Development of Education and Assessment Components of Victoria’s New Motorcyclist Graduated Licensing System: Summary Report

REPORT TO VICROADS

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EXECUTIVE SUMMARY

Background

This report summarises the development and piloting of the education and assessment curriculum for Victoria’s new motorcycle graduated licensing system (M-GLS), which comprises three stages:

1. Pre-learner stage: a small group education and assessment course to gain a motorcycle learner permit – the Motorcycle Permit Assessment (MPA).
2. Learner stage: a small group coaching ride, known as “Check Ride”.
3. Pre-licence stage: an individual coaching and assessment session to transition to a motorcycle licence – the Motorcycle Licence Assessment (MLA).

All stages were required to include both off-road and on-road practical components and a focus on awareness, judgment and decision making. “Train-the-trainer” induction programs were also required for each stage, which were titled “Trainer Courses”, as well as a course to become accredited to deliver these, which was titled the “Instructor Course”.

The project objectives were to develop and pilot off-road and on-road: pre-learner education activities to prepare the rider to undertake mandatory assessment to progress the learner permit; pre-learner assessment activities to enable a decision to be made on whether a learner permit should be issued; Check Ride activities to provide opportunities for a qualified coach to guide learners as they progress through the learner phase; and assessment activities to enable a decision to be made on whether a licence should be issued.

Curriculum Development: Guiding Framework and Methodology

A review of best-practice rider licensing education identified several curricula but a limited literature with few evaluations of program efficacy and no existing “best-practice” education and assessment model for novice motorcyclists. Therefore a best-practice framework for novice driver education was adapted into a Goals for Rider Education framework, comprising four hierarchical levels: basic vehicle control (operational level); mastery of traffic situations (tactical level); trip-related context and considerations (strategic level); and personal characteristics, ambitions and competencies (general level).

Training Needs Analysis was the methodology applied to develop the curriculum, requiring several sub-activities:

a) Define the target rider population, i.e. those individuals who will undertake the curriculum.
b) Specify the tasks that graduates should be able to perform.
c) Specify the knowledge, skills and attitudes required for safe and effective task performance.
d) Specify the knowledge, skills and attitudes to be learned through the curriculum and relevant principles of learning.

Target Population and Crash Types

The VicRoads Driver Licensing System records identified the target population of learner riders as predominantly male (83%) with average age of 26 years (median 30 years) and with most (over 99%) already holding a driver permit or licence. These demographics were also reflected in the profile of learner riders involved in crashes, as analysed from the VicRoads Road Crash Information System. The same percentage (83%) was male, with more than half (52%) aged under 26 years,
and near one-third (32%) aged 26-39 years, with the remaining 15% aged 40+ years. The five most common crash types for Victorian learner motorcyclists were led by motorcyclist-only loss-of-control crashes, either on straight or curved road sections, which accounted for a little over half of all their crashes (52%). A further one-fifth involved intersecting with other vehicles from adjacent or opposing directions. The remainder (each less than 10%) involved, in order, rear-end, sideswipe and head-on (not overtaking) crashes.

**Tasks, Teaching and Assessment Approaches**

Australian curricula were found to be more comprehensive for the project needs compared to other international exemplary models identified (in the UK, Germany, EU, Canada, United States and Japan). Two Australian models were found to be of particular relevance: the NSW model, as it was the first to include two mandatory stages and had been adopted by other jurisdictions, and the Queensland Q-RIDE model, given this was the only one to train learners on-road.

These were informed by Australian Quality Training Framework standards, with TLIC3038A *Apply safe motorcycle riding behaviours* the most applicable and used to define curriculum learning goals, key performance criteria, knowledge, skills and attitudes for the novice (pre-learner) through to the experienced (pre-licence) rider, according to five key areas:

1. Define and apply safe motorcycle riding behaviours.
2. Interpret and apply low-risk riding strategies.
3. Interpret and apply road rules applicable to safe motorcycle riding.
4. Manage collision when riding a motorcycle.
5. Demonstrate and maintain a high level of competence in motorcycle control skills – minimum safe level.

In order to inform the curriculum focus on judgment, awareness and decision making, literature on theories of behaviour change and teaching-learning applied in motorcycle education curricula and more broadly were identified. Principles of early theories of behaviour regarding causal attributions, cognitive dissonance and risk homeostasis were found to feature in motorcycle curricula. More complex models of behaviour change that have since been proposed in social and health psychology fields were also identified and considered. Common elements in these theories included the importance of self-regulation, having specific and challenging goals for safe riding and detailed plans how to achieve these within one’s own perceived capabilities, motivation and self-efficacy. Targets of intervention within these models included modifying counterproductive appraisals of threat and coping, priming safety-orientated subjective norms and prototypes, and boosting perceived behavioural control.

Rather than purely pedagogical (externally-focused) teaching approaches, incorporating andrological (internally-focused) approaches, where the learner increasingly takes an active role in and assumes responsibility for the learning process, was identified as important for the Victorian motorcyclist curriculum. Learning was also found more likely to be effective when: contextualised in the riders’ own life experiences; directly relevant and immediately applied; meeting intrinsic and extrinsic goals; when wide scope is managed by reduced content or extended timeframes; roles and responsibilities are made explicit; assessment is self-directed and involves critical and reflective thinking; and when creating self-awareness of abilities and self-confidence in learning.
A hybrid approach of testing and competency-based assessment addressed the requirements of the Assignment Brief and expectations of the Victorian rider training community. Each of the MPA, Check Ride and MLA courses first required individual demonstration of basic vehicle-handling competencies on the range, particularly including a higher than current standard of quick stop braking and slow riding, with the MPA in test conditions and Check Ride and MLA competency-based. This met requirements of the lowest level of the Goals for Rider Education hierarchy and sought to reassure trainers of participants’ competency at this level before taking them on-road to assess higher-level competencies. On-road assessments ensured each participant had time riding immediately in front of the trainer/assessor in order to be assessed individually, which was from a competency-based approach for the MPA and Check Ride, and in test conditions for the MLA. No coaching or feedback was undertaken for the on-road MLA until after the assessment was completed.

Trainers were also assessed with a hybrid testing and competency-based approach. Competency was required to be demonstrated via delivery of one of each of the following activities as intended: an on-range education activity, a classroom-based facilitated discussion, an on-range assessment activity and an on-road assessment activity. A multiple-choice test based on on-road riding scenarios was also developed to assess knowledge of the road rules and how to apply them appropriately for the MLA in comparison the MPA and Check Ride. Observation of satisfactory first deliveries of courses with learner or licence candidates was also included.

Pilot Studies Methodologies

Pilot course activities and materials were developed and piloted for the pre-learner stage first: the MPA Course for learner permit candidates and the respective Trainer Course and Instructor Course. The Check Ride and MLA courses and respective Trainer Courses were developed and combined for piloting second with licence candidates.

The research protocol was approved by the relevant research ethics committee. Pilots were undertaken in a Melbourne public transport Zones 1 and 2 location and an inner regional location near an outer regional boundary. Pilots with learner permit and licence candidates were continued until saturation was reached; that is, until no new learning requiring refinements to the curriculum were identified. Besides a questionnaire on participant demographics and characteristics, research measures were primarily qualitative, involving observations of all pilots, small group discussions and one-on-one interviews. Questions focused on impressions of the course content, materials and delivery, readiness to deliver the courses for trainers or to progress to a learner permit or licence for the candidates, as well as any risk or safety concerns and general feedback.

Motorcycle Permit Assessment Pilots

Five experienced trainers took part in the MPA Trainer Course, 23 riders in the two-day MPA Course pilots for learner permit candidates, and four trainers in the Instructor Course. The results led to valuable improvements to the curriculum materials and confirmed the times required for each activity and for the courses overall. Refinements addressed wording issues, clarification text needs, the ordering of activities, and management of fatigue for both the candidates and trainers. Saturation was reached in six pilots with the learner candidates.

Qualitative feedback from both learner candidates and trainers was overwhelmingly positive. Other outcomes that increased confidence in the value of the MPA Course included:
• Some participants judged by trainers at the start of Day 1 as unlikely to pass the range test did in fact pass, demonstrating the skill-building capacity of the course.
• One candidate who failed the MPA due to poor braking performance passed the current Victorian range test but only with a marginal pass on that braking activity, confirming the intended higher than current standard of braking required.
• The MPA Course was successfully delivered in a range of weather conditions.
• A diverse range of unexpected hazards were encountered during the on-road assessments, without adverse consequences.
• Instructors and Trainers reported acceptability of, and confidence in, the MPA and believed it was discriminating as intended among candidates who should and should not pass.

The final outcomes were a two-day MPA Course comprising 50 activities (summarised in Figure 4 within the report), with a supporting four-day Trainer Course and two-day Instructor Course.

Check Ride and Motorcycle Licence Assessment Pilots

Seven experienced trainers took part in the Check Ride and MLA Trainer Courses and 25 riders in the MLA Course pilots with licence candidates. The results led to changing the introductory and pre-road range skills checks components of the courses, and refinements to the curriculum materials, including assessment routes, as well as confirmed the times required for each activity. The findings also resulted in a reduction in the recommended maximum number of MLA course participants from six to five. Saturation was reached in five pilots with the licence candidates.

Riders’ choice of position within the lane (lateral positioning) was found to be the most common error in both the Check Ride and MLA on-road components. Trainers reported that the MLA discriminated well among those they would expect to pass or fail based on the candidates’ self-reported riding experience and performance on the range. Qualitative feedback from both learner candidates and trainers was overwhelmingly positive.

The final outcomes were a 3.5-hour course for Check Ride and a 1.25-hour MLA Course (with course activities summarised in Figure 5 within the report), with a supporting one-day Trainer Course for Check Ride and for the MLA.

Discussion and Conclusions

The project objectives were achieved over a two-year period, confirming the curriculum was feasible; not only that it could be delivered and received as intended, but also that it was generally acceptable to Victorian rider training providers, motorcycle learner permit and licence candidates, and wider stakeholders.

This is notwithstanding the need for on-going monitoring and evaluation, including potential refinements to course materials, the hybrid competency-based assessment and testing approach, and the ability to coach course participants effectively without resulting in miscalibration of perceived versus actual riding competency.

Some limitations were set on the scope of the project, which might have led to unknown different outcomes. The timeframe for the project precluded piloting the curriculum with the same participants throughout, that is, as learners through to licence candidates, which might have informed other unknown refinements or additions. Pre-road components of the MLA Course were piloted only in small groups, rather than with individuals, and therefore might require further refinements. Additionally, a much larger sample is needed for efficacy evaluation and establishing
standardised pass thresholds for assessments. On-going monitoring to remedy final refinements, followed by an outcome evaluation is planned by VicRoads to address these limitations.

The systematic approach to developing a tailored curriculum, guided by an adapted best-practice framework, exemplar curricula, and behaviour change and adult learning principles, offer promise in the potential of the new M-GLS education and assessment curriculum to improve the safety of newly-licensed riders in Victoria. Moreover, subject to further evaluation, this project has laid the foundation for establishing a best-practice guiding framework and model for developing tailored motorcycle licensing education curricula.
1. BACKGROUND

During late 2013, VicRoads sought expressions of interest to develop a mandatory pre-learner education curriculum for its new motorcycle graduated licensing system (M-GLS). This followed identification of an over-representation of learner motorcyclists in their crash statistics in 2010 [1] and a series of community consultation sessions in 2011 to obtain the views of stakeholders on how to address this. Analysis of Victorian crash data had shown that learner riders were three times more likely to be killed or seriously injured than their fully licensed counterparts [1]. The consultation process revealed strong support for improvements to the training curriculum for novice motorcyclists, with an earlier review of Victorian rider training identifying an over-reliance on the training of vehicle-handling skills compared to attitudinal skills [2].

Subsequently, through a series of tender processes in 2014, three contracts collectively requiring the development of the new M-GLS education and assessment curriculum were commissioned. This report summarises the resulting body of work undertaken over two years.

Transport and Road Safety (TARS) Research at The University of New South Wales (UNSW), in collaboration with Youthsafe, Learning Systems Analysis, LdeR Consulting and an independent senior advisor, was the successful tenderer for this work, with Stay Upright Rider Training the partner rider training provider for the pilot studies.

The remainder of this chapter outlines the objectives and requirements of the three contracts, provides an overview of the final education and assessment curriculum components, and outlines the structure of the remainder of this report. It is noted that the term “education” is used broadly to cover all teaching components, therefore including the more specific practical “training” (on vehicle), and that the terms “motorcycles” and “motorcyclists” or “riders” are used inclusively in relation to all powered-two-wheeler vehicles requiring licensure in Victoria, therefore including scooters and scooter riders.

1.1 Project Scope, Objectives and Requirements

At their core, the three VicRoads’ contracts required development and piloting of a three-stage education and assessment curriculum, comprising the following:

1. Pre-learner stage: a course incorporating all key requirements for obtaining a Victorian motorcycle learner permit, which became known as the “Motorcycle Permit Assessment” course.
2. Learner stage: a coaching opportunity and progress check on initial riding on the learner permit, known as “Check Ride”.
3. Pre-licence stage: an individual coaching and assessment session to transition to a Victorian motorcycle licence, titled the “Motorcycle Licence Assessment”.

All stages were required to include both off-road and on-road practical components and a focus on awareness, judgment and decision making. “Train-the-trainer” induction programs were also required for each stage, which were titled “Trainer Courses”, as well as a course to become accredited to deliver these, which was titled the “Instructor Course”.

The contracts were issued in order of, first, the pre-learner education curriculum, second, the learner permit and licence assessments and, third, the Check Ride. Each was delivered in a series of stages with interim reporting at each stage. Rather than finish each with a summary on that contract only, this report synthesises the work of each contract into the chronological sequence of
the three M-GLS stages (listed above). The objectives and summary requirements for each stage are detailed next.

1.1.1 Pre-Learner Curriculum

The first contract was CN8651 *Develop a Compulsory Curriculum for Pre-Learner Motorcyclists*. The objective was to develop and pilot test a pre-learner education curriculum that would prepare the rider to undertake mandatory assessments to progress to the learner permit. The contract included nine stages:

1. Refine and finalise project plan.
2. Identify curriculum learning goals.
3. Develop a detailed framework and approach for the curriculum.
4. Develop draft curriculum including instructor, trainer and pre-learner materials.
5. Pilot and evaluate the draft trainer materials.
6. Pilot and evaluate the draft pre-learner curriculum.
7. Pilot and evaluate the draft instructor materials.
8. Finalise the curriculum based on the pilots and feedback from key stakeholders.

Specific requirements and restrictions further detailed in the Assignment Brief or clarified in Stage 1, confirmed that the pre-learner education components should be suitable for the complete novice (i.e. riding a motorcycle for the first time) and for motorcycle and scooter type vehicles, and that additional remedial programs for those not able to complete the course successfully on the first attempt were out-of-scope. Also out-of-scope was the development of detailed hazard perception training or assessment (due to its development in a previous VicRoads contract). Piloting with pre-learners was expected to be conducted in at least one location within Zones 1 and 2 of the Melbourne public transport system and in at least one Victorian location classified as Outer Regional Australia under the Australian Statistical Geography Standard Remoteness Structure. The maximum range size for off-road practical training was restricted to the maximum space available at current training ranges in Victoria, although new range markings could be introduced. Likewise no new expensive technology or equipment could be introduced. The course was to be developed to be undertaken in small groups, initially with six candidates determined to be the maximum for the range size and on-road management.

While a maximum of two eight-hour days was originally specified, it became clear during the project, and with the addition of the assessment contract, that the two days would also need to include all pre-learner assessments, including time for the current vision test and knowledge test (out-of-scope for revision within the project) and the new off-road (range) assessment and on-road assessment. The workload on the first day limited the participant number to five, with six possible on the second day to accommodate an additional candidate being reassessed following a previously failed course.

1.1.2 Learner Permit and Licence Assessment

The second contract was CN8972 *Development of Victoria’s new motorcycle learner permit and licence tests*. The stated objective was as follows:

*The Provider shall identify a set of test tasks suitable for use in off-road and on-road tests, and the development of a test protocol. The Provider will also develop documentation and objective and subjective methods and tools for the off-road and on-road practical tests to enable a decision to be made on whether or not a learner permit or licence should be issued.*
The contract had seven stages:

1. Refine and finalise Tender Program in consultation with VicRoads.
2. Review and select target competencies and testing methodologies.
3. Draft test development.
4. Trial design.
5. Trialling, refinement and documentation.
6. Induction program.
7. Final report.

Through the research and consultation process, it was agreed to remove the term “test” at each stage, which led to the titles of the Motorcycle Permit Assessment (MPA) for requirements to gain a motorcycle learner permit and Motorcycle Licence Assessment (MLA) for the motorcycle licence.

The MPA on-range and on-road components were required to be combined within the small group course from the first pre-learner education curriculum contract, whereas the MLA was required to be conducted one-on-one on-road with the candidate and assessor. Through the project work for this and the third contract for Check Ride, it was determined that both the MLA and Check Ride should commence with on-range skills checks first to ensure candidates had achieved a minimum standard of riding competence before transitioning to the road. This therefore restricted all assessment routes to the areas surrounding training range locations, within the durations proposed in the Assignment Brief. The design therefore needed to be broad enough to apply to training locations from within Melbourne to Outer Regional Australia.

The Assignment Brief requirements included development of assessment protocols and route guides, with the Stage 6 “induction program” equivalent to the “Trainer Course”. The MPA components were combined together with the pre-learner education components into a single MPA Trainer Course and a separate MLA Trainer Course was developed and piloted. In keeping with the first contract, the Trainer Courses were piloted prior to the pilots with permit/licence candidates.

1.1.3 Check Ride

The third and final contract was CN9053 Development of Motorcycle Learner Stage Check Rides Program. The original stated objective was as follows:

The Provider shall develop a series of Check Rides to be undertaken by learner motorcyclists as a precursor to attempting the test for motorcycle licence. The Check Rides will provide opportunities for a qualified coach to guide the learner as he or she progress through the learner phase and develops critical competencies.

The contract had eight stages:

1. Provision of Contract Program.
2. Identify the Principles of the Check Ride Programs.
3. Development of a Specific Check Ride Program.
5. Induction program.
7. Development of final documentation.
The Check Rides were intended as coaching opportunities and progress checks, to commence from early in the learner permit phase in order to establish safe riding practices from the outset; that is, not as checks of readiness for the MLA. The Assignment Brief originally proposed that three separate Check Rides should be developed 10-30 minutes each. Through the work already progressed on CN8651 and CN8972 and practical considerations, it was subsequently agreed that instead of a series of brief one-on-one Check Rides, a half-day course was more appropriate. This would be more feasible for rider training providers to schedule, thereby also reducing costs for participants. Moreover, it would allow participants to ride to locations beyond those immediately within the vicinity of the training locations, thereby providing a wider range of riding environments and learning opportunities. A half-day duration allowed time for the pre-road on-range skills checks and, as participants were more likely to attend with their own vehicle, for participant vehicle checks and changes to provider vehicles if necessary.

1.2 Flowchart of the Education and Assessment Curriculum to be Developed and Piloted

The new M-GLS education and assessment requirements that were subject to development and piloted during the project are summarised in Figure 1. While titles and timings were determined during the project, the flow chart depicts the sequence of the various stages and assessment requirements that were proposed at a general level in the Assignment Briefs of the three contracts. At the time of the project work, Victorian motorcycle learner permits were required to be held for a minimum of three months and a maximum of 15 months.

![Flowchart of the Education and Assessment Curriculum to be Developed and Piloted](image-url)
1.3 Report Structure

The following Chapter 2 next reports on the framework used to guide the curriculum development and the overall methodology applied to develop the curriculum. Chapter 3 summarises the results of statistical analyses of Victorian data to identify the target novice rider population and crash types and Chapter 4 the review of literature undertaken in relation to teaching and assessment approaches. In Chapter 5, the pilot studies methodologies are detailed, followed by reporting on the results for the MPA in Chapter 6 and for Check Ride and the MLA in Chapter 7. General discussion and conclusions form Chapter 8, followed by the list of references (Chapter 9).
2. CURRICULUM DEVELOPMENT: GUIDING FRAMEWORK AND METHODOLOGY

The over-representation of novice motorcyclists in crash statistics is not unique to Victoria, with young and inexperienced riders consistently identified as at increased risk of a crash in Australia and internationally [3, 4]. There have been considerable efforts worldwide to develop motorcyclist specific education programs, both within or complementary to licensing systems [e.g. 5, 6]. Therefore, we first set out to identify “best practice” in this field, commencing with the pre-learner education curriculum. The following sections report on this effort, the lack of identification of a single program that met the project needs, the resulting guiding framework selected and adapted, and the methodological approach to developing the new education and assessment curriculum.

2.1 Literature Search on Best Practice in Novice Motorcyclist Education

A search of peer-reviewed literature was conducted in June 2014 using an on-line database, Scopus, supplemented with targeted searches of grey literature and training models in other Australian jurisdictions, as well as exemplar models in Europe, North America and Asia. Scopus contained over 49 million records for journal articles, book series, conference proceedings, trade publications, patent records and scientific web pages.

Searches focused on combinations of the terms “pre-learner” OR “learner” OR “novice” OR “beginning” OR “beginner” with “motorcyclist” OR “motorcycle” OR “rider”. Of a total of 177 matching records, only 62 were related to novice motorcyclists.

A key paper identified was a 2010 systematic review of previous evaluations of rider training programs (for all licence levels) conducted for the Cochrane collection [6]. As the Cochrane requirements are considered the “gold standard” in academic literature, and as no later program evaluation was identified, this paper became the main focus. It reviewed six evaluations specific to the pre-learner phase. Of the three cohort studies, two randomised control trials (RCTs) and one case-control study, only one RCT found statistically significant differences. The program it evaluated was in fact an Australian program conducted in New South Wales: the Australia Post Motorcycle Rider Training Scheme. Crash reductions were found at six months, one year and two years post-training. However, offence increases also were found also, but only at the one-year follow-up.

Given RCTs are considered the “gold standard” in evaluation research methods, it was promising that crash reductions were found. However, the potential increase in offences was cautionary. It has been clearly demonstrated in novice driver training evaluations that training can have an unintended counterproductive consequence by increasing perceptions of skills and performance to a higher level than actual, resulting in miscalibration or optimism bias, and therefore can lead to increased risk-taking and crash involvement [7]. This further emphasised the need for attention to awareness, judgment and decision-making skills as stipulated in the Assignment Brief. Given the Australia Post program was discontinued and was a more specialised program focusing on scooter riders delivering mail, it was not pursued further. Notably, the Cochrane review authors also concluded that many of the studies reviewed had inherent methodological weaknesses and that, overall, the literature was inconclusive as to the value of motorcyclist education [6].
2.2 Guiding Framework: Goals for Rider Education

Given the failure to identify a single model regarded as best practice in motorcycle education, and the project directive to include a greater balance of focus on awareness, judgment and decision making relative to vehicle-handling skills content, we turned to an applicable best-practice framework previously applied for education of novice car drivers [8, 9]: the Finnish Goals for Driver Education (GDE) model [10].

The GDE framework identifies specific knowledge and skills, risk-increasing factors and self-evaluation needs at four hierarchical levels, increasing in focus from physical to cognitive to attitudinal skills: (I) basic vehicle control (operational level); (II) mastery of traffic situations (tactical level); (III) trip-related context and considerations (strategic level); and (IV) personal characteristics, ambitions and competencies (general level). By substituting driver-specific terms applied in a novice driver GDE model [9] to those relevant for motorcyclists (such as “car” to “vehicle”, “driving” to “riding”, and “seatbelts” to “personal protective equipment” or “PPE”), we identified that the GDE framework also was applicable for addressing the higher-order skills required for our novice motorcyclist curriculum. The resulting Goals for Rider Education framework is presented in Table 1.

The self-evaluation column and highest level in particular offered guidance for the project requirement to inject more focus on awareness, judgment and decision making. The highest level, involving self-reflection, monitoring and evaluation of how riding is situated within wider personal motives and goals for life and day-to-day living, is the one least likely to be addressed in traditional motorcyclist education programs. It could be argued that the lowest level of the hierarchy plays a more crucial role in the safety of motorcyclists than drivers (given the greater occupant protection offered by passenger cars). However, the author of the original proposed hierarchical approach also argued that, while the higher levels always affect behaviour on the lower levels, the lower levels can also affect the higher ones, with success as well as failure on the higher levels affecting demands on lower levels [see 8]. Therefore, attention to all levels was deemed important.

2.3 Curriculum Development Methodology: Training Needs Analysis

While the Goals for Rider Education framework provided a guide on the types of components required, the specific components were determined by applying Training Needs Analysis [11, 12]. Training Needs Analysis involves several sub-activities, which in the context of the pre-learner education curriculum were summarised as:

a) Define the target rider population, i.e. those individuals who will undertake the pre-learner curriculum.

b) Specify the tasks that graduates should be able to perform.

c) Specify the knowledge, skills and attitudes required for safe and effective task performance.

d) Specify the knowledge, skills and attitudes to be learned through the pre-Learner curriculum and relevant principles of learning.

The next chapter addresses step (a) and following chapters (b) through (d), which included review of Australian Quality Training Framework standards, other model motorcycle education and assessment programs, and supporting literature on effective behaviour change and teaching approaches.
### Table 1. Goals for Rider Education framework (adaptation of CIECA GDE Matrix [9])

<table>
<thead>
<tr>
<th>Hierarchical levels of rider behaviour</th>
<th>Essential elements of motorcyclist rider training</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Knowledge and skills</td>
</tr>
<tr>
<td>I. Mastery of traffic situations (Tactical level)</td>
<td>Knowledge and skills regarding:</td>
</tr>
<tr>
<td></td>
<td>• traffic rules</td>
</tr>
<tr>
<td></td>
<td>• observation and use of signals</td>
</tr>
<tr>
<td></td>
<td>• anticipation</td>
</tr>
<tr>
<td></td>
<td>• speed adaptation</td>
</tr>
<tr>
<td></td>
<td>• communication</td>
</tr>
<tr>
<td></td>
<td>• safety margins</td>
</tr>
<tr>
<td></td>
<td>• etc.</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>II. Trip-related context and considerations (Strategic level)</td>
<td>Knowledge and skills regarding:</td>
</tr>
<tr>
<td></td>
<td>• choice of route</td>
</tr>
<tr>
<td></td>
<td>• estimated riding time</td>
</tr>
<tr>
<td></td>
<td>• effects of social pressure from pillions/co-riders</td>
</tr>
<tr>
<td></td>
<td>• estimating urgency of the trip</td>
</tr>
<tr>
<td></td>
<td>• etc.</td>
</tr>
<tr>
<td>III. Personal characteristics, ambitions and competencies (General level)</td>
<td>Knowledge and control of general ambitions in life, values and norms and personal tendencies that effect driving behaviour • lifestyle • peer group norms • motives in life • self-control and other characteristics • personal values and norms • etc.</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>IV. Personal characteristics, ambitions and competencies (General level)</td>
<td>Knowledge and control of general ambitions in life, values and norms and personal tendencies that effect driving behaviour • lifestyle • peer group norms • motives in life • self-control and other characteristics • personal values and norms • etc.</td>
</tr>
</tbody>
</table>
| I. Basic vehicle control (Operational level) | Knowledge and skills regarding:  
• control of direction and position of vehicle  
• surface grip, tyre pressure  
• dimensions of the vehicle  
• technical aspects of vehicle | Risks related to:  
• insufficient automation of basic skills  
• difficult (road) conditions (e.g. darkness, bad weather)  
• improper use of PPE, sitting position  
• etc. | Self-awareness concerning  
• strengths and weaknesses of basic vehicle control  
• strengths and weaknesses manoeuvring in dangerous situations  
• realistic assessment of own skill  
• etc. |
3. TARGET POPULATION AND CRASH TYPES

To identify the target population and crashes types for the new M-GLS curriculum, the age, gender and prior driver licensure of new learner motorcyclists was examined in VicRoads’ Driver Licensing System data records for 2014 and crash information from VicRoads’ police-recorded crash data for 2009-2013.

3.1 Learner Motorcyclists in Victoria

During the study period, information on Victorian motorcyclists in the Driver Licensing System from 1/1/2014 to 30/6/2014 was supplied. During this time, 8543 riders were issued a motorcycle learner permit in Victoria. The majority (83%) was male, with an average age of 26 years (median 30 years). By age groupings, 20% were aged less than 21 years, 41% aged 21-29 years, 19% aged 30-39 years, 12% aged 40-49 years and 8% aged 50 years or more. Most of these riders already held a car driver licence: 68% held a full driver licence, 24% held a probationary driver licence, 8% held a driver learner permit and less than 1% did not have any driver permit or licence.

3.2 Learner Motorcyclists in Crashes in Victoria

VicRoads provided data from their Road Crash Information System on all police-recorded crashes involving a powered two-wheel vehicle for the period from 2009-2013. The data included information about the riders’ motorcycle licence type, age and gender, as well as the configuration of road user movement used to classify the crash (Definition for Classifying Accidents, DCA).

Over the study period there were 9357 reported motorcycle crashes in Victoria including 2% fatal crashes, 44% serious injury and 51% other injury. No information was available for 3% of crashes. Of the 818 (9%) crashes involved learner motorcyclists, 3% were fatal, 52% serious injury and 45% other injury crashes.

Table 2 summarises the age and gender breakdown of the 818 learner riders, of which 83% was male. Age was categorised into three previously identified crash risk groups [3, 13]. As shown, little over half of the learners involved in crashes was aged 25 years or younger, with near one-third in the middle age group 26-39 years. A similar distribution by age was found for the male learners involved in crashes, whereas for females the age groups were more evenly represented.

Table 2. Gender and age distribution of Learner motorcyclists in crashes in Victoria (2009-2013)

<table>
<thead>
<tr>
<th>Age group (years)</th>
<th>Gender</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
<td>Total</td>
<td></td>
</tr>
<tr>
<td>≤25</td>
<td>56%</td>
<td>38%</td>
<td>52%</td>
<td></td>
</tr>
<tr>
<td>26-39</td>
<td>32%</td>
<td>32%</td>
<td>32%</td>
<td></td>
</tr>
<tr>
<td>40+</td>
<td>12%</td>
<td>30%</td>
<td>15%</td>
<td></td>
</tr>
</tbody>
</table>

3.3 Crash Types Involving Learner Motorcyclists in Victoria

Table 3 lists the most common types of crashes involving learner motorcyclists as grouped according to VicRoads’ crash coding system. A little more than half were motorcyclist-only crashes involving loss of control of the motorcycle, with sub-analysis identifying that 77% occurred on straight sections of roads compared to 23% at curves. A further one-fifth involved intersecting vehicles from adjacent or opposing directions, of which 62% occurred at T-intersections and 35%
at cross intersections. Smaller (less than 10%) proportions involved rear-end, sideswipe and head-on (not overtaking) crashes. The curriculum focused on these five crash types as the most common scenarios involving learner motorcyclists in Victoria.

Table 3. Types of crashes involving learner motorcyclists in Victoria (2009-2013)

<table>
<thead>
<tr>
<th>Crash Type</th>
<th>Proportion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loss of control</td>
<td>52%</td>
</tr>
<tr>
<td>(straight)</td>
<td>(77%)</td>
</tr>
<tr>
<td>(curve)</td>
<td>(23%)</td>
</tr>
<tr>
<td>Intersecting</td>
<td>20%</td>
</tr>
<tr>
<td>(T-intersections)</td>
<td>(62%)</td>
</tr>
<tr>
<td>(X-intersections)</td>
<td>(35%)</td>
</tr>
<tr>
<td>(multiple)</td>
<td>(3%)</td>
</tr>
<tr>
<td>Rear end</td>
<td>7%</td>
</tr>
<tr>
<td>Sideswipe</td>
<td>5%</td>
</tr>
<tr>
<td>(other vehicle lane change)</td>
<td>(45%)</td>
</tr>
<tr>
<td>(other vehicle in lane)</td>
<td>(23%)</td>
</tr>
<tr>
<td>(rider lane change)</td>
<td>(27%)</td>
</tr>
<tr>
<td>(other)</td>
<td>(5%)</td>
</tr>
<tr>
<td>Head on (not overtaking)</td>
<td>4%</td>
</tr>
<tr>
<td>Emerging</td>
<td>2%</td>
</tr>
<tr>
<td>Overtaking</td>
<td>2%</td>
</tr>
<tr>
<td>Manoeuvring</td>
<td>1%</td>
</tr>
<tr>
<td>Animal</td>
<td>1%</td>
</tr>
<tr>
<td>Object on path</td>
<td>1%</td>
</tr>
</tbody>
</table>
4. TASKS, TEACHING AND ASSESSMENT APPROACHES

To meet the (b) to (d) requirement of the Training Needs Analysis, a wide literature was consulted. Curriculum tasks and assessment needs were determined from Australian and international models of novice motorcyclist education identified from the initial literature review (section 2.1). Content and delivery approaches were further informed by literature on behaviour change theories, relevant to fostering positive riding behaviours and attitudes, and literature on adult learning principles.

4.1 Identification of Curriculum Tasks and Assessment Needs

4.1.1 Australian and International Approaches to Novice Motorcyclist Education

The literature review described in Section 2.1 identified a range of Australian and International rider training models applicable to pre-learner motorcyclists. Of particular interest from Australia were the New South Wales (NSW) model [14], given it was the first to include two mandatory stages and had been adopted by other jurisdictions (the Australian Capital Territory and Tasmania), and also the Queensland Q-RIDE model [15, 16], given this was the only one to train learners on-road. The Northern Territory model [17], also applied in South Australia, was also examined, but only a limited program was found to exist in Western Australia.

Dominant international models appraised spanned Europe (United Kingdom [18], Germany [19] and the European Commission [20]), North America (Canada [21] and the United States [22, 23]), and Asia (Japan [24]). The competencies in each program were compared and considered against the Goals for Rider Education framework. The timing of the study also allowed observation of New Zealand’s competency-based assessment program.

As a general framework, the European Initial Rider Training (IRT) Programme [20] was very comprehensive. It clearly was designed to bring European training standards closer together while allowing individual training organisations scope to design their own courses. The IRT also advocated an increased focus on high-order skills. The take up of the IRT framework across the European Union was unknown; however, the DVR German Road Safety Council and ACEM The Motorcycle Industry in Europe had introduced a Quality Label system to endorse riding schools that deliver programs that align with the IRT [25].

In contrast to the IRT model, the US National Highway Traffic Safety Administration’s Model National Standard for Entry-Level Motorcycle Rider Training [23] is very specific with clearly defined criteria for novice riders. The Basic Rider Course (BRC) of the US Motorcycle Safety Foundation [22] is the practical application of the NHTSA model into a detailed course curriculum. In terms of high-level detail and specificity the BRC of the MSF and the National Riding Standard produced by the UK Driving Standards Agency [18] were the leading courses in their respective regions. Rider training in Canada [21] and Japan [24] showed close links to these programs and in particular the MSF curriculum.

When Australian government rider training programs first began in Australia in the early 1990s they drew heavily on the MSF and DSA courses and their influence was still clearly evident in Australian curricula. However, Australian curricula were found to have progressed significantly in the tactical and strategic areas (roadcraft) compared to those internationally. Another notable comparison was that it was common practice in Australian curricula to address roadcraft at the end of the course whereas overseas courses often commenced with the subject. The other key
difference between local and international rider training programs was the inclusion overseas of advanced topics such as riding with a passenger, breakdown procedures, towing, motorcycle maintenance and group riding. Historically some of these topics were included in Australian novice rider curricula, but were gradually removed due to prioritisation of content in courses of limited durations and due to their lack of relevance as some components (i.e. passengers and towing) became restricted for novice riders within graduated licensing systems [5]. Based on these findings, the Australian curricula were deemed to be more comprehensive and best suited to the project needs.

4.1.2 Australian Quality Training Framework Standards

The Australian models are guided by the Australian Quality Training Framework, the national set of standards for vocational education. Of relevance for the current project generally is the TAE40110 Certificate IV in Training & Assessment [26] and more specifically TLIM4003A Develop safe motorcycle riding behaviours [27], which is for riding instructors and TLIC3038A Apply safe motorcycle riding behaviours [28], which defines the performance standard expected of an advanced rider. The latter is described as covering “higher order riding skills and knowledge that build upon basic rider licence requirements”. Therefore, the elements and performance criteria of TLIC3038A were deemed applicable for a rider qualifying for licensure.

TLIC3038A specifies five key areas:

1. Define and apply safe motorcycle riding behaviours.
2. Interpret and apply low-risk riding strategies.
3. Interpret and apply road rules applicable to safe motorcycle riding.
4. Manage collision when riding a motorcycle.
5. Demonstrate and maintain a high level of competence in motorcycle control skills – minimum safe level.

We specified sub-tasks at each level and the implications of performance criteria for a novice versus competent rider as summarised in Table 4. As such, column 3 summarises the performance criteria that were determined to be applicable to demonstrate for successful completion of the MPA. The final column 4 then represents the equivalent requirements for the MLA.

4.2 Behaviour Change Literature

Behaviour change theories were identified as relevant content for motorcyclist education curricula, particularly when objectives include adopting safe behaviours and deterring intentional risk-taking behaviours. Principles of early theories of behaviour regarding causal attributions [29], cognitive dissonance [30] and risk homeostasis [31] were found to feature in Australian motorcycle education curricula [e.g. 28, 32]. More complex models of behaviour change that have since been proposed in social and health psychology fields [33] were identified and also considered for inclusion. Relevant details of each of the theories explored can be summarised as follows:

- **Causal Attribution Theory**: posits that people inherently look for a cause and effect to explain events, attributing causes either to internal traits (e.g. personality) or external factors (e.g. situation, environment), with people who externalise rather than internalise their safety less likely to apply safe behaviours; therefore, identifying that promoting internal causal attributions can improve safety.
### Table 4. Australian Standard TLIC3038A Criteria: Implications for Novice and Experienced Riders

<table>
<thead>
<tr>
<th>Task</th>
<th>Performance Criteria</th>
<th>Novice Rider</th>
<th>Experienced Rider</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Define and apply safe motorcycle riding behaviours</td>
<td>1.1 Requirements for safe riding are acknowledged, interpreted and applied</td>
<td>1.1 Requirements for safe riding in on-road contexts appropriate to learner permit holders are acknowledged, interpreted and applied</td>
<td>1.1 Requirements for safe riding are acknowledged, interpreted and applied</td>
</tr>
<tr>
<td></td>
<td>1.2 Importance of attitude in abiding by the road rules in relation to level of risk faced by a rider is understood and taken into account in motorcycle riding activities</td>
<td>1.2 Importance of attitude in abiding by the road rules in relation to level of risk faced by a rider is acknowledged</td>
<td>1.2 Importance of attitude in abiding by the road rules in relation to level of risk faced by a rider is understood and taken into account in motorcycle riding activities</td>
</tr>
<tr>
<td></td>
<td>1.3 Importance of cooperation with other road users in order to ride safely is understood and taken into account in motorcycle riding activities</td>
<td>1.3 Purposes and techniques for communication (formal and informal) with other road users are understood</td>
<td>1.3 Importance of cooperation with other road users in order to ride safely is understood and taken into account in motorcycle riding activities</td>
</tr>
<tr>
<td></td>
<td>1.4 Motivation to ride safely is interpreted and described, including values, emotions and personal needs</td>
<td>1.4 The importance of factors affecting ability to ride safely is acknowledged, including values, emotions and personal needs</td>
<td>1.4 Motivation to ride safely is interpreted and described, including values, emotions and personal needs</td>
</tr>
<tr>
<td></td>
<td>1.5 Principles of proactive riding, also known as low-risk riding, that keep the rider at a low-level risk are interpreted and applied</td>
<td>1.5 Principles of proactive riding, also known as low-risk riding, that keep the rider at a low-level risk are understood</td>
<td>1.5 Principles of proactive riding, also known as low-risk riding, that keep the rider at a low-level risk are interpreted and applied</td>
</tr>
<tr>
<td></td>
<td>1.6 Specific factors that constitute an actual risk of a collision are understood and applied, including options for avoiding a collision; crash avoidance space; variables affecting minimum space; effects of observation, perception and response time; and consequences related to crash avoidance spaces</td>
<td>1.6 The relevance of factors that contribute to the risk of a collision are acknowledged, including options for avoiding a collision; crash avoidance space; variables affecting minimum space; effects of observation, perception and response time; and consequences related to crash avoidance spaces</td>
<td>1.6 Specific factors that constitute an actual risk of a collision are understood and applied, including options for avoiding a collision; crash avoidance space; variables affecting minimum space; effects of observation, perception and response time; and consequences related to crash avoidance spaces</td>
</tr>
<tr>
<td>Task</td>
<td>Performance Criteria</td>
<td>Novice Rider</td>
<td>Experienced Rider</td>
</tr>
<tr>
<td>------</td>
<td>---------------------</td>
<td>--------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>2 Interpret and apply low-risk riding strategies</td>
<td>2.1 Risk factors contributing to the formation of opinions and beliefs about low-risk riding are understood and applied</td>
<td>2.1 The importance of internal (e.g. personal well-being) and external (e.g. road conditions) risk factors that contribute to the formation of opinions and beliefs about low-risk riding is acknowledged</td>
<td>2.1 Risk factors contributing to the formation of opinions and beliefs about low-risk riding are understood and applied</td>
</tr>
<tr>
<td></td>
<td>2.2 Road safety information that reflects the changing road environment is clarified and taken into account in motorcycle riding activities</td>
<td>2.2 Road safety information that reflects the changing road environment is acknowledged</td>
<td>2.2 Road safety information that reflects the changing road environment is clarified and taken into account in motorcycle riding activities</td>
</tr>
<tr>
<td></td>
<td>2.3 Human psychological and physiological aspects that can influence low-risk riding are acknowledged and taken into account in motorcycle riding activities</td>
<td>2.3 The relevance of human psychological and physiological factors that can influence low-risk riding are acknowledged</td>
<td>2.3 Human psychological and physiological aspects that can influence low-risk riding are acknowledged and taken into account in motorcycle riding activities</td>
</tr>
<tr>
<td></td>
<td>2.4 Low-risk riding strategies are understood, interpreted and applied consistently</td>
<td>2.4 Low-risk riding strategies are understood and applied at a basic level</td>
<td>2.4 Low-risk riding strategies are understood, interpreted and applied consistently</td>
</tr>
<tr>
<td></td>
<td>2.5 Features and benefits of protective clothing are understood and applied</td>
<td>2.5 Features and benefits of protective clothing are understood</td>
<td>2.5 Features and benefits of protective clothing are understood and applied</td>
</tr>
<tr>
<td>3 Interpret and apply road rules applicable to safe motorcycle riding</td>
<td>3.1 Relevant rules and regulations are identified, interpreted correctly and consistently applied</td>
<td>3.1 Relevant rules and regulations are identified and interpreted correctly</td>
<td>3.1 Relevant rules and regulations are identified, interpreted correctly and consistently applied</td>
</tr>
<tr>
<td></td>
<td>3.2 Road signs, signals and markings are identified and taken into account in motorcycle riding activities</td>
<td>3.2 Road signs, signals and markings are identified and taken into account in motorcycle riding activities</td>
<td>3.2 Road signs, signals and markings are identified and taken into account in motorcycle riding activities</td>
</tr>
<tr>
<td></td>
<td>3.3 Purpose of road rules and traffic safety laws in ensuring safe and efficient regulation of traffic flow is understood and taken into account in motorcycle riding activities</td>
<td>3.3 Importance of road rules and traffic safety laws in ensuring safe and efficient regulation of traffic flow is acknowledged</td>
<td>3.3 Purpose of road rules and traffic safety laws in ensuring safe and efficient regulation of traffic flow is understood and taken into account in motorcycle riding activities</td>
</tr>
<tr>
<td>Task</td>
<td>Performance Criteria</td>
<td>Novice Rider</td>
<td>Experienced Rider</td>
</tr>
<tr>
<td>------</td>
<td>----------------------</td>
<td>--------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>4 Manage collision when riding a motorcycle</td>
<td>4.1 Common contributing collision factors, including age, experience, speed, drugs, alcohol, road conditions, fatigue and time of day are recognised, and appropriate actions are managed</td>
<td>4.1 The relevance of common contributing collision factors, including age, experience, speed, drugs, alcohol, road conditions, fatigue and time of day is acknowledged</td>
<td>4.1 Common contributing collision factors, including age, experience, speed, drugs, alcohol, road conditions, fatigue and time of day are recognised, and appropriate actions are managed</td>
</tr>
<tr>
<td></td>
<td>4.2 External factors that could lead to collisions, including speed, space, vision, road conditions, motorcycle condition and environmental conditions are understood and managed</td>
<td>4.2 The importance of external factors that could lead to collisions, including speed, space, vision, road conditions, motorcycle condition and environmental conditions is acknowledged</td>
<td>4.2 External factors that could lead to collisions, including speed, space, vision, road conditions, motorcycle condition and environmental conditions are understood and managed</td>
</tr>
<tr>
<td></td>
<td>4.3 Internal factors that could lead to collisions, including emotional factors, rider's own behaviours and rider's operation at high levels of risk are acknowledged and managed</td>
<td>4.3 The importance of internal factors that could lead to collisions, including emotional factors, rider's own behaviours and rider's operation at high levels of risk is acknowledged</td>
<td>4.3 Internal factors that could lead to collisions, including emotional factors, rider's own behaviours and rider's operation at high levels of risk are acknowledged and managed</td>
</tr>
<tr>
<td></td>
<td>4.4 Consequences of collisions in relation to relevant traffic laws and physical, financial and psychological costs to the individual and society are understood and managed</td>
<td>4.4 Consequences of collisions in relation to relevant traffic laws and physical, financial and psychological costs to the individual and society are acknowledged</td>
<td>4.4 Consequences of collisions in relation to relevant traffic laws and physical, financial and psychological costs to the individual and society are understood and managed</td>
</tr>
<tr>
<td></td>
<td>4.5 Functions of motorcycle controls are understood and demonstrated</td>
<td>4.5 Functions of motorcycle controls important to safe riding are understood and applied</td>
<td>4.5 Functions of motorcycle controls are understood and demonstrated</td>
</tr>
<tr>
<td></td>
<td>4.6 Corrective actions to be taken after a collision are understood and applied if required</td>
<td>4.6 Corrective actions to be taken after a collision are understood</td>
<td>4.6 Corrective actions to be taken after a collision are understood and applied if required</td>
</tr>
<tr>
<td>5 Demonstrate and maintain a high level of competence in motorcycle control skills – minimum safe level</td>
<td>5.1 Appropriate action is taken to respond to various types of adverse conditions</td>
<td>5.1 Appropriate actions to respond to adverse conditions in on-road contexts applicable to Learner Permit holders are understood</td>
<td>5.1 Appropriate action is taken to respond to various types of adverse conditions</td>
</tr>
<tr>
<td></td>
<td>5.2 Principles of braking are applied at a high level of competence</td>
<td>5.2 Principles of braking are applied in on-road contexts applicable to Learner Permit holders</td>
<td>5.2 Principles of braking are applied at a high level of competence</td>
</tr>
<tr>
<td>Task</td>
<td>Performance Criteria</td>
<td>Novice Rider</td>
<td>Experienced Rider</td>
</tr>
<tr>
<td>------</td>
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</tr>
<tr>
<td>5.3</td>
<td>Principles of steering and counter-steering are applied at a high level of competence</td>
<td>5.3 Principles of steering are applied in on-road contexts applicable to Learner Permit holders</td>
<td>5.3 Principles of steering and counter-steering are applied at a high level of competence</td>
</tr>
<tr>
<td>5.4</td>
<td>Slow speed manoeuvres are carried out at a high level of competence</td>
<td>5.4 Slow speed manoeuvres are carried out in on-road contexts applicable to Learner Permit holders</td>
<td>5.4 Slow speed manoeuvres are carried out at a high level of competence</td>
</tr>
<tr>
<td>5.5</td>
<td>Motorcycle is guided and controlled at a high level of competence</td>
<td>5.5 Motorcycle is guided and controlled in on-road contexts applicable to Learner Permit holders</td>
<td>5.5 Motorcycle is guided and controlled at a high level of competence</td>
</tr>
<tr>
<td>5.6</td>
<td>Principles of body weight transfer are applied at a high level of competence</td>
<td>5.6 Principles of body weight transfer are applied in on-road contexts applicable to Learner Permit holders</td>
<td>5.6 Principles of body weight transfer are applied at a high level of competence</td>
</tr>
</tbody>
</table>
• **Cognitive Dissonance Theory**: cognitive dissonance is a conflict or discord between thoughts or beliefs and actual behaviour (e.g. a person who wishes to be safe road user and believes fatigue is a major crash cause but still rides when fatigued); discussion to realise the disparity and the benefits of adopting the safe driving behaviour can encourage the safer behaviour [34].

• **Risk Homeostasis Theory**: proposes that people manage risk in a state of equilibrium, such that if we perceive something as safe we are likely to be less cautious in our behaviour (e.g. if we know our vehicle has ABS we might drive faster, follow closer and brake later than in a vehicle without ABS); therefore conversely, if we perceive something as dangerous or that perceived costs outweigh benefits, we are more likely to demonstrate safe behaviours.

• **Control Theory**: goals are set in a hierarchy and serve as a “reference value”; successful self-regulation is needed to inhibit behaviours lower in the hierarchy in favour of higher-level goals; therefore requiring self-monitoring.

• **Goal Setting Theory**: the relationship between goals and actual performance is based on specificity as well as difficulty, with difficult goals and specific goals more effective than general goals, also taking into account self-efficacy (perceived capability of performing the behaviour); therefore, there safe behaviour can be enhanced by setting both specific and challenging goals.

• **Model of Action Phases**: proposes distinct phases in achieving goals – pre-decisional phase (deliberate over which goal to pursue then form an intention), pre-actional phase (decide when, where and how to act), action (initiated and maintained if necessary), and evaluation of the outcome of the action (against what was desired); with a key reason for safe intentions not translating to behaviour being failure to elaborate in sufficient detail how to go about performing the intended action; therefore safe behaviour can be improved by promoting the forming of implementation intentions.

• **Strength Model of Self-Control**: self-regulation draws upon a limited resource that is quickly depleted when needing to strive effortfully to achieve a goal, such that subsequent goal striving is compromised; therefore, self-control resources need to be bolstered to ensure repeated goal striving is possible (therefore requiring self-regulation).

• **Protection Motivation Theory**: protection motivation (intention to perform a protective behaviour) is determined by threat appraisals (severity of the threat and probable vulnerability to the threat) and coping appraisals (response efficacy and self-efficacy); therefore, intervention should aim to modify counterproductive appraisals of threat and coping.

• **Theory of Planned Behaviour (TPB)**: behavioural intentions are a function of attitudes (i.e. general evaluation of favourableness) and subjective norms (i.e. perceived approval of important others), such that behaviour follows perceptions of what others expect one should do (as opposed to descriptive norms or perceptions of what others actually do); therefore, perceived behavioural control (similar to self-efficacy) is an important predictor of intention and of behaviour and therefore positive influences on this as well as intentions are the target of intervention.

• **Health Belief Model**: the probability of performing a particular health protective behaviour is based on four factors, (i) perceived threat of the outcome the behaviour might protect against (susceptibility and severity), (ii) perceived effectiveness of the preventive behaviour (benefits and barriers), (iii) general health motivation, and (iv) cues to action / immediate situational determinants (with self-efficacy also sometimes added to the model); therefore
building on social-cognitive theories of behaviour such as TPB by recognising external influences, which therefore are an additional target for intervention.

- **Elaboration Likelihood Model**: proposes two routes via by which interventions can be persuasive leading to message acceptance and changes in reference values, first, scrutiny of content desirability and feasibility, is effortful and therefore only likely when matching ability and motivation but more likely to be enduring and, second, relies on peripheral cues only (such as others’ attitudes) and is more transient and unstable, but can be targeted in intervention when motivation is low.

- **Prototype Willingness Model**: also proposes two routes to behaviour, the “reasoned pathway”, similar to TPB, and the “social reaction pathway”, for which a “prototype perception” of the type of person who engages in the behaviour, and similarity to the self, determines “behavioural willingness” within given circumstances and thus behaviour; therefore positive perceptions of the prototypical person can lead the person to be willing to act differently to intentions if supporting circumstances arise, and therefore interventions targeting this path have a more direct influence on behaviour.

- **Social Cognitive Theory**: proposes a reciprocal learning process between beliefs and behaviour process in which people select, react to and learn from experiences, with intentions a key determinant and self-efficacy having a direct effect on behaviour as well as indirect via other determinants; further, that the reciprocal learning process occurs through a process of self-monitoring, self-guidance via personal standards and corrective self-reactions; therefore, a focus on self and increasing an individual’s sense of self-efficacy is key.

Common elements in these theories therefore include the importance of self-regulation, having specific and challenging goals for safe riding and detailed plans on how to achieve these within one’s own perceived capabilities and motivation and sense of self-efficacy. Targets of intervention within these models include modifying counterproductive appraisals of threat and coping, priming safety-orientated subjective norms and prototypes, and boosting perceived behavioural control. These elements are particularly reflected in the Goals for Rider Education framework end column on self-evaluation skills.

### 4.3 Adult Learning

While behaviour change theories provide a guide as to what should be addressed in a behaviour-change focused program, teaching-learning theories provide a guide as to how this should be achieved. Approaches to teaching will differ depending on the target learner population and on whether the learning goal to be taught focuses on knowledge, skills and/or attitudes: that is, in the current curriculum context, whether teaching novice (pre-learner) or experienced (pre-licence) riders and whether focusing on basic operational and vehicle handling skills versus the higher-order skills or constructs. The following sections provide some background to this in relation to basic learning curves, describe the curriculum teaching approaches and structure of activities, as well as the approach to assessment.

#### 4.3.1 Learning curves

At a basic level, skill development has been shown in a range of fields (e.g. sports, chess, ballet, playing the piano and driving) to follow a power function according to practice or experience, such that a high level of errors initially drops dramatically and then more gradually thereafter with increasing practice or experience [7, 35]. However, for complex tasks (applicable to motorcycle
riding), this practice or experience is not simply repetition of the same activity but requires varied depth and breadth of experience (near and far transfer), with “gaps” or “pauses” important for ensuring rapid and retained learning [35]. Such gaps allow time for reflection and have implications both within extended courses, such as the two-day pre-learner course, as well as the overall curriculum, that is, allowing time between the pre-learner, Check Ride and pre-licence course phases.

In a novice driving context, it has been shown that the type of practice driving learners undertake even up to 50 hours is “more of the same” whereas complexity of the practice only increases at substantially higher levels of experience, and particularly sharply after approximately 110 hours [36]. This compares with research on chess playing, for example, that has found that 50 hours of training can bring performance levels of novices up to that of masters, but with limited strategies, such that the novices’ focus remains on salient patterns in the periphery compared to masters’ focus on central aspects critical for the selection of future moves, such that many more hours, if not years, of experience are required to reach expert level [37]. Therefore, while basic vehicle operational skills for riding can improve with repetitive practice, more tactical and strategic skills will require more complex teaching-learning approaches. The extension of the new M-GLS education and assessment curriculum to on-road environments allows for this greater complexity, yet therefore also requires that a level of competence at the basic operational skill level is achieved, and can be ascertained, before transitioning to the road.

4.3.2 Teaching Approach

Learning has been argued to be more effective when: contextualised in learners’ (in this case motorcyclists’) own life experiences; directly relevant and immediately applied; meeting intrinsic and extrinsic goals; wide scope is managed by reduced content or extended timeframes; roles and responsibilities are made explicit; assessment is self-directed and involves critical and reflective thinking; and when creating self-awareness of abilities and self-confidence in learning [38]; echoing lessons from the behaviour change literature.

One key distinction of teaching approaches that adapt to the needs of the learner is that between a pedagogical (externally directed) teaching approach, where the instructor maintains responsibility for the learning, and androgogical (internally directed) teaching approach, where the responsibility for learning transfers to the learner [39]. In adult learning theories, adults are viewed as internally-motivated and self-directed, bringing life experiences and knowledge to their learning experiences, as goal-oriented and relevancy-oriented, as well as practical in their learning. While some basic rider knowledge and skills are suited to a pedagogical approach, with a minimum permit age of 18 years in Victoria and the wide age spread of novice riders identified (section 3.1), the pre-learner curriculum also required an androgogical approach to achieve the full spectrum of learning proposed by the Goals for Rider Education framework.

Figure 2 presents a proposed continuum of teaching methods aimed at novice riders, which progresses from pedagogical to androgogical teaching styles. A transition from education programs based only on presentation, instruction and training approaches to those adopting a coaching approach is evident in the literature both for novice drivers [40, 41] and novice motorcyclists [42, 43]. In coaching approaches, rather than administering standardised, predetermined lessons, individualised feedback is given to riders such that they learn based on their own experiences, stimulating self-reflection and self-analysis; well-aligned with the Goals for Rider Education framework. The new M-GLS education and assessment curriculum was designed
to increasingly progress from traditional instruction and training at the basic vehicle control level
to coaching approaches at higher levels of the framework but also increasingly as transitioning
from the pre-learner to learner stages of the curriculum.

The major risk in the use of a coaching approach is in relation to the ability of the coach to
effectively use this learning strategy. Coaches need to be effective in their communication and
questioning techniques and use of these techniques is not natural to everyone and can result in
awkward and forced conversations that do not achieve the desired learning outcomes. Mitigation
of this risk requires effective development of coaching techniques and assessment, and
monitoring, to ensure coaches possess the requisite skills. Therefore it was important to focus on
this in the Trainer and Instructor Courses and to include support tools to facilitate more adult-
centred teaching (e.g. discussion cards and riding scenario diagrams to prompt facilitated
discussions and participant workbooks for candidates to record personal reflections).

Figure 2. Continuum of Teaching Methods

4.3.3 Structure of Activities

A series of education activities was developed suitable for delivery in small groups of up to five or
six novice riders for the pre-learner and learner stages. For the pre-learner stage, these included
in-classroom education and on-vehicle practical exercises, applying teaching methods across the
full spectrum of presentations to coaching. For both the pre-learner and learner Check Ride stage,
small group on-road rides were designed so that each participant would have a chance to lead a
stage immediately followed by the trainer, allowing individual coaching at stops in addition to
facilitated discussions with the wider group. For the individual pre-licence course, the focus was
on an individual practical off-road coaching session prior to an on-road assessment.

Activities were layered to address the increased expectations of TLIC3038A learning goals from
novice to experienced rider, and with attention to each of the hierarchical levels of the Goals for
Rider Education framework. The facilitated discussions particularly provided opportunity to address the higher levels directly. Each activity was structured in keeping with core adult learning principles of the general Australian Standard TAE40110 Certificate IV in Training & Assessment [26] and the more specific TLIM4003A Develop safe motorcycle riding behaviours [27], which can be summarised with the acronym MAPFORM:

- Active: engaging, connected, practical.
- Primacy and recency: first and last (points, activities) are most likely to be recalled and retained.
- Feedback: positive, immediate, one key point.
- Overlearning: practised beyond initial skill acquisition, change context not content, layered from simple to complex.
- Reinforcement: key words/phrases/sequences, in groups of three or five.
- Multi-sensory: seeing, hearing, touch combined.

Accordingly, each activity was designed to commence with a brief introduction, including a link to previous learning where applicable, then a more detailed explanation addressing three or five key points; both with attention to primacy and recency, such that the most important and immediately relevant points were made first and last. Next was a minimum of three practical demonstrations, with the exception of facilitated discussions for which demonstrations were replaced by scene setting. The first demonstration was a silent ‘normal’ demonstration (the “seeing”), the second a slow demonstration with verbal description (“seeing” and “hearing”), and the third the participants undertook together with the trainer also verbalising (multisensory: “seeing”, “hearing” and “touch” combined). This was followed by practice with a high number of repetitions (preferably until all participants demonstrated competency) and then feedback, or in the case of facilitated discussions, tasks were assigned and then discussions undertaken. An emphasis in feedback included helping learners self-identify their strengths and weaknesses and then coaching them on improvements where applicable. Each activity then ended with a recap or summary and a link to the next activity and/or “real-world” context.

The number, duration and sequence of activities were designed to allow for interspersing different delivery media and locations (e.g. balance of classroom and range, including for example some facilitated discussion on-range), with shorter and longer breaks (e.g. brief transition from classroom to range, longer meal breaks) to help maximise attention and minimise fatigue – both for the trainers and the course participants. Care was also taken to include attention to roadcraft and higher levels of the Goals for Rider Education framework throughout, rather than either at the beginning or the end of a course (which was apparent in several of the international models identified). A layering approach was taken, building complexity incrementally with each activity (e.g. progressing from an activity focusing only on riding in a straight line to the next activity riding curves first left/anticlockwise and then right/clockwise) or within an activity (e.g. first training the vehicle handling sequence required for a quick stop at a slower pace before coaching riders to increase travel speeds and reduce stopping distances).

4.3.4 Assessment Approaches

4.3.4.1 Learner and Licence Candidates

The assessments developed comprised a hybrid approach of testing and competency-based assessment. While a move away from individual testing towards competency-based assessments
has been recognised [e.g. 5], there was a need to balance this with the requirements of the Assignment Brief as well as the expectations of the Victorian rider training community. The vast majority of Victorian rider trainers had no previous experience delivering on-road rider training or assessment, particularly not with novices. Therefore, ensuring certainty of participants’ basic competency in off-road activities was important before requiring trainers to take a small group of novices out on the road.

The two-stage pre-learner assessment developed first required successful completion of an individual on-range vehicle-handling skills test, which particularly included a higher than current standard of quick stop braking and slow riding. This therefore met requirements of the lowest level of the Goals for Rider Education hierarchy and sought to reassure trainers of each participant’s competency at this level before taking them on-road to assess higher-level competencies. The second stage then comprised a group-based on-road coaching ride and competency-based assessment, with riders participating in single file and rotating position. This design ensured that each rider had a turn in the lead position with the trainer in second position in order to provide more targeted individual assessment and coaching. (Both the on-range and on-road assessments were undertaken later on the second day of the pre-learner course, and first required successful completion of a standard vision test and knowledge test on the first day, which were out-of-scope for revision within the current project.)

The second stage Check Ride was then designed as a purely coaching-focused, competency-based course, comprising on-range skills checks, including a slow ride and quick stop, before proceeding to a multi-stage on-road ride. The on-road ride was developed to be undertaken in at least five stages so that each could focus on one of the top five crash types. Each stage included road features relevant to the crash type (e.g. same direction crashes on single lane roads, sideswipe on multi-lane roads, loss-of-control crashes on roads with curves). Facilitated discussion was undertaken before each stage as well as after each stage, when individual coaching of the lead rider was also undertaken. While participants could not fail the course as it was not regarded as an assessment course per se, should a serious safety incident have occurred such that the trainer considered it unsafe for an individual to progress, a “not complete” could have been issued and the participant encouraged to undertake an individual lesson and/or (depending on the nature of the incident) more experience in low-risk riding environments before re-attending.

The final assessment to transition from a learner permit to licence was required to be undertaken individually on-road with pass/fail criteria. Therefore, it was designed to commence with competency-based on-range skills checks (the same as for Check Ride) and then proceed to an on-road ride in test conditions, but with a more competency-based scoring approach (a stricter version of the pre-learner competency-based assessment).

To minimise scoring requirements for trainers managing multiple riders, including on-road, assessment sheets were developed that required only recording errors for which coaching feedback was required, or specified errors that contributed to pass/fail outcomes. While a positive scoring approach was preferred, in which multiple demonstrations of riding competencies could be tallied, the implications for an individual trainer/assessor to do this from a motorcycle and for multiple candidates together within a short space of time was impractical. A single-page, grid-like scoring system was developed informed by the New Zealand competency-based assessment record sheets [44] and based on criteria that paralleled equivalent errors in the Victorian Drive Test for novice car drivers [45]. The Drive Test standards, which apply for a learner driver with a minimum of 120 hours of supervised practice driving transitioning to a driver licence, were modified primarily to constitute coaching feedback errors only for the MPA and Check Ride and
stricter pass/fail errors for the MLA. Only errors that risked immediate danger/collision of the rider, others on the course, or any other road user were included as automatic fail errors.

In terms of higher-order skills assessment, it was deemed not feasible to test the two highest levels of the Graduated Rider Education framework specifically, such as by self-report measures (given these are unlikely to be valid or reliable in this context [46]). Rather assessments allowed for scoring riders for any comments or demonstrations contrary to expectations of competency at these levels. In addition, the potential to develop multiple-choice items within the knowledge test to target some aspects of these levels more directly was acknowledged.

4.3.4.2 Trainers and Instructors

Assessment for trainer accreditation purposes was also primarily competency-based. Based on their qualifications and experience, trainers could be assumed to be competent in the teaching styles at the lower end of the continuum in Figure 2. Therefore, the focus was on higher-end facilitated discussion and coaching approaches. Trainers needed to demonstrate that they could deliver each of the different types of teaching activities involving these on at least one occasion during the MPA Trainer Course (i.e. they were not expected to grasp all course components immediately): an on-range education activity, a classroom-based facilitated discussion, an on-range assessment activity and an on-road assessment activity. Delivery according to that prescribed in the course materials was deemed a pass.

Further assessment involved observing each trainer’s first delivery to a group of permit or licence candidates, providing corrective feedback if necessary, and determining that a trainer not already competent was demonstrating effort and improvement to achieve the activity requirements.

For the MLA Trainer Course, additional assessment in regards to knowledge of the road rules and how to apply them appropriately for the MLA in comparison the MPA and Check Ride was the main focus. A series of example scenarios with multiple-choice assessment options (also drawn from those for Drive Test assessors) was developed, with several examples first used to teach and demonstrate the requirements, and additional examples used as a multiple-choice test requiring a high pass score. Satisfactory delivery of a mock on-road MLA with another course participant was also required, with final assessment also determined via observation of a first delivery during the MLA pilots with licence applicants.

4.4 M-GLS Curriculum Tasks and Assessment Requirements within the Goals for Rider Education Framework

Table 5 presents the resulting breakdown of tasks and assessment status for each stage of the M-GLS curriculum within the Goals for Rider Education framework, with assessment levels:

- **On opportunity**: tasks are not specifically included; however, if they happen to be observed and performance is deficient then they should be briefly discussed.
- **On deficiency**: these tasks are implicit within many other riding tasks and are to be observed, but only discussed if performance is deficient.
- **Briefly observed and discussed**: tasks that should have been reliably assessed during pre-learner education and assessment are quickly checked and underpinning rationale stated for reinforcement purposes.
- **Observed and discussed in detail**: these tasks are key aspects of the ride and should be monitored throughout the ride with adequate discussion to ensure performance problems are remedied.
### Table 5. Goals for Rider Education Tasks and M-GLS Staged Assessment Requirements

<table>
<thead>
<tr>
<th>Level</th>
<th>Goals for Rider Education Tasks</th>
<th>Motorcycle Permit Assessment: On-Range</th>
<th>Motorcycle Permit Assessment: On-Road</th>
<th>Check Ride</th>
<th>Motorcycle Licence Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic vehicle control (Operational level)</td>
<td>Perform vehicle pre-ride safety check</td>
<td>Not assessed</td>
<td>Not assessed</td>
<td>Briefly observed and discussed if own vehicle</td>
<td>Briefly observed and discussed if own vehicle</td>
</tr>
<tr>
<td></td>
<td>Mount/dismounting from side stand</td>
<td>Assessed</td>
<td>Feedback provided</td>
<td>Briefly observed and discussed</td>
<td>Assessed</td>
</tr>
<tr>
<td></td>
<td>Operate controls (location and use of without looking)</td>
<td>Assessed</td>
<td>Feedback provided</td>
<td>On deficiency</td>
<td>Assessed</td>
</tr>
<tr>
<td></td>
<td>Move an unpowered motorcycle</td>
<td>Assessed</td>
<td>Not assessed</td>
<td>On opportunity</td>
<td>Not assessed</td>
</tr>
<tr>
<td></td>
<td>Ride and stop an unpowered motorcycle (balance)</td>
<td>Competency-based observation</td>
<td>Not assessed</td>
<td>On opportunity</td>
<td>Not assessed</td>
</tr>
<tr>
<td></td>
<td>Riding posture</td>
<td>Competency-based observation</td>
<td>Feedback provided</td>
<td>Briefly observed and discussed</td>
<td>Feedback provided</td>
</tr>
<tr>
<td></td>
<td>Start/shutdown engine</td>
<td>Assessed</td>
<td>Feedback provided</td>
<td>On opportunity</td>
<td>Assessed</td>
</tr>
<tr>
<td></td>
<td>Move and stop (clutch, brake control)</td>
<td>Assessed</td>
<td>Feedback provided</td>
<td>Observed and discussed in detail</td>
<td>Assessed</td>
</tr>
<tr>
<td></td>
<td>Straight ride (clutch, accelerator and brake)</td>
<td>Assessed</td>
<td>Feedback provided</td>
<td>On deficiency</td>
<td>Assessed</td>
</tr>
<tr>
<td></td>
<td>Changing gears (excluding automatic transmissions)</td>
<td>Competency-based observation</td>
<td>Feedback provided</td>
<td>Briefly observed and discussed</td>
<td>Assessed</td>
</tr>
<tr>
<td></td>
<td>Slow riding, straight line and tight turn</td>
<td>Assessed</td>
<td>Feedback provided</td>
<td>Observed and discussed in detail</td>
<td>Assessed</td>
</tr>
<tr>
<td></td>
<td>Counter steering</td>
<td>Assessed</td>
<td>Feedback provided</td>
<td>On deficiency</td>
<td>Not directly assessed</td>
</tr>
<tr>
<td></td>
<td>Braking (and down changing if manual) for curve</td>
<td>Competency-based observation</td>
<td>Feedback provided</td>
<td>Observed and discussed in detail</td>
<td>Assessed</td>
</tr>
<tr>
<td></td>
<td>Ride curves</td>
<td>Assessed</td>
<td>Feedback provided</td>
<td>Observed and discussed in detail</td>
<td>Assessed</td>
</tr>
<tr>
<td></td>
<td>Firm braking to a complete stop</td>
<td>Assessed</td>
<td>On opportunity</td>
<td>On opportunity</td>
<td>On opportunity</td>
</tr>
<tr>
<td></td>
<td>Obstacle avoidance, not a quick swerve</td>
<td>Assessed</td>
<td>On opportunity</td>
<td>On opportunity</td>
<td>On opportunity</td>
</tr>
<tr>
<td></td>
<td>Change of path</td>
<td>Assessed</td>
<td>Not assessed</td>
<td>On opportunity</td>
<td>On opportunity</td>
</tr>
<tr>
<td>Level</td>
<td>Goals for Rider Education Tasks</td>
<td>Motorcycle Permit Assessment: On-Range</td>
<td>Motorcycle Permit Assessment: On-Road</td>
<td>Check Ride</td>
<td>Motorcycle Licence Assessment</td>
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<tr>
<td></td>
<td>Riding in the wet</td>
<td>On opportunity</td>
<td>On opportunity, feedback provided</td>
<td>On opportunity</td>
<td>On opportunity</td>
</tr>
<tr>
<td></td>
<td>Riding on loose/slippery surfaces</td>
<td>Not assessed</td>
<td>On opportunity, feedback provided</td>
<td>On opportunity</td>
<td>On opportunity</td>
</tr>
<tr>
<td></td>
<td>Riding over bumps and broken surfaces</td>
<td>Not assessed</td>
<td>On opportunity, feedback provided</td>
<td>On opportunity</td>
<td>On opportunity</td>
</tr>
<tr>
<td></td>
<td>Management of traffic situations (Tactical level)</td>
<td>Apply road rules</td>
<td>Not assessed</td>
<td>Feedback and assessment</td>
<td>On deficiency</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Use head checks and signals</td>
<td>Assessed</td>
<td>Feedback provided</td>
<td>Observed and discussed in detail</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Comply with legal road position</td>
<td>Not assessed</td>
<td>Feedback provided</td>
<td>Observed and discussed in detail</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ride in light to moderate traffic</td>
<td>Not assessed</td>
<td>Essential</td>
<td>Observed and discussed in detail</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Speed choice and management</td>
<td>Not assessed</td>
<td>Feedback provided</td>
<td>Observed and discussed in detail</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Observation and vision</td>
<td>Assessed</td>
<td>Feedback provided</td>
<td>Observed and discussed in detail</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Buffering</td>
<td>Not assessed</td>
<td>Feedback provided</td>
<td>Observed and discussed in detail</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Crash avoidance space (including 3 second following distance)</td>
<td>Not assessed</td>
<td>Feedback provided</td>
<td>Observed and discussed in detail</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hazard perception (observe/perceive/respond; unique/random vs constant)</td>
<td>Not assessed</td>
<td>Feedback provided</td>
<td>Observed and discussed in detail</td>
</tr>
<tr>
<td></td>
<td>Take account of trip-related contexts (Strategic level)</td>
<td>Apply low-risk riding strategies appropriate to a planned trip</td>
<td>Not assessed</td>
<td>Feedback provided</td>
<td>Observed and discussed in detail</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Forecast riding events relevant to safety</td>
<td>Not assessed</td>
<td>Feedback provided</td>
<td>Observed and discussed in detail</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Apply strategies for riding safely with a group</td>
<td>Not assessed</td>
<td>Feedback provided</td>
<td>Observed and discussed in detail</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Wear Personal Protective Equipment</td>
<td>Essential</td>
<td>Essential</td>
<td>Essential</td>
</tr>
</tbody>
</table>

TARS Research Report

UNSW
<table>
<thead>
<tr>
<th>Level</th>
<th>Goals for Rider Education</th>
<th>Motorcycle Permit Assessment: On-Range</th>
<th>Motorcycle Permit Assessment: On-Road</th>
<th>Check Ride</th>
<th>Motorcycle Licence Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Take account of personal characteristics, ambitions and competencies (General level)</td>
<td>Apply safe motorcycle riding behaviours</td>
<td>Competency-based observation</td>
<td>Feedback and assessment</td>
<td>Observed and discussed in detail</td>
<td>Assessed</td>
</tr>
<tr>
<td></td>
<td>Self-assess physiological and psychological fitness to ride</td>
<td>On observable deficiency</td>
<td>On observable deficiency</td>
<td>On observation and discussed in detail</td>
<td>On observable deficiency</td>
</tr>
</tbody>
</table>
5. PILOT STUDIES METHODOLOGIES

5.1 Overall Procedure

5.1.1 Motorcycle Permit Assessment (MPA) pilots

Materials for a two-day course comprising the pre-learner education curriculum and on-range and on-road learner permit assessment requirements (with time also permitted for the vision test and knowledge test) were developed into the Motorcycle Permit Assessment Course, as well as supporting MPA Trainer Course materials, and Instructor Course materials. Assessments for trainers were required to be developed for the Trainer Course, which ultimately required observing the candidate Trainers deliver the MPA Course. Likewise assessment for the Instructor Pilot ultimately required observing the candidate Instructors delivering a Trainer Course for other trainers. The development and piloting of these components were undertaken first, prior to the Check Ride and MLA Courses.

Stay Upright Rider Training (“Stay Upright”) provided the trainers and facilities for both the development phase and the pilot studies. Before conducting the pilots in Victoria, the on-range MPA course components were first run through with an expert Stay Upright trainer in New South Wales (where the Project Team was based), who had extensive experience training novice through to professional riders. This development phase was undertaken to check that the scope of the activities and criteria for assessments were appropriate for the range dimensions (marked out with chalk) and likely skill level of completely new riders (i.e. within VicRoads’ initial restriction to 40m range length and our stricter criteria for the MPA slow ride and quick stop activities than applied at that time in Victoria).

Following this development phase, the MPA Trainer Course pilot was undertaken with a first MPA Course pilot involving learner permit candidates immediately held on the following two days, with a scheduled gap before any additional pilots. This minimised deterioration of learning by Trainers before the first delivery and then allowed for refinements and reporting and approvals with VicRoads before continuing. Five additional learner candidate pilots were scheduled with the intention to pilot until “saturation” was reached, that is, until no new information or feedback was gained that suggested any further refinements were needed (which therefore could have required fewer or additional pilots). Once saturation was reached and all refinements to the MPA Course and Trainer Course made, the Instructor Course was piloted.

The main training location was at Stay Upright’s Hoppers Crossing location, which is where the Victorian Manager was based, and which met the criterion of a location within the Melbourne Zones 1 and 2 public transport system for the learner permit candidate pilots. All Trainer and Instructor Course pilots were held here. The Outer Regional Australia area location for additional candidate pilots was intended to be Stay Upright’s Horsham facility, although it was acknowledged from the outset that courses were more infrequent at this location. Therefore, the “back-up” location was their Ballarat training centre, which while classified as in Inner Regional Australia, is on the border of the Outer Regional Australia boundary and therefore services both regions. Ultimately, no pilots were possible at Horsham during the project timings, and therefore, only road route planning was undertaken at this location to demonstrate how the curriculum could be applied in Outer Regional Australia locations.
The on-range components were designed initially based on a 40m x 20m range size. This length was tight and placed some limitations on the travel speeds that could be achieved. After a closer review of Victorian range sizes undertaken part way through the MPA pilots, this was able to be increased to 42m. The intentional narrower width allowed a trainer to move readily from side to side of the range and facilitated activities that incorporated different manoeuvres on each side. Initial pilots were conducted on ranges marked out by chalk. When saturation had been reached near the end of the MPA candidate pilots, suggesting no further changes would be required to the main range markings, the two main pilot sites at Hoppers Crossing and Ballarat were then painted and available for the remaining Instructor Course pilot and then the Check Ride and MLA pilots.

The final range markings are illustrated in Figure 3. While representing a full circuit, lines are only marked in the curves on one side so as not to overload riders when first learning to think through their positioning through curves. The main outer lines of the straight sections along the length of the range are marked on the outside, as well as the inside on the side where multiple lanes are included in some activities. The yellow lines are used only in some activities, including parallel lines for a change of path activity, a merge lane, a box for a “stop in the box” activity, and a line across the multi-lane area as a change point in several activities, including indicating where to start braking in the quick stop activity. The small crosses and dots mark places at which other markers (cones, half tennis balls) can be used to mark out multiple lanes or obstacles.

5.1.2 Check Ride and Motorcycle Licence Assessment Pilots

The half-day Check Ride Course was developed with a structure that could allow two such courses to be implemented in one day and also side-by-side with the MPA Course days for locations with two classrooms but one range to share between the courses. Supporting materials for a one-day Check Ride Trainer Course material were also drafted.

The materials first developed for the MLA Course aimed for a one-hour course with single licence applicants and a one-day MLA Trainer Course. The on-road routes for the MLA were also designed to include all the key road features identified for the Check Ride and all competencies as summarised in Tables 4 and 5.

The MPA courses were the longest and most intensive courses. Completion of these first informed the recap and skills checks needs for the initial activities of the Check Ride and MLA courses, and allowed for staged deployment preparation for VicRoads. The comprehensiveness of the MPA Instructor Course and the similar approach and structure of activities in the MPA, Check Ride and MLA courses negated the need for additional Instructor courses for the Check Ride or MLA stage. Otherwise, the procedure reported for the MPA pilots was repeated for these two stages in combination: Check Ride Trainer Course and MLA Trainer Course back-to-back, followed immediately by a combined Check Ride and Trainer Course with licence candidates, with a break before additional courses were scheduled with the intent to reach saturation.
Figure 3. Range Markings 42m x 20m
These pilots were undertaken in combination primarily due to the recruitment strategy for participants and also time efficiency. The timing of the various contracts and requirements for the overall M-GLS project meant that it was not possible to trial the Check Ride program with riders who had completed the MPA Course pilots. Even though Check Ride was designed to be undertaken soon after acquiring a learner permit, it was not considered feasible to pilot the program with recent learners under the current Victorian licensing system. It was considered more appropriate to conduct a pilot with riders later in the learner phase who were more likely to have had sufficient riding experience to be able to undertake the on-road Check Ride safely. For the MLA pilots it was appropriate to recruit riders ready to undertake the current licence test, which could only be undertaken after a minimum of three months (maximum 15 months) on the learner permit. Therefore, it was proposed and approved to recruit current licence test applicants for combined pilots of the Check Ride and MLA courses.

As Stay Upright was currently delivering a 6.5 hour one-day licence course, the combined pilot course was designed to be completed within 6.5 hours. Participants completed the full Check Ride program in the morning, with the exclusion of the final Course Close activity. In the afternoon, participants who successfully completed the Check Ride then undertook the MLA on the same assessment route sequentially, with a brief time delay between participants so as not to overlap, with two Trainers in three waves. Following this, the final group post-ride brief and Course Close were completed.

This resulted in two key points of difference compared to how the MLA was designed to be delivered. First, activities prior to the on-road MLA were the same as for the Check Ride Course but undertaken individually, not as a group. These were excluded from the pilots as it was redundant to re-check the skills already assessed earlier that day. Likewise, the debrief and course close sessions were to be undertaken individually in the MLA Course, but were undertaken as a group in the combined Check Ride and Licence Course. Therefore, these activities remained “untested” in terms of timing and being undertaken individually in the stand-alone MLA Course.

Second, given the need to stagger the MLA, candidates had to wait before and/or after their MLA ride while the other candidates were being assessed, with each assessment requiring approximately 40 minutes. Those who completed the MLA first and last had the longest delays (essentially 2 x 40 minutes). This time was filled primarily by conducting the project research focus groups in addition to an afternoon tea break. In the pre-MLA time periods these focused on the Check Ride program and in the post-MLA time periods the focus was the MLA. Additionally, participants were offered to have personal one-on-one training on the range if they would like to focus on any particular skill or have some general coaching. This was to meet any personal or ethical concerns that the course was providing less training than they might have anticipated in the standard Stay Upright 6.5-hour course.

The research protocol was approved by the UNSW Human Research Ethics Committee (HREC), with project reference no. HREC HC14341.

5.2 Participant Recruitment

5.2.1 Rider Trainers

Stay Upright’s Victorian manager emailed all eligible trainers about the project and Stay Upright’s role and sought volunteers to participate. For the MPA pilots, experienced trainers who responded and were frequently available over the study period were invited to attend the first Trainer Course
and others responding were invited to be candidate Trainers for the Instructor Pilot. The email invitation was repeated for the combined Check Ride and MLA pilots. As the timing of this was close to the intended deployment dates for the new M-GLS, all available trainers were invited to attend the Trainer Course and the first pilot with licence applicants that immediately followed it.

On attendance at each Trainer and/or Instructor Course, trainers were provided with the HREC-approved Participant Information Statement and Consent Form. Following a verbal summary and question and answers, they signed the consent form and received a copy to retain.

5.2.2 **Motorcycle Learner Permit and Licence Candidates**

Learner permit and licence candidate participants were informed that alternative courses were available for a “study for VicRoads” when contacting Stay Upright to complete their standard courses during the study period. Requests for course participation could be via registration on the Stay Upright website, or by emails or phone calls to Stay Upright administration. All points of contact informed participants that the alternative courses included on-road as well as range-based training and assessment, could run up to an hour longer than the usual courses, would require their feedback to researchers, that a $50 discount on the standard course fees would apply, and then directed interested participants to the HREC-approved study announcement. Those interested could then register for the course directly online, via email or confirm via phone to Stay Upright administration.

The additional hour allowed for the longer contact time of the new courses and the need to include time for research feedback. In addition, any candidate failing the pilot assessment requirements was given the option to attempt the applicable current Victorian range test.

Each pilot course then began by providing participants with the HREC-approved Participant Information Statement and Consent Form. Following a verbal summary and question and answers, they signed the consent form and received a copy to retain.

5.3 **Measures**

The research approach was primarily qualitative, based on interviews and small group discussions (focus groups) throughout, so that rich feedback could be provided by rider participants and trainers, in addition to observations of all course deliveries. Quantitative surveys were included to establish demographics and baseline characteristics (e.g. riding experience and instructor experience), so that the range of participants involved in the piloting could be determined. Table 6 summarises the measures for each of the trainer and candidate pilots.

Questionnaire item are reported on in the results sections. For observations, at least one research team member was present throughout each course and recorded all questions, clarifications or recommended changes voiced by any of the participants. The end of course interviews or focus groups with Stay Upright participants focused on the general questions listed below.

**Trainer and Instructor Courses:**

- What are your impressions of the Course training content?
- What are your impressions of the Course training manual and other support materials?
- What are your impressions of the Course training delivery?
- How ready do you think you are to deliver the Course?
- Do you have any other risk or safety considerations to raise?
- Do you have any other questions or recommendations?
Table 6. Summary of Research Measures Applied During Project Phases

<table>
<thead>
<tr>
<th>PROJECT PILOT STUDIES</th>
<th>RESEARCH PARTICIPANTS</th>
<th>MEASURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trainer Course Pilots</td>
<td>• Candidate Trainers</td>
<td>• Questionnaire, Observation during course, Focus group end of course</td>
</tr>
<tr>
<td></td>
<td>• Candidate Instructors</td>
<td>• Observation, Focus group end of course</td>
</tr>
<tr>
<td>Permit/Licence Candidates Pilots</td>
<td>• Trainers</td>
<td>• Observation, Interview end of course</td>
</tr>
<tr>
<td></td>
<td>• Permit/licence Candidates</td>
<td>• Questionnaire, Observation during course, Focus group end of course</td>
</tr>
<tr>
<td>Instructor Course Pilot</td>
<td>• Candidate Instructors</td>
<td>• Observation, Focus group end of course</td>
</tr>
<tr>
<td></td>
<td>• Instructors</td>
<td>• Observation, Focus group end of course</td>
</tr>
<tr>
<td></td>
<td>• Candidate Trainers</td>
<td>• Questionnaire, Observation</td>
</tr>
</tbody>
</table>

Delivery of MPA or Check Ride and MLA courses:
- How well do you believe you delivered Course as intended?
- How well do you believe the candidates participated and responded to the Course as intended?
- Can you identify any factors you think might have adversely affected the conduct and outcome of the pilot (e.g. weather)?
- Can you identify any potential or observed risks associated with delivery or participating in the Course?
- Do you have any other risk or safety considerations to raise?
- Do you have any other questions or recommendations?

Similar questions were included in the focus groups with the permit or licence candidates:
- What are your impressions of the Course content?
- What are your impressions of the Course support materials?
- What are your impressions of how the Course was delivered?
- How ready do you feel now to ride on your own?
- How would you rate your riding ability as a new learner/licensed motorcyclist?
- Do you have any other risk or safety considerations to raise?
- Do you have any other questions or recommendations?

All feedback was reviewed and discussed with project team members and Stay Upright management, if applicable, to determine if and what refinements were needed. Any refinements were subject to piloting within the saturation model.

Key indicators of success were the points when Stay Upright participants believed they were adequately prepared to deliver the curriculum by the end of training, or after having any questions answered by the research team, that the candidates participated as intended, and that no serious safety concerns or other such issues were raised. In contrast, the question for permit/licence candidates about their riding ability was included to monitor the potential for miscalibration rather than expecting that they should feel completely competent for riding in any circumstances.
It was important for the candidates to express belief that the content and delivery of the courses were appropriate and they have no serious safety or other concerns.

Stakeholder feedback on the courses was received in several ways. First written reports at interim stages were provided to VicRoads. VicRoads provided any feedback on these from the Technical Reference Group, Project Advisory Group and Motorcycle Advisory Group. In addition, all rider training providers were invited to a series of joint meetings with VicRoads and Project Team members in 2015 (February 20, July 13 and November 17). The first two meetings were held at the VicRoads Kew office and included PowerPoint presentations and discussions led by VicRoads and the Project Team. The final meeting was held at the Stay Upright Hoppers Crossing range so that participants could also view the painted range and demonstrations of some of the on-range education and assessment activities. Manual components for the MPA were provided prior to the meeting and progress on the Check Ride and MLA was discussed.
6. MOTORCYCLE PERMIT ASSESSMENT

6.1 MPA Trainer Course Pilot

The MPA Trainer Course pilot was conducted in March 2015 at Hoppers Crossing with the range marked with a 40m x 20m circuit.

6.1.1 Participants

In total, 5 trainers took part: 4 male, 1 female; age range 40 to 59 years (average 52.8 years). Four were from Victoria (local, Melbourne suburbs or Ballarat area) and one from Queensland (national training manager). Their years of experience as a motorcycle instructor ranged from 2 to 31 years (average 14.6 years). Three were full-time trainers, 1 part-time and 1 casual; all with no additional employment. All also held a full/open/unrestricted driver licence and had been driving for an average of 34.2 years (range 22 to 42 years).

The trainers had held a full/open/unrestricted motorcycle licence for between 18 to 40 years (average 29.2 years). On average they rode for 6.5 hours per week (range 2 to 12 hours). One reported mostly riding a naked bike whereas 4 nominated a sports bike (with one also additionally nominating an adventure bike and trail/off-road bike). Table 7 summarises averaged responses to the question on their main reasons for riding, scored on a 5-point response scale, where 1 = Never, 2 = Rarely, 3 = Sometimes, 4 = Often and 5 = Very often.

<table>
<thead>
<tr>
<th>How frequently does your riding involve the following?</th>
<th>Mean score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commuting to work or study</td>
<td>3.4</td>
</tr>
<tr>
<td>Riding as a main means of transport</td>
<td>3.2</td>
</tr>
<tr>
<td>Riding for work as part of my job</td>
<td>4.2*</td>
</tr>
<tr>
<td>Recreation (on-road riding)</td>
<td>3.8</td>
</tr>
<tr>
<td>Recreation (off-road/trail riding)</td>
<td>2.6</td>
</tr>
<tr>
<td>Riding around the local area e.g. to the shops or beach</td>
<td>3.4</td>
</tr>
</tbody>
</table>

* removing the response of the national training manager increased this to 5.0 (i.e. all others rated this as ‘5’)

6.1.2 Results and Discussion

It became clear during course delivery that insufficient time had been allowed for question-and-answer time for the candidate Trainers, particularly when there were differences in how some activities were to be delivered compared to those already included in Stay Upright course, and typical approaches within the industry in Victoria. This provided important feedback of where more explanation time was needed, as well as detailed justifications and explanations of inclusions in the course materials to increase the acceptability and the standardisation of activities by Victorian trainers during rollout of the new M-GLS. Terminology modifications were made at this point, but no substantive changes in the activities.

During the focus group, all trainers were positive about the proposed MPA Course. An overall impression was that the activities were not “all that different” to current practice but more structured. The increased amount of riding compared to their current 12-hour course was particularly noted and valued. Nonetheless, concerns regarding fatigue were also raised. To some
extent this was countered by the longer days than intended that eventuated for this first pilot. However, it also became apparent that many trainers travel long distances to and from work, such that, allowing for the additional time required for setting up in the mornings and closing up in the evenings, an eight-hour training day was simply too long.

For the first pilot, the trainers also noted that they did not believe they have a “completely clear picture” of the Course overall given the stopping and starting and changes in timings compared to the original agenda. Therefore, to some extent final judgment was reserved until the participant pilots. Nonetheless, when asked, no particular safety risks or concerns (other than fatigue) were raised and some indicated that they would be happy to proceed to the pilots with shadowing/support by the Project Team.

Overall, the Trainer Course was successfully delivered but not optimally. Following this pilot, discussion with VicRoads also led to a contract variation to include a Pass/Fail assessment within the course. This was developed at this time for piloting during the Instructor Course pilot. In the interim, as all trainers proceeding to the learner candidate pilots would be accompanied by a research team member, assessment was conducted during this first delivery. A pass result required the trainer to demonstrate delivery of at least one on-range riding activity, one classroom-based facilitated discussion, one on-range assessment and one on-road assessment. This stage led to the MPA Trainer Course increasing to four days.

### 6.2 MPA Learner Candidate Course Pilots

The final schedule of pilots, number of participants and range dimensions are summarised in Table 8.

#### Table 8. Details of Pre-Learner Curriculum Pilots

<table>
<thead>
<tr>
<th>Date</th>
<th>Location</th>
<th>Range Size</th>
<th>Delivered by</th>
<th>Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>March 26-27, 2015</td>
<td>Hoppers Crossing</td>
<td>40m x 20m</td>
<td>Trainer 1 and Project Team</td>
<td>3 learner candidates</td>
</tr>
<tr>
<td>March 30-31, 2015</td>
<td>Hoppers Crossing</td>
<td>40m x 20m</td>
<td>Trainer 1</td>
<td>2 learner candidates</td>
</tr>
<tr>
<td>April 9-10, 2015</td>
<td>Hoppers Crossing</td>
<td>40m x 20m</td>
<td>Trainer 1 shadowed by Trainer 2</td>
<td>5 learner candidates</td>
</tr>
<tr>
<td>April 18-19, 2015</td>
<td>Hoppers Crossing</td>
<td>40m x 20m</td>
<td>Trainer 1 shadowed by Trainer 3</td>
<td>5 learner candidates</td>
</tr>
<tr>
<td>April 23-24, 2015</td>
<td>Hoppers Crossing</td>
<td>42m x 20m</td>
<td>Trainer 4</td>
<td>2 learner candidates</td>
</tr>
<tr>
<td>May 4-5, 2015</td>
<td>Ballarat</td>
<td>42m x 20m</td>
<td>Trainer 2</td>
<td>3 learner candidates</td>
</tr>
</tbody>
</table>

* Following the first-step pilots with 2-3 participants, it was considered important to go on to pilot the Curriculum with the 5 participant maximum on Day 1 and 6 on Day 2 to test the activities within the limits of the range size restrictions. Therefore, the additional Trainer also rode the on-range activities when appropriate.

** These were members of the VicRoads compliance team.
6.2.1 Participants

In total, 20 learner candidate participants, one returning rider and two experienced riders took part in the pilots, totalling 23 candidate participants, as well as four Trainers. For privacy, the details of the returning rider are included with those of the learner candidates; noting that this person had ridden on-and-off for about eight years but not for many years prior to participating in the pilot.

Of the 21 learner plus returning rider participants, 15 were male and 6 female, with an age range of 18 to 46 years (average 29.0 years). Only 5 were local to the Hoppers Crossing area and 1 to the Ballarat area for the respective courses. Table 9 summarises the residential areas of the participants and the associated classifications. It is noteworthy that some participants at Hoppers Crossing lived closer to the Ballarat venue and several lived in or near Geelong where another training venue operated by the same provider was located. This suggests participants were willing to travel to secure their preferred course dates or potentially to be involved in the pilots.

Table 9. Residential Postcodes and Classifications of Learner Candidate Participants

<table>
<thead>
<tr>
<th>Training location</th>
<th>Residential Postcode Classification</th>
<th>Number Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hoppers Crossing</td>
<td>Major cities – local</td>
<td>5</td>
</tr>
<tr>
<td>Hoppers Crossing</td>
<td>Major cities – Melbourne area</td>
<td>4</td>
</tr>
<tr>
<td>Hoppers Crossing</td>
<td>Major cities – Geelong area</td>
<td>1</td>
</tr>
<tr>
<td>Hoppers Crossing</td>
<td>Inner Regional – outer Geelong area</td>
<td>6</td>
</tr>
<tr>
<td>Hoppers Crossing</td>
<td>Inner Regional – Ballarat area</td>
<td>2</td>
</tr>
<tr>
<td>Ballarat</td>
<td>Inner Regional – local to Ballarat area</td>
<td>1</td>
</tr>
<tr>
<td>Ballarat</td>
<td>Inner Regional – outer Ballarat area</td>
<td>1</td>
</tr>
<tr>
<td>Ballarat</td>
<td>Major cities – Melbourne area</td>
<td>1</td>
</tr>
</tbody>
</table>

Additional survey details were available for 20 participants. Half (n=10) were in full-time employment and 2 were full-time students. Five were employed part-time, 2 were unemployed and 1 was not in the workforce (not looking for work). Previous experience riding was reported by number of trips off-road and on-road separately, with responses summarised in Table 10. While half reported no off-road experience and half no on-road experience, only 5 reported no experience in either condition.

Previous driving experience was indicated by two questions: first regarding licence type and second regarding years driving experience. The results for licence type are summarised in Table 11. Two-thirds of participants held a full/open/unrestricted driver licence. The remainder held Learner or Provisional driver licences, with the exception of one participant who had never been licensed. The average years of driving experience was 11.6 years, ranging from to 0 to 28 years.

Table 12 summarises responses to the question, "What type of motorcycle/scooter do you plan to ride most frequently (on-road)? Almost half report naked or sports bikes. Only one person nominated a scooter and also chose to participate in the Curriculum with a scooter.
Table 10. Previous Riding Experience of Learner Candidate Participants

<table>
<thead>
<tr>
<th>Number of Trips</th>
<th>Off-road Number Participants</th>
<th>On-road Number Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>10</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>15</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>20</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>50</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>100+</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

Table 11. Driving Experience – Learner Candidate Participants

<table>
<thead>
<tr>
<th>Do you have a licence to drive a car?</th>
<th>Number Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>1</td>
</tr>
<tr>
<td>Yes, I have a Learner licence</td>
<td>2</td>
</tr>
<tr>
<td>Yes, I have a Provisional 1 (Red)</td>
<td>3</td>
</tr>
<tr>
<td>Yes, I have a Provisional 2 (Green)</td>
<td>1</td>
</tr>
<tr>
<td>Yes, I have an unrestricted licence</td>
<td>13</td>
</tr>
</tbody>
</table>

Table 12. Intended Motorcycle / Scooter Type – Learner Candidate Participants

<table>
<thead>
<tr>
<th>Type</th>
<th>Number Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adventure</td>
<td>2</td>
</tr>
<tr>
<td>Trail/Off-road</td>
<td>1</td>
</tr>
<tr>
<td>Cruiser</td>
<td>3</td>
</tr>
<tr>
<td>Naked</td>
<td>5</td>
</tr>
<tr>
<td>Scooter</td>
<td>1</td>
</tr>
<tr>
<td>Sports</td>
<td>4</td>
</tr>
<tr>
<td>Touring</td>
<td>1</td>
</tr>
<tr>
<td>Don’t know</td>
<td>3</td>
</tr>
</tbody>
</table>

Two additional questions focused on reasons why participants might be applying for a motorcycle licence. Responses to the first question on the importance of different reasons for riding are summarised in Table 13, for which responses were rated on a 5-point scale, where 1 = Very important, 2 = Important, 3 = Neither important or unimportant, 4 = Unimportant and 5 = Very unimportant. The most important reason (lowest score) was for personal reasons, followed by social reasons, then transport and finally work reasons. One participant also rated “Other (please specify)” as very important with the reason being to save money.

Responses to the second question on intended reasons for riding are summarised in Table 14. As per a similar question asked of Trainers, responses were rated on a 5-point response scale, where 1 = Never, 2 = Rarely, 3 = Sometimes, 4 = Often and 5 = Very often. Recreational on-road riding was the leading reason (highest score), closely followed by riding in the local area and commuting. Riding for work purposes and recreational off-road riding were the lowest rated.
Table 13. Importance of Reasons for Riding - Learner Candidate Participants

<table>
<thead>
<tr>
<th>How important to you are each of the following reasons for riding?</th>
<th>Mean score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transport related reasons (e.g. convenient, cheaper transport, parking, etc)</td>
<td>2.7</td>
</tr>
<tr>
<td>Work related reasons (e.g. riding is a part of my job, to get a job, etc)</td>
<td>3.6</td>
</tr>
<tr>
<td>Social reasons (e.g. I have friends who ride, I like the social side, etc)</td>
<td>2.5</td>
</tr>
<tr>
<td>Personal reasons (e.g. I enjoy riding, I like the feeling of freedom, etc)</td>
<td>1.9</td>
</tr>
</tbody>
</table>

Table 14. Intended Reasons for Riding – Learner Candidate Participants

<table>
<thead>
<tr>
<th>How frequently do you think your riding will involve the following?</th>
<th>Mean score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commuting to work or study</td>
<td>3.4</td>
</tr>
<tr>
<td>Riding as a main means of transport</td>
<td>2.7</td>
</tr>
<tr>
<td>Riding for work as part of my job</td>
<td>2.1</td>
</tr>
<tr>
<td>Recreation (on-road riding)</td>
<td>3.7</td>
</tr>
<tr>
<td>Recreation (off-road/trail riding)</td>
<td>2.2</td>
</tr>
<tr>
<td>Riding around the local area e.g. to the shops or beach</td>
<td>3.5</td>
</tr>
</tbody>
</table>

6.2.2 Results and Discussion

Saturation was generally achieved in six pilots, although this might have in part be due to the lack of painted line markings, which required many clarifications (the working drafts of the trainer manuals necessarily needed to refer to the temporary markings, which were not always sufficiently clear, especially when the chalk markings were compromised by rain). Timings of activities were adjusted to meet actual needs, and it was determined that some reordering of activities was needed to improve flow and to divide the activities in a suitable way across the two days of the course. The need to truncate the course days to 7.5 hours of contact time for candidates was also apparent at this time, not only to manage the fatigue of the candidates but also the trainers. A change of direction around the circuit was also made to better identify vehicle control use by candidates.

Of the 18 learner candidates, the following results transpired for the MPA:

- 12 (66.7%) passed the range test component (in keeping with expectations based on the current range test in Victoria).
- Of these 12, all (100%) passed the on-road assessment.
- One novice who attended Day 1 did not attend Day 2 and therefore did not attempt the MPA and another who failed the knowledge test on Day 1 chose not to undertake the MPA range component on Day 2 (and was ineligible to progress to the road).
- Of the remaining four who failed the range test, three chose to attempt the current VicRoads Motorcycle Learner Permit Skill Assessment; of these two passed and one failed (all four were not eligible to undertake the on-road assessment).
- Of the four who failed the pilot range test, two were due to inability to pass the quick stop activity and two accumulated more than three errors (the maximum to pass).

Other outcomes that increased confidence in the value of the MPA Course included:

- Some participants who the trainers judged (based on expert experience) at the start of Day 1 as unlikely to pass the range test, did in fact pass. This included one participant who had never driven a car or ridden a bicycle. This demonstrated the skill-building capacity of the course.
• The MPA was conducted in a range of weather conditions, ranging from hot and sunny in the early pilots to extreme wind and hail in later pilots.

• One candidate who failed the MPA range component but passed the current Victorian range test had failed due to inability to meet the quick stop competency criteria – and received considerable debriefing that this was the reason. This person then passed the current range test but required the full 7m for the braking task, which the trainers suggested was extremely rare. This confirmed the intended higher than current standard of braking required for the MPA.

• A diverse range of “unexpected variables” were encountered during the first pilots of the on-road assessments, but despite these, no adverse consequences were noted (i.e. no participant panicked and no ride was abandoned). This included:
  o Unexpected extreme high winds when first reaching 80km/h commuter road.
  o Unexpected road surface hazard (greasy take-away food remains) when turning the first corner of the individual assessment ride on quiet residential road.
  o Children squirting water pistols at riders in quiet residential street (during an individual assessment in a school holiday period).
  o Minor crash of a vehicle not involved in the pilots at location of first intended stop in quiet residential road area.
  o Road/security incident with Police disallowing traffic on intended commute route to intended individual assessment area; requiring individual assessments in an alternative residential area.

• Instructors and Trainers reported acceptability of, and confidence in, the MPA and believed it was discriminating as intended among candidates who should and should not pass.

Other conclusions were as follows:

• The first activity in the range component of the MPA “Walk and Park the Motorcycle” was deemed particularly important in Victoria given motorcycles are allowed to be parked on footpaths (the only jurisdiction allowing this in Australia). It also was included as a gatekeeper for the potential need to perform this activity during the on-road assessment. However, this skill is already checked off as a competency in the training activities and without any objective evidence as to the relative importance of including this activity in test conditions, it was noted that this should be monitored and might be removed in future to reduce the overall testing time and particularly the wait for the last candidate to be tested.

• The on-road assessment pilots originally sought to determine a threshold for the maximum number of safety errors that would be considered acceptable before a fail would be recorded. It became clear during piloting that setting such a threshold was not appropriate for first-time riders, when nerves and anxiety can play a role. This included missing an occasional indicator cancellation or head/mirror check, slow speed adjustment or less than optimal road positioning. Further, such errors are often witnessed among experienced riders and therefore holding a new rider to high standards was not appropriate. Rather wording in the course materials was changed to emphasise feedback and coaching on such errors, and only errors that posed an immediate risk to the candidates, other participants or other road users led to a fail result.

The qualitative feedback from both learner candidates and trainers was overwhelmingly positive, albeit it was recognised that the learner candidates did not have a genuine perception of how the course differed to current practice. Nonetheless, their comments reflected that they were aware
of the gradual layering approach applied in the course and identified it as a strength. When prompted, they did not identify any risks or safety concerns, although some commented that the chalk lines on the range were difficult to see at times. This was encouraging given it was the first time for many riding on the road.

Trainers reported that the course was “a breath of fresh air” (“Love it!”) and believed it would be a valuable upgrade for Victoria. Several reported that it was “more fun” both for the participants and themselves as trainers. Some particularly commented on the value of the layering approach to skills development (“I liked how it slowly advanced, building layer on layer”).

The increased amount on on-bike riding time was particularly considered to be an important improvement. It was noted that the first day alone led to greater mileage recorded on the motorcycle odometers than Stay Upright’s current 12-hour course.

The trainer who participated both on the 40m x 20m range and 42m x 20m range specifically mentioned noticing a difference such that improved “smoothness” of the activities was experienced on the larger range. Also particularly importantly (and unprompted), this trainer noticed that he had become much more aware of his own position on the range and not only that of participants. This related not only to managing participants in different areas of the range but more awareness of potential work health safety issues for himself.

Some trainers particularly commented that their involvement in the pilot was a professional development opportunity that is rare in the industry and was greatly valued. This included learning from each other as well as the Project Team. The following personal critique particularly captured this:

There is quite a lot to “unlearn”... I have some bad habits that I need to address as an Instructor, but [the research team] was great, taking over where needed to, and giving me some much overdue feedback on my performance. It was enlightening and invaluable.

6.2.3 Conclusions

The pilots led to important clarifications and revisions to the course manual and supporting materials. The majority of wording changes were to better guide trainers, whereas changes to overall structure and timings were guided by learner candidate performance and addressed issues for both trainers and learners.

6.3 Instructor Course Pilots

The pilot two-day Instructor Course was conducted on 28-29 May 2015 in Hoppers Crossing with three previously trained (Stage 5) Trainers who had delivered Pre-Learner Courses (Stage 6). These Candidate Instructors then delivered the four-day Trainer Course activities, primarily in pairs, on 1-4 June 2015, also at Hoppers Crossing, with four Candidate Trainers who had limited exposure to and had not personally delivered the Pre-Learner Course.

6.3.1 Participants

Three candidate Instructors completed the two-day Instructor Course and delivered the Trainer Course with additional Stay Upright trainers. All were male and aged between 40 to 59 years (average 56.7 years). Their years of experience as a motorcycle instructor ranged from 2 to 31 years (average 14.0 years). All were full-time employed in the industry. All held a
full/open/unrestricted motorcycle licence (18 to 40 years, average 32 years) and driver licence (22 to 42 years, average 34 years). On average they rode for 8 hours per week (range 2 to 12 hours).

Three candidate Trainers completed the Trainer Course delivered by the new Instructors and an additional participant partially completed the course. The four candidate Trainers were males aged between 54 to 58 years (average 57.0 years). Their years of experience as a motorcycle instructor ranged from 11 to 20 years (average 16.3 years). The three participants who completed all components were one full-time trainer and two casual trainers (one with additional casual employment and one no additional employment). All held a full/open/unrestricted motorcycle licence (31 to 40 years, average 35 years) and driver licence (35 to 40 years, average 38 years). On average they rode for 10.3 hours per week (range 1 to 20 hours). Table 15 summarises averaged responses to the question on their main reasons for riding, scored on a 5-point response scale, where 1 = Never, 2 = Rarely, 3 = Sometimes, 4 = Often and 5 = Very often.

Table 15. Reasons for riding – Candidate Trainers (n=4)

<table>
<thead>
<tr>
<th>How frequently does your riding involve the following?</th>
<th>Mean score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commuting to work or study</td>
<td>3.8</td>
</tr>
<tr>
<td>Riding as a main means of transport</td>
<td>4.3</td>
</tr>
<tr>
<td>Riding for work as part of my job</td>
<td>4.8</td>
</tr>
<tr>
<td>Recreation (on-road riding)</td>
<td>4.3</td>
</tr>
<tr>
<td>Recreation (off-road/trail riding)</td>
<td>3.5</td>
</tr>
<tr>
<td>Riding around the local area e.g. to the shops or beach</td>
<td>3.3</td>
</tr>
</tbody>
</table>

6.3.2 Results

The two-day Instructor and four-day Trainer Courses were successfully piloted with all participants engaging in the content until all had achieved a pass for satisfactory performance. Each provided appropriate reflections on their involvement and personal goal setting. The pilot allowed appropriate time allocations to be revised and other minor revisions, including indicating where additional information on justifications and clarifications for trainers were needed in the course materials, including general work health safety concerns (e.g. when and where to stand and move around the range safely).

6.3.2.1 Feedback from Trainers During Course

Observations identified that candidate Trainers offered much positive feedback regarding the Trainer Course and its delivery by the newly-trained Instructors. The shift between being a “presenter” and “instructor” versus “coach” and “facilitator” (learner-focused teaching methods) was a common theme in their feedback:

*[It’s a] new way of thinking about how I go about [things] not just speaking. Being a facilitator and coach, not just do it. That it’s not fixed in one or the other, you can move back and forth. [There are] things to work on – like any new curriculum, there are set key words and need to remember them. Just something I have to work on.*

*That continuum was something... I understood that I knew that but had never been pointed out to me in that way and now it’s made me more conscious of it. I have to work on being more of a facilitator and less of an instructor.*

Other specific comments expressed that they valued the tools provided in the course materials and the reference card that summarised the activities and timings. For the latter they suggested
also including the gear/s that could be used for each range activity, which subsequently were added. They also reported a readiness and enthusiasm to deliver the course:

More generally, some mixed views were expressed about the individual range assessment. One of the trainers in particular believed that the competencies assessed could already be determined during the group riding activities and therefore the learner candidates should not be subject to the test conditions of the range assessment. This trainer had many years of experience and had witnessed many occasions when a rider who had shown competency in group activities had failed an individual test due to nerves. He also expressed concerns of inequity of testing order for this component, such as for the last person tested having to wait for the others to finish. Moreover he had also witnessed many occasions when riders who had not shown competency “fluked” the test. In contrast, a lesser experienced trainer expressed that having the individual test was important for him to feel confident to taking all those who passed on the road. He believed that having an individual assessment sheet completed as evidence that an individual had been assessed was important to him should an incident occur on the road that might suggest otherwise.

6.3.2.2 Focus Group Feedback: Instructors

General feedback from the Instructors was extremely positive about the Instructor Course:

Like the structure, how it was delivered. Like how roadcraft [delivered]... Did stuff [like this] before but just takes it to the next level.

Have been delivering [current curriculum] for so long... It was like a light bulb moment that if you really think about it and pull it apart more... you can make it even better.

The main concern was about the timing and ability to rollout the new M-GLS. The morning of the Instructor Course Day 1 “felt” somewhat overwhelming. By the end of the Trainer Course, feedback was more positive.

I’m much more aware of how I am out on the road; my position – about me, but also about others – if I move here, what will that car do.

Without it [the Instructor Course], it would have been a struggle. I wish I had done half a dozen of the [MPA] courses at least to feel comfortable with the content. Without the two days last week, wouldn’t have made myself clear and wouldn’t have understood without those two days. Fundamental.

I think they [candidate Trainers] responded quite well to it. They definitely embraced it. It gave them a much better idea of why it [MPA Course] was coming in. It showed gaps in the way they were currently delivering their current curriculum, differences out there in teaching style – we should all be teaching the same thing... I think that was fantastic.

Despite this, while one believed one of the Trainers was ready to progress with minimal input, he was less sure of the others. “No dramas, but not going to be polished, not going to be perfect.” This was not expected without the candidates having shadowed the MPA Course. The Instructors also reported that they would feel comfortable to deliver the course again.

In beginning, it was, “I don’t know about this”, very sceptical. Now I can’t wait. The sooner it’s in the better.

It’s definitely taken me to the next level – well I’ll let you know when I take my next class. The way I’m feeling now...[positive body language].
Professional development wise, it’s absolutely invaluable... it has accelerated my learning so much.

It’s been big but it’s definitely been beneficial.

No risks or safety concerns were raised, the only remaining concern was about the timings of some activities. The Instructors were reassured that VicRoads had confirmed these were subject to on-going monitoring and further refinements if needed. Overall, experience delivering the Trainer Courses had worked well by doing so in pairs of instructors. It was agreed it was preferable to deliver these (and future pilots course in the project) in pairs, so that the two Trainers/Instructors could provide support and learn from each other, as well as manage fatigue.

6.3.3 Stakeholder Consultations

The Instructor Course pilot, including revised Trainer Course and embedded assessments all worked well and allowed sufficient refinements to the course materials, before review by stakeholders.

The three in-person meetings with Victorian training providers allowed for discussion and clarification of the course progress and activities. The one Curriculum activity that required repeat discussions at all meetings and a demonstration at the final meeting was Partner Push. The only other on-going concern was the applicability of options to omit some course activities for experienced riders.

Concerns with Partner Push primarily related to concerns for those with physical limitations and potential for injury, as well as the usefulness of the activity for experienced riders. We argued this as an important non-powered introduction to two-stage braking, and to the front brake in particular. There was evidence in the pilots that several participants had previously learned to fear the front brake. Incorrect use of brakes can be a contributor to loss of control crashes and it was considered important to establish use calmly and correctly from the pre-learner stage. The demonstration included instruction on how to reduce the risk of injury and manage physical limitations of individuals. It was also explained that experienced riders only needed to demonstrate balance and stopping competency once, whereas novices would need to repeat the activity a number of times.

General agreement was reached on retaining Partner Push and the need for fewer demonstrations by experienced riders of competency in basic techniques generally (i.e. not only for Partner Push). Experienced riders were still expected to undertake all components of the course so that any incorrect techniques or poor habits formed could be identified and corrected. (Such instances were not uncommon in the pilot studies.)

Overall response to the MPA Course (and plans for Check Ride and MLA) was very positive. All concerns could be readily explained. Some useful minor revisions were suggested, but no major revisions were required.

6.4 Final MPA Course Activities

The final education activities for the MPA are summarised in the image of the reference card for the course in Figure 4.
The time available for pre-assessment education activities was greatly reduced by the needs to include all assessments within the two days and to reduce the full candidate contact time from 8 hours to 7.5 hours per day to manage fatigue. Assessments comprise activities numbered 30, 45 and, together with coaching number 48, with the vision test included with other necessary administrative components in the introductory activities number 1 to 4, and administration to issue certificates included in activity 50. The coloured rows highlight break times. The remaining activities are education components, of which those with a motorcycle icon in the “Location” column are undertaken on the range, or in the case of activity 48 on road, and those with the house icon take place in the classroom. Those including “Discussion” in the title relate to facilitated discussions, interspersed throughout the two days: activities number 5, 19, 25, 26, 29, 36 and 41.

The MPA addresses the performance criteria summarised for novices in Table 4 at the standards summarised in Table 5, with the final MPA range exercises, in sequence, comprising:

- Walk and park the motorcycle.
- Mount the motorcycle.
- Operation of controls.
• Controlled stop.
• Sharp left turn.
• Slow ride.
• Ride curve and change path.
• Quick stop.

The feedback errors recorded for the MPA on-road component are:
• Observation: fail to perform head check.
• Speed: too slow (10km/h+ below speed limit).
• Progression: stationary >5 seconds unnecessarily; stops unnecessarily before riding through crossing.
• Following distance: following distance <3 seconds; stops too close to vehicle in front (<1 motorcycle length).
• Lateral position: unsafe position within lane.
• Controls: fails to signal; stalls engine; wheel skid; foot down while moving; hits kerb heavily.
• Road rules: stops on crossing or crosswalk; blocks pedestrian at crossing; blocks traffic at intersection; fails to stop or stops incorrectly at STOP sign.

Fail errors comprise:
• Disobey: disobey directions of assessor, police or authorised traffic controller.
• Speeding: exceeds speed limit continuously 5 seconds or more (by 5km/h or more).
• Evasive action: evasive action required by another road user; otherwise causes immediate danger/risk of collision to other road user.
• Intervention: intervention by assessor or other road user required for safety reasons.
• Collision: collision due to applicant error (vehicle, pedestrian, object); drops or falls from motorcycle.
7. **CHECK RIDE AND MOTORCYCLE LICENCE ASSESSMENT**

7.1 **Trainer Course Pilots**

7.1.1 **Participants**

Recruitment of trainer participants was the same as that for the MPA Trainer Course pilot, with all eligible and available trainers attending the one day each of Check Ride Trainer Course and MLA Trainer Course on 18-19 September 2015 and the first combined pilot with licence candidates immediately following on September 20, all at Hoppers Crossing. This resulted in seven Stay Upright participants taking part, including the four previously trained up to Instructor level in the MPA pilots and three others not previously involved. All held *Certificate IV in Training and Assessment* accreditation and two had completed additional training qualifications.

All seven trainers were male. The age range was 41 to 60 years (average 55.3 years). All were from Victoria (local, Melbourne suburbs or Ballarat area) besides the National Training Manager from Queensland. Their years of experience as a motorcycle instructor ranged from 8 to 31 years (average 14.2 years). Three were full-time trainers, two part-time and two casual, of which one also had another full-time job, otherwise all others had no additional employment. All also held a full/open/unrestricted driver licence and had been driving for an average of 37.0 years (range 25 to 43 years).

The trainers had held a full/open/unrestricted motorcycle licence for between 20 to 42 years (average 35.6 years). On average they rode for 11 hours per week (range 1 to 20+ hours; with 2 reporting less than 10 hours, three 10 hours and two 20 hours). The majority (5 or 71%) reported mostly riding a sports bike and another nominated a sports touring bike, with one nominating a trail/off-road bike, and another additionally nominating this bike in addition to a sports bike.

Table 16 summarises averaged responses to the question on their main reasons for riding, scored on a 5-point response scale, where 1 = Never, 2 = Rarely, 3 = Sometimes, 4 = Often and 5 = Very often. All averaged to at least “sometimes” with the exception of off-road recreational riding. While riding as part of work was the highest rated, riding as a means of transport and commuting also averaged at the “often” rating, with other recreational riding and purposeful riding locally also common.

<table>
<thead>
<tr>
<th>How frequently does your riding involve the following?</th>
<th>Mean score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Riding for work as part of my job</td>
<td>4.3</td>
</tr>
<tr>
<td>Riding as a main means of transport</td>
<td>3.9</td>
</tr>
<tr>
<td>Commuting to work or study</td>
<td>3.7</td>
</tr>
<tr>
<td>Recreation (on-road riding)</td>
<td>3.4</td>
</tr>
<tr>
<td>Riding around the local area e.g. to the shops or beach</td>
<td>3.3</td>
</tr>
<tr>
<td>Recreation (off-road/trail riding)</td>
<td>2.4</td>
</tr>
</tbody>
</table>

7.1.2 **Results and Discussion**

7.1.2.1 **Course Delivery**

Delivery of the Trainer Course pilots proved more challenging than anticipated. This was likely in part due to the larger number of participants, but also as the planned new activities for the on-
range skills checks, to apply for both the Check Ride course (in a small group) and the MLA course (individually) did not run as well as expected and presented safety concerns. The need to first include more time recapping range safety and key sequences from the MPA Course was identified and the new skills checks activities were changed to alternative activities adapted from the simulated rides in the MPA Course.

While these were well-accepted by the trainers, the range seemed crowded with six riders, and the activities were somewhat complex to grasp quickly for the three trainers who had not previously participated in the project. Given that novices in the pilots would also not have completed the MPA Course (as well as applicants who already hold learner permits during the rollout of the new M-GLS), it was decided to limit the course to five applicants only. This would be more manageable for trainers needing to quickly learn the entire new M-GLS curricula. VicRoads could monitor this during the implementation trial and determine whether this might be increased to six participants once all Victorian trainers were very familiar with the new M-GLS curricula or later once all participating licence candidates should have completed the new MPA Course.

7.1.2.2 Trainer Assessment

All of the trainers participated satisfactorily in the Check Ride Trainer Course and successfully completed (“passed”) the assessments in the MLA Trainer Course; that is, no additional remedial training was required. All scored highly on the multiple-choice items regarding scenarios for on-road assessments. Any items with errors were discussed until all agreed with the correct answer. Taking an applicant’s intent into account when determining the type of error made (i.e. a feedback only versus a safety or fail error) was found to be particularly useful. This also led to discussion of route planning and the need to avoid “traps” (such as areas with unclear speed zone signage or atypical complex features), which was not the intention of the assessment. It was also made clear that in the case of an ambiguity, such as circumstances that could not be viewed adequately by the trainer, the assessment should err in the favour of the candidate. Feedback provided contributed to minor wording changes to the scenarios to remove any ambiguities.

7.1.2.3 Trainer Feedback

All trainers were positive overall about the content of the Trainer Courses and the expectations they provided of the Check Ride and MLA courses. The Check Ride on-road coaching component was particularly appreciated by the trainers. They enjoyed hearing the views and critiques of other trainers and noted that this generally did not occur in the industry; that often they operated solo. Discussion of the need to prioritise feedback points when stopping at each stage, rather than overwhelming riders with too many points at once, was also highlighted as an important point by the trainers who had not previously received on-road coaching training in the MPA pilot stage.

Trainers also expressed their appreciation of the hybrid testing and assessment approach proposed for MLA applicants, albeit those with wider knowledge of licensing noted that the industry was moving away from any testing, and some believed there should be no individual testing but rather only small group competency-based assessment throughout the new M-GLS.

Other more specific feedback led to adjustments in the MLA route used for the licence candidates pilots and refinements to some of the assessment criteria for scoring of speeding and road rule errors. In terms of prompted feedback during the focus group, all trainers reported that the course had been personally valuable and that they were ready to continue to the pilots with the support of the research team. The three trainers not previously involved in the MPA pilots were more reticent, however reassured by knowing that a research team member or another trainer with experience would accompany them to first deliver the pilots in pairs.
7.2 License Candidates Pilots

7.2.1 Participants

In total, 25 Licence candidates participated. All but two selected “to upgrade from a learner to provisional licence” as the reason for attending, with the remaining two converting from an interstate or international licence to a Victorian licence. Of the 25 participants, 19 (76%) were male, and ages ranged from 18 to 65 years (average 34.8 years), with 10 (40%) under 30 and 2 (8%) over 50 years of age.

Most participants attending the Hoppers Crossing pilots resided in suburbs neighbouring the facility, with one living in Prahran (inner south area of Melbourne). Participants at Ballarat lived in Ballarat or surrounding towns, with two (attending on different days) residing in Warrnambool (south coast). The majority (21 or 84%) were in full-time employment and the remainder part-time employment.

Among the 23 applicants converting from a learner permit to licence, months on the learner permit ranged from the minimum 3 months to near 15 months maximum, averaging 11 months with 10 (43.5%) holding the permit for less than 12 months. Of the two converting from other jurisdictions, one had held a provisional licence for 12 months the other a full/open/unrestricted licence for 15 years. Average hours of riding each week ranged from 0 to 40 hours, averaging 7 hours, with 19 (76%) participants reporting less than 10 hours (0-7.5 hours), three reporting 10 hours, two 18 hours and one 40 hours.

All but one participant reported previous driving experience (i.e. n=24 or 96%). Eighteen (72%) held a full/open/unrestricted driver licence, three (12%) a provisional driver licence (1 red, 2 green) and three a car learner permit. The participant without a driver licence or permit still reported one year of driving experience. Of the 24 others, years of driving experience ranged from 1 to 45 years, averaging 16.3 years; with about half reporting less than 10 years (n=13 or 54%), 10 (42%) between 20-30 years and one 45 years.

One person chose not to answer the question, “What type of motorcycle/scooter do you ride most frequently (on-road)?” and two selected two different types. The most frequently selected bike was a cruiser: n=10 or 42% of those responding. This was followed equally by a naked or a sports bike: n=5 or 21% each. Four (17%) nominated an adventure bike and one (4%) each a scooter and touring bike.

Results for the same two additional questions focused on participants’ reasons for riding as for the MPA are summarised in Tables 17 and 18. The most important reason for riding (lowest score) was for personal reasons, followed by social reasons, then transport and work reasons. Recreational on-road riding scored the highest average intended reason for riding, closely followed by riding in the local area, then commuting and riding for work or study purposes. Rating lowest were recreational off-road riding (although four participants rated this a 4 or 5) and riding as part of employment (with only one person rating this a 5 and all others a 1 or 2).

### Table 17. Importance of Reasons for Riding - Licence Candidate Participants

<table>
<thead>
<tr>
<th>How important to you are each of the following reasons for riding?</th>
<th>Mean score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work related reasons (e.g. riding is a part of my job, to get a job, etc)</td>
<td>3.8</td>
</tr>
<tr>
<td>Transport related reasons (e.g. convenient, cheaper transport, parking, etc)</td>
<td>2.9</td>
</tr>
<tr>
<td>Social reasons (e.g. I have friends who ride, I like the social side, etc)</td>
<td>2.2</td>
</tr>
<tr>
<td>Personal reasons (e.g. I enjoy riding, I like the feeling of freedom, etc)</td>
<td>1.6</td>
</tr>
</tbody>
</table>
Table 18. Intended Reasons for Riding - Licence Candidate Participants

<table>
<thead>
<tr>
<th>How frequently do you think your riding will involve the following?</th>
<th>Mean score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recreation (on-road riding)</td>
<td>4.1</td>
</tr>
<tr>
<td>Riding around the local area e.g. to the shops or beach</td>
<td>3.9</td>
</tr>
<tr>
<td>Riding as a main means of transport</td>
<td>3.1</td>
</tr>
<tr>
<td>Commuting to work or study</td>
<td>2.8</td>
</tr>
<tr>
<td>Recreation (off-road/trail riding)</td>
<td>2.1</td>
</tr>
<tr>
<td>Riding for work as part of my job</td>
<td>1.4</td>
</tr>
</tbody>
</table>

7.2.2 Results and Discussion

7.2.2.1 Pilot Course Dates and Participants

Table 19 summarises when and where the pilots took place and the number of participants. The first pilot was essentially a first-step development pilot, given changes had been made during the Trainer Course. As it had been scheduled to take place on the day immediately following the Trainer Course, it was still conducted with six licence candidates, as well as six of the trainers. Subsequent pilots were scheduled for a maximum of five participants. For one of these (October 23), it was discovered that one participant had enrolled mistakenly thinking it was a course for the MPA and therefore he was excluded. One additional pilot that had been scheduled mid-week was cancelled due to insufficient enrolments, but it was found that saturation was reached within the other five pilots and therefore was not rescheduled.

Table 19. Details of Combined MLA and Check Ride Pilots

<table>
<thead>
<tr>
<th>Date</th>
<th>Location</th>
<th>Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 September 2015</td>
<td>Hoppers Crossing</td>
<td>6 Licence candidates</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6 Trainers (in rotation)</td>
</tr>
<tr>
<td>2 October 2015</td>
<td>Ballarat</td>
<td>5 Licence candidates</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 Trainers</td>
</tr>
<tr>
<td>4 October 2015</td>
<td>Ballarat</td>
<td>5 Licence candidates</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 Trainers</td>
</tr>
<tr>
<td>23 October 2015</td>
<td>Hoppers Crossing</td>
<td>4 Licence candidates</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 Trainers</td>
</tr>
<tr>
<td>25 October 2015</td>
<td>Ballarat</td>
<td>5 Licence candidates</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 Trainers</td>
</tr>
</tbody>
</table>

As shown in Table 19, a total of 25 licence applicants participated. Of note, only two riders making enquiries regarding Stay Upright licence courses via phone/email (as opposed to booking directly on-line) chose not to opt for the project pilot course. One specifically cited a preference to do testing on a range and the other that she did not feel confident with group riding (both were female). It was not possible to know what proportion of potential participants seeking courses on-line during the pilot period chose not to opt for the pilot course.

7.2.2.2 Course Delivery

New timings for MPA key sequences review and skills check exercises were finalised in the first pilots. By the time of the last pilots, Trainers were able to comfortably deliver these activities within the allotted timeframe, with no new adjustments required.
All candidates completed the range skills checks to an acceptable level and no errors requiring a “Not Completed” result occurred during the Check Ride. The most common feedback errors during the Check Ride concerned lateral position (for most candidates in all but one pilot). It is noteworthy that buffering in terms of position within one’s lane is one of the key differences between driving and riding. Given that buffering cannot be well taught or demonstrated on the range, and that these candidates had not completed the MPA Course, this perhaps was not surprising. Occasional feedback was required regarding safe following distance and less commonly observation and control errors. No speed, progression or road rule errors occurred. Refinements were made for discussions during stops at each stage of the Check Ride as it become clear that time available at stops was too limited to cover all of the original intended discussion content.

For the MLA, refinements to the MLA road route suggested in the Trainer Course were found to be needed and therefore the route was revised. Twenty-three candidates passed and two failed the on-road MLA. Again lateral position was the most frequent safety error recorded: once or twice for 14 (56%) candidates. Observation errors were also common (12 or 48% of candidates), followed by control errors (8 or 32% of candidates). Three (12%) candidates recorded a too slow (unsafe) speed error and three a progression error. There was one instance of breaching a road rule. One candidate failed the MLA due to recording an excess number of control errors and was advised to undertake an individual lesson before re-attempting the current licence test. Another failed due to speeding, albeit this seemed in part due to confusion over a reduced speed limit due to road works. This applicant opted to undertake the current licence range test and passed.

Only two participants chose to take up the offer of completing additional one-on-one training on the range while other participants were undertaking their MLA: one prior to assessment and one following. The one opting for training prior to assessment was a mail delivery worker and requested more time on basic scooter handling skills, which was not considered to impact on his on-road assessment given that basic handling competency had already been established (by successful completion of the Check Ride range skills checks).

7.2.2.3 Licence Candidate Focus Group Feedback

The Licence candidates generally enjoyed the course and most feedback provided was positive. Perhaps given the “newness” of the on-road components, most of the initial feedback reflected on these. The following quotes are exemplary of the general feedback provided:

This is the right way of doing the test. Might be able to explain things [off-road] but not getting to experience them.

You can think you’re good on the range but out there [on the roads] is the best way to do it.

The group nature of Check Ride was particularly appreciated:

You learn more in a group, because it’s not just what you do but what you can see others doing and hear them getting their feedback.” (Emphasis added to show the point was about visually seeing errors and learning how to correct them, not just a wider range of examples.)

Some also commented on specific learning experiences:

[You can see it] would really teach you safety, not just about testing. Makes you think through actual crashes and what to look out for. Not just riding the same route every day.
I learned more about buffering. I would never have got that feedback.

It was really good to relate ‘slow ride’ to out there on the road.

All agreed there was a good mix of environments encountered during the Check Ride and one also specifically noted this for the MLA. Some participants expressed feeling uncomfortable not knowing where the ride would take them. One suggested that there was “good and bad when [you] don’t know the area” but that it was “really fun to ride the roads that we did” and another expressed that “not knowing where we were going was a bit odd” and that more landmarks rather than just directions would help, which led to further refinements of the route directions.

Most of the participants reported that they much preferred the MLA on-road compared to the current range test. Exemplary comments included:

There’s less pressure on the road. You’re just focusing on the road, your riding that you’re not thinking about assessed. On the range is far more pressure. Someone is watching every little thing.

There’s a lot more cues on the road. Like ‘head check’. You want to do a head check on the road.

Only 2 (8%) of the 25 participants (one younger male, one older female) decided that they would have preferred the current range test. They believed they were more aware or nervous of being assessed by having someone following them one-on-one than being observed solo on the range. Nonetheless, they both concurred with all other participants that the on-road coaching in particular had considerable benefits that could not have been achieved by on-range training only.

One of these participants also questioned why some would still have to do the course if they only wanted to ride a dirt bike but needed an on-road licence. This was a legitimate concern discussed already among the Project Team and with VicRoads. Exposing these riders to on-road riding when they otherwise might never ride on-road poses a risk of increased crash risk. It was considered, however, that as the ride occurs in a controlled environment, any small increase in risk should be outweighed by the larger decrease in risk afforded to those who do ride on-road. This could not of course be determined within the pilots. Another young male who had also only ridden a dirt bike off-road expressed how pleased he was that he had chosen to be part of the pilot – and not only because he believed it was his first “real” time riding on-road and would likely be his last, he said he still learned roadcraft tactics that also applied to off-road riding.

Apart from the few general comments regarding nervousness riding in traffic, few riders expressed any risk or safety concerns when prompted in the focus groups. One commented:

No everyone was really good. No drama really. Except maybe that car that did a U-Turn [in front of us].

This action by another road user was considered a reality of riding and the type of experience that riders need to learn to address, so was not considered to be a negative but part of the learning opportunities that the Check Ride program offered. Another commented that she felt uncomfortable with parking, which led to refinements in the manual to put more emphasis on this activity during the range skills checks. When prompted, factors viewed as affecting the pilot were excessive heat on one day and wind on another; again the reality of riding experiences generally.
Encouragingly, several participants summed up their perspectives in ways that countered the inherent training risk (of any program) of over-confidence and reflected that they had learned the importance of riding defensively:

*Just because we passed, doesn’t mean we can do everything. We’re still learning.*

*Now you have your licence and you can go wherever you want. But we’re green. You don’t have the experience yet.*

*It was a great experience, but I’ll probably never ride on the road again.* (dirt bike rider)

### 7.2.2.4 Trainer Interview Feedback after Delivering Pilots

An issue during these pilots based on trainer feedback related to the usability of the assessment sheets, both for the range and on-road, which went through multiple formatting iterations before finalising. Otherwise, as interview feedback was taken at the end of the course and therefore immediately after the MLA, this was a focus of much of the initial feedback from trainers.

Comments were positive about the overall approach, “Over 100% more beneficial than out there” [pointing to range]. However, there were also personal concerns on how well they might fare delivering the MLA on-road on their own (i.e. without the Project Team). One explained after his first delivery “...a bit more nerve wracking. A lot going on,” specifically mentioning keeping on track with directions, while watching for other cars – for oneself as well as for the applicant – and assessing. This was a legitimate concern but was not raised again, either by others or this same trainer after participation in subsequent pilots. This suggested that the considerable cognitive workload required might mostly be a concern when first learning to deliver the MLA, but could decrease with practice. A comment was made suggesting some support for this:

*It’s [on-road coaching] just about familiarisation. Now [I am more familiar] I am able to think less about what I am doing and more about them [licence candidates].*

One Trainer expressed concern that he had inadvertently “coached” the candidate at certain turns by turning on his indicator before the candidate had done so and then moving towards the turn. It was clarified that this was an essential support for navigation and was advisable over the candidate missing the turn, which was clarified in the MLA Trainer Course content. Another Trainer experienced two navigation errors by a licence candidate and was particularly concerned on the time allocated. Other hold-ups with traffic issues also occurred in some pilots. Therefore, the MLA documents were revised to allow an additional 15 minutes per candidate, that is, a total duration of 75 mins, for the MLA Course. Other feedback led to additional information on the braking lines marked on the range.

### 7.2.2.5 Stakeholder Feedback

Stakeholder feedback was limited largely to those involved in the pilot studies and oversight committees, as the final meeting open to all rider training providers occurred prior to collating all the findings from the Check Ride and MLA pilot studies and therefore with limited information available to those attending. Verbal discussion of progress on the Check Ride and MLA at the final provider meeting did not raise any general or specific concerns. Later feedback on the more-detailed written reports contributed to improved wording refinements and clarifications in course materials, but likewise no notable specific issues of concern.

One long-term experienced rider trainer expressed general concern with the MLA format as a one-on-one end-test rather than a group competency-based assessment. This was similar to views expressed earlier regarding the MPA (section 6.3.2.1) but was out-of-scope for the project.
7.3 Final Check Ride and MLA Course Activities

The final activities for the Check Ride and MLA Course as piloted in the combined course and summarised in the course reference card are presented in Figure 5, using the same shadings and KEY as for the MPA (Figure 4); however, with considerable extra time included within activity number 11 for research focus group feedback.

![Figure 5. Check Ride and Motorcycle Licence Assessment Course Reference Card](image)

The same feedback and fail errors apply to the Check Ride on-road component as for the MPA. Stricter criteria apply for the MLA. The MPA feedback errors are recorded as “safety errors” and must not exceed two errors in any given category, or reach 10 in total. Some feedback errors from the MPA and Check Ride are also upgraded to fail errors, namely, the road rules (with the exception that stopping on a crosswalk remains a safety error) and the control error of a heavy hit of the kerb is included as a collision.
8. GENERAL DISCUSSION AND CONCLUSIONS

This report summarises the broad research undertaken to develop and pilot the new education and assessment curriculum for Victoria’s new M-GLS. The research achieved the project objectives to develop and pilot off-road and on-road: pre-learner education activities to prepare the rider to undertake mandatory assessment to progress the learner permit and assessment activities to enable a decision to be made on whether a learner permit should be issued – the MPA Courses; Check Ride activities to provide opportunities for a qualified coach to guide learners as they progress through the learner phase – the Check Ride Courses; and assessment activities to enable a decision to be made on whether a licence should be issued – the MLA Courses. The pilot results confirmed the feasibility of the curriculum, not only that it could be delivered and received as intended, but also that it was generally acceptable to Victorian rider training providers, motorcycle learner permit and licence candidates, and wider stakeholders.

Curriculum activities were guided by the Goals for Rider Education framework, adapted from an equivalent best-practice model for novice driver education [9], and analysis of Victorian data to identify the target learner motorcyclist population and key crash types. A Training Needs Analysis focused on information from a range of Australian and international motorcyclist education programs [14-24] and Australian Quality Framework Standards [26-28], applying adult learning principles [38, 39] and latest theories of behaviour change [33]. Increases in competency-based approaches to assessment over single end-tests within the parameters of the study, and in coaching over training-only teaching methods, were included in keeping with trends evident in the research literature [e.g. 5, 42-44].

It is worth noting that another important motorcycle coaching program evaluation was published during the course of this project [43], which used the strong study design of the randomised control trial. The study found no evidence of safety improvements for participants, but rather, found indications of miscalibration (a concern raised in section 2.1). In particular, trained participants were more likely to report speeding behaviour compared to controls. The program evaluated was a voluntary one for riders who were already licensed and eligibility required a specified minimum level of riding experience. Therefore, these riders were already at the end stage of licensing and assumed to consider themselves as competent riders seeking more advanced training. This is quite different to the current project courses, which seek to develop safe riding practices from the outset, focusing on mandatory courses for novices seeking to learn how to ride a motorcycle for the first time and progress to a competent level. Therefore the timing and intent of the courses is quite different to the one evaluated. The M-GLS courses also seek to prevent miscalibration by addressing this potential directly, including in facilitated discussions and course close activities. It was encouraging that comments were made suggesting that this had been achieved, although only the planned on-going evaluation will be able to determine this.

The project research was not without limitations. Notwithstanding some specific constraints on the project scope, the timeframe precluded piloting the curriculum with the same participants as learners through to licence candidates. This might have informed other needs for the Check Ride and MLA, but this was unable to be confirmed or denied by the study methods. The study design also precluded specific piloting of the introductory and range skills checks components of the MLA with individuals only (which were piloted in small groups). Therefore, there remains a potential need to further refine the MLA timings and course materials. In addition, the project was not able to include a much larger research sample and longer timeframe in order to conduct efficacy evaluation or to establish standardised values for assessments. However, the continued
monitoring and evaluation of the curriculum by VicRoads will ensure any further refinements needed will be identified and remedied in future. A full outcome evaluation is planned.

The systematic approach to developing a tailored curriculum, guided by an adapted best-practice framework, exemplar curricula, and behaviour change and adult learning principles, offer promise in the potential of the new M-GLS education and assessment curriculum to improve the safety of newly-licensed novice riders in Victoria. Moreover, subject to further evaluation, this project has laid the foundation for establishing a best-practice guiding framework, Goals for Rider Education, and potentially a best-practice model for developing tailored motorcycle licensing education curricula for other Australian as well as international jurisdictions.
9. REFERENCES

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