Positioned for Safety 2010

A Motorcycle Safety Strategic Plan
2007–2010




MOTORCYCLE COUNCIL OF NSW

MOTORCYCLE
COUNCIL OF NSW
INCORPORATED
RIDERS UNITED

Before *Positioned for Safety*

- Motorcycle safety was not identified in the state road safety strategy, *Road Safety 2010*.
- Motorcyclists were not recognised as vulnerable road users with special needs.
- There were no behavioural programs to improve motorcycle safety.
- There was no recognition of the motorcycle hazards inherent in some road design features.

What was going wrong?

The MCC represented motorcyclists in NSW, but:

- were reactive rather than involved in setting motorcycle safety policy
- operated outside the road safety community network
- did not have access to basic motorcycle crash data
- did not have access to road safety expertise.

The strategic planning process involved:

- analysis of motorcycle crash data
- interviews with a wide range of stakeholders
- a survey of motorcyclists
- stakeholders' planning workshop.

Key stakeholders included:

- ambulance service
- automotive industry
- insurance industry
- local government
- motorcycle crash investigators
- motorcycle media
- motorcyclists
- police
- rider trainers
- road authorities
- road design and traffic engineers
- road safety researchers
- transport planners.

THE OUTCOME OF THE PROCESS

- Identified issues, misunderstandings and priorities.
- Defined 10 objectives.
- Described 91 strategies for achieving the objectives.

After *Positioned for Safety*

***Positioned for Safety* represented a watershed at its release in June 2002.**

- In 2005, an evaluation found that the plan had achieved significant benefit with 73% of the strategies having achieved outcomes.
- Road safety agencies and motorcyclists are now talking the same language.

The members of the MCC:

- gained understanding of the political imperatives, government processes and division of responsibility for road safety in NSW
- established communications with a wide range of road safety stakeholders.
- gained access to motorcycle crash data
- discovered opportunities for funding road safety projects.

Stakeholders gained increased understanding of:

- how to communicate with motorcyclists
- the MCC as a key stakeholder and conduit for consultation
- motorcyclists as road users with special needs
- motorcycle physics and environmental factors in crashes
- different perspectives on crash data and risk rates.

BROAD OUTCOMES

- The MCC is a more informed and effective lobby group.
- The MCC is recognised as the peak body representing motorcyclists in NSW.
- Communications with government agencies have been improved, and there is more effective two-way flow of information and consultation on motorcycle issues.
- Reliable data is now available, enabling the MCC to make informed and effective input to policy.
- Shared objectives for motorcycle safety have been recognised, and different perspectives have been reconciled.
- The MCC has a direction and a framework for its agenda for change, and priorities and objectives for the next few years have been set.
- Other stakeholders have a direction and a framework for motorcycle safety.
- Other organisations that had not previously recognised a role in motorcycle safety have a raised awareness of motorcycle issues.

Foreword

Motorcycles and scooters are the fastest growing sector of road users in NSW. For many riders, they are a convenient, cheap and fun solution to traffic congestion and parking. They have a small environmental footprint in terms of manufacturing, fuel usage, emissions, space occupancy and recyclability.

Despite a 63% increase in motorcycle numbers since 1995, the overall crash rate has decreased by 32% and the fatality rate has decreased by 36%. Motorcycling is much safer today than it was a decade ago, but motorcyclists still represent a significant proportion of road user casualties. Motorcycles make up just 3% of registered vehicles in the state, but motorcyclists represent 12% of road user fatalities and 8% of all those injured.

In 2001, with funding from the Motor Accidents Authority of NSW (MAA), the MCC undertook development of *Positioned for Safety*, a road safety strategic plan. This was a significant step for a volunteer organisation and demonstrated our frustration at the lack of action for motorcycle safety.

At the time there was little funding or provision for the special needs of motorcyclists as vulnerable road users in transport planning, facilities, road design or road safety behavioural campaigns. It was through the strategic planning process that we were able to recognise a number of important gaps in understanding between the road safety profession and motorcyclists.

While there is still much to do, motorcycle safety is now firmly on the road safety agenda in NSW. There has been less progress with transport and infrastructure planners, who have been slow to recognise the potential benefits of motorcycles as an environmentally friendly solution to traffic congestion without major investment in new transport infrastructure.

This 2007–2010 strategic plan is an effort to promote better understanding of motorcycle safety issues by providing practical information. We hope through this process to establish more productive relationships between government agencies and the motorcycling community. We believe that appropriate planning and strategies with adequate funding will deliver far better outcomes for the whole community in NSW.

We warmly thank the Motor Accidents Authority of NSW for their continued support in funding both of our strategic plans and a number of other motorcycle safety initiatives.

Guy Stanford
Chairman
Motorcycle Council of NSW

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DISCLAIMER: We are grateful to those who have provided the information and advice that has assisted in the development of this motorcycle safety strategic plan, however the views expressed in this document are those of the Motorcycle Council of NSW (MCC).

About the Motorcycle Council of NSW (MCC)

The Motorcycle Council of NSW Inc. (MCC of NSW) is an internationally recognised umbrella group for motorcycle clubs, associations and ride groups in the state of NSW. Established in 1982, the MCC represents over 47 clubs, with more than 38,000 riders.

The MCC is run on a voluntary basis and works with parallel organisations from other states and territories on commonly agreed goals. It is affiliated with the Australian Motorcycle Council (AMC), and has international connections, which include the Federation of European Motorcycling Associations (FEMA).

MCC membership is open to motorcycle clubs but not to individual members. Each member club has two delegate seats on the MCC, which meets monthly in Sydney. There are also separate monthly meetings of the Executive, which determines priorities. Membership is free. The MCC relies on volunteer work by members for all its activities, including fundraising. The MCC co-ordinates Motorcycle Awareness Week each year with funding support from the RTA.

The MCC is run on democratic lines. Member clubs raise issues from their own meetings via their delegates for discussion. The decision on whether an issue will be actioned or not is determined by a vote of the delegates. Some of the issues that have been taken up by the MCC include hard-wired headlights, rider training, exhaust label laws, fuel sticker laws, road maintenance practices, tolls, e-Tags, motorcycle awareness and insurance issues.

The MCC counts among its major achievements:

- the development and implementation of *Positioned for Safety*, the first motorcycle safety strategic plan
- the development of an internationally acknowledged website to provide information about motorcycle safety issues to riders at **<www.roadsafety.mccofnsw.org.au>.**
- commissioning and publishing *Barriers to Safety*, a research report into safety barriers
- the development of the NSW Learner Approved Motorcycle Scheme (LAMS)
- the introduction and annual coordination of Motorcycle Awareness Week.

The MCC also provides donations and supports member clubs in a wide range of community activities and charity projects. Other information about the MCC and a list of their community activities is available on the website **<www.mccofnsw.org.au>.**

Contents

Introduction

In 2001, the Motorcycle Council of NSW (MCC) developed a strategic plan for improving motorcycle safety. Since then, there has been an increased focus on motorcycle safety in NSW. There are now state-funded campaigns targeted at riders and other motorists, and a wide range of regional and community programs by local councils. In implementing their initial strategic plan, called *Positioned for Safety*, the MCC undertook several significant projects, including researching rider fatigue and protective clothing, developing a website to deliver motorcycle safety information to riders, and organising an industry seminar on protective clothing. The MCC has also been involved in a number of conferences and other forums to inform road safety professionals about motorcycle safety issues.

Positioned for Safety 2010 is the second strategic plan. It has been developed to build on the achievements of the first to continue the work of improving motorcycle safety in NSW.

BACKGROUND TO THE FIRST STRATEGIC PLAN

The development of *Positioned for Safety* in 2001 was possibly the first instance of a volunteer road-user group applying strategic planning methods to their own safety needs. At the time, motorcycle casualties in Australia were increasing, but there was little government investment in identifying causes or solutions beyond enforcement. Among 27 OECD nations, Australia ranked ninth-best for road safety, but ninth-worst for motorcycle safety. Motorcycle fatalities were almost double the median for OECD nations—that is, 6.2 per 10,000 registered motorcycles in Australia compared to the OECD median of 3.6 (ATSB, 2004a).

In 2001 the actual crash involvement rate for motorcycles in NSW was comparable to that of cars (272.1 vs 272.9 per 10,000 registered vehicles), but motorcyclists were four times more likely to be involved in a fatal crash (7.9 vs 1.9) and more than twice as likely (236.3 vs 101.1) to be involved in an injury crash (RTA, 2001a). Despite such figures, motorcyclists were not identified for targeted road safety programs. Through consulting with road safety agencies, it was discovered that, at the time, many road safety professionals believed motorcyclists were adequately covered under general road safety campaigns directed at all motorists. It was also believed that it would be difficult to effectively deliver targeted information to motorcyclists because they were a relatively small but divergent group of road users. A key finding of this consultation process was that the MCC was not recognised as a key stakeholder for consultation about motorcycle safety issues by the various road safety agencies (de Rome et al., 2002).

The MCC Executive believed that there was a need for more research, and for targeted programs to address motorcycle safety. They obtained the support of the Motor Accidents Authority of NSW (MAA) who funded the development of a motorcycle safety strategic plan. This first strategic plan, *Positioned for Safety*, was the product of consultation with the main stakeholders from government and industry and a survey of riders in 2001. It identified key motorcycle safety issues in NSW and listed 91 strategies for addressing them. It was published in 2002 and distributed to all identified stakeholders with responsibilities for road safety and injury prevention.

OUTCOMES

Three years later, in 2005, an independent evaluation reported that *Positioned for Safety* had achieved considerable success. The evaluation found that 75% of the strategies had achieved outcomes and that there had been an observable increase in the level of activity associated with motorcycle safety in NSW by government agencies, researchers and the community. In addition to the MCC's own projects, there was a range of initiatives by other agencies which may be directly or indirectly linked to the strategic plan. These included a state-funded motorcycle safety advertising campaign, and community-based projects by many local councils. Almost all (98%) of the local councils who had responded to the evaluation survey (n=69) stated that they were aware of *Positioned for Safety*. Of these, 60% included motorcycle safety in their strategic or annual road safety plans, and 73% were able to cite specific motorcycle safety projects (Riches, 2005). This latter figure is particularly significant when one considers that surveys in the period 1993–99 identified some 1,500 road safety projects by local councils, none of which were directed towards motorcycle safety (RTA, 1998; 1999b).

A second survey of motorcyclists was undertaken by the MCC in 2006 to inform the development of the second motorcycle safety strategic plan. That survey asked about riders' awareness of motorcycle safety messages, experiences of rider training, crash involvement, and perceptions and management of risk. Details were also sought as to the type of protective clothing worn by riders and their pillions. These responses were then compared to those given in 2001 to determine whether there had been any change in the road safety and risk management activities of motorcyclists during the intervening period.

The results suggest that the increased publicity about motorcycle safety has registered with riders. A higher proportion of respondents in 2006 (68% vs 76%) could recall a motorcycle safety message that made them pay attention. In the 2001 survey, motorcycle magazines and rider trainers had been the source of over half (59%) of the safety messages, but a far wider range of sources was reported in 2006. In particular, there appears to have been a general increase in safety dialogue amongst riders, with 21% citing other riders as the sources of the most memorable safety message that they had heard, compared to only 4% in 2001 (de Rome & Wood, 2007; de Rome & Brandon, 2007).

The successful development and implementation of *Positioned for Safety* has been an impressive achievement for a community organisation funded and staffed entirely by volunteers. The ongoing support of the MAA has been central to this success by providing further project grants. The grants fund the implementation of some of the strategies by other stakeholders and road safety professionals. A summary of the key achievements is provided in the appendix. Outcomes include the following.

- Improved communications have led to a better understanding of motorcycle safety issues by government agencies. The MCC has also gained a better understanding of government processes and division of responsibilities. This has enabled open discussion and acceptance of different views. Debate is no longer polarised because both sides now acknowledge the range of factors contributing to motorcycle crashes, including rider behaviour, other drivers and the road environment.
- Reliable data on motorcycle crashes is now available and provides a credible basis for the MCC to develop positions and prepare submissions for effective input to policy. This has also enabled the MCC to provide riders with data on crash risks and associated factors to inform their own rideing behaviour.

- Direction and a framework for activity has been established for the MCC and other stakeholders. Issues are no longer raised on an ad hoc basis. The MCC is now setting its own agenda for change. Priorities have been determined, with clear objectives for the next five years. Other stakeholders are able to link their initiatives to the objectives of *Positioned for Safety*.
- Raised awareness of motorcycle safety is also evident within a number of government and non-government agencies who had not previously identified a role in motorcycle safety. One of the most far-reaching outcomes has been the increased level of motorcycle safety activity in local government.

CONCLUSIONS

Positioned for Safety represented a watershed at its release in June 2002. It has become evident that the process was as important as the product, both for the motorcyclists and for many of the agencies involved. It created new networks by introducing the range of stakeholders to each other. It has enabled the road safety agencies and motorcyclists to develop a better understanding and appreciation of each other's perspectives. These interactions have led to synergy, with enhanced understanding and gains on all sides.

The members of the MCC have developed a better understanding of motorcycle safety issues within the policy development system. As a result they are a more informed and effective lobby group and are finally recognised as the peak body representing motorcyclists in the state. However, the process has also stretched the limits of the MCC as a volunteer-run organisation, and ongoing success is largely dependent on the involvement of a small number of dedicated individuals. This new strategic plan attempts to take account of this limitation and build sustainability into the system.

A

BACKGROUND

01 Motorcycle safety internationally

INTERNATIONAL CONTEXT

The resurgence of motorcycling in Australia in recent years is paralleled in all Western countries, leading to many more motorcycles on the roads, and more crashes and casualties. However, what has become apparent is that there is not a simple linear relationship between the number of riders and the number of crashes.

In the USA, between 1991 and 2001, the number of registered motorcycles increased by 17%, and the number of riders killed increased by 14% (NHTSA, 2004). Over a similar period in the UK (1993–2001) there was a 28% increase in motorcycling traffic and a 7% increase in motorcycle fatalities (AGM, 2004). By contrast, in Australia, while the number of registered motorcycles increased by 24%, motorcycle fatalities actually decreased by 6% (ATSB, 2002). Australia's record for motorcycle safety appears relatively good, particularly when compared to the USA but, as noted earlier, it is poor in contrast to our record of safety advances for other road users.

By 2000, as the number of motorcyclists continued to increase, there was mounting pressure to revise the approach to motorcycle safety in Australia as well as in Europe and America. While there are justifiable grounds for regarding motorcycling as a relatively high-risk form of transport, the focus on risk had prevented the advantages of motorcycles as a form of transport from being recognised. As a result, road safety professionals tended to focus on rider behaviour, whereas riders focused on external factors such as the road environment and other motorists. The divergence of views may best be understood as a cultural difference. Road safety practitioners, looking at crash statistics and comparing risk profiles, may view motorcycling as a high-risk form of transport to be contained or discouraged; motorcyclists, having made the choice to ride, are more likely to think in terms of identifying and managing risks. It is this cultural difference that must be bridged to enable road safety professionals and the motorcycling community to work together effectively.

STRATEGIC APPROACHES TO MOTORCYCLE SAFETY

The US was the first country to take a strategic approach to motorcycle safety with the publication of the *National Agenda for Motorcycle Safety* (MSF, 2000). Perhaps the most important achievement of the *National Agenda* was that it was a partnership between a road authority and the motorcycle community, and was based on acceptance of different views.

In 2001, the European Union released a comprehensive review of the literature on the use and safety of mopeds and motorcycles in Western European countries (Noordzij et al., 2001). The Royal Society for the Prevention of Accidents (RoSPA) in Britain also reviewed motorcycle crash risk and issued a position paper on motorcycling safety (RoSPA, 2001).

In Australia, after the MCC, with funding from the MAA, produced its first strategic plan *Positioned for Safety* (de Rome & Stanford, 2002), two state road authorities—VicRoads and the RTA—also developed motorcycle safety plans. The road authorities in Tasmania and South Australia followed, with plans released in 2003 and 2004 respectively.

Perhaps the most significant international development has been the UK government declaring a commitment to mainstreaming motorcycling in transport policy in *The Government's Motorcycling Strategy* (DFT, 2005). This is significant because, for the first time, a government has accepted a role both in promoting the advantages and managing the risks of motorcycles as a separate class of road use. This stage is yet to be achieved in Australia, where the position of motorcyclists is similar to that of bicycle riders over 20 years ago.

02

Strategic planning for motorcycle safety

PURPOSES OF THIS PLAN

Positioned for Safety 2010, the MCC's second motorcycle safety strategic plan, is intended to provide a framework and direction for the MCC and other stakeholders in motorcycle safety. Its refocused approach aims to take into account what has been learned and what has already been achieved, and to recognise the new challenges that have emerged.

We have continued to use the structure of the state strategic plan, *Road Safety 2010* (RTA, 1999a), in order to ensure motorcycle priorities and strategies can be integrated with the work of other stakeholders.

Road Safety 2010 addresses road safety from four perspectives.

1. **Safer People** focuses on encouraging safe behaviour by road users.
2. **Safer Roads** focuses on the planning, design and maintenance of a safer road environment.
3. **Safer Vehicles** focuses on encouraging the development and application of new and safer technology.
4. **Community Based Action** focuses on raising community understanding of road safety issues, and on promoting involvement and coordination between all road safety stakeholders.

The NSW Government's commitment to community involvement at the local level underpins the whole framework of *Road Safety 2010*. As a community organisation, the MCC has accepted the challenge to become involved by providing a focus for the activities of motorcyclists and other road safety stakeholders.

Positioned for Safety 2010 will contribute to improving motorcycle road safety in NSW by:

1. establishing clear road safety goals for the MCC and the motorcycling community
2. developing stakeholder support, awareness, ownership and participation in the process of improving road safety for motorcyclists
3. establishing an information base for coordinated motorcycle road safety initiatives.

THE STRATEGIC PLANNING PROCESS

Positioned for Safety 2010 was developed in consultation with a wide range of motorcyclists and other stakeholders. The process was as follows.

Stage 1 Research into motorcycle crashes in NSW was conducted to identify the associated issues and factors. We also reviewed the literature to identify motorcycle safety strategies and ideas from around the world.

Stage 2 A wide range of motorcycle and road safety stakeholders were consulted to obtain their views on the key issues and how to address them. These stakeholders included road authorities, police, rider trainers, local government staff, road design and forensic engineers, road safety researchers, and motorcycling industry and media representatives.

Stage 3 A survey of 1,299 motorcyclists was conducted to further develop profiles of motorcycle riders in NSW, to assist with designing and delivering motorcycle safety information. The survey sought information about sources of safety messages, rider training, participation in motorcycle clubs, crash experience and use of protective clothing.

Stage 4 The information gathered in the first three stages was collected and presented at a workshop for motorcycle and road safety stakeholders. The purpose of the workshop was to discuss and negotiate priorities, objectives and strategies for the MCC for the next three years. The recommendations of the workshop were developed into a plan and a draft circulated for comment by all participants. *Positioned for Safety 2010* is the final outcome of that process.

IMPLEMENTATION

Positioned for Safety 2010 will be implemented in stages over three years by a Steering Committee appointed by the MCC. Each year, the Steering Committee will develop an Annual Action Plan for their activities in the coming year. The Action Plans will identify the specific strategies to be implemented that year, and will provide details of the steps involved, including responsibilities, time frames and budgets. Individual strategies may be implemented by separate project work groups set up by the MCC, however overall responsibility for implementation and monitoring will remain with the Steering Committee. The Steering Committee will report on their progress in implementing the strategies identified in *Positioned for Safety 2010* and the relevant Annual Action Plans each year at the MCC annual general meeting.

There are essentially three levels of strategy in *Positioned for Safety 2010*, which are:

1. strategies that involve the MCC executive directly working at the local, state or national level with other organisations to achieve change in policy or service delivery
2. strategies that involve the MCC educating, informing and/or encouraging motorcyclists through the club network, the MCC website and the motorcycle media
3. strategies that involve motorcyclists working at the local community level to address specific problems in road design and road user behaviour.

The MCC's website will be the key medium for the implementation of the level 2 and 3 strategies above, in addition to being a reference site for motorcycling safety information.

OBJECTIVES OF THE PLAN

The central objective of *Positioned for Safety 2010* is to reduce the incidence of death and injury among motorcyclists. To do this, the plan has the following aims.

1. Ensure motorcycles are recognised as a growing and distinct mode of transport in all road planning and road safety programs.
2. Help influence motorcycle riders to adopt a low-risk attitude to motorcycle riding.
3. Reduce the incidence and severity of single-vehicle motorcycle crashes.
4. Reduce the incidence and severity of multi-vehicle crashes involving motorcyclists.
5. Ensure motorcycle safety is accommodated in the design and maintenance of roads and the road environment.
6. Include provision for motorcyclists in transport planning and facilities.
7. Increase motorcyclists' awareness, acceptance and usage of appropriate personal safety equipment.
8. Promote awareness of the risks to motorcyclists that are associated with the design features of some motorcycles and other vehicles.
9. Improve understanding, consultation and communication between government agencies and the motorcycling community.
10. Improve the public image and acceptance of motorcyclists.

MOTORCYCLE SAFETY ISSUES TO BE ADDRESSED BY THE PLAN

Using the four perspectives of road safety developed in the RTA's *Road Safety 2010* strategic plan (RTA, 1999a), ***Positioned for Safety 2010*** addresses the following motorcycle safety issues.

1 SAFER PEOPLE: road user behaviour

1.1 There is a need to address the behaviour of those motorcyclists who ride without consideration for their own safety or that of other road users.
1.2 There is a need to address the behaviour of those drivers who lack awareness and consideration for motorcyclists' safety.
1.3 There is a need for motorcyclists to better understand and manage road hazard risks.
1.4 There is a need to address unlicensed riding and reckless behaviour.
1.5 The crash-reduction benefits of novice rider training and practice are not well established.
1.6 The motorcycle rider training and licensing scheme does not incorporate post-licence training or assessment.
1.7 There is a lack of courtesy and tolerance demonstrated between all road users.
1.8 Safety information is not effectively disseminated to motorcyclists.

2 SAFER ROADS: road environment

2.1 Road fixtures and furniture may create crash and injury risks for motorcyclists.
2.2 Maintenance and upgrading practices may create crash and injury risks for motorcyclists.
2.3 The designers of new roads are not required to consider the specific vulnerabilities of motorcyclists.
2.4 Crash records are not used systematically to monitor and guide road maintenance practices.

3 SAFER VEHICLES AND EQUIPMENT: training and licensing

3.1 There is no independent, reliable information available to motorcyclists about the protective performance of motorcycle clothing and helmets.
3.2 There is no systematic monitoring or research into the safety of motorcycle engineering developments.
3.3 The vehicle regulation and Australian Design Rules systems do not provide adequate protection for road users.

4 COORDINATION, COMMUNICATION AND POLICY

4.1 Motorcycles are not recognised as a separate class of vehicle for road safety policy, or for traffic management and transport planning.
4.2 There is insufficient government investment in motorcycle safety research and development.
4.3 Police crash reporting does not provide sufficient information for analysing and researching motorcycle crash data.
4.4 There are insufficient avenues for consultation and independent advice to government on motorcycling issues.
4.5 There is insufficient industry involvement and support for motorcycle safety initiatives.
4.6 Government services do not adequately provide for motorcyclists.
4.7 The sustainability of motorcycle safety strategies depends on the resources of the MCC.

03 Motorcycle safety in NSW

MOTORCYCLE SAFETY SINCE 2001

There have been significant changes in relation to motorcycle safety in Australia since 2001. Overall, motorcycling in Australia is far safer now than it was during the last peak of interest in the 1980s, when there were more than 14 fatalities per 10,000 vehicles per year. The national rate of motorcycle fatalities decreased from 6.16 in 2001 to 5.52 in 2005. This improvement is largely due to fewer fatalities in 2001 in the Northern Territory, Victoria, NSW and WA, with more modest improvement in Tasmania. In contrast, SA, Queensland and particularly the ACT have moved against the trend with increased motorcycle fatality rates. Table A shows these figures (ATSB, 2006, Table 14).

TABLE A Change in the rate of fatal crashes per 10,000 registered motorcycles, 2001–05

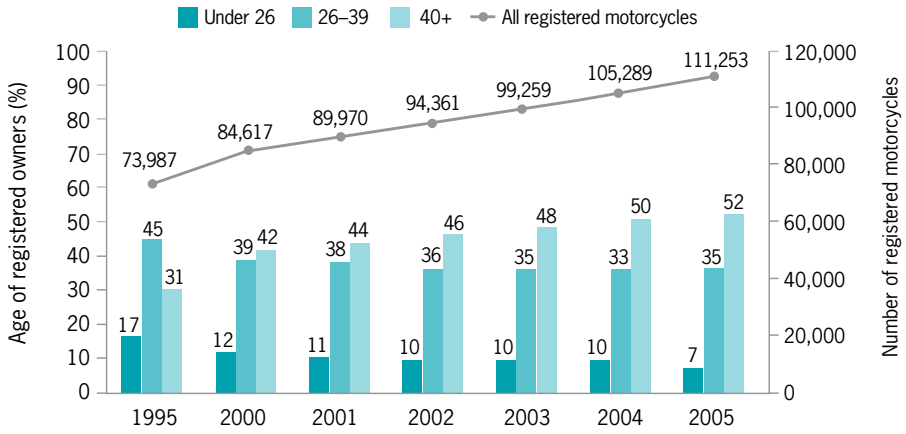
	NSW	VIC	QLD	SA	WA	TAS	NT	ACT	AUSTRALIA
2001	7.71	6.76	3.90	5.01	6.26	8.31	8.35	1.55	6.16
2005	5.58	4.46	6.57	6.19	4.15	7.40	5.89	10.83	5.52
CHANGE	**–2.13**	**–2.30**	**+2.67**	**+1.18**	**–2.11**	**–0.91**	**–2.46**	**+9.28**	**–0.64**

In NSW, motorcycling has the highest casualty rate for any form of motorised road transport. Some 90% of motorcycle crashes result in casualties, compared to 44% of all motor vehicle crashes. The reduction in the fatality rate from 7.71 to 5.58 in NSW is well above the national average. However, while motorcycle crashes comprise only 5% of all crashes in NSW, they represent 12% of all road fatalities.[1]

The number of motorcycles in NSW has increased steadily over the past 10 years. Overall, registrations have increased by 64%, from around 74,000 in 1995 to almost 121,000 in June 2006. Figure A shows the age of registered owners in NSW between 1995 and 2005.

1 Unless stated otherwise, all motorcycle crash data relating to New South Wales is drawn from data provided by the RTA for the period 2001–2005. The analysis does not necessarily reflect the views of the RTA.

FIGURE A Age of registered owners of motorcycles in NSW, 1995–2005



Despite the substantial increase in the number of motorcycles on the road, there has not been a comparable increase in crashes. In NSW there has been an average of 2,267 crashes and 62 fatalities in each of the past five years, which is very similar to the number in 1995. See Table B.

TABLE B Number of crashes in NSW, 1995–2005

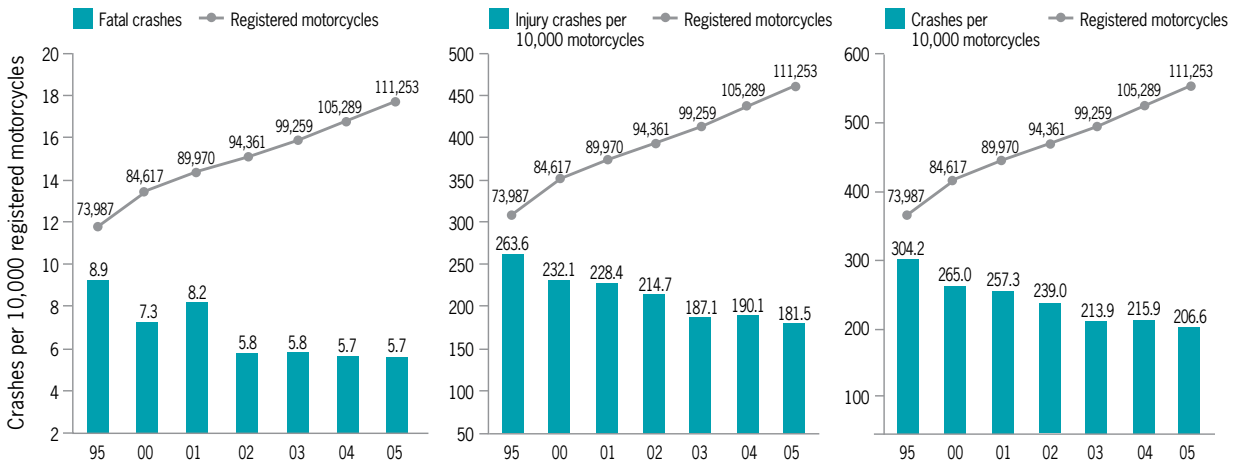
TYPE OF CRASH	1995	2000	2001	2002	2003	2004	2005
Fatal	66	62	74	55	58	60	63
Injury	1,950	1,964	2,055	2,026	1,857	2,002	2,019
Non-casualty	235	216	186	174	208	211	216
TOTAL CRASHES	**2,251**	**2,242**	**2,315**	**2,255**	**2,123**	**2,273**	**2,298**

When compared to the number of registered vehicles, the crash and fatality rates per 10,000 registered motorcycles are the lowest they have been in 10 years. See Table C and Figure B.

TABLE C Type and number of crashes per 10,000 registered motorcycles in NSW, 1995–2005

TYPE OF CRASH	1995	2000	2001	2002	2003	2004	2005
Registered motorcycles (actual number)	73,987	84,617	89,970	94,361	99,259	105,289	111,253
Fatal crashes (per 10,000 registered motorcycles)	8.9	7.3	8.2	5.8	5.8	5.7	5.7
Injury crashes (per 10,000 registered motorcycles)	263.6	232.1	228.4	214.7	187.1	190.1	181.5
All crashes (per 10,000 registered motorcycles)	304.2	265.0	257.3	239.0	213.9	215.9	206.6

FIGURE B Crash rates per 10,000 registered motorcycles in NSW, 1995–2005



TRENDS AND ISSUES IN MOTORCYCLE CRASH DATA

The characteristics and causes of motorcycle crashes can be best understood by distinguishing between three different types of crash:

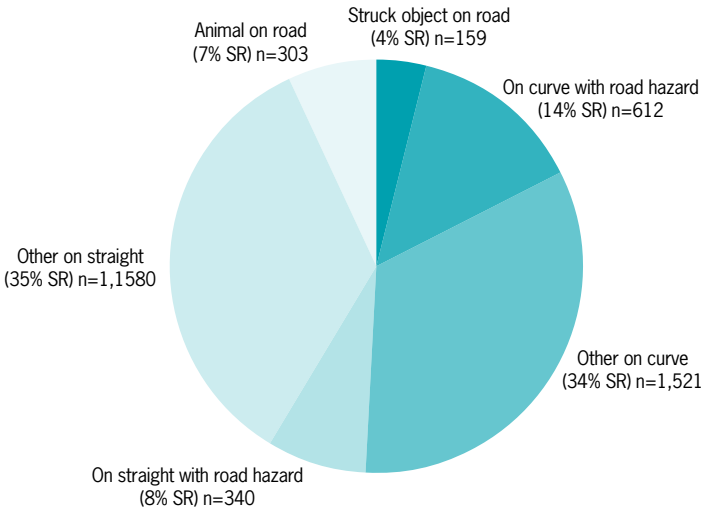
1. single-vehicle crashes
2. crashes with another vehicle/s due to the actions of the other driver/s
3. crashes with another vehicle/s due to the actions of the motorcyclist.

Single-vehicle crashes

Motorcycles have a much higher incidence of single-vehicle crashes than cars. Single-vehicle crashes accounted for 40% of all motorcycle crashes, versus 14% of all crashes in NSW between 2001–2005. Single-vehicle crashes accounted for over one-third (34%) of all fatal motorcycle crashes and more than one-quarter (26%) of all fatal car crashes. There were a total of 4,515 single-vehicle motorcycle crashes in NSW between 2001 and 2005.

Almost half of all single-vehicle motorcycle crashes occurred on curves (n=2,272/4,515). Twenty-one per cent (n=952/4,515) of all single-vehicle crashes were associated with some form of road surface defect or hazard, 7% (n=303) involved animals on the road, while 5% (n=159) struck some other object (including temporary road works). Figure C demonstrates these statistics.

FIGURE C Most common types of single-vehicle motorcycle crashes in NSW, 2001–05



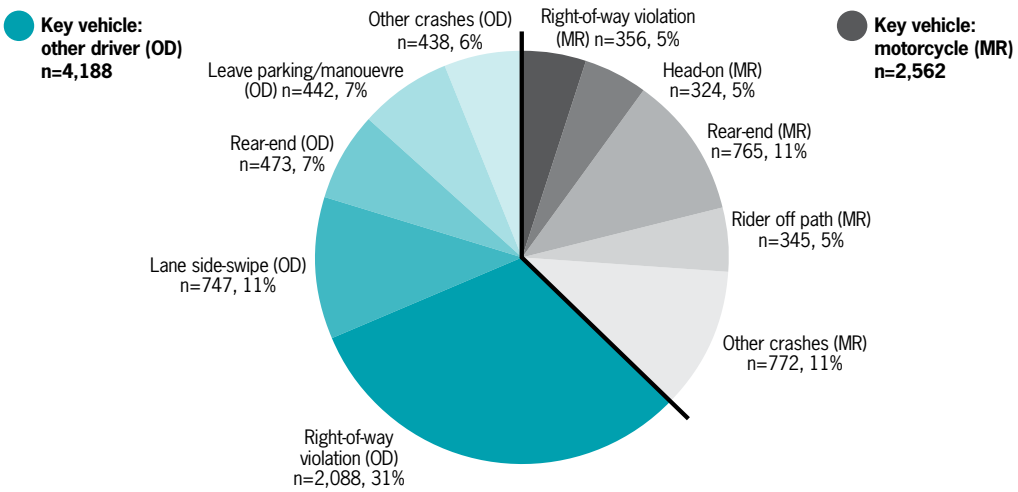
Multi-vehicle crashes

There were 6,750 crashes involving a motorcycle and another vehicle in NSW in the period 2001–05. Multi-vehicle crashes are more likely to be due to the actions of the other driver. The other driver was the key vehicle in 62% of multi-vehicle crashes (n=4,188) compared to the motorcyclist (38%, n=2,562).

Half of all crashes due to the other driver involved failure to give way to a motorcycle, usually at intersections, and in a further 18%, motorcyclists were side-swiped in laned traffic.

Motorcyclists were most likely to be responsible for rear-end collisions (n=765), which accounted for almost one-third of crashes where the motorcycle was the key vehicle. Figure D illustrates the most common types of collision by whether the key vehicle was the motorcycle (MR) or that of the other driver (OD).

FIGURE D Most common types of multi-vehicle motorcycle crashes in NSW, 1995–2005



RIDERS IN NSW

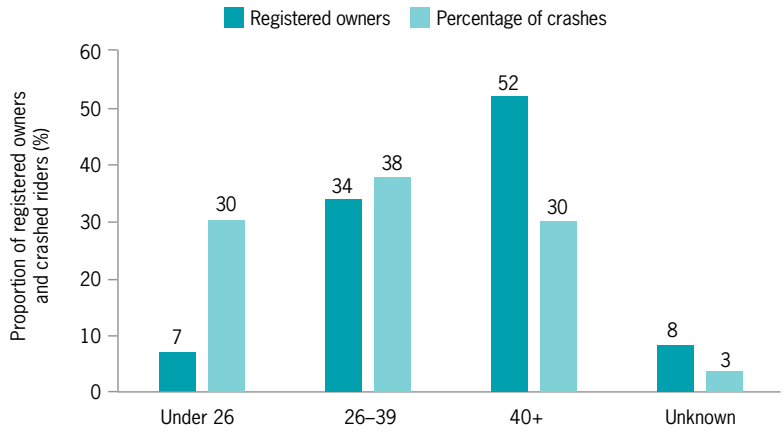
It is difficult to accurately estimate the number of motorcyclists in NSW. The number of motorcycle licences issued is misleading, as many drivers retain the motorcycle endorsement on their driving licence although they no longer own or ride a motorcycle. The number of registered motorcycles is a better indicator, but does not allow for those individuals who own more than one motorcycle nor those who ride machines registered to someone else. There are also an estimated 84,000 off-road motorcycles in NSW which are unregistered (MCC, 2007).

The pattern of ownership has also changed, with fewer motorcycles registered to younger people (under 26 years) than to people aged 40 years or more. In 2006, only 9% of registered owners were aged 25 or under, compared to 17% in 1995. However, we do not know how many young people ride motorcycles registered to someone else, perhaps as a means of avoiding the higher insurance premiums for riders under 25 years of age.

The average age of motorcyclists is now 42 years, due to a substantial increase in the number of older riders. In 2006, older riders (40+ years) comprised more than half (54%) of all registered owners in NSW. This amounts to a 186% increase in the numbers of older riders since 1995. The number of riders aged between 26 and 39 has remained fairly constant.

While it would appear that we do have fewer young rider casualties, there has been little improvement in the crash risk for this age group. Figure E below shows that in 2005, only 7% of registered owners were aged under 26 years, but this age group was involved in 30% of crashes. By comparison, people aged 40 years or more owned 52% of registered motorcycles but were involved in only 30% of crashes.

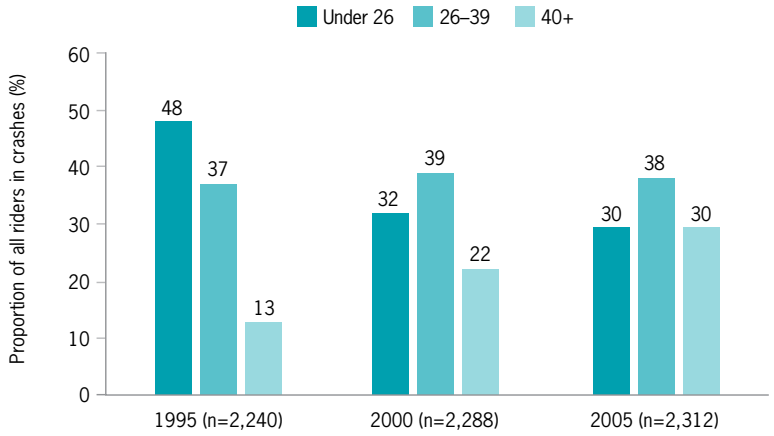
FIGURE E Proportion of registered owners in each age group compared to the age group of riders in crashes, NSW, 2005



However, as noted earlier, the validity of using the age of registered owners as an indicator of the actual young rider population is open to question.

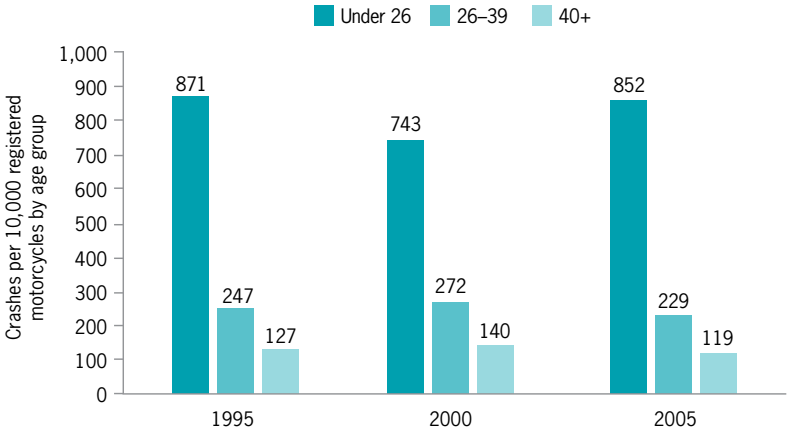
The age distribution of riders involved in crashes has changed significantly in recent years, while the total number of crashes has remained constant. The proportion of young rider casualties (under 26 years) has decreased substantially since 1995, from almost half (48%) of all rider casualties to less than one third (30%). See Figure F.

FIGURE F Proportion of riders in crashes by age group in NSW, 1995–2005



While there are many more older riders involved in crashes, this does not mean that older riders have a higher crash rate. Figure G shows the crash rate for each age group in terms of crashes for every 10,000 motorcycles registered to that age group. In terms of actual numbers, there has not been much change. We do not actually know whether the crash rate for young riders has changed, because we do not know the proportion of young people who are riding motorcycles not registered in their own names.

FIGURE G Crash rate by age group: crashes per 10,000 motorcycles registered to that age group, NSW, 1995–2005



SUMMARY: Motorcycle crashes in NSW

Road safety strategies have traditionally been devised by studying data about road fatalities. This approach, however, has limitations because fatalities are only a small proportion of all crashes. By focusing only on factors associated with fatal crashes, we risk overlooking the importance of other factors. This is particularly true of motorcycle crashes. For these reasons, in the following analysis we have included all crashes to attempt to provide a comprehensive report.

SUMMARY POINTS

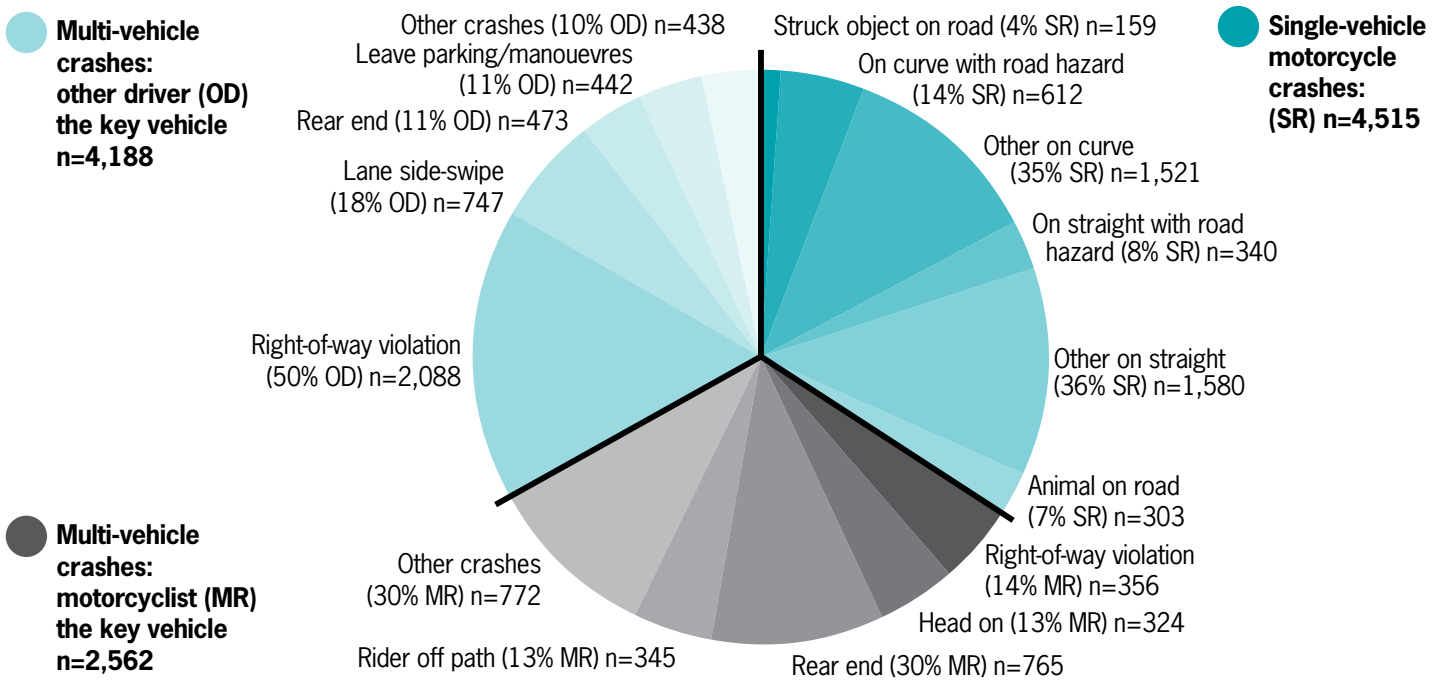
- Motorcycle crashes have the highest casualty rate of any motorised transport. They make up only 5% of all crashes in NSW, but result in 8% of injuries and 12% of fatalities.
- The number of registered motorcycles in NSW has increased by almost 64% in the past 10 years to almost 121,000 in 2006.
- The number of motorcycles involved in fatal crashes in NSW (relative to the number of registered motorcycles) has decreased from 8.9 per 10,000 registered motorcycles in 1995, to 5.7 in 2005.
- The number of crashes and casualties has remained at about the same level 1995 despite the huge increase in the number of motorcycles.
- The age profile of motorcyclists has changed. Riders over 40 years of age now make up 54% of registered owners, compared to 31% in 1995. Riders under 26 years of age own only 7% of registered motorcycles, compared to 17% in 1995.
- There are 413,667 people with motorcycle licences in NSW. Approximately 20,000 people applied for a motorcycle learner licence in 2005. Just under 8,000 progressed to a provisional licence (RTA, 2006c).
- The sale of new motorcycles continues to increase, with over 1,000 new motorcycles registered each month. In addition to the new registered road motorcycles, there were over 8,000 new off-road motorcycles sold in NSW in 2006 (FCAI, 2007).
- Motorcyclists and pedal cyclists comprise equal proportions of commuters using private transport in Sydney. Over half of all motorcycle commuters (7,129) in NSW live in the Sydney metropolitan area (ABS, 2002b).
- Between 2001 and 2005 there were over 11,000 motorcycle crashes in NSW, in which 306 motorcyclists died and 10,414 were injured. Pillion passengers made up 6% of those injured and 4% of those who died.
- Older riders (40 years or more) were involved in 27% of crashes. Riders aged 26–39 were involved in 39% of crashes. Young riders (under 26 years) were involved in 30% of all crashes.
- The majority (87%) of motorcycle crashes occurred in urban areas; 54% were in the Sydney metropolitan area. While only 13% of crashes occurred on high-speed country roads, they included 27% of all fatal crashes.
- Twenty-four per cent (24%) of riders in crashes were assessed as having been speeding for the conditions.
- Six per cent (6%) of riders were assessed to have been fatigued when they crashed.
- Five per cent (5%) of riders were found to have illegal blood alcohol levels when they crashed.

SINGLE-VEHICLE MOTORCYCLE CRASHES

Forty per cent (40%) of motorcycle crashes were single-vehicle crashes (n=4,515).

- Twenty-five per cent (25%) of all single-vehicle crashes occurred in country areas on weekends.
- Almost half of all single-vehicle crashes and 82% of fatal single-motorcycle crashes were assessed as involving excess speed for the conditions.
- Thirteen per cent (13%) of riders in single-vehicle crashes and 19% of those in fatal crashes were assessed as having been fatigued when they crashed.
- Half of all single-vehicle crashes occurred on curves (n=2,272/4,515).
  - Road surface hazards were identified as a contributing factor in 21% of single-vehicle crashes (n=952/4,515), in 27% of single-vehicle crashes on curves (n=612/2,272) and in 14% of fatal crashes on curves (n=13/94).
  - Collisions with roadside objects were involved in 36% of all motorcycle single-vehicle crashes, and in 55% of fatalities.

FIGURE H Number of motorcycle crashes and proportion within each type, NSW, 2001–05



NOTE: Percentages refer to the proportion of crashes within each of the three identified groups of crashes: Other Driver (OD), Motorcyle Rider (MR) or Single-vehicle (SR).

MULTI-VEHICLE MOTORCYCLE CRASHES

In multi-vehicle crashes, the term *key vehicle* is used to refer to the vehicle that is considered to have played the major role in the accident. This does not necessarily mean that the driver of the key vehicle was legally at fault.[2] Sixty per cent of motorcycle crashes involve at least one other vehicle.

Key vehicle—other driver

In almost two thirds (62%) of multi-vehicle crashes, the other driver was in the key vehicle (n=4,188/6,750).

- Half (50%) were due to the other driver failing to give way to a motorcyclist (n=2,088/4,188).
- Another 11% were due to a driver pulling out from a driveway or from a parked position into the path of a motorcyclist (n=442/4,188).
- Almost one in five (18%) involved the other driver side-swiping a motorcyclist in laned traffic (n=747/4,188).
- Eleven per cent (11%) were due to a driver rear-ending a motorcyclist (n=473/4,188).
- Over half (57%) of all motorcycle fatalities occurred in multi-vehicle crashes (n=173/306).

There were 178 crashes involving two motorcycles. The most common forms of motorcycle-to-motorcycle crash were head-on (n=47), rear-end (n=43) and side-swipe from adjacent lane (n=12).

Key vehicle—motorcyclist

In 38% of multi-vehicle motorcycle crashes, it was the motorcycle that was the key vehicle (n=2,562).

- The motorcycle was the key vehicle in over half (59%) of all fatal multi-vehicle crashes (n=105/178).
- Rear-end collisions are the single most common type of crash (30%) where the motorcycle is the key vehicle in a collision (n=765/2,562).
- Head-on collisions accounted for 6% of all crashes (n=404). The motorcycle was the key vehicle in 80% of these crashes (n=324/404). Overall, head-on crashes make up 13% of all crashes due to rider error (n=324/2,562).
- Riders failed to give way to another vehicle in 14% of crashes (n=356/2,562) and collided with another vehicle while out of control in a further 13% of crashes (n=345/2,562).

2 The identification of the 'key vehicle' is based on the Road User Movement (RUM) code, which describes the first impact that occurred during a crash. The primary purpose of the code is to describe the crash configuration, so while the key vehicle is often responsible for the crash this is not always the case. For example, a vehicle turning across the path of another at an intersection will be designated the key vehicle, even if the other vehicle has disobeyed a red light. It is the movement that is the key, not the legality of that movement.

B

POSITIONED FOR SAFETY 2010

01

SAFER PEOPLE

01

Safer People: road user behaviour

KEY ISSUES

1.1 There is a need to address the behaviour of those motorcyclists who ride without consideration for their own safety or that of other road users.
1.2 There is a need to address the behaviour of those drivers who lack awareness and consideration for motorcyclists' safety.
1.3 There is a need for motorcyclists to better understand and manage road hazard risks.
1.4 There is a need to address unlicensed riding and reckless behaviour.
1.5 The crash-reduction benefits of novice rider training and practice are not well established.
1.6 The motorcycle rider training and licensing scheme does not incorporate post-licence training or assessment.
1.7 There is a lack of courtesy and tolerance demonstrated between all road users.
1.8 Safety information is not effectively disseminated to motorcyclists.

Traditionally, behavioural change has been the central focus of road safety practitioners, as road user behaviour is generally held to be a factor in 90% of road crashes.

More recently, approaches known as 'safe systems' have emerged. These approaches recognise that relying on changing human behaviour is unrealistic, and that 'the system' has to be sufficiently robust to make allowances for human error. 'Safe systems' approaches emphasise the benefits of reducing the risk and consequences of errors by changing the environment, rather than focusing solely on behaviour. Education and enforcement, however, are still a part of this approach; road users are still responsible for complying and cooperating with road rules and other road users.

RIDER BEHAVIOUR ASSOCIATED WITH CRASHES

Road user behaviour contributes to motorcycle crashes in several ways. The following features were identified by analysing reported motorcycle crashes in NSW between 2001 and 2005.

- Five per cent (5%) of riders were found to have illegal levels of blood alcohol when they crashed.
- Six per cent (6%) of riders were considered to have been fatigued when they crashed.

- Twenty-four per cent (24%) of riders were considered to have been travelling at excessive speed, or at a speed that was excessive for the conditions, when they crashed.
- Forty per cent (40%) of motorcycle crashes were single-vehicle crashes (n=4,515):
  - Half of all single-vehicle crashes occurred on curves (n=2,272/4,515).
  - Road surface hazards and animals on the road were associated with 28% of single-vehicle crashes (n=1,251/4,515).
  - Twenty-five per cent (25%) of all single-vehicle crashes occurred in country areas on weekends (n=1,132/4,515).
  - Forty-three per cent (43%) of single-vehicle crashes occurred within the Newcastle, Sydney and Wollongong metropolitan regions, and a further 32% occurred on country roads with a speed limit of less than 80 km/h.
- Over half (57%) of all motorcycle fatalities occurred in multi-vehicle crashes (n=173/306); the motorcycle was the key vehicle in over half (56%, n=97/173).
- The motorcycle was the key vehicle in 38% of multi-vehicle crashes (n=2,562). In multi-vehicle crashes where the motorcycle was the key vehicle, the most common types of crashes were:
  - rear-end collisions, which accounted for 30% (n=765/2,562); note that riders are more likely (62%, n=765/1,238) to rear-end another vehicle than to themselves be rear-ended
  - riders failing to give way to another vehicle, which accounted for 14% of crashes (n=356), and colliding with another vehicle while out of control, which occurred in a further 13% of crashes (n=345)
  - head-on collisions, which accounted for 6% of all crashes (n=404). Note that the motorcycle was the key vehicle in 80% of head-on crashes (n=324/404). Overall, head-on crashes made up 13% of all crashes where the motorcycle was the key vehicle (n=324/2,562).

CRITERIA FOR DETERMINING FATIGUE

A motor vehicle controller is assessed as having been *fatigued* if the conditions described under (c) or (d) are satisfied together or separately.

(c) The vehicle's controller was described by police as being asleep, drowsy or fatigued.

(d) The vehicle performed a manoeuvre which suggested loss of concentration of the controller due to fatigue, that is:

the vehicle traveled onto the incorrect side of a straight road and was involved in a head-on collision (and was not overtaking another vehicle and no other relevant factor was identified); or

the vehicle ran off a straight road or off the road to the outside of a curve and the vehicle was not directly identified as travelling at excessive speed and there was no other relevant factor identified for the manoeuvre.
(RTA, 2005b)

Alcohol

Motorcycle riders with a blood alcohol concentration (BAC) of greater than zero have been found to have five times the crash risk compared to riders with zero level. Those with a BAC above 0.05% were estimated to have 40 times the risk of crashing than those with a BAC below that level (Haworth et al., 1997). Other studies have found that motorcyclists affected by alcohol are more likely to be involved in a single-vehicle loss-of-control crash, especially at night. Rider inattention or daydreaming has been identified as a major causal or contributing factor in 'alcohol-type' collisions (Ouellet & Kasantikul, 2006b).

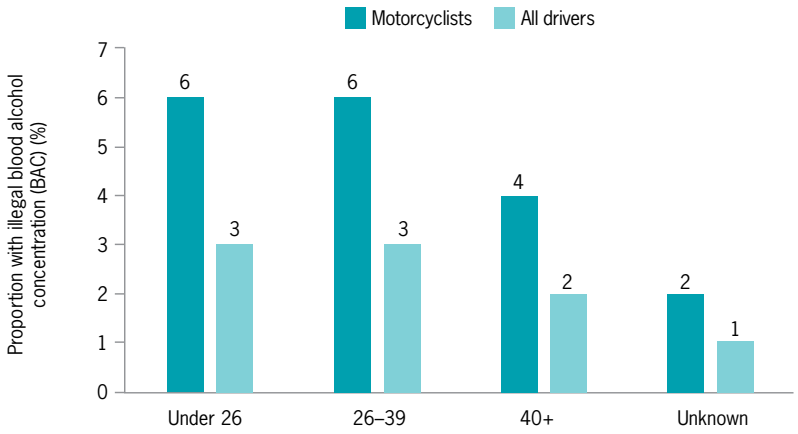
However, alcohol seems to be a more widespread problem for riders in some overseas countries than it is in Australia. For example, in the US where they do not have random breath testing, about 36% of riders involved in fatal crashes had a BAC of 0.10 g/100 ml or higher (NHTSA, 2003b). By comparison, in NSW 19% of riders in fatal crashes had an illegal BAC (RTA, 2007). This may be lower than in the US but it is still a substantially higher proportion than other drivers (12%) in fatal crashes in NSW. If we look at all motorcycle crashes, rather than just fatal crashes, 5% of motorcyclists were found to have illegal blood alcohol levels, compared with 2% of other drivers in crashes.

Alcohol was a contributing factor for at least 6% of motorcycle casualties and at least 6% of all vehicle casualties. Having a high BAC has also been associated with a number of other risk factors for riders, including unlicensed riding, riding a borrowed motorcycle, carrying a pillion passenger, illicit drug use and excessive speed (Haworth et al., 1997).

Where alcohol is a factor in a motorcycle crash, it is most frequently the rider rather than the other driver who is affected (92% vs 8%). A similar result was reported in a UK study where alcohol or drugs were involved in 3.4% of crashes where the rider was fully or partially at fault, but only 1.3% of crashes that were due to the action of the other driver (Clarke et al., 2004).

Older riders in NSW were less likely than young riders to be affected by alcohol when they crashed. Compared to the drivers of vehicles in non-motorcycle crashes, riders under age 40 years were twice as likely to have an illegal BAC when they crashed. See Figure 1.1.

FIGURE 1.1 Proportion of motorcyclists in each age group who crashed with illegal BAC compared to other drivers, NSW 2001–05[1]



1 It would be useful to know what proportion of these riders were also unlicensed. At this stage we only know that in 2005, 38% of those with illegal blood alcohol were also unlicensed.

Fatigue

Driver fatigue is recognised as a major contributor to the NSW road toll, but the role of fatigue in motorcycle crashes has not been established. Ten per cent (10%) of motorcycle fatalities (n=31) were thought to be associated with fatigue, in comparison to 18% of all vehicle fatalities (n=412).

Crash statistics indicate that a relatively higher proportion of motorcycle crashes occur on weekends than on weekdays. Over one-third (34%) of all motorcycle crashes in NSW occurred on a weekend, while the remaining 66% were spread over the five weekdays. Fifteen per cent (15%) of all fatal crashes occur on either Saturday or Sunday afternoon or early evening, which is when many riders are returning from day trips.

There are some grounds for concern that as a result, the numbers of crashes involving rider fatigue are underestimated and riders are not sufficiently warned of the risks they take. The criteria for fatigue that are used by police and the RTA tend to describe fatigue as it affects drivers rather than motorcycle riders—see 'Criteria for determining fatigue'.

Riding a motorcycle is far more physically and mentally demanding than driving a car. Rider fatigue is more likely to be a response to physical and mental exhaustion than to monotony. Fatigue may also be increased by exposure to the weather (heat, cold, wind noise, buffeting, etc.) and dehydration. It is worth considering whether some of the single-vehicle motorcycle crashes that are currently attributed to excessive speed may in fact be the result of poor judgment and loss of attention due to fatigue.

There is a need to research the causes and symptoms of motorcyclist fatigue and develop new criteria to be applied by police when reporting motorcycle crashes. This may clarify the relevance of fatigue as a factor in crashes and encourage the development of appropriate rider fatigue countermeasures.

Excessive speed

The factor most often identified in relation to motorcycle crashes is excessive speed for conditions. According to NSW statistics, inappropriate speed for conditions is associated with almost one in four motorcycle riders in crashes (24%), compared to 10% of other drivers in crashes.

There are grounds for questioning the basis upon which the contribution of inappropriate speed is determined, particularly in single-vehicle motorcycle crashes. While crashes may be caused, and certainly exacerbated, by excessive speed, the assumption that such crashes are simply due to excessive speed ignores the potential contribution of other factors. In order to help NSW riders to avoid such incidents, it is more useful to provide further detail to illustrate how easily things can go wrong.

The NSW method for determining excessive speed is based on a number of data items, including whether the vehicle skidded, slid or ran out of control (see 'Criteria for determining speeding involvement'). The same criteria are applied to all vehicle crashes, however this approach fails to recognise the different dynamics between single-track vehicles (such as motorcycles) and dual-track vehicles (such as cars). While speed may be most likely involved when a driver loses control of a car, it is not necessarily the case with a motorcycle. Loss of control can be due to loss of traction, even at extremely low speeds if the rider is caught unawares by a sudden change in the road surface. Whether their speed was 'inappropriate for the conditions' then hinges on whether the rider 'should have been able to anticipate' the possibility of such a change. This in turn may become an argument over the quality of road surfaces, and riders' ability and responsibility to recognise potential trouble spots.

Regardless of who wins that argument, it does raise the question as to whether the NSW statistics may over-represent the incidence of speed-related crashes at the expense of failing to recognise other factors.[2]

CRITERIA FOR DETERMINING SPEEDING INVOLVEMENT

The identification of speeding (excessive speed for the prevailing conditions) as a contributing factor in road crashes cannot always be determined directly from police reports of those crashes. Certain circumstances, however, suggest the involvement of speeding. The Roads and Traffic Authority has therefore drawn up criteria for determining whether or not a crash is to be considered as having involved speeding as a contributing factor.

Speeding is considered to have been a contributing factor to a road crash if that crash involved at least one *speeding* motor vehicle.

A motor vehicle is assessed as having been *speeding* if it satisfies the conditions described below under (a) or (b) or both.

(a) The vehicle's controller (driver or rider) was charged with a speeding offence; or

the vehicle was described by police as traveling at excessive speed; or

the stated speed of the vehicle was in excess of the speed limit.

(b) The vehicle was performing a manoeuvre characteristic of excessive speed, that is:

while on a curve the vehicle jack-knifed, skidded, slid or the controller lost control; or

the vehicle ran off the road while negotiating a bend or turning a corner and the controller was not distracted by something or disadvantaged by drowsiness or sudden illness and was not swerving to avoid another vehicle, animal or object and the vehicle did not suffer equipment failure. (RTA, 2005b)

2 It should be emphasised that the classification of a specific crash as having involved excessive speed by the RTA has no legal implications for the rider. It is purely for the purpose of informing crash research and the development of road safety policy.

Crashes on curves

Most motorcycle crashes on curves do not involve another vehicle but even when they do, the key vehicle is just as likely to be the motorcycle (53%). Only 16% of all motorcycle crashes on curves were due to the actions of another vehicle, compared to 46% of crashes on a straight road. The majority (71%) of fatal single-vehicle motorcycle crashes were on curves.

Riders aged under 26 years in single-vehicle crashes on curves were more likely to have exceeded the posted speed limit (41%) compared to riders aged 40 or over (15%).

The majority (63%) of motorcycle crashes on curves in NSW were defined as being associated with excess speed, including 84% of all single-vehicle crashes on curves (n=1,902/2,272). The stated speed at half (51%) of these 'excess speed' single-vehicle crashes on curves was recorded by police as being 60 km/h or less. While inappropriate speed may well have contributed to some of these apparently lower speed crashes, other factors may have also played a part. For example, a sudden change in the road surface can cause a loss of traction for a motorcycle at any speed. Road surface hazards, such as loose gravel, oil or potholes, were recorded by police as being a factor in 30% of these crashes (n=570/1,902).

Apart from the contribution of road surface hazards, motorcycle crashes on bends are generally regarded as being due to rider error. A number of studies have found that the causes of such crashes are most likely to be sliding out and falling due to over-braking, running wide due to excess (inappropriate) speed, or 'under cornering' (Hurt, Ouellet & Thom, 1981; Haworth et al., 1997; RoSPA, 2001; ACEM, 2004; Clarke et al., 2004). While the risk and severity of injury increases with speed, the conclusion of all of these studies was that high-speed riding is not the main area of concern, and that interventions should be directed towards riders' approach to braking and cornering.

OTHER DRIVERS

Multi-vehicle motorcycle crashes are more likely to be due to the action of the other driver. The key vehicle in 62% of multi-vehicle crashes was the other driver (n=4,188/6,750).

- Just under two-thirds (61%) were due to the other driver failing to give way to motorcyclists at an intersection (50%, n=2,088) or when pulling out of a driveway or parking space (11%, n=442/4,188).
- Almost one in five (18%) were due to a driver side-swiping a motorcyclist in laned traffic (n=747/4,188).
- The other vehicle is sometimes another motorcycle. There were 178 crashes involving two motorcycles, and another 41 involving three or more vehicles including other motorcycles. The most common forms of motorcycle-to-motorcycle crashes are head-on (n=47), rear-end (n=43) and lane side-swipe (n=12).

Rear-end collisions

Almost one in five (18%) of all multi-vehicle crashes are rear-end collisions (n=1,238/6750). These crashes are more likely to involve the rider crashing into the back of another vehicle than the reverse (62% vs 38%). An evaluation of road safety policies in Hong Kong found campaigns to reduce tailgating were an effective strategy for reducing motorcycle casualties (Wong et al., 2004).

Lane side-swipes

Lane side-swipes include crashes while turning a corner, as well as while changing lanes. The majority (79%) of these crashes are due to the other driver. It is more common for crashes to occur on left-hand turns and lane changes (55%) than right-hand turns and lane changes (31%).
In addition to campaigns that emphasise other drivers' responsibility to watch out for motorcyclists, it would also seem wise to raise motorcyclists' awareness of these as specific risks to manage.

Right-of-way violations

Right-of-way violations (ROWV) occurred most frequently at T-intersections and crossroads. In the majority of cases (85%), it is the driver who failed to give way to a motorcyclist. See Table 1.1.

TABLE 1.1 Road layout at the sites of motorcycle crashes due to right-of-way violations by drivers and riders, NSW, 2001–05

	RIGHT-OF-WAY VIOLATION BY:	
SITE	**OTHER DRIVER**	**RIDER**
T-junction	996	136
X-intersection	662	126
Roundabout	239	80
Two-way undivided	176	8
Other site	15	6
TOTAL	**2,088**	**356**

Motorcycle right-of-way crashes often involve almost inexplicable observation failure by the other driver (Hur, Ouellet & Thom, 1981; Clarke et al., 2004). In many cases, drivers involved in crashes with motorcyclists simply did not register their presence – they did not 'see' them. In Europe these crashes are known as LBDNS ('Looked But Did Not See'). In Australia, they are often called SMIDSY ('Sorry Mate I Didn't See You').

Inattentional blindness

Put simply, 'inattentional blindness' means that if you are not expecting to see something, you won't see it (Simons & Chabris, 1999; Most & Astur, 2007). These findings are important and suggest that motorcycle crashes could be reduced by changing motorists' expectations and perceptual behaviour. This could involve changing road safety messages to be more explicit in order to establish revised patterns of expectation (e.g. watch out for motorcyclists).

Some road authorities have responded to this type of research by promoting awareness of motorcyclists in public education campaigns. In the UK, Transport for London (TFL) implemented a range of safety measures aimed at changing the behaviour of car drivers as well as educating motorcyclists to avoid crashes. The number of killed and seriously injured motorcyclists in London fell by 30% from 1,286 in 2001 to 895 in 2004 despite a 10–15% increase in motorcycle traffic volume (Hewing, 2005). In NSW since 2002, a range of media products including posters and variable message boards have been used to encourage drivers to watch out for motorcyclists. The impact of these strategies has not yet been evaluated.

Drivers' expectations

There is also some evidence that driver expectations may be shaped by their experience. A number of studies have found evidence that drivers who didn't also ride a motorcycle or know anyone who rode a motorcycle were over-represented in car–motorcycle collisions (e.g. Hurt, Ouellet & Thom, 1981; ACEM, 2004; Magazzù, Comelli & Marinoni, 2006). Brooks and Guppy (1990) found evidence that a driver's lack of awareness of motorcycles is associated with driver error when interacting with motorcycles. Their findings suggest that programs to increase driver awareness of motorcycle operating characteristics and vulnerability in the traffic stream could have great potential for motorcycle accident prevention.

'Those of a restless nature need to remember that not all road users make similarly rapid decisions.'

– Anon

There is also some evidence that older, more experienced drivers are more likely to be at fault in a ROWV crash than younger drivers (Clarke et al., 2004). This is thought to be because the more experienced driver has developed expectations that allow fast and accurate prediction and behaviour. The consequence of their efficiency can be a crash when something occurs that does not conform to their expectations. There is also some suggestion that age-related visual impairment and reduced head movements may account for increased ROWVs by older drivers (Clarke et al., 2004).

Conspicuity

Many researchers have focused on the value of increasing the conspicuity of motorcyclists through strategies such as daytime lights, and wearing bright colours or contrasts (e.g. Hurt, Ouellet & Thom, 1981; Olsen, Halstead-Nussloch & Sivak, 1981). However, research into the benefits of increased conspicuity by riders has produced mixed results. Some have found a benefit (e.g. Yuan, 2000; Wells et al., 2004), whereas others have not (ACEM, 2004; Clarke et al., 2004).

Hole, Tyrell and Langham (1996) found that while conspicuity aids may be effective, this will also depend on how much contrast to the surrounding environment the aids provide. The researchers also concluded that drivers' expectations of seeing a motorcyclist will influence their capacity to notice one.

Current moves to have all vehicles use daytime running lights are likely to negate the benefits of daytime lights for motorcycles and may render them even less conspicuous. This may create further disadvantage for motorcyclists as well as other vulnerable road users.

Driver distraction

The widespread use of mobile phones in cars has drawn attention to a whole range of issues associated with driver attention and attitude to the driving task. A review of crash studies found driver distraction was associated with between 3.6% and 25% of crashes (Edquist et al., 2005). A New Zealand study found that driver distraction was involved in 9% of crashes and that the sources of distraction were both within the vehicle (42%) and outside it (52%). Phones were only one of a range of in-car distractions, which include other entertainment technology, passengers, food, drink and smoking (Gordon, 2005). Edquist et al. (2005) focused on external sources of distraction and found that visual clutter, such as billboards, increases driver workload and hinders drivers' detection of hazards.

UNLICENSED RIDERS AND HIGH-RISK BEHAVIOUR

Riding a motorcycle is a relatively high-risk form of transport due to the vulnerability of the rider should they be involved in a crash. Most riders attempt to manage their risks, but some riders engage in higher levels of risk-taking than others.

There is evidence that unlicensed riders contribute substantially to the proportion of riders who engage in high-risk activities. A comparison of sober, licensed riders with unlicensed or drunk riders from Australian national data found that the fatality risk for responsible riders was 53% lower when the high-risk riders were excluded from the analysis (FORS, 1999).

The latest available figures for NSW (RTA, 2007), have established that while only 8% of riders in crashes in 2005 were unlicensed (n=196/2,343), they included almost one-third of all those in fatal crashes (32%, n=24/74) and 38% of riders with illegal levels of blood alcohol (n=26/69).

We do not know what the figures are for earlier years, nor for the other behavioural factors, but there would appear to be merit in pursuing the approach of separating the extreme risk-takers from the rest. Crash statistics indicate that motorcyclists involved in crashes are more likely than other crash-involved drivers to have been speeding, to have illegal blood alcohol levels and/or to be affected by fatigue (see 'Rider behaviour associated with crashes' above).

RIDER TRAINING

It is over 30 years since the Motorcycle Operator Skills Test (MOST) was first developed by McPherson and McKnight (1976) in the US. Despite the increasing experience of riders and rider trainers in the intervening time, we still do not know how best to train riders to reduce their crash risk. A recent international review of training and licensing found 'there is no real evidence of particular programs or components leading to reductions in crash risk' (Haworth & Mulvihill, 2005, p. ix). The authors concluded that the injury-reduction benefits apparently associated with compulsory training could be due to their functioning as a deterrent and thus reducing the total number of young riders, rather than reducing their crash risk rate. The report recommended that best-practice rider training programs should increase the emphasis on roadcraft without any reduction of time on vehicle-control skills. They also concluded that hazard perception training held promise for the future.

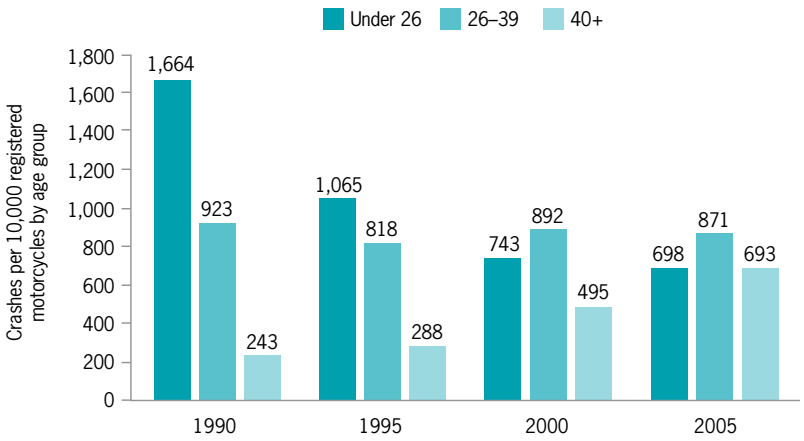
Novice rider training in NSW

Compulsory novice rider training was introduced in NSW in 1990. The scheme involves two levels of training—pre-learner and pre-provisional. Under the scheme, pre-learner riders undertake a seven-hour off-road training program over two days to ensure they have basic riding skills before obtaining a learner's licence. This licence is valid for 12 months, during which time the rider is restricted to a maximum speed of 80 km/h and may not carry a pillion passenger. Successful participants leave the course with the basic skills required to ride a motorcycle unaccompanied on the road. They are effectively licensed to learn to ride on the road in traffic.

After a minimum period of three months with the learner licence, they undertake a further six-hour training course, followed by a test, to obtain their provisional licence. The pre-provisional course includes training on public roads, and is intended to develop the riders' physical skills by teaching higher order cognitive skills. The provisional licence is issued for one year, during which time the rider is restricted to a maximum speed of 90 km/h and may not carry a pillion passenger.

Since the introduction of the compulsory training scheme, the sheer number of motorcycle casualties has decreased substantially. This is particularly apparent for riders under the age of 26 whose involvement in crashes is 58% lower (reduced from 1,664 in 1990 to 698 in 2005). See Figure 1.2.

FIGURE 1.2 Number of riders in crashes by age group since the introduction of compulsory learner training, NSW, 1990–2005



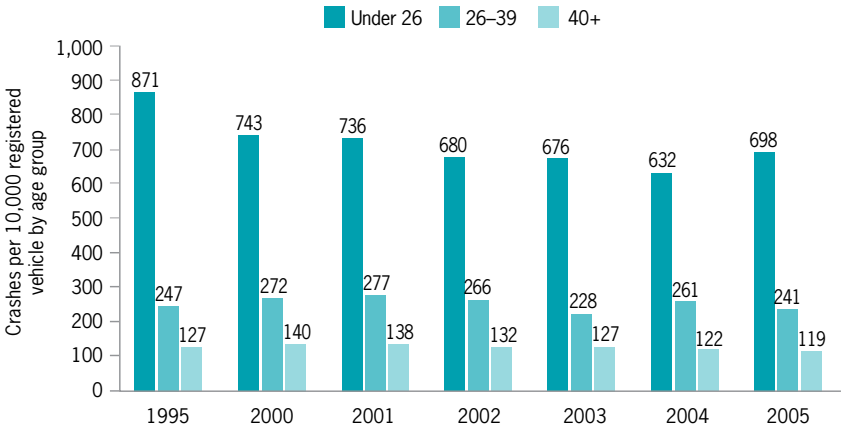
Despite the significant reduction in the number of young riders in crashes, the picture of what is actually happening to their crash rates is not all that clear. It is apparent that the crash involvement of young riders has reduced, but it is less clear whether this is due to a reduction in the number of young riders, or in their crash rate.

Crash rates by age

The crash rate by age of rider is usually calculated by the number of crashes per 10,000 vehicles registered to each age group. Using registration rather than licensing data aims to reflect current participation in riding.

In these terms, the crash rate for riders aged under 26 years had reduced by 20% from 871 to 698 over the past 10 years. There has been little change in the crash rates of older riders, which continue to be substantially lower than that of the young riders. See Figure 1.3.

FIGURE 1.3 Crash rate per 10,000 motorcycles registered to each age group, NSW, 1995–2005

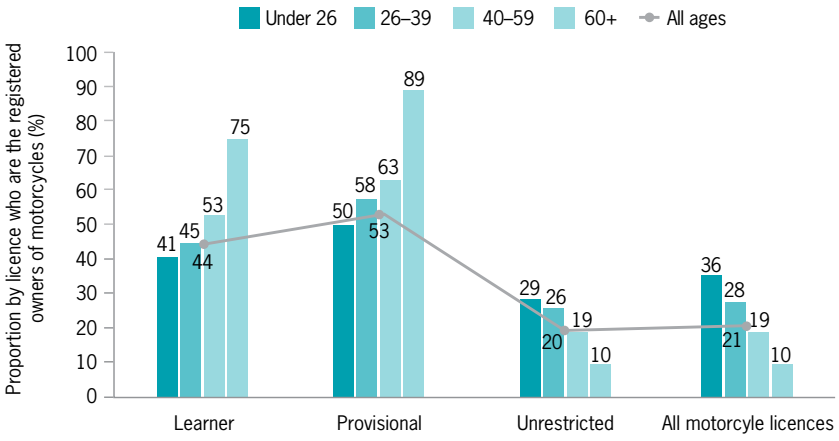


There are some concerns, however, that using registration data to estimate the rider population may underestimate the actual number of young riders.

Figure 1.4 shows the proportion of licensed riders by age who are the registered owners of motorcycles. Overall, 44% of learners are registered owners of motorcycles, compared to 53% of those with a provisional licence, but only 20% of all those with unrestricted licences. The proportion of registered owners within each licence class varies with age.

For example, only 41% of learners aged 16–25 are the registered owner of a motorcycle, compared to 75% of those aged 60 or more. The relative proportion varies with age, with the younger novice riders least likely to own a motorcycle. The reverse pattern appears with unrestricted licence holders, but this is also confused by the number who have ceased to ride and those who are on a break from riding.

FIGURE 1.4 Proportion of licence-holders in each age group who were also the registered owner of a motorcycle, NSW, June 2005



Consultation with rider trainers in NSW confirms that many novice riders do not have their own motorcycle at the time they apply for their provisional licence. This suggests that they have been dependent on hired or borrowed motorcycles for any practice they might do during the learning period.

There does not appear to be any data available on the number of hours of riding experience learner riders have had when they obtain their provisional licence. This means that we do not know what relationship exists between novice riders' crash incidence and their number of hours of riding experience. Nor do we have any reliable means of determining the actual size of the active road-riding population, and therefore do not know what the actual crash rate is for each age group.

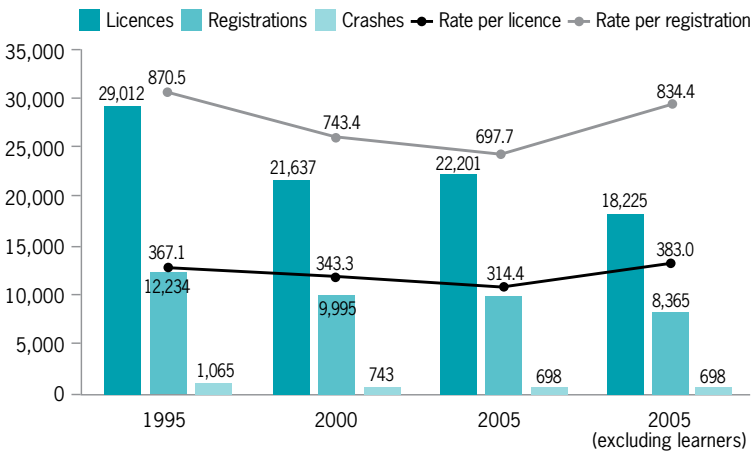
TABLE 1.2 Number of motorcycle licences, registrations and crashes by age group, NSW, 2005

	LEARNER	PROVISIONAL	UNRESTRICTED	TOTAL LICENCE HOLDERS	REGISTERED MOTORCYCLES	CRASHES
Under 26	3,976	5,106	13,119	22,201	8,194	698
26–39	2,955	3,076	105,049	111,080	38,018	871
40–59	1,039	155	224,274	225,468	51,421	630
60+	55	9	54,854	54,918	6,796	63
Unknown	3	3	660	666	6,824	81
TOTAL	**8,025**	**8,346**	**397,296**	**413,667**	**111,253**	**2,343**

Table 1.2 raises the question as to whether the number of registered owners is the best estimate of the rider population when assessing the crash rate. It is also a rider training and licensing issue. Why would so many young people go to the trouble of obtaining a motorcycle licence if they do not own a motorcycle? Some may have obtained the licence in order to learn to ride, with the intention of riding off-road. Perhaps some wait to acquire their own motorcycle until after they have turned 26, in order to avoid the insurance premium penalties incurred by riders and drivers up to 25 years of age.

Figure 1.5 shows the crash rate of riders under the age of 26 relative to the number of licences and to the number of registered motorcycles owned by this age group. It is clear from this graph that, apart from the initial improvement in the crash rate for young riders, there has been little change since 1995.

FIGURE 1.5 Number of licences and vehicles registered to licence-holders under age 26, relative to the crash rate per 10,000 licences and per 10,000 registered vehicles for that age group, NSW, 1995–2005



The reduction in the young rider crash rate may simply be a reflection of reduced exposure. It may be that the current rider licensing system is more effective at discouraging participation than actually decreasing the crash risk for those young people who do ride.

POST-LICENSING TRAINING

Once a rider has completed their learner training or pre-provisional training, there are no further compulsory training courses to help riders develop their skills or attitudes towards riding. Any courses or activities licensed riders undertake are at their own initiative.

This situation assumes that riding abilities are established during the training period and no further support for skills development is necessary. This is the same approach taken to driver development; it is assumed that driver competence develops through on-road experience. Reservations about the value of advanced rider training are generally based on research relating to advanced driver training programs. The rationale is that safe driving is more about attitude than operational skill, and there is evidence from car-driving research that advanced skills development training may actually encourage risk-taking behaviour (e.g. Christie, 2001).

There is little evidence, however, as to whether the same risks outweigh the benefits of post-licence motorcycle-rider training. An evaluation of a post-licence riding course in Scotland found that, after completing the course, motorcyclists reported reduced speeds in urban areas but increased speed in rural areas. The researchers commented that this outcome may be due to rider overconfidence as a result of the course (Ormston et al., 2003).

Safe riding is a more complex task, requiring much higher levels of skill and judgment (for example, in cornering or handling a loss of traction) than does safe driving (Mannering & Grodsky, 1995). A number of researchers have identified rider error, such as failure to respond, ineffective braking and inappropriate positioning, as contributing to crashes (e.g. Hurt, Ouellet & Thom, 1981; Haworth et al., 1997).

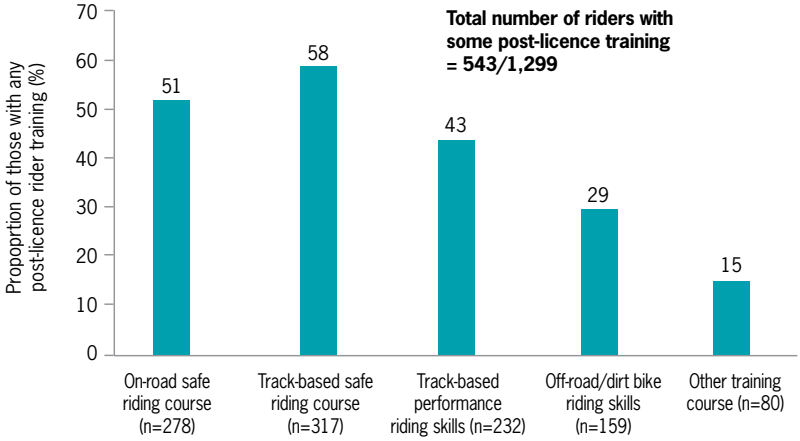
Post-licence rider training includes the improvement and integration of roadcraft and physical skills. There are essentially three means by which licensed riders can improve their riding skills. These are commercial advanced rider training programs, track days and less formal group rides.

Advanced rider training

Advanced rider training courses are offered by a number of rider training providers. They aim to refine critical skills once a rider has achieved sufficient experience to understand and apply their new learning. They generally focus on roadcraft, cornering, braking skills and so on, all of which are immediately transferable to riding on public roads. The focus on braking skills is particularly significant. Haworth et al. (1997) found that ineffective braking, or a failure to respond to a threat, occurred in 20% and 17% (respectively) of the motorcycle crashes they examined in Victoria. They also found that compared to completing a beginner's course, an intermediate course did not significantly change the odds of crashing, whereas an advanced course was associated with a significant decrease in the odds of crashing (Haworth et al., 1997).

A 2006 MCC survey of riders found that 42% (n=543) had completed some form of post-licence rider training, and 17% (n=226) had completed two or more such courses (de Rome & Brandon, 2007). The majority of the courses were described as focusing on safe riding rather than performance skills. See Figure 1.6.

FIGURE 1.6 Types of post-licence training completed by surveyed riders, MCC survey, 2006



Track days

Track days are conducted at off-road tracks. Track days are promoted as an opportunity to learn to refine riding skills and handle a motorcycle at touring speeds in a safe environment. The argument often proposed in support of track days is that it is safer to learn and practise these movements on a track rather than on a public road because it minimises the risks arising from an error of judgment. While track days are not races, they are an opportunity to ride at speed. To date there does not appear to have been any attempt to evaluate the postulated benefits or risks of such events, or to evaluate other post-licence rider training or development programs.

Riding in groups

The 2006 MCC survey also asked about riding in groups. More than two-thirds (73%) reported taking part in some form of organised group rides more than four times each year. Those who were members of motorcycle clubs were more likely to take part in formal club rides but, overall, 45%, including club members and non-members, rode with informal groups. Internet-based groups accounted for almost one in five (18%) (de Rome & Brandon, 2007).

Day rides are organised trips by groups of motorcyclists. They are primarily social but may also be designed to provide advice and support, or just company, for inexperienced riders on longer trips. Experienced riders are often paired with novices on day rides.

Mentoring

The MCC, in consultation with the RTA, has initiated an in-club rider mentoring program that provides selected club members with training and information on low-risk riding techniques. The mentor training is run as a day-ride with frequent stops to discuss and provide feedback. The focus is on decision-making and risk management, rather than on motorcycle control skills. The emphasis is on improving the trainees' understanding and ability to convey information to other riders. The purpose is to support these riders to act as mentors to other members of their club, both through discussion at club meetings, and by their example on group rides. The RTA Rider Training Section supports the program by providing specialised trainers.

Strategies for Safer People

1.1 There is a need to address the behaviour of those motorcyclists who ride without consideration for their own safety or that of other road users.

1.1.1 MCC to promote concepts of mastery of riding.

1.1.2 MCC to promote motorcyclists' awareness and understanding of their share of responsibility for crashes or for avoiding them.

1.1.3 MCC to work with motoring writers to promote discussion within the whole road-user community, and build an understanding of what is meant by 'road conditions' in reference to 'appropriate riding/driving' or 'speed'.

1.1.4 MCC to research and promote motorcyclists' awareness of the incidence and long-term outcomes of injuries.

1.1.5 MCC to work with other stakeholders for research to be funded into the causes and symptoms of fatigue, in order to:

- a develop countermeasures
- b develop new criteria to be applied in investigating fatigue in motorcycle crashes.

1.1.6 MCC to continue to work with behavioural experts to develop effective safety messages and strategies for motorcyclists.

1.1.7 MCC to work with other stakeholders to raise rider awareness of:

- a the risks of fatigue, distraction and mental exhaustion affecting the riding task
- b the risks of fatigue associated with discomfort and dehydration, due to inappropriate or ineffective clothing and physical exertion.

1.1.8 MCC to continue to work with the RTA to promote research and awareness of safe riding in groups.

1.1.9 MCC to continue to support awareness-raising campaigns about the risks of riding a motorcycle while under the influence of alcohol or drugs.

1.2 There is a need to address the behaviour of those drivers who lack awareness and consideration for motorcyclists' safety.

1.2.1 MCC to work with industry associations and other stakeholders to promote motorcyclist awareness by other road users.

1.2.2 MCC to work with other stakeholders for the reintroduction of general safe-driving messages to all road users (such as 'The Wise Old Owl' road safety campaign).

1.2.3 MCC to work with road safety authorities at federal, state and local government level:

- a to promote motorcycle awareness by other road users in all road safety and licence-testing products
- b to integrate motorcycle awareness as a regular part of general road safety messages and advertising campaigns
- c to integrate safety programs for motorcyclists, pedal cyclists and pedestrians in general with road safety messages directed towards motorists.

1.2.4 MCC to give recognition to responsible driving by other road users.

1.3 There is a need for motorcyclists to better understand and manage road hazard risks.

1.3.1 MCC to promote rider awareness of crash incidence, injuries, black spots and the types of traffic situations where errors occur.

1.3.2 MCC to work with local government and regional road safety personnel to identify and target motorcycle rest stops to promote safer riding behaviour.

1.4 There is a need to address unlicensed riding and reckless behaviour.

1.4.1 MCC to work with other stakeholders in government and industry, and seek funds for research to understand unlicensed and unregistered riding and develop strategies to reduce their incidence.

1.4.2 MCC to continue to support, promote and refine the LAM (Learner-Approved Motorcycle) scheme as a means to reduce unlicensed riding.

1.4.3 MCC to investigate the value of providing opportunities for novice riders to explore motorcycling in a safe, closed-road environment.

1.5 The crash-reduction benefits of novice rider training and practice are not well established.

1.5.1 MCC to work through the Australian Motorcycle Council (AMC) to request that the Australian Transport Safety Bureau (ATSB) promotes a national rider training syllabus which can then be audited.

1.5.2 MCC to work with the RTA to consider the recommendations of the recent reviews of rider training.

1.5.3 MCC to support the RTA to continue to review the novice rider training curriculum, with a focus on:

- a risk management strategies for dealing with problems, rather than focusing on control skills e.g. roadcraft, hazard perception, responding and planning strategic avoidance
- b the on-road component of the novice rider training and assessment system
- c the introduction of stepped power-to-weight restrictions
- d the Mature Age Rider Exemption Scheme (MARES).

1.6 The motorcycle rider training and licensing scheme does not incorporate post-licence training or assessment.

1.6.1 MCC to publish and promote the findings of the 2006 MCC motorcyclist survey on training and crash experience, and on the avenues to distribute safety messages to motorcyclists.

1.6.2 MCC to work with stakeholders to seek funding for research into post-licence rider training.

1.6.3 MCC to work with the RTA to undertake a study of post-licence rider training and skills development programs, including on- and off-road programs and mentoring.

1.6.4 MCC to work with the RTA and insurance industry to remove barriers to post-licence rider training.

1.6.5 MCC to work with RTA on the development of a mentor training program for club members.

1.6.6 MCC to work with the industry to promote/provide rider familiarisation or training courses as a part of the sale of new motorcycles when riders are upgrading.

1.7 There is a lack of courtesy and tolerance between all road users.

1.7.1 MCC to develop and promote on-road codes of riding practice to counter impulsive, ego-driven riding, and to promote appreciation of personal responsibility and consequences.

1.8 Safety information is not effectively disseminated to motorcyclists.

1.8.1 MCC to work with motorcycle media and industry to ensure they are better informed about motorcycle crash incidence and risk factors.

1.8.2 MCC to work with motorcycle media to achieve a balance between the interests of their readers and responsible portrayal of motorcycling.

1.8.3 MCC to work with industry and RTA to promote the benefits of club membership for young or inexperienced riders.

1.8.4 MCC to work with industry and RTA to identify means of reaching more riders for safety messages.

1.8.5 MCC to work with stakeholders, including RTA and health authorities, to provide information for parents of children and young people who wish to ride motorcycles.

1.8.6 MCC to work with the RTA and other stakeholders on the development and promotion of motorcycle-specific countermeasure information, such as the Victorian Motorcycle Advisory Council (VMAC) *Motorcycle Notes* series.

1.8.7 MCC to continue to work with the NRMA to promote motorcycle safety issues through the *Open Road* magazine.

1.8.8 MCC to explore the benefits of establishing links with other stakeholders, such as the Australian Transport Research Forum and Motorcycling Australia.

1.8.9 MCC to continue to collaborate with local councils in the development and dissemination of localised motorcycle safety messages.

1.8.10 MCC to explore options to support the management and promotion of the MCC Road Safety website.

1.8.11 MCC to explore options to strengthen opportunities for Motorcycle Awareness Week.

02

SAFER ROADS

02

Safer Roads: road environment

KEY ISSUES

2.1 Road fixtures and furniture may create crash and injury risks for motorcyclists.
2.2 Maintenance and upgrading practices may create crash and injury risks for motorcyclists.
2.3 The designers of new roads are not required to consider the specific vulnerabilities of motorcyclists.
2.4 Crash records are not used systematically to monitor and guide road maintenance practices.

In countries where road traffic law is generally respected, research now consistently shows that the greatest untapped potential for casualty reduction lies in creating safer roads (Hill & Brown, 2006). Road design and condition is more crucial to motorcyclists than to other motorists, due to the relative instability of two wheels compared to four, and to the vulnerability of the rider to impacts in a crash. Analysis of motorcycle crashes in NSW (2001–05) has identified a number of common features and contributing factors that relate to the road environment.

Forty per cent (40%) of motorcycle crashes were single-vehicle crashes (n=4,515). Rider error, including excessive speed, may have been a factor in these crashes, but road condition either caused or contributed to at least one in five. In addition, whatever the initial cause of these crashes, impacts with roadside objects increased the severity of their consequences.

- Half of all single-vehicle motorcycle crashes occurred on curves (n=2,272/4,515).
- Road surface hazards were identified as a contributing factor at:
  - twenty-one per cent (21%) of single-vehicle crashes (n=952/4,515)
  - twenty-seven per cent (27%) of single-vehicle crashes on curves (n=612/2,272)
  - fourteen per cent (14%) of fatal single-vehicle crashes on curves (n=13/94).
- Collisions with roadside objects were involved in 36% of all motorcycle single-vehicle crashes, and 55% of fatalities.

In the years 2001–05, there were 6,750 motorcycle crashes with one or more other vehicles. Over 43% (n=2,886) involved one motorist, usually the other driver, failing to give way to the other:

- other driver failing to give way to a motorcyclist (n=2,088)
- other driver pulling out from a driveway or parking into the path of a motorcyclist (n=442)
- motorcyclist failing to give way to other driver (n=356).

There were also 427 head-on collisions involving motorcyclists. The vast majority of these crashes (n=404/427) did not occur during overtaking manoeuvres, but most commonly occurred on curves (n=300/404). The motorcycle was the key vehicle in 85% of these crashes on curves (n=254/300).

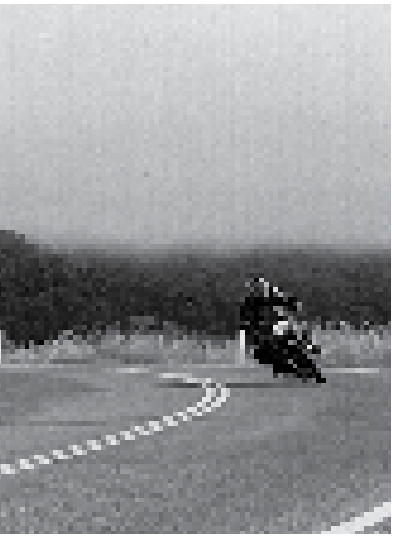
ROAD DESIGN

While road infrastructure programs generally make provisions for cyclists and pedestrians, they are less likely to cater for the specific safety needs of motorcyclists. Motorcyclists still tend to be subsumed under the general category of 'motorists' rather than identified as a separate group of vulnerable road users.[1]

The situation is changing as road authorities recognise the need to make specific provisions for motorcycles. However, to date, change has tended to be limited to piecemeal responses to specific issues rather than systematic approaches to mainstreaming motorcycle safety.[2] This is particularly apparent at the local government level, although in the past five years many local councils in NSW have identified motorcycle safety as an issue in their road safety strategic plans. It is unfortunately still apparent that few roads and traffic engineers are aware of specific safety design issues for motorcyclists. This lack of mainstream engineering awareness is disappointing, particularly as Australia led the world with the publication of a road engineer's guide on motorcycle safety (Austroads, 1999). Similar guidelines have only recently been issued in the UK and Europe (IHIE, 2005; ACEM, 2006).

1 See RTA (2006a), *Road Environment Safety: a Practitioner's Reference Guide to Safer Roads*, Roads and Traffic Authority NSW, Sydney, <www.rta.nsw.gov.au/roadsafety/downloads/road_environment_safety_practitionersguide.pdf>. This guide includes sections on pedestrian and pedal cycle safety but none on motorcycle safety. It includes a large number of references, including the Austroads *Guide to Engineering Practice: Part 13 – Pedestrian Safety* and *Part 14 – Bicycle Safety*, but not *Part 15 – Motorcycle Safety*, nor any other technical references for motorcycle safety.

2 In 2003, the RTA issued a revision of the *Traffic Control at Work Sites* manual. The revision included a requirement for steel plates covering excavations to have a skid-resistant treatment. A specification for the skid resistance of such plates has subsequently been developed (QA Specification 3368). See RTA (2006b).



Intersection layout

The majority (60%) of all motorcycle crashes are multi-vehicle crashes which tend to occur at intersections (56%), and more frequently where there are no traffic controls (68%).[3] These are typically crashes where the other driver (80%) failed to give way to the motorcyclist. There has been much research into the phenomenon of drivers who 'look but do not see' an approaching motorcyclist.[4] Driver awareness programs can play a part, but it is also essential that intersection design, signage and landscaping ensure uncluttered and clear lines of sight for all road users.

Harnen et al. (2003) have devised a model which may be useful to traffic engineers in developing design criteria for intersections that better accommodate motorcycles.

The City of Sydney and the RTA are trialling a scheme to reserve the last parking space at intersections for motorcycles. This scheme preserves line of sight for all road users by preventing larger vehicles from parking close to the intersection. The scheme also provides systematic allocation of motorcycle parking space in the city.

Allocation of road space

The allocation of road space to favour vulnerable road users is well established for bicycles and pedestrians, although not to date for motorcyclists in Australia.

Advance stop lines (ASLs) for cyclists at traffic lights are provided in Melbourne and are widely used in Europe. ASLs reserved for two-wheelers at large intersections have also been introduced in some Belgian, Dutch, Japanese and Swiss towns (ACEM, 2000). Trials of ASLs shared by motorcyclists and cyclists in London have produced encouraging results (Tilly & Huggins, 2003). Preliminary results suggest that the benefits for motorcyclists are similar to those achieved for cyclists by allowing them to be visible in front of other traffic and reducing the potential for conflict at intersections. Access to ASLs does require the cyclists/motorcyclists to filter through to the front of the traffic. This is not lane-splitting (riding between two lanes of moving traffic) but lane-filtering, which is permitted in Europe when traffic is stationary (Coyne, 2001; DFT, 2004).

The benefits of ASLs for both bicycles and motorcycles have already been demonstrated in Indonesia and Malaysia (Wigan, 2001a). Other preferential road allocations, such as motorcycle-only lanes in Malaysia, have produced a 39% reduction in crash levels (ACEM, 2000).

The Australian Motorcycle Council (AMC) has made a submission to the National Transport Committee (NTC) for motorcyclists in Australia to be able to share ASLs with cyclists.

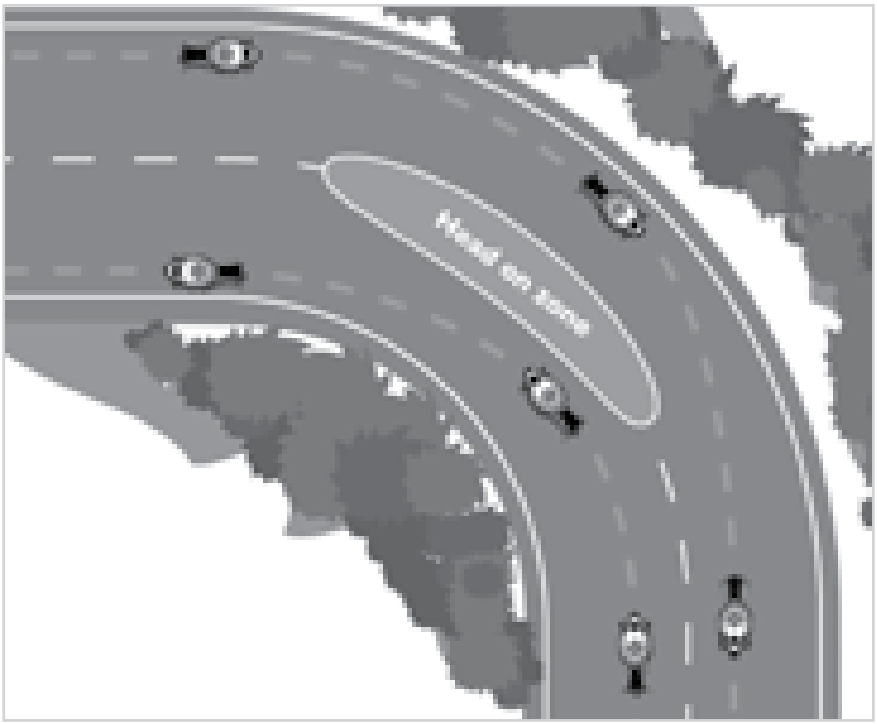
The head-on zone

Head-on crashes make up only 6% of motorcycle collisions, but constitute 14% of fatal crashes. The majority (95%) are not overtaking crashes, but occur when one vehicle crosses the centre line into the path of the other vehicle. It is usually the motorcycle (80%) that crosses that line and most commonly (74%) this is on a curve in what is called the head-on zone (RTA, 2003a). See Figure 2.1.

3 Traffic controls include traffic lights, stop signs and give-way signs.

4 See Section 1: Safer People, 'Other drivers'.

FIGURE 2.1 Head-on zone



THE PHYSICS OF CORNERING

A motorcycle does not corner by turning the handlebars.

Non-motorcyclists sometimes fail to appreciate the physics of a motorcycle.

Some even believe that motorcyclists leaning into corners are just thrill-seekers taking unnecessary risks!

When cornering, a motorcycle leans to change direction. A rider may lean up to 45 degrees from the vertical, which means that their head can be more than a metre away from the path of their wheels. This means that if the motorcycle is within a metre of the centre line, the rider's head will be over the line and in the path of oncoming traffic.

The safest curves are those with a large and constant radius. The most dangerous are those whose radius varies, causing the rider to change direction within the turn. Changes to direction or speed while turning, and therefore leaning, are more difficult and dangerous.

In order to have maximum vision through a curve, riders will move across to the furthest side of the lane before beginning a turn. This provides a better perspective from which to choose their path through the corner, enabling them to see and take account of any hazards on the road surface or oncoming traffic.

Sometimes a rider's options are limited to choosing between riding on a damaged or slippery surface, leaning into the path of oncoming traffic, or colliding with poles and posts on the side of the road.

Between 2001 and 2005 there were 339 head-on crashes in NSW where the motorcycle was the key vehicle. Inexperience and youth are likely factors, because one in three (33%) riders in a head-on collision is under 26 years old. Excessive speed is recorded as a factor in a quarter (27%) of these crashes. There is little else in the police crash records to explain why so many riders make this potentially devastating error. It would seem worthwhile to investigate the geometry of these curves to understand what happens in such crashes.

The vanishing point

Road engineers in Buckinghamshire, UK, have devised a useful means of using the vanishing point to guide riders when cornering, giving them a good idea of their position and speed. Crashes on bends often occur because the rider or driver has fixated on a roadside object such as a pole or tree, and misjudge their approach to the corner. The WYLIWYG (Where You Look is Where You Go) concept takes advantage of this and tries to get them to look elsewhere, in this case, into the vanishing point, so that this time, where they look is where they go.

FIGURE 2.2 Vanishing point

The vanishing point is the furthest point along a road to which a rider has an uninterrupted view of the road surface. On a level stretch of road this is where the right hand and left sides of the road appears to intersect. When the road bends, the limit point will appear closer to the rider and the tighter the bend, the closer it will appear. If the bend has a variable radius, then the limit point will appear to move back and forth before it finally moves further away as the road straightens out. Road engineers have exploited this feature by having hazard marking posts placed closer together and continuing further around the bend than usual. Guide posts are placed up until the point where the vanishing point starts moving away from the rider's view into the straight.

The effect ensures that the guide posts keep appearing into view, keeping the riders' attention into the bend and reducing the risk of them being distracted by other objects on the road-side such as trees or poles. Since this system was introduced there have been no motorcycle crashes on a previously notorious bend (Debell, 2007).

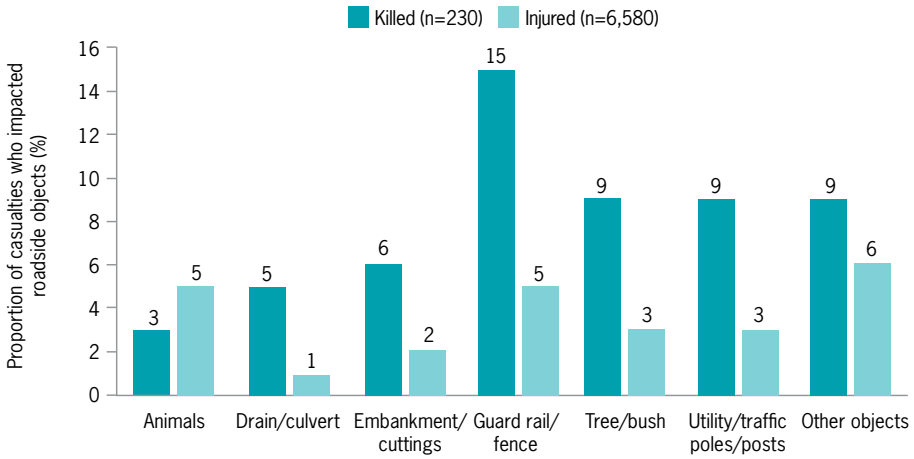
ROAD FURNITURE

Road furniture is the term used for all the fixtures in the road environment, including fixed objects on the road or in the road reserve. Fixed objects on the road surface, such as steel plates, 'silent cops' or raised lane markers, may create a significant crash risk for a motorcyclist. While use of such fixtures is specifically against guidelines (Austroads, 1999), many are still in place and some councils are still installing raised lane barriers to delimit cycle lanes. Fixed objects in the road reserve such as light poles, signposts, bus shelters and crash barriers may cause additional injuries to motorcyclists if they encounter them in a crash. The height and size of some signs, plants and other objects may also create a crash risk by obscuring motorcyclists from the view of other drivers.

Collisions with fixed roadside objects occurred in 39% of all single-vehicle motorcycle crashes in NSW (2001–05) and were involved in 52% of single-vehicle motorcycle fatalities. While motorcycle crashes into drains or culverts were less common and accounted for just 5% of fatalities, these were actually the most dangerous objects to hit, with a high proportion (19%) resulting in fatality.

- Only 7% of crashes involved an impact with an animal and just 3% of these resulted in fatality.
- Guard rails or fences were the objects most commonly struck (8%) and resulted in 15% of all single-vehicle motorcycle fatalities.
- Trees and bushes were the first objects hit in 14% of single-vehicle crashes and resulted in 9% of fatalities.
- Utility poles and other posts also accounted for 14% of crashes and a further 9% of fatalities.

FIGURE 2.3 Proportion of casualties from impacts with roadside objects in single-vehicle motorcycle crashes, NSW, 2001–05



Crash barriers

Crash barriers or guard rails are perhaps the most contentious form of road furniture. While they provide enhanced safety for most vehicle occupants, they present a significant safety risk for motorcyclists. In NSW crash barriers were the point of impact for 15% of riders who died and 5% of those who were injured in single-vehicle crashes.

Duncan et al. (2000) identified three common methods of improving the design of safety barriers to reduce the risk presented by the upright posts. These methods are covering the tops of existing posts on W-beam guard rails, installing additional W-beams on the lower sections of guard rail systems, and covering exposed posts with specifically designed covers to attenuate or disperse the force of an impact.

Wire rope fences tend to be the focus of many riders' fears, although until recently most reviews indicated that it was in fact the upright posts, common to many designs, that cause the most severe injuries (Gibson & Benetatos, 2000; AGM, 2004). However, recent simulations comparing motorcyclist collisions with concrete and wire rope barriers have shown that while the risk of injury in impacts with either type of barrier will be high, there are grounds for concern about the additional risk associated with wire rope fences. It was found in the simulation studies that, in many cases, the motorcyclist's extremities became caught between the wires, effectively guiding the motorcyclist into the posts. As a result of this snagging effect, the motorcycle and rider were subjected to large decelerations, and elevated injury risk for the rider (Berg et al., 2005).

There have been a number of advances in crash barrier designs and in guidelines issued by road authorities in Europe. In 1988 France adopted a procedure to test the effectiveness of under-rails to reduce injury to motorcyclists.[5] This procedure involves projecting a test dummy headfirst into the under-rail at 60 km/h at an angle of 30 degrees, and measuring a series of head injury criteria (HIC). The procedure requires that the road safety barrier system fitted with an under-rail be tested to the European standard EN 1317.

5 See INRETS Road Equipment Test Laboratory, <www.lier.fr/essais_eng.html>.

France also introduced criteria specifying locations where under-rails should be located, such as on motorway exit ramp corners and on corners of tight radii.[6] A number of proprietary designs have been approved for use including Railplast,[7] Moto Rail[8] and MotoTub.[9] Several European countries, notably Germany and the United Kingdom, are also installing under-rails (FEMA, 2005). More recently, Spain has developed a standard test procedure (UNE 135900); this standard is very similar to the French test. They have also introduced criteria which is very similar to the French criteria (Circular 18/2004).[10] The Spanish Standard requires that the road safety barrier system fitted with an under-rail be tested to the European standard EN 1317.

Queensland Main Roads have developed their own under-rail design using a W-beam.[11] This design has been installed at several locations. As part of the Victorian Motorcycle Black Spot Program, VicRoads is trialling two systems to reduce injury to motorcyclists. The first is an under-rail system, Rub Rail, and the second is a system of impact protectors installed around the posts on crash barriers. A third system, MotoTub, which is similar to Rub Rail, is under consideration.

Injury risks to motorcyclists presented by crash barriers include the following.

- Most barrier systems are too low to prevent motorcyclists from being catapulted over the top.
- W-beams have sharp edges.
- Wire mesh fences and wire mesh-topped barrier systems provide numerous lacerating surfaces.
- All rail and post systems are now designed with upright posts that are intended to break when impacted by a vehicle, but they still present a rigid and unforgiving barrier to a human body.
- Wire rope barriers may snag the rider's limbs, preventing them from dissipating their momentum by tumbling over the barrier, instead forcing them into an impact with the upright posts.
- Protruding reflectors provide sharp edges.
- Discontinuous or jagged barrier surfaces can present edges which concentrate rather than dissipate the forces of an impact.
- Rigid barriers do not attenuate the force of an impact, which is therefore absorbed by the impacting motorcycle and rider's body.

ROAD MAINTENANCE

Consistent levels of skid resistance are fundamental to motorcycle stability. Non-motorcyclists may not appreciate how some road surface conditions, which are not a problem to a car, can be dangerous for a motorcycle. This is because most of the braking effort and steering control for a motorcycle are applied through the front wheel, but acceleration force is through the rear wheel.

A sudden change in the road surface can be sufficient to cause a momentary loss of traction and destabilise the motorcycle. If the surface irregularities occur in a curve, intersection or braking zone, the sudden loss of traction while braking or changing direction increases the risk of skidding.

6 See French Ministry of Equipment, Transport and Housing, Ministerial Directives, Circular 88-49 (9 May 1988) and Circular 99-68 (1 October 1999), <www2.equipement.gouv.fr/bulletinofficiel/fiches/bo199919/a0190048.htm>.
7 French Ministerial Directive, Circular 99-19 (22 March 1999), <www2.equipement.gouv.fr/bulletinofficiel/fiches/Bo199907/A0070040.htm>.
8 French Ministerial Directive, Circular 99-75 (29 September 1999), <www2.equipement.gouv.fr/bulletinofficiel/fiches/Bo199920/A0200045.htm>.
9 French Ministerial Directive, Circular 99-74 (29 September 1999), <www2.equipement.gouv.fr/bulletinofficiel/fiches/Bo199920/A0200044.htm>.
10 Spanish Ministry of Public Works and the Economy, 'Circular Order 18/2004 on Criteria of the Use of Systems for Protection of Motorcyclists', <www.carreteros.org/normativa/barreras/oc18_04/018__04.pdf>.
11 Queensland Government, Department of Main Roads, Drawing RR-W.

Sudden changes to the road surface are a particular problem if the rest of the road is in good repair, because then they are unexpected and may not be noticed until it is too late.

Loss of traction can be caused by the tyre slipping on quite a small portion of road, such as a patch of loose gravel, a steel plate cover, an oil or diesel spill, a tar-jointing compound or a painted road marking.

Uneven surfaces can also cause traction problems. Corrugations, potholes, bumps and dips in the surface can all cause a skid by sudden shifting of the tyre contact point with the road. Surface irregularities may be the result of wear and tear or due to poorly restored trenches following road works. Road repairs that create a 'patchwork quilt' effect of raised bumps and surfaces are a particular problem, as each patch may have different traction features. Heavy vehicles also damage the road surface when they brake or turn, creating ripples and depressions. Another common surface problem is longitudinal grooves, which are created due to irregularities in the underlying substructure.

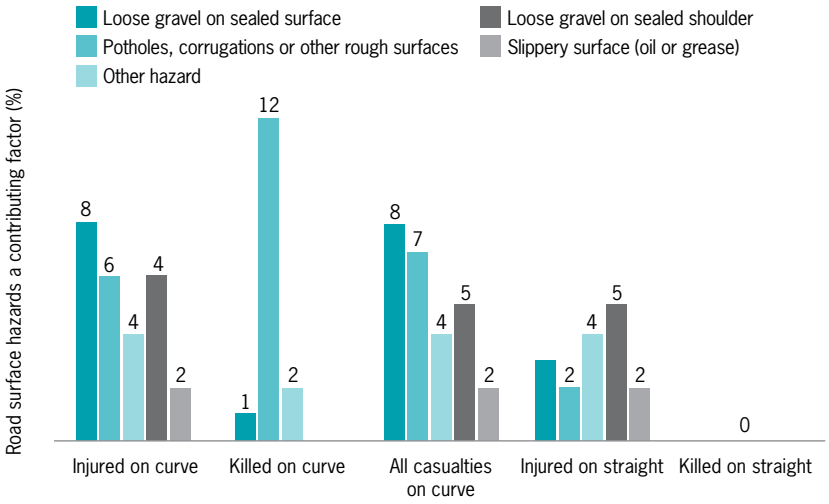
Road condition at crash sites

A number of studies have identified road surface features likely to have impaired traction at motorcycle crash sites. Haworth recorded such features at 53% of crash sites and concluded that the road surface actively contributed to the occurrence of the crash in 15% of cases (Haworth, 1999). The MAIDS (Motorcycle Accident In-depth Study) identified road surface defects at 30% of motorcycle crash sites (ACEM, 2004).

In NSW between 2001 and 2005, 929 motorcyclists were injured and 14 were killed in crashes associated with road surface hazards. These included 21% of all single-vehicle motorcycle crashes and 26% of crashes on curves. Road surface hazards were implicated in 11% of fatal single-vehicle crashes and 15% of fatal crashes on curves.

A breakdown of the types of hazards associated with single-vehicle crashes shows that loose gravel contributed to 14% of injuries and 13% of fatalities that occurred on curves. See Figure 2.4.

FIGURE 2.4 Proportion of motorcyclists killed and injured in single-vehicle crashes associated with different types of road surface hazards, NSW, 2001–05



In a survey of NSW motorcyclists, 42% of those who had been involved in a single-vehicle crash reported that it was due to loss of traction with the road surface—caused by potholes, loose gravel, slippery paint or tar (de Rome & Brandon, 2007).

ROAD AUTHORITIES

All road users can contribute to the safety of the roads by reporting any road hazards to the relevant road authority. The road authority may be held liable for damages from crashes caused by the condition or design of a road or the placement of road furniture, and will generally act quickly to rectify safety hazards when brought to their attention.

Motorists often assume that the organisation responsible for all roads in NSW is the RTA, but this is incorrect. In fact, the RTA is responsible only for 20% of the roads. These are the major state and regional roads, such as state highways, freeways and motorways. It is actually the local councils who are responsible for the design, management and safety of 80% of the road network in NSW. The RTA does provide guidelines for councils but is not liable for those works.

Steel plates covering service pits or used as temporary covers for roadworks openings are a common source of complaint by motorcyclists. The RTA has recently issued specifications for the skid-resistant friction coating of temporary steel road plates (RTA, 2006b).

Roadworks

While councils and the RTA are the key road authorities responsible for the design and construction of roads, they are frequently not responsible for the roadworks that disrupt traffic flow and leave the road surface scarred. Such roadworks are most commonly undertaken by the various utilities whose services are carried beneath the road surface, including telephone, water, sewer, gas and electricity. To gain access to these services, technicians must often open the surface of the road.

It is therefore the utility companies and their subcontractors who are most commonly responsible for the changes to the road surface—such as steel plate covers, trenches or raised sections of road—that create hazards for motorcyclists. However, they do so with the permission of the relevant road authority, so it is the road authority which has the ultimate responsibility for the safety of those roadworks.

In many cases, local councils will require utilities to make temporary repairs, preferring to complete the final restoration of the road surface themselves. As such work is additional to the council's own works program, there may be substantial delays before the permanent repairs are made, during which time the temporary surface may deteriorate and create a hazard for motorcycles. Codes and practices for the management of road openings are coordinated by the NSW Street Opening Conference (NSW SOC). Members of the NSW SOC include utilities, service providers, local government, transport system operators and government agencies.

ROAD SAFETY AUDITS

A road safety audit is a formal examination of an existing road or planned design in which an independent, qualified team of examiners reports on the crash risks for the different types of road users.

The unique characteristics of different vehicles, such as variations in the driver or rider's eye-height are often an important factor in accidents and should always be taken into account in safety audits (RTA, 2004). This is particularly the case for motorcycles because their stability is more sensitive to road design and maintenance faults. A revised Austroads Road Safety Audit manual incorporating motorcycle safety was released in 2002 (Austroads, 2002).

Some road authorities (e.g. VicRoads) now include motorcyclists as a part of the investigation team on some road safety audits (Andrea, 2006).

MONITORING THE SAFETY OF ROAD DESIGN AND MAINTENANCE PRACTICES

There is now increasing evidence that the application of basic 'hygiene' measures, such as signage, line marking and lighting, continues to pay the highest dividends in reducing death and serious injury (Hill & Brown, 2006). But there is little systematic monitoring of the safety of road design or maintenance practices in NSW. While fatal crash sites are usually investigated by police and the RTA to identify any contributing factors, this is rarely done for non-fatal crash sites. Systematic risk assessments such as road safety audits are most likely to be triggered by public reaction to a sequence of crashes, or as part of the process to identify locations for black spot grant applications.

Black spot programs

The *National Road Safety Strategy 2001–2010* notes the remarkable cost benefit from expenditure on road black spots and states the need to conduct road audits and black spot analysis to identify sites for improvement. General road improvements have been found to reduce fatalities by two lives each year per $100 million invested. Black spot programs have reduced fatalities by 20 lives each year per $100 million invested (ATC, 2001).

There is evidence that systematically conducting road safety audits at motorcycle crash sites could identify problems and their treatments, and enable a cost-effective setting of priorities for remedial work. VicRoads has demonstrated the benefits of such an approach with its Motorcycle Blackspot Program. Locations with high motorcycle crash rates were reviewed and treatments devised in consultation with motorcycle crash investigators. Most of the treatments were relatively modest engineering works, such as sealing shoulders; skid resistance treatments; improvements to drainage; sealing of bellmouths on gravel roads; and improvements to the general consistency of road conditions, delineation and line markings, and warning and advisory signs. A preliminary evaluation based on the first 51 treated sites indicated that there was a 37% reduction in rider casualty crashes, after adjusting for exposure, compared to control sites from around the relevant local government areas (Andrea, 2006).

In addition, evaluation of two state-wide Victorian black spots programs has identified significant reductions in motorcycle casualty crashes of 24% and 31% respectively (Scully et al., 2006).

AusRAP (Australian Road Assessment Program)

AusRAP is a sister program to the Australian New Car Assessment Program (ANCAP), part of an international program involving motoring organisations, road authorities and expert bodies working together to make roads safer. A key function of the RAP programs is to make decision-makers and the public aware of what needs to be done to improve the road infrastructure. The RAP ratings provide road engineers with benchmarks on how well or badly their roads compare with others in their own region or country, or internationally.

To date, AusRAP has been applied to the AusLink national network and state highways in Victoria and Western Australia. However, to date NSW has not subscribed to the AusRAP program.

In the future, AusRAP could be expanded to produce road risk maps using motorcycle crash data. The Road Protection Scores could also be adjusted to be sensitive to motorcycle-specific hazards.

The EuroRAP program has been very successful in helping British road authorities to incorporate risk assessments in determining their priorities and approaches to roadworks, including the reduction of motorcycle crashes (EuroRAP, 2006a). In 2004, due to the increasing incidence of motorcycle crashes, the EuroRAP assessments of the British road system were specifically focused on the causes of motorcycle crashes. While acknowledging the contribution of reckless behaviour by some motorcyclists, the EuroRAP report noted that stopping such behaviour on specific high-risk roads would not prevent the majority of motorcycle casualties. The report recommended that road engineers implement design features, particularly at junctions, to marshal traffic, improve layout and visibility, and thus prevent fatal collisions between drivers and motorcyclists. The report also recommended the installation of motorcycle-friendly safety fencing that incorporated shielding and energy-absorbing material (EuroRAP, 2004).

AusRAP has developed two standard protocols: risk mapping of casualty crashes, and a star rating system for roads using a Road Protection Score. Colour-coded risk maps use real crash and traffic flow data to illustrate a road's safety performance by measuring and mapping the number of casualty crashes along a route. The Road Protection Score involves a 'drive-through' inspection in specially equipped vehicles to capture video images of the roads. From this information, inspectors assess each road and assign star ratings based on major safety features and hazards.

AusRAP can influence road planning and policy in three main ways:

- The overall performance of a particular road can be directly compared to other roads.
- Rising road standards can be tracked, including how quickly best practice is being implemented.
- It can assist in decision-making about road investments.

Strategies for Safer Roads

2.1 Road fixtures and furniture may create crash and injury risks for motorcyclists.

2.1.1 MCC to develop a program to promote the systematic reduction in the number of utility poles and signposts in the road environment.

2.1.2 MCC to work collaboratively with the RTA to determine the extent of motorcycle crashes involving different types of roadside objects (e.g. crash barriers, roadside poles, etc.).

2.1.3 MCC to work collaboratively with the RTA on implementing guidelines for clear zones on existing roads to maximise safe recovery area. This should include:

- a requiring safety barriers, light poles, signposts and other road furniture to be placed as far away from the roadside as possible
- b promoting the increased usage of multi-purpose poles and mast arms for traffic lights
- c ensuring flat, smooth surfaces for barriers, e.g. concrete or water-filled barriers.

2.1.4 MCC to request Austroads to proceed with the proposed motorcycle roadside crash study on the relative safety risks of different styles of safety barrier to motorcyclists.

2.1.5 MCC to work collaboratively with the RTA and industry to undertake crash testing (computer modelling) of motorcycles into crash barriers.

2.1.6 MCC to work collaboratively with the RTA to develop criteria for motorcycle-friendly safety barriers (e.g. similar to those used in France and Spain).

2.2 Maintenance and upgrading practices may create crash and injury risks for motorcyclists.

2.2.1 MCC to work with the RTA to establish a protocol requiring engineers with motorcycle expertise to be consulted about proposed works programs to address motorcycle safety.

2.2.2 MCC to work with the RTA to assess and report on the risks associated with road maintenance standards for road authorities and engineers.

2.2.3 MCC to work with the NSW Streets Opening Conference (SOC) to ensure restoration practices are safe for motorcyclists. This may include the MCC making a presentation to a meeting of the Streets Opening Conference to raise their awareness of these issues.

2.2.4 MCC to work with other stakeholders (WorkCover, RTA, etc.) to establish procedures to ensure compliance with guidelines and standards at construction and maintenance work sites, including:

- a raising awareness of motorcycle hazards as a liability risk under OH&S at work sites (e.g. loose gravel or inappropriately placed barriers leading to a crash)
- b researching and promoting awareness of local governments' liability and individual employees' liability for work that results in motorcycle crashes and injury.

2.2.5 MCC to work with road authorities to develop:

- a an improved standard for thermoplastics and paint for slip-resistant road markings
- b technical guidelines on the use of crack sealant and standards for skid resistance.

2.3 The designers of new roads are not required to consider the specific vulnerabilities of motorcyclists.

2.3.1 MCC to work with the RTA to provide road engineers with a means of determining motorcycle-specific crash and countermeasure costs and budget implications in the short and long term.

2.3.2 MCC to request that the RTA revise the RTA *Road Design Guide*:

- a to provide information on motorcycle safety requirements to complement that provided for pedestrian and pedal cycle safety
- b to be made available on the internet.

2.3.3 MCC to request that Austroads provide assurance that the interests of minority road users (motorcyclists and pedal cyclists) will not be disadvantaged by the decision to cease production of guides for specific road users.

2.3.4 MCC to request that Austroads ensure the revision of codes and guides for road design, road safety, etc., allow for input from motorcycle safety experts.

2.3.5 MCC to work with the RTA and the Institute of Public Works Engineering Australia (IPWEA) to improve communications with road engineers and authorities about road environment issues affecting motorcycle safety. This may include:

a including motorcycle safety-related courses and integrating motorcycle safety issues into existing courses

b developing a video/PowerPoint presentation package about road surface and maintenance practices that present hazards for motorcyclists. The package should be stand-alone and designed as a training resource for RTA and local government roadworks staff and contractors

c developing a communications strategy to counter the perception of some road engineers that motorcyclists are only a small proportion of road users and therefore not a high priority (e.g. 'Riders can't expect road built to their standards' or 'Building better roads just encourages riders to go faster')

d working with the Australian Institute of Traffic Planning and Management (AITPM) to identify roads and traffic engineers with an interest/expertise in motorcycle safety.

2.4 Crash records are not used systematically to monitor and guide road maintenance practices.

2.4.1 MCC to request the Australian Transport Safety Bureau (ATSB) to assign specific funding for motorcycle black spot programs, recognising that motorcycle crashes are less likely to meet the current criteria for defining a black spot.

2.4.2 MCC to work with the RTA to develop a program of using crash data to identify routes or sites that represent a higher crash risk for motorcyclists, and recommending these sites for remediation work.

2.4.3 MCC to work with the RTA to use dynamic activated signs on major motorcycle routes and black spots.

2.4.4 MCC to encourage and facilitate hazard reporting to road authorities.

2.4.5 MCC to work with road authorities to establish a protocol to conduct compulsory investigations at the sites of all serious and fatal motorcycle crashes.

03

SAFER VEHICLES AND EQUIPMENT

03

Safer Vehicles and Equipment: training and licensing

KEY ISSUES

3.1 There is no independent, reliable information available to motorcyclists about the protective performance of motorcycle clothing and helmets.

3.2 There is no systematic monitoring or research into the safety of motorcycle engineering developments.

3.3 The vehicle regulations and Australian Design Rules systems do not provide adequate protection for road users.

MOTORCYCLE PROTECTIVE EQUIPMENT

Helmets

The majority (85%) of rider casualties in NSW were wearing a helmet when they crashed. Three per cent were recorded as not wearing a helmet, and there was no information available about the use of a helmet of the remaining 11% of casualty cases.

Eight per cent of those without helmets died, compared to three per cent of helmeted casualties. This is consistent with international research, which indicates that unhelmeted riders have two to three times the fatality rate of helmeted riders, and twice the rate of serious brain injury (Ouellet & Kasantikul, 2006a).

Helmet standards

The design, materials and construction of modern helmets has changed over the past 20 years. Modern helmets can be lighter, quieter and more comfortable than earlier designs. However, helmet standards have not taken account of the technological advances in helmet design (Ouellet & Kasantikul, 2006a). All helmet standards specifications are a compromise to balance impact absorption and penetration resistance with helmet weight. Recent research has found that some standards provide better protection than others. Thom found evidence that helmets meeting the DOT and DOT+ECE standards will provide better protection than those meeting the BSI and Snell standards, in tests designed to simulate actual street crash impacts (Thom, 2006).

The Australian standard, AS/NZ 1698, has been recently reviewed and updated. In terms of specifications for impact absorption and impact resistance, AS 1698 now sits midway between the DOT+ECE and BSI and Snell standards, and is similar to the Japanese helmet standard JIS-T8133.

Protective clothing

There is increasing evidence of the benefits for riders of wearing protective clothing, particularly in low-impact crashes. Studies have found that most motorcycle crashes occur at relatively low impacts and that perhaps half of all motorcycle injuries could be reduced or prevented by the use of effective protective clothing (ACEM, 2004; de Rome, 2006b).

While protective clothing will not prevent life-threatening injuries, it may reduce soft tissue injuries including cuts, abrasions, exhaust pipe and friction burns, and the stripping away of skin and muscle. These benefits are not trivial; such injuries may result in long-term disfigurement and disability from scarring, loss of muscle and tendons, and other joint damage. Effective protective clothing should also protect the rider from the elements in order to maintain a level of comfort and reduce dehydration, distraction and fatigue. By reducing discomfort, such clothing may reduce the risk of fatigue-related crashes (de Rome & Stanford, 2006).

Until recently there has been little information available to riders on the benefits or features of protective clothing. The development of standards for motorcycle protective clothing in Europe has set benchmarks for quality and performance. The industry is responding but reliable information about the protective performance of specific products is still not readily available to riders in Australia.

It is perhaps unrealistic to expect the motorcycle apparel industry to take a lead in raising standards for their products in the absence of demand from their markets. Consumers have been largely uninformed and undemanding, perhaps because the major source of information for riders is motorcycle magazines, which are dependent on the advertising for their revenue.

Since 2003 the MCC motorcycle safety website has provided a consumer guide to identifying effective protective clothing. The MCC is also working with the industry on the development of a system to assess locally sold products. The NSW Motor Accidents Authority (MAA) and the RTA have also run an eye-catching advertising campaign promoting the use of motorcycle protective clothing, and a number of local councils have also promoted protective clothing in rider education campaigns (de Rome & Stanford, 2006).

Rider usage of protective clothing

In 2006, a survey of 1,300 Australian motorcyclists asked riders about the protective clothing that they and their pillion passengers wore (de Rome & Wood, 2007).

The results found that while virtually all riders wore a helmet, motorcycle jacket and gloves, they were less likely to protect their legs and feet. Pillion passengers were far less likely to have adequate protective clothing. They had helmets, and most (around 80%) wore motorcycle jackets and gloves, but they were generally less likely to have motorcycle boots or pants.

Although a relatively small proportion (6%) of motorcycle casualties are pillions, they do tend to suffer serious injuries. The average cost of a motorcycle pillion claim under CTP (the NSW third-party personal injury insurance scheme) in 2000–06 was $200,606, whereas the average motorcycle rider claim was $164,240 (MAA, 2006).

One of the issues with the protective clothing worn by pillions is whether they have their own equipment. Regular pillions might be expected to have their own gear, whereas the occasional pillion is more likely to be borrowing gear or wearing older gear that the rider no longer wears.

MOTORCYCLE DESIGN

There have been significant technological advances in motorcycle tyres, brakes, lights and suspension in the past 20 years. There is also a range of new products developed for other vehicles, such as advanced braking systems and stability control, which may be adapted to improve the safety of riders. A recent review of Intelligent Technology Systems (ITS) for motorcycles identified those that enhance the stability, traction or braking properties of motorcycles, particularly on curves or in emergency braking situations, as being the most promising (Bayly, Regan & Hosking, 2006). Such features are now standard on most new cars, but they are not widely available on motorcycles. Other intelligent vehicle features such as blind spot warning systems, tyre pressure monitors and road surface condition monitors have also been developed but, again, they are not generally available on motorcycles.

There is a lack of independent research evaluating the benefits of ITS for motorcycles. Without such research, motorcyclists do not have the information to make informed decisions nor to create sufficient demand for such products to assure a viable market for the industry.

There is no agency in Australia with responsibility for monitoring new developments in motorcycle design or technology, nor for providing consumers with independent evaluations of the safety performance of different design features or motorcycle models to create more informed demand. For example, Hurt, Ouellet & Thom (1981) described serious pelvic injuries associated with specific designs in fuel tanks and handlebars. Over 25 years later medical journals continue to cite the incidence and treatment of such injuries in motorcyclists, but there does not appear to have been further research to discover whether such injuries are in fact associated with specific design forms (Hurson, Collins & McElwain, 2004; Ihama, Fuke & Miyazaki, 2007).

A program similar to the Australian New Car Assessment Program (ANCAP) program which evaluates the crash performance of cars would provide important information on motorcycles. While crash performance in terms of occupant protection may be inappropriate for motorcycles, the relative merits and handling features of new technology and designs could create a more informed market by providing guidance to riders and feedback to manufacturers.

Learner Approved Motorcycle Scheme (LAMS)

Since 2002, novice riders in NSW have been able to ride machines of up to 660cc where there is a low power-to-weight ratio. The system is known as LAMS (Learner Approved Motorcycle Scheme).

The LAMS class of motorcycles allows for machines which are physically larger in size than many small machines permitted as learner motorcycles. These larger machines may be regarded as more comfortable and therefore safer for physically larger or heavier riders.

Larger LAMS machines are less demanding in terms of gear selection than machines with smaller, high-revving engines, and require lower levels of concentration, similar to having automatic transmission in a car. They are more attractive to many novice riders, as they have a wider power band and require fewer gear changes. This removes a significant distraction, allowing more time to concentrate on traffic and road conditions.

Motorcycle manufacturers have responded by introducing several new models made specifically to capture this market. South Australia and Tasmania have followed the same path and introduced LAMS for riders with learner and provisional licences.

THE DESIGN OF OTHER VEHICLES

In an evaluation of road safety policies in Hong Kong, the authors commented that car crash-worthiness ratings and features, such as ABS brake systems, appeared to help to reduce casualties not only for drivers and passengers inside the cars but all other parties on the road, such as motorcyclists and pedestrians (Wong et al., 2004).

The ANCAP program evaluates vehicles in terms of occupant protection and aggressivity, which refers to the damage inflicted by the vehicle on pedestrians. Pedestrian impact tests estimate head and leg injuries to pedestrians struck by the test vehicle travelling at 40 km/h. In NSW, pedestrians make up 17% of fatalities, while motorcyclists make up 12%. Vehicle design features that would be harmful to a pedestrian are also likely to be equally harmful to motorcyclists and cyclists.

There are other vehicle design features that present specific hazards for motorcycles. These include designs that create blind spots behind and adjacent to the driver. In addition, some new designs have wider windscreen pillars ('A' pillars) which may restrict a driver's forward view of a motorcycle coming at an oblique angle. These wider pillars are a consequence of the development of side-impact airbags which are stored in the windscreen pillar in many vehicles (TRL Limited, 2006).

International harmonisation of vehicle standards needs to be scrutinised to ensure that safety for all road users is the first principle ahead of cost savings. Daytime running lights (DRLs), fog lights and clear indicator lights are all designed for northern hemisphere lighting conditions and may present increased risks for motorcyclists in Australian lighting conditions. A research study commissioned by the Japanese Government concluded that the benefits of DRLs on four-wheeled vehicles depends on the ambient light conditions (JASIC, 2003; 2004). The study found the key benefit was in very low light conditions, and that there was no benefit when lighting conditions exceeded 10,000 lux. The authors of the study recommended that DRLs on vehicles be capable of adjusting their luminous intensity according to lighting conditions to maximise the vehicle's ability to be seen without adversely affecting motorcycles and oncoming drivers.

Strategies for Safer Vehicles and Equipment

3.1 There is no independent, reliable information available to motorcyclists about the protective performance of motorcycle clothing and helmets.

3.1.1 MCC to work with other stakeholders to ensure that relevant data is collected in relation to protective clothing and helmets in crash investigations.

3.1.2 MCC to continue to support research into the injury reduction benefits of protective clothing.

3.1.3 MCC to work with stakeholders to seek government support for the motorcycle accessories industry to establish a means of assuring the protective quality of motorcycle clothing.

3.1.4 MCC to continue to work with the AMC on Helmets Standards Committee.

3.1.5 MCC to seek grants to fund the independent evaluation and critical review of helmet standards.

3.1.6 MCC to work with other stakeholders to ensure riders take responsibility for their own safety and that of their pillion passengers, and ensure that adequate protective clothing is worn.

3.1.7 MCC to work with the health insurance industry to introduce rebates on premiums for riders using protective clothing.

3.2 There is no systematic monitoring or research into the safety of motorcycle engineering developments.

3.2.1 MCC to work with other stakeholders to establish a program to identify any patterns of higher crash risks associated with different motorcycle models, including scooters.

3.2.2 MCC to work with other stakeholders to establish a program to research and evaluate the relative merits of new technology, brakes, ITS, etc. and promote this information to riders.

3.2.3 MCC to seek the support of the federal government to investigate an approach to motorcycle crash investigation similar to that used in the Australian National Crash In-depth Study (ANCIS).

3.2.4 MCC to work with industry to review ABS, combined, dual-combined and servo-assisted braking systems, and provide information on website.

3.2.5 MCC to review and publish reviews, research and links where possible for this area.

3.3 The vehicle regulations and Australian Design Rules systems do not provide adequate protection for road users.

3.3.1 MCC to work with other stakeholders for the development of Australian Design Rules (ADRs) to restrict the use of:

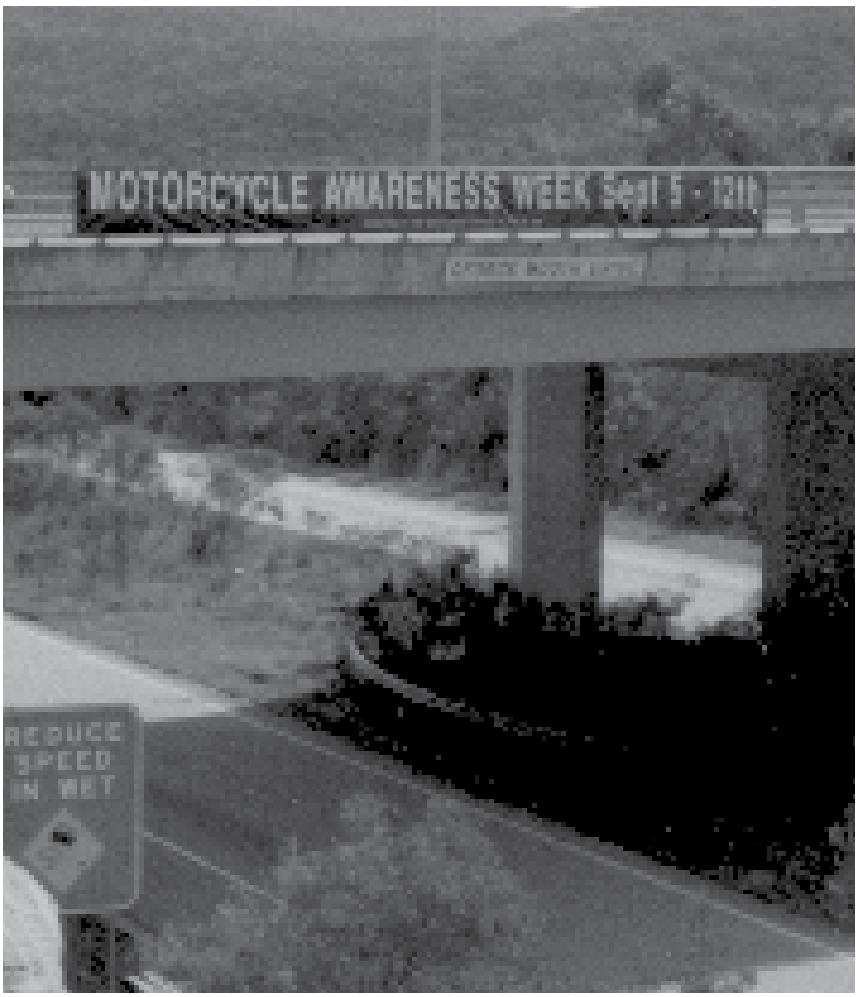
- a high-intensity headlights
- b clear lens indicators
- c wide ‘A’ and ‘B’ pillars that limit drivers’ view of vulnerable road users.

3.3.2 MCC to work with the NRMA to promote awareness of the NRMA Driver Vision Index and Vehicle Aggressivity Index to other motorists.

3.3.3 MCC to seek the support of other stakeholders in petitioning state parliament to ensure safe and equitable electronic tolling for motorcyclists.

04

COORDINATION, COMMUNICATION AND POLICY


MOTORCYCLE AWARENESS WEEK
REDUCE
SPEED
IN WET

04

Coordination, Communication and Policy

KEY ISSUES

4.1 Motorcycles are not recognised as a separate class of vehicle for road safety policy, or for traffic management and transport planning.
4.2 There is insufficient government investment in motorcycle safety research and development.
4.3 Police crash reporting does not provide sufficient information for analysing and researching motorcycle crash data.
4.4 There are insufficient avenues for consultation and independent advice to government on motorcycling issues.
4.5 There is insufficient industry involvement and support for motorcycle safety initiatives.
4.6 Government services do not adequately provide for motorcyclists.
4.7 The sustainability of motorcycle safety strategies depends on the resources of the MCC.

MOTORCYCLES AND GOVERNMENT POLICY

The issues listed above were identified in consultation with a range of stakeholders. They relate to the administrative and political context within which decisions affecting motorcycle safety in NSW are made. They also include a number of specific factors which adversely affect or limit the progress of efforts to improve motorcycle safety in NSW.

Perhaps the key issue is the fact that motorcycles are not formally recognised and accepted as a part of the transport system in NSW. This lack of recognition of motorcycles as a form of transport with specific benefits, and associated safety and traffic management requirements, is central to the discussion of motorcycle safety.

The process of setting road safety priorities and developing strategies is informed by road safety experts using crash data, research, and consultation with various interest groups and stakeholders. This process can work very well for those whose interests are recognised, but it appears to have failed to work in the best interests of motorcycle safety.

The process appears to have failed because:

- Road authorities have not been required to make separate provision for motorcyclists in the design of roads and facilities.
- Road authorities have not been required to develop expertise in motorcycle safety engineering.
- The crash data collected does not adequately inform understanding of the causes of motorcycle crashes.
- There has been relatively little research into motorcycle safety.

As noted earlier (Section 2), there are guidelines on the design of roads for the safety of motorcyclists, pedestrians and cyclists, but engineering practice at state and local government level appears to implement only those guidelines relating to pedestrians and cyclists. Road design plans are required to make provisions for some classes of road users (pedestrians and cyclists) but not for motorcyclists, who are subsumed under the general category of motorists.

The whole process of government depends on checks and balances provided by good-quality consultation with stakeholders. While the members of the motorcycle community have become better organised in representing their interests to government, the motorcycle industry and media have not engaged to lend their voice or economic support.

In order to make motorcycling more acceptable as a means of transport it has to become safer, and be perceived as safer. This will require change in four broad areas. Motorcyclists need to be:

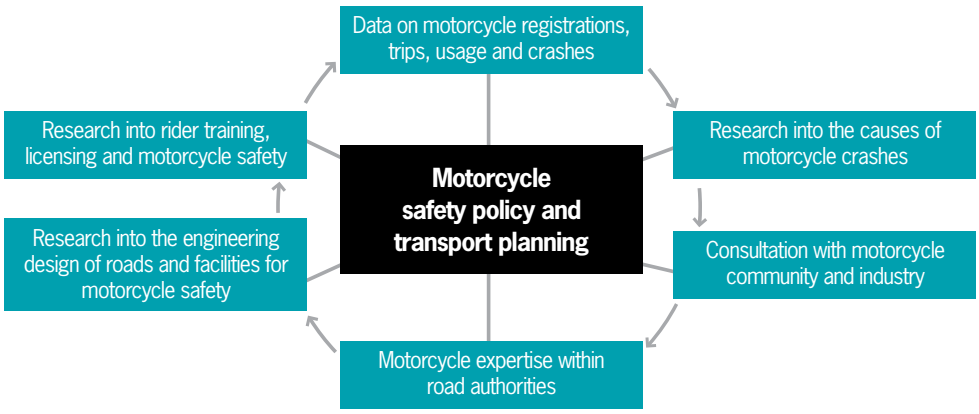
1. identified as vulnerable road users with special needs
2. included in crash research and safety monitoring programs
3. accommodated in the design and maintenance of the road environment
4. included in transport planning and facilities.

See Figure 4.1.

WHO SHARES AN INTEREST IN MOTORCYCLE SAFETY?

- riders and rider organisations
- transport and safety policy-makers
- safety organisations and authorities
- rider licensing and rider education legislators
- road infrastructure planners
- traffic code legislators
- local and regional traffic management authorities
- motorcycle and scooter manufacturers, importers and retailers
- motorcycle and scooter accessories dealers
- motorcycle media
- motorcycle sports industry and associations
- insurance sector/ health services

FIGURE 4.1 Planning for motorcycle safety



Systems approach

The traditional approach to road safety has been to place the primary focus on changing road user behaviour. Current thinking is to challenge these approaches, arguing that to err is human and that a safe road system should be designed to accommodate and reduce the risks and consequences of human error (WHO, 2004).

Australian road authorities, through Austroads, have formally adopted a 'safe systems' approach. This is expressed in the *National Road Safety Strategy* (NRSS) (ATC, 2001). The safe systems approach incorporates safer vehicles, safer roads, safer roadsides and safer speeds that are more forgiving of human error.

As noted earlier (Section 2), the work done in Victoria to identify the crash reduction benefits to motorcyclists through black spot remediation programs, as well as the evidence of the European Road Assessment Program, does offer promise if these approaches are adopted in NSW (Andrea, 2006; Hill & Brown; 2006; Scully et al., 2006). AusRAP provides a means of prioritising roadworks by providing independent crash risk assessments on all roads, but NSW has yet to sign on to that program. The needs of all road users, including motorcyclists, can and should be considered in the assessment and prioritising program.

VULNERABLE ROAD USERS WITH SPECIAL NEEDS

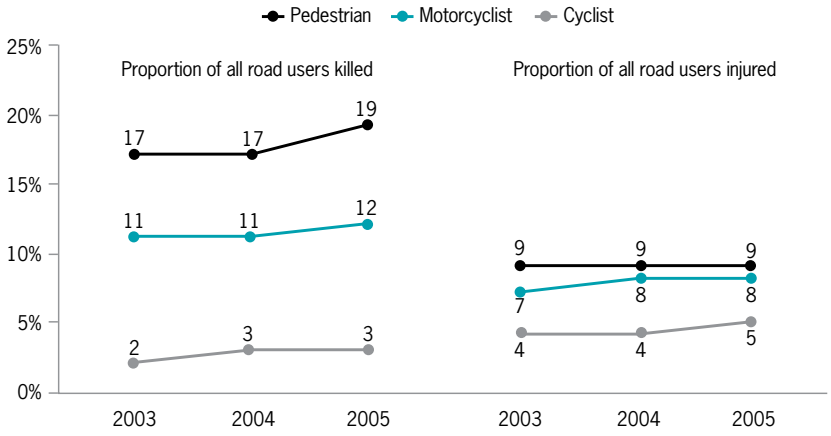
Injury reduction planning generally involves identifying priorities based on injury risk assessments. However, road safety priorities as reflected by expenditure in NSW do not appear to be based on comparative injury incidence.

Figure 4.2 shows the fatalities and injuries to all vulnerable road users[1] in NSW across the calendar years 2003–05. Of the vulnerable road users, motorcyclists are second only to pedestrians as a proportion of fatalities and injuries. In comparison, cyclists represent only a fraction of both fatalities and injuries but it is apparent that, despite their relatively low injury incidence, cyclists are a major focus of road safety programs in NSW, with more than $265 million invested in cycleways across NSW since 1995.[2]

1 Vulnerable road users (VRU) are those road users who are not protected within a vehicle. The term is most commonly used to refer to pedestrians, cyclists and motorcyclists.

2 New South Wales, *Legislative Assembly Questions and Answers*, ministerial answer to Lee Rhiannon MLC, 8 November 2005.

FIGURE 4.2 Motorcyclists, cyclists and pedestrians as a proportion of road users killed and injured in NSW, 2003–05



In the single year 2005–06, the RTA allocated $5.6 million for cycling infrastructure, education and promotion, and $7.8 million for pedestrian facilities and promotion.[3] In the Budget Estimates Committee Hearings of 20 September 2005, the NSW Parliament was told that $1.5 million had been spent on motorcycle safety 'to date', that is, across the three years since October 2002.[4]

There is little information available as to how such priorities are set, but these figures do suggest that, in NSW, expenditure on motorcyclists' safety does not reflect their relative injury risk.

MOTORCYCLE CRASH INVESTIGATION AND RESEARCH

It is apparent that we do not know enough about the causes of many motorcycle crashes. It is too easy to simply blame the rider without reviewing the other contributing factors. Crashes result from a combination of circumstances converging to a point when the rider does not have the skills or the options to avoid the crash. Systematic investigation is necessary to identify patterns of failure associated with driver/rider behaviour, road conditions, vehicle features and rider skill issues. However, there are a number of limiting factors that are more or less built into the current system.

Crash data is car-focused

The crash data that is collected in NSW covers a wide range of factors relating to the time and location, road conditions and vehicle movements, and the identity of the drivers/riders involved, all of which is useful for crash analysis. However, the disadvantage of the current system is that it focuses on factors most relevant to car crashes and does not provide for the different characteristics and factors that would only be relevant to other types of vehicle crashes, such as motorcycle or heavy vehicle crashes. The most significant consequence of this system for motorcyclists is the way in which behavioural factors associated with motorcycle crashes, such as speed or fatigue, are defined. As a result the relative contribution of speed may be overestimated, and that of fatigue underestimated in relation to motorcycle crashes.

Police crash data is not designed for researching the causes of crashes

In NSW, crash information recorded by police is the major source of data on the incidence and causes of crashes. However, the primary purpose of the police crash investigation system is to identify factors in relation to enforcement issues. The data collected is not designed as the basis for research into the causes and consequences of crashes, or research and analysis of crash trends.[5]

3 New South Wales, *Legislative Assembly Questions and Answers*, ministerial answer to Lee Rhiannon MLC, 8 November 2005.
4 New South Wales, *Roads Estimates Committee*, Minister for Roads, Joseph Tripodi MLA, in response to Lee Rhiannon MLC, 20 September 2005.
5 For example, since 1997, NSW Police do not distinguish between 'serious' and other injury crashes. All crashes are classified as either fatal, injury or non-injury crashes.

Crash investigations are carried out on all fatal and most serious injury crashes, although not all serious crashes will be investigated by the police crash investigators due to the demand on resources. A crash is determined to be 'serious' if there is a fatality or if injury that could constitute 'grievous bodily harm' in enforcement terms.[6] The primary purpose of such an investigation is to determine cause and effect in order to establish criminal culpability for prosecution. If the injured party was at fault in the crash, they are not generally considered to be a 'victim' in criminal justice terms. If there is no 'victim', there may be no criminal case for prosecution and therefore no need for police investigation. As a consequence, there are few detailed investigations of single-vehicle motorcycle crashes.

In 2006, there were just 50 police crash investigator positions in NSW, although there are, on average, 55 casualty crashes each day. As a result, most crashes are attended only by general duties police or highway patrol, who are not trained crash investigators. In the past, the RTA used to provide training on road safety and data collection at the NSW Police Academy, but this practice has ceased in recent years. It is up to the attending officer to decide whether to refer a crash for further investigation by police crash investigators. Effectively this means that a police officer without expertise in the highly specific dynamics of a crash may be the sole arbiter—determining causes from a forensic perspective, deciding who is to be prosecuted, and identifying any contributing road environment or vehicle factors. In addition, it is their assessment that determines the data entered into the police data system, which is used for subsequent crash research analysis.

Single-vehicle crashes are less likely to be investigated

Single-vehicle crashes are not generally subject to a full investigation unless they involve a fatality, or there are serious injuries but no witnesses to the cause of the crash. Approximately 40% of all motorcycle crashes are single-vehicle crashes. Little is known about the causes of these crashes, because they are generally not investigated. It is assumed that single-vehicle crashes are caused by excessive speed, because at some point the rider lost control of the vehicle.

As noted earlier, crash data shows that up to 21% of single-vehicle motorcycle crashes involve some road surface defects as a contributing factor, including 27% of crashes on curves. The data is also consistent with the reports of surveyed riders who had been involved in a single-vehicle crash—24% blamed road condition. In the 2006 MCC survey, almost two-thirds (63%) of the riders accepted responsibility for their single-vehicle crash, but were more likely to attribute this to lack of skills in observation (15%) or braking (12%), rather than their speed (15%) (de Rome & Brandon, 2007).

COST OF MOTORCYCLE CRASHES

Motorcycle crashes almost invariably result in some injury (91%), compared to only 44% of all vehicle crashes in NSW (RTA, 2005b). Each year there are over 2,000 motorcycle casualties, of whom 3% are fatally injured. By comparison, 2% of all vehicle occupants and 4% of pedestrian casualties are fatally injured (RTA, 2005b).

Relatively little is known about those injured motorcyclists in terms of the extent of their injuries and any associated long-term disabilities as a consequence of their crash. A recent in-depth study of motorcycle crashes in Europe (MAIDS)[7] found that the most serious injuries suffered by a high proportion (39%) of riders were relatively minor injuries—AIS Level 1 (ACEM, 2004).[8] Overall, almost half (49%) of all the injuries recorded in MAIDS were rated as minor. While such injuries are not life-threatening, they may have severe long-term consequences for the rider in terms of loss of mobility. A New Zealand study of motorcycle crash casualties who had received compensation for disablement reported that some 71% of claimants had some degree of mobility handicap (Clarke & Langley, 1995).

6 The definition of 'serious' used for crash investigation purposes is different to that used for crash statistics. Any crash where a person is taken to hospital will be recorded as a serious crash for data collection purposes, but may not actually involve serious injury (Consultation, Crash Investigation Unit, NSW Police Service).

7 MAIDS refers to the Motorcycle Accident In-Depth Study, a multi-centre case-control research study conducted in Italy, Spain, Germany, Holland and France from 1999 to 2001.

8 On the Abbreviated Injury Scale (AIS), a 0 indicates 'uninjured', and 6 is 'not survivable'.

In NSW, the average cost of a motorcycle rider claim through the Motor Accidents Authority is 3.8 times that of claims by other vehicle drivers, and the cost of a motorcycle pillion claim is 2.8 times that of claims by other vehicle passengers (MAA).[9] However, while the individual claim cost is relatively high, the number of claims is relatively low.

Under the 'fault-based' system in NSW, a vehicle controller is not able to claim for personal injury if they were the 'at-fault' vehicle in a crash. This, by definition, includes all single-vehicle crashes. This means that motorcyclists can only make a claim under the CTP scheme in those multi-vehicle crashes where the other driver was at fault.

During the five-year period 2001–05, there was an average of 837 multi-vehicle motorcycle crashes each year where the other driver was the key vehicle and therefore more likely to have been at fault. However, as Table 4.1 illustrates, relatively few of the motorcyclists (52%) and pillions (43%) involved in these crashes have made claims under the CTP scheme.

TABLE 4.1 Number of claims to the MAA by riders and pillions compared with the total number of riders and pillion casualties recorded by the RTA

YEAR	RIDER CASUALITIES WHERE OTHER DRIVER WAS IN THE KEY VEHICLE (RTA)	RIDER CLAIMS AGAINST OTHER DRIVERS (MAA)	ALL PILLION CASUALTIES (RTA)	ALL PILLION CLAIMS (MAA)
2001	755	333	153	79
2002	745	414	145	59
2003	661	358	113	58
2004	725	369	124	46
2005	722	397	126	41
TOTAL	**3,608**	**1,871 (52%)**	**661**	**283 (43%)**

The number of claims is surprisingly low when the number of crashes each year is considered. This may indicate that a large proportion of casualties in these reported crashes had injuries that were too minor to involve claims. This would be consistent with the findings of the European MAIDS study, which found that the most serious injury suffered by most riders is either minor AIS Level 1 (39%) or moderate AIS Level 2 (33%) injuries (ACEM, 2004). Motorcyclists together with pillions represent 8% of all road casualties in NSW, but motorcyclists make up only 2.8% and pillions 0.4% of all CTP (compulsory third party) claims to the Motor Accidents Authority.[10]

MOTORCYCLES IN TRAFFIC MANAGEMENT AND TRANSPORT PLANNING

Traffic planning and management is integral to a safe systems approach to road safety. Traffic management policy does recognise the different needs and vulnerabilities of pedestrians and pedal cyclists, but motorcyclists are rarely separately identified or accommodated. While this is a road engineering issue, accommodating motorcyclists is a higher level policy decision.

The boom of the motor car and urban growth since the 1950s has allowed housing developments far beyond the reaches of public transport. Australian transport planners tend to work from European models and to focus on walking, cycling and public transport as the alternatives to motor vehicles. However, this fails to recognise cycling and walking as relative luxuries in the context of modern urban growth. Cycling and walking are options available only to those who can afford to live within a reasonable distance of their destinations. This is particularly the case in Australia where distance, geography and climate place limitations on the extent to which walking or cycling can be viable options and where public transport has been allowed to decline over decades. For many, walking and cycling are recreational pursuits, not viable commuting options.

9 Based on NSW Motor Accidents Authority, Claims Register data for the period 2000–06, 30 June 2006.
10 Note that the CTP scheme in NSW is fault-based, so these figures represent only a proportion of all casualties from road crashes.

POWERED TWO-WHEELERS ARE AN EFFECTIVE MEANS OF TRANSPORT, WHICH OFFER:

1. increased mobility and flexibility
2. more efficient utilisation of road space
3. more efficient utilisation of parking space
4. fuel efficiency
5. reduced emissions compared to other vehicles
6. lower wear and tear of roads.

The disadvantages include:

1. increased vulnerability of riders in road crashes
2. impracticality in adverse weather conditions
3. the need for secure parking and storage facilities at transport interchanges and city centres
4. the noise of some motorcycles
5. pollution from exhaust emission (ACEM, 2006).

The latest NSW survey of household travel shows that the average weekday trip undertaken in NSW is 9.3 kilometres and the average person travels 35.5 kilometres each day (TPDC, 2006). For many, motorised transport is the only available option but, until recently, transport planners rarely considered the potential contribution of motorcycles as a more environmentally sustainable personal transport alternative to motor cars.

The lack of visibility for motorcycles in planning is not surprising as the NSW Department of Planning does not treat motorcycles as a separate form of motorised transport in data collection and analysis. This data is provided to other organisations, including other state and local government agencies, for use in transport and land use planning. A major source of this information is the regular Household Travel Survey (HTS), which does collect information about motorcycle usage but, rather than reporting it separately, collates it under the generalised heading of motorised transport. Thus the opportunity of tracking the emerging trend of motorcycle and scooter usage is lost.

As a consequence the NSW Government did not even mention motorcycles in the Sydney Metropolitan Strategy. This is a significant omission in terms of the promotion of motorcyclists' interests, as the strategy represents the NSW Government's long-term plan to 'maintain Sydney's role in the global economy and to plan for growth and change—a series of ongoing decisions, actions, plans, and projects' (NSW Department of Planning, 2005).

While the Metropolitan Strategy articulates a commitment to more sustainable transport, including more efficient vehicles, and to considering 'the full spectrum of land use, transport and related issues including all relevant social, environmental and economic factors', the omission of motorcycles makes it quite evident that not all options are being considered.

Some years ago, VicRoads commissioned a report on the present and potential roles for motorcycles in the total transport system. The objective was to provide a basis for developing a motorcycle strategy which included a balanced coverage of the mobility and accessibility contributions, as well as the inherent operating and safety costs. The report examined motorcycles as a transport option in terms of traffic flow and capacity, and environmental and economic impacts. The author found that motorcycles were currently inadequately integrated and underused in transport policy due to a singular focus on safety issues. He argued that, with appropriate vulnerable road user policies (covering pedestrians, cyclists and motorcyclists), road space management policies and improved economic evaluation systems, motorcycles could be efficiently integrated into transport and traffic models (Wigan, 2000; 2001b).

The United Kingdom has taken the lead in becoming the first Western government to make a commitment to mainstreaming motorcycling in transport policy (DFT, 2005). The viability of including motorcycles as a safe option in transport planning has already been demonstrated by the City of London.

In 2000, London published a Transport Strategy and Road Safety Plan for the city, which undertook to promote the use of motorcycles as a part of the congestion reduction program. Initiatives included exempting motorcycles from the congestion tax and incentives to encourage their use as an alternative form of transport. Promotional programs included providing advance stop lines and secure parking for motorcycles, and allowing them to use bus lanes. The provision of these facilities was complemented by motorcycle safety education campaigns aimed at both riders and other drivers. Over a three-year period there was a 10–15% increase in motorcycle trips in London, but a 30% reduction in the number of motorcyclists killed and injured (Hewing, 2005).

There are a range of consequences following from motorcycles not being recognised as a separate form of transport for the purposes of planning and policy.

- Cashless tollways are central to the NSW Government's approach to improving the movement of traffic around Sydney. However, motorcycles were not considered in the development of the e-TAG system. Current e-TAGs are designed to be fixed on the inside of an enclosed vehicle's windscreen, they are not weatherproof and there are few positions on any motorcycle where such a device can be fixed so that it can be scanned.
- Since the introduction of public private partnerships (PPP) in contracts for toll roads, motorcycles are now charged the same toll rate as a car, showing the failure to include motorcycles in planning.
- Parking and storage facilities for bicycles are encouraged under the Sydney Metropolitan Strategy and are included by most local councils as a part of their development control plans (see 'Example' at right). There are few examples of similar provisions being made for motorcycles.
- Advanced stop lines for two-wheelers are used in many parts of Europe and Asia but have not been considered in Australian cities.

EXAMPLE:
The Secure Bicycle Locker Program: a Department of Transport initiative managed by Bicycle New South Wales, integrating bicycle and public transport travel

Secure bicycle lockers have been installed for use at selected CityRail stations and Sydney Ferries throughout the network. They make it easy to cycle and take the train or ferry to work or school, to shop or just to get about town. The scheme is a Department of Transport initiative.

CONSULTATION AND COMMUNICATION

Public policy

Until recently, the NSW Government consulted with motorcyclists through the NSW Motorcycle Safety Consultative Committee, which met every six months for over 10 years. This committee was chaired by the RTA with membership restricted to the Motorcycle Council of NSW, the Motor Traders Association (MTA) and Federal Chamber of Automotive Industries (FCAI). Representatives from the Minister for Roads' office and the NSW Police were also invited to attend.

In 2005, the MCC withdrew from the committee after a series of events indicated a lack of willingness by RTA management to engage with riders in meaningful consultations as a part of the policy development process.

In 2007 it was proposed to establish a Ministerial Advisory Committee on Motorcycling. The proposed committee would provide advice to the Minister for Roads and include representatives of motorcyclists from the MCC and senior management of the RTA. The committee would provide the government with strategic policy and program advice on motorcycling matters in relation to safety, roads management and transport policy.

Attitudes of other road users

Motorcyclists have long suffered from a poor public image. Historically, this is derived from old stereotypes which are perpetuated by the media promoting fear and mistrust. The poor public image has direct road safety implications in the on-road behaviour of motorists towards motorcyclists.

A study for the Federal Office of Road Safety in 1995 identified a number of safety problems associated with the poor public image of motorcyclists (Krige, 1995). They found that motorists tended to be influenced by old 'bikie' stereotypes and feel an emotional distance from motorcyclists. They had little understanding of the riding activity or risks associated with it, nor did they have any knowledge of how to interact with motorcyclists as road users.

Brooks and Guppy (1990) also identified lack of social awareness of motorcycles as a factor which may predispose drivers to errors when interacting with motorcycles. Hurt, Ouellet and Thom (1981) and Magazzù, Comelli and Marinoni (2006) also found that drivers who were also motorcyclists or were familiar with motorcycling were less likely to be involved in a crash with a motorcycle.

Since the development of the first strategic plan, the MCC has actively worked to improve media relations and the public image of motorcyclists. There have also been a number of initiatives aimed at breaking down the 'us and them' attitudes between riders and other road users. These include state government public education campaigns targeting drivers as well as motorcyclists, in addition to a range of local government and community-based programs.

Attitudes of road safety professionals

The poor public image of motorcycle riders has also influenced the attitudes of some who work in road safety. The situation for motorcyclists is often similar to that of young drivers. Individuals from these two groups are more likely to be assumed responsible for any crash in which they are involved, whereas this is less likely for other road user groups. For example, it has been estimated that one-third of all pedestrian fatalities were alcohol-affected (NRMA, 2002), yet it is most unlikely that anyone would casually ask a pedestrian casualty whether they had been drunk at the time. However motorcyclists and young drivers are readily assumed to have been speeding if they are involved in a crash. Attitudes like these belong in the past, and they are shifting as we move away from blame models towards a systems approach to road safety.

Change has also been achieved as road safety practitioners develop a greater understanding of motorcycle safety issues through working with riders. Major advances in the past five years have resulted in a range of programs aimed at helping riders understand and improve their own safety. These have included a high-profile motorcycle safety advertising campaign funded by the RTA and MAA, and a number of community-based projects by local councils. The MCC has also developed a website, partly funded by the NRMA, to deliver motorcycle safety information to riders on a range of topics including protective clothing.

The results of an MCC survey of riders in 2006 indicate that these efforts have been successful, at least in gaining the attention of the riders who responded to the survey (de Rome & Wood, 2007). Compared to a similar survey in 2001, riders were more likely to recall having heard motorcycle safety messages that provided constructive advice on safe riding. There also appeared to be an increase in the level of safety dialogue among riders, with a higher proportion attributing the source of safety messages to other riders.

Other programs aimed at improving the road environment for motorcyclists are also appearing. Innovative and useful solutions, including the asymmetric repair of rural roads, line marking, widening and reshaping of problem curves (such as those developed within the RTA for addressing road black spots) have proved highly beneficial in reducing motorcycle crashes when evaluated in other jurisdictions (Levett, 2005; Reynolds, 2007). The evaluation of the Victorian Motorcycle Black Spot Program found a 37% reduction in motorcycle casualty crashes at treated sites (Andrea, 2006).

The essential basis of these programs has been the interaction between road safety professionals and motorcyclists with the shared goal of improving motorcycle safety. Where the road safety professionals have taken an active interest, we have seen improvements to motorcycle safety, or the foundations for improvements.

It has been a major objective of the MCC to establish more productive relationships with local, state and federal government agencies to ensure that motorcycles are treated in an equitable manner. Where this has been successful, such as in the inclusion of motorcyclists in consultations to develop motorcycle crash countermeasures, the combination of riders' experience with road safety professionals' knowledge has resulted in more effective solutions.

The next stage requires that motorcycles be systematically recognised as a separate class of road user in the development of transport planning and facilities. This may also contribute to a reduction in motorcycle crash rates through ensuring motorcyclists are considered in roads engineering and remediation works.

Strategies for Coordination, Communication and Policy

4.1 Motorcycles are not recognised as a separate class of vehicle for road safety policy, or for traffic management and transport planning.

4.1.1 MCC to work with other stakeholders for research into motorcycle traffic management strategies such as lane-splitting, lane-filtering, designated lanes and advanced stop lines for motorcycles.

4.1.2 MCC to seek input into the review of the NSW Roads Act to ensure the safety interests of motorcyclists are considered in relation to liability for roadworks and other issues.

4.1.3 MCC, through the Australian Motorcycle Council (AMC), to seek input into the review of the National Road Rules.

4.1.4 MCC to seek input into the review of motorcycle-related NSW Acts and Regulations.

4.1.5 MCC to work with other stakeholders to include motorcycle-specific provisions in the review of the RTA parking policy guidelines in relation to paid and unpaid parking.

4.1.6 MCC to be formally included as a key stakeholder in consultations and notified when traffic management policies and guidelines are developed or revised, and when drafts are placed for comment on the RTA website.

4.1.7 MCC to work with the RTA, NSW Department of Planning and Department of Local Government to:

- a integrate road safety and transport planning into local government planning instruments
- b work with professional associations and educational providers to include road safety and transport planning in the training of planners
- c formally recognise motorcycles as a separate form of motorised transport in transport planning and infrastructure development
- d include motorcycles as a separate form of transport in the Sydney Metropolitan Strategy.

4.1.8 MCC to work with NSW Department of Planning to:

- a have motorcycle safety and requirements for parking facilities incorporated into local government Development Control Plans
- b include motorcyclists as an identified transport group in their consultations for all future planning initiatives
- c collect and report data on motorcycles as a separate form of transport from other motor vehicles.

4.1.9 MCC to develop a strategy to work with the Australian Motorcycle Council (AMC) to ensure that motorcycles are incorporated into transport planning at federal, state and local government levels.

4.1.10 MCC to develop a strategy to promote motorcycles as a transport option through the NSW Government's strategy 'Action for Air', by promoting the environmental benefits of motorcycles as a mode of transport in terms of parking requirements, environmental considerations, fuel use and road space.

4.1.11 MCC to work with industry associations to:

- a take a lead in promoting benefits of motorcycles as a transport option in terms of reduction of fuel costs, congestion and parking facilities
- b fund the development of a comparison of the costs and benefits of motorcycles compared to cars and pedal cycles
- c work with the NRMA to repeat the 'Energy Challenge' to evaluate the actual costs of different types of transport, including cost of production of the vehicles.

4.1.12 MCC to work with relevant agencies to fund research into the cost and benefits of expenditure on cycle facilities compared to motorcycle facilities.

4.1.13 MCC to encourage motorcyclists to work with their local councils to provide secure motorcycle parking with lockers in commercial developments and commuter parking areas.

4.1.14 MCC to work with the RTA and legislators for the amendment of the NSW Roads Act and other relevant Acts of parliament to distinguish motorcycles as a separate class of road user.

4.2 There is insufficient government investment in motorcycle safety research and development.

4.2.1 MCC to work collaboratively with other stakeholders to ensure casualty crash data, including both injury and fatality crashes, is used as the basis of road safety policy and program initiatives for all road users.

4.2.2 MCC to work through the Australian Motorcycle Council (AMC) and the Australian Transport Council (ATC) to request road authorities to include kilometres travelled on the information provided when reregistering vehicles. This will enable more meaningful assessment of crash incidence by allowing calculation of crashes per kilometre rather than per registered vehicle.

4.2.3 MCC to work collaboratively with road authorities to enhance the system of crash investigation of all motorcycle crashes, and particularly single-vehicle crashes.

4.2.4 MCC to work collaboratively with other stakeholders for research to develop a better understanding of what happens in a crash. This may include:

a in-depth study of motorcycle crashes using the facilities now available to link police crash records with hospital records

b establishing a means of quantifying actual risk associated with road surface condition

c access to information used in coronial and criminal investigation of motorcycle crashes.

4.2.5 MCC, through the AMC, to request that the Australian Transport Council (ATC) provides information on the anticipated crash reduction benefits and costs associated with the introduction of frontal identification for motorcycles.

4.2.6 MCC to work with other stakeholders to establish a protocol for road authorities and researchers to consult with motorcyclists on all initiatives relating to motorcycle safety.

4.2.7 MCC to request that the RTA establish a full-time position for a manager with specific responsibility for motorcycle safety in the Road Safety Division of the RTA.

4.2.8 MCC to work collaboratively with the RTA on integrated programs involving road improvements, rider behaviour and enforcement.

4.2.9 MCC to work collaboratively with other stakeholders for research into the cause of single-vehicle motorcycle crashes.

4.2.10 MCC to work collaboratively with other stakeholders to research the differential crash risk patterns of different rider subgroups, by age and gender, for returning older riders, seasonal riders and novice riders.

4.3 Police crash reporting does not provide sufficient information for analysing and researching motorcycle crash data.

4.3.1 MCC to work with key stakeholders to ensure that the investigation of all serious and fatal motorcycle crashes is undertaken by people trained to understand motorcycle crashes. This is to ensure that the multiple factors are correctly identified and recorded for mass data collection to provide information for countermeasures.

4.3.2 MCC to work with key stakeholders to review police investigation, reporting and data collection of all road crashes. Considerations should include:

a extending the brief for police investigation of crashes to include determining contributing factors such as the road environment, rather than solely focusing on identifying culpability for enforcement purposes

b developing a checklist of factors that are more likely to be associated with other vehicle crashes, such as motorcycles and trucks

c revising police procedures to allow serious and fatal injury crash sites to be treated as crime scenes until investigations are completed

d ensuring that accredited crash investigators supervise the investigation of all fatal and serious injury crashes

e introducing a crash investigation training course for all trainee police officers with completion to be a prerequisite for leading any crash investigations

f including road safety training and resources in police crash investigation to ensure officers are able to identify road design and maintenance standards that may be contributing factors

g establishing a professional accreditation system and career path for police crash investigation experience and training.

4.3.3 MCC to work with other stakeholders to determine how police powers to close roads considered unsafe may be applied to ensure road authorities comply with road design and maintenance standards where non-compliance presents a road hazard.

4.3.4 MCC to work with police to investigate the perception by motorcyclists that they are automatically charged with negligent driving when involved in single-vehicle crashes.

4.3.5 MCC to work with key stakeholders for the establishment of a multidisciplinary project to undertake the forensic analysis of serious motorcycle crashes. This will improve understanding and the development of countermeasures.

4.3.6 MCC to promote the adoption of the international standards for in-depth investigation of motorcycle crashes for research purposes.

4.3.7 MCC to work with other stakeholders to enhance procedures for notification of hazardous road conditions and actioning of repairs by relevant road authority.

4.4 There are insufficient avenues for consultation and independent advice to government on motorcycling issues.

4.4.1 MCC to work with the RTA and other stakeholders to re-establish a consultative forum between the government and motorcycle community.

4.4.2 MCC to work with other agencies to formalise the framework for consultation and planning between government, other stakeholders and motorcycle community groups.

4.5 There is insufficient industry involvement and support for motorcycle safety initiatives.

4.5.1 MCC to work with RTA to establish a mechanism for improved liaison between industry, the rider community and road authorities.

4.5.2 MCC to work with motorcycle industry associations to review their codes of practice to ensure that safe riding practices are promoted and that unsafe riding practices are not endorsed by the industry.

4.5.3 MCC to work with motorcycle media to establish a code of conduct for motorcycle media.

4.5.4 MCC to work with industry associations to provide the MCC website with information on new research and developments in motorcycle technology and design, safety tips, buying a motorcycle and registration requirements, and include a link to the Register of Encumbered Vehicles (REVS).

4.5.5 MCC to work with industry associations to encourage their members to:

a include motorcycle safety as a value in their communications with their customers

b endorse the MCC road safety website and promote it to their customers

c promote networks between rider trainer and motorcycle retailer associations

d become stakeholders in motorcycle safety issues

e promote motorcycle hazard reporting by providing their customers with information on the process to follow and contact details.

4.6 Government services do not adequately provide for motorcyclists.

4.6.1 MCC to work with stakeholders for funding for research into post-crash rider rehabilitation.

4.6.2 MCC to work with local regulatory and community bodies to ensure programs such as the Traffic Offenders Program and the Sober Driver Program address motorcyclist issues.

4.6.3 MCC to seek funding for a project to improve the image of motorcyclists as tourists and consumers, to counter prejudice and clarify the relative economic benefits of motorcyclists to a community area.

4.6.4 MCC to work with local authorities to promote motorcycle-friendly tourist destinations.

4.6.5 MCC to continue to promote St John's Ambulance High-Velocity First Aid course.

4.6.6 MCC to increase focus on programs to support local motorcycle groups to engage with their local councils.

4.6.7 MCC to work with other stakeholders to develop protocols for road users to manage traffic at crash sites before emergency services arrive, and promote this on MCC website.

4.7 The sustainability of motorcycle safety strategies depends on the resources of the MCC.

4.7.1 MCC to seek funding to:

a employ a professional writer to convey information to riders

b continue to provide information to riders and other stakeholders through the MCC road safety website

c appoint a media manager to develop communications strategies and manage ongoing media response to issues as they appear.

4.7.2 MCC to seek funding to establish a full-time office and Education Officer position. The role would be to develop a more professional approach to issues and solutions and may include:

a producing regular media releases to maintain a presence in the public eye

b mainstreaming the messages and images of motorcyclists

c working with the motorcycle industry to establish annual awards for motorcycle-friendly organisations/councils; councils to be nominated on the MCC website

d devising a media and communications strategy to promote constructive relationships with public servants by recognising and rewarding positives, rather than attacking with negative media coverage

e maintaining the MCC website

f coordinating Motorcycle Awareness Week.

Appendix 1

Evaluation of *Positioned for Safety* [Extract]

By David Riches & Associates

MAIN CONCLUSIONS

The development of an MCC Road Safety Strategic plan for motorcyclists illustrates the benefits of effective consultation leading to new perspectives and directions. *Positioned for Safety* has demonstrated strong benefits and outcomes in the years since its launch in 2002.

The benefits of the plan are evidenced in both actuality and anecdote. The review of outcomes shows that 73% of them have been achieved. This is a significant result, given the ambitious nature of the plan. In the main stakeholders interviewed in the study provide a favourable response to the *Positioned for Safety* plan. There is a belief that the plan has achieved credible outcomes and has contributed to the road safety of motorcyclists in NSW.

In three years it is apparent that there is a significant shift within the way motorcycle safety business "gets done". Prior to the development of a strategic approach the motorcycle community appeared to have a reactive position to safety issues, and worked in isolation to "make a point". This made effective partnership approaches difficult, and was often a case of "us and them".

Since the launch of *Positioned for Safety* there has been a significant shift in thinking within the Executive of the Motorcycle Council of NSW and the motorcycling community. Perhaps this is best summarized as, "We have gone from being reactive to proactive".

An improved understanding of political and organizational imperatives, government processes and division of responsibility, as well as a clear direction and framework for activity has provided some early wins, as well as delivering maturing investments and long term gains to contribute to the safety of motorcyclists in NSW. These gains include significant financial resource allocations to motorcycle road safety education campaigns, and a commitment for action from major road safety organisations in NSW.

An increasing role and commitment to motorcycle safety is evident within partner organizations, such as the MAA, IPWEA, Local Government and the Police Service. However, the jurisdiction of the next plan needs to be considered. The evidence suggests broad organizational ownership and comfort with strategies is important to securing future commitment and funding to motorcycle road safety. It is desirable that the Roads and Traffic Authority, along with other road safety organizations should further support the next planning process to ensure that an approach emerges that complements existing NSW Government program objectives, whilst meeting the needs of the motorcycling community. This can be best achieved by jointly agreeing to planning aims and procedure prior to commencing the next planning phase. Recommendations to assist in this process follow (Recommendation 1.9).

The consultation reveals an overwhelming support for the continuance of a strategic approach to "build on the successes" achieved. In part, this is supported with the recognition *Positioned for Safety* has achieved with in NSW, Australia and at international levels as a model to emulate.

There is still room for the plan to grow over the next few years. Indeed, one of the main reasons to think ahead and continue to plan strategically is to make sure that the cumulative effects of all actions achieved so far result in future improved road safety outcomes for motorcycle riders.

The achievement of all strategies identified in the plan was not possible. This can be attributed to the ambitious nature of the plan, as well as the volunteer structure the MCC works within.

Recommendations are therefore made that provide for a strengthened administrative structure to enhance the capacity of the MCC to deliver outcomes. Other recommendations consider issues that arose during the study period. These include the next planning stage, strengthened partnerships, increasing the resource base, improving road safety research, improved communication practice and ongoing evaluation measures.

10. RECOMMENDATIONS

10.1 DEVELOPMENT OF A NEW PLAN

Recommendation 1.1 Build on current successes by seeking funding to develop a new plan to drive strategic direction for motorcycle safety from 2006–2009. Ensure the new plan carries forward uncompleted strategies and provides a priority for action.

Recommendation 1.2 Provide a cost based analysis of motorcycle crash risk and costs to the community to encourage allocations of road safety funds by major agencies.

Recommendation 1.3 Develop a cut down version of the plan to prove quick reference for non road safety practitioners e.g. Council General Managers, decision makers, local members etc.

Recommendation 1.4 Increase the print run for the next plan to provide sufficient quantity to allow for attrition of staff and misplaced copies for partner organizations.

Recommendation 1.5 Increase the emphasis on local government as a main stakeholder target in the next plan to build on current successes. The next plan should work to set the context for local planning and decision making as it affects the safety of motorcyclists, as a catalyst and mechanism to coordinate and focus road safety activity at the local level.

Recommendation 1.6 Unpack Objective 2 (Section 2.2) on page 20 of *Positioned for Safety* to provide a series of manageable strategies, supported by an objective that reads " To implement effective advocacy strategies to influence the decisions of road authorities as they relate to planning, design, construction and management of the roads and environment".

Recommendation 1.7 Consider relevant recommendations provided in the final report (currently under development) reviewing the VicRoads motorcycle safety strategy.

Recommendation 1.8 Continue with a strong consultative approach as the foundation for the development of the next plan. A strength of the current plan lies in its intersectoral nature and the development of a high degree of support amongst organisations that can make a difference to improved road safety for motorcyclists. It is important that this continue into a new planning cycle.

Recommendation 1.9 Brief the Roads and Traffic Authority, NRMA, MAA and other road safety agencies on successes outlined in this report and seek support for a new planning cycle.

Recommendation 1.10 Ensure that the next three year plan includes a review of achievement summarizing activity from the life of the previous plan.

10.2 LIAISON AND PARTNERSHIP

Recommendation 2.1 Support the RTA Motorcycle Consultative Committee and propose an extension of membership to include the police and other road safety agencies.

Recommendation 2.2 Develop a process to recognize organisations that contribute to the motorcycle road safety effort.

Recommendation 2.3 Negotiate with the RTA to strengthen links to the 13 17 00 number for road hazard reporting.

10.3 ADMINISTRATION

Recommendation 3.1 Source funding to employ a dedicated staff member (part-time) to conduct day to day activities of the MCC, liaise with the motorcycling community and partner organizations and implement the next plan (see 10.4 below).

It is recommended that the position not include road safety in the title, so as not to conflict and be confused with the current RTA Road Safety Officer program. Rather, the position could be titled Policy and Program Officer, Motorcycle Council of NSW (or similar).

10.4 FUND RAISING

Recommendation 4.1 Develop a bequest/fund raising strategy to assist in the long-term provision of staff and general administration of the MCC. If successful, this would self-fund the staff position recommended in 9.3 above, and retain MCC jurisdiction of the role.

Recommendation 4.2 Use membership constituency to create a data base of members that have strong links to business and liaise with constituent members to explore sponsorship options.

10.5 RESEARCH

Recommendation 5.1 Encourage and advocate for an increase in the number of funded research studies to provide credible evidence and information.

10.6 PLAN PROFILE

Recommendation 6.1 Continue to profile motorcycle road safety issues, partnership programs and planning outcomes at relevant conferences attended by practitioners and decision makers.

Recommendation 6.2 Continue to profile motorcycle road safety issues on the MCC web page, including a summary of achievements made between 2002-2005.

10.7 PLAN EVALUATION

Recommendation 7.1 Develop and refine a process to evaluate/measure the effectiveness of the MCC website hazard reporting system.

Recommendation 7.2 Provide an annual review of progress and provide a hard copy short summary report to all partner organizations, and elected members. Additionally, provide a running progress report on the web site on planning outcomes at regular intervals.

Appendix 2

New initiatives since 2002

While the MCC do not claim direct responsibility for all of the initiatives described below, it is significant that since 2002 there has been a raised level of awareness and activity associated with motorcycle safety in NSW.

Australasian College of Road Safety (ACRS)

The ACRS:

- held a seminar on motorcycle safety issues
- published articles on motorcycle safety in its journal
- declared a policy position of support for motorcyclists to be considered as a distinct road user group.

Institute of Public Works Engineering Australia (IPWEA)

The IPWEA:

- includes motorcycle safety as a consideration in the terms of agreement for utilities and others seeking to excavate and restore road surfaces
- provides grants to local councils for motorcycle safety projects under the Local Government Road Safety Program.

Local government

Prior to the development of *Positioned for Safety,* there were no local government programs with motorcycle safety as their primary objective. Motorcycle safety is now included in the road safety strategic plans of a number of councils. There have also been numerous motorcycle safety programs run by local councils in co-operation with local motorcyclists and other stakeholders.

Media

- The MCC was awarded the *ALLMOTO* internet motorcycle magazine award for their contribution to motorcycling safety though the strategic plan.
- The general news media now contact the MCC for comments about motorcycle-related news items.
- The MCC has been able to raise the level of discussion of safety issues in the motorcycle media, by being able to provide factual information based on current crash data.
- The MCC has been successful in engaging the involvement of motorcycle journalists in motorcycle safety projects.
- There has been an increase in the number of safety-related articles in motorcycle magazines.
- There has been a number of positive stories about motorcyclists in the general media.

Motor Accidents Authority of NSW (MAA)

The MAA has funded:

- the research and development of a web-based guide on motorcycle protective clothing (MCC)
- an industry seminar to promote awareness of issues associated with motorcycle protective clothing and the availability of the European Standards (MCC)
- a project to improve the safety of motorcycle riding in the Snowy Mountains (MCC)
- research into exposure by motorcycle make, model and type (RCSC Services)
- research into crashes of returned riders (MUARC)
- public education advertising campaigns on motorcycle safety with the RTA
- an independent evaluation of the implementation of *Positioned for Safety* (MCC)
- a rider safety education campaign 'Arrive Alive – Geared Up' (MCC)
- research into rider fatigue (Wollongong City Council)
- a guide to motorcycling in the Lower Hunter, Cessnock, Dungog, Maitland and Port Stephens Councils
- the 'Look out for yourself—be seen, look out for motorcyclists' campaign (Dubbo City Council)
- the development of a second motorcycle safety strategic plan to follow on from *Positioned for Safety*.

Motorcycle community

The development of the motorcycle strategic plan has also:

- resulted in a number of projects where motorcyclists worked with their local councils to improve safety on key motorcycle tourism routes[1]
- provided a role model for motorcycle groups in other states
- resulted in the MCC being asked to represent motorcyclists on the National Road Safety Strategy Panel
- encouraged motorcycle groups to establish their own local safety groups.

National Roads and Motorists Association (NRMA)

The NRMA:

- provides an annual grant to develop the MCC road safety website to communicate the road safety strategic plan to motorcyclists and road safety stakeholders (see www.roadsafety.mccofnsw.org.au)
- coordinated and funded an international speaker to address a motorcycle safety research seminar
- developed a policy position on motorcycle safety
- includes motorcycle safety articles in its members' magazine and website
- is developing an ITS motorcycle safety and security device which involves accident crash or theft notification.

Roads and Traffic Authority of NSW (RTA)

The RTA:

- developed a Motorcyclists and Pedal Cyclist Safety Action Plan
- developed a Motorcycle Safety Issues and Countermeasures summary document
- commissioned motorcycle road safety audits of popular motorcycle routes
- committed to major roadworks programs to reduce the crash risks on two key motorcycle routes
- conducted qualitative and quantitative motorcycle safety research in 2002, including an attitudinal survey of motorcyclists and drivers, and an observational study of the use of protective equipment by motorcycle riders and pillion passengers
- developed a system of advisory warning signs that are specific to motorcycle hazards.
- produced the state's first motorcycle safety advertising campaign in conjunction with the MAA in 2002, and repeated each year to the present date
- launched a new advertisement to coincide with Motorcycle Awareness Week in October 2006 advising drivers to 'Check twice for bikes'. This campaign was run on the backs of buses in the metropolitan Sydney region. This campaign has been repeated throughout NSW to the present date
- provides annual access to data on motorcycle crashes for publication on the MCC road safety website
- provides links to the MCC road safety web site on the RTA corporate website
- provides ongoing support for Motorcycle Awareness Week
- includes motorcycle awareness as a part of the general road safety messages on variable message boards
- includes motorcycling awareness brochures with drivers' registration renewals
- developed a technical specification for the slip resistance of metal sheet road covers
- developed a technical direction on motorcycle parking for traffic and transport engineers
- developed a pocket guide for riders on safe riding practices
- funded the printing and distribution of MCC-developed brochures on safe practices for group riders.

1 de Rome & Wood (2003).

Glossary

AAA	Australian Automobile Association
ABS	Anti-locking braking system
ACIS	Australian Crash Investigation Study
ADR	Australian Design Rules for vehicles
Advanced rider training courses	Post-licence training generally focusing on roadcraft, cornering, braking and other skills
AITPM	Australian Institute of Traffic Planning and Management
AMC	Australian Motorcycle Council
ANCAP	Australian New Car Assessment Program
ATSB	Australian Transport Safety Bureau
Austroads	The association of Australian and New Zealand road transport and traffic authorities
AusRAP	Australian Road Assessment Program
Body armour	Can refer to helmets but is generally used to refer to impact protectors added to clothing. May include elbow, back, shoulder and knee protectors. Clothing should be identified with a label of compliance with EU Standard EN 1621-1:1998
Casualty	Any person killed or injured as a result of an accident
Chopper	A motorcycle which has been modified with an extended front fork assembly. Usually fitted with extended upright handlebars to accommodate a more reclined riding position
Commuter	A lightweight, small-capacity motorcycle for urban use
Compulsory rider training	NSW novice rider training program
COPS	Computerised Operational Policing System
Countermeasure	A specific action taken to address an identified problem
Cruiser	A large, framed motorcycle with upright or pulled-back handlebars and large fenders. Typically has large padded seats with a low seat height; the rider sits upright or slightly reclined
CTP	Compulsory third-party insurance for registered vehicles in NSW
Day rides	Social events organised by motorcycle groups for groups of riders to travel together on a set route
DFT	Department for Transport (UK)
EN 1317	European standard for safety barriers
Fatal accident	An accident in which there is at least one person killed
Fatigue	Identified as a contributing factor in an accident if the controller was asleep, drowsy or fatigued and/or the vehicle performed a manoeuvre which suggested loss of concentration by the controller
FCAI	Federal Chamber of Automotive Industries—Motorcycle Group
FEMA	Federation of European Motorcyclists' Associations
FORS	Federal Office of Road Safety (now part of the ATSB)
HART	Honda Australia Roadcraft Training
Helmet	An approved motorcycle helmet complies with AS/NZS 1698
IMMA	International Motorcycle Manufacturers Association
Impact protectors	See *Body armour*
IPWEA	Institute of Public Works Engineering Australia
IRMRC NSW	Injury Risk Management Research Centre NSW

Key vehicle	The vehicle considered to have played the major role in a crash. This does not necessarily mean that the operator of the key vehicle was legally at fault
LAMS	Learner Approved Motorcycle Scheme (NSW)
Lane-filtering	The practice of passing a car in its own lane while the traffic is stopped
Lane-splitting	The practice of passing a car in its own lane while traffic is moving
LGSA	Local Government and Shires Associations
MAA	Motor Accidents Authority of NSW
MAIDS	Motorcycle Accident In-Depth Study, the OECD international standard for motorcycle crash investigation
MARES	Mature Age Riders Scheme
Middle-aged motorcyclists	Defined in this document as riders aged between 26 and 39 years
Motorcycle Awareness Week	A program of events to celebrate motorcycling and raise other road users' awareness of motorcycle safety in NSW. Organised by the Motorcycle Council of NSW and funded by the Roads and Traffic Authority
Motorcycle Consultative Committee	Committee chaired by the Roads and Traffic Authority and comprised of the Motorcycle Council of NSW Inc., the Motor Traders Association and the Federal Chamber of Automotive Industries—Motorcycle Group
MTA	Motor Traders Association
MUARC	Monash University Accident Research Centre
NCAP	New Car Assessment Program
NHTSA	National Highway Traffic Safety Administration (USA)
Nominal defendant	The Nominal Defendent Scheme in NSW enables an injured third party to make a CTP claim where the owner/driver of the vehicle at fault is uninsured or unidentifiable
NRSS	National Road Safety Strategy
NRMA	National Road Motoring Association
OECD	Organisation for Economic Co-operation and Development
Older motorcyclists	Defined in this document as riders aged 40 years or more
Partner	In this document, partners are defined as stakeholders who will be actively involved in the implementation of the Motorcycle Road Safety Strategic Plan
Pillion	Motorcycle passenger who sits behind the rider
PPP	Public private partnership for the development of infrastructure
Protective clothing	All outerwear with some injury-protective function, including boots, gloves and long pants or jacket. Protection may be provided through abrasion, tear- and cut-resistant fabric, and/or body armour (impact protectors)
Road furniture	The term used for all the fixtures in the road environment, including fixed objects on the road surface and in the road reserve. It includes bus shelters, cats' eyes, light poles, safety barriers, traffic signs and telephone boxes
Road Safety 2010	NSW Government road safety strategic plan for the period 2001 to 2010
Roadcraft	A collection of attitudes and decision-making policies which uses learned skills in order to avoid crises and crashes while travelling on the road
RSPA	Royal Society for the Prevention of Accidents (UK)
ROWV	Right-of-Way Violation
RTA	Roads and Traffic Authority of NSW
Scooter	A motorcycle with a floorboard for the rider's feet. Generally of small capacity, from 50 to 185 cc, with automatic transmission. The riding position is upright
SMIDSY	'Sorry Mate I Didn't See You', a common response when a motorist has hit or narrowly avoided hitting a motorcyclist

SOC NSW	Streets Opening Conference. Body comprised of utililities and road authorities and coordinated by the IPWEA, with responsibilty for codes and practices on managing street openings for the provision of underground utility services in NSW
Speeding	Defined as excessive speed for the prevailing conditions and may, but does not necessarily, imply exceeding the posted speed limit
Sports bikes	Motorcycles with drop handlebars, a small windscreen and an aerodynamic fairing. Riders tend to lean forward over the petrol tank
Stakeholder	In this document, stakeholders are defined as individuals and organisations with a personal interest in, or a professional responsibility for, motorcycles and motorcycling safety
Standard bikes	Motorcycles of a conventional design with upright handlebars and usually without fairings
Standards Australia	National body for establishing codes of practice or equipment standards
Stop line	The line at an intersection, usually accompanied by a stop sign or traffic light
TAC	Traffic Accident Commission (Victoria)
TADS	Traffic Accident Database System managed by the RTA
Tourers	Motorcycles designed for long-distance travel. They typically have a large fairing and are often fitted with removable side luggage compartments, rear cargo box and even trailers. Riders tend to sit upright
Track day	A privately run event at a closed race track in which riders may participate at their own risk
Traffic Offenders Program (TOP)	A program run by the NSW Police to educate and counsel drivers once they have come to the attention of the courts through their history of driving offences
Trail (or enduro) motorcycle	A motorcycle with suspension and tyres designed for riding on rough terrain. Some are also designed for use on public roads and may be registered. Almost 30% of the market in Australia are off-road bikes with about half of those also registered for on-road use
Unlicensed riders	Includes riders whose licence status is either disqualified, invalid or cancelled, or who have never been licensed
VMAC	Victorian Motorcycle Advisory Council
WIMA	Women's International Motorcycle Association
WHO	World Health Organization
Younger motorcyclists	Defined in this document as riders under 26 years

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