

## **Trialing connected vehicle technology in privately-owned light vehicles: An Australian first**

Anna Chevalier<sup>a</sup>, Vanessa Vecovski<sup>b</sup>, Chris Wright<sup>b</sup>, Paul Tyler<sup>c</sup>, John Wall<sup>b</sup>

<sup>a</sup>Australian Road Reserach Board; <sup>b</sup>Centre for Road safety, Transport for NSW; <sup>c</sup>Data 61, Commonwealth Scientific and Industrial Research Organisation

### **Abstract**

This Field Operational Test (FOT) will introduce up to 55 light vehicles owned by members of the public into Transport for NSW's Cooperative Intelligent Transport Initiative (CITI), the first large-scale, long-term connected vehicle initiative in Australia. Within the CITI testbed, there are up to 60 connected trucks, 11 connected public passenger buses, two light fleet vehicles, 1 fleet motorcycle and three connected signalised intersections operating. Findings from the light vehicle study will increase knowledge of the human-machine interface (HMI) and road safety benefits of this technology. The presentation will include an update on study progress and participant recruitment and demographic data.

### **Aim**

This study aims to:

- Gain experience in the deployment of connected vehicle technology into privately-owned vehicles
- Improve understanding of connected vehicle safety applications
- Evaluate participants' experience with the HMI
- Assess the benefits of connected road safety applications (Table 1), including:
  - harsh braking ahead (vehicle-to-vehicle (V2V))
  - intersection collision (V2V)
  - red traffic light warnings (vehicle-to-infrastructure (V2I))

### **Methods**

The study design is a before/after study, with participants not receiving alerts during the baseline period. Participants will complete surveys during the study and some will participate in a focus group discussion at the end.

The connected vehicle technology is configured to enable communication among vehicles and traffic signals fitted with the equipment, with messages transmitted over a dedicated radio frequency. Alerts are given within the testbed area (Figure 1).

### **Participants**

We have recruited 55 members of the public. Eligibility criteria were designed to ensure vehicles came into frequent contact. The first recruitment wave was parents/carers of a child who attends one of the supporting schools nearby Wollongong's Central Business District (CBD) and drives to/from the school 3+ times/week at the beginning/end of the school day. To boost recruitment, a second wave was undertaken through a market research company from residents living in the Illawarra and driving to/from/through the CBD 3+ times/week. In December 2017, local media (televised news, newspaper and radio) supported the recruitment of parents/carers.

Additional participant eligibility criteria include:

- Holding a full (not learner or provisional) NSW driver licence
- Owning a comprehensively insured, registered light vehicle the participant is willing to have installed with the equipment, or having permission from the vehicle owner
- Driving 5+ hours/week
- Driving the vehicle >80% of trips

This study has been approved by the University of Wollongong / Illawarra and Shoalhaven Local Health District Social Sciences Human Research Ethics Committee, NSW Department of Education, and Catholic Diocese of Wollongong. Each principal approved the school’s involvement in the study, and independent schools provided a letter of support.

**Study components**

Participation in the study involves:

- Participants' vehicles being fitted for approximately 10 months with connected and telematics technology to monitor driving
- Halfway through the study, participants will be trained about the system, and the connected vehicle equipment alerts will be activated
- Participants will complete online surveys at the beginning and end of the study
- Some participants will attend a focus group discussion at the end of the study
- Participants will meet a researcher once a month in the CBD to exchange secure digital memory cards which store the driving data


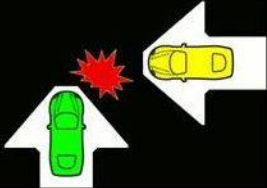

**Study progress**

Thirty-three parents recruited via schools expressed an interest in the study. Of these, 48% (16/33) met the eligibility criteria. The market research company identified 98 eligible volunteers. A few volunteers contacted or were contacted by researchers. Of eligible volunteers, 42% (55/132) consented to participate in the study.

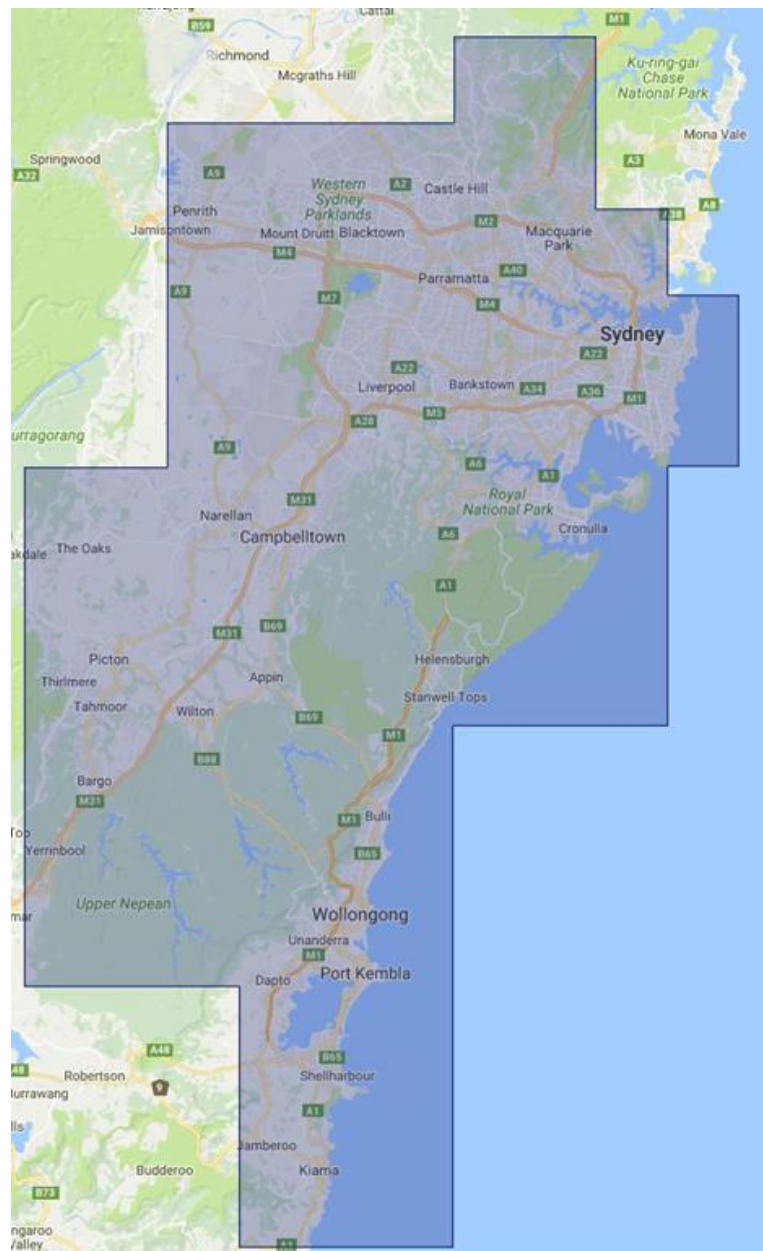
**Next steps**

Findings will provide a greater understanding of the road safety benefits and limitations of connected vehicle technology, and be used to inform policy about the future of this technology within NSW.

*Table 1. Screen displays of road safety applications used in this study*

Harsh braking ahead warning	Intersection collision warning	Red light warning
		

**Figure 1. Geofenced testbed in which connected vehicle technology operates for this study, including most of Sydney (excluding the northern beaches and far west) and south to Kiama**



## References

- Austrroads, 2011. Evaluation of the Potential Safety Benefits of Collision Avoidance Technologies Through Vehicle to Vehicle Dedicated Short Range Communications (DSRC) in Australia. Research Report AP-R375/11, Austrroads, Sydney.