

Attitudes and Opinions towards Intelligent Speed Adaptation

Cuenca, Vanessa¹; Wall, John¹; Boland, Peter¹; Prendergast, Margaret¹;
Creef, Kim²; Johnson, Bettina³; Barnes, Ben³;

¹Roads and Traffic Authority of New South Wales

²Stomp Services Pty Ltd

³Ipsos-Eureka Social Research Institute

Abstract

This paper presents the results of the attitudinal and behavioural research undertaken as part of the NSW Intelligent Speed Adaptation (ISA) Trial. Over 110 light vehicles from private and company fleets were fitted with an Advisory ISA device. In addition to the collection of speed records to measure compliance, drivers were asked to participate in quantitative and qualitative attitudinal research through focus groups, surveys and in-vehicle observations before, during and after their use of the device. The research examined a range of issues including motivators for using ISA, perceived benefits of the technology, and gathered feedback on the useability of the device. Analysis of pre and post-ISA attitudes towards speeding and self-reported speeding behaviour was also undertaken.

Results from the attitudinal research indicated that a majority of participants reported a reduction in the margin by which they exceeded the speed limit. Some drivers reported speeding less frequently either because the ISA device made them more aware of the speed limit, or because they wanted to avoid the audible warnings. There were no widespread concerns about the technology being distracting. Participants also reported being more aware of exceeding the speed limit, therefore speeding became a conscious choice rather than an inadvertent action. The acceptability of the ISA technology was generally high, but most participants felt that there should be an element of choice for the driver on whether to install the ISA technology.

Keywords

“intelligent speed adaptation”, ISA, speed, attitudinal research

Introduction

Speeding is a significant road safety issue in Australia and worldwide. In NSW, almost 39% of all fatal crashes and 16% of injury crashes have speed as a contributing factor. On average, approximately 177 people die each year in NSW as a result of being involved in a speeding related crash. Aside from the tragic cost in human lives and suffering, it is estimated that the cost to the community of speed related crashes is around \$1.5 billion a year - this is the cost that the community is willing to pay or forgo in exchange for a reduction in the probability of speed related casualties and towaway crashes (1). There has been extensive international research to indicate that the use of Intelligent Speed Adaptation (ISA) technology is an effective tool to reduce speeding and could bring substantial road safety benefits. Research conducted by the Centre for Automotive Safety Research suggests that the use of Advisory ISA across the road network could result in a fatal crash risk reduction of 11% (2).

The NSW Centre for Road Safety conducted the largest trial of Advisory ISA technology in Australia to assess the benefits of ISA technology for NSW. Over 110 vehicles including a mix of non-government private company fleets and privately owned vehicles participated in the trial. All vehicles were fitted with a data recorder which tracked their speed and location to generate speed compliance records. In addition to analysis of these speed compliance records, attitudinal and behavioural studies were conducted. The objectives of the attitudinal research were to: assess the acceptability, benefits and concerns about ISA technology; explore suggestions for improvement and the marketability of the technology; and ascertain whether the use of ISA technology results in changed attitudes towards speeding, an increased awareness of road safety issues and changes in self-reported behaviour. Quantitative and qualitative research was conducted at various stages of the trial.

Method

Participants in the trial included drivers from a mix of non-government private company fleets and privately owned vehicles. Initially, recruitment exclusively targeted fleet drivers (where the driver used a nominated vehicle at least 80% of the time for work purposes in the Wollongong, Shellharbour and Kiama Local Government Areas). However, an analysis of the fleet drivers' characteristics showed that 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 a good driving record with only a few carrying demerit points for a speeding offence. Recruitment was expanded to include private drivers, with a booster which targeted drivers specifically under the age of 25 years and over the age of 60 years, and drivers who reported that they were repeat speeding offenders. A total of 114 participants commenced the trial.

All drivers and fleet managers completed both quantitative and qualitative research. When first joining the trial all participants completed a 'Driver Commencement Questionnaire' which collected their demographic information and attitudinal responses. Prior to the ISA technology being installed in vehicles, an online pre-trial survey or 'Stage 1' survey was conducted with both drivers and fleet managers. This information quantified their attitudes before they experienced the technology. The Stage 1 questionnaire with fleet managers was in the form of a short telephone interview. Interviews were conducted with eight out of the nine organisations in the trial. The Stage 1 questionnaire for fleet and private drivers was administered online and completed by 103 participants out of a possible 112.

A number of in-depth interviews and vehicle based observations were conducted almost a month after the ISA devices had been installed to gauge any initial impressions. In-vehicle observations were conducted with five private drivers. An Ipsos-Eureka researcher travelled as a passenger in each participant's vehicle, observed the participant driving and interacting with the ISA device, and recorded any comments made by the driver. Cameras situated within the car were used to record footage of the journey. In addition to this, twelve in-depth interviews were conducted with fleet and private drivers. This research component captured participants' early experiences and first impressions with the ISA device. These early results were presented at the 2009 Intelligent Speed Adaptation Conference (3).

Just prior to the ISA technology being removed, another online survey ('Stage 2') was conducted with drivers and fleet managers to quantify their attitudes after they had experienced the technology. The questionnaire for fleet and private drivers was administered online and completed by 92 drivers, which represented 87% of drivers in the trial. In addition, fleet managers from seven of the nine participating organisations completed the questionnaire, primarily over the telephone. Qualitative research in the form of group discussions also took place to complement the quantitative results and allow in-depth and flexible exploration of some key topics. Four mini group discussions were conducted with private drivers, divided by age and gender. Two mini group discussions were conducted with fleet drivers and a final mini group discussion was held with fleet managers.

In order to capture any learning effects from the ISA technology and to assess changes in attitudes and behaviour once participants were no longer using the technology, a further stage of research was conducted. Fleet and private participants completed an online survey ('Stage 3') around two months after the ISA technology had been de-activated.

A repeated measures design was used, with some unique questions appearing in each of the Stage 1, 2 and 3 online surveys. Results were analysed separately for drivers and fleet managers in order to capture the different roles they played in the trial and the different experience they had with the ISA technology. Fleet managers were individuals identified as being either solely responsible for, or being highly influential in, their organisation's decision to become involved in the trial. It is likely they would be responsible for, or influential in, any decision to implement ISA technology in their fleet in the future. Some fleet managers did not personally drive a vehicle that had the technology installed. All fleet and private drivers experienced driving with the ISA technology.

A NSW Driver Comparison study was conducted to establish the extent to which the trial results could be generalised to the broader NSW driving population (including the Illawarra) and to measure the awareness of, attitudes towards, and potential support for, the ISA technology among the general driving community.

A quantitative research method was used for the comparison study. A questionnaire, consisting of many of the questions asked of trial participants as well as additional questions on the awareness and interest in ISA technology, was administered online with a total sample size of 1,145 NSW drivers. Of these, 107 drivers were based in the Illawarra. This oversampling of the region was to ensure robust comparisons to trial participants and non-trial Illawarra drivers. The remaining 1,038 drivers were from other regions of NSW. Quotas were set to ensure the sample was broadly representative of NSW licence holders. Weightings were applied to ensure the research sample was even more representative of licence holders on key demographic criteria.

Results

FLEET AND PRIVATE DRIVERS

Demographic profile

Of the participants who completed the surveys and therefore form the research sample, 36% were fleet drivers and 64% were private drivers. Sixty per cent of the participants were male. Figure 1 shows the age profile of the fleet drivers compared with private drivers and the gender breakdown within each age category. As the figure illustrates, the fleet driver sample had an older age profile and was male-skewed. Targeted recruitment ensured that private drivers were roughly normally distributed in terms of age and gender but with a boost in the under 25 age category. The research sample included a total of 16 provisional licence holders.

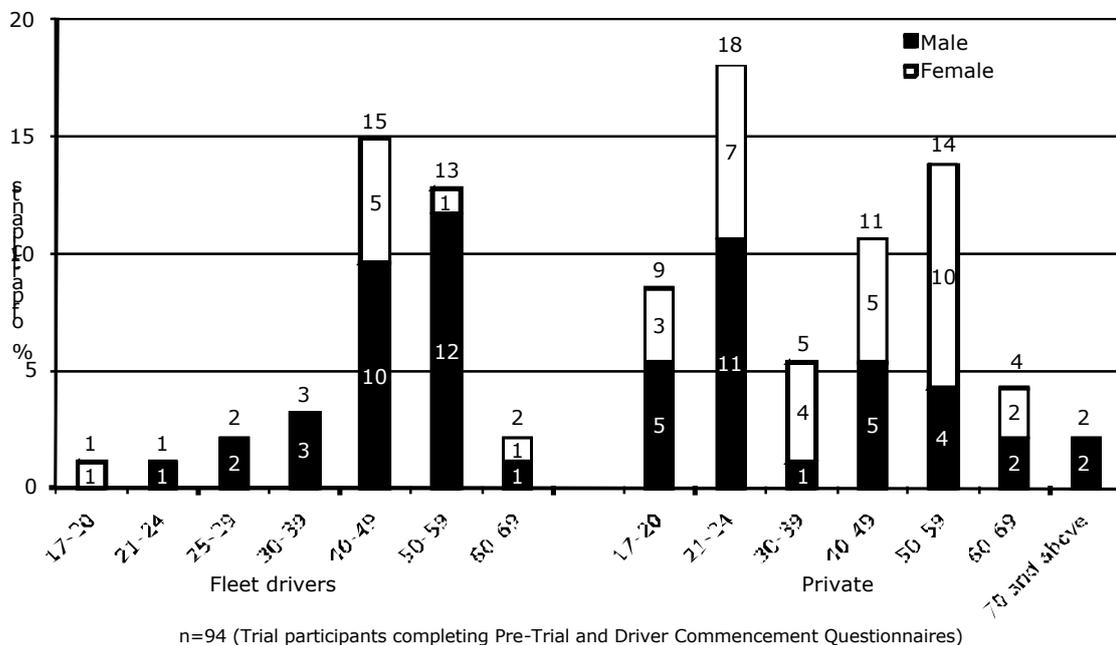


Figure 1 : Participant profile – gender by age by driver type

Perceived benefits of the ISA technology

With the ISA technology active in their vehicles, almost two in three (65%) participants agreed with the notion that the technology was 'of great use' to them. The mean level of agreement with this notion was lower than it had been at Stage 1 (dropping from a mean rating of 7.0 to 6.4) suggesting that although ISA was seen as useful, it was not as useful as they had anticipated when signing up for the trial.

In the group discussions held with drivers, the most commonly mentioned benefit of the ISA technology was that they were always aware of the speed limit that applies to any given stretch of road. Other commonly articulated perceived benefits included that the ISA technology:

- alerted them when they had accidentally drifted over the speed limit
- increased their awareness of how often they exceed the speed limit, and how often other motorists exceeded it
- made them aware of speed zones which they had not previously been aware of

"And it went beep, beep. And I thought what on earth are you beeping for and I looked and thought 40, when did they put 40 here... Never knew that an old people's home had 40 around it." [Fleet driver, drives over 20hours per week]

- made speeding a conscious decision to take that risk (a benefit only articulated by some male drivers);

"I realised you're more conscious of deciding to speed. You're more conscious that you made the wrong decision, it makes you think twice." [Private driver, Male, <25yrs]

- provided reassurance that they would not unwittingly get caught for speeding, and it helped them to relax by encouraging them not to be in a rush and worry about their speed.

As illustrated in Figure 2, having experienced the ISA technology, almost three in four research participants (73%) agreed at Stage 2 with the notion that the use of this technology in all vehicles would lead to a reduction in the *number* of crashes, with just under two in three (64%) thinking it would reduce the *severity* of road crashes. A clear majority (61%) also agreed that, with the technology in their vehicle, they had always been aware of the speed limit that applied to the roads that they had been on, as a strong 'personal' benefit. Just over half felt the technology had allowed them to spend more time attending to traffic demands - either because they had not needed to look at their speedometer as frequently (54%), or they had not needed to look for speed signs as often (52%).

Participants were divided on whether or not they had felt safer driving with the technology. This result was explored in the group discussions. Most felt that they didn't feel any different with the technology active. Most participants maintained they were already good, safe drivers, and there was a fair amount of resistance to the idea that having the technology in their vehicle would make them personally better drivers.

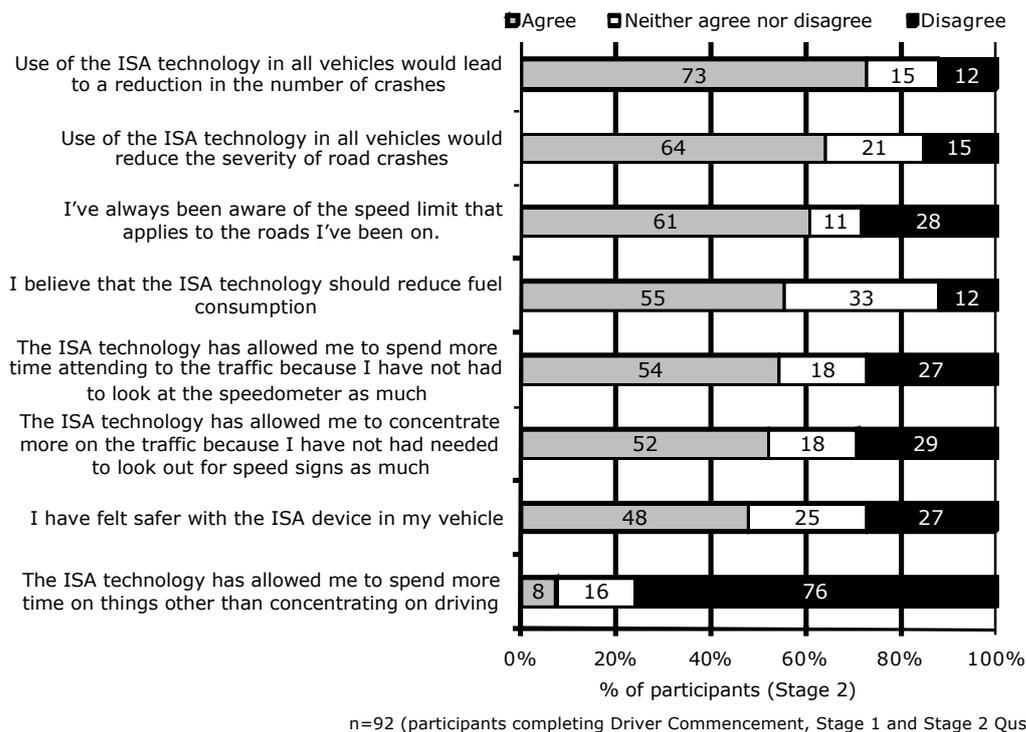


Figure 2: Extent of agreement with statements relating to benefits of the ISA technology – Stage 2
Question: Based on your experience with ISA technology in the ISA Trial, to what extent do you agree or disagree with each of the following statements about ISA technology and the ISA devices? [11-point scale from 0 (strongly disagree) to 10 (strongly agree), plus “don’t know”]

Concerns about the ISA Technology

The main concern expressed in the group discussions was that the ISA technology was ‘unforgiving’, i.e. not allowing the driver leeway to travel a few kilometres per hour over the speed limit. Several participants found the device ‘beeping’ as soon as the speed limit was reached irritating and frustrating.

Concerns about drivers reacting to the ISA warnings (and keeping to the speed limit) and therefore being the victim of tailgating were not very pronounced. While some expressed this as a concern in the group discussions, most seemed to consider it a hypothetical problem (having been tail-gated but being unperturbed). Other concerns included that the ISA technology:

- was disconcerting / distracting when first installed and not yet familiar, or when it was not functioning properly
- was unreliable at times – for example not starting up immediately and not detecting side streets
- was intrusive when there were passengers in the vehicle
- was a potential target for thieves
- was not positioned optimally in their vehicle - such that they had to turn their head to look at the device and hence take their eyes off the road.

In the Stage 2 online survey, just over half (54%) of the participants indicated that they agreed with the idea that driving with the ISA device had increased their frustration levels while driving.

As Figure 3 illustrates, between surveys there was a reduction in the mean level of agreement that: the ISA technology had distracted them from their driving; they had relied too heavily on the ISA technology; and that the ISA technology issues too many false warnings and errors. Red arrows on the graph indicate a statistically significant change between surveys. These changes in attitudes suggest that some of the concerns that participants had prior to the technology being activated in their vehicles did not come to fruition.

The average level of agreement with the statement ‘the ISA technology would be wasted on drivers who speed intentionally because these drivers would ignore or override the warnings’ increased significantly between surveys. Indicatively from feedback in the group discussions, this response is likely influenced by the fact that in its current form the ISA device could be turned off if the driver so wished.

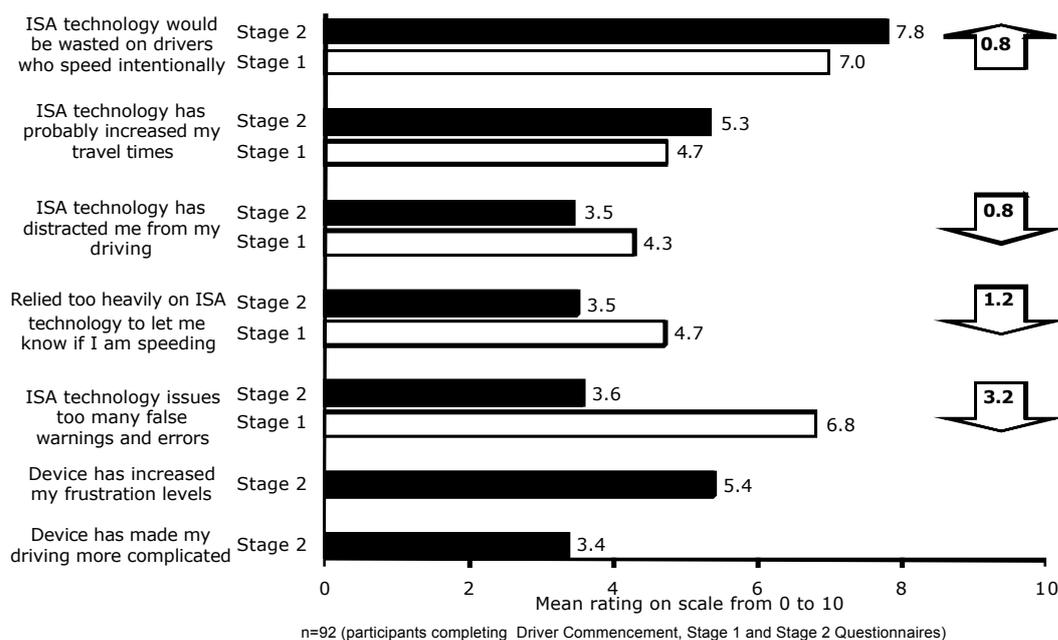


Figure 3: Changes in extent of agreement with statements relating to concerns about the ISA technology, with experience with the technology

Question: (Based on your experience with ISA technology in the ISA Trial,) to what extent do you agree or disagree with each of the following statements about ISA technology and the ISA devices? [11-point scale from 0 (strongly disagree) to 10 (strongly agree), plus “don’t know” (set as missing value for repeated measures analysis)]

Potential for distraction

Despite the decrease in agreement with the idea that the technology has distracted them from their driving, around one quarter of trial participants (27%) still agreed with this statement when it was included in the Stage 2 Questionnaire. The most common reasons given for the technology being at least to some extent distracting were that the warning tones were too persistent (58%) and too loud (52%).

Reliance on the technology and workload issues

The group discussions suggest that some participants relied heavily on the ISA technology to advise them of the prevailing speed limit, by accelerating, without looking at their speedometer, until the ISA device beeped. However, more commonly, participants explained that they had used the device as a ‘back-up’ to advise them if they unwittingly exceeded the speed limit - either by accident, or they had been unaware of the prevailing speed limit.

Reactions to audio warnings

Just under half (45%) felt that the audio warnings were *not* appropriate, in terms of their volume, pitch and persistency. In the group discussions a strong preference was expressed for the audio warnings to increase in frequency and volume as a driver persisted in exceeding the speed limit. While acknowledging that the audio warnings were important as a deterrent to speeding they felt that ‘nudging’ the limit should not result in such loud and persistent beeps.

The speed limit display and the red annulus around the speed limit value which appears just before the audio warnings were seen to be beneficial to those drivers whose device was installed where it could be seen out of the corner of their eye. The school zone audio warnings were particularly well received, as most recognised the importance of slowing down in these zones. The curve advisory warnings received mixed reviews. Some participants felt the ‘voice’ was startling and that the warnings were excessive on very windy roads.

Among those who reported that they had turned the ISA device off at least on the odd occasion, the majority (63%) reported that they had generally only turned it off for a short period before turning it back on. Those holding a provisional licence reported turning their device off more frequently than did full licence holders. Some indicated in the group discussions that they had never wanted to turn off their device as they valued having it there to alert them when they exceeded the speed limit. Others, however, admitted that they had felt obliged to leave it on because they were participating in a trial and, if outside of the trial, would turn it off in a variety of circumstances.

Impacts on behaviour

Although there was some shift between the Stage 1 and Stage 2 surveys towards participants reporting exceeding the speed limit less frequently, this shift was not statistically significant. However, given that the ISA technology alerted participants every time they exceeded the speed limit, it is likely that participants became more aware of the frequency with which they exceeded the speed limit. Between surveys there was a significant shift towards participants reporting exceeding the speed limit by a smaller average margin, with this change in behaviour apparently sustained at Stage 3. As illustrated in Figure 5, while only a quarter reported exceeding the limit by an average margin of less than five kilometres per hour prior to the ISA technology being activated, this proportion rose to 46% in both the Stage 2 and Stage 3 surveys. At Stage 2, fleet drivers reported exceeding the speed limit by a larger margin than private drivers. This difference was not observed at Stage 1.

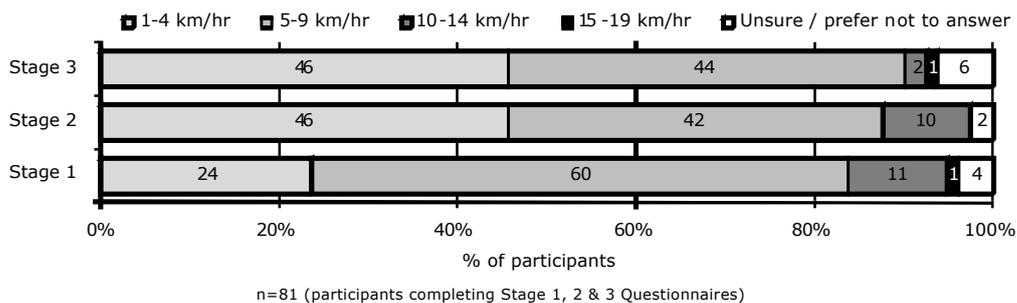


Figure 4: Average margin by which speed limit was exceeded

Question: When you are speeding, by how many kilometres per hour do you usually exceed the speed limit?

In Stage 3, participants were asked whether they thought their speeding behaviour had reverted back to that of their levels at Stage 1. As Figure 5 illustrates, just over half (54%) maintained that they were driving more slowly than before the ISA trial, but not as slowly as they were when the ISA technology was active. One in five drivers reported having completely reverted back to the way they drove before the trial. Those who reported that they had not slowed down because of the technology are included as “I drove no differently with the ISA device in my vehicle”.

Only one in ten felt they were driving just as slow as when the ISA was active. Just under one in three (32%) of these participants who felt they were still driving more slowly, explicitly mentioned that experience with the technology had made them think more about their own speed and made them more conscious of sticking to the speed limit. However, the research finds no evidence of attitudes toward speeding having changed with the use of the technology.

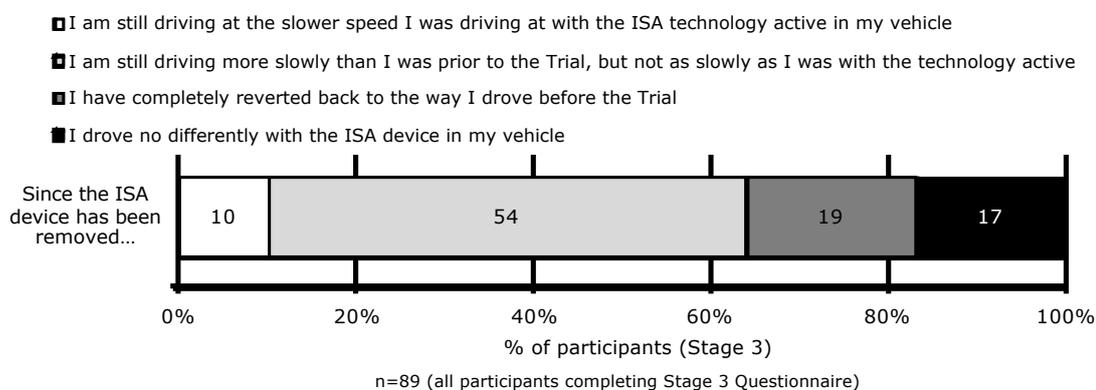


Figure 5: Changes in driving since de-activation of ISA

Question: Thinking about the way you have been driving since the ISA device has been removed (or has become non-operational), which of the following is most true?

Overall acceptability and personal interest in keeping the technology

Trial participants were asked to rate the overall acceptability of the ISA technology. The majority of participants (61%) gave it a positive rating. Participants were more likely to have a positive view of the technology (in terms of overall performance, usability, functionality and acceptability) than be inclined to recommend the technology to others, or be interested in using the technology themselves. Those participants who had experienced a greater number of technical issues with their devices tended to rate the overall acceptability of the technology lower.

Participants were divided on whether or not they would be interested in continuing to use the technology, with comparatively large proportions feeling very strongly one way or the other. As illustrated in Figure 6, one in five rated their interest at zero, indicating they would not be interested at all in keeping the technology, but almost exactly the same proportion (21%) rated their interest at 10, indicating they would be very interested in keeping the technology. Indicatively, it appears that those who had incurred speeding offences in recent years were more likely to be interested in having the technology in the future. Overall, interest in keeping the technology declined with actual experience with the technology. On scale of 1 to 10, the average interest rating was 7.2 at Stage 1. This rating dropped to 5.3 at Stage 2.

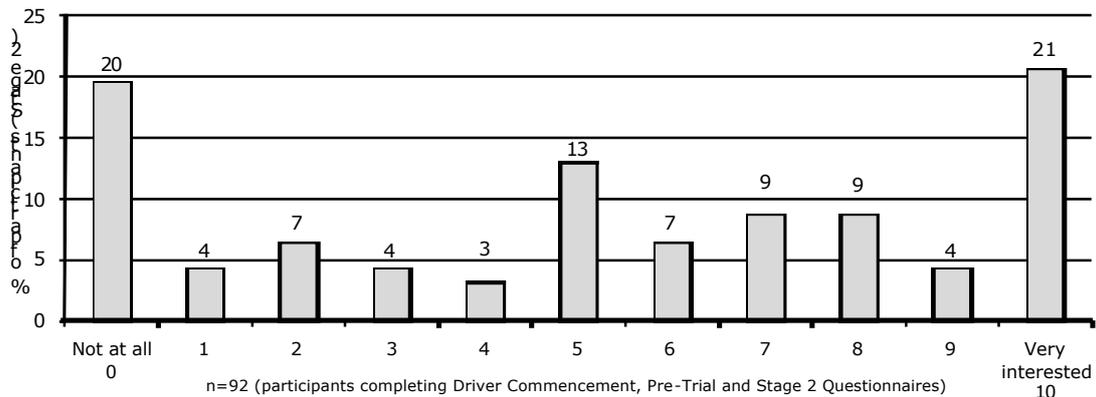


Figure 6: Ratings of personal interest in keeping the technology

Question: Hypothetically, if you had the option of keeping the ISA technology in your vehicle at the end of the Trial (at no extra cost), how interested would you be in continuing to use the ISA technology?

Use of ISA Technology by the broader community

Provisional licence holders ('P-platers') were most often nominated as a group that would particularly benefit from having the ISA technology in their vehicle (nominated by 92% of participants at Stage 1 and 82% of participants at Stage 2). Even 69% (11 out of 16) of provisional licence holders felt that the ISA technology would be particularly beneficial for people who hold a provisional licence. People who speed accidentally, people who have had their licence cancelled or suspended for speeding in the past, and younger drivers were also nominated by over 70% of participants. Comments made in the group discussions suggested that although many considered the technology as useful for all drivers, there was a tendency for individuals to view themselves as 'good, safe drivers' and as such, less in need of the technology for themselves.

After using the ISA technology, 72% of participants felt its use should be compulsory for at least some groups of drivers. The remaining 28% felt the technology should not be compulsory for anyone. The largest proportion of research participants (67%) felt the technology should be compulsory for those who have previously had their licence suspended or cancelled for speeding.

In the group discussions, strong support was expressed for the use of ISA technology being offered as an option for repeat speed offenders to reduce their sentence, or similar, during court appearances. Most felt that it was very important for drivers to have an element of choice on whether to use the ISA technology. For example, recidivist speeders could be given a choice of having the ISA technology installed or losing their driver licence. Potential covert measures of speed enforcement using the ISA technology (combined with a data recorder) were viewed negatively. Participants felt that using such technology for speed enforcement was not appropriate given that it may not be completely reliable or that the driver may have been exceeding the speed limit for a valid reason. In their view, the offender would need to exceed the limit often and for extended periods before being issued with an infringement was warranted.

Preferred ISA device features and marketability

The quantitative survey results suggested that there would be more interest in a device that constantly displayed the prevailing speed limit (84%) rather than only displaying the speed limit when the vehicle exceeded it (16%). More (88%) would prefer an Advisory device than one that physically prevented the vehicle from exceeding the speed limit (12%). Almost three quarters (72%) would prefer a device that could be turned on or off depending on the driving conditions, rather than a device that could not be turned off (28%). While many recognised that the ISA technology would be most effective if it could not be switched off, under these circumstances the technology was also less appealing. It is likely that including volume

control or a tolerance in exceeding the speed limit before the audio warnings take effect would lower the 72% of participants who would prefer a device that could be turned off.

There was far more interest in the ISA technology being integrated with a GPS navigation device (61% indicated that this would be their first preference) rather than as a separate ISA device (such as that which was used in the trial (28%) or as an application on a mobile phone (13%).

Willingness to pay

Among those interested in keeping the technology (rating their interest at between 6 and 10 out of 10), almost half (47%) would be willing to pay between \$100 and \$249 to have the device. The qualitative research results suggested that although most participants recognised that the ISA technology was useful, they would have limited interest in purchasing this technology as a stand-alone device for themselves. Most would feel comfortable acquiring the technology if it was made standard in a new vehicle - although they would want a choice of using it or not. The idea of all drivers having the technology made it more appealing to some.

“If it didn’t cost me anything and if I had the option, the choice of being able to use it or not, if I could turn it on and off then maybe I would consider using it. Because there are times, like you said before, driving around in a strange area, like for schools or speed zones that might suddenly creep up on you that you didn’t know about. That’s quite handy to have that, you know, that warning ability.” (Fleet driver, drives less than 20hours per week)

“No, I wouldn’t want to put up with it until I knew everybody else was putting up with it.” (Fleet driver, drives less than 20hours per week)

FLEET MANAGERS

Perceived benefits and concerns about the ISA technology

In both the Stage 1 and Stage 2 surveys, fleet managers were given a list of eight statements addressing possible benefits and drawbacks of having the ISA technology in their fleet vehicles. At Stage 2, the majority of fleet managers agreed (providing a rating of between six and ten on a scale from 0 – strongly disagree – to 10 – strongly agree) that the ISA devices had had significant benefits for their fleet of vehicles. The mean level of agreement was 5.0). A majority also agreed that the technology had:

- helped them to be better corporate citizens
- provided Occupational Health and Safety benefits
- resulted in fewer speeding fines and losses of licence.

While the mean level of agreement with the idea that the device had benefits for their fleet did not differ significantly between Stage 1 and Stage 2, there was a shift towards decreased agreement in relation to the three specific benefits mentioned above.

The idea that having the ISA devices in their fleet vehicles had resulted in increased travel times, had had a negative impact on vehicle performance, or had resulted in additional maintenance being required, were rejected. Three of the seven individuals surveyed indicated that they had no concerns about having the technology in their fleet vehicles. Concerns expressed by others included that the device had impacted on other devices within the vehicle, and the device had not been well received by staff.

Interest in keeping the technology

Having experienced the technology in their fleet vehicles, the mean level of interest in keeping the technology, on a scale from 0 (not at all interested) to 10 (very interested) was 7.3. Interest in keeping it was

roughly the same compared to the Stage 1 measure. For them to consider including the technology in their fleet vehicles in the future, they felt the technology would need to be:

- affordable
- easy to obtain
- have demonstrated benefits (e.g. fuel savings, reduced speeding infringements and speed-related crashes)
- be less obtrusive with fewer auditory warnings
- provide more of a tolerance band
- be part of a device that is smaller / more discreet than that trialled
- be able to be easily moved from an old vehicle into a new vehicle- to cope with high fleet turn-over
- have associated support in relation to device installation, user training and upgrades.

Those participating in the mini group discussion said that they do not operate in industries that experience the same pressure to invest in road safety measures that are experienced by, for example, trucking companies, where considerable investment on such things as fatigue management systems is undertaken. Their decision to purchase the technology would be based on a cost-benefit analysis.

Willingness to pay

All seven fleet managers completing the Stage 2 Questionnaire indicated that they would be prepared to pay to have the ISA technology in their fleet vehicles. The amount they would be willing to pay varied from less than \$100 per vehicle up to \$549 per vehicle. Their willingness to pay appeared to decrease following experience with the technology. Of the five fleet managers completing both the Stage 1 and Stage 2 questionnaires, three moved into a lower price category and two stayed unchanged.

Despite staff preferences to be able to switch off the technology when desired, fleet managers recognised that the ability to turn the ISA device on and off would weaken the effectiveness of the technology. As put by one fleet manager:

“If you can't turn it off there is one way to stop the beeping”

Comparison of trial participants to NSW Drivers

The NSW Driver Comparison study measured the awareness of, attitudes towards, and potential support for, the ISA technology among the general driving community.

Demographically there were some differences in the sample of drivers in the trial compared to the broader distribution of drivers within NSW. The trial participants were not recruited as a representative sample of NSW drivers. The trial had an emphasis on recruiting younger male drivers, P-plates and those who had prior speeding offences. The majority of the demographic differences are explained by this trial sampling decision, as those participating in the trial were more likely than NSW drivers overall, to be young, male, and members of a fleet.

The results from the survey indicated that current awareness of the ISA technology among the general driving population was not high, but support for it being made available was strong. Personal interest in having the technology was lower than general support for making it available. Just over three in five NSW drivers surveyed expressed interest in having the Advisory ISA technology, and just under half the supportive ISA technology. Even if drivers were not actively seeking out the technology for themselves, they would be unlikely to object to it being included as a standard in new motor vehicles.

Seven in ten NSW drivers would like to see ISA technology compulsory for at least some groups of drivers, with roughly one in three thinking Advisory ISA should be compulsory for all. Making its use mandatory was most strongly supported in the case of P-plates (and young, inexperienced drivers generally) and those who

have previously had their licence suspended or cancelled for speeding. This aligns with the opinions of trial participants. Interest in using ISA was higher among women and older drivers.

Just under two in five NSW drivers said they had an automatic speed alert function they could use in their vehicle. Of these, 72% used it 'some of the time'. The most common reason for not using the speed alert function was because it was annoying. Drivers with the automatic speed alert function also cited reasons relating to a lack of need for the technology ('I don't speed, I'm able to monitor my speed myself'), highlighting resistance to the idea that such technology was necessary for drivers like them.

After taking into account the demographic differences between the broader NSW driving population and the drivers participating in the trial, the groups were relatively similar. There were some differences, such as self-rated competency adapting to new technology being higher among trial participants, and trial participants having a higher proportion of prior speeding offences. However these variances are not significant after taking into account demographic differences. There were no significant differences in terms of attitudes towards speeding between NSW drivers overall, Illawarra drivers and drivers participating in the trial, which bodes well for the confidence one can have about generalising the trial findings to the broader driving population.

Discussion

The results from the attitudinal research indicate that the ISA technology was seen, overall, to have merit. The technology was seen as acceptable, even if participants wouldn't necessarily recommend the technology to others or be interested in using the technology themselves. Many perceive the technology to be more useful for those who are the 'real problem' on the roads, that is, for other drivers. There was considerable polarisation in terms of personal interest in using the technology in its current form. There was also evidence to suggest the technology was not as useful as participants thought it would be. After experiencing the technology, participants appeared to be less convinced of some of its benefits, but also had fewer concerns about its use. This is similar to results from other trials. The TAC SafeCar project which trialled Supportive ISA found that at the end of the study participants on average rated the system less useful compared to ratings given at the beginning of the study (4).

In a quantitative study of NSW drivers' attitudes towards speeding in New South Wales conducted by the NSW Centre for Road Safety in 2009, it was found that low-level speeding had high levels of social acceptability and that there was a perception that tolerance bands exist in speed enforcement (5). It is likely that these attitudes contribute to participants' frustrations with not being able to exceed the speed limit by a small margin without setting off the audible warnings. Many would either favour the technology incorporating some leeway or tolerance, such that the audio warnings only commenced a few kilometres per hour above the prevailing speed limit, or else, more commonly, the initial warnings being subtle and increasing in intensity as the vehicle exceeded the speed limit.

Just over half (54%) of the participants agreed that driving with the ISA device had increased their frustration levels while driving. The technology was seen as 'necessarily annoying', due to the strong role the audio warnings played in deterring speeding behaviour. If the technology remained in its current form, which enables the driver to switch the device off, it seems likely that a considerable number of people would opt to do this at times. This would be particularly true of those who choose to deliberately speed. Having an ISA device that could not be switched off would increase the effectiveness of the technology, but lower its acceptability. Volume control would make the technology more palatable and would likely limit the number of times the device was switched off.

While many would not mind having the technology in their vehicle, it seems unlikely that many would seek the product out, although it would be more marketable combined with satellite navigation or incorporated in to new vehicles. There is increased interest in the technology among those who have recently received an infringement for speeding. The mandatory use of ISA for some drivers is acceptable to most, assuming that there is perceived fairness (every driver has it or it is acquired through choice), with no covert surveillance coupled with the technology.

Provisional licence holders were most often nominated as a group that would particularly benefit from having the ISA technology in their vehicle. Even 69% of provisional licence holders felt that the ISA technology would be particularly beneficial to drivers who hold a provisional licence. People who speed accidentally, people who have had their licence cancelled or suspended for speeding in the past, and younger drivers were also nominated by a majority of participants.

The results of the Stage 3 survey show that two months after the device had been deactivated just one in ten trial participants felt that they were still driving just as slowly as they were while it had still been active. Just under one in three (32%) of these participants who felt they were still driving more slowly explicitly mentioned that experience with the technology had made them think more about their own speed. There is no other evidence that use of the technology causes changes across a range of attitudes towards speeding.

This is similar to the findings of Agerholm (6) who conducted studies in Denmark. After almost two years of participants experiencing the ISA technology, he found that after the ISA devices were deactivated, drivers returned to their normal driving behaviour and there were no learning effects, unless drivers' speeds were being monitored which made them more motivated to avoid speeding.

The majority of fleet managers agreed that the ISA devices had delivered significant benefits for their fleet of vehicles. After experiencing the ISA technology, fleet managers indicated that they would be prepared to pay to have the ISA technology in their fleet vehicles, however their willingness to pay appeared to decrease after having experienced the technology. Feedback from the group discussion was that the decision to purchase the technology would be based on an assessment that the benefits outweighed the costs. This suggests that the adoption of ISA technology by fleets could be facilitated by providing fleet managers with more information on the benefits of ISA technology.

The trial intentionally included a higher proportion of younger males, provisional licence holders, fleet drivers and drivers with prior speeding offences. After taking into account these demographic differences, results from the NSW Driver Comparison Study indicate that, attitudinally, the participants in the trial are not dissimilar to NSW drivers overall, which bodes well for extrapolating the trial results to broader NSW.

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