How would changing driver training in the Queensland licensing system affect road safety?

Deliverable 3: Evidence-based driver education policy options

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Executive summary

This is the final report in a series of three reports that examines education and training for novice drivers. This report provides an overview of the graduated driver licensing (GDL) system and outlines the expert opinion of four international novice driver experts about the potential road safety impacts of different training approaches if applied to the GDL system in place within Queensland. It also provides a consolidated summary of the advantages, disadvantages and potential road safety effects if different education and/or training approaches were implemented within Queensland's existing GDL system.

GDL systems are designed to reduce crash risk by limiting the crash risk for all new drivers rather than by reducing the crash risk that individual drivers face. These systems encourage new drivers to gain driving experience under lower risk conditions while limiting exposure to driving situations that are higher risk. These licence systems typically have three stages: learner, provisional and open. Some Australian states may have two phases in one of these stages (eg. L1 and L2 or P1 and P2).

The learner phase enables new drivers to learn to drive and accumulate their first driving experiences while accompanied by a more experienced driver who provides supervision. This phase is important as it delays a novice driver from obtaining their full licence, enables the new driver to learn and practice while under supervision and, in some cases, mandates the number of hours that the new driver must complete. The provisional phase is important because it places restrictions on new drivers once they commence driving without supervision. By doing so, this phase limits new drivers' exposure to risky driving situations while they are still developing their skills, attitudes and motivations essential for safe driving. Parental involvement is in an important support within GDL systems and can occur in both the learner and the provisional phases. Novice drivers that do not comply with GDL restrictions are more likely to crash. Thus, it appears that enforcement is important with both police officers and parents important for the enforcement of GDL restrictions.

There are interactions between GDL systems and driver education and training. Generally, GDL systems are likely to encourage novice drivers to choose a particular form of driver education and training over another. However, research into novice driver training and education tends to focus on a particular training approach rather than the way it interacts with a GDL system.

GDL systems are an effective countermeasure to reduce crash risk for new drivers. The Queensland GDL system was substantially altered in mid-2007. These changes include increasing the minimum period that a learner licence can be held from 6 months to 12 months, requiring all learner drivers to record 100 log book hours of supervised practice, the creation of provisional 1 and provisional 2 licences, requiring the passing of the hazard perception test to transition between the two provisional licences, requiring provisional drivers to display 'P' plates, introducing a high powered vehicle restriction and not allowing provisional 1 driver to carry more than one passenger aged 16 to 23 years during the hours of 11pm and 5am. The changes appear positive with new drivers spending a greater amount of time on their learner licence and acquiring a greater amount of supervised practice. There was more practice provided by parents and friends and the same amount of practice provided by professional driving instructors. The changes to the GDL system were associated with a 31% reduction in fatal crashes.

There are a number of considerations when understanding the potential benefits of a policy change within this area. The impact of each on road crashes is critical. However, this is often difficult to confirm. There are limited numbers of evaluation studies conducted regarding the relationship of education and training approaches within GDL contexts and evaluation studies regarding Australian GDL systems. This makes it difficult to understand the relationship between the education and training approach and the licensing system within which it operates. Thus, consideration is needed regarding whether, on balance, an alternative or additional training or education approach is likely to produce positive or negative alternations in the Queensland GDL system as a whole.

Expert opinion was sought using a questionnaire. Internationally recognised experts in the field of novice driver training were asked three questions: (1) what would be the likely road safety effects if this approach was introduced into or removed from the Queensland GDL? (2) how/where would be the most effective time to integrate such an approach into the Queensland GDL? and (3) List four potential issues (benefits or disadvantages) which informed your decision to questions 1 and 2. The experts were also asked to review the initial evaluative assessment ratings made by the CARRS-Q research team for each education and training approach reviewed in report 1.

The novice driver experts were most positive regarding supervised (on-road) driving experience as they considered that this was the most effective way for the learner to gain experience. They were generally positive towards professional driving instruction and considered it most suitable for those on a learner licence. There were mixed responses from the experts regarding high school driver education. Some expressed the belief that, depending on what was included in the education program, the method of delivery, and the quality of the lessons, there was potential in this approach. However, others expressed the firm belief that this approach could result in novice drivers obtaining their licences earlier and potentially encourage over-confidence in the young driver. The experts considered that using simulators in a training context has potential with most of them considering that it would be best to place this training within the learner licence phase of a GDL system.

All experts agreed that resilience training was a positive training approach and that it was important to address the attitudinal, motivational and decision-making factors that increase crash risk in novice drivers. All road safety experts agreed that hazard perception training improves perceptions of hazards and that poor hazard perception is a major cause of novice driver crashes. Situation awareness training was seen by the experts to be an extension of hazard perception training. Two experts indicated that insight training had the potential to reduce novice driver crashes, although all experts indicated that there is currently insufficient evidence in this area to form a firm conclusion about this. None of the experts supported the inclusion of advanced practical driving skills training. The expert opinion on the evaluative ratings provided by CARRS-Q resulted in a number of changes to the ratings of the different types of education and training. The variety of responses from the road safety experts demonstrates that the same research findings can be interpreted differently.

The CARRS-Q team considered the evidence from the literature and the expert opinion to draw conclusions about the potential benefits if various forms of education and training were introduced or removed from the Queensland GDL system. It is the opinion of the authors that requiring learner drivers to complete a mandatory number of hours of supervised driving practice is likely to have a positive road safety effect, although caution is needed if consideration is being given to changing the

current requirements in Queensland. The authors concluded that supervised on-road driving experience, despite the lack of clear evidence on the amount of practice required, is likely to have a positive impact on novice driver crashes. The authors also concluded that the use of professional driving instructors could improve equity for those who do not have access to a vehicle or to appropriate supervisors in order to obtain the required number of hours of supervised driving practice. It was also concluded that there is likely to be value in enhancing the current driving test because of the potential for this to enhance the quality and type of professional instruction currently available in Queensland. However, there is no clear evidence that professional driving instruction produces safer drivers when compared with other education and training approaches. As such, there doesn't currently appear to be a case for extending the number of hours of credit that can be obtained for undertaking professional instruction or for making this type of training mandatory.

There were several education and training approaches that the authors considered would be likely to have a negative effect on crashes if implemented within Queensland. These include time discounts for completing driving training, introducing a version of high school driver education that is similar to the approach historically used in the USA, and advanced practical driving skills training.

Resilience training, hazard perception training, situational awareness training, insight training and simulator training were not considered to have any demonstrable effect on road safety at the current time. However, the authors consider that several approaches show promise, despite the lack of available evidence. Simulator training may be beneficial in assisting novice drivers to acquire a range of vehicle control skills. Resilience and insight training are considered to have promise due to their focus on risk avoidance training. There may be benefits in individuals undertaking hazard perception training to improve this skill. While, situational awareness training is a newer form of training that offers potential, it requires additional research to identify its effectiveness.

Novice driver education and training is a diverse area with each education and training approach differing. The licensing system is likely to have a strong impact on education and training. Further research is needed to determine the optimal mix of education and training options, the most appropriate phase in which they should occur within a GDL system, and the potential benefits of making some types of education and training compulsory. The overarching goal of research and development in this area should be to identify programs and approaches that both reduce the crash risk of novice drivers and serve to strengthen the GDL system.

Contents

List of Abbreviations

CARRS-Q	Centre for Accident Research and Road Safety - Queensland
TMR	Queensland Department of Transport and Main Roads
PDA	Practical Driving Assessment
HPT	Hazard Perception Test
GDL	Graduated Driver Licensing
GDE	Goals for Driver Education
GADGET	Guarding Automobile Drivers through Guidance Education and Technology

1 Background

The Queensland Department of Transport and Main Roads (TMR) called for responses to a tender to investigate how changing driver training in the Queensland licensing system would affect road safety. Following a successful application by the Centre for Accident Research and Road Safety – Queensland (CARRS-Q), a program of work was developed. The project has three main objectives:

- Identify the policies and practices related to driver education and training, with a particular focus on jurisdictions comparable to Queensland;
- Consider the potential for simulator use in novice driver education, training and assessment; and
- Inform decision makers and policy developers of the ways in which different types of driver education and training for novice car drivers might be incorporated into the Queensland licensing system, and the likely effects on road safety.

2 The program of research

The current report is the third deliverable within the program of research. The central aim of this report is to provide:

1. The theoretical basis of the graduated licensing system;
2. Expert opinion - input was obtained from four international novice driver experts about potential road safety impacts of different training approaches as applied to the Queensland graduated driver licensing system ; and
3. A consolidated summary of expected advantages, disadvantages and potential road safety effects for implementation of existing and new education/training to the Queensland Graduated Driver Licensing (GDL) scheme; considering the theory of the graduated licensing system, comparative analysis between jurisdictions and expert opinion.

The other deliverables within the project are listed below:

Deliverable 1: Report on approaches to driver education and training in jurisdictions that are comparable to Queensland.

Deliverable 2: Report on simulators for skill acquisition training and assessment, and their impact on road safety

3 Method

The primary objective of this report (3) is to draw upon the research that was critically reviewed in Reports 1 and 2 in order to inform decision makers and policy developers of the ways in which different types of driver education and training for novice car drivers might be incorporated into the Queensland GDL system and the likely effects on road safety. Report 3 seeks to answer the following questions:

1. How could the types of driver education and training reviewed in Reports 1 and 2 be incorporated into the Queensland GDL system?
2. What are the potential issues (benefits and disadvantages) in allowing, or alternatively mandating, different types of driver education and training within the Queensland GDL system, including for which licence classes (for example, Learner, P1 or P2)?
3. Based on the research evidence, what would be the expected road safety effects of the various education and training options discussed (compared to the results being achieved under the current GDL system)?

It is not sufficient to use the published literature alone to address these questions. The research questions relate specifically to Queensland. Therefore, any hypothetical potential benefits, disadvantages or implications for road safety need to be context specific, taking into account the prevailing driver licensing policies and practices. The report uses a three-stage approach to address the research questions. Firstly, a brief overview of GDL is provided in order to provide context for the current report. This is not a comprehensive literature review that critiques studies. Instead it presents highly targeted information designed to provide background for the remainder of the report. Secondly, the results from an expert consultation process are presented. Four experts in the field of novice driver training and education were asked for their comments on possible road safety implications of each education and training approach discussed in reports one and two of the program of research. They were also asked to comment on which stage/s within a GDL system each approach is likely to be most effective. Finally, a consolidated summary of the expected benefits, disadvantages and potential road safety effects are presented.

4 Graduated Driver Licensing (GDL)

GDL systems are based on a public health approach and are thus designed to reduce crash risk by focusing on limiting the crash risk for *all* new drivers rather than the risk that *individual* drivers experience (Foss, 2007; Shults, 2010). GDL systems still allow new drivers to gain driving experience but under lower risk situations (McCartt, Teoh, Fields, Braitman, & Hellinga, 2010; Waller, 2003; Williams & Shults, 2010). Education and training countermeasures may occur at different phases within a GDL system, but the GDL system itself is also a countermeasure to improve road safety, independent of any training/education that occurs within it. The goal of GDL is to gradually introduce new drivers to more complex driving environments as they gain experience (Simpson, 2003; Williams & Shults, 2010). Within a GDL system, there are typically three licence stages: learner, provisional and open (Bates, Watson, & King, 2010a; Williams & Mayhew, 2003). As new drivers progress through the various licence stages, the restrictions are systematically lifted (Robertson & Finnegan, 2003). The first country to introduce a comprehensive GDL system was New Zealand in 1987. Since then, GDL systems have been introduced into other jurisdictions including in Australia, the United States of America and Canada (Simpson, 2003; Williams & Shults, 2010).

4.1 Components of GDL

4.1.1 Learner phase

The purpose of the learner phase is to enable new drivers to gain practical driving experience including the acquisition of basic vehicle handling skills (e.g., steering, braking, cornering, parking), managing the road environment (e.g., driving to the posted speed limit, lane keeping, merging in traffic) and interacting with other road users (Foss, 2007). The learner phase provides novice drivers with an opportunity to learn to drive and to accumulate their first driving experiences accompanied by an experienced driver as a supervisor (Mayhew, 2003; Shults, 2010). The learner phase is critical in a comprehensive GDL system (Bates, Watson, & King, 2009a) because it delays full licensing (i.e., independent unsupervised driving), provides opportunities for supervised learning and mandating the number of hours of practice a learner needs to complete (Bates, 2012). Delayed full licensing occurs when learner drivers are prevented from driving without supervision, thus limiting their exposure to risky situations and providing them with an opportunity to mature (Simons-Morton, 2007). There are a number of mechanisms that can be used to delay a new driver from obtaining a provisional licence (a provisional licence being the first phase of unsupervised driving). These mechanisms include increasing the amount of time that new drivers must spend in a learner licence phase and/or increasing the minimum age at which they can obtain a learner licence (McCartt, Farmer, & Jenness, 2010; Williams, 2007, 2009). Delayed full licensing can also occur when the rules and policies regarding obtaining a driver's licence make it more difficult or expensive to obtain a licence. For instance, new drivers may have to pass difficult written and practical assessments or incur high expenses for training, testing and licence fees (Williams, 2009).

While basic vehicle handling skills can be learnt by new drivers quickly within a few hours (Lund, Williams, & Zador, 1986), the higher order skills used while driving, such as perception, attention and judgement, develop over several years. The exact amount of practice required for driving to become a more mentally and physically automated task is not known (Simons-Morton, 2007) and appears to vary from driver to driver. The actual amount of practice undertaken by learner drivers is affected by

a range of factors including increasing self-confidence as vehicle control skills improve, time constraints due to the learner driver participating in a range of activities such as part-time work or social events, as well as pressures from the requirement to complete secondary school at the same time as learning to drive (Harrison, 2004).

Section 2.2.1.1 of Report 1 within this program of research discussed mandating the number of hours that a learner driver must complete (Bates, Filtness, et al., 2013). However, there are elements of a GDL program that may facilitate the accumulation of a mandated number of hours. As an example, a compulsory log book may increase parental awareness of the requirement for new drivers to complete a certain number of hours of practice while on a learner licence (Bates, Watson, & King, 2014a; O'Brien, Foss, Goodwin, & Masten, 2013), and so lead to more supervised hours being driven.

4.1.2 Provisional phase/s

The provisional phase (or phases in jurisdictions where there are two provisional licence phases for a novice driver to progress through, such as Queensland) is an important component within GDL systems because it aims to limit the new driver's exposure to high risk situations when they first commence driving by themselves (Preusser & Tison, 2007). While the exact restrictions vary between jurisdictions, these high risk situations may include driving at night, with passengers or after consuming alcohol (Preusser & Leaf, 2003).

Some of the restrictions applied during the provisional phase are effective in reducing crashes, including limiting driving at night (Williams & Shults, 2010), placing limits on the number of passengers of a similar age to the young driver (Vanlaar et al., 2009; Williams, 2007; Williams & Shults, 2010) and having a lower blood alcohol content limit for new drivers compared with more experienced drivers (Zwerling & Jones, 1999). However, the evidence regarding the effectiveness of other restrictions on reducing crashes is less definitive.

Research suggests that it is possible that there are safety benefits resulting from the implementation of high-powered vehicle restrictions due to the higher crash and injury risks that result when these cars are driven by young people (Keall & Newstead, 2013). Despite this, very few young people in Australia drive these types of vehicles, suggesting the possibility that the costs of introducing and maintaining this type of restriction outweighs the safety benefits of the restriction (Keall & Newstead, 2013). It is also unknown the degree to which crash risk migrates to other vehicles due to factors associated with the drivers (who would otherwise drive high-powered vehicles).

It appears that the introduction of laws limiting mobile phone use have limited effect on the use of these devices by young drivers (Foss, Goodwin, McCartt, & Hellinga, 2009). Queensland research suggests that young drivers are likely to use their mobile phone in a manner designed to conceal that they are using their phone from people outside the vehicle on a regular basis. For instance, 50.9% of the sample reported using their mobile phone to send a message in a concealed manner at least one or twice a week while approximately two thirds (60.8%) reported reading a message in a concealed manner at least once or twice a week (Gauld, Lewis, & White, 2014). Importantly, the effectiveness of a mobile phone restriction is likely to be impacted upon by the degree to which it is enforced (Curry, Hafetz, Kallan, Winston, & Durbin, 2011; Foss et al., 2009). Given the high incidence

of reported mobile phone use, it appears that restrictions are not adequately enforced to deter phone use, possibly due to the difficulties associated with enforcing this behaviour.

4.2 Parental involvement

Parental involvement is an important factor in the success of GDL systems (Bates, Watson, & King, 2009b; Glendon, 2013; Jacobsohn, Garcia-Espana, Durbin, Erkoboni, & Winston, 2012; Mayhew, 2003; Williams & Shults, 2010). Parents can be involved in both the learner phase and the provisional phase. While others may be involved in the supervision of learner drivers, parents play a key role in ensuring that their learner driver obtains sufficient supervised practice, at least in jurisdictions that require 100 or 120 hours of supervised practice (Bates, Watson, & King, 2014b). There is some suggestion that while both parents appear to provide supervision during the learner period in approximately two-thirds of situations (Bates, Watson, & King, 2013), mothers provide greater levels of supervised driving practice to learner drivers than any other supervisor (Goodwin, Foss, Margolis, & Waller, 2010; Scott-Parker, Bates, Watson, King, & Hyde, 2011).

Within the provisional licence phase, parents can play an active role in ensuring that novice drivers comply with GDL restrictions and may place additional restrictions on new drivers, over and above those mandated by the GDL system (Beck, Shattuck, Raleigh, & Hartos, 2003). It appears that parents are more likely to place restrictions on young drivers if they are licensed under a GDL system rather than a different licensing system (Beck et al., 2003; Hartos, Simons-Morton, Beck, & Leaf, 2005). When young drivers who are about to commence driving without supervision have limited access to a vehicle (usually owned by their parents), parents are more likely to impose limits on their child's driving (Hartos, Beck, & Simons-Morton, 2004). Young drivers who have parents that set stricter limits report engaging in less risky driving behaviour and having fewer traffic offences and crashes (Ginsburg, Durbin, Garcia-Espana, Kalicka, & Winston, 2009; Simons-Morton & Ouimet, 2006; Simons-Morton, Ouimet, & Catalano, 2008).

4.3 Enforcement

It appears that compliance with GDL requirements is an important component of reducing crash risk. Novice drivers subject to GDL restrictions are more likely to crash when they are not complying with the night driving restrictions and passenger restrictions than if they are compliant (Carpenter & Pressley, 2013). Two groups are important for the enforcement of GDL restrictions: police officers and parents.

4.3.1 Law Enforcement of GDL

It is difficult for police officers to enforce GDL provisions if they are unable to recognise which driving restrictions apply to which licence (Hedlund, 2007). Additionally, police officers need to have a solid understanding of the GDL laws (Goodwin, Wells, Foss, & Williams, 2006). In Queensland, and some other jurisdictions, the requirement for learner and provisional drivers to display 'L' and 'P' plates assists the police to enforce the GDL requirements (Scott-Parker, Watson, King, & Hyde, 2012b). The display of these plates is designed to improve compliance with, and enhance enforcement of GDL laws. In principle, the need to display 'L' and 'P' plates should reduce risky driving and young driver crashes (Haworth & Senserrick, 2005). However, young drivers are unlikely to display 'P' plates when they are not compulsory (Bates, 2012) or not effectively enforced. Novice drivers in New Jersey are required to display a decal (a small sticker placed on their number plate) to indicate their licence status. Since its introduction, it appears as if the display of this decal is facilitating enforcement by

police (McCartt, Oesch, Williams, & Powell, 2013). Although the use of 'P' plates is beneficial for law enforcement, some research suggests that some novices have avoided punishment from police even when the officer is aware that the novice is subject to restricted licence conditions (Scott-Parker, Watson, King, & Hyde, 2012a).

4.3.2 Parental Enforcement of GDL

Given the difficulties associated with police enforcement of GDL provisions, there is an inherent implication within the system that parents are expected to reinforce driving restrictions and monitor compliance with them (Williams & Chaudhary, 2008). Parents, in many cases, enforce the various provisional licence restrictions that are present within a GDL system (Chaudhary, Williams, & Casanova, 2010; Foss & Goodwin, 2003; Scott-Parker, Watson, King, & Hyde, 2013b; Williams, Leaf, Simons-Morton, & Hartos, 2006; Williams & Shults, 2010). However, effective enforcement of the provisions by parents is reliant on them being aware of the GDL requirements applicable in their jurisdiction (Chaudhary et al., 2010). Research does suggest that parents are supportive of GDL systems (Williams & Shults, 2010). This support may be mutual in that the requirements placed on a novice driver by a GDL system may be consistent with parental attempts to place certain restrictions on the driving experiences of their teenager/young adult.

4.4 Interactions between GDL and education

As stated in Section 2.2 of Report 1 within this program of research, there are interactions between GDL systems and driver training (the teaching of procedural and/or cognitive driving skills with specific objectives in mind, such as obtaining a licence) and driver education (the teaching of topics regarding safe and responsible driving including road rules, risk taking, road safety, and awareness of how personal characteristics may influence driving behaviour) (Bates, Filtness, et al., 2013). Generally, GDL systems, and licensing systems more generally, are likely to encourage novice drivers to choose a particular form of driver education and training, such as private supervision, over another (Bates, Watson, & King, 2006, 2010b). For instance, many GDL systems require learner drivers to undertake a certain number of hours of supervised practice. This encourages learner drivers to practice their driving with private supervisors. However, research into novice driver training and education tends to focus on a particular training approach of interest rather than the way it may interact with a GDL system.

It appears that formal driver education is closely linked to GDL systems in North America as, in 37 of 62 jurisdictions, adolescents who attend a program can receive their licence between three months and two years earlier than those who do not attend an education program (Mayhew, Simpson, & Singhal, 2005). However, it appears that the link between formal driver education and the licensing system is not as well designed as it could be. For instance, most driver education and training is focused at the learner period within GDL systems rather than being provided in a more phased approach (e.g. in both the learner and the provisional phases) that is a key feature of GDL systems (Mayhew & Simpson, 2002).

It appears that very few people attend a formal driver education course within the Queensland and New South Wales GDL systems. Telephone interviews conducted with drivers who had just obtained a provisional licence in Queensland and New South Wales (prior to the mid-2007 licensing changes), identified that only 6.9% of participants from Queensland and 19.1% from New South Wales reported completing a formal driver education and training course (this does not include

professional driving lessons or supervised practice but does include other forms of driver education and training) while on a learner licence (Bates et al., 2009a).

In some jurisdictions, driver education is used as a substitute for supervised practice. However, this appears to reduce the overall hours of practice undertaken by the novice driver. Possible reasons for this reduction in hours is that parents may deliberately encourage their children to undertake driver education instead of providing supervised practice or that driver education may encourage parents to be overconfident in their child's ability to drive (Mayhew, 2007). As discussed in Report 1, it also may be because in some jurisdictions, novice drivers are able to obtain their licence earlier if they complete a professional driver education course. However, it is not considered best practice to enable a novice driver to obtain their licence earlier as a result of attending a formal driver education and training course due to the associated increase in crash risk (Hirsch, Maag, & Laberge-Nadeau, 2006; Lewis-Evans, 2010).

In many places, the only required education in GDL systems is that a learner driver undertakes a legally required amount of supervised driving practice. However, as documented in Report 1, several jurisdictions require new drivers to undertake a hazard perception test. In some Australian states, this test is undertaken by learner drivers while in other states it is undertaken by provisional drivers (Bates, Filtness, et al., 2013). Report 2 within this program of research discusses hazard perception training and assessment in greater detail (Filtness, Tones, Bates, Watson, & Williamson, 2013). In systems that require novice drivers to complete a hazard perception test, there is an assumption that either hazard perception training will occur or that novice drivers will develop their hazard perception skills at some stage during the licensing process such as while they are driving on a learner or provisional licence. The other training discussed in Report 1, such as insight training and resilience training, is offered in a manner that is independent of the GDL system.

4.5 Effectiveness of GDL systems

Evidence is growing from a range of evaluations indicating that GDL is effective in reducing crash risk for new drivers (Ehsani, Bingham, & Shope, 2013; Hallmark, Veneziano, Falb, Pawlovich, & Witt, 2008; Masten, Foss, & Marshall, 2011; Neyens, Donmez, & Boyle, 2008). In a review of GDL within the United States of America (USA), 21 studies of GDL within 14 individual jurisdictions, and six studies of GDL in the USA nationwide were collected, reviewed, and summarised (Shope, 2007). The study found positive results, usually involving crash rate reductions, to varying degrees in nearly all the studies. Given differences in approaches, study goals, methods, and analyses, the results are surprisingly consistent (Shope, 2007). The results indicated that overall, GDL programs in the United States have reduced the youngest drivers' crash risk by approximately 20 to 40%. Research on teen driving and making GDL systems more comprehensive could further reduce teen drivers' motor-vehicle crashes, injuries, and fatalities (Shope, 2007).

4.5.1 Research regarding the impact of changes to Queensland's GDL system

Queensland's GDL system was substantially changed in mid-2007 resulting in a system that required learner drivers to obtain more driving experience while on the learner phase and limiting their driving in higher risk situations (Bates, Watson, & King, 2008; Scott-Parker et al., 2011). In the remainder of this report, education is considered in relation to the current Queensland GDL system. In order to contextualise this it is necessary to understand the current system and the impact of the 2007 changes. The key changes to the GDL system included: increasing the minimum period that a

learner licence could be held from 6 months to 12 months, requiring all learner drivers to record 100 log book hours of supervised driving practice within a learner log book, the creation of provisional 1 (P1) and provisional 2 (P2) licences (instead of the single provisional phase that existed previously), requiring passing of a hazard perception test (HPT) to transition from P1 to P2, requiring both P1 and P2 drivers to display 'P' plates, introducing a high powered vehicle restriction, and not allowing P1 drivers to carry more than one passenger aged 16 to 23 years during the hours of 11pm to 5am (Newstead & Scully, 2013). The current Queensland licensing system is displayed in Figure 1, as depicted in Report 1.

Figure 1. Current GDL system in Queensland

To date, only a few studies have considered the impact of the changes made to the Queensland GDL system. One study (Scott-Parker et al., 2011) compared the experiences of drivers who obtained and completed their learner licence under the former GDL system (*n* = 149) with the experiences of drivers who obtained and completed their learner licence under the new GDL system (*n* = 183). Participants in the sample were from Brisbane and Townsville. The former GDL participants completed a telephone interview while the new GDL participants completed an online survey.

The amended GDL system seems to have achieved many of the planned outcomes/restrictions. Drivers who obtained and completed their learner period under the new system spent a greater amount of time on their learner licence and acquired a significantly greater amount of supervised practice when compared with those under the former system. Additionally, parents and friends provided more hours of practice under the current system when compared with the previous system. There was no difference in the amount of training provided by professional driving instructors to learner drivers under the two systems. Despite obtaining a greater amount of supervised practice, those under the new system did not report that it was more difficult to obtain supervised driving practice, which is an important finding, demonstrating that the changes are not prohibitive to obtaining a licence. Additionally, there was a decline in the self-reported amount of unsupervised driving occurring in the new system when compared with the former system (Scott-Parker et al., 2011).

Newstead and Scully (2013) reported on the preliminary results of a comprehensive evaluation of the impact of the changes to Queensland's GDL system on police-reported crashes. As part of this evaluation they created 10 treatment groups representing individuals at different stages within the licensing process as well as a comparison group. Licensing data were collected that enabled the classification of participants into one of the 11 groups and to extract exposure data that were used for each group. Additionally, police reported crashes were obtained and matched to the licensing data. This enabled the type of licence held by an individual when they crashed to be identified. The research identified that the changes to the GDL system in Queensland were associated with a 31% reduction in fatal crashes, a 13% reduction in fatal and serious injury crashes and a 4% reduction in all crashes. However, a limitation of this study was the restricted amount of crash data available for the period after the changes were implemented in Queensland (Newstead & Scully, 2013).

5 Considerations in understanding potential benefits of policy change

The criteria for assessing the impact (positive, neutral, or negative) of any given training/education approach can be considered in a number of ways. From a road safety perspective, the most important impact of any approach would be a reduction in road crashes, followed by a reduction in traffic offences. While critical, any impact on crashes is, however, difficult to confirm. Two major factors contribute towards this difficulty. Firstly, since crashes are rare events, large sample sizes are needed to detect effects of any intervention with statistical confidence. Secondly, learning to drive is a personal experience in which individuals predominantly self-select their training approach. Consequently, randomised control trials are very difficult to conduct (for a discussion of the difficulties inherent in driver education and training research see Report 1, section 2.1.3). Furthermore, it is difficult to interpret why a program is not effective in reducing crashes if only an outcome evaluation is conducted. Without a process evaluation as well, it is not possible to assess whether the program/intervention was optimally implemented (i.e., whether it is achieving its learning objective) (Watson, 2003).

Additionally, there is a paucity of evaluation studies conducted within the Queensland GDL and other Australian GDL systems, and in many instances, not within a GDL system at all. This makes it hard to infer results and to understand whether the findings are likely to be valid in the Queensland context. Furthermore, specific driver education/training approaches are often evaluated as a standalone entity when in reality it may be part of a larger GDL system. Therefore, it is important to understand how training might impact on the system within which it will be administered. In the absence of firm evidence of crash reductions, other criteria are sometimes considered when attempting to assess the impact (i.e., other likely effects) of introducing any given training/education. These can include: changes in offence rates; assessments of skill acquisition; success in passing the driving test etc. However, each of these indicators has their own specific limitations. A final consideration with regard to evaluations is that the comparison condition that is used in most evaluations is the conventional method of driver training/education, which may be more effective than anticipated, thus making it hard to detect a positive effect of a change.

Improving road safety may be the aim of introducing a particular training/education requirement. However, it is also important to acknowledge that there are competing interests in relation to participation in the licensing system, namely safety and mobility (Bates et al., 2010a). Therefore, not unnecessarily introducing barriers to participation in a GDL system should also be a key objective. For instance, the financial cost of an approach may place an unnecessary burden on individuals/families or on the government or private organisations involved with delivering/administering the approach. Social justice needs, in terms of equity of the target population to access training/education, should also be considered. For example, if policy was based purely on research evidence it could be concluded that males should be subject to higher age at licensing regulations than females, because young males have a higher crash risk than young females and are more sensitive to driving rewards as well as being more likely to engage in sensation seeking behaviour (Scott-Parker, Watson, King, & Hyde, 2013a). However, this would likely be considered socially unjust by many in the community. The rate of progression through the licensing system and the rate of skill acquisition are other factors that may be impacted upon from the introduction of any given training/education approach. Finally, the inconvenience to novice drivers and their

families during their involvement in the GDL system is another consideration, particularly in terms of encouraging voluntary compliance with requirements.

Taking all of these issues and potential impacts into account is a complex, yet necessary task when any GDL policy changes are contemplated. Overall, the key question would seem to be whether, on balance, an alternative/additional training/education approach is likely to produce positive or negative changes in the Queensland GDL system as a whole? For example, if a driver education program introduced into Queensland high schools accelerated the rate at which young people attain their licence, and therefore (as has been experienced in the USA), resulted in increased fatalities because of increased exposure to risk, the overall change would certainly be deemed as having had a negative impact. However, if it was determined that the same program had no impact on fatalities (i.e., no reduction or increase in crash risk) but its introduction was at significant financial cost to schools and communities, then it would be reasonable to conclude that the initiative had a neutral effect on road safety but was not desirable overall due to its financial impact on the community. Importantly, if such an initiative provided a more convenient mechanism for novice drivers to access basic driver education information, thereby reducing the financial cost to their families (by not needing to pay for professional instruction, and consequently facilitating access to education among the financially disadvantaged), the program may be considered to have positive impact, even if the road safety impact was neutral. In a GDL system which is, by nature, reliant on parental commitment, the likely economic and social impacts of any safety-related policy changes are an important consideration, particularly if there is any chance of them undermining or reducing the expected road safety benefits.

6 Expert consultation

6.1 Method for Expert Consultation

In order to further assess the training approaches identified in Reports 1 and 2 of this program of research, expert opinion was sought via questionnaire (see Appendix 1). This included background information regarding each training approach discussed in the Literature Review in Report 1 and Figure 1 to demonstrate the Queensland GDL system. Four researchers (Dan Mayhew from Canada, Willem Vlakveld with input from Divera Twisk from The Netherlands, Teresa Senserrick from Australia, and Allan Williams from the USA), each recognised as international experts in the field of novice driver training, reviewed Reports 1 and 2 and provided responses to the following three questions:

1. What would be the likely road safety effects if this approach was introduced into or removed from the Queensland GDL?
2. How/where would be the most effective time to integrate such an approach into the Queensland GDL (Pre-learner, Learner, P1, P2, Open)?
3. List four potential issues (benefits or disadvantages) which informed your decision to questions 1 and 2?

The experts were also asked to review the assessments made at the end of each section in the literature review in Report 1. The research team had previously made an evaluative assessment relating to each of the education/training approaches (see Appendix 1), focusing on:

1. The effectiveness of the approach in reducing road crashes among the target group, based on the available evidence,
2. The strength of the available evidence, and
3. The scope of the training in terms of the extent to which each training and education approach addresses key aspects of the Goals for Driver Education (GDE) principles (see section 3.1 of Report 1 for detail of GDE).

As will be described later in this report (see Section 6.2.4), the ratings used for the evaluative assessment were subsequently amended, based on feedback from the expert panel. Finally, the experts were asked to provide any additional comments relating to the contents of Reports 1 and 2, or additional thoughts concerning novice driver training approaches or research findings that they thought would be useful for the research team to consider. The expert opinion regarding each training approach has been synthesised and is reported below. In each case, expert opinion is synthesised while presenting a direct reflection of their expert opinion. While experts were specifically asked to consider the Queensland GDL in their response, it is probable that experts may not have been able to entirely disassociate the nuances of the Queensland system from their experience in their own jurisdiction. Consequently, some opinions presented in the next section may be more applicable to the experts' home jurisdiction than to the Queensland context.

6.2 Synthesis of expert opinion

6.2.1 Professional on-road driving instruction

The experts were generally positive towards professional (learn to drive) instruction as a beneficial way to train novice drivers. However, the experts expressed the belief that while this was a good way to train skills and facilitate passing a driving test, the removal of professional instruction as a training option would likely decrease the P1 practical driving test pass rate but that the impact on road safety is hard to determine. Those who undertake professional instruction are a self-selecting group so even if subsequent crash risk is monitored it is hard to determine if this is directly impacted by the professional instruction. One expert also noted that there is no evidence that those drivers trained by professionals are any safer than those trained by private supervisors. Furthermore, there is a trend in countries such as Germany (that previously did not allow any private supervision at all) towards introducing private supervision into their systems. Experts also noted that crash risk will only be reduced if training covers all GDE levels, and that although professional instruction has the potential to be able to do this it would depend on the quality of instruction provided by individual instructors.

One expert noted that altering requirements of the practical driving assessment is a good way of influencing the content of professional instruction. For instance, if the practical driving assessment was developed to include further measures of safe driving, the training offered by professional instructors would be adjusted to reflect the new demands because they are likely to 'teach to the test'. Depending on manipulations made to the test, there would be potential for the training of safer driving skills, however, it would still be difficult to determine actual road safety benefits of professional instruction. A different expert noted that professional instruction has social benefits in that they allow stable supervision for those who do not have regular access to private supervisors. Two experts suggested that greater benefits could be achieved by an integrated partnership between professional instructors and private supervisors.

In considering professional (learn to drive) instruction, the following advantages and disadvantages were noted by experts. These include reflections of the current system and potential for what this approach could achieve:

Advantages

- Can be customised and tailored to the skill of the individual.
- If a two tiered program including basic and higher-order skills is applied there will be increased likelihood of transfer of safe driving skills to independent driving.
- Some evidence that professionals are better than private supervisors at teaching, identifying and correcting errors.
- Potential for manipulation of instructor accreditation minimum standards to further reduce inter-instructor differences.
- Potential to correct possible bad habits which may have been observed from private supervisors.
- Likely to reflect current knowledge in driver training/education and any recent changes to practical driving assessment requirements.
- Disadvantaged youth (in terms of access to supervisor) are among the most likely to seek professional instruction as they may lack suitable supervisor of vehicle.
- If it was made mandatory it would ensure more teens receive the benefits of professional instruction.

Disadvantages

- This type of instruction often only focuses on skills needed to pass the test; people are not motivated to undertake the coaching necessary for addressing the higher GDE levels. This is a problem particularly if the test is relatively weak.
- Cost is likely to be an impacting factor on choice of instructor and number of training sessions obtained. A cheap instructor is not necessarily a safe one.
- Reliance on professional instruction reduces variation of experience which is linked to increased crash risk.
- Literature reviews and meta-analysis suggest professional instruction to pass the driving test does not reduce crash rate.
- This type of education is difficult to evaluate as crashes are rare and it is difficult to randomly assign participants.
- Professional instruction teaches skills, and lack of skills is not usually the cause of crashes.

There was consensus that professional driving instruction is most suitable for those on a **learner licence**. One expert noted that early in the learner phase, professional instruction could result in technically better, although not necessarily safer drivers. Three experts commented that professional instruction at the end of the learning process would be good to hone skills and had potential to target the mid and higher GDE levels. Two experts argued that **P1** drivers could benefit from professional driving instruction for targeted training on higher order skills and on situations which are rarely encountered (e.g. night time driving, driving in heavy traffic, high speed, wet weather, moving between urban and rural environments). Finally, one expert commented on the potential for further training those with an **open licence.** Specifically, they suggested that drivers who were new to Queensland or who move between urban and rural areas could benefit from voluntary professional instruction.

6.2.2 Supervised on-road practice

Overall, supervised (on-road) driving experience received the most positive comments of all training approaches. All of the experts were in agreement that this is an effective way for the learner to gain experience and that there is strong potential for positive road safety effects in particular because of the potential to extend the learner phase using a mandated hours requirement. It was recognised that a certain amount of practice will be necessary before road safety effects can be realised, however, experts noted that there is no clear consensus in the literature as to how many hours this should be. Experts were not specifically asked how many hours of supervision they felt was most appropriate, however, one expert noted that at least 100 practice hours is likely to have positive safety benefits. One expert commented that removal of the existing supervised (on-road) driving requirement from the current Queensland system would almost certainly result in a subsequent increase in crashes during the P1 phase.

In considering supervised on-road practice, the following advantages and disadvantages were noted by experts. These include reflections of the current system and potential of what this approach could achieve:

Advantages

- Exposes learners to practice driving under supervision which has a low crash risk.
- Allows gradual progression of practice from low crash risk (e.g. car parks) to higher risk conditions (e.g. night time driving).
- Allows parents to judge if the novice is ready to take their test.

- Increasing quantity of private supervision during learner phase is the most investigated and promoted way to reduce P1 crashes and has been shown to be effective at reducing crash risk in the first 2 unsupervised years.
- Without private supervision learners would likely rely on professional lessons, which often lack variety.
- Research suggests bad habits picked up from private supervisors does not outweigh the overall benefits, and likely could be addressed by good professional instruction.
- Required 100+ hours has potential to delay licensing which has safety benefits.

Disadvantages

- Parents do not always have sufficient tools to assist them as supervisors.
- Not all parents are good drivers or good teachers. Learners may adopt poor/unsafe/risky driving from a private supervisor.
- It is not clear from research the extent to which supervised driving experience translates into safer driving when unsupervised.
- Effects are only found if supervised practice is for a longer rather than shorter time/distance travelled.
- Required 100+ hours results in more practice of novices but puts a strain on some families.

All experts reported supervised on-road practice to be suitable for use in the **learner** phase. One expert noted that supervised on-road practice could be started prior to any professional instruction and also thought that it would be possible to use high school driver education in place of early stage professional instruction.

One expert argued that **P1** drivers could benefit from supervised on-road practice to target situations which are rarely encountered (e.g. night time driving, driving in heavy traffic, high speed, wet weather, moving between urban and rural environments). Although for this use, they recommended that it should be a voluntary, not mandatory, licensing requirement.

6.2.3 High school driver education

Responses were mixed towards high school driver education**.** Two experts felt that there was potential for such programs to have a positive effect, particularly if there is more emphasis on on-road lessons and less on classroom based learning. However, they also indicated that outcomes will be dependent on the quality of the lessons provided. The experts who did not recommend high school driver education stated that this was because results from evaluation studies suggest that this training has no effect on crash risk and that it could result in novices obtaining their licence earlier and potentially induce overconfidence, both of which are associated with increased crash risk. One expert expressed the opinion that it would be possible to use high school driver education during the early **learner** licence phase instead of early stage professional instruction.

In considering high school driver education the following advantages and disadvantages were noted by experts. These include reflections of the current system and potential of what this approach could achieve:

Advantages

- Efficient means by which teens can learn how to drive.
- This would ensure a baseline of education and training for all which may not otherwise be achieved.
- Good high school driver education (in line with NHTSA recommendations) has potential to contribute towards reduced collisions.

- USA high school training follows set formats with minimal on-road time. European high school training has more on-road time. The format may be the reason research evidence regarding this is relatively negative.
- This would be a convenient method to learn basic driving skills, potential at no or little cost to the participant.

Disadvantages

- Should not be used as a time discount or substitute for on-road practice or a reduction in other driving education as a time based trade off.
- Training could result in some young people getting P1 earlier and therefore increase crash involvement in P1.
- There is insufficient research evidence to establish safety benefits at present.
- Its effectiveness (in terms of crash risk) has not been proven and is unlikely to be proven. Instead, research should focus on evaluation in terms of how well superior basic driving skills are obtained.
- Depending on the implementation strategy, those who are disadvantaged (e.g. do not consistently attend the same school) may not access this and become more disadvantaged.
- Often this is group based learning which cannot provide the same quality as professional one-to-one instruction.
- Most review studies are of USA high school driver education and are rather old.

One expert suggested that high school driver education could be best applied as a three phase approach, with separate education programs targeting **pre-learner, learner and P1**. This same expert also expressed the belief that resilience training could be introduced in a similar three phase manner. Additionally, they thought that there was potential for simulators to be used within the context of high school driver education, suggesting using simple scenarios to focus on basic vehicle handling skills for **pre-learners**, as they prepare to become a **learner**. Finally, one expert recommended high school driver education not to be used at all due to extensive evidence indicating increases in crash involvement associated with earlier licensing.

6.2.4 Simulator training

Simulator training was an approach thought to have promise. However, experts noted that it is first important to ensure that the simulators used have ecological validity and sit within a valid training curriculum. One expert compared simulators to text books to emphasise that they are tools within an education program, the effects of which are highly dependent on the training content. Two experts argued that a distinction should be made between simulators and computer based training. With separation in this manner, computer based training was considered to be a useful tool for teaching higher order cognitive skills which has been proven as effective for skill acquisition. In addition, there is greater research evidence surrounding computer based training. As such, one expert suggested that if this type of training for cognitive skills was mandatory, there would be potential for reduction in crashes during the P1 phase. The current literature regarding simulator training has all been with self-selecting samples, making results hard to interpret. Furthermore, the focus of this research has predominantly been on skill acquisition. While skill acquisition is an important aspect of learning safe driving behaviours, the impact on crashes is currently unclear.

In considering simulator training, the following advantages and disadvantages were noted by experts. These include reflections of the current system and potential of what this approach could achieve:

Advantages

- Can expose novices to high risk situations with no real crash risk.
- Can be used to demonstrate consequences of unsafe decisions under controlled conditions (e.g. poor gap acceptance).
- Could be used as a minimum judgment as to whether a novice is ready to undertake private supervision. Assuming that proficiency on a simulator relates to on-road driving. This may minimise risk during instructor or parent supervision.
- Increase awareness and understanding of safe driving.
- It is possible to conduct this training without causing overconfidence during the learner phase; however, it is not clear for provisional drivers.
- Simulators are used in the Netherlands at the start of training, this helps to pass a test although it is not clear if it impacts road safety.
- There is some evidence that skills transfer to on-road driving.

Disadvantages

- Further research is necessary to see how skill acquisition translates to real world driving.
- Some aspects of safe driving can only be obtained through experience, simulator training may undermine this.
- Cost with students probably required to pay for use of the simulators.
- Few studies investigate retention of skills. Those that do, do not have random assignment of participants.

The **learner** phase was also believed to be a suitable location for simulator training by three of the experts. As noted above, one expert suggested that **simulator** training at this time would be a good supplement to high school driver education**.** A different expert, in support of simulators for **learner** training, noted that this opinion was limited to cognitive skills training only and that simulators should not be recommended for procedural training. The last of these three experts indicated the belief that although basic skills could be learned in simulators early in the **learner** phase, higher order skills are best learned after the novice has supervised on-road experience.

6.2.5 Resilience training

All experts were positive about the potential of resilience training; one expert went as far as saying that, in their opinion, “resilience training should be an essential component of driver training”**.** It was universally acknowledged that the attitudinal, motivational and decision-making factors targeted through resilience training are critical for safe driving, even though there is not extensive evidence as to impacts on road safety. This type of training aims to improve self-evaluation and risk awareness so is probably best suited to those with some unsupervised driving experience. It was also noted that because resilience training addresses attitudes rather than driving technique it would have benefits for groups of young people traveling together as well as individual drivers. It may be beneficial to combine resilience training of some form with other programs targeting adolescent behaviour (e.g. safe sex or drugs use). Although, there is not sufficient evidence to comment on direct road safety benefits, resilience training would particularly target crashes occurring in the P1 phase which is the phase with greatest crash risk. Further research would be needed to determine road safety impacts and where, within the licensing system, the optimal implementation phase would be.

In considering resilience training, the following advantages and disadvantages were noted by experts. These include reflections of the current system and potential of what this approach could achieve:

Advantages

- Can deliver valuable information to address behaviour before habits are formed.
- The biggest value of this is that it addresses pressures and decisions that influence "how" an individual chooses to drive.
- Standard driver education is good for learning driving skills but has little influence on other factors important in crash involvement. Resilience training could be a complement by addressing this gap.
- No chance of over-confidence as there is no direct focus on a driving skill.
- It would fit well within current high school curriculum (relatively low cost to implement) and could be included with other safety attitude training e.g. safe sex.
- Provides a situation where "real world" peer groups are together.
- Resilience training is common in second phase driver training in Europe (e.g. 6 months after licensed to drive unsupervised).
- Resilience training has been successful in other health education programs (not road safety).

Disadvantages

- If provided in schools there would be a mix of pre-learner, learner and provisional drivers in the same school. It is not clear how this would be managed.
- Evaluations are mixed as to if it is effective or not.
- At the moment there is little research evidence.

As noted above one expert suggested resilience training could be best applied as a three phase approach, with separate education programs targeting **pre-learner, learner and P1** although the content would need to vary depending on the stage of the novice. Two other experts also suggested that resilience training could be administered in high schools. However, both of these experts recommended that it be best suited to **P1** phase when the driver has some experience of unsupervised driving. Although, it was also recognised that general resilience training, including passenger-related aspects, could be administered to **pre-learners** and has potential to be included with wider safety topics such as safe sex. The final expert made no comment on how resilience training could be administered but expressed the belief that it was best suited to the **learner** or **P1** phase.

6.2.6 Procedural skills training

In keeping with the terminology used in Report 1, experts were asked to comment on the effectiveness of procedural skills training. It was viewed negatively by all experts. Based upon their comments, it is apparent that when considering the phrase 'procedural skills training', each expert was referring to training of advanced practical handling skills (e.g., skid training) rather than basic vehicle handling skills (e.g., braking, steering, parking). Particular emphasis was placed on skid training as something which should be avoided because evidence has demonstrated that it can lead to overconfidence and poor retention of rarely used skills which leads to increased crash risk. However, it was noted by one expert that procedural skills training has been redeveloped in Scandinavia where it is in wide use and there have, anecdotally, been no reported negative effects. One expert suggested that the only likely potential benefit if procedural skills training was

undertaken during the learner phase was an increased pass rate of practical driving assessment. However, they did not envisage any subsequent road safety benefits.

In considering procedural skills training, the following disadvantages were noted by experts (no advantages were reported). These include reflections of the current system and potential of what this approach could achieve:

Disadvantages

- No evidence that this reduces crash risk.
- Trained drivers may feel they have skills necessary for driving in risky conditions and therefore not avoid driving in them.
- There is a risk of overconfidence and increased crashes.
- There is a focus on skills which are rarely used, and therefore learning may not be retained.
- Expensive for no likely benefits.
- Difficult to make available in remote areas.
- Attractive to young males who are already most at risk of crash, attendance of such training may further inflate risk.
- This was mandatory in Norway until late 1980s, when it was evaluated and found to result in increased crash risk.
- Replication evaluations also found skid recovery training to increase crash risk, in novices and truck drivers.

All experts noted that they would not recommend procedural skills training at any phase of licensure.

6.2.7 Hazard perception training

All experts were in agreement that hazard perception training results in improved perception of hazards and that poor hazard perception is a major cause of novice driver crashes. Consequently, it could be inferred that road safety benefits would be expected as a result of hazard perception training. However, all experts commented that there is currently not enough research evidence for definitive conclusions to be drawn on the road safety impact or long term implications of such training. Hazard perception assessment is already a mandatory component of the Queensland licensing system. While it could be assumed that the majority of novice drivers are completing some form of training prior to completing this assessment, it may not be occurring in any systematic way (but simply as part of obtaining experience). Therefore, it is probable that the introduction of mandatory training would likely further improve hazard detection, which would thus have an impact on the assessment pass rate. One expert suggested that it may be possible to include two hazard perception tests of increasing difficulty (between learner to P1 and between P2 and open licence). This expert suggested that this may have a positive road safety impact, although they acknowledged that this was based on opinion and not research evidence. Further research is necessary (particularly in transferability of skills to on-road driving) before conclusions can be made about road safety effects.

In considering hazard perception training, the following advantages and disadvantages were noted by experts. These include reflections of the current system and potential of what this approach could achieve:

Advantages

- This skill is critical to safety.
- Effective training is necessary, particularly in jurisdictions with hazard perception tests.
- Many studies demonstrate hazard perception skill acquisition.
- Has potential to increase peripheral vision known to be a problem in new drivers.
- Synergistic effects if all drivers are trained the same, particularly in relation to managing in-car distractions as young drivers will also be passengers.
- Hazard perception test introduction in Britain reduced crash involvement.
- Novice drivers who score poorly at a hazard perception test have higher fatal crash risk.
- As long as it doesn't lead to overconfidence this training should help drivers better cope on highways.

Disadvantages

- Designing and evaluating an effective program which impacts road safety are of high importance.
- Could be considerable costs to set up, particularly for rural QLD. It may be possible to use simple PC based training to reduce this.
- Additional requirements can make the already disadvantaged more disadvantaged.

The **learner** phase or **P1** was suggested as an effective location of hazard perception training by all of the experts. However, two experts specified that if this was during the **learner** phase it should be later rather than sooner, so as to occur after some driving experience had been obtained. One expert noted that multiple hazard perception training requirements may have safety benefits, with basic training during the **learner** phase and more complex training in **P1**, however, they noted that there is no research evidence to support multiple hazard perception training occasions at this point in time. Three experts reported that **situation awareness** training should be included with hazard perception training.

The same expert who noted that professional on-road instruction could be of some use for open licence also noted that hazard perception training may be beneficial for those with an open licence who had not received any hazard perception training while in an earlier licensing phase. However, the expert acknowledged that this may be difficult to mandate.

6.2.8 Situation awareness training

Situation awareness training was seen by all experts to be an extension of or a type of hazard perception. As such, separate comments were not provided for each question pertaining to this training approach by all experts. Instead, the experts provided limited comment about their beliefs relating specifically to situation awareness and made reference to their comments for hazard perception training as being applicable here. Overall, two experts expressed the belief that situation awareness and hazard perception were too closely linked to be considered as separate training approaches. The other two experts considered situation awareness as an extension of hazard perception, noting that while this is an important skill researched within the road safety domain, there is limited evidence regarding the impact of situation awareness training on driver behaviour and subsequent crash risk.

One expert recommended that situation awareness training not be used because in his/her opinion, this is not a very well developed concept.

6.2.9 Insight training

Insight training was seen as an area of potential by two experts. They argued that the underlying concept is good and there is potential to reduce risky behaviour if it is administered well. All experts indicated that there is currently insufficient evidence to comment on the road safety implications of insight training.

In considering insight training, the following advantages and disadvantages were noted by experts. These include reflections of the current system and potential of what this approach could achieve:

Advantages

- Address overconfidence and improves awareness of self-limitations, so has promise for road safety benefits.
- Most beneficial if follows some unsupervised driving experience.
- Potential to create a 'defensive' (as opposed to aggressive) driving culture.
- With all drivers exposed to the same program, other benefits are likely as young drivers are often passengers of other young drivers.
- Even though evidence is limited, P1 crash risk is so high this is worth trying as it is not too costly and is likely to have some benefit.
- Training is common in Scandinavia, called safety hall training. However, there is limited evidence.

Disadvantages

- Need to avoid unintentional lack of confidence which may result in being too cautious/hesitant which is an unsafe driving behaviour.
- The additional requirements, particularly financial, could make the disadvantaged more disadvantaged. Support schemes could help this. Research evidence is not clear how beneficial offering insight training programs would be.

Insight training was suggested as being potentially effective for **P1** drivers by three experts. It was noted that driving unsupervised requires a more complex type of insight than supervised learner driving so it would be useful to have a few months unsupervised driving prior to insight training. One expert suggested that insight training could also be undertaken during the **learner** phase to instil cautious/courteous driving attitudes from the start of their driving career. However, if this were to occur they indicated the belief that refresher training during **P1** would still be beneficial, although this was based on opinion and not research evidence. One expert reported being uncertain about the potential benefit of insight training**.**

6.2.10 Expert Opinion on Assessment Ratings

Table 3 reports the preliminary ratings provided by the research team to the experts (see Appendix 1 for more details), along with a summary of the experts' responses. Please note that the preliminary ratings reflect the initial scale for effectiveness developed by the research team, which was subsequently modified in light of the responses received from the experts. The revised, final version of the ratings is provided in the next section of this report (Section 7).

Table 3: Preliminary ratings associated with different types of education provided to experts

	Effectiveness	Strength of evidence	Scope of Training	Experts in total agreement	Experts in partial agreement	Experts in disagreement
Professional on-road driving instruction	****	***	B,C,D		2	2
Supervised on-road driving experience	****	**	B,C,D	1	3	
High school driver education	**	*	C,D	2	1	1
Simulators	***	**	C,D	3	1	
Resilience training	***	**	A,B	4		
Procedural skills training*	*	*	C,D	3	1	
Hazard perception education	***	**	C,D	4		
Situation awareness training	***	*	C,D	2	2	
Insight training	**	*	C	4		

*Note that this term was used in the initial phases of this project, including the expert consultation phase, but has been reworded as 'Advanced Practical Skills Training' in this final report.

The variety of responses from experts demonstrates that the same research findings can be interpreted differently. All experts were in total agreement for the ratings regarding **resilience training, hazard perception training** and **insight training.** All but one expert were in agreement for the ratings for **simulator** and **procedural skills training**.

Interestingly, two experts disagreed with the assessment given for **professional on-road driving instruction.** The comments provided by the experts to explain their disagreement demonstrate that the underlying factor for this, in part, lies with the definition of effectiveness. In this case, effectiveness was defined by the project team as relating solely to crash reduction. However, these two experts noted that there is no clear evidence that professional on-road instruction does reduce crash risk, and that the majority of evidence for the effectiveness of this type of training comes from studies with alternative metrics as the outcomes of interest (e.g. skill acquisition). Consequently, it was the opinion of these two experts that while the ratings represented the positive evidence around professional instruction, effectiveness was rated too highly by the project team in regard to crash risk reduction alone.

There was also mixed opinion regarding **high school driver education.** Experts who were in agreement with the original project team ratings stated that there is not much evidence regarding the effectiveness of this approach. However, the expert who disagreed with the project team ratings commented that this was once again related to the nature of the rating system. This expert argued that there should be an additional level of effectiveness which captured the concept of "no positive effects" because some studies have suggested high school education results in increased crash involvement which was not able to be represented by the rating scale originally proposed by the project team (see Appendix 1). The expert who indicated partial agreement also commented on the inability of the effectiveness scale to capture a negative impact as demonstrated by evidence.

Although there was general agreement with the ratings for **supervised on-road practice,** there were some interesting comments from the experts on this issue. One expert noted the strong difference between the GDL systems in the USA which require many less hours (often 20 – 30 hours) of supervised practice, as compared to the Queensland GDL system. Therefore, they were concerned that results from evaluation studies conducted under one type of system may not be applicable to another. The same expert also thought that GDE level B, which refers to the new driver learning

about driving goals and context, could be addressed by supervised practice, although he/she noted that this may not be the case in all circumstances.

6.3 CARRS-Q consideration of expert opinion

This section provides discussion on issues relating to how the expert opinion was consistent or not with the evaluation ratings made by CARRS-Q as documented in Report 1 and reproduced in Table 3 of the current report. It is important to recognise that experts provided comment according to their professional experience which is likely to be influenced by the jurisdictions in which they work.

6.3.1 Professional (learn to drive) instruction

In general, the experts agreed with the CARRS-Q evaluation ratings for professional (learn to drive) instruction as presented in Report 1. However, the experts noted that when considering evaluations of this particular approach, there was likely to be more evidence for effectiveness in terms of skill acquisition than in relation to crash reduction. As a consequence, the effectiveness rating for professional instruction has been adjusted down accordingly in the revised evaluation rating (see next section).

One aspect mentioned by experts was the potential for differences between instructors and, therefore, differences in the quality of professional driving instruction across the state. While this is likely, it is acknowledged that TMR already requires minimum standards to be met in order for driver trainers to be accredited in Queensland. This approach should mitigate some degree of variability. However, it may be that by increasing/tightening these minimum requirements, there is potential that inter-instructor variability may be reduced and quality enhanced. Importantly, there is no information currently available to allow for an assessment of the quality and scope of the professional instruction currently offered in Queensland.

One expert noted that professional instruction could correct for bad habits obtained during private supervision. It is acknowledged that while there is potential for this to occur, it is unclear how widespread this problem is, nor the extent to which it actually contributes to crashes.

It is recognised that novice drivers may be disadvantaged in terms of achieving mandated driving hours if they do not have regular access to a supervisor and/or a vehicle. Professional instruction offers opportunity to access a supervisor (albeit at a financial cost) where it may not otherwise be possible (e.g., school students living away from home, such as boarding at school, may not have regular access to a private supervisor).

One expert noted that it is difficult to evaluate crash risk resulting from professional instruction because participants in research studies are rarely randomly assigned to groups. Although this is correct, it is also important to note that this same limitation applies to all of the training approaches evaluated. Similarly, the financial costs associated with the introduction or alteration of many of the training approaches reviewed throughout this program of research is another limitation applicable to each of them.

6.3.2 Supervised (on-road) driving experience

Expert opinion was consistent with the CARRS-Q evaluation ratings presented in Report 1 for supervised (on-road) driving experience. One expert noted that a high number of mandated hours of supervision (e.g. 100+) may put a strain on some families. This is acknowledged as a genuine

consideration, although learner drivers surveyed following the introduction of the 100 hours requirement reported less difficulty obtaining practice than those before the change (Scott-Parker et al., 2011).

It is also acknowledged that the requirement to attain a high number of mandated hours may also have an impact on professional instruction in that families may consider the strain of supervising a novice as preferable to the financial strain incurred by accessing professional instruction.

6.3.3 High school driver education

There was variation of opinion between experts regarding high school driver education. This was likely influenced by standard practice within the jurisdiction in which the expert is based. High school driver education is common practice in North America and some European countries. In particular, the financial cost associated with such training may vary and was thus reflected in expert comment. In some schools there is potential that this may be included within standard school lessons where as others may identify it as an optional extra to be paid for by parents. In light of the comments by experts, the effectiveness rating was reduced, the strength of evidence rating increased, and the scope of training was also increased to include all GDE levels because there is potential for the full range of skills to be addressed by courses in future but would need to be different from those historically offered in the USA and upon which most research evaluations have been conducted.

It was noted by experts that high school driver education training could potentially result in some people achieving P1 earlier. It is recognised that this could occur, however, it would be dependent on the extent to which the training directly encouraged or facilitated the students to obtain their learner and/or provisional licence. In this regard, it is feasible that certain types of school-based road safety education could actually serve to discourage young people from seeking to obtain their drivers licence as soon as possible.

One issue relating to high school driver education is that it may exacerbate disadvantage if it is not openly accessible to all. For instance, if high school driver education was only available in private schools then those attending state school would be at a disadvantage. Further, if it was administered in all schools, those who do not have a stable school life (absenteeism or changing schools) may be disadvantaged.

6.3.4 Simulator training

In comparison to the CARRS-Q ratings provided for simulator training, the experts generally expressed slightly more reservation because they were more stringent in separating out research evaluations conducted on simulators and on PC based training. They also noted the oversight in not including GDE level B in the CARRS-Q rating. Therefore, the rating has consequently been updated (refer Table 4).

6.3.5 Resilience training

All experts agreed with the CARRS-Q evaluation of resilience training presented in Report 1.

6.3.6 Procedural skills training

All experts generally agreed with the CARRS-Q evaluation of procedural skills training presented in Report 1. As noted earlier, the term ‘procedural skills training’ used in Report 1 referred to advanced practical skills courses (e.g., skid training), as opposed to basic vehicle handling skills training (e.g.,

braking, steering, parking). It is clear from their comments that the experts each considered 'procedural skills training' in this manner, since they focussed on the research findings that have highlighted the lack of evidence, and sometimes negative results, obtained from studies evaluating this type of training.

6.3.7 Hazard perception training

The experts generally agreed with the CARRS-Q evaluation ratings presented in Report 1. However, the GDE level B was also noted by them as relevant to hazard perception training. Therefore, the revised ratings presented in Table 4 reflect this. It was noted by experts that introducing an additional licencing requirement for hazard perception training had potential to make those already disadvantaged more disadvantaged. While, this potential is acknowledged, it should be recognised that this would apply to all new licencing requirements and is not specific to hazard perception training.

6.3.8 Situation awareness training

Expert opinion was that situation awareness training should be included with hazard perception training and all feedback from the experts inferred that their comments relating to hazard perception were also applicable to situation awareness training. It is recognised that there is some overlap between situation awareness and hazard perception. Within novice driver training, situation awareness has received much less research attention than hazard perception. Consequently, situation awareness as a standalone concept may be hard to evaluate for this population at this point in time. There is, however, additional research on situation awareness within the wider road safety literature, where it is described as going beyond the detection and response to hazards, by focussing on a higher level understanding of the road system as a whole (Salmon et al., 2012). In light of expert concern regarding the small volume of novice driver-specific situation awareness training evaluations available in the literature, the revised effectiveness rating (Table 4) has been reduced.

6.3.9 Insight training

Overall, the experts agreed with the CARRS-Q evaluation of insight training presented in Report 1. One expert expressed the opinion that although there is limited evidence regarding crash risk, they believed that insight training would be worth trying because it is a relatively cheap approach. They also noted that P1 crashes were numerous, and therefore, any approach with potential should be tried. However, this is an opinion which could equally be applied to some other promising training approaches, such as resilience training.

It was noted that the introduction of additional training requirements (particularly if they have significant financial implications) could place additional burden on the more disadvantaged members of society. However, this is a statement which could equally apply to any of the training approaches discussed in this program of research.

7. Consolidated summary and overall conclusions

As discussed in Section 5, there are many ways in which the impact of changes to the Queensland GDL system can be considered. From a road safety perspective, reducing crashes and associated fatalities and injuries of novice drivers (and associated impacts on other road users) should be the primary objective of any such changes. Beyond this objective, however, there are a range of other impacts that should also be considered when assessing the likely advantages or disadvantages of any alterations to the current GDL system. A key consideration needs to be the extent to which any change strengthens or undermines the overall GDL system. Additionally, the aim of any change to the GDL system should be to *not* introduce unnecessary obstacles to gaining a licence if there is no clear road safety evidence to support such a change. As such, this section seeks to summarise and synthesise the information obtained from the earlier phases of the project to provide information on which to base decisions about altering the current Queensland GDL system.

As a result of the expert consultation, the assessment ratings documented in Report 1 of this program of research have been reconsidered and revised. In particular, it was considered important to alter the effectiveness scale so that it reflected the potential for a negative impact of training. Subsequently, the following definition of the effectiveness rating is now proposed.

Effectiveness:

*****	Demonstrated to be effective by several high-quality evaluations with consistent results
****	Demonstrated to be effective in certain situations
***	Likely to be effective based on balance of evidence from high-quality evaluations or other sources
**	Effectiveness still undetermined; different methods of implementing this countermeasure produce different results; limited or no high-quality evaluation evidence
*	Demonstrated to have a negative effect

Strength of Evidence:

***	Many high quality evaluations
**	Some high quality evaluations
*	Few high quality evaluations

Scope of Training:

A	Addresses at least one curriculum category within the GDE goals for life/skills for living level
B	Addresses at least one curriculum category within the GDE driving goals and context level
C	Addresses at least one curriculum category within the GDE mastery of traffic situations level
D	Addresses at least one curriculum category within the GDE vehicle manoeuvring level

The rating system is designed to provide an indicative summary of each education/training approach. Besides assessing how effective each approach is, the rating system is designed to characterise its scope, as measured against the GDE.

The revised and final summary table showing ratings for each training approach is presented in Table 4.

Table 4: Consolidated evaluation of evidence

Education and training approach	Effectiveness	Strength of the evidence	Scope of training
Professional on-road driving instruction	***	**	B,C,D
Supervised on-road driving experience	****	**	B,C,D
High school driver education	*	**	A,B,C,D
Simulators	**	**	B,C,D
Resilience training	***	**	A,B
Advanced Practical skills training	*	*	C,D
Hazard perception education	***	**	B,C,D
Situation awareness	**	*	C,D
Insight training	**	*	C

The remaining section of this report represents a consolidated summary of the synthesis of expert opinion and available evidence (as critiqued in the literature review in Report 1) on each of the training approaches discussed throughout the project. It is recognised that with each of the approaches discussed throughout this program of research, there are potential implications (e.g., financial burden, creating inequity or social disadvantage) to be considered. The views expressed below are those of the CARRS-Q research team.

7.1 Time discounts for completing driver education

Providing time discounts to Learner drivers who complete driver education courses would effectively decrease time to progress through the GDL system, and has been shown to be associated with higher crash involvement in other jurisdictions. Therefore, it is the opinion of the authors that the introduction of this approach in Queensland would be likely to have a negative effect on safety.

7.2 Mandatory hours of practice

It is recognised that the Queensland GDL system already requires 100 hours of supervised practice to be recorded in a log book, although this may be as little as 80 hours of actual practice if the 3 for 1 professional driving instruction option is chosen by Learner drivers. This is acknowledged as an important initiative which has served to increase the amount of on-road experience obtained by Queensland learner drivers prior to obtaining their P1 licence. While this requirement, along with the lengthening of the learner licence period to twelve months, has increased the average time the learner licence is held, the average age at which the provisional licence is obtained appears to have remained unchanged, probably due to the fact that the learner licence can now be obtained at 16 years of age. However, caution is required if consideration was to be given to changing the number of hours in the Queensland GDL system until such time as current requirements have been effectively evaluated. There is no evidence to indicate that the number of hours of practice should be reduced, and no clear evidence that they should be increased. There is also a risk that increasing the hours required without appropriate education and enforcement could lead to more unlicensed driving among this group. It is the opinion of the authors that requiring mandatory hours of practice is likely to have a positive road safety effect.

7.3 Professional on-road driving instruction

As noted above, the Queensland GDL system currently has provision for Learner drivers to record one hour of professional driving instruction as the equivalent of three hours of driving practice in their log book. There is no clear evidence that receiving professional driving instruction produces safer drivers than private supervision, although it may represent a more efficient way of learning to drive and preparing for the driving test. It is recognised that extending the 3 for 1 hours discount for professional instruction may improve equity for those young people who do not have access to a vehicle or to appropriate supervisors (e.g., school students living away from home). However, it is also recognised that mandating this type of instruction would create difficulties if it was unavailable in all parts of Queensland. Most critically, any extension to the 3 for 1 discount would effectively reduce the overall amount of on-road driving experience required of learners who take up the option to go below 80 hours.

Nevertheless, it is possible that professional instruction could provide P1 drivers with learning and/or experience which they would not otherwise obtain during the learner phase, and so encouraging professional instruction might be beneficial for some people. Finally, it is important to acknowledge that improving the driving test has the potential to improve the standard of professional driving instruction provided in Queensland. Indeed, it is possible that long term improvement to professional instruction could promote greater alignment with training practices and the goals espoused by the GDE principles.

7.4 Supervised on-road driving experience:

It is the opinion of the authors that if the current provisions allowing for supervised on road driving experience were to be removed, it would likely lead to an increase in P1 crashes due to a reduced amount of on-road driving/learning experience obtained prior to gaining a P1 licence. In addition, it is possible that removing this option would most likely produce negative financial and social impacts because instruction would need to be exclusively sought from professional instructors. Since there is no clear evidence on the number of hours of practice required, the current requirements in Queensland are likely to be the most beneficial until stronger evidence emerges. It is the opinion of the authors that allowing supervised on-road driving experience is likely to have a positive impact on crashes.

7.5 High school driver education:

Introducing driver education into schools would represent a substantial cost burden in terms of development, implementation, maintenance, and evaluation of the program. One potential benefit of the introduction of this type of education would be that it could help to ensure that most school-based learner drivers receive a baseline level of education and training that might not otherwise be achieved, although this would disadvantage those learners who do not attend school. Additionally, it is recognised that such a program, if based on those traditionally offered in the USA, would be unlikely to counteract the problem of facilitating earlier licensing and the consequent increase in crash involvement among young people. The potential to address resilience training (see next section) in some form of high school education program is a promising option for this type of

instruction in the future. However, in its current form (i.e., based on those programs offered in the USA), there is no clear evidence that this type of education has a positive road safety impact. It is the opinion of the authors that high school driver education is likely to have a negative impact on crashes if it facilitates earlier licensing.

7.6 Resilience training:

This training approach shows promise because it does not focus on mastery of the driving task but on strategies associated with risk avoidance. In that sense, it may be beneficial in achieving road safety aims in that it promotes development of the concept of 'how a person chooses to drive' as opposed to 'how to drive'. It is the opinion of the authors that there is potential for resilience training to reduce novice driver crashes. However, this requires confirmation through appropriately designed and evaluated trials. There is also potential benefit from combining resilience training with broader training approaches that target a wider range of risk taking activities by young people. One example of a program currently running in schools in the Australian Capital Territory and Queensland that addressed adolescent risk taking from a broad perspective (i.e., not specific to road safety/driving issues) is the Skills for Preventing Injury in Youth (SPIY) program (Chapman, Buckley & Sheehan, 2012). It is the opinion of the authors that resilience training has the potential to have a positive impact on crashes, but that further development and research is required.

7.7 Simulator training:

The use of simulators for training novice drivers is recognised as an area of promise, although the impact on crash risk is currently unclear. Available evidence suggests that such training could be expected to improve the pass rate on hazard perception tests. However, there is not enough evidence at present to prescribe best practice or to suggest mandating this training approach in Queensland. It is recognised that costs associated with the provision of simulators and associated software and maintenance issues could be prohibitive to government and to the participation by all novice drivers. Simulator training appears to have the most potential in the early phase of licensure to fast track the automation of basic vehicle handling skills. However, it is the opinion of the authors that currently, there is no demonstrable effect of simulator training on road safety.

7.8 Advanced practical skills training:

Training in basic vehicle handling skills, such as braking and steering, is an inherent requirement of learning to drive. As noted throughout this report, the majority of evidence relating to practical skills training refers to evaluations conducted on training that is more focussed on advanced vehicle control skills (e.g., skid control training) than on basic vehicle handling skills. Overwhelmingly, these evaluations have found either no effects or negative impacts on road safety, presumably due to creating over-confidence in skills. In addition, it is recognised that there would be substantial financial costs associated with implementing more extensive advanced practical skills training throughout Queensland. Based on available evidence, it is the opinion of the authors that advanced practical skills training would be likely to have no impact, or even a negative impact, on crashes if introduced.

7.9 Hazard perception training:

Although there is currently a Hazard Perception Test incorporated into the Queensland GDL system, no formal hazard perception training is provided. However, the likely benefits of more systematic training in this area remain unclear. Hazard perception training appears to be a promising approach,

as long as it does not lead to over-confidence and as long as the skills acquired by the learner driver relate to the ability to recognise and respond to hazards appropriately. It is the opinion of the authors that in relation to hazard perception training, there is currently no demonstrable effect of road safety evident from the available evidence.

7.10 Situational awareness:

The concepts defined and covered under the umbrella of situational awareness training are diverse and currently, there is no standard understanding of what this type of training includes and what differentiates situational awareness training from concepts such as hazard perception training. More research is needed to develop and refine this training approach. It is the opinion of the authors that currently, there is no demonstrable effect on road safety from the available evidence.

7.11 Insight training:

This training approach holds promise because it has the potential to target over-confidence of novice drivers and aims to improve awareness of personal limitations. It also has the potential to introduce unintended consequences such as a lack of confidence in skills resulting in over-cautiousness, and hesitant or unsafe driving behaviours. However, to date, there is no clear evidence for a positive road safety impact from this type of training. Therefore, it is the opinion of the authors that currently, there is no demonstrable effect on road safety from the available evidence on insight training.

7.12 Conclusion

As this report indicates, while there is a great deal of consensus among road safety experts concerning the effectiveness of different types of driver training and education, differences of opinion still exist. However, after considering the literature and the expert opinion provided by the international consultation process, it is concluded that there are several driver education and training countermeasures that would likely be detrimental if included in the Queensland GDL system. The research evidence suggests that the adoption of high school driver education in the form commonly used in the USA, and the inclusion of advanced practical skills training (e.g., skid training) may be detrimental to new drivers. It is also the conclusion of the authors that the provision of time discounts for individuals who complete driver education would undermine the integrity of the GDL system and contribute to an increase in crash involvement among novice drivers who take up this option. In contrast, it is the opinion of the authors that the continued use of mandatory hours of practise for learner drivers at their current level, the use of professional on-road driving instruction, and supervised driving practise more broadly, are beneficial for new drivers. However, further data and research is needed to refine these types of driver education and training. In this regard, making changes to the number of supervised hours required before obtaining sufficient data would make verification of the effects of the existing requirements difficult, or even impossible.

Other types of driver education and training show promise, although further research is required. For instance, simulator training may be beneficial in assisting novice drivers to acquire a range of vehicle controls skills, particularly in the initial stages when learning basic skills such as car control skills including steering and braking, while resilience and insight training show promise because to the focus on risk avoidance strategies. However, further research is needed to confirm this.

Situational awareness training is a newer form of training that requires additional research to identify its effectiveness.

Given that Queensland's GDL system includes a hazard perception test, the requirement for new drivers to obtain this skill is implied. Thus, there may be benefits in individuals undertaking hazard perception training to improve this skill. Making changes to the current hazard perception test or the pass mark required may increase the number of people seeking training specifically to enhance their hazard perception skills.

Novice driver education and training is a diverse area with a range of options available. Each type of driver education and training is different in terms of its aim or approach. Additionally, novice driver education and training is likely to be heavily influenced by the licensing system that operates within a specific jurisdiction. Further research is needed to determine the optimal mix of education and training options, the phase in which they should occur within a GDL system, and potential benefits of making some types of education and training compulsory. The overarching goal of research and development in this area should be to identify programs and approaches that both reduce the crash risk of novice drivers and serve to strengthen the GDL system.

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9. Appendix 1

Review Document for Expert Input into
CARRS-Q Reports Relating to Novice Driver Training in Queensland

CARRS-Q was commissioned by the Queensland Department of Transport and Main Roads (TMR) to investigate how changing driver training in the Queensland licensing system would affect road safety. We thank you for agreeing to provide expert opinion on this important topic.

9.1 Reviewer Instructions:

This document allows you to provide expert opinion on two reports that have been prepared by CARRS-Q for TMR thus far.

Report 1 (*Trends in driver education and training*) and Report 2 (*Simulators for skill acquisition training and assessment, and their impact on road safety*) are still in draft form. A further report (Report 3) will be prepared and presented to TMR after we receive your feedback. Your comments will not be specifically attributed to you. Rather, we will be synthesising your feedback, along with that of 3 other experts, into the final report.

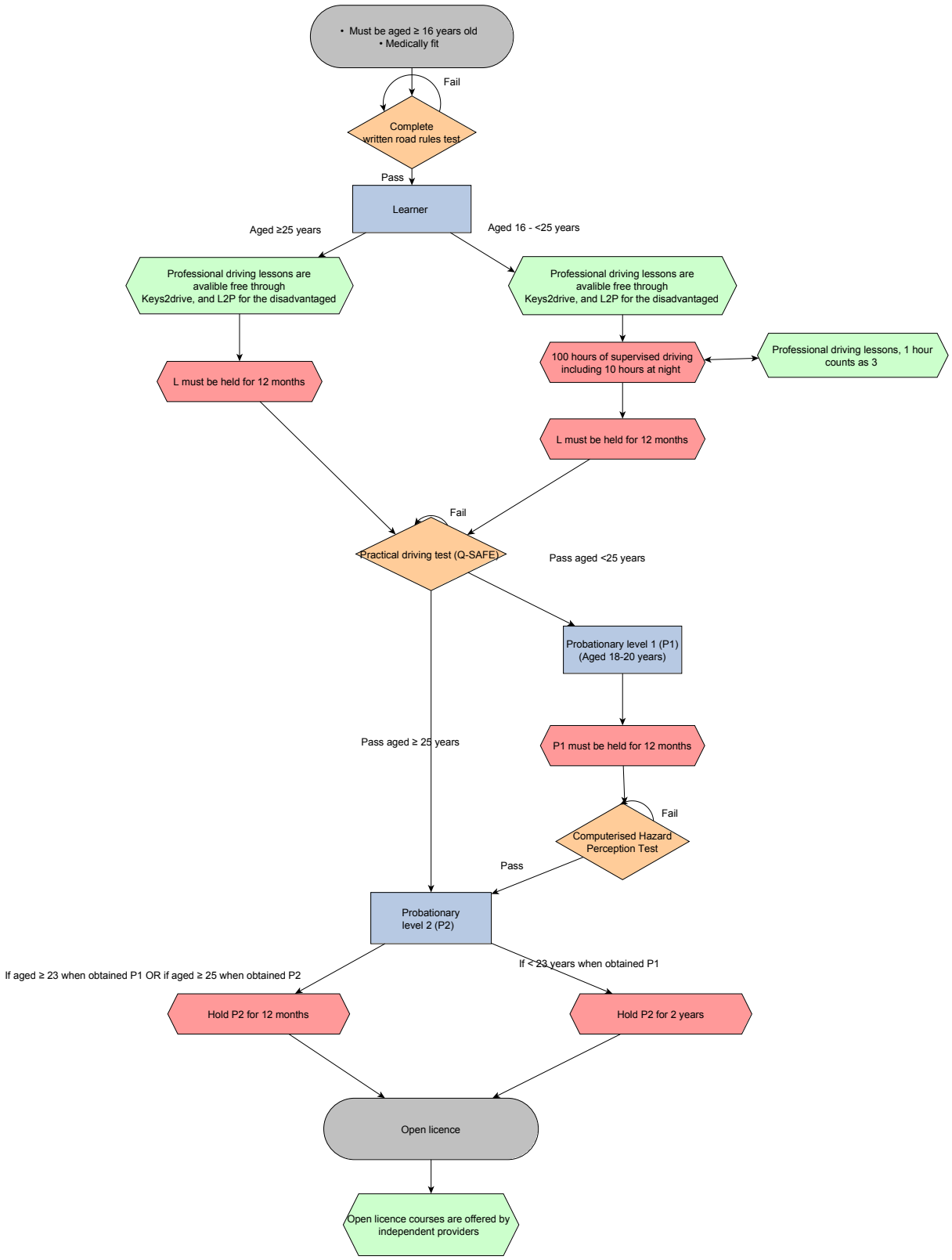
To streamline the review process, we recommend that you:

1. Read the following background information which includes-
    a. A flowchart providing you with details of the current Graduated Driver Licensing system in Queensland;
    b. An overview of the Definitions used to refer to various driver licensing and training concepts discussed in the reports.
2. Complete the review document by-
    a. Providing answers to 3 questions on each of the various training approaches that are identified and reviewed in Report 1 (see next part of this document);
    b. Reviewing the 3 Evaluative Ratings that we have given to each training approach in Report 1 and provide comment on whether you agree with our ratings; and
    c. Providing final overall feedback about novice driver training approaches and the two draft Reports.
3. Refer to Reports 1 and 2 as needed.

Please note: Please use as much space as you feel necessary to answer the questions. In all cases, the review is focused on driver training/education **NOT** driver assessment.

9.2 Background information

9.2.1 CURRENT GDL IN QUEENSLAND



9.2.2 DEFINITIONS USED IN THE PROJECT (pg 7-8 of Report 1):

Driver training and driver education are two distinct, yet related concepts. Driver training refers to the teaching of procedural and/ or cognitive driving skills with specific objectives in mind, such as obtaining a license or learning particular skills. Driver education is broader than training and encompasses topics regarding safe and responsible driving (e.g., road rules, road safety, risk taking activities). As outlined below, there are different types of driver education and training:

Supervised on-road driving experience: A novice driver receives supervised on-road driving experience when a more experienced driver provides the novice driver with an opportunity to practice their driving on the road. This practice, while frequently provided by parents, is also provided by people with a range of other relationships to the learner driver.

Professional driving instruction: Professional driving instruction occurs when the training is delivered by an individual whose specific role is to provide people with the knowledge and skills needed to function safely within a road environment in a systematic and structured manner. The training can occur on the road or in an off road facility. The professional driving instructor normally receives a payment for their assistance.

Simulator training: Simulator training involves the use of a computer to assist in the driver training or education. Driving simulators offer control over the driving experience but may lack some similarities to driving. Additionally, some people may develop simulator sickness.

Resilience training: The role of resilience training is to reduce novice drivers taking risks by improving their interpersonal skills. Some courses in this area may not contain content that is specifically focussed on driving, however, the skills taught within the course can be applied more broadly including in the driving context.

Procedural skills training: This type of training involves teaching novice drivers how to undertake a sequence of actions that may become automatic after practice. This could include manoeuvring or operating the vehicle.

Hazard perception training: Hazard perception training is designed to improve individuals' abilities to recognise potential hazards and hazardous situations while driving. It also provides some potential options that the driver could take in order to avoid hazards.

Situation awareness training: Situation awareness training is designed to improve novice drivers understanding of the environment around them. This type of training aims to improve novice drivers' cognitive skills.

Insight training: Insight training does not teach novice drivers how to control a vehicle or undertake driving related tasks. Instead, the training is designed to increase the understanding of young people regarding the dangers they face while driving. By doing so, the training aims to reduce the over-confidence of young drivers and encourage more cautious behaviour.

Education can be delivered at different times during the licensing process. Pre-licence training (pre-learner and learner) refers to training that occurs before an individual is able to drive a vehicle by themselves. In comparison, post-licence training (provisional 1 & 2 and open licence) occurs after a driver is able to drive by themselves.

9.3 SECTION 1: TRAINING APPROACHES FOR YOUR COMMENT

Please consider each training approach in turn and answer the following 3 questions for each approach (the questions are repeated over several pages to allow you to refer easily to them). In each case, please use as much room as you feel is required to answer the question.

Q1: What would be the likely road safety effects if this approach was introduced into or removed from the Queensland GDL? **Q2: How/where would be the most effective time to integrate such an approach into the Queensland GDL (Pre-learner, Learner, P1, P2, Open)?** **Q3: List four potential issues (benefits or disadvantages) which informed your decision to questions one and two?**

Education/Training approach: Professional (Learn to Drive) driving instruction (pg 19, Report 1)	
Response to Q1	
Response to Q2	
Response to Q3	

Education/Training approach: Supervised (on-road) driving experience (pg 21, Report 1)	
Response to Q1	
Response to Q2	
Response to Q3	

Q1: What would be the likely road safety effects if this approach was introduced into or removed from the Queensland GDL?

Q2: How/where would be the most effective time to integrate such an approach into the Queensland GDL (Pre-learner, Learner, P1, P2, Open)?

Q3: List four potential issues (benefits or disadvantages) which informed your decision to questions one and two?

Education/Training approach: **High school driver education (pg 24, Report 1)**	
Response to Q1	
Response to Q2	
Response to Q3	

Education/Training approach: **Simulator training (pg 27, Report 1 + Report 2).** *Please consider both full simulators and PC based training*	
Response to Q1	
Response to Q2	
Response to Q3	

Q1: What would be the likely road safety effects if this approach was introduced into or removed from the Queensland GDL? **Q2: How/where would be the most effective time to integrate such an approach into the Queensland GDL (Pre-learner, Learner, P1, P2, Open)?** **Q3: List four potential issues (benefits or disadvantages) which informed your decision to questions one and two?**

Education/Training approach: **Resilience training (pg 34, Report 1)**	
Response to Q1	
Response to Q2	
Response to Q3	

Education/Training approach: **Procedural skills training (pg 39, Report 1)**	
Response to Q1	
Response to Q2	
Response to Q3	

Q1: What would be the likely road safety effects if this approach was introduced into or removed from the Queensland GDL? **Q2: How/where would be the most effective time to integrate such an approach into the Queensland GDL (Pre-learner, Learner, P1, P2, Open)?** **Q3: List four potential issues (benefits or disadvantages) which informed your decision to questions one and two?**

Education/Training approach: Hazard perception education and training (pg 40, Report 1 + pg 19, Report 2 NB: not assessment	
Response to Q1	
Response to Q2	
Response to Q3	

Education/Training approach: Situation awareness training (pg 43, Report 1)	
Response to Q1	
Response to Q2	
Response to Q3	

Q1: What would be the likely road safety effects if this approach was introduced into or removed from the Queensland GDL?

Q2: How/where would be the most effective time to integrate such an approach into the Queensland GDL (Pre-learner, Learner, P1, P2, Open)?

Q3: List four potential issues (benefits or disadvantages) which informed your decision to questions one and two?

Education/Training approach: Insight training (pg 43, Report 1)	
Response to Q1	
Response to Q2	
Response to Q3	

9.4 SECTION 2: EVALUATION RATINGS

At the end of each section in the literature review in Report 1, we have made an evaluative assessment relating to each of the education/training approaches, focussing on:

1) The effectiveness of the approach in reducing road crashes among the target group, based on the available evidence,

2) The strength of the available evidence, and

3) The scope of the training in terms of the extent to which each training and education approach addresses key aspects of the Goals for Driver Education (GDE) principles (see section 3.1 of Report 1 for greater detail of GDE).

The ratings that were used for this purpose are:

Effectiveness:

*****	Demonstrated to be effective by several high-quality evaluations with consistent results
****	Demonstrated to be effective in certain situations
***	Likely to be effective based on balance of evidence from high-quality evaluations or other sources
**	Effectiveness still undetermined; different methods of implementing this countermeasure produce different results
*	Limited or no high-quality evaluation evidence

Strength of the evidence:

***	Many high quality evaluations
**	Some high quality evaluations
*	Few high quality evaluations

Scope of Training:

A	Addresses at least one curriculum category within goals for life/skills for living
B	Addresses at least one curriculum category within driving goals and context
C	Addresses at least one curriculum category within mastery of traffic situations
D	Addresses at least one curriculum category within vehicle manoeuvring

The rating system is designed to provide an indicative summary of each education/training approach. Besides assessing how effective each approach is, the rating system is designed to characterise its scope, as measured against the GDE. The availability of published research has a direct impact on the robustness of the ratings provided within this report.

Reviewer Instruction:

Please review the ratings for each training approach (see below) and indicate your level of dis/agreement with our rating. If you partially agree or disagree with our rating, please describe why.

	Effectiveness	Strength of evidence	Scope of Training
Professional on-road driving instruction	****	***	B,C,D

Level of dis/agreement with CARRS-Q rating: ☐Totally agree ☐ Partially agree ☐Disagree

Comment:_____

_____

_____

	Effectiveness	Strength of evidence	Scope of Training
Supervised on-road driving experience	****	**	B,C,D

Level of dis/agreement with CARRS-Q rating: ☐Totally agree ☐Partially agree ☐Disagree

Comment:_____

_____

_____

	Effectiveness	Strength of evidence	Scope of training
High school driver education	**	*	C,D

Level of dis/agreement with CARRS-Q rating: ☐Totally agree ☐Partially agree ☐Disagree

Comment:_____

_____

_____

	Effectiveness	Strength of evidence	Scope of training
Simulators	***	**	C,D

Level of dis/agreement with CARRS-Q rating: ☐Totally agree ☐Partially agree ☐Disagree

Comment:_____

_____

_____

	Effectiveness	Strength of evidence	Scope of Training
Resilience training	***	**	A,B

Level of dis/agreement with CARRS-Q rating: ☐Totally agree ☐Partially agree ☐Disagree

Comment:_____

_____

_____

	Effectiveness	Strength of evidence	Scope of Training
Procedural skills training	*	*	C,D

Level of dis/agreement with CARRS-Q rating: ☐Totally agree ☐Partially agree ☐Disagree

Comment:_____

_____

_____

	Effectiveness	Strength of evidence	Scope of Training
Hazard perception education	***	**	C,D

Level of dis/agreement with CARRS-Q rating: ☐Totally agree ☐Partially agree ☐Disagree

Comment:_____

_____

_____

	Effectiveness	Strength of evidence	Scope of Training
Situation awareness training	***	*	C,D

Level of dis/agreement with CARRS-Q rating: ☐Totally agree ☐Partially agree ☐Disagree

Comment:_____

_____

_____

	Effectiveness	Strength of literature	Scope of training
Insight training	**	*	C

Level of dis/agreement with CARRS-Q rating: ☐Totally agree ☐Partially agree ☐ Disagree

Comment:_____

_____

_____

SECTION 3: OVERALL COMMENTS

Please provide any other comments you would like to make relating to the contents of Reports 1 and 2, or additional thoughts you may have concerning novice driver training approaches or research findings that you think would be useful for the research team to consider.

_____
_____
_____
_____
_____
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We thank you!