MONASH University
Accident Research Centre

GRADUATED LICENSING FOR MOTORCYCLISTS

(RSD 0981)

by

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Preface

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Abstract:

Graduated licensing was originally introduced as a method to address the high crash involvement of young, newly licenced drivers. It has since emerged as a logical option for reducing the incidence of crashes among novice motorcyclists. The aim of the current research was to determine how to enhance the current graduated licensing process for motorcyclists in Victoria to achieve improved road safety outcomes. The research involved four iterative stages of work. Stage 1 involved a literature review, a comparison of current rider and car driver GLS across all nine Australasian jurisdictions, and an analysis of crash data. Stage 2 involved a workshop with representatives from key stakeholder organisations and bodies, and the conduct of two focus groups with new riders. Stage 3 involved an exercise to provide a preliminary estimate of the regulatory impact of those recommendations, deriving from Stages 1 and 2, which would require legislative change were they to be implemented. Stage 4, the final stage, involved developing a prioritised list of the recommendations. Based on the research, a suite of recommendations for improving the current rider GLS in Victoria was proposed. Comprising the recommendations were those which encourage riders to gain more experience, those which impose restrictions on riders, and those which promote improvements in rider testing and/or training.

Key Words:

Graduated licensing, GLS, motorcyclists, riders, crash countermeasures.

Disclaimer

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Executive Summary

VicRoads commissioned the Monash University Accident Research Centre (MUARC) to carry out research to determine how to enhance the current graduated licensing process for motorcyclists in Victoria to achieve improved road safety outcomes. The research involved four iterative stages of work. Stage 1 involved a literature review, a comparison of current rider and car driver GLS across all nine Australasian jurisdictions, and an analysis of crash data. Stage 2 involved a workshop with representatives from key stakeholder organisations and bodies, and the conduct of two focus groups with new riders. Stage 3 involved an exercise to provide a preliminary estimate of the regulatory impact of those recommendations, deriving from Stages 1 and 2, which would require legislative change were they to be implemented. Stage 4, the final stage, involved developing a prioritised list of the recommendations. These recommendations, along with a brief justification of each, are presented in the Table below.

Recommendation	Justification	Priority
Gaining More Experience		
Increase the minimum duration of the Learner phase from 3 months to 6 months.	Greater opportunity for practice under conditions of low risk. Crash risk is reduced with increased experience. (This assumes concomitant changes regarding a requirement for practice.)	High
Increase the maximum duration of the Learner phase from 15 months to 18 months.	To be consistent with recommendation above. (This assumes concomitant changes regarding a requirement for practice.)	High
Allow Learners one option to renew their Learner's Permit at the end of the first 18 months.	To ensure that Learners who would prefer to gain additional practice during the Learner period do not feel pressured into prematurely obtaining their licence at the end of the Learner phase (This assumes concomitant changes regarding a requirement for practice.)	High
Full car licence holders who obtain a rider licence will be given a P1 licence instead of a Full licence with restrictions	Consistency; minimise confusion and facilitate compliance with, and enforcement of, licence conditions by displaying appropriate plate; facilitate effective enforcement of licence conditions; through the display of P plates, convey to other road users the novice status of the rider; perceived protective influence of display of P plates	High
Riders without a Full car driver's licence and aged over 21 years of age will be required to complete both the P1 and P2 licence phases – that is, they will not bypass the P1 licence phase	Inexperience, in addition to age, is a major contributor to novice rider crashes. Exemptions purely on the basis of age are not well justified.	High

Recommendation	Justification	Priority
Gaining More Experience (cont.)		
For those Learner riders without a car licence (Probationary or Full), encourage the accrual of 120 hours of on-road riding practice during the Learner period. A minimum proportion of hours should be accrued under supervision with an accredited instructor/trainer as part of assisted rides or similar.	Maximise quantity of practice during the Learner period	High
For those Learner riders with a car licence (Probationary or Full), encourage the accrual of 50 hours of on-road riding practice during the Learner period. A minimum proportion of hours should be accrued under supervision with an accredited instructor/trainer as part of assisted rides or similar.	Maximise quantity of practice during the Learner period	High
Update the Learner rider handbook and associated resources to highlight the range of environments across which practice should be accrued	Maximise quality of practice during the Learner period	Medium
Restrictions		
Riders with a Full rider licence (i.e. beyond the Learner and restricted licence phases) will be subject to a BAC limit of 0.02	Effect of alcohol consumption on motorcycle riding is more dramatic than its effects on car driving, and alcohol has been reported to be a major contributing factor to fatal motorcycle crashes.	Medium
Riders in the Learner and P1 phases (i.e. all newly licenced riders) will be subject to a night-time riding curfew - ideally 8 pm to 6 am, but recommend 10 pm to 6 am. (Exemptions would need to be put in place for those individuals who must ride at night for work purposes.)	Larger than expected number of motorcycle crashes during night-time hours for novices (Learner and restricted) in general	Low
Riders in the Learner, P1 and P2 phases will be subject to a restriction on using a mobile phone (all modes) while riding	Interacting with a mobile phone while riding serves to increase task demand, which is particularly problematic for novices.	High

Recommendation	Justification	Priority
Restrictions (cont.)		
Riders who undertake their Learner test and P test on a motorcycle with an automatic transmission will be restricted to riding motorcycles with automatic transmissions. (Once fully licensed, these riders will be able to ride a manual transmission motorcycle only after passing the practical licence test on a motorcycle with manual transmission.)	Typically, scooters are equipped with automatic transmissions while most motorcycles (at least those on the LAMS list) have a manual transmission. Apart from transmission, there are differences between scooters and motorcycles which may make riding a scooter less demanding than riding a motorcycle. In the current system, it is permissible for riders to obtain their permit and licence on a scooter, but then ride a motorcycle. Imposing an automatic transmission restriction presents a partial alternative to introducing a separate licence class for scooter riders. One of the challenges in introducing a separate scooter licence is the lack of a clear definition of what constitutes a scooter. Without such a definition, correctly and unambiguously labelling a particular make and model a scooter could become futile.	High
Training and Testing		
Develop and implement a rider HPT which all riders must pass to obtain a Probationary licence	There is much emphasis in the rider literature on hazard perception. Much discussion centres on the unique hazards faced by riders that are not faced by car drivers. The current HPT was designed to address the key hazards faced by car drivers. The additional hazards faced by riders are not considered as part of the current test.	High
Develop and implement a more challenging practical test which all riders must pass to obtain a Probationary licence. The test should include an on-road component.	The current practical test for the rider licence is deemed to be too easy and of little practical significance. Other jurisdictions (e.g. New South Wales) include an on-road component in their rider licence practical test.	High

Recommendation	Justification	Priority
Training and Testing (cont.)		
Develop and implement a standardised training curriculum for use by all training providers.	Completion of an appropriate training course is not compulsory in Victoria. However, a very high proportion of novice riders will undertake at least some formal training during the licensing process. There appears to be much variability across training providers in the training programs offered. There is much discussion in the car driver training literature at least, that training programs are ineffective in reducing driver crash risk post-training. This has been attributed largely to the content of the training as these traditional programs have tended to focus on vehicle control training and knowledge of the road rules. A similar argument has been made regarding motorcycle rider training. In order to maximise their effectiveness, rider training programs would need to pay due attention to the training of skills which are key to safe riding. Consideration would need to be given to how best to impart such training.	Low
Consider the development of an Exit test – which riders must pass in order to become a Full licence holder	An Exit test would help to ensure that riders do not graduate prematurely to Full licence (unrestricted) licence status.	Low
Consider the development and implementation of a standard for protective gear for all riders (i.e. including scooter riders) to comply with at testing	Wearing protective gear is said to confer some safety benefits. Were novices required to purchase protective gear as part of the testing process then it is conceivable that they will continue to wear that gear post-testing. However, before such a measure can be put in place, consideration needs to be given to what constitutes an appropriate standard of protective gear.	Medium

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Chapter 1 Introduction

1.1 Background and Research Objective

Graduated licensing was originally introduced as a method to address the high crash involvement of young, newly licensed car drivers. It does so by targeting the key factors which contribute to young novice driver crash involvement: age and inexperience. In light of the high crash risk among novice motorcyclists, the success of graduated licensing for novice car drivers, and the importance assigned to age and inexperience in the crashes of novice riders, graduated licensing has emerged as a logical option for reducing the incidence of crashes among novice motorcyclists.

In 2007-2008, Victoria rolled out its new graduated licensing system (GLS) for novice car drivers. Changes to the existing system included, the mandatory accrual of at least 120 hours of driving by novice drivers during the Learner phase, a new driving test for all Probationary licence applicants, replacement of the three year Probationary licence with a one year "P1" (red) Probationary licence followed by a three year "P2" (green) Probationary licence, and a ban on any mobile phone use by novice drivers during the Learner and P1 phases.

While a GLS for motorcyclists is currently in place in Victoria, it is not as comprehensive as the new system for novice car drivers. Against this background, VicRoads commissioned the Monash University Accident Research Centre (MUARC) to carry out research to determine how to enhance the current graduated licensing process for motorcyclists in Victoria to achieve improved road safety outcomes.

1.2 Aims of the Research

The specific aims of the research were as follows:

1. To analyse crash data to determine the crash profile of Learner and novice riders in their first years of licensed riding;
2. To consider graduated licensing measures for motorcyclists that could address the typical novice motorcyclist crash factors and lead to improved road safety outcomes;
3. To identify what deficiencies exist in the licensing of novice motorcyclists when compared to the licensing of novice car drivers, and any implications of these deficiencies;
4. To investigate the extent of any safety benefits that might be expected from separating a scooter licence from the motorcycle licence; and
5. To develop a prioritised list of measures that could be implemented as part of a strengthened motorcycle GLS.

1.3 Research Stages and Activities

The research aims were addressed through four largely iterative stages of work. Several activities were carried out across the stages. The stages and project activities are summarized in Figure 1.1.

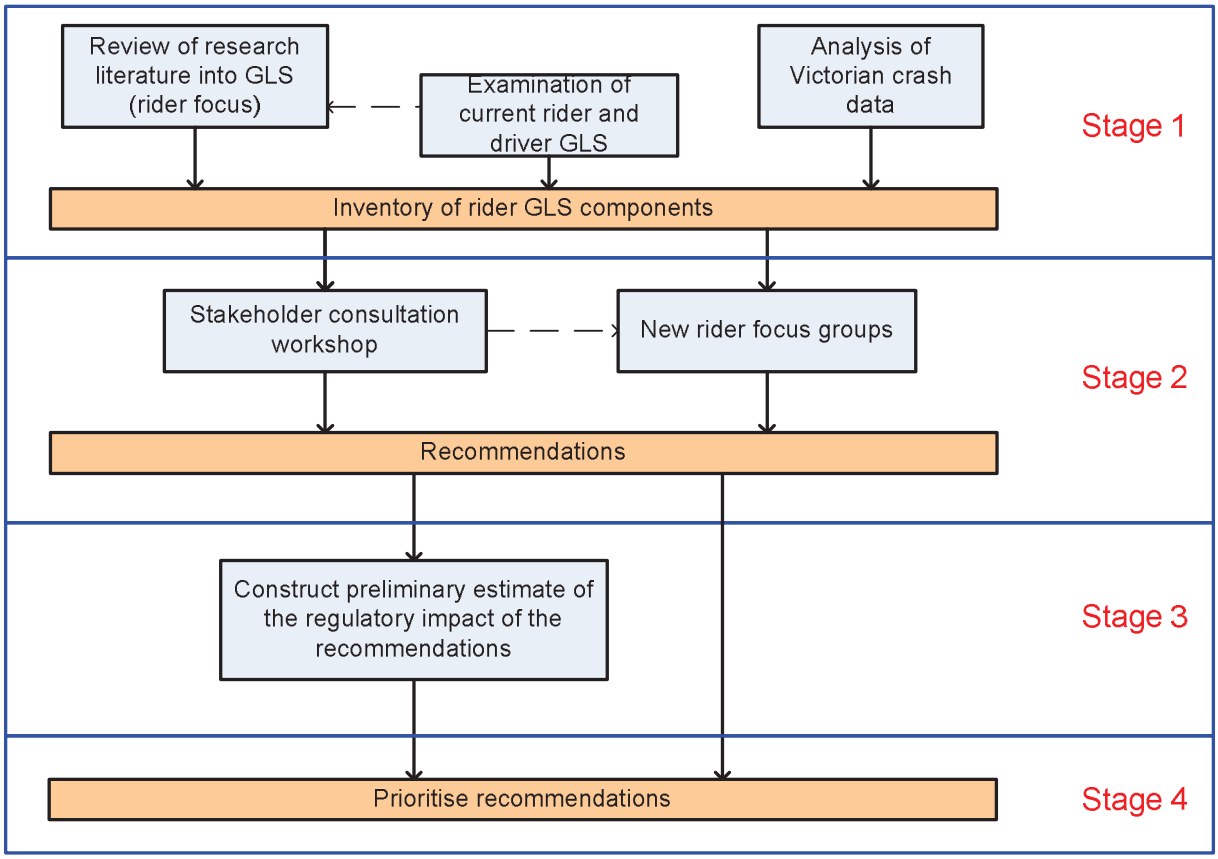

Figure 1.1 Overview of research stages and activities

Stage 1 activities included a review of the research literature into GLS. While the focus of the review was on GLS for motorcyclists, the literature into car driver GLS was referred to as appropriate for comparative purposes. Moreover, in light of the previous review on motorcycle rider licensing undertaken for VicRoads by Haworth, Greig and Wishart (2007), the current review drew on journal and conference papers and technical reports that were published in the last two to three years – that is, since the review prepared by Haworth et al. (2007). Nonetheless, seminal work, either in graduated licensing or with implications for graduated licensing, which was published prior to 2006-2007 was incorporated into the review as appropriate (e.g. Mayhew & Simpson, 2001).

Twenty components of GLS were considered as part of the literature review. Discussion of each of these twenty components was augmented by a detailed comparison of the rider and car driver licensing systems in place in Australia (eight jurisdictions) and New Zealand (one jurisdiction). The literature review and a high-level summary of the GLS comparison exercise is documented in Chapter 2. The detailed comparison is given in Appendix A.

Stage 1 also involved an analysis of Victorian crash data. The details of this analysis are presented in Chapter 3. A key objective of the crash analysis was to determine those conditions that lead to higher crash risks for novice riders when compared with experienced riders.

The outcomes of the Stage 1 activities led to the construction of an inventory of rider GLS components. This inventory, augmented with the key outcomes from the literature review, comparison exercise, and data analysis, is presented in Chapter 4.

In general, Stage 2 of the research involved the gathering of preliminary information on stakeholder and rider acceptance of the components, or a selected subset of components, comprising the initial inventory. In particular, Stage 2 activities were designed to identify opportunities for increasing public awareness of the GLS components and for identifying barriers to their implementation. Stage 2 activities comprised a workshop with key stakeholders, and the conduct of two focus groups with novice riders. The outcomes of these two activities are documented in Chapters 5 and 6, respectively.

Given the outcomes of the Stage 2 activities, a list of recommendations for enhancing the current Victorian rider GLS was developed. For those recommendations which would require legislative change, an exercise was conducted to provide a preliminary estimate of the regulatory impact of these recommendations. This activity, which is presented in Chapter 7, formed Stage 3 of the research.

The final stage of the research, Stage 4, involved categorising the recommendations into those with high, medium, and low priorities. The recommendations considered here were those explored as part of the regulatory impact exercise, as well as those that would not involve legislative change. The outcomes of this prioritization activity are presented in Chapter 8, along with some concluding remarks.

The current Chapter concludes with an overview of the current GLS for riders in Victoria.

1.4 Current GLS for Riders in Victoria

Figure 1.2 presents a schematic overview of the current GLS for motorcycle riders in Victoria. In the current system, the minimum age at which an individual can apply for a Learner's Permit to ride a motorcycle in the state of Victoria is 18 years. To be granted a Learner's Permit, the individual must pass an eyesight test, a driver knowledge test, a rider knowledge test, and a practical riding test, which is conducted off-road[1] at a training facility. With the exception of the driver knowledge test, these tests are administered by VicRoads accredited providers. These providers also offer various rider training packages. However, completion of a training program is not required as part of the current rider GLS in Victoria. This is in contrast to the situation in certain other Australasian jurisdictions, such as New South Wales. Individuals who possess a car driver's licence or Learner's Permit at the time of their test for a rider Learner's Permit are not required to complete the driver knowledge test.

The rider Learner's Permit is valid for 15 months. If the Learner does not obtain a rider licence within this 15 month period, the Learner's Permit expires and cannot be renewed. The Learner would be required to satisfy all of the test requirements for the Learner's Permit again in order to be reissued with a valid Learner's Permit.

The minimum holding period for the Learner's Permit is three months. A holder of a rider Learner's Permit is not permitted to carry a pillion passenger, must ride with a zero blood alcohol concentration (BAC), must not use a mobile phone while riding, must not tow, must display an "L" plate on the rear of his/her motorcycle, and must ride a motorcycle which is on the list of Learner Approved Motorcycles (LAMS). In Victoria, LAMS motorcycles are those

[1] The term "off-road" is used throughout this report to refer to training provided at a training facility.

with an engine capacity not exceeding 660cc and with a power to weight ratio that does not exceed 150 kW/tonne. Currently, Learner riders in Victoria are not required to accrue a minimum number of riding hours in preparation for their licence tests, nor are they required to ride under supervision during the Learner Period. This is in contrast to the current car driver GLS in Victoria, which requires that Learners must accrue a minimum of 120 hours of practice under supervision.

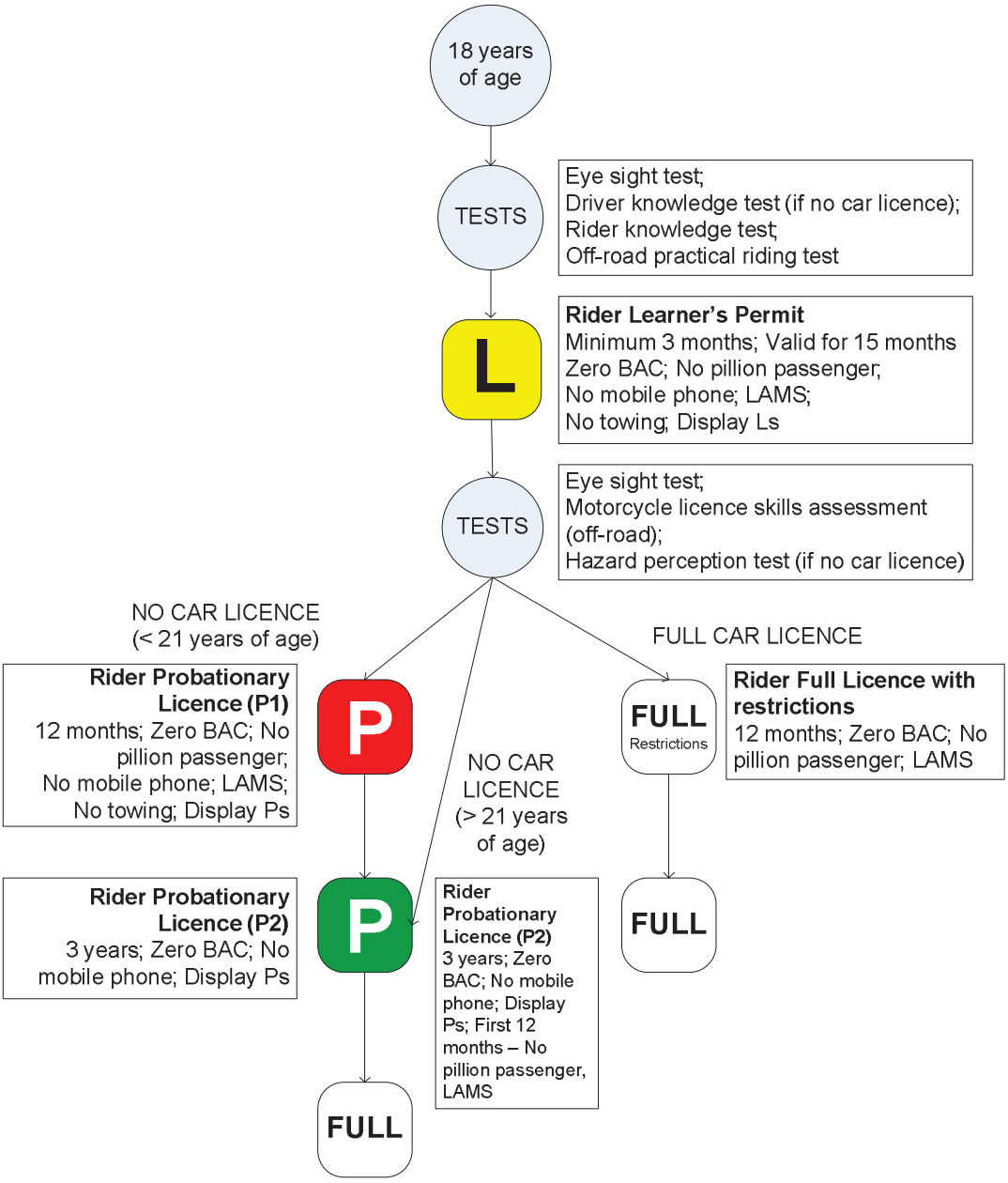

Figure 1.2 Schematic overview of the current GLS for riders in Victoria

To be granted a rider licence, the Learner rider must pass an eyesight test, and a motorcycle practical skills test, which is conducted at a training facility. Riders who do not already have a car driver's licence must also pass the computer-based hazard perception test. This test is administered to all novice car drivers applying for a driver's licence. That is, the current hazard

perception test which is administered to novice riders is the one which was developed for novice car drivers.

Following successful completion of the rider licence tests, the novice rider who is already a fully licensed car driver is granted a Full licence with restrictions. During this restricted phase, which lasts for 12 months, the newly licensed rider must ride a LAMS motorcycle, must not carry a pillion passenger, and must ride with a zero BAC. At the conclusion of the 12 months, the restrictions are lifted. Novice riders, who do not hold a car licence at the time of the rider licence test and who are under 21 years of age, progress through two Probationary licence phases. The first phase, the P1 phase, lasts for 12 months. P1 licence holders are subject to the same restrictions as those riders on a Full licence with restrictions. However, in addition, they must not tow, must not use a mobile phone while riding, and must display a red "P" plate on the rear of their motorcycle. The P2 phase follows. During this phase, which lasts for three years, novice riders are no longer required to adhere to some of the restrictions which were in place during the P1 phase. The following restrictions remain, however: the requirement to ride with a zero BAC, and the requirement to refrain from using a mobile phone while riding. In addition, riders must display a green "P" on the rear of their motorcycle during the P2 phase. Novice riders, who are not Fully licensed car drivers at the time of the rider licence test but who are aged over 21 years, bypass the P1 phase and move straight into the three year P2 phase. However, for the first 12 months, these riders are subject to LAMS and the no pillion passenger restriction. At the end of the P2 period, all restrictions are lifted.

Novice riders, who, at the time of passing the motorcycle licence tests are in the Probationary phase of their car driver's licence, will be issued with a Probationary motorcycle licence as well. The Probationary period for the rider licence will last for *up to* four years, ending at the same time as the Probationary period for the car driver's licence. Probationary riders who are in the red P phase of their car driver's licence are required to display a red P on their motorcycle, while Probationary riders who are in the green P phase of their car driver's licence are required to display a green P on their motorcycle. However, regardless of which colour P the rider must display, for the first 12 months of the rider Probationary period they must adhere to the same restrictions as those riders who hold a Full licence with restrictions: zero BAC, no pillion passengers, and LAMS. Further, a Full 12 months of restrictions (no pillion passenger, LAMS, zero BAC) must be satisfied even by those riders for whom the entire Probationary period (technically P2 period) is less than 12 months. For example, if a rider's P2 period ends after 6 months, then that rider must, for the first 6 months of his/her Full rider licence, continue to adhere to the restrictions of no pillion passenger, LAMS, and zero BAC.

Fully licensed riders can carry a pillion passenger, are not restricted to riding a LAMS motorcycle, and are subject to a 0.05 BAC while riding. Under the current licensing system, riders of all motorcycles, including mopeds (up to 50cc and maximum speed of 50 km/h) and scooters (step-through design and typically automatic transmission), must go through the same licensing process. This is in contrast with some other jurisdictions where individuals who are qualified car drivers can ride a moped.

Chapter 2 Review of the Literature and Commentary into GLS for Motorcyclists

2.1 Overview

The purpose of the literature review is to identify a Full range of measures or components that could comprise an enhanced graduated licensing system (GLS) for motorcyclists in the state of Victoria, Australia. While the focus of the review is on rider licensing, the literature into car driver graduated licensing systems is also referred to as appropriate. This is necessary given the paucity of research in the area of motorcycle rider GLS. Indeed, the development of GLS for motorcycle riders, relative to that for car drivers, is in its infancy. Studies exploring the effectiveness of GLS for motorcyclists are scarce and those that have been undertaken have yielded largely inconclusive findings. This is largely a consequence of limitations of the methods used and in the availability of relevant data.

The review commences with a brief introduction to the concept of GLS, and the basic philosophy underlying GLS. Information is presented on the overall effectiveness of GLS. In this regard, reference is made to the two studies to have explored the effectiveness of motorcycle GLS to date. This leads to a discussion of individual GLS measures. For each measure, the rationale behind that measure is discussed, as is any information on the measure's effectiveness as a crash countermeasure. Issues relevant to the enforcement, and user compliance, of a given measure are also considered as appropriate. The review concludes with a brief discussion of the future of GLS, highlighting opportunities for further improvement of current practices.

2.2 What is Graduated Licensing?

Graduated licensing was originally introduced as a method to address the high crash involvement of young, newly licensed car drivers. GLS is intended to target the key factors which contribute to young novice driver crash risk: age and inexperience. Graduated licensing is a system that delays Full licensure, thus providing beginners with the opportunity to first gain experience and to acquire critical skills under conditions of low risk. As the novices gain maturity and experience, licensure restrictions are gradually lifted and the novices are granted the opportunity to experience and master new, more complex traffic conditions and scenarios. Eventually, all restrictions are removed and the novice is granted a Full privilege licence (Hedlund, 2007; Vanlaar, Mayhew, Marcoux, Wets, Brijs & Shope, 2009; Williams, 2008; Williams & Mayhew, 2008).

The development and implementation of GLS by road authorities has increased over the last 10 to 15 years, primarily due to the success of GLS in reducing the incidence of crashes among young novice car drivers (Mayhew & Simpson, 2001). Traditionally, GLS comprise three phases: a supervised Learner's period, an Intermediate (restricted) Licence that limits unsupervised driving in high-risk situations, and a Full privilege licence. GLS for car drivers are in place in all Australian states and territories, as well as in New Zealand, and most jurisdictions across the United States and Canada. It is important to recognise, nonetheless, that there is much variation across jurisdictions in the number and depth of graduated

licensing measures in place, as well as in the levels of enforcement and public compliance of those measures. These differences across jurisdictions have led to discussions of which GLS measures are the most effective and therefore, which measures should be included in the "optimal" system. The optimal form of each measure is also a subject of much discussion and debate. For a recent and in-depth discussion on GLS for car drivers refer Hedlund (2007), Williams and Mayhew (2008), Insurance Institute for Highway Safety (2009), and Senserrick (2009).

2.2.1 Graduated licensing for motorcyclists

The high crash involvement of motorcyclists is well documented. In a recent report, it was noted that while motorcycles account for 4.5 percent of all Australian passenger vehicle registrations and 0.9 percent of vehicle-kilometres travelled, motorcycle riders account for approximately 15 percent of all road fatalities and a higher proportion of serious injuries (Johnston, Brooks & Savage, 2008). Moreover, as noted by Haworth et al. (2007), riding a motorcycle is much more likely to result in death or serious injury than travelling in a car. In Australia, the rate of motorcycle rider deaths per distance travelled was reported as being approximately 30 times the rate for occupants of passenger vehicles, and the rate for serious injuries as being approximately 41 times greater (Johnston et al., 2008). This pattern is not unique to Australia, however, as similar estimates have been reported in other developed countries (Jamson & Chorlton, 2009; Liu, Hosking & Lenné, 2009). In the United States, for example, motorcycle riders were reported to be approximately 34 times more likely than passenger vehicle occupants to die in a motor vehicle traffic crash per vehicle miles travelled in 2004. Per registered vehicle, the fatality rate for motorcycle riders in 2004 was 4.8 times higher than that for passenger vehicle occupants (National Highway Traffic Safety Administration, 2006).

Age and inexperience also play an important role in the crashes of novice motorcycle riders (Lin & Kraus, 2009). It is for this reason that graduated licensing for motorcyclists has been presented as an attractive and logical option for reducing the incidence of crashes among novice motorcycle riders. However, while the vast majority of novice car drivers are also young, obtaining their licence at the minimum age or close to it, the same is less true for novice motorcycle riders. Increasingly, older individuals (e.g. 30 years and over) are becoming motorcycle riders for the first time. This raises the issue of whether older novice motorcyclists should go through the same GLS, with all the same conditions and restrictions, as young novice motorcyclists. Another issue concerns the finding that the majority of novice motorcyclists are already car drivers. This is certainly the case in Victoria, where the minimum licensing age for riding a motorcycle is higher than that for driving a car. Thus, how novice riders who are already car drivers should be treated as part of a GLS for motorcyclists also deserves attention. The question that is most often raised in this regard is to what extent skill as a car driver transfers to skill as a motorcycle rider. As discussed below, this is an issue that remains to be explored fully.

GLS for motorcyclists are in place in all states and territories in Australia, and also in New Zealand. Several jurisdictions across North America also have some form of GLS in place for motorcyclists, although, typically, such systems are less widespread and comprehensive than those in place for car drivers. For a detailed and recent description of the licensing systems in the United States, refer Hanchulak and Robinson (2009).

Most countries across Europe follow the current European directive on licensing. Changes to licensing are being proposed as part of the Third European Directive on Licensing, which is

to come into effect in 2013. In general, the proposed changes will increase the age at which individuals will be able to ride certain categories of motorcycle and, more generally, powered two wheelers. As summarised in SafetyNet (2009), the following changes are being proposed:

- Mopeds with a maximum speed of 45 km/h – Minimum licensing age of 16 years (may range from 14 to 18 years across countries) and applicants must pass a compulsory theory test OR hold a motorcycle/car licence (some countries may require that the applicant pass a practical test or hold a motorcycle licence);
- Up to 125 cc motorcycle (with maximum 11 kW and 0.1 kW/kg) – Minimum licensing age of 16 years (may range from 16 to 18 years across countries) and applicants must pass a compulsory theory and practical test OR hold other motorcycle licence (some countries may allow applicants to hold a car licence instead);
- Up to 35 kW motorcycle (with maximum 0.2 kW/kg) – Minimum licensing age at least two years older than for 125 cc licence class (i.e. at least 18 years) and applicants must pass a compulsory theory and practical test OR spend two years on a 125 cc licence and pass a practical training course/test; and
- Unrestricted motorcycle – Minimum licensing age of 24 years and applicants must pass a compulsory theory and practical test OR spend two years on 35 kW licence class and pass a practical training course/test.

SafetyNet (2009) notes that the main differences within the existing licensing directive are: less freedom available to countries regarding moped licensing; an increase in the minimum age at which individuals can obtain an unrestricted motorcycle licence from 21 years to 24 years); and introduction of the 35 kW class to replace the current 24 kW category. Further detail on rider licensing systems in Europe is contained in the supplement to this report.

Effectiveness of GLS for motorcyclists

Only two studies to date have explored the effectiveness of GLS in their entirety for motorcyclists. Both of these investigations were discussed in detail in a previous report to VicRoads on GLS for motorcyclists by Imberger and Gan (2003). Accordingly, only an overview of each of these studies is presented here.

Reeder, Alsop, Langley and Wagenaar (1999) – New Zealand

The GLS for motorcycle riders in New Zealand was introduced in 1987 at the same time as the GLS for car drivers. The entry requirements and features of each of the Learner and Restricted phases are given in Table 2.1. These requirements and features applied irrespective of the novice rider's age and whether the novice rider already held a car driver's licence. There was no requirement to complete and pass a test for the novice to progress from a restricted to a Full licence. There was also no time limit after which the Learner and restricted licences expired.

The specific purpose of the study was to evaluate the impact of the GLS on motorcycle crashes that resulted in serious injury. Data on injuries resulting from motorcycle crashes were obtained for the years 1978 to 1994, inclusive, from the New Zealand Health Information Services national public hospital inpatient data files. Time series analysis revealed that the introduction of the GLS was followed closely by a significant reduction in hospitalisations resulting from a motorcycle crash among the main GLS target group of 15 to 19 year olds, but not among riders aged 20 to 24 years and riders aged 25 years and above. Despite this

seemingly positive outcome, Reeder et al. (1999) acknowledged that the reduction in injuries associated with motorcycle crashes may have been due to an overall reduction in exposure to motorcycle licensing during the period following the introduction of GLS rather than to a reduction in riding in high-risk circumstances. The extent to which the significant reduction in injuries was associated with a decrease in overall exposure as opposed to a reduction in riding in high-risk situations was not examined by Reeder et al. (1999). The authors concluded with the need for further research to explore the reasons for the downward trend in motorcycle registration and licensing.

Table 2.1 GLS for motorcycle riders in New Zealand (as described in Reeder et al., 1999)

Learner Licence (Phase 1)	Restricted Licence (Phase 2)
Entry requirements: ▪ Minimum age of 15 years ▪ Pass vision, road rule knowledge, and motorcycle theory test ▪ Pass basic motorcycle handling skill test (off-road) *Features:* ▪ Minimum 6 months (reduced to 3 months with approved training) ▪ BAC < 0.03% ▪ 250cc engine capacity restriction ▪ No riding between 10:00pm and 5:00am ▪ No passengers ▪ Maximum speed limit of 70 km/h ▪ Must display "L" plate	*Entry requirements:* ▪ Pass practical riding test (on-road) *Features:* ▪ Minimum 18 months (reduced to 9 months with approved training) ▪ Blood Alcohol Content (BAC) < 0.03% ▪ 250cc engine capacity restriction ▪ No riding between 10:00pm and 5:00am ▪ Passenger may be carried in a sidecar

It is interesting to note that the current GLS for motorcyclists in New Zealand represents a change somewhat from the system described by Reeder et al. (1999). Specifically, in the current system, the blood alcohol content (BAC) for novice riders over the age of 20 years, regardless of whether they are on a Learner or Restricted licence, is set at 0.08%. For Learner or Restricted riders under the age of 20 years, the BAC is still at 0.03%. As described below there is a strong argument for a zero BAC for novice motorcyclists regardless of their age. Further, as part of the Restricted Licence, there is a restriction on the carriage of any passengers. Also, for riders above the age of 25 years, the minimum holding period for a Restricted licence is six months, which can be reduced to three months with the successful completion of an approved training course. Riders under the age of 25 years are still required to hold a Restricted licence for a minimum of 18 months. Completion of the approved training course can occur after the Restricted licence has been held for six months. The final difference between the current system and the one described by Reeder et al. (1999) is that to be granted a Full licence in the current system, eligible riders must complete and pass a practical on-road riding test. The current system has yet to be evaluated.

Mayhew and Simpson (2001) – Canada

In 2001, Mayhew and Simpson (2001) released a technical report which described the GLS for motorcyclists in place or being considered for introduction in Canada and in the United States. Mayhew and Simpson's review considered only those systems which apply to individuals who do not already have a car driver's licence.

As part of their report, Mayhew and Simpson (2001) conducted a preliminary evaluation of the GLS for motorcyclists which were in place in the Canadian provinces of Ontario, Nova Scotia, and Québec. The programs in Ontario and Nova Scotia were introduced in 1994, while the program in Québec was implemented in 1997. Only these three jurisdictions were studied as relevant crash data were not available for those jurisdictions that had introduced GLS for motorcyclists more recently.

For each of the programs in Ontario, Nova Scotia and Québec, a summary of the entry and exit requirements and features of each of the Learner and Intermediate phases is given in Table 2. To explore the extent to which the introduction of the GLS in Ontario, Nova Scotia and Québec were closely following by reductions in the number of crashes involving novice motorcyclists (defined as 16 to 17 year olds for Ontario and Nova Scotia, and 16 to 19 year olds for Québec), annual data from 1990 to 1998 on the number of motorcycle riders and passengers involved in traffic crashes was obtained and examined for trends. Internal and external control groups were used to control for extraneous factors. The internal control group involved motorcyclists aged 25 to 54 years. The external control group involved motorcyclists from Canadian jurisdictions which did not introduce graduated licensing during the same periods as the three provinces of interest.

In summary, the pattern of findings for Ontario and Nova Scotia were inconclusive regarding the effectiveness of the GLS for the target group in place in each of these two provinces. While declines in the number of crashes were observed among the target group in Ontario following the introduction of GLS, declines were also apparent in the 25 to 54 year old age group and in the external control group. Moreover, the rate of decline in collisions among 16 to 17 year olds in Ontario was greater before the introduction of the GLS than following its introduction. Thus, it is conceivable that the reductions in collisions among 16 to 17 year old riders in the post-GLS introduction period may have been the result of whatever other factors were responsible for the pre-existing downward trend in motorcycle crashes in the target age group rather than the GLS. This pattern of findings was similar in Nova Scotia. Mayhew and Simpson (2001, p. 36) conclude:

> At the very least, the safety impact of graduated licensing for young motorcyclists is not apparent from the above comparisons. Further investigation is required to "factor out" or control for" the pre-existing downward trend to determine if reductions are still apparent and, if so, whether the program accounted for them.

A more promising pattern of findings was revealed for Québec. For example, while there was a decrease in the number of crashes involving motorcyclists in the target group following introduction of the GLS, there was an increase in the number of crashes involving motorcyclists aged 25 to 54 years. Moreover, there was a significant 23% decrease in the rate of injury crashes among 16 to 19 years olds from 1995-1996 (pre-GLS) to 1999 (post-GLS).

This contrasts with the small and non-significant decreases (2 to 5%) in crash rates among the older rider age groups. Thus, by controlling for changes in exposure (specifically, changes in motorcycle ownership), it was possible to show that the GLS in Québec was effective in reducing collisions among 16 to 19 year old motorcyclists – the main target group. Such analyses were not undertaken for Ontario and Nova Scotia as comparable data on exposure were not available. Despite the positive outcome for GLS in Québec, it is still conceivable that, as in Ontario and Nova Scotia, other factors contributed to the downward trend in motorcycle crashes among novice riders in Québec given that this trend was present in the pre-GLS period. Mayhew and Simpson (2001) concluded that further evaluation was necessary to establish whether the GLS introduced in Québec in 1997 had an independent and positive impact on the number of motorcycle crashes among novice riders.

Despite the caveats in their conclusions, Mayhew and Simpson (2001) propose, as a possibility, that the Québec GLS may be effective; however, the programs in Nova Scotia and Ontario may not be effective in decreasing the number of crashes among novice motorcyclists. Indeed, as can be gleaned from Table 2.2, there are several differences between the programs in Nova Scotia and Ontario and the program in Québec. These differences may have contributed to the relative differences in the overall effectiveness of the programs. Most notably, Québec, but neither Ontario nor Nova Scotia, requires that the novice rider be supervised during the Learner phase. The minimum length of the Learner phase is also longer in the Québec GLS than in the Nova Scotia GLS and, in particular, the program in Ontario.

Table 2.3 presents a summary of the current GLS for motorcycle riders in each of Ontario, Nova Scotia and Québec. Additions to the information presented in Table 2.2 are emboldened. The key additions relate to the requirements and features of GLS for those novice riders who are older and already hold a car driver's licence. As noted above, the Mayhew and Simpson (2001) report focussed on the licensing of novice riders for whom a motorcycle licence was the first licence. Other additions include information regarding the types of vehicles permitted to be driven by holders of a particular licence class and/or phase, and maximum holding periods for some licence classes and/or phases.

Table 2.2 GLS for motorcycle riders in Ontario, Nova Scotia and Québec (as described in Mayhew & Simpson, 2001)

Learner Licence (Phase 1)	Intermediate Licence (Phase 2)
Ontario	
Entry requirements: ▪ Minimum age of 16 years ▪ Pass vision, road rule knowledge, and written motorcycle theory test *Features:* ▪ Mandatory 60 days ▪ Zero BAC ▪ Ride only during daylight hours ▪ Ride only on roads with speed limits of 80 km/h or less ▪ No passengers	*Entry requirements:* ▪ Pass on-road test, either as part of an approved motorcycle safety course or at a Driver Examination Centre *Features:* ▪ Mandatory 22 months (reduced to 18 months with approved course) ▪ Zero BAC *Exit requirement:* ▪ Pass advanced on-road exit test
Nova Scotia	
Entry requirements: ▪ Minimum age of 16 years ▪ Obtain regular (Class 7) Learner driver's licence (i.e. pass vision & road rule knowledge tests) ▪ Pass written motorcycle rules test ▪ Pass motorcycle practical "balance" test *Features:* ▪ Mandatory 6 months (reduced to 3 months with approved motorcycle training course) ▪ Zero BAC ▪ Drive only during daylight hours ▪ No passengers	*Entry requirements:* ▪ Pass on-road practical riding skills test *Features:* ▪ Mandatory 24 months ▪ No driving between midnight and 5:00am ▪ Zero BAC *Exit requirement:* ▪ Complete an approved motorcycle rider improvement program
Québec [a]	
Entry requirements: ▪ Minimum age of 16 years ▪ Pass motorcycle knowledge test ▪ Complete rider training *Features:* ▪ Mandatory 8 months ▪ A first Learner permit is issued for a minimum of 1 month to allow riding as part of the mandatory rider training course ▪ After passing a practical off-road test, a second Learner's permit is issued for a minimum of 7 months ▪ Supervised by a licensed Fully rider (with two years experience) on another motorcycle ▪ Zero BAC ▪ No passengers	*Entry requirements:* ▪ Pass on-road test ▪ Novices 25 years and over can apply for a Full motorcycle licence *Features:* ▪ Valid for 24 months or until reach 25 years of age (whichever comes first) ▪ Zero BAC *Exit requirement:* ▪ No additional requirements

[a] In Québec, novices are licensed for the engine capacity of the motorcycle they plan on riding. There are three licence types: (1) any motorcycle, (2) motorcycle with an engine capacity of 400 cc or less, and (3) motorcycle with an engine capacity of 125 cc or less.

Table 2.3 Current GLS for motorcycle riders in Ontario (as at May 2009)

Learner Licence (Phase 1)	Intermediate Licence (Phase 2)
Ontario [a]	
Entry requirements ***(to obtain 'Class M1' licence):*** ▪ Minimum age of 16 years ▪ Pass vision, road rule knowledge, and written motorcycle theory test *Features:* ▪ Mandatory 60 days **(valid for 90 days)** ▪ Zero BAC ▪ Ride only during daylight hours ▪ Ride only on roads with speed limits of 80 km/h or less **(some roads excepted)** ▪ No passengers ***Types of vehicles allowed:*** ▪ **Motorcycle (under restricted conditions – see *Features*)** ▪ **Limited-speed motorcycle (i.e. maximum speed of 70km/h)** ▪ **Moped**	*Entry requirements* ***(to obtain 'Class M2' licence):*** ▪ Pass on-road test, either as part of an approved motorcycle safety course or at a Driver Examination Centre *Features:* ▪ Mandatory 22 months (reduced to 18 months with approved motorcycle safety course **– i.e. completed during M1 or M2 phase – course certificate valid for 2 years from the issue date)** ▪ Zero BAC ***Types of vehicles allowed:*** ▪ **Motorcycle (zero BAC)** ▪ **Limited-speed motorcycle (i.e. maximum speed of 70km/h)** ▪ **Moped** ▪ **Class G vehicle (i.e. passenger vehicle) under the conditions that apply to a Class G1 licence holder – i.e. zero BAC; accompanied by supervisor – Fully licensed driver, with at least four years driving experience and zero BAC; number of passengers does not exceed number of working seat belts; no driving between midnight and 5:00am; and must refrain from driving on certain roads, such as high speed expressways** *Exit requirement* ***(to obtain 'Class M' licence):*** ▪ Pass advanced on-road exit test

[a] **Ontario Ministry of Transportation, www.mto.gov.on.ca/english/dandv/driver/gradu/index/shtml**

Table 2.3 (cont.) Current GLS for motorcycle riders in Nova Scotia (as at May 2009)

Learner Licence (Phase 1)	Intermediate Licence (Phase 2)
Nova Scotia [b]	
For individuals WITHOUT a valid driver's licence ('Classes 1-5' [c]): *Entry requirements* ***(to obtain 'Class LM' licence):*** ▪ Minimum age of 16 years ▪ Obtain regular (Class 7) Learner driver's licence (i.e. pass vision & road rule knowledge tests) ▪ Pass written motorcycle rules test ▪ Pass motorcycle practical skills "balance" test *Features:* ▪ Mandatory 6 months (reduced to 3 months with approved course) ▪ Zero BAC ▪ Drive only during daylight hours ▪ No passengers **For individuals WITH a valid driver's licence ('Classes 1-5' [c]):** ***Entry requirements (to obtain 'Class 5 LM' licence):*** ▪ **Hold a valid driver's licence ('Classes 1, 2, 3, 4 or 5')** ▪ **Pass written motorcycle rules test** ▪ **Pass motorcycle practical skills "balance" test** ***Features:*** ▪ **Mandatory 3 months (reduced to 1 month with approved motorcycle training course)** ▪ **Zero BAC** ▪ **Drive only during daylight hours** ▪ **No passengers** ***Exit requirements (to obtain Motorcycle Endorsement on driver's licence):*** ▪ **Pass on-road practical riding skills test. If the test is taken on a motorcycle with an engine size of 100 cc's or less, then receive a "D" endorsement, which allows the rider to operate a 100 cc's or less motorcycle** ▪ **OR pass an approved motorcycle training course**	**For individuals WITHOUT a valid driver's licence ('Classes 1-5' [c]):** *Entry requirements* ***(to obtain 'Class 6N' licence):*** ▪ Pass on-road practical riding skills test. **If the test is taken on a motorcycle with an engine size of 100 cc's or less, then receive a "D" endorsement, which allows the rider to operate a 100 cc's or less motorcycle** *Features:* ▪ Mandatory 24 months ▪ No driving between midnight and 5:00am ▪ Zero BAC *Exit requirement* ***(to obtain a 'Class 6' licence):*** ▪ Complete an approved motorcycle rider improvement program **(including a 6 hour "defensive driving" course)**

[b] **Service Nova Scotia and Municipal Relations Registry of Motor Vehicles, www.gov.ns.ca/snsmr/paal/RMV/paal380.asp**

[c] **Class 1 - semi-trailers and tractor-trailer combinations; Class 2 - large buses (over 24 passengers); Class 3 - vehicles or vehicle-trailer combinations weighing greater than 14,000 kg; Class 4 - smaller buses, vans seating under 24 passengers for compensation, taxis and ambulances; Class 5 - cars, pick-up trucks, sport utility vehicles and vans having a seating capacity of less than 24.**

Table 2.3 (cont.) Current GLS for motorcycle riders in Québec (as at May 2009)

Learner Licence (Phase 1)	Intermediate Licence (Phase 2)
Québec [d]	
Entry requirements ***(to obtain 'Class 6A' Learner's licence):*** ▪ Minimum age of 16 years ▪ Pass motorcycle knowledge test **or Full knowledge test if do not already hold a Probationary or class 5 (passenger vehicle) driver's licence** ▪ Complete rider training course *Features:* ▪ Mandatory 8 months ▪ A first Learner permit **('Class 6R' licence)** is issued for a minimum of 1 month **(maximum 18 months)** to allow riding as part of the mandatory rider training course ▪ After passing a practical off-road test, a second Learner's permit is issued for a minimum of 7 months **('Class 6A' Learner's licence)** ▪ Supervised by a Fully licensed rider (with two years experience) on another motorcycle ▪ Zero BAC **(unless already hold a Full 'Class 5' driver's licence, then BAC limit is 0.08)** ▪ No passengers	*Entry requirements* ***(to obtain a 'Probationary' licence):*** ▪ Pass on-road test ▪ **Novices 25 years and over, and novices who already hold a 'Class 5' driver's licence are granted a Full 'Class 6A, B or C' [e] motorcycle licence after passing the on-road test** *Features:* ▪ Mandatory 24 months or until reach 25 years of age (whichever comes first) ▪ Zero BAC **(unless already hold a Full 'Class 5' driver's licence, then BAC limit is 0.08)** ▪ Cannot serve as the accompanying rider for someone who is learning *Exit requirement* ***(to obtain a 'Class 6A, B or C' [e] licence):*** ▪ **No additional requirements** **<u>Note:</u> Holders of a Class A, B or C licence are also authorised to drive vehicles in Class 6D (moped or motorised scooter) and Class 8 (farm tractor)**

[d] **Société de l'assurance automobile Québec, www.saaq.gouv.qc.ca/en/driver_licence/classes/class_6abc/php**

[e] In Québec, novices are licensed for the engine capacity of the motorcycle they plan on riding. There are three licence types: **Class 6A** - any motorcycle, **Class 6B** - motorcycle with an engine capacity of 400 cc or less, and **Class 6C** - motorcycle with an engine capacity of 125 cc or less.

The above discussion raises the issue of which features or measures of GLS for motorcyclists are, or are likely to be, the most effective. The most compelling evidence of the relative effectiveness of program elements would come from studies which compare, across jurisdictions with different programs, changes in crash rates associated with the introduction of GLS. That is, by comparing the relative effectiveness, in terms of reduction of crash rates, of the different systems in place across jurisdictions, it is possible to gauge which individual components are the more effective. In the absence of such evidence, an indirect approach is to explore the extent to which given measures are consistent with the underpinning philosophy of graduated licensing, and the extent to which such measures would address the specific crash types associated with motorcycle riding. To this end, Mayhew and Simpson (2001) suggested that the "optimal" GLS for motorcyclists would comprise at least three phases and each of the Learner and Intermediate phases would consist of certain features as outlined in Table 2.4.

Table 2.4 Features of an optimal GLS for motorcyclists (as described by Mayhew & Simpson (2001))

Learner Licence (Phase 1)	Intermediate Licence (Phase 2)
▪ Riding would be permitted only under the supervision of a Fully licensed motorcyclist following closely on another motorcycle or in a passenger vehicle ▪ The accrual and logging of practice riding hours – a minimum number of hours of practice would need to be accrued and the log book entries would need to be certified by the supervisor ▪ Riding under supervision would be restricted to daylight hours to ensure that the novice rider can be seen by the supervisor – supervised riding at night would be impractical ▪ Riding would not be permitted on certain types of higher speed roads (e.g. freeways) – again this is because supervised driving would be impractical on such roads ▪ Zero BAC for both the novice and the supervisor ▪ No riding with passengers ▪ Must display plates on the motorcycle to denote that the rider is a Learner rider	▪ No riding permitted between the hours of 9:00pm/10:00pm to 5:00am (unless a supervisor – that is, a Fully licensed rider – is present as a pillion passenger or in a sidecar) ▪ No riding permitted on certain types of higher speed roads (unless a supervisor is present as a pillion passenger or in a sidecar) ▪ For the first few months, no riding with passengers (unless the passenger is the novice's supervisor) ▪ After the first few months, riding with passengers is permitted unless the passengers are under the age of 20 years ▪ Zero BAC ▪ Must display plates on the motorcycle to signal to other road users that the rider is in the Intermediate phase of licensure

The third and final phase of the optimal GLS for motorcyclists proposed by Mayhew and Simpson (2001) is the Full licence phase. The novice rider would graduate to the Full licence phase when all conditions of the first two licence phases have been met. These conditions may include a crash- and violation-free record, passing an initial "entry" off-road (e.g. balance) test and on-road skills test, and later, passing a more advanced exit test that focuses on higher-order skills such as hazard perception.

Similar to Mayhew and Simpson (2001), and based on a review of the literature, Haworth et al. (2007) proposed a list of "best practice" components for motorcycle licensing and training. These were:

- No exemptions from licensing, training or testing requirements for older applicants;
- Minimum age for Learner and provisional motorcycle licences higher than for car licences;
- Zero BAC for Learner and provisional licence holders;
- Restrictions on carrying pillion passengers for Learners and provisional licence holders;
- Power-to-weight restrictions for Learners and provisional licence holders;
- Minimum holding periods for Learner and provisional licences;

- Maximum holding period for the Learner licence;
- Display plates to denote the phase of licensure;
- Learner riders being followed by a supervisor;
- Compulsory training to obtain Learner and provisional licences;
- Increased road craft training as part of the Learner and provisional phases;
- Off-road testing for Learners, and a mix of on-road and off-road training for provisional riders;
- Off-road testing to obtain a Learner's permit, and on-road testing to obtain a provisional licence; and
- Hazard perception testing.

More recently, the National Highway Traffic Safety Administration (NHTSA) in the United States released their guidelines for a rider GLS (Hanchulak & Robinson, 2009). Critically, there is much consistency between the NHTSA guidelines and the best practice components specified by Mayhew and Simpson (2001) and also by Haworth et al. (2007). Particular emphasis is placed on maximising the duration of the Learner and Intermediate phases and in the mandatory accrual of a minimum number of hours of certified riding practice (16 to 24 hours during the Learner phase and 30 hours during the Intermediate phase) under restricted conditions. These conditions include: a restriction on the carriage of passengers, no riding during the hours of 10:00pm and 5:00am, zero tolerance for alcohol and drugs, and a mandatory requirement to wear protective gear.

The next section of this report describes each of the components in Mayhew and Simpson's (2001) model system in greater depth. The additional best practice components, identified by Haworth et al. (2007), are also discussed, as are other components drawn out of a more general review of the GLS literature. In every case, the rationale behind the measure is discussed as is any information on the measure's effectiveness and related issues (e.g. enforcement, compliance). Also, to the extent possible, reference is made to the systems for motorcyclists and, for comparison, drivers of passenger vehicles, which are currently in place in jurisdictions across Australia and New Zealand.

Discussion of individual GLS components

Number of phases

Traditionally, GLS comprise three phases: a Learner phase (supervised, restricted), an Intermediate phase (solo, restricted), and a Full licence phase (solo, unrestricted). More recently, some jurisdictions have introduced systems which comprise four or five phases. Such systems are usually created by splitting the Intermediate phase into two sub-phases and, in some cases, the Learner phase into two sub-phases also; however, other variations also exist. As can be seen in Appendix A, Table A-1, instances of four or five phase systems are in place in several Australian jurisdictions for car drivers. While four phase systems also exist for motorcycle riders, they are not as common as for car drivers or not as clearly defined.

Beyond the traditional three phase approach, dual Learner (i.e. L1 and L2) and Intermediate (i.e. P1 and P2) licence phases allow for more staggered removal of restrictions. Dual Learner and/and Intermediate phases may be beneficial in complex systems as distinct, well-defined

phases may facilitate user understanding of the conditions associated with a given licence phase and therefore, compliance with those conditions. Whether this is the case is not known.

Nevertheless, even for three phase systems, the distinction between phases is currently more clearly defined in the systems for car drivers than in those for motorcyclists. This is because, in the case of car drivers, the initial, Learner, phase is typified by supervised driving under restricted conditions. As will be discussed further below, riding under supervised conditions during the Learner period is not necessarily a requirement for motorcycle licensing. This has the potential to blur the distinction between the Learner and Intermediate phases for motorcycle riders. While other aspects of rider GLS may help to ensure that such blurring of phases by riders, other road users, and law enforcers is minimised (e.g. the requirement to display plates), the absence of a supervision requirement during the Learner phase introduces the need for clear incentives to ensure that riders progress from the Learner to the Intermediate phase of licensing. Introducing penalties for those riders who would otherwise choose not to progress from the Learner to the Intermediate phase constitutes a further option. This issue is returned to below in the context of maximum time periods for holding a Learner's Permit.

It is important to recognise that the presence of additional phases (beyond three) does not necessarily imply a GLS of longer duration. Thus, while allowing for more staggered removal of restrictions, novices may be exposed to a given licence condition for a shorter period of time. Under such circumstances any potential value to be gained by introducing a given restriction is compromised by not exposing the novices to the restriction for a sufficiently long period. The relationship between the length of time that novices should be subject to a given licence condition (and at what point during their skill development) and crash risk is an area worthy of further investigation.

Minimum age for obtaining a Learner's Permit and an Intermediate Licence

In principle, a lower minimum age for obtaining a Learner's Permit and a higher minimum age for obtaining an Intermediate Licence serves to increase the duration of the Learner phase and, therefore, the opportunity for novices to obtain practice under relatively low-risk conditions.

As can be seen in Appendix A, Tables A-2, there is much variation across Australasian jurisdictions in the minimum age for obtaining a rider Learner's Permit, ranging from 15 years in New Zealand to 18 years in Victoria and Queensland. This is broader than that for novice car drivers, for whom the minimum Learner age ranges from 15 years in New Zealand to 16 years in all Australian jurisdictions, except in the Australian Capital Territory (ACT) where the minimum age is 15 years 9 months. Of note is that Queensland requires novice riders to have held an Intermediate or Full car driver's licence for at least 12 months prior to applying for a rider Learner's Permit.

Across jurisdictions, there is relatively greater consistency, in general, between the rider and car driver licensing systems in the minimum age at which an Intermediate Licence can be obtained (see Appendix A, Table A-3). The minimum age for obtaining an Intermediate Licence to ride a motorcycle ranges from 15 years 6 months in New Zealand to 18 years 6 months in New South Wales (NSW), while for car drivers, the minimum age ranges from 15 years 6 months in New Zealand to 18 years in Victoria. The discrepancy in the Learner's Permit minimum age between the rider and car driver licensing systems results, in some jurisdictions, in a shorter Learner phase for riders than for car drivers. The duration of the

Learner phase is considered further in the next section. It is important to note that in no jurisdiction is the minimum Learner age or the minimum Intermediate Licence age younger for riders than it is for car drivers. This is an important consideration given the argued benefits for potential skill transfer from car driving to motorcycle riding. This issue is considered below.

Among young novice car drivers, crash risk has been found to decrease with increasing (solo) licensing age (Williams & Ferguson, 2002) To date, no studies have directly explored the effects of licensing age on the crash risk of motorcycle riders. Some indirect evidence, however, comes from a study undertaken in the United Kingdom by Sexton, Baughan, Elliot & Maycock (2004), which showed that the crash liability for a rider aged 60 years with only one year of experience was approximately 70% less than that for a rider aged 17 years with only one year of riding experience. Haworth et al. (2007) contend that imposing a high minimum licensing age for riders is likely to be beneficial as it ensures that riders are more mature and, therefore, less likely to engage in deliberate risks and, where the licensing age for car driving is lower than that for motorcycle riding, encourages potential novice riders to become novice car drivers first. The argument here is that skill transfer from car driving to motorcycle riding may occur; however, the extent to which this is actually the case is not clearly understood.

Some preliminary insight into the issue of skill transfer derives from a recent study (Liu et al., 2009) which used a motorcycle simulator to compare the hazard perception skills of participants who could be distinguished on the basis of their riding and driving experience. Of particular interest here are the comparisons made between the following two groups of participants: experienced drivers (defined as drivers with a Full car driver's licence) and inexperienced drivers (defined as drivers with a Probationary car driver's licence) - both of whom had no previous riding experience and who were not licensed to ride a motorcycle. In the driving context, experienced drivers have been shown to demonstrate heightened hazard perception ability relative to novice drivers (Underwood, 2007). In their study, Liu et al. (2009) found that the experienced drivers demonstrated superior hazard perception skill in the riding context compared with the inexperienced drivers. Specifically, in the rural simulation, which included hazards such as other vehicles, changes in speed limit, and changes in road surface quality, the experienced drivers had significantly fewer crashes than their less experienced driver counterparts.

In summary, while there is evidence that a younger minimum age for the Learner's Permit and an older minimum age for the solo Intermediate Licence is suitable for novice drivers, further research is necessary to determine the appropriate minimum ages for novice riders. Minimum age considerations will need to take into account, among other issues, the potential for positive skill transfer from car driving to motorcycle riding. This too is an area for further research.

Time periods for holding a Learner's Permit (minimum and maximum)

The longer the minimum Learner and/or Intermediate periods, the greater the opportunity for novice riders to obtain practice under conditions of low-risk, and the likelihood that certain licence conditions/restrictions will be imposed for a duration that is sufficient to allow any benefits to be realised in terms of crash risk. A maximum holding period for the Learner's Permit serves to facilitate the progression of riders from the Learner phase to the Intermediate phase, thus ensuring that novices do not remain in the Learner phase indefinitely.

As with the minimum age for obtaining a Learner's Permit, there is much variation across Australasian jurisdictions in the minimum time period for holding a Learner's Permit, and in the maximum length of the Learner's Permit holding period (see Appendix A, Tables A-2). For example, for novice riders, the minimum Learner holding period ranges from 3 months (Victoria, NSW and ACT) to 6 months (all other jurisdictions); although in Queensland, riders who undertake Q-RIDE (competency-based training and assessment program) have no minimum Learner's Permit holding period. There is also no minimum holding period for Learner riders in Western Australia who have a car driver's licence. In contrast, the minimum Learner holding period for novice car drivers is generally longer, ranging from 6 months (e.g. ACT) to 12 months (e.g. Victoria). Of further note is that Victoria has a reduced minimum Learner period for novice drivers who are aged 21 years or over, and NSW has no minimum Learner holding period for drivers over 25 years. Whether older applicants should receive exemptions as part of the licensing process is the subject of much debate (e.g. Haworth et al., 2007). Understanding the implications of older applicant exemptions is particularly important in the context of rider licensing given the trend in many jurisdictions for individuals first embarking on motorcycle riding to be older adults.

The effect of length of the Learner period on rider crash risk has not been explored previously. In the case of novice car drivers, increasing the duration of the Learner period (by lowering the minimum age for obtaining a Learner's Permit) has been shown to have a positive effect on crash risk for those novices who made use of the longer period (Gregersen, et al., 2000; Gregersen, Nyberg & Berg, 2003). However, if this effect were mediated by supervision, then it could be argued that a longer Learner period may not be as beneficial for novice riders, if the Learner period does not require supervised riding practice. Further, Haworth et al. (2007) argue that minimum time periods for accruing practice and gaining experience are more likely to be ineffective when riding is undertaken as a recreational activity rather than as the main mode of transport. Haworth et al. (2007) also state that a more effective and direct approach to ensuring sufficient practice would be to mandate logging hours of practice. It should be recognised that, in the absence of supervision as a requirement during the Learner phase, this approach may require a strict mentor to help ensure novice rider compliance with the log book requirement and to ensure that the log book is completed accurately and truthfully. The issue of supervision for motorcycle riders as part of the licensing process is further considered below.

It has been argued that the requirement for a maximum holding period for the Learner's Permit is particularly relevant for those rider licensing systems where supervision is not a condition of riding while on a Learner's Permit. It is believed that, by restricting the maximum length of the Learner period, the prevalence of "permanent Learners" can be minimised and, in so doing, Learner riders can be encouraged to obtain sufficient practice and complete the requirements to graduate to the next licensing phase (Haworth et al., 2007).

Supervision during the Learner phase

Supervision by an appropriately qualified individual during the Learner phase is a defining characteristic of car driver GLS. However, due to the impracticalities associated with the provision of supervision for the novice rider, supervision is less often a feature of the Learner phase of rider GLS. All Australasian jurisdictions mandate supervised driving as part of the Learner phase of the car driver GLS. In contrast, only two (Queensland and Western Australia) of the nine jurisdictions require Learner riders to acquire practice under supervised conditions (see Appendix A, Table A-4).

Supervised driving is associated with a smaller crash risk for novice drivers than is unsupervised driving (Gregersen et al., 2003; Mayhew & Simpson, 2001). For the novice rider, however, the effects of supervision on crash risk are unknown. In considering the merit of supervision for Learner riders it is important to recognise that riding with a supervisor either as a pillion passenger or seated in a sidecar could increase the difficulty of the novice's task of maintaining balance and coordination. Under such circumstances, any potential benefit to be gained from supervision might be negated. To address this issue, Mayhew and Simpson (2001) suggested that the supervisor ride near the novice rider on another motorcycle or follow closely in a passenger vehicle. However, such an approach is unlikely to be of benefit if the value of supervision derives from more than just the supervisor's physical presence. In the case of novice car drivers, at least, the benefit of supervision has been reported to be due to the nature of the interaction between the supervisor and the Learner. Indeed, a recent trend in novice driver safety has been to educate supervisors in order to maximise the effectiveness of their supervision (e.g. Williams, 2007). The implication for riding is that, provided the supervisor is appropriately qualified (i.e. a fully licenced rider) and can communicate with the novice (albeit remotely), then the case could be made that Learner riders would also benefit from supervision. Suitable communication technology may help to address this challenge. On the other hand, a requirement for supervision might inadvertently reduce the amount of riding by novice riders or even discourage potential riders from becoming riders, due to the potential limited availability of appropriate supervision (e.g. Haworth et al., 2007). Further research is required to understand clearly the potential implications, positive and negative, of supervision during the Learner period on subsequent riding performance and behaviour. The implications on rider mobility would also need to be considered.

Certified hours of practice during the Learner phase

The requirement to log the number of hours of supervised practice during the Learner phase is intended to ensure that novices accrue sufficient practice, often across a range of conditions, before advancing to the Intermediate phase of licensure. As can be seen in Appendix A, Table A-5, only Western Australia mandates a minimum number of hours of supervised riding practice. However, this requirement is for only those Learner riders who do not hold a car driver's licence. Six of the nine jurisdictions require that Learner car drivers accrue a certain number of hours of practice. However, the minimum number of hours varies across jurisdictions. For example, novice drivers, in both Victoria and NSW, must log at least 120 hours of practice, while Western Australia, in contrast, has a 25 hour minimum for both their Learner drivers and riders.

To date, the effect of number of hours of certified practice on driver crash risk has not been explored directly. The often cited '120 hour' minimum derives from the research noted above which reported that the average number of hours accrued for those novices who made use of the longer Learner period (and for whom a reduction in crash risk was observed) was approximately 120 hours (Gregersen et al., 2003). Nonetheless, the requirement for extensive minimum hours of practice could extend the Learner period for those novices who might have otherwise hurried through this period. This would result, indirectly, in novices obtaining their Intermediate and, in turn, Full licence when they are older.

In the absence of supervision as a requirement, the compulsory or, at least, recommended, accrual of a minimum number of hours of practice is still an option for Learner riders. However, as discussed above such an approach would require an honour system to ensure that the log book is completed accurately. In any event, of note is the proposition (e.g. Haworth et al., 2007) that the requirement for logging a minimum number of hours could

discourage potential riders from becoming riders, thus reducing the number of riders on the roads.

Display of plates to denote phase of licensing

Clearly signalling the phase of licensure to other road users and the authorities plays an important role in the effective enforcement of licensing conditions. Displaying plates can also be said to provide novices with a sense of protection. As can be seen in Appendix A, Table A-6, all jurisdictions across Australasia require the display of plates to signify the Learner phase, and in most cases, the Intermediate phase also. This is the case for both rider and driver licensing. Where two Intermediate phases are in place, a different look plate is used to differentiate the two sub-phases. However, in Tasmania and South Australia, Intermediate licence holders who have entered the second sub-phase are no longer required to display a plate.

Blood Alcohol Content (BAC) restrictions

A BAC restriction requiring that novice riders maintain a zero-level BAC while riding serves to ensure that novices are not alcohol-impaired when they ride. All Australasian jurisdictions, with the exception of the ACT and New Zealand, have a zero BAC restriction, which applies at least across the Learner and Intermediate phases of their respective licensing systems (see Appendix A, Table A-7). This is the case for both rider and driver licensing.

There is much evidence relating alcohol consumption to motor vehicle crashes. Moreover, as discussed by both Haworth et al. (2007) and Mayhew and Simpson (2001) there is evidence that, even at low levels of alcohol consumption, the crash risk of novice drivers is more severely affected than that of older, more experienced drivers.

There is also considerable evidence demonstrating a link between alcohol and motorcycle crashes (e.g. Colburn, Meyer, Wrigley & Bradley, 1993; Lin & Kraus, 2009; Soderstrom, Dischinger, Ho & Soderstrom, 1993; Soderstrom, Dischinger, Kerns & Trifillis, 1995; Sun, Kahn & Swan, 1998). Haworth et al. (2007), for example, cite a European study which found that alcohol-involved riders were over-represented among crashed riders and that the risk of crash involvement while under the influence of alcohol was 2.7 times greater than the risk when sober. In a recent study undertaken in the United States, Creaser, Ward, Rakauskas, Shankwitz and Boer (2009) demonstrated significant decrements in riding performance following increasing levels of alcohol intoxication (0, 0.02, 0.05, 0.08% BAC). Riding performance was assessed on a test track with task scenarios based on the Motorcycle Safety Foundation's training program. Adverse effects on riding performance were found at the two highest levels of alcohol intoxication. In a hazard avoidance task where a warning was provided when the motorcycle was 1.5 seconds away from the hazard, participants took longer to react to the hazard in both the BAC 0.05 and 0.08 conditions compared to the zero-BAC condition. Some negative performance effects were also observed at the lower BAC of 0.02%. For example, participants in all alcohol conditions demonstrated a tendency to drive at faster maximum speeds and with greater speed variability in a curve negotiation task than they did in the zero-BAC condition. Further, there is evidence that alcohol is implicated more frequently in the fatal crashes of motorcycle riders than in the fatal crashes of car drivers (e.g. Soderstrom et al., 1993). This is often attributed to the importance of coordination and balance in motorcycle riding (e.g. Haworth et al., 2007) compared to car driving.

While there is no direct evidence of the effect of alcohol on the crash risk of novice riders relative to more experienced riders, there is strong evidence from evaluations of zero-BAC

among novice car drivers that such a measure is effective in reducing the crash risk of this group (Mayhew & Simpson, 2001). This result, coupled with the finding that the effects of alcohol consumption on motorcycle riding (due to the added importance of coordination and balance in riding) are more dramatic than the effects of alcohol consumption on car driving, confirms the value of a zero-BAC for novice motorcyclists across both the Learner and Intermediate phases of licensure.

Passenger restrictions

In the case of riding, passenger restrictions refer restrictions on novice riders carrying a pillion passenger [1]. In some cases, the restriction extends to bans on carrying a passenger in a sidecar. As can be seen in Appendix A, Table A-8, all Australasian jurisdictions, with the exception of Western Australia, do not permit the carriage of a pillion passenger. In South Australia, during the Learner phase, a pillion passenger is permitted as long as he/she holds a Full rider licence.

The negative effect of carrying certain types of passengers on young novice driver crash risk is well documented (e.g. Regan & Mitsopoulos, 2001; Williams, 2007). This heightened crash risk has been attributed to the increased propensity for young novice drivers' to be distracted (and affected by distractions) and to take deliberate risks while driving in the presence of peer passengers. Despite concerns over restriction compliance, there is mounting evidence of the effectiveness of passenger restrictions as part of car driver GLS (e.g. Cooper, Atkins & Gillen, 2005; Williams, 2007).

For a rider, carrying a passenger (as a pillion passenger or in a sidecar) makes the task of balancing the motorcycle more difficult (Haworth et al., 2007; Mayhew & Simpson, 2001). Aside from the potential negative behavioural effects of certain passengers on novices, this presents a further challenge for the novice rider. On this basis, passenger restrictions for novice riders appear well justified.

Night time restrictions

Night time restrictions as part of GLS prohibit driving/riding during certain time periods at night. While four (NSW, South Australia, Western Australia, New Zealand) of nine Australasian jurisdictions have a night time restriction in place as part of their car driver GLS, night time restrictions are in place for novice riders in Western Australia and New Zealand only (see Appendix A, Table A-9). It is interesting to note that, in Western Australia, the night time restriction for novice riders applies only if the rider does not already have a car driver's licence. Restriction start times range from 10 pm to 12 am. The same restriction end time of 5 am applies across the driver and rider systems and across those jurisdictions that have a night time restriction in place.

Reduced visibility at night makes the task of driving and riding during night time hours more demanding, particularly for novices. That is, reduced visibility at night acts to further compromise novices' developing abilities, such as their ability to effectively perceive hazards. Limiting novice car drivers' exposure to night time driving has been shown to be an effective crash countermeasure. As summarised by Williams (2007), across the North American jurisdictions of Florida, Michigan, North Carolina and Nova Scotia, the reduction in crashes during the *restricted* hours among novice drivers was between 16% (Florida) and 59%

[1] A **pillion** is a secondary pad, cushion, or seat behind the main seat of a motorcycle. A passenger in this seat is said to "ride pillion" or may themselves be referred to as a "pillion."

(Michigan). Across these four jurisdictions, restriction start times ranged from 9 pm (North Carolina) to midnight (Michigan and Nova Scotia).

Despite the reported success of night time restrictions for novice car drivers, Williams (2007) lists a number of factors which may limit the effectiveness of night time driving bans. Particularly noteworthy is that a large proportion of night time crashes involving novice drivers occur before midnight. However, midnight is the typical starting time for night time restrictions in many jurisdictions. Williams (2007, p. 181) argues that the "key to increasing the effectiveness of night time restrictions is to expand the number of hours covered". Indeed, in North Carolina where the restriction starting time is 9 pm, a 47% reduction in crashes during the restricted hours was found. While public support for the early starting time in North Carolina has been reported, Williams (2007) highlights the importance of examining the relationship between restriction acceptance and effectiveness for other jurisdictions with an early start time. This is because reduced acceptance could lead to reduced restriction compliance and, in turn, reduced effectiveness.

Nonetheless, given the rationale behind night time restrictions for car drivers and the positive results to date, it has been argued that novice riders would also benefit from being restricted from riding at night. Further research is necessary to explore more definitively the relationship between time of day and rider crash risk and, in turn, between restriction effectiveness and acceptance.

Road type and speed restrictions

Road type restrictions prohibit driving/riding on certain road types. Speed restrictions prohibit driving/riding above a certain speed – even if the posted speed limit is higher. While there are no Australasian jurisdictions which impose a road type restriction, five jurisdictions impose speed restrictions as part of their GLS for riders. For example, in NSW, novice drivers and riders who are in the Learner phase are not permitted to exceed a speed of 80 km/h. Novice riders and drivers who are in the first phase of their Intermediate licence must observe a maximum speed of 90 km/h, while those novices who are in the second phase of their Intermediate licence must not exceed a speed of 100 km/h. Western Australia has in place speed restrictions for their novice drivers (Learner phases only), but not novice riders (see Appendix A, Table A-10).

In the literature, road and speed restrictions are often considered together, as the types of road which might be restricted are usually associated with high speeds. The rationale behind such restrictions stems from research that has shown roads with high traffic volume, mixed vehicle types and multiple lanes to be associated with a higher task demand, particularly for novices, than other road types (e.g. Crundall & Underwood, 1998). In principle, travelling at lower speeds provides drivers/riders with a greater safety margin.

Studies exploring the effectiveness of road type/speed restrictions for novice drivers have produced mixed results. It has been argued, for example, that a difference in speed between novices and other road users (where the posted speed limit is higher than that permitted for novices) could act to increase crash risk. While research into the effectiveness of road type and/or speed restrictions has not been undertaken to date for novice car drivers, the same argument could also be leveraged against such restrictions for novice riders (see Haworth et al., 2007). In the case of speed restrictions, Haworth et al. (2007) also note that such restrictions for novice motorcyclists may not be sufficiently low to result in a reduction in severity of motorcycle crashes. This is because fatalities and serious injuries are associated with low speed motorcycle crashes in addition to those that occur at higher speeds.

Mobile phone restrictions

Mobile phone restrictions prohibit driving/riding while the novice is using a mobile phone. Such restrictions typically prohibit all mobile phone use, including hands-free. As presented in Appendix A, Table A-11, while six jurisdictions across Australasia (Victoria, NSW, Queensland, South Australia, Tasmania, Northern Territory) have in place a mobile phone restriction for novice drivers, only three of these jurisdictions (Victoria, Tasmania, Northern Territory) have extended this restriction to also apply to at least some novice riders.

A strong association exists between mobile phone use and decreased driving performance and increased crash risk (for reviews, see Caird, Willness, Steel & Scialfa, 2008; Drews & Strayer, 2009; Horrey & Wickens, 2006; McCartt, Hellinga & Bratiman, 2006). In general, mobile phone use while driving or riding acts to compromise one's ability to devote sufficient attention to the driving task. Novices are considered to be particularly at risk given their inexperience and high propensity to use mobile phones while driving. However, the latter can be seen to be relatively more applicable to novices who are also young (e.g. Lee, 2007; Young & Lenné, 2008). In principle, banning all mobile phone use for novice drivers and riders appears well justified.

To date, only one study has been undertaken to explore the effectiveness of a mobile phone restriction as part of GLS (Foss, Goodwin, McCartt & Hellinga, 2009). The findings of this study, which explored the short-term effects of North Carolina's recent ban on the use of mobile phones by novice car drivers under the age of 18 years, were not, however, overly optimistic. The observational study showed that the proportion of young novice drivers using mobile phones did not alter significantly from before the introduction of the ban to after the ban's introduction. In interviews conducted with novice drivers and with parents of novice drivers, the novices were more likely than parents to say that they were aware of the mobile phone restriction, however, support for the restriction was greater among parents. Moreover, enforcement of the restriction was perceived to be low. Foss et al. (2009) highlights the importance of well-publicised enforcement to discourage mobile phone use while driving. Raising awareness of the risks associated with mobile phone use while driving and riding would also help, in principle, to improve public compliance and therefore, effectiveness of a mobile phone restriction as part of licensing.

Engine capacity/Power-to-weight restrictions

Motorcycles vary in their engine capacity and in their power output. Engine capacity restrictions prohibit novices from riding motorcycles with an engine capacity above a certain cubic capacity. Power-to-weight restrictions prohibit novices from riding motorcycles that exceed a certain power-to-weight ratio. All Australasian jurisdictions have in place a restriction based on engine capacity, power-to-weight ratio, or both (refer Appendix A, Table A-12).

Research into the relationship between engine size and crash risk have produced mixed results. A 1997 European Commission funded literature review (cited in Sexton et al., 2004) concluded that engine size is not a key contributing factor in motorcycle crashes. In contrast, after controlling for mileage, rider age and rider experience, Sexton et al. (2004) found that the crash liability of riders of motorcycles with an engine capacity over 125cc was 15% less than that of riders with smaller bikes. Nonetheless, there appeared to be an effect of engine capacity on crash severity, in that the higher crash risk of smaller capacity motorcycles was confined mainly to crashes of the lowest severity.

In any case, there is some evidence to suggest that there are no gains in safety to be realised through imposing engine capacity restrictions as part of GLS. In a study carried out in New

Zealand, where Learner and Intermediate licence holders are not permitted to ride a bike exceeding 250cc, Langley, Mullin, Jackson & Norton (2000) failed to find any evidence of increased crash risk among those Learner and Intermediate riders who did not comply with the 250cc restriction compared with those novice riders who did. It is important to recognise, however, that the majority of Learner and Intermediate riders in the study were already complying with the restriction. Moreover, in general, there was no consistent pattern of increasing crash risk with increasing engine capacity. It has been argued that engine capacity restrictions are ineffective, at least in part, because some small capacity motorcycles are nonetheless very powerful (Langley et al., 2000; Haworth et al., 2007). This has led to the introduction of restrictions based on power-to-weight ratio instead of, or in addition to, engine capacity (e.g. Learner Approved Motorcycle Scheme; LAMS). Research is necessary to examine the effectiveness of such restrictions on rider crash risk.

Towing restrictions

Towing restrictions prohibit novices from towing vehicles such as caravans and trailers. As can be seen in Appendix A, Table A-13, three jurisdictions in Australia have a towing restriction for novice riders during the Learner phase at least.

There is little research demonstrating the relationship between towing and novice driver/rider crash risk. Nonetheless, it can be argued that towing may place undue demands on novices, thus justifying restrictions on towing for at least the most inexperienced drivers and riders.

Automatic transmission restrictions and separate licence class for scooter riders

Automatic transmission restrictions prohibit novices from driving/riding a vehicle/motorcycle with a manual transmission. While almost all Australasian jurisdictions have an automatic transmission restriction in place for novice car drivers, only NSW and Queensland impose such a restriction on novice riders (see Appendix A, Table A-14). In NSW, for example, the form of this restriction is such that riders who complete their Pre-Learner rider course or Pre-Provisional (Intermediate licence) rider course on a motorcycle with an automatic transmission are restricted to riding automatic motorcycles during the Learner phase and the first stage of the Intermediate phase, respectively.

Beyond the skills that are required to drive a vehicle with an automatic transmission, driving a vehicle with a manual transmission requires coordination of the accelerator, clutch, gears and brakes. Accordingly, controlling a vehicle with a manual transmission is generally considered to be more demanding than controlling a vehicle with an automatic transmission. Given their inexperience, this effect may be particularly pronounced for novice drivers, although this remains to be demonstrated empirically. A similar logic can be seen to apply to motorcycles with an automatic transmission versus those with a manual transmission.

In Victoria, Learner riders and riders during the first 12 months of their licensure are not permitted to ride a motorcycle that is not part of the Learner Approved Motorcycle Scheme (LAMS). In general, approved motorcycles under this scheme are those with an engine capacity not exceeding 660cc and with a power-to-weight ratio not greater than 150kW/t. It is noteworthy that, while there are some exceptions, the only type of powered-two-wheeler with an automatic transmission that would have the potential to be approved under LAMS would be scooters, which in contrast to motorcycles (step-over design) are often associated with a step-through design. This raises the issue of whether an automatic transmission restriction would sufficiently address the specific needs of scooter riders (Haworth et al., 2007). Sales

data released by the Federal Chamber of Automotive Industries indicates that sales of scooters in 2008 represented a 7.8% increase compared to 2007 (www.fcai.com.au/motorcycles/introduction). Given the increasing popularity of scooters, the question has been asked of whether a separate licence class should be introduced for individuals who wish, or intend, to ride a scooter, but not a motorcycle. Currently, riding a scooter (excluding mopeds[1]) requires a motorcycle licence in all Australasian jurisdictions (see Appendix A, Table A-15). It is noteworthy that Western Australia has a licence category that is specific for riders of mopeds who do not have either a motorcycle or car licence.

Rewards for completion of education/training

To encourage novices to undertake certain courses, rewards, such as time discounts, may be offered. As can be seen in Appendix A, Table A-16, only two Australasian jurisdictions offer such rewards. New Zealand offers time discounts to Intermediate drivers and riders for completion of an approved course. In addition, Intermediate licence car drivers in the ACT can increase their demerit point allowance by completing the Road Ready Plus course. The Road Ready Plus course is available to Intermediate licence car drivers aged 17 to 25 years who have held their Intermediate licence for at least 6 months. The course is voluntary and includes completion of a workshop with other eligible course participants.

Allowing novice car drivers, who successfully complete a training program, to graduate sooner has been found to be associated with an elevated crash rate (Mayhew & Simpson, 2001). Given that a shorter Learner and/or Intermediate phase exposes novices to high risk circumstances sooner (the precise circumstances that graduated licensing is intended to address), the award of time discounts for successful completion of rider training/education is not justified. Moreover, an evaluation of the Road Ready Plus course (Di Pietro, Hughes & Catchpole, 2004) was inconclusive regarding any potential benefits of the program in terms of crash reductions and reductions in post program completion of demerit point accrual.

Exemptions/time discounts for older applicants

Older novices differ from their younger counterparts in maturity and lifestyle. As age is an important contributing factor to young novice crash risk, some jurisdictions offer exemptions or time discounts to their older applicants. Indeed, several Australasian jurisdictions offer exemptions or time discounts for older applicants (see Appendix A, Tables A-1 to A-3, A-5 to A-9, and A-16).

Irrespective of age, inexperience is a primary contributing factor to novice driver crash risk (Mayhew & Simpson, 1995). Through experience, novices learn the critical skills for safe driving/riding. GLS aims to provide novices with opportunities to gain experience under conditions of low-risk. In principle, providing older novices with exemptions and time discounts may compromise this aim.

Test requirements

Progression from one phase of licensing to the next typically requires successful completion of certain tests. In order to maximise pass-rates, tests, in principle, also serve to encourage novices to accumulate driving instruction and experience. The types of tests administered as

[1] Mopeds are operationally defined here as having an engine capacity of no more than 50cc and as having a maximum speed limit of approximately 50 to 60km/h.

part of GLS include, Knowledge tests, Practical tests, Hazard perception tests, and Exit tests. All Australasian jurisdictions administer tests as part of their GLS. While the practical tests for drivers are typically carried out on-road, there is variability across jurisdictions as to whether the practical tests for riders incorporate on-road components or are carried out exclusively off-road. Few jurisdictions require completion of an exit test for novices to progress from Intermediate to Full licensure (see Appendix A, Table A-17). A synopsis of the key issues surrounding each test type is presented below. For a more in-depth discussion, refer Haworth et al. (2007).

Knowledge (theory) tests

Knowledge tests are designed to ensure that novices have a basic understanding of road laws prior to entering the road environment. However, the relationship between passing a knowledge test and driving performance is not clear.

Practical tests

In principle, practical tests are intended to ensure that novices have acquired the minimum skills to operate a vehicle/motorcycle. However, it has been argued that as most motorcycle practical tests are conducted off-road, and often in a small and restricted area, the ability of these tests to measure vehicle control skills at typical on-road speeds is limited, as is their ability to measure higher-order cognitive skills. Thus, while the rationale behind practical, performance based tests is sound, it has been argued that there is a need to improve the quality of the tests (e.g. through increasing the focus on hazard perception) to maximise the potential value and effectiveness of practical tests (Haworth et al., 2007; Mayhew & Simpson, 2001). One recommendation which has been proposed in the literature is that off-road testing be undertaken to obtain a Learner's Permit, and on-road testing be carried out in order for the rider to advance to the Intermediate licence phase.

Hazard perception tests (computer-based)

A relationship exists between reduced hazard perception ability and heightened crash involvement among novice riders (see Liu et al., 2009). Thus, the requirement for successful completion of Hazard Perception test as part of GLS is sound. However, in order to maximise the effectiveness of such tests for riders, it is imperative that the tests target those hazards that are most relevant to riders (Haworth et al., 2007).

Exit tests (computer-based or practical)

Exit tests ensure that novices have achieved a certain level of skill before graduating to a Full licence. These tests typically target higher order skills, such as hazard perception. Exit tests hold promise as a means to identify those novices who might be at greater risk of collision should they be granted a Full licence prematurely and, thus, to identify those individuals who should continue on a restricted licence for a longer period (Mayhew & Simpson, 2001).

Mandatory training

As with testing, progression from one phase of licensing to the next may involve completion of a compulsory training course. Most jurisdictions require novice riders to complete training to enter the Learner phase and also the Intermediate phase (refer Appendix A, Table A-18). Nonetheless, optional training is all that is offered by some jurisdictions (e.g. Victoria).

In general, training is considered to play an important role in bringing novices to the point of being sufficiently competent to pass their test to become a Learner's Permit or Intermediate Licence holder. However, it has been argued that most current courses are too short to provide novice riders with the necessary and sufficient skills (e.g. vehicle control and higher order cognitive) that are needed to safely ride a motorcycle on the road. One recommendation which has been proposed in the literature is that the completion of courses which take place over a number of days be mandated, and that the courses incorporate both off-road and on-road practical components. For further discussion on rider training, refer Haworth et al. (2007).

Reduced demerit point thresholds and other penalties for traffic and licence condition violations

Reduced demerit point thresholds (relative to Fully licensed drivers/riders) and other penalties for traffic and licence condition violations among novice drivers/riders are important tools for user compliance of licence conditions. They also serve to ensure that at-risk novices do not advance prematurely through the licence phases and, in principle, discourage aberrant driving behaviour. Most Australasian jurisdictions have in place as part of their GLS a strict penalty system for lack of adherence to traffic and licence conditions. These penalty systems include, at a minimum, a lower demerit point threshold for novices than for Fully licensed drivers/riders (refer Appendix A, Table A-19).

An association between lower demerit point thresholds and reduced incidence of crash involvement and traffic violations has been observed for car drivers (for a review, see Senserrick & Whelan, 2003). In one study, relative to a control group, fewer crashes and traffic violations were reported for those drivers who were subject to a lower demerit point threshold condition as part of their GLS. Further, for those novices who did reach the demerit point threshold, a reduction in recidivism following licence suspension was found. In general, further research is necessary to explore the effectiveness of the various penalty mechanisms in place for both car drivers and riders.

Technology

In-vehicle technologies could assist in the enforcement and compliance of licence conditions. Alcohol interlocks are a type of in-vehicle technology that is already being used in several Australasian jurisdictions (refer Appendix A, Table A-19).

The positive effects of certain in-vehicle technologies on driving performance and safety are well documented (e.g. Regan, et al., 2006). The use of in-vehicle technology to provide appropriate feedback to novice car drivers is currently an active area of research. For example, the safety benefits of providing event-triggered feedback to novice drivers is being explored as part of a research project which is currently underway at the University of Iowa (McGehee, Carney, Raby, Lee & Reyes, 2007; McGehee, Raby, Carney, Lee & Reyes, 2007). A device (DriveCam), which is installed in the vehicle of the novice driver, records a short video clip in response to a range of safety critical events as they occur. Immediate feedback to the driver is provided in the form of a blinking LED on the camera. A weekly report card, which is mailed to parents to review with their novice driver, presents a summary in graphical form of the novice's weekly and cumulative performance regarding their unsafe driving behaviours and how this performance compares with other novice drivers. Preliminary results of an evaluation study revealed that combining the DriveCam technology with parental weekly review of safety-relevant incidents resulted in a significant decrease in the number of events triggered for

the more at-risk novice drivers – that is, those drivers who had the highest rate of safety-related events during the initial, baseline period. The overall purpose of the feedback is that it help novice drivers become aware of their unsafe driving practices and, hence, improve their driving.

The use of in-vehicle technologies to enhance the safety of motorcycle riders has also been discussed (Bayly, Regan & Hosking, 2006). In light of developments for novice car drivers, the use of in-vehicle communication technology to provide appropriate supervision or feedback to novice riders is a further avenue worthy of exploration.

2.3 Conclusion

GLS aims to address the high crash involvement of novice riders and drivers by delaying Full licensure until novices have gained some initial experience in conditions of relative low-risk. The development of GLS for motorcycle riders, relative to that for car drivers, is still in its infancy. While it is acknowledged that, increasingly, more is becoming known about the crash types and skill deficits (namely hazard perception) of novice riders, additional research is still required to better delineate the underlying mechanisms. Implicit in this aim is the need to determine to what extent knowledge and skills from car driving transfer to motorcycle riding, and the role of supervision and practice (quantity and quality) during the Learner period for riders.

Currently, many of the components that make up rider GLS are based on extrapolations from car driver GLS and knowledge of skill deficits in novice car drivers. Further development of such systems would benefit from more systematic evaluation of existing approaches using mass crash data, and of a greater understanding of the skill differences between novice and experienced riders. The way in which technology can be used as part of the licensing process for riders offers another exciting and promising avenue of research.

Chapter 3 Analysis of Crash Data

3.1 Data

3.1.1 Crash data

VicRoads supplied MUARC with data from their Road Crash Information System (RCIS) for all crashes in which the rider of a motorcycle, a moped or a scooter was seriously injured or killed on the Victorian road network in the period from 1st January 2003 to 31st December 2007. The data only included cases in which the rider was killed or seriously injured. Therefore, crashes in which a pillion passenger was killed or seriously injured but the rider was neither killed nor seriously injured were not included in the data supplied by VicRoads. However, crashes in which a rider is uninjured or only receives minor injuries while their pillion passenger is seriously injured or killed occur rarely, representing less than two percent of serious (or fatal) motorcycle crashes.

The crash data provided by VicRoads contained information on 4,495 riders who were seriously injured or killed in the period 2003-2007. The crash data provided included the accident number assigned to the crash as well as an identifier of the vehicle that the rider was riding when the crash occurred. This enabled each rider record to be matched to a broader RCIS crash dataset that MUARC had previously obtained from VicRoads which contained information on many variables relating to the crash circumstances. Such variables include the date and time of the crash, the location of the crash (including the features of the road environment where the crash occurred), the weather at the time of the crash, the condition of the road and the rider's age and sex. The broader RCIS database also contained information on the configuration of the crash in the form of Definition for Classifying Accident (DCA) codes. The broader RCIS dataset could also be used to determine whether other road users were involved in the crash.

When the process of matching the two datasets was complete, it was found that all but five of the 4,495 seriously injured or killed riders could be matched to a unique record in the broader RCIS database. Therefore, the sample used in the present analysis comprised of 4,490 riders who were seriously injured or killed on the Victorian road network in the period 2003-3007.

3.1.2 Licensing data

As described in Chapter 1 (Section 1.4), the process of obtaining a Full motorcycle licence in Victoria varies for different individuals. The process that an individual must follow will depend on their age and whether they already possess a Full car driver's licence. A resident of Victoria who is aged 18 years or older can obtain a motorcycle Learner's Permit if they pass a road law test, a motorcycle knowledge test, a practical motorcycle skill assessment and an eyesight test. The Learner's Permit is valid for fifteen months and cannot be renewed. After three months of holding the Learner's Permit, a rider is eligible to apply for a Full licence (with restrictions) or a Probationary licence. The rider who is successful in obtaining a motorcycle licence is issued either a Full motorcycle licence with restrictions for the first twelve months or a Probationary motorcycle licence. A Probationary motorcycle licence is

issued for up to four years if a rider does not already possess a Full car driver's licence, while a Full licence with restrictions is issued if a rider already possesses a Full car driver's licence. These restrictions include a zero BAC reading, a ban on carrying pillion passengers and the requirement that a LAMS bike be ridden.

VicRoads supplied data on the licences held by each of the 4,495 riders who were seriously injured or killed due to crashes that occurred on the Victorian road network in the period 2003-2007. These data contained information on the most recent level of motorcycle licence that the rider had obtained as well as the date when that level of licence had been obtained.

Categorisation of riders by licence level and age

The licensing data described in the previous section were matched to the unique crash records described in Section 3.1.1. The crash data also contained some useful information on the level of licence held by the seriously injured or killed riders. For example, the crash data included a variable describing the licence status of the rider at the time of the crash, as judged by the attending police officer. The attending officer could describe the licence as either valid, suspended, cancelled, expired, surrendered or disqualified. Alternatively if the rider was not licensed to ride a motorcycle, they could be classified as unlicensed. The jurisdiction in which the licence was issued was also recorded by the attending officer and this information was also present in the crash data. These variables were used to classify each of the 4,490 seriously injured or killed riders into the categories presented in Table 3.1.

As well as containing information on each rider's motorcycle licence, the licensing data provided by VicRoads contained information on the rider's car driver's licence if the rider also possessed a car driver's licence. Such data were used to determine whether a rider's licence was subject to riding restrictions when the crash occurred or whether a licence that was originally assigned as a Probationary licence was still in its Probationary phase when the crash occurred.

Only riders categorised as having valid or suspended licences at the time of the crash were included in the analyses presented in this report. Riders of unknown licence type or status at the time of the crash were categorised in the "unknown" category, while riders whose licence status was not "valid" or "suspended" were categorised in the "excluded" category. This enabled categorisation of each of the 4,490 seriously injured or killed riders into one of the ten categories listed in Table 3.2, which were each defined using rider age and level of licensing variables. Riders were firstly disaggregated into two age groups: a young rider group for those riders aged 25 years or younger; and an older rider age group for those riders aged 26 years or older. Then, riders in these two age groups were disaggregated by their level of licensing.

Riders in the unknown and excluded categories were not included in the analyses presented in Section 3.2. Therefore, of the 4,490 seriously injured or killed riders, 3,601 (80.2%) were eligible to be included in the analyses. Of these 3,601 riders, only 41 (1.1%) held suspended licences or permits when they were seriously injured or killed, with the remainder holding valid permits or licences.

Table 3.1 Motorcycle licence status of riders seriously injured or killed on Victorian roads in the period 2003-2007

Licence Status and Type	Number	Percentage
Valid Learner's Permit	573	12.8
Valid Probationary	246	5.5
Valid Full	2,919	65.0
Suspended Learner's Permit	11	0.2
Suspended Probationary	11	0.2
Suspended Full	24	0.5
Expired Learner's Permit	37	0.8
Expired Probationary	5	0.1
Expired Full	20	0.4
Disqualified Learner's Permit	19	0.4
Disqualified Probationary	9	0.2
Disqualified Full	10	0.2
Cancelled Learner's Permit	7	0.2
Cancelled Probationary	2	0.0
Cancelled Full	18	0.4
Surrendered Learner's Permit	3	0.1
Surrendered Full	8	0.2
Non-Victorian Licence	182	4.1
Licence Not Required	7	0.2
Unlicensed	124	2.8
Unknown	255	5.7
Total	4,490	100.0

Young riders who were in the first 12 months of their Probationary motorcycle licence and young riders who held Full licences with restrictions when they crashed were both included in the "Young licensed – restricted" category. Similarly, older riders who were in the first 12 months of their Probationary motorcycle licence and older riders who held Full motorcycle licences with restrictions were both categorised in the "Older licensed – restricted" category. The decision to aggregate Fully licensed riders with restrictions and riders within the first 12 months of their Probationary licence was made because differentiating between these two categories within the two rider age groups would have resulted in low counts of riders, which would prohibit meaningful statistical analysis.

Table 3.2 Age and motorcycle licence status of riders seriously injured or killed on Victorian roads in the period 2003-2007

	Number	Percentage
Young Learner	323	7.2
Young licensed - *restricted*	172	3.8
Young licensed - *not restricted*	253	5.6
Older Learner	291	6.5
Older licensed - *restricted*	248	5.5
Older licensed - *not restricted*	2,314	51.5
Excluded	458	10.2
Unknown	431	9.6
Total	4,490	100

It would be ideal to categorise riders by their level of experience. Level of experience could be defined in a number of different ways but probably one of the best ways of measuring level of experience would be in terms of the amount of time riders had spent riding their motorcycles. Unfortunately, data specifically related to the number of years that riders have regularly operated a motorcycle and the numbers of kilometres they typically travel in a year are not available for each record in the RCIS database. Therefore, in this report, level of licensing was used as a proxy for level of experience. It was assumed that riders who held Full motorcycle licences without restrictions were more experienced riders than those who held Full licences with restrictions and Probationary licence holders, who were in turn more experienced than Learner riders.

As well as supplying licensing data on riders killed or seriously injured on Victorian roads in the period 2003-2007, VicRoads supplied aggregated totals of the annual number of motorcycle licences issued in the period 2003-2008. These data were used in Section 3.2.1 to establish the risk of different groups of riders being seriously injured or killed per 100,000 licences. These exposure data supplied by VicRoads did not distinguish, however, between Full licences without restrictions and Full licences with restrictions. As previously explained, while the number of licensed riders is not an ideal measure of exposure to risk, in the absence of other more accurate measures of exposure, the total number of licensed riders is considered a valid surrogate.

3.1.3 Registration data

VicRoads also provided registration data for each of the motorcycles involved in crashes in which the rider was seriously injured or killed in the period 2003-2007. These data included information on the make, model, engine capacity and year of manufacture of the motorcycle involved in the crash as well as the date of birth and the post code of residence of the registered owner. The former set of variables enabled a subset of motorcycles to be identified, i.e. those that could be classified as scooters or mopeds.

3.2 Results

3.2.1 Categorising riders

As noted above, in this report riders have been categorised in terms of their age and their level of licence, and the distribution of the types of crashes each group were involved in have been compared. Table 3.3 shows the annual number of Victorian motorcycle licences, Probationary motorcycle licences and motorcycle Learner's Permits that were current or suspended by age category for each year in the period 2003-2007. As previously explained, the "young" category included riders aged 25 years or younger while the "older" category included riders who were older than 25 years. Only valid and suspended licences or permits have been included in the aggregated counts within each age and licence category. The licensing data provided by VicRoads did not enable calculation of how many of the Full licences valid in a particular year were Full licences with restrictions.

It can be seen that the number of young riders issued with Learner's Permits has increased in the last three years for which data are available, while the number of older Learners has been increasing since 2003. It can also be seen that there were very few older riders with Probationary motorcycle licences; presumably because most people who seek to obtain a motorcycle licence after the age of 25 already have a Full car driver's licence and so will obtain a Full motorcycle licence with restrictions when they pass their motorcycle licence test.

Table 3.3 also shows the number of riders who were seriously injured or killed each year in the period 2003-2007 for categories defined by age and licence level. These totals were derived using the crash data supplied by VicRoads which were described in Section 3.1.1 of this report. Dividing these totals by the number of licences issued gives a measure of risk of serious injury or death. It can be seen that young riders were at greater risk of serious injury or death than older riders. Furthermore, for both older riders and young riders, the risk of serious injury or death per 100,000 licences is greater for Learners than for riders who either had Probationary motorcycle licences or Full licences. In order to confirm these findings, it would be necessary to compare crash frequencies against data indicating the annual amount of riding each group participated in for each year in the period 2003-2007. As previously stated these data are not available.

Table 3.3 The number of licensed riders and the number of riders seriously injured or killed in crashes by age*† category and level of licensing, Victoria, 2003-2007

	2003	2004	2005	2006	2007	2003-2007
Number of licensed riders						
Young* Learners	6,936	6,889	6,959	7,565	8,133	36,482
Young Probationary	2,367	2,026	1,864	1,819	1,856	9,932
Young Full	10,225	9,772	9,669	9,599	9,909	49,174
Older† Learners	9,978	10,237	10,287	11,716	13,233	55,451
Older Probationary	396	370	361	370	385	1,882
Older Full	233,214	240,934	249,643	259,774	271,579	1,255,144
Number of riders seriously injured or killed						
Young Learners	70	63	65	51	74	323
Young licensed-*with restrictions*	30	41	44	27	30	172
Young licensed-*no restrictions*	52	36	53	47	65	253
Older Learners	55	61	50	50	75	291
Older licensed-*with restrictions*	45	39	49	60	55	248
Older licensed-*no restrictions*	447	437	482	431	517	2,314
Seriously injured or killed per 100,000 licences						
Young Learners	1,009.2	914.5	934.0	674.2	909.9	885.4
Young Probationary / Full	651.2	652.7	841.1	648.1	807.5	719.0
Older Learners	551.2	595.9	486.1	426.8	566.8	524.8
Older Probationary / Full [a]	210.6	197.3	212.4	188.7	210.3	203.8

* Young riders are those aged 25 years or younger

† Older riders are those aged 26 years or older

[a] This category includes licence holders who are no longer active riders.

With the data available, it was not possible to compare risk in terms of death or serious injury per 100,000 licences for riders who have Full licences without restrictions against those with Probationary licences or Full licences with restrictions. This was because it was not possible to determine how many of the current or suspended Full licences issued each year were subject to restrictions.

In the analyses that follow in Section 3.2.2, the characteristics of the types of crashes that different groups of riders were involved are examined. The absence of exposure data measured in terms of distances travelled does not weaken the findings resulting from these analyses. This is because the analyses compare the types of crashes in which the different rider groups are involved. Situations that are a risk to young or inexperienced riders are identified by comparing the distribution of crash types for the different rider groups. If a higher than expected number of crashes of a certain type are observed for one group of riders when compared to other groups, this type of crash is assumed to be a risk factor for that particular

rider group. As is evident in the following section, the analyses presented adjust for potential confounding factors when identifying such risk factors. Furthermore, appropriate statistical tests (i.e. chi square and Fisher's exact tests) were used to test the significance of relationships between the age and licensing level of the rider and variables related to each crash characteristic.

In Section 3.2.3 analyses will be restricted to the crash characteristics of riders of motorcycles that are defined either as mopeds or scooters. Analyses of the restricted sample of riders of mopeds or scooters were undertaken because some recent studies suggest that mopeds and scooters are used for different purposes and in different ways when compared to larger motorcycles.

3.2.2 All motorcycles

In this section, the distribution of various crash characteristics is compared for different categories of seriously injured or killed riders where categories were defined using rider age and level of licensing (see Section on *Categorisation of riders by licence level and age* for details). Counts of seriously injured or killed riders were compared for riders grouped into the following six categories:

1. Young Learner riders;
2. Young licensed riders - with restrictions;
3. Young licensed riders - no restrictions;
4. Older Learner riders;
5. Older licensed riders - with restrictions; and
6. Older licensed riders – no restrictions.

As previously mentioned, young riders in the first 12 months of their Probationary licence were categorised as young licensed riders – with restrictions, along with young riders who had Full licences that were subject to restrictions. Similarly, older Probationary riders were categorised as older licensed riders - with restrictions, along with older riders who had Full licences that were subject to restrictions.

The following crash characteristics were examined:

1. Crash location;
2. Proximity to home;
3. Time of day and day of week;
4. Speed zone;
5. Number of vehicles involved (using Definition for Classifying Accident (DCA) codes);
6. Road surface conditions;
7. Passengers; and
8. Engine capacity.

Crash location

For all but one of the 3,601 seriously injured or killed riders available for use in these analyses, the location of the crash could be classified as either being in the Melbourne Statistical Division or in the rest of Victoria. Table 3.4 shows the distribution of seriously injured or killed riders by the location of the crash for cases in which it was possible to classify the location as either being in the Melbourne Statistical Division or the rest of Victoria. Using a chi-square test, a significant (χ^2 (5)=65.9, p<0.001) relationship was found between whether the crash occurred in the Melbourne Statistical Division and the age and level of licensing of the rider.

Table 3.4 The distribution of seriously injured or killed riders categorised according to age and level of licensing by whether the crash occurred in the Melbourne Statistical Division or the rest of Victoria, 2003-2007

Rider age and licence group	Melbourne Statistical Division	Rest of Victoria	Total
Young Learner	241	82	323
	(+22.3%)	(-34.9%)	
Young licence - restricted	126	46	172
	(+20.1%)	(-31.4%)	
Young licence - not restricted	163	90	253
	(+5.6%)	(-8.8%)	
Older Learner	193	98	291
	(+8.7%)	(-13.6%)	
Older licence - restricted	168	80	248
	(+11.1%)	(-17.3%)	
Older licence - not restricted	1,305	1,008	2,313
	(-7.5%)	(+11.7%)	
Total	2,196	1,404	3,600*

χ^2 (5)=65.9, p<0.001, *There was one case in which the location of the crash was unknown

For each cell of Table 3.4, the figures in brackets represent the deviation that the observed values differ from the values that would be expected if there was no relationship between whether the crash occurred in the Melbourne Statistical Division or the rest of Victoria and the age and licensing level of the rider. For each cell the deviation is presented as a percentage of the value expected if there was no relationship between the two variables. A positive percentage indicates that the observed number of cases in the cell was higher than expected, while a negative percentage indicates that the observed value was less than expected. Deviations of an absolute value in excess of ten percent have been highlighted to aid interpretation of results. Cells in which the observed counts were greater than the expected counts by ten percent have been highlighted in red and cells in which the observed counts were less than the expected counts by ten percent have been highlighted in blue.

It can be seen from Table 3.4 that for all rider categories except older riders who had a licence with no restrictions, a greater than expected number of riders were seriously injured or killed in crashes that occurred in the Melbourne Statistical Division. However a greater than expected number of older riders who had licences with no restrictions were injured in crashes that occurred in the rest of Victoria.

Proximity to home

As well as classifying the location of the crash as being in the Melbourne Statistical Division or the rest of Victoria, the VicRoads RCIS also provided information on the Local Government Area (LGA) and post code of the crash location. Furthermore, the RCIS data also contained information on the post code of each rider's residential address. These residential post code data were used to determine which LGA the rider lived in and whether the rider lived in the Melbourne Statistical Division or the rest of Victoria. Of the 3,601 seriously injured or killed riders available for use in these analyses, 2,358 (65.5%) lived in the Melbourne Statistical Division while 885 (24.6%) resided in the rest of Victoria. The area of residence of the remaining 358 (9.9%) riders could not be determined because their residential post code was not recorded in the RCIS dataset.

The proximity of the crash to the rider's home is analysed in this section. The crash location of riders living in the Melbourne Statistical Division is examined first, followed by riders living in the rest of Victoria.

Riders living in the Melbourne Statistical Division

Of the 2,358 cases of riders who lived in the Melbourne Statistical Division being seriously injured or killed, there was only one case in which the status of the crash location, in terms of whether it occurred in the Melbourne Statistical Division or the rest of Victoria, could not be accurately determined. Table 3.5 shows the distribution of the crash location for the remaining 2,357 cases of riders who resided in the Melbourne Statistical Division. The chi-square test result indicated that for riders living in Melbourne, there was a significant ($\chi^2(5)=34.7$, $p<0.001$) relationship between the age and level of licensing of the rider and whether the crash occurred in the Melbourne Statistical Division or in the rest of Victoria.

It can be seen from Table 3.5 that for young Learner riders and young riders with licences that are subject to restrictions who lived in Melbourne, the observed number who were seriously injured or killed in crashes that also occurred in the Melbourne Statistical Division was higher than expected, while the number seriously injured or killed in crashes in the rest of Victoria was lower than expected. In contrast, for older riders who lived in Melbourne and who had licences without restrictions, the observed number who were seriously injured or killed in crashes that occurred in the rest of Victoria was higher than expected.

Table 3.5 The distribution of seriously injured or killed riders who lived in the Melbourne Statistical Division categorised according to age and level of licensing by whether the crash occurred in the Melbourne Statistical Division or the rest of Victoria, 2003-2007

Rider age and licence group	Rest of Victoria	Melbourne Statistical Division	Total
Young Learner	20	210	230
	(-55.5%)	(+13.5%)	
Young licence - restricted	12	111	123
	(-50.1%)	(+12.2%)	
Young licence - not restricted	31	137	168
	(-5.7%)	(+1.4%)	
Older Learner	33	165	198
	(-14.8%)	(+3.6%)	
Older licence - restricted	35	145	180
	(-0.6%)	(+0.1%)	
Older licence - not restricted	330	1,128	1,458
	(+15.7%)	(-3.8%)	
Total	461	1,896	2,357*

χ^2 (5)=34.7, p<0.001, *There was one case in which the location of the crash was unknown

For all but one of the 2,358 cases of a rider who lived in the Melbourne Statistical Division and were seriously injured or killed, the Local Government Area of the crash was known. Table 3.6 shows the distribution of whether the crash location for the remaining 2,357 cases was in the same LGA as where the rider lived. The chi-square test result indicated that for riders living in Melbourne, there was a significant (χ^2(5)=24.7, p<0.001) relationship between the age and level of licensing of the rider and whether the crash occurred in the same LGA as where the rider lived.

It can be seen from Table 3.6 that, for young Learner riders and young riders with licences with no restrictions who lived in Melbourne, the observed number of riders seriously injured or killed in crashes that occurred in their local LGA was higher than expected. In contrast, for older riders who had licenses with restrictions who lived in Melbourne, the observed number who were seriously injured or killed in crashes that occurred outside of their local LGA was higher than expected.

Table 3.6 The distribution of seriously injured or killed riders who lived in the Melbourne Statistical Division categorised according to age and level of licensing by whether the crash occurred in the same LGA as the LGA where the rider resided, 2003-2007

Rider age and licence group	Different LGA	Same LGA	Total
Young Learner	115	115	230
	(-19.1%)	(+30.8%)	
Young licence - restricted	75	48	123
	(-1.3%)	(+2.1%)	
Young licence - not restricted	96	72	168
	(-7.5%)	(+12.1%)	
Older Learner	111	87	198
	(-9.2%)	(+14.9%)	
Older licence - restricted	123	57	180
	(+10.6%)	(-17.2%)	
Older licence - not restricted	936	522	1,458
	(+3.9%)	(-6.3%)	
Total	1,456	901	2,357*

χ^2 (5)=24.7, p<0.001, *There was one case in which the location of the crash was unknown

Of the 2,358 cases of a rider who lived in the Melbourne Statistical Division being seriously injured or killed, there were twelve cases in which the post code of the crash location could not be determined. Table 3.7 shows the distribution of whether the crash location for the remaining 2,346 cases was in the same post code area as the rider's residential post code. The chi-square test result indicated that for riders living in Melbourne, there was a significant (χ^2 (5)=18.0, p=0.003) relationship between the age and level of licensing of the rider and whether the crash occurred in the same post code as where the rider lived.

It can be seen from Table 3.7 that for both young Learner riders and older Learner riders who lived in Melbourne, the observed number seriously injured or killed in crashes that occurred in their local post code area was higher than expected.

Table 3.7 The distribution of seriously injured or killed riders who lived in the Melbourne Statistical Division categorised according to age and level of licensing by whether the crash occurred in the same post code as the post code of the rider's residence, 2003-2007

Rider age and licence group	Different post code	Same post code	Total
Young Learner	169	58	227
	(-10.3%)	(+50.6%)	
Young licence - restricted	108	15	123
	(+5.7%)	(-28.1%)	
Young licence - not restricted	137	31	168
	(-1.8%)	(+8.8%)	
Older Learner	158	40	198
	(-3.9%)	(+19.1%)	
Older licence - restricted	153	26	179
	(+2.9%)	(-14.4%)	
Older licence - not restricted	1,223	228	1,451
	(+1.5%)	(-7.4%)	
Total	1,948	398	2,346*

χ^2 (5)=18.0, p=0.003, *There were 12 cases in which the location of the crash was unknown

The following section contains the same analyses as those presented in Tables 3.5, 3.6 and 3.7, but for riders who did not live in the Melbourne Statistical Division.

Riders living in the rest of Victoria

There were 885 cases of riders not residing in the Melbourne Statistical Division being seriously injured or killed. Of these 885 riders, only 62 (7.0%) were involved in crashes that occurred in the Melbourne Statistical Division, with the remaining 823 (93.0%) being seriously injured or killed in crashes that occurred in the rest of Victoria. Table 3.8 shows the distribution of the crash location by the age and licensing level of the rider. Due to low expected cell counts in half the cells in Table 3.8, Fisher's exact test was used to test the significance of the relationship between crash location and the age and licensing level of the rider instead of the usual chi-square test. The Fisher's exact test score of 8.5 indicated that for riders who did not live in Melbourne, the relationship between the age and level of licensing of the rider and whether the crash occurred in the Melbourne Statistical Division or in the rest of Victoria was not quite significant (p=0.109).

Table 3.8 The distribution of seriously injured or killed riders who did not live in the Melbourne Statistical Division categorised according to age and level of licensing by whether the crash occurred in the Melbourne Statistical Division or the rest of Victoria, 2003-2007

Rider age and licence group	Melbourne Statistical Division	Rest of Victoria	Total
Young Learner	3	51	54
	(-20.7%)	(+1.6%)	
Young licence - restricted	4	30	34
	(+67.9%)	(-5.1%)	
Young licence - not restricted	9	51	60
	(+114.1%)	(-8.6%)	
Older Learner	6	58	64
	(+33.8%)	(-2.5%)	
Older licence - restricted	2	37	39
	(-26.8%)	(+2%)	
Older licence - not restricted	38	596	634
	(-14.4%)	(+1.1%)	
Total	62	823	885

Fisher's exact test score = 8.5, p=0.109

The reader may detect that the observed counts in some of the cells in Table 3.8 deviated from the expected counts by what appears to be an impressive margin. This is despite the Fisher's exact test indicating that the relationship between the two variables was not significant. However, it is important to remember that, in this report, the observed and expected counts of each cell are compared by calculating their percent difference. This means that where an expected cell count is small in magnitude, a small absolute difference between the expected count and the observed counts can result in a large deviation when the difference is measured as a percentage. For example, in Table 3.8 it was observed that young riders with restricted licences who did not live in Melbourne were more often seriously injured or killed in crashes in Melbourne. Assuming that there was no relationship between the location of the crash and the age and licensing level of the rider, the expected number of young riders with restricted licences seriously injured or killed in crashes occurring in Melbourne was 2.4. When measured in absolute terms, the difference between the observed and expected counts is less than two. However when measured as a percentage of the expected count, the observed count is 68% greater than would be expected. This example demonstrates why it is not advisable to assume that two variables are related based only on comparisons of expected and observed cell counts in cells with low expected counts. This is one reason why statistical tests such as the chi-square test and Fisher's exact test should be used to test of the relatedness of two variables in the first instance.

Table 3.9 shows the distribution of whether the crash location was in the same LGA as where the rider lived for riders who did not live in the Melbourne Statistical Division. The chi-square test result indicated that for riders not living in Melbourne, the relationship between the age and level of licensing of the rider and whether the crash occurred in the same LGA as where the rider lived was not significant (χ^2 (5)=4.7, p=0.448). By comparison, Table 3.6 demonstrated that there was a significant relationship between whether the crash occurred in the same LGA as the rider's residence and the age and licensing level of the rider for riders living in the Melbourne Statistical Division. One reason that the relationship between the two variables was significant for riders living in the Melbourne Statistical Division, but not for riders living in the rest of Victoria, could be that the lower number of riders living in the rest of Victoria reduced the power of the analysis.

Table 3.9 The distribution of seriously injured or killed riders who did not live in the Melbourne Statistical Division categorised according to age and level of licensing by whether the crash occurred in the same LGA as the LGA where the rider resided, 2003-2007

Rider age and licence group	Different LGA	Same LGA	Total
Young Learner	18	36	54
	(-14.5%)	(+9.3%)	
Young licence - restricted	10	24	34
	(-24.6%)	(+15.7%)	
Young licence - not restricted	29	31	60
	(+24%)	(-15.3%)	
Older Learner	23	41	64
	(-7.8%)	(+5%)	
Older licence - restricted	14	25	39
	(-7.9%)	(+5.1%)	
Older licence - not restricted	251	383	634
	(+1.6%)	(-1%)	
Total	345	540	885

χ^2 (5)=4.7, p=0.448

Of the 885 cases of riders who did not live in the Melbourne Statistical Division being seriously injured or killed, there were three cases in which the post code of the crash location could not be determined. Table 3.10 shows the distribution of whether the crash location for the remaining 882 cases was in the same post code area as the rider's residential post code. The chi-square test result indicated that for riders not living in Melbourne, the relationship between the age and level of licensing of the rider and whether the crash occurred in the same post code as where the rider lived was not significant (χ^2 (5)=2.4, p=0.789).

Table 3.10 The distribution of seriously injured or killed riders who did not live in the Melbourne Statistical Division categorised according to age and level of licensing by whether the crash occurred in the same post code as the post code of the rider's residence, 2003-2007

Rider age and licence group	Different post code	Same Post code	Total
Young Learner	36	18	54
	(-4.5%)	(+10.5%)	
Young licence - restricted	21	13	34
	(-11.6%)	(+26.8%)	
Young licence - not restricted	43	17	60
	(+2.6%)	(-6.1%)	
Older Learner	48	16	64
	(+7.4%)	(-17.1%)	
Older licence - restricted	26	13	39
	(-4.5%)	(+10.5%)	
Older licence - not restricted	442	189	631
	(+0.3%)	(-0.7%)	
Total	616	266	882*

χ^2 (5)=2.4, p=0.789, *There were three cases in which the location of the crash was unknown

Time of day and day of week

Table 3.11 presents the distribution of seriously injured or killed riders categorised according to their age and level of licensing by whether the crash occurred at night *vs.* day, and whether the crash occurred on the weekend or on a weekday. Weekend night crashes are defined as any crash that occurred between 8pm and 6am on a Friday or Saturday night, while weekday night crashes were those that occurred between 8pm and 6am on a Sunday to Thursday night. A chi-square test showed that there was a significant (χ^2 (15)=60.2, p<0.001) relationship between the time of day and day of the week when the crash occurred and the age and licensing level of the rider.

It can be seen from Table 3.11 that the observed number of young Learner riders crashing at night (on both weekends and weekdays) was greater than the expected number of young Learner riders who crashed at these times. This was also true for young riders who held unrestricted licences. The observed number of young riders with restricted licences who crashed on weekend nights was also greater than expected. However, interestingly, the number of young riders with restricted licences who crashed on weekday nights was not greater than expected. Another interesting result is that a greater than expected number of older riders who held restricted licences crashed at night on weekdays, but fewer than expected were observed to crash at night on weekends.

Table 3.11 The distribution of seriously injured or killed riders categorised according to age and level of licensing by when the crash occurred in terms of time of day and day of week, Victoria, 2003-2007

Rider age and licence group	Weekend Night	Weekend Day	Weekday Night	Weekday Day	Total
Young Learner	28	100	44	151	323
	(+85.8%)	(-16.7%)	(+75.2%)	(-7.2%)	
Young licence - restricted	9	51	13	99	172
	(+12.2%)	(-20.3%)	(-2.8%)	(+14.3%)	
Young licence - not restricted	22	80	25	126	253
	(+86.4%)	(-15%)	(+27.1%)	(-1.1%)	
Older Learner	14	106	25	146	291
	(+3.1%)	(-2%)	(+10.5%)	(-0.4%)	
Older licence - restricted	9	89	22	128	248
	(-22.2%)	(-3.5%)	(+14.1%)	(+2.5%)	
Older licence - not restricted	86	913	151	1,164	2,314
	(-20.3%)	(+6.1%)	(-16.1%)	(-0.1%)	
Total	168	1,339	280	1,814	3,601

χ^2 (15)=60.2, p<0.001

Table 3.4 demonstrated that the age and licensing level of riders was significantly related to whether crashes resulting in a rider being seriously injured or killed occurred in the Melbourne Statistical Division or in the rest of Victoria. It was found that there was a significant relationship between the location of the crash and the age and licensing level of the rider, with a greater than expected number of young Learner riders and young riders with restricted licences being seriously injured or killed in crashes in the Melbourne Metropolitan area. A test of the relationship between *when* the motorcycle crashes occurred and *where* they occurred revealed that these two variables were highly related (χ^2 (3)=372.1, p<0.001), with the numbers of crashes that occurred in the Melbourne Statistical Division at night on weekends being greater than expected. This was also true for crashes occurring in Metropolitan Melbourne at night on weekdays. This raises the possibility that the observed number of young riders crashing at night is greater than expected due not to deficiencies in the abilities of young riders but because they do more riding in Metropolitan areas where there may be greater risks associated with night time riding (possibly because other road users have difficulty seeing motorcyclists at night or because of risks associated with alcohol affected road users during these hours).

When the relationship between rider age and licensing level and when the crash occurred (in terms of time of day and day of week) was analysed for crashes occurring in the Metropolitan area only, it was found that the pattern of results was very similar to that of Table 3.11, with the exception of young riders with restricted licences. Specifically, Table 3.12 below shows

that when the sample of seriously injured or killed riders was restricted to those involved in crashes in the Melbourne Statistical Division, the relationship between rider age and licence group and when the crash occurred was significant ($\chi^2(15)=39.2$, $p<0.001$), with the number of young Learner riders crashing at night greater than expected for both weekends and weekdays. Similarly, the number of young riders with unrestricted licences crashing at night on weekdays and at night on weekends was also greater than expected. However when restricted to crashes occurring in the Melbourne Statistical Division, young riders with restricted licences were no longer over-represented in crashes that occurred at night on weekends.

Table 3.12 The distribution of seriously injured or killed riders categorised according to age and level of licensing by when the crash occurred in terms of time of day and day of week, Melbourne Statistical Division Only, 2003-2007

Rider age and licence group	Weekend Night	Weekend Day	Weekday Night	Weekday Day	Total
Young Learner	26	55	35	125	241
	(+89.5%)	(-8.2%)	(+42.4%)	(-12.5%)	
Young licence - restricted	7	29	10	80	126
	(-2.4%)	(-7.4%)	(-22.2%)	(+7.2%)	
Young licence - not restricted	17	33	22	91	163
	(+83.2%)	(-18.6%)	(+32.3%)	(-5.8%)	
Older Learner	10	52	22	109	193
	(-9%)	(+8.4%)	(+11.8%)	(-4.7%)	
Older licence - restricted	8	37	20	103	168
	(-16.3%)	(-11.4%)	(+16.7%)	(+3.5%)	
Older licence - not restricted	57	340	115	793	1,305
	(-23.3%)	(+4.8%)	(-13.6%)	(+2.6%)	
Total	125	546	224	1,301	2,196

$\chi^2(15)=39.2$, $p<0.001$

The relationship between rider age and licensing level and when the crash occurred was also analysed for the sample restricted to riders seriously injured or killed in crashes in the rest of Victoria (i.e. everywhere but the Melbourne Statistical Division). As can be seen from Table 3.13, for this analysis, it was necessary to merge several rider and licence groups to minimise the number of cells with low expected counts. Table 3.13 shows that when the sample of seriously injured or killed riders was restricted to crashes in the rest of Victoria, the relationship between rider age and licence group and when the crash occurred was not significant ($\chi^2(6)=7.7$, $p=0.258$).

Table 3.13 The distribution of seriously injured or killed riders categorised according to age and level of licensing by when the crash occurred in terms of time of day and day of week, Victoria (but not including the Melbourne Statistical Division), 2003-2007

Rider age and licence group	Weekend Night	Weekend Day	Weekday Night	Weekday Day	Total
Young riders - Learner, restricted and not restricted	9 (+34.8%)	114 (-7.3%)	15 (+72.5%)	80 (+0.4%)	218
Older riders -Learner and restricted)	5 (-8.3%)	106 (+5.6%)	5 (-29.6%)	62 (-4.7%)	178
Older licensed - not restricted	29 (-6.1%)	572 (+0.6%)	36 (-10.5%)	371 (+0.7%)	1,008
Total	43	792	56	513	1,404

χ^2 (6)=7.7, p=0.258

Table 3.11 showed that a greater than expected number of young Learner riders and young riders with unrestricted licences crashed at night (on both weekends and weekdays). Table 3.12 showed that this over-representation in serious night time crashes among young Learners and young riders with unrestricted licences was observed for crashes that occurred in Metropolitan areas. Also, although not statistically significant, Table 3.13 showed that young riders as a broad group were over-represented in serious night time crashes when the sample was restricted to crashes occurring in regional areas. That the over-representation of young Learner riders and young riders with unrestricted licences in serious night time crashes was observed for crashes occurring in *both* Metropolitan Melbourne and regional areas suggests that the over-representation of these groups of young riders in serious crashes occurring at night is not due to these groups of riders doing more riding in Metropolitan areas but rather because of *when* they are more likely to ride and the manner in which they ride during those times, irrespective of location. Similarly, a greater than expected number of older Learner riders and older riders with restricted licences were seriously injured or killed in crashes that occurred at night on weekdays in Metropolitan areas. Conversely, Table 3.12 suggests that young riders with restricted licences appear to be no more at risk of being seriously injured or killed at night than other groups of riders when adjustment is made for the effect of the location of the crash.

One way of reducing the number of young riders and inexperienced older riders being seriously injured or killed at night is to impose night-time restrictions on these groups of riders. However if night-time riding restrictions were to be introduced, it is necessary to know when specifically the night-time crashes involving the various at risk groups of motorcyclists are occurring – that is, when between the hours of 8 pm and 6 am are the predominant number of crashes occurring.

It would be useful to test the relationship between rider age and licensing level and the time of the day and week when the crash occurred, where the time that the crash occurred was classified into more-precisely defined categories: for example, distinguishing between crashes occurring before midnight and crashes occurring after midnight. Unfortunately, in the present analysis, classifying night-time crashes into more-specific categories would result in prohibitively low expected counts in many of the cells of the contingency tables used to

compare rider age and licensing level and the time that the crash occurred. Low expected counts in numerous cells would violate the assumption of normality that is a requirement for using chi-square tests to test the relatedness of two variables.

Figures 3.1 and 3.2 show what time of the night crashes that resulted in riders being seriously injured or killed occurred. Figure 3.1 shows the distribution for riders seriously injured or killed in crashes that occurred on the weekend, while Figure 3.2 shows the distribution for crashes that occurred during the week. For each Figure, separate distributions of what time of night the crashes occurred are presented for each of the age and licensing level groups of riders.

Table 3.11 demonstrated that young riders, in general, were at increased risk of crashing at night on weekends than other groups of riders. Figure 3.1 reveals that for young Learner riders 50% of those who were seriously injured or killed while riding at night on weekends crashed between 8pm and 12am, while 38% of young riders with restricted licences who were killed or seriously injured while riding at night on weekends crashed between 8pm and 12am. The analogous proportion for young riders with unrestricted licences was 64%. That half of the young Learner riders and nearly two thirds of the young riders with unrestricted licences who were seriously or injured or killed at night on weekends were involved in crashes that occurred in the period 8pm to 12am may be due to more young riders riding before 12am than after 12am and it is possible that their risk of involvement in a serious crash increases after 12am. However the results presented suggest that there are substantial risks for these young riders in the hours from 8pm to 12am and that this heightened risk applies for all young riders, irrespective of licensing level.

Table 3.11 also demonstrated that young Learner riders, young riders who have licences without restrictions, older Learner riders and older riders who had restricted licences were all at increased risk of crashing at night on weekdays. Figure 3.2 reveals that for each of these four groups of riders, more than 70% of those who were seriously injured or killed while riding at night on weekdays crashed between 8pm and 12am.

When considering the impact of introducing night time restrictions, it is important to remember that most crashes involving motorcycles actually occur during the day. Figure 3.3 shows the distribution of riders seriously injured or killed by the time of day of the crashes for riders grouped into two broad licence categories: experienced (those with licences not subject to any form of restrictions); and inexperienced (those who are subject to restrictions). It can be seen that for both inexperienced and experienced riders, only a small proportion of crashes occur at night, with most crashes occurring in the late afternoon.

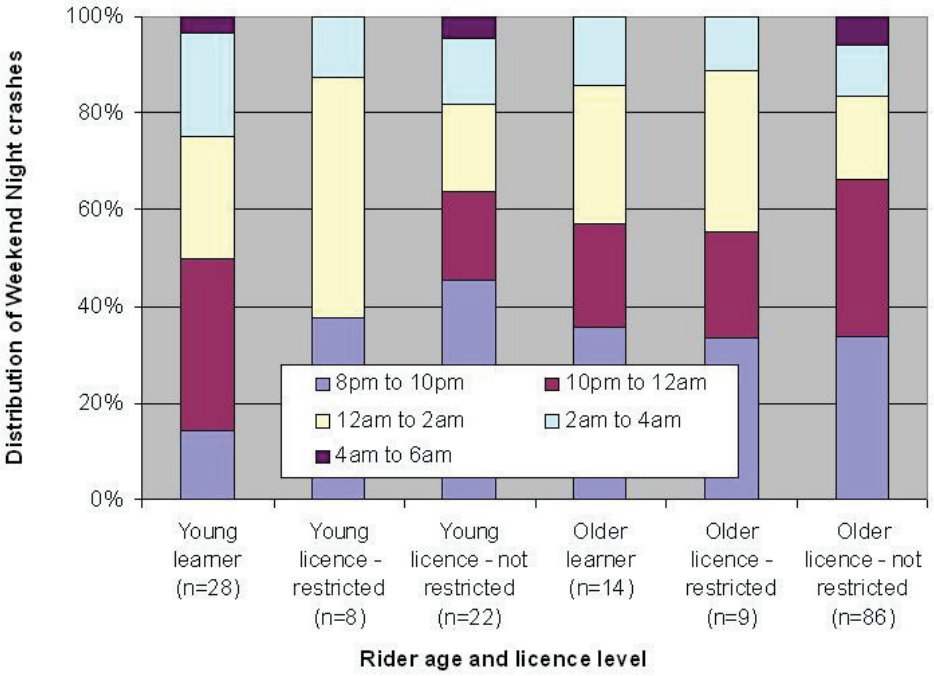

Figure 3.1 Distribution of riders seriously injured or killed in crashes occurring at night on weekends by rider age and licensing level

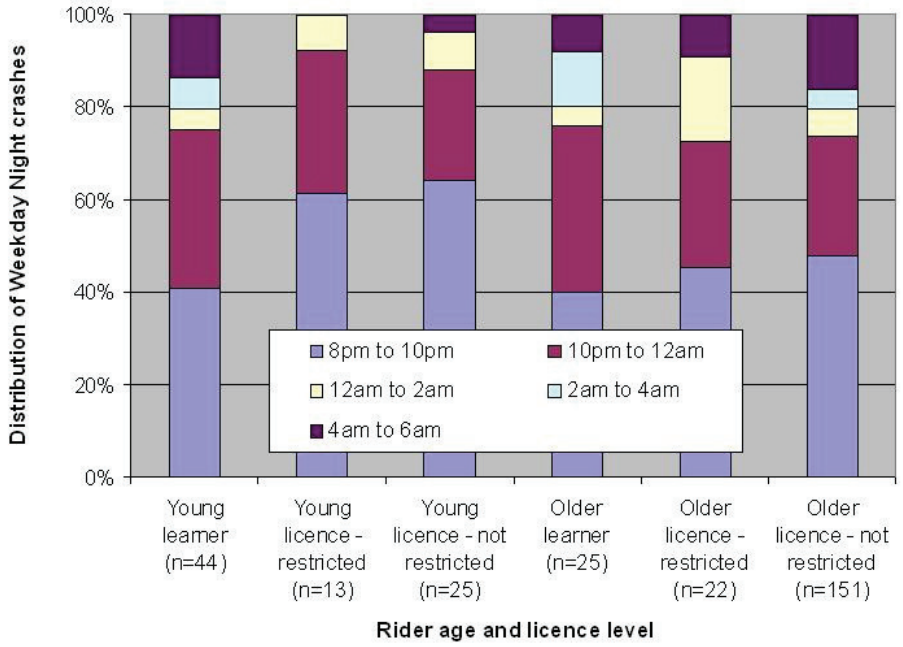

Figure 3.2 Distribution of riders seriously injured or killed in crashes occurring at night on weekdays by rider age and licensing level

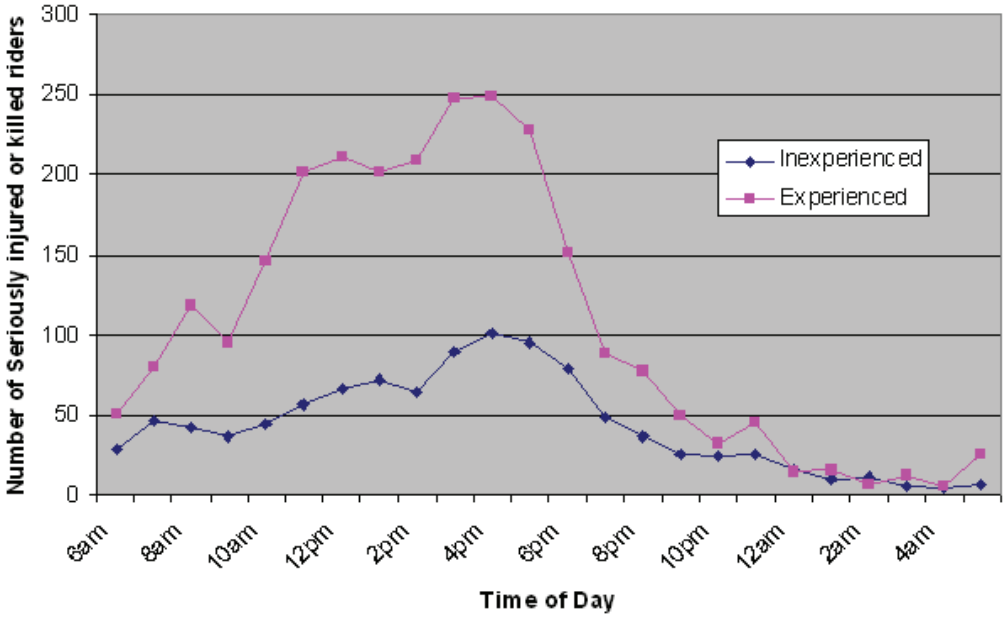

Figure 3.3 Distribution of riders seriously injured or killed in crashes by time of day for inexperienced riders (those riders who are subject to restrictions) and experienced riders (unrestricted Full licences only)

Speed zone

Of the 3,601 cases eligible for analysis, 21 (0.6%) riders were involved in "off-road" crashes while 153 (4.2%) were involved in crashes that occurred at a location where the speed limit was unknown. The distribution of the speed zone by rider age and licensing level for the remaining 3,427 cases is presented in Table 3.14. The chi-square test result indicated that there was a significant (χ^2 (10)=76.3, p<0.001) relationship between the age and level of licensing of the rider and the speed zone in which the crash occurred.

Figure 3.4 shows the distribution of riders seriously injured or killed by the speed zone of the crash where riders have been grouped into two broad categories defined by their level of experience. Learner riders and riders with restricted licences have been categorised in the Inexperienced category (irrespective of their age) while riders with unrestricted Full motorcycle licences have been categorised in the Experienced category. It can be seen that for both groups of riders, the highest incidence of crashes occurred in 40-60 km/h speed zones. However when compared to inexperienced riders, seriously injured or killed experienced riders were over-represented in crashes that occurred in 100-110 km/h speed zones.

Table 3.14 The distribution of seriously injured or killed riders categorised according to age and level of licensing by the speed zone in which the crash occurred, Victoria, 2003-2007

Rider age and licence group	40-60 km/h	70-90 km/h	100-110 km/h	Total
Young Learner	198	59	47	304
	(+33.4%)	(+1.5%)	(-51.8%)	(0%)
Young licence - restricted	90	37	39	166
	(+11.1%)	(+16.6%)	(-26.7%)	(0%)
Young licence - not restricted	108	53	83	244
	(-9.3%)	(+13.6%)	(+6.1%)	(0%)
Older Learner	150	53	75	278
	(+10.5%)	(-0.3%)	(-15.9%)	(0%)
Older licence - restricted	132	43	62	237
	(+14.1%)	(-5.1%)	(-18.4%)	(0%)
Older licence - not restricted	995	410	793	2,198
	(-7.3%)	(-2.4%)	(+12.5%)	(0%)
Total	1,673	655	1,099	3,427*

χ^2 (10)= 76.3, p<0.001, *There were 174 cases in which a valid speed zone could not be determined

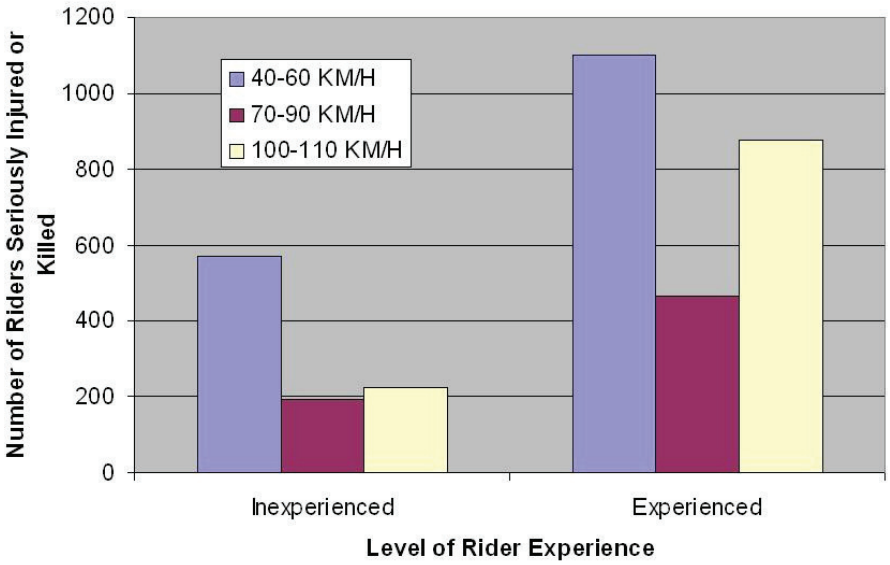

Figure 3.4 Distribution of riders seriously injured or killed in crashes by speed zone for inexperienced riders (those riders who are subject to restrictions) and experienced riders (unrestricted Full licences only)

When crashes in Metropolitan Melbourne were analysed separately from those that occurred in the rest of Victoria, it was found that the relationship between age and licence level and speed zone was not quite significant ($\chi^2(10)=15.5$, $p=0.116$). However, as Table 3.15 shows, for crashes occurring in rural areas, there was a significant relationship between rider age and licence level and speed zone ($\chi^2(10)=30.6$, $p<0.001$), with a greater than expected number of young Learner riders being seriously injured or killed in crashes in 40-60 km/h speed zones and a greater than expected number of young riders with restricted licences being seriously injured or killed in both 40-60 km/h and 70-90 km/h speed zones. A greater than expected number of older Learner riders were also seriously injured or killed in crashes in 70-90 km/h speed zones. However while a greater than expected number of older riders with restricted licences were seriously injured or killed in crashes in 40-60 km/h zones, fewer than expected were seriously injured or killed in 70-90 km/h zones.

These results suggest that the number of Learner riders and riders with restricted licences of any age crashing in high speed zones (100-110 km/h) was less than expected partly because these groups of riders are more likely to crash in urban areas where the speed limits of most roads are less than 100 km/h. However, the number of inexperienced riders of all ages crashing in lower speed zones in rural areas appears to be greater than would otherwise be expected. Another possible reason for these results is that Learner riders may self-restrict what types of roads they ride on.

Table 3.15 The distribution of seriously injured or killed riders categorised according to age and level of licensing by the speed zone in which the crash occurred, Victoria (but not including the Melbourne Statistical Division), 2003-2007

Rider age and licence group	40-60 km/h	70-90 km/h	100-110 km/h	Total
Young Learner	28	8	31	67
	(+75%)	(-0.3%)	(-27.9%)	(0%)
Young licence - restricted	12	7	23	42
	(+19.6%)	(+39.1%)	(-14.6%)	(0%)
Young licence - not restricted	10	13	62	85
	(-50.7%)	(+27.7%)	(+13.7%)	(0%)
Older Learner	23	13	56	92
	(+4.7%)	(+17.9%)	(-5.1%)	(0%)
Older licence - restricted	26	4	41	71
	(+53.3%)	(-53%)	(-10%)	(0%)
Older licence – not restricted	206	108	606	920
	(-6.3%)	(-2%)	(+2.7%)	(0%)
Total	305	153	819	1,277*

χ^2 (10)=30.6, p=0.001, *There were 127 cases in which a valid speed zone could not be determined

Number of vehicles involved/DCA

The number of vehicles involved in a crash was determined using the Definition for Classifying Accident (DCA) codes of each crash. Of the 3,601 cases eligible for analysis, 17 (0.5%) riders were involved in crashes in which it could not be determined whether another vehicle was involved. The distribution of whether more than one vehicle was involved by rider age and licensing level for the remaining 3,584 cases is presented in Table 3.16.

The chi-square test result indicated that there was a significant ($\chi^2(5)=31.0$, $p<0.001$) relationship between the age and level of licensing of the rider and whether the crash was a single vehicle crash or a multiple vehicle crash. It can be seen from Table 3.16 that the observed number of young Learner riders and young riders with restricted licences who were seriously injured or killed in multiple vehicle crashes was greater than expected. However a greater than expected number of older Learner riders were seriously injured or killed in single vehicle crashes.

Table 3.16 The distribution of seriously injured or killed riders categorised according to age and level of licensing by whether the crash was a single vehicle crash or a multiple vehicle crash, Victoria, 2003-2007

Rider age and licence group	Multiple Vehicle	Single Vehicle	Total
Young Learner	173	147	320
	(+13%)	(-12%)	
Young licence - restricted	101	70	171
	(+23.5%)	(-21.5%)	
Young licence - not restricted	132	120	252
	(+9.5%)	(-8.7%)	
Older Learner	106	183	289
	(-23.3%)	(+21.4%)	
Older licence - restricted	112	135	247
	(-5.2%)	(+4.8%)	
Older licence - not restricted	1,090	1,215	2,305
	(-1.1%)	(+1%)	
Total	1,714	1,870	3,584*

χ^2 (5)=31.0, $p<0.001$, * There were 17 cases in which it could not be determined if more than one vehicle was involved in the crash

Table 3.4 demonstrated that the number of young riders seriously injured or killed in crashes that occurred in the Melbourne Statistical Division was greater than expected (irrespective of licence level). A test of the relationship between whether a motorcycle rider was seriously injured or killed in a single vehicle crash or a multiple vehicle crash and whether the crash occurred in the Melbourne Statistical Division or the rest of Victoria revealed that the type of crash was significantly related to the location of the crash ($\chi^2(1)=449.4$, $p<0.001$), with the

number of riders seriously injured or killed in multiple vehicle crashes that occurred in the Melbourne Statistical Division being greater than expected. Likewise, the number of riders seriously injured or killed in single vehicle crashes in rural areas was greater than expected. It is possible that the observed number of young riders seriously injured or killed in multiple vehicle crashes was greater than expected not due to deficiencies in the abilities of young riders but because they do more riding in Metropolitan areas where multiple vehicle crashes are more likely to occur.

Table 3.17 The distribution of seriously injured or killed riders categorised according to age and level of licensing by whether the crash was a single vehicle crash or a multiple vehicle crash, Melbourne Statistical Division Only, 2003-2007

Rider age and licence group	Multiple Vehicle	Single Vehicle	Total
Young Learner	150	89	239
	(+1.2%)	(-2%)	
Young licence - restricted	83	42	125
	(+7.1%)	(-11.6%)	
Young licence - not restricted	113	49	162
	(+12.5%)	(-20.4%)	
Older Learner	93	99	192
	(-21.9%)	(+35.7%)	
Older licence - restricted	92	75	167
	(-11.1%)	(+18.2%)	
Older licence - not restricted	823	476	1,299
	(+2.2%)	(-3.6%)	
Total	1,354	830	2,184*

χ^2 (5)= 24.6, p<0.001, * There were 12 cases in which it could not be determined if more than one vehicle was involved in the crash

Table 3.17 shows the analysis of the relationship between rider age and licensing level and whether the crash was a single vehicle crash or a multiple vehicle crash for crashes occurring in the Metropolitan area only. It was found that when the sample of seriously injured or killed riders was restricted to crashes in the Melbourne Statistical Division the relationship between rider age and licence group and whether the crash was a single or multiple vehicle crash was still significant (χ^2 (5)=24.6, p<0.001) and the number of young riders who were involved in multiple vehicle crashes was still greater than expected. However, the difference between expected and observed counts of young Learner riders and young riders with restricted licences was no longer as pronounced as the differences observed in Table 3.16. The difference between expected and observed counts for older Learner riders seriously injured or killed in single vehicle crashes that was observed in Table 3.16 was also observed in Table 3.17 when crashes were restricted to those occurring in the Melbourne Statistical Division.

The relationship between rider age and licensing level and whether the crash was a single vehicle crash or a multiple vehicle crash was also analysed for the sample restricted to riders seriously injured or killed in crashes in the rest of Victoria (i.e. everywhere but the Melbourne Statistical Division). It was found that when restricted to crashes occurring in the rest of Victoria, the relationship between rider age and licensing level and whether the crash was a multiple vehicle crash or a single vehicle crash was significant (χ^2 (5)=13.7, p=0.017). It can be seen from Table 3.18 that the pattern of results was similar to those displayed in Table 3.16.

Table 3.18 The distribution of seriously injured or killed riders categorised according to age and level of licensing by whether the crash was a single vehicle crash or a multiple vehicle crash, Victoria (but not including the Melbourne Statistical Division), 2003-2007

Rider age and licence group	Multiple Vehicle	Single Vehicle	Total
Young Learner	23	58	81
	(+10.3%)	(-3.6%)	
Young licence - restricted	18	28	46
	(+52.1%)	(-18%)	
Young licence - not restricted	19	71	90
	(-18%)	(+6.2%)	
Older Learner	13	84	97
	(-47.9%)	(+16.6%)	
Older licence - restricted	20	60	80
	(-2.8%)	(+1%)	
Older licence - not restricted	267	738	1,005
	(+3.2%)	(-1.1%)	
Total	360	1,039	1,399

χ^2 (5)=13.7, p=0.017, * There were five cases in which it could not be determined if more than one vehicle was involved in the crash

These results suggest that the significant relationship between rider age and licensing level and whether the crash was a multiple vehicle crash or a single vehicle crash is partly due to the fact that a greater than expected number of young riders crash in Metropolitan areas (see Table 3.4) and that the risk of having a multiple vehicle crash is greater in Metropolitan areas than in regional areas.

Road surface conditions

Of the 3,601 cases eligible for analysis, the road surface condition when the crash occurred could not be determined for 52 (1.4%) riders. Table 3.19 shows the distribution of surface condition by rider age and licensing level for the remaining 3,549 cases of a rider being

seriously injured or killed. The chi-square test result indicated that the relationship between the age and level of licensing of the rider and whether the road was wet or dry when the crash occurred was almost significant (χ^2 (5)=9.7, p=0.086).

Table 3.19 The distribution of seriously injured or killed riders categorised according to age and level of licensing by whether the road surface was wet or dry when the crash occurred, 2003-2007

Rider age and licence group	Dry	Not dry	Total
Young Learner	284	34	318
	(+2.9%)	(-18.9%)	
Young licence - restricted	143	24	167
	(-1.4%)	(+9%)	
Young licence - not restricted	221	28	249
	(+2.2%)	(-14.7%)	
Older Learner	238	48	286
	(-4.1%)	(+27.3%)	
Older licence - restricted	203	42	245
	(-4.6%)	(+30%)	
Older licence - not restricted	1,992	292	2,284
	(+0.5%)	(-3.1%)	
Total	3,081	468	3,549*

χ^2 (5)=9.7 p=0.086, * There were 52 cases in which the status of the road surface was unknown

When examining the percent differences between the expected and observed cell counts in Table 3.19 it can be seen that there was a trend for greater than expected numbers of young riders with restricted licences, older Learner riders and older riders with restricted licences to be seriously injured or killed in crashes that occurred on road surfaces that were not dry (i.e. that were wet or icy). Conversely, there was a trend for fewer than expected numbers of young Learner riders and young riders with unrestricted Full licences to be seriously injured or killed in crashes that occurred on roads that were not dry.

Passengers

Of the 3,601 seriously injured or killed riders eligible for analysis, only 139 (3.9%) were carrying a pillion passenger when the crash occurred. Table 3.20 shows the distribution of whether a seriously injured or killed rider was carrying a pillion passenger when the crash occurred. The chi-square test result indicated that there was a significant (χ^2 (5)=29.0, p<0.001) relationship between the age and level of licensing of the rider and the presence of a pillion passenger. However this significant relationship may be due to the restriction on the carriage of pillion passengers, which is applicable to Learner riders and riders in their first year

of being. In light of this restriction, it is not surprising that riders who did not have Full licences were less likely to be carrying a pillion passenger when they were involved in a serious crash. When the analysis was restricted to riders with unrestricted licences, it was found that the relationship between age (young riders versus older riders) and the presence of a pillion passenger was not significant (χ^2 (1)=1.0, p=0.320).

Table 3.20 The distribution of seriously injured or killed riders categorised according to age and level of licensing by whether a pillion passenger was present when the crash occurred, 2003-2007

Rider age and licence group	Rider Only	Rider and Pillion Passenger	Total
Young Learner	312	11	323
	(+0.5%)	(-11.8%)	
Young licence - restricted	170	2	172
	(+2.8%)	(-69.9%)	
Young licence - not restricted	244	9	253
	(+0.3%)	(-7.8%)	
Older Learner	290	1	291
	(+3.7%)	(-91.1%)	
Older licence - restricted	247	1	248
	(+3.6%)	(-89.6%)	
Older licence - not restricted	2,199	115	2,314
	(-1.2%)	(+28.7%)	
Total	3,462	139	3,601

χ^2 (5)= 29.0, p<0.001

Engine capacity

Of the 3,601 cases eligible for analysis, the engine capacity of 110 (3.1%) of the motorcycles could not be determined. Table 3.21 shows the distribution of engine capacity by rider age and licensing level for the remaining 3,491 cases of a rider being seriously injured or killed. The chi-square test result indicated that there was a significant (χ^2 (20)=1,215.0, p<0.001) relationship between the age and level of licensing of the rider and the engine capacity of the motorcycle.

It can be seen from Table 3.21 that the observed number of young Learner riders seriously injured or killed who were riding motorcycles with capacity greater than 250cc was less than expected. This was also the case for young riders with restricted licences, older Learner riders and older riders with restricted licences. Across all age and level of licensing groups, comparatively few riders were riding motorcycles of capacity 125cc or less.

The significant relationship between engine capacity and level of licensing is perhaps mainly due to restrictions regarding the types of motorcycles that riders who are not Fully licensed are permitted to ride.

Table 3.21 The distribution of seriously injured or killed riders categorised according to age and level of licensing by the engine capacity of the motorcycle they were riding, 2003-2007

Rider age and licence group	<61cc	61-125cc	126-260cc	261-500cc	>500cc	Total
Young Learner	1	12	238	13	39	303
	(-45.1%)	(-2.6%)	(+170.7%)	(-54.6%)	(-77.4%)	
Young licence - restricted	1	8	89	8	56	162
	(+2.6%)	(+21.4%)	(+89.3%)	(-47.8%)	(-39.2%)	
Young licence - not restricted	0	2	49	23	171	245
	(-100%)	(-79.9%)	(-31.1%)	(-0.7%)	(+22.7%)	
Older Learner	10	20	205	17	29	281
	(+491.6%)	(+75%)	(+151.4%)	(-36%)	(-81.8%)	
Older licence - restricted	1	16	143	14	67	241
	(-31%)	(+63.2%)	(+104.5%)	(-38.5%)	(-51.1%)	
Older licence - not restricted	8	84	289	255	1,623	2,259
	(-41.1%)	(-8.6%)	(-55.9%)	(+19.4%)	(+26.4%)	
Total	21	142	1,013	330	1,985	3,491*

χ^2 (20)= 1,215.0, p<0.001, * There were 110 cases in which the engine capacity could not be determined

Figure 3.5 shows the cumulative distribution of seriously injured or killed riders by the engine capacity of the motorcycles they were riding at the time of the crash where riders have been grouped into two broad categories defined by their level of experience. It can be seen that just over 20% of inexperienced riders were riding motorcycles of engine capacity less than 250cc when they were seriously injured or killed, while about a similar number were riding motorcycles of capacity greater than 250cc. The remaining 54% of inexperienced riders who were seriously injured or killed were riding 250cc motorcycles. More than 80% of experienced riders were riding motorcycles of capacity greater than 250cc.

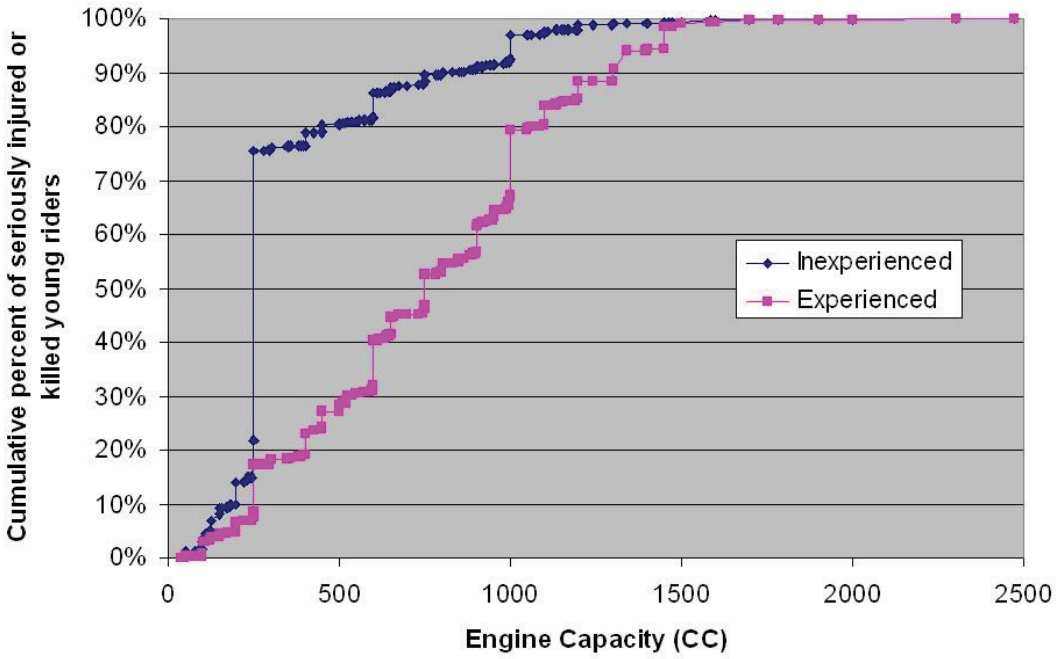

Figure 3.5 Distribution of riders seriously injured or killed in crashes by engine capacity for inexperienced riders (those riders who are subject to restrictions) and experienced riders (unrestricted Full licences only)

Summary of risk factors

Table 3.22 summarises the results of Section 3.2.2. The first column of Table 3.22 contains the riding situations that were identified as being risk factors for certain groups of riders. Highlighted cells represent the types of riders, defined by rider age and level of licensing, for which these riding situations were judged to be a significant risk. The criteria for a cell to be highlighted was that the variable used to define the riding situation was found to be significantly related to the rider and licensing variable and where the observed count for the particular riding situation was greater than the expected count for the particular rider group. Significant relationships that were most-probably due to the effect of a confounder were excluded. For example, in Table 3.21 it was shown that, for crashes in which a rider was seriously injured or killed, there was a significant relationship between rider age and licensing level and the engine capacity of the motorcycle. However this relationship was probably significant because of the confounding effect of restrictions on what types of motorcycles can be used by riders who are not Fully licensed. Therefore Table 3.22 does not list large capacity motorcycles as a risk factor for older Fully licensed riders.

It can be seen from Table 3.22 that young Learner riders and young riders with unrestricted licences were at risk of being seriously injured or killed when riding at night on both weekends and during the week. Older Learner riders and older riders with restricted licences were at increased risk when riding at night during the week.

Riders of all ages who had unrestricted licences were at increased risk when riding in high speed zones in rural areas, while young riders of all licence levels were at increased risk of involvement in multiple vehicle crashes when compared with older riders. Older Learner

riders and older riders with restricted licences were at increased risk of being involved in single vehicle crashes.

Table 3.22 A summary of risk factors for riders (grouped by age and licensing level) being seriously injured or killed

Riding situation	Young Riders			Older Riders		
	Learner	Licensed - restricted	Licensed – not restricted	Learner	Licensed - restricted	Licensed – not restricted
Riding at night – weekends (Table 3.11)	■		■			
Riding at night – weekdays (Table 3.11)	■		■	■	■	
High speed zone in rural areas (Table 3.15)			■			■
Multiple vehicle crashes (Tables 3.16, 3.17, 3.18)	■	■	■			
Single vehicle crashes (Tables 3.16, 3.17, 3.18)				■	■	
Metro riders riding in rural areas (Table 3.5)						■
Metro riders riding close to home (Tables 3.6, 3.7)	■		■	■		

Riding in rural areas was a risk factor for older riders who lived in Metropolitan areas and who did not have licence restrictions. Young Learner riders and young riders with unrestricted licences were at greater risk of being seriously injured or killed in crashes that occurred close to where they lived. This was also true for older Learners.

It is interesting that the only risk factors identified for older riders with unrestricted licences both involved riding in rural areas. This could be because their increased level of experience as both motorcyclists and possibly also as car drivers makes them better skilled at avoiding dangerous situations in urban environments. It may also be because older riders are more likely to ride in urban areas.

As can be appreciated when reading Sections 3.2.2, many of the riding situations examined were related to each other. This means it is difficult to get a clear picture of what factors pose the most risk to inexperienced riders. However, the following broad conclusions can be made:

1. Young Learner riders and young riders with unrestricted licences showed increased risk of involvement in serious crashes at night on both weekends and weekdays;
2. Young Learner riders and young riders with unrestricted licences showed increased risk of involvement in serious crashes close to where they lived;

3. Both young riders and older riders who have unrestricted licences showed increased risk of involvement in serious crashes that occurred in high speed zones in rural areas;
4. Young riders of all licence levels showed increased risk of involvement in serious multiple vehicle crashes;
5. Older Learner riders and older riders with restricted licences showed increased risk of involvement in serious single vehicle crashes;
6. Older Learner riders and older riders with restricted licences showed increased risk of crashing at night on weekdays;
7. Older riders with unrestricted licences who lived in Metropolitan Melbourne showed increased risk of crashing in rural areas; and
8. Older Learner riders showed increased risk of crashing in close proximity to their own home.

3.2.3 Scooters

Identifying and categorizing scooter riders

Of the 3,601 seriously injured or killed riders who were eligible to be included in the analyses, 394 (10.9%) were identified as riding either mopeds or scooters. For the purposes of this report, mopeds have been included in the scooter category and a scooter is defined as any "step through" motorcycle. Identifying riders of scooters was a difficult process for a number of reasons. The VicRoads crash database does contain a vehicle type variable which contains separate values for motorcycles and a separate variable for scooters and a third variable for mopeds. However examining this variable for types of vehicles that are known to be scooters reveals that more often than not, these vehicles are simply classified as motorcycles. The value in this variable is dependent on how the attending police officer reports the vehicles involved in the crash. It would appear that in many cases the attending officer categorises any two wheeled motorised vehicle as a motorcycle. To compound the problem, the VicRoads registration data does not provide information on whether a vehicle is a step through scooter or a conventional motorcycle. Furthermore, the range of engine capacities in which step through scooters are now available means that the engine capacity variable in the registration dataset cannot be used to identify scooters.

Fortunately, VicRoads did provide a list of makes, models and vehicle identification numbers (VINs) of vehicles which were known to be scooters. A computer program was devised that searched for records in the registration and crash databases that matched the scooter make, model and VIN values supplied by VicRoads. Any vehicle in the crash file with a make, model and VIN value that matched the values supplied by VicRoads was deemed to be a scooter. Furthermore, any record in the crash data set which the attending officer described as being a scooter was also assumed to be a scooter.

Finally, the make and model codes of all vehicles in the crash database that had not yet been identified as being a scooter were compared against those that had been identified as being a scooter. Those vehicles that had identical make and model values as vehicles that had already been identified as being a scooter were also assumed to be scooters.

Table 3.23 shows the distribution of seriously injured or killed scooter riders by their age and licence level compared with that of riders of all types of motorcycles who were seriously

injured or killed. It can be seen that, when compared to riders of all types of motorcycles, a greater proportion of scooter riders were young Learners or older Learners.

Table 3.23 Age and motorcycle licence level of scooter riders seriously injured or killed on Victorian roads in the period 2003-3007

	Scooter Riders		All Riders	
	Number	Percentage	Number	Percentage
Young Learners	75	19.0	323	9.0
Young licence- restricted	26	6.6	172	4.8
Young licence - no restrictions	11	2.8	253	7.0
Older Learners	77	19.5	291	8.1
Older licence - restricted	49	12.4	248	6.9
Older licence - no restrictions	156	39.6	2,14	64.3
Total	394	100	3,601	100

Table 3.24 shows the number of scooter riders who were seriously injured or killed by the year of the crash. The table also shows what proportion of motorcycle riders killed or seriously injured each year were riding scooters. It can be seen that the percentage of riders seriously injured or killed who were riding scooters increased from eight percent in 2003 to nearly fifteen percent in 2007. This may reflect the increasing popularity of scooters as a mode of transportation. The fact that more than one third of seriously injured or killed scooter riders are Learner riders (see Table 3.23) may indicate that many scooter riders are new to motorcycling.

Unfortunately it is not possible to estimate whether scooter riders are more at risk of being involved in a serious crash than riders of conventional motorcycles. This is because motorcycle licences and permits issued in Victoria do not distinguish between riders of scooters and conventional motorcycles.

Table 3.24 The distribution of scooter riders seriously injured or killed on Victorian roads by year of crash (2003-2007)

Year of crash	Number	Percent of all seriously injured or killed riders
2003	56	8.0
2004	66	9.7
2005	72	9.7
2006	80	12.0
2007	120	14.7
Total	394	10.9

The following sections contain similar analyses to those completed for seriously injured or killed riders of all types of motorcycles, which were completed in Section 3.2.2. However in the following sections, the sample of riders considered is restricted to seriously injured or killed riders of scooters. The following crash characteristics were examined:

1. Crash location;
2. Proximity to home;
3. Time of day and day of week;
4. Speed zone;
5. Number of vehicles involved/DCA;
6. Road surface conditions;
7. Passengers; and
8. Engine capacity.

Crash location

Table 3.25 The distribution of seriously injured or killed scooter riders categorised according to age and level of licensing by whether the crash occurred in the Melbourne Statistical Division or the rest of Victoria, 2003-2007

Scooter rider age and licence group	Melbourne Statistical Division	Rest of Victoria	Total
Young Learner	66	9	75
	(+3.8%)	(-21.2%)	
Young licence - restricted	20	6	26
	(-9.3%)	(+51.5%)	
Young licence - not restricted	9	2	11
	(-3.5%)	(+19.4%)	
Older Learner	66	11	77
	(+1.1%)	(-6.2%)	
Older licence - restricted	39	10	49
	(-6.1%)	(+34%)	
Older licence - not restricted	134	22	156
	(+1.3%)	(-7.4%)	
Total	334	60	394

χ^2 (5)=3.1, p=0.678

Table 3.25 shows the distribution of seriously injured or killed scooter riders by the location of the crash. When tested using a chi-square analysis, it was found that rider age and licence level

was not significantly related to the crash location ($\chi^2(5)=3.1$, p=0.678). However it can be seen from Table 3.25 that 84.8% of the scooter riders seriously injured or killed were involved in crashes that occurred in the Melbourne Statistical Division, compared with only 61.0% of riders involving all types of motorcycles (see Table 3.4). This demonstrates that, compared to riders of conventional motorcycles, relatively more scooter riders suffer serious injuries and fatalities in urban areas compared to rural areas.

Proximity to home

Of the 394 seriously injured or killed scooter riders available for use in these analyses, 315 (79.9%) lived in the Melbourne Statistical Division, while 38 (9.6%) resided in the rest of Victoria. The area of residence of the remaining 41 (10.4%) scooter riders could not be determined because their residential post code was not recorded in the RCIS dataset nor was it available from the registration data provided by VicRoads.

Scooter riders living in the Melbourne Statistical Division

Table 3.26 The distribution of seriously injured or killed scooter riders who lived in the Melbourne Statistical Division categorised according to age and level of licensing by whether the crash occurred in the Melbourne Statistical Division or the rest of Victoria, 2003-2007

Scooter rider age and licence group	Rest of Victoria	Melbourne Statistical Division	Total
Young Learner	58	4	62
	(-0.8%)	(+12.9%)	
Young licence - restricted	18	1	19
	(+0.5%)	(-7.9%)	
Young licence - not restricted	7	0	7
	(+6.1%)	(-100%)	
Older Learner	56	4	60
	(-1%)	(+16.7%)	
Older licence - restricted	34	4	38
	(-5.1%)	(+84.2%)	
Older licence - not restricted	124	5	129
	(+1.9%)	(-32.2%)	
Total	297	18	315

Fisher's exact test score = 3.6, p=0.557

Table 3.26 shows the distribution of the crash location for the 315 cases of scooter riders who resided in the Melbourne Statistical Division. As the contingency table applicable to this result

contained several cells with low cell counts, Fisher's exact test was used to test the relationship between the crash location and the age and licensing level of the rider. The Fisher's exact test score of 3.0 indicated that for riders living in Melbourne, the relationship between the age and level of licensing of the rider and whether the crash occurred in the Melbourne Statistical Division or in the rest of Victoria was not significant (p=0.649).

Table 3.27 shows the distribution of whether the crash occurred in the same LGA as where the rider lived for the 315 cases of scooter riders who resided in the Melbourne Statistical Division being seriously injured or killed. The chi-square test result indicated that for scooter riders living in Melbourne, the relationship between age and level of licensing and whether the crash occurred in the same LGA as where the rider lived was not significant (χ^2 (5)=3.4, p=0.643).

Table 3.27 The distribution of seriously injured or killed scooter riders who lived in the Melbourne Statistical Division categorised according to age and level of licensing by whether the crash occurred in the same LGA as the LGA where the rider resided, 2003-2007

Scooter rider age and licence group	Different LGA	Same LGA	Total
Young Learner	35	27	62
	(-2.8%)	(+3.9%)	
Young licence - restricted	11	8	19
	(-0.3%)	(+0.5%)	
Young licence - not restricted	2	5	7
	(-50.8%)	(+70.5%)	
Older Learner	38	22	60
	(+9%)	(-12.5%)	
Older licence - restricted	23	15	38
	(+4.2%)	(-5.8%)	
Older licence - not restricted	74	55	129
	(-1.3%)	(+1.7%)	
Total	183	132	315

χ^2 (5)=3.4, p=0.643

Table 3.28 shows the distribution of whether the crash location was in the same post code area as the rider's residential post code for scooter riders who lived in Melbourne and who were seriously injured or killed. The chi-square test result indicated that for riders living in Melbourne, the relationship between the age and level of licensing of the rider and whether the crash occurred in the same post code as where the rider lived was not significant (χ^2(5)=2.5, p=0.797).

Table 3.28 The distribution of seriously injured or killed scooter riders who lived in the Melbourne Statistical Division categorised according to age and level of licensing by whether the crash occurred in the same post code as the post code of the rider's residence, 2003-2007

Scooter rider age and licence group	Different post code	Same post code	Total
Young Learner	49	13	62
	(-5%)	(+24.6%)	
Young licence - restricted	17	2	19
	(+7.6%)	(-37.4%)	
Young licence - not restricted	5	2	7
	(-14.1%)	(+69.8%)	
Older Learner	51	9	60
	(+2.2%)	(-10.8%)	
Older licence - restricted	31	7	38
	(-1.9%)	(+9.5%)	
Older licence - not restricted	109	20	129
	(+1.6%)	(-7.9%)	
Total	262	53	315

χ^2 (5)=2.5, p=0.797

The following section contains the same analyses as those presented in Tables 3.26, 3.27 and 3.28 but for scooter riders who did not live in the Melbourne Statistical Division.

Scooter riders living in the rest of Victoria

There were 38 cases of seriously injured or killed scooter riders who were identified as not residing in the Melbourne Statistical Division. Of these 38 scooter riders, only 4 (10.5%) were involved in crashes that occurred in the Melbourne Statistical Division, with the remaining 34 (89.5%) being seriously injured or killed in crashes that occurred in the rest of Victoria. Table 3.29 shows the distribution of the crash location by the age and licensing level of the scooter rider. Due to low expected cell counts in many of the cells in Table 3.29, Fisher's exact test was used to test the significance of the relationship between crash location and the age and licensing level of the scooter rider. The Fisher's exact test score of 3.4 indicated that for scooter riders who did not live in Melbourne, the relationship between the age and level of licensing of the rider and whether the crash occurred in the Melbourne Statistical Division or in the rest of Victoria was not significant (p=0.696).

Table 3.29 The distribution of seriously injured or killed scooter riders who did not live in the Melbourne Statistical Division categorised according to age and level of licensing by whether the crash occurred in the Melbourne Statistical Division or the rest of Victoria, 2003-2007

Scooter rider age and licence group	Melbourne Statistical Division	Rest of Victoria	Total
Young Learner	1	5	6
	(+58.3%)	(-6.9%)	
Young licence - restricted	1	4	5
	(+90%)	(-10.6%)	
Young licence - not restricted	0	2	2
	(-100%)	(+11.8%)	
Older Learner	1	4	5
	(+90%)	(-10.6%)	
Older licence - restricted	0	3	3
	(-100%)	(+11.8%)	
Older licence - not restricted	1	16	17
	(-44.1%)	(+5.2%)	
Total	4	34	38

Fisher's exact test score = 3.4, p=0.696

Table 3.30 shows the distribution of whether the crash location was in the same LGA as where the rider lived for scooter riders who did not live in the Melbourne Statistical Division. The Fisher's exact test score of 2.4 again indicated that for riders not living in Melbourne, the relationship between the age and level of licensing of the rider and whether the crash occurred in the same LGA as where the rider lived was not significant (p=0.867).

In both Tables 3.28 and 3.29 it can be seen that for many cells, the percent deviation of the observed counts from the expected counts were very high. This is due to the cell counts in these cells being very low, meaning that a small absolute difference in expected and observed counts would result in a large percent deviation. These large percent deviations should not therefore be interpreted as suggesting that there is a significant relationship between the two variables.

Table 3.30 The distribution of seriously injured or killed scooter riders who did not live in the Melbourne Statistical Division categorised according to age and level of licensing by whether the crash occurred in the same LGA as the LGA where the rider resided, 2003-2007

Scooter rider age and licence group	Different LGA	Same LGA	Total
Young Learner	2	4	6
	(+40.7%)	(-12.6%)	
Young licence - restricted	1	4	5
	(-15.6%)	(+4.8%)	
Young licence - not restricted	0	2	2
	(-100%)	(+31%)	
Older Learner	2	3	5
	(+68.9%)	(-21.4%)	
Older licence - restricted	0	3	3
	(-100%)	(+31%)	
Older licence - not restricted	4	13	17
	(-0.7%)	(+0.2%)	
Total	9	29	38

Fisher's exact test score = 2.4, p=0.867

Table 3.31 shows the distribution of whether the crash location was in the same post code area as the rider's residential post code for seriously injured or killed scooter riders who did not live in Metropolitan Melbourne. A Fisher's exact test score of 1.9 indicated that for scooter riders not living in Melbourne, the relationship between the age and level of licensing of the rider and whether the crash occurred in the same post code as where the rider lived was not significant (p=0.935).

Table 3.31 The distribution of seriously injured or killed scooter riders who did not live in the Melbourne Statistical Division categorised according to age and level of licensing by whether the crash occurred in the same post code as the post code of the rider's residence, 2003-2007

Scooter rider age and licence group	Different post code	Same Post code	Total
Young Learner	4	2	6
	(+10.1%)	(-15.6%)	
Young licence - restricted	3	2	5
	(-0.9%)	(+1.3%)	
Young licence - not restricted	1	1	2
	(-17.4%)	(+26.7%)	
Older Learner	4	1	5
	(+32.2%)	(-49.3%)	
Older licence - restricted	2	1	3
	(+10.1%)	(-15.6%)	
Older licence - not restricted	9	8	17
	(-12.5%)	(+19.2%)	
Total	23	15	38

Fisher's exact test score = 1.9, p=0.935

Time of day and day of week

Table 3.32 presents the distribution of seriously injured or killed scooter riders categorised according to their age and level of licensing by whether the crash occurred at night and whether the crash occurred on the weekend or on a weekday. For this analysis, it was necessary to merge several rider and licence groups to minimise the number of cells with low expected cell counts. Fisher's exact test score of 17.0 showed that the relationship between the time of the week when the crash occurred and the age and licensing level of the rider was significant (p=0.014).

It can be seen that a greater than expected number of young scooter riders of all licensing levels were involved in serious crashes at night on weekends, while a greater than expected number of young Learner scooter riders and young scooter riders with restricted licences were seriously injured or killed in crashes at night during the week and also during the day on weekends. There were also greater than expected numbers of older scooter riders with Learner permits or restricted licences being seriously injured on the weekends (both at night and during the day), while a greater than expected number of older scooter riders with unrestricted licences crashed on weekdays during the day.

Figure 3.6 shows the time of the day of the crashes that resulted in the 394 scooter riders being seriously injured or killed. Scooter riders have been grouped into two broad categories according to their level of experience: inexperienced riders included riders who were subject to restrictions; while experienced riders only included riders with unrestricted motorcycle licences. It can be seen that for experienced scooter riders, the number of serious injuries and

fatalities rise sharply in the morning and fall throughout the afternoon hours, only rise sharply again in the evening peak period.

Table 3.32 The distribution of seriously injured or killed scooter riders categorised according to age and level of licensing by when the crash occurred in terms of time of day and day of week, Victoria, 2003-2007

Scooter rider age and licence group	Weekend Night	Weekend Day	Weekday Night	Weekday Day	Total
Young - Learner and restricted	5	23	15	58	101
	(+14.7%)	(+10.8%)	(+77.3%)	(-14%)	
Young licensed - not restricted	1	2	1	7	11
	(+110.7%)	(-11.6%)	(+8.5%)	(-4.7%)	
Older - Learner and restricted	7	32	8	79	126
	(+28.8%)	(+23.5%)	(-24.2%)	(-6.1%)	
Older licensed - not restricted	4	24	9	119	156
	(-40.6%)	(-25.2%)	(-31.1%)	(+14.3%)	
Total	17	81	33	263	394

Fisher's exact test score =17.0, p=0.014

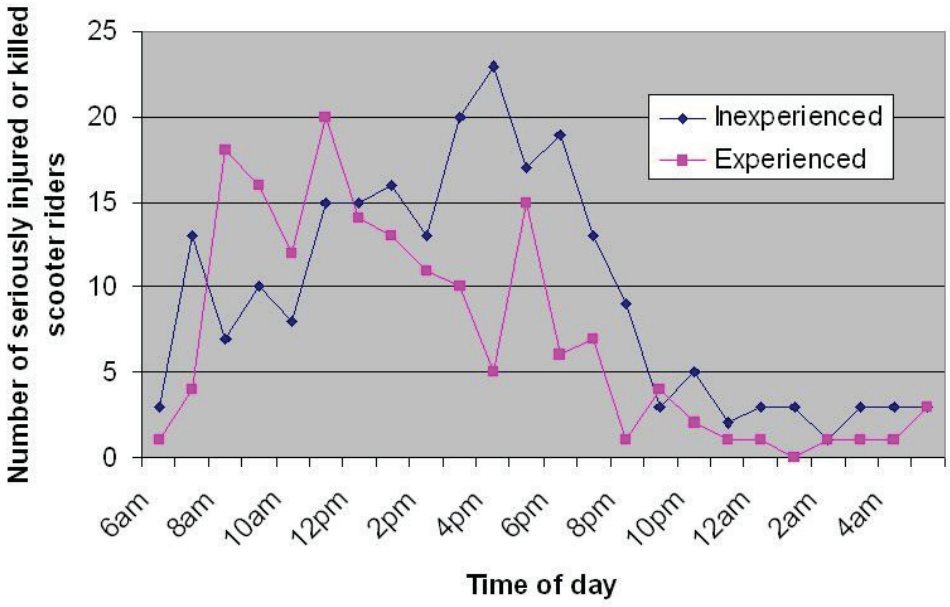

Figure 3.6 Distribution of scooter riders seriously injured or killed in crashes by time of day for inexperienced riders (those riders who are subject to restrictions) and experienced riders (unrestricted Full licences only)

Speed zone

Of the 394 cases of a scooter rider being seriously injured or killed, four (1.0%) riders were involved in "off-road" crashes while 17 (4.3%) were involved in crashes that occurred at a location where the speed limit was unknown. The distribution of the speed zone by rider age and licensing level for the remaining 373 cases is presented in Table 3.33. As before, it was necessary to merge some of the licensing categories due to low expected counts in some of the cells. The chi-square test result indicated that the relationship between the age and level of licensing of the rider and the speed zone in which the crash occurred was significant (χ^2 (6)=15.1, p=0.021).

Some interesting observations can be made from Table 3.33. Firstly, only 12.1% of the serious crashes involving scooter riders occurred in 100-110 km/h speed zones, compared with 32% of crashes involving all types of motorcycles (see Table 3.14). It is also interesting to note that a greater than expected number of young scooter riders and older scooter riders with restricted licences were involved in crashes that occurred in 100-110 km/h speed zones. Such an over-representation among young riders and older inexperienced riders was not observed when riders of all types of motorcycles were analysed. There was also a trend for young scooter riders with unrestricted licences to be over-represented in serious crashes in 70-90 km/h speed zones. These results may indicate that young scooter riders are at risk when riding in high speed environments and that they are more likely to ride in these environments as they gain experience.

Table 3.33 The distribution of seriously injured or killed scooter riders categorised according to age and level of licensing by the speed zone in which the crash occurred, Victoria, 2003-2007

Scooter rider age and licence group	40-60 km/h	70-90 km/h	100-110 km/h	Total
Young - Learner and restricted	65	18	14	97
	(-4.6%)	(+4.9%)	(+19.6%)	(0%)
Young licensed - not restricted	3	5	3	11
	(-61.2%)	(+156.9%)	(+126.1%)	(0%)
Older - Learner and restricted	85	16	17	118
	(+2.6%)	(-23.4%)	(+19.4%)	(0%)
Older licensed - not restricted	109	27	11	147
	(+5.6%)	(+3.8%)	(-38%)	(0%)
Total	262	66	45	373*

χ^2 (6)= 15.1, p=0.021, *There were 21 cases in which a valid speed zone could not be determined

Number of vehicles involved/DCA

Of the 394 seriously injured or killed scooter riders, only one could not be categorised in terms of how many vehicles were involved in the crash. The distribution of whether more

than one vehicle was involved by rider age and licensing level for the remaining 393 cases has been presented in Table 3.34. The chi-square test result indicated that the relationship between the age and level of licensing of the scooter rider and whether the crash was a single vehicle crash or a multiple vehicle crash was significant (χ^2 (5)=25.5, p<0.001).

Table 3.34 The distribution of seriously injured or killed scooter riders categorised according to age and level of licensing by whether the crash was a single vehicle crash or a multiple vehicle crash, Victoria, 2003-2007

Scooter rider age and licence group	Multiple Vehicle	Single Vehicle	Total
Young Learner	44	31	75
	(-6.3%)	(+10.5%)	
Young licence - restricted	19	7	26
	(+16.7%)	(-28%)	
Young licence - not restricted	8	3	11
	(+16.2%)	(-27.1%)	
Older Learner	39	37	76
	(-18%)	(+30.2%)	
Older licence - restricted	20	29	49
	(-34.8%)	(+58.2%)	
Older licence - not restricted	116	40	156
	(+18.8%)	(-31.4%)	
Total	246	147	393*

χ^2 (5)= 25.5, p<0.001, * There was one case in which it could not be determined if more than one vehicle was involved in the crash

Comparing Table 3.34 with Table 3.16, it can be seen that when riders of all types of motorcycles were included in the sample analysed (Table 3.16), all young riders were over-represented in multiple vehicle crashes. However, when the sample was restricted to riders of scooters, Table 3.34 indicated that young Learners were not over-represented in serious multiple vehicle crashes. Table 3.34 also shows that older scooter riders who have unrestricted licences were over-represented in serious multiple vehicle crashes, while a greater than expected number of older scooter riders who licence restrictions and older scooter riders with Learner permits were observed in serious single vehicle crashes.

Road surface conditions

Of the 394 scooter riders who were seriously injured or killed, there were only five cases (1.3%) in which the road surface condition when the crash occurred could not be determined. Table 3.35 shows the distribution of surface condition by rider age and licensing level for the remaining 389 cases of a scooter rider being seriously injured or killed. A Fisher's exact test score of 10.9 indicated that the relationship between the age and level of licensing of the

scooter rider and whether the road was wet or dry when the crash occurred was significant (p=0.044).

From Table 3.35 it can be seen that there was a trend for fewer young scooter riders than expected to be seriously injured or killed in crashes that occurred on roads that were not dry. In contrast, a greater than expected number of older scooter riders, with the exception of those who were Learners, were seriously injured or killed in crashes that occurred on roads that were not dry. Comparing with Table 3.16 indicates that this trend is specific to older scooter riders and not older riders of other types of motorcycles.

Table 3.35 The distribution of seriously injured or killed scooter riders categorised according to age and level of licensing by whether the road surface was wet or dry when the crash occurred, 2003-2007

Scooter rider age and licence group	Dry	Not dry	Total
Young Learner	67	6	73
	(+10.5%)	(-51.6%)	
Young licence - restricted	23	2	25
	(+10.8%)	(-52.8%)	
Young licence - not restricted	10	1	11
	(+9.5%)	(-46.4%)	
Older Learner	64	13	77
	(+0.1%)	(-0.5%)	
Older licence - restricted	34	14	48
	(-14.7%)	(+71.9%)	
Older licence - not restricted	125	30	155
	(-2.9%)	(+14.1%)	
Total	323	66	389*

Fisher's exact test score = 10.9, p=0.044, * There were five cases in which the status of the road surface was unknown

Passengers

Of the 394 seriously injured or killed scooter riders, only eight (2.0%) were carrying a pillion passenger when the crash occurred. Table 3.36 shows the distribution of whether a seriously injured or killed rider was carrying a pillion passenger when the crash occurred. The Fisher's exact test score of 4.2 indicated that the relationship between the age and level of licensing of the scooter rider and the presence of a pillion passenger was not significant (p=0.421).

Table 3.36 The distribution of seriously injured or killed scooter riders categorised according to age and level of licensing by whether a pillion passenger was present when the crash occurred, 2003-2007

Scooter rider age and licence group	Rider Only	Rider & Pillion Passenger	Total
Young Learner	73	2	75
	(-0.6%)	(+31.3%)	
Young licence - restricted	25	1	26
	(-1.9%)	(+89.4%)	
Young licence - not restricted	11	0	11
	(+2.1%)	(-100%)	
Older Learner	77	0	77
	(+2.1%)	(-100%)	
Older licence - restricted	49	0	49
	(+2.1%)	(-100%)	
Older licence - not restricted	151	5	156
	(-1.2%)	(+57.9%)	
Total	386	8	394

Fisher's exact test score = 4.2, p=0.421

When reviewing the percent by which the observed counts deviated from the expected counts in Table 3.36, the reader is reminded that the expected counts were very low for all the cells relating to a pillion passenger being present. Where there are low expected cell counts, a small absolute difference between expected and observed counts will result in an exaggerated percentage deviation.

Engine capacity

Of the 394 seriously injured or killed scooter riders, the engine capacity of three (0.8%) of the scooters could not be determined. Table 3.37 shows the distribution of engine capacity by rider age and licensing level for the remaining 391 cases of a scooter rider being seriously injured or killed. Due to low cell counts, rider age and licensing level categories were merged, resulting in two broad categories: inexperienced scooter riders, which composed of Learner riders Probationary riders and riders with restricted licences; and experienced scooter riders, which comprised of scooter riders who had unrestricted motorcycle licences. Each of these categories included riders previously classified as young riders and riders classified in the older rider category.

A Fisher's exact test score of 6.4 indicated that there was a significant ($p<0.001$) relationship between engine capacity and rider age and licensing level, with experienced riders being more likely to ride scooters of capacity greater than 260 cc than inexperienced riders.

The fact that only one inexperienced rider was riding a scooter with engine capacity above 260cc could be due to restrictions on what types of motorcycles riders who are not Fully

licensed are permitted to ride. However it is also true that, for riders of all ages, there were very few riders seriously injured of killed while riding a scooter of engine capacity greater than 260cc. Nearly two thirds of the scooters involved in serious crashes had engine capacity between 126-260cc.

Table 3.37 The distribution of seriously injured or killed scooter riders categorised according to age and level of licensing by the engine capacity of the motorcycle they were riding, 2003-2007

Scooter rider age and licence group	<61cc	61-125cc	126-260cc	261-500cc	>500cc	Total
Inexperienced	11	43	171	0	1	226
	(+5.7%)	(-36.4%)	(+20.8%)	(-100%)	(-65.4%)	
Experienced	7	74	74	6	4	165
	(-7.8%)	(+49.9%)	(-28.4%)	(+137%)	(+89.6%)	
Total	18	117	245	6	5	391

Fisher's exact test score = 58.7, $p<0.001$, * There were three cases in which the engine capacity could not be determined

Summary of risk factors

Only 11% of the sample of seriously injured or killed riders available for analysis were identified as being scooter riders. This reduced the power of the scooter-specific analyses presented in Section 3.2.3, meaning that the probability of correctly identifying a risk factor for scooter riders was less than the probability of correctly identifying a risk factor when riders of all types of motorcycles were included. Indeed many of the riding situations that were identified as being risk factors when riders of all types of motorcycles were included in the analysis were not found to be significant risk factors when the analysis sample was restricted to scooter riders. This does not mean that these riding situations do not pose a risk for scooter riders. Reducing the size of the sample included in the analysis increased the probability that actual risk factors for scooter riders will not be identified.

However the analyses presented in Section 3.2.3 have delivered some interesting results concerning serious crashes involving scooters. The following broad conclusions can be made from the analysis of scooter riders who were seriously injured or killed:

1. Scooter riders represent an increasing proportion of seriously injured or killed motorcyclists;
2. More than one third of seriously injured or killed scooter riders are Learner riders, compared with only 17% of seriously injured or killed riders of all types of motorcycles;
3. An increasing number of people appear to be obtaining motorcycle Learner's Permits and riding scooters as their first bike;
4. Serious crashes involving scooters are relatively more likely to occur in urban areas than are serious crashes involving conventional motorcycles;

5. Some of the trends for when young scooter riders and older inexperienced scooter riders were at increased risk of involvement in serious crashes were similar to those identified for riders of all types of motorcycles, for example:
    a. Young scooter riders showed increased risk of involvement in serious crashes at night on weekends
    b. Older scooter Learner riders were at increased risk of being involved in serious single vehicle crashes;
6. There is evidence that scooters are used differently to conventional motorcycles in terms of where they are being operated. For example, older Learner riders of all types of motorcycles who lived in Metropolitan areas were more likely to be involved in crashes close to where they lived, while this trend was not evident for scooter riders; and
7. Young scooter riders may be at risk when riding in high speed environments and young scooter riders may be more likely to ride in such environments as they gain experience.

Further investigation of the above conclusions is required in a more-comprehensive and detailed analysis of serious scooter crashes. In particular, it would be useful to further study the differences in how scooters and conventional motorcycles are used by young and inexperienced riders.

Chapter 4 Preliminary Inventory of GLS Features and Components

The review of the literature yielded a list of 21 GLS components or features. These 21 items were tabulated and augmented with information from the comparison exercise, the literature review, and the crash data analysis activity. The augmented inventory is presented in Table 4.1, which commences on the following page. A version of this augmented inventory was used as preparatory reading for participants attending the stakeholder workshop. The process and key outcomes of the stakeholder workshop are summarised in Chapter 5.

It should be noted that revisions were made to the crash data analysis following the construction of the initial inventory. These revisions mainly involved reclassifying riders according to their experience level rather than their licence status. Thus, in the concluding remarks from the analysis of crash data column of Table 4.1 reference is often made to riders based on their stage of licensure. Despite this caveat, the broad conclusions drawn from the revised data analysis do not deviate substantially from those presented in Table 4.1.

Table 4.1 Preliminary inventory of GLS features and components

GLS feature/ component	Description	Current rider GLS practice in Australasian jurisdictions & comparison with driver GLS	Concluding remarks from the literature review	Concluding remarks from the analysis of crash data
Number and nature of phases	Traditionally, GLS comprise 3 phases: Learner (supervised, restricted), Intermediate (solo, restricted), and Full (solo, unrestricted). More recently, the GLS of some jurisdictions comprise 4 or 5 phases, created by splitting the Intermediate phase into 2 sub-phases and, in some cases, the Learner phase into 2 sub-phases also.	Instances of 4 or 5 phase systems do exist in Australia for car drivers. While 4 phase systems do exist for motorcycle riders, they are not as common as for car drivers or not as clearly defined. **Refer Table A-1**	Beyond the traditional 3 phase approach, dual Learner and Intermediate licence phases allow for more staggered removal of restrictions. This may be beneficial in complex systems as distinct, well-defined phases may facilitate user understanding of the conditions associated with a given licence phase and therefore, compliance with those conditions. Whether this is the case is not known. It is important to note that additional phases (beyond 3) do not necessarily imply a GLS of longer duration. Thus, while allowing for more staggered removal of restrictions, novices may be exposed to a given licence condition for a shorter period of time. The relationship between the length of time novices should be subject to a given licence condition (and at what point during their skill development) and crash risk needs to be explored further. A further point worthy of noting is that, in the case of motorcycle licensing, the distinction between the Learner and Intermediate licence in the traditional sense is less clear when the Learner phase is not typified by supervised riding.	The analysis of the crash data revealed that young Learner riders and young riders with a Probationary licence were more likely to be involved in serious crashes at night on both the weekend and during the week. However, the increased risk associated with riding at night was not evident during the week for young fully licensed riders. This suggests that it is appropriate for different restrictions to be applied to novice riders based on their level of experience. Restricting Learner and Probationary riders from travelling at night but allowing newly fully licensed riders to ride at night on weekdays but not at night on weekends is an example of how a multi -phase licensing system could be used to enable young riders to acquire essential skills (e.g. riding at night) while avoiding situations of particular risk to young riders (e.g. riding at night on weekends).
Minimum age for obtaining a Learner's Permit and an Intermediate Licence	In general, a lower minimum age for obtaining a Learner's Permit and higher minimum age for obtaining an Intermediate Licence serves to increase the Learner phase and therefore opportunity for supervised practice under relatively low-risk conditions. It also serves to delay the start of solo driving. An implication of the latter is that the novice is more mature (and, arguably, less likely to engage in deliberate risks).	There is much variation across jurisdictions in the minimum age for obtaining a Learner's Permit and also the minimum age for obtaining an Intermediate Licence. For example, for novice riders, the minimum Learner age ranges from 15 years (New Zealand) to 18 years (Victoria and Queensland). This is broader than that for novice drivers, for whom the minimum Learner age ranges from 15 years (New Zealand) to 16 years (all Australian jurisdictions, except ACT). Noteworthy is that Queensland requires novice riders to have held an Intermediate or Full car driver's licence for at least 12 months prior to applying for a rider Learner's Permit. **Refer Tables A-2 and A-3.**	To date, no studies have explored the effects of licensing age on the crash risk of motorcycle riders. Among young novice drivers, crash risk has been found to decrease with increasing (solo) licensing age. It has been argued that the minimum age for obtaining a Learner's Permit and an Intermediate Licence for riders should be higher than the corresponding ages for car drivers. Doing so would serve to reduce the amount of riding (and therefore, crashes) among novices below a certain age. It would also have the possibility of encouraging potential novice riders to become novice car drivers first. The argument here is that there may be some transfer of critical skills from car driving to motorcycle riding. The extent to which this is the case is currently unclear.	One of the key results of the crash data analyses was that young riders and older Probationary riders were more likely to be involved in multiple vehicle crashes. This could be because both groups have less experience in high task demand traffic environments as they have had limited or no experience as a driver of a car. By making the possession of a full car licence a requirement for obtaining a motorcycle Learner's Permit, individuals wishing to obtain a motorcycle Learner's Permit would already have had experience in high task demand traffic environments prior to becoming a novice rider.
Time periods (minimum and maximum) for holding a Learner's Permit and an Intermediate Licence	The longer the Learner and/or Intermediate period, the greater the opportunity for practice under conditions of low-risk, and the likelihood that certain licence conditions/restrictions will be imposed for sufficient duration in order for any benefits in terms of crash risk to be realised. A maximum holding period for the Learner's Permit ensures that novices do not remain in the Learner phase indefinitely.	As with minimum age, there is much variation across jurisdictions in the minimum time period for holding a Learner's Permit and/or Intermediate Licence, and in the maximum Learner's Permit holding period. For example, for novice riders in general, the minimum Learner holding period ranges from 3 months (Victoria, NSW and ACT) to 6 months (all other jurisdictions). In contrast, the minimum Learner holding period for novice drivers is generally longer, ranging from 6 months (e.g. ACT) to 12 months (e.g. Victoria). Noteworthy is that Victoria has a reduced minimum Learner period for novice drivers over 21 years, and NSW has no minimum Learner holding period for drivers over 25 years. **Refer Tables A-2 and A-3.**	The effect of length of the Learner period and of the Intermediate period on rider crash risk has not been explored previously. In the case of novice car drivers, increasing the duration of the Learner period (by lowering the minimum age for obtaining a Learner's Permit) has been shown to have a positive effect on crash risk for those novices who made use of the longer period. However, If this effect were mediated by supervision, then it could be argued that a longer Learner period may not be as beneficial for novice riders, if the Learner period does not require supervised riding practice. It has been argued that the requirement for a maximum holding period for the Learner's Permit is particularly relevant for those rider licensing systems where supervision is not a condition of riding while on a Learner's Permit. By restricting the maximum length of the Learner period, the prevalence of "permanent learners" could be minimised and, in so doing, encourage learner riders to obtain sufficient practice and complete the requirements to graduate to the next licensing phase.	The data analysis revealed that, in general, young riders are at greater risk than older riders and, within each age category, fully licensed riders are less at risk than Learner riders or riders with a Probationary licence. This suggests that experience is critical and making sure riders safely complete the Learner and Intermediate phases of riding is very important. Longer Learner and Intermediate periods could give riders more experience but they would only be effective if they promoted novice riders gaining experience in low risk conditions.

Table 4.1 (cont.) Preliminary inventory of GLS features and components

GLS feature/ component	Description	Current rider GLS practice in Australasian jurisdictions & comparison with driver GLS	Concluding remarks from the literature review	Concluding remarks from the analysis of crash data
Supervision during the Learner phase	Supervision by an appropriately qualified individual during the Learner phase is a defining characteristic of car driver GLS. Due to the impracticalities associated with the provision of supervision for the novice rider, supervision is less often a feature of the Learner phase of rider GLS.	All jurisdictions mandate supervised driving as part of the Learner phase of car driver GLS. In contrast, only two (Queensland and Western Australia) of the nine jurisdictions require learner riders to acquire practice under supervised conditions. **Refer Table A-4.**	Supervised driving is associated with a smaller crash risk for novice drivers than unsupervised driving. For the novice rider, the effects of supervision on crash risk are unknown. In considering the merit of supervision for Learner riders, it is important to recognise that riding with a supervisor either as a pillion passenger or seated in a sidecar could increase the difficulty of the novice's task of maintaining balance and coordination. Under such circumstances, any potential benefit to be gained from supervision might be negated. To address this issue, it has been suggested that the supervisor ride near the novice rider on another motorcycle or follow closely in a passenger vehicle. However, such an approach is unlikely to be of benefit if the value of supervision derives from more than just the supervisor's physical presence. In the case of novice drivers, at least, the benefit of supervision has been reported to be in the nature of the interaction between the supervisor and the learner. Indeed, a recent trend in novice driver safety has been to educate supervisors in order to maximise the effectiveness of their supervision. The implication for riding is that, provided the supervisor is appropriately qualified and can communicate with the novice (albeit remotely), then the case could be made that Learner riders would also benefit from supervision. Suitable technology may help to address this challenge. However, despite its nature, it has been proposed that the requirement for supervision would inadvertently reduce the amount of riding by novice riders or even discourage potential riders from becoming riders, due to limited availability of appropriate supervision.	It is difficult to use crash data to determine the benefits of supervision during the learner period as it is not possible to identify crashes where the novice rider was riding in the presence of an experienced rider.
Certified hours of practice during the Learner phase	The requirement to log the number of hours of supervised practice during the Learner phase is intended to ensure that novices accrue sufficient practice, often across a range of conditions, before advancing to the Intermediate phase of licensure.	Only Western Australia mandates a minimum number of hours of supervised riding practice, and this is only for those riders who do not have a car driver's licence. In contrast, six of the nine jurisdictions require that learner drivers accrue a certain number of hours of practice. However, the minimum number of hours varies across jurisdictions. Novice drivers in both Victoria and NSW must log at least 120 hours of practice. Western Australia, in contrast, has a 25 hour minimum. **Refer Table A-5.**	To date, the effect of number of hours of certified practice on crash risk has not been explored directly. The often cited '120 hour' minimum derives from the research noted above which reported that the average number of hours accrued for those novices who made use of the longer Learner period (and for whom a reduction in crash risk was observed) was approximately 120 hours. Nonetheless, the requirement for extensive minimum hours of practice could extend the Learner period for those novices who might have otherwise hurried through this period. This would result, indirectly, in novices obtaining their Intermediate and, in turn, Full licence when they are older. In the absence of supervision as a requirement, the accrual of a minimum number of hours of practice is still an option for Learner riders. However, this approach may require a strict mentor to ensure that the log book is completed accurately and truthfully. In any event, of note is the proposition that the requirement for logging a minimum number of hours could discourage potential riders from becoming novice riders and, therefore, reduce riding exposure.	This has not been studied directly, but the data indicate that older riders are less at risk of being involved in a serious crash than younger riders. If it is assumed that older riders have greater experience than younger riders, increasing the experience of young riders while they are still Learners appears to be a good idea.

Table 4.1 (cont.) Preliminary inventory of GLS features and components

GLS feature/ component	Description	Current rider GLS practice in Australasian jurisdictions & comparison with driver GLS	Concluding remarks from the literature review	Concluding remarks from the analysis of crash data
Display of plates to denote phase of licensing	The display of 'L' and 'P' plates is intended to facilitate the enforcement of licensing conditions.	All jurisdictions require the display of plates to signify the Learner phase and, to a large extent, the Intermediate phase also. This is the case for both rider and driver licensing. Where two Intermediate phases are in place, a different look plate is used to differentiate the two sub-phases. In Tasmania and South Australia, Intermediate licence holders who have entered the second sub-phase are no longer required to display a plate. **Refer Table A-6.**	Clearly signalling the phase of licensure to other road users and the authorities plays an important role in the effective enforcement of licensing conditions.	The crash data available do not enable further comment on this topic. The data analysed pertain only to the Victorian licensing system so it was not possible to compare crash rates and circumstances with other jurisdictions that have different requirements for the display of plates.
Zero BAC	The zero BAC restriction serves to ensure that novices are not alcohol impaired when they drive or ride.	All jurisdictions, with the exception of the ACT and New Zealand, have a zero BAC restriction, which applies at least across the Learner and Intermediate phases. This is the case for both rider and driver licensing. **Refer Table A-7.**	Alcohol consumption adversely affects driving and riding performance. This is the case particularly for novices. There is strong evidence from evaluations of zero BAC among novice drivers that such a measure is effective in reducing the crash risk of this group. This result, coupled with the finding that the effects of alcohol consumption on motorcycle riding are more dramatic than on car driving (due to the role of coordination and balance in riding), confirms the value of a zero BAC for novice riders across both the Learner and Intermediate phases of licensure at least.	The crash data available do not enable further comment on this topic as BAC-related variables recorded in the crash database are largely incomplete.
Passenger restrictions	In the case of riding, passenger restrictions refer restrictions on novice riders carrying a pillion passenger or a passenger in a sidecar.	All jurisdictions, with the exception of Western Australia, do not permit the carriage of a pillion passenger. In South Australia, during the Learner phase, a pillion passenger is permitted as long as he/she holds a full rider licence. **Refer Table A-8.**	The negative effect of carrying certain types of passengers on young novice driver crash risk is well documented. This heightened crash risk has been attributed to young novice drivers' potential increased propensity to be distracted (and affected by distractions) and to take deliberate risks while driving in the presence of peer passengers. The implementation of passenger restrictions as part of driver GLS for car drivers has been shown to be effective. For a rider, carrying a passenger (as a pillion passenger or in a sidecar) makes the task of balancing the motorcycle more difficult. Aside from the potential negative behavioural effects of passengers on novices, this presents a further challenge for the novice rider. On this basis, passenger restrictions for novice riders appear well justified.	The crash data available do not enable further comment on this topic as there are very few cases of novice riders being seriously injured or killed while carrying a passenger. This is partly because of Victorian licensing restrictions on novice riders carrying pillion passengers.
Night time restrictions	Night time restrictions limit driving/riding to daylight hours.	Night time restrictions are in place for novice riders in some form in both Western Australia and New Zealand. **Refer Table A-9.**	Reduced visibility at night makes the task of driving and riding during night time hours more demanding, particularly for novices. Limiting novice car drivers' exposure to night time driving has been shown to be an effective crash countermeasure. By implication, it has been argued that novice riders would also benefit from being restricted from riding at night.	The crash data analysis indicated that young Learner riders and young Probationary riders were more likely to crash at night on weekends and at night on weekdays when compared to other categories of riders. Young fully licensed riders were also more likely to crash at night on weekends than older riders however this increased risk was not evident for crashes at night on weekdays. This suggests that one way of reducing risk for novice riders while still giving them experience of riding at night would be to restrict Learner and Probationary riders from riding at night on both weekends and weekdays, but allowing riders who have recently acquired a full licence to ride at night on weekdays but not at night on weekends for a period.

Table 4.1 (cont.) Preliminary inventory of GLS features and components

GLS feature/ component	Description	Current rider GLS practice in Australasian jurisdictions & comparison with driver GLS	Concluding remarks from the literature review	Concluding remarks from the analysis of crash data
Road type/ Location/ Speed restrictions	Road type/ location restrictions prohibit driving/riding on certain roads. Speed restrictions prohibit driving/riding above a certain speed – even if the posted speed limit is higher.	Only NSW has in place a road type/ location restriction for novice riders. Five jurisdictions impose speed restrictions as part of their GLS for riders. Western Australia has in place speed restrictions for novice drivers, but not novice riders. **Refer Table A-10.**	Roads with high traffic volume, mixed vehicle types and multiple lanes are associated with a higher task demand, particularly for novices, than other road types. In principle, travelling at lower speeds provides drivers/riders with a greater safety margin. In the literature, road and speed restrictions are often considered together, as the types of road which might be restricted are usually associated with high speeds. Studies exploring the effectiveness of road type/speed restrictions for novice drivers have shown mixed results. It has been argued, for example, that a difference in speed between novices and other road users (where the posted speed limit is higher than that permitted for novices) could act to increase crash risk. A further argument is that restricting Learners to lower speeds than posted prevents them from gaining experience at higher speeds under conditions of low-risk and supervision.	The analysis of the crash data revealed that the number of young Learner riders and young Probationary riders being involved in serious crashes in high speed zones (100-110 km/h) was less than expected. This was also true for older Learner and Probationary riders. This suggests that restricting the speed of novice riders may not be an appropriate restriction on novice riders. However, the analysis showed that young riders were more at risk of being involved in multiple vehicle crashes, which could suggest that they are more at risk when riding in high traffic volume environments where there is a higher task demand. Such environments do not necessarily correlate with parts of the road network where high vehicle speeds are allowed. Requiring novice riders to obtain a full car licence prior to obtaining a motorcycle Learner's Permit may improve the hazard perception of novice riders in environments requiring higher task demand.
Mobile phone restrictions	Mobile phone restrictions prohibit driving/riding while the novice is using a mobile phone. Such restrictions typically prohibit all mobile phone use, including hands-free.	Several jurisdictions have in place a restriction on mobile phone use for novice car drivers. However, while some jurisdictions restrict mobile phone use for all novices, driver and rider, other jurisdictions restrict use for novice drivers only. **Refer Table A-11.**	A strong association exists between mobile phone use and decreased driving performance (and therefore, increased crash risk). In general, mobile phone use while driving compromises one's ability to devote sufficient attention to the driving task. Due to their inexperience, novices are particularly at risk. Banning all mobile phone use for novice drivers and riders is well justified.	The crash data available do not enable further comment on this topic as mobile phone use at the time of the crash was not recorded in the crash database.
Engine capacity/Power-to-weight restrictions	Motorcycles vary in their engine capacity and in their power output. Engine capacity restrictions prohibit novices from riding motorcycles with an engine capacity above a certain size. Power-to-weight restrictions prohibit novices from riding motorcycles that exceed a certain power-to-weight ratio.	All jurisdictions have in place a restriction based on engine capacity, power-to-weight ratio, or both. **Refer Table A-12.**	In terms of engine capacity limits, there is some evidence to suggest that there are no overall gains in safety associated with imposing engine capacity restrictions as part of GLS. It has been argued that engine capacity restrictions are ineffective, at least in part, because some small capacity motorcycles are nonetheless very powerful. This has led to the introduction of restrictions based on power-to-weight ratio instead of, or in addition to, engine capacity restrictions (e.g. Learner Approved Motorcycle Scheme; LAMS). Further research is necessary to more definitively explore the effectiveness of such restrictions on rider crash risk. As purchasing a motorcycle is arguably viewed by many to be a large and long-term investment, any benefits associated with the requirement to purchase an approved motorcycle as part of early licensure, may carry through to full licensing. Research exploring motorcycle purchase patterns as a function of licensure would be required to explore this issue.	The analysis of crash data did reveal that there was a significant relationship between engine capacity and rider age and level of licensing. However the reduced likelihood for seriously injured young and novice riders to be riding motorcycles with higher capacity engines (greater than 500 cc) is most-likely due to licensing restrictions on what types of motorcycles novice riders may ride. Therefore, it is difficult to use crash data to determine whether these restrictions are having a positive influence on novice rider safety.
Towing restrictions	Towing restrictions prohibit novices from towing objects such as caravans and trailers.	Three jurisdictions have in place a towing restriction for novice riders during the Learner phase at least. **Refer Table A-13.**	It can be argued that towing places undue demands on novices, thus justifying restrictions on towing for at least the most inexperienced drivers and riders.	The crash data available do not enable further comment on this topic as whether the rider was towing another vehicle at the time of the crash was not recorded in the crash database.

Table 4.1 (cont.) Preliminary inventory of GLS features and components

GLS feature/ component	Description	Current rider GLS practice in Australasian jurisdictions & comparison with driver GLS	Concluding remarks from the literature review	Concluding remarks from the analysis of crash data
Automatic transmission restrictions	Automatic transmission restrictions prohibit novices from driving/riding a vehicle/motorcycle with a manual transmission. Noteworthy is that most scooters (step-through design) have an automatic transmission, while most motorcycles (step-over design) have a manual transmission.	While almost all jurisdictions have an automatic transmission restriction in place for novice drivers, only NSW and Queensland impose such a restriction on novice riders. **Refer Table A-14.**	Beyond the skills required to drive a vehicle with automatic transmission, driving a vehicle with manual transmission requires coordination of the accelerator, clutch, gears and brakes. Accordingly, controlling a vehicle with a manual transmission is generally considered to be more demanding than controlling a vehicle with an automatic transmission. A similar logic applies to motorcycles with an automatic transmission versus those with a manual transmission. If not learnt as part of driving/riding under low-risk conditions, driving/riding a vehicle/motorcycle with a manual transmission when restrictions are removed may place undue demands on novices. Automatic transmission restrictions for Intermediate and Full licence holders (for several months at least) appear logical.	The transmission of the motorcycle was not analysed in the crash as data on the transmission of the crashed motorcycle were not available.
Separate licence for scooter riders	Scooters differ from motorcycles in several ways (e.g. transmission, design) that may justify a separate licence category for riders of scooters. Scooters, as defined here, exclude mopeds.	Currently, riding a scooter (excluding mopeds) requires a motorcycle licence in all jurisdictions. Noteworthy is that Western Australia has a licence category that is specific for riders of mopeds who do not have either a motorcycle or car licence. **Refer Table A-15.**	Ultimately, whether there should be a separate licence category for riders of scooters depends on a number of factors, including the extent to which the training needs of scooter riders are adequately addressed as part of current licensing initiatives (e.g. mandatory training, tests, automatic transmission restriction). The implications, regulatory and otherwise, would also need to be considered.	The following comprise some of the broad conclusions that can be made from the analysis of scooter riders who were seriously injured or killed: (1) Scooter riders represent an increasing proportion of seriously injured or killed motorcyclists; (2) More than one third of seriously injured or killed scooter riders are Learner riders, compared with only 17% of seriously injured or killed riders of all types of motorcycles; (3) Serious crashes involving scooters are relatively more likely to occur in urban areas than are serious crashes involving conventional motorcycles; and (4) Some of the trends for when young scooter riders and older inexperienced scooter riders were at increased risk of involvement in serious crashes were similar to those identified for riders of all types of motorcycles, for example, young scooter riders showed increased risk of involvement in serious crashes at night on weekends.
Rewards (e.g. time discounts) for completion of education/ training	To encourage novices to undertake certain courses, rewards may be offered.	New Zealand offers time discounts to Intermediate drivers and riders for completion of an approved course. Intermediate licence holders in the ACT can increase their demerit point allowance by completing the Road Ready Plus course. **Refer Table A-16.**	Allowing novice car drivers, who successfully complete a training program, to graduate sooner has been found to be associated with an elevated crash rate. Given that a shorter Learner and/or Intermediate phase exposes novices to high risk circumstances earlier (the precise circumstances that graduated licensing is intended to address), the award of time discounts and other rewards for successful completion of rider training/education is not justified.	The analysis of crash data suggests that novice riders are at increased risk of being involved in multiple vehicle crashes. However the data do not enable it to be determined whether novice riders' skills in coping in high task demand environments would be improved if they completed a rider training course. Furthermore, the data do not enable it to be determined the extent to which any benefits of a rider training course would mitigate the disadvantages of reducing the Learner and/or Intermediate phases.
Exemptions/ time discounts for older applicants	Older novices differ from their younger counterparts in maturity and lifestyle. As age is an important contributing factor to young novice crash risk, some jurisdictions offer exemptions or time discounts to their older applicants.	Several jurisdictions offer exemptions or time discounts for older applicants (e.g. reduced Learner period). **Refer Tables A-1 to A-3, A-5 to A-9, and A-16.**	Irrespective of age, inexperience is a primary contributing factor to novice driver crash risk. Through experience, novices learn the critical skills for safe driving/riding. GLS aims to provide novices with opportunities to gain experience under conditions of low-risk. Providing older novices with exemptions and time discounts may compromise this aim.	Analysis of the crash data revealed that there are differences between older novice riders and younger novice riders in both their risk of being involved in a serious crash and the types of crashes in which they are involved. For example, the risk associated with young riders riding at night was not evident for older Learner riders. Furthermore, serious crashes involving young Learner riders were more likely to involve multiple vehicles than serious crashes involving older learner riders.

Table 4.1 (cont.) Preliminary inventory of GLS features and components

GLS feature/ component	Description	Current rider GLS practice in Australasian jurisdictions & comparison with driver GLS	Concluding remarks from the literature review	Concluding remarks from the analysis of crash data
Testing	Progression from one phase of licensing to the next typically requires successful completion of certain tests. In order to maximise pass-rates, tests also serve to encourage novices to accumulate driving instruction and experience. The types of tests administered as part of GLS include, Knowledge tests, Practical tests, Hazard perception tests, and Exit tests.	All jurisdictions administer tests as part of GLS. While the practical tests for drivers are typically carried out on-road, there is variability across jurisdictions as to whether the practical tests for riders are undertaken on-road or off-road at a training facility. Few jurisdictions require completion of an exit test for novices to progress from Intermediate to Full licensure. **Refer Table A-17.**	Knowledge tests ensure that novices have a basic understanding of road laws prior to entering the road environment. However, the relationship between passing a knowledge test and driving performance is not clear. Practical tests ensure that novices have acquired the minimum skills to operate a vehicle/motorcycle. However, it has been argued that as most motorcycle practical tests are conducted off-road at a training facility, and often in a small and restricted area, the ability of these tests to measure vehicle control skills at typical on-road speeds is limited, as is their ability to measure higher order cognitive skills. Thus, while the rationale behind practical, performance based tests is sound, it has been argued that there is a need to improve the quality of the tests (e.g. through increasing the focus on hazard perception) to maximise the potential value and effectiveness of practical tests. One recommendation is that off-road testing (i.e. at a training facility) be undertaken to obtain a Learner's Permit, and on-road testing be carried out in order for the rider to advance to the Intermediate licence phase. A relationship exists between reduced hazard perception ability and heightened crash involvement among novice riders. Thus, the requirement for successful completion of Hazard Perception test as part of GLS is sound. In order to maximise the effectiveness of such tests for riders, it is imperative that the tests target those hazards that are most relevant to riders. Exit tests ensure that novices have achieved a certain level of skill before graduating to a full licence. These tests typically target higher order skills. Exit tests hold promise as a means to determine those novices who might be at greater risk of collision should they be granted a full licence prematurely, and thus, identify those individuals who should continue on a restricted licence for longer.	The analysis of the crash data suggested that novice riders who did not already hold a full car licence were at greater risk of being involved in multiple vehicle crashes. It is possible that these riders are deficient at riding in environments that require well-developed hazard perception skills. Such skills may enable them to better anticipate the movement of other traffic units.
Mandatory training	As with testing, progression from one phase of licensing to the next may involve completion of a compulsory training course.	Most jurisdictions require novice riders to complete training to enter the Learner phase and also the Intermediate phase. **Refer Table A-18.** Optional training is offered by some jurisdictions (e.g. Victoria)	In general, training is considered to play an important role in bringing novices to the point of being sufficiently competent to pass their test to become a Learner's Permit or Intermediate Licence holder. However, it has been argued that most current courses are too short to provide novices riders with the necessary and sufficient skills (both vehicle control and higher order cognitive) that they need to safely ride a motorcycle on the road. One recommendation is that the completion of courses which take place over a number of days be mandated, and that the courses incorporate both off-road and on-road practical components.	The analysis of the crash data revealed that novice riders who did not already hold a full car licence were at increased risk of being involved in multiple vehicle crashes. There was also evidence that young riders were at increased risk of being involved in serious crashes at night. Introducing mandatory training that address the specific deficiencies of different groups of novice riders could potentially reduce the involvement of these riders in serious crashes.

Table 4.1 (cont.) Preliminary inventory of GLS features and components

GLS feature/ component	Description	Current rider GLS practice in Australasian jurisdictions & comparison with driver GLS	Concluding remarks from the literature review	Concluding remarks from the analysis of crash data
Reduced demerit point thresholds & other penalties for traffic and licence condition violations	Reduced demerit point thresholds (relative to fully licenced drivers/riders) and other penalties for traffic and licence condition violations are important tools for user compliance of licence conditions. They also serve to ensure that at-risk novices do not advance prematurely through the licence phases, and to discourage aberrant driving behaviour.	Most jurisdictions have in place as part of their GLS a strict penalty system for lack of adherence to traffic and licence conditions. These penalty systems include, at a minimum, a lower demerit point threshold for novices than for fully licenced drivers/riders. **Refer Table A-19.**	An association between lower demerit point thresholds and reduced incidence of crash involvement and traffic violations has been observed. In one study, relative to a control group, fewer crashes and traffic violations were reported for those drivers who were subject to a lower demerit point threshold condition as part of their GLS. Further, for those novices who did reach the demerit point threshold, a reduction in recidivism following licence suspension was found. In general, further research is necessary to explore the effectiveness of the various penalty mechanisms in place.	The crash data did not provide details on the infringement history of riders seriously injured or killed in motorcycle crashes. Therefore it is difficult to use the crash data to estimate the effect on safety of the way penalties to novice riders are applied.
Use of technology	In-vehicle technologies could assist in the enforcement and compliance of licence conditions.	Alcohol interlocks are a type of in-vehicle technology that is already being used in several jurisdictions. **Refer Table A-19.**	The positive effects of certain in-vehicle technologies on driving performance and safety are well documented. The use of in-vehicle technology to provide appropriate supervision or feedback to novice riders is an avenue worthy of consideration.	Technology to assist riders in high task demand environments could assist young riders when they first encounter these environments. Such technology could include vehicle proximity sensors to alert riders of the presence of other vehicles travelling close to them. Technology to discourage riders from infringing against the restrictions applicable to their level of licensing could also be considered. The electronic recording of distance driven could be used in combination with a learner log book to encourage riders to gain riding experience during their Learner phase. A flash video recorder could be used to deter novice riders from taking part in risky riding behaviours. The flash camera could be used to record and store video images of events immediately prior to a crash or a near-miss event occurring. In cases where the rider responded to a hazard, the video footage could also be used in a training or supervision environment to review whether the rider responded to the hazard safely. Triggers that indicate a dangerous event or near-miss could include excessive acceleration, cornering at an inappropriate speed or an evasive side-to-side manoeuvre. This would require the installation of an accelerometer as well as a flash camera.

Chapter 5 Stakeholder Workshop

5.1 Overview

A workshop hosted by MUARC was conducted with representatives from key stakeholder organisations and bodies on Thursday 28 May 2009. The main objective of the workshop was to discuss the preliminary inventory of rider GLS components in terms of potential issues relating to implementation, user acceptance, compliance, mobility, enforcement and economic implications.

A list of invitees was generated by VicRoads in consultation with MUARC, and included representatives from Victoria Police, the Department of Justice, the Transport Accident Commission (TAC), the Road Traffic Authority of New South Wales (RTA – NSW), VicRoads, MUARC, and the Victorian Motorcycle Advisory Council (VMAC). Established in 1998, the role of VMAC is to provide the State Government with strategic advice on issues relating to the management and development of motorcycling in Victoria. As outlined on the VicRoads web site, "the structure and wide-ranging membership of VMAC ensures that the balanced advice that it provides is contemporary, well informed and represents the views of the motorcycling community". The final list of workshop participants is given in Table 5.1.

Table 5.1. Workshop participants and represented stakeholders

Stakeholder representative	Stakeholder
[redacted]	Victoria Police
[redacted]	Dept of Justice
[redacted]	TAC
[redacted]	VMAC
[redacted]	VMAC
[redacted]	RTA - NSW
[redacted]	VicRoads
[redacted]	VicRoads
[redacted]	VicRoads
[redacted]	MUARC
[redacted]	MUARC
[redacted]	MUARC
[redacted]	MUARC
[redacted]	MUARC

Following a presentation of the project overview, including the overall project aims and progress completed to-date, an inventory of 20 rider GLS components was reviewed by the

group. A handout (Table 4.1 and Appendix A) was provided to each participant two weeks prior to the workshop that described each component, the current state of GLS practice in Australasian jurisdictions for each component as well as relevant findings from both the literature review and the analysis of crash data. The rider GLS components which were considered at the workshop were:

1. Number and nature of phases;
2. Minimum age for obtaining a Learner's Permit;
3. Time periods (minimum and maximum) for holding a Learner's Permit;
4. Supervision during the Learner phase;
5. Certified hours of practice during the Learner phase;
6. Display of plates to denote phase of licensing;
7. Zero BAC requirement;
8. Passenger restrictions;
9. Night time restrictions;
10. Road type/speed restrictions;
11. Mobile phone restrictions;
12. Engine capacity/power-to-weight restrictions;
13. Towing restrictions;
14. Automatic transmission restrictions and separate licence for scooter riders;
15. Rewards (e.g. time discounts) for completion of education/training;
16. Exemptions/time discounts for older applicants;
17. Testing;
18. Mandatory training;
19. Reduced demerit point thresholds and other penalties for traffic and licence condition violations;
20. Use of technology; and
21. Other

The main discussion points for each of the rider GLS components are summarised below.

5.2 Main Discussion Points

5.2.1 Number and nature of phases

The general consensus of the stakeholder group was that simplifying the motorcycle rider GLS system in Victoria would be a positive change. Many participants favoured a simpler structure of licensing phases than the current situation, especially if there was no evidence from the crash data to reject such a decision. It was reported that police officers have

difficulty interpreting the current GLS in Victoria; a GLS that is difficult to understand will also be one that is difficult for police to enforce. Finally, it was noted that greater consistency across all Australian states and territories in terms of the number and nature of motorcycle GLS phases would be desirable.

5.2.2 Minimum age for obtaining a Learner's Permit

Several participants noted that VicRoads is unlikely to change or lower the current age for obtaining a motorcycle Leaner's Permit. It was explained that the reason why the Leaner's Permit minimum age in Victoria for riders is 18 years, while that for car drivers is 16 years, is so as not to increase the likelihood that young people will opt to ride a motorcycle instead of a car, the latter being the safer form of transport.

There was some discussion of the situation in other states: Queensland, for example, requires that a new motorcycle rider must have had a driver's license for at least one year before being issued with a Learner's Permit to ride a motorcycle. The more general point being discussed here was to what extent there is transfer of skill from car driving to riding. It was also mentioned that hazard perception skills that are developed when driving a car are believed to be very different from those developed whilst riding a motorcycle. The transfer of skills from motorcycle to car is also probable.

Finally, the issue of driver distraction was raised. It was argued that riders are generally more focussed on the task of riding than car drivers are on the task of driving and, as such, motorcycles are more vulnerable in terms of being hit by a vehicle driven by a distracted car driver. The risk of a car being hit by a motorcycle ridden by a distracted rider is much less, and the outcome would be much less serious. Regardless, participants agreed that more research was needed before changes to the minimum Learner's Permit could be considered, and should not be changed on a 'leap of faith' basis.

5.2.3 Time periods (minimum and maximum) for holding a Learner's Permit

It was explained that the reason why the current Victorian rider GLS has a short Learner phase (3 month minimum and 15 month maximum) relative to that for car drivers is because of the absence of a requirement for supervised practice. Moreover, the 15 month maximum, in principle, serves to ensure that Learner riders remain engaged during the Learner period.

It was stressed that the duration of the Learner's phase must take into account any training and/or knowledge tests that may also be required. More generally, consideration must be given to the possibility of extending the minimum duration of the Learner's phase, especially if a requirement for supervised riding is added to the motorcycle GLS. Consideration must also be given to whether to extend the duration of restrictions (LAMS, no pillion passenger), which currently must be adhered to for the first 12 months of licensure.

5.2.4 Supervision during the Learner phase

In some other jurisdictions internationally (e.g., Quebec, Canada), there is a requirement for supervised riding, with the supervisor (minimum 2 years riding experience) accompanying the novice rider on a separate motorcycle. In Western Australia, there is a requirement for a

supervisor to accompany the novice either as a pillion or sidecar passenger, or on another motorcycle behind the novice rider. There is also a requirement of 25 hours minimum supervised riding for riders who do not hold a car driver's licence.

Discussion ensued regarding the importance of effective communication between supervisor and Learner rider in order to maximise the effectiveness of supervision. It was discussed that the United Kingdom currently has a requirement for an instructor to ride behind the novice on a separate motorcycle. One-way communication occurs via an ear piece. It was argued, however, that the required skills to communicate through the radio would be too difficult for a novice, and would entail high task demand. Another option would be to have a post-ride 'debrief' session after each practice ride.

Caution regarding this measure was also made with respect to the increased risk of crashing when a novice rider rides as part of a group. There is also the concern that, if the supervisor is an older rider who has not received any formal training or been adequately tested, then the supervision component would simply allow for bad habits to be passed along to the novice. There is also the concern that peer pressure to ride in situations that may not otherwise be ridden in might take place, which would further increase crash risk.

5.2.5 Certified hours of practice during the Learner phase

Stakeholders made a number of comments with respect to this possible GLS component, including the suggestion, based on an interpretation of previous research involving novice car drivers, that the number of practice hours must be at least 120 hours in order to be of benefit. It was also argued that, to be of benefit, the practice must be supervised, which then raises the previously mentioned issues regarding a possible requirement for supervision. If a requirement for a logbook were put in place, there would have to be some sort of associated repercussions for the rider if the logbook were not completed.

Some participants were wary that it may not be a good idea to mandate a certain number of minimum hours of riding time; that this would be of questionable value. A 'learning journal' was raised as another possibility through which novice riders could manage their learning process; they could self-restrict the conditions that they are exposed to, and the learning journal would provide guidance as to which conditions to ride in on a gradual basis. For example, as their skills base increased by riding in different conditions, novices could add further riding conditions at later stages that included increases in complexity. Guidelines would have to be very concrete, in order to minimise the likelihood that novice riders would overestimate their skills too early in the process.

Whatever the case, if a decision is made to require a certified amount of practice, it would be imperative to use an objective measure, and that this requirement would need to be accompanied by concrete guidelines regarding riding conditions as a function of complexity.

5.2.6 Display of plates to denote phase of licensing

The general consensus of the stakeholder group regarding the display of plates was that it would help with ease of enforcement, especially in terms of passenger restrictions and engine size restrictions. Indeed, the GLS literature reinforces that the display of plates is essential in terms of effective enforcement.

5.2.7 Zero BAC requirement

The finding that the effects of alcohol are more significant in motorcycle riders than in car drivers, in terms of alcohol's effects on balance and perceptual skills, was discussed. Unfortunately, there is a paucity of information regarding the effects of alcohol in fatal and serious injury motorcycle crashes, and the data analysis conducted for the present project was not able to determine the contribution of alcohol impairment to motorcycle crash risk.

In NSW, data show that involvement of alcohol among fatal motorcycle crashes is greater than that for car crashes. The 'borrowed bike' problem (riding a bike that is not their own) was also mentioned as a very significant problem in NSW and potentially, in other jurisdictions as well.

An option that was raised as a possibility was to increase the duration of the alcohol restriction to last for the entire early riding period, whether a rider is fully licensed or not, up to a certain age (e.g., up to the age of 26). The decision would depend on what future crash data reveals.

According to some stakeholder representatives, the compliance rate for alcohol restrictions in motorcycle riders is very high (according to breathalyser 'blitzes' over certain weekends). The possible use of alcohol interlocks for motorcycles was also discussed. Finally, the use of drugs by motorcycle riders was raised as being more of an issue than the use of drugs by car drivers.

There is a case for an extended zero BAC, regardless of a riders' experience. It was proposed that such a change could be based on 'first principles' analysis alone, instead of requiring supportive crash data.

5.2.8 Passenger restrictions

It was reported that, in NSW, the current practice is to not allow any passengers under the age of 18. This requirement was enacted because of the belief that people under that age are not able to make accurate assessments regarding the risk they assume when riding a motorcycle as a passenger.

It is clear that having a pillion passenger affects a rider's balance and coordination. Side cars, although easier to balance, are more difficult to control, and add to the complexity of the riding task. This applies to motor trikes as well, which also happen to be overrepresented in crashes. Motor trikes are currently excluded from the LAMS list in Victoria. Weight distribution (that occurs when riding with a pillion passenger or when a motorcycle is overloaded) is linked to an increase in crashes.

There is already a requirement for P1 licence holders to not carry passengers. The question, therefore, is whether the licensing authority should increase this restriction phase to include all P2 riders as well, and to extend beyond the 12-month restriction period for novice Fully licensed riders.

Finally, the more general comment was made of the possibility of removing restrictions in staggered phases, rather than removing them all at once, which is what happens currently. Group members also stressed that it is important to educate novice riders as to *why* there are these restrictions in place.

5.2.9 Night time restrictions

There are currently no night time restrictions in place for motorcycle riders in Victoria. NSW also has no night time restrictions; reportedly because there is not enough significant data to support such a restriction. It was acknowledged that it is difficult to do proper crash risk analyses, as there is currently no day *vs.* night exposure data available. Crashes that occur at night typically involve multiple vehicles and occur in suburban locations. This supports the contention that recreational riding is a much bigger issue, in terms of crashes, than riding for commuting.

Some stakeholders urged VicRoads to consider issues regarding potential mobility reduction if night time riding restrictions were introduced. Any consideration that is given to these issues should be supported by strong evidence. Enforcement of such restrictions should be eased if a rider can demonstrate the need to commute during night time hours.

To introduce a 10pm to 6am restriction, for example, it would be necessary to look at the detailed profile of crash risk. It may be only necessary or beneficial to have a night time restriction for the Learner phase of GLS. Also, consideration must be made for the possibility that a night time restriction might have the unintended effect of reducing practice time for novices.

5.2.10 Road type /Location /Speed restrictions

Stakeholders did not, in general, support the restriction of riders from riding on roads with certain speeds, as this would mean that riders would avoid getting experience on these roads. It was also expected that restrictions related to time of day, would be likely to address many of the same risks involved with type or speed of road.

Speed restrictions that apply only to motorcycles and/or scooters (for example, restricting these vehicle types to only 80 km/h on freeways) were not supported by the stakeholder representatives. Participants thought that, in this case, the speed differential between the motorcycle and other vehicles would increase the risk of a collision beyond any benefit to be gained by the original speed restriction. Finally, the group agreed that road type / speed restrictions would be very difficult for police to enforce.

5.2.11 Mobile phone restrictions

Mobile phone restrictions were not discussed at length due to lack of time. However, a mobile phone restriction for both Learner and *all* newly licenced riders was seen as positive.

5.2.12 Engine capacity / Power-to-weight restrictions

Group consensus was that the length of duration of the LAMS restriction should be extended to full P1 and P2 phases (not just P1). It was also agreed that VicRoads should continue to keep a list of LAMS-approved motorcycles on its web page, and that this list should be updated regularly. It was also stressed that restrictions related to engine capacity and/or power-to-weight restrictions should be consistent across Australian states and territories.

5.2.13 Towing restrictions

The group agreed that towing restrictions should remain as they are currently (i.e. no towing allowed during the Learner and P1 phases).

5.2.14 Automatic transmission restrictions and separate licence class for scooter riders

With respect to this proposed measure, as well as that regarding the possibility of having a separate licence for scooter riders, the group agreed that it would be best to base any possible licensing restriction in these areas to *transmission type* (manual *vs.* automatic), rather than vehicle type. Participants mentioned that it would be too difficult to define what does, and does not, constitute a motorcycle or a scooter, and that it would be too cumbersome to maintain a current list of all scooters and/or motorcycles. With this potential system, riders would have the option of getting two separate licences, one for riding motorcycles and one for riding scooters.

A suggestion was made that any restriction that would be based on transmission type should remain in place until at least the end of the Probationary or restricted phase of licensing. In NSW, the automatic transmission restriction (in cars) ends automatically after the P1 phase (no test required). This is also the case for car licences in Victoria. However, the popularity of automatic transmission cars makes this issue less significant for cars than for motorcycles, which are mostly equipped with manual transmissions.

5.2.15 Rewards (e.g. time discounts) for completion of education/training

Participants discussed this option, but agreed that available research evidence does not currently support such a reward system. Further, there is the issue of whether easing of restrictions/progression through GLS should be based on the number of demerit points, rather than simply on time since initial licensure.

5.2.16 Exemptions/time discounts for older applicants

Exemptions for older novice riders are already in place in Victoria in that applicants who are aged over 21 years and who do not hold a car licence progress straight from the Learner's to the P2 phase upon being awarded their rider's licence. Unless analyses of relevant crash data demonstrate that crash risk is higher in young novice riders relative to older novice riders, then exemptions/time discounts for older applicants are not well justified.

5.2.17 Testing

The group discussed whether there is a need for an Exit test from the Learner phase. The ACER test (1999, in Victoria) was shown to reliably predict crashes, and further evaluation of this test is being planned. NSW is currently considering whether to build and/or require an exit test after the P2-phase. This would be based on the NSW Driver Qualification Test, which is the computer-based exit test completed by car drivers at the end of the P2 phase to

graduate to the Full licence. The test targets advanced hazard perceptions skills, and knowledge of road rules and safe driving practices.

It was stated that any testing program would take upwards of $2 million to develop and test, and that it would require a lengthy development time; however, another participant informed the group that the technological platform that would support such testing already exists, so this estimate is most likely inflated.

5.2.18 Mandatory training

The group discussed whether there is a need in Victoria for mandatory training. It was mentioned that, currently, the number of students who seek out training programs is quite high, and the pass rate from these training programs is also quite high. The point was made that, if such is the current state of affairs, and there is only approximately 2% of novice riders who are missing out on training, then why not 'close the gap', and require training for all riders? Cost considerations need to be made if such a scheme were to be put into place. There would also be a need to demonstrate that those who do not engage in training are also those riders who have a higher crash risk. Currently, there is no evidence to support such a contention.

Other points to consider regarding mandatory training that were raised by participants included: 1) the need to evaluate any training programs (current and future), 2) the need for any training program to emphasise higher order skills training, 3) the need to consider equity across riders' socioeconomic status, and the possibility that requiring a training program may make it difficult for some people to access this, relatively cheap, form of transportation, 4) the fact that motorcycle groups are not currently in favour of required training, 5) the need for funding for any training program development, and 6) the need for an on-road assessment component of any training program.

5.2.19 Reduced demerit point thresholds & other penalties for traffic & licence condition violations

See discussion for Sections 5.2.16 and 5.2.17 , above.

5.2.20 Use of technology

The potential use of simulation in motorcycle training programs was mentioned, as was the use of in-vehicle technology to provide feedback to novice riders. There is technology that is currently available (e.g. DriveCAM) that is capable of achieving this in car drivers. The use of technology as a training tool was generally seen by participants in a positive light, and it was also noted that this technology could be used in a testing capacity as well.

It was stressed by several group members that consideration should be given to the requirement for manufacturers to produce motorcycles with antilock braking systems (ABS), as novice riders in particular are well-known to have problems in the area of safe braking, and this technology would assist them in this regard. Value of ABS in motorcycles would be similar to the safety benefits of electronic stability control (ESC) and air bags in cars. ABS is currently available in motorcycles, and the cost during the manufacturing stage is manageable (unlike ESC and other technologies), so its inclusion in new motorcycle models should be

considered. It was noted, however, that the cost of ABS is still approximately $1000 per motorcycle. It was also noted that Europe is considering mandating ABS in motorcycles.

Participants also discussed the possibility of using alcohol interlocks on all motorcycles, especially when considering longer-term safety options for motorcycles (and cars).

5.2.21 Other

A significant discussion took place regarding the possibility of introducing a requirement for protective gear to be worn as part of testing. The implication being that, once purchased for the test, riders would continue to wear the gear post testing. There are currently many riders who do not wear protective gear when riding, and this is especially the case for scooter riders. If safety gear were mandated, even if only for the Learner test, participants agreed that that would increase the usage across all riders. The requirement for protective gear standards was noted, as was the option to require 'full skin coverage' as an alternative to a certain type of gear. It was also noted that standards in this area currently exist in Europe, and it would be acceptable to explore the use of these standards in Victoria.

5.3 Conclusions

In summary, the workshop provided the opportunity for representatives from a stakeholder group of motorcycle training, safety, policy, and enforcement experts to discuss a number of components that could be considered in order to enhance the Victorian GLS for motorcycle riders. Group members agreed that several of these components were more likely than others to allow for significant benefits and/or have fewer issues relating to implementation than others, and were identified as representing areas for further consideration by VicRoads. These key areas are listed below:

- Minimum and maximum time periods for holding a Learner's Permit;
- Certified hours of practice during the Learner phase (quantity and quality);
- Display of plates to denote phase of licensing (should apply to all novice riders including those who are on a Full licence with restrictions);
- Zero BAC (proposal to extend duration of current restriction);
- Night time restrictions;
- Mobile phone restrictions (should apply to all novice riders);
- Automatic transmission restrictions (as an alternative to a separate licence class for scooter riders);
- Exemptions/time discounts for older applicants;
- Testing; and
- Requirement for protective gear at testing.

Chapter 6 Focus Groups

6.1 Introduction

Two focus groups were conducted to gather information on new riders' perceptions of the current licensing process for motorcyclists in Victoria, and on specific graduated licensing components. On the basis of the discussion with stakeholder representatives at the previously held workshop, a subset of graduated licensing components was selected for targeted discussion in the focus groups. The components, or aspects of components, selected for discussion (based on the outcomes of the previous research activities) were:

- Display of plates for riders on a Full licence with restrictions;
- Minimum Learner's Permit age;
- Length of the Learner phase (including minimum and maximum lengths);
- Supervision during the Learner period & logging hours of practice;
- Length of zero BAC restriction;
- Length of pillion passenger restriction;
- Night time restriction;
- Length of the LAMS restriction;
- Automatic transmission restriction & separate licence class for scooter riders;
- Testing (on-road v off-road) & training (mandatory v voluntary); and
- A minimum protective gear requirement at testing.

The current Chapter provides an outline of the focus group method followed by a presentation of the key findings. Prior to undertaking this research, approval was obtained from the Monash University Standing Committee on Ethics in Research Involving Humans.

6.2 Method

6.2.1 Participants

Two focus groups were conducted with a total of 13 participants. Each participant was involved in a single focus group only. All participants were considered to be new to riding in that they were holders of:

- a valid Victorian motorcycle Learner's Permit (or were intending to apply for one in the next 3 months); or
- a valid Victorian motorcycle Probationary licence and had held that licence for no more than 12 months); or

- a valid Victorian motorcycle Full licence and had held that licence for no more than 12 months (i.e. "Full licence with restrictions").

One focus group was held with "young, new riders" . To be eligible for this group, new riders were required to be aged between the ages of 18 and 25 years. A second focus group was held with "older, new riders". To be eligible for this second group, participants were required to be aged 30 years or older.

Several strategies were used to recruit participants for the focus groups. Word-of-mouth, as well as flyers distributed across the Monash University Clayton and Caulfield campuses, local Shopping Centres, and by rider training providers, were the most successful strategies. All participants provided written informed consent prior to taking part in their focus group, and were compensated $20 for their involvement.

Group 1 – Young new riders

Seven participants, five males and two females, attended the first focus group. Participants ranged in age from 18 to 23 years, with a mean age of 20.7 years. Four participants were current holders of a rider Learner's Permit, while the remaining three participants were within the first 12 months of their rider's licence (either P1, P2 or Full). The average age at which participants obtained their Learner's Permit to ride a motorcycle was 20.3 years (Range 18 to 23 years). Across participants, the number of hours reported to be spent riding each week on average ranged from 2 to 8 hours, with a mean of 4.9 hours. All participants owned their own motorcycle or scooter. Six participants indicated that they ride a motorcycle, while two participants indicated that they ride a scooter. (One participant rode both a motorcycle and a scooter.) The engine capacity of these vehicles ranged from 125 to 600cc, with four of the seven participants riding a motorcycle with an engine capacity of 250cc.

All participants in the young, new rider group were also licensed car drivers. Three participants were current holders of a Full car driver's licence, while the remaining four participants all held a current Victorian Probationary car driver's licence. The average age at which participants obtained their car driver Learner's Permit was 16.7 years (Range 16 to 21 years). Across participants, the number of hours reported to be spent driving each week on average ranged from 2 to 12 hours, with a mean of 5.7 hours.

Group 2 – Older new riders

The second group comprised six participants: five males and one female. Participants' age ranged from 30 to 39 years, with a mean age of 34.7 years. Four participants were current holders of a Full rider's licence with restrictions, that is, they were within the first 12 months of their rider's licence. The remaining two participants either held a current, or were intending to apply in the next three months for a, rider Learner's Permit. The age at which participants obtained their rider Learner's Permit ranged from 27 to 36 years, with a mean age of 33.3 years. For those participants who were already qualified to ride a motorcycle on road, the reported average number of hours spent riding each week ranged from zero to 11 hours, with a mean of 3.8 hours. All six participants indicated that they ride, or intend to ride, a motorcycle. There were no scooter riders in the group. Five participants indicated that they own their own motorcycle. The engine capacity of these motorcycles ranged from 250 to 650cc, with three of the five participants riding a motorcycle with an engine capacity of 250cc.

All participants in the older, new rider group were fully licensed car drivers. The age at which participants obtained their car driver Learner's Permit ranged from 16 to 19 years, with a mean age of 17.7 years. Across participants, the number of hours reported to be spent driving each week on average ranged from one to 14 hours, with a mean of 7.8 hours.

6.2.2 Discussion guide

A list of open-ended questions was developed to guide the focus group discussions. The opening question asked for participants to express their reasons for becoming a rider, and to discuss any general comments regarding the current Victorian rider licensing process. This led on to a more targeted discussion of selected individual licensing components. These components were listed above in the Introduction to the Chapter.

6.2.3 Procedure

Both focus groups were held at the Accident Research Centre, which is on the Clayton campus of Monash University. The duration of each focus group session was approximately two hours and each session proceeded in the following manner:

- Introduction: Participants were given a brief overview of the project, and were briefed on the aims of the focus groups.
- Guided discussion: The discussion generally followed the format set out in the discussion guide, however, with some minor variation between groups in terms of the order in which individual licensing components were discussed.
- Final matters: Participants were thanked for their attendance and received their payment.

Two members of the project team conducted the focus groups. One of the researchers facilitated the discussion, while the other researcher documented the key discussion points. Both sessions were recorded, and the recordings were later used to augment the key discussion points as needed.

6.2.4 Data analysis

For the opening question and each of the individual licensing components considered, the key themes were extracted. Consistencies and inconsistencies in the views between groups are also highlighted.

6.3 Results

6.3.1 Reasons for becoming a rider

The primary reasons for becoming a rider (and by implication, going down the path of obtaining a rider's licence) varied between the young and older groups. Participants in the young, new rider group first expressed that their reason for wanting to ride a motorcycle was because of their perception that riding a bike is fun. The primary reason, however, was based

on the view that the costs associated with riding a motorcycle are less than those associated with driving a car. The main reason, therefore, was financial. The main reason for older participants, in contrast, was either that they had developed an interest in motorcycles only recently or that, while they had always wanted to ride a motorcycle, they had not taken the opportunity to obtain a licence until recently.

6.3.2 General comments regarding the current Victorian rider licensing process

Participants' main comment was that the licensing process for riders is confusing. The young, new riders felt that the rider licensing path for individuals who were Probationary car drivers was particularly unclear. Specifically, there was confusion as to the distinction between the red and green Probationary phases for motorcycle riders who were already Probationary car drivers in terms of the duration of each phase and in terms of which restrictions apply during each phase. There was also some confusion as to whether a mobile phone restriction applied to all newly licensed riders, even those new riders who were on a Full licence with restrictions, or whether this restriction applied to new drivers during the red Probationary phase only. Participants in the older, new rider group, in particular, noted some confusion regarding LAMS in terms of which motorcycles are on the list of approved motorcycles and which ones are not. For example, it was noted that there is a discrepancy between what is advertised or marketed as a LAMS motorcycle and what actually appears on the VicRoads LAMS list. More generally, participants reported that the VicRoads website did not provide them with current and clear information regarding the rider licensing process.

6.3.3 Display of plates for riders on a Full licence with restrictions

The majority of participants, irrespective of group, felt that a requirement for holders of a Full licence with restrictions to display a plate to denote their novice status would be a positive change. There were two main reasons for this point-of-view. Firstly, participants felt that it would facilitate the enforcement of restrictions. Secondly, participants felt that it would be useful for conveying to other road users that they are novice riders. All participants agreed, however, that introducing an additional look plate to be used by only those riders on a Full licence with restrictions would add to the confusion which they believe already surrounds the red and green plates for Probationary riders. Participants suggested that riders who are in the first 12 months of their licence should all display the same look plate, irrespective of their age and of their driver's licence status.

6.3.4 Minimum Learner's Permit age

Across the two groups, participants, in general, felt that the current minimum age (18 years) at which an individual can apply for a rider Learner's Permit in Victoria is appropriate. Participants felt that the higher minimum Learner age for riders relative to car drivers encouraged individuals to first become car drivers and thus gain on-road experience under more protected circumstances than might otherwise be the case if they were permitted to start riding at a younger age. The young, new riders felt that it was inappropriate for individuals' first experience on the road to be without supervision, which would be the case if they were to become Learner riders before Learner car drivers. It was expressed that, at least in the current

system, 18 year old Learner riders will have had up to two years to experience traffic in the presence of a supervisor, who is perceived as having a protective influence. The older, new riders felt that being a driver first provided the basic foundation for becoming a rider. While it was acknowledged that riding a bike requires the use of skills that are not involved, or not involved to the same degree, in driving a car, it was felt that being a car driver first helped prospective riders transition into riding. The older, new riders also felt that, as experienced drivers, they had a better awareness of how other drivers perceive and interact with riders and so, were in a position to self-regulate their riding performance to allow for the perceived limitations of drivers in interacting with riders on the road.

6.3.5 Length of the Learner phase

Currently in the Victorian system, the minimum period for which an individual must hold a rider Learner's Permit before applying for a motorcycle licence is 3 months. Participants were asked whether they felt that this minimum duration is appropriate. Overwhelmingly, all participants, irrespective of group, felt that the current minimum duration is too short. Participants felt that a longer Learner period would maximise the opportunity for practice before obtaining a licence. Indeed, of the riders who took part in the focus groups, the majority had waited more than three months before taking the licence test because, at three months, these participants did not feel that they were "ready" to take the test. Participants in the young group who did not already have a Full car driver's licence expressed that they perceive the first 12 months of the Probationary phase (i.e. red phase) to be a continuation of the Learner phase. This is because the restrictions that apply during the Learner phase also apply during the red Probationary phase, and secondly, because the licence test is perceived to be too easy to pass. The implication, it was felt, is that there could be licensed riders on the road who have had very little, if any, on-road practice while on their Learner's Permit. While the same sentiment was said to apply irrespective of whether the rider was a Probationary rider or a Fully licensed rider with restrictions, the Probationary rider, it was felt, would be more protected on the road as he/she would be required to display a plate to denote his/her novice rider status.

In essence, it was felt that the "short" minimum Learner phase duration, coupled with the 15 month maximum duration without the option to renew, forces Learner riders to take the licence test, even if they do not feel sufficiently prepared. The risk, as stated above, is that there could be riders on the road who are licensed, but who have had limited prior experience. However, it was acknowledged, that not all riders fall into this category. Indeed, represented at the focus groups were riders who indicated that they had ridden everyday while on their Learner's Permit and had undertaken the licence test at 3 months. Thus, even though these riders would have held their Learner's Permit for 3 months only, they may, at the time of the licence test, actually have had more riding experience than those riders who did not ride or rode sporadically during the Learner phase and sat their licence test at later than 3 months. For some participants, this raised the issue of whether the point at which riders could apply for the licence should be experience, or competency, based.

In conclusion, participants felt that a minimum Learner Permit duration of longer than 3 months would be appropriate. While participants did not state explicitly that the maximum Learner period should be longer than 15 months, they did express that Learner riders should be permitted one opportunity to renew their permit without having to redo the Learner test. As returned to below, participants also expressed their perception that the current licence test is too easy to pass, even by those riders who have not taken the opportunity to accrue experience during the Learner period.

6.3.6 Supervision during the Learner period and logging hours of practice

Participants were advised that, in some Australian states other than Victoria, Learner riders are not permitted to ride unless they are accompanied by a supervisor. Participants in both groups were unanimous in their dislike of a supervision requirement for riders during the Learner period. It was felt that the requirement to ride with a qualified supervisor would be impractical. Many of the older riders felt that it would deter people from riding (including themselves) as it would be too difficult to find a suitable supervisor. Moreover, it was felt that, even if a suitable supervisor were available, it could reduce the amount of practice that some riders might have otherwise accrued if there were no supervisor requirement.

Participants across both groups felt that having a supervisor as a Learner rider would add an unnecessary level of complexity to the task of riding and could serve to distract and overload the novice rider. Participants provided arguments against both possible supervisor scenarios, the first being where the supervisor is required to follow the Learner rider on another motorcycle, and the second being where the supervisor travels as a pillion passenger. Regarding the first scenario, the older rider group felt that a following rider would "add to the number of things to think about". The young rider group agreed and added that maintaining constant communication with the following rider would be a challenge. The challenge of communicating effectively with the supervisor was also said to apply to the second scenario where the supervisor travels as a pillion passenger. However, participants' main concern with the second scenario was the potential adverse effect on balance and coordination associated with carrying a pillion passenger.

Despite the negative views surrounding compulsory supervision as a Learner rider, several participants were generally supportive of the idea of undertaking supervised rides with a qualified rider trainer, who provides tips and feedback on riding performance at appropriate points during the course of a ride. Indeed, several of the participants in the younger group felt that there was discord between the amount of effort and money put towards car driver training/driving lessons and rider training/riding lessons. Thus, the prospect of individuals devoting more effort to rider training/riding lessons than they do currently was not considered to be unreasonable.

Participants were also asked their views on being required to log hours of riding practice as a Learner rider. As with compulsory supervision, participants were not overly supportive of such a potential requirement. All participants felt that it would be too difficult to enforce and that the rate of compliance would be low. There was also much discussion surrounding what would be the minimum number of hours that would be required for logging purposes, and whether this number would need to be consistent with the current Victorian requirement for Learner car drivers. While opposed to compulsory logging of hours, participants indicated that providing Learner riders with guidance on the importance of practice, both in terms of quantity (i.e. number of hours) and quality (i.e. range of driving situations) would be useful.

6.3.7 Length of zero BAC restriction

Participants were asked their views on the possibility of extending the length of the current zero BAC restriction beyond the first 12 months of licensure. In effect, such an extension would apply to Fully licensed riders with restrictions and those riders whose Probationary licence ends before the minimum restriction duration (i.e. 12 months) has been satisfied.

Reactions to this topic varied between the two participant groups. The older group were indifferent to the idea of the extension. All participants indicated that they would not drink before riding. Even so, several participants felt that a zero BAC for more experienced riders was perhaps too stringent. The question for the older riders was not whether the zero BAC restriction should be extended, but whether a 0.02 BAC limit should be imposed for all riders beyond the zero BAC period. This suggestion stemmed from the view held among participants that, at a given BAC, riding a motorcycle is more dangerous than driving a car.

Participants in the younger group were not in support of extending the current 12 month restriction. Moreover, within the younger group there was disagreement as to the appropriateness of the zero BAC restriction in its current form. A minority of participants in the young group expressed that a zero BAC for those newly licensed riders who were also Fully licensed car drivers was inappropriate given that these riders had already satisfied a zero BAC requirement as part of the car driver licensing process. Further, these participants held very strongly the opinion that there is a step change relationship between degree of impairment and BAC such that below a BAC of 0.05 there is no impairment, while above this value there is impairment. The majority of participants in the young group disagreed with this point-of-view, however, expressing that newly licensed riders should be restricted to a zero BAC irrespective of their car driver licence status. Indeed, consistent with the older group, these participants also believed that the negative effect on riding of a given BAC could be greater than that on driving. On this basis, it was suggested that a BAC lower than 0.05 might be appropriate for riders beyond the first 12 months of licensure. A BAC of 0.02 was offered as one possibility.

6.3.8 Length of pillion passenger restriction

Participants were asked their views on the possibility of a lengthening of the current restriction on the carriage of pillion passengers. As was the case with zero BAC, in effect, an extension of the restriction would apply to Fully licensed riders with restrictions and those riders whose Probationary licence ends before the minimum restriction duration (i.e. 12 months) has been satisfied.

All participants, irrespective of group, agreed that carrying a pillion passenger while riding was inherently more difficult and less safe than riding without a pillion passenger. Most participants were indifferent to an extension of the current pillion passenger restriction. Nonetheless, in the older group, a small number of participants advised against such an extension, arguing that it would not deter those riders who wish to carry a pillion passenger from doing so.

6.3.9 Night time restriction

Participants were unanimously opposed to the idea of a night time restriction for novice riders. Participants in both groups expressed concern about the negative impact such a restriction could have on their mobility. Although, this was perceived to be less of a potential concern if the restriction applied from midnight to early morning as opposed to from dusk to dawn. The general sentiment in the older group was that a night time restriction would most affect those people for whom riding a motorcycle is their sole mode of transport, that is, mainly younger riders.

As an alternative to a night time restriction, participants in the younger group suggested that a greater emphasis in training materials be placed on the risks associated with riding at night. It was argued that riders may not be aware that riding at night is a risky activity.

6.3.10 Length of the LAMS restriction

Participants, regardless of group, expressed a preference for the current LAMS over the previous arrangement where novice riders were not permitted to ride a motorcycle with an engine capacity exceeding 260cc. At a more fundamental level, all participants agreed that imposing restrictions on the power and size of bike that novice riders are permitted to ride is appropriate.

Across groups, participants held mixed views as to whether the LAMS restriction should be extended beyond the first 12 months of licensure. Such an extension, in effect, would apply to Fully licensed riders with restrictions and those riders whose Probationary licence ends before the minimum restriction duration (i.e. 12 months) has been satisfied. Several participants expressed indifference as they were not planning to replace their bike with a larger and/or more powerful bike at the end of the restricted period. These participants felt that there was sufficient variability within the current LAMS to accommodate the needs and likes of new riders and, as such, there would be less of a desire to want to purchase a new bike once the restricted period was over. A small number of participants felt that extending the restriction beyond 12 months would be appropriate as this would help to discourage from riding those people who only wish to ride bikes that are larger and/or more powerful than those on the LAMS list, and so who might have otherwise waited until the end of the 12 month restriction period before first purchasing and riding a bike on-road. The assumption here was that a period any greater than 12 months would be perceived as too long a waiting period by some people. However, a further sub-group of participants felt that a longer restriction period would be associated with a low rate of compliance among those riders who wished to ride larger and/or more powerful bikes.

6.3.11 Automatic transmission restriction and separate licence class for scooter riders

Participants were asked their thoughts on the possible introduction of an automatic transmission restriction. This would limit those riders who undertake their Learner test on a bike with an automatic transmission to ride only automatic bikes during the Learner period, and those riders who undertake their licence test on a bike with an automatic transmission to ride only automatic bikes during the Probationary phase or during the first 12 months of licensure, whichever is longer. Participants were also asked whether, instead of an automatic transmission restriction, there should be a separate licence class for scooter riders, the implication being that riders who pass the tests on scooter, thus obtaining a dedicated scooter licence, would not be permitted to ride a motorcycle unless they were to undertake subsequently the tests on a motorcycle

Across the two groups, participants felt that an automatic transmission restriction of the type described would be appropriate in principle given that such a restriction applied for car drivers. It was expressed that an automatic transmission restriction would most affect those riders who undertake their tests on a scooter. Indeed, it was considered inappropriate for riders who pass their tests on a scooter to be granted a permit or licence to ride a motorcycle. The perception that an automatic transmission restriction would most impact scooter riders

raised the issue of whether the fundamental difference between riding a scooter and riding a motorcycle was in the transmission type. If the key difference is in transmission type, then an automatic transmission restriction would be sufficient to ensure that the needs of scooter riders are adequately addressed. However, if the fundamental skill differences extend beyond transmission type to include, for example, vehicle handling, cornering, and seating position, then a distinct scooter licence class may be the more appropriate option.

Participants in the older group highlighted the challenge associated with categorising certain bikes as scooters. This would be an issue which would need to be resolved if a separate scooter licence were to be introduced. These participants raised as a further issue whether motorcycle riders would be permitted to ride scooters if there were a separate licence class for scooter riders. Several participants commented that potential moped riders are deterred from riding a moped because of the requirement in Victoria that they undergo the same licensing process as for motorcycle riders. It was suggested that riders on a motorcycle licence be permitted to ride motorcycles, scooters and mopeds, while riders on a scooter licence be allowed to ride scooters and mopeds only. By implication, a moped only licence would permit riders to ride mopeds only.

In conclusion, while, in general, the younger participants preferred the automatic transmission restriction option to the separate scooter licence option, participants in the older group held mixed views. It was felt that both options would address the issue of riders undertaking their tests on a scooter despite their intention to ride a motorcycle. This stemmed from the general understanding that riding a scooter, for some reason, is easier than riding a motorcycle. Thus, those riders who undertake their tests on a scooter are doing so to maximise their chances of passing the tests. Nonetheless, several participants felt that an automatic transmission restriction would not fully distinguish between the skill sets of scooter riders and motorcycle riders. Several other participants felt that potential challenges in unambiguously categorising bikes as either scooters or motorcycles could make the process of introducing a separate scooter licence class potentially impossible.

6.3.12 Testing (on-road v off-road) and training (mandatory v voluntary)

Participants were asked for their views on the two practical tests that must be passed in order for an individual to become a licensed rider. The first test is taken as part of the requirements for a Learner's Permit. The second test is taken in order to obtain a rider licence.

Almost all of the comments focussed on the licence test. This was the case across groups. All participants felt that the current licence test is too easy. The implication is that even those individuals who have had no riding practice during the Learner period would be able to pass. Participants also questioned whether the licence test sufficiently tested the skill set required for on-road riding. Raised as specific issues were that the current test does not allow riders to travel at speeds which may be more typical of on-road riding, nor does it test riders' ability to interact with other traffic in a realistic setting. Several participants in each group said that they felt as though they did not deserve to ride on-the-road after passing such an "easy" test, and one that did not test the novices' skills on-the-road. The general consensus both within and across groups was that, provided that the test targets the relevant skill set, an on-road component, alongside an off-road component for assessing the more basic skills, would be perceived as appropriate.

All of the participants who attended the focus groups had reported taking part (or that they would take part) in a training course prior to undertaking their tests. It is interesting to note

that most of the participants at the focus groups thought that completing a pre-test rider course through an accredited training provider was compulsory in Victoria. Nonetheless, most participants felt that their desire to undertake the training was independent of whether the training was mandatory or voluntary. Several participants noted that there is no real cost saving in completing the test without also completing the training. In any case, participants indicated that their tests had been embedded within their training courses.

The commonly held view among participants was that the purpose of the training was to teach the trainees what they need to know to pass the test, and not to really teach them how to be good riders. Moreover, it was felt that there was much variation across training providers and instructors in the quality and depth of the training provided, and also in training content and its relevance to on-road riding and interacting with traffic. While some of the participants in the older rider group indicated "shopping around" for a training provider so as maximise the quality of their training, most of the participants in the young rider group cited cost as the main determinant of which training provider they chose. Across groups, other factors which influenced choice of training provider were: location of provider relative to home; session availability; and number and time of day of sessions.

In conclusion, while several participants felt that they could pass the licence test without having first completed the pre-licence training course, participants still indicated that they would undertake the training as it provides them with extra opportunity for practice. This was perceived to be of particular importance to those riders who did not own their own bike prior to passing the licence test. Nonetheless, it was expressed that increasing the consistency of the quality and content of training across providers and instructors would be highly desirable and should be a priority.

6.3.13 A minimum protective gear requirement at testing

A question raised at the Stakeholder Consultation Workshop was whether a requirement to wear a certain standard of protective gear could be incorporated into the licensing process. Specifically, it was suggested that participants be required to wear protective gear to carry out their Learner and licence tests. The rationale here was that, having already made the investment, riders would continue to wear the gear post-testing.

Participants at the focus groups were asked to voice their opinions on such a requirement. In principle, the participants were not opposed to the idea. While cost of the gear was raised as a concern, participants indicated that, were they required to purchase the gear for their tests, they would continue to wear the gear post-testing. Nonetheless, there was much discussion surrounding what and how much protective gear would be required. Most participants agreed that, at a minimum, riders should be required to bring their own helmet. Several participants, mainly in the older group, argued that requiring novice riders to wear additional protective gear (e.g. full leathers) to the test would ensure that only those riders who are serious about riding would continue through the licensing process.

Other issues raised in the context of protective gear were the need to first raise awareness among novice riders of the potential benefits of wearing protective gear, for example, through advertising campaigns, and whether scooter riders should be subject to the same protective gear requirement as motorcycle riders. Indeed, the prospect of scooter riders wearing, for example, full leathers, was considered to be something that would not be well received among scooter riders.

6.4 Conclusion

Two focus groups were conducted to gather information on new riders' views of current and potential aspects of the licensing process in Victoria. In general, participants expressed the view that the current rider GLS in Victoria would benefit from being more streamlined. The following more specific conclusions can be drawn:

- *Display of plates for riders on a Full licence with restrictions* – Supported, in principle;
- *Minimum Learner's Permit age* - Current minimum age of 18 years is appropriate;
- *Length of the Learner phase (including minimum and maximum lengths)* – The minimum length should be extended and Learner riders should be given one opportunity to renew the Permit without having to redo the test;
- *Supervision during the Learner period & logging hours of practice* – Not supported, although it should be recommended that Learner riders accrue practice hours across a range of situations;
- *Length of zero BAC restriction* - Increasing the duration of the current zero BAC restriction was not supported, although reducing the BAC for Fully licensed riders to 0.02 should be considered;
- *Length of pillion passenger restriction* - Increasing the duration of the current pillion passenger restriction was not supported;
- *Night time restriction* – Not supported;
- *Length of the LAMS restriction* - Increasing the duration of the LAMS restriction was not supported;
- *Automatic transmission restriction* – Supported, in principle;
- *Separate licence class for scooters* – In part contingent on first being able to unambiguously classify certain bikes as scooters;
- *Testing (on-road v off-road)* – The licence test should be more challenging and relevant, and incorporate both on-road and off-road components;
- *Training (mandatory v voluntary)* – Voluntary training is sufficient, although greater consistency across training providers and instructors in training quality and content would be desirable; and
- *A minimum protective gear requirement at testing* – Supported, in principle, although further consideration needs to be given to what would constitute the minimum amount of gear to be worn to carry out the tests.

Chapter 7 Regulatory Impacts: Pointers for Regulatory Impact Statement

7.1 Introduction

Significant changes to both State and Federal regulatory regimes in Australia now require the preparation of a regulatory impact statement (RIS). The objective of these statements is to ensure that where regulatory proposals are likely to have sizeable impacts on businesses, individuals or the economy as a whole, we are able to present all relevant information to decision makers in order to optimise Government policy decision making. The regulatory impact statement required under Victoria's Guide[1] comprises four key components:

1. A description and assessment of the nature and extent of the problem being addressed (including its context)
2. A statement of the objectives of the proposed regulatory arrangements
3. A description of the expected impact on affected groups (including economic costs and benefits of the proposal as well as social and environmental benefits)
4. An outline of other options considered but not recommended as well as an outline of consultation arrangements and review/sun-setting arrangements.

Overall then, such an analysis informs decisions regarding the extent to which Government action is necessary, the objectives of such an intervention, and whether the benefits expected from the proposal exceed the associated costs and impacts.

This component of the research project, while not presenting an RIS *per se*, represents a preliminary effort to highlight and address potential issues relating to any future requirements of an RIS. Consequently, it is not intended to be definitive, but rather aims to outline qualitative comments and 'pointers' through a preliminary analysis that identifies and classifies likely impacts associated with any related prospective GLS regulatory activities. A much more thorough and detailed analysis of issues would be required for the actual calculation of costs and benefits to support a RIS.

Preceding research has involved preparation of a literature review of several aspects of GLS as well as an analysis of Victorian crash data in order to inform policy options for improving GLS for motorcyclists and scooter riders in Victoria. It has therefore provided the information necessary to inform the first component of a RIS – describing the extent and the nature of the problem being addressed. It has also provided a context in which the objectives of proposed regulatory actions can be understood; in other words, to improve the safety of motorcyclists in Victoria. This section of the report will therefore aim to articulate the recommendations arising from the analysis and review. It will also clarify the target populations to be affected along with the expected impacts, both beneficial and otherwise, which are likely to arise from any regulatory change.

[1] Victorian Guide to Regulation 2nd edition April 2007

7.2 Recommendations Requiring Legislative Change

Based on the previous activities undertaken as part of the current research, three groups of recommendations are suggested for legislative change. These three groups comprise recommendations which encourage riders to *gain more experience* (5 recommendations), those which impose *restrictions on riders* (4 recommendations) and those which promote improvements in *testing and/or training* (3 recommendations).

7.2.1 Gaining more experience

E1. Increase the minimum duration of the Learner phase from 3 months to 6 months

E2. Increase the maximum duration of the Learner phase from 15 months to 18 months

E3. Allow learners one option to renew their Learner's Permit at the end of the first 18 months

E4. Full car licence holders who obtain a rider licence will be given a P1 licence instead of a Full licence with restrictions

E5. Riders without a Full car driver's licence and aged over 21 years of age will be required to complete both the P1 and P2 licence phases – that is, they will not bypass the P1 licence phase.

7.2.2 Restrictions on riders

R1. Riders with a Full rider licence (i.e. beyond the Learner and restricted licence phases) will be subject to a BAC limit of 0.02

R2. Riders in the Learner and P1 (i.e. all newly licenced riders) phases will be subject to a night-time riding curfew (with exemptions for those who must ride at night for work purposes.)

R3. Riders in the Learner, P1 and P2 phases will be subject to a restriction on using a mobile phone (all modes) while riding

R4. Riders who undertake their Learner test and P test on a motorcycle with an automatic transmission will be restricted to riding motorcycles with automatic transmissions. (Once fully licensed, these riders will be able to ride a manual transmission motorcycle only after passing the practical licence test on a motorcycle with manual transmission.)

7.2.3 Testing and training

T1. Develop and implement a rider hazard perception test (HPT) which all riders must pass to obtain a Probationary licence

T2. Develop and implement a more challenging practical test which all riders must pass to obtain a Probationary licence. The test should include an on-road component.

T3. Develop and implement a standardised training curriculum for use by all training providers.

The context in which these recommendations arise along with the rationale behind each recommendation for regulatory change is outlined in Table 7.1, following.

Table 7.1 Outline of regulatory actions from the research activities

Proposal number	Regulatory Proposal	Rationale for Regulatory Change
Gaining More Experience		
E1.	Increase the minimum duration of the Learner phase from 3 months to 6 months	Greater opportunity for practice under conditions of low risk. Crash risk is reduced with increased experience. (see Data Analysis, Table 3.3)
E2.	Increase the maximum duration of the Learner phase from 15 months to 18 months	To be consistent with recommendation E1
E3.	Allow Learners one option to renew their Learner's Permit at the end of the first 18 months	To ensure that Learners who would prefer to gain additional practice during the Learner period do not feel pressured into prematurely obtaining their licence at the end of the Learner phase
E4.	Full car licence holders who obtain a rider licence will be given a P1 licence instead of a Full licence with restrictions	Consistency; minimise confusion and facilitate compliance with, and enforcement of, licence conditions by displaying appropriate plate; facilitate effective enforcement of licence conditions; through the display of P plates, convey to other road users the novice status of the rider; perceived protective influence of display of P plates
E5.	Riders without a Full car driver's licence and aged over 21 years of age will be required to complete both the P1 and P2 licence phases – that is, they will not bypass the P1 licence phase	Inexperience, in addition to age, is a major contributor to novice rider crashes. Exemptions purely on the basis of age are not well justified.

Table 7.1 (cont.) Outline of regulatory actions from the research activities

Proposal number	Regulatory Proposal	Rationale for Regulatory Change
Restrictions		
R1.	Riders with a Full rider licence (i.e. beyond the Learner and restricted licence phases) will be subject to a BAC limit of 0.02	Effect of alcohol consumption on motorcycle riding is more dramatic than its effects on car driving, and alcohol has been reported to be a major contributing factor to fatal motorcycle crashes. "In general, the motorcyclist will be involved in an accident at a lower BAC than the same individual in a four-wheeled passenger vehicle. …suggests that motorcyclists cannot operate with similar performance at BAC equal to that of motor vehicle drivers. …the permissible BAC should be adjusted to reflect the greater injury risk of operating a motorcycle while intoxicated."[1] Through lowering of the legal BAC for *all* motorcycle operators, there may be an increase in individual rider's awareness of the relatively greater effects of alcohol consumption on rider crash risk and severity. The introduction and enforcement of a lower alcohol limit (i.e. lower than 0.05) has been calculated as having a likely benefit-cost ratio of 3:1.[2]
R2.	Riders in the Learner and P1 phases (i.e. all newly licenced riders) will be subject to a night-time riding curfew - ideally 8 pm to 6 am, but recommend 10 pm to 6 am. (Exemptions would need to be put in place for those individuals who must ride at night for work purposes.)	Larger than expected number of motorcycle crashes during night-time hours for novices (Learner and restricted) in general (see Data Analysis, Table 3.11)
R3.	Riders in the Learner, P1 and P2 phases will be subject to a restriction on using a mobile phone (all modes) while riding	This is a consequence of recommendation E4 (above), and would extend the mobile phone restriction to novice riders who hold a Full car licence with restrictions.
R4.	Riders who undertake their Learner test and P test on a motorcycle with an automatic transmission will be restricted to riding motorcycles with automatic transmissions. (Once fully licensed, these riders will be able to ride a manual transmission motorcycle only after passing the practical licence test on a motorcycle with manual transmission.)	Typically, scooters are equipped with automatic transmissions while most motorcycles (at least those on the LAMS list) have a manual transmission. Apart from transmission, there are differences between scooters and motorcycles which may make riding a scooter less demanding than riding a motorcycle. In the current system, it is permissible for riders to obtain their permit and licence on a scooter, but then ride a motorcycle. Imposing an automatic transmission restriction presents a partial alternative to introducing a separate licence class for scooter riders. One of the challenges in introducing a separate scooter licence is the lack of a clear definition of what constitutes a scooter. Without such a definition, correctly and unambiguously labelling a particular make and model a scooter could become futile.

[1] Sun et al. (1998)

[2] Torpey, Ogden, Carmeron & Vulcan. (1991). *Indicative benefit/cost analysis of road trauma countermeasures*. MUARC

Table 7.1 (cont.) Outline of regulatory actions from the research activities

Proposal number	Regulatory Proposal	Rationale for Regulatory Change
Testing and Training		
T1.	Develop and implement a rider HPT which all riders must pass to obtain a Probationary licence	There is much emphasis in the rider literature on hazard perception. Much discussion centres on the unique hazards faced by riders that are not faced by car drivers. The current HPT was designed to address the key hazards faced by car drivers. The additional hazards faced by riders are not considered as part of the current test.
T2.	Develop and implement a more challenging practical test which all riders must pass to obtain a Probationary licence. The test should include an on-road component.	The current practical test for the rider licence is deemed to be too easy and of little practical significance. Other jurisdictions (e.g. New South Wales) include an on-road component in their rider licence practical test.
T3.	Develop and implement a standardised training curriculum for use by all training providers.	Completion of an appropriate training course is not compulsory in Victoria. However, a very high proportion of novice riders will undertake at least some formal training during the licensing process. Choice in training providers varies, but includes cost, proximity to home, and course availability considerations. There appears to be much variability across training providers in the training programs offered. For example, differences exist in terms of training content, duration, purpose, and delivery strategy. There is much discussion in the car driver training literature at least, that training programs are ineffective in reducing driver crash risk post-training. This has been attributed largely to the content of the training as these traditional programs have tended to focus on vehicle control training and knowledge of the road rules. In other words, such training programs have been criticised for training car drivers in how to pass the licence test and not in how to be safe and independent drivers. A similar argument has been made regarding motorcycle rider training. In order to maximise their effectiveness, rider training programs would need to pay due attention to the training of relevant higher-order cognitive and perceptual skills which are key to safe riding. Consideration would need to be given to how best to impart such training. A thorough review of the current training programs offered in Victoria, in terms of their content, duration, effectiveness, and acceptability to students, would be an essential first step.

Each of these potential regulatory changes would need to be assessed, in order to determine the likely benefits flowing, along with potential costs arising.

7.3 Level of Regulatory Costs

We begin by determining the size of the target group of people that would be affected by the proposed regulatory change, and commenting on the probable costs associated with each recommendation. At the broadest level, Victoria had a population of 12,568 new motorcycle license holders in the 12 month period of July 2007 to June 2008[1]. A further 19,943 held new motorcycle Learner's Permits at this time[1]. In order to begin the process of mapping out regulatory costs, the number of people affected by the proposed regulatory changes along with the broad cost estimates for each recommendation are shown in Table 7.2, below.

Table 7.2 Outline of likely regulatory cost impacts from recommendations

Proposal number	Regulatory Proposal	Number of people in target group	Likely Regulatory Cost Impacts
Gaining More Experience			
E1.	Increase the minimum duration of the Learner phase from 3 months to 6 months	All new Learner's permit holders (i.e. 19,943 people, July 2007 to June 2008)	Minimum impact
E2.	Increase the maximum duration of the Learner phase from 15 months to 18 months	A minority of Learners (though the proportion is unknown.)	Minimum impact
E3.	Allow Learners one option to renew their Learner's Permit at the end of the first 18 months	A minority of Learners (though the proportion is unknown.)	
E4.	Full car licence holders who obtain a rider licence will be given a P1 licence instead of a Full licence with restrictions	Unknown	
E5.	Riders without a Full car driver's licence and aged over 21 years of age will be required to complete both the P1 and P2 licence phases – that is, they will not bypass the P1 licence phase	Unknown	

[1] Source: VicRoads

Table 7.2 (cont.) Outline of likely regulatory cost impacts from recommendations

Proposal number	Regulatory Proposal	Number of people in target group	Likely Regulatory Cost Impacts
Restrictions			
R1.	Riders with a Full rider licence (i.e. beyond the Learner and restricted licence phases) will be subject to a BAC limit of 0.02	Unknown	
R2.	Riders in the Learner and P1 (i.e. all newly licenced riders) phases will be subject to a night-time riding curfew - ideally 8 pm to 6 am, but recommend 10 pm to 6 am. (Exemptions would need to be put in place for those individuals who must ride at night for work purposes.)	All new Learner riders and newly licenced riders (i.e. up to 32,511 people, July 2007 to June 2008)	Major impact in terms of reduced personal mobility Not quantifiable, but considerable policy issue
R3.	Riders in the Learner, P1 and P2 phases will be subject to a restriction on using a mobile phone (all modes) while riding	Unknown	Minimum impact
R4.	Riders who undertake their Learner test and P test on a bike with an automatic transmission will be restricted to riding bikes with an automatic transmission	Unknown	Minimum impact (likely to be limited to inconvenience, irritation).
Testing and Training			
T1.	Develop and implement a rider hazard perception test which all riders must pass to obtain a Probationary licence	All newly licenced riders (i.e. 12,568 people, July 2007 to June 2008)	Significant costs of: test development, implementation, administration, and measurement.
T2.	Develop and implement a more challenging practical test which all riders must pass to obtain a Probationary licence. The test should include an on-road component.	All newly licenced riders (i.e. 12,568 people, July 2007 to June 2008)	Significant costs of: test development, implementation, administration, and measurement. Also increased costs to riders for a longer test duration.
T3.	Develop and implement a standardised training curriculum for use by all training providers.	All new Learner riders and newly licenced riders (i.e. up to 32,511 people, July 2007 to June 2008)	Significant cost in curriculum development and evaluation. Also costs related to training the trainers.

7.4 Level of Regulatory Impacts

To make preliminary estimates regarding regulatory impacts, we firstly estimated the number of relevant casualty accidents experienced by the target group to which the recommended regulatory change was directed. We then estimated a possible crash reduction factor appropriate for this group of accidents to yield an estimate of the likely overall casualty crash benefit. These estimates were based on previous findings found in the literature (where available) and discussions with the project team. Benefit estimates are shown both in terms of the number of serious casualty motorcycle crashes saved (per annum) and of the resulting annual economic benefit (per annum), using an average cost figure per serious casualty motorcycle crash saved of $A564,800[1]. The reader will note that many of the recommendations are not associated with an estimated benefit due to the unavailability or paucity of previously published supportive evidence.

Table 7.3 Outline of likely regulatory impact parameters from recommendations

Proposal number	Regulatory Proposal	Number of relevant serious casualty crashes experienced in target group	Estimate of likely reduction in crashes	Likely Regulatory Impact
Gaining More Experience				
E1.	Increase the minimum duration of the Learner phase from 3 months to 6 months	All Learner Permit holders (i.e. 74 people seriously injured or killed in 2007)[2]	Unknown	Minimum impact
E2.	Increase the maximum duration of the Learner phase from 15 months to 18 months	All Learner Permit holders (i.e. 74 people seriously injured or killed in 2007)[2]	Unknown	Minimum impact
E3.	Allow Learners one option to renew their Learner's Permit at the end of the first 18 months	All Learner Permit holders (i.e. 74 people seriously injured or killed in 2007)[2]	Unknown	
E4.	Full car licence holders who obtain a rider licence will be given a P1 licence instead of a Full licence with restrictions	Unknown	Unknown	
E5.	Riders without a Full car driver's licence and aged over 21 years of age will be required to complete both the P1 and P2 licence phases – that is, they will not bypass the P1 licence phase	Unknown	Unknown	

[1] Source: Scully, Newstead & Corben (2008).

[2] Source: Table 3.3

Table 7.3 (cont.) Outline of likely regulatory impact parameters from recommendations

Proposal number	Regulatory Proposal	Number of relevant serious casualty crashes experienced in target group	Estimate of likely reduction in crashes	Likely Regulatory Impact
Restrictions				
R1.	Riders with a Full rider licence (i.e. beyond the Learner and restricted licence phases) will be subject to a BAC limit of 0.02	All Full licence holders that ride with a BAC over 0.02 (i.e. up to 582 people seriously injured or killed in 2007[1])	Say, an estimate of 10%	If a reduction in serious casualty crashes of 10% was achieved, this would result in an estimated economic benefit of up to around $32 million annually.
R2.	Riders in the Learner and P1 (i.e. all newly licenced riders) phases will be subject to a night-time riding curfew - ideally 8 pm to 6 am, but recommend 10 pm to 6 am. (Exemptions would need to be put in place for those individuals who must ride at night for work purposes.)	All Learner and licenced with restrictions riders who ride and crash during night-time hours (i.e. 164 people seriously injured between 2003 and 2007 – based on the ideal 8 pm to 6 am curfew)[2]	Say, an estimate of 30%	If a reduction in serious casualty crashes of 30% was achieved, this would result in an estimated economic benefit of around $5.6 million annually in terms of reduced road trauma. A major impact would occur in terms of reduced personal mobility, however. This is largely unquantifiable, but is clearly a policy parameter of considerable importance.
R3.	Riders in the Learner, P1 and P2 phases will be subject to a restriction on using a mobile phone (all modes) while riding	Unknown	Unknown	Minimum impact
R4.	Riders who undertake their Learner test and P test on a bike with an automatic transmission will be restricted to riding bikes with an automatic transmission	Unknown	Unknown	Minimum negative impact (likely to be limited to inconvenience, irritation). Possible benefits in terms of reduction in crashes due to lack of skills.

[1] Source: Table 3.3.

[2] Source: Table 3.11

Table 7.3 (cont.) Outline of likely regulatory impact parameters from recommendations

Proposal number	Regulatory Proposal	Number of relevant serious casualty crashes experienced in target group	Estimate of likely reduction in crashes	Likely Regulatory Impact
Testing and Training				
T1.	Develop and implement a rider hazard perception test which all riders must pass to obtain a Probationary licence	Unknown	Unknown	Significant costs of: test development, implementation, administration, and measurement. Potential benefits in terms of a reduction in crashes related to poor hazard perception skills.
T2.	Develop and implement a more challenging practical test which all riders must pass to obtain a Probationary licence. The test should include an on-road component.	Unknown	Unknown	Significant costs of: test development, implementation, administration, and measurement. Potential benefits in terms of a reduction in crashes due to unskilled licensed riders.
T3.	Develop and implement a standardised training curriculum for use by all training providers.	Unknown	Unknown	Significant cost in curriculum development and evaluation. Also costs related to training the trainers. Potential benefits in terms of a reduction in crashes due to unskilled licensed riders.

These three groups of regulatory strategies have differing characteristics. Those focusing on experience tend to result in small impacts, but also encompass minimal costs. Those focusing on restrictions promise the highest road trauma improvements, but in the case of the possible night-time curfew initiative, can also involve a fundamentally difficult trade-off with mobility loss. On the other hand, those regulatory initiatives focusing on testing and training may result in real but longer term trauma gains, whilst also most likely involving significant short-term development costs.

7.5 Conclusions

Overall, it is clear that five of the potential recommendations would result in major identifiable regulatory items in terms of either significant costs or significant benefits, i.e.:

R1. BAC limit for Full license holders: where a significant road trauma reduction has been estimated at possibly $32 million each year.

R2. Night-time curfew: where a social impact of loss of mobility for those riders who do not possess a car driver's licence would occur in future under this initiative, but would need to be weighed against the potential trauma reduction benefit of approximately $5.6 million per annum.

R4. Automatic Transmission restriction: where riders who currently undertake their tests on a scooter and immediately 'upgrade' to a motorcycle will in future be restrained from doing so, with a sizable (but unknown) road safety benefit and little cost impact other than changes to the licensing system.

T1. Develop a HPT for motorcyclists: where although the development of a dedicated HPT for motorcyclists is intuitively sensible and may reap real trauma reduction benefits, both these benefits and the likely significant costs are not currently known.

T2. Develop a more challenging practical licence test: where the inclusion of an on-road component in testing is again intuitively sensible, but has unknown costs and benefits at the present time.

It is also clear that whilst there is considerable room for better cost and benefit information for most of these regulatory initiatives, the highest priorities for pursuing such information improvements relate to the above five arenas. Specifically, better RIS. information is needed in terms of:

- Greater accuracy on the likely road safety benefits achievable through the introduction of a .02 BAC limit for full license holders (updating estimates now almost two decades old);
- Greater accuracy on the likely road safety benefits achievable through a night-time curfew given the coarseness of the above percentage reduction estimate and the likely transfer of a proportion of night-time trips to day-time periods and from motorcycle to car;
- Stronger guidance on the likely relative feasibility and success of mobility reduction initiatives (such as a night-time curfew) which may have occurred in other public policy domains; and
- Greater accuracy on the potential costs as well as long term benefits associated with the development, implementation and administration of dedicated tests for both rider hazard perception and for practical on-road rider skills.

Chapter 8 Concluding Remarks

8.1 Overview

The overall objective of this research was to determine how to enhance the current GLS for motorcyclists in Victoria; the ultimate goal of this research being improved road safety outcomes. The specific aims of this research were five-fold:

1. To analyse crash data to determine the crash profile of Learner and novice riders in their first years of licensed riding;
2. To consider graduated licensing measures for motorcyclists that could address the typical novice motorcyclist crash factors and lead to improved road safety outcomes;
3. To identify what deficiencies exist in the licensing of novice motorcyclists when compared to the licensing of novice car drivers, and any implications of these deficiencies;
4. To investigate the extent of any safety benefits that might be expected from separating a scooter licence from the motorcycle licence; and
5. To develop a prioritised list of measures that could be implemented as part of a strengthened motorcycle GLS.

The research aims were addressed through four iterative stages of work. Stage 1 comprised a review of the most recent and relevant research literature into GLS, a comparison of current rider and car driver GLS in each of the nine Australasian jurisdictions, and an analysis of Victorian crash data. The output of Stage 1 was an inventory of rider GLS components or features. This inventory served as the starting point for Stage 2, which comprised a workshop with representatives from key stakeholder organisations and bodies, and focus groups with new riders. The output of Stage 2 was a list of recommendations, the majority of which were ones which would require legislative change were they to be implemented. These particular recommendations – that is, those that would require legislative change – were targeted for further examination in Stage 3, which comprised an exercise, albeit preliminary, into the regulatory impacts associated with introducing the changes proposed by these recommendations. The final stage, Stage 4, involved prioritising all of the recommendations which derived from the research. The entire list of recommendations and their respective priorities are presented at the end of this Chapter.

The following sections provide a high level overview of the research findings against each of the specific research aims.

8.2 Summary of Key Research Findings: Aims 1 to 4

8.2.1 To analyse crash data in order to determine the crash profile of Learner and novice riders in their first years of licensed riding

The outcomes of this exercise were presented in Chapter 3. Analyses were conducted for all motorcycle riders, and then specifically for scooter riders (including mopeds). Across both sets of analyses, several broad conclusions were made. From a recommendations point-of-view, of particular note is the finding which demonstrated increased risk of serious injury or death for Learner riders relative to Probationary and Full riders (considered as a whole). The assumption here is that Learner riders have less experience than both Probationary and Fully licenced riders. At a very high level, this outcome justifies the need for a licensing system that introduces riders to conditions of higher-risk over time – that is, with experience. Moreover, the effect of experience applies across younger and older riders. This too is an important finding as, at a high level, it suggests that licensing exemptions, based on age alone are not well-justified. What these results do not provide, however, is an indication of the degree to which prior driving experience (or as a proxy, driver licensing status) justifies exemptions from certain licensing conditions and/or shorter exposure to restrictions. The issue of skill transfer from car driving to motorcycle riding is an important and timely topic on which future research efforts in motorcycle rider safety should be focussed.

Examination of specific crash characteristics revealed that time of day was an important risk factor. While the absolute number of crashes during night-time hours is less than the number of crashes during day-time hours, analysis of the data indicated that, in general, novice riders are involved in a greater than expected number of crashes during night-time hours (8 pm to 6 am). Plots of the proportion of crashes by time of day during this night-time period revealed that the crashes were spread throughout this time period. Thus, to maximise the effectiveness of a night-time curfew, novices would need to be restricted from riding at all times between the hours of 8 pm and 6 pm. Nevertheless, restricting riding during even a sub-set of these hours would, at least in theory, help to reduce the incidence of serious injury and fatal rider crashes. While participants in the focus groups did not view the prospect of night-time restrictions favourably (see Chapter 6), provided measures were put in place to raise acceptance and compliance of night-time restrictions (e.g. awareness raising campaigns), the overall benefits to be obtained from the introduction of a night-time curfew are likely to be significant (see Chapter 7). However, what is not clear from the data is for how long during licensure a night-time curfew should apply. The data suggest that younger riders beyond the Learner and restricted phases are experiencing a higher than expected number of crashes during night-time hours, in general. What is uncertain is for how long post-licensure such a pattern persists. Further research is required to explore this issue.

8.2.2 To consider graduated licensing measures for motorcyclists that could address the typical novice motorcyclist crash factors and lead to improved road safety outcomes

The literature review and commentary served to identify a range of rider GLS components and features. It was concluded, however, that many of these components and features are

based on extrapolations from car driver GLS and knowledge of skill deficits in novice car drivers. Nonetheless, on the basis of the entire research, several components and features can be identified as having the most potential to address novice rider crash patterns either directly or indirectly through improved enforcement and compliance of conditions. Herein is a summary of these components and features:

- Streamlined phases;
- Higher minimum age for obtaining a rider Learner's Permit relative to a car driver Learner's Permit;
- Minimum six months time period for holding a Learner's Permit;
- Maximum time period for holding a Learner's Permit although with an option to renew;
- Accumulation of a minimum number of hours of practice during the Learner phase;
- Supervised practice during the Learner period;
- Display of plates to denote phase of licensing;
- Zero BAC requirement;
- No pillion passenger requirement;
- Night-time restriction;
- Mobile phone restriction;
- Automatic transmission restriction;
- Practical skills testing – both on-road and off-road – and dedicated rider hazard perception testing;
- Training that addresses advanced skills (e.g. hazard perception) in addition to basic riding skills (e.g. balance); and
- Use of protective gear.

8.2.3 To identify what deficiencies exist in the licensing of novice motorcyclists when compared to the licensing of novice car drivers, and any implications of these deficiencies

The literature review and commentary, and the rider and car driver GLS comparison exercise, helped to identify, in the first instance, discrepancies between the current licensing practices of riders and those of car drivers. In general, and as noted in the conclusion to the literature review, the development of GLS for motorcycle riders, relative to that for car drivers, is still in its infancy. While it is acknowledged that, increasingly, more is becoming known about the crash types and skill deficits of novice riders, additional research is still required to better delineate the underlying mechanisms.

Specifically, the research conducted herein helped to identify several deficiencies in the licensing of novice riders relative to the licensing of novice car drivers. Of particular note here are those aspects of GLS which relate to the accumulation of experience under conditions of low risk. For example, in Victoria at least, riders have a shorter minimum Learner period than do car drivers, and there is no requirement for supervision during the Learner period or for the accumulation of a minimum number of hours of practice under certain conditions. While

a requirement for supervision as a Learner rider might be counterproductive due to its additional demands on the novice rider, increasing the minimum duration of the Learner period and recommending the accumulation of a minimum number of hours of practice under certain conditions have merit given the evidence to support such measures for novice car drivers. This can include a recommendation that at least a certain number of practice hours be accrued under supervision with a qualified instructor/trainer through assisted rides or similar.

8.2.4 To investigate the extent of any safety benefits that might be expected from separating a scooter licence from the motorcycle licence

The analysis of crash data also revealed that scooter riders represent an increasing proportion of seriously injured or killed motorcyclists, and that an increasing number of riders are obtaining a rider Learner's Permit and then riding scooters as their first bike. At a very general level, these findings add support to the issue already raised by the licensing authority of whether special provisions in the licensing process should be made for scooter riders. In any case, it is interesting to note that some of the trends regarding when young and older inexperienced scooter riders were at increased risk of involvement in serious crashes were similar to those identified for riders of all types of motorcycles.

However, a major limiting factor in introducing a separate scooter licence is that of unambiguously classifying certain vehicles as scooters. Other issues concern the extent to which the skill set of scooter riders differs from that of motorcycle riders, and the situation of individuals undertaking their tests on a scooter with the intention of riding a motorcycle once licenced. The conclusion reached as part of this research is that an automatic transmission restriction may be sufficient to address, at least in the short-term, some of the primary concerns associated with scooter riders.

8.3 Recommendations: Aim 5

In conclusion, a program of research was carried out with the intention of determining how best to enhance the current GLS for riders in Victoria. It is envisaged that the recommendations deriving from this research would, as a whole, help to ensure that this goal is realised. Table 8.1 presents a prioritised list of recommendations. Each recommendation is identified as being of high, medium or low priority with respect to development and implementation considerations. In addition to those recommendations considered as part of the regulatory impact exercise, this list includes recommendations that would not, at least initially and without further development, require legislative change. Consistent with Chapter 7, the recommendations in Table 8.1 are presented as three separate groups: recommendations which encourage riders to *gain more experience*, those which impose *restrictions on riders*, and those which promote improvements in *testing and/or training*. Those recommendations with a number are those which were considered as part of the regulatory impact exercise in Chapter 7 and, so would involve legislative change were they to be implemented. The numbers correspond with those used in Chapter 7.

It should be noted that an overarching goal in developing the list presented in Table 8.1 was to provide a suite of recommendations that would give a more streamlined rider GLS than is currently in place in Victoria. A major implication of these recommendations is a GLS for riders in Victoria that is partially independent of that currently in place for car drivers.

Moreover, it is not intended that each recommendation be considered in isolation; many of the recommendations are complementary and their predicted effectiveness is based on them being implemented concomitantly.

Table 8.1 Prioritised list of recommendations

Number	Recommendation	Priority
Gaining More Experience		
E1.	Increase the minimum duration of the Learner phase from 3 months to 6 months. (This assumes concomitant changes regarding a requirement for practice.)	High
E2.	Increase the maximum duration of the Learner phase from 15 months to 18 months. (This assumes concomitant changes regarding a requirement for practice.)	High
E3.	Allow Learners one option to renew their Learner's Permit at the end of the first 18 months. (This assumes concomitant changes regarding a requirement for practice.)	High
E4.	Full car licence holders who obtain a rider licence will be given a P1 licence instead of a Full licence with restrictions	High
E5.	Riders without a Full car driver's licence and aged over 21 years of age will be required to complete both the P1 and P2 licence phases – that is, they will not bypass the P1 licence phase	High
	For those Learner riders without a car licence (Probationary or Full), encourage the accrual of 120 hours of on-road riding practice during the Learner period. A minimum proportion of hours should be accrued under supervision with an accredited instructor/trainer as part of assisted rides or similar.	High
	For those Learner riders with a car licence (Probationary or Full), encourage the accrual of 50 hours of on-road riding practice during the Learner period. A minimum proportion of hours should be accrued under supervision with an accredited instructor/trainer as part of assisted rides or similar.	High
	Update the Learner rider handbook and associated resources to highlight the range of environments across which practice should be accrued	Medium
Restrictions		
R1.	Riders with a Full rider licence (i.e. beyond the Learner and restricted licence phases) will be subject to a BAC limit of 0.02	Medium
R2.	Riders in the Learner and P1 phases (i.e. all newly licenced riders) will be subject to a night-time riding curfew - ideally 8 pm to 6 am, but recommend 10 pm to 6 am. (Exemptions would need to be put in place for those individuals who must ride at night for work purposes.)	Low
R3.	Riders in the Learner, P1 and P2 phases will be subject to a restriction on using a mobile phone (all modes) while riding	High

Table 8.1 (cont.) Prioritised list of recommendations

Number	Recommendation	Priority
Restrictions		
R4.	Riders who undertake their Learner test and P test on a motorcycle with an automatic transmission will be restricted to riding motorcycles with automatic transmissions. (Once fully licensed, these riders will be able to ride a manual transmission motorcycle only after passing the practical licence test on a motorcycle with manual transmission.)	High
Testing and Training		
T1.	Develop and implement a rider HPT which all riders must pass to obtain a Probationary licence	High
T2.	Develop and implement a more challenging practical test which all riders must pass to obtain a Probationary licence. The test should include an on-road component.	High
T3.	Develop and implement a standardised training curriculum for use by all training providers.	Low
	Consider the development of an Exit test – which riders must pass in order to become a Full licence holder	Low
	Consider the development and implementation of a standard for protective gear for all riders (i.e. including scooter riders) to comply with at testing	Medium

Figure 8.1. provides a schematic overview of the revised GLS for riders in Victoria. The key departures from the current system (Figure 1.2) are highlighted in red font. In summary, the main changes apply to the Learner phase; the suite of, and content of, tests associated with obtaining a licence; the introduction of a night-time restriction for both Learner and P1 riders; the introduction of an automatic transmission restriction; the removal of exemptions based on age alone; and fewer streams for the rider licence. It is important to acknowledge that, in the absence of any published research relating length of restrictions to crash risk, it is not possible at this time to recommend increases to the duration of the no pillion passenger and LAMS restrictions that are currently in place for the first 12 months of licensure. Nonetheless, as a by-product of extending the minimum Learner period by 3 months, there will be an increase across licence phases in the duration of certain restrictions. A final comment concerns the issue of supervision during the Learner period. Given the impracticalities associated with a requirement for the accrual of many hours of supervised riding, we are not recommending an obligatory requirement for supervision in all cases, as is the case for Learner car drivers. However, given the potential benefits to be gained through supervised practice, we are recommending that at least some practice under the guidance of an accredited trainer/instructor be encouraged during the Learner period as part of a revised motorcycle GLS.

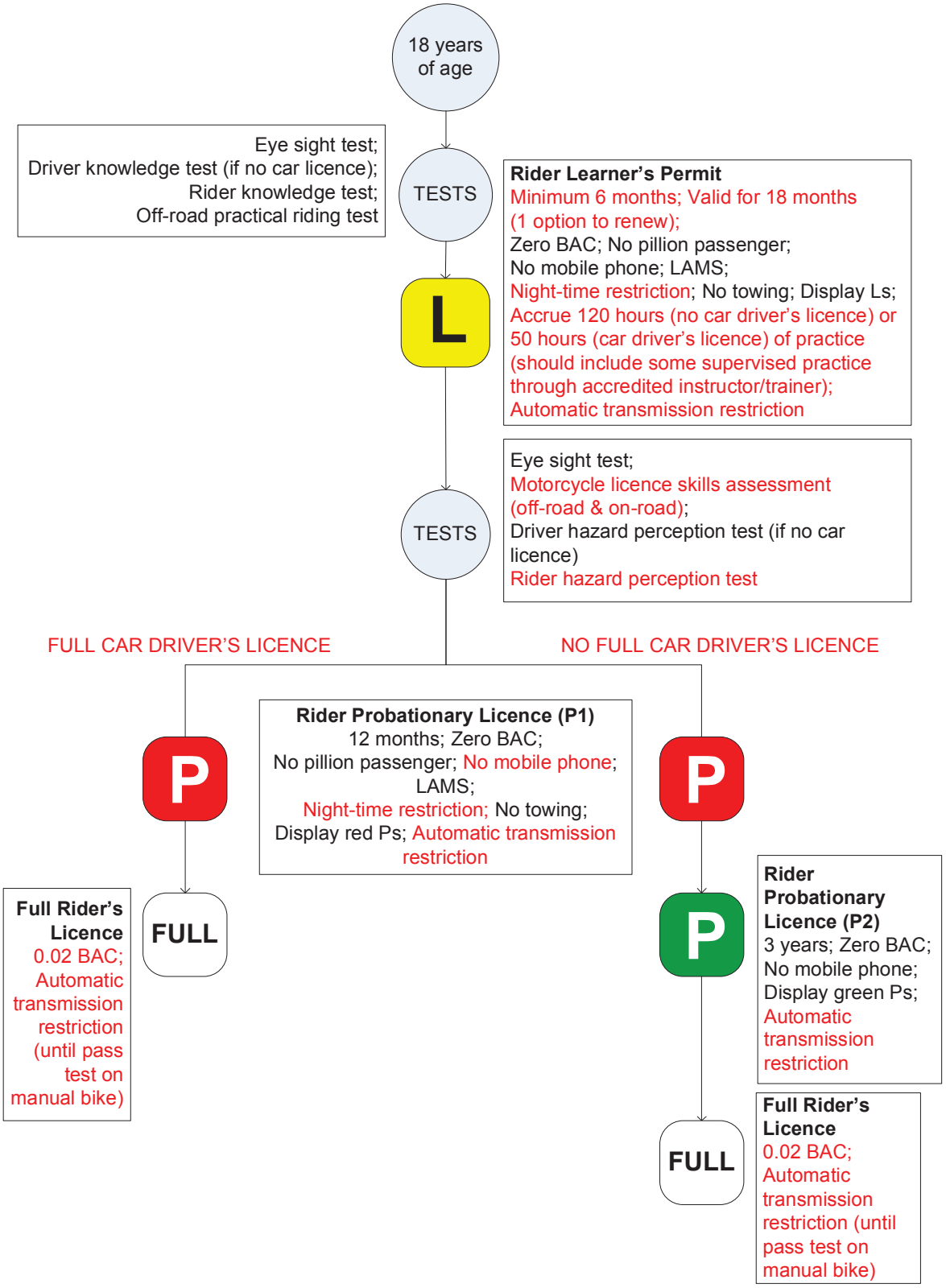

Figure 8.1 Recommended rider GLS for Victoria (key changes from the current system shown in red font)

To conclude, the recommendations proposed here are compared against the features of an optimal GLS for motorcyclists proposed by Mayhew and Simpson (2001) and the "best practice" components proposed by Haworth et al. (2007). These listings were presented on pages 29 to 30 of this report. Table 8.2 distinguishes between those recommendations that are consistent with what has been previously proposed as "best practice" or "optimal" and those that have not, but were considered, on the basis of the current research, to be worthy of inclusion in a motorcycle GLS.

Table 8.2 Prioritised list of recommendations against best practice motorcycle GLS models of Haworth et al. (2007) and Mayhew and Simpson (2001)

Number	Recommendation	Priority
Recommended as a critical element for a best practice motorcycle GLS model		
E1.	Increase the minimum duration of the Learner phase from 3 months to 6 months. (This assumes concomitant changes regarding a requirement for practice.)	High
E2.	Increase the maximum duration of the Learner phase from 15 months to 18 months. (This assumes concomitant changes regarding a requirement for practice.)	High
E3.	Allow Learners one option to renew their Learner's Permit at the end of the first 18 months. (This assumes concomitant changes regarding a requirement for practice.)	High
E4.	Full car licence holders who obtain a rider licence will be given a P1 licence instead of a Full licence with restrictions	High
E5.	Riders without a Full car driver's licence and aged over 21 years of age will be required to complete both the P1 and P2 licence phases – that is, they will not bypass the P1 licence phase	High
	For those Learner riders without a car licence (Probationary or Full), encourage the accrual of 120 hours of on-road riding practice during the Learner period. A minimum proportion of hours should be accrued under supervision with an accredited instructor/trainer as part of assisted rides or similar.	High
	For those Learner riders with a car licence (Probationary or Full), encourage the accrual of 50 hours of on-road riding practice during the Learner period. A minimum proportion of hours should be accrued under supervision with an accredited instructor/trainer as part of assisted rides or similar.	High
R2.	Riders in the Learner and P1 phases (i.e. <u>all</u> newly licenced riders) will be subject to a night-time riding curfew - ideally 8 pm to 6 am, but recommend 10 pm to 6 am. (Exemptions would need to be put in place for those individuals who must ride at night for work purposes.)	Low
T1.	Develop and implement a rider HPT which all riders must pass to obtain a Probationary licence	High

Table 8.2 (cont.) Prioritised list of recommendations against best practice motorcycle GLS models of Haworth et al. (2007) and Mayhew and Simpson (2001)

Number	Recommendation	Priority
T2.	Develop and implement a more challenging practical test which all riders must pass to obtain a Probationary licence. The test should include an on-road component.	High
T3.	Develop and implement a standardised training curriculum for use by all training providers.	Low
Recommended for inclusion in a motorcycle GLS		
	Update the Learner rider handbook and associated resources to highlight the range of environments across which practice should be accrued	Medium
R1.	Riders with a Full rider licence (i.e. beyond the Learner and restricted licence phases) will be subject to a BAC limit of 0.02	Medium
R3.	Riders in the Learner, P1 and P2 phases will be subject to a restriction on using a mobile phone (all modes) while riding	High
R4.	Riders who undertake their Learner test and P test on a motorcycle with an automatic transmission will be restricted to riding motorcycles with automatic transmissions. (Once fully licensed, these riders will be able to ride a manual transmission motorcycle only after passing the practical licence test on a motorcycle with manual transmission.)	High
	Consider the development of an Exit test – which riders must pass in order to become a Full licence holder	Low
	Consider the development and implementation of a standard for protective gear for all riders (i.e. including scooter riders) to comply with at testing	Medium

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Appendix A GLS Component Comparisons

Starts on next page.

Table A-1 Comparison between motorcycle rider and passenger vehicle driver licensing in Australia and New Zealand: Number of phases

Jurisdiction	Rider		Driver	
	Number of phases	Phases	Number of phases	Phases
Australia				
Victoria	3 or 4	Without full car licence: <21 years old: L, P1, P2, Full [a]; >21 years old: L, P2, Full; With full car licence: L, Full (with restrictions), Full	3 or 4	<21 years old: L, P1, P2, Full; >21 years old: L, P2, Full;
New South Wales	3 or 4	If aged >25 years, have a full car driver's licence, and have held P1 rider licence for 12 months: L, P1, Full; All others: L, P1, P2, Full	4	L, P1, P2, Full
Queensland	3	Class R-E [b]: L, P, Full; Prior to applying for Ls, the novice rider must have held a P or full car licence (Class C) for at least 12 months in the preceding 5 years	3 or 4	<25 years old: L, P1, P2, Full; >25 years old: L, P2, Full
South Australia	3	L, P, Full	4	L, P1, P2, Full
Western Australia	3	Class R-E [c]: L, P, Full	5	L1, L2, P1, P2, Full
Tasmania	4	L, P1, P2, Full	5	L1, L2, P1, P2, Full
Northern Territory	3	L, P, Full	3	L, P, Full
ACT	3	L, P, Full	3	L, P, Full
New Zealand	3	L, P, Full	3	L, P, Full

Note. L = Learner licensing phase; L1 = Learner phase 1; L2 = Learner phase 2; P = Intermediate licensing phase; P1 = Intermediate Phase 1; P2 = Intermediate Phase 2; ACT = Australian Capital Territory; BAC = Blood Alcohol Concentration

[a] Unless stated otherwise, the "Full" phase refers to a full licence with no restrictions

[b] In Queensland, a Class R-E licence qualifies the rider to ride any motorcycle that is a learner approved motorcycle (i.e. maximum 660 cc and maximum 150 kW/t). Riders who have held a Class R-E P or full licence for at least one year, can apply for a Class R licence, which does restrict riders to riding motorcycles that are learner approved.

[c] In Western Australia, a Class R-E licence qualifies the rider to ride any motorcycle with or without a side car attachment with an engine capacity not exceeding 250cc. Riders who have held a Class R-E licence for at least one year, can apply for a Class R licence, which qualifies the rider to ride any motorcycle. A further licence class, Class R-N, qualifies a rider to ride a moped only. In this case, mopeds are defined as having an engine capacity of no more than 50cc and having a maximum travel speed of 60 km/h. Individuals with a Class R-E, Class R or Class C (car) licence are already permitted to ride a moped. Riders who pursue a Class R-N licence, proceed through L, P and Full licence phases.

Table A-2 Comparison between motorcycle rider and passenger vehicle driver licensing in Australia and New Zealand: Minimum age for obtaining a Learner's Permit, and the minimum and maximum time periods for holding a Learner's Permit

Jurisdiction	Rider			Driver		
	Minimum age	Minimum duration	Maximum duration	Minimum age	Minimum duration	Maximum duration
Australia						
Victoria	18 years	3 months	15 months	16 years	<21 years old - 12 months; 21 to 25 years old – 6 months; >25 years old – 3 months	10 years
New South Wales	16 years 9 months	3 months	12 months	16 years	<25 years old - 12 months; >25 years – No waiting period	5 years
Queensland	18 years	Class R-E: 6 months (Q-SAFE) or none (Q-RIDE) & have held a P or full car licence (Class C) for at least 12 months in the 5 years prior to applying for Ls	2 years	16 years	12 months	3 years
South Australia	16 years	6 months	2 years	16 years	6 months (Expected to increase to 12 months in 2010)	24 months (renewal for 9 months)
Western Australia	Class R-E: 16 years	Class R-E: 6 months (car licence holders exempt)	3 years	L1 – 16 years; L2 – 16 years 6 months	L1 – 6 months; L2 – 6 months	L1 + L2 - 3 years
Tasmania	16 years 6 months	6 months	12 months	L1 - 16 years L2 – 16 years 3 months	L1 – 3 months; L2 – 9 months	3 years
Northern Territory	16 years	6 months	2 years	16 years	6 months	2 years
ACT	16 years 9 months	3 months	2 years	15 years 9 months	6 months	2 years
New Zealand	15 years	6 months	-	15 years	6 months	-

Note. L = Learner licensing phase; L1 = Learner phase 1; L2 = Learner phase 2; ACT = Australian Capital Territory; Q-SAFE here refers to the practical riding test for the rider licence; Q-RIDE refers to the competency-based training and assessment program for Learner riders. It offers an alternative to the Q-SAFE path.

Table A-3 Comparison between motorcycle rider and passenger vehicle driver licensing in Australia and New Zealand: Minimum age for obtaining an Intermediate Licence, the time periods for holding that licence, and the minimum age for obtaining a Full (unrestricted) Licence

Jurisdiction	Rider			Driver		
	Minimum age P	Duration P	Minimum age Full	Minimum age P	Duration P	Minimum age Full
Australia						
Victoria	P1 - 18 years 3 months	If no car licence, P – 4 years; If have P car licence, P period will match up with P period for car driver licence & end at the end of the P car licence period; If have a full car licence, no P, but issued a full licence with restrictions for 12 months (Total = 12 months to 4 years)	22 years 3 months	P1 – 18 years; P2 – 19 years	<21 years old: P1 – 12 months, P2 – 3 years; >21 years old: no P1, P2 – 3 years (Total = 3 or 4 years)	22 years
New South Wales	P1 – 17 years; P2 – 18 years	P1 – Valid for 18 months, but can be upgraded to P2 after 12 months; P2 – Valid for 30 months, but can be upgraded to full licence after 24 months; If aged >25 years, have a full car driver's licence, and have held P1 rider licence for 12 months, can by-pass P2 and move straight to a full rider licence (Total = 2 to 4 years)	20 years	P1 – 17 years; P2 – 18 years	P1 – Valid for 18 months, but can be upgraded to P2 after 12 months; P2 – Valid for 30 months, but can be upgraded to full licence after 24 months (Total = 3 or 4 years)	20 years
Queensland	18 years 6 months	12 months	19 years 6 months	P1 – 17 years; P2 – 18 years	Case 1: <23 years old, P1 - 12 months, P2 <25 years old – 2 years, P2 >25 years old – 12 months. Case 2: 23 years old, P1 – 12 months, P2 >24 years old – 12 months. Case 3: 24 years old, P1 – 12 months, P2 - none Case 4: >25 years old, P1 - none, P2 - 12 months (Total = 12 months to 3 years)	20 years

Note. P = Intermediate licensing phase; P1 = Intermediate Phase 1; P2 = Intermediate Phase 2; ACT = Australian Capital Territory

Table A-3 (cont.) Comparison between motorcycle rider and passenger vehicle driver licensing in Australia and New Zealand: Minimum age for obtaining an Intermediate Licence, the time periods for holding that licence, and the minimum age for obtaining a Full (unrestricted) Licence

Jurisdiction	Rider			Driver		
	Minimum age P	**Duration P**	**Minimum age Full**	**Minimum age P**	**Duration P**	**Minimum age Full**
Australia (cont.)						
South Australia	16 years 6 months	12 months	17 years 6 months	P1 – 16 years 6 months; P2 – 17 years 6 months	P1 – 12 months; P1 + P2 combined – 2 years (minimum)	19 years
Western Australia	Class R-E: 17 years	Class R-E: 2 years; After 12 months can apply for upgrade to Class R, which permits the rider to ride any motorcycle.	19 years	P1 – 17 years; P2 – 17 years 6 months	P1 – 6 months; P2 – 18 months (Total = 2 years)	19 years
Tasmania	P1 - 17 years; P2 – 18 years	P1 – 12 months; P2: 18 to 23 years old – 2 years, 23 to 25 years old – 12 months or until turn 25 years (whichever is later), >25 years old – 12 months (Total = 2 to 3 years)	20 years	P1 – 17 years; P2 – 18 years	P1 – 12 months; P2: 18 to 23 years old – 2 years, 23 to 25 years old – 12 months or until turn 25 years (whichever is later), >25 years old – 12 months (Total = 2 to 3 years)	20 years
Northern Territory	17 years	12 months	18 years	17 years	<25 years old - 2 years; >25 years old – 12 months (Total = 12 months or 2 years)	19 years
ACT	17 years	3 years; If hold a full car driver's licence – 12 months (Total = 12 months or 3 years)	20 years	17 years	3 years	20 years
New Zealand	15 years 6 months	<25 years old – 18 months; > 25 years old – 6 months; Can be reduced to 12 and 3 months, respectively, if complete an approved course (Total = 3 to 18 months)	16 years 6 months	15 years 6 months	<25 years old – 18 months; > 25 years old – 6 months; Can be reduced to 12 and 3 months, respectively, if complete an approved course – for < 25 year olds, the course can be done after 6 months on P. (Total = 3 to 18 months)	16 years 6 months

Note. P = Intermediate licensing phase; P1 = Intermediate Phase 1; P2 = Intermediate Phase 2; ACT = Australian Capital Territory

Table A-4 Comparison between motorcycle rider and passenger vehicle driver licensing in Australia and New Zealand: Supervision during the Learner's phase

Jurisdiction	Rider		Driver	
	Supervision?	**Characteristics**	**Supervision?**	**Characteristics**
Australia				
Victoria	No	n/a	Yes	The supervisor must hold a full car driver's licence and have a BAC of less than 0.05.
New South Wales	No	n/a	Yes	The supervisor must hold a full car driver's licence and have a BAC of less than 0.05.
Queensland	Yes	The supervisor must travel in the sidecar or in a car/on other motorcycle behind the learner rider. The supervisor must hold a full licence for the same class of vehicle, and have held that licence for at least one year.	Yes	The supervisor must hold a full car driver's licence and have held that licence for at least one year.
South Australia	No	n/a	Yes	The supervisor must hold a full car driver's licence, have held that licence for at least two years, and have a BAC of less than 0.05 and no cannabis or speed in his/her blood or oral fluid.
Western Australia	Yes	The supervisor must travel as a pillion passenger, in the sidecar, or on another motorcycle behind the learner rider. In the case of Class R-E, the supervisor must hold a licence for the same licence class or higher, and have held that licence for at least four years.	Yes	L1 & L2 - The supervisor must hold a car driver's licence and have held than licence for at least four years.
Tasmania	No	n/a	Yes	The supervisor must hold a full car driver's licence and have held that licence for at least two years.
Northern Territory	No	n/a	Yes	The supervisor must hold a full car driver's licence.
ACT	No	n/a	Yes	The supervisor must hold a full car driver's licence.
New Zealand	No	n/a	Yes	The supervisor must hold a full car driver's licence and have held that licence for at least two years.

Note. ACT = Australian Capital Territory; BAC = Blood Alcohol Concentration; n/a = Not applicable; L1 = Learner phase 1; L2 = Learner phase 2

Table A-5 Comparison between motorcycle rider and passenger vehicle driver licensing in Australia and New Zealand: Mandatory practice/logged hours during the Learner's phase

Jurisdiction	Rider		Driver	
	Mandatory practice?	Characteristics	Mandatory practice?	Characteristics
Australia				
Victoria	No	n/a	Yes	For novice drivers under 21 years only - minimum 120 hours supervised practice including 10 hours at night.
New South Wales	No	n/a	Yes	Minimum 120 hours supervised practice including 20 hours at night.
Queensland	No	n/a	Yes	For novice drivers under 25 years only, minimum 100 hours supervised practice with at least 10 hours at night.
South Australia	No	n/a	Yes	Minimum 50 hours supervised practice including 10 hours at night. (Expected to increase to 75 hours in 2010)
Western Australia	Yes	Class R-E: L - minimum of 25 hours supervised practice (car licence holders exempt)	Yes	L2 only - minimum 25 hours supervised practice.
Tasmania	No	n/a	Yes	L2 only - minimum 50 hours of supervised practice.
Northern Territory	No	n/a	No	n/a
ACT	No	n/a	No	n/a
New Zealand	No	n/a	No	n/a

Note. L = Learner licensing phase; L1 = Learner phase 1; L2 = Learner phase 2; ACT = Australian Capital Territory

Table A-6 Comparison between motorcycle rider and passenger vehicle driver licensing in Australia and New Zealand: Display of plates to signify licensing phase

Jurisdiction	Rider		Driver	
	Plates?	Characteristics	Plates?	Characteristics
Australia				
Victoria	Yes	L - yellow background with black L; If no car licence: P, first 12 months - red background with white P; P, 3 years thereafter - green background with white P. If have P car licence: look of P plate will depend on whether P1 or P2 of car licence. Rear only.	Yes	L - yellow background with black L. P1 - red background with white P. P2 - green background with white P. Front and rear.
New South Wales	Yes	L - yellow background with black L & '80' symbol in top right corner; P1 - White background with red P & '90' symbol in bottom right corner; P2 – White background with green P & '100' symbol in bottom right corner. Rear only.	Yes	L - Yellow background with black L & '80' symbol in top right corner; P1 - White background with red P & '90' symbol in bottom right corner; P2 – White background with green P & '100' symbol in bottom right corner. Front and rear.
Queensland	Yes	L - yellow background with black L; P – White background with red P (P1), white background with green P (P2). Rear only. Full car licence holders exempt from displaying P.	Yes	L - Yellow background with black L; P1 - White background with red P; P2 - White background with green P. Rear only. Front and rear.
South Australia	Yes	L - yellow background with black L; P – White background with red P. Rear only.	Yes	L- Yellow background with black L; P1- White background with red P. Front and rear. P2 - no
Western Australia	Yes	L - yellow background with black L; If night-time riding restrictions apply, P – red background with white P; If night-time restrictions do not apply, P – green background on white P. Rear only.	Yes	L - Yellow background with black L; P1 - red background with white P; P2 - green background with white P. Front and rear.
Tasmania	Yes	L - yellow background with black L; P1 – white background with red P. Rear only. P2 - no	Yes	L1 & L2 - yellow background with black L; P1 - white background with red P. Front and rear. P2 - no
Northern Territory	Yes	L - yellow background with black L; P - white background with red P. Rear only.	Yes	L - yellow background with black L; P - white background with red P. Front and rear.
ACT	Yes	L – yellow background with black L; P – white background with red P. Front and rear.	Yes	L – yellow background with black L; P – white background with red P. If successfully complete Road Ready Plus course (available to 17 to 25 year olds after first 6 months of P period) or aged 26+ years, then no longer required to display P plates after first 6 months of P period. Front and rear.
New Zealand	Yes	L - yellow background with black L. Rear only.	Yes	L – yellow background with black L. Front and rear.

Note. L = Learner licensing phase; L1 = Learner phase 1; L2 = Learner phase 2; P = Probationary/Provisional/Restricted licensing phase; P1 = Probationary/Provisional Phase 1; P2 = Probationary/Provisional Phase 2; ACT = Australian Capital Territory

Table A-7 Comparison between motorcycle rider and passenger vehicle driver licensing in Australia and New Zealand: Zero BAC

Jurisdiction	Rider		Driver	
	Zero BAC?	**Characteristics**	**Zero BAC?**	**Characteristics**
Australia				
Victoria	Yes	L & P1, P2 or first 12 months of licensure.	Yes	L; P1 & P2
New South Wales	Yes	L, P1 & P2	Yes	L, P1 & P2
Queensland	Yes	L & P under age 25 years (BAC for P licence holders over age 25 years is 0.05; if have had licence disqualified, then zero BAC applies).	Yes	L; P1 & P2
South Australia	Yes	L & P	Yes	L; P1 & P2
Western Australia	Yes	L & P	Yes	L1 & L2; P1 & P2
Tasmania	Yes	L; P1 & P2	Yes	L1 & L2; P1 & P2
Northern Territory	Yes	L & P	Yes	L, P & first 12 months of full or until turn 25 years old (whichever is sooner)
ACT	No	L & P – BAC of 0.02.	No	L & P – BAC of 0.02.
New Zealand	No	L & P – BAC of 0.03 if under age 20 years & BAC of 0.08 if over age 20 years.	No	L & P – BAC of 0.03 if under age 20 years & BAC of 0.08 if over age 20 years.

Note. L = Learner licensing phase; L1 = Learner phase 1; L2 = Learner phase 2; P = Intermediate licensing phase; P1 = Intermediate Phase 1; P2 = Intermediate Phase 2; ACT = Australian Capital Territory; BAC = Blood Alcohol Concentration

Table A-8 Comparison between motorcycle rider and passenger vehicle driver licensing in Australia and New Zealand: Carriage of passengers

Jurisdiction	Rider		Driver	
	Passenger restrictions?	Characteristics	Passenger restrictions?	Characteristics (Applies to P phase/s only)
Australia				
Victoria	Yes	L & P1 or first 12 months of licensure – pillion passenger not permitted.	Yes	P1 only – not permitted to carry more than one passenger aged between 16 and 21 years (excluding spouse & sibling).
New South Wales	Yes	L, P1 & first 12 months of full licence (if over 30 years of age and have held a full car driver's licence for the last five years) – pillion passenger not permitted.	Yes	P1 only – under age 25 years, not permitted to carry more than one passenger under the age of 21 years between 11pm and 5am.
Queensland	Yes	L & first 12 months of licensure – pillion passenger not permitted.	Yes	P1 only – under age 25 years, not permitted to carry more than one passenger under the age of 21 years between 11pm and 5am.
South Australia	Yes	L only – pillion passenger not permitted unless he/she holds a full rider licence	No	n/a.
Western Australia	No	n/a	No	n/a
Tasmania	Yes	L & P1 only – pillion passenger not permitted; L exception – pillion passenger permitted if the rider is being instructed by the pillion passenger and the instructor has held a motorcycle licence for at least three years	No	n/a
Northern Territory	Yes	L & P – pillion passenger not permitted	No	n/a
ACT	Yes	L only – pillion passenger not permitted	No	n/a
New Zealand	Yes	L & P – no passengers are permitted	Yes	P – no passengers are permitted unless the supervisor is present.

Note. L = Learner licensing phase; P = Intermediate licensing phase; P1 = Intermediate Phase 1; P2 = Intermediate Phase 2; ACT = Australian Capital Territory; n/a = Not applicable

Table A-9 Comparison between motorcycle rider and passenger vehicle driver licensing in Australia and New Zealand: Night time driving restrictions

Jurisdiction	Rider		Driver	
	Night time restrictions?	Characteristics	Night time restrictions?	Characteristics (Applies to P phase/s only)
Australia				
Victoria	No	n/a	No	n/a
New South Wales	No	n/a	Yes	P1 only - if aged under 25 years, may only carry one passenger under the age of 21 between 11pm and 5am.
Queensland	No	n/a	No	n/a
South Australia	No	n/a	Yes	If a serious disqualification offence is committed, a curfew condition prohibiting driving between 12am and 5am, unless accompanied by a qualified supervisor, is imposed for 12 months upon returning to driving.
Western Australia	Yes	P only - if first licence, then must not drive between midnight and 5am for the first 6 months of the P period	Yes	P1 only - must not drive between midnight and 5am.
Tasmania	No	n/a	No	n/a
Northern Territory	No	n/a	No	n/a
ACT	No	n/a	No	n/a
New Zealand	Yes	L & P - must not drive between 10pm and 5am.	Yes	P - must not drive between 10pm and 5am without a supervisor.

Note. L = Learner licensing phase; P = Intermediate licensing phase; P1 = Intermediate Phase 1; P2 = Intermediate Phase 2; ACT = Australian Capital Territory; n/a = Not applicable

Table A-10 Comparison between motorcycle rider and passenger vehicle driver licensing in Australia and New Zealand: Road type, location or speed restrictions

Jurisdiction	Rider		Driver	
	Road/Location/ Speed restrictions?	Characteristics	Road/Location/ Speed restrictions?	Characteristics
Australia				
Victoria	No	n/a	No	n/a
New South Wales	Yes	L - maximum speed 80km/h & must not drive in Centennial Park when in Sydney; P1 - maximum 90 km/h; P2 - maximum 100 km/h	Yes	L - maximum speed 80km/h & must not drive in Centennial Park when in Sydney; P1 - maximum speed 90km/h; P2 - maximum speed 100km/h
Queensland	No	n/a	No	n/a
South Australia	Yes	L - maximum speed 80km/h	Yes	L - maximum speed 80km/h (or 100km/h if accompanied by professional driving instructor); P1 & P2- maximum speed 100km/h
Western Australia	No	n/a	Yes	L1 & L2 - maximum speed 100km/h & must not drive in Kings Park
Tasmania	Yes	L & P1 - maximum speed 80km/h	Yes	L1, L2 & P1 - maximum speed 80km/h
Northern Territory	Yes	L - maximum speed 80km/h (unless under the direct supervision of an authorised motorcycle instructor conducting an approved training program); P - maximum speed 100km/h	Yes	L - maximum speed 80km/h (unless under the direct supervision of an authorised driving instructor conducting an approved training program); P - maximum speed 100km/h
ACT	No	n/a	No	n/a
New Zealand	Yes	L - maximum speed 70 km/h on the open road	No	n/a

Note. L = Learner licensing phase; L1 = Learner phase 1; L2 = Learner phase 2; P = Intermediate licensing phase; P1 = Intermediate Phase 1; P2 = Intermediate Phase 2; ACT = Australian Capital Territory; n/a = Not applicable

Table A-11 Comparison between motorcycle rider and passenger vehicle driver licensing in Australia and New Zealand: Mobile phone restrictions

Jurisdiction	Rider		Driver	
	Mobile phone restrictions?	**Characteristics**	**Mobile phone restrictions?**	**Characteristics**
Australia				
Victoria	Yes	L, P1 & P2 - no mobile phone use at all (inc. hands-free)	Yes	L, P1 & P2 - no mobile phone at all (inc. hands-free)
New South Wales	No	n/a	Yes	L & P1 - no mobile phone use at all (inc. hands-free); P2 – no hand-held mobile phone use
Queensland	No	n/a	Yes	L, P1 & P2 - no mobile phone use (inc. hands-free); In addition, the supervisors and any additional passengers are not permitted to use a mobile phone on loudspeaker.
South Australia	No	n/a	Yes	L & P1 - no mobile phone at all (inc. hands-free)
Western Australia	No	n/a	No	n/a
Tasmania	Yes	P1 only – no mobile phone use (inc. hands-free)	Yes	P1 only - no mobile phone use (inc. hands-free)
Northern Territory	Yes	L & P - no mobile phone use (inc. hands-free)	Yes	L & P - no mobile phone use (inc. hands-free)
ACT	No	n/a	No	n/a
New Zealand	No	n/a	No	n/a

Note. L = Learner licensing phase; P = Intermediate licensing phase; P1 = Intermediate Phase 1; P2 = Intermediate Phase 2; ACT = Australian Capital Territory; n/a = Not applicable

Table A-12 Comparison between motorcycle rider and passenger vehicle driver licensing in Australia and New Zealand: High-powered vehicle restrictions and engine capacity/power-to-weight restrictions

Jurisdiction	Rider		Driver	
	Engine/Power-to-weight restrictions?	Characteristics	Power restrictions?	Characteristics (Applies to P phase/s only)
Australia				
Victoria	Yes	L & P1 or first 12 months of licensure - if issued before 1 July 2008, may ride any motorcycle not exceeding 260cc or any Learner Approved Motorcycle (LAM). If issued on or after 1 July 2008 may only ride a LAM.	Yes	P1 & P2 - cannot drive any vehicle with: 8 or more cylinders, a turbo-charged or super-charged engine that is not diesel powered, and modifications that increase engine performance. A number of high performance 6 cylinder vehicles are also restricted.
New South Wales	Yes	L, P1 & P2 - must only ride motorcycles that have an engine capacity of not greater than 660ml with a power to weight ratio not greater than 150kW/t, and are on the List of Approved Motorcycles for Novice Riders.	Yes	P1 & P2 - cannot drive any vehicle with: 8 or more cylinders, a turbo-charged or super-charged engine that is not diesel powered, modifications that increase engine performance, and any other vehicle identified by the RTA, including some 6 cylinder vehicles.
Queensland	Yes	Class RE: L, P & full must only ride motorcycles that have a maximum engine capacity of 660ml with a power to weight ratio of up to 150 kW/t, and are approved under the LAM scheme. Class R: P & full (eligible to apply for upgrade once have held a Class RE P or full licence for at least one year – i.e. P or full licence will be upgraded) – no restrictions.	Yes	P1 & P2 - restrictions on high powered vehicles for novices under 25 years. Restrictions apply to vehicles with: 8 or more cylinders, a turbo-charged or super-charged engine that is not diesel powered, an engine that has a power output of more than 200kW as per the manufacturers' specifications, a rotary engine that has an engine capacity of more than 1146cc as per the manufacturers' specifications, and a modified engine.
South Australia	Yes	Class R-Date: L & P – must only ride motorcycles that have a maximum engine capacity of 660ml with a power to weight ratio of up to 150 kW/t, and are approved under the LAM scheme.	No	n/a
Western Australia	Yes	Class R-E: L & P - maximum engine capacity of 250cc.	No	n/a
Tasmania	Yes	L & P1 only – must only ride LAM.	No	n/a
Northern Territory	Yes	Class R(r): L, P and full (if already hold a full car driver's licence) – must only ride a LAM.	No	n/a
ACT	Yes	L and first 12 months of P - must not drive a motorcycle with a power to weight ratio exceeding 150 kW/t.	No	n/a
New Zealand	Yes	L & P - maximum engine capacity of 250cc	No	n/a

Note. L = Learner licensing phase; P = Intermediate licensing phase; P1 = Intermediate Phase 1; P2 = Intermediate Phase 2; ACT = Australian Capital Territory; n/a = Not applicable; RTA = Road Traffic Authority ; LAM/S = Learner Approved Motorcycle/ Scheme

Table A-13 Comparison between motorcycle rider and passenger vehicle driver licensing in Australia and New Zealand: Towing

Jurisdiction	Rider		Driver	
	Towing restrictions?	**Characteristics**	**Towing restrictions?**	**Characteristics**
Australia				
Victoria	Yes	L & P1 - no towing.	Yes	L - no towing; P1 - no towing (unless for work or if under instruction).
New South Wales	Yes	L & P1- no towing	Yes	L - no towing; P1- permitted to tow light trailers up to 250kg unloaded weight
Queensland	No	n/a	No	n/a
South Australia	No	n/a	No	n/a
Western Australia	No	n/a	No	n/a
Tasmania	No	n/a	Yes	L1 & L2 - no towing
Northern Territory	No	n/a	No	n/a
ACT	Yes	L – must not tow a trailer	Yes	L - must not tow a trailer exceeding 750kg GVM
New Zealand	No	n/a	No	n/a

Note. L = Learner licensing phase; P = Intermediate licensing phase; P1 = Intermediate Phase 1; P2 = Intermediate Phase 2; ACT = Australian Capital Territory; n/a = Not applicable

Table A-14 Comparison between motorcycle rider and passenger vehicle driver licensing in Australia and New Zealand: Automatic transmission

Jurisdiction	Rider		Driver	
	Transmission restrictions?	**Characteristics**	**Transmission restrictions?**	**Characteristics**
Australia				
Victoria	No	n/a	Yes	P1 & P2 – restricted to driving an automatic vehicle if tested in one.
New South Wales	Yes	L – restricted to riding an automatic motorcycle if completed pre-learner course on one; P1 – restricted to riding an automatic motorcycle if completed pre-provisional course on one.	Yes	P1 only – restricted to driving an automatic vehicle if tested in one.
Queensland	Yes	L, P & Full – restricted to riding an automatic motorcycle if tested on one.	Yes	P1, P2 & Full – restricted to driving an automatic vehicle if tested in one.
South Australia	No	n/a	No	n/a
Western Australia	No	n/a	Yes	L2, P1, P2 & Full – restricted to driving an automatic vehicle if tested in one.
Tasmania	No	n/a	No	n/a
Northern Territory	No	n/a	No	n/a
ACT	No	n/a	Yes	P – restricted to driving for the first 12 months an automatic vehicle if tested in one.
New Zealand	No	n/a	Yes	P & Full – restricted to driving an automatic vehicle if tested in one.

Note. L = Learner licensing phase; L1 = Learner phase 1; L2 = Learner phase 2; P = Intermediate licensing phase; P1 = Intermediate Phase 1; P2 = Intermediate Phase 2; ACT = Australian Capital Territory; n/a = Not applicable

Table A-15 Licence requirements to ride mopeds and scooters in Australia and New Zealand

Jurisdiction	Moped [a]	Scooter [b]
Australia		
Victoria	Motorcycle licence	Motorcycle licence only
New South Wales	Motorcycle licence only	Motorcycle licence only
Queensland	Car licence or Motorcycle licence	Motorcycle licence only
South Australia	Car licence or Motorcycle licence	Motorcycle licence only
Western Australia	Car licence or Motorcycle licence; Class R-N licence for mopeds only	Motorcycle licence only
Tasmania	Motorcycle licence only	Motorcycle licence only
Northern Territory	Car licence or Motorcycle licence	Motorcycle licence only
ACT	Motorcycle licence	Motorcycle licence only
New Zealand	Car licence or Motorcycle licence	Motorcycle licence only

Note. ACT = Australian Capital Territory

[a] Moped are operationally defined here as having an engine capacity of no more than 50cc and having a maximum speed of approximately 50km/h

[b] Scooters are operationally defined here as having a step-through design, and an automatic transmission (and exclude mopeds)

Table A-16 Comparison between motorcycle rider and passenger vehicle driver licensing in Australia and New Zealand: Rewards for completion of education or training

Jurisdiction	Rider		Driver	
	Rewards?	**Characteristics**	**Rewards?**	**Characteristics**
Australia				
Victoria	No	n/a	No	n/a
New South Wales	No	n/a	No	n/a
Queensland	No	n/a	No	n/a
South Australia	No	n/a	No	n/a
Western Australia	No	n/a	No	n/a
Tasmania	No	n/a	No	n/a
Northern Territory	No	n/a	No	n/a
ACT	No	n/a	Yes	Road Ready Plus course can be undertaken after 6 months on a P licence - doubles the novice demerit point allowance from 4 to 8, & P licence holders no longer have to display P plates.
New Zealand	Yes	P can be reduced to 12 months (if under 25 years) and 3 months (if over 25 years) if complete an approved course.	Yes	P can be reduced to 12 months (if under 25 years) and 3 months (if over 25 years) if complete an approved course.

Note. P = Intermediate licensing phase; ACT = Australian Capital Territory; n/a = Not applicable

Table A-17 Comparison between motorcycle rider and passenger vehicle driver licensing in Australia and New Zealand: Test requirements

Jurisdiction	Rider			Driver		
	Entry L	**Entry P**	**Exit**	**Entry L**	**Entry P**	**Exit**
Australia						
Victoria	Eye sight test; Car knowledge test (if no car licence); Motorcycle knowledge test; Off-road practical test.	Eye sight test; Motorcycle licence skills assessment (off-road); Hazard perception test (computer based) (if no car licence).	Nil	Eye sight test; Car knowledge test.	P1 - On road driving test; Hazard perception test (computer based).	Nil
New South Wales	Eye sight test; Pre-learner course; Driver Knowledge test (DKT).	P1 – Pre-provisional course; Riding skills test.	Nil	Eye sight test; Driver knowledge test (DKT).	P1 - On-road driving test; P2 - Hazard perception test (computer based).	Driver Qualification Test (computer based) - advanced hazard perception, and knowledge of road rules and safe driving practices.
Queensland	Eye sight test; Knowledge test.	Eye sight test; Q-Ride OR Q-SAFE (on-road riding skills test).	Nil	Eye sight test; Knowledge test.	P1 - Eye sight test; Q-SAFE (on-road driving test); P2 - Hazard perception test (computer based); (>25 year olds undertake Q-SAFE to move from L directly to P2).	Nil
South Australia	Knowledge test (if no car licence); Rider Safe Course – Basic training	Rider Safe Course – Advanced training	Nil	Knowledge test.	P1 – On-road driving test (VORT – Vehicle On-Road Test) OR CBTA option; P2 - Hazard perception test (computer based).	Nil

Note. L = Learner licensing phase; P = Intermediate licensing phase; P1 = Intermediate Phase 1; P2 = Intermediate Phase 2; CBTA = Competency Based Training Assessment

Table A-17 (cont.) Comparison between motorcycle rider and passenger vehicle driver licensing in Australia and New Zealand: Test requirements

Jurisdiction	Rider			Driver		
	Entry L	**Entry P**	**Exit**	**Entry L**	**Entry P**	**Exit**
Australia (cont.)						
Western Australia	Eye sight test & Medical declaration; Knowledge test (if no car licence); Class R-E: Motorcycle theory test.	Practical test.	To upgrade to Class R: Practical test	L1 – Eye sight test & Medical declaration; Knowledge test; L2 - On-road driving test (PDA - Practical Driving Assessment).	P1 - Hazard perception test (computer based).	Nil
Tasmania	Eye sight test; Driver knowledge test; Pre-learner motorcycle course.	P1 - Pre-provisional motorcycle course.	Nil	Eye sight test L1- Driver Knowledge Test; L2- On-road driving test.	P1- On-road driving test.	Nil
Northern Territory	Eye sight test; Knowledge test (if no car licence); Motorcycle Operator Skills test (MOST) (if do not undertake METAL Basic course)	On-road driving test (if do not undertake METAL Advanced course)	Nil	Eye sight test; Knowledge test OR Approved training program (e.g. DTAL – Driver Training And Licensing - has theory & practical components)	On-road driving test OR Approved driving program.	Nil
ACT	Eye sight test; Knowledge test (part of Road Ready) (if no car licence); Learner rider motorcycle course.	Practical rider assessment.	Nil	Eye sight test; Knowledge test (part of Road Ready).	Practical on-road driving test OR CBTA option.	Nil
New Zealand	Eye sight test; Knowledge test; Basic handling skills test.	Eye sight test; On-road riding test.	On-road riding test.	Eye sight test; Knowledge test.	Eye sight test; On-road driving test.	On-road driving test.

Note. L = Learner licensing phase; L1 = Learner phase 1; L2 = Learner phase 2; P = Intermediate licensing phase; P1 = Intermediate Phase 1; P2 = Intermediate Phase 2; ACT = Australian Capital Territory; CBT = Competency Based Training; METAL = Motorcycle Education Training and Licensing

Table A-18 Comparison between motorcycle rider and passenger vehicle driver licensing in Australia and New Zealand: Mandatory training requirements

Jurisdiction	Rider		Driver	
	Mandatory training?	Characteristics	Mandatory training?	Characteristics
Australia				
Victoria	No	n/a	No	n/a
New South Wales	Yes	To obtain L - Pre-learner course (can undertake at 16 years 6 months); To obtain P1 - Pre-provisional course.	No	n/a
Queensland	Yes	To obtain P – For those who choose the Q-Ride option.	No	n/a
South Australia	Yes	Rider Safe Course: To obtain L – Basic training; To obtain P – Advanced training.	Yes	To obtain P2 (if incurred 1 – 3 demerit points during P1) – Driver Awareness Course (comprises written & practical elements).
Western Australia	No	n/a	No	n/a
Tasmania	Yes	To obtain L – Pre-Learner Motorcycle Training Course (valid for 3 months; can be undertaken at minimum age of 16 years 4 months; includes a "simulated" on-road ride); To obtain P1 - Pre-Provisional Motorcycle Training Course (can be undertaken at minimum age of 17 years & after at least 6 months on L; includes an on-road ride).	No	n/a
Northern Territory	Yes	To obtain L - Motorcycle Education Training and Licensing (METAL) Basic course; To obtain P – METAL Advanced course.	No	n/a
ACT	Yes	To obtain L- Learner Rider Motorcycle Course; If do not already hold a car licence, then must first successfully complete the Road Ready course and obtained a L car licence.	Yes	To obtain L - Road Ready course.
New Zealand	No	n/a	No	n/a

Note. L = Learner licensing phase; P = Intermediate licensing phase; P1 = Intermediate Phase 1; P2 = Intermediate Phase 2; ACT = Australian Capital Territory; n/a = Not applicable

Table A-19 Comparison between motorcycle rider and passenger vehicle driver licensing in Australia and New Zealand: Lower demerit point threshold, extension of licensure and other penalties in general

Jurisdiction	Rider			Driver		
	Lower demerit point threshold	**Extension of licensure**	**Other penalties**	**Lower demerit point threshold**	**Extension of licensure**	**Other penalties**
Australia						
Victoria	Yes	Yes	Fines, demerit points as well as licence suspension or cancellation apply for breaking licence conditions. Alcohol interlocks fitted for disqualified riders after suspension.	Yes	Yes	Fines, demerit points as well as licence suspension or cancellation apply for breaking licence conditions. Alcohol interlocks fitted for disqualified drivers after suspension.
New South Wales	Yes. Double demerit points for all speeding, seatbelt and helmet offences during all public holidays.	No	Fines, demerit points as well as licence suspension or cancellation apply for breaking licence conditions. Alcohol interlocks fitted for disqualified riders upon re-issue of licence.	Yes. Double demerit points for all speeding and seatbelt offences during all public holidays.	No	Fines, demerit points as well as licence suspension or cancellation apply for breaking licence conditions. Alcohol interlocks fitted for disqualified drivers upon re-issue of licence.
Queensland	Yes	Yes	Penalties apply for not adhering to conditions.	Yes	Yes	Penalties apply for not adhering to conditions. Accumulation of 4 or more demerit points in 12 months results in a late night driving restriction.
South Australia	Yes	No	Penalties apply for not adhering to licence conditions. Curfew imposed for serious disqualification offenses. Alcohol interlocks for riders re-issued with licence (as of May 2009).	Yes	Yes	Penalties apply for not adhering to licence conditions. Curfew imposed for serious disqualification offenses. Alcohol interlocks for drivers reissued with licence (as of May 2009).

Table A-19 (cont.) Comparison between motorcycle rider and passenger vehicle driver licensing in Australia and New Zealand: Lower demerit point threshold, extension of licensure and other penalties

Jurisdiction	Rider			Driver		
	Lower demerit point threshold	Extension of licensure	Other penalties	Lower demerit point threshold	Extension of licensure	Other penalties
Australia (cont.)						
Western Australia	Yes	No	Penalties apply for not adhering to licence conditions. Any demerit points accrued as a learner are carried over into the P phases.	Yes	No	Penalties apply for not adhering to licence conditions. Any demerit points accrued as a learner are carried over into the P phases.
Tasmania	Yes	Yes	Penalties apply for not adhering to licence conditions. If a licence is lost twice within one licence stage- or within 6 months then the driver is sent back to the previous licence stage.	Yes	Yes	Penalties apply for not adhering to licence conditions. If a licence is lost twice within one licence stage, or within 6 months, then the driver is sent back to the previous licence stage.
Northern Territory	Yes	Yes	Penalties apply for not adhering to licence conditions. Alcohol Ignition Lock (AIL) program to commence 9 April 2009.	Yes	Yes	Penalties apply for not adhering to licence conditions. Alcohol Ignition Lock (AIL) program to commence 9 April 2009.
ACT	Yes	No	Penalties apply for not adhering to licence conditions.	Yes	No	Penalties apply for not adhering to licence conditions.
New Zealand	No	No	Penalties apply for not adhering to licence conditions.	No	No	Penalties apply for not adhering to licence conditions.

Note. ACT = Australian Capital Territory; P = Intermediate licensing phase

MONASH University
Accident Research Centre

GRADUATED LICENSING FOR MOTORCYCLISTS

(RSD 0981)

SUPPLEMENT

by

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Contents

Introduction

This report has been prepared as a supplement to the main report entitled Graduated Licensing for Motorcyclists (RSD 0981). This supplement comprises two parts. An overview of each part is given here.

Part A - Comparison of rider licensing systems in European countries

This part comprises a detailed listing and comparison of the structure, components and features of rider licensing systems currently in place in a number of European jurisdictions. Also presented is an overview of the 3rd Driving Licence Directive, which will apply from 2013, and the changes to rider licensing that are being proposed as part of this Directive. The information for this activity was sourced primarily from information that is publicly available on the internet and from that provided by key contacts in Europe.

Part B – Presentation of data relating potentially to the effectiveness of rider licensing systems

This part comprises a compilation of data relating potentially to the effectiveness of rider licensing systems. The information for this activity was sourced from key contacts in motorcycle rider safety in Australia, New Zealand, North America, and Europe. Contacts were asked to provide any recent, quantified information, published or unpublished (and regardless of how preliminary), on the effectiveness of the rider licensing system (or elements/components of the rider licensing system) in their jurisdiction. They were advised that this information could take several forms – for example, changes in the numbers of fatalities or serious injuries, violations, licences issued, unlicensed riders, registered motorcycles (including mopeds and scooters), and changes in the costs associated with licensing and/or training. Additional information was sourced from some recent journal publications on best practice licensing components.

Part A Rider Licensing in Europe

Current practice

Current access to powered-two-wheelers in European Union (EU) Member States is regulated by the 2nd Driving Licence Directive (Directive 91/439/EC), which came into force in 1991 for full implementation by July 1996. Table 1 comprises a detailed listing of the structure, components and features of rider licensing systems currently in place in the following European jurisdictions: Austria, Belgium, Denmark, Finland, France, Germany, Great Britain, Greece, Hungary, Ireland, Italy, Netherlands, Norway, Portugal, Slovenia, Spain, Sweden, Switzerland[1]. Information for Belgium, Finland, France, Great Britain, Hungary, Ireland, Netherlands, Norway, Portugal, Slovenia and Sweden was sourced primarily from CIECA (2009). Information for Great Britain was also sourced from www.direct.gov.uk/en/Motoring/LearnerAndNewDrivers/RidingMotorcyclesAndMopeds/index.htm. Information for Austria was sourced primarily from www.kfv.at/kuratorium-fuer-verkehrssicherheit/dienstleistungen/mehrphasen-fahrausbildung/ and for Germany from www.bmvbs.de/Verkehr/Strasse/EU-Fuehrerschein-,1447.1041638/Fahrerlaubnisklassen.htm. Information for Italy was sourced primarily from www.trasporti.gov.it/page/NuovoSito/site.php?o=vd&id=2713 and for Spain from www.dgt.es. Information for Switzerland was sourced primarily from www.admin.ch/ch/d/sr/c741_51.html. Finally, information for Denmark and Greece was sourced through personal communication with contacts in each country: Niels Agerholm (Aalborg University) in Denmark, and Ioanna Spyropoulou (National Technical University of Athens) in Greece.

Rider licensing systems in Europe are often described as having a "stepped" or "tiered" structure. In general, there are several licensing categories for powered-two-wheelers, with the defining feature of each category relating to motorcycle engine size. The typical categories are:

- 'A1' for motorcycles with engine size up to 125 cc and power up to 11 kW;
- 'A-restricted' (or 'A-limited' or 'A2') for motorcycles with engine size up to 25 kW and power-to-weight ratio up to 0.16 kW/kg; and
- 'A' for motorcycles with unlimited engine size or power capacity.

Mopeds are not covered by the current, 2nd Directive. Therefore, access to mopeds is determined at the national level (European Transport Safety Council, 2008), resulting in much variability across countries in terms of entry requirements. Information regarding access to mopeds is also included in Table 1. Some countries also have a 'light moped' category (not listed in Table 1). For example, in Denmark, 16 and 17 year olds can apply to ride a moped with a maximum design speed of 30 km/h.

As shown in Table 1, the minimum ages to ride a moped (up to 50 cc and maximum design speed of 45-50 km/h) ranges from 14 years (e.g France) to 18 years (Denmark). A number of jurisdictions already require moped riders to pass a theory test and a practical test. Theory and

[1] While not an EU Member State, Switzerland uses the EU system of vehicle categories and has generally adopted much of the EU legislation with regard to licensing.

practical training is also a requirement in some countries. In general, in most countries, individuals who are already licenced car drivers (classified as "category B" licence holders) are permitted to ride a moped without acquiring a separate licence to ride a moped.

Not all countries have a separate A1 category licence. Under the 2nd Directive, this category is optional. As shown in Table 1, Belgium, Denmark, and the Netherlands do not currently have a separate A1 category. In Belgium, for example, category B licence holders are permitted to ride an A1 category motorcycle after having held their category B licence for 2 years. However, even if some countries that do have a separate category A1 licence, individuals with a category B licence are permitted to ride an A1 motorcycle. In Italy, this entitlement is automatic. In Spain, category B licence holders are permitted to ride a category A1 motorcycle after having held the category B licence for at least three years. In Austria, category B licence holders must have held that licence for five continuous years and must undertake six hours of additional training before being permitted to ride an A1 motorcycle. In Switzerland, category B licence holders are entitled to ride an A1 motorcycle after completing 8 hours of practical training.

According to the 2nd Directive, the minimum age for a category A1 licence is 16 years. Table 1 shows that minimum ages range from 16 years (e.g. Finland) to 18 years (e.g. Switzerland). With the exception of Great Britain, where it is 17 years, the minimum age for applying for an A-restricted licence is 18 years. In some countries, individuals with a category A1 licence can progress to an A-restricted licence after 2 years either automatically (Finland) or after completing some additional practical training and testing (e.g. Greece). In Great Britain, access to an A-restricted motorcycle is immediate if the practical test for the A1 licence is taken on a motorcycle with a design speed exceeding 100 km/h.

With the exception of Spain and Ireland (no direct access option), there are two options for accessing a full-category A licence: progressive access and direct access. Progressive access is similar to graduated licensing in that applicants progress, over time, from a lighter motorcycle (smaller engine size) to a heavier motorcycle. Direct access gives applicants immediate access to a given motorcycle category. The minimum age associated with the progressive access route ranges from 19 (Great Britain) to 20 years (e.g. Finland). The minimum regulated age associated with the direct access route is 21 years. In practice, it ranges from 21 (e.g. Netherlands) to 25 (Germany) years.

Progressive access to the full-category A licence occurs after two years on the A-restricted licence. In some countries, access is automatic after two years (e.g. Norway), while in other countries, access is conditional upon completing practical training and testing (Slovenia), and a theory test (Hungary).

In general, theory and practical testing requirements for motorcycle licensing must be satisfied for entitlement to a category A1, A-restricted and A (direct access) licence. It is typical for practical testing to include both off-road (i.e. on private grounds) and on-road (i.e. on public roads) components. In many countries, successful completion of theory and practical training is also a requirement. In most countries, practical training and testing on public roads requires that the instructor/examiner follow the trainee on another motorcycle or in a car. In some countries, both options are permissible. In Finland, the instructor can accompany the trainee as a pillion passenger during practical, on-road training and, in Norway, during testing also. Typically, the instructor/examiner communicates with the trainee via handsfree radio.

Some countries impose a 'provisional' or 'learner' licensing period in preparation for practical testing. During this provisional period, learner riders are permitted to practice on public roads. In Belgium, Great Britain, Ireland, Sweden and Italy, learner riders must display a plate to denote their provisional licence status. In Great Britain (for direct access to full-category A),

Norway, Sweden, and Finland (option 3 only—see Table 1), riders must be supervised during their private, on-road practice by an appropriately qualified supervisor. In Great Britain and Norway, the supervisor follows on another motorcycle. In Sweden and Finland the supervisor follows on another motorcycle or accompanies the learner as a pillion passenger on the same motorcycle. In Finland, it is also permissible for the supervisor to follow in a car. In all four countries, supervisors typically communicate with the trainee via radio.

Some jurisdictions impose additional restrictions/requirements on their provisional riders. In Belgium, moped, A-limited and A (direct access) provisional licence holders are not permitted to ride during certain nighttime hours on certain days. Learners are also not permitted to carry passengers. No carriage of passengers is also a requirement in Great Britain for moped, A1, A2 and A (direct access) learner riders. Also, in Great Britain, riding is not permitted on motorways and riders are encouraged to wear fluorescent or reflective clothing.

There are some age-based restrictions imposed in some countries. No carriage of passengers is a requirement in Spain for moped riders under 18 years of age, and in Germany, category A1 licence holders who are under the age of 18 years are restricted to riding an A1 motorcycle with a maximum design speed of 80 km/h.

Finally, in both Great Britain and Germany, A1, A-restricted and A (direct access) licence holders are restricted to riding a motorcycle with an automatic transmission if their practical test was carried out on a motorcycle without a clutch lever. In Great Britain, full-category A licence holders who are restricted to riding a motorcycle with automatic transmission are permitted to ride a motorcycle with a manual transmission after passing a practical test on a manual transmission motorcycle.

3rd Driving Licence Directive

The 3rd Driving Licence Directive (Directive 2006/126/EC) will come into full effect in January 2013. It will replace the current 2nd Directive. An overview of the 3rd Directive was provided in the main report. Herein is a summary of the key changes being proposed. This summary was prepared using the information provided in the Memo prepared by the European Commission Directorate General for Energy and Transport available at http://ec.europa.ec/dgs/energy_transport/publication/memos/2006_03_27_driving_licence_en.pdf.

The 3rd Directive will extend to mopeds (new 'category AM'), giving countries less flexibility with regards to moped licensing. Applicants for moped licences will be required to pass a mandatory theory test. EU Member States may require that applicants also pass a practical test of skills for this category of licence.

A further change is the introduction of a power-to-weight ratio for category A1 motorcycles. Thus, under the 3rd Directive, category A1 motorcycles are those with a maximum engine capacity of 125 cc, a power not exceeding 11 kW *and a power-to-weight ratio not exceeding 0.1 kW/kg*. All EU Member States will be required to include this category. The minimum age for the category A1 licence will remain at 16 years, although EU Member States may elect to impose a 17 or 18 years of age minimum.

Table 1. Summary of rider licensing structure, components and features in each of 18 European countries

Jurisdiction	Category	Description	Entry requirements		Restrictions/Requirements	Comments/Progression to next licence category
			Minimum age	Training & Testing		
Austria	Moped	Moped (i.e. up to 50 cc & maximum design speed of 50 km/h)	15 years	Complete theory training and practical training. Pass theory and practical tests.	-	Category B licence holders do not need a separate licence to ride a moped.
	A1	Motorcycle up to 125 cc & power up to 11 kW	18 years	Complete practical training. Pass theory and practical tests.	-	Category B licence holders who have held their licence for 5 continuous years, are not in the probationary period and have completed 6 hours of practical training do not need a separate licence to ride an A1 motorcycle.
	A-restricted	Motorcycle up to 25 kW & power-to-weight ratio up to 0.16 kW/kg	18 years	Complete theory training and practical training. Pass theory and practical tests.	-	Category A-restricted licence holders progress automatically to a full category A licence after holding an A-restricted licence for 2 years. (Minimum age 20 years.)
	A	Motorcycle with no engine or power restrictions	21 years	As for 'A-restricted'.	-	-
Belgium	A3	Moped (i.e. up to 50 cc & maximum design speed of 50 km/h)	16 years	Complete 2 hours practical training with a driving school (on private ground), pass theory test, and pass practical test (on private ground) OR Pass theory test, hold a provisional licence for 12 months, and then pass practical test (on private ground).	Provisional licence holders must display "L" plates while riding, are not permitted to ride between 10pm and 6am on Friday, Saturday and Sunday nights, on the night before a public holiday, and the night of a public holiday, and are not permitted to carry passengers until all tests have been passed.	Category B (i.e. passenger vehicle) licence holders do not need a separate licence to ride a moped. Similarly, motorcycle up to 125 cc & power up to 11 kW can be ridden on Category B licence after having held that licence for 2 years. There is no separate category for motorcycles of this description.
	A-limited	Motorcycle up to 25 kW & power-to-weight ratio up to 0.16 kW/kg	18 years	Pass theory test, undertake 6 hours of practical training with a driving school, hold a provisional licence for 12 months, and pass practical tests (on private ground & public roads) OR Complete minimum 8 hours of practical training with a driving school, pass theory test, and pass practical tests (on private ground & public roads). Training on public roads –instructor and trainee communicate via radio; the instructor follows on another motorcycle or in a car. The trainee must pass the practical test on special grounds before undertaking the practical test on public roads. During the practical test on public roads, the examiner follows in a car and communicates with the trainee via radio.	As for 'A3'.	Category A-limited licence holders progress automatically to a full category A licence after 2 years on the A-limited licence. (Minimum age 20 years.) Category A-limited licence holders with less than 2 years on the A-limited licence can obtain a full category A licence by passing the practical tests for the A licence (on private ground & public roads).
	A	Motorcycle with no engine or power restrictions	21 years	As for 'A limited'.	As for 'A limited'.	NA

Note. "-" denotes not known/details not provided

Table 1 (cont.). Summary of rider licensing structure, components and features in each of 18 European countries

Jurisdiction	Category	Description	Entry requirements		Restrictions/Requirements	Comments/Progression to next licence category
			Minimum age	Training & Testing		
Denmark	Moped	Moped (i.e. up to 50 cc & maximum design speed of 50 km/h)	18 years	-	-	Category A1, A and B licence holders do not need a separate licence to ride a moped.
	A-restricted	Motorcycle up to 25 kW & power-to-weight ratio up to 0.16 kW/kg	18 years	Complete theory training (approximately 20 hours) and practical training (approximately 17 hours) on private ground and public roads. Pass theory and practical (on public roads) tests.	-	Category A-restricted licence holders progress automatically to a full category A licence after holding an A-restricted licence for 2 years. (Minimum age 20 years.)
	A	Motorcycle with no engine or power restrictions	21 years	As for 'A-restricted'.	-	NA
Finland	Moped	Moped (i.e. up to 50 cc & maximum design speed of 50 km/h)	15 years	Pass theory test, complete 6 hours of theory training, about 3 hours of practical training (on private ground & public roads), and pass practical manoeuvring test (on private ground).	NA	Category A1, A and B licence holders do not need a separate licence to ride a moped.
	A1	Motorcycle up to 125 cc & power up to 11 kW	16 years	Complete theory (9 hours) and practical (7.5 hours) training with a driving school, and pass theory test, practical manoeuvring test (on private ground) and practical test (on public roads) OR Complete theory (9 hours) and practical (about 3 hours) training with a driving school, pass a theory test and practical manoeuvring test (on private ground), and practice privately on public roads alone for up to 3 months, then pass the practical test (on public roads) OR Complete theory training, and practice on public roads with a supervisor for 9 months, then pass theory and practical tests. Options 1 & 2, Training on public roads – instructor and trainee communicate via radio; instructor follows in a car or on another motorcycle, or accompanies the trainee on the same motorcycle. The 'car' option is the most common. During the practical on-road test, the examiner follows in a car or on another motorcycle.	Option 2 – during private on-road practice, the learner must display learner plates (a white triangle). Option 3 – during on-road practice, the learner must be supervised while riding at all times. The supervisor must have had at least 3 years of motorcycle riding experience and have passed a theory test. The supervisor follows in a car or on another motorcycle, or accompanies the learner on the same motorcycle.	Option 1 most common; Option 2 used by less than 10% of learners; Option 3 rarely used. Category A1 licence holders progress automatically to an A-restricted licence after holding an A1 licence for 2 years. (Minimum age 18 years.)
	A-restricted	Motorcycle up to 25 kW & power-to-weight ratio up to 0.16 kW/kg	18 years	As for 'A1'.	As for 'A1'.	Category A-restricted licence holders progress automatically to a full category A licence after holding an A-restricted licence for 2 years. (Minimum age 20 years.)
	A	Motorcycle with no engine or power restrictions	21 years	As for 'A-restricted'.	As for 'A-restricted'.	NA

Note. "-" denotes not known/details not provided

Table 1 (cont.). Summary of rider licensing structure, components and features in each of 18 European countries

Jurisdiction	Category	Description	Entry requirements		Restrictions/Requirements	Comments/Progression to next licence category
			Minimum age	Training & Testing		
France	BSR certificate	Moped (i.e. up to 50 cc & maximum design speed of 50 km/h)	14 years	Complete school-based road safety education courses, and 5 hours practical training with a driving school (on private ground)	NA	Category B (i.e. passenger vehicle) licence holders do not need a separate licence to ride a moped.
	A1	Motorcycle up to 125 cc & power up to 11 kW	16 years	Complete practical training (on private ground & public roads) with a driving school, and pass theory test, practical test on private ground (manoeuvres and oral questions), and practical test on public roads. Training on public roads – instructor and trainee communicate via radio. Practical test on public roads – examiner and trainee communicate via radio; examiner is driven by the instructor in a car behind the trainee.	NA	Category B licence holders can ride an A1 motorcycle after holding a B licence for 2 years and after completing 3 hours of practical training with a driving school. Category A1 licence holders can ride an A-limited motorcycle after passing the practical test for the A-limited licence.
	A-limited	Motorcycle up to 25 kW & power-to-weight ratio up to 0.16 kW/kg	18 years	As for 'A1'.	NA	Category A-limited licence holders progress automatically to a full category A licence after holding an A-limited licence for 2 years. (Minimum age 20 years.)
	A	Motorcycle with no engine or power restrictions	21 years	As for 'A-limited'.	NA	NA
Germany	M	Moped (i.e. up to 50 cc & maximum design speed of 50 km/h)	16 years	Pass theory test and practical test (on public roads)	-	-
	A1	Motorcycle up to 125 cc & power up to 11 kW	16 years	As for 'M'.	If rider under 18 years (i.e. 16-17 years), restricted to riding A1 motorcycle with a maximum design speed of 80km/h. If practical test is on vehicle without a clutch lever, licence restricted to vehicles without clutch lever	-
	A-restricted	Motorcycle up to 25 kW & power-to-weight ratio up to 0.16 kW/kg	18 years	As for 'A1'.	If practical test is on vehicle without a clutch lever, licence restricted to vehicles without clutch lever	Category A-restricted licence holders progress automatically to a full category A licence after holding an A-restricted licence for 2 years (minimum age 20 years).
	A	Motorcycle with no engine or power restrictions	25 years	As for 'A-restricted'.	As for 'A-restricted'.	NA

Note. "-" denotes not known/details not provided

Table 1 (cont.). Summary of rider licensing structure, components and features in each of 18 European countries

Jurisdiction	Category	Description	Entry requirements		Restrictions/Requirements	Comments/Progression to next licence category
			Minimum age	Training & Testing		
Great Britain	P	Moped (i.e. up to 50 cc & maximum design speed of 50 km/h)	16 years	Apply for a provisional licence and then complete Compulsory Basic Training (CBT) with a licensed instructor. Successful completion of CBT validates the provisional licence for 2 years, during which the rider can ride solo. CBT includes both theory and practical (on private ground and public roads) components. To achieve non-provisional status, riders must pass theory and practical (private grounds and public roads) tests. CBT will need to be retaken if both theory and practical tests are not passed while the CBT is valid (2 years). Training on public roads - instructor and trainee communicate via radio; the trainer follows on another motorcycle. Practical test on public roads - examiner and trainee communicate via radio; the examiner follows on another motorcycle or in a car. While not required, it is expected that trainees complete additional training in preparation for the theory and practical tests.	Provisional riders must wear "L" plates ("D" plates in Wales), and are not permitted to carry pillion passengers or ride on motorways. They should also wear fluorescent or reflective clothing.	Category A and B licence holders do not need a separate licence to ride a moped. (However, Category B licence holders who obtained their full car licence after 1 February 2001 will need to complete CBT.) Full moped licence holders progress automatically to a provisional A1/A2 licence. (Must be at least 17 years old.)
	A1	Motorcycle up to 125 cc & power up to 11 kW	17 years	As for 'P'.	As for 'P'. If practical test is conducted on a motorcycle with an automatic transmission, then restricted to riding automatics only.	Riders who take the practical test on a motorcycle with a design speed exceeding 100 km/h can ride an A2 motorcycle.
	A2	Motorcycle up to 25 kW & power-to-weight ratio up to 0.16 kW/kg	17 years	As for 'A1'.	As for 'A1'.	Category A2 licence holders progress automatically to a full category A licence two years after having passed the A2 licence tests. (Minimum age 19 years.)
	A	Motorcycle with no engine or power restrictions	21 years	As for 'A2', with the exception that a rider with provisional status is not permitted to ride solo.	As for 'A2'. The provisional rider must be supervised while riding at all times. The supervisor must be a licensed instructor. The supervisor follows on another motorcycle and maintains radio contact with the trainee rider.	Full category A licence holders who ride an automatic motorcycle, but who wish to ride a manual motorcycle, are able to do so after passing a practical test on a motorcycle with manual transmission.

Note. "-" denotes not known/details not provided

Table 1 (cont.). Summary of rider licensing structure, components and features in each of 18 European countries

Jurisdiction	Category	Description	Entry requirements		Restrictions/Requirements	Comments/Progression to next licence category
			Minimum age	Training & Testing		
Greece	Moped	Moped (i.e. up to 50 cc & maximum design speed of 50 km/h)	16 years	NA	NA	Currently not recognised as a category of licence by the Ministry of Transport, but is still valid. Issued by the traffic police.
	A1	Motorcycle up to 125 cc & power up to 11 kW	18 years	If do not hold a driver's licence - complete theory training on road rules (20 units), theory training on PTW topics (10 units), and practical training first on private ground and then on public roads(8 lessons). If hold a driver's licence – complete theory training on PTW topics (10 units), and practical training first on private ground and then on public roads (8 lessons). Pass theory and practical tests.	Practical training and testing cover three topics: Group A – Preparation of vehicle and cautions when stationary; Group B – On the move (critical errors), and Group C – On the move (simple errors). The candidate must not fail any of the Group A and B activities, and must not fail more than 5 (of 12) Group C activities or the same activity twice. Group A activities are tested on private ground, and Groups B and C on public roads.	Category A1 licence holders may progress to an A-restricted licence after four practical lessons and passing the practical test.
	A-restricted	Motorcycle up to 25 kW & power-to-weight ratio up to 0.16 kW/kg	18 years	If do not hold any other licence - complete theory training on road rules (20 units), theory training on PTW topics (10 units), and practical training first on private ground and then on public roads (10 lessons). If hold a driver's licence - complete theory training on PTW topics (10 units), and practical training first on private ground and then on public roads (10 lessons). Pass theory and practical tests.	As for 'A1'.	Category A-restricted licence holders progress automatically to a full category A licence after holding an A-restricted licence for 2 years. (Minimum age 20 years.)
	A	Motorcycle with no engine or power restrictions	21 years	As for 'A-restricted'.	As for 'A-restricted'.	NA
Hungary	Moped	Moped (i.e. up to 50 cc & maximum design speed of 50 km/h)	14 years	Complete theory training (16 hours) and practical training on private ground (4 hours) and public roads (6 hours) with qualified instructor. Pass theory and practical (on private ground and public roads) tests. Training on public roads - instructor and trainee communicate via radio; the trainer follows on another motorcycle. Practical test on public roads - examiner follows in a car.	NA	Category B (i.e. passenger vehicle) licence holders do not need a separate licence to ride a moped.
	A1	Motorcycle up to 125 cc & power up to 11 kW	16 years	Complete theory training (22 hours) and practical training on private ground (6 hours) and public roads (12 hours) with qualified instructor. Pass theory and practical (on private ground and public roads) tests.	NA	Category A1 licence holders can ride an A-restricted motorcycle after holding an A1 licence for 2 years and after completing 6 hours of practical training with a qualified instructor and passing practical tests (on private ground and public roads). (Minimum age 18 years.)

Note. "-" denotes not known/details not provided

Table 1 (cont.). Summary of rider licensing structure, components and features in each of 18 European countries

Jurisdiction	Category	Description	Entry requirements		Restrictions/Requirements	Comments/Progression to next licence category
			Minimum age	Training & Testing		
Hungary (cont.)	A-restricted	Motorcycle up to 25 kW & power-to-weight ratio up to 0.16 kW/kg	18 years	Complete theory training (22 hours) and practical training on private ground (10 hours) and public roads (16 hours) with qualified instructor. Pass theory and practical (on private ground and public roads) tests.	NA	Category A-restricted licence holders can ride an A motorcycle after holding an A-restricted licence for 2 years and after completing 6 hours of practical training with a qualified instructor and passing the theory and practical tests (on private ground and public roads). (Minimum age 20 years.)
	A	Motorcycle with no engine or power restrictions	21 years	As for 'A-restricted'.	NA	NA
Ireland	M	Moped (i.e. up to 50 cc & maximum design speed of 50 km/h)	16 years	Pass theory test and apply for a learner's permit (valid for 2 years), which qualifies the trainee to ride a moped solo on public roads. After a minimum of 6 months, the trainee can take the practical test (on public roads). Practical test on public roads - examiner follows in a car.	Learner riders must display "L" plates when riding on public roads.	NA
	A1	Motorcycle up to 125 cc & power up to 11 kW	16 years	As for 'M'.	As for 'M'.	NA
	A-restricted	Motorcycle up to 25 kW & power-to-weight ratio up to 0.16 kW/kg	18 years	As for 'A1'.	As for 'A1'.	Category A-restricted licence holders progress automatically to a full category A licence two years after having passed the A-restricted licence tests. (Minimum age 20.5 years.)
	A	Motorcycle with no engine or power restrictions	No direct access (that is, access is via progression from category A-restricted only).			NA
Italy	M	Moped (i.e. up to 50 cc & maximum design speed of 50km/h)	14 years	Complete training course. Pass theory and practical tests	-	Category A or B licence holders do not need a separate licence to drive a moped
	A1	Motorcycle up to 125 cc & power up to 11 kW	16 years	Pass theory test, hold a provisional licence for 1-6 months, pass practical test (on private grounds and public roads). Practical test on public roads - examiner follows in a car.	During provisional period, must display 'P' plates; may only practice in 'places with few people'. If the practical test is on a motorcycle with automatic transmission, licence is restricted to automatic.	Category B licence holders do not need a separate licence to ride a category A1 motorcycle.
	A-gradual access	Motorcycle up to 25 kW & power-to-weight ratio up to 0.16 kW/kg	18 years	As for 'A1'.	As for 'A1'.	Category A-gradual access licence holders progress automatically to a full category A licence after holding an A2 licence for 2 years and after passing the practical test. (Minimum age 20 years.)

Note. "-" denotes not known/details not provided

Table 1 (cont.). Summary of rider licensing structure, components and features in each of 18 European countries

Jurisdiction	Category	Description	Entry requirements		Restrictions/Requirements	Comments/Progression to next licence category
			Minimum age	Training & Testing		
Italy (cont.)	A	Motorcycle with no engine or power restrictions	21 years	As for 'A-gradual access'.	As for 'A-gradual access'.	NA
Netherlands	AM	Moped (i.e. up to 50 cc & maximum design speed of 50 km/h)	16 years	Pass theory test. (From 2010, also pass practical test.)	NA	Category A and B licence holders do not need a separate licence to ride a moped.
	A-restricted	Motorcycle up to 25 kW & power-to-weight ratio up to 0.16 kW/kg	18 years	Pass theory test and practical (private ground and on-road) test. Practical test on public roads - examiner follows in a car. Practical training not mandatory, but recommended in order to pass the practical test. This training is conducted on public roads with a qualified instructor. Trainee and instructor communicate via radio.	NA	There is no separate category A1 licence. Category A-restricted licence holders progress automatically to a full category A licence after holding an A-restricted licence for 2 years. (Minimum age 20 years.)
	A	Motorcycle with no engine or power restrictions	21 years	As for 'A-restricted'.	NA	NA
Norway	Moped	Moped (i.e. up to 50 cc & maximum design speed of 50 km/h)	16 years	Complete basic theory course (17 hours), practical lessons (14 hours, on private grounds and public roads), and two 'guidance' lessons with a driving school to assess progress. Then, pass theory test. Private, supervised practice on public roads is permitted once the theory course has been completed.	The supervisor must be at least 25 years old, & have at least a category A1 licence. The supervisor follows on another motorcycle, and the learner and supervisor communicate via radio.	Category B licence holders do not need a separate licence to ride a moped.
	A1	Motorcycle up to 125 cc & power up to 11 kW	16 years	Complete basic theory course (unless completed to obtain licence in another category), A1 theory course (3 hours), minimum 4 hours practical training with driving instructor on public roads, and two 'guidance' lessons with a driving school to assess progress. Then, pass A1 theory test, and practical tests (on private ground and public roads). Private, supervised practice on public roads is permitted once the theory courses have been completed. Practical test on public roads - examiner travels as a pillion passenger, or follows on another motorcycle.	As for 'Moped'.	Category A1 licence holders can ride an A-restricted motorcycle after holding an A1 licence for 2 years and after completing the practical training for the A-restricted licence, and passing the practical tests for the A-restricted licence. (Minimum age 18 years.)

Note. "-" denotes not known/details not provided

Table 1 (cont.). Summary of rider licensing structure, components and features in each of 18 European countries

Jurisdiction	Category	Description	Entry requirements		Restrictions/Requirements	Comments/Progression to next licence category
			Minimum age	Training & Testing		
Norway (cont.)	A-restricted (A2)	Motorcycle up to 25 kW & power-to-weight ratio up to 0.16 kW/kg	18 years	Complete basic theory course (unless completed to obtain licence in another category), A theory course (3 hours), minimum 8 hours practical training with driving instructor on public roads, 4 hours practical training (braking, manoeuvring) on private ground, and two 'guidance' lessons with a driving school to assess progress. Then, pass a theory test, and practical tests (on private ground and public roads). Private, supervised practice on public roads is permitted once the theory courses have been completed. Practical test on public roads - examiner travels as a pillion passenger, or follows on another motorcycle.	As for 'A1'.	Category A-restricted licence holders progress automatically to a full category A licence after holding an A-restricted licence for 2 years. (Minimum age 20 years.)
	A	Motorcycle with no engine or power restrictions	21 years	As for 'A-restricted'.	As for 'A-restricted'.	NA
Portugal	Moped	Moped (i.e. up to 50 cc & maximum design speed of 50 km/h)	16 years	Pass theory test and practical test. Practical training is optional.	NA	Category B licence holders do not need a separate licence to ride a moped.
	Motorcycles under 50 cc	Motorcycle up to 50 cc	16 years	Complete theory training (8 hours), and practical training (8 hours, on public roads). Then, pass theory test and practical test (on private ground and public roads).	NA	NA
	A1	Motorcycle up to 125 cc & power up to 11 kW	16 years	Complete theory training (32 hours), and practical training (16 hours, public roads). Then, pass theory test and practical test (on private ground and public roads). Regarding the theory training, Category B/B1 licence holders only need to complete 4 hours.	NA	NA
	A-restricted	Motorcycle up to 25 kW & power-to-weight ratio up to 0.16 kW/kg	18 years	As for 'A1'.	NA	Category A-restricted licence holders progress automatically to a full category A licence after holding an A-restricted licence for 2 years. (Minimum age 20 years.)
	A	Motorcycle with no engine or power restrictions	21 years	As for 'A-restricted'.	NA	NA

Note. "-" denotes not known/details not provided

Table 1 (cont.). Summary of rider licensing structure, components and features in each of 18 European countries

Jurisdiction	Category	Description	Entry requirements		Restrictions/Requirements	Comments/Progression to next licence category
			Minimum age	Training & Testing		
Slovenia	AM	Moped (i.e. up to 50 cc & maximum design speed of 50 km/h)	15 years	Complete 40 hours theory training and practical training (on private ground and public roads). Then, pass theory test and practical test (on private ground and public roads). Training on public roads - instructor and trainee communicate via radio. Practical test on public roads – examiner and trainee communicate via radio; examiner is driven by the instructor in a car behind the trainee.	NA	Category B licence holders do not need a separate licence to ride a moped.
	A1	Motorcycle up to 125 cc & power up to 11 kW	16 years	As for 'AM'.	NA	Category A1 licence holders can ride an A-restricted motorcycle after holding an A1 licence for 2 years and after completing the practical training for the A-restricted licence, and passing the practical tests for the A-restricted licence. (Minimum age 18 years.)
	A-restricted (A2)	Motorcycle up to 25 kW & power-to-weight ratio up to 0.16 kW/kg	18 years	As for 'A1'.	NA	Category A-restricted licence holders can ride full A motorcycle after holding an A-restricted licence for 2 years and after completing the practical training for the full A licence, and passing the practical tests for the full A licence. (Minimum age 20 years.)
	A	Motorcycle with no engine or power restrictions	24 years	As for 'A-restricted'.	NA	NA
Spain	AM	Moped (i.e. up to 50 cc & maximum design speed of 45 km/h)	14 years	Pass theory test.	No passengers unless driver is at least 18 years old	Category B licence holders do not need a separate licence to ride a moped.
	A1	Motorcycle up to 125 cc & power up to 11 kW	16 years	Pass theory test for general road traffic (holders of any other licence are exempt) and theory test for class A1. Pass practical tests on private ground and public roads.	-	Category B licence holders who have held their licence for 3 years do not need a separate licence to ride an A1 motorcycle.
	A2	Motorcycle up to 25 kW & power-to-weight ratio up to 0.16 kW/kg	18 years	Pass theory test for general road traffic (holders of any other licence are exempt) and theory test for motorcycles. Pass practical tests on private ground and public roads.	-	Category A2 licence holders progress automatically to a full category A licence after holding an A2 licence for 2 years. (Minimum age 20 years.)
	A	Motorcycle with no engine or power restrictions	No direct access (that is, access is via progression from category A2 only).			NA

Note. "-" denotes not known/details not provided

Table 1 (cont.). Summary of rider licensing structure, components and features in each of 18 European countries

Jurisdiction	Category	Description	Entry requirements		Restrictions/Requirements	Comments/Progression to next licence category
			Minimum age	Training & Testing		
Sweden	Moped	Moped (i.e. up to 50 cc & maximum design speed of 50 km/h)	15 years	Complete theory and practical training (12 hours, at least 4 hours practical on private ground and public roads), and pass theory test.	NA	Category A and B licence holders do not need a separate licence to ride a moped.
	A1	Motorcycle up to 125 cc & power up to 11 kW	16 years	Complete theory training (3 hours) and practical training (4 hours, on private ground). Then pass theory test and practical test (private ground and public roads). Practical test on public roads - examiner and trainee communicate via radio; the examiner follows on another motorcycle. Practice on public roads can be undertaken prior to the tests. Two options: with an approved supervisor or with a driving school.	When practising on public roads with a supervisor, the learner must display "L" plates. The supervisor can ride either as a pillion passenger or on a another motorcycle.	NA
	A-restricted (A2)	Motorcycle up to 25 kW & power-to-weight ratio up to 0.16 kW/kg	18 years	As for 'A1'. Exception: an applicant who already has an A1 licence does not need to complete the theory training again.	As for 'A1'.	Category A-restricted licence holders progress automatically to a full category A licence after holding an A-restricted licence for 2 years. (Minimum age 20 years.)
	A	Motorcycle with no engine or power restrictions	21 years	As for 'A-restricted'.	As for 'A-restricted'.	NA
Switzerland	M	Moped (i.e. up to 50 cc & maximum design speed of 30 km/h)	16 years	Pass theory and practical tests.	-	Category A and B licence holders do not need a separate licence to ride a moped.
	A1	Motorcycle up to 125 cc & power up to 11 kW	18 years	Pass theory test, hold a learner licence for 4 months, during this time must complete 8 hours practical training with instructor and complete a traffic safety course. Pass practical test (public roads).	-	Category A1 licence holders can ride an A-restricted motorcycle after holding an A1 licence for 2 years. Category B licence holders who have completed 8 hours of practical training do not need a separate licence to ride an A1 motorcycle.
	A-restricted	Motorcycle up to 25 kW & power-to-weight ratio up to 0.16 kW/kg	18 years	Pass theory test; hold a learner licence for 4 months, during this time must complete 12 hours practical training with instructor and complete a traffic safety course. Pass practical test (public roads).	-	Category A-restricted licence holders can ride full A motorcycle after holding an A-restricted licence for 2 years and after passing the practical test for the full A licence. (Minimum age 20 years.)
	A	Motorcycle with no engine or power restrictions	25 years	As for 'A-restricted'.	-	NA

Note. "-" denotes not known/details not provided

Additional changes have been proposed to encourage progressive access (and therefore, discourage direct access) to heavier motorcycles. A new 'category A2' (motorcycle up to 35 kW and maximum power-to-weight ratio of 0.2 kW/kg) will replace the current A-restricted/A-limited category. For category A2, the minimum entry age will be 18 years. However, if an EU Member State fixes the minimum age for category A1 at 17 or 18 years, the minimum age for category A2 will be 19 and 20 years, respectively, because there must be at least two years between the minimum age for category A1 and the minimum age for category A2. A category A1 rider who wishes to progress to a category A2 licence after two years will be granted access once they have passed a practical skills test or have completed practical training.

Similarly, for progressive access to full-category A, applicants will need to have held a category A2 licence for two years and must pass a practical skills test or complete practical training. If the minimum age for category A2 is 18, then the minimum age for progressive access to category A will be 20 years. If the minimum age for category A2 is older than 18 years, then the minimum age for progressive access to category A will also be older, to ensure a minimum two year separation between the two categories. The requirement for training or testing to progress from category A1 to A2 and from category A2 to A is to avoid the situation where applicants meet the requirements for a lighter motorcycle, but wait two years to purchase a heavier motorcycle and to start riding. Finally, under the 3rd Directive, the minimum age for direct access to a full-category A licence will increase from 21 years to 24 years.

In closing, it is noteworthy that the proposed 3rd Directive has not been met with full, unequivocal support. For detailed information on the position of key bodies such as the Federation of European Motorcyclists (FEMA), ACEM – The Motorcycle Industry in Europe, and Féderation Internationale de Motocyclisme (FIM) see http://www.fema-online.eu/index.php?page=3rd-driving-licence-directive and http://cieca.preview-it.info/download.asp?file=ACEM_3DLD_Position_CIECA_16June09.pdf. The latter was an accompanying document for the CIECA Rider Workshop, which was held on 16 June 2009. A Table from this document is reproduced here as Table 2 (below), whichsummarises the various 3rd Directive situations, minimum access ages and the training concepts proposed by ACEM. For further detail, refer to the CIECA Rider Workshop. Presentations are available at the following address: http://www.cieca.be/template_events.asp?eve_id=8&lng_iso=EN.

Table 2. Summary of various 3rd Directive situations, minimum access ages and the training concepts proposed by the Motorcycle Industry in Europe (ACEM)[a]

Situation	Requirement	ACEM proposal	Further details of ACEM proposal [b]
Novice riders to obtain a motorcycle driving licence of any category, minimum access ages: AM: 14 years of age A1: 16 years of age A2: 18 years of age A: 24 years of age	Testing (training is a national competence)	Compulsory training prior to testing: AM: 7 hours A1: 15 hours A2: 20 hours A: 24 hours	Modular Initial Rider Training (IRT) approach; hazard perception training; e-Coaching; 3:1 ratio pupil-instructor
Progressive access riders with lower category experience (A1 to A2; A2 to A)	Testing or training	Training, instead of testing: 7 hours	More hours if decided by instructor; modular IRT approach (not repeating what was trained before); as above
Novice riders in the equivalence options, with car experience (B-A1, B-AM)	None	Compulsory training: B/AM: 4 hours B/A1: 7 hours	Based on IRT modules; training on powered-two-wheeler controls (if different from car) and resulting braking/evasion manoeuvres; e-Coaching

[a] Source and for further detail:
http://cieca.preview-it.info/download.asp?file=ACEM_3DLD_Position_CIECA_16June09.pdf
[b] For information on Initial Rider Training: www.initialridertraining.eu/docs/2007_IRTFinalReport.pdf and
www.cieca.be/download/9.%20Aline%20Delhaye%20IRTProject.ppt

Part B Motorcycling Data

Overview

Responses to our email request for information were received (either directly or indirectly) from 18 key contacts across Australia, New Zealand, North America and Europe. In some cases, our request for information was forwarded to others who in turn responded.

The general consensus across responses was that there exists no recent, equivocal data pertaining to the effectiveness of rider licensing systems and their components. As explained, part of the issue relates to inconsistencies across jurisdictions in the type and quality of data that are collected. Nonetheless, the majority of responses included links to published reports, presentations, websites, and position papers. The sections which follow provide a compilation of the information available/provided for each region. Most of the information provided below show changes in key measures (e.g. fatalities, registrations) over time. Unless indicated otherwise, the extent to which these changes relate directly to changes in licensing practices are largely unknown.

Australia

All states and territories in Australia have in place a graduated licensing system for novice riders. An overview of the main features of these systems is given in the main report. For the purposes of this supplement, of particular interest was whether there are any preliminary data relating to the revised graduated licensing system for riders in NSW which was implemented in July 2009. The advice received from our contact at the Road Traffic Authority in NSW was that it is too early to tell. However, noteworthy are the following key findings which derive from evaluations (unpublished) of the car driver graduated licensing system in NSW which was implemented in July 2007. Key reforms implemented at this time included: passenger and vehicle restrictions, zero BAC, automatic suspension for any speeding, a tougher driving test, and 120 hour learner driver logbooks. The key findings are summarized as follows:

- Since the reforms in 2007, NSW has had a 45% reduction in P1 crashes;
- The most effective interventions seem to be the automatic speeding suspension, new driving test, and the 120 hour logbook;
- Learners who have logged only 50 hours have greater trouble passing the new driving test and have higher crash involvement than learners who have logged 120 hours;
- The key elements of the new driving test are observation, responding to hazards, and multi-tasking;
- The passenger and vehicle restrictions seem to be effective, but have been harder to evaluate for their stand-alone effects; and
- The Hazard Perception Test (HPT) for entry to P1 phase and the Driver Qualification Test (DQT) for entry to full licensure are both identifiers of crash risk; those who pass these tests on the first attempt have a lower crash rate than those who do not.

New Zealand

A graduated licensing system is in place for riders of motorcycles in New Zealand. An overview of the current system is provided in the main report. An overview of the evaluation study conducted by Reeder, Alsop, Langley and Wagenaar (1999) is also provided. In general terms, there has been a reduction in the number of motorcyclists killed or injured in New Zealand since the introduction of the graduated licensing system in 1987. As can be seen in Figure 1, the sharpest reduction in the late 1980's was for 15 to 19 year old riders, with this age group most likely to comprise novice riders. In New Zealand, the graduated licensing system applies to all novice riders, irrespective of the rider's age and whether the novice rider already has a car driver's licence. The recent increase in the number of deaths and injuries in the 40+ year age bracket has been attributed to an increase in the number of riders who have returned to motorcycle riding after a significant period of non-riding.

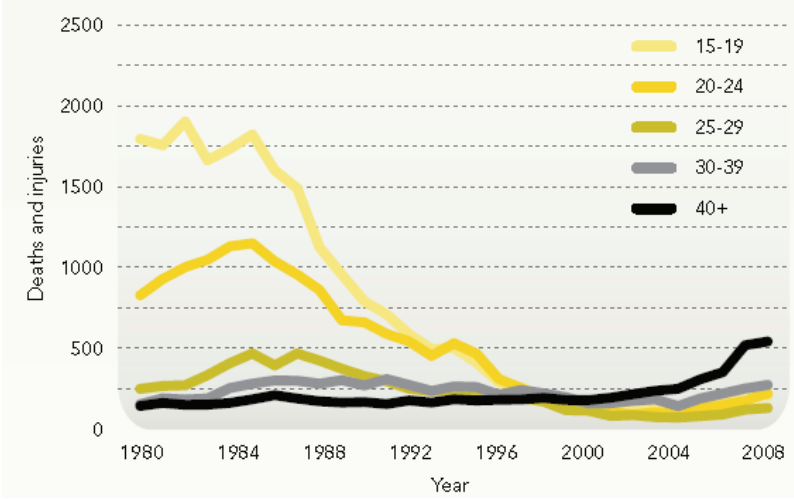


Figure 1. Relative evolution of the number of motorcyclists killed or injured, New Zealand (Source: "Safer Journeys" – New Zealand's Road Safety Strategy 2010-2020 available at www.transport.govt.nz/saferjourneys/)

At the time of writing, no further data pertaining to the effectiveness of the New Zealand rider graduated licensing system (including its components) could be sourced. Noteworthy, however, is that New Zealand, as part of their Road Safety Strategy 2010-2020 ("Safety Journeys"), are proposing to introduce a power-to-weight restriction for novice riders (currently novice riders are restricted to riding motorcycles with an engine capacity not exceeding 250 cc) and to improve rider training and licensing (including licensing of moped riders) (www.transport.govt.nz/saferjourneys/).

North America

In the United States (US), operator licensing falls under the jurisdiction of the individual states. An overview of motorcycle operator licensing (2008) practices in each US state (including the District of Colombia) has been compiled by the Motorcycle Safety Foundation. For information, this document is reproduced in Appendix A. Further detail is available in Hanchulak and Robinson (2009). Noteworthy is that, at the time of writing, 15 states adopt a

graduated licensing system for motorcycle riders, and 9 states adopt a stepped or tiered licensing system.

Across the US in 2008, there were over seven million registered motorcycles and scooters on the roads, and over 5,000 motorcycle rider fatalities. Figure 2 shows that, since the late 1990's, both the number of motorcyclist fatalities and the number of registered motorcycles and scooters has been steadily increasing.

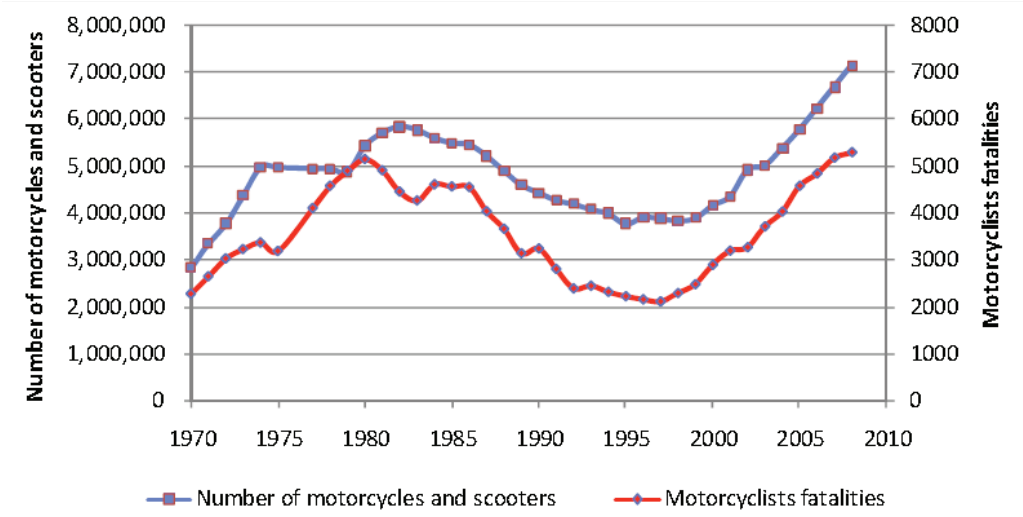


Figure 2. Relative evolution of the number of motorized two-wheelers in traffic and the number of motorcyclists killed in traffic, United States (Source: IRTAD, 2009)

Examination of fatality data for 2008 through the Fatality Analysis Reporting System (FARS), indicates that approximately 25 percent of all motorcyclists killed in the US did not possess the proper rider's licence or endorsement on their driver's licence at the time of the crash (NHTSA, 2008). State-specific information on motorcyclist fatality and injury data, licensing data, and registration data are held by individual states. Requests for information have been sent to three states as nominated by the Director for Licensing at the Motorcycle Safety Foundation: Georgia, Maryland and Vermont. At the time of writing, this information is forthcoming.

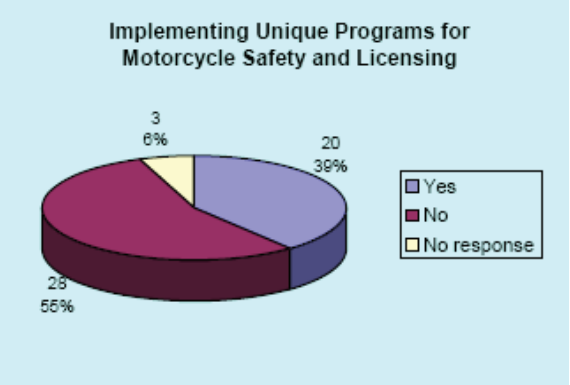
The report by Hanchulak and Robinson (2009) summarises the results of the 2007 'Motorcycle Licensing and Safety Survey of the States', which was distributed to all states through the American Association of Motor Vehicle Administrators (AAMVA) to ascertain the current status of motorcycle licensing practices. Of particular interest here is the outcome of a question which asked whether the state had introduced any unique motorcycle safety and/or licensing program(s), and if so, whether the state had been able to measure any reduction in motorcycle crashes and fatalities since the program(s) was implemented. These data are presented in Table 3, which is reproduced directly from the report. Of the 20 states that reported that they had introduced a unique motorcycle safety and/or licensing program, it is interesting to note that only one state (South Carolina) reported being able to measure any reduction in crashes. A request for further information has been sent on our behalf to the key contact in South Carolina. At the time of writing, this information is forthcoming.

Table 3. Summary of state responses to questions "Has your jurisdiction implemented any unique programs for motorcycle safety and licensing?" and "Have you been able to measure any reduction in motorcycle crashes and fatalities as a result of the program implementation?" (Source: Hanchulak & Robinson, 2009)

Table B-22 Jurisdiction	Has your jurisdiction implemented any unique programs for motorcycle safety and licensing? If yes, explain.	Have you been able to measure any reduction in motorcycle crashes and fatalities as a result of the program implemented?
Alabama	NO	NO
Alaska	NO	NO
Arizona	NO	NO
Arkansas	NO	NO
California	YES, riders under 21 must complete a CHP-sanctioned motorcycle safety course. DMV waives skills test for those who take basic rider course and experienced rider course for riders 21 and older.	NO
Colorado	YES, Colorado DOT manages the MOST program, which provides tuition reimbursement to motorcycle students and is funded by fees on endorsements and registrations, also educates motorcyclists regarding dangers of drinking & driving	NO
Connecticut	NO	N/A
Delaware	YES, enhanced patrols by LE for aggressive driving, DUI check points, as well as billboards and flyers.	NO, the program is too new to determine the results.
Florida	NO	N/A
Georgia	NO	N/A
Hawaii	NO	N/A
Idaho	NO	NO
Illinois	YES, Motorcycle Rider Safety Training waiver program	NO
Indiana	NO	N/A
Iowa	YES, motorcycle task group gets info out on motorcycle safety and sharing the road, hosts a yearly motorcycle safety forum	NO
Kansas		
Kentucky	NO	NO
Louisiana	NO	N/A
Maine	YES, Maine Motorcycle Safety Education Course, 8-hr classroom-based, developed in cooperation w/MSF, MSF Basic Rider Course	NO
Maryland	YES, in-traffic rider education	NO
Massachusetts	YES, commercials, safety days at dealerships, booths at motorcycle expos	NO
Michigan	NO	N/A
Minnesota	YES, encouraged the completion of safe rider training by including the skills test waiver with successful completion of the course	NO
Mississippi	NO	NO
Missouri	NO	N/A
Montana	NO	N/A
Nebraska	NO	N/A
Nevada	NO	N/A
New Hampshire		
New Jersey	NO	N/A
New Mexico	NO	N/A
New York	YES, governor traffic safety committee sponsored a statewide motorcycle awareness initiative, the TV media campaign featured 15- and 30-sec announcements focusing on driver inattentiveness to motorcycles and failure to yield, ads distributed statewide	NO
North Carolina	YES, skills waiver program	NO
North Dakota	NO	NO

Table 3 (cont.). Summary of state responses to questions "Has your jurisdiction implemented any unique programs for motorcycle safety and licensing?" and "Have you been able to measure any reduction in motorcycle crashes and fatalities as a result of the program implementation?" (Source: Hanchulak & Robinson, 2009)

Table B-22 Jurisdiction	Has your jurisdiction implemented any unique programs for motorcycle safety and licensing? If yes, explain.	Have you been able to measure any reduction in motorcycle crashes and fatalities as a result of the program implemented?
Ohio	YES, Ohio MC Strategic Plan and "Ride Smart" Plan	NO
Oklahoma	NO	N/A
Oregon	YES, State approved motorcycle safety program (TEAM OREGON) has designed a beginning course to get riders endorsed, completion of course includes knowledge & skills testing, also an intermediate course so a person 21 or older w/motorcycle permit can complete course and go to DMV to get endorsement, designed to get students trained & properly licensed	NO
Pennsylvania	YES, changed learner's permit process to require applicants to pass a motorcycle knowledge test prior to receiving permit, did a mass mailing to motorcycle owners, increased funding for the free motorcycle safety training, distributed "sharing the road" and "drive aware we're out there" info to vehicle owners and license holders up for renewal	NO
Rhode Island	YES, mandatory education program	NO
South Carolina	YES, upgrading our courses, examiner training, manuals and tests and enacting legislation, the State's highway safety plan will include all cross-agency efforts to reduce motorcycle crashes, including public information programs and stricter enforcement	YES
South Dakota	NO	N/A
Tennessee	YES, implementing in-school awareness and education program aimed at teen riders, implementing motorcycle awareness program in conjunction w/Governor's Highway Safety Office	NO
Texas	YES, mandatory helmet usage	NO
Utah	NO	N/A
Vermont	NO	N/A
Virginia	NO	N/A
Washington	YES, 3-wheel operator licensing & training	NO
West Virginia	NO	N/A
Wisconsin	NO	N/A
Wyoming	YES, MSF course	NO
District of Columbia		



Of additional interest are the responses to the questions concerning moped licensing. Of the 40 states that responded to the question "Have you seen an increase in moped usage/registrations?" 18 responded that they had seen an increase. Of these, 50% did not require moped operators to be tested; whereas, in the 22 cases where a state reported no increase in moped usage, 36% did not require testing of moped operators. Thus, there does not appear to be a relationship between motorcycle registrations and whether or not testing is required to ride a moped. The data pertaining to these questions are summarised in Table 4, which is reproduced from Hanchulak and Robinson (2009).

Table 4. Summary of state responses to questions concerning mopeds (Source: Hanchulak & Robinson, 2009)

Mopeds				
Table B-10 **Jurisdiction**	Have you seen an increase in moped usage/registrations?	Do you test moped operators?	If yes, do you test moped operators on knowledge, skills or both?	Do you restrict moped operators to the use of mopeds only?
Alabama	*	YES	Knowledge	YES
Alaska	NO	NO	N/A	N/A
Arizona	*	NO	N/A	YES
Arkansas	NO	YES	Both	YES
California	NO	YES	Both	YES
Colorado	YES	NO	N/A	NO
Connecticut	NO	NO	N/A	NO
Delaware	YES	NO	N/A	N/A
Florida	YES	NO	N/A	NO
Georgia	NO, not required to be registered	YES	N/A, Any class license or permit allows for moped operation	NO
Hawaii	YES	YES	Both	YES
Idaho	YES	NO	N/A	N/A
Illinois	YES	NO (only need a valid IL drivers license)	N/A	N/A
Indiana	NO	YES	Both	YES
Iowa	YES	NO	N/A	NO
Kansas				
Kentucky	NO	YES	Knowledge	NO
Louisiana	NO	NO	N/A	NO
Maine	*	YES	*	YES
Maryland	NO	YES	Knowledge	YES
Massachusetts	NO	NO	N/A	YES
Michigan	YES	YES	Knowledge	YES
Minnesota	NO	YES	Both	YES
Mississippi	YES	YES	Both	*
Missouri	*	NO	N/A	N/A
Montana	*	YES	Both	NO
Nebraska	YES	YES	Both	NO
Nevada	NO	YES	Both	YES, if used for testing
New Hampshire				
New Jersey	NO	YES	Both	YES
New Mexico	NO	NO	N/A	NO
New York	YES	NO	N/A	N/A
North Carolina	*	NO	N/A	N/A
North Dakota	NO	YES	Knowledge	YES
Ohio	NO	YES	Both	YES
Oklahoma	NO	YES	Both	NO
Oregon	YES	YES, a person w/a regular operators license can operate a moped w/out a moped license, do not undergo moped testing	Both	YES, if the person does not hold a regular operators license

Table 4 (cont.). Summary of state responses to questions concerning mopeds (Source: Hanchulak & Robinson, 2009)

Mopeds															
Table B-10	Have you seen an increase in moped usage/registrations?			Do you test moped operators?			If yes, do you test moped operators on knowledge, skills or both?					Do you restrict moped operators to the use of mopeds only?			
Jurisdiction															
Pennsylvania	NO			YES, a person with a non-commercial class C License can operate a moped			Both					NO, however, they can only operate a non-commercial class C vehicle or a moped			
Rhode Island	YES			NO			N/A					N/A			
South Carolina	NO			YES			Knowledge					YES			
South Dakota	YES			YES			Both					NO			
Tennessee	YES			YES			Both					NO			
Texas	YES			YES			Both					YES			
Utah	YES			YES			Both					YES, if less than 100cc			
Vermont	NO			NO			N/A					YES			
Virginia	NO			NO			N/A					NO			
Washington	*			NO			N/A					N/A			
West Virginia	YES			NO			N/A					N/A			
Wisconsin	*			NO			N/A					N/A			
Wyoming	NO			NO			N/A					N/A			
District of Columbia															
	Y	N	*	Y	N	*	K	S	B	*	N/A	Y	N	N/A	*
	18	22	11	26	22	3	6	0	18	4	23	20	15	12	4

Summary: Of the jurisdictions that responded to the survey more have not seen an increase in moped usage/registrations. Many did not respond to this question.

Of the jurisdictions that responded to the survey most test moped operators, but it is not a significant difference

Of the jurisdictions that responded to the survey most test moped operators on both knowledge and skills, however many do not test moped operators so it was not applicable to all.

Of the jurisdictions that responded to the survey most restrict moped operators to the use of mopeds only, however, many do not test moped operators so it was not applicable to all.

* Did not answer or respond to question

To conclude this section, four published studies are summarised that relate to the effectiveness of licensing components in place in North American jurisdictions. These study summaries are presented under the following headings: licensing laws and rider mortality, best practices in rider training and licensing, and effectiveness of motorcycle education courses/training.

Licensing laws and rider mortality

A population-based ecologic study was conducted to explore the relationship between motorcycle licensing laws and rider mortality rates in the US for the period 1997 to 1999 (McGwin, et al., 2004). Information on rider fatalities for all 50 states plus Washington DC was derived from FARS and combined with exposure information and helmet and licensing laws to calculate rate ratios (RRs) and 95% confidence intervals (CIs) for the association between states' rider mortality rates per mile of travel and helmet and licensing laws. Exposure data, in terms of annual motorcycle miles of travel, number of riders, and number of registered motorcycles, was obtained from the Federal Highway Administration (FHA), while information regarding helmet and licensing laws was obtained from NHTSA. A summary of state motorcycle rider and licensing characteristics (at the time of the study) is presented in Table 5.

Table 5. Summary of state motorcycle rider and licensing characteristics (Source: McGwin, et al., 2004)

Characteristic	Number of states (%)
Learner's permit required	48 (94.1)
Skill test for learner's permit*	8 (16.8)
Duration of learner's permit	
1-95 days	10 (20.8)
95-190 days	15 (31.3)
> 190 days	23 (47.9)
Number of learner's permit restrictions, mean (range)*[a]	3.3 (1-6)
Training required for licence applicants	
All applicants	2 (10.5)
Only applicants < 18 years	13 (68.4)
Only applicants < 21 years	4 (21.1)
Licensing system	
Standard	39 (76.5)
Tiered** or Graduated	12 (23.5)
Helmet law	
None or Partial	30 (58.8)
Full	21 (41.2)

* Among states requiring a learner's permit

** Tiered systems place restrictions on motorcycle operation based on engine displacement

[a] The most common licensing restrictions were: no riding with passengers, no riding during the evening, and mandatory helmet use.

Crash risk data for the association between motorcycle operation laws and motorcycle rider mortality were calculated using two offset variables, miles of travel and number of licensed

riders. Using miles of travel, the following laws were independently associated with lower mortality rates:

- Presence of a skill test requirement (RR, 0.76; 95% CI, 0.69-0.84)
- Longer permit duration - 95-190 days (RR, 0.86; 95% CI, 0.79-0.95) and >190 days (RR, 0.87; 95% CI, 0.81-0.93)
- Three or more learner's permit restrictions (RR, 0.78; 95% CI, 0.73-0.84)
- Full helmet law (RR, 0.76; 95% CI, 0.71-0.81)

Using number of licensed riders, the following laws were independently associated with lower mortality rates:

- Three or more learner's permit restrictions (RR, 0.79; 95% CI, 0.73-0.84)
- Training required for licence applicants (RR, 0.80; 95% CI, 0.74-0.86)
- Full helmet law (RR, 0.77; 95% CI, 0.72-0.82)

It is important to note that the skill test laws referred to above focussed on new riders only, whereas the crash analysis was of all rider deaths and all motorcycle miles of travel. As it was not possible to limit the analyses to deaths of new riders or the proportion of miles accumulated by new riders only, it is possible that the benefits of skill testing for new riders might, in actuality, be even more significant.

Best practices in rider training and licensing

In 2003, there were 47 state-legislated rider education programs in the US, and all 50 states and Washington DC required that riders hold a licence to operate a motorcycle on a highway. However, program administration and the degree of coordination between rider education programs and licensing agencies varied widely across states.

A study was conducted in 2005 to develop a model of best practices in motorcycle rider education and licensing. Using detailed rider education and licensing data from all 47 states that offered state-legislated motorcycle rider education, the states that most closely adhered to this best practices model in terms of efficient and effective program components were identified. An overview of the best practices model is presented in Figure 3.

Program administration refers to the structure and organisation of a jurisdiction's rider education and licensing activities. This was assessed through four variables. For example, a point was awarded to a state if the licensing agency is the same as the rider education agency.

Rider education focuses on the details of delivering training efficiently and effectively to motorcycle operators. Thus, this dimension focuses on aspects of training course quality. This was assessed through 22 variables. Across the US, the most recognised curricula for rider education programs are the courses created by the Motorcycle Safety Foundation (MSF).

Licensing relates to practices to encourage operators to ride legally and prescribe procedures for ensuring that only skilled riders are licensed to operate motorcycles. This was assessed through six variables. Noteworthy is that, regarding the skills test, NHTSA recommends that the examination should be administered on public roads so that riders can be evaluated in real-world conditions. Two points were awarded to states that required on-road testing, one point

to states that administered off-road testing only, and no points to states that did not administer any skills test.

Initial evidence supports the validity of the model with high best practice states (e.g. Oregon, Delaware, Idaho, Nevada, New Mexico, Maryland, Ohio, Hawaii, Washington, and Minnesota; score ≥ 19 out of 36) having the lowest rates of motorcycle rider fatalities, and the low best practice states (Kansas, Arizona, Kentucky, New Jersey, West Virginia, Rhode Island, and South Carolina; score ≤ 9 out of 36) having the highest rates of rider fatalities.

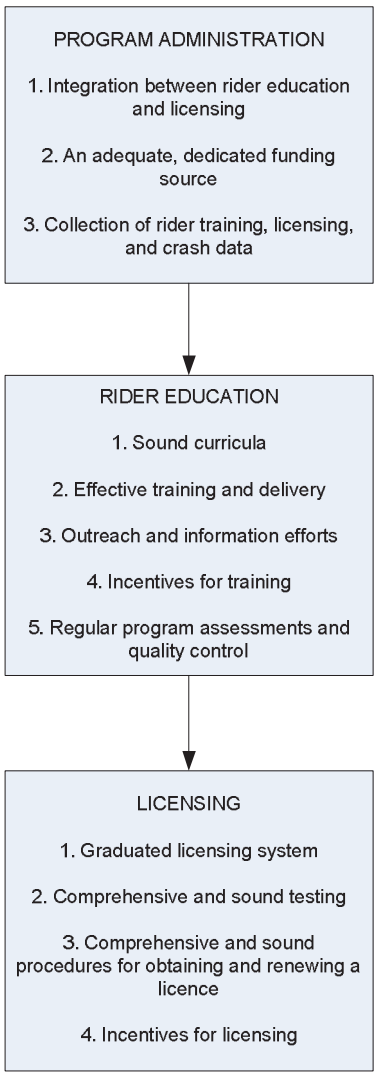


Figure 3. Overview of best practices model (Source: Baldi et al., 2005)

Effectiveness of motorcycle education courses / training

A 2009 literature review (Daniello et al., 2009) explored the effectiveness of motorcycle education courses in North America in terms of crash rates, violation rates, and the use of personal protective equipment (as determined through past research). The past research included results from seven previously published studies. The authors noted that there exists much variability across studies in terms of program curricula, outcome metric and methods—for example, in terms of sample size, data collection mechanisms, and degree of experimental

or statistical control. Thus, comparisons across studies were not straightforward. A key limitation was that the studies focussed on outcome events that might be influenced by training, but they did not explore directly the measures relating to program quality (e.g. content, delivery mechanism, instructor factors). A summary of the seven studies and their outcomes in terms of crash rates and violation rates is presented in Table 6.

Table 6. Summary of study findings in terms of effect of training on crash rates and violation rates (Source: Daniello et al., 2009)

Study *	**Findings regarding crash rates** (Compared to untrained riders)	**Findings regarding violation rates** (Compared to untrained riders)
Billheimer (1998)	Fewer crashes/km 6 months post-training for trained riders with <805 km of prior experience; Similar number of crashes/km 6 months post-training for trained riders with >805km of prior experience; No difference in number of crashes/km one and two years post-training.	Lower violations/km 6 months post-training for trained riders with <805km of prior experience; Higher violations/km 6 months post-training for trained riders with >805km of prior experience.
Davis (1997)	Fewer crashes/operator for program graduates; Crashes involving program graduates were not as severe; Crash responsibility was equally distributed between graduates and non-graduates.	NA
Jonah, Dawson & Bragg (1982)	Fewer reported crashes by program graduates; No effect on crashes seen between program graduates and informally trained groups when controlled for sex, age, time licensed, distance travelled education, and drinking.	Lower traffic violations seen among program graduates.
McDavid, Lohrman & Lohrman (1989)	Trained riders had fewer motor vehicle crashes; Trained riders tended to be in fewer and less severe motorcycle crashes.	NA
Mortimer (1984)	Crashes/mile for those trained was not lower after controlling for age and years licensed.	No difference in violations/mile between trained and untrained riders.
Mortimer (1988)	Those trained did not have fewer crashes/mile.	No difference in frequency of violations nor in violations/mile.
Savolainen & Mannering (2007)	Increased number of crashes for those who were trained and for those who were trained more than once.	NA

* All cited in Daniello et al. (2009)

A very recent US study undertaken by the Highway Loss Data Institute (Insurance Institute for Highway Safety, 2010) shows that training does not appear to reduce the crash risk of young riders. The main finding of the report is that the frequency of insurance claims for riders younger than 21 is 10 percent higher for those in states where training is required than for those in states where training is not required (however, this difference was not statistically significant). The authors of the report recommend, nevertheless, that training "probably is the right way for most riders to learn (the) unique skills required for motorcycling. Just don't count on it to reduce crashes". The analysis looked at collision losses in four states (California, Florida, Idaho, and Oregon) that require rider education for license applicants younger than 21, compared with losses in 28 states without training requirements. The study did not include

data from 13 other states that require training for riders younger than 18, plus one state that mandates it for riders younger than 16, because sample sizes were too small. It is important to note, as well, that the analysis pertained to all collision types and severity levels, so it is not possible to deduce whether training might have any specific effects on certain crash types (i.e. fatal or serious injury crashes).

Europe

An overview of the rider licensing systems currently in place in Europe was presented in Part A of this supplement. Analyses conducted on European data collected as part of the European-funded Motorcycle In-Depth Study (MAIDS) indicated that riders without licences are over-represented in the crash population. This is reflected in Table 7, which is reproduced from a presentation delivered by Jacques Compagne, Secretary General of ACEM at the CIECA Workshop on Category A Training and Testing, which was held in April 2008 (see www.cieca.be/template_events.asp?eve_id=21&lng_iso=EN).

Table 6. Crash and exposure data as a function of licence status (Source: MAIDS, Compagne, 2008)

PTW licence qualification

	Accident data		Exposure data	
	Frequency	Percent	Frequency	Percent
None, but licence was required	47	5.1	13	1.4
Learner's permit only	4	0.4	1	0.1
PTW licence	608	66.0	697	75.6
Only licence for OVs other than PTW	125	13.6	125	13.5
Not required	104	11.3	86	9.3
Unknown	33	3.6	1	0.1
Total	921	100.0	923	100.0

Figures 4 to 12 show the changes over time (since 1970) in the number of powered-two-wheelers in traffic and the number of moped and motorcycle riders killed in traffic. These data are presented for each of nine European countries: Austria, Denmark, Finland, France, Greece, Netherlands, Spain, Sweden and Switzerland. In Austria, Denmark, France, Netherlands, and Switzerland both the number of mopeds and the number of moped riders killed in traffic has been decreasing over time, with numbers having started to plateau by the early 1990's. While the number of mopeds has increased in recent years, the number of moped rider deaths has reached a plateau in both Sweden and Finland, and decreased both in Spain and Greece. A largely different pattern emerges for motorcycles. In each of the nine countries for which the data are presented, the number of motorcycles and scooters has been increasing, with most countries demonstrating a relatively sharp increase in numbers in the last 10 to 15 years. In most cases, the number of motorcyclist deaths has decreased over the years, with numbers starting to plateau in several countries. A notable exception is Greece, where the number of motorcyclist deaths has shown an overall increase over the years. The degree to which these patterns in the data reflect changes in licensing, particularly the introduction of the 2nd Directive, in the early to mid-1990's is unknown.

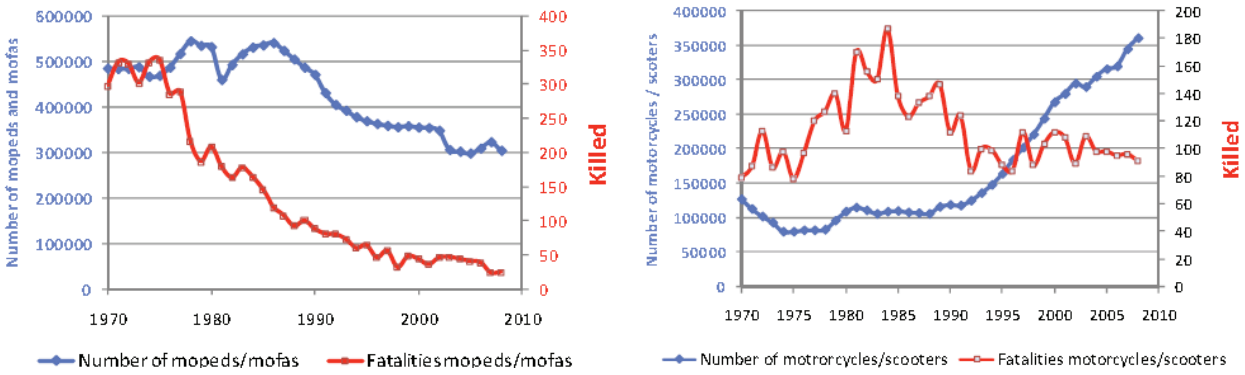


Figure 4. Relative evolution of the number of powered two-wheelers in traffic and the number of moped riders and motorcyclists killed in traffic, Austria (Source: IRTAD, 2009)

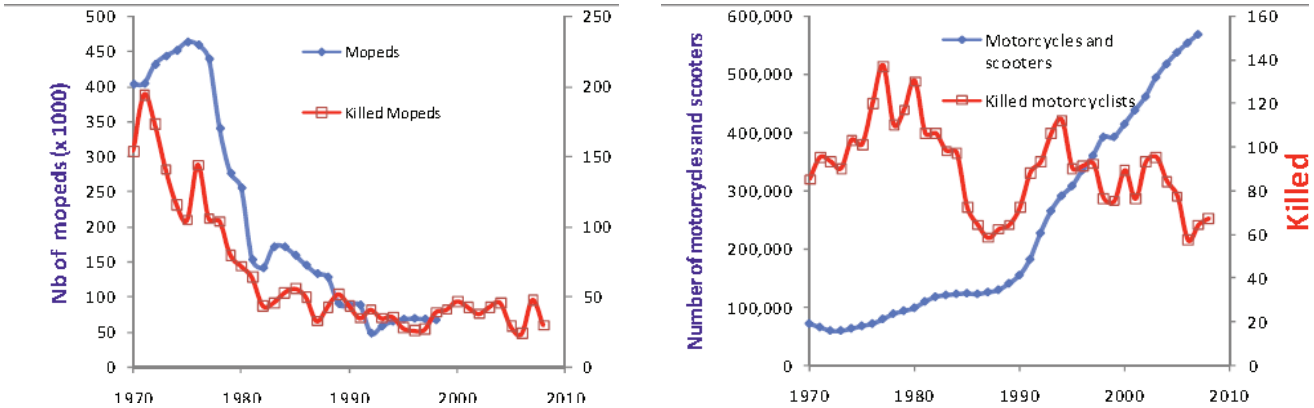


Figure 5. Relative evolution of the number of powered two-wheelers in traffic and the number of moped riders and motorcyclists killed in traffic, Denmark (Source: IRTAD, 2009)

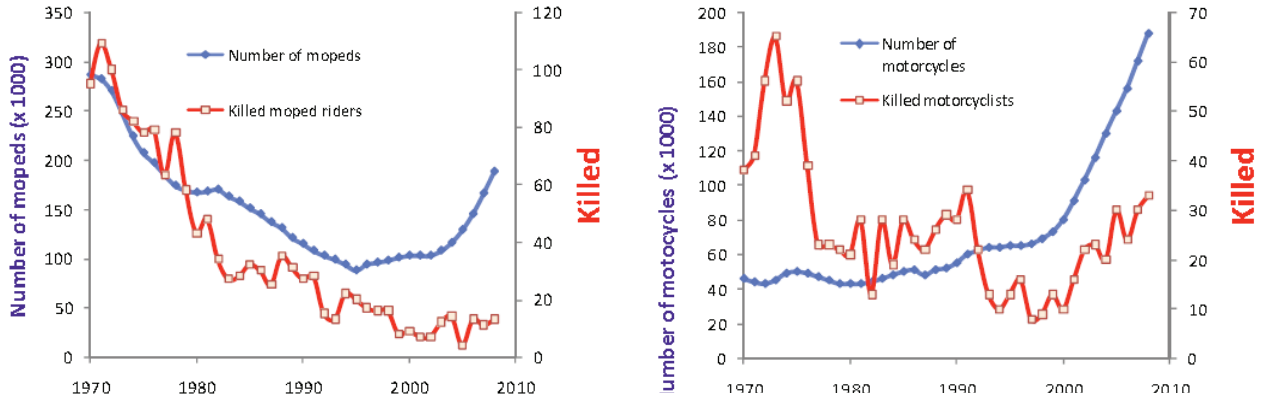


Figure 6. Relative evolution of the number of powered two-wheelers in traffic and the number of moped riders and motorcyclists killed in traffic, Finland (Source: IRTAD, 2009)

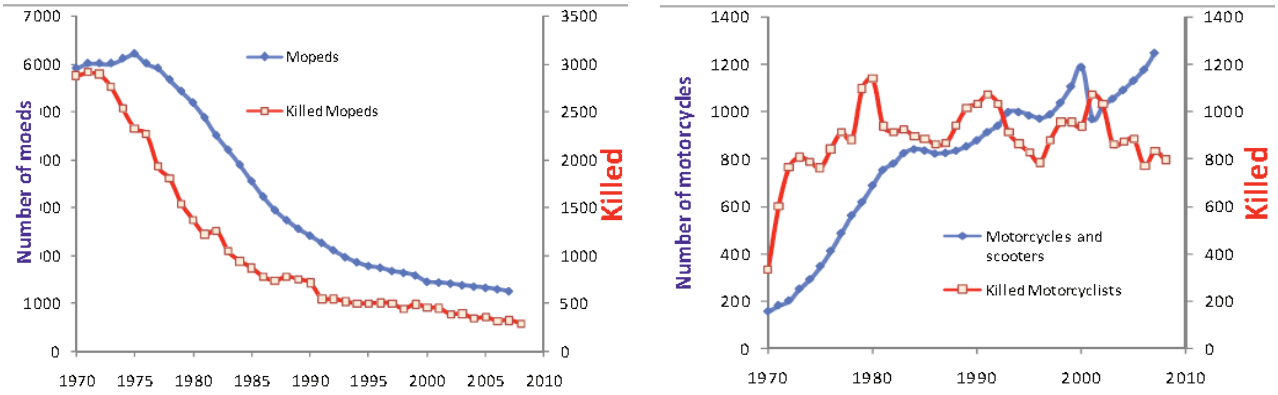


Figure 7. Relative evolution of the number of powered two-wheelers in traffic and the number of moped riders and motorcyclists killed in traffic, France (Source: IRTAD, 2009)

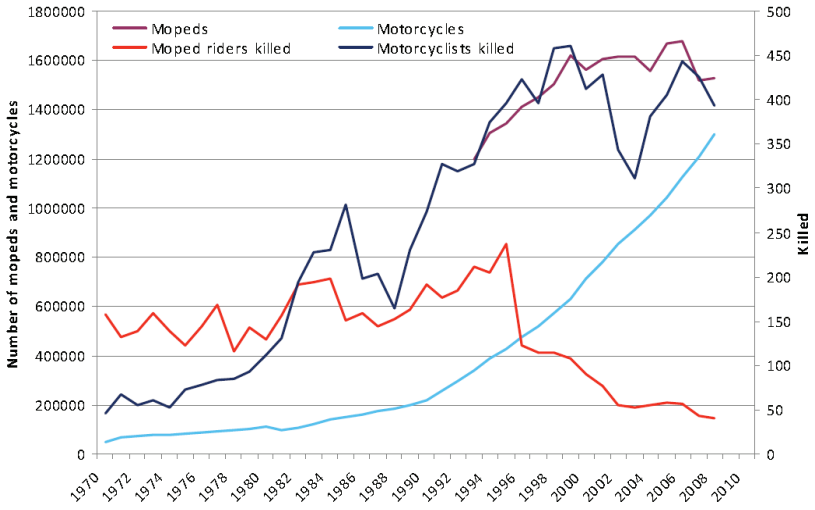


Figure 8. Relative evolution of the number of powered two-wheelers in traffic and the number of moped riders and motorcyclists killed in traffic, Greece (Source: IRTAD, 2009)

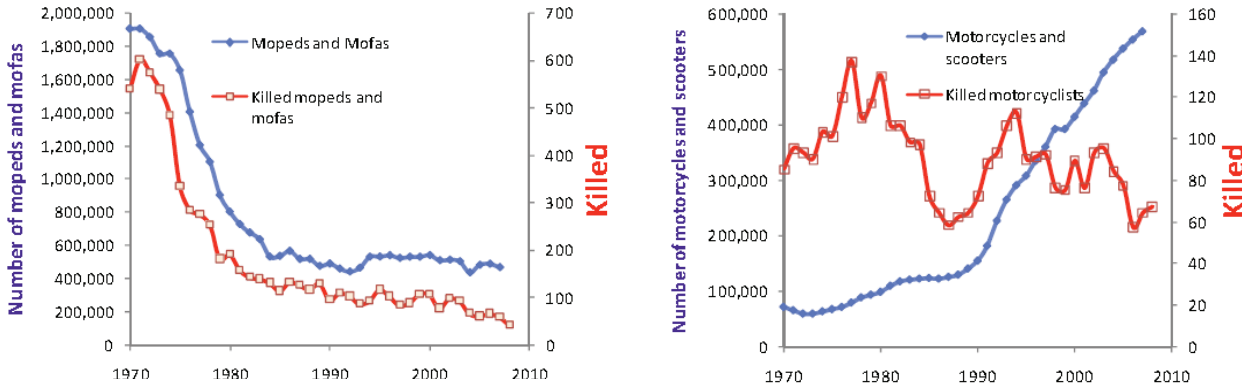


Figure 9. Relative evolution of the number of powered two-wheelers in traffic and the number of moped riders and motorcyclists killed in traffic, Netherlands (Source: IRTAD, 2009)

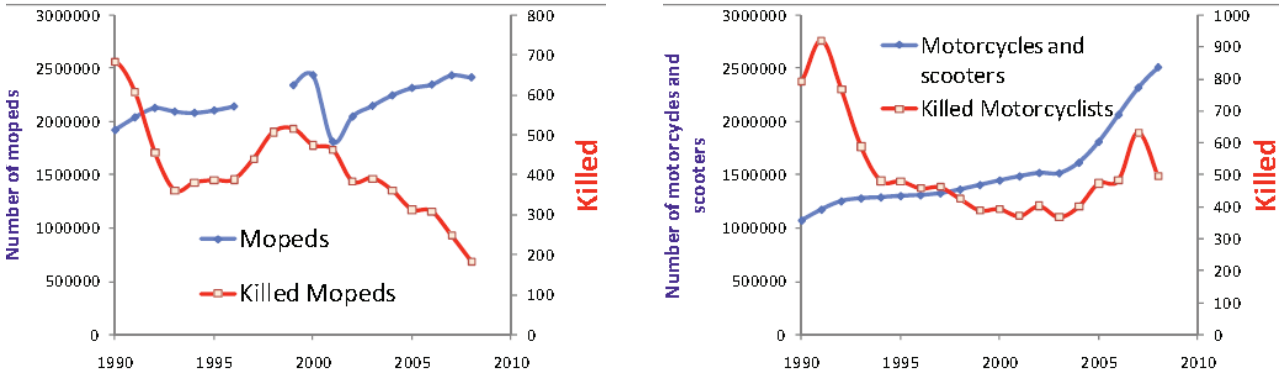


Figure 10. Relative evolution of the number of powered two-wheelers in traffic and the number of moped riders and motorcyclists killed in traffic, Spain (Source: IRTAD, 2009)

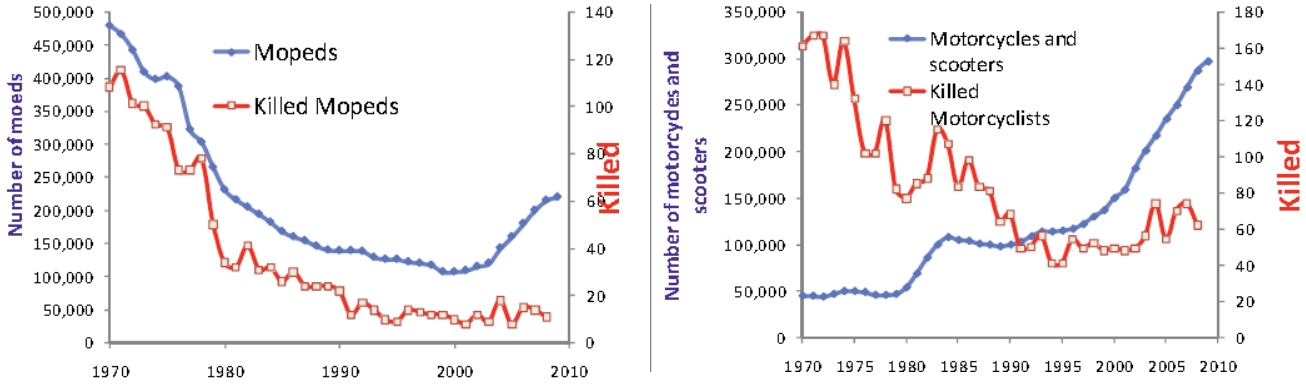


Figure 11. Relative evolution of the number of powered two-wheelers in traffic and the number of moped riders and motorcyclists killed in traffic, Sweden (Source: IRTAD, 2009)

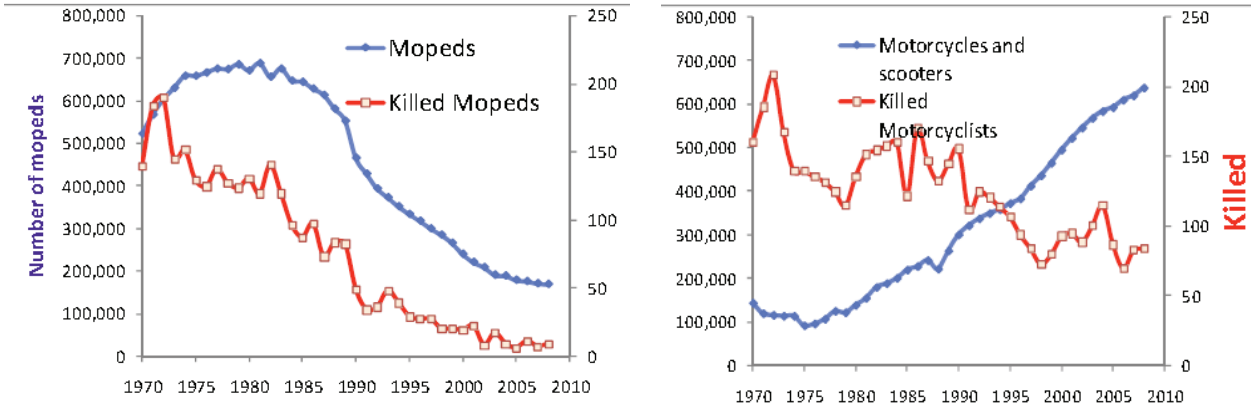


Figure 12. Relative evolution of the number of powered two-wheelers in traffic and the number of moped riders and motorcyclists killed in traffic, Switzerland (Source: IRTAD, 2009)

In Great Britain, Figure 13 shows that there was a decrease in the number of new motorcycle registrations in the early 2000's, with numbers stabilising in the last few years. The number of killed or seriously injured motorcycle riders has followed a similar pattern. In contrast, the number of powered-two-wheelers has shown an increase during the same period (Figure 14).

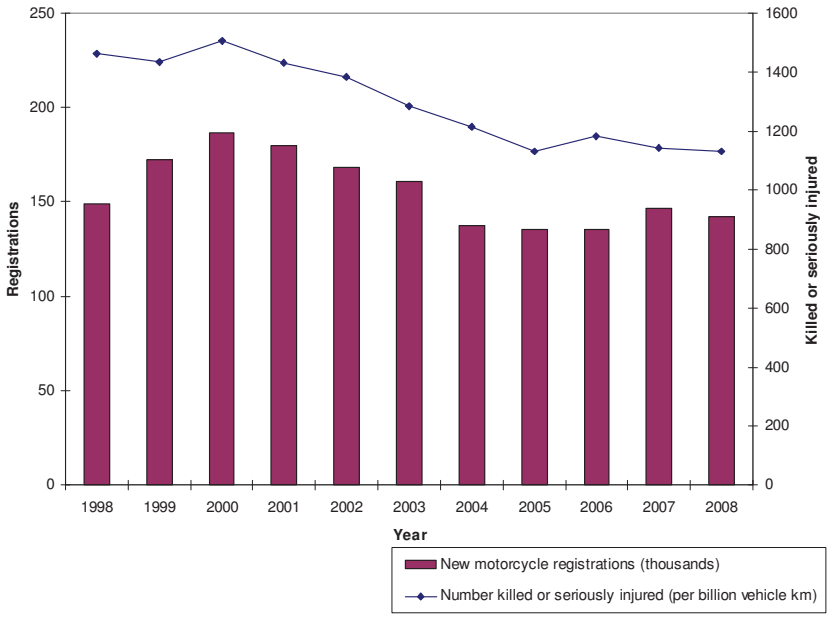


Figure 13. Relative evolution of the number of killed or seriously injured motorcyclists and new motorcycle registrations, Great Britain (Source: Department for Transport, 2009)

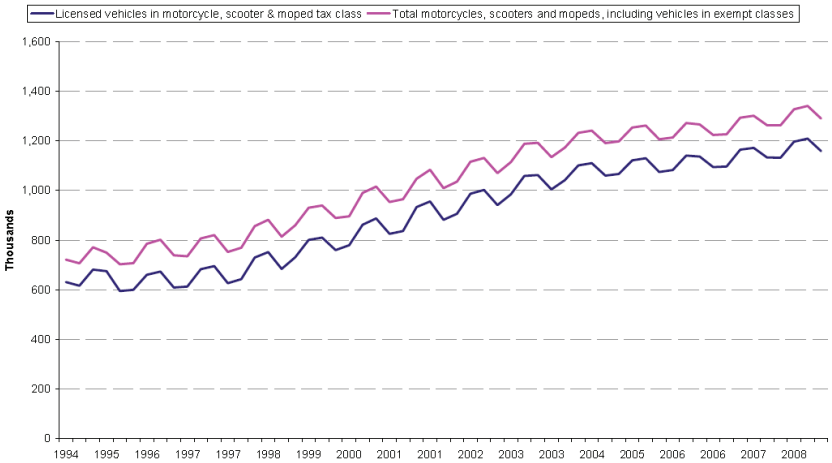


Figure 14. Relative evolution of the number of licenced and total powered-two wheelers, Great Britain (Source: Department for Transport, 2009)

The following key findings are taken from the Department for Transport's "Compendium of Motorcycling Statistics 2009":

- There were about 1.3 million licensed motorcycles in Great Britain in 2008 which is the highest it has been since the 1980's;
- Of the licensed motorcycles in 2008, the most common engine size was between 501 and 700 cc, with roughly one in ten motorcycles having an engine size of 50 cc or smaller;
- The distance driven by motorcycles in 2008 was 5.1 billion vehicle kilometres, which represents a decrease of 8% from 2007;
- The overall casualty rate for motorcyclists has improved since 1998 – in 2008, the number of deaths or serious injuries was 1, 131 per billion kilometres driven, which is 23% less than it was a decade earlier;
- In 2008, over 60% of all deaths or serious injuries involving riders of motorcycles with an engine size of 50 cc or smaller occurred in riders under the age of 20; and
- The total number of riders killed or seriously injured in 2008 was 10% lower than in 2007, with the greatest decrease taking place for 16 year old riders.

Further, it is noteworthy that, while the number of tests for the motorcycle licence in Great Britain has increased since the mid-2000's, the pass-rate has remained relatively steady. This pattern is illustrated in Figure 15.

Figure 15. Relative evolution of motorcycle training: Number of tests and pass rate, Great Britain (Source: Driving Standards Agency, cited in Department for Transport, 2009)

To conclude, a study is presented which relates to changes in the licensing of the A1 category in Spain. Segui-Gomez and Lopez-Valides (2007) explored some preliminary consequences of the change in policy in Spain in 2004 which allowed individuals who had previously held a licence to operate a passenger vehicle for at least three years to ride a motorcycle of up to 125cc (i.e. category A1) without any additional licensing requirements. The key findings are as follows.

- There was an increase in the number of smaller motorcycles in Spain following the policy change. In 2004, there was a 129% increase in registrations of 50-125 cc motorcycles,

followed by another increase of 172% in 2005. It was noted that the prior educational programs and fees acted as a barrier for some to obtaining a motorcycle licence.

- There was an increase in the number of fatal motorcycle-related crashes in Spain following the policy change. Between 2003 and 2005, there was a 28% increase in motorcycle deaths, despite the greater use of helmets.
- However, it is important to note that these data do not control for exposure. Therefore, it is not known if the increase in motorcycle registrations was due to a substitution of motorcycles for passenger cars or a net overall increase in motorized travel.

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Appendix A Motorcycle Licensing Information

The following document was prepared by the Motorcycle Safety Foundation and is reproduced in full here for information purposes only.

CYCLE SAFETY INFORMATION

Government Relations Office
1235 S. Clark St., Ste. 600
Arlington, VA 22202

National Resource Office
2 Jenner, Ste. 150, Irvine, CA 92618-3806
www.msf-usa.org

This Cycle Safety Information Sheet summarizes state motorcyclist licensing procedures. This information was obtained from each state's drivers' licensing agency and from other available source documents. Although this summary represents information from the most authoritative sources available, MSF is not responsible for accuracy or completeness. Contact your state agency for additional information.

STATE MOTORCYCLE OPERATOR LICENSING – 2008

State	Operator Licenses (2007)		Vehicle Registrations (2007)		Tiered Licensing System	Rider Education Required for Licensing
	Auto	Motorcycle	Auto	Motorcycle		
Alabama	4,634,533 (3)	1,923,243 (3)	1,959,564	110,368	Yes, ≤ 5 bhp or ≤ 150 cc (4)	No
Alaska	449,096	36,521	238,229	25,702	No	No
Arizona	4,211,892	240,752	2,219,959	124,374	Yes, ≤ 100 cc (4)	(2)
Arkansas	2,046,044	144,117	934,397	64,095	Yes, ≤ 250 cc (4)	No
California	23,697,667	1,181,475	19,828,580	750,816	No	Yes, under age 21
Colorado	3,287,017	303,746	774,558	111,376	No	No
Connecticut	2,311,481 (3)	197,847 (3)	1,976,809	64,484	No	Yes, under age 18
Delaware	636,254	44,913	465,445	23,246	No	Yes, under age 18
D.C.	330,363	168,064	161,267	1,048	No	No
Florida	15,272,680	807,862	7,075,000	618,648	Yes, ≤ 150 cc (4)	Yes
Georgia	7,304,140	320,928	4,124,835	171,116	No	No
Hawaii	856,163	44,378	513,558	29,646	No	No
Idaho	985,000	52,565	519,417	43,497	No	Yes, under age 21
Illinois	8,667,801	599,057	5,738,487	307,971	Yes, < 150 cc (4)	Yes, under age 18 for > 150 cc
Indiana	4,926,277	233,434	2,669,659	146,986	No	No
Iowa	1,907,198	234,472	1,714,654	160,912	No	Yes, under age 18
Kansas	1,974,238	160,000	871,088	77,192	No	No
Kentucky	2,860,729	192,560	1,910,851	61,900	No	No
Louisiana	3,083,516 (1)	79,785 (1)	1,883,585	64,024	No	No
Maine	1,009,780	96,998	563,294	49,835	No	Yes
Maryland	4,029,787	248,938	2,638,741	78,251	No	Yes, under age 18
Massachusetts	4,612,829 (1)	232,730 (1)	3,255,216	144,458	No	No
Michigan	6,414,925	525,800	4,921,819	267,208	No	Yes, under age 18
Minnesota	3,900,000	360,143	2,538,688	229,445	No	Yes, under age 18
Mississippi	1,965,464	54,804	1,127,033	27,777	No	No
Missouri	4,139,632 (3)	311,764 (3)	2,667,891	92,321	Yes, ≤ 250 cc (4)	No
Montana	720,000 (3)	108,000 (3)	383,613	20,284	No	No
Nebraska	1,363,094	73,192	801,263	40,133	No	No
Nevada	1,783,984	112,619	688,508	60,752	No	No
New Hampshire	998,214 (1)	120,987 (1)	638,920	75,559	No	Yes, under age 18
New Jersey	5,870,720 (1)	264,100 (1)	3,784,092	163,429	No	No
New Mexico	5,100,000 (3)	58,400 (3)	687,253	46,490	Yes, ≤ 100 cc (4)	Yes, under age 18
New York	11,071,911 (3)	593,268 (3)	8,784,537	315,450	No	No
North Carolina	6,539,740	391,000	3,569,371	115,807	No	No
North Dakota	472,145	127,783	340,054	27,526	Yes, ≤ 250 cc (4)	Yes, under age 16 (limited to < 250 cc)
Ohio	7,522,979	667,104	6,297,355	345,612	No	Yes, under age 18
Oklahoma	2,296,680 (3)	145,790 (3)	1,592,481	101,190	Yes, ≤ 250 cc (4)	No
Oregon	3,083,216	226,781	1,433,440	95,645	No	Yes, under age 21
Pennsylvania	8,526,210	774,500	5,756,016	352,738	No	No
Rhode Island	712,890 (3)	63,582 (3)	486,192	31,146	No	Yes
South Carolina	3,038,238	152,915	1,928,844	94,734	No	No
South Dakota	536,686	70,270	368,372	58,343	No	No
Tennessee	4,351,868	275,466	2,996,307	143,822	Yes, ≤ 5 bhp or ≤ 125 cc (4)	No
Texas	18,340,262	853,000	8,680,601	384,261	Yes, ≤ 250 (4)	Yes, under age 18
Utah	1,758,443	143,491	1,126,719	54,358	Yes, 90 cc; 249 cc; 649 cc (5)	No
Vermont	538,372	56,938	294,275	25,804	No	No
Virginia	5,436,825	312,588	3,923,468	80,008	No	No
Washington	4,681,927 (1)	370,314 (1)	3,124,451	205,263	No	Yes, under age 18
West Virginia	1,327,569	76,709	693,785	44,844	No	No
Wisconsin	4,075,764	464,782	2,627,838	324,833	No	Yes, under age 18
Wyoming	420,777	58,215	209,873	37,985	No	No
Totals	199,192,875	15,358,690	134,510,252	7,093,163		

Blanks indicate data not available due to no response from state.
N/A = Not Applicable
(1) 2002 information
(2) For under 18, rider education or parental certification of 25 hours of supervised motorcycle practice required.
(3) 2006 information
(4) May obtain motorcycle license at younger age for small displacement motorcycles.
(5) License restricted based on cc size of motorcycle upon which rider tested.

Motorcyclist Learner Permits

State	Issue Fee/ Renewal Fee	Issuance Test For Permit	Duration	Restrictions
Alabama (3)	$23/$23	Knowledge	N/A	N/A
Alaska	$15/ $5	Knowledge	2 Years	Supervision
Arizona	$7/ $7	Knowledge	7 Months	No Passenger, No Freeway, Time of Day
Arkansas	$5/$0	Knowledge	6 Months	N/A
California	$28/$28	Knowledge	1 Year	No Passenger, No Freeway, Time of Day
Colorado	$10.60/ $10.60	Knowledge	5 Years	N/A
Connecticut (3)	$0/ $5.50	Knowledge	60 Days	No Passenger, No Freeway, Time of Day, Helmet, Eye Protection
Delaware	$8/$2	Knowledge	60 Days	No Passenger, No Freeway, Time of Day, Helmet, Eye Protection
D.C.	$20/ $20	Knowledge	1 Year	N/A
Florida	**********NO PERMIT ISSUED**********			
Georgia	$10/$10	Knowledge & Vision	6 Months	Helmet, No Passenger, Restricted Roadways, Time of Day, Eye Protection
Hawaii	$5/ $5	Knowledge	1 Year	No Passenger, Time of Day
Idaho	$11.50/ $11.50	Knowledge	180 Days	No Passenger, No Freeways, Time of Day
Illinois	$10/ $10	Knowledge	2 yrs. under 18; 1 yr. 18 or over	Time of Day, Supervision
Indiana	$9/ $9	Knowledge	1 Year	No Passenger, Time of Day, Helmet
Iowa	$6/ N/A	Knowledge	4 Years	Supervision
Kansas	$6/$6	Knowledge	1 Year	Supervision
Kentucky	$12/ $12	Knowledge & Skill	3 Years	No Passenger, Eye Protection, Helmet
Louisiana	**********NO PERMIT ISSUED**********			
Maine	$10/ N/A	Knowledge	2 Years	No Passenger, Time of Day
Maryland	$45/ $0	Knowledge	6 Months	No Passenger, Supervision
Massachusetts (1)	$30/$30	Knowledge	2 Years	Helmet, Eye Protection, No Passenger, Time of Day
Michigan	$13.50/ $12.50	Knowledge	180 Days	No Passenger, Time of Day, Supervision, Helmet, Eye Protection
Minnesota	$21/ $1	Knowledge	1 Year	No Passenger, No Freeway, No Night, Helmet
Mississippi	$1/$1	Knowledge & Skill	1 Year	Supervision, Helmet
Missouri (3)	$1/ $1	Knowledge & Traffic Signs	6 Months	No Passenger, Time of Day, 250cc, Under 18, Daylight Driving Only
Montana (3)	$0.50/ N/A	Knowledge	1 Year	Supervision, Helmet
Nebraska	$8/ $8	Knowledge	1 Year	Supervision, Helmet, Under 18, No Interactive Wireless Communication Device
Nevada	$26.75/ 26.75	Knowledge	1 Year	No Passenger, Time of Day, Supervision
New Hampshire (1)	$30/$5	Knowledge	30 Days	No Passenger, Time of Day, Helmet
New Jersey (1)	$5/$5	Knowledge	90 Days	No Passenger
New Mexico (3)	$7/$7	Knowledge	6 Months	No Passenger, Under 18, Time of Day, Helmet
New York (3)	$14/ $14	Knowledge	1 Year	Supervision
North Carolina	$15/ $15	Knowledge & Traffic Signs	18 Months	No Passenger
North Dakota	$10/ $8	Knowledge	6 Months	No Passenger, Time of Day
Ohio	$19.50/ $19.50	Knowledge	1 Year	Helmet, No Passenger, Restricted Roadways, Time of Day, Eye Protection
Oklahoma (3)	$25.50/ $21.50	Knowledge & Car	4 Years	N/A
Oregon	$18/ $18	Knowledge	1 Year	No Passenger, Time of Day, Helmet, Supervision
Pennsylvania	$10/ $5	Knowledge	1 Year	No Passenger, Time of Day, Supervision
Rhode Island (3)	$25/ N/A	Knowledge & Skill	18 Months	None
South Carolina	$2.50/ $2.50	Knowledge	1 Year	Helmet & Eye Protection Under Age 21, Time of Day, Supervision
South Dakota	$8/ $8	Knowledge	1 Year	No Passenger, Helmet Under Age 18, Restricted Hours, Supervision
Tennessee	$6.50/$0	Knowledge & Skill	1 Year	Helmet, No Passenger, Restricted Roadways, Time of Day, cc Restrictions (certain ages)
Texas	$15/8	Knowledge	Varies	Supervision
Utah	$9.50/ $9.50	Knowledge	6 Months	No Passenger & Time of Day, Posted More Than 60 mph
Vermont	$7 test fee/ $0	Knowledge	120 Days	Daytime Only, No Passenger, VT Only, May Only be Renewed Twice
Virginia	$3/ N/A	Knowledge	1 Year	Helmet, No Passenger, Restricted Roadways, Time of Day, Supervision, Parent Consent
Washington (1)	$15/$15	Knowledge & Skill	90 Days	No Passenger, Time of Day
West Virginia	$5/$5	Knowledge & Skill	90 Days	Helmet, No Passenger, Time of Day, Eye Protection
Wisconsin	$32/ $32	Knowledge	6 Months	Helmet, No Passenger (except class M license holder with 2 years of licensure), Time of Day unless accompanied by licensed person age 25 or older, Eye Protection
Wyoming	$0/$0	Knowledge	90 Days	None

State Licensing Agency Information

State	Knowledge/ Skills Testing Agency	License Issuance Agency	Operator License Test Sites	M/C License Test Sites	# Examiners Who Test Motorcyclists	3rd Party Testers Used
Alabama (3)	DPS	Same	78	78	113	None
Alaska	DMV	Same	33	33	40	10
Arizona	MVD	Same	60	22	178	None
Arkansas	State Police	Dept. of Finance & Admin., Revenue Div.	100	100	37	None
California	DMV	Same	167	167	631	None
Colorado	DMV	Same	34 (state)	11 (state)	45	73
Connecticut (3)	DMV/ DOT	DMV	11	7	45	20
Delaware	DMV	Same	4	3	27	None
D.C.	DMV	Same	1	1	6	None
Florida	Highway Safety & MV	Same	181	174	500	CDL
Georgia	Dept. of Driver Services	Same	63	38	None	MC/CDL
Hawaii	Co. Examiner Drivers Sec.	Same	16	7	48	None
Idaho	Co. Sheriff's DMV Offices/ ID 3rd Party Skills Testing	County Sheriff's DMV Offices	192	28	None	All
Illinois	Sec. of State	Same	117	101	638	None
Indiana	BMV/ ABATE	BMV	170	22	None	ABATE
Iowa	DOT – Driver Services	Same	109	76	189	None
Kansas	Driver's License Bureau	Same	34	34	150	None
Kentucky	State Police	Circuit Court	140	140	75	None
Louisiana (1)	DPS	Same	84	84	450	MC
Maine	BMV/BMV 3rd Party	BMV	36	36	36	None
Maryland	Motor Vehicle Administration	Same	15	15	152	MC Safety Instructors
Massachusetts (1)	Registry of Motor Vehicles/ State Police	Registry of Motor Vehicles	37	42	114	MC
Michigan	Sec. of State	Sec. of State/ Dept. of State	Skills - 295	Skills - 115	151	82
Minnesota	DPS	Same	93	75	105	MC/CDL
Mississippi	Hwy. Patrol	Same	60	60	51	CDL
Missouri (3)	Hwy. Patrol	Dept. of Revenue	154	138	205	None
Montana (3)	DMV	Same	48	48	34	MT MSF
Nebraska	DMV	Same	98	98	79	None
Nevada	DMV	Same	16	16	75	None
New Hampshire (1)	DPS	Same	14	14	23	MC
New Jersey (1)	DMV	Same	N/A	N/A	N/A	N/A
New Mexico (3)	DMV	Same	68	68	68	MC/CDL
New York (3)	DMV	Same	138	96	164	None
North Carolina	DMV	Same	114	100	505	36
North Dakota	DOT	Same	28	28	40	None
Ohio	Highway Patrol	BMV	85	70	220	None
Oklahoma (3)	Driver's License Div.	TAG Agents	59	59	125	None
Oregon	DMV	Same	51	33	350	None
Pennsylvania	DOT	Same	72	71	151	513 MC/CDL
Rhode Island (3)	CCRI	DMV	6	0	0	CCRI
South Carolina	DMV	Same	69	51	175	None*
South Dakota	DPS	Same	73	46	39	MC/CDL
Tennessee	Dept. of Safety	Same	102	102	243	MC/CDL
Texas	DPS/ Driver's License Div.	DPS	306	306	402	None
Utah	Driver's License Division	Same	22	22	175	None
Vermont	DMV	Same	11	6	12	39 - MSF Certified RiderCoaches
Virginia	DMV	Same	71	71	200	17
Washington (1)	Dept. of Licensing	Same	68	52	147	None
West Virginia	DMV	DMV	25	25	50	MSF
Wisconsin	DOT /DMV	Same	92	28	100	None
Wyoming	WyDOT	Same	29	29	45	None

* SC has a pilot program with technical schools and motorcycle dealerships. Must complete MSF course and administer state test to qualify as TPT.

General Licensing Information

State	Age without Rider Education	Age with Rider Education	License/ Endorsement Codes	License/ Endorse-ment Fees	Duration (Yrs.)	Driver's License Required For M/C Endorse-ment	Graduated Licensing System For:	
							Driver's License	Motorcycle License
Alabama			M (3)	N/A (3)	4 (3)		Yes	
Alaska			M1 & M2	$20.00	5		Yes	No
Arizona		16	M	$7.00	Till Age 65, Then Every 5	No	Yes	
Arkansas			M & MD	$10.00	4			
California	21	16	M1 & M2	$28.00	5	No	Yes	No
Colorado		16	M	Endorsement - $2.00	5	No	Yes	
Connecticut	18	16	M (3)	$0.00 (3)	4 or 6 (3)	No	No	
Delaware	18	16 & 10 mo.	M	$8.00	5	No		
D.C.	17	17	M	$7.00	up to 5	Yes	Yes	
Florida	16	16	MTCY also/ MTCY only	$7.00/ $15.00	4, 8	No	Yes	No
Georgia	17	17	M	$20.00 /$35.00	5, 10	No		
Hawaii			Class 2	$3.00 per year	4, 6, 2		Yes	
Idaho	21	15	M	$11.50	4 or 8	Yes	Yes	
Illinois	18	16	L & M	$10.00	5 to 1	Yes	Yes	No
Indiana	16 & 1 mo.	16 & 1 mo.	M	$5.00, $6.00, $10.00, $15.00	2, 3, 4, 6	Yes	Yes	No
Iowa	18	14	MTCY only = Class M; Endorsement added = Endorsement L	$10.00; $1.00 duplicate + $1.00 per year	5	No	Yes	No
Kansas		16	None	$10.00	4 or 6	No		
Kentucky		17	M	$10.00	4	Yes	Yes	No
Louisiana			M (1)	$8.00 (1)	4 (1)			
Maine			I	$0.00	Life		Yes	
Maryland	18	16 & 3 mo.	M	$45.00	5	No	Yes	
Massachusetts		16.5	M (1)	$15.00 Plus Processing Fees (1)	5 (1)	No		
Michigan	18	16	CY	$13.50	4	Yes	Yes	
Minnesota	18	16	M	$13.00	4	No	Yes	
Mississippi	15	14	E	$5.00	4	No	Yes	
Missouri		16	M (3)	Varies (3)	2,3,6 (3)	No	Yes	Yes
Montana		15	M (3)	$.50 per year (3)	8, 4 Depends on Age (3)	No	Yes	
Nebraska		17	M	$0.00	5	No	Yes	
Nevada		16	M	$26.75	4	No	Yes	
New Hampshire			MC (1)	$37.00 (1)	4 (1)			
New Jersey			M (1)	N/A (1)	4 (1)			
New Mexico	18	13	M, W, Z (3)	$15.50 (3)	4 (3)	No		
New York		16	M & MJ (3)	Varies (3)	5 to 8 (3)	No	Yes	
North Carolina	16.5	16.5	M	$1.75/year	5 or 8	Yes	Yes	No
North Dakota	16	14	M	$10.00	4	No	No	
Ohio	18	16	M, M1, M3 & R	$23.00	4	No	Yes	
Oklahoma			M (3)	$4.00 (3)	4 (3)		No	
Oregon	21	16	M	$74.00	4	Yes	Yes	No
Pennsylvania		16	M & V (restricted to motor-driven cycle)	$5.00	4	No	Yes	No
Rhode Island			H (restrictions) (3)	$25.00 (3)	Life (3)		Yes	
South Carolina			M	$25.00	10 65 & Up 5	No	Yes	No
South Dakota			2, 3	$8.00	5	No	Yes	
Tennessee		16	M & MP	$17.50	3 to 7	No		
Texas	18	15	M	$15.00	6	Yes	Yes	Yes
Utah			M, O, U, 2, 3	$9.50	5	Yes	Yes	Yes
Vermont	16	16	M, A, B	$2.00 per year	2 or 4	Yes	Yes	No
Virginia		16	M	$2.00	5	No	Yes	
Washington	18	16	3 or R (1)	$10.00 (1)	5 (1)	No		
West Virginia	18	18	F	$5.00 (1)	4 (1)	No	Yes	Yes
Wisconsin	18	16	M	$22.00	8	No	Yes	No
Wyoming			M or TM	$3.00	4		Yes	No

Motorcycle Knowledge Testing

State	*Handbook Used*	*Knowledge Tests*	*Automated Test*
Alabama (3)	MOM	Yes	Yes
Alaska	MOM	MSF	Yes
Arizona	MOM	Local	Yes
Arkansas	Local	Local	No
California	MOM	MSF	No
Colorado	MOM	Local	No
Connecticut (3)	MOM	Local	Yes
Delaware	MOM	MSF	Yes
D.C.	Local	Local	Yes
Florida	BRC	MSF	No
Georgia	MOM	MSF	No
Hawaii	MOM	MSF	No
Idaho	Modified MOM	MSF	Yes
Illinois	Modified MOM	MSF/Local	Yes
Indiana	MOM	MSF	Yes
Iowa	MOM	MSF	Yes
Kansas	MOM	MSF	No
Kentucky	Local	Local	Yes
Louisiana (1)	MOM	MSF	Yes
Maine	Modified MOM	Local	No
Maryland	Local	MSF	Yes
Massachusetts (1)	Local	Local	Yes
Michigan	MOM	MSF	No
Minnesota	Modified MOM	Local	Yes
Mississippi	MOM	Local	Yes
Missouri (3)	MOM	MSF	Yes (17 stations)
Montana (3)	MOM	MSF	Yes
Nebraska	MOM	MSF	Yes
Nevada	MOM	MSF	Yes
New Hampshire (1)	Local	Local	No
New Jersey (1)	MOM	N/A	Yes
New Mexico (3)	MOM	MSF/Local	No
New York (3)	MOM	MSF	Yes
North Carolina	MOM	MSF	Yes
North Dakota	MOM	MSF	Yes
Ohio	MOM	MSF/Local	Yes
Oklahoma (3)	MOM	MSF	No
Oregon	Modified MOM	Modified MSF	Yes
Pennsylvania	Modified MOM	MSF/Local	Yes
Rhode Island (3)	MRC:RSS	N/A	No
South Carolina	Local	Modified Alternate Most	Yes
South Dakota	MOM	MSF	Yes
Tennessee	MOM	Modified MOM	Yes
Texas	MOM	MSF	Yes
Utah	MOM	MSF	At some locations
Vermont	MSF MOM or Basic RiderCourse Handbook	MSF	At some locations
Virginia	MOM	MSF	Yes
Washington (1)	MOM	MSF	Yes
West Virginia	MOM	MSF	Yes
Wisconsin	MOM	Local	Yes
Wyoming	MOM	MSF	No

Motorcycle Skills Testing

State	Primary Skills Test	Secondary Skills Test	Rider Education Waiver	Accept Completion Card From Other State	3-Wheel Sidecar Testing	3-Wheel Sidecar Operation Restriction
Alabama	None (3)	None (3)	No	No	No (3)	None (3)
Alaska	Alternate MOST	None	Yes	Yes	Yes	3-Wheel Only
Arizona	Alternate MOST	None	Yes	No	No	None
Arkansas	Serpentine	None	Yes	Yes	No	None
California	Serpentine & Slow Ride	None	Yes	No	No	None
Colorado	Alternate MOST	None	Yes	Yes	Yes	Sidecar, 3-Wheel Only
Connecticut	Alternate MOST (3)	None (3)	Yes	No	No (3)	None (3)
Delaware	Alternate MOST	None	Yes	Yes	No	None
D.C.	Alternate MOST	Local Off-Street	No	Yes MD & VA	No	None
Florida	BRC	None	Yes	Yes	SITEP	Sidecar, 3-Wheel Only
Georgia	RS7	RS7	Yes	No	RS7–3W	
Hawaii	Alternate MOST	None	Yes	No	Yes	3-Wheel Only
Idaho	Alternate MOST	None	Yes	Yes	Yes	Sidecar, 3-Wheel Only
Illinois	Alternate MOST	None	Yes	No	Modified Alternate MOST	Sidecar, 3-Wheel Only
Indiana	Alternate MOST	Yes	Yes	Yes	Yes	Sidecar, 3-Wheel Only
Iowa	Alternate MOST	None	Yes	Yes	Modified Alternate MOST	Sidecar, 3-Wheel Only
Kansas	Alternate MOST	None	Yes	N/A	Yes	None
Kentucky	Local Off-Street	None	Yes	Yes	Yes	3-Wheel Only - Trike
Louisiana	Local On-Street (1)	None (1)	Yes	No	No (1)	None (1)
Maine	Local On-Street	None	No	Yes	Yes	None
Maryland	Local Off-Street	Local Off-Street	Yes	No	Yes	Sidecar, 3-Wheel Only
Massachusetts	Local Off-Street (1)	Local Off-Street (1)	Yes	Yes	Modified M/C Skill Test (1)	Sidecar, 3-Wheel Only (1)
Michigan	Alternate MOST	None	Yes	Yes	Modified Alternate MOST	Sidecar, 3-Wheel Only
Minnesota	Alternate MOST	Alternate MOST	Yes	No	Modified M/C Skill Test	3-Wheel Only
Mississippi	M/C In-Traffic	Local On-Street	No	N/A	Car Skill Test	Sidecar, 3-Wheel Only
Missouri	Local Off-Street (3)	None (3)	Yes	No	Yes (3)	Yes, Displayed as "W" Restriction (3)
Montana	Alternate MOST (3)	Local On-Street (3)	Yes	No	Modified M/C Skill Test (3)	Sidecar, 3-Wheel Only (3)
Nebraska	MIT	Alternate MOST	Yes	No	MIT	Sidecar, 3-Wheel Only
Nevada	Alternate MOST	None	Yes	Yes	Yes	Sidecar, 3-Wheel Only
New Hampshire	Alternate MOST (1)	Alternate MOST (1)	Yes	N/A	Car Skill Test (1)	Full M/C Privilege (1)
New Jersey	Alternate MOST (1)	None (1)	Yes	No	Yes (1)	Full M/C Privilege (1)
New Mexico	Alternate MOST (3)	Local On-Street (3)	Yes	Yes	Modified M/C Skill Test (3)	Full M/C Privilege (3)
New York	Local On-Street (3)	None (3)	Yes	No	Modified M/C Skill Test (3)	Sidecar, 3-Wheel Only (3)
North Carolina	Local Off-Street	None	Yes	Yes	Yes	None
North Dakota	Alternate MOST	Local Off-Street	Yes	Yes	Modified Alternate MOST	Sidecar, 3-Wheel Only
Ohio	Alternate MOST	None	Yes	Yes	Modified M/C Skill Test	Sidecar, 3-Wheel Only
Oklahoma	Local On-Street (3)	None (3)	Yes	Yes	No (3)	None (3)
Oregon	Alternate MOST	None	Yes	No	Modified M/C Skill Test	Sidecar, 3-Wheel Only
Pennsylvania	Local Off-Street	Local Off-Street	Yes	No	Modified M/C Skill Test	Full M/C Privilege
Rhode Island	MRC:RSS (3)	None (3)	No	No	No (3)	None (3)
South Carolina	Modified Alternate Most	None	No	No	Knowledge & Skills Tests (Modified Alternate Most)	Sidecar, 3-Wheel Only
South Dakota	M/C In-Traffic	Local On-Street	Yes	N/A	Car Skill Test	Full M/C Privilege
Tennessee	Local Off-Street	Local On-Street	Yes	Yes	Car Skill Test	Full M/C Privilege
Texas	M/C In-Traffic	None	Yes	Yes	M/C In-Traffic	N/A
Utah	Alternate MOST	Modified Alternate MOST	Yes	Yes	Modified Alternate MOST	Sidecar, 3-Wheel Only
Vermont	RST	BRC & ERC Lic. Waiver Skill Test	Yes	Yes	Yes	Sidecar, 3-Wheel Only
Virginia	Alternate MOST	Local Off-Street	Yes	Yes	Local	None
Washington	Alternate MOST (1)	None (1)	Yes	Yes	M/C In-Traffic (1)	Sidecar, 3-Wheel Only (1)
West Virginia	Alternate MOST	Alternate MOST	Yes	N/A	N/A	Sidecar, 3-Wheel Only
Wisconsin	MIT	None	Yes	Yes	MIT	3-Wheel Only
Wyoming	Alternate MOST	None	Yes	Yes	No	None