Best Practice Intervention Framework for Recidivist Speeding Offenders

Cairney, P. T., Styles, T. O., & Imberger, K. L.
ARRB Group Ltd

Abstract

Speed-related crashes are a continuing concern in Australasia. Inappropriate speed contributes to approximately 29% of fatal crashes in Australia and 35% of fatal crashes in New Zealand [Austroads] and Western Australian work having shown that approximately 2% of drivers committed at least two high level (more than 20 km/h over the speed limit) speeding offences in a three-year period [1]. On behalf of Austroads, ARRB Group undertook to develop a framework for an intervention to promote safe driving among recidivist speeders. Five key tasks were carried out during the project:

1. a literature review was undertaken to investigate the scale and nature of speeding, with particular emphasis on the issue as it applies to the Australian and New Zealand road networks
2. key models of behaviour change and adult learning principles were reviewed
3. a literature review and consultations were carried out to identify interventions currently available for recidivist speeders
4. a best practice intervention framework was created
5. an appropriate method for the trial and evaluation of the proposed intervention was put forward.

This paper is focused on the fourth task (which was guided by the outcomes of tasks one through three) and describes a potential intervention option that combines two in-vehicle technologies and driver education.

Keywords

Recidivist, speeding, repeat offender, intervention

Introduction

The relationship between speed and crash risk is well established. Austroads [2] reported that inappropriate speed contributes to approximately 29% of fatal crashes in Australia and 35% of fatal crashes in New Zealand. The National Road Safety Action Plan 2007-2008 [3] notes that moderation of speeds is critical in establishing a safe road system. Indeed, the safe system approach requires, in part, that:

- speed is managed, in a way that takes account of the risks on different parts of the road system
- road users are advised, educated and encouraged to obey road rules
- enforcement and penalties are applied to deter road users from breaking the [3].

Because even low end speeding increases the collective risk to road users, there has been substantial investment in preventing such behaviour. In Australia and New Zealand there is a heavy reliance on enforcement initiatives, backed up by mass media campaigns like the RTA’s Speeding: No one thinks big of you campaign and the Transport Accident Commission’s (TAC) Pictures of you campaign. Drivers for whom the deterrent effect of such measures falls short find themselves subject to increasingly severe penalties. For example, larger fines and more demerit points apply for higher speeds. At sufficiently high speeds, or following the accumulation of a sufficient number of demerit points, a driver’s license can be suspended or disqualified. Vehicle impoundment has also been adopted for ‘hoon’ behaviour in some jurisdictions. An intensive intervention for recidivist speeders may be a useful adjunct to this penalty structure and one of the actions listed in the 2007-2008 National Road Safety Action Plan is establishment of a best practice model for the rehabilitation of repeat speeding offenders.
The appropriately target an intervention, it is necessary to understand the intended audience. Based on a comprehensive review of literature, Fylan et al. [4] highlight four subtypes of speeder.

**Unintentional speeders** are drivers who speed because they have limited knowledge of traffic rules, are not aware of the correct speed limit, experience a lapse of attention or temporarily underestimate their speed.

**Moderate occasional speeders** consider themselves to be safe and skillful drivers, and exceed the limit by an amount they believe to be relatively small. This group do not identify themselves as speeders, and typically do not experience pleasure from speeding.

**Frequent high speeders** are aware that they drive faster than average and may acknowledge that this represents an increased risk. Frequent high speeders nevertheless believe that they personally are safe drivers. This group has a higher intention to speed and a more positive attitude to speeding than Unintentional Speeders and Moderate Occasional Speeders, and they tend to speed more often and experience more pleasure and emotional outlet from driving. Importantly, these drivers take more risks and report more crashes or traffic violations. Frequent high speeders are usually more experienced drivers and are more likely to be men. Fylan et al. suggest that it is necessary to address the fact that for these drivers, speeding has become a habit.

**Socially deviant drivers** acknowledge that their speeding is dangerous. This group enjoys taking risks and breaking rules and may engage in more general law breaking. Socially deviant drivers score higher than other groups on the personality measures of psychoticism, thrill, adventure seeking and boredom. These drivers are more likely to be young, and drivers who grow out of this behaviour pattern are most likely to do so by the age of 26 years.

Fylan et al. note that while both unintentional and moderate occasional speeders are only likely to exceed the speed limit by a small amount, frequent high-speed drivers and socially deviant drivers will show a much wider range of speeds. Frequent high speed drivers and socially deviant drivers would appear to be the most appropriate target groups for an intervention aimed at recidivist speeders.

This paper, and the Austroads report upon which it is based [5], is focussed on describing the development of an intervention framework for recidivist speeders in which education and driving assistance technologies are combined.

**Method**

A literature review, stakeholder consultations, and a review of health behaviour change models and adult learning principles were undertaken in arriving at recommendations for a framework intervention for recidivist speeders. The literature review was performed to identify existing technological and education based speeding prevention interventions and how effective these have been, and was based on papers identified using a search of the internet and the following databases:

- Transportation Research Information Service (TRIS) online
- International Transport Research Documentation (ITRD)
- PsycINFO (USA, via Dialog)
- ERIC – Education Resources Information Center (USA)
- The Australian Transport Index (ATI).

The stakeholder consultation component of the project was also aimed at identifying existing interventions for recidivist speeders. The consultation was focussed on Australian and New Zealand road authority initiatives (overseas material was sourced via the literature search). Only New South Wales and South Australia operate programs for recidivist speeders (Speeding Traffic Offenders Program [STOP])
and the Driver Intervention Program, respectively) although some other jurisdictions are contemplating such initiatives.

Models of behaviour change and the principles of adult learning were also reviewed to assist in the identification of the cognitive and social factors that should be addressed by an intervention for recidivist speeders. The models investigated included the Health Beliefs Model, the Theory of Planned Behaviour and the Theory of Reasoned Action, Social Cognitive Theory and the Elaboration Likelihood Model.

The interventions that have been used in Australia and overseas to prevent speeding provided useful information on how a course for recidivist speeders could be administered. The few intervention examples that have been subject to outcome evaluation, along with some of the more well-researched behaviour change models, provided useful information on potentially valuable content and delivery approaches. This body of knowledge (on evaluated interventions and behaviour change models) was drawn together to arrive at a new framework intervention which combines an in-vehicle technology and an education and motivation based component that would each represent a new initiative.

**Results**

Based on the findings of the literature review, stakeholder consultations and review of health behaviour change models and adult learning principles, it appears that a promising option for intervention with frequent high-speed drivers and socially deviant drivers as described by Fylan et al. [4] is a program that combines the use of in-vehicle data recorders (IVDRs) and intelligent speed adaptation (ISA), both of which have been successful in promoting reductions in unsafe driving [6,7,8], with an education/motivation component delivered during group sessions. Group sessions provide a forum for addressing many of the factors that health behaviour change models suggest influence behaviour, and are a key component of speeding interventions developed to date, which evaluations have supported with preliminary evidence of success.

The first column of Table 1 and Table 2 list the components that adult learning principles, the Health Beliefs Model, the Theory of Planned Behaviour, the Theory of Reasoned Action, Social Cognitive Theory and the Elaboration Likelihood Model suggest are important in effective behaviour change interventions. The second column describes which theory or theories the construct forms part of. The third column provides a brief explanation of how the construct could be addressed using a combination of in-vehicle technologies and group ‘face to face’ sessions.
<table>
<thead>
<tr>
<th>Important intervention components</th>
<th>Key source of theoretical evidence that it is important</th>
<th>How the proposed intervention could address the component</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interactivity</td>
<td>Adult learning principles, Elaboration Likelihood Model (ELM)</td>
<td>Group discussion is a key part of proposed intervention.</td>
</tr>
<tr>
<td>Tailored to the group/individual</td>
<td>Adult learning principles, ELM</td>
<td>Personalised feedback based on the IVDR and the potential to tailor discussion content around this, and around the issues expressed by the group/individual.</td>
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<td>Allow time for reflection</td>
<td>Adult learning principles, ELM</td>
<td>Multiple sessions, spread over a period of time, are proposed.</td>
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<tr>
<td>The setting of goals</td>
<td>Social Cognitive Theory (SCT)</td>
<td>IVDR enables the setting of clear and measurable goals.</td>
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<tr>
<td>Build confidence that progress toward goals is being made</td>
<td>Adult learning principles</td>
<td>IVDR enables the setting of clear and measurable goals that can be monitored.</td>
</tr>
<tr>
<td>A comfortable learning environment</td>
<td>Adult learning principles</td>
<td>Trained group facilitators recommended, it would also be important for the group discussions to be preceded by discussion of appropriate conduct in the group environment.</td>
</tr>
<tr>
<td>Demonstrate how the issue is meaningful to the audience</td>
<td>ELM</td>
<td>Group speed profiles could be used to highlight ‘problem areas’ and how these particular behaviours contribute to crashes could be discussed in the group setting.</td>
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<td>Well constructed and convincing messages</td>
<td>ELM</td>
<td>‘Market testing’ of course materials would be important in the development phase.</td>
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<td>Messages are repeated</td>
<td>ELM</td>
<td>Multiple sessions are proposed, enabling key messages to be rephrased and repeated.</td>
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<td>Absence of environmental constraints that make the behaviour difficult or impossible</td>
<td>Health Belief Model, Theory of Planned Behaviour (TPB), SCT</td>
<td>This can be included in discussions in the group setting. Exercises could include identifying different sources of pressure from other road users to speed, and to change the relative importance given to each influence, and identifying/rehearsing methods of resisting pressures to speed. Being able to see initial successes through IVDR data will reinforce the message that participant’s speeding is within their own control.</td>
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<td>Participants form a strong intention, or make a commitment to perform the behaviour</td>
<td>TPB</td>
<td>If commitment can be secured in the group setting (possibly through the use of a reward system), the combination of not wanting to let the group down and the potential to monitor adherence to any commitments made could be a powerful change motivator.</td>
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<td>Participants believe that the likely advantages of not speeding outweigh the likely disadvantages</td>
<td>TPB, SCT</td>
<td>IVDR enables the setting of clear and measurable goals and thus also allows for the introduction of rewards for success. Group discussion provides a good format for providing information on enforcement penalties and discussing the negative consequences of speeding, such as the greater cost of car insurance, and the implications of being banned from driving, such as the loss of a job and social life, and increased day-to-day hassles [4]. Some information about how speed contributes to crashes is appropriate, but should not be a key focus as most drivers think this outcome, although negative, unlikely.</td>
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| The person’s emotional reaction to performing the behaviour is more positive than negative | SCT | Group discussions provide an appropriate format for topics like those put forward by Fylan et al. [4]:  
- Would it not be healthier to get one’s kicks in contexts (extreme sports, for example) where the only one whose life is at risk is oneself? Is it really appropriate to feel good about putting other people at risk?  
- We are ready to criticise others for their selfish and dangerous behaviour on the road. Are we immune from doing the same things? (hypocrisy)  
- The good feelings that can arise from driving more slowly, such as feeling less anxious and feeling more in control.  
- We underestimate the extent to which emotion influences our behaviour. We need to gain control of our driving, not let our emotions control us. |
| The participants perceive normative pressure to perform the behaviour | TPB, SCT | Comparing group speed data with that of a typical driving population will highlight the fact that they are behaving abnormally, and the IVDR would make it possible to set measurable group goals to facilitate normative pressure from within the group of participants. |
| Help participants break the habit of speeding | Not typically included in models of behaviour change because it is tautological [9] | IVDR data provides a record of driving behaviour that may assist drivers overcome habitual speeding by offering them tangible goals associated with alternative driving behaviours. In-vehicle alert systems also help make drivers cognizant of the fact that they are speeding. It is recommended that the intervention occur over a period of time. The longer the intervention can prevent the behaviour the more time drivers have to replace speeding with safer driving habits. |
Discussion

The intervention framework proposed for frequent high-speed drivers and socially deviant drivers is a program that combines IVDRs and ISA with an education/motivation component delivered during group sessions. Each of these two components is discussed in more detail below.

In-vehicle technologies

In-vehicle data recorders (IVDR) are on-board devices that record information about the movement, control and performance of the vehicle. The systems currently available can respond to excessive speed, defined in relation to a pre-defined upper limit, and also with many of the consequences of speeding, e.g. sharp decelerations, high lateral forces when cornering or changing lanes. Essentially, IVDR systems consist of:

- algorithms that can associate risk with specific vehicle movement (speed and forward and lateral acceleration)
- accelerometers, which measure the forces imparted on the vehicle while driving
- GPS to track location and provide inputs to speed measurement
- a mobile phone connection to transmit data from the vehicle over a network for website access
- a website on which performance data for driver review is accumulated.

A dashboard display can be used to give instant, ongoing feedback to the driver about the safety of their driving. For example, a green light to indicate safe driving, yellow to indicate that the driving is moving beyond what can be considered safe, and red to indicate an unsafe action. The web-based component accumulates trip information which can be aggregated to weekly or monthly driving reports. IVDRs are becoming widely available and are finding a range of applications. IVDRs have reached the point where the reliability of the technology, the cost, and the ease with which the information can be displayed and interpreted makes them viable for a range of applications, remedial programs included.

Intelligent speed adaptation (ISA) is a generic term used for a class of ITS which either provides feedback to the driver when the prevailing speed limit is exceeded or limit the vehicle’s speed to comply with the speed limit [10]. ISA systems include a device fitted to the vehicle (mounted on the dashboard) which alerts the driver to the speed limit of the road on which the vehicle is travelling [11].

The present generation of IVDRs can process only absolute speed and changes in speed and acceleration while ISA technology as it stands does not record when the speed limit has been exceeded. If an IVDR can be configured to communicate exceeding the speed limit in addition to high risk braking and cornering behaviours, then comprehensive feedback about instances where speed limits were exceeded or speed was too fast for the conditions, resulting in excessive braking or cornering forces, would be available to the driver.

The importance of instantaneous feedback in improving performance has long been understood (see Welford [12] for a discussion of relevant studies to that date); at the same time, trip or weekly reports based on data collected by the IVDR could be used to offer a consolidated picture of performance to be discussed with a program facilitator or supervisor. This facilitates the setting of goals against which progress can be measured. Goal setting is widely recognised as essential for the initiation and maintenance of behaviour change [13] as goals motivate people to lessen the discrepancy between their current circumstance and the desired circumstance [14].
Group discussions

To ensure the highest possible success rate for a program based around the use of ISA and IVDR technology, it will be necessary to have ongoing contact with course participants to review their driving behaviour as the intervention progresses, as well as to incorporate relevant motivational and educational content. Group discussion was identified in the literature review as an element that seems to make for a successful program. Feedback about driving behaviour is the critical ingredient of IVDR packages. An arrangement that brought participants together to discuss their feedback, along with other driving issues, could be a very effective way to proceed.

The size of the intervention groups has important cost implications. Research provides no definitive guidance as to the optimal size of intervention groups, but suggest that because driver offender courses should be intensive and deal with drivers’ personal beliefs and values, small groups are preferable [15]. In addition, larger groups are associated with problematic group processes [15]. For example, ‘social loafing’ and ‘free riding’ (in which some members of the group withdraw from the process), and a feeling of anonymity among group members. Although an intervention based on larger (than 12 people) discussion groups would be less expensive, reductions in the impact of the course messages may make it a false economy.

The selection of content to be covered during group discussions with program participants will require careful consideration. It is unreasonable to expect participants to attend a very large number of group discussions, or to attend lengthy group discussions (especially given that these will need to be offered during non-business hours, probably evenings). This means that course content must be limited, and selected for maximum behaviour change impact. The components that appear to be important in a behaviour change intervention as identified during the project, and the way in which each is addressed in the intervention framework put forward were presented in Table 1.

Piloting

Before a course for recidivist speeders could be made available it would be necessary to run a trial and possibly a demonstration project. It would also be crucial to consult extensively with representatives of the police and court systems to guide decisions about exactly how recidivist speeders could be compelled, or simply encouraged, to participate and appropriate eligibility criteria.

Key disadvantages of the proposed framework

A significant hurdle to overcome in achieving IVDR technology that can communicate breaches of the speed limit is the fact that regularly updated accurate speed limit maps are not available for all Australian roads.

Further, despite their success in modifying driver behaviour while fitted, evidence to date suggests that the benefits that might be achieved using IVDR and ISA technologies alone will not persist in the long term. Further, experience gained during the development of alcohol interlock programs suggests that participants have drink-driving recidivism rates up to 90% lower than non-participants but once the interlock is removed recidivism rates are comparable, and that therefore interventions based around that particular in-vehicle technology should incorporate education, counselling and regular assessment of progress [16].

Of course, adopting a multi-faceted approach such as that suggested in this paper has disadvantages. It will be much more costly to use in-vehicle technologies and an education-based approach than using either alone. Further, the combined ISA/IVDR technology still needs to be developed, a curriculum and supportive materials for the motivation/education component has to be produced and then the intervention program would need to be piloted and refined. All of these are costly exercises that would take several years to complete. This combined in-vehicle technology/education approach is put forward not as the most economical option, but as the option which appears most likely to produce road safety benefits
based on the evidence reviewed. Further, any in-vehicle technology, especially one associated with the collection and reporting of data, may be met with opposition from those who believe that it is invasive.

Lastly, an operational definition of ‘recidivist’ speeder will be required to identify those who might be encouraged to engage in the intervention. To identify frequent high speed drivers and socially deviant drivers based on traffic infringement history, Fylan et al. [4] recommend looking for any excessive speed traffic violation and previous traffic violations (not necessarily speed related) and, in the case of socially deviant drivers, a range of traffic and non-traffic violations.

Conclusion

In summary, a program based on a combined ISA/IVDR system would require substantial investment in equipment, and an ongoing program of monitoring and group discussion would require substantial investment for development and in human resources for delivery. However, based on the empirical and theoretical evidence reviewed it is likely to deliver greater benefits than existing approaches.

References


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