

Early findings from First Australian Connected Light, Privately-owned Vehicle Trial

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Abstract

This Field Operational Test (FOT) involves 55 consenting members of the public having their light vehicles fitted with cooperative intelligent transport systems (C-ITSs) and telematics equipment as part of Transport for NSW's Cooperative Intelligent Transport Initiative (CITI). CITI is the first Australian large-scale, long-term C-ITS initiative. The FOT included three safety alerts: harsh-braking ahead, intersection collision and red traffic light warnings. Participants were evenly split by gender (52.7% males), the majority aged 40-59 years (67.3%, 37/55), and 94.5% had held their driver licence 10+ years. End-of-study survey findings will be presented, including participants' experience of the human-machine interface (HMI).

Aim

This study aims to improve understanding of:

- Deploying C-ITSs into privately-owned vehicles
- Participants' experience with the HMI and acceptance of the system
- The benefits of C-ITS safety applications, including:
 - Harsh-braking ahead (vehicle-to-vehicle (V2V))
 - Intersection collision (V2V)
 - Red traffic light warnings (vehicle-to-infrastructure (V2I))

Methods

Participants' vehicles were fitted for approximately 10 months with technology to provide alerts and monitor driving. This before/after study involved participants not receiving alerts during the baseline period. Prior to the alerts being activated, participants were trained in what to expect from the alerts and troubleshooting equipment issues. Monthly, participants met a researcher to exchange memory-cards storing the driving data. Participants completed online-surveys during the study, and some participated in a focus group at the end.

The C-ITSs were configured to enable communication among vehicles and traffic signals fitted with the equipment, with messages transmitted over a dedicated radio frequency within the geofenced-testbed, including most of Sydney (excluding the northern beaches and far west) and extending south to Kiama. Up to 60 trucks, 11 public buses, two light fleet vehicles, 1 fleet motorcycle and three signalised intersections operated within the testbed.

Participant eligibility criteria were designed to ensure CITI vehicles came into frequent contact, and included:

- 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

The first recruitment wave was parents/carers with a child attending one of the supporting schools nearby Wollongong's Central Business District (CBD) and drives to/from the school 3+ times/week. A second wave was undertaken via market research company of Illawarra residents driving to/from/through the CBD 3+ times/week.

This study has been approved by the University of Wollongong / Illawarra and Shoalhaven Local Health District Human Research Ethics Committee, NSW Department of Education, and Catholic Diocese of Wollongong. Principals approved school's involvement in the study.

Study progress results

Thirty-three parents recruited via schools expressed interest in the study, and 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.

Participants were evenly split by gender (52.7%, 29/55 males); 14.5% (8/55) were aged 21-39 years, 67.3%, 37/55) 40-59 years, and 18.2% (10/55) 60-79 years. Most (94.5%, 52/55) had held their driver's licence for 10+ years, and 61.8% (34/55) reported being the only driver of the vehicle. Five participants (9.1%) self-reported being involved in a single crash during the three-years prior to the study resulting in a towed vehicle or injured person. Most participants' vehicles (89.1%, 49/55) were successfully fitted with the study equipment.

Next steps

Results from the end-of-study survey will be presented, including participants' experience of the HMI. Findings will provide greater understanding of the road safety benefits and limitations of C-ITS technology and inform policy considerations about the future of this technology within NSW.