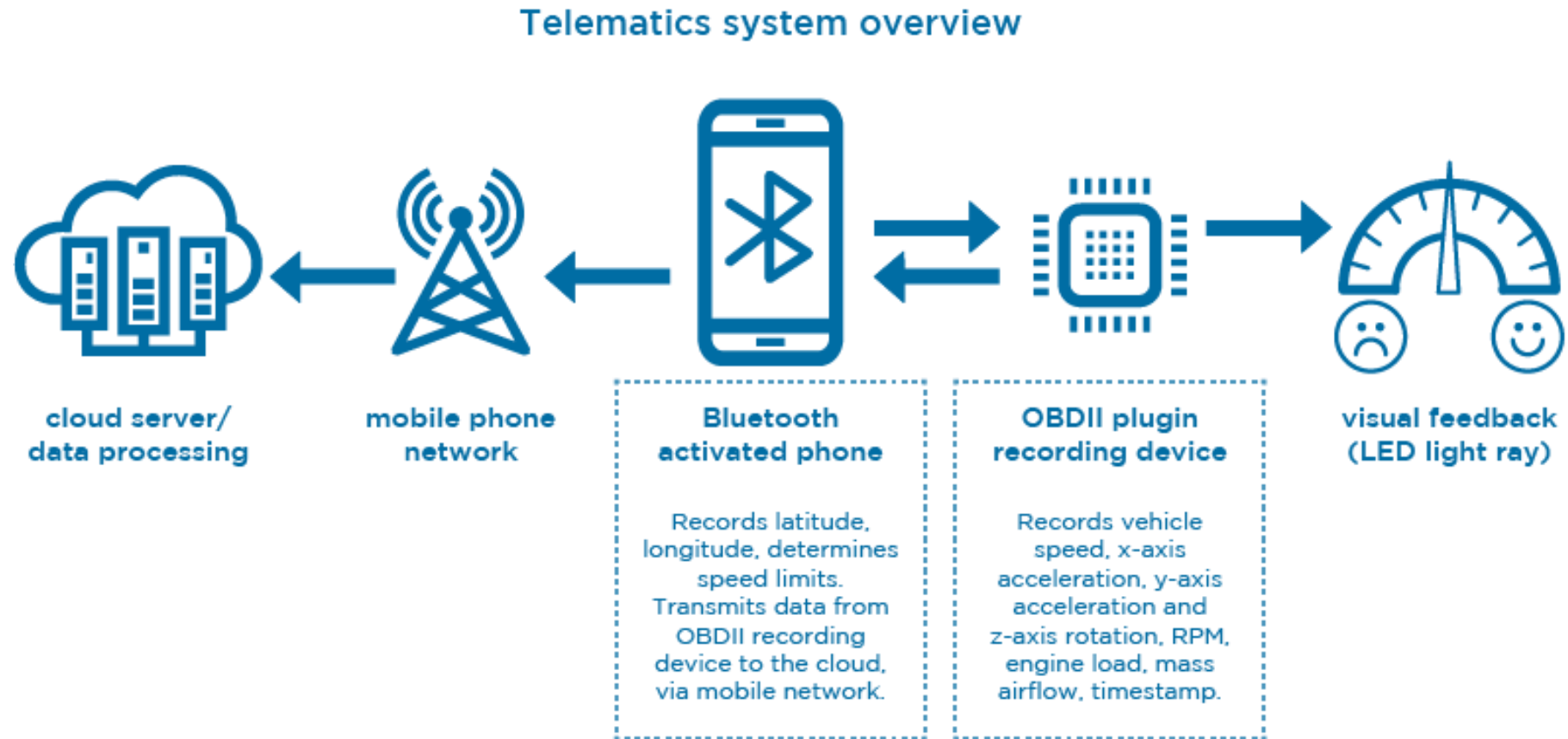
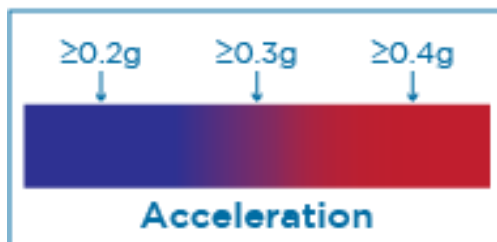
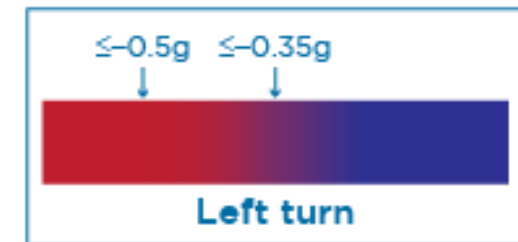
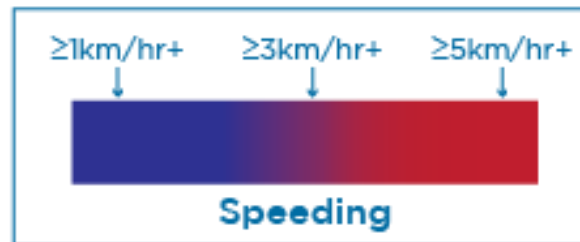
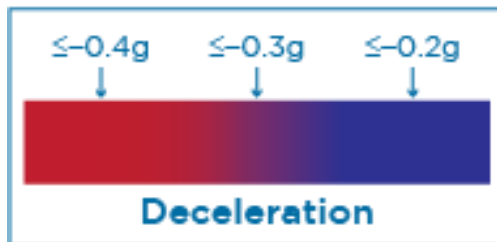


Figure 2 – overview of real time feedback system

Overview of real time feedback system



- LED light ray provides feedback in real time.
- Set at a constant blue, the light ray turns red if a driver is accelerating too quickly, braking harshly, cornering too hard or driving above the posted speed limit.
- The light rays are configured differently so that ONLY the treatment group receive feedback.



A g is a measure of acceleration. By way of comparison, 1g is the equivalent of travelling from 0km/hr to 100km/hr in 2.95 seconds.

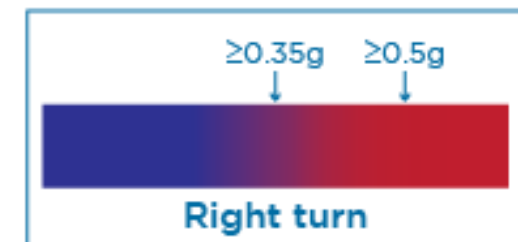


Figure 3 – overview of treatment group system vs control group system

