



**MotoSafe**



Final Report for “The Motorcyclist Incident Reporting Tool: A New Incident Reporting and Learning System to Improve Motorcyclist Safety”  
(September 2024)



Centre for Human  
Factors and  
Sociotechnical  
Systems



Motorcycle crashes are a longstanding road safety issue nationally in Australia and worldwide<sup>1</sup>. Key to preventing these crashes is the development of evidence-based interventions, which includes an in-depth understanding of the contributory factors involved<sup>2,3</sup>. Currently, no valid incident reporting and learning system exists for motorcyclists to report their incidents (crashes and near miss incidents) to provide this necessary information. This project aimed to develop, test, refine, and implement an incident reporting and learning system for motorcyclists (**MotoSafe**).

MotoSafe was developed and implemented as a free mobile app that provides motorcyclists with a simple and quick way of reporting their motorcycling incidents. Motorcyclists can report important information about the incidents (e.g., time and location, incident description) and the factors that contribute to the incidents. Development of the app, including the development of a systems thinking-based contributory factor classification scheme, was informed by a literature review on motorcycling incidents and consultations with motorcycling and road safety stakeholders via subject matter expert workshops.

Information collected in MotoSafe is analysed and used to identify trends in incidents and understand incident causation, to inform the development of strategies designed to improve motorcyclist safety. MotoSafe also presents a summary of the incidents reported to its users, assisting motorcyclists to understand the potential hazards involved when they are riding.

MotoSafe was trialled for a 6-month period, from 28 February 2024 to 28 August 2024. This report presents the aggregated findings from the trial and includes an analysis of the crashes and near miss incidents reported during the 6-month trial period.

MotoSafe is funded through the ACT Road Safety Fund Grants Program, a scheme by the ACT Government that supports road safety research and the development of new, innovative road safety technologies and products.. MotoSafe was developed by the Centre for Human Factors and Sociotechnical Systems at the University of the Sunshine Coast in collaboration with I Need Website Pty Ltd (Dr App).

MotoSafe is free to download from the [App Store](#) and [Google Play](#). All information provided is confidential.

Information about MotoSafe, including Frequently Asked Questions, can be found on our [project website](#).



Reporting data from:  
28 February 2024 to 28 August 2024

## Users



223 Motorcyclists



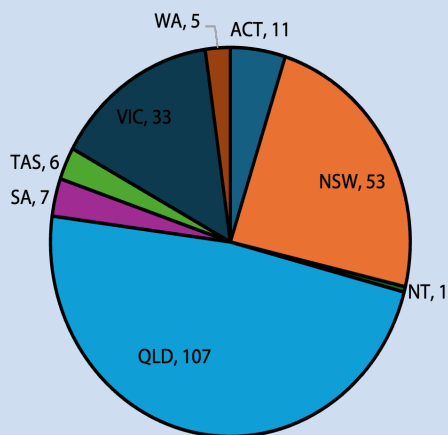
194 Males



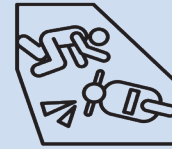
27 Females

2 Prefer Not to Say

## State/Territory Representation



## Summary Data



45

Incidents reported



2,246.6

Hours motorcycled

20

Incidents per 1,000 hours  
motorcycled

## Crashes

9

Crashes reported

4

Crashes per 1,000 hours  
motorcycled

## Near Miss Incidents

36

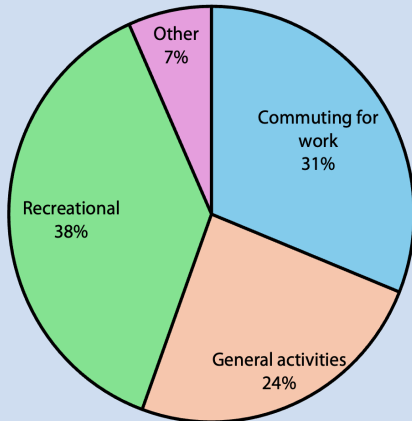
Near misses reported

16

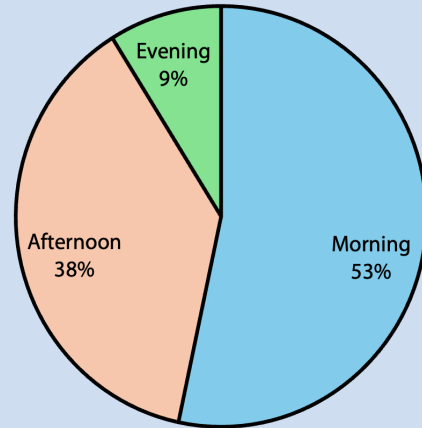
Near misses per 1,000 hours  
motorcycled

## Incident Data

### Reason for Trip



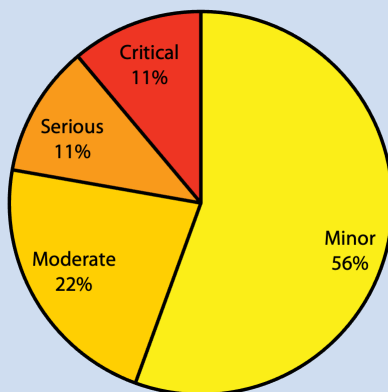
### Time of Day



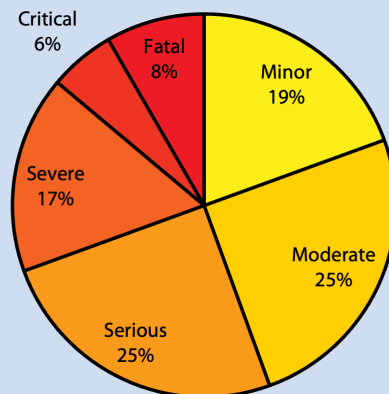
## Severity Rating

For crashes, the reported severity reflects users' perceived *actual* severity of the crash. For near miss incidents, the reported severity reflects users' perceived *potential* severity of the crash in the event that the near miss had progressed to a crash.

### Crashes



### Near Miss Incidents



**Minor:** Requires localised care with short-term effects.

**Moderate:** Requires ongoing care (localised or external) with short- to medium-term effects.

**Serious:** Requires timely external care (hospital or general practitioner) with medium- to long-term effects.

**Severe:** Requires urgent emergency assistance with long-term effects.

**Critical:** Requires urgent emergency assistance with serious ongoing long-term effects.

**Fatal:** Fatality (i.e., results in the death of one or more road users involved).

## Contributory Factors: Crashes

Supervision and management of motorcyclist and road user behaviour	Other road user vehicle maintenance & repairs (1)											
Motorcyclist and other road users	<i>Motorcyclist Behaviour</i> Swerving (1)   Speed (too fast) (1)   Misjudgement (4)   Other (1) Loss of control (3)   Inappropriate movement (1)   Reaction time (2)				<i>Motorcyclist Knowledge, Skills, &amp; Experience</i> Situational awareness (1)   Motorcycle handling skills (1)   Inexperience (1) Familiarity with motorcycle (2)   Familiarity with route (2)				Motorcyclist injury (1)			
Equipment, environment, and surroundings	<i>Motorcyclist Protection, Clothing, &amp; Personal Items</i> Helmet/visor/goggles (1)   Jacket/shirt (1)   Gloves (1) Footwear (1)   Back/elbow/knee/shoulder protection (1)   Backpack/bag (1)						<i>Surfaces, Obstacles, or Debris</i> Painted areas (1)   Oil (1)   Road debris (2) Motorcycle tyres or wheels (2)   Information warnings/feedback (1)   Motorcyclist/motorcycle conspicuity (1)					
Other Road User Behaviour	Pulling out in front of vehicle (1)   Sudden braking (1)   Swerving (1)   Speed (too fast) (1)   Failing to give way (2)   Non-compliance with road rules (2) Misjudgement (1)   Unintentional/unexpected behaviour (1)   Inappropriate movement (1)   Unsafe lane change (1)   Looked but failed to see (1)   Position of vehicle on road (1)						<i>Other Road User Knowledge, Skills, &amp; Experience</i> Situational awareness (1)   Inexperience (1)					

*Note.* A contributory factor represents a factor (action, event, condition, state, omission) that, if it had not occurred or existed at the relevant time, then either the incident would not have occurred or the consequences would not have been as serious.

The numbers in parenthesis indicate the absolute number of times the contributory factor was reported across 9 crashes. The boxes shaded in grey represent the most frequently reported contributory factors.

## Contributory Factors: Near Miss Incidents

Supervision and management of motorcyclist and road user behaviour	Motorcyclist advocacy education & awareness (1)	Motorcycle maintenance & repairs (1)	Other road user vehicle maintenance & repairs (1)	Motorcyclist education & training (1)	Other road user education & training (1)	Police enforcement of road rules (1)	Media & social media (1)		
Motorcyclist and other road users	<i>Motorcyclist Behaviour</i>			<i>Other Road User Behaviour</i>					
	Sudden braking (1)	Swerving (1)	Position of motorcycle on road (1)	Using personal device (1)	Pulling out in front of vehicle (10)	Swerving (2)	Speed (too fast) (4)	Speed (too slow) (3)	Failing to give way (12)
	<i>Motorcyclist Knowledge, Skills, &amp; Experience</i>			Non-compliance with road rules (16)	Misjudgement (7)	Unintentional/unexpected behaviour (4)	Inappropriate movement (2)	Unsafe lane change (8)	Looked but failed to see (5)
	Knowledge of road rules (2)	Situational awareness (7)	Motorcycle handling skills (3)	Reaction time (1)	Indicating/signalling (1)	Position of vehicle on road (4)	Distance to motorcycle (5)	Verbal abuse (1)	
	Familiarity with motorcycle (2)	Familiarity with route (1)		<i>Other Road User Knowledge, Skills, &amp; Experience</i>			<i>Other Road User Mental Condition</i>		Other road user physical condition (3)
<i>Motorcyclist Physical &amp; Mental Condition</i>			Knowledge of road rules (5)	Situational awareness (11)	Handling skills (1)	Sleepiness (1)	Mental overload (1)	Passenger verbal abuse (1)	
Physical health (1)	Physical fitness (1)	Mental health (1)	Inexperience (2)	Familiarity with route (1)	Other (2)	Lack of attention (2)	Other (3)		
<i>Community Motorcyclists Group Planning &amp; Decision-Making</i>									
Event/ride route planning (1)	Event/ride timing (1)	Proceeding with event/ride (1)							
Risk assessment (1)	Instruction/communication (1)								
Equipment, environment, and surroundings	<i>Motorcycle</i>			<i>Motorcyclist Protection, Clothing, &amp; Personal Items</i>					Motorcyclist/motorcycle conspicuity (5)
	General condition (2)	Handling characteristics (1)	Tyres or wheels (1)	Helmet/visor/goggles (5)	Jacket/shirt (5)	Pants/shorts (4)	Gloves (4)	Footwear (5)	Other road user/vehicle conspicuity (2)
	Brakes (1)	Lights/indicators (2)		Back/elbow/knee/shoulder protection (4)	Glasses (1)	Backpack/bag (1)	Other (2)		
<i>Motorcyclist Devices</i>			<i>Motorcyclist Information &amp; Data</i>		Other road user vehicle general condition (1)	Other road user vehicle device (1)			
Mobile phones (2)	Audio devices (1)	GPS (2)	Route guidance (2)	Warnings/feedback (1)					

Note. A contributory factor represents a factor (action, event, condition, state, omission) that, if it had not occurred or existed at the relevant time, then either the incident would not have occurred or the consequences would not have been as serious.

The numbers in parenthesis indicate the absolute number of times the contributory factor was reported across 36 near miss incidents. The boxes shaded in grey represent the most frequently reported contributory factors.

## Summary

The overall incident rate was 20 motorcycling incidents per 1,000 hours motorcycled, with a crash rate of 4 crashes per 1,000 hours motorcycled and a near miss incident rate of 16 near misses per 1,000 hours motorcycled. However, these incident rates must be interpreted with caution due to participants' likelihood to under- or over-report their motorcycling activity and/or report of motorcycling incidents.

Near miss incidents were reported more often than crashes, with the rate of near miss incidents being approximately 4 times higher than the rate of crashes. This finding highlights the importance of collecting near miss incident data, in addition to crash data, to understand and improve motorcyclist safety<sup>4,5</sup>. This is also further emphasised by the finding that the majority of near miss incidents had a perceived severity rating of moderate to fatal.

For **reported crashes**, 56% were perceived by motorcyclists to be minor, 22% moderate, 11% serious, and 11% critical. No reported crashes were perceived to be severe or fatal. The most frequently reported contributory factors included:


- Motorcyclist behaviour
  - *Misjudgement and Loss of control*

For **reported near miss incidents**, 19% were perceived by motorcyclists to be potentially minor, 25% moderate, 25% serious, 17% severe, 6% critical, and 8% fatal. The most frequently reported contributory factors include:

- Other road user behaviour
  - *Non-compliance with road rules, Failing to give way, Pulling out in front of vehicle, and Unsafe lane change*
- Other road user knowledge, skills, and experience
  - *Situational awareness.*

The current findings from the MotoSafe trial demonstrate that motorcyclists most frequently reported contributory factors relate to the behaviours, skills, knowledge, and experience of motorcyclists (i.e., the users themselves) and other road users. These findings suggest that strategies to improve motorcyclist safety should consider interventions that will improve motorcyclists' and other road users' behaviour and their skills, knowledge, and experience (e.g., education, training, in-vehicle warnings). Other interventions that should be considered include ensuring adequate motorcyclist protection and clothing.

Notably, the findings also demonstrate that motorcyclists perceived factors beyond road users and surrounding environment to have contributed to the reported incidents. For example, '*other road user vehicle maintenance and repairs*' were perceived by motorcyclists to have contributed to both crashes and near miss incidents. This is an important finding, indicating that the development of strategies to improve motorcyclist safety should consider factors across the broader road transport system, beyond factors relating to road users and their surrounding environment.



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MotoSafe is the first-of-its-kind to support motorcyclists in reporting their crashes and near miss incidents. The trial demonstrates the potential utility of having motorcyclists report their own information, and the findings from the trial indicate that MotoSafe provides useful information that helps us to better understand motorcycling incidents. Further and more widespread use of the app will enable more informed decision making around the development of interventions aiming to motorcyclist safety.

The data submitted to MotoSafe over this first 6 months has been valuable; however, we continue to investigate ways to improve reporting culture among motorcyclists. We are exploring ways to increase the number of users, and to encourage users to report all incidents they experience. Building a comprehensive dataset of cycling incidents will allow us to identify trends in motorcycling incidents and further inform incident prevention strategies.

Our research team is currently exploring ways we can refine the app based on feedback from our users and other motorcycling and road safety stakeholders for further implementation.

We thank those who have contributed to the MotoSafe trial.





## References

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