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Evaluation of the ACT Government's safer cycling reforms

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ABSTRACT

This report provides an evaluation of the two major components of the ACT Government's safer cycling reforms trial: a minimum passing distance (MPD) when overtaking cyclists and the allowance for cyclists to remain on their bicycles when crossing at pedestrian crossings. An analysis of the crash data during the pre-trial and trial periods was conducted in an attempt to identify evidence of any safety benefits for cyclists or any potential increased risks for cyclists or pedestrians as a result of the trial rules. An analysis of the enforcement data during the pre-trial and trial periods was also carried out in an attempt to identify the level of compliance with the new rules introduced for the trial. Finally, results of pre-trial and post-trial community surveys, correspondence from community members and comments from a cyclist organisation were analysed to assess public awareness and safety perception of the trial rules. The analysis of the crash data suggests that the MPD component of the safer cycling reforms trial might have contributed to an improvement in the safety of cyclists in the ACT. However, there was an increase in the number of crashes between motor vehicles and cyclists riding across pedestrian crossings during the trial period. The small number of infringements of the MPD rule, combined with the fact that in some cases its enforcement was based on reports from cyclists, suggests that ways should be investigated to allow the Police to practically enforce the MPD rule in the future. Awareness of the trial rules as well as the public perception of their potential safety benefits increased throughout the trial. It is suggested that further data be collected to perform a more detailed analysis of the reasons for the crashes between motor vehicles and cyclists at pedestrian crossings. Infrastructure changes and a focused education campaign that may help reducing cyclist crashes at pedestrian crossings are also suggested.

KEYWORDS

Cyclists Safety, Minimum Passing Distance (MPD), ACT safer cycling reforms

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Summary

In November 2015, the ACT Government began the “Safer Cycling Reforms” trial, which involved the following:

- A minimum passing distance (MPD) was introduced on all roads in the ACT
- Allowance for riders to remain on their bicycles when crossing at pedestrian crossings

The trial period formally ended on 31 October 2017, but the conditions of the trial have been extended until a formal independent evaluation is undertaken. The objective of this study was to formally evaluate the effects of the trial on cyclist safety as well as the public perceptions on the trial.

An analysis of the crash data during the pre-trial and trial periods was conducted in an attempt to identify evidence of any safety benefits for cyclists or any potential increased risks for cyclists or pedestrians as a result of the trial rules. An analysis of the enforcement data during the pre-trial and trial periods was also carried out in an attempt to identify the level of compliance with the new rules introduced for the trial. Finally, results of pre-trial and post-trial community surveys, correspondence from community members and comments from a cyclist organisation were analysed to assess public awareness and safety perception of the trial rules.

Due to the limited number of crashes and infringements, statistically significant conclusions could not be made. That is, any of the differences noted in this report could have occurred within a natural fluctuation of the crashes or infringements. However, the following observations related to the two components of the safer cycling reforms trial, can still be made.

MPD

- Rear-end crashes caused by following motor vehicles during the pre-trial period and trial periods changed from 13 to 11. Potentially, a greater reduction of these types of crashes may have occurred due to an increased number of people cycling throughout the two years of the trial.
- No evidence was found to suggest that there was an increased crash risk for motorists related to the introduction of the MPD based on the analysis of crash data. Indeed, motorist head-on crashes during overtaking manoeuvres decreased (N=8 and N=4, before and during the trial, respectively).
- The small number of infringements of the MPD rule (N=11) combined with the fact that in some cases enforcement of this rule was based on referred reports from cyclists, suggests that methods or technologies by which Police can routinely evaluate and enforce MPD compliance should be investigated in the future.

Allowance to ride across pedestrian crossings

- No crashes between pedestrian and cyclists riding across pedestrian crossings were found during either the pre- and post-trial periods. However, crashes between motor vehicles and cyclists riding across pedestrian crossings increased following the trial commencement (N=22 and N=35 before and during the trial, respectively). This may confirm initial concerns from some ACT residents that cyclists may suddenly ride across pedestrian crossings from footpaths without giving enough time for motorists to react. Further investigation with a detailed analysis of the causes for each of those crashes is required.

Public perception and cyclist awareness

- Awareness of the trial rules as well as the public perception of their potential safety benefits increased throughout the trial. However, some ACT residents argued that the MPD rule may not be practical on narrow roads and suggested better education of cyclists regarding the reforms were necessary.
- The results of the pre- and post-trial surveys indicated a general increased awareness of cyclists among motorists as a result of the safer cycling reforms.

Cycling participation in the ACT

- A slight decline in general cycling participation among ACT residents occurred following the commencement of the trial according to the post-trial phone community survey; however, the number of cyclists that reported riding regularly increased during the same period. Independently, according to the National Cycling Participation survey, there was a general increase in cycling in the ACT for the period 2015-2017.

The following recommendations are suggested:

- Implementing infrastructure changes that can more actively help reduce crashes between cyclists and motor vehicles at pedestrian crossings located along shared paths by calming both bicycle and motor traffic and increasing situational awareness. Treatments might include:
 - Wider pedestrian crossings (preferably on a raised platform)
 - Speed platforms located along the roadway in the proximity of the pedestrian crossing
 - Signs and/or pavement symbols warning motorists of crossing cyclists
 - Tactile marking and/or raised platforms located along the segments of the shared path immediately approaching a crossing
- Consider extending the crossing allowance trial period further, to monitor crash and infringement data and perform additional research to investigate the reasons for the increase in the number of crashes between cyclists and motor vehicles at pedestrian crossings.
- An education campaign aimed at demonstrating how motorists should pass safely cyclists as well as how cyclists should safely cross at pedestrian crossings. An educational campaign ideally should highlight aspects of the MPD rule such as:
 - Need for motorists to remain behind cyclists if the prevailing road conditions do not allow adequate space to comply with the MPD
 - Need for motorists to wait and ensure that any opposing traffic lanes are clear before straddling or crossing centrelines
 - The need for motorists and cyclists to slow down to a safe speed when approaching pedestrian crossings

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1 Introduction

Cycling is becoming increasingly popular throughout Australian cities, because of health benefits, environmental benefits, convenience for commuting purposes, or as a recreation activity. Given the increasing number of cyclists on the road concurrent with cycling strategies aiming to increase cycling participation, most Australian jurisdictions have introduced or trialled new road rules to improve safety for cyclists.

1.1 Background

In 2014, results from an inquiry into vulnerable road users in the ACT were published (Standing Committee on Planning, Environment and Territory and Municipal Services, 2014). Of the 28 recommendations proposed for improving road safety for vulnerable road users, five recommendations formed the basis of the ACT Government's "Safer Cycling Reforms" trial.

In November 2015, the ACT Government began the Safer Cycling Reforms trial, which included the following trial rules:

- A Minimum Passing Distance (MPD) when overtaking cyclists on all roads in the ACT
 - one metre in speed zones 60 km/h and below (Recommendation 15)
 - one and a half metres in speed zones above 60 km/h (Recommendation 16)
- Allowances for cyclists to remain on their bicycles when crossing at pedestrian crossings (Recommendation 7)

Additionally, to assist with compliance with the MPD rules, motorists are allowed to cross, straddle or drive on centre-lines and painted islands when overtaking cyclists in order to provide the MPD, provided the passing manoeuvre is safe to undertake and there is a clear view of any approaching traffic.

The trial period formally ended on 31 October 2017; however, the conditions of the trial have been extended until a formal independent evaluation is undertaken. The ACT Government, Justice and Community Safety Directorate (JACS) commissioned an independent evaluation of the trial by the Centre for Automotive Safety Research (CASR) at the University of Adelaide.

1.2 MPD and allowance to ride across pedestrian crossings in Australian jurisdictions

Most Australian jurisdictions have introduced or are trialling laws that require motorists to provide an MPD when overtaking cyclists, as summarised in Table 1.1.

Furthermore, most Australian jurisdictions, with the exception of the Northern Territory, have laws set in place that allow cyclists to ride across pedestrian crossings under specific conditions, as summarised in Table 1.2. In some jurisdictions such as NSW and WA, cyclists are allowed to ride only across pedestrian crossings that are equipped with dedicated bicycle traffic lights. In ACT, QLD, SA, and TAS, cyclists are generally allowed to ride across most types of pedestrian crossings as long as they obey traffic lights and other signals, give way to pedestrians, and keep to the left of oncoming bicycle riders.

Table 1.1
Summary of available MPD rules in Australian jurisdictions

	MPD Rule	Special Conditions
ACT	Trialled law: <ul style="list-style-type: none"> • 1 metre in speed zones 60 km/h and below • 1 ½ metres in speed zones above 60 km/h 	Drivers are allowed to cross centre line markings, including single and double continuous white lines and painted islands, to provide a MPD to the cyclist (but only when it is safe to do so and when the driver has a clear view of oncoming traffic)
NSW	Permanent law (trialled for 2 years): <ul style="list-style-type: none"> • 1 metre in speed zones 60 km/h and below • 1 ½ metres in speed zones above 60 km/h 	Drivers are allowed to cross centre line markings, including single and double continuous white lines and painted islands, to provide a MPD to the cyclist (but only when it is safe to do so and when the driver has a clear view of oncoming traffic)
NT	Proposed rule (expected in 2019): <ul style="list-style-type: none"> • 1 metre in speed zones 60 km/h and below • 2 metres in speed zones above 70 km/h 	N/A
QLD	Permanent law (trialled for 2 years): <ul style="list-style-type: none"> • 1 metre in speed zones 60 km/h and below • 1 ½ metres in speed zones above 60 km/h 	Drivers are allowed to cross centre line markings, including single and double continuous white lines and painted islands, to provide a MPD to the cyclist (but only when it is safe to do so and when the driver has a clear view of oncoming traffic)
SA	Permanent law (without trial): <ul style="list-style-type: none"> • 1 metre in speed zones 60 km/h and below • 1 ½ metres in speed zones above 60 km/h 	Drivers are allowed to cross centre line markings, including single and double continuous white lines and painted islands, to provide a MPD to the cyclist (but only when it is safe to do so and when the driver has a clear view of oncoming traffic)
TAS	Permanent law (without trial): <ul style="list-style-type: none"> • 1 metre in speed zones 60 km/h and below • 1 ½ metres in speed zones above 60 km/h 	Drivers are allowed to cross centre line markings, including single and double continuous white lines and painted islands, to provide a MPD to the cyclist (but only when it is safe to do so and when the driver has a clear view of oncoming traffic)
VIC	Suggested rule: <ul style="list-style-type: none"> • 1 metre in speed zones 60 km/h and below • More than 1 metre in speed zones above 60 km/h 	N/A
WA	Permanent law (without trial): <ul style="list-style-type: none"> • 1 metre in speed zones 60 km/h and below • 1 ½ metres in speed zones above 60 km/h 	Drivers are allowed to cross centre line markings, including single and double continuous white lines and painted islands, to provide a MPD to the cyclist (but only when it is safe to do so and when the driver has a clear view of oncoming traffic)

Table 1.2

Summary of the rules allowing cyclists to ride across pedestrian crossings in Australian jurisdictions

	Allowed Crossing Type	Allowance Conditions
ACT	<ul style="list-style-type: none"> Marked foot crossing School crossing Signalised pedestrian crossing 	<ul style="list-style-type: none"> Check for approaching traffic and be prepared to stop Slow to 10 km/h or less (both approaching and riding through crossing) Cross only if the green pedestrian light is showing (at a signalised intersection) Give way to any pedestrian on the crossing Keep to the left of any oncoming bicycle rider
NSW	Signalised pedestrian crossing with specific bicycle crossing lights ONLY	<ul style="list-style-type: none"> Bicycle allowed to ride across a crossing ONLY where bicycle crossing lights are installed (must obey any traffic signals or signs) Dismount and walk across the crossing if there is no bicycle crossing light
NT	None	NO allowance to ride on a children's crossing, marked foot crossing or pedestrian crossing
QLD	<ul style="list-style-type: none"> Marked foot crossing School crossing Signalised pedestrian crossing 	<ul style="list-style-type: none"> Wait for the green 'walk' sign (or come to a complete stop first, at unsignalised intersections) Proceed slowly and safely Give way to any pedestrian on the crossing Keep to the left of any oncoming bicycle riders
SA	<ul style="list-style-type: none"> Marked foot crossing School crossing Signalised pedestrian crossing 	<ul style="list-style-type: none"> Obey any pedestrian or bicycle crossing lights Slow down on the approach to the crossing and keep a sharp lookout for pedestrians and vehicles Keep to the left, give way to any pedestrian, and cross without delay
TAS	<ul style="list-style-type: none"> Pedestrian crossing Marked foot crossing (controlled by lights) School crossing 	<ul style="list-style-type: none"> Ride slowly and safely Give way to pedestrians on the crossing Keep left of oncoming cyclists or pedestrians
VIC	Signalised pedestrian crossing with specific bicycle crossing lights ONLY	<ul style="list-style-type: none"> Bicycle allowed to ride across a crossing ONLY where bicycle crossing lights are installed (must obey any traffic signals or signs) Dismount and walk across the crossing if there is no bicycle crossing light
WA	Signalised pedestrian crossing with specific bicycle crossing lights ONLY	<ul style="list-style-type: none"> Bicycle allowed to ride across a crossing ONLY where bicycle crossing lights are installed (must obey any traffic signals or signs) Dismount and walk across the crossing if there is no bicycle crossing light

1.3 Previous Investigation of MPD laws

Concerns for the safety of vulnerable road users has seen many jurisdictions in Australia introduce MPD laws for motor vehicles when overtaking cyclists. In Australia, MPD laws require a gap of one metre on roads with speed limits of 60 km/h or below, and one and a half metres on roads with speed limits above 60 km/h. To date MPD laws are in place in Queensland, South Australia, New South Wales, the ACT, and Tasmania. Western Australia has implemented a trial of MPD, and the Northern Territory plan to implement a trial in the future. In conjunction with MPD laws, many states/territories have also changed existing laws to allow cyclists of all ages to ride on the footpath. Outside of Australia, a number of international jurisdictions have introduced, or are considering introducing, MPD laws, including the USA (24 states), France, Belgium, Ireland, and the UK.

Three studies evaluating MPD laws were identified. Two Australian studies, both conducted by CARRS-Q, evaluated the two-year trial of MPD laws in Queensland (Schramm et al., 2016) and New South Wales (Transport for New South Wales, 2018). These studies involved road user surveys, observations of passing behaviour, focus groups with stakeholders, analysis of infringement and crash data, and review of literature. The Queensland review also included a review of correspondence received by the Government regarding the law. The third study was undertaken in the city of Baltimore, Maryland (USA) and involved analysis of video footage collected by five cyclists on their regular commuting routes (Love et al., 2012).

Results of the Australian studies indicate that MPD laws improve cycling safety. In NSW a 15% reduction in cycling casualty crashes was reported for the 10 months following the start of the trial, while in Queensland 48 fewer cycling crashes were reported over the course of the trial period compared to a period of similar length before the trial. Across both studies, the observed driver compliance with these laws was generally high, at least at sites where observations were conducted. In addition to this, the road user surveys indicated that both drivers and cyclists believed drivers were leaving more room when overtaking cyclists during the trial period (Schramm et al., 2016; TfNSW, 2018). In NSW reasonable support for the MPD law among surveyed drivers was reported in both the pre-trial (64%) and post-trial (69%) surveys. In Queensland around half (53%) of surveyed drivers supported the law. Although drivers appear to hold concerns about potential unintended consequences of MPD laws, no evidence of unintended consequences was identified in either study, regarding exemptions allowing drivers to cross double solid centre lines, straddle lanes, or drive on painted medians when passing cyclists. The biggest issue identified by the Police in both studies were the difficulties associated with enforcing the MPD law. Consultations in both Queensland and NSW revealed initial Police concerns regarding the enforcement of an MPD offence, while surveys of road users revealed that many (80% cyclists, 50% drivers) believed the rule was not being enforced. Despite this, 61 infringement notices were issued in NSW (TfNSW, 2018) and 60 in Queensland (Schramm et al., 2016). A need to identify approaches to enforce MPD laws has also been acknowledged.

The study investigating MPD laws in Baltimore found that the monitored cyclists were regularly passed at distances of 3 feet (about a metre) or less and that compliance with the MPD law was higher where roads allowed more room for cyclists, including bike lanes and wider traffic lanes (Love et al., 2012). Low levels of enforcement for the MPD rule were also reported, with only two cases in which the law was enforced, both of which involved a collision with a cyclist.

The mentioned studies examining the effect of MPD laws have generally found that highest levels of non-compliance with the laws occurs on narrower roads where it is most difficult to leave the minimum distance while remaining in the only available lane of travel. Arguably, these are the circumstances in which the MPD is most important. While a limited road width can provide some explanation for non-

compliance, other reasons associated with driver behaviour may also be related and should be investigated. It is possible that non-compliance may be attributed to driver factors such as low levels of awareness of road rule exemptions associated with the MPD (e.g., crossing double solid centre lines), a disregard for cyclist safety by some drivers, driver perceptions about the legitimacy of the law, or a lack of understanding of how passing cyclists under the MPD laws should operate. Furthermore, it is possible that education regarding passing cyclists only when it is possible to leave the minimum safe distance may also have been lacking. While the law implies that if it is not possible to adopt the safe-passing distance a driver should not pass until safe to do so, this may not have been adequately communicated to the general driving public. Finally, a generally perceived low likelihood of penalty for breaching MPD laws may also contribute to non-compliance.

Both Australian studies concluded that MPD laws benefit cyclist safety, and the rule was maintained following the completion of the trial in both NSW and Queensland. However, both jurisdictions also noted some issues with the implementation of the trial. These issues are generally related to resolving the difficulties associated with enforcement and communication/education regarding exemptions to other road rules that were implemented to accommodate the MPD. While enforcement may benefit from technological approaches such as video footage and devices capable of measuring distances between cyclists and passing vehicles in the near future, ongoing education may be required to address shortcomings in the other areas.

2 Objective and Method

The objective of this study was to assess whether there have been any direct as well as any public-perceived road safety benefits to cyclists, or any disbenefits to other road users, as a result of the ACT Safer Cycling Reforms trials. A further objective of this study was to determine whether there are sufficient grounds to support retaining the safer cycling trial rules permanently in the ACT.

Three data sources from the ACT were examined:

1. An analysis of the crash data during the pre-trial and trial periods was conducted in an attempt to identify whether there was evidence of any safety benefits for cyclists as a result of the introduction of the MPD rule, or if there was any reduction in safety for cyclists or pedestrians as a result of the allowances to ride across pedestrian crossings without dismounting. Additionally, an analysis of motor vehicle head-on and side swipe crashes was also conducted in an attempt to identify whether such crashes increased following the introduction of the MPD rule, due to the allowance for motorists to cross, straddle or drive on centre-lines and painted islands if necessary to provide the MPD when overtaking cyclists.
2. An analysis of Police enforcement data during the pre-trial and trial periods was also carried out in an attempt to identify the level of compliance with the safer cycling reforms trial rules.
3. Results of pre-trial and post-trial community surveys, and correspondences received from ACT residents, were analysed to identify any public perceived safety benefits or negative feedback resulting from the introduction of the MPD rule and change of cycling rule at pedestrian crossings. Additionally, feedback on the safer cycling reform trial was obtained from Pedal Power, which is the largest membership-based cycling organisation in the ACT, with over 7,700 members. Pedal Power represent the interests of people who ride bicycles in the ACT as well as people who would like to start riding.

2.1 Crash data analysis

An analysis of the crash data reported in the ACT over a period spanning 2 years prior (Nov. 1, 2013 – Oct. 31, 2015) and 2 years after (Nov. 1, 2015 – Oct. 31, 2017) the commencement of the trial was conducted. The ACT road crash database codes three levels of injury for road crashes; fatal, injury (any severity) and Property Damage Only (PDO).

The crash data were initially filtered to identify non-single vehicle crashes and only those crashes in which at least one of the vehicles involved was a bicycle (*Vehicle Type = Bicycle* & number of vehicles involved ≥ 2). These crashes were then classified based on the involvement of any other vehicle type(s) or pedestrian(s) in the crash, using the following grouping criteria:

- Bicycles only – *Vehicle Type = Bicycle* (For any vehicle reported in the crash)
- Bicycle(s) & Vehicle(s) - *Vehicle Type = Bicycle* OR *Vehicle Type = any of the other available motor vehicle categories* (For any vehicle reported in the crash, with at least a vehicle falling into each of the filter criteria)
- Bicycle(s) & Pedestrian(s) - *Vehicle Type = Bicycle* OR *Vehicle Type = Pedestrian* (For any vehicle reported in the crash, with at least a vehicle falling into each of the filter criteria)
- Bicycle(s) & Vehicle(s) & Pedestrian(s) - *Vehicle Type = Bicycle* OR *Vehicle Type = Pedestrian* OR *Vehicle Type = any of the available motor vehicle categories* (For any vehicle reported in the crash, with at least a vehicle falling into each of the filter criteria)

2.1.1 MPD-related crashes

To identify potential MPD-related crashes, those crashes between bicycles and vehicles were further disaggregated into crashes that might be expected to occur as a consequence of poor passing distance between a leading cyclist and a following/overtaking vehicle based on the following criteria:

- Rear-end crashes
 - Rum Code Description = Rear-End OR Rum Code Description = Left – Rear OR Rum Code Description = Right – Rear
 - Vehicle Lane = 1st (kerb or left) lane
- Side-swipe crashes
 - Rum Code Description = Side Swipe

Each of these two types of MPD-related crashes were then classified according to the three reported injury levels: fatal, injury, and PDO.

Additionally, those crashes that may have occurred when a cyclist did not respect the minimum passing distance when overtaking another cyclist were identified by filtering the crashes between bicycles (group “Bicycles only”) based on the following criteria:

- Rum Code Description = Rear-End OR Rum Code Description = Side Swipe

2.1.2 Crashes at pedestrian crossings

To identify crashes that involved pedestrians and cyclists who were riding across pedestrian crossings, those crashes between bicycles and pedestrians (group “Bicycle(s) & Pedestrian(s)”) were further filtered based on the following criterion:

- Traffic Control = Marked Pedestrian Crossing OR Traffic Control = School Crossing

Similarly, to identify crashes that involved vehicles and cyclists who were riding across pedestrian crossings, those crashes between bicycles and vehicles (group “*Bicycle(s) & Vehicle(s)*”) were further filtered based on the following criterion:

- Traffic Control = Marked Pedestrian Crossing OR Traffic Control = School Crossing

Each of these two categories of crashes at pedestrian crossings were then classified according to the three reported injury levels: fatal, injury and PDO.

2.1.3 Vehicle head-on and side-swipe crashes during overtaking

To identify vehicle head-on and side-swipe crashes that might have occurred as a consequence of an inadequate overtaking manoeuvre, all vehicle crashes were filtered based on the following criteria:

- Head-on crashes
 - Rum Code Description = Head On - Overtaking
 - Vehicle Movement = Overtaking right side
- Side-swipe crashes
 - Rum Code Description = Side Swipe
 - Vehicle Movement = Overtaking right side

Each of these two types of crashes were then classified according to the three reported injury levels: fatal, injury, and PDO.

2.2 Analysis of the infringement data

Police enforcement data were obtained to assess the level of compliance, as well as potential issues related to the MPD rule and the allowance of cyclists to ride across pedestrian crossings. Traffic Infringement Notices (TINs) and cautions that were issued in the ACT during the pre-trial and trial periods and that were related to these two aspects of the trial were analysed. To identify the level of awareness of cyclists by motorists, other infringements that were issued related to motorists not yielding to cyclists during the same periods were also collected and analysed.

2.3 Summary of the pre-/post-trial surveys

The ACT Government commissioned Micromex Research to conduct phone surveys of ACT residents before and after the safer cycling reforms trial commenced. The questionnaires for those pre- and post-trial surveys were prepared by Micromex Research in collaboration with the ACT Government. The survey questions covered both major aspects of the safer cycling reforms as well as cycling habits of participants.

The pre-trial survey was conducted on a sample of 407 participants between September 3 and September 7, 2015. The post-trial survey was conducted on 400 participants between October 19 and October 26, 2017. The chosen sample size for both the pre- and post-trial surveys provides a maximum sampling error of plus or minus 4.9% at a 95% level of confidence. The sample of the pre- and post-surveys were weighted by age and gender to reflect the 2011 and 2016 Australian Bureau of Statistics community profiles of the ACT, respectively.

3 Results

3.1 Crash data analysis

A summary of all the non-single bicycle-related crashes during the pre-trial and trial periods is provided in Table 3.1. The total number of reported non-single bicycle-related crashes changed from 401 to 386 between the pre-trial and trial periods. The number of crashes between cyclists and motorised vehicles remained almost constant (N=385 and N=380 in the pre-trial and trial period, respectively). However, the proportion of crashes between cyclists and pedestrians as well as cyclist-only crashes reduced fairly considerably, despite the relatively low numbers, compared to crashes with motor vehicles.

Table 3.1
Summary of all non-single bicycle-related crashes during the pre-trial and trial periods

	Pre-Trial	Trial	Change
Bicycles & Motorised Vehicles	385	380	-5
Bicycles & Pedestrians	9	5	-4
Bicycles & Other bicycles	7	1	-6
Total	401	386	-15

3.1.1 MPD-related crashes

Bicycles & Motorised Vehicles

A summary of potential MPD-related crashes between bicycles and motorised vehicles during the pre-trial and trial periods is provided in Table 3.2. A slight change of MPD-related crashes occurred during the trial period compared to the pre-trial period. In particular, rear-end crashes changed from 20 to 18 while the number of side-swipe crashes remained the same in the periods before/during the trial. Note that it was not possible to identify from the crash data which of those rear-end and side-swipe crashes may have occurred as a consequence of cyclists colliding with a vehicle as opposed to vehicles colliding with cyclists.

The distribution of injury and PDO crashes was similar for the periods before and during the trial. In particular, the number of injury crashes and PDO crashes changed from 13 to 11 for rear-end crashes, while there was no change for side swipe crashes in the periods before/during trial. While there were no fatal bicycle rear-end collisions prior to the trial, one rear end fatal crash[†] occurred during the trial period.

Table 3.2
Summary of MPD-related crashes between cyclists and motor vehicles during the pre-trial and trial periods

	Pre-Trial		Trial		Change
	Rear-End Crashes	Side-Swipe Crashes	Rear-End Crashes	Side-Swipe Crashes	Rear-End & Side-Swipe Crashes
Injury Level					
- Fatality	-	-	1 [†]	-	+1
- Injury	6	3	5	3	-1
- PDO	7	4	5	4	-2
Subtotal (by Crash Type)	13	7	11	7	-2
Total MPD-related crashes	20		18		-2

Bicycles only

A summary of all the crashes involving only bicycles during the pre-trial and trial periods is provided in Table 3.3. The total number of reported crashes involving only bicyclists reduced by six crashes between the pre-trial and trial periods. There were no lane side-swipe crashes reported during the trial period. Additionally, there were no head-on crashes between cyclists reported during the trial period.

Table 3.3
Summary of bicycle-only crashes during the pre-trial and trial periods

	Pre-Trial	Trial	Change
Rear – End	1	1	0
Lane Side Swipe	3	-	-3
Head On	1	-	-1
Other	2	-	-2
Total	7	1	-6

3.1.2 Crashes at pedestrian crossings

Bicycle crashes with motor vehicles while riding across pedestrian crossings

A summary of all the crashes involving motor vehicles and cyclists riding across pedestrian crossings for the pre-trial and trial periods is provided in Table 3.4. The number of these type of crashes increased by 13 during the trial period compared to the pre-trial period. Table 3.5 shows these crashes disaggregated by the presence or not of a shared path either side of the pedestrian crossing.

During the safer cycling reforms trial, the number of crashes between cyclists and motor vehicles at pedestrian crossings increased for locations where a shared path was available and decreased for locations where there was no path. The locations of the four pedestrian crossings with the highest number of crashes between cyclists and motor vehicles, which are all located at midblock crossings with shared paths, are shown in Figure 3.1.

Note that the number of crashes between pedestrians and motor vehicles at pedestrian crossings during the pre-trial and trial periods remained almost constant (N=11 and N=12 in the pre-trial and trial period, respectively). Thus, it is expected that the behaviour of motorists at pedestrian crossing was consistent during the pre-trial and post-trial periods. Additionally, an analysis based on Google Maps (using the street-view option) indicated that no pedestrian traffic lights were available for any of the pedestrian crossings where these crashes occurred.

Table 3.4
Summary of bicycle-motor vehicle crashes while riding across pedestrian crossings during the pre-trial and trial periods

	Pre-Trial	Trial	Change
Injury Level			
- Fatalities	-	-	-
- Injuries	8	12	+4
- PDOs	14	23	+9
Total	22	35	+13

Table 3.5

Bicycle-motor vehicle crashes while riding across pedestrian crossings aggregated by presence of a shared path

	Pre-Trial	Trial	Change
Shared path (on either side of the crossing)			
- Available	6	25	+19
- Not available	16	10	-6
Total	22	35	+13



Figure 3.1

Locations of the four pedestrian crossings with the highest number of crashes between cyclists and motor vehicles during the trial period

Cyclists crashes with pedestrians while riding across pedestrian crossings

No crashes were reported between pedestrians and cyclists while riding across pedestrian crossings during the pre-trial or the trial periods. However, other pedestrian-cyclist crashes that were unrelated to pedestrian crossings occurred during both the pre-trial (N=9) and trial (N=5) periods.

Vehicle head-on and side-swipe crashes during overtaking

A summary of all the crashes involving head-on collisions between opposing motor vehicles, as a consequence of overtaking manoeuvres during the pre-trial and trial periods is provided in Table 3.6. Crash data from the period before and during the trial not indicate any increased occurrence of head-on crashes with vehicles travelling in opposing directions, while performing overtaking manoeuvres. Indeed, the number of head-on crashes resulting from overtaking manoeuvres reported during the trial period halved, compared to the pre-trial period. However, it must be noted that it was not possible to identify whether any of those crashes specifically involved overtaking bicyclists and the numbers of these types of crashes were already very low.

Table 3.6

Summary of vehicle head-on crashes as a consequence of an overtaking manoeuvre during the pre-trial and trial periods

	Pre-Trial	Trial	Change
Injury Level			
- Fatalities	2	-	-2
- Injuries	3	1	-2
- PDOs	3	3	-
Total	8	4	-4

There were no side-swipe crashes between vehicles travelling in opposite directions during the comparison periods.

3.2 Analysis of the infringement data

Police enforcement data related to non-compliance with the MPD rule or related to riding across pedestrian crossings issued during the two years prior to the trial and the two years during the trial was examined. A summary of the traffic infringement notices (TINs) and cautions are listed in Table 3.7. Eleven motorists were issued a TIN or caution related to non-compliance with the MPD rule during the trial. Only one cyclist was issued a TIN for non-compliance with pedestrian crossing allowances. Note that three of the infringements of the MPD rule (two TINs and one caution) were retroactively issued as a result of cyclists reporting the infractions to the Police. In two cases, helmet cam footage was available and provided to Police as evidence, while in another case the offender made admissions upon being questioned by Police.

Table 3.7

Summary of infringements related to MPD rule or riding across pedestrian crossings during the pre-trial and trial periods

	Pre-Trial		During Trial	
	TINs	Cautions	TINs	Cautions
MPD RELATED				
- Overtake bicycle rider too closely	-	-	6	5
- Not keep out of path of bicycle/pedestrian	-	1	-	-
Sub Total (per Period)	1		11	
CYCLISTS AT PEDESTRIAN CROSSING				
- Proceed on crossing on bicycle (with red crossing lights)	-	-	1	-
- Bicycle cross on children's pedestrian crossing	1	-	-	-
Sub Total (per Period)	1		1	
Total Infringements (per Period)	2		12	

Other types of infringements related to drivers not yielding to cyclists are listed in Table 3.8. The number of these general infringements against cyclists reduced during the trial period, compared to the pre-trial period. Notably, there were 24 fewer motorists issued with a TIN or caution for driving in a bicycle lane (77 prior to the trial compared to 53 during the trial).

Table 3.8
Summary of various infringements related to drivers not yielding to bicyclists during the pre-trial and trial periods

	Pre-Trial		During Trial	
	Infringements	Cautions	Infringements	Cautions
DRIVERS NOT YIELDING TO BICYCLISTS				
- Not give way to bicycle rider on pedestrian crossing	-	-	-	1
- Not stop at children's crossing - bicycle rider on crossing	-	-	1	-
- Not give way to bicycle rider (flashing yellow light)	-	-	-	1
- Drive in bicycle lane	47	30	32	21
Total Infringements (per Period)	77		56	

3.3 Public perception

A summary of the correspondence related to the safer cycling reforms received from ACT residents before and during the trial period, is provided in Table 3.9. An additional summary of the results of the pre- and post-trial surveys is provided in the sub-sections that follow.

Table 3.9
Summary of the correspondence related to the safer cycling reforms

		Number of Letters/Emails	Relevant Comments
MPD 15 letters to Minister 12 emails to Access Canberra	In Favour	19 (10 from cyclists)	- Education of cyclists is required for proposed changes to work (4 submissions) - Suggested some roads should be exempted as they are too narrow (2 submissions)
	Against	8 (none from cyclists)	A submission outlined a petition on "motorcycle change organisation for decision makers", listing 500 votes against, mostly motivated by fears that these changes may pose a danger to motorcyclists
Ped. crossing allowance 11 letters 8 emails to Access Canberra	In Favour	5 (3 from cyclists)	A submission suggested the reforms could work if cyclists were educated
	Against	14 (2 from cyclists)	- A submission from a Parent and Citizen board indicated all members are against educating children to ride across crossings - Reforms could work if cyclists were educated (2 submissions)

3.3.1 Awareness of the Cycling Reforms trial

The awareness level of the safer cycling reforms trial reported in the post-trial survey essentially doubled compared to the pre-trial survey, indicating that 70% of the ACT residents became aware of the reforms at some stage during the trial.

3.3.2 Support of MPD and crossing components

Support of both the MPD and pedestrian crossing allowance components of the safer cycling reforms increased during the trial, as indicated by an increase in the mean rating for specific questions on this topic between the pre-trial and post-trial surveys. This is summarised in Table 3.10. Overall, in the

post-trial survey, the MPD component obtained wider public support (average slightly more than “Supportive” rating) compared to the pedestrian crossing allowance component (average slightly more than “Somewhat supportive” rating).

Table 3.10
Mean rating of the support of the safer cycling reforms in the pre- and post-trial surveys

	Pre trial (N = 407)	Post trial (N= 400)
Mean Rating (MPD)	3.8	4.1
Mean Rating (Ped. crossing allowance)	2.9	3.2

(Rating ranging from 1 through 5. 1 = Not at all supportive; 5 = Completely supportive)

The post-trial survey rating of support split by respondents who reported to ride a bicycle and those who reported to not ride is shown in Figure 3.2. The corresponding mean ratings are summarised in Table 3.11.

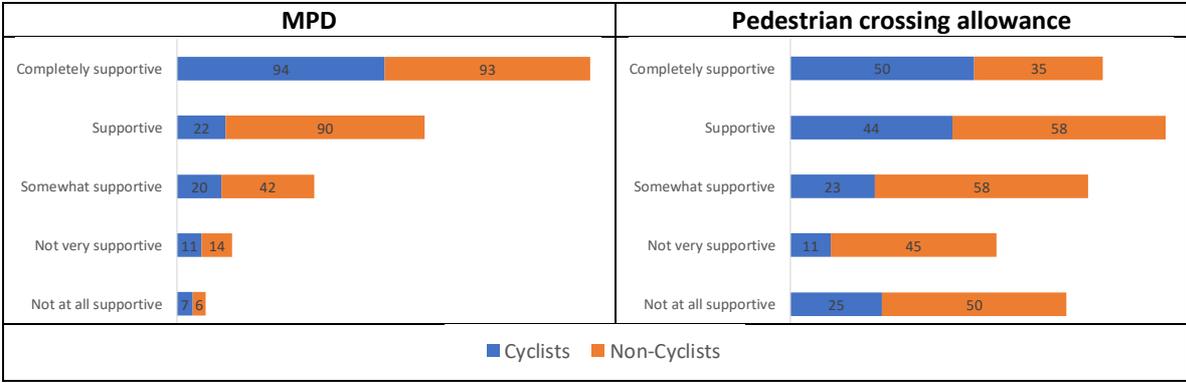


Figure 3.2
Ratings for the support of the safer cycling reforms in the post-trial survey (disaggregated by cyclists and non-cyclists)

Table 3.11
Mean rating of the support of the safer cycling reforms in the post-trial survey (disaggregated by cyclists and non-cyclists)

	Cyclists (N = 154)	Non-Cyclists (N= 246)
MPD	4.2	4.0
Crossing	3.5	2.9

(Rating ranging from 1 through 5. 1 = Not at all supportive; 5 = Completely supportive)

Among all the ACT residents who reported support of the MPD rule, cyclists expressed stronger support (mean rating of 4.2 over a maximum of 5) compared to non-cyclists (mean rating of 4.0 over a maximum of 5). Generally, the major reason for support of the MPD was a perceived or believed cycling safety benefit as a result of this rule (68% in the post-trial survey). On the other hand, those who were either conditionally (somewhat) supportive (16% in the post-trial survey) or not supportive of the MPD rule (9% in the post-trial survey) reported their major concerns as being insufficient space to comply with the MPD rule on narrower roads, personal experience of improper/unsafe behaviour of cyclists, or a general argument that cyclists should not share the road with fast moving traffic.

Among the ACT residents who supported allowance of cyclists to ride across pedestrian crossings, cyclists expressed stronger support (mean rating of 3.5 over a maximum of 5) compared to non-cyclists (mean rating of 2.9 over a maximum of 5). Generally, the main reason for supporting the pedestrian crossing allowance for cyclists was the convenience for cyclists to avoid dismounting (37% in the post-trial survey), which seems to be supported also by non-cyclist survey participants under the condition that cyclists would slow and watch for them when sharing the crossing. On the other hand, those who were either conditionally (somewhat) supportive (20% in the post-trial survey) or not supportive (33% in the post-trial survey) of the allowance to ride across pedestrian crossings were most likely to report the concern that cyclists may become a hazard to pedestrians, including potentially abusing the privilege of the allowance, or generally argued that cyclists should dismount at pedestrian crossing.

3.3.3 Perception of the space given while overtaking cyclists

From both the pre-trial and post-trial surveys, it appears clear that cyclists and motorists have an almost opposite perception of enough space being “always” provided when overtaking cyclists. Figure 3.3 shows the self-assessment of the space given when overtaking a cyclist, split by respondents who reported to ride a bicycle and those who reported to not ride in the post-trial survey. Only 8% of cyclists reported that they felt enough space was always provided when being overtaken by a vehicle, compared to 70 % of vehicle drivers reporting that they always gave enough space when overtaking cyclists in 60 km/h speed zones. The corresponding mean ratings are summarised in Table 3.12.

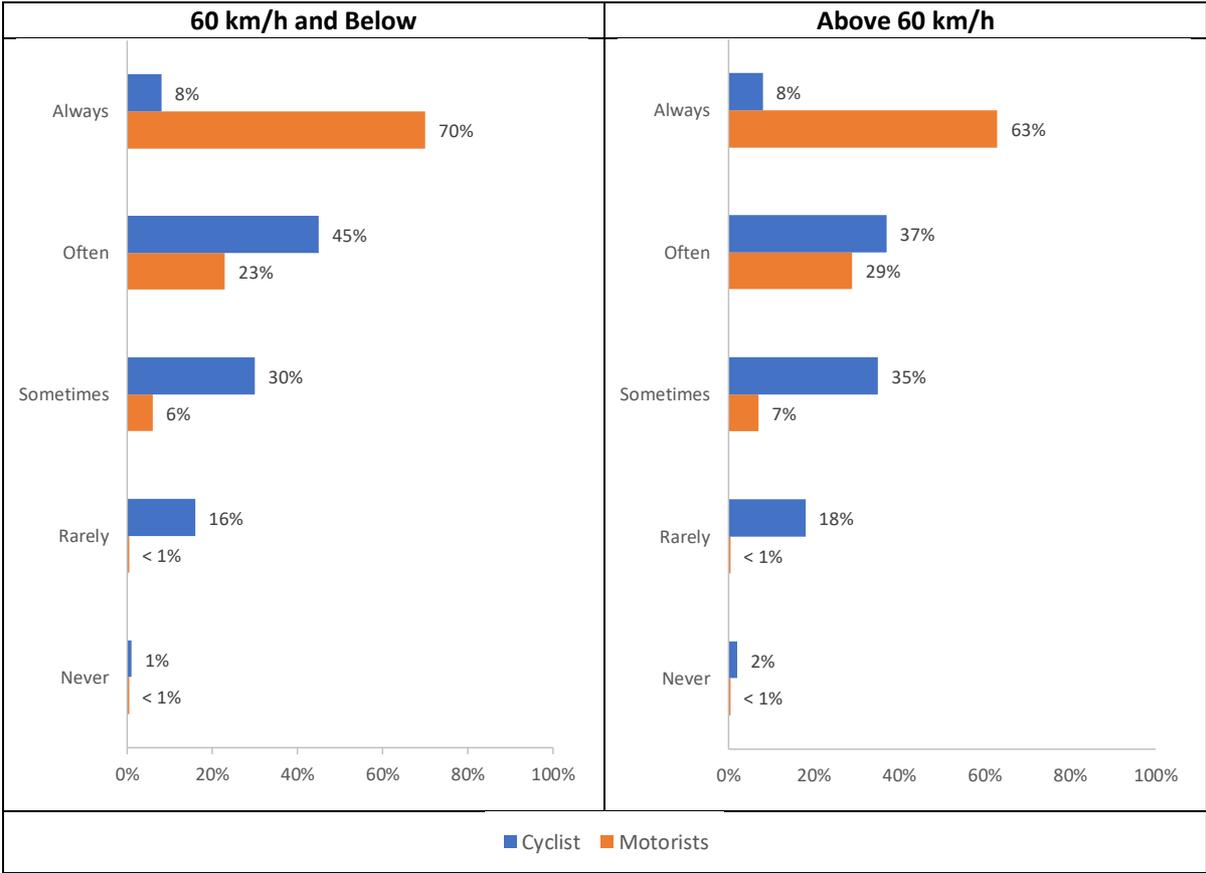


Figure 3.3
 Ratings for self-assessment of the space given when overtaking a cyclist in the post-trial survey
 (disaggregated by cyclists and non-cyclists)

Table 3.12
Mean rating for self-assessment of the space given when overtaking a cyclist in the post-trial survey
(disaggregated by cyclists and motorists)

	Cyclists (N = 154*)	Motorists (N= 381)
Mean Rating (Above 60 km/h)	3.3	4.5
Mean Rating (60 km/h and below)	3.4	4.6

(Rating ranging from 1 through 5. 1 = Not at all supportive; 5 = Completely supportive)
* Equivalent number of respondents after data have been weighted to reflect the 2016 ABS community profile of the ACT

It is interesting to note that the percentage of motorists who reported in the post-trial survey that they “always” provide enough space when overtaking cyclists decreased to 63% for speeds above 60 km/h and decreased to 70% for speeds equal or below 60 km/h, compared to 76% in the pre-trial survey (for any speed range). This could be an indication that the introduction of the trial MPD rule may have induced some motorists to become more critical when it comes to self-judging the actual distance at which they overtake cyclists.

3.3.4 Influence of the safer cycling reforms trial on bicycle usage

Based on the comparison of the pre- and post-survey, it appears that the safer cycling reforms trial had some mixed effects on residents who were already riding a bicycle before the trial, while it had very limited influence on preventing/inducing residents who were not riding a bicycle before the trial to start riding a bicycle during the trial.

The post-trial community survey indicated an overall reduction of 10% in bicycle usage compared to the pre-trial period. However, it is interesting to note that, compared to the pre-trial period, the percentage of ACT residents who reported riding with a high frequency (i.e., 5+ times a week) more than doubled (21% in the post-trial versus 9% in the pre-trial); whereas the percentage of residents who reported riding with a lower frequency (i.e., at least once per week) reduced by more than half (10% in the post-trial versus 22% in the pre-trial). It should also be noted that, in general, an increase in the rate of bicycle usage in the ACT appears from the estimated bicycle usage estimates of the National Cycling Participation Survey (NCPS) for the years 2015 and 2017 (Munro, 2015; Munro, 2017). Based on the NCPS, which is a bi-annual survey focused specifically on estimating bicycle usage across Australia, in the ACT bicycle riding with a frequency of at least once per week increased by 26.1% between 2015 and 2017. Details of the estimated NCPS bicycle usage for the ACT and the corresponding change in vehicle registrations in the ACT over the same period, are shown in Tables A1 and A2 in Appendix A, respectively.

It is also interesting to note that in both the pre-trial and post-trial surveys, among residents who reported not riding a bicycle at all, only a small percentage indicated concerns about road safety as their reason for not riding (8% in the pre-trial and 6% in the post-trial). Indeed, the largest majority (90% in the pre-trial and 78% in the post-trial) reported non-safety related concerns such as age, injury/health issues, not owning a bicycle, inability to ride and lack of time as the most common reasons for not riding a bicycle.

3.3.5 Feedback from Pedal Power

The feedback received from Pedal Power on the safer cycling reform is reported below:

“Despite the law being in place for over three-years, instances of unsafe passing still regularly occur, and there remains an unacceptably high number of crashes between cars and bikes on Canberra roads. There are clearly too many people who do not fully understand the laws, misapply them, or disobey them.

Pedal Power believes that there are three areas in which more action is required from the ACT Government to improve compliance with the Minimum Passing Distance Laws:

- *Education: More work needs to be undertaken to improve the understanding of the Minimum Passing Distance laws in our community. Pedal Power still encounters confusion from members of the public about a number of aspects of the law, particularly:*
 - *The distances that are required to be given in the speed zones above and below 60km/h,*
 - *That vehicles are permitted to cross solid lines to pass safely, provided that it is safe to do so.*

Many bike riders are also unaware of about legal processes that need to be undertaken in prosecuting a driver that does not obey the law. Pedal Power believes more emphasis needs to be placed on the minimum passing distance laws during initial driver education and testing, and that refresher information needs to be provided to long time licence holders.

- *Signage: Road signs are an important way of reminding and reinforcing road laws. There are currently no advisory signs in the ACT that remind drivers of the minimum passing distance laws or what distance is required to be given in a current speed zone. This needs to change. Signs should be displayed throughout the ACT that clearly advise motorists of the law, and the minimum passing distance required in each speed zone. Signs should be prominently positioned on key roads that are known routes for bicycle riding.*
- *Enforcement: There have only been a handful of drivers prosecuted and fined for breaching the minimum passing distance laws in the last three years. Enforcement of new laws is a critical element to changing people's behaviour, both as a deterrent and an important community education tool. Without enforcement any law is ultimately meaningless. Pedal Power endorses the enforcement model pioneered by the West Midlands Police in the UK. This involves a roadside operation featuring police officers riding bikes who record close passing behaviour by motorists, who are then pulled over further down the road. The motorist can choose to receive a fine or have a 10-minute education session about the minimum passing distance laws. This action saw a 20% reduction in the number of cyclists killed or seriously injured on that county's roads¹."*

¹ This reduction rate is according to the West Midlands Police in England, who indicated that "The number of cyclists killed or seriously hurt on the region's roads has dropped by a fifth since #OpClosePass was introduced a year ago." (Sep. 23, 2017). [Retrieved 19 September 2018 from <https://twitter.com/WMPolice/status/911527355029614593>]

4 Discussion

This study provides an attempt to assess the safety benefits of the ACT Safer Cycling Reforms trial and the corresponding level of compliance during the trial. The study also provides a summary of the public perception of the potential benefits and dangers that may arise as a consequence of the reforms.

4.1 Assessment of the safety benefits and compliance

4.1.1 Safety benefits

Comparison of the crash data for the two years before and two years after the commencement of the trial seems to indicate mixed effects in terms of safety for cyclists. Overall, injury and PDO crashes involving cyclists decreased during the trial, although there was one cyclist fatality. However, this fatal crash was somehow anomalous given the fact that it involved a cyclist who was involved in an organised cycling ultra-endurance race, and is currently the subject of a coronial inquest.

The number of MPD-related crashes changed from 20 to 18 during the pre-trial and trial period, but this was only for rear-end crashes. Note that it is not possible to identify whether this change was within a natural variation of this type of crashes (i.e., not statistically significant). There was also an apparent decrease in the total number of crashes between cyclists during the trial, particularly for side-swipe crashes.

However, the number of crashes involving bicyclists and motor vehicles at pedestrian crossings increased from 22 to 35 during the trial. It was found that this crash type only increased at locations where a shared path intersects with a roadway. This may indicate that cyclists riding on these paths may not be slowing adequately to the required speed of 10 km/h when approaching pedestrian crossings. Further investigation is required to confirm this hypothesis. Interestingly, there was a small decrease in the number of collisions between cyclists and motor vehicles on pedestrian crossings at locations where there were no shared paths.

4.1.2 Compliance

The extremely small number of infractions of the MPD rule that were reported during the trial period does not allow any definitive conclusions regarding compliance with the MPD rule by drivers throughout the trial. It seems unlikely that the extremely low number of infractions in the ACT trial can be purely attributed to good compliance of the rule. Some of the cautions and TINs relating to the MPD rule were retroactively issued as a result of cyclists reporting the infractions to the Police. This supports the hypothesis that the low number of infractions issued during the trial was a consequence of practical difficulties for the Police in enforcing the MPD rule. Given potential technical difficulties with Police enforcing the MPD rule, there may be a reliance on cyclists proactively pursuing MPD non-compliance.

Nonetheless, a reduction in the number of other types of infringements related to drivers not yielding to cyclists between the pre-trial and the trial periods seems to indicate an increased awareness of cyclists and cyclist safety following the commencement of the trial.

4.1.3 Potential unintended consequences of the safer cycling reforms

Based on the community survey data, a small percentage of ACT residents expressed concerns relating to the introduction of the MPD rule and an increased risk in head-on collisions. Analysis of

crash data before commencement of, and during the safer cycling reforms trial, does not seem to indicate an increase in the risk of head-on crashes for motor vehicles as a result of the MPD trial. Similarly, crash data did not indicate any increase in the risk of crashes with pedestrians resulting from the allowance of cyclists riding across pedestrian crossings.

However, the crash data did show an increase in the number of crashes between motor vehicles and bicyclists at pedestrian crossings.

Based on a comparison of the results between the pre- and post-trial community survey, it appears that bicycle usage increased for frequent riders but slightly decreased for casual riders. Additionally, the implementation of the safer cycling reforms trial did not seem to dissuade non-cyclists from participating in cycling activities.

As a side note, there were no reports of any increase in harassment or road rage against cyclists in any of the ACT community correspondence received.

4.2 Public perception

Based on the commentary feedback received during the phone surveys among ACT residents and the written correspondence regarding the safer cycling reforms, the following major points emerged in terms of the public perception of potential safety benefits and issues that might arise as a result of either of the two components of the trial:

- Better education of cyclists on both components of the trial is required
- Compliance of the MPD component may not be practical on narrow roads
- Allowance to ride across pedestrian crossings may result in an increased collision risk due to unpredictable cyclist behaviour, particularly for younger children

Education of drivers as well as specific road signs that remind drivers of the need to comply with the MPD law were suggested in the feedback received from Pedal Power. This is somewhat consistent with the approach taken by the Tasmanian Government who have installed relevant “pass cyclists safety” signs around their state (see Figure B1 in Appendix B) and have indicated the locations of the signs on a publicly accessible map (Tasmanian Road Safety Advisory Council, 2018).

Furthermore, Pedal Power also suggested consideration of new enforcement approaches, with the option for drivers who have been found to violate the MPD rule to choose between receiving a fine or have a 10-minute education session about the MPD rules. For enforcement to be effective, Pedal Power suggested to consider the enforcement model pioneered by the West Midlands Police in the UK, where police officers riding bikes record close passing behaviour by motorists, who are then pulled over further down the road.

4.3 Study limitations

Due to the small number of crashes, it was not possible to submit the data to statistical testing. This means that it is not possible to demonstrate that any of the apparent changes in crash numbers were statistically significant. That is, any of the apparent differences noted in this report could have occurred by chance.

Furthermore, due to limited information within the crash data relating to rear-end and side-swipe crashes between bicycles and motor vehicles, it could not be ascertained which crashes were the consequence of a cyclist hitting a vehicle or cyclist being hit by the vehicle. Similarly, the limited

information available in the crash data did not allow identification of whether vehicle head-on crashes that occurred during an overtaking manoeuvre were related at all to cyclist passing events.

Finally, due to the small number of infringements reported during the trial period, it was not possible to assess the level of compliance with the MPD component of the trial. However, this will likely be addressed in more detail at the conclusion of the ACT Road Safety Fund's Project "An evaluation of bicycle passing distances in the ACT", currently being undertaken by the University of Adelaide's Centre for Automotive Safety Research.

4.4 Conclusion

The analysis of the crash data is consistent with the MPD component of the safer cycling reform trial improving the safety of cyclists in the ACT. Due to the low numbers, any of the differences found in the analysis of the crash data could have occurred within the bounds of random variation. Collection of data for a longer period would be necessary to obtain statistically significant results. Based on the small number of crashes collected during the first two years since trial commencement, it would be necessary to consider at least an additional two years of crash data to determine whether there is any measurable effect resulting from the safer cycling reforms. However, it must be noted that any significant change in cycling exposure during an extended data collection period should also be taken into account to properly evaluate crash numbers.

Rear-end crashes of cyclists which were caused by following motor vehicles changed from 20 to 18 during the pre-trial and trial periods. Furthermore, considering that in the ACT, the estimated number of residents who cycle at least once a week increased at a much higher rate than the number of vehicle registration during the period 2015-2017, the potential safety benefits resulting from the safer cycling reforms trial may actually be underestimated due to the increased exposure of cyclists throughout the two years of the trial. Additionally, no evident increased crash risk for motorists related to the introduction of the MPD rule could be identified from the analysis of crash data. Indeed, the crash data indicated an apparent decrease in head-on crashes between motor vehicles resulting from overtaking manoeuvres during the trial periods, compared to the pre-trial period. Finally, the results of the pre- and post-trial surveys suggest that the introduction of the MPD rule appears to have contributed to an increased awareness of cyclists among other road users.

Regarding the allowance of cyclists to ride across pedestrian crossings, the analysis of crash data indicated an apparent increase in the number of crashes between motor vehicles and cyclists riding across pedestrian crossings during the trial period. During both the pre- and post-trial surveys, some participants expressed concerns that some cyclists may suddenly ride across pedestrian crossings from footpaths without giving enough time for motorists to react. Based on the fact that most of the crashes between motor vehicles and cyclists riding across pedestrian crossings during the post-trial period occurred at shared paths intersecting with roads, it is suggested that further infrastructure treatments to slow down and warn approaching motorists, as well as cyclists, of the presence of a crossing be undertaken. Further investigation is warranted regarding the causes for each of those motor vehicle and bicycle crashes at pedestrian crossings as well as the assessment of the effectiveness that proposed treatments may have on reducing these types of crashes.

Based on the results of the pre- and post-trial surveys, the awareness of the trial rules as well as the public perception of their potential safety benefits increased throughout the trial. However, some of the ACT residents, either during the survey interviews or through the correspondence received during the trial period, argued that complying with the MPD rule may not be practical on narrow roads and also suggested that better education of cyclists on some aspects of the reform was necessary for the trial rules to work as expected. It is worthwhile to note that both previous studies that assessed the MPD

trial in NSW and QLD reported limited driver awareness of the exemptions to other road rules. Those studies also suggested the need to educate drivers not to overtake cyclists when the road conditions do not allow it to be done safely. Finally, those studies reported that the highest level of non-compliance was on narrow winding roads, which is one of the conditions where compliance to the MPD rule would be expected to be most required.

Although the community survey analysis indicated a slight reduction in the general bicycle usage among ACT residents since the commencement of the trial, the number of cyclists who were riding with a higher frequency increased during the same period. Indeed, a general increase in cycling participation rates in the ACT for the period 2015-2017 appears from the data reported in a separate survey focusing primarily on estimating bicycle usage across Australian jurisdictions on a bi-annual basis.

Finally, the small number of infringements, combined with the fact that enforcement of the MPD rule in some cases was based on retroactive reports from cyclists, suggests that ways should be investigated to allow the Police to practically enforce this aspect of the trial in the future. Monitoring the results of the trial and evaluation of passing distance measurement technology currently being undertaken by the Centre for Accident Research and Road Safety – Queensland (CARRS-Q) will be useful for future reference.

Despite potential technical difficulties to measure the distance at which a vehicle may overtake cyclists, it is important that prescribed values are specified in the MPD rule in order to provide drivers with a clear indication of what is considered to be a safe passing distance. Prescribing values for a minimum passing distance is also consistent with MPD laws introduced in most other jurisdictions in Australia. Additionally, a prescribed minimum passing distance would provide vehicle manufacturers with a criterion to program safe manoeuvres for overtaking cyclists in future autonomous-type vehicles, which will be equipped with sensors to measure the distance of surrounding vehicles on the side of the car, including cyclists. Independently from the specific minimum distances prescribed in the MPD rule, the Police should also use discretion to assess when a vehicle is overtaking cyclists in an unsafe manner based on the specific road and traffic conditions.

Based on the above-mentioned conclusions, the following recommendations are suggested:

- Implementing infrastructure changes that can more actively help reduce crashes between cyclists and motor vehicles at pedestrian crossings located along shared paths by calming both bicycle and motor traffic and increasing situational awareness. Treatments might include:
 - Wider pedestrian crossings (preferably on a raised platform)
 - Speed platforms located along the roadway in the proximity of the pedestrian crossing
 - Signs and/or pavement symbols warning motorists of crossing cyclists
 - Tactile marking and/or raised platforms located along the segments of the shared path immediately approaching a crossing
- Consider extending the crossing allowance trial period, in order to monitor crash and infringement data, and to perform additional research to investigate the reasons for the increase in the number of crashes between cyclists and motor vehicles at pedestrian crossings (e.g., monitor cyclist-driver interactions at critical crossings along shared paths using video cameras). Additionally, an extension would also allow assessment of the effectiveness of countermeasures aimed at reducing the number of crashes between cyclists and motor vehicles at pedestrian crossings.

- An education campaign aimed at demonstrating how motorists should safely pass cyclists as well as how cyclists should safely cross at pedestrian crossings, especially along shared paths. An educational campaign ideally should highlight aspects of the reforms such as:
 - The need for motorists to remain behind cyclists if the prevailing road conditions do not allow adequate space to comply with the minimum passing distances for the speed limit of the road (this aspect of the MPD rule is implied and drivers may mistakenly misinterpret that they be exempted to provide a MPD if the road conditions do not allow for that)
 - The need for motorists to wait, to ensure that any opposing traffic lanes are clear before straddling or crossing centrelines to overtake cyclists
 - The need for motorists and cyclists to slow down to a safe speed when approaching pedestrian crossings

Acknowledgements

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The ACT Department of Justice and Community Safety provided a summary of the major topics of the correspondence that was received by ACT residents regarding the safer cycling reforms trial.

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Appendix A – Cycling usage and vehicle registrations in the ACT

Table A1
Cycling usage in ACT in the period 2015-2017 (Source: National Cycling Participation Survey)

Cycling frequency	2015	2017	Change	Change %
At least once a week	81,700	103,000	21,300	+26.1
Once a Year	170,200	184,400	14,200	+8.3

Table A2
Motor vehicle registrations in ACT in the period 2015-2017 (Source: ABS)

2015	2017	Change	Change %
283,572	295,633	12,061	+4.3

Appendix B – Signs reminding of MPD when passing cyclists

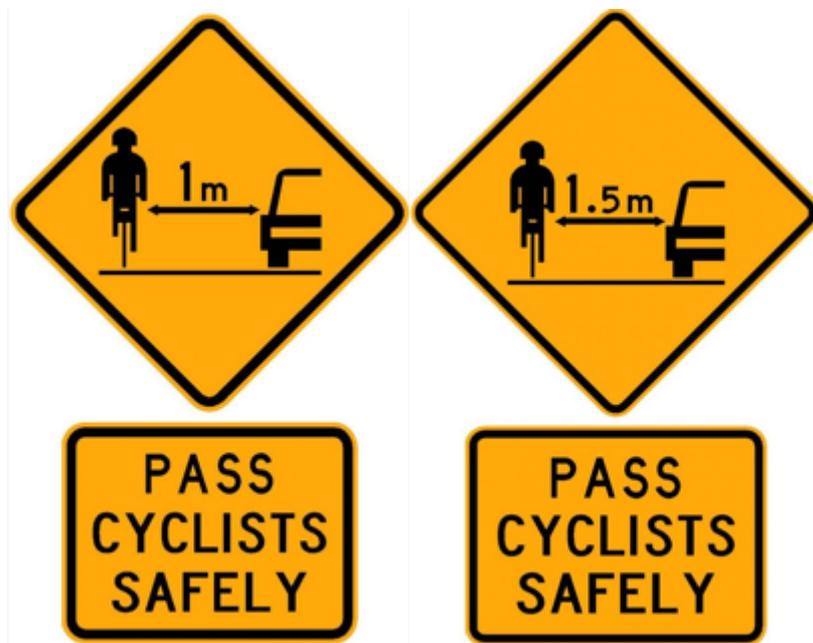


Figure B1

Signs used in Tasmania to remind motorists of their obligation to provide a MPD of 1 metre in zones with a speed limit of 60 km/h and below (left) and 1.5 metres in zones with a speed limit above 60 km/h (right)
(Source: Tasmanian Road Safety Advisory Council, 2018)