THE NEW SOUTH WALES INTELLIGENT SPEED ADAPTATION TRIAL

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ABSTRACT

The New South Wales Centre for Road Safety is currently conducting the largest trial of Advisory Intelligent Speed Adaptation technology in Australia. More than 100 vehicles are participating in the trial which is being conducted in the Illawarra Region of the state. This trial is unique because each vehicle is connected to a centralised computer system which automatically updates changes to speed zones. The NSW ISA trial aims to:

• Research the potential road safety benefits of advisory ISA systems in NSW.
• Measure the economic effects in terms of fuel consumption and effects on travel time of installing ISA systems in NSW vehicles.
• Assess the acceptability of ISA systems to drivers and managers using and administering private fleets and to drivers of private vehicles

Already more than 2 million individual speed compliance records from trial vehicles have been collected as part of the project. Attitudinal and behavioural studies have also been conducted as part of the trial. Initial results of changes to speed zone compliance and the results of the in-vehicle behavioural observational study trial will be presented at the conference.

INTRODUCTION

The NSW Intelligent Speed Adaptation Trial is the largest trial of intelligent road safety technology ever conducted by a government agency in Australia to date. By the end of the trial it is expected that more than 100 privately owned connected vehicles will have taken part in the project.

Almost 40% of all fatal crashes and 16% of injury crashes in NSW involve a speeding driver. On average, approximately 194 people die in speed-related crashes each year. Aside from the tragic cost in human lives and suffering, speed-related crashes cost the community around $800 million a year in hospital bills, lost earnings and other costs. Furthermore, even small reductions in speed will yield substantial safety benefits (Kloeden et al 2002)

Highly credible research reviewed in the Speed Management Report from the OECD suggests that the mandatory use of a limiting Intelligent Speed Adaptation system could bring about a reduction of serious crashes of up to 50%, while the voluntary use of an advisory ISA system could result in a crash reduction of up to 10% across the network (OECD 2006). This is consistent with a similar estimated benefit of ISA from a Victorian study (Regan et al 2006).

In addition to substantial safety benefits, ISA offers the opportunity to save running costs, fuel and carbon emissions as well as improve traffic flow (Regan et al, 2006; Servin, Boriboonsomsin & Barth, 2006).

The distinctive benefits of the NSW trial include focused evaluation of advisory ISA (the most readily implemented version), a larger sample size building on other Australian trials in Western Australia and Victoria, highly accurate speed zone mapping, the inclusion of private and fleet vehicles with general population drivers and the collection of extensive data (fuel usage, speeds and speed zone compliance, speeding infringements received and user acceptance).

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METHODS

Three Local Government Areas (Wollongong, Shellharbour and Kiama) within the Illawarra Region were selected for the NSW ISA trial. The total length of the road network in this area is approximately 2,500 km and boasts a population of more than 263,000. RTA Road Safety Officers have located over 4,000 speed signs using GPS receivers in the trial area and mapped almost 950 speed zones.

Recruitment of participants and refinement of sample

Recruitment commenced with major Illawarra employers in early May 2008. Currently nine companies are providing drivers for the trial. An additional 20 companies were approached to join the trial but were either found to be unsuitable or they declined to participate. Initially, recruitment targeted exclusive drivers (ie the driver used a nominated vehicle at least 80% of the time) who drove 80% of the time in the Wollongong, Shellharbour and Kiama Local Government Areas. Around 44 fleet and over 60 private drivers were nominated to participate in the trial.

However, an analysis of the fleet driver’s characteristics conducted by ISA project officers showed that young drivers under the age of 25 years and over the age of 60 years were under-represented in the trial. Most drivers who had agreed to participate in the trial also had an excellent driving record with only a few carrying demerit points for a speeding offence. Additional drivers were recruited specifically under the age of 25 years and over the age of 60 years. Recruiters also targeted drivers who were repeat speeding offenders.

A GPS enabled speed data recorder was installed into all vehicles at least one month before the ISA devices was installed. This enabled researchers to develop a speed limit compliance profile for each vehicle in the trial. The data recorder records the speed and location of each vehicle very ten seconds. The data recorder will continue to operate whilst the ISA device is installed and for a period of up to one month after the device is removed.

Already we have collected more than 2 million individual speed compliance records from trial vehicles as part of the project.

A number of attitude and behavioural studies will be completed before during and after the trial. The first stage of this research included collecting basic information from the participants including attitudes to speeding, experience with technology and expectations for the ISA system.

The second stage of research gathered drivers’ early perceptions, ‘first impressions’, of the ISA technology and the ISA device that will have recently been fitted into their car. Broadly, the research explored drivers’ attitudes, acceptability, benefits and concerns with the ISA device. Focus areas for the research included:

- Useability and user friendliness of the ISA device, including any problems experienced and whether they perceived the device as simple or complex
- Perceived benefits, including perceptions of improved safety
- Effect on vehicle performance. Whether the device interfered with any of the car’s other systems.
- Any concerns, including any perceptions of decreased driver safety/feelings of lack of control
- Speed limit ‘warning’ alerts. How accurate were they? Explore whether there are times when some alerts are more necessary than others. How effective, or annoying were they
- Explore situations in which the device may have been turned off. How often has it been turned off, and for what reason
- Explore the degree of distraction caused by the device
- Self reported impact on driving behaviour
- Explore how reliant drivers becoming on the ISA device. Are they more or less observant of speed signs? Are they less observant and therefore likely to drive to the actual road conditions
- Suggestions and recommendations for improvement to the ISA devices
- Likelihood of drivers to recommend ISA devices to others
- Explore differences in perceptions and opinions based on whether they were to be in their own vehicle or in their fleet vehicle
- Any unanticipated consequences of having the device in their car
- Device reliability and usability
- Fuel records
- Speeding Infringements

An in-vehicle observation study was also conducted early in the trial to examine how drivers interact with the ISA device.

The Advisory ISA system being used in the NSW trial is unique in that each vehicle is connected to a centralised computer which updates speed zones automatically when they change. In previous ISA trials reviewed by our researchers speed zones were updated manually by inserting a new data set contained on a media card. This had the potential for data sets to become rapidly out of date, thus leading to conflicting information between the speed zone displayed on the device and the zone displayed on roadside signs. It is expected that this rapid update facility using GPRS communication will improve the drivers’ experience with ISA by minimising potential information conflicts. The trial will evaluate this.

RESULTS AND DISCUSSION

Initial results from the trial will be presented at the conference but were not available at the time of writing this abstract.

REFERENCES

Crackel L. (Year unknown) Intelligent Speed Adaptation – Western Australia’s Demonstration Project, Western Australian Office of Road Safety,


