Review of Post-Licence Motorcycle Rider Training in New South Wales

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Key Findings

- Forty post-licence rider training (PLRT) options were offered in New South Wales
- Most PLRT courses (55%) appeared likely to support riders' risk management
- Basic skills are sometimes lacking in prospective PLRT participants
- Strategies to increase PLRT participation are worth considering

Abstract

Fully licensed motorcyclists represented over two thirds of riders killed on New South Wales (NSW) roads from 2010 – 2014. An ongoing need to address crash risks among this cohort is recognised and there is strong support for post-licence rider training (PLRT) among rider advocates and stakeholders. This research, commissioned by Transport for NSW, examined the PLRT environment in NSW to assess the extent to which courses targeted specific rider skills and competencies. Before commencement of this research, key riding competencies were identified by Transport for NSW in consultation with motorcycle stakeholder groups, and included scanning, buffering, setting up brakes, basic motorcycle handling, cornering, and lane positioning. A desktop review of 40 available courses provided an overview of relevant course content, locations and costs. The review was supplemented by interviews with eight training providers to gather information on course structure, components, delivery, promotion and trainee characteristics. The collective information was used to identify which training options support riders' risk management and promote improved safety outcomes. A wide range of courses was identified, and in most cases there was no standardised curriculum. Most courses appeared to support rider risk management and most also appeared to address roadcraft and defensive riding principles, albeit to varying degrees. Providers noted participant diversity in characteristics, needs and motivations for undertaking rider training, reflecting a need for a diverse range of course offerings including individualised training. Key groups were catered for including returning riders, female riders, inexperienced riders, commercial riders and aspirational racers.

Keywords

Motorcycle, Rider Training, Post-licence, Returning Rider, Skills, Competency

Introduction

Motorcyclists comprised 15 to 20 percent of all Australian road user fatalities over the 10 years commencing 2009 (BITRE, 2019). This situation is reflected in New South Wales (NSW) where a continuing need to address rider crash and injury risks was identified in the *Motorcycle Safety Strategy 2012-2021* (TfNSW, 2012). NSW rider fatalities fluctuated between 51 and 71 annually from 2009 to 2018 (BITRE, 2019). A similar pattern is observed for serious injuries, with a yearly average of 2,600 NSW riders hospitalised from 2008 to 2015 (TfNSW, 2017). This lack of progress in terms of raw numbers should be viewed in the context of the consistent upward trend in NSW motorcycle licences and registrations (TfNSW, 2019); reducing the number of crashes is especially challenging in an environment of apparent increased usage (Figure 1).

Much attention has been directed in recent decades to improving the safety of novice motorcycle riders in NSW, with the introduction of a Graduated Licensing Scheme
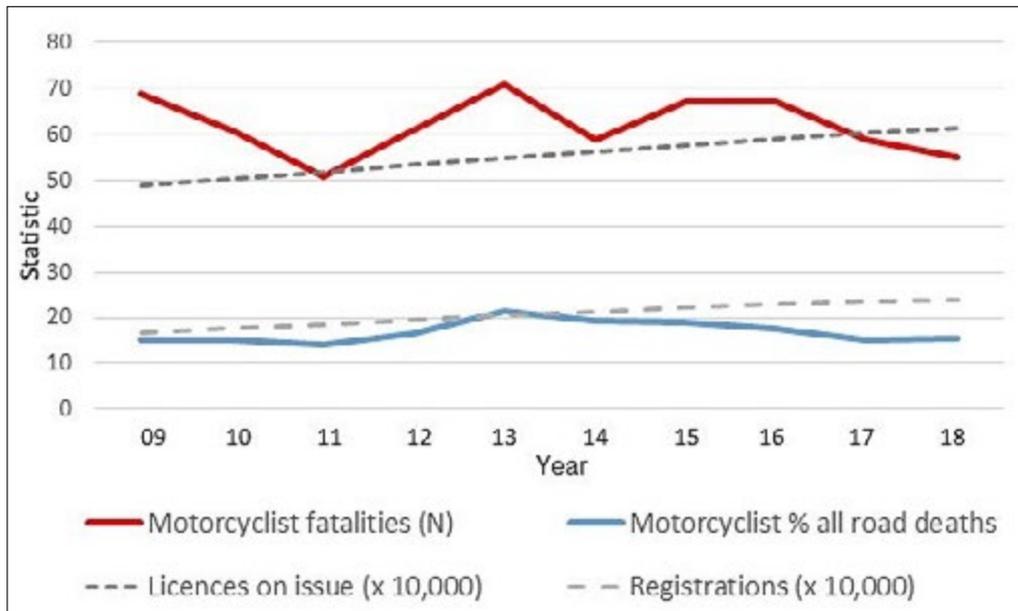
Figure 1. Ten-year NSW motorcycle fatality, registration & licensing trends 2009-2018 (BITRE/Transport for NSW)

(GLS) in 2009 and the Learner Approved Motorcycle Scheme (LAMS) in 2002. Research in Australia and elsewhere has generally focused on novice and pre-licence rider training programs and their effects (Langford, 2003; Kardamanidis, Martiniuk, Ivers, Stevenson & Thistlewait, 2010; Ivers et al., 2016). However, fully licensed riders comprised around 90 percent of all licensed riders and more than two thirds of rider fatalities in NSW from 2010 to 2014 (TfNSW, 2015). Moreover, analyses of motorcyclist fatalities and injuries by age group show an increasing involvement of riders aged 40 years or older (TfNSW, 2017). Factors underlying this trend likely include the ageing of the rider population, the greater susceptibility of older riders to serious injury (relative to younger riders), and potentially motorcyclists returning to riding after an extended break (often termed 'returning riders'). These trends support previous recommendations for the development of programs to address the issue of returning riders (Haworth, Blackman, Fernandes, & Ma, 2013) and, by extension, increases in recreational riding in general.

Research on returning riders and their crash involvement is complicated by inconsistencies in returning rider definitions, and difficulties identifying them in official crash datasets. Conceptually, Haworth et al. (2013, p. 2) describes a returning rider as 'someone who was an active rider in the past, who then became a dormant rider for a period and recently became an active rider again'. An operational definition is more challenging, where difficulties arise particularly in determining (a) the length of break from riding and (b) the exposure or amount of riding undertaken since resuming the activity. These parameters are key to examining the relative safety of returning riders, but there is wide variation in the setting of these in research to date, with the minimum length of break ranging from one to ten years and the exposure since

returning similarly inconsistent (Haworth et al., 2013). Absence of a validated definition notwithstanding, a 2018 survey of 1,290 active Queensland riders by the current authors (unpublished) found that 19.1 percent had taken a break of two or more years from riding at some point in their motorcycling history. When returning to riding after an extended break, these riders face potential challenges including loss of vehicle handling skills due to lack of practice, unfamiliarity with a motorcycle or motorcycle type (including changes in design and performance), riding on unfamiliar routes (Brown et al., 2015; Haworth et al., 2013) and loss of physical fitness. While the concern for returning riders' safety is warranted, they are but a subset of fully licensed riders whose crash risk needs to be reduced to meet the goals of current and future road safety strategies.

Fully licensed riders, including returning riders, are not currently required to undertake any post-licence rider training (PLRT) in NSW or other Australian jurisdictions and there is no requirement to demonstrate continuity of riding to maintain a motorcycle licence. Some insurers in Australia offer small policy discounts for PLRT participation, but the effects of these or other incentives on participation rates are unknown. Voluntary PLRT has general support from key motorcyclist stakeholder groups and organisations, including the Australian Motorcycle Council. The Motorcycle Council of NSW goes somewhat further, having advocated mandatory refresher courses for riders whose records show a gap in motorcycle ownership. Beyond Australia, voluntary PLRT is supported by organisations such as the Federation of European Motorcyclists' Associations (FEMA) and the American Motorcyclist Association (AMA), but these stakeholders are largely opposed to mandatory training programs for fully licensed riders.

A recent online survey of crash-involved riders distributed by motorcycling-focused organisations, clubs, social media and websites across 30 countries provides a global perspective on the prevalence of PLRT. The sample included riders who were members of motorcycle clubs or organisations as well as other participants recruited through social media (Hardy, Margaritis, Ouellet, & Winkelbauer, 2020). Among 1,578 respondents (85 percent held full licences), 43 percent reported having undertaken voluntary PLRT. Of the Australia respondents (n=127), 46 percent had undertaken PLRT. Research in Australia also indicates that most riders do not undertake PLRT (Haworth, Rowden, Wishart, Buckley, & Watson, 2012), but the perceived value of rider training in general has been shown to increase with age, with riders in their fifties tending to value it most highly (Sakashita, Stephen, Senserrick, Lo, & Ivers, 2014). Interestingly, Sakashita et al. (2014) also found that perceived value of training declined with participation, but these results may be related to the type of training and participant recruitment and selection in their study. While there is likely some self-selection for PLRT for safety reasons, perceived value may not always relate to safety; participants seeking to primarily to increase skills may suffer from overconfidence and increased crash risk as a result of PLRT (Kardamanidis et al., 2010).

PLRT courses for road riders include on-road advanced rider courses, refresher courses and track-based courses. With notable variations within and between these categories of rider training, different objectives and motivations can be expected to influence rider participation. As well as general advanced rider training courses and refresher courses there are also PLRT courses focusing on specific environments, such as urban riding, group riding and adventure riding courses, for example. With a wide range of PLRT options, course participation outcomes may differ in terms of rider safety. Research to date has examined numerous pre- and post-licence rider training programs including their observed effects in various locations, with generally inconclusive results (Langford, 2003; Kardamanidis et al., 2010; Haworth et al., 2012; Ivers et al., 2016; Sakashita et al., 2014). However, research has not considered in detail the broader PLRT environment in a specific geographic region or jurisdiction. Therefore, the current research was commissioned by Transport for NSW to explore the characteristics of PLRT courses in NSW and the extent to which they targeted identified rider skills and competencies to address motorcycle crash and trauma risk.

Aims and Scope

As noted above, statistics show a lack of progress in reducing crash involvement of fully licensed and older riders in NSW. PLRT is often raised as one potential avenue to address this problem, but the nature and characteristics of the overall PLRT environment are poorly understood. The aim of this study was to investigate the extent to which existing PLRT courses target identified key rider skills and competencies to address motorcycle crashes in NSW, and to identify courses that appear likely to provide a safety benefit for participating riders. The findings were intended to inform recommendations on which courses, if any, appear appropriate for supporting riders to manage crash risk. The study did not attempt to objectively evaluate PLRT courses in terms of effectiveness in reducing crash and injury risk.

The study scope encompassed PLRT courses offered to licensed motorcyclists in NSW, including courses conducted on public roads as well as closed circuits. Whilst 'public roads' may include unsealed roads, courses tailored specifically for off-road motorcycle riders (including ATV riders) were not within the scope of the research. Track day courses aimed exclusively at training riders to participate in race days were also out of scope.

Methods

The research involved two key tasks, including: (1) a desktop review of PLRT courses available in NSW, including an overview of available courses describing their stated objectives, content, cost and locations; and (2) interviews with training providers to facilitate in-depth review of theoretical and practical course components and to obtain information on PLRT participant characteristics.

Task 1: Desktop Review

Electronic and printed media were searched in December 2015 to identify PLRT courses on public roads and/or closed circuits. The promotional and marketing material were examined to assess the extent to which each course *claimed* to address six key rider competencies which had been identified by Transport for NSW through feedback from motorcycle stakeholder groups and analysis of crash types:

- Scanning (hazard observation)
- Buffering (maintaining crash avoidance space)
- Setting up brakes (hazard response). Note, this entails light initial brake application to ensure controlled and progressive deceleration.
- Basic motorcycle handling (balance, steering and braking technique)
- Cornering
- Lane positioning

The desktop review also examined the extent to which the courses stated that they addressed 'roadcraft' and/or 'defensive riding'. 'Roadcraft' is a popular term among practitioners (e.g. the UK Police Foundation 'Motorcycle Roadcraft' handbook (Mares, Coyne, & MacDonald, 2013; Allardice, 2002), but not academics. Broadly speaking, roadcraft constitutes an optimal combination of

practical skills, situational awareness, hazard perception and response, and attitudes and behaviours. While a comprehensive range of skills and factors can be the focus of training programs, roadcraft essentially is an overarching strategy that riders may adopt to transfer these skills and concepts to the road environment. These components have been demonstrated to have a significant influence on rider safety (Haworth et al., 2012; Transport for NSW, 2015).

Task 2: Interviews

Interview methods and recruitment

The audio-recorded interviews consisted of a series of semi-structured and open-ended questions for discussion over a scheduled period of one hour (according with QUT Human Research Ethics Committee Approval 1500001138). All training providers identified in Task 1 were invited to participate in a telephone or Skype interview to discuss their full range of PLRT options. The NSW Motorcycle Alliance assisted in establishing contact with relevant training providers. Initial contact with training providers occurred by telephone or email, through which agreement to participate in the research was sought and the processes for participation established. Active rider trainers and PLRT program managers (with practical training experience) from eight of the 10 training providers were interviewed in January to February 2016. Two providers declined to participate: one because a suitable time for interview could not be established and the other being a single instructor who was then contracting to another provider and not providing training independently. Note that training was advertised by Provider E (see Results) as described above but was not being delivered as such at the time of writing. Interview length ranged from 49 to 71 minutes, with average duration of 61 minutes.

Interview topics

The interviews explored the theoretical and practical components of the relevant courses offered, and how course delivery in practice addressed the six key rider competencies listed above, as well as roadcraft, defensive riding and related attitudinal and behavioural issues. Relevant course materials that were not publicly available were also discussed.

Interviewees were queried regarding yearly participant numbers (last 12 months), age, gender, motivations, previous experience, and motorcycle types ridden, but the level of detail provided by interviewees varied. Indications of participants' apparent overall skill level and the proportion of participants that might be loosely defined as 'returning riders' were also sought. These questions were raised in the final section of the interview and in some cases were emailed to providers after termination of the interview because of time constraints.

Results

Task 1: Identification of Providers and Relevant Courses

Ten organisations were identified as PLRT providers in New South Wales (referred to as organisations A to J), who varied in terms of origins, functions and commercial activities. Six organisations were primarily providers of motorcycle rider training, but also offered 'track day' events, guided motorcycle tours, pre-purchase motorcycle inspections and motorcycle transport. Three organisations were associated with motorcycle sales. Two organisations also provided driver training for other vehicles at the post-licence level. Seven organisations provided pre-learner

Table 1. NSW PLRT course information obtained through online search

Provider	Number of PLRT course levels/types	Course duration	Course costs AUD	Location (region)	Training environment*
A	4	1 day	575	Sydney	Track
B	1 (customised)	Not specified	Not specified	Mid North Coast	Road, Other
C	4	3hrs – 1 day	145 - 300	Sydney	Road, Track, Other
D	5	1 day	395	Sydney	Track
E	2	1 – 3.5hrs	80 - 170	Sydney	Road, Other
F	7	3hrs – 3 days	85 - 2200	Sydney, Sth Tablelands, Central Coast	Track, Road, Other
G	5	3hrs – 1 day	0 - 550	Sydney	Track
H	3	3 – 11hrs	Not specified	Not specified (variable)	Not specified
I	6	1 day	450 - 690	Sydney	Track
J	3	3 – 4hrs	Not specified	Central & Nth Coast, Nth Tablelands, Wollongong	Not specified

*Track = Closed circuit race/training track; Road = Public road; Other = Isolated area (e.g. carpark)

and licence training as well as PLRT, advertising qualified and formally accredited instructors. Three organisations providing only track-based PLRT courses emphasised the competitive riding and racing experience of instructors, for whom formal accreditation as qualified on-road instructors was not confirmed in online material.

Forty different PLRT options were identified, including two courses with no practical riding component (a seminar addressing 'roadcraft and mental skills' and a workshop on basic motorcycle care, maintenance and repair). Two options were for female-only groups that were similar in content to equivalent-level courses open to all genders. Four options were described as personalised, specialised, private lesson or private tuition, indicating one-on-one training or very low student-instructor ratios closely tailored to individual needs. For three providers offering multiple levels of training, the highest or most advanced levels appeared to involve a substantial amount of one-on-one coaching and tailoring to individual requirements. One-on-one training may also occur in other courses, but most options seemed to involve student-instructor ratios of three to ten students per instructor.

Course costs and locations (regions), where available, are summarised in Table 1. The costs vary according to factors such as course duration, location, facilities and student-instructor ratio. The least expensive courses were those of short duration, with courses of half a day or less generally priced below $200. One provider (G) offered short classroom-only workshops free of charge, which may have been designed to attract participants to the provider's practical courses. Courses of one-day duration were the most numerous with all levels of training considered, however entry to some higher-level courses required prior completion of a lower-level course. The advertised costs for a single one-day course ranged from about $300 to $700, although most were in the $400 to $600 range.

Training locations were generally concentrated close to larger population centres, including Sydney and surrounds, Wollongong, Newcastle and the Central Coast region. The training locations identified in the North Coast region were largely limited to one provider. NSW riders may also have attended some training courses in South East Queensland and Victoria; these are not identified in the current research. No PLRT courses were identified in central, western or far southern NSW.

Website Content and PLRT Course Descriptions

This section provides a description of the content on training providers' websites and, specifically, references to the six identified key riding competencies (scanning, buffering, setting up brakes, basic motorcycle handling, cornering, and lane positioning), as well as roadcraft and defensive riding. All course descriptions were sourced from the online material.

Key competencies

Table 2 summarises the key competencies that were identified in the providers' online material, either as general references or specific references for any of the PLRT options promoted. One website did not provide any detail (Provider B). Cornering and vision or scanning (hazard observation) were the two key competencies identified by all other providers.

Seven providers referred to braking and related skills. While this key competency refers specifically to 'setting up brakes', the online content suggests varying levels of attention to different braking issues (e.g., straight line, front brake, rear brake, cornering and trail braking), and perhaps different approaches to teaching. However, it could arguably be expected that coverage of brake application would generally include 'setting up' (which refers to initial

Table 2. Website reference to key competencies and roadcraft/defensive riding

Provider	Key Competencies identified on website						Roadcraft Defensive
	Scanning	Buffering	Braking	Handling	Cornering	Lane Pos.	
A	✔				✔		
B							
C	✔		✔	✔	✔		✔
D	✔		✔		✔	✔	
E	✔			✔	✔	✔	✔
F	✔	✔	✔	✔	✔	✔	✔
G	✔		✔		✔		✔
H	✔		✔		✔		✔
I	✔		✔		✔		
J	✔		✔	✔	✔		✔

light application of both brakes to ensure controlled and progressive deceleration thereafter).

The concepts of buffering and lane positioning were identified as separate key competencies. However, as overlapping concepts, they seem likely to be addressed together in most instances. Either or both of these concepts were explicitly referred to in three providers' website content. As skills and competencies, these concepts may be less relevant for courses primarily aiming to support track-day participation and racing.

'Basic motorcycle handling (balance, steering and braking technique)' is expressed as a key competency comprising at least several separate skills and tended not to be readily identifiable in providers' online content. Moreover, it refers to a general level of competency that might be assumed to have already been attained by prospective PLRT participants through mandatory licensing and training processes (or through experience for riders whose licensure predates such requirements). It is likely that all PLRT options (excepting classroom- and workshop-only courses) address 'basic motorcycle handling' as a matter of course, although it may not be mentioned as such in the online material.

Safety, roadcraft and defensive riding

Most providers made few specific references to 'safety' in their course descriptions, particularly in relation to public roads. In one Level 1 (track-based) course, the provider stated that 'within the boundaries of good sense and safety, the speed you ride is up to you'. Similarly, another provider referred specifically to ensuring 'safety' at the training venue only. Another provider included a small section on each page stating that 'safety is a key objective for (the provider) and has a large focus in the training courses on offer' and in other information indicated that courses at all levels aim to enhance safety on public roads. One provider also referred specifically to an objective to 'improve your on-road safety'. The absence of any literal reference to 'safety' of course does not necessarily mean that it was overlooked. For example, one provider's homepage stated that 'the primary objective of all courses is to minimise the chance of being involved in a road crash', although the term 'safety' was not used.

All provider websites and online course descriptions were searched for references to 'roadcraft' and/or 'road craft'. There were specific references to 'roadcraft' or 'defensive riding' in six of the providers' websites (Table 2), and three providers also used the term in their course descriptions. Only one reference to 'roadcraft' in the online content approached any explanation of the term, describing it as including 'group riding, overtaking, line sacrifice, creating a buffer at any time, braking in a corner, manoeuvring in tight areas, and road positioning'.

Task 2: Interviews with PLRT Providers

Table 3 summarises the information collected regarding the 29 course options offered by the eight interviewed providers.

Providers were asked if they could rate the average skill level of PLRT attendees. The overall response was that participants' motorcycle control skills were often poor, with braking skills a particular concern. When asked what aspect of training participants were most enthusiastic about, one provider responded that they 'should be most enthusiastic about the front brake, but they're not'. The stated objective of providers overall was to see 'improvement' at the end of training.

End of course testing was not conducted as such for any of the PLRT options identified. Providers of track-based courses appeared to conduct some form of assessment for entry to higher level courses, but details of the assessment/s were not sought by the researchers. Providers were not asked whether they conducted formal PLRT course evaluations, but note that these courses were not subject to auditing as applied to the mandatory pre-licence courses. One provider noted that they invited post-course feedback from participants, which most were said to have provided with variable detail.

Table 3. Post-licence training participation among interviewed NSW providers*

Provider	Trainee Age range	Male %	Motorcycle types	Returning %	Average skill level	Trainees per year
A	Up to 87	95	Sport	NA	Variable	Up to 900
B	18-60	NA	Touring, Cruiser	20	NA	Up to 40
C	Up to 80	80	NA	20	NA	NA
D	NA	85	Mixed	10-15	Poor	NA
F	20-75	80	NA	NA	Poor	NA
G	NA	84	Sport, Touring, Adventure, Cruiser	25-30	Avge-poor	~320
J	17-60	50	Cruiser, Adventure, Touring	40	Avge-poor	>200

*Relevant information was not obtained from one interviewed provider. NA = Not available.

Returning riders

Providers indicated that 10 to 40 percent could be categorised as 'returning riders'. The estimate was highest for the only provider offering a 'Refresher Rider' course explicitly targeting this group. Many other providers indicated the suitability of some courses for returning riders, but their course titles did not explicitly target this group.

Courses with the lowest representation of returning riders appeared to be those that are exclusively track-based with high-level skills development focus. One provider also reported efforts to increase returning rider representation, noting that these riders can tend to exhibit concerning levels of over-confidence.

Motorcycle types

The mix of motorcycle types reported differed according to the particular courses and course providers, with track-based courses predominantly attended by riders of sport motorcycle. One provider indicated that there was no particular 'stand out' motorcycle type in his experience and, further, that a mixture of different types was not difficult to manage due to riders generally being graded on 'pace' rather than motorcycle type. However, this provider reported that cruiser riders had relatively greater challenges to overcome in cornering and braking due to lower ground clearance and heavier machine weight compared with other motorcycle types.

Another provider talked of some of the challenges faced as an instructor when confronted with an apparent student-motorcycle mismatch. To summarise, a physically small rider had acquired a relatively large and tall 'Adventure' type motorcycle. This motorcycle choice was reportedly influenced by an adventure riding story that the student had seen on television. Clearly reluctant to tell his client that she had erred in her choice of motorcycle, he went on to discuss a strategy to support the rider in successfully managing the associated physical challenges.

Addressing individual needs and specified competencies

The specified competencies were often framed as skills or abilities by providers. The interviews showed that the courses often address a wider range and greater number of competencies than suggested by the online material. When asked about how they address the specified competencies, the response was typically that the training was individually tailored. In the case of lower level courses, a modified version of the pre-provisional curriculum was sometimes followed but otherwise set curricula were either highly flexible or avoided altogether. Although each provider appeared to have a somewhat different approach, potentially influenced by student characteristics as well as course design, similar outcomes were generally sought for equivalent-level courses across the providers.

For example, the discussion with the provider of the 'Refresher Rider' course outlined the course background, content and process. This three-hour course was said to be popular with returning riders and was usually conducted one-on-one. Participants often took the course before returning to riding and an element of the training was said to address participants' unfamiliarity with a new motorcycle where appropriate. When asked about specific competencies, the provider stated that they first conduct an assessment to gauge students' apparent skill level, including demonstration of how to start and stop in the 'ready position' and basic low speed cornering. This occurred before going on-road, as did a component on roadcraft covering buffering, lane positioning and general hazard avoidance. The on-road component began initially on quiet roads, where the student led the instructor with regular stops and debriefings.

Another course was primarily aimed at pre-provisional riders but was well attended by returning riders who were said to comprise 20 percent of participants on average and on occasions, an entire group. The components of this half-day closed-circuit course progressed through: posture, mount/dismount, the 'ready position' and starting; left turns (said to be the direction that most did well); gear changing; hill starts; slow rides (gears 1-3, maximum 60 km/h); right turns; harder braking; and cornering preparation (including posture, scanning, path choice). A lead-follow method was employed, with the lead alternating in this case between student and instructor in contrast to the course previously described.

Another provider suggested all their post-licence courses included the same basic components, commencing with posture which was said to 'feed into all else'. Next addressed were braking and downward gear changes including revving on the change to enhance compatibility of engine and wheel speeds (sometimes referred to as 'blipping'). Simulated hazard avoidance using traffic cones was then reportedly addressed, followed by cornering, lane positioning and buffering. The provider also noted attention to 'mental skills', interpreted broadly to include situational awareness, behaviour and attitudes appropriate to the riding context, as well as physical skills.

Unlike most others, one provider followed a set curriculum for the first three of its four training levels. Attracting mostly 'sport' riders, the curriculum was described as set, but tailored, involving a mixture of classroom and track sessions, with drill sheets to be completed. The course reportedly focused primarily on cornering, vision and improvement of related skills, while roadcraft did 'get a mention' during lower level courses.

Roadcraft and defensive riding

As proposed earlier by the authors, roadcraft can be viewed broadly as an optimal combination of practical skills, situational awareness, hazard perception and response, and attitudes and behaviours. With some exceptions, most

courses appeared to address the principles of roadcraft and defensive riding, but varied in the extent to which and the ways in which they did this. The terms and concepts used by providers in reference to roadcraft included the following, in no particular order:

- Buffering
- Lane positioning
- Following distance (gap to vehicle in front)
- Sideswipe risks
- Hazard perception
- Scanning
- Planning in advance (choosing the time to ride)
- Decision-making (choosing between high risk and low risk)
- Group riding
- Mental skills (self-control)
- Overtaking
- Line sacrifice
- Braking in a corner
- Manoeuvring in tight areas

These terms and concepts are neither mutually exclusive, nor independent where cognition is involved from basic practical skills and their execution. For example, choosing an appropriate following distance or whether to overtake are aspects of decision-making and self-control. Additionally, they were apparently addressed selectively not only among the providers but also among the courses offered, usually based on perceived need or value. Indeed, in a small number of cases attitudinal concerns were reportedly addressed outside the concept of 'roadcraft' as such, with one provider noting for example that some participants would appear to 'pay to argue'. In other words, some riders were not very open to learning or absorbing what was taught.

The extent to which roadcraft was included as an explicit course component varied. One provider indicated that roadcraft was a program element that was currently under development. In contrast, another relatively new provider appeared to have already fully incorporated roadcraft into their overall training program. Yet another provider indicated that roadcraft sessions were an optional course component.

Discussion

The current research sought to examine the PLRT environment in NSW and to identify course options showing potential to improve safety outcomes for licensed motorcycle riders, in particular through attention to identified skills and competencies. A wide range of options were identified and the PLRT environment continues to evolve in terms of course content and availability. Some of the available options had road and traffic safety

improvement as explicit core objectives, while others did not. Generally, courses of the latter type (track-based) may attract participants with higher sensation-seeking tendencies, while those of the former type may appeal to riders who are relatively risk averse. Although this proposition invites speculation as to potential safety outcomes, it is unfortunately not possible in the current research to estimate the effects of either type of course in terms of on-road crash and injury risk. Evaluations of specific PLRT programs to date are extremely limited, have been methodologically compromised and have shown mixed results (Kardamanidis et al., 2010). However, regardless of the type of course, the stated key goal of PLRT providers generally is to improve participant skills, knowledge and abilities. Providers reported achieving this to varying degrees with most participants across all levels. As noted, however, PLRT is not subject to external auditing and formal post-course testing of participants was not conducted by providers for the purpose of internal evaluation.

As both a fundamental attraction and an inherent challenge of motorcycle riding, it is unsurprising that much attention and emphasis in PLRT concerns cornering and related skills. Vision, scanning and observation skills are important for more than just hazard perception in the context of motorcycle riding and can be considered integral to cornering manoeuvres in general. In this sense, where providers pay specific attention to cornering, they can also be expected to address in some way vision and observation as part of those activities. However, it is important to distinguish between traffic and non-traffic contexts in relation to these skills and competencies, feeding into the concept of roadcraft. To the extent that roadcraft and defensive riding are attitudinal and behavioural issues, it is interesting that relevant course components can be optional; negative attitudes toward (and avoidance of) a roadcraft component may reflect a belief among some PLRT participants that they have little or nothing to learn in that area.

The deficient skill levels frequently observed by some providers seemed in part to reflect a perceived failure of pre-licence training and assessment. Several providers expressed frustration with the then-current motorcycle rider licensing and training system. These issues were beyond the scope of the current research and providers were therefore not asked to expand on such comments. However, there is potential for research to further examine why some fully licensed riders present to PLRT courses lacking basic skills and competencies. While pre-licence training and assessment may be a factor in these observations among providers, other factors including lack of recent riding experience (practice) and/ or general complacency toward maintaining skills may also contribute. Responses on returning rider representation were estimates only and given the lack of a clear 'returning rider' definition, reluctance or inability among providers to offer an estimate is understandable. Nonetheless, returning

riders appear to comprise a substantial proportion (10 – 40%) of all PLRT participants and are included in those observed by some providers as lacking basic skills.

The current research suggests that PLRT frequently aims to correct unsafe behaviours and improve basic skills as well as strengthening the competencies of riders who are relatively accomplished. The absence of direct evidence of safety effects is acknowledged in the current research, while any positive effects of PLRT on motorcycle safety overall may be minimal due to low participation rates. Unfortunately, with relevant data not obtained from several providers, it has not been possible in the current study to reliably estimate PLRT participation rates (see Table 3). However, with just over 241,000 registered motorcycles and scooters in NSW in 2018, it seems likely that only a small fraction of licenced riders undertakes PLRT in any given year (acknowledging that some individuals hold multiple registrations).

As noted in the introduction to this paper, clear support for PLRT has been shown among local and international stakeholders. The current research supports their promotion of ongoing, repeated and progressive training experiences. However, there are relatively few riders self-selecting for PLRT. On the prospect of mandating PLRT participation either periodically for continuing riders or as a 'refresher' for returning riders (however they be defined), there is currently no evidence base for program effectiveness to support such a recommendation. The challenge of objectively evaluating PLRT effectiveness in reducing crash risk thus remains a topic for further research. Whether voluntary or mandatory, efforts to increase participation must consider the diversity of PLRT programs available, as identified in the current research, and that course costs are a likely barrier for many riders. Further, it is not clear which strategies, such as increased advertising and promotion or added incentives, would significantly increase participation.

Conclusions

The research identified 36 practical PLRT courses and four theoretical, classroom or workshop options that may assist riders to manage potential crash risks. Trainees were reported to have vastly different characteristics, needs and objectives for undertaking training; some reportedly required skills development from a low level while some were highly competent. This reflects a need for a diverse range of course offerings, which appears to be largely met across NSW overall, although courses were geographically limited and some course costs a potential if not likely barrier to participation.

Many of the PLRT programs contained, and were often structured around, the key competencies identified above. There was generally no standardised curriculum and, arguably, such an approach would not provide the flexibility needed for providers to realise the goal of 'improvement' across a diverse PLRT participant population. Providers indicated that prospective PLRT participants sometimes lacked basic skills that could be expected to be acquired through pre-licence training. Prerequisites were usually set for higher level course participation, and training was often tailored to participants' individual requirements.

The extent to which each training course would likely support riders to manage on-road risks was examined, based on the inclusion of key competencies in program components, as well as the broadly defined concepts of 'roadcraft' and 'defensive riding'. Around half of available courses appeared likely to support riders' risk management, clearly addressing both skills and roadcraft, while 20 percent appeared to include only limited skills and roadcraft content. The remaining options were track-based courses, with a higher degree of uncertainty regarding potential road safety benefits.

Advocacy for motorcycle rider training, including voluntary PLRT, continues among stakeholders as a key strategy for improving rider safety and reducing motorcycle crash risk. With existing evaluations of rider training showing mixed results and notable limitations, and with a wide range of PLRT options available, the need seems clear for further research examining the potential contribution of specific forms of PLRT toward achievement of road safety strategy goals.

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