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Managing recidivist traffic offenders: What works?

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Report documentation

TITLE

Managing recidivist traffic offenders: What works?

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ABSTRACT

Drivers who repeatedly and persistently engage in illegal and dangerous behaviours are a threat to the safety of other road users. The aim of this review is to identify various approaches used throughout the world to address recidivism among drivers convicted of offences related to drink and drug driving, speeding, unlicensed driving, and reckless or dangerous driving. Legal and administrative, non-punitive, and technological approaches to manage recidivists were identified. Based on the evidence, recidivism is most likely to be reduced through the use of an holistic and multifaceted approach that is tailored to a specific problem and which includes supervision, therapeutic intervention, and the incorporation of technologies to manage and monitor behaviour. The assessment of offender risk and early intervention will play an important role in this process. The rehabilitation of driving offenders that addresses underlying problems may produce benefits for the individual and society beyond improving road safety.

KEYWORDS

Recidivist, rehabilitation, therapeutic intervention, risk assessment, deterrence

Summary

The propensity for certain driving behaviours to increase the risk of crashing has been well documented. Among these, speeding, driving under the influence of drugs or alcohol, and reckless or dangerous driving are of considerable concern. Drivers who repeatedly and persistently engage in these behaviours are a threat to the safety of other road users. The traditional approach to manage driver behaviour is through the enforcement of traffic laws, the penalties for which are intended to encourage compliance (i.e., general deterrence) or deter offenders from repeating the behaviour (i.e., specific deterrence). While a deterrence-based approach might be effective for most drivers, those who repeatedly offend despite the experience of legal and administrative sanctions may require some other approach.

This report examines the options available to target and reduce recidivism by drivers who speed, drive under the influence of alcohol or drugs, or drive in a reckless or dangerous manner. The aims of this report are to identify the best method to respond to recidivists and develop an understanding of recidivism in South Australia. This review considers three approaches for responding to recidivists, with a section addressing current issues and practices relevant to each type. These are:

- Legal and administrative approaches
- Non-punitive (or therapeutic) approaches
- The use of technology

This information contained in this report was current as of July 2018.

Legal and administrative approaches

These include penalties such as fines, licence sanctions, vehicle sanctions, custodial sanctions, and specialised courts. Legal and administrative sanctions rely on the principles of specific deterrence to prevent recidivism, and while they are effective for some offenders they are ineffective for recidivists. While some suggest this may be due to the low likelihood of detection (as perceived by the offender), a growing area of research investigating differential deterrence (i.e., why some people are more deterrable than others) suggests recidivists may possess characteristics that make them least affected by the threat or experience of legal sanctions (Loughran et al., 2012; Piquero et al., 2011). While legal and administrative sanctions may be ineffective for preventing recidivism among a sub-group of driving offenders they have value in terms of identifying recidivists (e.g., demerit point systems) and for limiting the potential for further harm (e.g., vehicle or custodial sanctions). With some exceptions (e.g., some types of DUI courts), if used in isolation legal and administrative sanctions cannot be expected to reduce recidivism. Therefore, some other approach is necessary.

Non-punitive interventions

Non-punitive interventions adopt various approaches with the intent to change the behaviour of recidivist offenders. Other jurisdictions around the world have recognised the need to go further than relying on deterrence to prevent recidivism and have implemented a range of strategies including psychological screening, intensive supervision, and therapeutic interventions to manage and rehabilitate recidivist offenders. Collectively, research in this area highlights the need to take full advantage of all opportunities for early intervention by identifying drivers with a high risk of recidivism: the earlier the screening and provision of treatment, the better the road safety outcomes. Each offender presents with unique characteristics, personal needs, comorbidities, and underlying factors that need to be targeted for their rehabilitation. Therefore, programs that combine multiple components and approaches have a greater likelihood of effecting change.

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Technology

There has been some advancement in the development and use of a variety of technologies to reduce recidivism either by managing driver behaviour or improving the ability to detect or identify offenders. Technology is playing a role in a modern approach to driving recidivism. Alcohol interlock programs are in use globally and have demonstrated success at preventing drink driving, albeit limited to the time during which the offender is on the program. Trials with other technologies, such as intelligent speed adaptation (ISA), also show that, once removed, the positive effect of the technology is lost. While there is some recognition of the potential uses of technology, these as yet have not been fully explored. For example, it has been noted that technology could form a useful part of intervention programs as a means to prevent behaviour (e.g., alcohol interlock) but also as a tool for exploring behaviour (e.g., times when interlock was triggered). In-vehicle monitoring devices may also provide information about driving behaviours and patterns that could also be useful in therapeutic settings. To the best of the authors' knowledge such an approach has not been adopted.

Discussion

Based on this review it would appear that South Australia is presently comparable with other jurisdictions in terms of the legal and administrative sanctions for driving offenders and assessment of drink and drug drivers, but there remains room for improvement in these, and other areas. At present there are no driver intervention or rehabilitation programs in South Australia, and only recidivist drink and drug drivers or drink/drug drivers with child passengers are legally required to undergo assessment for substance dependence. In order to improve the management and rehabilitation of recidivist offenders, South Australia could consider adopting an innovative approach combining punitive sanctions and technology with a therapeutic intervention to manage and treat the complex issues underpinning problematic driving behaviours in the recidivist offender. An essential component of this approach is the assessment of an offender's level of risk.

Offender risk assessment is important to identify the factors that underpin the offender's behavior. It is also important to distinguish between different problem behaviours, as the constellation of factors associated with one behavior are quite often different to those associated with another. While some driving offences may be considered the result of driver error, it is evident that in the case of recidivist offenders the behaviour is most likely symptomatic of some other underlying issue. Consequently, rather than respond to this as a driving behaviour (e.g., licence sanctions) it is necessary to adopt a therapeutic approach that addresses the issues that underpin the behaviour. Offender risk assessment is also necessary as the success of an intervention depends on matching the intensity of treatment with the level of risk.

Adopting an evidence-based approach to recidivist offender rehabilitation that addresses the underlying causes of the behaviour can be expected to contribute to meeting the targets of the *SA Strategic Plan*, not only with regard to reductions in recidivism and to meet road safety targets, but in other priority areas. For some, the detection of an initial driving offence may, for example, identify individuals dependent on a substance who would otherwise go untreated. Attendance at an appropriate mandated treatment (triggered by the driving offence) may be the catalyst for change that improves the individual's overall well-being, functioning and quality of life in other domains (e.g., physical and mental health, lifestyle, relationships, employment, social-functioning, etc.). The benefits of this approach could extend to the individual and society, not only with regard to road safety, but also to other priority areas such as health, community, and prosperity.

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Recommendations

While legal and administrative sanctions are generally ineffective for preventing or reducing recidivism they are an important aspect of offender management. However, these sanctions alone are insufficient to alter the behaviour of recidivist offenders. Vehicle technologies that restrict vehicle control are effective at preventing offending but are inadequate to produce genuine behaviour change. Therapeutic approaches have demonstrated some success in changing the behaviour of traffic offenders and it is considered viable that if combined with legal sanctions and technological devices this would give the offender the best possible chance to change their behaviour. Based on these general observations and the more detailed findings outlined in this report the following recommendations regarding the management of recidivist driving offenders are offered:

- The management of recidivist driving offenders would be best served by the adoption of an holistic approach, including the assessment of risk, legal and administrative sanctions, and the incorporation of technology.

- There would be benefits in offenders undergoing risk assessment to identify the underlying causes of behaviour and appropriate therapeutic treatment needs.

- There are at present no therapeutic interventions for driving offenders in South Australia and so the adoption of a therapeutic approach would require the development of appropriate intervention programs. Driving offender intervention or rehabilitation programs must be based on psychological principles of behaviour change and evidence of what works for offender rehabilitation.

- The use and efficacy of existing penalties can be improved with a higher level of supervision and use of various technologies to prevent offending and monitor offender behaviour.

The recommendations are aligned with the themes highlighted in the *SA Strategic Plan* priority for South Australian Ideas, particularly using innovation and boldness to be a leader in social reform, to upturn convention, and to always seek improvement.

Conclusion

Recidivists are a distinct group who persistently offend despite having experienced legal sanctions. For many of the offenders in this group, traditional deterrence measures will be ineffective. Research investigating differential deterrence suggests that recidivists are most likely to possess characteristics that make them least affected by the threat or experience of legal sanctions. Therefore, some other approach is required. Current evidence indicates that in-vehicle technologies are reasonably effective for controlling or preventing undesired behaviours, although only while the technology is installed. Well designed therapeutic rehabilitation programs hold some promise; most of the evidence is for drink or drug driving and involve treatment for alcohol/drug dependence rather than driving behaviour. An holistic and multifaceted approach to offender rehabilitation including supervision, therapeutic intervention, the incorporation of technologies to manage and monitor behaviour, and that is tailored to a specific problem, has the potential to reduce recidivism. The assessment of offender risk and early intervention will play an important role in this process. Furthermore, the rehabilitation of driving offenders that addresses underlying problems (e.g., drug/alcohol dependence, risk taking, etc.) may produce benefits for the individual and society beyond improving road safety.

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1 Introduction

The propensity for certain driving behaviours to increase the risk of crashing has been well documented. Among these speeding, driving under the influence of drugs or alcohol, and reckless or dangerous driving are of considerable concern. Drivers who repeatedly and persistently engage in these behaviours are a threat to other road users. The aim of this review is to identify various approaches used throughout the world to address recidivism by drivers who speed, drive under the influence of alcohol or drugs, or drive in a reckless or dangerous manner.

The traditional approach to manage driver behaviour is through the enforcement of traffic laws, the penalties for which are intended to encourage compliance (i.e., general deterrence) or deter offenders from repeating the behaviour (i.e., specific deterrence). While a deterrence-based approach might be effective for most drivers, those who repeatedly offend despite the experience of legal and administrative sanctions may require some other approach.

This report examines the options available to target and reduce recidivism by drivers who speed, drive under the influence of alcohol or drugs, or drive in a reckless or dangerous manner. The aims of this report are to identify the best method to respond to recidivists and develop an understanding of recidivism in South Australia. This review considers three approaches for responding to recidivists with a section addressing current issues and practices relevant to each type. These are:

- Legal and administrative approaches
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- The use of technology.

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Approaches for addressing recidivist traffic offenders were identified by a review of scientific literature. To ensure the best evidence was considered only programs relevant to the offences of interest and that have been subject to evaluation were included. Drink (and to a lesser extent drug) driving has received a considerable amount of research interest while comparably little has been done in the areas of speeding, unlicensed driving, and reckless or dangerous driving. Clark and Edquist (2013) have noted the difficulties in identifying the most effective interventions for recidivists due to inconsistencies in research methodology between studies, and complicated factors in offender populations, which have hindered the soundness of study designs and made it difficult to make comparisons across evaluations. The following concerns have been consistently raised in the research literature (e.g., af Wåhlberg, 2011; Clark & Edquist, 2013; Palk et al., 2015):

- Participant samples are non-homogeneous, yet rehabilitative programs often undertake a 'one size fits all' intervention. For instance, some evaluations include: first offenders and recidivists, offenders having committed different traffic offences, and differences between individuals in terms of the reasons for traffic offending.

- True control groups can be difficult to identify or access. For example, participants randomly allocated to a control group have typically still received some form of intervention, be it in the form of a simultaneously occurring sanction (e.g., fines or loss of licence), or simply just being detected by the police, and are therefore not truly a 'non-treatment' group because some form of treatment effect is still likely.

- Operationalisation of key variables is not universal rendering comparisons between evaluations difficult (e.g., recidivism may be defined in one program as having two or more traffic offences, while another may require multiple high offences). This leads to variations in estimates of program effectiveness. For example, recidivism outcome

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measures of crash rates, number of re-offences, amount of time until re-offending or program content recall will likely all yield different effectiveness outcomes. Issues regarding the definition of recidivism are discussed in more detail below.

- Self-report data is open to social desirability biases and typically leads to more positive results in regard to assessments of effectiveness, yet is often criticised for its low correlation with actual positive driving behaviour change. As such, crash rates or further driving offences post completion of a driver intervention have been favoured as more reliable in measuring behaviour change, but must be interpreted cautiously. For example, young drivers' (below 25 years of age) crash rates tend to decline over time, even in the absence of any intervention, because of their increased driving experience (af Wåhlberg, 2011). Ultimately, af Wåhlberg (2011) suggests using multiple outcome measures for more reliable estimates of program efficacy.

1.1   Defining recidivism

An important aspect of this review, and an issue that is relevant to policy and the recommendations of this report, is how a recidivist offender is defined. The basic definition is essentially any driver who reoffends following conviction for a prior offence. This, however, is rather simplistic and our approach to recidivism needs to be more nuanced. The reasons for this will become clear as questions regarding the definition are resolved.

One key issue requires consideration of the nature of the offence: do we consider recidivism to be a future offence of the same type (e.g., speeding), or include multiple offences (e.g., drink driving, speeding, dangerous driving)? Furthermore, should this definition be extended to consider a broader range of offences, including those not related to driving? Research in this area indicates there may be important differences between different types of offenders, which will influence how we respond to the problem. For example, a driver with only one type of offence (e.g., drink driving) may have a specific problem (in this case dependence on alcohol), whereas someone with a diverse history may have a general problem with impulse control. What works for one offender may not be the best approach for another. This problem also underscores the importance of assessing the risk of offenders in order to identify who is likely to reoffend and appropriate interventions for the offender.

Another consideration in the definition of a recidivist is the nature of the offending. Someone with multiple speeding offences may be the result of a series of mistakes arising from a lack of awareness of the speed limit of the road they are driving on or that they are over the speed limit. In contrast, the speeding behaviour of other offenders may be more deliberate and a routine part of their driving behaviour. While both types of behaviour are a concern for road safety, in the context of this report, it is perhaps the deliberate behaviour with which we should be most concerned. Having said this, there are options for managing both types of behaviour (see Discussion) and a means to assess offender risk will be essential to the implementation of this.

The definition of recidivism adopted in the research literature must also be considered as these can vary across studies (e.g., re-arrest vs. conviction, length of follow-up period). Research findings must therefore be interpreted in light of the extent to which the definition used in research corresponds with the one adopted for this report. Most of the research is examining the effect of a type of treatment (e.g., penalty, therapy) on subsequent behaviour and therefore considers only offences of the same type. This makes sense, because if, for example, you want to know what prevents drink driving you measure the impact of an intervention on drink driving. Another aspect of recidivism is the time-frame for reoffending. The literature appears to generally adopt a five year period (i.e., any repeat offence within the five year period of the first (also called "index") offence). The time period is important: too short and it may fail to capture future offences, too long and it may alter the nature of the phenomenon (e.g., two offences 10

years apart is different to 10 offences in a two year period). There is some indication that most drivers who reoffend do so within the first three years (e.g., Donovan et al., 1990; Chaudhary et al., 2011; Watson et al. 2015). Another issue with regard to reoffending time periods is whether it includes the period of incapacitation (e.g., imprisonment, licence suspension, vehicle impoundment, alcohol interlock, etc.). While further offending during the period of incapacitation is curtailed, evidence discussed throughout this report indicates offending often recommences once this period ends. Arguably, to truly reflect the effectiveness for an intervention to prevent future offending the time period to identify recidivism should account for this period and consider effects over the longer-term.

From a legal perspective, South Australian legislation relevant to driving offences typically defines repeat offences as subsequent offences of the same or similar type within the five year period proceeding the date of the current offence. In general, consideration of repeat offending does not consider offences of another type. For example, a previous drink driving offence is not considered for speeding offences and speeding offences are not considered with regard to drink driving offences. This is an important consideration because it essentially excludes drivers with a history of poor behaviour in a number of areas.

A final note for consideration is the definition of recidivism adopted by the *SA Strategic Plan* (Government of South Australia, 2011), of which Target 19 is the reduction of reoffending. Under this target a recidivist is defined as a person aged 10 or older who has been proceeded against by police more than once during a financial year. This definition is at odds with most other definitions which apply a longer time frame and may not be suitable for driving recidivists where licence suspension or vehicle impoundment (for example) restrict the offender's ability to offend in that period.

1.2   Project relevance to the *SA Strategic Plan*

South Australia's Strategic Plan is a guide to ensuring the future wellbeing of the State by growing economic prosperity, attaining sustainability, improving safety, fostering creativity and innovation, building communities, and expanding opportunities. The Plan has six priority areas – community, prosperity, environment, health, education, and ideas – and identifies a number of visions, the goals necessary to achieve these visions, and targets to measure progress towards them.

This project is relevant to the *Safe communities and healthy neighbourhoods* priority which encompasses the goals of reducing reoffending and ensuring South Australians are safe and protected at work and on the roads. More specifically, the findings and recommendations of this report will provide guidance on achieving Target 19 (reducing repeat offending) and Target 22 (reduce road fatalities and serious injuries by at least 30% by 2020). These targets are complementary in that achieving reductions in driving offence recidivism will also help achieve a safer road environment.

1.3   Organisation of the report

Each section provides an overview of the relevant research for each of the approaches (legal and administrative, non-punitive, and technology). Each section concludes with a summary table outlining the offences for which the identified interventions are considered appropriate, including a brief comment on the benefits of the intervention.

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2 Legal and administrative approaches

The traditional approach to regulating driver behaviour is through the application of laws and penalties governing safe and acceptable behaviour on the roads. While common sense, courtesy, and self-interest will encourage some level of compliance, without the threat of legal or administrative sanctions more people than already do would break the rules and any safety benefit would be lost (Cunningham, 2008). The goals of such an approach to regulating behaviour are to encourage desired behaviour through the deterrence of undesired behaviours and to punish those who breach the rules. Researchers have long held to the notion that there are two types of deterrence: *general deterrence* applies to the general population and *specific deterrence* applies to individuals who have experienced punishment for breaking the law (Stafford & Warr, 1993).

When considering the legal and administrative approaches for dealing with recidivism we are basically asking how effective are penalties as a specific deterrent for those who have been caught. Deterrence theory suggests deterrence is influenced by three factors: the certainty of detection (i.e., risk of detection), the severity of punishment, and how quickly the individual is punished. Setting aside swiftness for the present (with very few exceptions, legal and administrative punishments are not swift), the present state of research suggests severity and certainty have the greatest effect on deterrence and, of these, certainty is likely the most important (Bouffard et al., 2017; Loughran et al., 2012; Szogi et al., 2017). Certainty is usually considered in terms of the risk or likelihood of detection by police and is therefore influenced by enforcement levels and practices.

In this section legal sanctions are those imposed by the criminal justice system while administrative sanctions are those imposed by the agency in charge of licensing and registration. Broadly speaking the following types of sanctions are applied to *all* traffic offenders although it is common for penalties to follow a tiered system such that subsequent offences attract stronger sanctions. The sanctions include: fines, demerit points, licence sanctions, vehicle sanctions, custodial sanctions, specialised courts, other judicial measures, and legislation. The efficacy of these approaches are discussed further below.

2.1 Fines

Fines are undoubtedly one of the most common sanctions applied to traffic offenders. It is common for the value of a fine to differ across types of offences, and also increase in line with the severity of a particular offence (e.g., speeding by more than 30km/h over the limit has a higher fine than speeding by less than 10km/h over the limit). Another common practice in order to increase deterrence is to periodically increase the penalty (i.e., fine) for an offence. While increasing the penalty is one potential means for increasing deterrence there is little evidence to support this approach. Having said this, however, a penalty is a necessary component of deterrence and it should be of sufficient weight so as to offer some deterrent; higher fines may reasonably be expected to be a larger deterrent than lower fines. However, research on the effects of increased fines on subsequent court appearances have found no relationship between the fine amount and likelihood of reappearance in court (Moffat & Poynton, 2007), while others have found drivers who receive a speeding citation were twice as likely as those who did not to receive a further citation in the following 12 months (Lawpoolsri et al., 2007). Lawpoolsri et al. (2007) also found that drivers receiving an additional sanction – probation before judgement (see Section 2.5) – were significantly less likely to receive a subsequent speeding citation. An investigation of the effects of increased speeding penalties on recidivism rates in Queensland demonstrated small but statistically significant reductions in recidivism (Watson et al., 2015). Following the introduction of increased penalties this study also found evidence of fewer offences but those penalised under the increased penalties demonstrated shorter delays until re-offence compared to those under the original

penalty regime. This study also found evidence that increased penalties had less effect on the more persistent and problematic offenders (Watson et al., 2015).

2.2 Licence sanctions

Licence sanctions are measures taken against a person's licence, such as disqualification, suspension or cancellation, making it illegal for the person to operate a motor vehicle. In some cases such measures can be enforced on the spot for drink/drug driving offences, be the result of a demerit points system (DPS), or the result of a court sentence or order. Research has found that licence sanctions provide a good general deterrent, but not a specific deterrent for drink driving (Fell & Scherer, 2017). Fell and Scherer (2017) found administrative licence suspension (i.e., suspension of licence by licensing body) was an effective general deterrent for drivers with low level BACs (≥.01) but ineffective for intoxicated drivers (BAC ≥.08).

Licence sanctions can vary in length depending on the severity and type of offence, and repeat offences often attract longer disqualification/suspension periods. Of the studies identified examining length of licence sanctions the findings are somewhat mixed. Fell and Scherer (2017) found that any length of disqualification reduced alcohol related fatalities but longer periods appeared to be better than shorter. Interestingly, significant reductions in alcohol-related road fatalities were observed for low level BAC drivers (≥.01) but no observable change in fatalities involving high level drink drivers (BAC ≥.08). An Australian study found that while any length of disqualification period was effective, longer periods did not reduce recidivism (Moffatt & Poynton, 2007). The available evidence suggests that in terms of specific deterrence licence sanctions are insufficient to prevent recidivism. While much of the evidence addresses drink driving it is not clear the extent to which this may be true for other offences. It would appear that these findings are due to the nature of the offender, with evidence indicating people who drink drive have higher alcohol consumption levels and have many similarities with problem alcohol users (Mann et al., 2003).

Another aspect of licence-based sanctions that are an important part of many jurisdictions' offence management measures is the Demerit Point System (DPS). Under DPS driving offences accrue (or in some cases lose) points against or from the driver's licence and will, upon reaching a points threshold, generally trigger a licence sanction. The benefits of a DPS is that it provides a good general deterrent, allows authorities to identify re-offenders, and allow an opportunity to correct behaviour (Klipp et al., 2013). As with other legal and administrative penalties DPS require a suitable level of enforcement to be effective. In a number of European jurisdictions (e.g., Germany, France, the UK) licence sanctions triggered by accumulation or loss of points require offenders to either undergo some form of assessment and/or complete some form of driver remediation program, and offenders are unable to obtain their licence until this has been completed (Klipp et al., 2013). In terms of recidivism a study of the effect of DPS in Norway found that fully licensed drivers with previous penalty points are more likely to incur new points but also that drivers with four or more points (one or two offences away from loss of licence) were found to have a reduced probability of incurring new points (Sagberg & Ingebrigsten, 2018). It should be noted that as part of the Norwegian DPS system drivers receive a warning letter advising them of the consequences of further penalty points. These findings suggest that drivers who incur penalty points exhibit behavioural tendencies that lead to further infringements and points but that at some threshold the impending loss of licence serves as a deterrent to some.

Licence-based sanctions generally result in an individual's loss of the legal right to drive, which may have the unintended consequences of leading some to drive while unlicensed. It has been noted that in some cases drivers will drive while disqualified, an offence in itself, and forgo the process of legally re-obtaining their licence, as the process is undesirable and they have successfully driven unlicensed previously, making the possession of a licence irrelevant (Baldock, 2013; SAC, 2009). It is possible that

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simply removing the right to legally drive a vehicle is insufficient to prevent further offending, particularly if the offender's experience is one of avoiding detection and punishment (Loughran et al., 2012; Piquero et al., 2011; Stafford & Warr, 1993).

2.3 Vehicle and registration plate sanctions

Vehicle sanctions are actions taken against an offender's vehicle and include wheel clamping, impounding, and forfeiture. These have been effective for preventing recidivism (Goodwin et al., 2015; Lapham et al., 2007; Voas & De Young, 2002), the likely mechanism of which is the removal of the vehicle as the instrument of offending, although this appears to be limited to the period during which access to the vehicle is restricted. However, from an administrative perspective jurisdictions have found it difficult to recover the costs of impoundment and sale of forfeited vehicles also fails to recoup costs (Voas & De Young, 2002). Furthermore, in some jurisdictions some offenders have been found to not recover their vehicles from the impound (due to associated costs and processes) while others appear to circumvent the measure with the purchase of another vehicle (Voas & De Young, 2002). In Australia, drivers who may be impacted by impoundment laws have indicated that they would simply drive a cheap, replaceable vehicle or attempt to escape and evade police rather than have their vehicle taken (Leal et al., 2009). Such comments suggest laws seen as overly harsh may have a negative impact on safety, as offenders, instead of ceasing the behaviour, may rather commit other offences in an effort to escape the consequences.

While the evidence suggests restricting access to or ability to use a vehicle increases the time to next offence, research in this area has failed to determine whether these effects are simply due to an inability to offend or due to a deterrent effect. Furthermore, there is some evidence that the effect of vehicle sanctions, specifically forfeiture, may be limited to the time during which the sanction is in effect (Lapham et al., 2007).

Registration plate sanctions include the use of special plates, stickers, and in some states confiscation of plates, and have primarily been used for DUI or unlicensed driving offenders (Voas et al., 2008). In some US states special "family plates" are issued that allow family members to drive an offender's vehicle but allow the police to easily identify and intercept vehicles to determine who is driving. Stickers are a similar approach used in several US states to identify vehicles for which registration had been cancelled (usually for driving while suspended). This was usually achieved by police at the time of detection, with the sticker placed on the registration plate to identify that the action had taken place. The presence of the sticker thus enabled police to identify and intercept vehicles to determine if the driver was properly licensed (Voas et al., 1997). Goodwin et al. (2013) note that the use of special plates had never been evaluated and that the use of stickers had mixed results with evaluations demonstrating reduced recidivism in Oregon but not in Washington, while also noting that the practice has been discontinued.

Several US states also confiscate or impound plates of offending (typically DUI) drivers. The plates are removed by the arresting police at the time of the offence and the offender may also be required to surrender the plates of any other vehicles they own. An evaluation of the Minnesota plate impoundment law found that it increased the time to the next DWI offence, particularly in the months immediately following the offence but also beyond the length of the impoundment period (Leaf & Preusser, 2011). Driving while suspended offences were also reduced (Leaf & Preusser, 2011).

While special plates or marking licence plates with stickers could be used in a modern enforcement system, Automatic Number Plate Recognition (ANPR) technology (see Section 4.2) fulfils the same purpose – allowing police to identify vehicles of interest. It is possible that physically branding the vehicle of an offender may have an effect on behaviour as a physical reminder that police will be more interested

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in the vehicle (as opposed to a more subtle ANPR approach), and some non-legal sanctions (e.g., peer disapproval, feelings of shame or guilt, etc.) may also have a deterrent effect (Freeman et al., 2006; Freeman et al., 2016). While such effects are theoretically possible, research would be necessary to confirm this.

2.4   Custodial sanctions

Perhaps the most severe of all, custodial sanctions are generally reserved for the most serious offences, although in some cases persistent recidivists may eventually attract a custodial sentence. It is thought that imprisonment should be an effective specific deterrent because offenders should be motivated to avoid returning to prison. However, the literature on the general effects of imprisonment (i.e., for other non-driving offences) on future offending suggests this is not the case and that terms of imprisonment have either no impact or increase recidivism (Loughran et al., 2009; Nagin & Snodgrass, 2013; Nieuwbeerta et al., 2009). Despite this, Canadian research on the effects of sentence length on DUI recidivism has found that the likelihood of new drink driving convictions decreases with increased sentence length (Weinrath & Gartrell, 2001). This study also found those who received the shortest sentence were most likely to reoffend and identified that a sentence of 5-6 months was the optimal length to provide a specific deterrence. Sentences beyond this length did not yield any further benefit for reductions in repeat offences.

There are some points to consider regarding the above findings. First, much of the research on the effects of prison sentences has been conducted in the US where there are differences between jail sentences and prison sentences: jail sentences are shorter and served in local jurisdictions (e.g., county or city) whereas prison sentences are longer and served in state or federally managed facilities. Research comparing the differences between these has shown jail sentences have better outcomes than prison sentences (Cochran et al., 2014). Second, sentence length can be determined by a number of factors, including characteristics of the offence and the offender. Criminogenic individuals (those most likely to engage in criminal behaviours) are perhaps also more likely to attract longer sentences due to their criminal history, because they may commit more serious offences, or a combination of the two. These individuals also have a higher propensity to reoffend in the future. With regard to the first point, it is likely that the more criminogenic offenders are sentenced to prison rather than jail. The final point to consider is the access to services and rehabilitation while in custody and the potential impact of the environment on the individual. Cochran et al. (2014) suggest that those given less severe sanctions such as supervised probation (see below) or even jail have better access to programs designed to rehabilitate and prevent recidivism, whereas prisons are known for their criminogenic environments.

Home detention is a form of custodial sanction where the period of incarceration is served in a suitable residence to which the offender is restricted at all times with the exception of authorised activities (e.g., attend school, work, or treatment). Offenders are usually monitored with some form of tracking device, usually worn around the ankle, may also be subjected to routine or random alcohol or drug testing, and other conditions deemed appropriate by a judge may also be included. Breaching the conditions of home detention may result in a prison sentence although offenders should be motivated to adhere to conditions as time served at home is preferable (i.e., easier) to time served in prison. Furthermore, serving a period of home detention means the offender is not placed in the criminogenic environments of a prison and is able to preserve prosocial bonds (e.g., employment), which, according to some theories of offending behaviour, should serve to reduce the likelihood of offending in the future (Freeman et al., 2016; Shoemaker, 2010). It should be noted that attachment to anti-social influences (e.g., family, peers) who favour risky behaviours is likely to promote offending and risky driving behaviour (Taubman - Ben-Ari & Katz - Ben-Ami, 2012; Voogt et al., 2014.) Home detention also benefits society by reducing prison overcrowding and the substantial financial costs of keeping someone imprisoned.

While home detention sentences are not employed specifically with driving offenders, it is available as a sentencing option for DUI offenders in some US jurisdictions. Studies of the effectiveness of home detention show that the outcomes are similar to other forms of imprisonment in terms of recidivism (Courtright et al., 1997). While concerns regarding offender incapacitation have been identified (e.g., whether offenders comply with conditions of home detention), evidence indicates that offenders on home detention generally successfully complete the period without revocation for breaching conditions and that those sentenced for a DUI offence complete the sentence without compromising the safety of the community (Courtright et al., 1997; Stanz & Tewksbury, 2000). However, compared to other offender types (e.g., property, bad checks, etc.) DUI offenders have also been identified as most likely to reoffend following completion of a home detention sentence, and those with more than one prior offence (i.e., recidivists) are also more likely to be rearrested (Stanz & Tewksbury, 2000). It would also appear that the effect of home detention or electronic monitoring is only sustained for the life of the sentence or while the device is in use (Courtright et al., 1997; Lapham et al., 2007). The evidence reviewed for this report suggests home detention is similar to other custodial sanctions in terms of recidivism and is probably less effective for recidivist offenders.

An interesting effect of home detention has been identified in the USA where some jurisdictions implemented home detention for DUI offenders who elected to not enter an interlock program, claiming instead that they would not drive. When home detention was used as the alternative (i.e., the offender must enter the interlock program or go on home detention) the rate of offenders entering the interlock program was found to increase (Roth et al., 2009).

2.5   Specialised courts & other judicial measures

In the USA concerns over the prevalence of drink driving and drink driving recidivism has led a number of jurisdictions to introduce specialised courts, known as DUI (driving under the influence) courts, to manage drink driving offenders. While there is some jurisdictional variation in the operation of these courts, common features include: clinical assessment of alcohol problems, daily supervision (e.g., daily check in), weekly treatment groups, random drug and alcohol screening, self-help groups (e.g., Alcoholics Anonymous), meetings with probation officers and court officials, and close monitoring of court orders and sanctions (Fell et al., 2011; Goodwin et al., 2015; Lapham et al., 2007; Miller et al., 2015). Reviews of DUI courts have produced mixed findings regarding their effectiveness in reducing further drink driving offences (Miller et al., 2015), although this is likely due to the variation in DUI court operations. Those courts comprising multiple components and involving higher levels of supervision are likely to be more effective than those that do not. For example, Fell et al. (2011) found a 38% reduction in recidivism (based on total number of offences) for those attending the DUI court program compared to offenders in different but demographically matched jurisdictions without DUI courts. The therapeutic elements of DUI courts are discussed further in Section 3.2.7.

In a review of the use of minimum mandatory penalties for driving while disqualified or suspended, the Victorian Sentencing Advisory Council (SAC; 2009) also considered the implications of alternate sentencing options, one of which was the introduction of a specialist court to hear driving offences. The SAC recognised the potential value of adopting a specialist list for traffic offences but considered the problem oriented approach of a specialist court to be resource intensive and unwarranted in many cases.

Another approach used in the US is what is known as Probation Before Judgement (PBJ), a sentencing option that suspends the sentence for a period (e.g., 6-12 months) with the requirement that the individual not breach the conditions of probation. Offenders are required to pay the fine associated with their offence but retain their demerit points, and no conviction is recorded upon successfully completing the PBJ period. A breach of the probationary conditions cancels the PBJ and the offender receives the

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full penalty. PBJ is only available to those who plead guilty to the offence. Studies examining the effect of court-imposed penalties on recidivism provide some evidence that this approach can reduce recidivism with those receiving PBJ observed to have lower recidivism rates (by as much as 39%) than offenders who receive no penalty (Chaudhary et al., 2011), although others have found that PBJ appears to be more effective for first-offenders than repeat offenders (Taxman & Piquero, 1998). Taxman and Piquero (1998) noted in their study that first offenders were significantly more likely to receive PBJ than repeat offenders, which may account for this finding.

Other common legal outcomes from sentencing are the suspended sentence and good behaviour bond. Suspended sentences are a serious penalty and are reserved for cases where a custodial sentence would otherwise have been given. The theory behind the "special deterrent" effect of suspended sentences is that the punishment is known and certain (i.e., the prison sentence), which is proposed to deter further offending. Australian research suggests the effect of suspended sentences on recidivism is similar to supervised bonds (Weatherburn & Bartels, 2008) but the risks of being punished for a breach appear to be very, very low (Bartels, 2009). While this may be excused to some extent where offenders commit few offences in breach but evidence from Tasmania shows that 40% of offenders commit 11 or more offences in breach of the suspended sentence, while only 8% commit one offence, 5% commit two, and 27% 3-5 offences (Bartels, 2009). Failure to prosecute breaches undermines the effectiveness of the sentence and also contributes to the negative perception of this sentence among the general public.

A good behaviour bond is a court order for the offender to be of good behaviour and abide conditions specified by the court (e.g., sobriety), and is one of the most widely used alternatives to prison in Australia (Poynton et al., 2014). A failure to comply with the conditions of a good behaviour bond can result in the offender being re-sentenced for the original offence and any new offences. Studies examining the effect of bonds on recidivism have found no difference in re-offending between offenders on supervised versus unsupervised bonds and offenders on supervised bonds versus suspended sentences (Weatherburn & Bartels, 2008; Weatherburn & Trimboli, 2008). However, a study examining the effect of the length of bond has found that offenders on bonds of at least 24 months have lower rates of recidivism and also longer delays to re-offending compared to those on shorter bonds (i.e., less than 24 months; Poynton et al., 2014). The effectiveness of good behaviour bonds as a specific deterrent are strongly influenced by the perceived certainty of detection. While this is generally quite low for many offenders, the above findings appear to suggest extending the period during which they must be of good behaviour also extends the threat of further punishment for noncompliance, which may increase the perceived risk of further offending.

A final consideration is the management of offenders before their case is heard in court. In Lancaster County (Pennsylvania, USA) the DUI Repeat Offender Program (DROP) fits DUI recidivists with alcohol monitoring devices (known as a SCRAM anklet) while released on bail and awaiting trial (Lancaster County District Attorney's Office, 2016, 2017). The SCRAM (Secure Continuous Remote Alcohol Monitor) anklet continually monitors blood alcohol concentration using transdermal alcohol monitoring methods (which samples alcohol concentration in perspiration) and daily reports are provided by the monitoring agency reporting the previous day's activity. Any violations detected usually result in the revocation of bail and the issuance of a bench warrant, following which a judge rules on further ramifications for the offender (Lancaster County District Attorney's Office, 2016). All Monitoring and device rental costs are paid by offenders. Lancaster County's experience with this program demonstrates considerable success with 99% of supervised offenders remaining sober and, of those who violate bail conditions by drinking, none are charged with a new DUI offence (Lancaster County District Attorney's Office, 2017). While the program has not, to our knowledge, received further scientific evaluation, the above statistics, which were derived from official monitoring data, suggest there is some benefit for adopting such an approach for managing offenders in the period between the commission of

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an offence and being sentenced. On a further note, it is also possible to pair the SCRAM device with RF or GPS monitoring to track offenders location and compliance with restrictions and approved activities (SCRAM Systems, 2018).

2.6 Summary of legal and administrative approaches

Table 2.1 provides an overview of the types of legal and administrative approaches to addressing recidivism for drink driving, speeding, unlicensed driving, and dangerous driving.

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Table 2.1
Summary of legal and administrative approaches to address driving recidivism

Type of approach	Operational Status	Comment
DUI Courts	In use	Varied success due to substantial differences in DUI courts across US jurisdictions. It is likely that those adopting multiple components, including high level of supervision and assessment and treatment of alcohol problems are more effective than those that do not.
Interlock programs	In use	Very effective at preventing drink driving. Effect is lost once interlock is removed.
Increased penalties for repeat offenders	In use	Most jurisdictions have a tiered system whereby subsequent offences attract more severe penalties in terms of fines, demerit points, and potential jail sentence.
Hoon legislation	In use	Special laws targeting dangerous driving, including street racing or hooning have been found to have limited effect. Some evidence that harsher penalties introduced by these laws may have unintended consequences (e.g., attempts to flee police).
Demerit points	In use	Demerit points systems are widely used and applied to most driving offences. They are effective for identifying problem drivers and provide opportunity to correct behaviour. In the EU drivers who lose their licence due to demerit points are required to undertake driver improvement courses. Some evidence that drivers close to losing their licence due to approaching demerit point limits start to behave themselves.
Fines	In use	Fines on their own have limited effect. They have been found to reduce likelihood of receiving subsequent speeding citations in a 12 month period when combined with Probation Before Judgement, which includes a 6-12 month good behaviour condition.
Home detention	Previously used	Evidence that home detention is similar to other custodial sanctions in terms of recidivism and is probably less effective for recidivist offenders. When used as the alternative penalty home detention has been found to increase the uptake of alcohol interlock programs. Evidence that it is as effective as prison for incapacitating offenders.
Probation Before Judgement	In use	Has been found to be more effective at reducing speeding citations than demerit points.
Suspended sentence	In use	Believed to have a special deterrent effect as the penalty for breach is known and harsh. In reality, the risk of punishment for a breach is very, very low. The effect on recidivism is similar to supervised bonds. Viewed as a let-off by the general public.
Good behaviour bond	In use	One of the most widely used alternatives to prison in Australia. No difference in the effectiveness of bonds based on level of supervision but periods greater than 24 months are better than shorter periods. Effect on recidivism is not different to suspended sentences.
Alcohol monitoring while on bail	In use	DUI offenders in Lancaster County wear SCRAM bracelets to monitor alcohol use while on bail. Has been found to be 99% effective for preventing drinking and no offenders were arrested for DUI offences.
Registration plate actions[a]	In use	Can help police identify drivers of interest, increasing likelihood of interception and detection. Stickers have been found to reduce recidivism in some jurisdictions but not others. Impoundment of registration plates was found to reduce recidivism (increased delay to next offence) even beyond the impoundment period.
Vehicle sanctions[b]	In use	Very effective for preventing the use of a vehicle. Does not prevent the use of other vehicles. Impounding and forfeiture may not be cost effective for authorities. Some indication of unintended consequences such as fleeing from police.
Licence sanctions[c]	In use	Found to have good general deterrent effect but lack of specific deterrence. Mixed findings regarding length of suspension or disqualification periods.

Note. [a] Registration plate actions include removal of plates, attaching stickers to plates, or special plates. [b] Vehicle sanctions include impoundment, wheel clamping, and forfeiture. [c] Licence sanctions include suspension or disqualification.

3 Non-punitive interventions

Punitive sanctions alone have limited ability to deter recidivists, ultimately because these individuals need support to develop insight to understand the personal issues underpinning their traffic offending behaviours, and to take responsibility for changing these behaviours. A punitive response alone does not address the underlying causes of offending behaviour and thus, an individual is vulnerable to reoffending once a legal sanction is lifted. Non-punitive sanctions include interventions that use an educational and/or therapeutic approach to support traffic offenders' rehabilitation, motivate individuals to undertake change in offending driving behaviours, and to sustain this change. Educational programs aim to change behaviour, skills, beliefs and attitudes through the provision of knowledge. However, as behaviour is influenced by a variety of interrelated factors (psychological, social, cultural, environmental, etc.) educational programs alone may not sufficiently produce the behaviour change required for rehabilitation of the recidivist traffic offender. Therapeutic traffic offender treatment programs aim to change behaviours underpinning problematic driving. The research literature clearly highlights that traditional educational methods are ineffective in producing long-term behaviour change in recidivist traffic offenders, while therapeutic responses have demonstrated some positive impact, although this too has been variable (Tasmania Law Reform Institute, 2017). Of note, punitive sanctions for recidivist traffic offending, such as licence disqualification, imprisonment, and monetary fines, reveal a similar absence of long-term positive driver behaviour change (Clark & Edquist, 2013). Notwithstanding this difficulty in producing long-term change, rehabilitation programs continue to be funded worldwide, likely because there remains a general consensus that the provision of education increases participants' insight into the risks associated with their driving behaviours and their motivation to change, particularly when knowledge or skills are limited, and may therefore reduce risk-taking behaviours (Clark & Edquist, 2013).

This section identifies the various non-punitive approaches adopted with traffic offenders that are in operation or have been in operation in Australia and internationally. It begins with a discussion more broadly of those interventions designed and used with all categories of traffic offenders. This is followed by a discussion of interventions addressing specific types of offending, including drink and drug driving, speeding, reckless driving and unlicensed driving. While the scope of this project is related to recidivist offenders, the following discussion intentionally includes information relevant to first offenders, due to the applicability for treatment with recidivist offenders.

3.1 Interventions for all traffic offender categories

3.1.1 Medical Psychological Assessment (MPA)

In Germany, individuals who have lost their licence as the result of serious or repeat offences are legally required to undertake a 'Medical Psychological Assessment' (MPA) prior to reinstatement of their driver's licence (Glitsch & Knuth, 2016). Offenders are mandated to undertake the MPA at their own expense (approximately 400-1,000 EUR). The MPA determines fitness to drive and predicts future driving behaviour. Traffic offences for this purpose are defined as:

- Blood alcohol concentration (BAC) level greater than 0.16 g/100ml

- Repeat offences where BAC is higher than 0.05 g/100ml

- Driving under the influence of recreational drugs

- An accumulation of traffic violations including speeding, failing to stop at a red traffic light, or driving unlicensed.

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The MPA is conducted by two traffic experts (one medical and one psychological) and is based on medical examination (including laboratory analysis of biomarkers); computer-based performance tests (of visual perception, concentration, attention and reaction); and psychological clinical interview (explores awareness and insight into the problem behaviour). To receive a 'positive' result and have one's licence reinstated, one must demonstrate that they have made "sufficient and sustainable changes in behaviour" which is obtained by approximately 40% of all MPA cases (Glitsch & Knuth, 2016, p. 337). Approximately 50% of all MPA candidates receive a negative assessment which results in no licence reinstatement because of either "insufficient or unsustainable changes in behaviour" and approximately 10% are given "a recommendation to participate in mandatory training program" resulting from an apparent lack of knowledge said to be amenable to training (Glitsch & Knuth, 2016, p.337).

In their investigation of 1,631 participants randomly selected from a pool of 141,242 traffic offenders, Glitsch and Knuth (2016) operationalised successful rehabilitation as a positive result on the MPA. They considered their sample to be mostly representative of the general population in Germany, with the majority first offenders, 20.6% repeat offenders and 3.7% having had their licence revoked for a third time. Information was obtained via self-report questionnaire sent by the federal motor transport authority and responses were reported retrospectively. Although offence type was not separated in the analysis, offenders who did not undergo any counselling/consultation were half as likely to achieve a positive MPA (37.1%) and were three times more likely to be mandated to attend training courses (21%) than were those who had self-reportedly completed counselling/consultation before undertaking the MPA (70% and 7.6%, respectively). However, the nature of the counselling/consultation was not provided as this was only quantitatively collected (Glitsch & Knuth, 2016). Additionally, a positive result on the MPA rose to 81% for offenders who had participated in consultation/counselling prior to the MPA had also received information relating to the process of the MPA early in their post-offending period (i.e., within two months of their offence) (Glitsch & Knuth, 2016). The provision of timely information and personally relevant information was paramount in rehabilitation because it motivated behaviour change by enhancing awareness. It was proposed that rehabilitation of traffic offenders would be more successful if behaviour change was mandated prior to reinstatement of one's driving licence, as with the use of the MPA, as legal sanctions alone had not elicited sufficient long-term behaviour change. For example, Hilger et al. (2012, cited in Glitsch & Knuth, 2016), reported significantly lower drink driving recidivism rates post-completion of the MPA in Germany at three year follow-up, when compared to recidivism of traffic offenders in countries where the MPA was not undertaken (6.5%-8.3% compared with 20-28%, respectively).

3.1.2 Drive Alive (DA)

The 'Drive Alive' (DA) Program in Ohio was described as a group interactive educational program catering to adolescent drivers having committed "moderate to serious" traffic offences including speeding, at fault crashes, driving under the influence, and reckless vehicular operation (Ekeh, Hamilton, D'Souza, Everrett & McCarthy, 2011, p.225). The Traffic Magistrate determines which of these offenders are to be mandated to attend the DA program, which consists of 10 hours over a four-week period (in lieu of receiving other legal sanctions such as fines or payment of court costs). The program caters to groups of 20-30 participants and includes exposure to an emergency department, simulated trauma resuscitations, drug and alcohol education, presentations by survivors of severe trauma and interactive components facilitated by physical, occupational and speech therapists. Ekeh et al. (2011) undertook an analysis of the driving records of offenders (obtained from the Bureau of Motor Vehicles) who had completed the DA program between 2003 and 2008 (n=488), and compared this with a randomly selected group of similarly matched controls who were ordered to receive standard traditional sanctions only (n=458). The authors noted that non-randomisation of participants to each group was a limitation of the study, and that any of the pre-existing differences between the groups (such as the lower mean age in the control group) could have affected the results. Recidivism was defined as the

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number of offenders who engaged in one or more traffic infractions following the completion of the DA program or the date of sentencing in the control group. Analysis of the driving records were undertaken at six monthly intervals for five years, which revealed that at six-month follow-up there was a statistically significant lower rate of recidivism in the intervention group (26.4%) than in the control group (32.3%). Further analysis revealed that the reduction in recidivism related to participants aged 16 years or younger in the intervention group, but was not observed for those aged 17 and 18 year old. Notably, this difference was not maintained in the longer term (Ekeh et al., 2011). Beyond six months, the intervention effect disintegrated with no statistically significant differences remaining between the groups (Ekeh et al., 2011). Consequently, Ekeh et al. (2011) suggested that future research could focus on the evaluation of booster sessions (where participants attend at some time in the future for a refresher type course) with the specific aim of enhancing the longevity of the intervention effect. It should be noted here that other studies have found effects to last longer than six months in traffic offender populations (see drink driving section below, for example). Additionally this evaluation did not report any baseline information relating to the participants' functioning, such as substance use, and thus potential barriers to change may have remained unidentified in the recidivist offenders.

3.1.3 Young Driver Scheme (YDS)

Although the following study did not directly assess the relevance of the program to recidivists or offenders of all ages, the use of an online component may provide a particularly important role in reaching a wider sample of offenders in the development of a recidivist package. af Wåhlberg (2011) studied the effectiveness of the Young Driver Scheme (YDS), an online driver education program in England, with a sample of non-serious driving offenders (most were for non-excessive speeding) under the age of 25 (n=665). The YDS uses an online 'e-learning' package, with five modules to be completed over a 28-day period, each finishing with a 25-item multiple choice test. This program commenced in the UK in 2008, and participants were offered to substitute payment of fines for participation in the YSD. While the main intervention component was online, this was preceded by a road safety educational face-to-face component, delivered by a driver trainer. At six months follow-up post-completion of the YSD, the online 'e-learning' program was significantly more effective in reducing both the number of driving penalty points accrued and the number of police reported driving offences, than was a traditional in-class two and a half hour education program related to speeding offences (n=1,000), or simply payment of fines in a group of offenders who had either previously taken a traditional class, refused to take a class, or had been caught excessively speeding (n=1,000). af Wåhlberg (2011) acknowledged the methodological limitations posed by non-randomisation of the participants to groups, with the results potentially affected by baseline differences that existed between those who opted to pay fines compared to those who opted to undertake an educational program. Furthermore, self-reported collisions were lower for the YDS group than that of the comparison groups, although the validity of self-report data (and inherent biases) was noted, as was the potential for a regression to the mean effect (af Wåhlberg, 2011). af Wåhlberg (2011) described on-line driver education as differing from standard face-to-face education programs in terms of ease of use/limits travel, participation that is free from social-stigma/constraints and being visually pleasing and interactive. Such characteristics may enhance motivation to engage and learn from standard educational programs.

3.1.4 The Blacktown Traffic Offenders Program (BTOP)

The Traffic Offenders Program (TOP) is a pre-sentencing driver education program used in New South Wales, Australia designed to target traffic offenders having committed any traffic violation. As of 2013, TOP was operating at 51 sites in NSW, facilitated by Non-Government Organisations (Rourke & Jones, 2012). The literature review revealed evaluation data for the TOP in Blacktown, NSW, which has been in operation since 1992. The TOP purportedly builds offenders' resilience to cease future high risk driving behaviours (Clark & Edquist, 2013) through the provision of general road safety information

(Palk, Fitts, Wilson, Sheehan, Wishart, & Taylor, 2015) in large group setting of up to 200 participants (Rourke & Jones, 2012). Participants are court referred, although this is a voluntary pre-sentencing diversionary program (Palk et al., 2015). Upon sentencing, offenders are questioned by the Magistrate to assess learning from the course (Bamford, Symes, Tynan & Faulks, 2008). Participants are required to complete a written homework assignment at the end of each group session, over 8 sessions for 2 hours duration (Palk et al., 2015). The most recent evaluation was undertaken by Rourke and Jones (2012) who analysed data from official court records for those who commenced the BTOP between 1994 and 2011 (n= 9, 633) to determine risk factors for reoffending. Relating to road safety, they operationalised re-offence as any new traffic offence committed within the two years post program commencement, for which they discovered a 10.5% traffic re-offence rate. A number of risk factors for future traffic convictions were revealed, including being between 16 and 20 years old, having concurrent offences, or one or more convictions for violence/theft/drug offences, and more traffic convictions in the 5 years prior to the current offence. Participants were excluded from the analysis if they had previously undertaken the program. While the results were promising as not all offenders completing the program did recidivate, the authors noted the absence of a control group in the study design, and remarked that it was not possible to comment on the effectiveness of this program in reducing recidivism. They suggested that the findings could be used to assess those presenting with high risk factors for recidivism and thus may benefit from intensive intervention (Rourke & Jones, 2012).

3.2   Drink and drug driving

There is a wide array of literature investigating treatment programs that have been designed specifically to target drink driving, including recidivist drink drivers. Whereas, research relating to the rehabilitation of recidivist drug driving appears scarce, or is sometimes incorporated within drink driving programs.

3.2.1   Overview of drug driving

While it is well understood that driving under the influence of psychoactive substances (both licit and illicit) increases the risk of injury or death (Schulze et al., 2012), alcohol has been identified as the most commonly used psychoactive drug that drivers consume, and as such rehabilitation for drink driving has received more attention than drug driving in the literature (Wolff et al., 2013). Drug driving "remains significantly less well understood than drink driving" which appears largely due to the variety of substances available and to their complex and varied effects on people and their driving (Atchison, 2017, p.6). Poly-drug use (two or more drugs in combination, including alcohol) may have an even greater impact on driving impairment, with some risk estimates being additive or even multiplicative, and there is no universally agreed way to measure the impairment caused by the varying and constantly evolving drugs (newer 'designer drugs' for example) (Atchison, 2017; Wolff et al., 2013). Additionally, driving impairment is exacerbated by the sleep deprivation that often results from consumption of psychoactive drugs (Atchison, 2017).

A comprehensive literature search revealed limited research of rehabilitation specifically for drug drivers. Atchison (2017) has highlighted the need to identify appropriate rehabilitation programs for drug driving, adding further that they should be differentiated from drink driver rehabilitation and address the specific needs of drug drivers. Schulze et al. (2012) argued that screening, assessment and rehabilitation should be legally regulated to determine offenders' individual needs, and that participation be mandatory for high-risk offenders, repeat offenders, and novice drivers. Furthermore, a recent study undertaken by Jones, Holmgren & Ahlner (2015) calls for early intervention to prevent recidivism. For example, they found that while 50% of drivers arrested for driving under the influence in Sweden are found to have stimulants in their toxicology, they found that 75% of drivers killed in road crashes had a positive amphetamine toxicology at the time of the crash and had previously been arrested for illicit drug use, or

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drug driving. Jones et al. (2015) consequently recommended that early intervention, substance abuse assessment and treatment may prove more beneficial than conventional penalties for drug driving.

3.2.2 Overview of drink driving

As with drug driving, a one-size-fits all approach does not meet the treatment needs of repeat drink driving offenders with complex individual issues, which are often clinical and chronic in nature. For instance, comorbidity is a common problem for drink drivers who often meet a diagnosis of alcohol abuse/dependence, as well as co-occurring abuse of other substances, mental health diagnoses, personality factors, and have differing characteristics, motivation, attitudes and perceptions related to drink driving, thus requiring specialist and often long-term clinical treatment (Fylan, Hempel, Grunfeld, Conner & Lawton, 2006; Houwing, 2016; Mullen, Ryan, Mathias & Dougherty, 2015; Richardson, 2013; National Transportation Safety Board: NTSB, 2013; Tasmania Law Reform Institute, 2017; Wilson, 2015). Effectively, recidivist drink drivers present as a heterogeneous group who appear extremely resistant to change, and require an individualist intervention approach. Brown, Bhatti & Di Leo (2013) report that although no single factor predicts driving under the influence, there are consistent characteristics and antecedents identified in the literature that must be strongly considered when devising interventions, as these factors may pose barriers to change, including:

- Limited education about drink driving, limited skills to separate drinking from driving, and alcohol-related disorders (Terer & Brown, 2014).
- Sensation seeking, psychopathic deviance, disrespect for legal authorities and sanctions, hostility, and attitudes that reinforce traffic offending, minimise personal concern for risk associated with driving while under the influence (Brown et al., 2013).

Additionally, Houwing (2016) found that as a group, recidivist drink drivers and first time heavy-drinking offenders differ greatly on a number of variables when compared to the general population. Houwing denoted four major risk groups for significantly increased risk of crash or injury when driving under the influence:

- High BAC offenders (0.12 g/100ml BAC or higher)
- Driving under the influence of combined alcohol and psychoactive substances
- Young male drivers whose crash rate after consuming alcohol increases faster than experienced drivers
- Repeat drink driving offenders, who are not deterred by penalties.

Given that offending individuals often have limited insight into their problem behaviour, there is a need for pre-treatment assessment, or at least screening, to determine the most appropriate course of intervention, rather than assigning one to attend a pre-determined, or generic course. Waiting until one reaches recidivist drink driving status to provide treatment is less effective than early intervention, and thus more damaging to the safety of society at large. Importantly, research by Ahlin, Zador, Rauch, Howard and Duncan (2011) suggested that all drink driving offenders (first-time and recidivist) are at high risk of reoffending regardless of the type of sanction that is imposed on them. Hence, the time of the first offence provides a window of opportunity to screen or assess offenders for underpinning behaviours, and consequent treatment can then be tailored to the identified needs (Wilson, 2015). There is an abundance of research that identifies first-time offenders as having a general pattern of substance misuse, which is associated with other high-risk behaviours. For instance, Wilson reported that 40% of first time drink driving offenders also reported using cannabis monthly and 25% using ecstasy at least monthly (2015). Furthermore, recent profiling of Tasmanian recidivist drink drivers revealed that the majority of recidivist offenders were male, had a history of alcohol abuse and problematic drug abuse,

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and were unlicensed/disqualified or suspended at the time of the offence (Tasmania Law Reform Institute, 2017).

It has long been recognised that a multifaceted approach to drink-driving is needed, and that a one-size fits all educational approach will not reduce recidivism. Meaningful behavioural change is difficult to achieve because underlying problems contributing to drinking and drinking remain unaddressed by such programs (e.g., Moore, Harrison, Young & Ochshorn, 2008). A review of the interventions published with evaluation data and offered to drink driving and drug driving offenders is detailed below.

3.2.3   Specific drink driving programs for first offenders

Brief screening and intervention at first offence

In a report regarding prevention of alcohol problems in England, Kaner (2010) argued that, in circumstances where screening all individuals was not possible, that at the very least screening high-risk groups with a validated questionnaire such as the Alcohol Use Diagnostic Identification Test (AUDIT) would prove to be an important pre-intervention strategy. A hierarchy of intervention was recommended by Kaner (2010), beginning with brief structured advice; brief interventions in the form of motivational interviewing or motivational enhancement therapy; and for those whom this did not help, or those with a high likelihood of alcohol dependence, specialist treatment was considered imperative. In a study of first offenders, Wilson (2015) found that based on these recommendations the majority of offenders (65.2%) in the study required advice, brief counselling and continued monitoring, while 14.1% required specialist referral for assessment and treatment. Given that assessment or screening indicates that a higher level of treatment intervention is required for some offenders, it is necessary to review the effectiveness data in the literature to develop an understanding of the most appropriate interventions. These will be reviewed in detail in the following sections.

In terms of using the time of the first offence as a window for opportunity, it seems warranted that all first offence drink driving and drug driving offenders undergo a professional, clinical assessment or at the very least are screened by a clinician to determine the most appropriate treatment approach. In this regard, Wilson argued that "one of the most effective brief interventions in the health sector has been early identification and [provision of] brief advice" (2015, p. 54). Davis, Beaton, Von Worley, Parsons and Gunter (2012) retrospectively examined data from a New Mexico cohort of individuals who received screening and a brief intervention (n=211) with a control group (n=215), all of whom were defined by the AUDIT as being 'at-risk' for developing alcohol misuse; dependent drinkers were excluded from the study. The brief intervention occurred as part of a larger project undertaken through the University of Connecticut Health Centre, whereby two clinics were randomly allocated to either providing the brief intervention or to providing usual care. Participants across all sites completed self-report screening questionnaires, and one clinic was selected to provide the brief intervention for those reporting a positive score for 'at-risk' drinking. The intervention was in the form of a three to five minute motivational interviewing (MI) session with a physician, nurse specialist or mid-level provider. Drink driving citation data was obtained from the New Mexico Department of Transport which revealed that, for those in the brief MI group, there was a significant reduction in reduced drink driving citations, with the control group having a 3.38 times higher risk of a drink driving citation than the brief MI group, a difference which was maintained at five-year follow-up (Davis et al., 2012).

Preventing Alcohol-Related Convictions (PARC)

As detailed above, research has demonstrated that it is warranted to target offenders before they become recidivists (at which time behaviours are further entrenched and resistant to change), and that treatment programs may prove more effective than other strategies. For example, Rider, Voas, Kelley-Baker, Grosz and Murphy (2007) compared two educational group programs for first time Driving Under

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the Influence (DUI) offenders in Florida who were mandated to attend. The evaluation was based on randomisation of program instructors to either a traditional education group (n=55 instructors who were not trained in the content of the other group (n=4,135 first offenders) or to a novel group named Preventing Alcohol-Related Convictions (PARC) (n=61 instructors and n=5,463 first offenders). Participants were blind to instructor allocation and simply chose which group to join based on the suitability of the group's operating time with their personal schedule. Instructor fidelity to course content was maintained through observation of group sessions, which ranged in size from 2-33 participants. The programs both consisted of 12 hours, over four sessions, and only differed by the content of the fourth session. The traditional group emphasised educating group members on controlling their drinking while the PARC group emphasised educating group members on controlling driving and thus supporting the development of insight that controlling one's alcohol intake is an unreliable means to avoiding drinking and driving. The latter was achieved through analysis of individuals' DUI history and consequent development of insight that one's ability to control their drinking is unreliable when exposed to alcohol; to come to the conclusion that not driving one's car to an event where alcohol can be consumed is the only reliable way to abstain from drinking and driving; and to devise their own plan with adaptive alternatives which is reported back to the group. Analysis of driving records from the Florida Department of Motor Vehicles revealed that the PARC curriculum had resulted in statistically significant reduced recidivism (operationalised as adjudicated and convicted for DUI offences after program completion) compared to the traditional group at both one year (42% less likely to recidivate) and two years (25% less likely to recidivate) follow-up post intervention. Rider, Kelley-Baker, Voas, Murphy, McKnight and Levings (2006) considered that this novel approach may prove more appealing to some DUI offenders who are not encouraged to abstain from alcohol consumption as a rehabilitative approach.

Steering Clear

In Australia the 'Steering Clear' program was designed as a self-help means in preventing recidivism in first time drink-driving offenders, convicted for driving with a breath alcohol content <0.15 g/100ml (Wilson, Palk, Sheehan, Wishart & Watson, 2017). Wilson et al. (2017) developed an educational and theoretically driven pilot study, to determine usability and applicability of the program and engagement of first-offenders recruited following Court sentencing. The program was a two-hour online interactive educational and behavioural program underpinned by theoretical principles of behaviour change (including Cognitive Behavioural Therapy and Motivational Interviewing). A traditional educational component aimed to enhance participant knowledge (including one's understanding of the impact of differing levels of BAC on driving and the relationship between standard drinks and associated BAC and alcohol metabolism) while the theoretical component aimed to enhance behaviour and attitudinal change (develop insight into alcohol consumption and drink driving, to increase motivation for change, maintain self-efficacy, plan ahead for action, enhance coping skills and plan for relapse prevention). Although the sample was small (n=15) the program had a positive effect of self-reported cognitions, namely that all participants reported their intention to think about changing their alcohol consumption and to refrain from drinking and driving. While the relationship between self-reported intentions and actual future behaviour is open to question and therefore the effect on recidivism is unknown, such online interventions do have the benefit of widespread availability (including to rural and remote communities) and cost effectiveness. The authors of the study suggested that online interventions are an important next step for future research in enhancing readiness to change recidivist behaviour (Wilson et al., 2017).

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3.2.4 Specific drink and drug driving programs for recidivist offenders

One For the Road

In New Zealand a therapeutic group intervention named 'One for the Road' was designed to target recidivist drink and drug drivers through exploration of the underlying issues related to drink and drug driving in a group format (Dawber & Dawber, 2013). The program focused on facilitating engagement, empathy and commitment to change; challenging cognitions and attitudes related to both drink driving and drinking; promoting a zero tolerance for drink/drug driving and enhancing self-awareness. The program was described as being 'experiential', using the theoretical principles of "motivational interviewing, Gestalt therapy, CBT [Cognitive Behavioural Therapy], group process, transactional analysis, role play and relapse prevention" (Dawber & Dawber, 2013, p.3). The authors targeted behaviour change at both the individual and group level, and designed the program to be culturally appropriate, thus catering to 50% of the participants who were of Maori and Pacific Islander origin. The first of three sessions incorporated interviews, assessments and warm up (although this was not described in any detail), while the second and third sessions were run in groups of 10-12 participants (for six and four hours duration, respectively). The authors noted that they intentionally kept the duration of the program brief in the hope that this would maintain client retention, which resulted in an approximate 80% completion rate. A total of 570 recidivist drink drivers (with an average of 4 prior convictions) had completed the program in 2013.

Dawber and Dawber (2013) analysed driving offence data from the New Zealand Transport Agency which revealed that 3.5% of the offenders who had completed the 'One for the Road' group program (n=570) were reconvicted of alcohol related driving offences during the period of 6 to 30 months post completion, with the majority of these relapses (2.6%) occurring within the first six months. Additionally, prior to their attendance at group therapy, screening questionnaires indicated that the average participant was found to be pre-contemplative and not considering changing their offending behaviour; 11% were assessed to be alcohol dependent; drink drivers often perceived their behaviour to be justified because of strong cognitive distortions, such as, "I only had a few", "I drive better when I'm drunk", "Where's the victim, I haven't hurt anybody", and as such rehabilitation was needed to target these distortions. Following the intervention, responses on self-report questionnaires indicated positive attitude changes such that 80% of group completers had increased their motivation to change and had a lower risk of future drink driving, with 97% of all participants anonymously reporting their intention to drive with a zero blood alcohol concentration in the future. Participants were not actually asked to report actual drinking driving, and thus may simply not have been caught. The authors noted that a randomised controlled trial would be vital in the future to determine the efficacy of the program, and therefore it remained unclear whether the findings were attributable to the program or would have occurred in the absence of the intervention. It was noted that those simultaneously in legal proceedings may have been less motivated to attend in a genuine way and been more resistant to change (Dawber & Dawber, 2013).

Hero to Healing

'Hero to Healing' is a drink driving rehabilitation program specifically developed in consultation with Aboriginal Elders in two regional and remote Far North Queensland communities in Australia to be culturally sensitive for Aboriginal participants (Fitts & Palk, 2016). It is theoretically founded in cognitive behavioural therapy and the Community Reinforcement Approach (CRA) with the underlying premise that one's community (i.e., family, friends, and peers) plays a significant role in supporting and reinforcing recovery. The program consists of four, two-hour weekly group sessions, and includes education on alcohol and cannabis use, and rather than altering cognitions, it aims to "focus on the implications of drink driving on the community and changing external factors to make non-drinking more appealing" (Fitts & Palk, 2016, p. 75.). A pilot program was undertaken with a small sample of

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participants who identified as Aboriginal, with a minimum of one drink driving conviction (n=17). The program was also attended by five Aboriginal elders and three community members, the latter of whom were invited to attend because of their potential past involvement in participants' drink driving behaviour. At the time of publication, the authors noted that an evaluation on the long-term effects on recidivism had been planned, and while no quantitative data was available, focus groups undertaken with the sample of program completers revealed that the 'Hero to Healing' program appealed to the participants and that it was important to the Indigenous participants to include family and elder supports in their rehabilitation. The significance of considering such culturally diverse programs in Australia is imperative in rehabilitation for Indigenous Australians.

Sober Driver Program

The New South Wales (NSW) Sober Driver Program (SDP) was developed for recidivist drink-driving offenders (defined as two or more convictions for drink driving over the previous 5 years). It has been running in NSW since 2002 (Mills, Hodge, Johansson & Conigrave, 2008) and was adopted in Tasmania in 2008. It is not a treatment program for alcohol abuse, but rather purports to reduce recidivism by teaching participants to separate drinking from driving (Department of Justice, 2015; Mazurski, Withaneachi & Kelly, 2011). Mills et al. (2008) argue that the program aims to change drink driving behaviour, rather than drinking behaviour, based on the premise that recidivist drink drivers have self-reported a motivation to stop driving under the influence (Freeman, Liossis, Schonfeld & Sheehan, 2005). The SDP offers a post-conviction 18 hour educational and skills-based group program, traditionally over nine-weeks (two hours weekly), or a condensed version (three, six hour sessions) the latter of which is aimed to target rural communities and to meet increasing demand, delivered through the Correctional Services by two trained group facilitators (Department of Justice, 2015; Mills et al., 2008; Mazurski et al., 2011; Tasmania Law Reform Institute, 2017). The program is designed to be interactive and uses a standardised educational and group cognitive-behavioural therapy framework to restructure cognitions that resulted in drink driving and to change behaviours by supporting skill development (Mills et al., 2008). There is also a segment related to relapse prevention and stress management (Mills et al., 2008; Mazurski et al., 2011).

Participants must meet 'suitability' criteria (to maximise participation), which, for example, excludes people with mental health issues or literacy struggles (Toohey, 2012, cited in Tasmania Law Reform Institute, 2017, p. 28). At the time of writing, Tasmania's program had not yet been formally evaluated, but it was noted that of the 1,240 offenders who met eligibility criteria in 2014-2015, only 773 were assessed to be 'suitable' (Tasmania Law Reform Institute, 2017). There was an 84% reported graduation rate (Department of Justice, 2015).

Evaluations of the program in NSW had been published in 2008 (Mills et al.) and 2011 (Mazurski, et al.). Mills et al. (2008) compared 2-year post completion recidivism rates between SDP participants (n=1,740) and a community control group (n=9,667) who only received legal sanctions, (the authors acknowledged that the offenders were not randomised to these groups therefore any differences found between the groups may have been attributable to differences at baseline rather than a result of the intervention). Participants completed surveys at baseline, immediately after group completion and four months post completion, which indicated that 25% of offenders demonstrated "evidence of probable alcohol dependence" on the AUDIT (Mills et al., 2008, p.72). There was a high attrition rate, with only 38% of initial responders completing assessment at all three time points. Mills et al. (2008) argued that motivational interviewing may be an important first step for resistant individuals given that even motivated clients in treatment for alcohol dependence had a 39% relapse rate over a 12 month period (Mann, Hintz & Jung, 2004). Mills et al. (2008) concluded that the SDP combined with existing sanctions appeared to be an "effective intervention" given that SDP completers were 43% less likely to reoffend at the 4 month follow-up period than the comparison group who received punitive sanctions only (p. 72).

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Mills et al. (2008) hypothesised that this was possibly due to the effect of improved knowledge, attitudes, and skills about drinking driving, and while knowledge declined over time, it still remained higher than at program commencement. This may highlight the need for refresher or top-up courses to aid motivation for continued abstinence from offending behaviour.

Mazurski et al. (2011) further investigated the sample of participants from the Mills et al. (2008) study and found that the effects had been maintained at 5.5 years follow-up (n=1,691), and replicated the findings in a new group of participants (n=1,405), such that participants were 44% less likely to re-offend than the comparison group (matched controls, although the participants were not randomised to groups) over a 3 year follow-up. Additionally, they found no significant differences in recidivism between the condensed version (n=196) and the full version (n=1,209) of the program. Following 5.5 years, approximately 15% of the Sober Driver participants had reoffended, and 20% of the comparison group. Mazurski et al. (2011) argued that participation in the SDP reduced the likelihood of future offending, and estimated that participation in the Sober Driver Program prevented 50 additional re-offences annually.

Back on Track

In Canada, since 2000, convicted drink-drivers (first offence or recidivists) have been mandated to attend a program called 'Back on Track' (BOT) following a period of licence suspension. Participants are allocated to one of two groups based on formal assessment of the severity of their substance use problems (operationalised by a threshold score obtained using a battery of self-report questionnaires relating to addiction, drug and alcohol use). Individuals are allocated to an 8-hour "education workshop" if assessed as having "less severe" substance use problems, or to the 16-hour "treatment workshop" if assessed as "more severe" (Wickens et al., 2016, p.3; Ma, Byrne, Haya & Elzohairy, 2015). No information was provided to detail the content of the treatment group, thus the type of treatment remains unknown. Wickens et al. (2016) undertook an evaluation of 59,134 people (88% male) who had participated in the BOT program between 2000 and 2010 (72.4% education program; 27.6% treatment program; 25.8% reported previous drink-driving offence), and found a recidivism rate (defined as re-attendance at BOT) of less than one per cent. Statistical analyses indicated that at the time of their first attendance at BOT the following characteristics significantly predicted recidivism: being male; having higher scores on alcohol dependence; having experienced adverse legal consequences from substance use. Notably, allocation to group treatment had not predicted recidivism.

Ma et al. (2015) undertook an analysis of three cohorts of drink driving offenders, those before the BOT was implemented (n=19,163), those attending only a one day BOT educational intervention (9, 610), and those attending the multi-component BOT (n=7,864) described above. Analysis demonstrated that recidivism was significantly lower for those who undertook the educational BOT program (6.7%) compared to those who only received licence restrictions (8.5%) but the multi-component program yielded the greatest results (5.5% reduction in recidivism). While program completion was mandatory before regaining one's licence, problematically, less than 30% of those with licence suspension did not complete the BOT program in the mandatory one year. They concluded that the implementation of the BOT program, delivered in conjunction as a package with legal sanctions, was associated with reduced recidivism that was not statistically seen in the traffic data over four years prior to the implementation of the BOT program.

3.2.5 Motivational interventions

Ultimately recidivist offending is maintained by behaviours and cognitions that serve a purpose to the individual. When an individual is stuck in this pattern of offending, and thus unable to change their behaviour, one's readiness, or motivation to change can be enhanced by supporting the individual to

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begin to consider changing undesirable behaviours. In this regard, Motivational Interviewing (MI) is a collaborative therapeutic technique used in clinical intervention with individuals who need support to develop a commitment to undertake some level of behavioural change. As such, MI has proven beneficial in the clinical realm traditionally with substance use disorders, and more recently it is emerging in a number of problem areas; for instance, it has understandably been applied to drinking and driving. The current literature review has identified a number of studies that have investigated the application of MI to drinking and driving. There are vast differences between these studies, including the length and intensity of the motivational component employed, the level of training the therapist/facilitator has, and the mode of delivery and content, all of which are likely contributors to the mixed findings reported below, although differences in methodology between studies likely also renders MI's effectiveness difficult to ascertain.

In two evaluation studies conducted by the same research team in Canada, recidivist drink drivers were self-selected through responding to recruitment advertisements, but were only selected if their recidivist status could be corroborated with official driving records (showing a minimum of two drink driving convictions in the past 15 years) and screened positive for alcohol problems as indicated by the AUDIT (Brown et al., 2010; Ouimet et al., 2013). Notably, participants were excluded if they had a substance dependence disorder at initial assessment. Participants were randomly allocated to one of two groups:

- Brief motivational interviewing (BMI) - a 30 minute manualised intervention conforming to MI principles (with treatment fidelity enhanced though therapist supervision)

- Information control group - a 30 minute session with manualised delivery of scripted educational information relating to drinking and driving and alcohol misuse, but in the absence of MI principles.

All assessments were undertaken by independent interviewers who were blind to group allocation. In the earlier study, follow up assessments were conducted at six and 12 months to investigate the effectiveness of BMI in reducing the number of self-reported 'risky drinking days' (defined as the number of days that men consumed three or more standard drinks, or women consumed two or more standard drinks) (Brown et al., 2010). Brown et al. (2010) found that at six and 12-month follow-ups there was a significantly reduced number of days engaged in self-reported risky drinking for both the BMI group (n=92) and the information control group (n=92) compared to baseline. Whereas only the BMI group resulted in a significantly ongoing reduction in risky drinking between six and 12 month follow-up (25% reduction), and significantly greater reductions at six months in an alcohol biomarker indicative of excessive drinking, compared to the information control group. The self-report data was consistent with a significant reduction in multiple blood biomarkers of alcohol use.

In the later investigation, Ouimet et al. (2013) sought to determine the efficacy of the BMI in increasing the length of time until further recidivism (operationalised as driving re-arrests resulting in conviction) compared to the information control group, over a five year follow-up, as well as exploring the impact of age on the efficacy of BMI. The majority of the sample were from the original study (Brown et al., 2010). The results indicated that for the BMI group (n=85) the intervention significantly delayed the time before re-arrest for dangerous traffic violations (driving while intoxicated, speeding, or other moving traffic violation) over a five year follow-up for younger drivers only, compared to those in the control group (n=95), whereas no statistical differences were found in re-arrest rates for older participants compared to the control group. It was noted that the authors defined the youngest age group as 26.4 to 42.8 years of age, and thus their results apply to this age bracket. Additionally, for the remainder of participants, receiving the educational information alone had an impact, but people with substance dependence disorder were excluded from the studies so this intervention remained untested for this harder to treat population (Ouimet et al., 2013). Collectively the researchers concluded that brief MI had potential to be implemented in settings where people did not actively seek treatment, such as routinely at hospitals and

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courts, for example, and preventatively, prior to being involved in road accidents (Brown et al., 2010), particularly for the younger population of drivers (Ouimet, 2013).

An earlier study that did not exclude participants for alcohol dependency produced different results. Schermer, Moyers, Miller and Bloomfield (2006) found that brief MI was effective in reducing recidivism (operationalised as re-arrest for driving under the influence) at three years compared to standard care. All participants who were drivers or passengers and were hospitalised for an injury resulting from a motor vehicle crash were screened for alcohol misuse, and then underwent 45 minute assessment relating to (alcohol use and driving history) before randomisation to one of two groups:

- Brief MI - which was not manualised, but purported to use the principles of MI (non-confrontational, reflective listening and empathic style, for one approximate 30 minute session) (n=62)

- Standard care - the provision of phone numbers for treatment services while in the trauma centre (n=64)

Traffic data was obtained from State Traffic Safety in New Mexico for up to three years following participants' hospital discharge. Multivariate analyses showed that brief MI was the strongest protective factor against DUI arrests, and that only nine people needed to receive the intervention to prevent one DUI arrest.

Web-based motivational interviewing

More recently Osilla, Paddock, Leininger, D'Amico, Ewing and Watkins (2015) suggested that maintaining the fidelity of motivational principles amongst therapists can make it hard to deliver the intervention uniformly, and as such piloted a web-based Motivational Interviewing (MI) intervention targeting first time drink driving offenders in Los Angeles. Offenders were recruited if they demonstrated 'at risk' alcohol consumption in the past year using the Diagnostic and statistical Manual of Metal Disorders IV. They randomised offenders to one of three conditions:

- Usual care - this consisted of a 36 hour educational program, support groups, educational sessions and 12-step meetings (n=54)

- Usual care plus in-person MI (n=51)

- Usual care plus web-based MI (n=54)

Both of the MI conditions (computer or face-to-face) consisted of individual 45-minute sessions, followed by two 10-minute booster sessions aimed at reducing drinking and related problems. Participants completed web-based surveys at baseline, after the first MI session, and at three months post baseline (or at program termination), which was effectively at the cessation of 'usual care' and thus not a good indicator of longer behavioural change. Participants reportedly favoured the in-person MI over the web-based MI, but both MI groups reported significantly greater quality and satisfaction with their sessions than did participants in the usual care condition.

Alcohol and marijuana consumption and drinking and driving was self-reported over the period of three months, and so may have been subject to memory biases. Nonetheless, all groups self-reported a reduction in these outcome variables, but there were no statistically significant differences between the groups, although the follow-up was short compared to abovementioned MI studies. Interestingly, 67% of participants at baseline met the criteria for alcohol dependence but the MI content was only tailored to 'at-risk' drinkers rather than dependent drinkers, whereas Schermer et al. (2006) specifically catered to include this group of individuals.

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Mississippi Alcohol Safety Education Program (MASEP)

An earlier investigation sought to determine the contribution that motivational components had towards enhancing the impact of educational programs delivered in the Mississippi Alcohol Safety Education Program (MASEP; Robertson, Gardner, Xu & Costello, 2009). This is a court-mandated group program designed for first time offenders convicted of driving under the influence (DUI) of alcohol or another drug, although the study included recidivists (for example, those with multiple convictions that were at least five years prior were legally considered as a first offenders, and some participants had multiple DUI citations in a short period before facing court for their first offence). Since its inception in 1972, the MASEP has undergone best practice revisions guided by the research literature. Initially, this was done in 1989 to account for the majority of participants presenting with serious substance abuse problems. This revision transformed the MASEP from being purely educational to an interactive group which fostered the opportunity to provide feedback related to individual assessment results and to consider the development of individuals' own 'avoidance plan' to support offenders to avoid driving under the influence in the future. A later development in 2000 included the provision of trained facilitators in the delivery of motivational enhancement therapy to enhance individuals' readiness to change, including the individualised feedback of assessment data as it related to problem alcohol consumption and the development of individualised avoidance plans throughout all four sessions of the 12 hour program. Baseline assessment was undertaken to identify drinking status (low or high problem severity) using the Mortimer-Filkins Questionnaire (MFQ), which had been specifically designed to assess the DUI population (Mortimer et al., 1971; cited in Robertson et al., 2009). Recidivism was operationalised as subsequent DUI citations with official data obtained from driving citation records and court records.

Robertson et al. (2009) investigated recidivism for a group of 15,898 participants who were mandated to attend the earlier MASEP educational program; 16,504 participants mandated to attend the later motivationally enhanced program; and 17,937 people who were mandated to undertake the program but did not enrol in it. The inclusion of the motivationally enhanced program resulted in significantly lower recidivism rates (23.75%) than the purely educational program (26.46%) over a three-year follow-up period, with the exception of those with the highest educational attainment, for whom there was no difference in recidivism status found between the programs. Recidivism was also compared by completion status, specifically between three groups: those who completed the MASEP within 3 months; those who did not attend as prescribed (ie., 'non-completers' who dropped out of the program or had inconsistent attending); and those who were mandated but did not attend at all. Interestingly, over a three-year follow-up, statistically significant results indicated that non-completers recidivated at the highest rate (35.82%) compared to completers (21.14%) and non-enrollers (29.46%). Furthermore, regardless of completion status, higher recidivist rates were seen for both those who had a prior DUI history and for those who met criteria for being 'problem drinkers'. Robertson et al. (2009) cautioned that significant events in Mississippi simultaneous to the implementation of the revised program may have confounded the results given the possibility that law enforcement was unable to target DUI at that time. The authors argued that the intervention appeared more effective for first time offenders than for those who required substance abuse treatment services, with higher rates of recidivism for those with prior DUI offence and problem drinking (Robertson et al., 2009). As such, Robertson et al.'s (2009) research supports the inclusion of programs that use multiple components to target resistant behaviours.

3.2.6 Combined Cognitive Behavioural Therapy & Motivational Interventions

The Driver Education and Evaluation Program (DEEP) & Prime for Life

In 2015, Beadnell, Crisafulli, Stafford, Rosengren and DiClemente sought to replicate and extend the abovementioned Robertson et al. (2009) findings that compared standard care with a motivational program. In Maine, USA, driver's licences are immediately removed from a recidivist offender at the time

of the offence, while first offenders receive a 90-day restriction on their licence, both while they complete a mandated intervention intended to reduce the risk of recidivism (defined as rearrest for drinking and driving). Prior to 2001, the intervention program consisted of a standard care intervention whereby offenders were allocated to one of two groups depending on offender status (n=6,086; n=2, 226 did not complete the program):

- First offenders with a BAC less than or equal to 0.14 were assigned to the Adult Assessment Program: individual 2-hour substance use assessment using the Substance Abuse Life Circumstance Evaluation Scale which gave participants the opportunity to report and reflect on their life circumstances. No standardised feedback was provided to participants (n=1,856 completed this program)

- All other DUI offenders were allocated to a 'Weekend Intervention Program' (WIP) receiving 22-hours of group intervention. The WIP used a cognitive-behavioural approach and presentations based on the health belief model to support offenders to understand their involvement with drugs and alcohol and gently confront participants to self-evaluate and to consider treatment where necessary. Additionally, for those with a diagnosable substance use disorder, there was a further minimum of six sessions over sixty days with a counsellor for substance abuse treatment before licence reinstatement (n=2,004 completed this program)

From January 2001, all offenders were instead allocated to Prime For Life (PFL; n=6,181; n=2,083 did not complete the program):

- A motivationally enhanced group intervention, using a manualised 20-hour program delivered over three consecutive days. This was facilitated by trained substance abuse counsellors who were taught how to self-monitor their adherence to treatment protocol. The program was founded in behaviour change theories and aimed to motivate individuals to reduce their alcohol and drug consumption to avoid negative consequences (n=1,415 completed this program)

- Additionally, for those with a diagnosable substance use disorder, following completion of PFL, a further minimum of six sessions over 60 days with a counsellor for substance abuse treatment was required before licence reinstatement (n= 2,683 completed this program)

Beadnell et al. (2015) compared these two cohorts, those who received standard care (which included cognitive behavioural therapy) prior to January 2001 and those who received the motivational enhancement program from its inception in 2001. Analysis of official State Record Data, indicating rearrest rates over the subsequent three years post-completion of the intervention, revealed significantly lower recidivism for those who completed the stand alone treatments of motivational enhancement program (PFL; 7.4%) compared to the standard care two hour intervention (9.9%) and when PFL was coupled with additional substance abuse treatment (for those with diagnosed substance abuse; (12.1%) compared to offenders completing the 22 hour standard care program (14.7%). These effects were found regardless of gender, prior DUI or prior intervention completion. However, regarding age, in the PFL plus substance treatment group completers, there were lower rearrest rates only for the older offenders (aged 40 years and higher) compared to the standard care programs. There were no significant differences for non-completers between the intervention groups.

TRIAD

In Florida, a recidivist drink driving program named TRIAD was developed to target recidivist drink drivers, using Cognitive Behavioural Therapy and Motivational Enhancement Treatment to identify and restructure cognitive distortions (beliefs that maintain a behaviour) that recidivists automatically used in

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justifying their drinking and driving behaviour (Moore et al., 2008). Participants (n=62) attended twice weekly, once for a sixty minute psycho-educational group and once for a sixty minute individual counselling session, followed by weekly homework assignments over a 3-5 month period (program length was dependent on the client's individual needs). Initial assessments were undertaken by a substance abuse treatment facility to determine eligibility for entry into the program, including that participants must have been sentenced by the court to engage in a treatment program and have had a minimum of two drinking and driving convictions without having caused death or serious injury. Baseline self-report questionnaires identified participants as having considerable drinking problems, such that 57-76% were classified as 'alcoholics' (depending on which cut-off score was used). Throughout the duration of the program, participants were required to remain drug and alcohol free, which was assessed via urinalysis. A total of 87% of participants graduated from the program. At 21-month follow-up, official data indicated that 12.9% of graduates, and 75% of the non-completers had been re-arrested for driving under the influence (it was noted that two participants were arrested for driving under the influence during the course of the treatment program). Total charges for each group were recorded at 27.8% of the graduates and 87.5% of the non-completers having been rearrested for a criminal offence, included driving with a revoked licence, reckless driving, possession of a controlled substance and possession of a firearm. Unfortunately no control group was included, and the authors noted that the effects of the study were possibly confounded by a drink driving initiative that was released in the community that ran simultaneous to the treatment program.

Under the Limit (UTL)

Under the Limit (UTL) purports to be an evidence based drink driving rehabilitation program in Queensland, Australia which has been in operation since 1993, but has undergone revisions based on research literature (Palk et al., 2015). UTL is based on Cognitive Behavioural Therapy and aims to provide education about the impact of drinking and driving, address drinking and drinking and driving factors (strategies to avoid drinking and driving, track drinking levels and a plan to manage it, and change attitudes to drinking) under the monitoring of a probation officer. While it is available to a broad range of participants, including discussion of illicit and licit drug use, it largely caters to high range BAC offender or repeat DUI offenders. Participants must volunteer to be under a probation order and pay a fee for attendance at the program. The program runs 11 sessions of one and a half hours duration, in small groups (8-10 participants). No recent investigations have reported quantitatively on the program's efficacy, although older investigations have reportedly highlighted a reduction in recidivism of 15% for offenders in the intervention group compared to controls, which has further increased to 55% for offenders with both prior drink driving offences and a high BAC (greater than or equal to 0.15g/100ml) (Siskind et al., 2000, cited in Palk et al., 2015; Ferguson et al., 2001, cited in Palk et al., 2015). More recently, Sheehan, Fitts, Wilson and Schramm (2012) reported on their qualitative analysis of 30 participants post-completion of the program which revealed self-reported reductions in alcohol intake and drinking and driving and increased knowledge in these areas, although no objective data was used, nor a control group, and thus the findings are difficult to generalise, not to mention limitations inherent in self-report data.

3.2.7 Multi-component rehabilitation for drink and drug driving

A comprehensive meta-analysis was recently undertaken to investigate the effectiveness of interventions for recidivist drink drivers (Miller, Curtis, Sønderlund, Day & Droste 2015). Of the 42 studies that were included for analysis, Miller et al. (2015) found that the studies were essentially incomparable given the differences in study methodology, or because there was insufficient statistical information to calculate effect sizes. They concluded that although there was a "dearth of high quality evaluations of DUI interventions" which limited the "robustness of the conclusions" it was "reasonable to conclude that evidence exists to suggest that multi-component programs are more effective than those which target

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only one aspect of the issue" (Miller et al., 2015, p.27). Miller et al. (2015) argued that the research literature demonstrates an "insufficient evidence base for the effectiveness of DUI interventions, especially regarding which interventions work best for which groups and levels of offenders" (Miller et al., 2015, p. 28). From the current literature review we know that drink driving and drug driving offenders are a heterogeneous group, such that any underlying struggles with substance use and motivation to change one's behaviour is likely to manifest in varied ways and thus an intervention effective with one recidivist may be ineffective with another. Behaviour change is difficult for any individual, while the fear of being convicted and attending court is incentive enough for many to be a law abiding citizen, for the recidivist offender with a substance addiction, their addiction "is stronger than the fear of what *could* happen or even what does happen" (Wallace, 2011, p. 120). Remembering that substance dependence is a diagnosable disease and as such significantly impacts on one's social, occupational and daily living skills, due to the symptoms of dependence (including, cravings, physical dependence/withdrawal, tolerance, and loss of control), which may be exacerbated by the presence of comorbid mental health diagnoses. Therefore, substance use is not something that one can simply abstain from without support, and it is the underlying reason that traditional sanctions fail to be effective for this population of recidivists (Wallace, 2014). Furthermore, any underlying core problems and comorbidities do not resolve in the longer term following participation in a brief educational or even generic treatment program, and thus interventions must be designed to intervene at individual level and target the underlying causes of the problem behaviours.

Miller et al. (2015) argue that those interventions with the most intensive supervision and a range of strategies show the most promise for effectiveness, and so to reduce recidivism, a mandated multimodal "wraparound" approach (provision of core treatment for primary diagnosis, with additional services for comorbid issues like mental health, medical problems and other substance abuse) is needed (p. 642). Palk et al. (2015) also support multi component programs combining punitive sanctions, probation supervision and treatment in the form of education and rehabilitation. Mullen et al. (2015) acknowledge that effectiveness research on this wraparound approach for reducing recidivism in drinking and driving is in its infancy, yet cite promising effects of such a program for youths (e.g., Pullmann, Kerbs, Koroloff, Veach-White, Gaylor & Sieler, 2006). They argue that investigating the effectiveness of this approach with standardized screening measures (e.g., structured clinical interviewing of substance issues and other comorbid issues) is therefore warranted in trying to reduce the rates of recidivist drink and drug driving (Mullen et al., 2015).

Driving While Impaired (DWI) Courts

Driving While Impaired (DWI) courts bring a multi-component approach to recidivism by combining intensive court supervision (including possibility for punitive sanctions) with individualised and intensive long-term treatment, the latter of which is informed through clinical screening and assessment (Wallace, 2014). The primary goal of the DWI court is public safety, and the court relies on the psychological principals of human behaviour to teach offenders how to change their undesirable behaviours. The intense supervision provided by a DWI court is very unlike a traditional criminal court whereby breaches can go unnoticed until the offender's next contact with law enforcement. Rather, random and scheduled testing and supervision means that participants are always held accountable for their behaviour, and the "rapid response to a violation is a key factor in changing a DWI offender's behaviour" (Wallace, 2011, p.116). For instance, clients are brought before the court if there are any breaches to the conditions ordered by the judge (such as missing an appointment, staying out after curfew, receiving a positive result on a drug test), and receive a punitive response to this, thus teaching the individual the immediate consequences of their actions. While there is a response to every breach, these differ depending on what stage of recovery the offender is in, and ultimately each individual is supported to address the underlying causes to their offending behaviours. Importantly, positive behaviours are reinforced as a means to increasing desired behaviours because any behaviours that are reinforced

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have the highest likelihood of increasing. DWI courts aim for developing offender accountability and thus associated changes in offending behaviour for those whom traditional countermeasures are not effective (NTSB, 2013).

The length of time that one receives individualised treatment for substance abuse and addiction has been shown to be the most reliable predictor of success in relation to positive or targeted behaviour change in the long-term (Wallace, 2011). Wallace (2011) indicated that generally a minimum of one year was needed, such that "beyond a ninety-day threshold, treatment outcomes improved in direct relationship to the length of time spent in treatment" (p.108). Additionally, Wallace (2011) reported that mandated offenders tend to remain longer in treatment and thus benefit, even thought they did not select this course of action voluntarily. Wallace (2014) argues that such a finding demonstrates the need for court intervention, and that this is one way of supporting people to attend for treatment even when they have minimal insight about the underlying nature of their problems.

DWI courts differ greatly, as do operational descriptions within the literature, which can make validity and reliability of evaluations between courts difficult (Miller et al., 2015). Wallace (2014) agues that methodologically sound studies of DWI courts that rigorously follow the DWI court model, suggest that DWI courts are effective, and early evidence indicates that they are reducing the incidence of DWI related crashes in the USA (NTSB, 2013). Conservative estimates indicate DWI courts reduce recidivism by "approximately 12 per cent better than other sentencing options, and the best DWI courts are as much as 60 percent better" (Harron & Kavanaugh, 2015, p. 6). A recent investigation in 2016 compared DWI courts with hybrid drug treatment courts (which accept both alcohol and drug addicted offenders, including DWI) in North Carolina, USA, where there is a mandatory one year licence suspension following DWI arrest (minimum two years for a second offence) (Sloan, Gifford, Eldred & McCutchan). Interestingly, participation in these courts is voluntary and at the offender's expense. Both types of courts use a collaborative team approach in supporting offenders, including legal representatives (police, judge, probation officers) and treatment providers, and includes a multi-component approach of punitive sanctions (judicial supervision, mandatory drug testing, penalties) and treatment. Eligibility is restricted to high risk/need offenders who are chemically dependent, and focus is on treatment of the underlying addictions, with sobriety as the aim. The average time is 15.1 months in the program, but many participants drop out prematurely. Participants must demonstrate ongoing abstinence for six or more months to graduate from the court program. Sloan et al. (2016) reported that "the re-arrest probability for DWI court completers during four year follow up, was less than half the probability for drug courts" (p. 203). The completion of DWI court program was associated with significantly reduced DWI re-arrest/conviction, compared to matched controls who were never referred to a treatment court program. Of concern, only just over one percent was referred to a specialty court, and only half the participants enrolled in the DWI court completed the program (Sloan et al., 2016). Wallace (2011) argues that while prosecutors typically seek to incarcerate a fourth, fifth, or sixth time recidivist drink driver, it is these offenders who are particularly in need of attending a DWI court, as the underlying problems (usually alcohol dependence) will not resolve in gaol, and as such a person's dependence to alcohol should be the factor granting them entry to the program, rather than the number of offences they've committed. Hence, unmotivated participants need to be supported to increase readiness to change.

The Alcohol and Other Drug Treatment Court in New Zealand (AODT Court) was established in 2012, to pilot its effectiveness in responding to the treatment of chronic recidivist drink drivers. The program only accepts people into their rehabilitation program under strict conditions, including that the individual must have been charged with their third or subsequent drink driving offence; plead guilty to this offence; consent to their participation; have a clinically diagnosable moderate to severe substance dependency that is driving their traffic offending behaviour; be at risk of harm to themselves or others because of their alcohol or drug misuse; and be free from serious medical or mental health disorder. This court

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caters to approximately 100 participants annually. However, sentencing is deferred until such time as the offender has undertaken the treatment/rehabilitation program as devised in court, (averaging 19 months or longer where necessary). Following completion of the program a default sentence is imposed to enable each individual to receive ongoing and intensive supervision, to ensure they are supported for a further 12-24 months. The court develops an individual treatment plan for each offender, based on their clinical needs, which includes developing an understanding of each individual's comorbidities, including drug dependence and mental health (Tasmania Law Reform Institute, 2017). Multiple evaluations and reports since its inception indicated that by 2016, 70 offenders had completed the program and had not been returned to prison; and there were "74 offenders who had been exited from the court" (interview with Judge Lisa Tremewan, 2016, cited in Tasmanian Law Reform Institute, 2017).

There are no DWI specific courts in Australia, although the Tasmania Law Reform Institute in their recent literature review suggested that because research had demonstrated that a traditional criminal justice response, educational programs and alcohol ignition interlock had proven ineffective for the recidivist drink driver that a specialist court be piloted in Tasmania to respond to the heterogeneous needs of these offenders (2017).

3.3   Speeding

A comprehensive literature search revealed that, overall, there is little research regarding the effectiveness of therapeutic interventions specific to changing behaviour in recidivist speeding offenders, with more traditional and punitive sanctions relied upon (Watson et al., 2012). Furthermore, like recidivist drink and drug driving offenders, sufficient empirical evidence exists to describe speeding offenders as a heterogeneous group of people for whom differing interventions must be carefully tailored and evaluated to elicit behavioural change rather than simply relying on traditional legal sanctions, media campaigns and generic educational programs (e.g., Austroads, 2009; Fylan et al., 2006; Mackay et al., 2013; Watson et al., 2012; Watson et al., 2015). For instance, Watson et al. (2015) found that in their sample of 1,000 offenders in Queensland, Australia, 55.2% of recidivist high-range speeding offenders (convicted for driving 30 km/h or more above the speed limit on two or more occasions) had a prior criminal offence (compared to 7% of once only low-range speeders). Looking at the larger group of data (n=84,456), Watson et al. (2015) found that recidivist high-range speeding offenders, when compared to non-recidivists, were more likely to have been involved in a crash, to have a range of previous traffic offences (including, drink driving, unlicensed driving, dangerous driving), and to have committed a criminal offence. The high-range speeding recidivists appear to often take risks across multiple domains (Watson et al., 2015) and have been identified in the literature as resistant to change, and less amenable to interventions aimed at behavioural change (e.g., Fylan et al., 2006, & Harrison, 2008, cited in Watson et al., 2015). Similarly, Mackay, Knight and Leal (2013) found that young drivers are overrepresented among those who frequently speed (exceed the speed limit more than 50% of the time) and that middle-aged drivers (40-59 years old) represented the largest group of speeding drivers in a survey of Queensland drivers. No gender effect was found when looking at the frequency of speeding, as opposed to excessive speed.

Reasons for difficulties in changing the behaviour of speeding offenders may lie in the underlying attitudes and beliefs held by these offenders. For instance, a representative sample of Queensland drivers indicated that low-level speeding remains socially acceptable, and individuals continue to report their beliefs that low-level speeding does not increase the risk of crash or injury (despite evidence to the contrary) and that speeding was often a conscious choice (Mackay et al., 2013). While different terms are used throughout the literature to categorise these offenders, the operationalisations appear similar (Watson et al., 2012). Fylan et al. (2006) identified four types of speeding offenders each amenable to differing interventions, which seem to be the most widely adopted by researchers. According to Fylan

et al. (2006) two categories of speeding offenders ought to be targeted for recidivist intervention, specifically through challenging their distorted cognitions that relate to their speeding behavior:

- Those who habitually drive faster than average (habitual behaviour is very resistant to change, and requires learning and training to break the cycle), yet despite awareness of the greater risk, they believe they are safe drivers and experience pleasure and an emotional outlet from speeding ('Frequent high speeders')

- Those who acknowledge that their speeding is dangerous, yet assert that they enjoy taking risks and breaking the rules ('Socially deviant drivers'). This sub-group score high on personality traits of psychoticism, thrill, adventure seeking, and boredom.

The remaining two categories apply to 'unintentional speeders' and 'moderate occasional speeders', whom Fylan argues are probably more amenable to traditional sanctions, including educational and technological approaches (Fylan et al., 2006).

Fylan et al. (2006) warned against using a driver's apprehended speed as a measure of the category of speeder to which they identify, and as such recommended that an appropriate analysis of their driving record be undertaken to gain a valid measure of their typical speeding behaviour and thus inform their intervention. Watson et al. (2012) argues that innovative sanctions are needed for the repeat high-range speeders, who also tend to be involved in criminal activity and other risky driving behaviours, and unreceptive to traditional methods. As with rehabilitation for driving under the influence, a multimodal approach is also recommended as best practice in changing the behaviour of recidivist speeders, including a combination of driver rehabilitation coupled with in-vehicle technologies (Austroads, 2009; Cairney, Styles & Imberger, 2009; Fylan et al., 2006; Baldock, Grigo, Raftery, Wundersitz & Lydon,2012).

Repeat Speeders Trial (RST)

The only recidivist speeding therapeutic study that could be found in the research literature over the past ten years was the Repeat Speeders Trial (RST), conducted in Victoria, Australia, which also investigated Intelligent Speed Adaptation (Young, Stephan, Newstead, Rudin-Brown, Tomasevic & Lenné, 2013). The RST investigated the effectiveness of the implementation of a two-part group behavioural intervention (BI) program with recidivist speeding offenders (aged 21 years or older and holding a full drivers licence) randomly allocated to the BI group (n=237) or to a behavioural survey (n=221; Young et al., 2013). In the BI group, participants undertook two hours of group intervention (with 6-10 participants), over two consecutive weeks. The BI program was designed by a road safety psychologist and reviewed by a panel of psychologists with the aim to support offenders to reduce their speeding behaviour. The authors acknowledged that the long-term impact of the program remained unknown as the follow-up period was brief (only 5 weeks post completion), but self-report data completed pre-and-post participation suggested that the behavioural program positively influenced recidivist speeders' speeding behaviour, attitudes towards speeding and driving more generally (Young et al., 2013). As detailed above, and noted by the authors, self-report accounts do not necessarily result in actual behaviour change, which may be particularly relevant to illegal behaviours such as speeding, and subject to social desirability biases, where offenders may under-report illegal behaviours and attitudes (Styles, Imberger & Cairney, 2009). However, this study represents an important direction for future research into therapeutic intervention for recidivist speeders.

3.4 Reckless driving

Reckless driving is a broad term applied to many different driving behaviours, with speeding perhaps the most frequently studied, but other behaviours include close passing and tailgating, running red traffic

lights, changing lanes and overtaking when unsafe, using mobile phone, driving under the influence or when fatigued (McNally & Bradley, 2014). McNally and Bradley (2014) argue that urgent research is needed to determine the nature of reckless driving, such that an aetiology of why drivers engage in such behaviours can be used as a means to guide intervention. In development of a new reckless driving measure (the Reckless Driver Behaviour Scale), they determined through self-report four distinct factors in the reckless driving of young drivers: distraction, substance use, placing the vehicle in an unsafe environment beyond design expectations, and speed and positioning of the vehicle relative to other vehicles and objects. Due to the emergence of these distinct factors, McNally and Bradley considered that interventions tailored to the specific type of reckless behaviour may be most effective, rather than treating recklessness as one generic behaviour. The authors acknowledged the limitations to their data, being that the majority of their sample were female psychology undergraduates, although the homogeneity of the sample was reduced somewhat by the incorporation of some participants from the general Australian and New Zealand population.

In terms of literature detailing rehabilitation of recidivist reckless drivers, only three investigations could be found that related in some way to reckless driving. Please note that one of these has been discussed in section 2.1.2 above (Drive Alive Program) as it is an educational course that caters to the young driving offender population who have committed any type of traffic offence, including reckless driving. The investigations reported below relate, in part, to reckless driving rehabilitation but the offence is operationalised differently between them and the efficacy data is limited. It appears that further research is warranted in determining the best practice for rehabilitation of reckless drivers.

Road Trauma Awareness Seminar (RTAS)

Although the Road Trauma Awareness Seminar (RTAS) is a 2.5 hour educational intervention available to all traffic offenders generally, and no evaluation data could be found, it is being discussed in this section because it is the only intervention found within the literature that specifically provides for both first-time offenders and recidivists typically convicted for "hoon" offences. The program is defined as "non-treatment based" but is founded in restorative justice principles and based on three psychological models (Narrative Discourse, Experiential Learning, and Cognitive behavioural Intervention; Clark & Edquist, 2013, p. XVII). The program aims to reduce recidivism by encouraging participants to change their driving behaviour through a three-step process of education, reflection and prevention. Firstly, participants are educated about: the impact of road trauma and safe driving; then provided the opportunity to reflect on personal accounts of road trauma, and evaluate their attitudes and behaviours; culminating in identification of preventative strategies for driving challenges, including situations of impatience, inattention, aggression and peer pressure (for further information on course content and theoretical background, see Clark & Edquist, 2013). The program is facilitated by educators who have undergone a two-day training segment and typically have a background in social sciences or counselling. The RTAS commenced in Victoria, Australia in 2006, and uses volunteer speakers (with personal experiences of trauma) and emergency service personnel. Groups cater for up to 15 people, attendees are typically males aged 20-25 years (with approximately 1,200 participants attending per annum). Participants are referred by the Magistrates Court, their solicitor, or self-referred, and must pay $300 for a first offence, or $500 for repeat offence. Unfortunately, as no evaluation data has been published, further research would be needed to gain an understanding of the program's efficacy in reducing reckless driving recidivism.

Risky driving and hazardous drinking

The second study addresses risky driving which could be conceived as a reckless style of driving. Sommers et al. (2013) undertook a randomised controlled trial to investigate the efficacy of a brief intervention for reducing both risky driving and hazardous drinking in patients admitted to a trauma

centre emergency department with injuries or illnesses in Cincinnati, Ohio. Presenting patients underwent a three-minute screen to determine eligibility for participation, including positive endorsement of two risky driving behaviours over the past month (wearing a seatbelt only some of the time or never, and two or more instances of driving 20 mph over the speed limit or driving through a yellow light as it changed to red) and endorsement of hazardous drinking items (five or more alcoholic drinks each day). Participants were excluded for a number of reasons including scores on the AUDIT indicating alcohol dependence. Eligible participants (n=476) were randomly allocated to one of three groups:

- Brief intervention group (BIG; n= 150) - received baseline assessment, a 20-minute structured interview, followed by brief intervention and then follow up telephone assessment interviews at three, six, nine, and twelve months)

- Contact control group (CCG; n= 162) - same as BIG, minus the brief intervention

- No-contact control group (NCG; n= 164) - 12 month follow-up only

The BIG consisted of two 20-minute patient-centred sessions; one face-to-face intervention in the emergency department; and a telephone booster intervention 10-14 days post discharge from the ED (with the aim to review progress to, and adapt the earlier developed contracts). The intervention style focused on providing personalised feedback, being non-confrontational and used reflective listening techniques to explore safe driving practices, provision of information on alcohol use, discussion of pros and cons pertaining to changing behaviours, and initiation of behaviour change contracts. Nurse clinicians were trained by a psychologist to meet treatment protocol, and were videotaped and evaluated by external experts. Assessments were undertaken by trained research assistants who were blind to treatment condition. Behavioural data was self-reported, although the study complemented this with traffic violations and crash report data from motor vehicle records and police jurisdictions. At nine-month follow-up, the intervention group showed significantly increased self-reported seatbelt use, adherence to traffic signals, reduced speeding and reduced drinking and driving compared to the two control groups. Hazardous drinking was significantly reduced at six months but no longer at nine months. Sommers et al. (2013) calculated that they would need to treat six offenders to increase seat belt use in one offender and seven offenders to reduce hazardous drinking in one offender.

3.5   Unlicensed driving

Similar to the aforementioned categories of recidivist traffic offenders, the population of unlicensed driving offenders is also described in the literature as a heterogeneous group with differing driving behaviours exhibited amongst them, and so innovative countermeasures are likely to be required to manage sub-groups of unlicensed drivers (Watson, 2004; Baldock et al., 2013). Watson (2004) identified two particularly problematic groups of unlicensed drivers: those who drive, but had never been licensed (who pose problems because of their likely driving inexperience) and those who drive whilst disqualified from holding a licence (which is typically problematic because the underpinning cause of the licence removal remains unaddressed). Furthermore, many unlicensed driver choose to keep driving because of a perceived low likelihood of being detection.

Watson (2004) argued that addressing the maintaining factors of alcohol misuse could reduce unlicensed driving if this was the underling causative factor, and that rehabilitation measures could therefore be incorporated into drink driving rehabilitation programs. However, Watson (2004) also suggested that there should also be a focus on trialling rehabilitation programs specifically targeted at other underpinning psychological variables that may contribute to driving unlicensed. These might include the "social deviance" associated with risk-taking and antisocial behaviours present in some unlicensed offenders (Sentencing Advisory Council, 2009, p. 32) and poor impulse control (Watson, 2004). Evidence from the Sentencing Advisory Council (2009) supports Watson's (2004) findings that

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unlicensed offenders also had driving under the influence offences, but this did not account for all unlicensed offenders. For instance, of the 8,087 offenders sentenced for driving while disqualified or suspended between 2004-2005 in Melbourne, 51.8% had committed previous drink driving or drug driving offences (7.4% had four or more prior drink or drug driving offences), and 32% were recidivist driving unlicensed offenders (2009). It is evident from this literature review that further research is needed to better understand the factors that lead to recidivist unlicensed driving in Australia, and this information can be drawn upon to target interventions. Baldock et al. (2013) suggested that rigorously evaluated education or rehabilitation trials should be considered, but tailored to the main behaviours of concern that resulted in the licence disqualification (i.e., drink driving, speeding, etc.). A thorough search for literature yielded only one evaluation of a rehabilitation program for recidivist unlicensed drivers, and although encouraging, the results were reported in 2000 and no recent literature could be found to further support this program.

Driver Offender Treatment (DOT)

Although unlicensed driving tends to be associated with high risk driving behaviours, such as drink driving and speeding, Bakker, Hudson and Ward (2000) theorised that psychosocial factors including maladaptive coping mechanisms in response to stressful life events results in a compulsion to drive. Bakker et al. (2000) developed the Driver Offender Treatment (DOT) program as a means of teaching effective resolution of interpersonal problems and management of emotional struggles to aid in relapse-prevention of unlicensed driving resulting from this aetiology. The DOT is a group-based approach for recidivist disqualified driving offenders in New Zealand. The treatment used a manualised cognitive behavioural therapy framework to support cognitive restructuring of distortions that maintain offending; social sills; anger management; problem solving; and relapse prevention. The most recent efficacy study reported in 2000 found that in a group of 34 incarcerated men and 110 disqualified men in the community who had been referred by probation officers, that on average they had 7.1 driving while disqualified convictions (as well as an average of 3.4 alcohol related convictions and 7.9 criminal convictions). The DOT program consisted of 36 group sessions over a 10 week period, two and a half hours a day, four days each week, for which a high level of engagement was reported. Assessment interviews were conducted at baseline and to assess motivation among other factors, and self-report questionnaires were completed. Follow-up varied, but ranged from one month to three years, at which time reoffence rates were 28% for treated individuals and 73% for the comparison group (although the authors noted that these groups were not directly comparable due to the study methodology and the treatment group being afforded less time to reoffend). Statistical analyses revealed an 18% reduction in reconviction of driving while disqualified for the treatment group. It was noted that AUDIT scores showed that many of the offenders had alcohol problems that may have been better served in drink driving rehabilitation treatment first.

Despite no additional evaluation studies being available, the DOT study reveals the potential benefits of specific and intensive rehabilitation in this group of unlicensed recidivist offenders, and lends further support to the notion that they represent a distinct subgroup of driving offenders, and require intervention beyond generic offending programs.

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3.6 Summary of non-punitive approaches

Tables 3.1-3.5 provide an overview of the types of non-punitive approaches for addressing recidivism for drink driving, speeding, unlicensed driving, and reckless or dangerous driving.

Table 3.1
Any type of traffic offence interventions

Intervention	Target group	Location	Comment
Young Driver Scheme	Non-serious traffic offences for individuals under 25 years of age	England	Educational online program, preceded by one face-to-face educational group session. At 6-month follow-up more effective in reducing both the number of driving penalty points accrued and police reported driving offences, than traditional in-class education program, or payment of fines. Motivation may be enhanced by online components ease of use, free from social-stigma/constraints and being visually pleasing and interactive.
Medical Psychological Assessment (MPA)	First Offence (if serious) & Recidivist	Germany	Comprehensive medical and psychological clinical assessment process determines fitness to drive following offence, and used to predict future driving behaviour. Lower drink driving recidivism rates evident in Germany at 3 year follow-up, compared to those where no MPA used.
Blacktown Traffic Offenders Program	Any traffic violation	NSW, Australia	Large educational group program (8x2 hour sessions) catering to up to 200 participants simultaneously. 10.5% re-offence rate at 2 years follow-up but no control group. Risk factors for future traffic offending identified and thus indicator of where to provide intensive intervention.
Drive Alive	Targets young driver population for any moderate to serious traffic offence	Ohio, USA	Interactive/educational group sessions for groups of 20-30. Suggest followed-up with booster session because improved driving behaviour in intervention group at 6 months compared to control group was lost beyond the 6 months (5 year follow-up). Additional traffic offences committed by 26.4% intervention group significantly lower than similarly matched controls (32.3%). No randomisation to groups, but control group randomly selected.
Road Trauma Awareness Seminar (RTAS)	First and recidivist	Victoria, Australia	All traffic offenders but specifically targets hoon offenders. 2.5 hour seminar for up to 15 participants. Based on restorative justice and psychological theory but defined as purely educational and non-treatment based. Purports to change driving behaviour through education, reflection and prevention. No evaluation data published.

Table 3.2
Drink and drug driving interventions

Offence Type	Intervention	Target group	Location	Comment
Drink & Drug Driving	One for the Road	Recidivist Offenders. Culturally appropriate to Maori and Pacific Islander population.	New Zealand	Interview/assessment then 10 hours over 2 group therapy sessions. Founded in theoretical principals aimed at challenging distorted cognitions related to drink driving and drinking; enhancing commitment to change and self-awareness. 3.5% reconviction for alcohol related driving offences in the 6-30 months post completion, but 2.6% of these in the first 6 months. Self-reported low future risk of driving with alcohol. No control group.
	Driver Education and Evaluation Program (DEEP) & Prime for Life (PFL)	First offender and Recidivist	Maine, USA	Two cohorts compared 1) Standard care – pre 2001 (low level offenders: 2 hours substance abuse interview/assessment with no feedback; or 22 hours group intervention using Cognitive Behavioural Therapy (CBT) and further 6 counselling sessions if diagnosable substance disorder) 2) Motivational intervention (MI)- post 2001 for all offenders (manualised 20 hours group program to reduce substance use; followed by further 6 counselling sessions if diagnosable substance disorder). Compared to standard care, MI reduced recidivism at 3 years (rearrests); MI+counselling lower recidivism for 40+ years of age only (harder to treat substance dependent group).

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	Mississippi Alcohol Safety Education Program (MASEP)	First offenders, but also accepts recidivists	Mississippi, USA	Motivationally enhanced educational program (4 group sessions, 12 hours, targets readiness to change and development of avoidance plans) compared with interactive educational program (10 hours). Caters to individuals with problem drinking. Recidivism at three-years significantly lower drink driving citations for motivational group (23.75%) than educational group (26.46%), but no differences between groups for offenders with higher education. Higher recidivism for: those who dropped out than those who were mandated but did not attend; and for prior DUI and problem drinker status.
	Driving While Impaired Courts	Recidivist	USA & New Zealand	Multi-component approach via intensive court supervision throughout a period of individualised and intensive long-term treatment. Different to traditional criminal court: rapid response to violations aimed at changing offenders' behaviour. Generally 1 year minimum attendance for best outcomes, with 12%-60% reductions in recidivism observed when stringent criteria followed.
Drink Driving	Screening with Alcohol Use Disorders Identification Test (AUDIT)	First offender and Recidivist	Widespread usage	AUDIT screens individuals for 'at risk' and 'dependent' drinking, highlights level of intervention required in a hierarchical manner.
	Brief Motivational Interviewing (MI)	'At risk' drinkers	New Mexico, USA	Brief 3-5 minute motivational interviewing (MI) session for 'at risk' drinkers (dependent drinkers excluded). 3.38 times higher risk of future drink driving in controls than MI group, which remained at 5-year follow-up.
	Preventing Alcohol Related Convictions (PARC)	First Offenders	Florida, USA	PARC (12 hours over 4 group sessions) aims to enhance insight that controlling drinking not reliable so instead control driving/access. Those randomised to PARC significantly reduced recidivism at 1 year (42%) and 2 years (25%) follow-up compared to traditional education regarding controlling drinking.
	Steering Clear	First Offenders: if breath alcohol content <0.15 g/100ml.	Australia	2 hour online interactive educational and behavioural program, underpinned by cognitive behavioural therapy and motivational interviewing. Pilot study - Small sample limits generalisability and self-report data, but positive intentions to refrain from drinking and driving.
	Hero to Healing	First Offenders & Recidivists. Culturally appropriate for Aboriginal participants	Australia	Specifically designed in collaboration with Aboriginal Elders. 4x2 hour weekly group sessions, founded in a Community Reinforcement Approach (that inclusion of community important in recovery) and cognitive behavioural therapy. Includes education on alcohol and cannabis use, and focuses on making non-drinking more appealing because of the impact of drink-driving on the community. Further research needed: Qualitative pilot study based on small sample of (n=17) positive self-reports.
	Sober Driver Program	Recidivist: Excluded if not suitable, i.e., mental health or literacy struggles.	Australia	Same material presented in either a longer duration (9x2 hour weekly sessions) or a condensed version (3x6 hour sessions). Cognitive Behavioural Therapy framework and education which aims to teach participants to separate drinking from driving, supports skill development, relapse prevention and stress management. 2008 study not randomised, found treatment group 43% less likely to re-offend at 4-month follow-up compared to controls who only received legal sanction. They noted that knowledge declined over time, but remained higher than at the onset of the program, and may warrant refresher type follow-up. 2011 study replicated the effects with a new treatment group with three year follow-up (non-randomised), and found effects remained at 5.5 year follow-up with participants from earlier study.

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Back on Track	First Offender & Recidivist	Canada	Allocated based on severity of substance use problems. Multicomponent treatment workshop (16 hours: treatment type undefined) lowest recidivism (5.5%) for drink driving offences, compared to legal sanctions only (8.5%) and the 8 hour educational program (6.7%).
TRIAD	Recidivist	Florida, USA	Cognitive Behavioural Therapy and Motivational Enhancement Therapy aims to target and restructure cognitive distortions that are maintaining offending behaviour. Initial assessment classified 57-76% of participants (n=62) as alcoholics. Attended 1xweek 60 min psycho-educational group and 1xweek 60 min individual counselling, over 3-5 months dependent on individuals' needs. Monitored for alcohol and drug use and required to be negative – 87% graduated from the program. 21 month follow-up, 12.9% of graduates had been rearrested for driving under the influence compared with 75% of non-completers. No control group.
Under the Limit (UTL)	High range BAC offender or repeat DUI offenders	NSW, Australia	UTL is based on Cognitive Behavioural Therapy, 11x sessions of 1.5 hours, in small groups (8-10 participants). Reduction in recidivism of 15-55% compared to control group but efficacy studies old (2000-2001).
Motivational Interviewing (MI)	Recidivist, but substance dependence excluded	Canada	Randomised to brief MI (30 minutes brief manualised and supervised) or information control (manualised 30 minute provision of education). Assessors blind to treatment allocation and self-report data corroborated by alcohol biomarkers. 1st study targeted risky drinking, which reduced in both groups (each n= 92) compared to baseline, but only ongoing reductions for MI group between 6 and 12 month follow-up, and significantly greater reduction in alcohol biomarkers at 6 months compared to control. 2nd study majority same participants but followed-up for 5 years and recidivist measure of re-arrest found MI group (n=85) increased length of time till re-arrest only for 'younger' population in their groups they defined as (26.4 – 42.8 years of age) compared to information control.
Motivational Interviewing (MI)	First offender and Recidivist	New Mexico, USA	All had positive alcohol misuse screen or BAC of .08 or higher on admission. Recidivism (DUI arrests) in drivers and passengers presenting to hospital after being injured in crash. Random allocation to brief 30 minute MI session or standard care, the latter simply provision of contacts for alcohol treatment centres. Argued that results showed 9.4 patients needed to receive brief MI to prevent one DUI arrest.
Web based Motivational Interviewing (MI)	First offenders; at-risk drinkers	Los Angeles, USA	Random allocation to one of 3 groups: Standard care (SC); or SC plus motivational interviewing; or SC plus web-based motivational interviewing. Self-report data on alcohol use and drinking and driving reduced for all groups, but no significant differences between groups. Participants reported greater satisfaction with program in both MI conditions than SC. 67% alcohol dependent, but only tailored to at risk drinkers, short 3-month follow-up.

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Table 3.3
Speeding interventions

Intervention	Target group	Location	Comment
Drive Alive Program		Ohio, USA	See comments in Table 3.1
Repeat Speeders Trial (RST)	Recidivist	Victoria, Australia	Randomly allocated to a two-part behavioural intervention (BI) program (2 hours small group intervention over two weeks) to support reduction in speeding designed by road safety psychologist or to behavioural survey. Self-report data pre-and-post BI positively influenced speeding behaviour, attitudes, although no objective data and short follow-up of 5 weeks.

Table 3.4
Reckless or dangerous driving interventions

Intervention	Target group	Location	Comment
Drive Alive Program		Ohio, USA	See comments in Table 3.1
Risky Driving and hazardous drinking	General population of people presenting to trauma centre with injury or illness; excluded if alcohol dependent	Ohio, USA	Randomised controlled trial aimed at reducing hazardous drinking and risky driving behaviours. Brief intervention (2x20 minute sessions & telephone booster 10-14 days after) compared with 2 control groups who received assessment only (at 12 months; and the other assessments at each time point). Assessors were blind to group allocation. Self-report and traffic violation data revealed at 9 months significantly increased seatbelt use, adherence to traffic signals, reduced speeding, reduced drinking and driving, in intervention group compared to controls at follow-up and hazardous drinking significantly reduced at 6 but no longer at 9 months.

Table 3.5
Unlicensed driving interventions

Intervention	Target group	Location	Comment
Driver Offender Treatment	Recidivist; incarcerated and in the community	New Zealand	Intensive Cognitive Behavioural Therapy – 36 group sessions over 10 weeks (2.5 hours 4x week). At baseline averaged 7.1 driving disqualified convictions and AUDIT scores revealed many had alcohol problems. 1 month – 3year follow-up, 18% reduction in reconviction. Comparison group 73% re-offence rate compared with 28% of treated group, but methodological limitations to this comparison. Old study (2000).

4   Technology

This section explores the potential for different types of technology to reduce recidivism either by managing driver behaviour or improving the authorities' ability to detect or identify offenders. Some of the technologies discussed in this section have been in use or trialled with driving offenders while others are included as they are considered to offer some potential for use with driving offenders. Technologies have been grouped according to their application to offenders as either restricting behaviour, monitoring behaviour, or detecting offenders.

4.1   Behaviour management devices

There are several technologies that are designed to manage the behaviour of drivers. These include interlock devices that restrict the operation of a vehicle unless the driver proves fitness to drive, and assistance technologies that can help the driver operate the vehicle legally.

4.1.1   Interlocks

Interlocks are devices that restrict behaviour by preventing the operation of a vehicle if the driver fails a test proving their fitness to drive. In relation to driving offences there are two devices of interest: the alcohol interlock and licence interlocks.

Alcohol interlocks

Alcohol interlocks have proven to be very successful in the prevention of drink driving, so much so that they have been implemented in a number of jurisdictions across North America, Europe, and Australia. The evidence for the efficacy of these devices is well documented elsewhere (e.g., Willis et al., 2009) and has previously been addressed by CASR (see Bailey et al., 2013; Lindsay, 2015 [unpublished]; Kleoden et al., 2016 [unpublished]). Perhaps the most important issue regarding the use of interlocks is whether the scheme is voluntary (i.e., offenders elect to enter the interlock program) or mandatory (i.e., all eligible offenders must enter the program in order to get their licence back). While alcohol interlocks have demonstrated success at preventing drink driving, the research also shows that this effect only lasts while the device is installed in the vehicle (Houwing, 2016; Marques & Voas, 2012; Miller et al., 2015; Willis et al., 2009). Furthermore, mandatory interlocks are not intended for drivers who are dependent on alcohol; therapy would be a more suitable intervention for this group (Houwing, 2016).

Given the success of interlocks for preventing drink driving, a similar approach for drug driving offenders would be desirable. At the time of writing this report, the authors are unaware of any such device although it is plausible that such technology may become available in the future. One of the key problems to overcome in the development of a drug driving interlock is the ability to collect and analyse samples in a manner viable for use in an interlock.

Licence interlocks

Baldock (2013) reviewed the available options for reducing unlicensed driving and suggested that an electronic licence that worked as an ignition key will, in theory, be highly effective for preventing unlicensed driving. Baldock noted that no such option is yet available although the introduction of 'smart card' licences suggest the feasibility of using a licence interlock with further development of the technology.

Another possibility for an interlock is the use of biometric systems which rely on unique biomarkers such as fingerprints. Fingerprint based security devices are becoming increasingly more common and are now available on smartphones. It is conceivable that something similar could be incorporated into

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vehicles in the future. In a paper describing a fingerprint based licensing system, Ashwin et al. (2013) propose a system where, in order to start the vehicle, the driver inserts a smart card licence (which contains fingerprint information) into the vehicle, and then a fingerprint scanner is used to verify that the licence matches the driver and that the licence is valid.

A potential drawback of the smart licensing system is that it would require considerable infrastructure and co-operation at a national level to work. It would be necessary to store driver details in both the licence and the licensing database and there is a need to ensure the identity of the individual using the licence to prevent fraud. The linking of smart licences with biometric scanning may benefit this, although the use of smart licences may not be necessary if biometric systems are capable of remotely linking with the licensing database to determine the status of the driver.

Other biometric systems that are in use in other areas and may also be feasible for use in vehicles. For example, the iPhone X uses facial recognition as a security feature. Advances in these types of technology and their potential for use in driver licensing and identification should be monitored. While Baldock (2013) suggests it is difficult to determine a timeline for the introduction of these technologies, Nissan revealed a prototype vehicle that included a fingerprint ignition system at the 2018 Detroit Motor Show (Duff, 2018).

4.1.2 Driver assistance technologies

Intelligent Speed Adaptation (ISA)

There are a raft of Advanced Driver Support Systems (ADAS) that assist drivers with the driving task. Of these it would appear that Intelligent Speed Adaptation (ISA) has the greatest potential for use and is the only one that has been used with recidivist offenders.

As the name suggests, ISA systems are designed to assist drivers with the management of vehicle speed. There are three types of ISA: advisory, supportive, and restrictive. Advisory and supportive ISA devices alert drivers (audibly and/or visually) when they are travelling above the posted speed limit. Additionally, supportive devices prevent the vehicle from exceeding the limit but are able to be overridden (i.e., the driver can increase vehicle speed beyond that imposed by the ISA system). Restrictive ISA systems prevent a vehicle from exceeding the speed limit and cannot be overridden by the driver. The potential use of such systems with recidivist speeders is self evident. While there are a number of studies demonstrating the positive effect of (most commonly advisory) ISA on vehicle speeds (e.g., Jamson, 2006; Jiminéz et al., 2008; Regan et al., 2006; Vlassenroot et al., 2007; WallénWarner & Aberg, 2008) only two addressing the use of ISA with speeding offenders were identified: the Repeat Speeders Trial in Victoria, Australia (Stephan et al., 2014) and the Dutch Speedlock trial in The Netherlands (van der Pas et al., 2014).

The Victorian trial assessed the benefits of an advisory system while the Dutch trial examined both advisory and restrictive systems. Both studies demonstrated both types of ISA systems reduced the time drivers spent over the speed limit, with the Victorian trial also finding drivers returned to the speed limit faster than the control group who did not have ISA. The Dutch trial produced similar results but found the Speedlock (restrictive) system to have a greater effect than the Speedmonitor (advisory) system. Interestingly, in the Dutch trial, drivers with the Speedlock system were found to have a higher mean speed than those with the Speedmonitor system, likely because those in the latter could drive to the maximum speed to which the limiter was set (which was the speed limit + a margin) whereas those in the latter were required to regulate speed themselves. This suggests monitoring devices may be more effective for speeding offenders (because the mean speeds were lower) but the study also found that the more serious offenders were also more likely to override the system. Each system featured an override switch to disable the system for a short period – this was designed to allow for errors in the

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speed mapping (e.g., where the speed limit was not correct). Participants using the override switch were required to provide the reason for doing so at the end of each trip for each instance of use (van der Pas et al., 2014).

While these studies demonstrated that ISA successfully curtailed the speeding of recidivist speeders, both trials also found drivers invariably returned to their old speeding habits once the technology was removed (Stephan et al., 2014; van der Pas, 2014). Furthermore, the Victorian trial excluded "very high risk" (defined as drivers who spent 10% of time driving 15km/h above the speed limit on two or more days per week or exceeded the speed limit by 35km/h for at least 15 seconds three or more times during a week), which is arguably the group requiring the most control. The Dutch trial shows a positive effect for serious offenders and while the advisory system was found to result in lower mean speeds, feedback from experts suggested the restrictive system would be the best option for speed offenders.

4.2   Detection and monitoring devices

As noted in Section 2, perhaps the most important aspect for deterrence is the element of risk of detection: how likely am I to be caught? While the devices described below may not directly prevent offending behaviour, they may have a more indirect effect through deterrence mechanisms by increasing the likelihood of being caught. Monitoring the driving behaviour of offenders may also have other benefits when combined with therapeutic approaches or allow for a higher level of supervision. We can track vehicles and behaviour and be provided with alerts when they do something wrong which could trigger other events, such as breach of probation or other sentence conditions. Alternatively, monitoring in itself might help improve the behaviour of some drivers.

This report is concerned with the prevention of recidivist drivers so only measures that could be used for this population have been considered. While speed cameras can aid with the detection of recidivist offenders their purpose is to detect all vehicles travelling over the speed limit, not specifically the identification of recidivist speeders. The main effect of speed cameras on recidivists is the potential to deter future speeding but, by definition, this effect is arguably lacking for this population.

In-Vehicle Data Recorders (IVDRs)

In-vehicle data recorders are devices that are attached to a vehicle and record data about its operation such as speed and acceleration (longitudinal and lateral). Some systems are based on GPS, while others use accelerometers, and some systems incorporate cameras (Carney et al., 2010; Farmer et al., 2010; McGehee et al., 2007; Toledo & Shiftan, 2016; Toledo et al., 2008). Cameras are used to record footage of incidents (as triggered by IVDR data, e.g., under strong braking conditions) from the driver's perspective (e.g., front facing the outside of the vehicle) and inside the cabin, and can be used to determine the nature of the incident (including false-positives), identify who is driving the vehicle, and identify other factors of interest such as driver distraction and seat belt use (Carney et al., 2010; McGehee et al., 2007).

The constant monitoring of driving available with such systems improve deterrence, as they maximise the risk of detection for offending behaviour. Traditional methods of enforcement are only able to detect illegal or unsafe behaviour at a point in time and only if it occurs in the presence of a speed or red light camera, police patrols, or if it results in a crash. An IVDR can continually monitor driver behaviour (as determined by vehicle operating characteristics) and provide warnings to the driver and report the behaviour to authorities.

Examples of the type of monitoring possible are provided by pay as you drive (PAYD) insurance policies, for which premiums are determined by vehicle use as recorded by IVDRs (Ayuso et al., 2014; Dijksterhuis et al., 2015; Paefgen et al., 2014), and use of IVDRs for fleet management and safety

(Toledo & Shiftan, 2016). IVDRs have successfully been used by insurers to develop risk profiles based on characteristics such as where, when and how the policy holder drives (Dijksterhuis et al., 2015). These characteristics are derived from data such as mileage, speeding, the type of roads driven on, trip/journey time, time of day, day of week, and risky driving manoeuvres identified using accelerometers (Ayuso et al., 2014; Bolderdijk et al., 2011; Dijksterhuis et al., 2015; Paefgen et al., 2014). While studies examining the effect of PAYD on driving behaviour show the potential for some improvement in behaviour (Bolderdijk et al., 2011), particularly when the driver is provided with real-time feedback on their behaviour (Dijksterhius et al., 2015), it is noted that drivers with such policies may still exceed the speed limit (Ayuso et al., 2014) and any gains may fade over time (e.g., Bolderdijk et al., 2011). Similar effects on behaviour have been observed for commercial vehicle fleets but research shows that managers are able to use data from IVDRs to monitor driver behaviour and provide feedback when problems are identified, which has been found to improve driver behaviour and safety (Toledo et al., 2008; Toledo & Shiftan, 2016).

Other research has examined the potential for IVDRs to improve young driver behaviour by monitoring their behaviour and providing feedback (Carney et al., 2010; Farah et al., 2014; Farmer et al., 2010; McGehee, 2007). Noting that young drivers are generally safest when they are learning and accompanied by an adult supervisor (e.g., Kloeden, 2008), several researchers have sought to replicate this effect by using IVDRs to provide real-time feedback on driving and also to generate reports on driving for parents, which were intended to help parents address poor driving. These studies have generally found that while the behaviour of good drivers does not change (which is to be expected as minimal behaviour change is needed), the behaviour of drivers considered to take more risks shows statistically significant improvement such that their behaviour becomes comparable with the good drivers (Carney et al., 2010; McGehee et al., 2007). As with other technologies, however, these gains tend to be lost once the technology is "removed", as revealed during a follow-up period when IVDRs remained installed but all feedback was stopped.

The inclusion of GPS systems with IVDRs may also offer some potential to introduce or better manage other sentencing options (e.g., suspended sentences, restricted driving conditions, etc.). For example, geofencing is the term given to defining an area using a virtual GPS-based boundary within which a device (e.g., vehicle) is able to operate and when leaving this area can result in an alert being sent to a monitoring agency (Reclus, 2013). Geofencing has been used in fleet management (tracking vehicles and theft prevention), and in the monitoring of individual offenders in France (Reclus, 2013). Geofencing and IVDR technologies could be employed in offender management by defining and monitoring the conditions of appropriate vehicle use, including the geographic regions and roads on which it may be driven, the times during which it may be used (e.g., commuting times), who may use the vehicle, and monitor their behaviour while driving. Such an approach may be beneficial where some sanctions may impose undue hardship on offenders or their families (e.g., those in country areas with poor public transport). This would allow courts to improve the effectiveness of such penalties without jeopardising public safety.

The utility of IVDRs for obtaining accurate and objective data on natural driving behaviour sees them widely used in research, primarily to monitor driving and determine the effects of interventions aimed at improving behaviour (further to the research cited in this section see Stephan et al., 2014, and van der Pas, 2014 for other examples).

The body of evidence regarding the use of IVDRs demonstrates that they can be used to have a positive influence on driving behaviour, particularly among drivers who have the most to benefit (i.e., those who demonstrate more dangerous driving). It would appear that improvements are most likely derived from feedback, and it is likely that immediate in-vehicle feedback is more effective than delayed feedback (e.g., a report provided on a website at weekly or monthly intervals), although the latter can yield benefits

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when used for appropriate coaching. However, this evidence also demonstrates that it is still possible to breach traffic laws (e.g., speed limits) and drive dangerously (e.g., too fast through corners, harsh braking), even among those who are aware the devices are installed and where there is some reward or other benefit for driving safely (e.g., discounted vehicle insurance). Furthermore, there is also evidence that any potential benefit from these devices fades with time.

While no evidence of the use of IVDRs specifically in the management of driving offenders, these systems have a number of features that have the potential to improve management and supervision of offenders. These include:

- Data on driving behaviour that can be used to ensure offenders adhere to sentence conditions (e.g., good behaviour).

- Drivers can be identified using either cameras or electronic licences or magnetic keys (McGehee et al., 2007; Toledo et al., 2008). It may also be possible to link the IVDR with other licence interlock devices such as those described in section 4.1.1.

- Cameras can also be used to improve performance of the system by allowing operators to identify false-positive events. This may also improve the legitimacy of devices among people who are coerced to use them.

- They can transmit data wirelessly allowing authorities to access the data for monitoring and reporting (Farmer et al., 2010; McGehee et al., 2007)

- There is the potential to track vehicles and their drivers using GPS. This may provide other opportunities such as geofencing which can be used to determine an area (or roads) within which an offender is permitted to drive under sentencing conditions (e.g., only for work or family purposes).

- Data from IVDRs can be used for coaching to improve driver behaviour and could be used in conjunction with therapeutic approaches.

Automatic Number Plate Recognition

Automatic Number Plate Recognition (ANPR) uses computer algorithms to read vehicle registration numbers from images captured by camera, and compares them against a database to identify unregistered, uninsured, defected, or stolen vehicles (Parliamentary Advisory Council for Transport Safety, 2005). By matching vehicles with owners (and potential drivers) it is also possible to identify drivers who are unlicensed (due to disqualification or suspension), who have special driving restrictions (e.g., alcohol interlocks), or who may be of interest for other reasons (e.g., prior history of drug/drink driving, wanted for some other criminal offence).

ANPR allows an intelligence-based approach to traffic policing allowing police to more reliably intercept vehicles and drivers of interest and improve detection of illegal driving. ANPR can be deployed as mobile devices attached to police vehicles, stationary cameras set up at roadside locations, and may even use footage from CCTV cameras. The diversity here, particularly with mobile devices provides the opportunity to police a wide area, which has the potential to improve deterrence by increasing the risk of detection.

The Parliamentary Advisory Council for Transport Safety (2005) found that ANPR devices resulted in a greater, more visible police presence and enabled greater use of more traditional road policing methods (i.e., direct observation of drivers), allowing greater detection of other traffic offences such as seat-belt use, observable defects, mobile phone use, and driving manner.

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Transdermal alcohol monitoring (TAM)

Transdermal alcohol monitoring involves wearing devices around the ankle which can detect the gas phase of alcohol in the air just above the surface of the skin. The alcohol concentration curves are similar to BAC (breath alcohol readings) but are delayed by 2 hours due to the way alcohol is processed by the body. As such they are useful for monitoring alcohol use but the delay in reading probably make them infeasible for any type of interlock device. However, they can be used to monitor someone on a good behaviour bond that excludes consumption of alcohol. It is possible to incorporate home-detention technology also.

Based on case studies (McKnight et al., 2012) TAM is used for repeat DUI offenders and is usually worn for monitoring before trial, as condition of a bond or parole, or as an alternative to incarceration. Most people on TAM also undergo some other kind of treatment dependent upon the type of offence (e.g., violent offenders might go to anger management, drug users may receive rehabilitation, etc.). Evidence from the DUI Repeat Offender Program in Lancaster County, Pennsylvania, indicates that the use of the SCRAM anklet has been successful for ensuring 99% of offenders remain sober, while those who do drink are not arrested for new DUI offences (Lancaster County District Attorney's Office, 2016, 2017).

4.3   Summary of technological approaches

Based on the above information the potential use of vehicle technologies to prevent or address the behaviour of recidivist offenders is summarised in Tables 4.1 - 4.4.

Technologies that prevent a behaviour from occurring are most desirable and would also improve safety for other road users. They may also provide a sufficient deterrent should the offender's experience prove sufficiently negative. Other systems may encourage safer, more legal driving but the risk of offending remains. The potential effect on deterrence requires further investigation. Monitoring systems could also be used as part of intensive supervision programs for offenders and may also have utility if incorporated with other treatment programs.

Table 4.1
Summary of technologies to address drink driving recidivism

Type of technology	Operational Status	Comment
Interlock	In use	Alcohol interlocks are currently widely used to prevent= drink driving. There are at present no drug interlocks. The effectiveness of alcohol interlocks lasts only while installed.
ANPR	In use	Can be used to identify vehicles of known drink drivers allowing police interception and testing. May increase perceived risk of drink driving. May be less effective if offenders drive vehicles registered under someone else's name..
Transdermal Alcohol Monitoring	Potential	While the alcohol concentration curves are approx. two hours behind BAC curves, making them unsuitable for any type of interlock, they may be useful to monitor DUI offenders for whom abstinence is a sentencing condition.

Table 4.2
Summary of technologies to address speeding recidivism

Type of technology	Operational Status	Comment
ISA	Trial	Advisory and restrictive systems have been trialled with offenders. Demonstrated to be effective but only while systems are installed. Restrictive systems are considered most suited for offenders.
IVDR & other monitoring	Potential	On-board monitoring of driver behaviour would allow detection of speeding and other dangerous driving behaviour but not prevent it occurring. This increases the likelihood of detection and may deter speeding behaviour.

Table 4.3
Summary of technologies to address unlicensed driving recidivism

Type of technology	Operational Status	Comment
Licence interlock	Potential	Could involve the use of smart licences or biometric scanning (e.g., fingerprint or facial recognition). An interlock preventing unlicensed drivers has the potential to be highly effective but the time when such systems will be available is unknown.
ANPR	In use	Help police identify the vehicles associated with unlicensed drivers allowing police to perform checks more frequently. Increases risk of detection but does not prevent behaviour. May be less effective if offenders drive vehicles registered under someone else's name.

Table 4.4
Summary of technologies to address dangerous driving recidivism

Type of technology	Operational Status	Comment
ISA	Potential	ISA may reduce incidence of speeding. Restrictive ISA would prevent this. ISA is only effective while installed. May not prevent other dangerous acts (e.g., burnouts, drifting).
IVDR & other monitoring	Potential	Monitoring systems could be used to alert authorities to dangerous driving behaviour. Increases risk of detection but does not prevent behaviour. If used in conjunction with therapeutic approach may help improve behaviour.

5 Discussion

Drivers who persistently engage in high-risk behaviours while driving pose a substantial threat to the safety of all road users and reducing the risk posed by such drivers will play an important role in achieving Targets 19 (reduce repeat offending) and 22 (reduce road fatalities and serious injuries by at least 30% by 2020) of the South Australian *Strategic Plan*. The aim of this review has been to identify various approaches used throughout the world to address recidivism among drink and drug drivers, speeding, unlicensed driving, and reckless or dangerous driving. Legal, therapeutic, and technological approaches to the management of recidivist offenders were explored. While the studies reviewed above demonstrate varying levels of success in terms of reduced recidivism, many of the programs and trials that have been evaluated have tended to exclude the worst offenders. As such the evidence of their success may in part be due to the characteristics of the offenders involved in the trials – low risk offenders who may have a greater likelihood of successful rehabilitation. Any serious attempt to reduce recidivism *must* include those most likely to reoffend: medium to high risk offenders (Hollin, 1999; Day & Howells, 2002). Other limitations in the research may include: the unavoidable introduction of sample bias (e.g., low-risk offenders) because it is rarely possible to randomly allocate offenders to a penalty or treatment, the definition and operationalisation of recidivism, and the presence of other confounding factors. Another issue that often limits reviews such as this is the lack of methodological consistency throughout the literature that makes comparison and generalisation of findings difficult. Despite these limitations a number of observations are possible.

Legal and administrative sanctions rely on the principles of specific deterrence to prevent recidivism and while they are effective for some offenders they are ineffective for recidivists. While some suggest this may be due to the low likelihood of detection (as perceived by the offender), a growing area of research investigating differential deterrence (i.e., why some people are more deterrable than others) suggests recidivists may possess characteristics that make them least affected by the threat or experience of legal sanctions (Loughran et al., 2012; Piquero et al., 2011). While legal and administrative sanctions may be ineffective for preventing recidivism among a sub-group of driving offenders they have value in terms of identifying recidivists (e.g., demerit point systems) and for limiting the potential for further harm (e.g., vehicle or custodial sanctions). With some exceptions (e.g., some styles of DUI courts), if used in isolation legal and administrative sanctions cannot be expected to reduce recidivism. Therefore, some other approach is necessary.

Other jurisdictions around the world have recognised the need to go further than relying on deterrence to prevent recidivism and have implemented a range of strategies including psychological screening, intensive supervision, and therapeutic interventions to manage and rehabilitate recidivist offenders. Collectively, research in this area highlights the need to take full advantage of all opportunities for early intervention by identifying drivers with a high risk of recidivism: the earlier the screening and provision of treatment, the better the road safety outcomes. Each offender presents with unique characteristics, personal needs, comorbidities, and underlying factors that need to be targeted for their rehabilitation. As such programs that combine multiple components and approaches have a greater likelihood of effecting change.

Technology is also playing a role in a modern approach to driving recidivism. Alcohol interlock programs are in use globally and have demonstrated success at preventing drink driving albeit limited to the time during which the offender is on the program. Trials with other technologies, such as ISA, also show that, once removed, the positive effect of the technology is lost. While there is some recognition of the potential uses of technology these as yet have not been fully explored. For example, it has been noted that technology could form a useful part of intervention programs as a means to prevent behaviour (e.g., alcohol interlock) but also as a tool for exploring behaviour (e.g., times when interlock was triggered).

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In-vehicle monitoring devices may also provide information about driving behaviours and patterns that could also be useful in therapeutic settings. To the best of the authors' knowledge such an approach has not been adopted.

Based on this review it would appear that South Australia is presently comparable with other jurisdictions in terms of the legal and administrative sanctions for driving offenders and assessment of drink and drug drivers, but there remains room for improvement in these, and other areas. At present there are no driver intervention or rehabilitation programs in South Australia, and only recidivist drink and drug drivers or drivers with child passengers are legally required to undergo assessment for substance dependence. Furthermore, it was not possible to identify current practices in terms of court-imposed sanctions for driving offenders in South Australia due to the lack of an easily accessible and useable data source; a better understanding of current judicial practices (i.e., what penalties (including conditions of good behaviour bonds, etc.) are used, how they are used, and for which offenders they are used) would be useful. Drawing on experiences in other jurisdictions, there may be some potential for the adoption of practices including increased monitoring of offenders on bail, suspended sentences and good behaviour bonds, and the introduction of a specialised court for driving offenders (or a sub-group of driving offenders, e.g., drink drivers). This has some precedent (e.g., DUI/DWI courts in the US and Alcohol and Other Drug Treatment Court in New Zealand; local examples include drug court, youth court, etc.) and could be explored as part of a comprehensive recidivist offender management system.

In order to improve the management and rehabilitation of recidivist offenders, South Australia could consider an innovative approach combining punitive sanctions and technology with a therapeutic intervention to manage and treat the complex issues underpinning problematic driving behaviours in the recidivist offender. An essential component of this approach is the assessment of an offender's level of risk.

Offender risk assessment is important as the success of an intervention depends on matching the intensity of treatment with the level of risk. Individuals with serious problems (e.g., substance dependence) or with a higher risk of recidivism require a higher level of intervention (Antonowicz & Ross, 1994; Casey et al., 2013; Day & Howells, 2002; SUPREME, 2007). Matching the intensity of the treatment with individual risk is important to the success of an intervention because low intensity interventions for high-risk individuals have little to no effect, while high intensity interventions for low-risk individuals can actually have a negative effect and increase the individual's level of risk (Andrews & Dowden, 2006).

Offender risk assessment is also necessary to identify the factors that underpin the offender's behavior. It is also important to distinguish between different problem behaviours, as the constellation of factors associated with one behavior are quite often different to those associated with another. For example, risk factors for drink driving include alcohol abuse or dependence, mood disorders, antisocial behavior, positive attitudes towards drink driving, and drink driving being perceived as the social norm (Birdsall et al., 2012; Choi et al., 2016; LaBrie et al., 2011; Quinn & Quinn, 2015). Conversely, deliberate dangerous driving (i.e., "hooning") has been linked with factors such as sensation seeking and risk taking, a general tendency towards deviance, peer pressure, socialisation, and aggression (Beanland et al., 2014; Clark et al., 2011; Gheroghiu et al., 2015; Sinclair, 2013; Vasallo et al., 2016; Watson et al., 2015). Furthermore, there may also be fundamental differences between offenders who commit the same type of offences. Bukasa et al. (2008) suggest that treatment for drug and alcohol drivers should be differentiated, and that dependent and non-dependent drivers within these groups should also receive separate interventions. Targeting the underlying factors associated with the aetiology of the behaviour is necessary for successful rehabilitation (Antonowicz & Ross, 1994; Casey et al., 2013; Day & Howells, 2002).

While some driving offences may be considered the result of driver error, it is evident that in the case of recidivist offenders the behaviour is most likely symptomatic of some other underlying issue. Consequently, rather than respond to this as a driving behaviour (e.g., license sanctions) it would be better to adopt a therapeutic approach that addresses the issues that underpin the behaviour. For example, a drink driving offence may be underpinned by a drug dependence associated with a mental health disorder, hence targeting the drink driving behavior in isolation will not resolve the individual's therapeutic needs, and the offending behaviour is likely to persist. Such a response would require a collaborative, multi-departmental approach encompassing DIT, Health, and the Criminal Justice System (Courts, SAPOL, and Corrections).

Adopting an evidence-based approach to recidivist offender rehabilitation that addresses the underlying causes of the behaviour can be expected to contribute to meeting the targets of the *SA Strategic Plan*, not only with regard to reductions in recidivism and to meet road safety targets, but in other priority areas. For some, the detection of an initial driving offence may, for example, identify individuals dependent on a substance who would otherwise go untreated. Attendance at an appropriate mandated treatment (triggered by the driving offence) may be the catalyst for change that improves the individual's overall well-being, functioning and quality of life in other domains (e.g., physical and mental health, lifestyle, relationships, employment, social-functioning, etc.). The benefits of this approach extend to the individual and society, not only with regard to road safety, but also to other priority areas such as health, community, and prosperity.

5.1   Recommendations

While legal and administrative sanctions are generally ineffective for preventing or reducing recidivism they are an important aspect of offender management. However, these sanctions alone are insufficient to alter the behaviour of recidivist offenders. Vehicle technologies that restrict vehicle control are effective at preventing offending but are inadequate to produce genuine behaviour change. Therapeutic approaches have demonstrated some success in changing the behaviour of traffic offenders and it is considered viable that if combined with legal sanctions and technological devices this would give the offender the best possible chance to change their behaviour. Based on these general observations and the more detailed findings outlined in this report the following recommendations regarding the management of recidivist driving offenders are offered.

The recommendations are aligned with the themes highlighted in the *SA Strategic Plan* priority for South Australian Ideas, particularly using innovation and boldness to be a leader in social reform, to upturn convention, and to always seek improvement.

Recommendation 1: The management of recidivist driving offenders should involve an holistic approach.

An holistic approach to driving offender management includes the assessment of recidivism risk to identify the underlying causes of behaviour and appropriate therapeutic treatment needs (e.g., alcohol/drug use/dependence, mental health diagnoses, risk taking, etc.), legal and administrative sanctions (e.g., supervision, fines, licence sanctions, etc.), and the incorporation of technology (to manage behaviour and as a tool for use in rehabilitation). Ideally the management of recidivists would include:

- Mandated treatment with qualified professional; multi-component; targeted content – not a one-size-fits all program.

- To address the risks and needs of each offender; treatment and rehabilitation should be determined by the unaddressed needs of the individual, including referral to specialist services such as drug or alcohol programs.

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- Following completion of an individualised program, offenders should undergo further professional assessment prior to licence reinstatement. The licence should only be reinstated if the results of the assessment suggest this to be appropriate.

- Professional support to increase motivation to meaningfully engage with the intervention, inclusion of booster sessions/follow-up with therapist. Consideration should be given to the use of reminders by SMS or email, and online booster sessions where applicable.

- Trial the DWI court approach but adapt it for South Australian needs. Make use of available schemes (e.g., MAIS) and technologies (e.g., in-vehicle data recorders, ISA, transdermal alcohol monitors) where available.

Recommendation 2: Offender risk assessment

In an ideal system, driving offenders would undergo assessment of risk to identify the underlying causes of offending behaviours so that appropriate measures to manage these are undertaken. Risk assessment would ideally be undertaken by a qualified professional and include assessment of a variety of relevant factors (e.g., substance dependence, personality, daily functioning, mental health) as indicated by the offender's history.

Consideration should also be given to the adoption of a preventative approach to identify at-risk individuals through the introduction of risk assessment for first offenders. The introduction of screening in a public health setting, such as those presenting at an emergency department following involvement in a crash may also help identify other high-risk drivers. Early identification and intervention for high-risk drivers will be an important step to preventing recidivism.

While there are a number of screening instruments for a variety of offenders, the authors are unaware of a suitable instrument for use with driving offenders. Given the complexities and differences between different types of behaviour it may be necessary to develop an instrument specific for this population. Research is needed to identify the criminogenic factors (i.e., factors that are related to offending and predict recidivism) necessary to establish the offender's level of risk and identify targets for intervention (Day & Howells, 2002).

Recommendation 3: Develop the necessary intervention programs

There are at present no therapeutic interventions for driving offenders in South Australia, and so, if such an approach were to be adopted, intervention programs would need to be developed. Driving offender intervention or rehabilitation programs must be based on psychological principles of behaviour change and evidence of what works for offender rehabilitation. While they will be based on many of the same principles, unique programs designed to address the aetiology of different behaviours will be necessary.

Initially it may be feasible to divert drink and drug driving offenders to existing treatment services, provided the service meets the criteria for an appropriate behavioural intervention. Other offenders, such as recidivist speeders, unlicensed drivers, or dangerous drivers may also benefit from other existing treatment services (e.g., risk assessment should identify appropriate treatment options), but it is likely that it would be necessary to develop new programs. This may require further research to identify the factors associated with risk for these offences.

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The following provide simplified examples of what different types of interventions may involve. Note that the level of intervention would be determined by an assessment of the offender's risk. The types of programs that might be considered include:

- Drink or drug drivers referred to a substance dependence/abuse treatment program with their progress monitored by the courts. If indicated by risk assessment drivers could be placed on MAIS and/or monitored using Transdermal Alcohol Monitoring anklets.

- Low level speeding offenders may benefit from an advisory form of ISA, and so could be placed on a program using this technology.

- High level speeding offenders may require stricter controls such as restrictive ISA. Risk assessment may also identify factors such as risk taking or thinking styles as targets for therapeutic intervention, which could be addressed by an appropriately designed program. The offender would remain in the ISA program until the conclusion of intervention and until re-assessment of risk suggests it is appropriate to remove the device.

- Other types of offenders (e.g., unlicensed drivers, dangerous drivers) may also benefit from these technologies and therapeutic interventions. Those with a high level of risk could also undertake therapeutic programs where appropriate in conjunction with other sanctions such as home detention.

Recommendation 4: Improving the use and efficacy of existing penalties

The research indicates that legal and administrative penalties are ineffective for recidivists. While increasing the severity of penalties serves to punish repeated poor behaviour (and offences should be punished) they cannot be relied upon to change that behaviour. As such, rather than punishment or deterrence, the primary consideration for the use of legal and administrative sanctions should be the extent to which they can prevent further harm by restricting and controlling the driving behaviour of recidivists. Penalties should prevent recidivists from driving (e.g., vehicle sanctions, custodial sanctions) or ensure that when they drive the do so without jeopardising the safety of others (e.g., alcohol interlocks, ISA).

The effectiveness of current penalties, such as suspended sentences, could be improved by introducing monitoring to the penalty. It has been noted that perhaps the biggest flaw in these penalties is the very low likelihood of detecting breaches and the failure to prosecute breaches when they are detected. Monitoring, either with IVDRs or GPS/TAM anklets (or a combination of the two), could be worthwhile. Depending on the results of risk assessment, MAIS for anyone on a suspended sentence or good behaviour bond should also be considered.

5.2 Conclusion

Recidivists are a distinct group who persistently offend despite having experienced legal sanctions. For many of the offenders in this group, traditional deterrence measures will be ineffective. Research investigating differential deterrence suggests that recidivists are most likely to possess characteristics that make them least affected by the threat or experience of legal sanctions. As such, some other approach is required. Current evidence indicates that in-vehicle technologies are reasonably effective for controlling or preventing undesired behaviours, although only while the technology is installed. Well-designed therapeutic rehabilitation programs hold some promise; most of the evidence is for drink or drug driving and involve treatment for alcohol/drug dependence rather than driving behaviour. An holistic and multifaceted approach to offender rehabilitation including supervision, therapeutic intervention, the incorporation of technologies to manage and monitor behaviour, and that is tailored to a specific

problem, has the potential to reduce recidivism. The assessment of offender risk and early intervention will play an important role in this process. Furthermore, the rehabilitation of driving offenders that addresses underlying problems (e.g., drug/alcohol dependence, risk taking, etc.) may produce benefits for the individual and society beyond improving road safety.

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Acknowledgements

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