NSW GOVERNMENT Transport for NSW

Centre for Road Safety

TOWARDS ZERO

NSW Motorcycle Safety Action Plan 2017–2019

November 2016

Contents

Foreword

Motorcycle safety is incredibly important to the NSW Government as our riders become increasingly significant. Even though motorcycles only represent 4 per cent of motor vehicle registrations, motorcyclists accounted for 19 per cent of all fatalities and 21 per cent of all serious injuries in 2015.

The NSW Road Safety Strategy for 2012-21 aims to reduce road trauma in NSW over the next decade. It sets out the strategic direction the NSW Government is taking to address this important issue, and aims to reduce fatalities and serious injuries by at least 30 per cent.

The NSW Motorcycle Safety Strategy 2012-2021 (the Strategy) establishes a ten year direction to make motorcycle riding in NSW safer and to reduce the motorcycle road toll. The Strategy identified the key safety initiatives and key actions for delivery in the first three years.

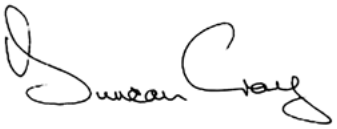
Some of the key achievements of the first three years include:

- Launching the Ride to Live campaign, including the Ride to Live website
- Releasing the Making Roads More Motorcycle Friendly Guide
- Funding the Motorcycle Safety Infrastructure Program
- Installing emergency phones on popular motorcycle routes in remote locations with little to no mobile phone coverage
- Completing motorcycle underrun barrier testing
- Completing an in-depth crash study into the factors involved in motorcycle crashes
- Legalising the use of global standard helmets in NSW.

With most of the key actions for the first three years completed and newly emerging motorcycle road safety issues, the Motorcycle Safety Action Plan 2017-2019 (the Action Plan) is the next phase in delivering the Strategy. The Action Plan outlines 19 key action items that the Government will deliver to improve motorcycling safety over the next three years. The Action Plan was developed by the Centre for Road Safety in close consultation with key stakeholders, including:

- Roads and Maritime Services
- The NSW Police Force
- State Insurance Regulatory Authority
- Local Government NSW
- NSW Motorcycle Council
- National Motorcycle Alliance
- Australian Motorcycle Council
- Federal Chamber of Automotive Industries
- NRMA Motoring and Services.

The NSW Government and Centre for Road Safety will continue to coordinate road safety initiatives and work with stakeholders to implement the actions in this plan. It is essential we work together to make conditions for motorcycle riders in this state safer so, as registrations go up, the road toll goes down.



The Hon. Duncan Gay MLC
Minister for Roads, Maritime and Freight

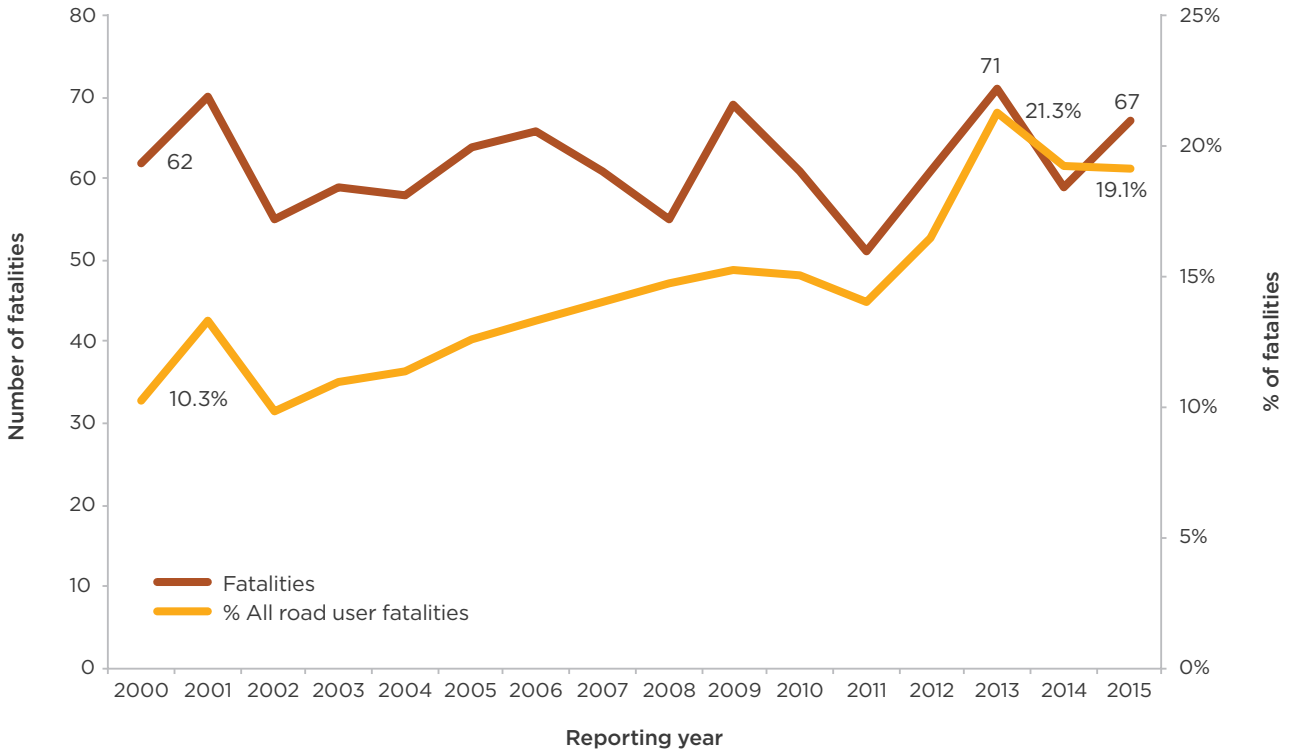
Context

Motorcyclists are vulnerable road users and account for a significant portion of the trauma on our roads each year. Aside from drivers, more motorcyclists are killed or seriously injured on our roads than any other type of road user. Of the 350 people killed on NSW roads in 2015, 67 (or 19.1 per cent) were motorcyclists. Similarly, of the 12,121 people hospitalised with serious injuries as a result of crashes in 2015[1], 2,485 (20.5 per cent) were motorcyclists. At the same time the number of motorcyclists on our roads is increasing.

The popularity of motorcycling is continuing to grow in NSW. Between 2000 and 2015, motorcycle registrations increased by 146 per cent, over three and a half times the rate of change for other motor vehicles. This increase represents an additional 129,000 motorcycles using and sharing NSW roads and a corresponding increased risk of motorcycle road crashes. Despite this, motorcycles today still only make up 4.2 per cent of all registered motor vehicles in NSW.

Within this context, motorcyclists are increasingly over-represented in the NSW road toll. Since 2000, there has been a significant reduction in the overall road toll in NSW; however, the number of motorcyclists killed on our roads has remained relatively constant and the number injured has increased. This has meant that motorcyclists are making up an increasing proportion of those killed and injured on our roads each year. Between 2000 and 2015, the percentage of motorcyclist fatalities rose from 10.3 per cent to 19.1 per cent of all those killed on NSW roads. Over the same period, the number of motorcyclists injured has increased from 7.1 per cent of all injuries to 9.5 per cent of all injuries.

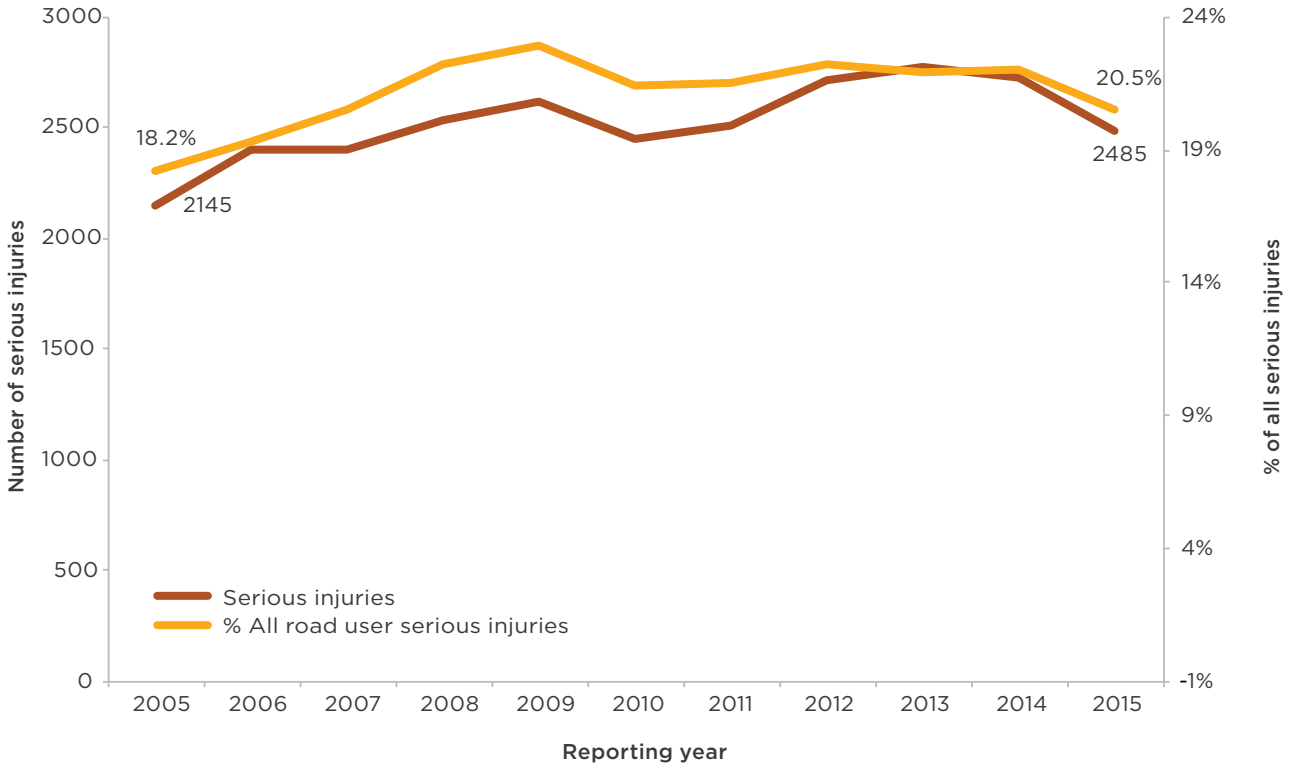
Figure 1: Motorcyclist fatalities, number and percentage of all fatalities, 2000 to 2015.



1 At the time of publication, 2015 is the most recent year with complete serious injury data.

Transport for NSW's Centre for Road Safety is now linking health data with Police crash reports to gain a better understanding of serious injuries that are the result of crashes on NSW roads. This work has been completed for 2005 to 2015 for all road users, and the Centre for Road Safety is continuing to match health data quarterly as casualty data are finalised. Initial findings indicate that the number of serious injuries among motorcyclists is increasing significantly. The total number of serious injury hospitalisations increased nearly 16 per cent from 2,145 in 2005 to 2,485 in 2015. This equates to an increase in the percentage of motorcyclist serious injury hospitalisations from 18.2 per cent to 20.5 per cent of serious injury hospitalisations for all road users.

Figure 2: Motorcycle serious injuries (total hospitalisations), number and percentage of all serious injuries (total hospitalisations), 2005 to 2015.



Motorcyclists are vulnerable road users and remain more exposed to crash risk than other motorists. This vulnerability is due to the design and performance of motorcycles, their sensitivity to variability in road surface and design, and the lack of protection for riders and passengers compared to other motorists. These factors all contribute to the continued disproportionate involvement of motorcyclists in fatal and serious injury crashes on NSW roads. Behavioural factors which are common to all road user groups such as speed, alcohol and fatigue also remain significant contributors to the motorcyclist road toll.

In November 2015, the Staysafe Committee completed its inquiry into motorcycle safety in NSW. The Committee made recommendations to improve road safety for motorcyclists addressing key themes including crash data improvements, better road design and management, improved communication, rider training and use of protective clothing and equipment. Transport for NSW's Centre for Road Safety coordinated a whole-of-government response with input from other relevant agencies, with the NSW Government supporting all but one of the recommendations. The response addresses key motorcycle safety risks and concerns raised by stakeholders at the inquiry.

This Action Plan aligns with the response to the Staysafe Committee and builds on the initiatives in the Strategy by targeting key areas identified through research and analysis in the past five years and consultation with key stakeholders.

Towards Zero Strategy and a Safe Systems approach

This Action Plan is a key element of the Towards Zero Strategy which has the ultimate goal of zero deaths and serious injuries. Just as it is no longer acceptable that it is inevitable that some people will die in the workplace, it cannot be acceptable that some people will die or be seriously injured on NSW roads.

To achieve the ultimate goal of zero deaths and serious injuries on NSW roads, the NSW Government applies the Safe System approach which is underpinned by these principles:

- People are human and sometimes make mistakes – a simple mistake shouldn't cost anyone their life
- Road users have a limited tolerance to physical force – roads, roadsides and vehicles need to be designed to minimise crashes or reduce forces if a crash happens
- Road safety is a shared responsibility – everyone needs to make safe decisions on and around the road and those responsible for delivering road safety programs and infrastructure need to prioritise safety.

Initiatives to ensure safer roads, speeds, people and vehicles need to be implemented together so the road system not only keeps people moving, but safe and protected.

As with all road crashes, the extent and severity of motorcycle crashes are rarely attributable to just one factor, because there are often overlapping and multi-dimensional contributing factors. The Safe System approach helps to understand and address complex motorcycle safety issues.

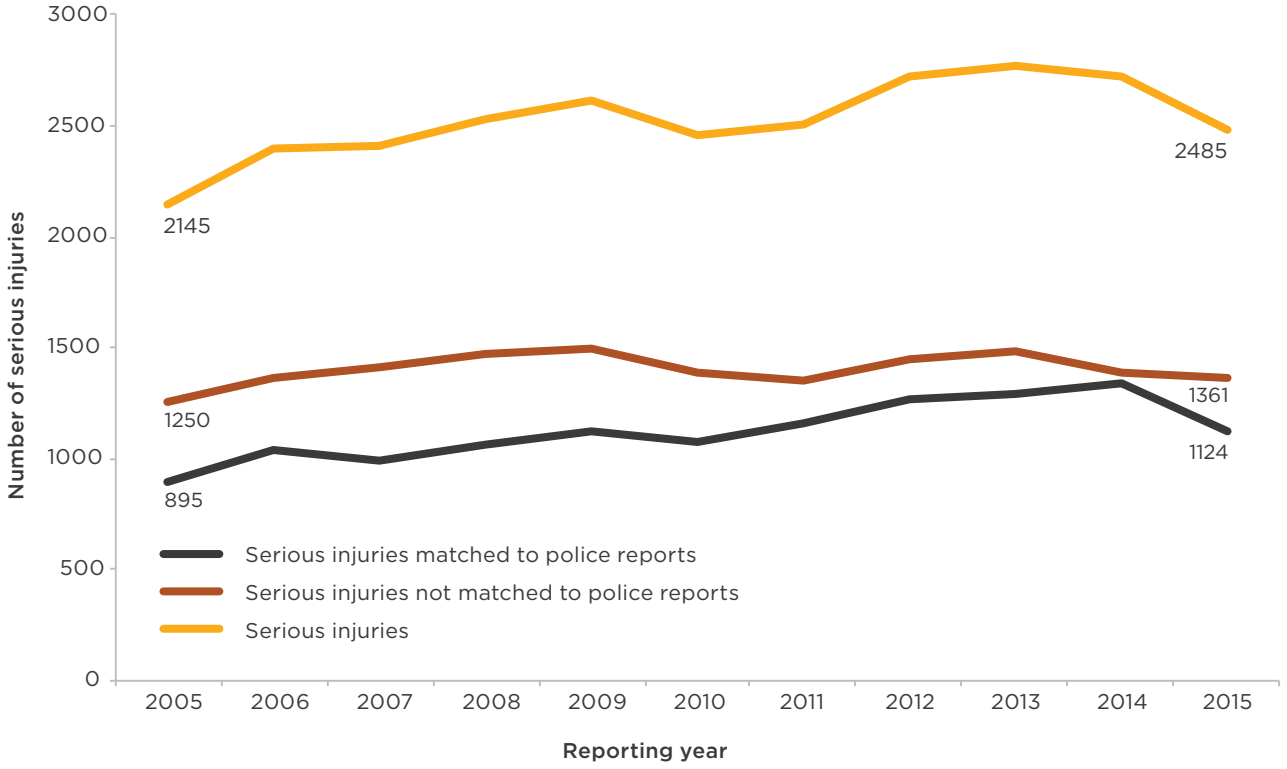
A focus on serious injuries

The NSW Road Safety Strategy sets targets to reduce both fatalities and serious injuries by at least 30 per cent by 2021. Obtaining regular and consistent serious injury data to measure progress and provide evidence for current and future program and projects has been challenging.

The Centre for Road Safety has undertaken a major project to link hospital admissions data with police crash records to identify, monitor and analyse serious injuries that are the result of road crashes. This process has been completed for the period from 2005 to 2015, and the Centre for Road Safety is continuing to match health data quarterly as casualty data is finalised. Not all hospital records can be matched to a Police crash report, and where records are not matched the information about a crash can be limited. Where records are matched, however, more reliable details of the characteristics and consequences of a crash are available. In total, approximately 55 per cent of serious injuries identified in hospital records could be matched to a Police crash report across all road users. The proportion of serious injuries matched to Police reports was high among drivers (84 per cent), pedestrians (64 per cent) and passengers (58 per cent), however the rate was considerably lower among motorcyclists (44 per cent) and pedal cyclists (18 per cent).

As a result of this project, there is now significantly more detailed information available on motorcyclist serious injuries. Between 2005 and 2015, there were almost 28,000 motorcyclist serious injuries representing more than 20 per cent of all serious injuries for this period.

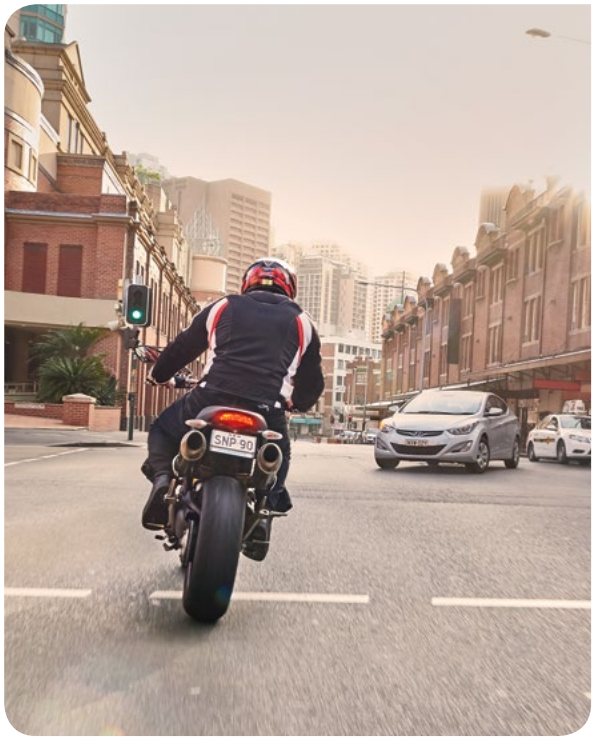
Figure 3: Motorcyclist serious injuries: matched, unmatched and total hospitalisations, 2005 to 2015.



Matched serious injury data provide an improved profile of the characteristics and consequences of motorcyclist serious injury crashes. An initial analysis of motorcyclist matched serious injury data for the five year period between 2011 and 2015 found that:

- Ninety per cent of motorcyclists who are seriously injured are male
- Motorcycle riders aged 40 and above made up 54 per cent of serious injuries
- Serious injuries are more likely in urban areas and on roads with lower speed limits. A significant proportion (over 40 per cent) also occur at intersections
- Serious injuries are more evenly distributed across commuter[2] and recreational periods[3] while fatalities are more likely in recreational periods
- Out of control (on a straight road or bend without hitting an object) and rear end/ other same direction crashes account for a notably higher proportion of serious injuries than fatalities
- Fracture is the most common type of injury
- The majority of serious injuries involved injuries to the knee and lower leg, shoulder and upper arm, elbow and fore arm, thorax and head
- Speed or alcohol involvement was associated with higher severity serious injuries.

2 Commuter period refers to Monday to Friday from 6am to 10am and from 3pm to 7pm.
3 Recreational period refers to Saturday and Sunday.



Unmatched data can help define the scale of motorcyclist serious injuries. While work is still being done to reduce the number of unmatched serious injuries, it is also important to understand the reason some serious injuries cannot be matched. For example, there are a relatively high number of unmatched serious injuries arising from crashes where the motorcyclist fell without first striking another object (49 per cent). This suggests that motorcyclists are less likely to report single vehicle crashes in cases where they can make their own way to hospital.

Analysis of serious injury data is ongoing and is a key focus of this three year action plan. Findings will support the delivery of actions in this plan, as well as the identification of areas for future research and the development of policy and project options.

The remainder of this document does not use unmatched data. References to serious injuries relate to injuries that have been identified in the crash data as a matched serious injury.

In-depth crash study

A key action in the first three years of the *NSW Motorcycle Safety Strategy 2012-2021* was the completion of a motorcyclist in-depth crash study to provide a detailed understanding of the risk factors influencing crash involvement and poor motorcyclist injury outcomes[4]. The study, completed by Austroads in 2015, was based on the analysis of 102 crashes, comprising 92 serious injury crashes and 10 fatal crashes in NSW. The study identified key themes in relation to crash and injury causation.

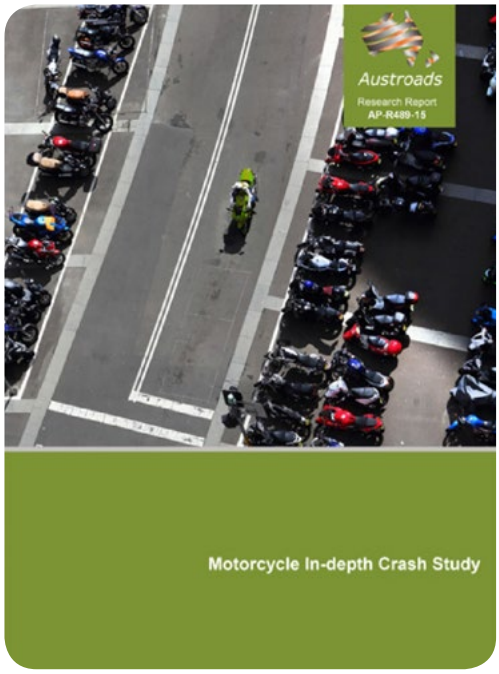
Key themes in relation to crashes included:

- Motorcyclists need to be seen
- Braking ability needs to be optimised
- Rider control needs to be maintained
- Riders need appropriate experience.

Key themes in relation to injuries included:

- Riders need good quality protective equipment
- Motorcycle design should mitigate injury to the rider
- Roadside furniture and other vehicles need to be more forgiving.

These findings have been considered together with improved serious injury data to develop the actions in this Action Plan.



4 Austroads 2015, *Motorcycle In-depth Crash Study*, Research Report AP-R-489-15, Austroads, Sydney.

Initiatives/countermeasures

Safe Roads

Objective

Reduce the number of crashes, the severity of injuries and number of fatalities attributable to road design, maintenance and operational factors.

Focus areas

Road surface and environment

The road surface and the road environment are significant contributors to the frequency and severity of motorcycle crashes. Key risk factors include the quality of the road surface, the presence of damage or loose gravel, and roadside furniture or obstructions that impair vision.

The 2015 Austroads *Motorcycle In-depth Crash Study*, which was based on NSW crash data, suggested that the condition of the road surface was a contributing factor in as many as a quarter of motorcycle casualty crashes[5], and that impaired vision was a contributing factor in 13 per cent of crashes[6].

Roadside furniture and other roadside obstructions also play a critical role in crash survivability. Between 2011 and 2015, 84 motorcyclists were killed (27 per cent of all motorcyclist fatalities) and 835 seriously injured (14 per cent of all motorcycle serious injuries) in crashes where the first impact was with an object.

Barriers, signs, median strips, fences and trees are all potential impact points for motorcyclists. The placement and design of these objects need to mitigate both the risk of a crash occurring and the severity of a crash, should one occur.

Alignment and road design

Road alignment and design influence the ability of motorcyclists to maintain control, how motorcyclists and other road users interact and the severity of crashes that do occur.

Motorcyclists are more exposed to loss of control than other road vehicles, and more vulnerable to elements of road design that can compromise handling or impair vision.

5 Ibid, p.59.
6 Ibid, p.81.

Between 2011 and 2015, 52 per cent of all rider fatalities involved the motorcycle running off the road or out of control on the road, with these fatalities twice as common on curves (34 per cent) compared to straight lengths of road (18 per cent).

Similarly, between 2011 and 2015, 44 per cent of motorcyclist serious injuries involved a motorcycle running off the road, with more than half of these occurring on a curve. Furthermore, in around 90 per cent of "right-through" crashes (where one vehicle turns right across the path of an oncoming vehicle) that resulted in a motorcyclist fatality or serious injury, the other vehicle was considered the vehicle whose movements was most likely to have played the major role in the crash.

The in-depth crash study identified key elements of road alignment and design that have the potential to contribute to crashes including[7]:

- No shoulders or narrow shoulders
- Curves with impaired visibility
- Road treatments, such as median strips and traffic islands
- Controlled and uncontrolled intersections.

Location

The nature of motorcycle casualty crashes varies significantly by location.

Between 2011 and 2015, two thirds of motorcycle fatalities occurred in country areas, with over half of all motorcycle fatalities in NSW being on two-way undivided single carriageways in country areas.

Conversely, between 2011 and 2015, 60 per cent of motorcyclist serious injuries occurred on metropolitan roads, more commonly with relatively low speed limits and at intersections.

In country areas, the ability for emergency services to respond quickly to crashes is often limited due to a combination of poor mobile phone reception and greater distances.

In metropolitan areas, there is much greater interaction between motorcyclists and other motor vehicles.

Safe Road actions

1. Focussing on high risk routes, and deliver targeted infrastructure improvements as part of the Motorcycle Infrastructure Safety Improvement Program.
2. Conduct ongoing research on road barrier systems and develop fact sheets and guidelines to inform road engineering practitioners.
3. Continue to provide guidance for road design, engineering and maintenance practitioners on the most appropriate road treatments to ensure safer road environments for motorcyclists.
4. Improve post-crash emergency response and analysis.
5. Install satellite phones along popular routes that have limited mobile phone reception.

7 Ibid, pp.83-86.

Safe People

Objective

Reduce the number of motorcycle crash fatalities and the severity of injury by reducing rider impairment and speeding, improving awareness, training and regulatory measures.

Focus areas

Dangerous and risk taking behaviours

Behavioural factors including speed, alcohol and fatigue remain significant contributors to motorcycle fatal and serious injury crashes in NSW.

Of fatal crashes occurring between 2011 and 2015:

- Illegal alcohol was a factor for 17 per cent of motorcycle riders involved
- Excessive or inappropriate speed was a factor for 54 per cent of motorcycle riders involved
- Fatigue was a factor for 8 per cent of motorcycle riders involved.

Of serious injury crashes between 2011 and 2015:

- Illegal alcohol was a factor for 5 per cent of motorcycle riders involved
- Excessive or inappropriate speed was a factor for 28 per cent of motorcycle riders involved
- Fatigue was a factor for 7 per cent of motorcycle riders involved.

Age, gender and experience

Casualty trends among motorcyclists by age are variable. Generally, however, younger riders have the highest casualty rate per licence. While motorcyclist fatalities under the age of 30 have been declining over the last 15 years – from 36 in 2001 to 17 in 2015 – this age group still has the highest number of fatalities. Riders under the age of 30 also make up more than 40 per cent of all motorcyclist serious injuries.

Motorcyclists aged 40 years and over are making up an increasing proportion of the road toll, in particular those in the 50 to 59 year age group. Fatalities in the 50 to 59 year age group have tripled over the last ten years, and 48 were killed on NSW roads between 2013 and 2015.

There has been a similar trend with serious injuries. Between 2005 and 2015, serious injuries among motorcyclists aged 40 years and over have almost doubled, with the 50 to 59 age group increasing by 125 per cent and the 60 to 69 age group more than doubling.

Males were the majority of motorcycle riders involved in fatal crashes (96 per cent), and in serious injury crashes (90 per cent) between 2011 and 2015. In addition, 17 per cent of riders involved in fatal crashes between 2010 and 2014, and eight per cent of riders involved in serious injury crashes between 2011 and 2015 did not hold a valid motorcycle rider's licence.

Lack of recent riding experience and appropriate training was also a key issue identified by stakeholders.

Scooters and mopeds

The popularity of scooters and mopeds has grown considerably over the last 15 years.

Between 2000 and 2015, scooter and moped registrations grew from 945 to 14,676. This represented an increase from one per cent of all motorcycle registrations in NSW in 2000 to seven per cent by 2015.

The increase in the popularity of scooters and mopeds has been accompanied by an increase in the number of scooter and moped riders killed and injured on NSW roads. Of the 621 motorcyclists killed between 2006 and 2015, 20 were riding scooters or mopeds. Significantly, 13 of these fatalities were between 2013 and 2015.

Injuries among scooter and moped riders have also increased by 62 per cent from 2006 to 2015. In 2015, five per cent of all motorcycle injuries involved a scooter or moped rider.

Some characteristics of scooter and moped casualties differ from those of other motorcycle casualties, in part reflecting the different demographics and usage of scooters and mopeds.

Compared with other motorcycle casualties, scooter and moped casualties are more common in the metropolitan areas, at intersections and on unclassified roads.

Scooter injuries and fatalities are more common amongst females and those aged 26 to 39 years while moped injuries and fatalities are more common amongst those aged under 17 years.

Lane change/sideswipe crashes are more likely for scooter casualties while adjacent angle crashes at intersections and manoeuvring crashes are over-represented amongst moped casualties.

Safe People actions

6 Analyse serious injury data for motorcycle related crashes and review findings from the in-depth crash study to inform policy and program options to reduce road trauma for motorcyclists.

7 Conduct research on key behavioural issues to improve motorcycle rider safety.

8 Continue support for Motorcycle Awareness Week and other stakeholder events and initiatives.

9 Review and update the Ride to Live campaign and website to address motorcycle safety issues based on key insights.

10 Evaluate the motorcycle Graduated Licensing Scheme.

11 Review current post-licensing courses to determine appropriateness of courses and options to better promote appropriate rider training for infrequent riders.

12 Monitor scooter and moped safety issues and address through the development of targeted communications for urban commuting riders.

Safe Speeds

Objective

Reduce speeding as a contributor to motorcycle fatalities and injuries.

Focus area

Excessive speed

Speed remains the most significant behavioural contributor to motorcycle casualty crashes.

Speeding refers to both riding in excess of the posted speed limit and riding too fast for the road or the conditions. Indicators of speed include a vehicle skidding, sliding or losing control.

Between 2011 and 2015, excessive or inappropriate speed was identified as a contributing factor in 54 per cent of motorcycle rider involvements in fatal crashes and 28 per cent of motorcycle rider involvements in serious injury crashes.

The involvement of speed was higher in country areas, where fatal crash involvements were more common and a greater portion of fatal crash involvements were on roads with posted speed limits of 70km/h or higher. Conversely, motorcyclist serious injuries were more common in metropolitan areas on roads with a posted speed limit of 60km/h or lower.

Motorcyclists have less time to react to dangerous situations when travelling at higher speeds, and are more exposed to serious injury or death in the event of a crash.

The in-depth crash study identified inadequate advisory signage, in particular curve speed advisory signage[8], as a contributing factor in a number of crashes.

Safe Speed actions

13 Review advisory signage on popular recreational motorcycle routes and provide guidance to riders to improve consistency and effectiveness.

14 Continue to collaborate with the NSW Police Force to examine options for improved enforcement of motorcycle speeding.

8 Austroads 2015, op. cit., p.86.

Safe Vehicles

Objective

Reduce the number of motorcyclist fatalities and the severity of injury in motorcycle crashes through protective clothing and safe motorcycle features, including design of other vehicles (visibility for drivers).

Focus areas

Protective equipment

Motorcycles provide very little protection to the rider in the event of a crash. The instability of motorcycles combined with the likelihood of ejection mean that a rider is at a much greater risk of serious injury or death as a result of a crash than drivers of other motor vehicles.

One quarter of motorcycle fatalities and almost one third of serious injuries between 2005 and 2015 involved a rollover (or falling to the roadway), and a further 27 per cent of fatalities and 14 per cent of serious injuries involved the motorcycle striking an object such as a tree or a guardrail.

Protective clothing is an important countermeasure in mitigating the risk of serious injury or death.

While helmets are compulsory, riders still need to ensure they choose and use the safest helmet.

Other items of protective clothing are optional. The in depth crash study identified both that uptake is low, and that the quality of products available to riders is mixed[9]. For example, crash analysis suggested that as few as 33 per cent of riders who crashed wore protective pants, and less than 10 per cent of protective pants provided effective impact protection.

Vehicle safety features

Half of all motorcyclist involvements in fatal crashes and 43 per cent of involvements in injury crashes between 2011 and 2015 involved the motorcycle out of control or running off the road on a straight or curve.

Advanced rider assistance and Intelligent Transport Systems (ITS) have the potential to improve the stability, braking and handling of motorcycles and help riders reduce the risk of a crash. Design and safety features of other vehicles can also contribute to safety outcomes for motorcyclists. For example Blind Spot Warning Devices can help address issues associated with visibility of motorcyclists.

A recent study into the use of Antilock Braking Systems (ABS) on motorcycles found that ABS technology had the potential to reduce serious injuries in crashes by as much as 39 per cent[10].

This is supported by findings from the in-depth crash study, which identified the uptake of advanced rider systems, including ABS, as a key area to consider for further action.

Stakeholders also expressed support for the uptake and improvement of ITS, such as vehicle to vehicle communication and collision avoidance systems.

9 Austroads 2015, op. cit., p.70.
10 Monash University Accident Research Centre 2015, *Evaluation of the Effectiveness of Anti-lock Braking Systems on Motorcycle Safety in Australia*, MUARC, Melbourne.

Safe Vehicles actions

15 Conduct ongoing research and stakeholder consultation into motorcycle safety features and standards.

16 Evaluate the effectiveness of the Consumer Rating Assessment of Helmets (CRASH) program.

17 Develop improved consumer information on motorcycle protective gear and helmets for riders.

18 Investigate the feasibility and effectiveness of technologies that improve motorcyclists' road safety, including Intelligent Transport Systems (ITS) and Safety Assist Technology (SAT).

19 Contribute to the National Road Safety Strategy: Contribute to RIS to consider mandating ABS for motorcycles.

Summary of action items

Safe Road

1. Focussing on high risk routes, and deliver targeted infrastructure improvements as part of the Motorcycle Infrastructure Safety Improvement Program.
2. Conduct ongoing research on road barrier systems and develop fact sheets and guidelines to inform road engineering practitioners.
3. Continue to provide guidance for road design, engineering and maintenance practitioners on the most appropriate road treatments to ensure safer road environments for motorcyclists.
4. Improve post-crash emergency response and analysis.
5. Install satellite phones along popular routes that have limited mobile phone reception.

Safe People

6. Analyse serious injury data for motorcycle related crashes and review findings from the in-depth crash study to inform policy and program options to reduce road trauma for motorcyclists.
7. Conduct research on key behavioural issues to improve motorcycle rider safety.

8. Continue support for Motorcycle Awareness Week and other stakeholder events and initiatives.

9. Review and update the Ride to Live campaign and website to address motorcycle safety issues based on key insights.

10. Evaluate the motorcycle Graduated Licensing Scheme.

11. Review current post-licensing courses to determine appropriateness of courses and options to better promote appropriate rider training for infrequent riders.

12. Monitor scooter and moped safety issues and address through the development of targeted communications for urban commuting riders.

Safe Speed

13. Review advisory signage on popular recreational motorcycle routes and provide guidance to riders to improve consistency and effectiveness.

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ISBN 978-1-925582-24-6