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Survey of cyclist travel and crash experiences in the Australian Capital Territory

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Abstract

Cycling is a popular means of transportation with immense benefits to both individuals (e.g., health) and society (e.g., environmental). The proportion of the population who cycle increased in all states and territories of Australia between 2001 and 2010, with the Australian Capital Territory (ACT) having the highest proportion of cyclists. However, safety issues such as less than optimal infrastructure, near-misses, collisions with vehicles, and severe injury outcomes, could be holding back further increases in participation. This project investigated the daily travel and safety of cyclists in the ACT. Three hundred and twenty-one cyclists completed a survey about their travel, crashes, injuries, and perceived safety on the ACT road network. Participants were a broad cross-section of cyclists in age, gender, and home residence across the ACT. They regularly rode (81% rode 2 to 3 days per week or more) resulting in high average distances (average of 82 kilometres per week). Almost two-thirds (60%) identified as confident riders. Overall, 80% thought that Canberra is a safe place to ride. However, there were safety issues that they encountered on the ACT road system. They did not feel comfortable riding on many common road situations in the ACT, they reported a large number (272 locations) of infrastructure issues with the road network that affect cyclists, half (53%) had been involved in a crash, and two-thirds (68%) had experienced a near miss. These are likely to be substantial cycling barriers to less experienced cyclists, as well as individuals considering taking up cycling. Cycling-focussed infrastructure and facilities should be provided to encourage cycling and improve safety. It is hoped that the perspectives of the cyclists surveyed for this project can contribute to creating a safer environment for cyclists in the ACT.

Keywords

Bicyclists, travel, exposure, crashes, road design

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Summary

Cycling is a popular activity and means of transportation that has immense benefits to both individuals (e.g., health) and society (e.g., environmental). The proportion of the population who cycle increased in all states and territories of Australia between 2001 and 2010, with the Australian Capital Territory (ACT) having the highest proportion of cyclists. The ACT is geographically suited to cycling, with Canberra being a planned city with a centralised and flat CBD. This suggests that, even though cycling participation is high in the ACT (an estimated 23.3% of ACT residents ride a bicycle in a typical week), it could be further improved. Safety issues such as less than optimal infrastructure, near-misses, collisions with vehicles, and severe injury outcomes, could be holding back further increases in cycling participation.

The purpose of this project is to *better understand the daily travel and safety experiences of cyclists who use the ACT road network*. To this end, an online survey was conducted with cyclists in the ACT about their *personal travel, crash experiences, injury outcomes, and perceived safety on the ACT road network*. Specifically, the cyclists were asked to identify any locations where they believe there are safety issues with the infrastructure, to identify locations where they have experienced near-misses and collisions (including injury information), for their opinions on how infrastructure can be improved, for their opinions on existing cycling-focussed infrastructure, and for their opinions regarding recent ACT safer cycling reforms and other law reforms.

The sample of participants who were recruited was large (321 individuals) and represented a broad cross-section of cyclists in terms of their age, their gender, and the geographical spread of their home residences across the ACT. They regularly rode (81% rode 2 to 3 days per week or more) resulting in high average distances (average of 82 kilometres per week) on a range of different bicycle types (e.g., road bike, mountain bike, etc.) and for a range of different reasons (i.e., commuting, recreation, sport/exercise). Almost two-thirds (60%) identified as confident riders. Overall, 80% of respondents thought that Canberra is a safe place to ride. They also reported a high level of performing common cycling safety behaviours. Eighty-six percent indicated that they wore clothing they thought made them more visible at least sometimes and 78% reported always using their lights at night or in hazardous weather conditions that cause reduced visibility. Eighty-four percent reported that they always complied with mandatory helmet laws. Thirty-four percent indicated that they never cross through intersections against a red-traffic signal, while 31% reported that they have on rare occasions, with 20% reporting that they do it sometimes, 8% often and 2% always.

Despite 80% of respondents viewing Canberra as a safe place to ride, there were safety issues that they reported encountering on the ACT road system. They did not feel comfortable riding in many common road situations in the ACT (particularly busy arterial roads or highways with multiple traffic lanes without adequate bike lane facilities), they reported a large number (272 locations) of infrastructure issues with the road network in the ACT that affect cyclists, just over half (53%) had been involved in a crash while cycling (58% of whom had been in at least one crash with a motor vehicle), and just over two-thirds (68%) had experienced a near miss. These safety issues are likely to be substantial cycling barriers to less experienced cyclists, as well as individuals considering taking up cycling. Cycling-focussed infrastructure and facilities should be provided to encourage cycling and improve safety. It is hoped that the perspectives of the cyclists surveyed for this project can contribute to creating a safer environment for cyclists in the ACT.

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1. Introduction

Cycling is a convenient form of transport that provides health and physical fitness benefits to the individual (Bauman, Rissel, Garrard, Ker, Speidel, & Fishman, 2008; De Hartog, Boogaard, Nijland, & Hoek, 2010; Götschi, Garrard, & Giles-Corti, 2016; Mueller, et al., 2018; Van Cauwenberg, de Geus, & Deforche, 2018), as well as financial benefits (Guariso & Malvestit, 2017; Logan et al., 2023). It also provides societal benefits such as reduced environmental, traffic and economic impacts (Guariso & Malvestit, 2017; Logan et al., 2023; Neeves & Brand, 2019).

1.1. Cycling participation in the Australian Capital Territory

In 2011, 17.8% of Australians (approximately 4 million individuals) had ridden a bike in the previous week, and 39.6% (approximately 8.3 million individuals) had ridden a bike in the previous year (Munro, 2011). Data reported by Johnson, Chong, Carroll, Katz, Oxley, and Charlton (2014) taken from the Australian Government (Department of Communications Information Technology and the Arts) annual report *Participation in Exercise, Recreation and Sport* showed that the proportion of the population who rode bikes for exercise, recreation and sport increased in all states and territories of Australia between 2001 and 2010. The Australian Capital Territory (ACT) had the highest proportion of cyclists compared to all other states and territories. The ACT is geographically suited to cycling, with Canberra being a planned city with a centralised and flat CBD, making cycling an attractive transport option. From the 2021 National Walking and Participation Survey in the ACT (Munro, 2021), it was estimated that 23.3% of ACT residents ride a bicycle in a typical week, compared to the national average of 18%. An estimated 33.9% of the population (aged over 15), on the other hand, could not ride or were not interested in riding. This indicates that cycling participation in the ACT could be higher.

1.2. Cycling safety

Johnson et al. (2014) undertook a naturalistic study of 36 cyclists in the ACT between 2011 and 2012. The cyclists wore helmets mounted with video cameras and GPS data loggers. The study also involved a survey and in-depth exit interviews. While no collision events were recorded, 91 potentially unsafe cyclist-interactions were identified. These data provided interesting insights into cycling safety. Most of the events (93%) were due to the actions of the driver of a motorised vehicle. The most common event types involved drivers turning left across the path of the cyclist (37%), drivers turning across the path of the cyclist from the adjacent direction (33%), and unexpectedly opened vehicles doors (18%).

In 2021, the Royal Automobile Association of South Australia (2021) undertook their *Risky Rides 2020* report and found that 21% of RAA members were also cyclists. The report documented the 10 riskiest roads and 5 riskiest off-road paths, as revealed by their sample of 471 cyclists. The risky roads included those with uneven and rough surfaces, those with discontinuous bikes lanes, and those with no bicycle lanes provided, as well as roads that were considered risky due to experiences with motor vehicles or trucks (e.g., proximity or speed). Interestingly, even after the minimum passing distance rule was implemented in SA, 91% of cyclists experienced a close pass or side-swipe crashes involving motor vehicles (also right-angle crashes). Thirty-nine percent of surveyed cyclists had been involved in a collision with a motor vehicle.

As cycling rates increase, an unfortunate consequence is an increase in the number of cyclist crashes, particularly those with no other vehicle involved, which result in serious injuries (Schepers & Heinen, 2013). Research in the ACT by de Rome, Boufous, Gregerson, Senserrick, Richardson, and Ivers (2012) found that crashes on shared paths were, on average, higher in severity than those on roads, while crashes occurring in bike lanes were the least severe compared to other cycling environments. However, crashes between cyclists and motor vehicles lead to the most serious injury outcomes for the cyclist (Boström & Nilsson, 2001; Chong, Poulos, Olivier, Watson, & Grzebieta, 2010; Haileyesus, Annest, & Dellinger, 2007), and most fatal cyclist crashes involve a motor vehicle (Schepers et al., 2015; Schepers, Stipdonk, Methorst, & Olivier, 2017). A cyclist has a 3.6 times higher risk of serious injury when they collide with a vehicle compared to cyclist crashes in which no vehicle is involved (Rivara, Thompson, & Thompson, 1997). One of the biggest barriers to the uptake of cycling, as a healthy and sustainable transport choice, is the perceived and actual risk of crashes (Beck, Perkins, Olivier, Chong, & Johnson, 2021; von Stülpnagel & Lucas, 2020). This is particularly the case given the unprotected nature of cycling and the consequent vulnerability to injury and increased risks that cyclists face. Comparisons of cyclist and vehicle occupant exposure and crash rates in France by Bouaoun, Haddack, and Amoros (2015) revealed that cyclists have about a 1.5 times higher risk of being killed than car occupants, both on the basis of time spent travelling and the number of trips. However, older research using data from the United States in 2001 by Pucher and Dijkstra (2003) found that cyclists were twelve times more likely than car occupants to be killed on a per distance driven basis (72 versus 6 fatalities per billion kilometres). The rates from the US were also compared to data from the Netherlands and Germany though, and it was found that, per kilometre and per trip cycled, American cyclists were twice as likely to get killed as German cyclists and over three times as likely as Dutch cyclists.

1.3. Summary and overview of the present project

In summary, cycling is a popular means of transportation and has immense health benefits. However, participation could be higher in the ACT, and safety issues such as less than optimal infrastructure, near-misses, collisions with vehicles, and severe injury outcomes, could be holding participation back. The day-to-day travel and safety experiences of cyclists are greatly influenced by the road environment and the cycling-focussed infrastructure provided for their use (Meuleners, Stevenson, Fraser, Oxley, Rose, & Johnson, 2019). For instance, a systematic review of literature by Salmon, Naughton, Hulme and McLean (2022) found that the most commonly identified contributory factors to cyclist crashes are related to the road environment and cycling infrastructure, as well as cyclist and driver behaviour. It is crucial that a safe cycling environment is provided for cycling participation to increase and to maximise the full benefits that can be achieved for individual cyclists and the community (Johnson, 2011; Pucher, Dill, & Handy, 2010). It is important to survey cyclists who use infrastructure frequently, so that in the absence of a Road Safety Audit on the cycling network in the ACT, an informal audit through every-day cyclists can highlight issues that can be addressed by the ACT Government.

The purpose of this project is to better understand the daily travel and safety experiences of cyclists who use the ACT road network. Cyclists in the ACT were surveyed regarding their personal travel, crash experiences, injury outcomes, and perceived safety on the ACT road network. Specifically, they were asked to identify any locations where they believe there are safety issues with the infrastructure, to identify locations where they have experienced near-misses and crashes (including injury information), for their opinions on how infrastructure can be improved, for their opinions on

existing cycling-focussed infrastructure, and for their opinions regarding recent ACT safer cycling reforms and other law reforms. Their perspectives on how cycling travel and safety in the ACT can be improved were also sought. It is intended that the perspectives of these cyclists, obtained through the survey, can contribute to creating a safer environment for cyclists in the ACT.

2. Method

2.1. Participants

Participants were recruited through advertisements (emails, fliers, social media, and blog posts) that were distributed amongst all ACT Government staff, Pedal Power ACT members and other interested stakeholder organisations in the ACT (including Canberra Cycling Club, Vikings Cycling, Conservation Council, Greens ACT, Micromobility Report, Amy Gillett Foundation, and Australian National University Cycling Club). To be eligible, participants had to be aged 18 years or older. They also had to regularly cycle (at least once a month) in the ACT and undertake a considerable proportion of their riding on roads and public paths. The intention of these eligibility criteria was that the participants would be adults and would have a high level of experience with using the ACT road system as cyclists. The survey was written in English, although interested participants who were not fluent in English were informed in the recruitment advertising that they could have a family member, friend, or translator present who could interpret the survey for them.

2.2. Materials

The survey on cyclist travel and crash experiences in the ACT consisted of 140 individual questions and was divided into 16 sections. A copy of the complete survey is provided in Appendix A. The development of this survey was based on similar surveys conducted by Johnson et al. (2014) and Raftery, Oxley, Thompson, and Wundersitz (2016), with many of the survey sections and individual items adapted from these other surveys. The Royal Automobile Association's *Risky Rides 2020* (2021) report also influenced the creation of the present survey.

2.2.1. Demographic questions, riding purpose and bicycle types ridden

The first section sought brief demographic information on the participants, including their home postcode, gender identity (male, female, non-binary, or gender not listed), age (e.g., 18 to 24, 25 to 34, etc.), and approximate income per annum (less than $18,200, $18,201 to $45,00, $45,001 to $120,000, or $120,001 or more). Details were also sought on how much riding the participants undertake (proportions) for various purposes (commuting, recreational, and sport/exercise), the type of bike that they most commonly ride (e.g., road, mountain, etc.), and their reasons for choosing this bike (open text field).

2.2.2. Cycling exposure/frequency

Participants were asked in this section to provide information on the amount of riding they undertake (i.e., exposure information) including how often they ride (e.g., once a week, 2 to 3 days per week, etc.), how many kilometres they ride per week (open text field), how many trips they ride per week (open text field), and how many years they have been cycling (e.g., 1 to 2, 3 to 5, etc

2.2.3. Route choices, motivations and rideability

The third section sought the participants' thoughts on a specific route that they ride including their motivations for taking the route (open text field), whether it is comfortable to cycle on (seven-point scale: very uncomfortable to very comfortable), whether it is cyclist friendly (yes, somewhat, or no), what is bad about it (or what are the key issues – open text field), and what is good about it (open text field).

2.2.4. Riding confidence and level of comfort based on scene presentation

The fourth section examined the riding confidence of the participants. It started by asking what their riding style is under normal traffic conditions (confident, cautious, interested, or not interested). These riding styles were based on, and adapted from, the Four Types of Cyclist defined and examined by Dill and McNeil (2013, 2016), Geller (2006), and Pearson, Reeder, Gabbe, and Beck (2023).

Next, a series of 17 screenshot images taken from Google Street View of roads and bike lanes in the ACT were shown and the participants were required to rate their level of comfort if they were cycling at the locations shown (seven-point scale: very uncomfortable to very comfortable). The ratings of perceived comfort riding a bike in various scenarios was based on, and adapted from, research by Dill and McNeill (2013), Fitch, Carlen, and Handy (2022), O'Hern, Stephens, Young, and Koppel (2019) and Pearson et al. (2023), with the same seven-point comfort scale as the present study used in Fitch et al. (2022).

2.2.5. Hypothetical scenarios/interactions with police

In this section participants were presented with four hypothetical scenarios/interactions with police and were asked to rate how much anger they would feel (five-point scale: none at all to very much) in those scenarios (e.g., you are fined for cycling without lights).

2.2.6. Hypothetical scenarios/interactions with motor vehicles

Similarly, four hypothetical scenarios/interactions with motor vehicles (e.g., a motor vehicle forces you off your path) were presented and participants were asked to rate how much anger they would feel in those scenarios.

2.2.7. Hypothetical scenarios/interactions with cyclists and pedestrians

Three scenarios relating to interactions with other cyclists (e.g., a cyclist overtakes you on a narrow lane) and two related to pedestrians (e.g., a pedestrian blocks the bicycle lane), were presented and participants were asked to rate how much anger they would feel in those scenarios.

Each of these scenarios were used to determine an overall Cycling Anger Scale (CAS) that has been developed and utilised in other studies (Marín Puchades, 2017; Oehl, Emmermann, Brandenburg, & Huemer, 2016; Oehl, Brandenburg, & Huemer, 2019; O'Hern et al., 2019; Stephens, O'Hern, & Koppel, 2020; Stephens, O'Hern, Young, Chambers, Hassed, & Koppel, 2020) to investigate cyclists' tendencies to become angry interacting with their cycling environment, in particular their interactions with other road users. Research has demonstrated that the 12-item CAS has acceptable reliability with a total scale Cronbach's alpha of 0.66 (and subscale Cronbach's alphas of: police interaction = 0.86, cyclist interaction = 0.68, car interaction = 0.67, pedestrian interaction = 0.84) (Oehl et al., 2016) and good internal consistency on an Australian sample with a total scale Cronbach's alpha of 0.82 (and subscale Cronbach's alphas of: police interaction = 0.74, cyclist interaction = 0.79, car interaction = 0.84, pedestrian interaction = 0.89) (Stephens, O'Hern, Young et al., 2020). The same 12-item CAS as used in Oehl et al. (2016), O'Hern et al. (2019), Stephens, O'Hern, and Koppel (2020) and Stephens, O'Hern, Young et al. (2020) was used for the present research, although an additional item was added to the police interaction section (you are fined for cycling without a properly fitted helmet).

2.2.8. Clothing, visibility and helmet use

In this section participants were asked to respond to a series of questions about the clothing they wear and their visibility while riding. Specifically, they were asked how often they wear clothing that they believe makes them more visible and how often they wear a correctly fastened helmet while riding (never, sometimes, or always for both). If they answered never or sometimes for the latter question, they were asked to provide details why. They were asked how often they use bicycle lights while riding at night, or in hazardous weather conditions that cause reduced visibility, as well as how often they use them during the day (never, sometimes, or always for both).

2.2.9. Safety habits/road rules compliance

This section asked about their general safety habits, including whether they ever cross through an intersection against a red traffic signal (and if they do, why?), whether they ever turn left through a red traffic signal, and whether they use hand signals to indicate their intention to turn left and right (and if they do not, why?). These questions were based on, and adapted from, survey items that related to red light obedience and use of hand signals in Johnson et al. (2014). A five-point scale (never to always) was used for these three questions. The participants were also asked whether they had ever been given an infringement or caution by police while riding, and, if yes, to provide detail about what it was for.

2.2.10. Crash/conflict cycling experiences

The tenth section sought details about any crashes or conflicts the participants had experienced while riding. Many of the questions in this section were adapted from survey items in Johnson et al. (2014) and Raftery et al. (2016).

Firstly, they were asked if they had ever been involved in a crash while cycling. If they had, they were then asked how many crashes they had ever been involved in because of a motor vehicle (never, one, two, or three or more). They were also asked how many crashes they had been involved in on a road, shared path, or bike path in which no motor vehicle was involved (e.g., they were travelling too fast and lost control of their bike - never, one, two, or three or more). Next, they were required to describe what happened in their most recent significant crash (open text field); what they believe was the reason for the crash, or what caused it (open text field); how long ago it occurred (open text field); whether it happened on their regular cycling route; and whether they reported it to police. There was a space where they could provide the address or GPS coordinates of the location of the crash.

Following this, they were asked what the environmental/lighting conditions were at the time (daytime sunny, night time, dusk/dawn, raining daytime, raining night time, raining dusk/dawn), whether they had lights switched on (yes – front only, yes – rear only, yes – front and rear, or no), what clothing they were wearing (open text field), and if there were any issues with the surface they were riding on (open text field).

Crash injuries

Cyclists were asked to document any injury that they received from their most significant recent crash (no injury, treatment by self or bystander, treatment by private doctor, treatment by ambulance at crash scene, treated at hospital – self-presented, treated at hospital – ambulance presented, admitted to hospital – self-presented, or admitted to hospital – ambulance presented). There were open text fields to report the areas of their body that were injured (e.g., arm, head) along with the type of injury for each injured body region (e.g., laceration, broken bone); what caused the injuries

(e.g., hitting the ground); and any long-term effects of the injuries (including mental health) or whether they had made a full recovery. After this, they were asked whether they had ever had a crash in which they hit their head, and, if they had, whether they were wearing a helmet and whether they believe the helmet protected them from a more severe head injury.

Specific crash type experiences and perceived causation

Next, the participants were required to indicate whether they had ever been involved in several specific types of crashes while cycling, including in which a vehicle turned left in front of them; turned right in front of them; someone was getting in or out of their car as the participant was riding past; or problems with the roads, bicycle lanes, or infrastructure in the ACT directly caused the crash (e.g., they came off their bike due to a pothole in the bike lane). If they had been involved in a crash that was the direct result of problems with the roads, bicycle lanes, or infrastructure in the ACT, they were required to provide details (what occurred, what was the problem, and has it been fixed since). They were also asked to provide the address or GPS coordinates of the location.

2.2.11. Cycling experiences and conditions

They were then asked if they had ever been involved in a near miss (event with the potential to result in either a crash or injury but did not). If they had, they were presented with a series of fourteen specific types of near misses (e.g., vehicle passing with less than a metre of space, cut off by a vehicle turning left or right, run off the road by a vehicle, etc.) to find out if they had experienced them (never, once, two to three times, more than three times, regularly, or constantly). The items in this section were adapted from survey items that related to near misses in Raftery et al., (2016). They were also asked what the outcome of their most significant recent near miss was (open text field), whether it occurred on their regular cycling route, what the address or GPS coordinates of the location are, what the environmental/lighting conditions at the time were (daytime sunny, night time, dusk/dawn, raining daytime, raining night time, raining dusk/dawn), whether they were using lights that were switched on at the time (yes – front only, yes – rear only, yes – front and rear, or no), what clothing they were wearing at the time (open text field – e.g., normal, sports, high-vis, colour, etc), and whether there were any issues with the pavement surface they were riding on (open text field – e.g., debris, poor surface, potholes, etc.).

2.2.12. On-road cycling experiences or infrastructure issues

This section allowed participants to answer specific questions about their cycling experiences on the road, firstly, whether they had ever reported a driver to the police. If they had, they were required to provide details about the behaviour they reported and what the outcome was (open text field). They were then required to highlight any specific issues on the ACT road system that affect cycling safety, provide the address or GPS coordinates of the location(s) and describe the nature of the issue(s) (open text fields). They were asked to share any video footage of their most recent significant crash or near miss by uploading it through a web link to a University of Adelaide Box account and to describe the video in an open text field. They were also given the opportunity to upload photos of any problematic roads, lanes, or infrastructure in the ACT, along with the address(es) or GPS location(s) and a description of the issues. They were asked if they ever had any incidents with heavy vehicles (trucks or buses) while cycling (yes – crash, yes – near miss, or no) and, if they had, to explain the circumstances (open text field).

2.2.13. Interactions with other road users

The thirteenth section sought information on the participants' interactions with other road users. Specifically, they were asked if they have ever been bullied or intimidated by another road user while

cycling. If they had, they were asked to provide the circumstances of the most recent incident (open text field). Following this, they were asked if they had ever (never, rarely, sometimes, often, or always) experienced nine specific types of bullying or intimidation (e.g., verbal road rage, someone deliberately driving close, physical assault road rage, etc.). They were required to rank (from most to least common) the road users (drivers, motorcyclists, pedestrians, other bicyclists) that the aggression they have experienced comes from. They were also asked to provide details of other forms of road rage they have ever experienced (open text field).

2.2.14. Perceived safety in the ACT

The next section asked the participants whether they think Canberra is a safe city in which to ride a bike and to provide information about why (open text field).

2.2.15. Perceived outcomes of ACT safer cycling reforms

The following section listed three recent safer cycling reforms in the ACT (e.g., allowing cyclists to ride across pedestrian crossings without dismounting) and asked the participants to indicate whether the reforms make cycling safer in the ACT. They were also asked to provide their thoughts or ideas on other possible interventions that would improve cycling safety in the ACT.

2.2.16. Cycling while affected by alcohol, drugs or distractions

The final section contained several general questions. They were asked if they had ever ridden their bike while under the influence of alcohol or drugs or if they had ever ridden while distracted, for example while using a mobile phone.

2.2.17. Vehicle ownership/usage frequency

Finally, participants were asked if they own a motor vehicle and if they regularly drive a motor vehicle (yes – 1 to 2 days a week, yes – 3 to 5 days a week, yes – 6 to 7 days a week, or no).

2.3. Procedure and statistical analyses

The survey was available for participants to complete online through the Survey Monkey website (https://www.surveymonkey.net) for a period of three months (4th of August to 16th of October 2023). A weblink and a quick response (QR) code were provided in the distributed advertisements for participants to use to access the survey. Participants were provided with an online survey preamble/information sheet when they started the survey through Survey Monkey (provided in appendix B). Ethics approval for this research was granted by the Human Research Ethics Committee at the University of Adelaide (approval number H-2023-127). The online survey preamble informed the participants that they could withdraw from the study at any stage (within a month from when they completed the survey) and that their data would remain confidential. The online survey preamble also informed the participants that the completion and submission of survey responses was taken as an indication that they had read the information in the online survey preamble and consented to participate. The survey took approximately 30 to 40 minutes to complete. Following completion of the survey, participants and their data were only identified through their email address (provided for the purposes of entry into a prize draw, being sent a copy of the research results, and retrieving their data and deleting it if they wished to withdraw from the study following completion of the survey) and an assigned chronological number. The data were downloaded from Survey Monkey and then deleted from the website. In gratitude for their time, participants were entered into a draw

for one of four $100 Coles Myer gift vouchers. The survey data were analysed using frequency counts, percentages, ratios, and measures of central tendency (averages and medians).

3. Results

3.1. Survey responses

A total of 420 people clicked on the survey link, read the participation information sheet, and commenced the survey. This total included several participants who did not answer any cycling related questions, as well as a number who attempted the survey more than once from different internet provider (IP) addresses. The data were filtered so that participants who did not answer any bicycle related questions and those with duplicate e-mail addresses were removed from the sample. This resulted in 321 valid survey participants. Only results pertaining to cyclist crash and travel experiences in the ACT were analysed and are presented in the following section.

3.1.1. Demographics

Gender

A majority (61%) of the survey participants identified as being male, while 37% identified as being female, and 2% identified as non-binary or chose not to disclose their gender. This distribution is consistent with Munro (2021) where 59.5% of cyclists were male and 40.5% were female.

Age

The highest proportion of cyclists was in the 35 to 44-year age group (29%) followed by the 25 to 34-year-old age group (24%) and the 45 to 54-year-old age group (22%). Age distribution by gender is shown in Figure 3.1.

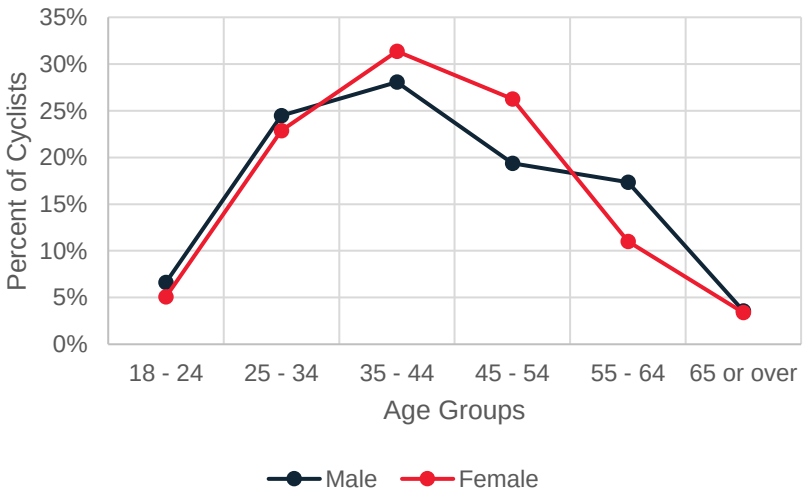

Figure 3.1
Age distribution by gender.

Geographical distribution

The distribution of cyclists by residential locality, for the 80% of survey participants who provided their postcode, is shown in Figure 3.2. Just over half of the cyclists in the survey resided in the north of the ACT (53.3%), 31.4% in the south and 10.1% in the west of Canberra.

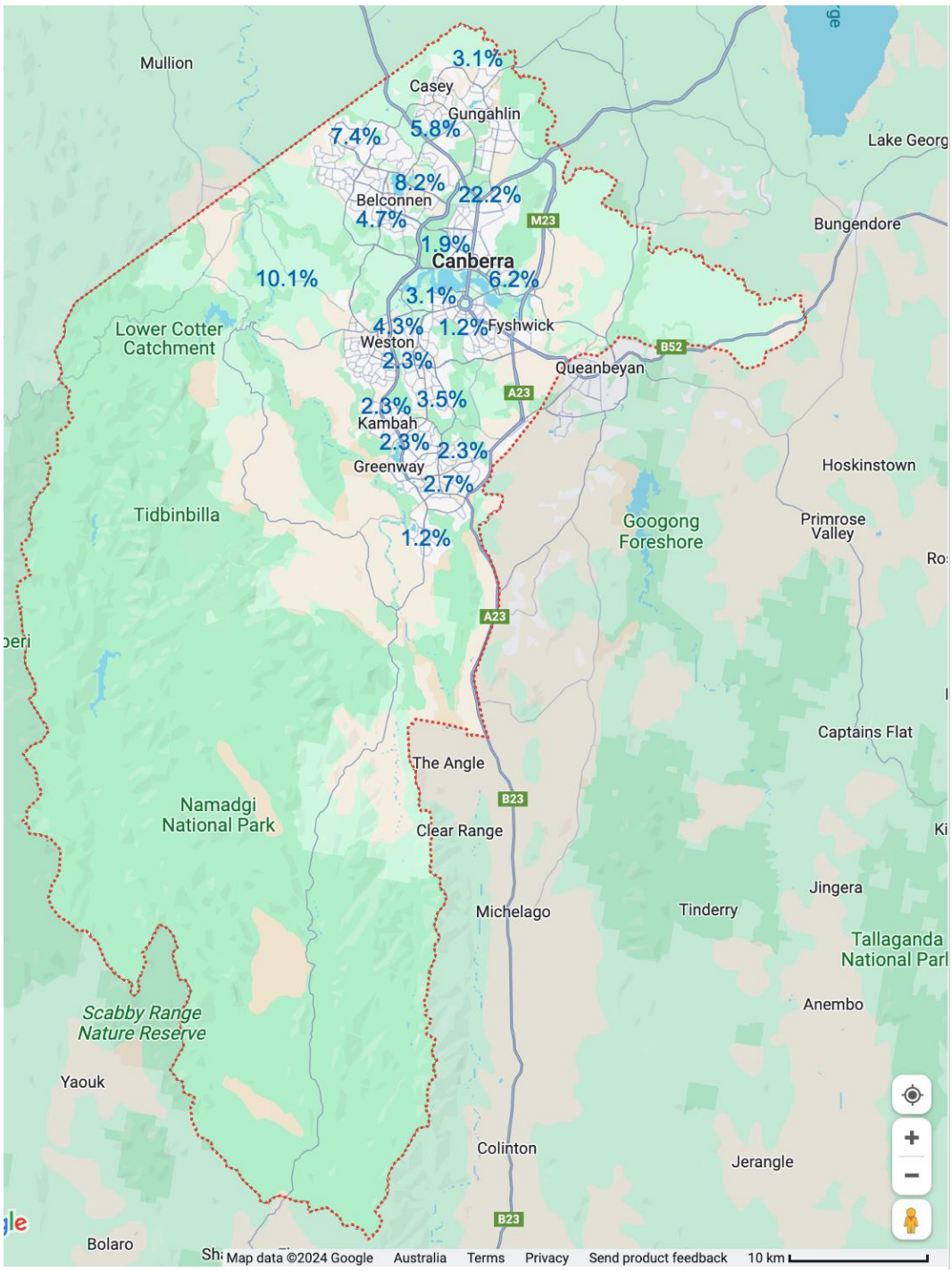

Figure 3.2
Geographical distribution of survey participants by postcode

3.1.2. General cycling and exposure responses

Several questions were asked of the participants to determine their main motivations for cycling, what bicycle that they ride and their confidence riding in traffic.

Motivations for cycling

Respondents were asked to allocate a proportion of their cycling to each of the categories of commuting, recreation, or sport/exercise. Of the 321 cyclist respondents, fewer than 5% used their bicycle for a single purpose and most cyclists had different proportions of trip purposes. On average, 50% of cycling was undertaken for commuting, 24% for recreation and 38% for sport/exercise.

Bicycle types

A majority (77%) of the cyclist sample reported riding one single bike type, with the most popular being road bikes, comprising 30% of the cyclist sample, followed by commuter/hybrid bikes (17%), mountain bikes (10%) electric/pedal assist bikes (11%), comfort/step through bikes (3%), gravel bikes (2%), fixie/single speed bike (2%) cargo bikes (1%) and touring bikes (1%). The remainder of the sample reported riding two or more different bicycle combinations with the most common bicycles in that sample being road bikes (22%), mountain bikes (16%), commuter/hybrid (15%), Electric/pedal assist (12%), fixie/single speed (8%), cargo bike (7%), comfort/step through (6%) and gravel bikes (5%).

There were a range of reasons as to why cyclists in the sample rode specific bicycle types. Road bikes were frequently chosen for being lightweight, having thinner tires, lower rolling resistance, speed, and suitability for road riding, training, and longer commutes. Users of these bicycle types also did so for exercise, fitness, socialising with riding groups and participating in road cycling challenges, as well as the health benefits of these respective activities.

Some cyclists preferred bikes that were versatile and that could be used on various terrains. Mountain bikes were chosen for their durability and robustness making them ideal for all riding terrains and in all environmental conditions. Similarly, gravel bikes were also favoured for being able to be used both on-road and off-road paths.

A persistent theme from respondents was that bike choice was also based on suitability for commuting (e.g., easiest to get to university, fastest to get to work), functional design (e.g., can commute long distances in comfort), practicality (e.g., can put panniers on it and carry loads, such as groceries) and serving multiple purposes such as transporting kids and commuting. E-bikes were particularly popular for commuting because they provided power assistance, which reduced rider effort over longer distances, and have a low effect on the environment (compared to cars).

The cyclists also preferred certain types of bikes due to their appearance (aesthetics), enjoyment of riding (e.g., enjoying road cycling challenges), and value (cheap/gift/cost effective). Other specific bike features were noted as being preferred, including aerodynamics (e.g., road bikes with drop handlebars), recumbent bikes for comfort and modified bikes for urban riding or family needs (e.g., transporting children).

Riding frequency and exposure

The distribution of cycling frequency in the sample is shown in Figure 3.3. A majority (81%) of cyclists rode at least 2 to 3 times a week, 49% of cyclists riding 4 to 5 days a week and 16% of cyclists riding almost every day.

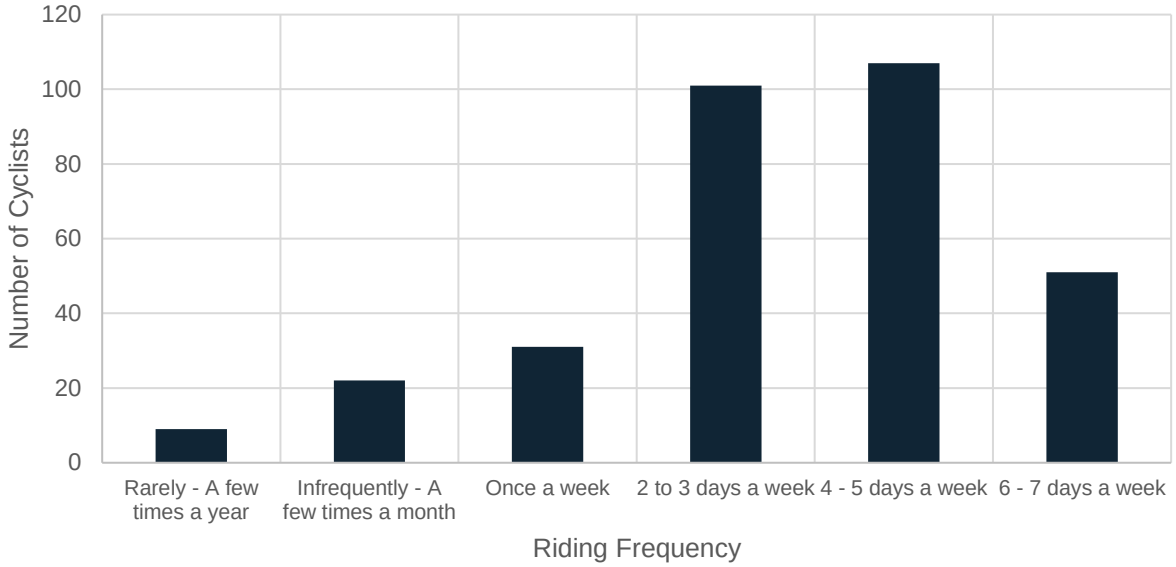

Figure 3.3
Distribution of cycling frequency.

There were 278 cyclists (86% of sample) who gave their approximate weekly travel distance, and the sum of this weekly travel distance was almost 23,000 km. On average, each cyclist rode 82 kilometres per week with individual weekly distances ranging from 1 to 500 kms per week.

A majority (59%) of cyclists had more than 10 years of experience riding, 28% had 3 to 10 years of experience and 13% had been riding for less than 2 years, as shown in Motivations for choice of regular routes

Many cyclists chose off-road paths as their preferred cycling route as they provided a safe separated space and minimized on-road cycling, which allows for avoidance of interaction and potential conflict with traffic. This provided a safer cycling experience and reduced the anxiety of interacting with motorised traffic. Their travel on off-road paths was also viewed as free flowing, as there are no traffic signals. Additionally, cyclists with a preference for paths enjoyed the quiet, natural, and aesthetically pleasing scenery and green space provided by these routes, which subsequently reduced stress and provided a more enjoyable experience. However, there were safety concerns, such as increased anxiety relating to safe navigation on paths when they intersected with roads.

It was acknowledged by the cyclists that prioritising safety and the use of paths resulted in longer routes and increased travel times, although a few felt that their selected routes were efficient for them and were the most direct routes to their destinations. There were some concerns regarding off-road paths, however, relating to maintenance and quality, and riders indicated that ongoing improvements to paths were required.

For those cyclists who preferred on-road routes, the primary reason was their preference for the most direct, fastest, most efficient, and most convenient route for their daily commuting activity. Roads were also cited as being smoother as well as providing a mix of terrain including steep roads and flat roads through different scenic and pleasant routes. Cyclists also enjoyed the varied cycling experience, social riding, and the exercise from on-road cycling.

Safety was also a key motivation for many cyclists who expressed a preference for on-road cycling lanes, dedicated cycle ways and segregated bike lanes, as they minimise interactions with motorised traffic. However, they also expressed concerns relating to heavy traffic during peak hour, night cycling and roads with poor infrastructure, particularly with incomplete bicycle lanes or lanes that suddenly ended. Other factors that contributed to a poor riding experience were the lack of awareness and respect from drivers.

On-road cyclists generally acknowledged that off-road paths were a safer option, but they felt the complexity of navigation on these paths, the longer routes and their time constraints resulted in selection of shorter and quicker on-road routes at the expense of safety.

For cyclists who chose a combination of off-road and on-road routes, selection was made for a variety of reasons including speed, safety, and efficiency of using a combination. Cyclists chose paths to avoid intersections, high speed roads, traffic lights and peak hour interactions with motor vehicles. Some cyclists chose roads based on the times of day when traffic conditions were light but reverted to paths when traffic conditions were heavy. Similarly, when off-road paths were busy with pedestrians, they preferred roads. These cyclists were critical of infrastructure on off-road paths, due to bumpy terrain from tree roots, poor surface quality, seasonal issues (including magpie nesting seasons), and poor lighting. They were also critical of incomplete on-road bike paths and those that suddenly terminated at various locations.

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Table 3.1.
Rider experience

Riding Experience	Count	Percentage
Less than 1 year	11	3%
1 - 2 years	31	10%
3 - 5 years	58	18%
6 - 10 years	31	10%
Greater than 10 years	188	59%
Prefer not to answer/No Answer	2	0.1%
Total	321	100%

Choice of cycling routes

Most cyclists (74%) indicated they had preferred routes when they rode their bicycle and a majority (89%) of those cyclists considered their chosen routes to be cyclist friendly (38%) or somewhat friendly (51%). However, when asked to rate the comfort and ease of these routes only 53% indicated that their routes had some level of positive cycling comfort and ease. The distribution of cycling comfort and ease is shown in Table 3.2.

Table 3.2
Level of comfort and ease for cyclists on their routes of choice

Comfort and ease	Count	Percentage
Very uncomfortable	18	8%
Moderately uncomfortable	33	14%
Slightly uncomfortable	38	16%
Neither comfortable nor uncomfortable	23	10%
Slightly comfortable	17	7%
Moderately comfortable	69	29%
Very comfortable	37	15%
Prefer not to answer	4	2%
Grand Total	239	100%

Just over 60% of cyclists gave details of their preferred cycling routes. Based on the information provided, there was a reasonably similar distribution of cyclists preferencing exclusively off-road bike paths (33%), exclusively on-road use only (34%) and routes that combined off-road bike paths and on-road routes (32%) as shown in Figure 3.5.

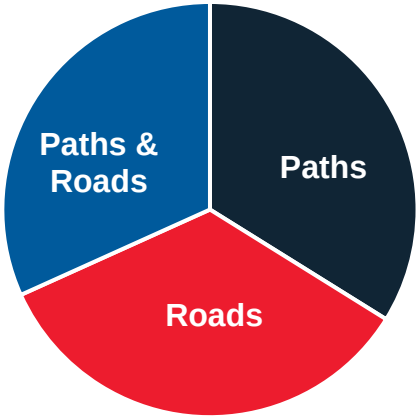

Figure 3.4.
Distribution of cyclist's preferences for different routes.

Motivations for choice of regular routes

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road paths, however, relating to maintenance and quality, and riders indicated that ongoing improvements to paths were required.

For those cyclists who preferred on-road routes, the primary reason was their preference for the most direct, fastest, most efficient, and most convenient route for their daily commuting activity. Roads were also cited as being smoother as well as providing a mix of terrain including steep roads and flat roads through different scenic and pleasant routes. Cyclists also enjoyed the varied cycling experience, social riding, and the exercise from on-road cycling.

Safety was also a key motivation for many cyclists who expressed a preference for on-road cycling lanes, dedicated cycle ways and segregated bike lanes, as they minimise interactions with motorised traffic. However, they also expressed concerns relating to heavy traffic during peak hour, night cycling and roads with poor infrastructure, particularly with incomplete bicycle lanes or lanes that suddenly ended. Other factors that contributed to a poor riding experience were the lack of awareness and respect from drivers.

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Positive responses relating to cyclists' regular routes

When asked to highlight the positive aspects of their selected routes, and as discussed previously, cyclists appreciated routes that provide safety, efficiency, scenic beauty, and directness. Efficiency for their commute was a common positive aspect, with cyclists often selecting the most direct routes, which allowed for faster commuting, convenience, and time savings and they appreciated routes that were not complex or had unnecessary diversions. The aspects that were thought to contribute to efficiency included the presence of bike paths and dedicated bicycle lanes, limited traffic lights, and wide, well-maintained lanes. Green corridors with a natural scenic environment, riding paths along lakes, rivers and through park lands and bushland was seen as enhancing the routes some cyclists prefer.

The cyclists particularly valued well-designed and well-maintained off-road bike paths, on-road bike lanes and other dedicated bicycle infrastructure. Good separation from road traffic and wide lanes that assisted to minimise interactions and conflict with road traffic was appreciated for improving overall safety. Smooth, good quality road and path surfaces assisted with the comfort of the cycling experience.

Negative response relating to cyclists' regular routes

The cyclists had a range of negative views related to their regular routes, such as when the routes were not consistently separated from vehicle traffic, they had to share road space with unfriendly drivers and they had to share path space with distracted pedestrians and off-leash dogs. Other negative views on their regular routes included where there was an absence of bike lanes, cars parked in bike lanes, bike lanes suddenly ending, the bike lane being too narrow and where cars failed to give way to cyclists at intersections resulting in potential conflicts. Gravel and debris, unevenness, tree roots and water pooling on footpaths, bike paths and bike lanes were common negative aspects of various routes, as were difficulties in crossing busy roads, particularly where off-road paths intersect these roads.

The inconsistency of bike lanes and the absence of continuous cycle paths in various areas forced cyclists onto the road, where they encounter heavy traffic, narrow lanes, and inadequate road conditions. Issues like tree roots damaging pavements, potholes, and lack of proper drainage further contribute to the discomfort and potential hazards. They also noted problems with the fear of crashes at intersections, particularly when cars make left turns across cycle paths.

3.1.3. Riding style

Respondents were asked to nominate their riding style, under normal traffic conditions. Most riders self-reported that they were confident riders (60%), while cautious riders accounted for 33% of the sample and interested riders accounted for 6%.

3.1.4. Level of comfort with various ACT roads

A total of 17 road scenes from around the ACT were presented to the cyclists (see Table 3.4 Median comfort score and percentage of any positive comfort for all cyclists, confident cyclists and cautious cyclists for each scene presented to the participants.) in a non-specific order and they were asked to report their level of comfort if they were cycling on that particular road or path. The 17 scenes depicted various common scenarios faced by cyclists in the ACT as well as a few unique road scenarios. The scoring for comfort was on a 7-point Likert scale as shown in Table 3.3.

Table 3.3
Various levels of comfort and corresponding numerical score

Level of Comfort	Score
Very uncomfortable	-3
Moderately uncomfortable	-2
Slightly uncomfortable	-1
Neither comfortable nor uncomfortable	0
Slightly comfortable	1
Moderately comfortable	2
Very comfortable	3

Table 3.4 displays the summarised results of the cyclists' comfort ratings for each of the cycling scenarios presented to the study participants. The results shown are the median values for level of comfort for each scenario and the percentage of participants who indicated any level of positive comfort (% positive; slightly, moderately or very comfortable) for all cyclists, confident cyclists and

cautious cyclists respectively. The results are also shown in a heatmap style with the legend shown in Figure 3.5.

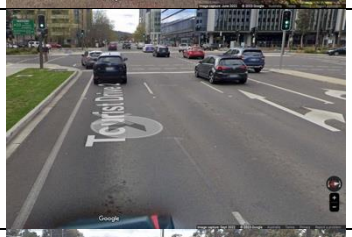
Overall, cyclist comfort on these road scenes from around the ACT was low, with a majority of the sample (more than 50%) reporting some level of discomfort for 15 of the 17 scenes. Unsurprisingly, Scene 6 (depicting a bike path completely separated from the road) was overwhelmingly rated the most comfortable, with the highest median comfort level score (3) and with over 80% of all cyclist groups reporting it comfortable with some level of positivity. Scene 12 (depicting quiet side road) was the second highest rated cycling scenario, with 57% of all cyclists reporting a positive level of comfort and a median comfort level score of (1). However, while 65% of confident cyclists reported a positive level of comfort for this road environment, only 42% of cautious cyclists reported a positive level of comfort for the same environment and their median rating for the scene was (0), neither comfortable or uncomfortable.

It is interesting to note that there was generally a slight disparity between the level of comfort confident cyclists reported compared to cautious cyclists for the same scenario. In most scenarios, confident cyclists were 8% to 77% more likely to consider a scene more positive in terms of comfort compared to cautious cyclists. Those with large differences between the ratings of the confident and cautious groups of cyclists included scene 4 (local road with parked vehicles and no bike lanes), scene 15 (multiple lane arterial road with a bike lane) and scene 16 (multiple lane arterial road with a bike lane). Curiously, there were three scenarios where there were more cautious cyclists who considered the scenarios to be more positive in comfort compared to confident cyclists. Although these differences were only slight they were related to scene 6 (depicting a bike path completely separated from the road), scene 8 (multiple lane arterial road with no bike lane) and scene 9 (multiple lane arterial road with a bike lane that suddenly ends).

Table 3.4
Median comfort score and percentage of any positive comfort for all cyclists, confident cyclists and cautious cyclists for each scene presented to the participants.

	Scene Image	All		Confident		Cautious	
N		Median	% Positive	Median	% Positive	Median	% Positive
1		-2	25%	-2	26%	-2	20%
2		-1	33%	-1	40%	-2	22%
3		-1	33%	-1	38%	-1	24%

4		-2	39%	0	46%	-2	26%
5		0	47%	1	54%	-1	36%
6		3	87%	3	86%	3	90%
7		0	45%	0	50%	-1	38%
8		-2	17%	-2	16%	-2	17%
9		-2	19%	-2	18%	-3	19%
10		-1	34%	-1	35%	-1.5	32%
11		-1	40%	0	47%	-1	30%

12		1	57%	1	65%	0	42%
13		-1	32%	-1	38%	-2	23%
14		-1	37%	-1	42%	-1	30%
15		-1	39%	0	49%	-2	26%
16		0	43%	1	53%	-1	30%
17		-2	18%	-2	18%	-3	18%

Uncomfortable			Neutral	Comfortable		
Very	Mod	Slighty		Slighty	Mod	Very
-3	-2	-1	0	1	2	3

Any Level of Positive Comfort (Slightly/Moderately/Very)

0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

Figure 3.5
Legend corresponding to heat map for median comfort levels and percentage of cyclists who reported any level of positive comfort.

3.1.5. Safe cycling behaviours

Visibility

Cyclists were asked about their behaviours regarding visibility levels while riding. Most cyclists indicated that they wore clothing they thought made them more visible either sometimes (46%) or always (40%). Seventy-eight percent reported always using their lights at night or in hazardous weather conditions that causes reduced visibility, while 15% reported sometimes using them. During daylight hours only 26% of cyclists always activated their lights, 41% sometimes used them, while a third never used their lights during the day.

Compliance with mandatory helmet laws (MHL)

While most cyclists (84%) self-reported always complying with MHLs, 11% reported only sometimes complying while 4% indicated they never complied with the MHLs. The reasons for non-compliance included being too troublesome, inconvenient, and uncomfortable or having the belief it was unnecessary or not a safety risk for short trips or trips at low speed and on paths segregated from cars. Others indicated they had preference for hats or beanies or were concerned with their hair. Quite a few cyclists were uncertain as to why they didn't wear helmets and one cyclist cited examples from Copenhagen and Amsterdam suggesting that it is safe enough where speeds are slow and there is a positive feedback loop of more people cycling when helmets are not required. A few cyclists had objections to MHL and believed that helmet use should be optional, particularly when riding on bike paths, and hence cited this as why they did not comply.

Compliance with red traffic signals

Just over a third (34%) of cyclists indicated that they never cross through intersections with red-traffic signals, while 31% reported that they have on rare occasions. However, just under a third of cyclists reported that they sometimes (20%), often (8%) or always (2%) crossed through a red-traffic signal. Interestingly, in terms of turning left at a red-signal, more cyclists either never (42%) or rarely (27%) turned left through a red-traffic signal, while 30% reported that they sometimes (20%), often (8%) or always (2%) turned left through a red-traffic signal.

Several common reasons were given by cyclists for going through red lights. The most frequent reason given was familiarity with the various intersections, an understanding of the traffic signal sequences and lack of vehicular traffic (particularly in the early morning periods) and, for these reasons, they perceived less risk to their safety. Another significant motivating factor was the issue of traffic lights not adequately accommodating cyclists' needs, including delayed signal changes, inadequate allocation of time for crossing, and failure of traffic light sensors to detect bikes (particularly for lightweight bikes), which results in long wait times. While some cyclists emphasised safety concerns and adherence to traffic rules, a recurring theme was the frustration with traffic light systems designed primarily for motorised vehicles, which prompted cyclists to make their own judgments for efficient and safe riding through red signals.

3.1.6. Issues with ACT Infrastructure

Survey respondents were asked to provide locations (GPS coordinates or street addresses) where they believed there were issues with the ACT infrastructure, as well as details about what these issues were. In total, 276 locations were reported (and subsequently mapped) with an additional 125 comments and descriptive locations of infrastructure that they perceived as problematic. A

geographical map of the ACT showing locations where cyclists highlighted infrastructural issues is presented in Figure 3.6. Each infrastructure issue was allocated a Location number (with google maps hyperlink) that links to a description of the infrastructure issues and the GPS coordinates provided in Appendix C.

The hyperlinks attached to the Location number in Appendix C generally presents a Google streetview of the issue documented by cyclists. In situations where there was reference by a cyclist to an off-road bike path, and this was not visible from the Google streetview, a link to the Google aerial map view (with Google's bicycle infrastructure layers turned on) was used.

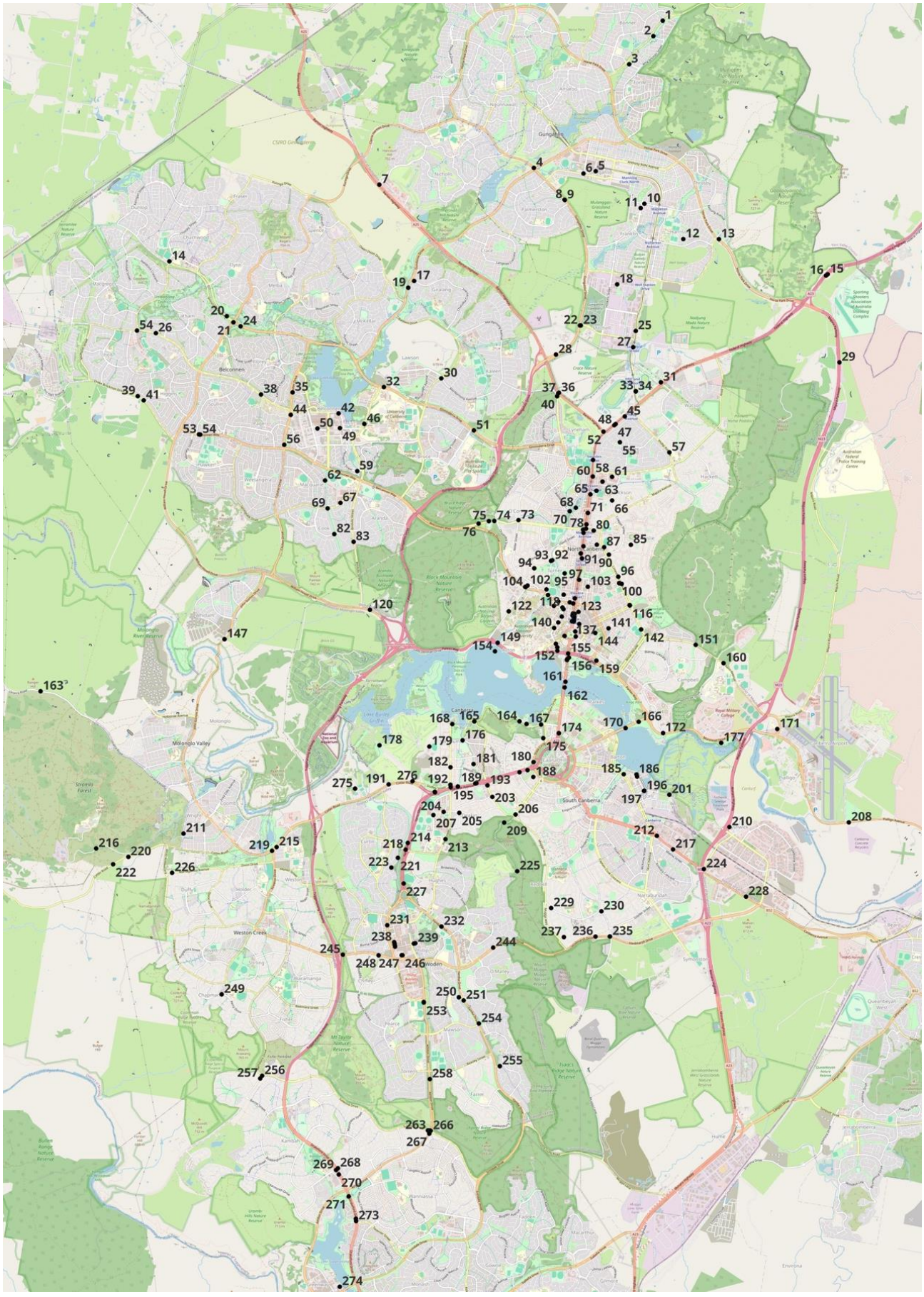


Figure 3.6
A geographical map of the ACT showing locations where cyclists highlighted infrastructure issues.

There were several recurring infrastructure issues that cyclist reported as problematic, and several cyclists referred to the same general location for various reasons. Recurring issues related to maintenance issues. Roads with disappearing bike lanes or lacking bike lanes was a frequent concern for cyclists, particular in instances where they believed that there was adequate space for a bike lane, evidenced by a wide verge or large central median (e.g., Locations 39, 53 and 54). Some cyclists indicated that on-road bicycle lanes offered no real protection and there were several locations where there were concerns of frequent vehicle conflicts with bike lanes, particularly where they were located near parking areas. Various sections of the on-road bike lane on Northbourne Ave were frequently referred to as being too narrow and running parallel to three-lanes of busy traffic, or problematic when near parking and drop off areas, or when cars turned left across the bike lane.

Even where specific segregated bike lanes were provided for cyclists, respondents highlighted safety issues. A notable example was the segregated path on Northbourne Avenue, at the intersection with London Circuit (Locations 132,134,136 and 202) shown Figure 3.7(a). Cyclists reported that they felt vehicle drivers were not aware of the raised segregated path, and conflicts often arose with left turning vehicles and cyclists exiting the segregated path. Some also felt that the bike path was often obstructed by pedestrians and advertisements.

Figure 3.7
(a) Segregated path on Northbourne Avenue at the intersection with London Circuit
(b) Segregated bike path on Corinna Street

Some cyclists also felt that the segregated bike path on Corinna Street shown in Figure 3.7(b), had safety issues particularly relating to sections of raised concrete that divided the bike path from traffic lanes actually being a hazard and vehicles parking in the bike lanes (locations 240, 242 and 243). The segregated Belconnen bike way was also considered problematic at Emu Bank (Figure 3.8a) with multiple vehicle crossing points over the bike way in a short length (to access fast food restaurants – locations 42 and 43) that led to conflicts with bikeway users. Some cyclists felt that shared zones were not respected by motorists, and one cyclist provided a photo indicating one location with persistent issues [Figure 3.8(b)], while another cyclist felt that a shared zone in the city (location 123) was not safe for cyclists or pedestrians. The cyclist stated that *"Shared zone does not work for cycling into the city. Bike infrastructure ends. Cars constantly speed. Bunda street is not safe for pedestrians or cyclists. Passenger car volume is still too high."*

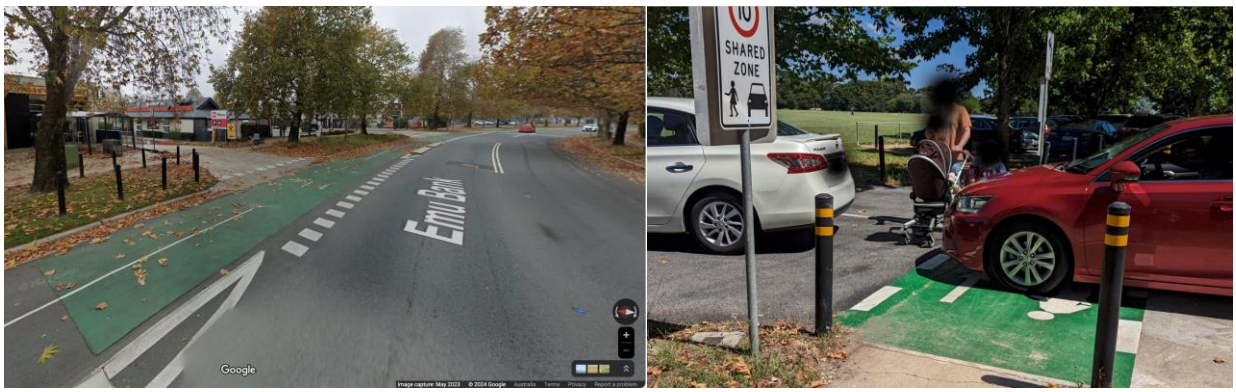


Figure 3.8
(a) Multiple vehicle crossing/conflict points along the bike way at Emu Bank
(b) Motorist not respecting shared zone at Brindabella.

There were many issues highlighted with various off-road bike paths and shared paths. These included general maintenance issues, rough riding surfaces from tree roots, debris (particularly rain induced path debris), poor lighting, potholes, sharp turns, blind corners and visibility issues (e.g., location 1, 2, 3 and 104). Many locations were highlighted where off-road paths intersected with roads and the transition was considered dangerous because of a lack of cyclist prioritisation (e.g., locations 165, 167, 169, 175, 176, 217, and many more). Figure 3.9(a) shows location 217, which a cyclist indicated was a problematic crossing, with the space provided in the median not being sufficient to provide adequate cyclist protection. Insufficient or inadequate space for protection was also highlighted by cargo bike users, particularly around light rail crossings.

Another crossing location highlighted by several cyclists was Location 259, 260, 261 and 262 (all the same location) as shown in Figure 3.9(b). Cyclists need to negotiate two lanes of traffic queuing for the roundabout and, in peak periods, crossing from one part of the off-road bike path becomes a very difficult task.

Figure 3.9
(a) Crossing point with insufficient protective space in the median
(b) Crossing point with insufficient opportunities to cross.

Several cyclists also expressed safety issues with crossing high speed merge lanes or highlighted issues with bike lane conflicts with merging or left turning vehicles and issues with speed differential between vehicles and cyclists. Examples cited include Location 156 shown in Figure 3.10(a) where vehicles are required to merge across a bike lane, and Location 183, 156, 194 and 200 where cyclists have to merge across a vehicle lane. It was noted as being particularly problematic during busy periods when opportunities for safe merging occur infrequently.

Figure 3.10
(a) Location 156 where vehicles merge across a bike lane
(b) Location 194, where bicycles merge across vehicle lanes.

Shared paths were frequently mentioned as problematic, particularly as they were often perceived as being too narrow to accommodate pedestrians and cyclists bi-directionally. Two areas were highlighted in particular: Location 152 and 153, the shared footbridge over Parkes Way shown in background of Figure 3.11(a) and (b) and Location 161, the shared path over Lake Burley Griffith as shown in Figure 3.11(c).

Figure 3.11
(a) Shared footbridge over Parkes Way
(b) Photo of shared footbridge over Parkes Way, 2018
(c) Shared path over Lake Burley Griffith.

There were many other locations highlighted by the cyclists in the study as having issues and these are documented in Appendix C.

3.1.7. Overall perceived cycling safety in Canberra

Eighty-three percent of cyclists (268/321) responded to the question about overall cycling safety in Canberra and most (80%, N=214) stated that they thought Canberra was a safe place to ride. The cyclists were asked to explain why they believed Canberra was a safe place to ride, or alternatively, why they believed it wasn't safe.

Why Cyclists believe Canberra is a safe place to ride

Overall, cyclists perceived that Canberra was a safe place to ride because of the comprehensive off-road bicycle infrastructure, which they compared favourably to the other cities in Australia. Cyclists perceived the bicycle network both on and off-road to be generally well planned and encouraging of cycling for commuting. However, there was also acknowledgement that the infrastructure did require on-going maintenance and optimisation for improved accessibility and safety.

As discussed earlier, there were three cyclist types: those who preferred the safety and pleasant commutes along the segregated off-road bike paths, those preferring more direct routes on-road and those preferring an optimal combination of the two options

The overall perceived attitude of drivers in Canberra towards cyclists was generally considered positive, with cyclists feeling that they were perceived as valid road users, although some felt that a minority of drivers were unobservant, aggressive, and made certain situations dangerous.

Why cyclists believe Canberra is not a safe place to ride

The concerns raised about the safety of riding in Canberra related to the fragmented and inadequately prioritized cycling infrastructure, issues with infrastructure on high-speed roads being inadequate for safety (narrow painted lines cited as not being very protective) and safety being compromised further by bicycle lanes that abruptly ended. There were also concerns about busy roads and Highways. Northbourne Ave and Gungahlin Drive were given as examples of busy roads that would benefit from safety enhancements.

Insufficient maintenance of existing infrastructure, poorly designed intersections and sharing paths with pedestrians and animals were also highlighted as impacting safety negatively. Motor vehicle drivers also contributed to cyclist safety concerns, particularly inattentive, impatient, and aggressive drivers who lacked awareness of other road users. Further, it was felt that the transport system in Canberra was prioritised for motor vehicles and cyclists were an afterthought

3.1.8. Safer Cycling Reforms

As part of the safer cycling reforms introduced in the ACT in 2015, a number or rules were introduced to improve cyclist safety. Cyclists were asked to respond to whether the rules below had any perceived safety effect:

1. Minimum distance requirements for a vehicle to pass a cyclist of 1 metre on roads with speed limits of 60 km/h or lower and 1.5 metres on roads with speed limits higher than 60 km/h.
2. Increased penalties for road users who cause (or are negligent in) a crash in which a vulnerable road user has experienced actual bodily harm.
3. Allowing cyclists to ride across pedestrian crossings (without dismounting)

The cyclist responses are shown in Table 3.5. Of the cyclists who responded to the questions relating to the ACT Safer Cycling Reforms, only the minimum passing distance rules were acknowledged by most respondents as making cycling safer in the ACT, with 69% agreement. The allowance of cyclists to ride across pedestrian crossings without dismounting was only perceived to have improved cycling safety in the ACT by 54% of cyclists and almost equal numbers of cyclists perceiving no safety benefit (22%) or uncertainty of the safety benefit (23%) of this reform. The increase in penalties for road users who cause (or are negligent in) a crash in which a vulnerable road user has experienced actual bodily harm had the least perceived safety benefit by cyclists, with 46% of cyclists perceiving a safety benefit.

Table 3.5
Perceived safety benefits of ACT's Safer Cycling Reforms

Safer Cycling Reform	Makes Cycling Safer	Does not make cycling safer	Not sure	No answer	Total	N
Minimum Passing Distance Rules	69%	18%	13%	0%	100%	268
Increased penalties for road users (injuring VRUs)	46%	26%	28%	1%	100%	268
Cyclist allowed cyclists to ride across pedestrian crossings	54%	22%	23%	1%	100%	268

Other possible interventions that would improve cycling safety in the ACT

Cyclists were given an additional opportunity to convey possible interventions that they perceived might improve cycling in the ACT. Suggested interventions were provided by just over half of the participants and revolved around the themes of a safe system including safer infrastructure, safer people (education and enforcement), safer speeds and miscellaneous interventions. Some participants suggested single interventions while others suggested combinations of interventions.

With respect to safer infrastructure, most cyclists suggested more dedicated segregated infrastructure, improvements and maintenance to current dedicated infrastructure and better bicycle network planning, so that infrastructure was better connected or less discontinuous. Intersection improvements were also suggested to reduce incidents of conflicts between vehicles and cars, particularly in left turn manoeuvres.

With respect to enforcement and education, a considerable number of cyclists felt drivers lacked awareness about the legitimacy of cyclists being on roads and the rules related to drivers regarding cyclists, including the minimum passing distance rules applying across the network, including when bike lanes are provided. Cyclists also felt that while rules implemented as part of the safer cycling reforms were positive, they felt enforcement of those rules was lacking and hence diluted the potential safety effect of those reforms. Cyclists also felt that it was difficult encouraging enforcement even when reporting issues with evidence.

Cyclists also felt that awareness programs and education should begin at licensing, should include re-education, including for professional drivers (buses, trucks, taxis, etc.) and publicity and promotion should occur in a way that "humanises" cyclists. Negative media that allegedly incites anti-cyclist sentiment should be actively discouraged. Several cyclists highlighted the fact that there needed to be a broader cultural shift in thinking regarding how road users of the ACT transport network

acknowledge cyclists operating within the system. There was a perception that the transport network was primarily designed for motor vehicles and that network efficiency for this road user type was the highest operational priority while cyclists were an after-thought that had to fit within the system.

Consequently, it was further perceived that motorists had an increased sense of entitlement over road use rather than a shared entitlement with cyclists. This results in motor vehicle road movements that appear to disrespect cyclist's rights to the network and subsequently their rights to safety. Movements such as turning left and right across bicycle paths of travel or opening doors in front of cyclists were frequently noted as problematic for cyclists, leading to heightened anxiety and crashes around intersections and parking areas. This is likely due to inherent flaws in system design as well as the lack of acknowledgement of cyclists using the system. While increased penalties for injuries to vulnerable road users appeared to go some way in addressing the physical and energy inequity between motor vehicles and cyclists, it was believed that presumed liability laws, such as those in various European countries were needed to improve the safety of cyclists, by automatically putting crash fault on motorists and hence encouraging a change in safety culture with respect to drivers and cyclists.

Some respondents also felt that cyclists needed to acknowledge limitations in the system, and that riding at speed across pedestrian crossings with the expectation that vehicles will give-way is a safety issue too. There was also reasonable acknowledgement that lowering speed limits and slowing traffic created a safer environment for cyclists. Individual responses are documented further in Appendix E.

3.1.9. Crash involvement.

One hundred and seventy participants (53.0%) reported that they had been involved in a crash while cycling, 117 (36.4%) indicated that they had never been involved in a crash, and 34 (10.6%) did not provide a response. Of the 170 crash-involved cyclists, 99 (58.2%) had been involved in a crash because of a motor vehicle, with 60 riders involved in one such crash, 27 involved in two such crashes and 12 in three. Additionally, 129 (75.9%) of the 170 cyclists indicated that they had been in a crash on a road, shared path, or bike path in which no motor vehicle was involved (e.g., travelling too fast and lost control of their bike), with 55 involved in one crash of this type, 32 in two and 42 in three or more. One hundred and six (62.4%) of the crash-involved riders indicated that their most recent significant crash occurred on their regular cycling route. Only 49 (28.8%) had reported their most recent significant crash to police.

The participants were asked about what happened in their most recent significant crash. Their responses were grouped into general categories of crash types and are presented in Table 3.5. The most common type of crash involved the cyclist losing control, for example due to issues with the surface of the road, a fault with their bike, travelling too fast, wet conditions, or overtaking or avoiding pedestrians or another cyclist. The second most common type involved colliding with a motor vehicle.

Table 3.5
Types of crashes involving cyclists in the ACT.

Crash type	Frequency
Collision with a motor vehicle	40
Collision with an animal	4
Collision with another cyclist	11
Single cyclist – lost control	54
Single cyclist – hit an obstacle/fixed object	11
Single cyclist – motor vehicle cut across in front	5
Single cyclist – forced off road by a motor vehicle	5
Single cyclist – details unknown	1

Ninety participants provided the exact location in the ACT where their most recent significant crash occurred. Figure 3.12 presents a geographical map of the ACT displaying the locations of the crashes. The locations of the crashes are presented with different colours according to the different types of crashes listed in Table 3.5.

The cyclists provided additional information about the crashes. Seventy-six crash-involved cyclists (44.7%) reported that they had their bike lights on at the time of the crash, while 72 (42.4%) responded that they did not have their lights on. Table 3.6 displays the responses of the participants regarding the weather and lighting conditions at the time of the crash. Most crashes occurred during the daytime in sunny conditions, and a smaller number occurred during dusk/dawn periods and night-time. Few crashes occurred while the weather was inclement (overcast or raining).

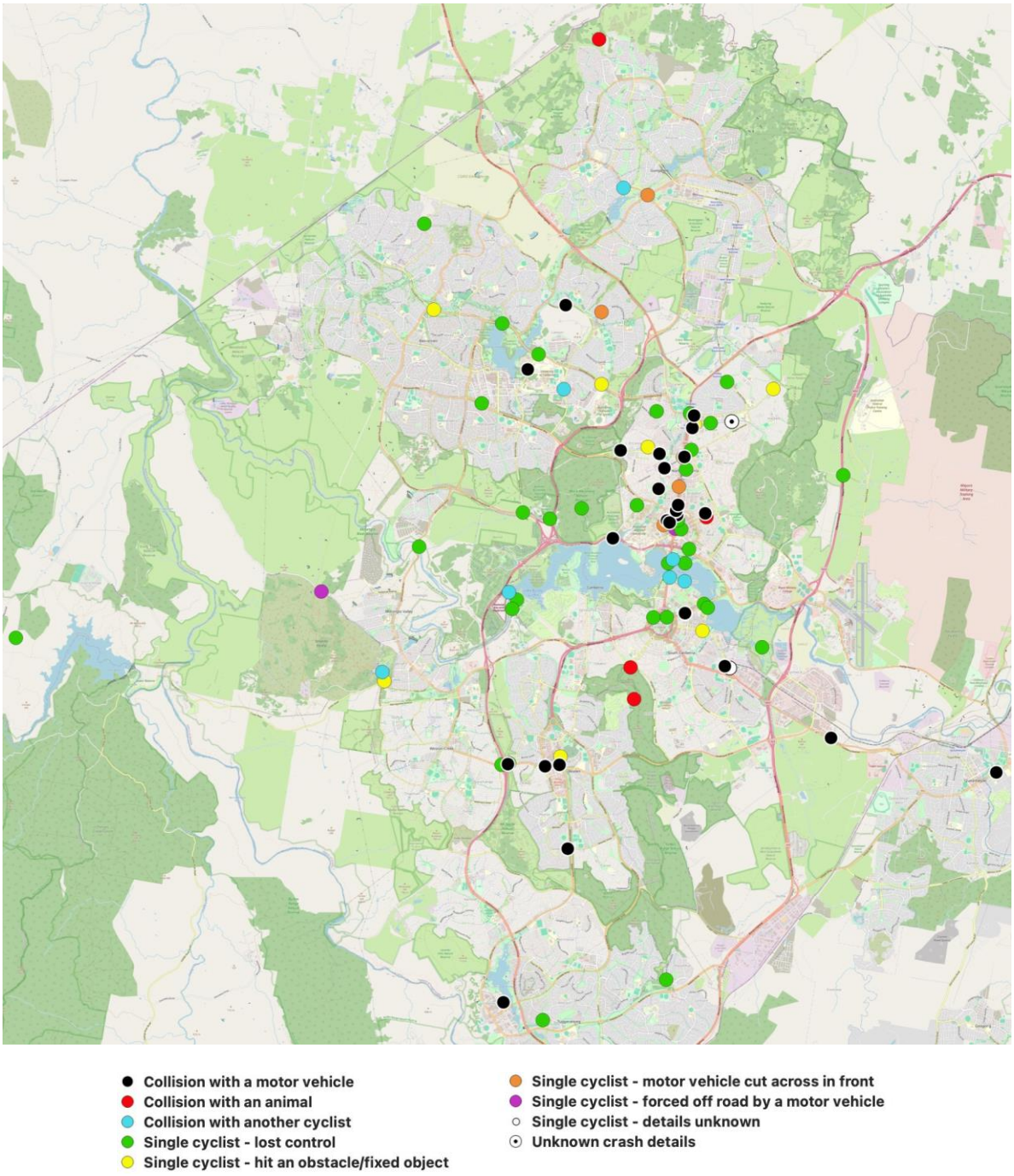


Figure 3.12
A geographical map of the ACT displaying the locations of the crashes and legend.

Table 3.6
Weather/lighting conditions at the time of crashes involving cyclists in the ACT

Weather/lighting conditions	Frequency
Daytime sunny	106
Dusk/dawn	26
Night-time	11
Overcast	9
Raining daytime	5
Raining dusk/dawn	3
Raining night-time	4

Table 3.7 presents the level of injury severity that the cyclists received from the crashes. The most common level of injury required treatment by the cyclist themselves or bystanders, followed by no injuries, treatment at hospital where the cyclists presented themselves, and treatment by a private doctor.

Table 3.7
Injury severity of cyclists involved in crashes in the ACT

Injury severity	Frequency
No injury	35
Treatment by self or bystander	70
Treatment by private doctor	13
Treatment by ambulance at crash scene	8
Treated at hospital – self presented	22
Treated at hospital – ambulance presented	4
Admitted to hospital – self presented	4
Admitted to hospital – ambulance presented	9

Figure 3.13 shows the same geographical map of the ACT as in Figure 3.12 but with the locations of the crashes presented with different colours according to the different levels of injury severity listed in Table 3.7. The cyclists were also asked about the specific areas of their bodies that were injured in their most recent significant crash. These responses were aggregated and are provided in Table 3.8. It should be noted that a cyclist may have had multiple body regions injured in a crash, so the total number of injuries in Table 3.8 is larger than the number of cyclists who had been involved in a crash. The most common injuries by far were to the upper and lower extremities, although there were also a number to the head, face, and neck regions.

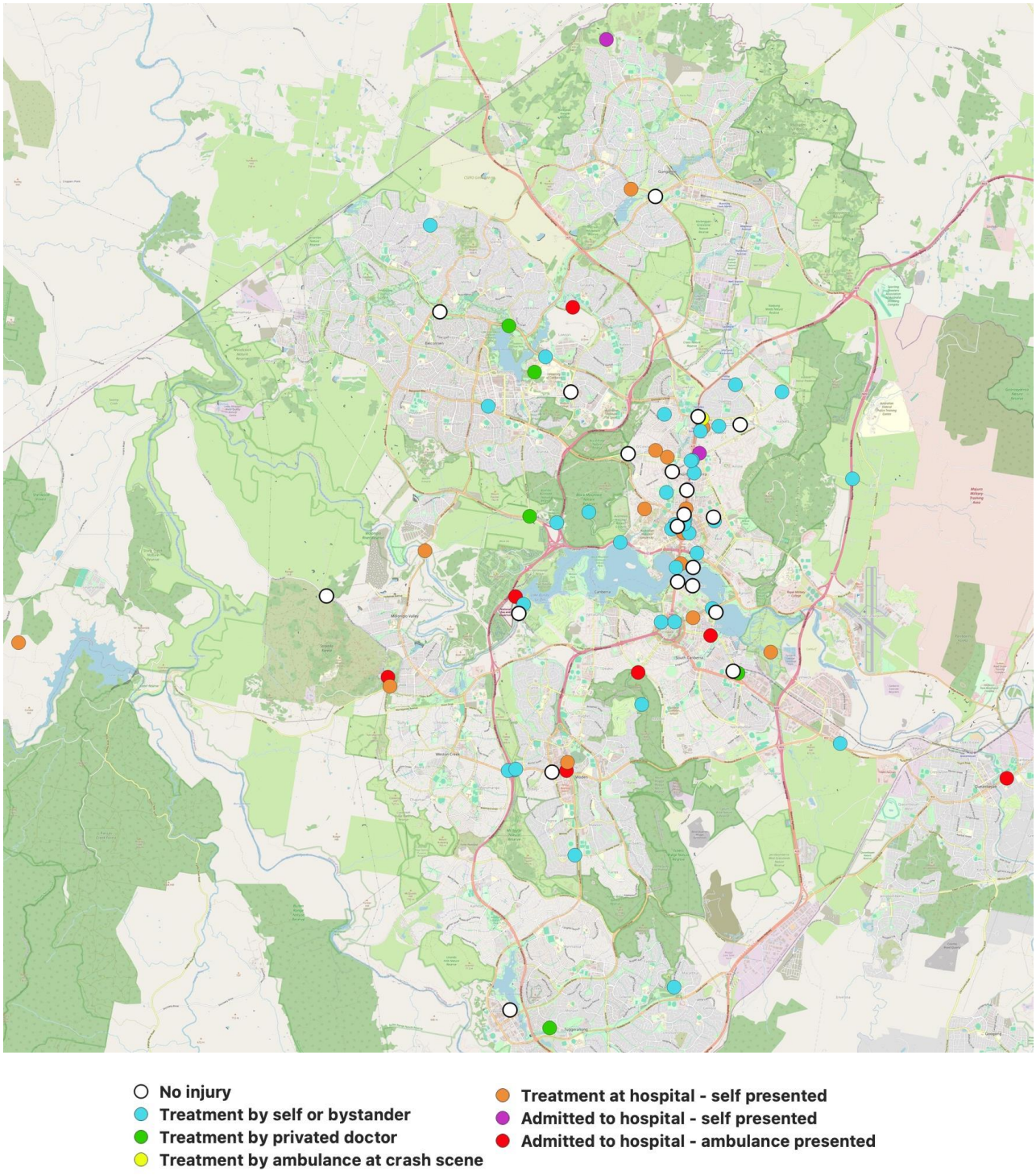


Figure 3.13
A geographical map of the ACT displaying the locations by injury severity.

Table 3.8
Body regions of cyclists that were injured in crashes in the ACT

Body region	Frequency
Abdomen	1
Spine	3
Head	15
Face	8
Neck	7
Thorax	8
Upper extremity	85
Lower extremity	72

In terms of specific types of crashes, 45 (14.0% of total sample of 321) participants reported that they have had a crash in which a vehicle turned left in front of them and 27 (8.4%) have had a crash in which a vehicle turned right in front of them. Thirty-four (10.6%) have had a crash which involved someone getting into or out of a vehicle as they were riding past (i.e., dooring). Also, 72 (22.4%) reported that they had been involved in crashes that were the direct result of problems with the roads, bicycle lanes, or infrastructure in the ACT (such as a traffic island that protruded into the bike lane, storm water drains that encroached on the bike path, tree roots on the bike path, potholes and loose gravel on the road, broken and cracked segments of the bike path pavement, and sunken ground below bike path). Seventy-nine (24.6%) participants reported that they have had a crash in which they hit their head. Seventy-six noted that they were wearing a helmet when they hit their head, and 68 thought that the helmet protected them from a more severe head injury.

3.1.10. Near misses

There were 219 (68.2%) participants who reported that they have experienced a near miss (event with the potential to result in either a crash or injury but didn't, including a vehicle passing too closely) while riding their bicycle. They were then asked how often they had experienced various types of near misses, and the results are presented in Table 3.9. The most commonly occurring near misses (50% or more of the participants had experienced them more than 3 times, regularly or constantly) were cyclists perceiving being passed by a vehicle with less than one metre of space, cyclists being cut off by a vehicle turning left or right, and a pedestrian/animal unexpectedly walking into the path of the cyclists. The least commonly occurring near misses (50% or more of the participants had never experienced them or had only experienced them once) were a mechanical fault of the bike, cyclists being run off the road by a vehicle, cyclists misjudging the speed of an approaching vehicle when crossing an intersection, cyclists nearly being hit by a vehicle turning through a gap in traffic, and cyclists travelling too fast for conditions.

Table 3.9
Frequency of different types of near misses experienced by cyclists in the ACT (*n*=225)

Type of near miss	Never %	Once %	Two-three times %	More than three times %	Regularly (e.g., weekly) %	Constantly (approx. every ride) %
Vehicle passing you with less than one metre of space	5.9	4.1	14.5	31.7	32.6	11.3
Cut off by vehicle turning left or right	8.5	4.9	27.4	38.1	19.3	1.8
Vehicle failed to give way at T-junction	22.5	6.8	26.1	32.9	10.4	1.4
Vehicle failed to give way at crossroad	20.7	7.4	28.1	31.3	11.1	1.4
Vehicle failed to give way at roundabout	21.1	8.3	23.4	33.5	11.0	2.8
Swerve to avoid suddenly open car door in front of you	28.9	15.1	22.7	28.4	4.4	0.4
Vehicle stopped suddenly in your lane of travel	32.7	9.4	20.6	28.7	7.6	0.9
Nearly hit by vehicle turning through gap in traffic	44.5	9.5	18.6	22.7	4.1	0.5
Run off road by vehicle	54.1	16.7	15.8	11.3	1.8	0.5
Pedestrian/animal unexpectedly walks into your path	7.2	8.5	28.7	37.7	15.7	2.2
Loss of control on slippery, uneven, or damaged surface	17.5	14.8	38.1	26.9	2.7	0.0
Misjudged the speed of approaching vehicle when crossing intersection	42.6	13.9	30.0	10.8	2.7	0.0
Travelling too fast for conditions (e.g., down a hill/around a corner)	35.0	16.6	32.7	14.3	0.4	0.9
Mechanical fault of bike resulted in near miss (e.g., brake failure)	62.8	17.0	13.9	5.4	0.9	0.0

One hundred and fifty-nine (72.5%) of the 219 participants who had experienced a near miss indicated that their most recent significant near miss occurred on their regular cycling route. One hundred and eleven (50.7%) of the 219 reported that they had their bike lights on at the time of the near miss, while 72 (32.9%) responded that they did not have their lights on. Table 3.10 displays the responses of the participants regarding the weather and lighting conditions at the time of the near miss. Most near misses occurred during the daytime in sunny conditions, and a smaller number occurred during dusk/dawn periods and night-time. Few crashes occurred while the weather was inclement (overcast or raining).

Table 3.10
Weather/lighting conditions at the time of near misses experienced by cyclists in the ACT

Weather/lighting conditions	Frequency
Daytime sunny	132
Dusk/dawn	35
Nighttime	11
Overcast	10
Raining daytime	3
Raining dusk/dawn	1
Raining nighttime	3

One hundred and eighteen participants provided the exact location in the ACT where their most recent significant near miss occurred. Figure 3.14 presents a geographical map of the ACT displaying the locations of the reported near misses. A geographical map of the ACT is also provided in Figure 3.15 that combines the locations of the near misses with the reported crashes (detailed in Section 3.1.9).

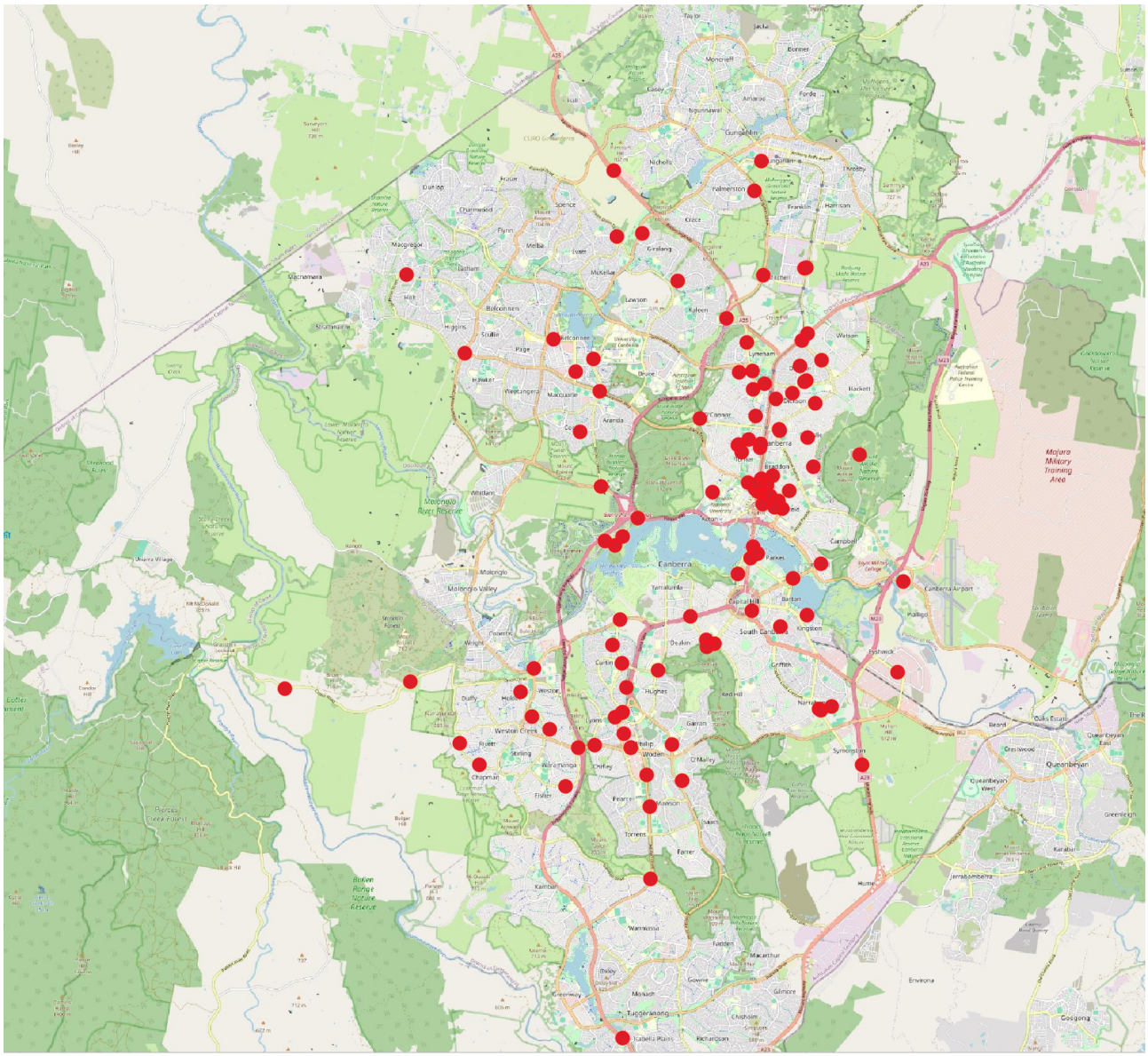


Figure 3.14
A geographical map of the ACT displaying the locations of the reported near misses.

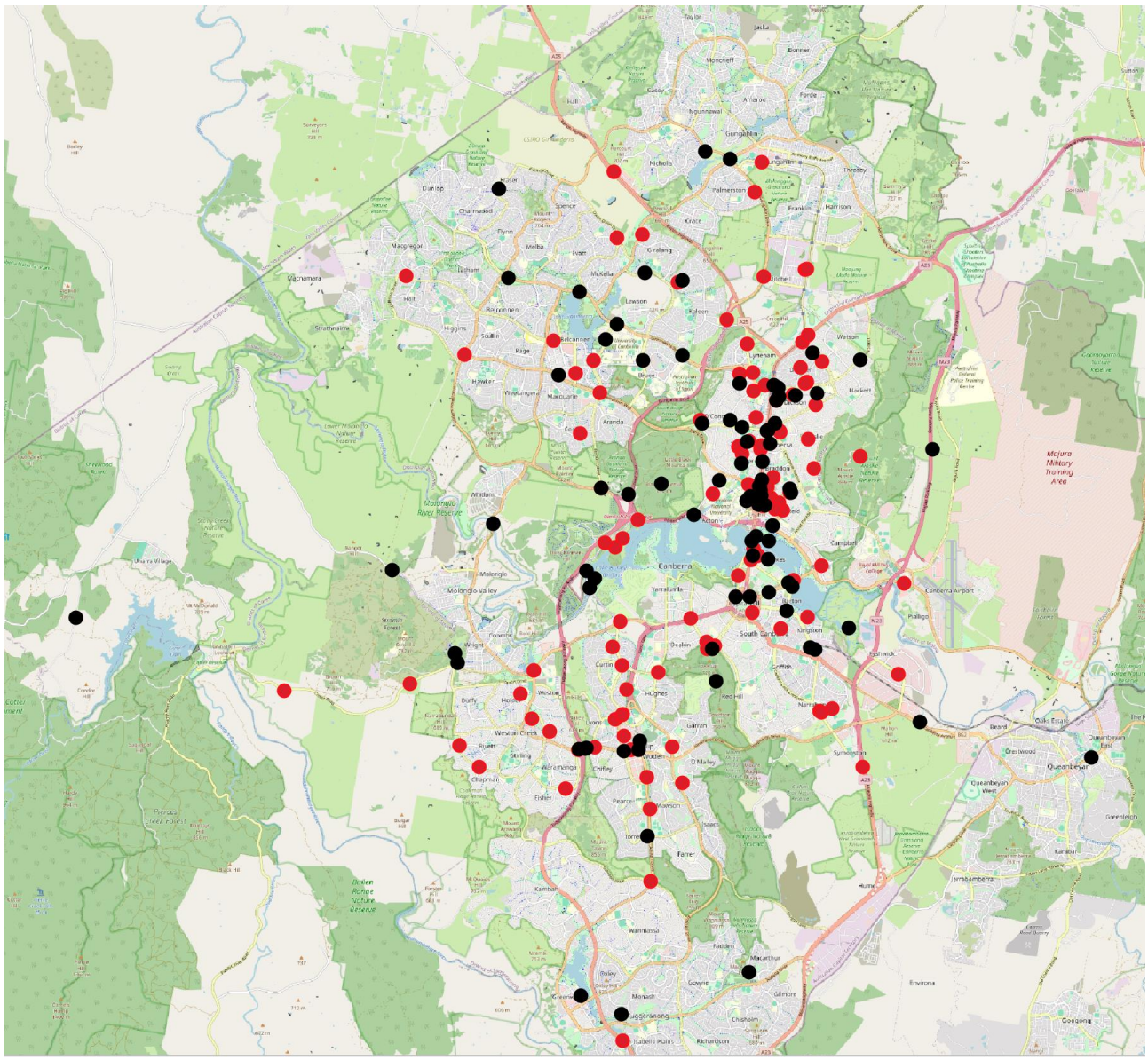


Figure 3.15
A geographical map of the ACT combining the locations of reported near misses and crashes.

4. Discussion

The purpose of this project was to conduct a survey of a large sample of cyclists who regularly cycle on the ACT road network to better understand their travel, safety, and crash experiences. The sample of participants who were recruited was large (321 individuals) and represented a broad cross-section of cyclists in terms of their age, their gender, and the geographical spread of their home residences across the ACT. They regularly rode (81% rode 2 to 3 days per week or more) resulting in high average distances (average of 82 kilometres per week) on a range of different bicycle types (e.g., road bike, mountain bike, etc.) and for a range of different reasons (i.e., commuting, recreation, sport/exercise). *Almost two-thirds (60%) reported that they are confident riders*. Overall, *80% of respondents thought that Canberra is a safe place to ride*. However, the survey results demonstrated that there are many safety issues that cyclists encounter on the ACT road system, such as:

- Respondents did not feel comfortable riding in many common road situations in the ACT,
- they reported a large number (272 locations) of infrastructure issues with the road network in the ACT that affect cyclists,
- just over half (53%) of the respondents had been involved in a crash while cycling, and
- just over two-thirds (68%) had experienced a near miss.

These results are discussed in more detail in the following sections.

4.1. Safety issues as barriers to cycling participation

Firstly, it should be highlighted that these safety issues were noted by a sample of experienced and confident cyclists. This suggests that these issues are likely to be substantial barriers for less experienced and/or less confident cyclists, or those who would like to take up cycling. For example, research by Boufous, Beck, Macniven, Pettit and Ivers (2021) conducted an online survey of 1335 cyclist aged 50 years or above in New South Wales, Australia and found that safety concerns (including motorist behaviour or aggression (34%), speed and volume of traffic (27%), proximity to motor vehicle traffic (26%) and not enough separated bike lanes (23%)) were the main barriers to cycling amongst older cyclists. Therefore, these issues are likely to be holding back further participation in cycling in the ACT and need to be considered for future planning of the road network. Hopefully, some of the other results of this survey can highlight some of the specific areas that need to be considered to improve cycling participation and safety.

4.2. Cyclists' comfort on ACT roads

Examining the respondents' level of comfort in specific road scenes from the ACT (see Figure 3.6, earlier) is a useful way to identify what areas of the ACT network need to be improved for cycling participation and safety. It is important to consider the situations in which even *confident* cyclists do not feel comfortable, in order to improve safety. It is also important to look at those situations in which *cautious* cyclists do not feel comfortable, to improve both cycling participation and safety. An examination of the situations in which both confident and cautious cyclists generally feel uncomfortable (i.e., in which fewer than 50% reported that they were comfortable) highlights that they are not comfortable near traffic, particularly on busy arterial roads or highways with multiple

traffic lanes without adequate bike lane facilities. They also do not feel safe riding past parked vehicles. They prefer bike paths completely separated from the road, or, if the bike lane is situated on the road, that it is wide, well maintained and clearly delineated. A review of literature by Reynolds, Harris, Teschke, Cripton, & Winters (2009) found that clearly marked bike specific facilities improved safety for cyclists, reducing injury or crash rates by about half compared to unmodified roads. Pucher and Buehler (2008) examined how the Netherlands, Denmark and Germany have made bicycling a safe, convenient, and practical way to get around their cities and found that the key to achieving high levels of cycling appears to be the provision of separated cycling facilities.

The situations where they felt particularly uncomfortable (fewer than 20% were comfortable) related to busy multi-lane roads without bike lanes or where the bike lane suddenly ends. Cyclists are present on many roads, particularly those in metropolitan and suburban areas. It could, therefore, be suggested that it is incumbent upon governments and road safety authorities to consider providing suitable infrastructure and facilities for their safe usage. This often requires a re-think of the road space and how it is best utilised, but also of the most important priorities regarding the users of the road. It is also interesting to examine the situations in which the cautious riders felt substantially less safe than the confident riders. Generally, these situations involved narrow bike lanes and where vehicles were parked on the side of the roads. These issues, as well as those that were particularly uncomfortable for both groups, should be the key considerations in efforts to improve safety, encourage cycling and increase participation.

4.3. Crash experiences of cyclists and their resulting injuries

Examining the specific information that the cyclists provided about the crashes and near-misses they have experienced is another way of identifying important considerations for future cycling participation and safety. The most common type of crash for the cyclists in the present study did not involve a motor vehicle (e.g., a single cyclist loss of control crash) and generally these crash types go unreported in official road crash statistics (Beck et al., 2019) This remains problematic as unreported single cyclist crashes provide no feedback loop for transport planners or government agencies responsible for optimising road safety on all parts of the transport network. Consequently, systemic, or persistent issues on the transport network that may contribute to these crash types go unaddressed. Seventy-six percent of the participants who had been in a crash while cycling had been in at least one that did not involve a motor vehicle. Research has also shown that single-bicycle crashes account for the most cyclists admitted to hospital (Schepers, 2012). However, crashes with a motor vehicle were still common. Fifty-eight percent of those cyclists who had been in a crash had been in at least one collision with a motor vehicle. By way of comparison, the *Risky Rides 2020* report by the Royal Automobile Association in South Australia (2021) found that 39% of 471 surveyed cyclists had been involved in a collision with a motor vehicle. Research by Beck et al. (2016) examined the crashes of cyclists who were admitted to hospital in Victoria, Australia, and found that 69% of crashes occurred on-road and were a combination of single cyclist-only events (56%) and multi-vehicle crashes (44%).

Fortunately, a majority of the most recent crashes of the cyclists in the present survey resulted in a low level of injury severity to the cyclists, with 64% resulting in no injury to the cyclist or treatment by the cyclist themselves or a bystander at the scene. It was also shown in the present study that the most common areas of the cyclists' bodies that were injured were the upper and lower extremities, which would be the first areas to contact the ground in single cyclist crashes and would be less likely

to lead to life threatening injuries (compared to injuries to the head, face, neck, spine, thorax, or abdomen). It should be acknowledged that the sample in the present study were regular cyclists. Therefore, it is likely that information about crashes with more severe injury outcomes would have been underrepresented as many cyclists who had been injured to such a degree would likely choose not to continue cycling, or not be physically capable of cycling (and so would not participate in the present study).

They also provided more detail about their overall history of crash involvement (not just their most recent crash). Fourteen percent of the total sample of 321 participants reported that they have had a crash in which a vehicle turned left in front of them and 8% have had a crash in which a vehicle turned right in front of them. Eleven percent have had a crash which involved someone getting into or out of a vehicle as they were riding past (i.e., dooring). Twenty-two percent had been involved in crashes that were the direct result of problems with the roads, bicycle lanes, or infrastructure in the ACT. The ACT have drafted design guides for best practice solutions for future intersection designs (Transport Canberra and City Services, 2023) and this undoubtedly should help prevent the above-mentioned intersection crash types. However, a system wide holistic approach is necessary to ensure greater safety across the network. This means acknowledging the shared approach to road safety, and designing and implementing a system that minimises opportunities for crash types such as dooring (for example, by providing safety buffer areas parallel to parking) and addressing infrastructure maintenance issues (potholes, rutting, debris, tree root damaged paths, etc.) in a timely manner to minimise cyclist exposure to the risks associated with them. Some cyclists indicated that they had reported various infrastructure issues for repair but there appeared to be a lack in urgency to rectify them. Response to infrastructure maintenance requirements (particularly when it has been highlighted by a system user) should be addressed efficiently, as minor costs in repairs are likely to be less significant compared to the public health costs resulting from a crash.

4.4. Near misses

Near misses were also common, with 68% of the cyclists reporting that they had experienced one. Many other studies have also shown that near misses are a regular part of cycling (Aldred, 2016; Aldred & Crossweller, 2015; Johnson et al., 2014; RAA, 2021). Near misses are frightening for cyclists and this combined with their regularity is likely to have a substantial effect on cycling experience and uptake (Aldred, 2016; Aldred and Crossweller, 2015). Interestingly, the most common near misses were those that involved the actions of other road users (cyclists being passed by a vehicle with less than one metre of space, cyclists being cut off by a vehicle turning left or right, and a pedestrian/animal unexpectedly walking into the path of the cyclists). In contrast, many of the least common near misses related to the actions of the cyclists themselves (mechanical fault of the bike, cyclists misjudging the speed of an approaching vehicle when crossing an intersection, and cyclists travelling too fast for conditions). It should be noted, however, that this information was self-reported by the cyclists, and, therefore, it is possible that they underestimated their contribution to the near misses involving other road users (e.g., the near misses may have been exacerbated by the actions of the cyclists, such as through their travelling speed). These results are similar to a naturalistic study of 36 cyclists in the ACT between 2011 and 2012 by Johnson et al. (2014), which found that 93% of 91 potentially unsafe cyclist-interactions that were captured were due to the actions of the driver. The most common event types involved drivers turning left across the path of the cyclist (37%), drivers turning across the path of the cyclist from the adjacent direction (33%), and unexpectedly opened vehicles doors (18%). Unexpectedly opened vehicle doors were still common

in the present study, with 56% of cyclists reporting that they had experienced it two to three times or more.

4.5. Cyclists' thoughts on infrastructure in the ACT

Overall, the results of the commentary on bicycle infrastructure in the ACT by the participants in this study were quite consistent among cyclists who used similar parts of the cycling network. The cyclists who mainly used off-road paths highlighted the fact that, while off-road paths offer improved safety and a lower stress environment, there are still considerable issues that required addressing, particularly where the off-road path network intersects with the motorised traffic network and priority is given to the traffic. Even at locations where priority favours vulnerable road users, cyclists felt it was not respected by motor vehicle drivers. It is important to address these safety concerns by auditing various locations of concern and introduce measures to improve safety. This may include physical speed reduction measures (e.g., raised plateaux) or speed limit reductions.

Many cyclists shared frustrations related to path maintenance being inadequate, deteriorating pavement surfaces (e.g., tree roots making paths bumpy), blind corners and shared paths being too narrow to accommodate pedestrians and cyclists simultaneously.

Cyclists consistently mentioned the need for more segregated bike paths to improve cyclist safety. However, cyclists were also critical of some of the segregated infrastructure being provided, as they felt it resulted in unintended negative consequences. Examples cited included the raised path on Northbourne Ave, where it was felt that the mechanism of segregation leads to a decreased awareness of cyclists, particularly for left turning vehicles. It was also perceived that the separated bike path at Corinna Street is also less than optimal, with cyclists perceiving that the raised concrete kerbing used as a separator to traffic is a hazard and the bike path is disrespected by drivers who use the area as parking and block the path. While these segregated paths were designed for improved safety, monitoring use and continual improvement is important, to ensure the implementation of these paths are optimal.

On-road cyclists frequently highlighted that they felt the "painted lines" that are on-road bicycle lanes offer very little protection to them. Many cyclists felt that bike lanes are too narrow and were particularly critical of the bicycle lanes on Northbourne Ave as well as general safety on Northbourne Ave. This road was cited frequently by the study sample in terms of infrastructure issues, crashes and near misses. Cyclists also found that installation of the light-rail network further exacerbated cycling issues. The implication of providing bike lanes on a road is that it should be accessible to cyclists in a safe way. The persistent declaration by cyclists that Northbourne Ave is problematic and dangerous is worthy of greater attention to improve safety.

In addition to discontent with the width of bicycle lanes on the ACT road network, cyclists appeared to be dissatisfied by the discontinuous nature of on-road bicycle lanes, particularly when the termination of bicycle lanes occurs at locations where it was considered hazardous to cyclists and resulted in competition for space on roads with fast moving traffic. The feasibility of reducing speed limits on roads where this occurs could be considered to address this concern. The provision of opportunities for cautious cyclists to safely exit the road path onto the footpath (as suggested by some cyclists), may also be worthy of consideration.

Cyclists were very critical of scenarios (and locations) where fast moving traffic merges across bicycle lanes and scenarios where bicycle lanes lead to specific cyclist crossing points to merge across fast moving traffic. Interestingly, one such location that was mentioned by the cycling sample as highlighting this issue was the same as the scenario presented in Scene 2 (see Figure 3.6, earlier); the road merge of Yarra Glen Road and Cotter Road. This location was monitored for a week as part of a previous ACT Road Safety Fund project (Mackenzie & Ponte, 2020) and it was found that, of the 693 cyclists who merged across traffic to continue along the parallel bike path, only 10.8% used the crossing infrastructure as intended (stopping, waiting, and crossing). Most cyclists (66.4%) merged across the traffic lane a short distance past the designated crossing point and 22.8% merged across the lane at a point much further past the designated crossing point. Further, 69% of these cyclists merged across the traffic lane in the absence of any vehicle traffic, 25.7% crossed after a vehicle passed and 5.1% crossed in front of a vehicle. In addition to being a safety concern, this seems to demonstrate that the crossing point design is not consistent with the expectations of cyclists and may require further attention.

The alternative option of continuing the bicycle lane and retaining cycle lane priority does expose cyclists to increased conflict risk with merging traffic; however, most cyclists (according to Mackenzie & Ponte, 2020) are retaining continuity by disregarding the designated crossing point. A further issue related to layouts of the roads described above is the use of ‘painted green bike lanes’ where there appears to be confusion as to what they represent. Some cyclists reported that they felt the green bike lanes represent some sort of “right of way” whereas the intended purpose is for increased awareness of the bike lanes. This causes further frustration among cyclists, as they feel they are being disrespected.

On a positive note, most of this sample of experienced and confident cyclists (80%) believed that Canberra is a safe city in which to cycle. They also provided further detail about why they consider it to be safe. Overall, they thought that Canberra was a safe place to ride due to the comprehensive off-road bicycle infrastructure. They noted that the bicycle network both on and off-road was generally well planned and encouraging of cycling for commuting. The also believed that the attitude of drivers in Canberra towards cyclists was generally positive and made cyclists feel that they were valid road users.

4.6. Safe cycling behaviours

The sample of cyclists generally reported a high level of performing common cycling safety behaviours. Specifically, 86% indicated that they at least sometimes wore clothing they thought made them more visible and 78% reported always using their lights at night or in hazardous weather conditions that causes reduced visibility. Eighty-four percent reported that they always complied with mandatory helmet laws. Thirty-four percent indicated that they never cross through intersections against a red-traffic signal, while 31% reported that they have on rare occasions, with 20% reporting that they do it sometimes, 8% often and 2% always. The reasons given for red-light non-compliance (which cannot, of course, justify the behaviour, given it is unlawful), highlight again the priority of the traffic system favouring motor vehicle throughput and efficiency. Traffic lights not adequately accommodating cyclists' needs, including delayed signal changes, inadequate allocation of time for crossing, and failure of traffic light sensors to detect bikes prompted cyclists to make their own judgments for efficient and safe riding through red signals. Johnson et al., (2013) found similar reasons for red-light non-compliance, cyclists who rode through red lights considered their actions

to be safe and that infrastructure issues influenced their non-compliance. Suggestions given by Johnson et al., (2013) for managing this behaviour was to provide more cyclist-inclusive infrastructure, increased enforcement and education. Schramm et al., (2008) found that in crashes where cyclists were considered at fault, 6.5% occurred because of cyclist non-compliance with a red-light. Mechanisms to reduce these types of crashes are important as part of a safe system.

Providing mechanisms or technology that detect the presence of cyclists, particularly when there are no vehicles present, should be considered to decrease red-light non-compliance and improve cycling efficiency and safety. This could also reduce frustration among drivers who commonly allege that cyclists' always run through red lights.

4.7. Safe cycling culture and education in the ACT

There was strong support among cyclists for inducing a cultural change in society, particularly among drivers and their polarised perspectives on cyclists and their behaviour. It was suggested that education of all drivers and increased promotion of awareness of the validity of active travel and cyclist's shared rights to the transport system, should be considered to help shift negative attitudes. Mechanisms to prevent inciting anti-cyclist sentiment in the media were considered important, as was increased enforcement of behaviours that could potentially harm cyclists. Finally, the idea of a presumed liability law, to better protect cyclists and other vulnerable road users (as described in Boufous, 2017) was also a persistent suggestion by cyclists to help improve road safety.

Ultimately, the ACT bike network, like all bike networks that are incorporated into a transport system, would benefit from ongoing monitoring, assessment, and optimisation. It might be beneficial to have dedicated bicycle safety teams (if they do not already exist) that can address cyclist safety concerns promptly and efficiently, and this should be feasible given the relatively small size of the ACT. The test of the safety of a bicycle transport network is how the system copes with riders of all ages or, more correctly, how riders of all ages cope with the system. The sample in this study captured very few or indeed none of the most vulnerable road user types: the very old and the very young. One of the largest cohorts of cyclists in Canberra is those aged 17 and under (Munro, 2021), and this study has revealed that there are many issues (on-road and off-road) facing confident, mature and experienced riders, which suggests that these issues might be amplified for younger and older riders. With these findings in mind, it is important to consider the 8 80 cities idea with respect to cycling, that "… if everything we do in our cities is great for an 8 year old and an 80 year old, then it will be better for all people …" (8 80 cities, n.d., para. 2), which requires a re-think on many aspects of transport planning. It is noted that the ACT does currently take this approach.

4.8. Future research

It would be interesting to conduct this survey again with cyclists in different states and territories to determine if similar general safety issues (e.g., common types of crashes, bike path width and maintenance) are highlighted. This would show whether the safety, crash and infrastructure issues noted in this study for the ACT are common in other jurisdictions or are unique to the ACT. If they are common, then the ACT could look to the approaches that other jurisdictions have taken in their attempts to create a safer road system for cyclists. The ACT could also provide instruction to other jurisdictions based on their experiences of enhancing the safety of the road system for cyclists. Such research would also highlight what national reforms, areas of investment and leadership roles are

required for these safety outcomes. Research has shown that the risks of cycling are lower in countries with good infrastructure (Mindell, Leslie, & Wardlaw, 2012; Pucher & Buehler, 2008; Pucher et al., 2010), which provides further evidence that improving cycling infrastructure and providing physical separation between bicycles and motor vehicles improves safety (Maizlish, Woodcock, Co, Ostro, Fanai, & Fairley, 2013).

It would also be interesting to conduct research on cyclists who have been severely injured in crashes, in terms of their injuries, longer-term outcomes, recovery, and thoughts on the safety of the ACT road system and what changes and reforms could be made to improve safety. Such research could also investigate whether they have stopped cycling, whether they have stopped due to their injuries or their experiences, and whether their experiences have had a flow-on effect of deterring others from cycling.

Another line of inquiry that would be interesting would be to provide specific further questions to the cyclists about the road situations that they find uncomfortable (e.g., busy multi-lane roads without bike lanes or where the bike lane suddenly end, narrow bike lanes, bike lanes in close proximity to parked vehicles) and get them to identify how they believe the safety of these situations could be improved. This would allow cyclists to have an active role in the optimisation process, so that, rather than deciding what would make cyclists more comfortable for them, road authorities could defer to the knowledge and experience of the cyclists themselves. It might be that small changes that may otherwise be overlooked by authorities, such as improved lighting on separated bike paths, might create a more comfortable and safe experience for cyclists.

It would also be beneficial for future survey research on cyclists on their travel and safety to involve individuals who do not currently cycle, including those who would consider taking it up and those who believe that they would never cycle. This would provide an interesting indication of the predominant barriers to the uptake of cycling and identify the key safety concerns for these individuals. It would also be interesting to compare their beliefs to both the confident and cautious cyclists represented in the present study. However, such a participant sample, would require a considerably different recruitment strategy to involve non-cyclists and may function best when embedded within a general household travel survey that does not focus specifically on cyclists, such as in Munro (2021).

4.9. Study limitations

This study specifically recruited participants who were aged 18 years or older, regularly cycled (at least once a month) in the ACT and undertook a considerable proportion of their riding on roads and public paths. The intention of this recruitment was that the participants would be adults and would have a high level of experience with using the ACT road system as cyclists. However, it would also have been interesting to examine the travel and safety experiences of younger cyclists on the ACT road system, as well as novice cyclists who were considering undertaking cycling on a more regular basis. According to Munro (2021), the highest cycling participation rate on a population basis (according to their definition) was among children aged 10 and under, followed by 10 to 17-year-olds. While the motivations for cycling and exposure rates among children excluded in this study might differ from the adult cyclists in this study, the same transport network is shared by both cycling cohorts. The negative issues highlighted by experienced cyclists who self-reported being confident or cautious riders are likely to be amplified for younger aged cyclists who are more vulnerable, less experienced and are exposed to the same transport network conditions.

It should also be acknowledged that there may have been some degree of social desirability bias in the responses by the participants to some of the questions. They may have provided answers and information that they thought would be more socially acceptable or generally appropriate, particularly relating to their role in crashes and their safety related behaviours (e.g., helmet wearing). Also, as noted earlier, the responses were self-reported so the cyclists may have underestimated their own role in the crashes and near misses they were involved in. It may also have been the case that some participants may have had frustrations (e.g., with the behaviour or safety of motorists) that they wanted to voice or highlight that may have affected their answers to certain questions.

4.10. Conclusion

Cyclists are one of the most vulnerable types of road users, given their lack of physical protection when exposed to motorised traffic and consequent risk of injury. However, the benefits of cycling are many and, as such, it is a very popular means of transportation, exercise, and recreation. The ACT has the highest cycling participation in Australia, and the capital, Canberra, is geographically suited to cycling with a centralised and flat central business district. However, even with these advantages, cycling participation in the ACT could be higher. This report has shown that safety issues such as less than optimal infrastructure, near-misses, collisions with vehicles, and severe injury outcomes, are likely to be preventing people undertaking more cycling. It is necessary to consider these issues in future efforts to create a safe road system in the ACT. It is important that safe infrastructure and facilities are provided for cyclists to use. Ultimately, it is hoped that the perspectives of these cyclists, obtained through the present survey, can contribute to creating a safer environment for cyclists in the ACT.

4.11. Recommendations

Based on the findings of this project, the following general recommendations are made by the authors to improve both safety and cycling participation in the ACT:

- Safety concerns are a barrier to cycling participation. Cyclists who regularly use the ACT road network (and advocacy organisations) should be consulted in planning and design stages of any future changes to the road network so that potential issues can be identified prior to instalment or construction of infrastructure that may have the potential to affect cyclists safety or decrease useability.
- This study only targeted people who identified as cyclists, however, any strategies to increase cycling participation should also identify ACT residents who are “interested but concerned” and this cohort should also be consulted.
- This study has identified several cycling infrastructure issues (and their locations) as reported by cyclists, as being problematic, with several cyclists highlighting the same issue/location. There appears to be a need to conduct a cycling network specific safety audit, with the locations identified in this study being and ideal initial starting point.
- Twenty-two percent of participants had been involved in crashes that were the direct result of problems with ACT roads, bicycle lanes, or infrastructure. It is essential that on-road bike lanes and paths, (shared and separated) are well maintained and regularly repaired. This includes providing regular checks and maintenance, and ensuring that specific issues that are reported by cyclists are investigated and addressed promptly. The transport system would benefit from ongoing monitoring, assessment, and optimisation.

- Cyclists are not comfortable near traffic, particularly on busy arterial roads or highways with multiple traffic lanes without adequate bike lane facilities. They also do not feel safe riding past parked vehicles. Where possible, bike paths that are separated from the road should be provided. Additionally, use or increased use of marked buffering space between bicycle lanes and traffic lanes and between bicycle lanes and parked vehicles, should be more widely deployed. This would assist with vehicles complying with the MPD rule and reduce or prevent dooring incidences.
- For bike lanes on the roadway, they should be wide, well maintained (including regular sweeping to clear debris) and clearly defined. Green painted bike lanes should be evaluated for effectiveness and should not replace more appropriate and more protective cycling infrastructure
- Given that a significant number of cyclists expressed dissatisfaction with regards to the discontinuity of on-road bike lanes or the sudden terminations of on-road bike lanes at critical road network points, more emphasis should be placed on maintaining bike continuity. Where this is not possible, entry ramps to footpaths (where practical) should be considered, so that cyclists are not forced to merge with faster moving traffic and have the opportunity for segregation.
- At intersections where bicycle lanes terminate, installation of advanced green bicycle signals would assist with queued bicycles in negotiating travel across intersections with less vehicle conflict as well as improving cyclist visibility.
- Fourteen percent of participants had a crash in which a vehicle turned left in front of them and 8% had a crash in which a vehicle turned right in front of them. As such, intersections should be considered locations of particularly high risk of collisions with motor vehicles. Advanced green bicycle signals may assist with reducing these types of conflicts and stonger alignment with ACT's design guides for best practice solutions for future intersection designs (Transport Canberra and City Services, 2023) will also help to reduce the risk that intersections pose for cyclists.
- Where high incidences (or high potential) of left-turn across bicycle crashes occur, installation of kerb extensions/protected intersections that encourage slower vehicle left turns, improve cyclist visibility (sight lines) should be considered. This may be of particular benefit on Northbourne Ave/Tourist Drive 1 intersection outside the Sydney Building, which has been identified as problematic by cyclists.
- Where mixed traffic or potential conflict interactions are necessary, more consideration should be given to cyclist safety rather than transport efficiency, this is particularly relevant to scenarios where cyclists are required to cross merging traffic. Cyclist safety interventions could include localised speed reductions of traffic with measures such as raised platforms and or reduced speed limits.
- Sixty-eight percent of participants had experienced a near miss and most involved the actions of other road users (e.g., cyclists being passed by a vehicle with less than one metre of space, cyclists being cut off by a vehicle turning left or right). This reiterates the importance of the points above related to the benefits of separated bike paths, marked buffer areas and intersection risks.
- The locations of crashes and near-misses presented in this report should be considered to target efforts to improve infrastructure and cycling safety. Roads and locations where many crashes and near misses have occurred – such as Northbourne Avenue – should be monitored, assessed, and optimised. Additionally, where specific separated cycling

infrastructure has been installed, it is important to assess whether unintentional consequences have arisen or have been noted at the detriment of cyclist safety. Some of these locations have been described above and include too many conflict/turn points across dedicated cycling infrastructure, vehicular use of infrastructure for parking and causing obstructions, incorporating additional roadside hazards in the design as well as issues relating to poor sight lines and left-turning vehicles.

- The sequencing and functionality of traffic lights at intersections should better accommodate cyclists. This includes improving pavement inductive loops or clearly marking where cyclists should wait for optimal detection, using sensors that aren't reliant on induction or providing responsive cyclist activated systems. Shorter signal cycles or more adaptive signal cycles, particularly when vehicular traffic levels are low should be adopted and provision of adequate time for cyclists to cross, would decrease red-light non-compliance and improve cycling efficiency and safety. Additionally, at locations where there is a negligible safety issue when permitting a cyclist to turn left on a red signal, signage allowing cyclists to turn left on a red signal should be considered, to decrease signal non-compliance and improve cycling efficiency.
- Road crossing areas for separated paths need addressing to improve safety and perceived safety for cyclists. Where possible, particularly for low volume traffic roads, priority could be given to pedestrians/cyclists, with additional road infrastructure to slow vehicles or infrastructure (for example kerb extensions) to improve visibility and decrease crossing distances should also be considered.
- For roads with larger widths that include medians with pedestrian/cyclist refuges, adequate space should be provided to ensure larger bikes such as cargo bikes are accommodated safely. Just as local street design requires consideration of garbage truck movements, cycling infrastructure should also consider cargo bikes that require more than the standard space provided for bicycles. Further, where non-compliance of motor vehicles has been identified, efforts to improve compliance should be enhanced.
- Proactive or more visible enforcement of the safer cycling reforms should also be considered to improve cyclist safety, with clear information on what is required from cyclists if they wish to report a driver for non-compliant or unsafe behaviour.
- Finally, persistent and ongoing promotion and education of drivers reinforcing the validity of active travel and the safety rights of cyclists to use the transport system would help shift negative attitudes.

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Appendix A – Cyclist travel and crash experiences in the ACT survey

Demographics

1. What is your home postcode? (Enter '**Not sure**' if you prefer not to answer) ……..
2. Which of the following options most closely aligns with your gender?
   Woman Man Non-binary

   A gender not listed here Prefer not to answer
3. What is your age in years?
   18 - 24 25 - 34 35 - 44 45 - 54

   55 - 64 65 or over Prefer not to answer
4. What is your approximate income per annum?
   Less than $18,200 $18,201 - $45,000 $45,001 - $120,000

   $120,001 + Prefer not to answer
5. What proportions of your riding are undertaken for the following purposes? (Note total should add up to **100%**)
   Commuting (%) ……. Recreational (%) ……. Sport/Exercise (%) …….
6. What is the most common type of bike that you ride?
   Road bike Commuter/hybrid bike Mountain bike

   Fixie/single speed bike Electric/pedal assist Cargo bike

   Comfort/step through bike Prefer not to answer Other (please specify)……..
7. What are your reasons for choosing this bike? (Enter '**Not sure**' if you don't know or prefer not to answer)
   ……

Cycling frequency

8. Approximately how often do you ride?
   Rarely – A few times a year Infrequently – A few times a month

   Once a week 2 to 3 days a week

   4 to 5 days a week 6 to 7 days a week

   Prefer not to answer
9. On average, approximately how many kilometres do you ride per week? (Enter '**Not sure**' if you don't know or prefer not to answer)
   ……

10. On average, approximately how many trips do you ride per week? (Enter '**Not sure**' if you don't know or prefer not to answer)
    …….
11. How many years have you been cycling?
    Less than 1 year 1 - 2 years 3 - 5 years 6 - 10 years

    Greater than 10 years Prefer not to answer

Route choices

12. Do you generally take a particular route when you ride? Yes No

If there is a specific road or bike path that you undertake a lot of your riding on, please answer the following questions. If there are several, pick the one that you would like to discuss.

13. What is the route/road/bike path that you take? (Enter '**Not sure**' if you don't know or prefer not to say)
    ……..
14. What are your motivations for taking this route? (Please explain or enter '**Not sure**' if you don't know or prefer not to say)
    ……...
15. How would you rate the comfort and ease of cycling on this route?
    Very uncomfortable Moderately uncomfortable

    Slightly uncomfortable Neither comfortable nor uncomfortable

    Slightly comfortable Moderately comfortable

    Very comfortable Prefer not to answer

16. Would you say that this route is cyclist friendly?
    Yes Somewhat No Prefer not to answer

17. What makes this route bad, or what are the key issues? (Enter '**None**' if there is nothing that makes this route bad or '**Not sure**' if you prefer not to answer)
    ……..
18. What is good about this route? (Enter '**None**' if there is nothing that makes this route good or '**Not sure**' if you prefer not to answer)
    ……

Riding confidence

19. Under normal traffic conditions, would you say that your riding style is:
    Confident Cautious Interested Not interested Prefer not to answer

20. Please rate your level of comfort if you were cycling on this road:

Very uncomfortable

Moderately uncomfortable

Slightly uncomfortable

Neither comfortable no uncomfortable

Slightly comfortable

Moderately comfortable

Very comfortable

Prefer not to answer

21. Please rate your level of comfort if you were cycling in this bike lane:

Very uncomfortable

Moderately uncomfortable

Slightly uncomfortable

Neither comfortable no uncomfortable

Slightly comfortable

Moderately comfortable

Very comfortable

Prefer not to answer

22. Please rate your level of comfort if you were cycling on this road:

Very uncomfortable

Moderately uncomfortable

Slightly uncomfortable

Neither comfortable no uncomfortable

Slightly comfortable

Moderately comfortable

Very comfortable

Prefer not to answer

23. Please rate your level of comfort if you were cycling on this road:

Very uncomfortable

Moderately uncomfortable

Slightly uncomfortable

Neither comfortable no uncomfortable

Slightly comfortable

Moderately comfortable

Very comfortable

Prefer not to answer

24. Please rate your level of comfort if you were cycling in this bike lane:

Very uncomfortable

Moderately uncomfortable

Slightly uncomfortable

Neither comfortable no uncomfortable

Slightly comfortable

Moderately comfortable

Very comfortable

Prefer not to answer

25. Please rate your level of comfort if you were cycling on this separated bike path:

Very uncomfortable

Moderately uncomfortable

Slightly uncomfortable

Neither comfortable no uncomfortable

Slightly comfortable

Moderately comfortable

Very comfortable

Prefer not to answer

26. Please rate your level of comfort if you were cycling in this bike lane:

Very uncomfortable

Moderately uncomfortable

Slightly uncomfortable

Neither comfortable no uncomfortable

Slightly comfortable

Moderately comfortable

Very comfortable

Prefer not to answer

27. Please rate your level of comfort if you were cycling on this road with this signage:

Very uncomfortable

Moderately uncomfortable

Slightly uncomfortable

Neither comfortable no uncomfortable

Slightly comfortable

Moderately comfortable

Very comfortable

Prefer not to answer

28. Please rate your level of comfort if you were cycling on this road after the bike lane ends:

Very uncomfortable

Moderately uncomfortable

Slightly uncomfortable

Neither comfortable no uncomfortable

Slightly comfortable

Moderately comfortable

Very comfortable

Prefer not to answer

29. Please rate your level of comfort if you were cycling in this bike lane:

Very uncomfortable

Moderately uncomfortable

Slightly uncomfortable

Neither comfortable no uncomfortable

Slightly comfortable

Moderately comfortable

Very comfortable

Prefer not to answer

30. Please rate your level of comfort if you were cycling in this bike lane:

Very uncomfortable

Moderately uncomfortable

Slightly uncomfortable

Neither comfortable no uncomfortable

Slightly comfortable

Moderately comfortable

Very comfortable

Prefer not to answer

31. Please rate your level of comfort if you were cycling on this road:

Very uncomfortable

Moderately uncomfortable

Slightly uncomfortable

Neither comfortable no uncomfortable

Slightly comfortable

Moderately comfortable

Very comfortable

Prefer not to answer

32. Please rate your level of comfort if you were cycling in this bike lane:

Very uncomfortable

Moderately uncomfortable

Slightly uncomfortable

Neither comfortable no uncomfortable

Slightly comfortable

Moderately comfortable

Very comfortable

Prefer not to answer

33. Please rate your level of comfort if you were cycling in this bike lane:

Very uncomfortable

Moderately uncomfortable

Slightly uncomfortable

Neither comfortable no uncomfortable

Slightly comfortable

Moderately comfortable

Very comfortable

Prefer not to answer

34. Please rate your level of comfort if you were cycling in this bike lane:

Very uncomfortable

Moderately uncomfortable

Slightly uncomfortable

Neither comfortable no uncomfortable

Slightly comfortable

Moderately comfortable

Very comfortable

Prefer not to answer

35. Please rate your level of comfort if you were cycling in this bike lane:

Very uncomfortable

Moderately uncomfortable

Slightly uncomfortable

Neither comfortable no uncomfortable

Slightly comfortable

Moderately comfortable

Very comfortable

Prefer not to answer

36. Please rate your level of comfort if you were cycling on this road:

Very uncomfortable

Moderately uncomfortable

Slightly uncomfortable | Neither comfortable no uncomfortable

Slightly comfortable | Moderately comfortable

Very comfortable | Prefer not to answer

Interactions with Police

Imagine that each of the following situations was actually happening to you as a bicyclist, please rate how much anger you would experience:

37. You are fined for cycling without lights.
    None at all | A small amount | A moderate amount
    A large amount | Very much | Prefer not to answer
38. You are fined for cycling without a properly fitted helmet.
    None at all | A small amount | A moderate amount
    A large amount | Very much | Prefer not to answer
39. You are fined for cycling on the wrong side of the road.
    None at all | A small amount | A moderate amount
    A large amount | Very much | Prefer not to answer
40. You are fined as your bicycle is considered not fit for the road (no bell, poor brakes).
    None at all | A small amount | A moderate amount
    A large amount | Very much | Prefer not to answer

Interactions with motor vehicles

Imagine that each of the following situations was actually happening to you as a bicyclist, please rate how much anger you would experience:

41. A fast driving car overtakes you without leaving adequate space.
    None at all | A small amount | A moderate amount
    A large amount | Very much | Prefer not to answer
42. A motor vehicle forces you off your path.
    None at all | A small amount | A moderate amount
    A large amount | Very much | Prefer not to answer
43. A motor vehicle fails to give you right of way.
    None at all | A small amount | A moderate amount
    A large amount | Very much | Prefer not to answer
44. A motor vehicle overtakes you on a narrow lane.
    None at all | A small amount | A moderate amount

A large amount Very much Prefer not to answer

Interactions with other cyclists and pedestrians

Imagine that each of the following situations was actually happening to you as a bicyclist, please rate how much anger you would experience:

45. A cyclist overtakes you on a narrow lane.
    None at all A small amount A moderate amount
    A large amount Very much Prefer not to answer
46. A cyclist rides very quickly towards you and thereby obstructs you.
    None at all A small amount A moderate amount
    A large amount Very much Prefer not to answer
47. A cyclist forces you off your path.
    None at all A small amount A moderate amount
    A large amount Very much Prefer not to answer
48. A pedestrian blocks the bicycle lane.
    None at all A small amount A moderate amount
    A large amount Very much Prefer not to answer
49. A pedestrian walking in the bicycle lane.
    None at all A small amount A moderate amount
    A large amount Very much Prefer not to answer

Clothing and visibility

50. How often do you wear clothing that you believe makes you more visible?
    Never Sometimes Always Prefer not to answer
51. How often do you wear a correctly fastened helmet while riding?
    Never Sometimes Always Prefer not to answer
52. If you answered NEVER or SOMETIMES to the previous question what are your motivations for not wearing a correctly fastened helmet? (Enter '**Not sure**' if you don't know or prefer not to answer)
    ……..
53. How often do you use bicycle lights while riding at night, or in hazardous weather conditions that causes reduced visibility?
    Never Sometimes Always Prefer not to answer
54. How often do you use bicycle lights during the day?
    Never Sometimes Always Prefer not to answer

Safety habits

55. When cycling, do you ever cross through an intersection against a red traffic signal?
    Never Rarely Sometimes Often Always

    Prefer not to answer

56. If you answered RARELY, SOMETIMES, OFTEN, or ALWAYS, what makes you decide to cross against a red traffic signal? (Please explain or enter '**Not sure**' if you don't know or prefer not to answer)
    …….
57. When cycling, do you ever turn left through a red traffic signal?
    Never Rarely Sometimes Often Always

    Prefer not to answer

58. When cycling, do you use hand signals to indicate your intention to turn left and right?
    Never Rarely Sometimes Often Always

    Prefer not to answer

59. If you answered NEVER, RARELY or SOMETIMES, what makes you decide to **Not** use hand signals to indicate your intention to turn left and right? (Please explain or enter '**Not sure**' if you don't know or prefer not to answer)
    …….
60. Have you ever been given an infringement or caution by police while riding?
    Yes – infringement Yes – caution No Prefer not to answer

61. If YES, what was the infringement/warning(s) for? (Please specify infringement/warning and reason or enter '**Not sure**' if you don't know or prefer not to answer)
    ……

Crash/conflict experiences

62. While cycling, have you ever been involved in a crash?
    Yes No Prefer not to answer

63. While cycling, have you ever been involved in a crash as a result of a **motor vehicle**?
Never crashed as a result of a motor vehicle 1 crash 2 crashes

3 or more crashes Prefer not to answer

64. While cycling, have you ever been involved in a crash on a road, shared path, or bike path **where no motor vehicle was involved** (e.g., travelling too fast and lost control of bike)?
    Never crashes under this scenario 1 crash 2 crashes

    3 or more crashes Prefer not to answer

65. Can you please describe what happened in your **most recent significant crash**? (Enter '**Not sure**' if you don't know or prefer not to answer)
    ……
66. What do you believe was the reason for the crash, or caused it? (Please explain or enter '**Not sure**' if you don't know or prefer not to answer)
    ……

67. How long ago did this crash occur? (Enter '**Not sure**' if you don't know or prefer not to answer)
    ……
    ….
68. Did this happen on your regular cycling route?

- Yes No Prefer not to answer

69. Was this crash reported to Police? Yes No Prefer not to answer
70. Please provide the address or GPS coordinates (i.e., from Google Maps) of the location where the crash occurred (Enter '**Not sure**' if you don't know or prefer not to answer)
    ……
    ….
71. What were the environmental/lighting conditions at the time of the crash?

    Daytime sunny | Night-time | Dusk/dawn | Overcast

    Raining daytime | Raining night-time | Raining dusk/dawn | Can't remember

    Prefer not to answer

72. Were you using lights that were switched on at the time?

    Yes – front only | Yes – rear only | Yes – front and rear

    No lights on | Can't remember | Prefer not to answer

73. Do you recall what clothing you were wearing at the time of the crash (normal, sports, hi-vis, colour, etc)? (Enter '**Not sure**' if you don't know or prefer not to answer)
    ……
74. Do you recall if there were any issues with the pavement surface you were riding on (decries, poor surface, potholes, slippery etc.)? (Enter 'None' if there were no issues or '**Not sure**' if you don't know or prefer not to answer)
    ……
75. What was the severity of the injury that you received from your most significant recent crash?

    No injury | Treatment by self or bystander

    Treatment by private doctor | Treatment by ambulance at crash scene

    Treated at hospital – self-presented | Treated at hospital – ambulance presented

    Admitted to hospital – self-presented | Admitted to hospital – ambulance presented

    Prefer not to say

76. Please list the areas of your body that were injured (e.g., arm, head) along with the type of injury that each body region sustained (e.g., laceration, broken bones, etc.). (Enter '**Not sure**' if you don't know or prefer not to answer)
    ……..
77. What caused the injuries you sustained in the crash (e.g., hitting the ground, being hit by a part of the car)? (Enter '**Not sure**' if you don't know or prefer not to answer)
    ……

78. Please list any long-term effects of these injuries (including mental health decline) or have you made a full recovery? (Enter '**Not sure**' if you don't know or prefer not to answer) ……
79. Have you ever had a crash in which you hit your head?
- Yes No Prefer not to answer

80. If YES, were you wearing a helmet?
- Yes No Prefer not to answer

81. If YES, do you believe your helmet protected you from a more severe head injury?
- Yes No Prefer not to answer

82. Have you ever had a crash in which a vehicle turned left in front of you?
- Yes No Prefer not to answer

83. Have you ever had a crash in which a vehicle turned right in front of you?
- Yes No Prefer not to answer

84. Have you ever had a crash which involved someone getting into or out of a car as you were riding past (e.g., 'dooring')? Yes No Prefer not to answer
85. Have you ever been involved in any crashes that were the direct result of problems with the roads, bicycle lanes, or infrastructure in the ACT (you came off your bike due to a pothole in the bike lane)? Yes No Prefer not to answer
86. If YES, what occurred in the crash, what was the problem, and has it been fixed since? (Please explain or enter '**Not sure**' if you don't know or prefer not to answer) ……..
- ……
87. Please provide the address or GPS coordinates (i.e., from Google Maps) of the location (Enter '**Not sure**' if you don't know or prefer not to answer) ……

Cycling experiences on the road

88. When cycling, have you ever had a **near miss** (event with the potential to result in either a crash or injury but didn't, including a vehicle passing too closely)?
    Yes No Not sure Prefer not to answer

When cycling, have you ever experienced the following types of near misses?

89. Perceiving a vehicle passing you with less than a metre of space
    Never Once
    Two to three times More than three times
    Regularly (e.g., weekly) Constantly (e.g., almost every time you ride)
    Prefer not to answer
90. Cut off by a vehicle turning left or right
    Never Once

Two to three times More than three times

Regularly (e.g., weekly) Constantly (e.g., almost every time you ride)

Prefer not to answer

91. A vehicle failed to give way at a T-junction

Never Once

Two to three times More than three times

Regularly (e.g., weekly) Constantly (e.g., almost every time you ride)

Prefer not to answer

92. A vehicle failed to give way at a cross road

Never Once

Two to three times More than three times

Regularly (e.g., weekly) Constantly (e.g., almost every time you ride)

Prefer not to answer

93. A vehicle failed to give way at or on a roundabout

Never Once

Two to three times More than three times

Regularly (e.g., weekly) Constantly (e.g., almost every time you ride)

Prefer not to answer

94. Swerve to avoid a suddenly open car door

Never Once

Two to three times More than three times

Regularly (e.g., weekly) Constantly (e.g., almost every time you ride)

Prefer not to answer

95. Vehicle stopped suddenly in your lane of travel

Never Once

Two to three times More than three times

Regularly (e.g., weekly) Constantly (e.g., almost every time you ride)

Prefer not to answer

96. A vehicle turning through a gap in traffic nearly hit you

Never Once

Two to three times More than three times

Regularly (e.g., weekly) Constantly (e.g., almost every time you ride)

Prefer not to answer

97. Run off the road by a vehicle

Never Once

Two to three times More than three times

Regularly (e.g., weekly) Constantly (e.g., almost every time you ride)

Prefer not to answer

98. A pedestrian or animal unexpectedly stepped into your path

Never Once

Two to three times More than three times

Regularly (e.g., weekly) Constantly (e.g., almost every time you ride)

Prefer not to answer

99. Loss of control on slippery, uneven, or damaged (pothole) surface

Never Once

Two to three times More than three times

Regularly (e.g., weekly) Constantly (e.g., almost every time you ride)

Prefer not to answer

100. Misjudged the speed of an approaching vehicle when crossing an intersection and needed to speed up in order to safely clear the intersection

Never Once

Two to three times More than three times

Regularly (e.g., weekly) Constantly (e.g., almost every time you ride)

Prefer not to answer

101. Travelling too fast for conditions (e.g., down a hill or around a corner)

Never Once

Two to three times More than three times

Regularly (e.g., weekly) Constantly (e.g., almost every time you ride)

Prefer not to answer

102. Mechanical fault of bike resulted in near miss (brake failure, chain break, chain dropped, etc.)

Never Once

Two to three times More than three times

Regularly (e.g., weekly) Constantly (e.g., almost every time you ride)

Prefer not to answer

103. What was the outcome in the most significant recent near miss that you experienced as a single cyclist or involving a motor vehicle? (Please explain or enter '**Not sure**' if you can't remember or would prefer not to answer or '**N/A**' if you've never had a near miss)
……
….

104. Did this near miss occur on your regular cycling route?
Yes No Prefer not to answer Have never had a near miss

105. Please provide the address or GPS coordinates (i.e., from Google Maps) of the location where the near miss occurred (Enter '**Not sure**' if you don't know or prefer not to answer or '**N/A**' if you've never had a near miss)
……..

106. What were the environmental/lighting conditions at the time of your most significant near miss?
Daytime sunny Night-time Dusk/dawn Overcast

Raining daytime Raining night-time Raining dusk/dawn Can't remember

Prefer not to answer Have never had a near miss

107. Were you using lights that were switched on at the time?
Yes – front only Yes – rear only Yes – front and rear

No lights on Can't remember Prefer not to answer

Have never had a near miss

108. Do you recall what clothing you were wearing at the time of the near miss (normal, sports, high-vis, colour, etc. – enter '**Not sure**' if you don't know or would prefer not to answer or '**N/A**' if you've never had a near miss)?
…….

109. Do you recall if there were any issues with the pavement surface you were riding on (debris, poor surface, potholes, slippery, etc. – enter '**Not sure**' if you don't know or would prefer not to answer or '**N/A**' if you've never had a near miss)?
……..

Cycling experiences on the road

110. Have you ever reported a driver to the police?
Yes No Prefer not to answer

111. If you have reported a driver to the police, what behaviour did you report and what was the outcome (please specify or enter '**Not sure**' if you don't know or prefer not to answer)?
……

112. Please highlight any issues on the ACT road system that affect cycling safety by providing the address or GPS coordinates of the location and describing the nature of the issue below:

- Location 1: ……
- Location 2: ……
- Location 3: ……

113. Do you have any video footage of your most significant recent crash or near miss that you would like to share? If you do, please upload the video onto the following link:

114. Do you know of any problematic roads, lanes, or infrastructure in the ACT? Can you please provide the address or GPS location and describe the issue?

115. Do you have any photos of the problematic road, lane, or infrastructure in the ACT? Or you can screenshot an image from Google Streetview highlighting the issues? If you do, please upload the photos onto the following link:

116. Have you ever had any incidents with heavy vehicles (trucks or buses) while cycling?

Yes – crash Yes – near miss (including a vehicle passing too closely)

No Prefer not to answer

117. If YES, what were the circumstances of the crash or near-miss (please explain or enter '**Not sure**' if you don't know or prefer not to answer)? ……

Interactions with other road users

118. Have you ever been **bullied or intimidated** by another road user while cycling?

- Yes No Prefer not to answer

119. If YES, what were the circumstances of the most recent incident (please explain or enter '**Not sure**' if you don't know or prefer not to answer)? ……

120. Have you ever experienced **verbal road rage**?

Never Rarely Sometimes Often Always

Prefer not to answer

121. Have you ever experienced **aggressive horn sounding road rage**?

Never Rarely Sometimes Often Always

Prefer not to answer

122. Have you ever experienced **hand gesture road rage**?

Never Rarely Sometimes Often Always

Prefer not to answer

123. Have you ever experienced **tailgating by a vehicle**?

Never Rarely Sometimes Often Always

Prefer not to answer

124. Have you ever experienced someone **deliberately driving close to you**?

Never Rarely Sometimes Often Always

Prefer not to answer

125. Have you ever experienced **physical assault road rage**?

Never Rarely Sometimes Often Always

Prefer not to answer

126. Have you ever experienced someone **cutting in front of you**?

Never Rarely Sometimes Often Always

Prefer not to answer

127. Have you ever experienced someone **throwing an object at you**?

Never Rarely Sometimes Often Always

Prefer not to answer

128. Have you ever experienced **poor behaviour** targeted **at you**?

Never Rarely Sometimes Often Always

Prefer not to answer

Please specify the poor behaviour that has been targeted at you ……..

129. Of the aggression that you have experienced, which road users does it come from? Please rank from most at the top to least at the bottom, or select N/A if you have not experienced any aggression, don't know or prefer not to answer.

-
- ……. Drivers
- ……. Motorcyclists
- ……. Pedestrians
- ……. Other bicyclists
-

130. Have you ever experienced other forms of road rage? (please explain) ……..

……

General perceived safety in the ACT?

131. In general, do you think that Canberra is a safe city in which to ride a bicycle?

-

Yes No Prefer not to answer

132. Why? (Please explain or enter '**Not sure**' if you don't know or prefer not to answer)

- ……..…….

- **Recent ACT safer cycling reforms**

- Listed below are several safer cycling reforms that have been implemented in the ACT. Please indicate whether you believe that they make cycling safer in the ACT or not.

133. Increased penalties for road users who cause (or are negligent in) a crash in which a vulnerable road user has experienced actual bodily harm.
Makes cycling safer in the ACT Does not make cycling safer in the ACT

Not sure Prefer not to answer

134. Minimum distance requirements for a vehicle to pass a cyclist of 1 metre in speed limits of 60 km/h or lower and 1.5 metres in speed limits higher than 60 km/h.
Makes cycling safer in the ACT Does not make cycling safer in the ACT

Not sure Prefer not to answer

135. Allowing cyclists to ride across pedestrian crossings (without dismounting).
Makes cycling safer in the ACT Does not make cycling safer in the ACT

Not sure Prefer not to answer

136. Do you have any thoughts/ideas on other possible interventions that would improve cycling safety in the ACT?
……

- **General other questions**

137. Have you ever ridden your bike while under the influence of alcohol or drugs?
Yes No Prefer not to answer

138. Have you ever ridden while distracted, for example using a mobile phone?
Yes No Prefer not to answer

139. Do you own a motor vehicle?
Yes No Prefer not to answer

140. Do you regularly drive a motor vehicle?
Yes, 1 to 2 days a week Yes, 3 to 5 days a week

Yes, 6 to 7 days a week No

Prefer not to answer

Appendix B – Online survey preamble

PROJECT TITLE: A survey of cyclist travel and crash experiences in the Australian Capital Territory

HREC approval number: H-2023-127

Principal Investigator: **James Thompson**

Dear participant,

You are being invited to participate in the research project described below.

What is the project about, and who is undertaking the research?

This research project is about the travel experiences of bicyclists in the Australian Capital Territory (ACT). The aim is to examine how much riding bicyclists do, the routes that they regularly take, their riding confidence, their safety practices, their experiences with crashes or near misses, their injury outcomes from any crashes, and their perceptions of their overall safety on the ACT road network. This will help to identify how cycling travel and safety in the ACT can be improved.

This project is being conducted by James Thompson and Giulio Ponte from the University of Adelaide and funded through the ACT Road Safety Grant.

Why am I being invited to participate, and how long will it take?

You are being invited as you are aged 18 years or older, you regularly cycle (at least once a month) in the ACT and undertake most of your riding (i.e., more than half) on roads and public paths (i.e., not trails/mountain bike riding or indoor cycle tracks).

You are being invited to complete an online survey, that is expected to take a total of 20 to 30 mins. The survey questions are about how much and how often you ride, the routes that you regularly take, your riding confidence, your safety practices, any crashes or near-misses you have been involved in, your injuries from any crashes, and your thoughts on the safety of the ACT road network for cyclists. The survey is written in English. If you would like to participate in the survey but are not fluent in English, please feel free to have a family member, friend or translator present who can interpret the survey for you.

For your time, you will be entered into a prize draw to win one of four $100 Coles Myer gift vouchers.

What are the potential benefits of the research project?

This research will highlight the road safety issues that exist for bicyclists in the ACT (related to other road users, roads and infrastructure, and government policies), and may assist in identifying ways to address these issues and improve the safety of ACT bicyclists in the future. It is about giving a voice to bicyclists to have a say about their comfort and safety on the road.

Are there any associated risks, and can I withdraw my participation?

It is possible that answering questions about past crashes and injuries could cause you some emotional distress and discomfort. If this were to occur, you are welcome to cease any further participation. Additionally, contact details for trauma support and counselling services are provided to all participants.

Participation in this project is completely voluntary. If you agree to participate, you can withdraw from the study at any time within a month from when you complete the online survey.

What happens with my information?

All responses are confidential. However, your email address will be necessary for the following purposes:

- If you wish to withdraw from the study at any time within a month from when you complete the online survey. This is required so that your survey responses can be identified and removed.
- So that any data (e.g., videos, pictures, GPS coordinates) that you upload can be linked to your survey responses.
- If you wish to be emailed a link to the results of the research.
- To contact you if you are one of the winners of the four $100 Coles Myer gift vouchers.

Your email addresses will be stored separate from your survey responses and will be deleted at the conclusion of the project. There is no way you can be identified in the stored survey data. Data will be stored securely in encrypted computers and only the researchers will have access to your responses. The data will be stored for 5 years. Results will be published in a report and conference presentation or journal article. All results will be based on group data. There is no way you could be identified in any publication. Data could potentially be re-used in future related studies by the same researcher.

Your information will only be used as described in this participant information sheet and it will only be disclosed according to the consent provided, except as required by law.

Who do I contact if I have questions about the project?

If you have any questions about the project, you can contact the researchers using the details below:

James Thompson **Ph:** +61 8 8313 0917 **Email:** james.thompson@adelaide.edu.au

Giulio Ponte **Ph:** +61 8 8313 3554 **Email:** giulio.ponte@adelaide.edu.au

What if I have a complaint or concerns?

The study has been approved by the Human Research Ethics Committee at the University of Adelaide (approval number H-2023-127). This research project will be conducted according to the NHMRC National Statement on Ethical Conduct in Human Research 2007 (Updated 2018). If you have questions or problems associated with the practical aspects of your participation in the project, or wish to raise a concern or complaint about the project, then you should consult the Principal Investigator. If you wish to speak with an independent person regarding concerns or a complaint, the University's policy on research involving human participants, or your rights as a participant, please contact the Human Research Ethics Committee's Secretariat on:

Phone: +61 8 8313 6028 **Email:** hrec@adelaide.edu.au **Post:** Level 3, Rundle Mall Plaza, 50 Rundle Mall, ADELAIDE SA 5000

Any complaint or concern will be treated in confidence and fully investigated. You will be informed of the outcome.

If I want to participate, what do I do?

The completion and submission of survey responses will be taken as an indication that you have read the above information and consent to participate.

Yours sincerely,

Dr James Thompson, Research Fellow, Centre for Automotive Safety Research, University of Adelaide

Mr Giulio Ponte, Research Engineer, Centre for Automotive Safety Research, University of Adelaide

Appendix C – List of infrastructure issues in the ACT identified by the sample of cyclists

Location	Comment	Latitude	Longitude
1	Blind corner under the bridge on shared path.	-35.1555144	149.1518051
2	Blind corner under the bridge on shared path.	-35.1587137	149.1494354
3	Blind corner under the bridge on shared path.	-35.1645041	149.1433387
4	No reason given, presumably crossing issue.	-35.1858831	149.1193188
5	Gungahlin Place heading south to Efkarpidis St and on to Valley Ave (to get to Palmerston). Gungahlin Place and Efkarpidis St quite rough.	-35.1865546	149.1349087
6	This bike path is not continuous to town centre of Gungahlin. Very bad cycle interface for Gungahlin town centre in general.	-35.1870368	149.1318261
7	No reason given, presumably poor layout of ending bike lane.	-35.189324	149.080347
8	Bike lane ends and then restarts.	-35.1924399	149.1270517
9	No reason given, presumably poor layout of ending bike lane.	-35.1925073	149.1271105
10	No reason given, presumably problematic crossing point.	-35.1932735	149.1471842
11	Oodgeroo Avenue. Trees that have not been pruned by the local council obstructs view of pedestrians, cyclists and drivers.	-35.1941679	149.1462423
12	Dimby Street, Harrison - plant hedge of houses partially covering the bike path making it impossible to ride on them, hence forcing people to ride on road which is a potential risk for accident with cars.	-35.2005549	149.1569871
13	All of the bike path endings/connections? In my experience, almost every bike path in the ACT just abruptly ends at some point with no clear place to go, if not dumping you out onto a major road (i.e. been caught out by the bike path along Horse Park Drive which ends with no warning and the only place to go is onto the side of a dual carriageway just after Bettong Ave). Northbourne Ave and Limestone Ave both need proper, separated, or protects bike paths not just a bike gutter.	-35.2005637	149.1659739

14	Trying to cross the road here at the roundabout is very dangerous both ways as people driving into and out of Charnwood are for some reason very aggressive towards cyclists.	-35.2051464	149.0273921
15	Exit ramp to Majura Drive off Federal Hwy It is very difficult for cyclists to cross the off-ramp to Majura drive here safely. Vehicles are travelling at high speed and the corner makes it very difficult to see them coming.	-35.2078167	149.193397
16	Exit ramp to Majura Drive off Federal Hwy.	-35.2080806	149.1929693
17	No reason given, presumably crossing issue	-35.2091837	149.0891215
18	No reason, presumably narrow road, no bike infrastructure.	-35.2098816	149.1403072
19	This is a very poor-quality path used as a detour around a bike path that is out of action due to road works.	-35.2105844	149.087634
20	Ginninderra Drv, Kingsford Smith Drv intersection. Cycling lane disappears for Ginninderra Drv in both directions.	-35.2164578	149.0418848
21	Bike lane ends after each intersection traveling east on Ginninderra Dr.	-35.2177162	149.043553
22	Gungahlin Drive and Sandfort Street, presumably crossing issues.	-35.2183677	149.1309257
23	Gungahlin Drive and Sandfort Street. Cars to give way on pedestrian crossing as they enter Gungahlin Drive southbound.	-35.2183681	149.1311498
24	Ginninderra Drv, Kingsford Smith Drv intersection. Cycling lane disappears for Ginninderra Drv in both directions.	-35.2185454	149.0453563
25	No reason given.	-35.2194852	149.1449977
26	Southern Cross Drive from Kippax to Kingsford Smith Drive, presumably no bike lanes.	-35.2199457	149.0240009
27	Riding on Flemington in general sucks - crossing tracks at angles, bike lanes often blocked by rubbish or scooters, northbound bike lane has a hard wall and little separation with vehicles, cars constantly using bike lane to turn into Sandford St.	-35.2228445	149.144352
28	Barton Hwy, Gungahlin Drv roundabout. Cycle crossing point when heading East on Barton Hwy is unsafe and usually unusable.	-35.2243544	149.1248803
29	No reason given.	-35.2259711	149.1963604

30	Baldwin drive at Lawson, cycle lane ends.	-35.2292646	149.0959625
31	Cyclists going to the Farmer's market must deal with inattentive drivers going to the servo and Maccas. Zero bike infrastructure.	-35.2300804	149.1513394
32	Bike path closed here due to construction work and cyclists regularly ride the wrong way along the on-road bike lane.	-35.2310572	149.0814925
33	No reason given.	-35.2318748	149.1449954
34	Very stupid lighting controls on the bike path across the Flemington Road entrance to EPIC. "Don't walk" shown when the traffic lights are green along Flemington Road. Completely ridiculous! Are you really supposed to stop and press the button at this point. Completely nonsensical for a pretty new crossing and shows complete ignorance of bicycling needs. Too many others to mention. When I see something very dangerous, I'll report it to 'fix my road'.	-35.2319653	149.1450038
35	No reason given.	-35.2321555	149.0584705
36	No reason given, presumably crossing issue	-35.2322354	149.1256328
37	No reason given, presumably conflict inducing intersection.	-35.2323534	149.1254263
38	Through to Kippax is the worst section of path.	-35.2325925	149.0505062
39	Drake Brockman Drive - no bike lane and huge centre space on the road. One lane each way and lots of traffic.	-35.2329286	149.0194325
40	Crossing Ellenborough St near the Barton Highway on C1. Needs a Wombat crossing and reduced speed limits .	-35.2329518	149.1251824
41	Drake Brockman Dr. no lights or bike lane, this is a major connecting road in West Belconnen	-35.2337978	149.0209297
42	Belconnen bike way is hazardous along Emu Bank with multiple vehicle crossing points for access to fast food restaurants.	-35.2364921	149.0700601
43	Separated cycle lanes on Emu Bank, Belconnen. Multiple car park entries cross the separated lanes. Drivers don't pay attention to cyclists. I have had multiple near misses and refuse to ride there anymore.	-35.2364921	149.0700601
44	Intersection of Luxton St & Coulter Dr (Belconnen) - on-road bike path ends after intersection with no route to get onto pedestrian path.	-35.2367845	149.0580128
45	Northbourne Ave bike path between Barton Hwy and Phillip Ave.	-35.2371136	149.1422396

46	Footpath narrows with traffic light pole and ramp handrails, people stand at lights waiting to cross blocking path.	-35.2386459	149.0765587
47	Terrible path condition.	-35.2386787	149.1399286
48	Bike path along Federal Highway.	-35.2389185	149.1395829
49	Dirt washout on footpath.	-35.2395178	149.0704087
50	Dirt washout on footpath.	-35.2395991	149.06474
51	Reported to Fix My Street but not fixed, part of road overgrown and littered with leaf-fall.	-35.2399856	149.1041895
52	In order to continue using bike path, cyclists must cross intersection at two lights. This takes at least 5 min because cars are given preference.	-35.2402547	149.1368631
53	Belconnen Way - no bike lane and huge centre strip available.	-35.2408132	149.0348633
54	Southern Cross Drive - bike lane simply stops mid-road. Huge space in centre strip available.	-35.2194205	149.0192362
55	No reason given, presumably no bike lane and huge centre strip available.	-35.2408548	149.0351944
56	No reason given, presumably no bike lane.	-35.2424349	149.1410034
57	Intersection of Belconnen Way & Coulter Dr: Belconnen Way bike lanes end suddenly with no alternative route.	-35.2429521	149.0563685
58	Rough road surface.	-35.2445264	149.1534884
59	No pedestrian crossing or lights makes it difficult to get past sporting parents.	-35.2460757	149.1342351
60	Lack of cyclist prioritisation along cycle way routes, forcing cyclists to halt for local car traffic, and descend onto the roadway.	-35.248374	149.0747758
61	No reason given, presumably crossing issue.	-35.2494865	149.1341712
62	No reason given, presumably car park conflicts.	-35.249561	149.1390241
63	Lack of cyclist prioritisation along cycle way routes, forcing cyclists to halt for local car traffic, and descend onto the roadway.	-35.2502998	149.066657
64	Cars speed and no cycling infrastructure to safely make way into the Dickson Shopping area	-35.2505447	149.1366166
65	No reason given - presumably crossing issue.	-35.2524181	149.1350819
66	Button for crossing is difficult to access when using a cargo bike as it is located far away from the crossing, behind existing railing for bridge.	-35.253168	149.1335805
67	Short advertised bike lane.	-35.2544265	149.1390394

68	Redfern Street, Macquarie near Jamison, the bicycle path becomes a 2 lane road with no way to get your bike off onto the kerb	-35.2549249	149.0705347
69	Massive tyre-sized perpendicular crack in bike path.	-35.2559354	149.129895
70	Lack of cyclist prioritisation along cycle way routes, forcing cyclists to halt for local car traffic, and descend onto the roadway.	-35.2560632	149.067309
71	No convenient way to cross wattle street from Northern bike path to continue journey.	-35.2566438	149.1283579
72	Northbourne Avenue bike lanes north and south are narrow and near the three lanes of traffic.	-35.257003	149.1329363
73	Northbourne Ave - very narrow cycle lane in busy traffic.	-35.257003	149.1329363
74	Miller Street (at Quandong Street intersection), O'Connor, shared path road crossing would benefit from a redesign and upgrade.	-35.2584731	149.1154278
75	Macarthur street turning off from Belconnen way has no bike path going towards Belconnen only on the side going towards O'Connor.	-35.258643	149.1093382
76	Bad road and bike lane just ends.	-35.25869	149.1079649
77	Bad road and bike lane just ends.	-35.2591911	149.1053703
78	The white paint on roads providing so called "cycling infrastructure" is tragic - drivers do not care about cycle lanes and they provide no real protection or separation for cyclists. Northbourne Avenue is still terrible and very dangerous - I never ever ride there.	-35.2593479	149.1325772
79	Corner of Wakefield Ave and Northbourne - crossing of slip lanes and light rail.	-35.2602405	149.1324771
80	MacArthur Avenue into Wakefield Avenue. Insufficient traffic light time for a bicycle to clear the intersection.	-35.2604375	149.1317134
81	Drivers speeding through red lights (I see this here regularly).	-35.2606306	149.1344085
82	Most of Northbourne Avenue is extremely high risk for lack of driver awareness of cyclists in the bike lane. Also due to the amount of arterial roads (i.e. constant left turns by cars).	-35.2611005	149.1318221
83	Lack of cyclist prioritisation along cycle way routes, forcing cyclists to halt for local car traffic, and descend onto the roadway.	-35.2613526	149.0689833
84	Belconnen Aranda ACT 2614 - very narrow path.	-35.262941	149.0738549
85	Lowanna St, presumably narrow road.	-35.2635388	149.1351891

86	Intersection Cox St and Campbell Street Ainslie has bad surface.	-35.2635584	149.1437735
87	Tram crossing impossible to navigate with loaded cargo bike.	-35.2638629	149.1318116
88	Limestone Ave - No reasons given.	-35.2640539	149.1370263
89	Northbourne Avenue bike lanes north and south are narrow and near the three lanes of traffic.	-35.2653431	149.1311392
90	Northbourne Ave, No reason given	-35.2653431	149.1311392
91	No reason given, presumably crossing issue.	-35.2655847	149.138233
92	Tram crossing impossible to navigate with loaded cargo bike.	-35.2663692	149.1314454
93	Bike path ends, should continue on Western side of Sullivans creek.	-35.2667469	149.1239548
94	No reason given, presumably problematic crossing point, little space in middle	-35.2668669	149.1236289
95	No reason given, presumably no bike infrastructure.	-35.2683959	149.1194014
96	No reason given, presumably infrastructure issue	-35.269443	149.1270746
97	No reason reason given, presumably Bike lane on Limestone Avenue abruptly ending.	-35.2701327	149.1405901
98	No reason given, presumably bus stop in bike lane.	-35.2707637	149.1307241
99	Limestone Ave needs a bike path.	-35.2714637	149.14083
100	Limestone Avenue is a heavily trafficked road with no dedicated cycle lane. This causes cyclists to ride on a vehicle lane, and results in risky or narrow overtakes from vehicles which are unsafe.	-35.2714637	149.14083
101	Limestone Avenue is quite scary to cycle down because of no cycle lane and the car lanes are quite narrow so cars find it difficult to pass cyclist. I sometimes ride on the pavement instead, but it is very broken so is also quite difficult and slow to ride on.	-35.2714637	149.14083
102	Limestone Avenue - main route to east side of town but very poor infrastructure	-35.2716212	149.1414516
103	Blind corner maybe needs a convex mirror.	-35.2719511	149.1177096
104	Lonsdale St in Braddon very poor quality.	-35.2722028	149.1329174
105	Pedestrian crossing button missing homing beeps.	-35.2722329	149.117107
106	No reason given, presumably lack of bike lane, bus lane taking the space.	-35.272286	149.1172278
107	Sullivan's Creek bike path.	-35.2727557	149.1224845

108	No bike infrastructure to ride from bike path into Braddon on Gould Street, Eloura Street, Mort Street or Lonsdale Street.	-35.2738355	149.1268401
109	Cycle lane next to bus lane does not allow buses 1m to pass. Dangerous.	-35.2739061	149.1228781
110	Cars turning left into McKay St across cycling traffic.	-35.2745848	149.129639
111	Cyclists travelling into Braddon leave bike path onto road and intersections with zero bike infrastructure.	-35.2752524	149.1254735
112	No reason given, presumably crossing issue.	-35.2754209	149.1283657
113	No reason given, perhaps left turn vehicle conflicts, light rail track issues.	-35.2756429	149.1292415
114	Limestone Ave has no paths/lanes or they just end. It is a significant link for people who live in or traverse the area.	-35.275969	149.1434459
115	Limestone Ave - cycle lane disappears randomly for no good reason (this is one example of a Canberra-wide problem).	-35.2760522	149.1434948
116	Limestone Ave - cycle lane disappears randomly for no good reason.	-35.2760522	149.1434948
117	Limestone Avenue - the bike lane ends and then there is limited room.	-35.2760522	149.1434948
118	No cycle infrastructure on Kingsley St, Acton and it can be very busy with cars and multiple driveways into UniLodge and Toad Hall.	-35.2761359	149.124354
119	From corner of Barry Drive and Marcus Clarke St to Rudd St (to head towards city) - no bike lane to join the two sections.	-35.2764718	149.1265125
120	Cycle Lane is separated but rises up and down - kerb should stay to maintain protected sections, but bike lane should be level.	-35.2768223	149.126779
121	The Bicentennial National Trail Belconnen - irregular and uneven surface (lumps and bumps)	-35.2769576	149.0779761
122	Traffic light is always red for pedestrians/cyclists unless pressed. Should be green and in sync with motorised light phase.	-35.2772656	149.1129803
123	Shared zone does not work for cycling into the city. Bike infrastructure ends. Cars constantly speed. Bunda street is not safe for pedestrians or cyclists. Passenger car volume is still too high.	-35.2773819	149.1305589

124	Drop-off lane in high traffic zone with double parking and crossing bicycle lane.	-35.2777347	149.1291608
125	No reason given, presumably parking conflicts with cyclists.	-35.2777992	149.1295823
126	No reason given, presumably poor-quality bike lane.	-35.2779107	149.1291387
127	Jolimont Centre drop-off zone, cars not looking as they pull in and out, very high risk of being doored.	-35.2779975	149.1291249
128	Vehicle drop off/pick up outside Jolimont Centre on Northbourne Ave. Cars are erratic. Cycling past on the road means you need to pull out into traffic, which can be heavy.	-35.2781782	149.1290916
129	No reason given,presumably because the C8 path ends and there's no further bicycle infrastructure.	-35.2783472	149.126355
130	Separated bike lines in Canberra CBD - bikes entering and leaving these ramps aren't seen by drivers.	-35.2783918	149.1295064
131	Is a raised cycleway which is completely unnecessary.	-35.2784849	149.1294923
132	Northbourne Avenue next to Sydney and Melbourne Buildings - raised bicycle path is often obstructed by pedestrians, advertising infrastructure.	-35.2786705	149.1294631
133	Separated bike lanes in Canberra CBD - bikes entering and leaving these ramps aren't seen by drivers.	-35.2792125	149.1293746
134	Northbourne Road and London Circuit intersection - the raised separated bike lane just confuses drivers, and they don't look for cyclists when turning.	-35.2793007	149.1293604
135	Tourist Drive 7, Canberra ACT 2601. This location feels very unsafe as many vehicles turn left and cross the path of cyclists. Vehicles often fail to see the cyclist as the cycle path is separated and raised up from the height of the road and so they presumably don't realise the cyclist is a vehicle in this instance (and presumably assume they don't have right of way).	-35.2793007	149.1293604
136	Northbourne Avenue next to Sydney and Melbourne Buildings - raised bicycle path is often obstructed by pedestrians, advertising infrastructure.	-35.2793047	149.1289227

137	Northbourne Avenue travelling south. The bike lane becomes a grade separated off road path (recently upgraded, within the last few years). The off-road path re-joins the road just before an intersection. When lights are green, because bike lane is off road and at the same grade as the pedestrian pavement, motorists often turn left in front of me. I understand this infrastructure was designed and installed with no design consultations from PedalPower ACT, the peak cycling advocacy body in ACT.	-35.2793869	149.1293467
138	Cycle Lane is separated but rises up and down - kerb should stay to maintain protected sections, but bike lane should be level. Also, traffic light phase preferences motorise vehicles and will always be red for a cyclist travelling.	-35.2795571	149.1254632
139	Cycling just disappears then you're in the traffic.	-35.2798832	149.1307444
140	All the cyclist priority lanes on Marcus Clarke Street have good intentions but are very dangerous as cars turn in front of cyclists even though cyclist have right of way. Unfortunately, it is not well known to cars that they must give way, or they haven't realised there's even a cyclist there.	-35.2807004	149.1244246
141	Boolee street, uneven surface, lighting.	-35.280772	149.1381309
142	Bike lane on Limestone Avenue abruptly ends.	-35.2809986	149.1463529
143	Roadworks for the just completely closed off the cycleway.	-35.2814244	149.1297487
144	Gap in city loop cycle route on Bunda Street between the Bunda Street shared zone and the lane on Binara St/Allara St.	-35.2817188	149.1347957
145	Marcus Clarke to London Circuit - no easy bike access.	-35.2823356	149.1270458
146	Canberra, Australian Capital Territory 2601. This location has road works at present. There are many vehicles which turn left here and fail to see or give way to the cyclists continuing straight ahead at the lights. There have been many incidents in this location on my commute where vehicles have not seen the cyclist and have crossed in front of (or hit) them.	-35.2824505	149.1298798
147	No reason given, presumable bad surface, no bike lanes.	-35.2830026	149.0413135
148	Coppins Crossing, no reason given, presumably bad surface, no bike lanes.	-35.2830026	149.0413135

149	Parkes Way (east bound) on the bridge at Sullivans Creek, presumably crossing point issue.	-35.2837427	149.1101909
150	Corner of Edinburgh Ave and Marcus Clarke St - transition from two-way path on one side of the road to one-way bike lanes on both sides.	-35.2839476	149.1248525
151	There's gravel build up on the cycle path making it slippery for anyone on a road bike.	-35.2841717	149.1601225
152	Bridge is extremely narrow. Used by pedestrians and cyclists. Dangerous to both.	-35.284688	149.1252289
153	Narrow shared footbridge at the end of Marcus Clarke Street over Parkes Way - seen so many pedestrian-cyclist near misses.	-35.2853775	149.1252458
154	Lots of the segregated bike paths around Canberra are far too narrow to safely pass pedestrians and other cyclists, this section around Lake Burley-Griffin is a good example.	-35.2855	149.109503
155	This section of the bike path on Commonwealth Avenue (northbound) has large potholes and loose pavement that has been there for years.	-35.2859563	149.1279484
156	Canberra Central, Parkes ACT 2600. This location has a cyclist 'right of way' green-paved lane, however vehicles merging here are at an angle that makes it very difficult to see cyclists who are in their blind spot in this lane. I have witnessed many near misses where drivers have failed to see cyclists in the lane as the vehicle has merged.	-35.2868083	149.1281551
157	Poor surface, poor lighting, lots of cars turning left.	-35.2870968	149.1277139
158	Path is poorly lit, which is a significant issue when cars are turning off onto Parkes Way at 60+ km/h.	-35.2872815	149.1276778
159	Parkes Way - no bike lane along most of its length	-35.287418	149.1350794
160	No reason given, presumably poor-quality bike lane/lack of bike lane.	-35.2879424	149.1671271
161	The bridges across Lake Burley-Griffin are not wide enough for pedestrians and cyclists to share.	-35.2917644	149.1272868
162	Commonwealth Bridge is narrow, debris, cracked paths	-35.2929366	149.1270737
163	Little to no verge on regular CBR cycling route.	-35.2937233	148.9949256
164	Lack of cyclist prioritisation along cycle way routes, forcing cyclists to halt for local car traffic, and descend onto the roadway.	-35.2999233	149.11568
165	Lack of cyclist prioritisation along cycle way routes, forcing cyclists to halt for local car traffic, and descend onto the roadway.	-35.2999369	149.1043036

166	Kings Ave has narrow lanes. Some cars pass very close.	-35.3000203	149.1457426
167	Lack of cyclist prioritisation along cycle way routes, forcing cyclists to halt for local car traffic, and descend onto the roadway.	-35.3004646	149.1174564
168	Lack of cyclist prioritisation along cycle way routes, forcing cyclists to halt for local car traffic, and descend onto the roadway.	-35.3004867	149.098739
169	Lack of cyclist prioritisation along cycle way routes, forcing cyclists to halt for local car traffic, and descend onto the roadway.	-35.3005819	149.1211223
170	Kings Ave Bridge is narrow, debris, cracked paths.	-35.3013095	149.1424337
171	The bike path ends abruptly here, this corner is full of debris and is not safe to turn quickly and you have to swerve around it.	-35.3015057	149.1806852
172	Trying to crossover Morshead Drive coming out of Russell to access cycle path around the lake. This is nearly impossible in peak hour traffic.	-35.302329	149.1518994
173	Any place where bicycle lanes suddenly end are very problematic e.g. turn off from Commonwealth Park to State. Generally, the bike infrastructure around the Parliamentary Triangle is poor.	-35.3023648	149.1256099
174	Bike lane leading onto State Circuit abruptly ends.	-35.3023648	149.1256099
175	Lack of cyclist prioritisation along cycle way routes, forcing cyclists to halt for local car traffic, and descend onto the roadway.	-35.303388	149.1216884
176	Bike path Yarralumla, no reason given, presumably lack of cyclist prioritisation along cycle way routes, forcing cyclists to halt for local car traffic, and descend onto the roadway.	-35.3038215	149.101336
177	There are roots that make the path very bumpy - which catches me out sometimes when riding in the dark.	-35.3043522	149.1665544
178	Lack of cyclist prioritisation along cycle way routes, forcing cyclists to halt for local car traffic, and descend onto the roadway.	-35.3048601	149.080379
179	No safe/legal access to cycleway southbound from Novar St (needs an off-ramp from Novar St southbound to the cycleway between Kintore Cr and the Dudley St intersection).	-35.3051115	149.0929497

180	Coming around State Circle at this point means the bike lane disappears and you are required to contend with traffic entering your lane from behind on your left side. This traffic has just exited Adelaide Avenue in a long sweeping bend with a speed limit of 70km/h. Crossing here is dangerous.	-35.3083129	149.1192255
181	Hopetoun Circuit in Deakin, no reason given presumably lack of infrastructure.	-35.3087153	149.1041018
182	Novar St and Dudley St signal junction - no reason given, presumably unusual layout.	-35.3093703	149.0982901
183	This location and ALL locations on Adelaide Avenue (east and west bound) where on- or off-ramps join the road, and the bike lane is completely unprotected. Green paint on the road is NOT SUFFICIENT infrastructure to protect cyclists from vehicles travelling at 80kmh. This applies to all roads in ACT where bike lanes are present on multilane carriageway where on-/off-ramps join/leave the road.	-35.3099647	149.1177063
184	Bike lane forces riders to cross slip lanes without right of way which can be near impossible during peak hours and no viable alternative.	-35.3103946	149.1156915
185	Broken bollard with sharp edges, then heading approximately 15m north there are lifted pavers on the path.	-35.310817	149.1419618
186	Eastlake Parade, Kingston (no reason given).	-35.3108617	149.1451888
187	Dooring shenanigans, and then the bike lane runs out.	-35.3113011	149.1453357
188	No reason given, presumably blind corner.	-35.3113701	149.1191633
189	Adelaide Avenue exit to Hopetoun Circuit - high speed drivers exiting behind and in front of my bike.	-35.3126424	149.1048311
190	This point is also on Adelaide Avenue and is one of the slip lane exits into Deakin/Yarralumla. It is an uphill section of road where vehicles are travelling at 80km/h, but cyclists will likely only be travelling at 20km/h. The speed differential is horrendous, and more than twice I have almost been collected by a heavy vehicle exiting into the slip lane while I was on the painted green bike lane.	-35.3127164	149.1045455
191	Vehicles turning out of Lady Denman Drive don't look for cyclists, only look for cars.	-35.3128947	149.082698
192	Positive - Novar St and Dudley St signal junction. Give pedestrian crossing green signal a head start (5-10 sec) before motorist signal turns green. This should happen at all signals in the ACT.	-35.3129655	149.0982606

193	Potholes repeatedly reported and never fixed.	-35.3130948	149.1076104
194	Very frustrating merge during peak hour.	-35.3133335	149.1001412
195	Road lanes are too narrow for cyclists and motor-vehicles to share.	-35.3134598	149.0983166
196	Cycle lane on Eyre St doesn't connect at bridge to off road bike path so you end up at a gutter after Eastlake Parade on main Lake Burley Griffin bike path.	-35.3142231	149.1471513
197	Lack of cyclist prioritisation along cycle way routes, forcing cyclists to halt for local car traffic, and descend onto the roadway.	-35.3142359	149.1470685
198	Cyclists on Adelaide Ave have to negotiate fast moving congested traffic entering from Cotter Rd at peak times.	-35.3144318	149.0943361
199	Left turn, bicycle crossing issues.	-35.3144318	149.0943361
200	This is in one of the photos you shared. It's an absurdly unsafe crossing point for cyclists with vehicle traffic passing from behind you at 80km/h on both sides. The ACT Government recently reconfigured this away from traffic merge point, to a continuation of the left lane allowing vehicles flowing off Cotter road to maintain 80km/h onto Adelaide Avenue. Previously, cyclists could rely on the merge to slow traffic down sufficiently to safely cross. I don't ride on Adelaide Avenue anymore because of this.	-35.3145542	149.0943652
201	Eyre St, Kingston ACT 2604 - blind corners for traffic.	-35.3150231	149.1534729
202	The raised bike path outside the Melbourne and Sydney buildings in Civic - both pedestrians and drivers think it's a footpath so pedestrians use it and drivers don't give way when turning left.	-35.2792125	149.1293746
203	Can be very congested. Drivers turning right from Hopetoun into MacGregor don't give way to cyclists travelling north on Hopetoun.	-35.315473	149.1088456
204	Kent Street (lack of cycling infrastructure).	-35.3185515	149.0965571
205	Strickland Street (lack of cycling infrastructure).	-35.3187717	149.1005147
206	Road narrows due to island, cars sometimes attempt to overtake and find the gap is too small	-35.3191132	149.1146937
207	Deakin main road. Cars park along the sides.	-35.3192165	149.0939696
208	There is debris on the bike route, it is not safe to turn left, then sharp right to cross the road. I need to unclip here, or just hop the gutter.	-35.3207269	149.1987339
209	No reason given, presumably lack of bike lane.	-35.3207674	149.111826
210	Bike lane ends as you turn into Fyshwick on Newcastle Street, leaving you to fight it out for a spot with cars.	-35.3216779	149.1686127

211	Cyclist using round-a-bouts despite clearly marked not allowed.	-35.3230324	149.0309692
212	Bike lane on Canberra Avenue abruptly ends.	-35.3234931	149.1503212
213	Kent Street Deakin on-road lane ends.	-35.3241796	149.0970163
214	No reason given, presumably crossing issue.	-35.3249578	149.087534
215	No reason given, presumably conflicts with left turning vehicles.	-35.3258138	149.0544408
216	So many potholes. And roos.	-35.3260899	149.008937
217	Canberra Ave Fyshwick intersection at Nyrang Street. Not enough space in the middle of the road for a bike, cyclist could be hit waiting.	-35.3262884	149.1544017
218	The right lane is turning and straight ahead. Sometimes a car turning right waits for the green arrow and goes when this occurs by which time traffic that can only go straight in the left lane has gone. I've been caught out assuming all cars are turning right in the right-hand lane while crossing at the pedestrian crossing, albeit on a red no crossing. I'm not sure what the fix is except learning from the experience.	-35.3263387	149.0869848
219	No reason given, presumably bike lane ending abruptly and crossing issue.	-35.326569	149.053278
220	Cotter Road; debris in bike lane.	-35.327831	149.0170684
221	Big bumps across path can cause crash.	-35.3280218	149.0850272
222	Cotter Rd, on this straight part of road drivers overtake cyclists into oncoming traffic. Driver of oncoming car is often forced off the road by overtaking car. Driver of car forced off the road then abuses the cyclists for causing the car driver to overtake in a dangerous manner.	-35.3293464	149.0132168
223	Unnecessarily tight turn, rough surfaces caused by tree roots and lack of maintenance, area frequented by unrestrained dogs.	-35.3300315	149.0833756
224	No reason given, presumably crossing issue.	-35.3303372	149.1621719
225	Lack of cyclist prioritisation along cycle way routes, forcing cyclists to halt for local car traffic, and descend onto the roadway.	-35.3307748	149.1151133
226	No reason given, presumably no bike infrastructure	-35.3311046	149.0280877
227	Yarra Glen road towards Garran. Bike lane is poorly maintained, lots of debris which makes the lane smaller and causes me to have to swerve around a lot.	-35.3333048	149.0864908
228	Multiple tree roots causing cracked pavement on the cycle path on Canberra Ave between Hindmarsh Drive and Newcastle Street mean cyclists use the road instead of the cycle path.	-35.336014	149.1728102
229	Poorly lit at night.	-35.3383559	149.1236655

230	Chicanes to slow traffic and allow cars to park parrallel (?) but shrink the width of the road where cars attempt to pass. Perhaps a speed hump would be better although this road has speed humps also.	-35.3390252	149.1363436
231	Kerb installed obliquely into cycleway, would be very hazardous if a cyclist collided with it (I understand the term is: pancake)	-35.3418994	149.0823445
232	Yamba Dr - shared path on west side between Kitchener and Justinian St so many tree roots.	-35.3421671	149.0960056
233	On-road bike lane disappears near top of the hill.	-35.3442174	149.1384597
234	Hindmarsh Drive heading west, after the hill over Mt Mugga, on road cycle lane terminates in a kerb in an 80kmh speed zone.	-35.3442174	149.1384597
235	Hindmarsh drive between Fyshwick and Woden Presumably disappearing bike lane.	-35.3442242	149.1385091
236	On-road bike lane disappears near top of the hill.	-35.3442413	149.1348588
237	Corner of Tamar and Endeavour Streets in Red Hill - very bad camber on the corner resulting in a number of crashes.	-35.3443415	149.1268881
238	Vehicles parked in the bike lane.	-35.3453803	149.0840921
239	Very rough cycleway just recently installed as a detour around the construction site - the surface is so rough it almost throws you off your bike, and the approach to Wilbow St crossing now has very poor visibility due to realignment of cycleway.	-35.3456049	149.0894202
240	Corinna Street Woden and the placing of a useless and dangerous concrete plinth to separate the cars from bike lane.	-35.3456216	149.0841759
241	Lack of cyclist prioritisation along cycle way routes, forcing cyclists to halt for local car traffic, and descend onto the roadway.	-35.3456669	149.0890383
242	Corinna Street Woden and the placing of a useless and dangerous concrete plinth to separate the cars from bike lane.	-35.3459436	149.0842257
243	Corinna St - cars using bike lane as parking outside Westfield.	-35.346298	149.0843071
244	Bike lane ends halfway up the hill with no option to turn around.	-35.3464967	149.1090524
245	No reason given, presumably the debris on the bike path.	-35.3479559	149.0711464
246	Vehicles turning into or out of Ball St not giving way to bikes on the bike path VERY DANGEROUS AND A GREAT WAY FOR A CYCLIST TO GET KILLED.	-35.3480616	149.0861922

247	No reason given, presumably issues with Bike Lane configuration.	-35.3480657	149.0859763
248	Repeated reporting of pooling of water covering a whole lane. Fixes did not fix the problem.	-35.3480891	149.0801574
249	Rear carpark of shops car often blocking pedestrian access.	-35.3561131	149.0405902
250	No reason given, presumably crossing issue	-35.3567297	149.1003918
251	Yamba Drive, no reason given, presumably lack of bike infrastructure.	-35.3573795	149.1016048
252	Bumpy path.	-35.3576882	149.091547
253	No reason given, presumable problematic offroad bike path.	-35.3578168	149.0915535
254	At the end of Mawson Drive, crossing Yamba Drive, going onto the cycle path that follows the Floodway to O'Malley. Going from the lights through the pines the dirt track is well used but in poor condition.	-35.3621271	149.1054433
255	No reason given, presumably bike path issue under bridge.	-35.3708919	149.1107318
256	Kambah pool road coming from Namatjira - it would be good to have a bike path next to the road.	-35.3728716	149.0507764
257	Signs up indicating crossing ahead but no crossing in place.	-35.3734263	149.0503064
258	Athlon Drive (nothing specified, presumably lack of bike lanes).	-35.3735584	149.0930706
259	No reason given, presumably problematic crossing point	-35.3841124	149.0931211
260	No reason given, presumably problematic crossing point.	-35.3841241	149.0925916
261	No reason given, presumably problematic crossing point.	-35.3841265	149.0926079
262	The traffic has right of way (reasonably so) but then you have to assess the likelihood of cars not covering the path AND not having the chance to take a quick break in the traffic. Sometimes a car is willing to let you go, but this is even worse as you don't know if the car in the lane over will also let you go.	-35.3841519	149.0926894
263	If you could put in an underpass at this section of road it would greatly facilitate being able to ride from Wanniassa / Kambah to Woden.	-35.3841519	149.0926894
264	No reason given, presumably problematic crossing point.	-35.3841519	149.0926894

265	No reason given, presumably problematic crossing point.	-35.3841736	149.0931732
266	No reason given, presumably bike path interaction with road.	-35.3841981	149.0932792
267	Cnr of Athllon and Sulwood Dr - C4 route crosses a fast road in all directions with no priority.	-35.3847791	149.0929369
268	No reason given, presumably left turn conflict issues	-35.3918913	149.0698956
269	No reason given presumably bike lane ending at intersection and beyond.	-35.392264	149.0694272
270	No reason given, presumably issues because of left turning vehicles	-35.3931805	149.0701215
271	No reason given, presumably debris in bike lane	-35.3976892	149.0726116
272	The alternative here is a decrepit old footpath with no signage.	-35.4022712	149.0744288
273	Many locations where main road has a designated cycle lane which disappears after the next set of lights. This significantly reduced the usefulness of the designated cycle lane and the rest of the road for cycling purposes. Bike lanes disappear on the left-hand side on Drakeford Drive between Lake Tuggeranong and the Tuggeranong Parkway.	-35.4027589	149.0744781
274	No reason given, presumable the concrete separations and turning conflicts.	-35.4162582	149.0703634
275	No off-road path between these two points https://goo.gl/maps/PzWsNarxPs5hcuPp8	-35.3137686	149.07423
276	Direct link here would be nice https://goo.gl/maps/WM81Fq1RJxnsHYzp6	-35.3122477	149.088715

Appendix D – Additional commentary on infrastructure issues in the ACT

Comments
Too much to list, most of the problems for me is significant amounts of loose soil washing onto the cycleways in some cases more than 5-8cm deep.
Bike path behind Bruce/Belconnen Way, Lyneham Causeway bike path; are very rough despite their high usage.
Northbourne Avenue, bike lane is very badly protected, temporary traffic management often puts cyclists into main traffic lanes, extremely difficult to turn left.
Limestone Ave and Fairbairn Ave is a convenient route from north Canberra to Fyshwick, but the lanes are narrow and there's only a small portion of bike lane.
Drakeford Drive; Adelaide Avenue.
I believe cyclists should have their own path separate to the road's that cars drive on.
Off road path through Dickson along Northbourne Ave needed.
Northbourne Ave - very narrow cycle lane in busy traffic.
Paths needing work on C4.
Temporary traffic lights due to road work.
Northbourne Avenue - no raised bike lane with high volume traffic and buses stopping.
Everywhere there isn't a dedicated, separated bike path.
Everywhere - unswept on-road cycle lanes
Generally, the cleanliness of roads or bike lanes that can lead to punctures.
All throughout Inner South/Parliamentary Triangle and Yarralumla, and Deakin.
All throughout inner south / parliamentary Triangle and Yarralumla, and Deakin.
All cycle lanes that stop mid road and leave you on the road.
Anywhere the bike lane stops abruptly.
Northbourne Avenue - no off-road path.
Clarity of cyclist right of way drop off for interstate bus terminal in Civic.
Debris on left hand verge too many to name.
Northbourne Ave.
Northbourne Ave.
Northbourne Avenue - no separated bike lane and many of my friends have been hit there.
Northbourne Avenue; construction in bike lane and cars parked in bike lane, with no room for cars to go.
Marcus Clarke St from Barry Dr to University Ave has bad cycling infrastructure, bike lane abruptly changes side of the road.
Top of Majura Parkway connecting to Federal Highway via the circular link.

Belconnen bikeway on Emu Bank.
Every road/light rail crossing involves crossing halfway and then waiting a full light's cycle to cross the other half. Makes it too tempting to not wait.
Lack of raised crossing at intersection of C3 & Bauhinia St: very steep drop/raise on kerb.
Adelaide Avenue - good bike lane to Deakin then you have to go on the road with high speed traffic.
Ellenborough cycle lane ends.
C1 at pedestrian crossing on Barry Drive and Marcus Clarke St. Crowded, impossible to turn safely when exiting crossing, 90-degree turn.
Bike path too close to the roundabout on Florey Drive and Ginninderra Drive, impossibly dangerous in peak traffic times.
Adelaide Ave on-road path (full length) and the absence of a quality off-road path.
Mt Stromlo Rd.
Brewer St and Corinna St.
Canberra Ave from Queanbeyan to Fyshwick.
Bike path, Curtin.
Hindmarsh Drive.
Ten Mile Road.
Intersection of Cultivation Street and Katoomba Street in Harrison - cars approaching Nullabor Avenue after school pick-up come very fast and fail to give way to bikers travelling across the Nullabor Avenue.
Majura Ave, narrow lanes, no bike lane, or path.
Southern Cross Dr west of Kingsford-Smith Dr; Southern Cross Dr bike lanes end suddenly with no alternative route.
Adelaide Avenue exit to State Circle - drivers cross into bike lane because it looks like a car lane
Manning Clarke Crescent and The Valley Avenue.
Mostly on main roads with cycling "lanes" that motorist feel are OK to drive in
Between AIS and Gungahlin Drive, no connection.
Coranderrk Street, uneven surface, lighting.
No bike lane through most roundabouts, and because the road narrows cars speed up to get in front or try and squeeze past at the narrow point.
Limestone Avenue – no path or little path.
Belconnnen Way (east bound) opposite Hawker bottle shop - cycle lane just ends.
Kings Ave Bridge - too narrow, pedestrian/cyclist/pet interactions, debris, and glass, cracks.
Lighting along western loop of Lake Burley Griffin, combined with areas of poor path quality make it difficult to use when not full daylight.
City.
Kingsford Smith Drv, Spalding St intersection. Early morning drivers often fail to stop/give way.
Drake Brockman Dr.

Bike path near Dickson Woollies, lots of bumps.
Mouat Street, significant potholes in road.
There is no ongoing bike path from O'Connor Ridge through to Mitchell, need to get on the Freeway to ride through to Mitchell.
Corinna and Ball St intersection.
Federal Highway to Eaglehawk - the bike lane is full of debris.
Lonsdale St is terrible to ride through with cars parked on both sides of the road and pavements filled with pedestrians, it needs a proper bike lane that continues through Haig Park onto Ljong St.
Telopea Park West and then trying to connect with LBG bike path.
Canberra Ave riding from Barton to Narrabundah - not only is there only an on-road option, but the bike lane just suddenly stops.
Narrabundah - poor bike lanes.
No-good off-road cycleway down Maribyrnong past shops.
Bridge over Parkes Way too narrow.
Commonwealth Ave exit citybound before London Circuit.
Bike path Civic.
Melrose Drive
No access from Nullabor Avenue to Albatross Crescent - so public is forced to use the very busy highway (Horse Park Drive).
Wakefield Ave, narrow lane, no bike lane or path.
Kuringa Dr. North of Kingsford Smith Dr. No bike lanes, and the separated bike path next to Kuringa Dr ends suddenly.
Carruthers Street - incomplete bike lane.
Gundaroo Drive and Nellie Hamilton Avenue.
Any road with rubbish - let's say all roads, as cycling lanes are not cleaned often enough and all the debris moves to the side of the road.
The off-road cycling lane along the whole length of Marcus Clarke Street is appallingly badly designed. It is difficult to follow, puts you on the wrong side of the road at several intersections and is poorly signed.
Booroondara Street, uneven surface, lighting.
Mitchell - Whole suburb is problematic, particularly Hoskins Street.
There are many others.
Canberra Ave (side road, next to Airmaster/Fire and Rescue, Bayldon meats) - cars/trucks parked on the road from businesses that prevent cyclists from being able to ride on the side of the road, potholes, trucks pass close.
Surface on bridge that is part of cycle path crossing from Scrivener Dam to Molonglo River footpath (heading to Weston Creek) - very slippery when wet, bumpy when dry.
Mitchell.
Include the usage category "transport" instead of just "commuting" and "recreational"
Increased penalties for causing bodily harm will also not change the fact that bodily harm has already occurred - it is better to prevent the likelihood of accidents arising in the first place, and I do not believe penalties or minimum passing distance requirements are effective in doing so. These measures are purely reliant on behaviour and compliance - of every driver, on every

occasion that they drive past a cyclist; for a cyclist's daily commute, this means they are reliant on the behaviour of tens if not hundreds of drivers on every ride and as such cyclist safety seems more a factor of sheer luck given how many variables it is reliant upon proceeding successfully. Penalties and minimum distances seem to be based on assumption that drivers are actively being negligent or malicious towards cyclists; they do not address any inherent safety risks in the actual design of cycling infrastructure which I believe is the more of the problem. In many cases the infrastructure design makes it difficult for drivers to comply - there is often very little space for a driver to provide the recommended gap without putting themselves at risk from other vehicles in adjacent lanes or crossing centre lines, and speed limits on roads make it very difficult for drivers to follow a cyclist at the cycle's speed (as this would severely impede traffic) so they are more likely to make a risky overtake to maintain traffic flow. Most drivers are not actively seeking to harm cyclists; it is more that many roads are designed in a way that makes it difficult for drivers to protect cyclist safety without unreasonably compromising vehicle traffic flow. Given the narrow width of cycle lanes and the fact they run directly alongside traffic lanes also, it is almost impossible for a car to avoid running over a cyclist if they crash while riding and fall into the path of the vehicle lane, so drivers are also highly reliant on the cyclist's riding skill and the safety of the cycle lane from slip hazards etc. As such, both cyclists and drivers are put in a very precarious situation to protect the cyclist's safety and one can argue there is very little a driver can do to avoid causing harm, through no fault of either party, if a cyclist has an unlucky slip.
Make bike lanes run the entire length of roads instead of cutting off randomly.
I would consider riding on major roads if there were a barrier between the traffic and bikes - the current system does not seem safe to me.
Perhaps install lighting in some dark areas.
More convex mirrors and separated bike paths or at least a painted line.
More separated infrastructure.
Separated cycleways.
Safety would be significantly improved by more physically separated cycling infrastructure on busy roads and highways (e.g. Northbourne Ave, Gungahlin Drive). As well as cars getting too close, I've had to swerve into traffic to avoid cars pulled over in bike lanes along major roads, and rubbish/debris on the sides of highways is a significant hazard. I also wonder about the impact of breathing vehicle exhaust when cycling directly alongside cars during peak hour - there is a noticeable air quality difference cycling on the bike path beside Gungahlin Drive at Mitchell than on the bike lane further towards Lyneham, or on the Barton Highway.
More car free areas and physical barriers between bikes and cars
More kerb segregated bike lanes (so drivers know that they are entreating a bike lane) - genuine attempt to pedestrianize city centres - not like the 'partial' attempts in Tuggeranong and in the city.
Make better bike paths
Better integration of cycle lanes with intersections (why does my lane just end???) and more "cycle ways"/"cycle corridors" to improve connectivity between major roads with on-road cycle lanes.
Invest in decent bicycle infrastructure, separate bike paths and many more of them. Take some space away from cars but make sure motorists cannot get onto the bicycle lane by delineating the paths by barriers from the motor lane (auditory, colour, physical barriers). Public awareness campaign targeted to motorists to understand dangerous behaviours in cars towards bicycles.
Putting an on-road cycle land at Coppins Crossing
Improved quality of paths. Safer/better designed crossing points where paths cross busy roads.
To build more separated bike paths. Also to give options for cyclists who want to travel to nearby outer areas like Tidbinbilla, Cotter or Namadgi. For instance, bike lanes or paths on these routes, or even a bus with a bike rack to take you past the worst of the roads.

Some bike lane markings are really faded, or the cyclist symbol paint on the road is faint / tokenistic (eg Drake-Brockman Drive). Having a clear line on stroads helps with psychological safety.
Drivers to be more bike aware! Not sure how to improve that thoug, improve the bike infrastructure. Also, if ACT government cannot keep the road bike lanes and verges clear of dangerous debris then provide non road adjacent routes for cyclists.
More dedicated bike/walking paths which are separate to the road.
Better maintenance of existing infrastructure and linking on road/suburban streets to segregated paths more.
Installing separated cycle paths on major routes.
Barriers between bike lanes and car lanes, as long as the bike lane isn't filled with debris; more education about cyclists rights on the roads and why they may not ride in a bike lane.
Separated or properly protected bike lanes! No more 'bike gutters' or painted cycle lanes. Everything that the Netherlands do. To me more penalties for drivers, etc. will have very limited change, it's about the infrastructure and prioritising cyclists and their safety over cars.
Raised bike lanes.
Raised bike lanes, more dedicated bike lanes, better bike parking facilities in public spaces.
Fixing missing links in cycle network.
Use one of the services that maps actual cycling commuter routes and focus on making them safer, e.g. Strava Metro - it's bloody free for you to use! https://metro.strava.com/ More segregated bike paths. Wider bike paths. More street sweeping on common commuter routes.
I do not care to ride on the road in the built-up city areas - I will always choose an off-road route. I'll point out that is possible to ride from just about anywhere to just about anywhere in Canberra, entirely on off-road paths - it just takes longer! But is much more pleasant, and for me it is much safer. On-road lanes may be marginally safer than no on-road lane, but a motor vehicle can easily come into the lane - intentionally or otherwise - and the cyclist will always come off worst. Expanding the off-road network, and improving the existing off-road network, would help make me feel a lot safer when out on my bike. In particular, bright street lighting that is sensibly spaced, and properly positioned, should be installed on main paths. Regular path inspections, and rapid rectification of faults should be the norm. Old, life-expired path surfaces should be replaced regularly. Poor alignments on older paths - tight curves, steep grades, bad sight lines, dips where water pools, etc - should be identified and removed.
Traffic humps on left-hand turns onto major roads, such as -35.379082, 149.056030.
Making sure that pedestrian signal buttons are placed on the LHS of intersections and making pedestrians and cyclists keep left. Fix the bike paths. Better lighting of bike paths. Don’t have cycle lanes that disappear and reappear on roads.
Car free zones.
Better infrastructure. Penalties after the fact of an accident are not enough of a deterrent for most drivers
Continuous cycle routes. Separated cycle lanes would be ideal.
Dedicated, separated bike lanes.
Greater maintenance of older bike paths between town centres.
Regularly sweep the major roads with on-road cycle lanes so that cyclists could ride on the far left of the lane and not risk getting punctures or crashing because of the amount of road debris that has piled up. Hindmarsh Drive in Weston Creek, Piallago Ave, Horsepark Drive and Federal Hwy are some examples. Before getting a car licence, force all drivers to undertake bicycle awareness training and make them ride through some busy streets.
Better design and maintenance.
Maintenance of cycle paths; separated cycle/pedestrian paths around popular areas eg. lakes; fewer people complain on the FB Canberra Notice board Group about how 'cyclists should pay

registration' blah blah blah - so perhaps education on where funding for road maintenance comes from?
Fining drivers for not leaving enough space etc only makes drivers more aggressive against riders. There needs to be cycling safe spaces - separate to pedestrians, separate to motorised vehicles. Expecting cars, buses, trucks, pushbikes and pedestrians to share the same space is crazy - please increase the number of bike paths throughout Canberra (which actually lead somewhere – i.e. north, south, in/out of the city centre) and separate the bike lanes from motorised vehicle traffic etc (i.e. separate spaces) - Denmark model has spaces for motorised vehicles, another space for cyclists (running the same direction as the traffic on both sides of the roads - i.e. not one narrow space which shares traffic travelling both directions) and another space for pedestrians.
The ACT government needs to make investing in fully segregated direct bicycle infrastructure a priority because a lot of the safety issues are around driver behaviour that results in bringing Bicycle riders and drivers into conflict due to poorly designed bicycle infrastructure.
More dedicated bike lanes without the need to shuffle around between areas.
More separated bike paths are the best way to improve safety. I am comfortable to ride highways and roads but always choose bike paths if there is one.
Separated cycle paths. Separate bike and pedestrian paths in busy areas. Police should take road rage seriously.
More dedicated cycle lanes, separating us from pedestrians and vehicles. On a construction site in the city, they installed concrete barriers to separate the cycle lane to traffic. This made cycling much safer. Like the centre barrier on the park way
Create proper cycling lanes that are sufficient width.
More separated and off-road bike lanes that are connected. Particularly the inner south which stops the city from being easily connected to Woden via a direct safe route e.g. through Deakin .
More bike lanes separate to the road.
Planning bike lanes.
Dedicated bike lanes.
Add safe roads for cyclists.
If you want more people to reduce their carbon footprint, ease traffic congestion, and get more exercise by cycling, there needs to be dedicated infrastructure for cycling. Cycling on the road isn't safe, and I don't think anyone likes shared paths. It's not enough to tell drivers to leave more space when there's no more space on the road they can give without swerving into the next lane or traffic grinding to a halt while everyone merges right and then back again.
More priority crossing at traffic lights and crossings for cyclists.
Maintain road cleanliness to a higher standard.
Separate bike lanes from the road with some sort of barrier. The raised bike lanes on Northbourne Ave near London Circuit are good.
Make pedestrian path shared as bike path rather than having bike path on road where vehicles are crossing at a speed of 80-100km/hr
Addressing areas where bike lanes end without and off ramp option to join footpath. A north Canberra cycle way on the East of Northbourne Ave.
More bike lanes.
More direct segregated bike paths.
Finish off bike lanes so that they do not stop mid road. Ensuring slip lanes have signs that cause drivers to slow before they arrive at the slip lane. Build more dedicated bike lanes on the edge of roads - similar to how European cities do it.
If the government wants to skimp on building proper cycle networks, then at least install physical barriers to protect the cyclists using on-road cycle lanes. I've had friends hit multiple times on Northbourne Ave.
More bike lanes and shared paths are the way forward.

Dedicated bike paths (not lanes) are the only place I feel comfortable. Unless the lanes have enough space for 1.5 meters, there's no point saying/legislating that cars have to give it.
Bike paths that provide direct commuting routes - they seem to generally be scenic, but sometimes you are just trying to get to work. This is why I sometimes choose the road.
More path networks the better. Bring on the path between Stromlo and Blue Range Hut via Cotter Pines!
Separate bicycle path from on-road cycling. Connect existing bicycle infrastructure and provide more crossing at town centres.
Separate path network is the only way. Culture shift is not within the remit of the government, especially when the passing distance rules are almost impossible to enforce. This is mainly because bicycle dashcams are prohibitively expensive for the average rider. With respect to a separate path network, some offer a good, reasonably direct access e.g. Belconnen - Woden. Others do not, e.g. Belconnen - Civic. Belconnen - Civic commuters are then forced to choose - high risk riding next to high-speed traffic, versus much less direct but safer riding through Bruce Ridge/AIS adding approximately 30% increase in commute distance.
Separate pedestrians and cyclists on paths
Separate on road cycling lanes would be good.
Dedicated cycle paths
Bicycle/pedestrian lanes only.
Too many roads don't have bike lanes
Separated bike paths
More off road cycle paths, more on road cycle paths.
More cycleways in the suburb areas
Dedicated cycling paths or cycling lanes with separate from the road.
Separated bike paths, particularly along the tram/major routes and roads over 80km/h, added traffic lights for bikes, instead of fines the threat of having the car crushed would actually be effective
Building better dedicated bike path infrastructure.
More off road bike paths and better maintenance of these assets.
Separate bike and pedestrian paths
Increase the number of off road cycle paths.
Consistent bike lanes that do not suddenly end. Complete the link between Queanbeyan and the Parliamentary Triangle and Civic. Perhaps follow the railway line next to it via a rail trail like path.
Separate bike paths from footpaths and roads to reduce chance of crash/obstruction, maintain cycling paths so they are used, better lighting for females to feel safer.
Better road design and a more “watch out for cyclists” signs
Separated bike infrastructure. Bike paths next to every road of 4 lanes or more. Wider footpaths next to every road with a 60km/h speed limit. Cyclist friendly corners and intersections.
Better policing of driver behaviour. The ACT Police are very lazy when it comes to investigating interactions between cars and bicycles.
None of these reforms are effective because they are not enforced or followed up by ACT policing. The onus of keeping vulnerable road users safe needs to be shifted to the operators of the most dangerous vehicles on the road. IE introduction of presumed liability laws.
Drivers are not always aware that riders can ride across pedestrian crossings, signage or painted symbols on the crossing. Bikes could be fitted with sensors and cameras to identify vehicles travelling too close to cyclists and warnings sent out. Health insurers and the ACT government may be interested in funding considering the cost to the system. Every day is a new opportunity to gain experience as a road rider and I feel the same for drivers. Given the intention is to change behaviour I believe warnings are better.

Improving road quality (primarily by repairing potholes) on roads with high bike traffic; establishing requirements for construction projects that interfere with bike lanes (that is, making provision for alternate bike routes mandatory); higher police traffic in highly bike trafficked areas. I don't necessarily think increasing penalties will serve as a deterrent, nor will increasing minimum distance requirements, if there is no actual threat of enforcement. Perhaps, similar to speeding or drunk driving, police could target drivers driving dangerously near bikes?
More policing and enforcement of cars passing close or turning in front of bikes. Has happened in front of a police car and they do nothing. Safety cameras at intersections or bad locations that monitor and can be used to report dangerous drivers. Close lanes to cars and have bikes/scooter/pedestrians only.
It would be nice to see more police out on the roads, speed guns, RBTs and just general traffic policing. Drink driving is rampant here as is speeding and a general level of disregard for road rules e.g. cars running red lights.
Active enforcement of the laws would make a difference. All the laws in the world have no impact if they aren't enforced.
More action from the police when evidence of traffic violations is submitted.
enforcing parking in marked bike lanes of blocking pedestrian access points, not just good for cyclist but also prams/walkers.
Increased penalties are not being applied by judges. For example, a driver used his car as a weapon, injured the rider and totalled the bike and the media reported that the driver did not get a custodial sentence because he was 'very nice and remorseful'. Wrong public message.
Actually issuing fines to drivers for passing too close or other offences.
Education including penalties.
Awareness raising of the above - ensuring motorists know that cyclists are allowed to ride on roads, that motorists are required to provide a minimum passing distance, that increased penalties will be applied etc.
Education of drivers that the passing distance is required EVEN when a painted on-road bike lane is present.
Awareness campaigns.
Somehow change drivers from being complacent about cyclists. It is not that we can't be seen, it's just that many drivers don't actually look for anything smaller than a car.
Driver awareness training on vulnerable road user experiences for professional drivers (bus, heavy vehicles, taxis, uber drivers) or all drivers as part of the driver licensing system. 10 yearly driver tests for license renewals with vulnerable road user awareness components included.
Media campaign to motivate drivers try cycling (including on the road) - so that they pick up a positive habit but in doing so get a better appreciation of what it is like riding alongside cars and then drive in a safer manner (e.g. leaving adequate space for cyclists on the road). Lots of drivers have no sense of spatial awareness on the road (close passes).
Driver re-education on the rights of cyclists on the road.
Education about the green bike lanes, speed limits on some shared paths - like across Commonwealth Ave Bridge and Kings Ave Bridge, cycle path maintenance.
Motorist education program - cyclist are legitimately permitted to use the road network. Most road users break road rules - doesn't entitle a motorist to mortally threaten cyclists for some another's actions. Oblige motorists to spend time on a road edge, back turned, ideally cycling, if not able, standing/walking to understand the vulnerability of a cyclist to a close and fast passing motor vehicle.
Promotion of public awareness of cyclists by motorists (as has been done for motorcyclists, but much more). Look out for bikes!
Public safety campaign reminding drivers how to deal with cyclists appropriately.
We need to normalise the riding of bikes on the road. I think there are still a number of drivers out there who resent road riding. I don't know why but they are in the minority.
There are many shared pathways in the ACT used regularly by cyclists to commute. While cyclists wear helmets, high vis, have lights and use bells, many pedestrians wear dark clothes

and either walk multiple people abreast or walk with headphones and are looking at their phones, so they don't hear a cyclist's bell. If pathways are to be shared, a campaign could be introduced to encourage pedestrians around the capital to make themselves more visible, particularly in winter where it gets dark around commuting time, and to avoid distractions such as phones while walking on shared pathways.
I think the above questions (107, 108 and 109) indicate things that help, however I think there are other things that need to be looked at: Driver education courses - it should be mandatory that Learner drivers are properly educated about riding with cyclist safety in mind so they know how to drive around cyclists in a safe and confident manner. Consistent cycle paths on all main roads would help embed the idea in driver's minds that cyclists are equal road users. Ensuring all on-road cycle paths are that green colour (it's a reminder to check for cyclists and ensures that the cycle lane is not so easily forgotten). Adding cycle-specific lights at traffic lights would ensure that cyclists are factored into signalised intersections. Maybe removing the cyclist right of way across some of the on ramps and off ramps of the main Canberra roads and instead installing a crossing zone where cyclists need to stop and check for traffic might alleviate some of the issues where cars are merging in front of and around cyclists.
Education for pedestrians and motorists that humanises cyclists and helps these groups to understand the needs of cyclists and their signals would be really helpful. Something similar to the Canberra Health Service Occupational Violence campaign that highlights all the elements of a person's life and hobbies, not just their role as a health worker.
More education of the public regarding the reforms.
Educational campaigns to educate drivers on the legal rights of vulnerable road users. Many drivers think cyclists are in the wrong if riding two abreast etc. Make it illegal for media organisations to incite anti cyclist sentiment often by perpetuating myths or fuelling hatred.
More cyclist awareness as part of getting your license.
Most of the difference between here and Europe for example is the level of driver education and awareness. Most of the risk to cyclists on roads are careless drivers that don't check blind spots or turn in front of you because they don't pause and see you approaching an intersection, don't check before opening car doors and generally aren't trained to a safe level before they receive their licences.
Probably an advertising campaign that shows that cyclists are normal people that do normal things. They have jobs (like Emergency Services), they have families, and they don't deserve to be bullied or harassed when riding to work or just for exercise.
Educate cyclists and pedestrians so that both can share the footpaths and cycle paths safely.
Slow. The. Cars. Reduce local street speed limits to 30km/h. Provide dedicated, separated, and integrated networks of cycle paths across the city on roads where speed limits are more than 30km/h.
Speed checks on rural roads around the ACT.
Reducing speed limits from 50 km/h in suburban streets and considering more 40 or 30km/h zones. Revisiting if 60 km/h suburban streets should be 50 km/h. Broader education efforts. A master plan for improving active travel with dedicated infrastructure budget.
Please return to dismount at pedestrian crossings. Too many stupid cyclists ride across too fast, and many crossings are not engineered with adequate sight distance for drivers to safely see a cyclist approaching at speed - even the allowed nominal 10km/hr (under s38(C)2) is too fast in some situations but many riders hit pedestrian crossings at >20km/hr and expect to survive! Dismounting is a no-brainer and the ACT variation to the Australian Road Rules is madness.

Remove the mandatory helmet law. It is a waste of time and resources for police to monitor this and give people riding bicycles infractions for this. We are all adults and should be able to make our own decisions about this. More importantly, mandatory laws like this gives the perception to people who want to ride bicycles that it is a dangerous activity, which is unfortunate. We need more people on bicycles which will increase the visibility for drivers. I believe drivers who see people riding bicycles without a helmet would make them think twice about recklessly driving past other human beings. Japan does not have much cycling infrastructure, yet they have lots of people who ride bicycles and therefore the driving population see this and driver slower around people (other human beings). We just need people in cars to humanise so called "cyclists". I'm not a cyclist. I'm a person who rides a bicycle from point A to point B. A bicycle needs to be viewed as a safe mode of transportation. Get rid of silly laws (like the helmet law) that make people think it is a dangerous activity. I would still wear a helmet because that is my choice. We also need more off the road cycling options to get more children and women riding their bicycles.
I wish I did! I'm not sure why many drivers have such negative attitudes, when cyclists make their roads less crowded. I like the 'share the road' idea.
Default liability provisions. These exist in some European countries and automatically assume motorists are at fault in incidents with cyclists unless they can prove otherwise.
Allowing bicyclists to cross against lights when safe to do so.
In some countries, the motorist is automatically deemed to be at fault in an incident with a cyclist, unless they can prove otherwise. Mechanisms like this help to ensure motorists take more care around vulnerable road users.
Check all bikes for an audible bell. Penalties for cyclist who don't have one also if they don't use it.
Magpies can be serious hazard when attacking cyclists on roads
Incentivise all road design engineers to commute to work. I see too many designs done by people who appear to have no idea what they are doing.
Reversing the onus of proof so that in the breach, the driver has to demonstrate that they did not cause the crash. If new drivers learnt this rule, they would show much more caution. Stop signs at pedestrian crossings. Far too many people say 'didn't see the person coming'. If they had to prepare to come to a complete stop, the risk would be eliminated. Slower speeds in local streets, mean that drivers would have a bigger field of view and would be able to stop more easily. Properly protected lanes on really busy roads where there is no real path alternative (a footpath is not an alternative - that is unfair to frail people who worry about being mown down by a bike or an escooter).
It doesn't matter what the penalties are when they are never issued. It doesn't matter what the laws are when there is no one enforcing them. If cyclists want motorists to obey laws (eg. minimum passing distance), they need to be less hypocritical generally and stop crossing on red lights, or riding after dark with no lights.
Allowing cyclists to ride across pedestrian crossings (without dismounting) makes cycling safer because then everybody knows that that is the rule and drivers need to give way when turning left
Dogs on leads, mandatory helmet wearing (enforced) on roads and paths, electric scooters speed limited (enforced) and helmet wearing enforced. Priority at intersections when crossing button is pushed. For example, if the light is green allow the pedestrian button to override the crossing light to allow you to cross or make the crossing light automatically change to green when the traffic lights do. Better road sensors to be used to identify cyclists stopped at red lights.
Awareness and signage of courtesy by and towards all path and road users.
Cyclists need to dismount at a pedestrian crossing, I do, and I am a driver and a cyclist.
Secure Bike cages in all major bus stops, tram stops and shopping centres.
Set up danger warnings (presumably as an alert system for cars in potential conflict with cyclists).
Consult and invest please.

Cyclists should dismount when traversing across pedestrian crossings.
A million!! I could write, and have written, essays on this stuff. There are lots of good and valid ideas floating around that would measurably improve things, the most prominent being more and better-connected separated bike infrastructure. But the biggest barrier to cyclist safety in my (somewhat educated) opinion is the lack of cyclist participation. It's a chicken-or-the-egg situation but more cyclists would force the government to invest in more infrastructure (paths, bike cages, lighting etc.) and better policy (workplaces/destinations providing safe bike storage and EOT facilities, roads being built with cycling at the forefront not an afterthought, actively discouraging motor vehicle use e.g. through reducing parking, introducing car-free zones, whatever works according to research). This would in turn encourage more people to cycle, and the more people who cycle the fewer cars there will be on the roads (cars being the established highest risk to cyclist safety). What cars there will be on the roads may then be driven by people who are also cyclists and who may be more aware of the dangers that their cars pose. So the key is really societal behavioural change (easy!). I think encouraging people to start travelling by bike, particularly women who currently make up a tiny proportion of regular cyclists, thereby reducing the number of cars on the road, is the key to improving overall cyclist safety. It needs to be a long game with slow but meaningful change and requires more than simply building more paths. Also just want to note re: the 'anger at police' section - a personal gripe is the focus on placing the onus on cyclists to take sole responsibility for their safety, rather than emphasising that the majority of dangerous situations for cyclists result from motor vehicle interactions. The new law in the ACT re: negligent driving is a good step to switching some responsibility onto drivers, although it is hard to enforce without video evidence. While I personally would always wear a helmet, hi vis etc., realistically if a cyclist who isn't wearing a helmet suffers a head injury because a car hits them, that is the driver's fault for hitting a cyclist, not the cyclist's fault for not wearing a helmet. Road safety is everyone's responsibility, but careless driving by cars has both a higher likelihood of causing an accident and more severe consequences than anything a cyclist could do. The solution is to reduce the number of cars, improve the awareness of drivers and increase the number of cyclists.
The problem with the minimum distance passing rules is that on narrow roads there is no room and cars won't wait.
Enforcement of road rules for cyclists and e-scooter riders, as e-scooters are also a hazard: they're left on paths, e-scooter riders rarely wear helmets, and seem to know less about road rules than some cyclists do.
Revisit speed limits for scooters, make full face helmets compulsory for wheels less than 14" diameter.
HOW CAN A CAR SEE A CYCLIST COMING TO AND ACROSS A PEDISTRIAN CROSSING IF THE RIDER IS NOT STOPPING AND WALKING? IT SEEMS TO BE A BACKWARDS STEP AS IT REDUCES A VEHICLES CHANCES OF STOPPING ON TIME.
All of the above depend on the situation, and none of them are really effective without a change in culture and attitude of drivers, pedestrians and cyclists to respect each other's rights to be there.
Improving the numbers of cyclists will make them more visible and raise awareness
Get the cyclist off the road and create Cycling Highways.
Bike security, bike security, bike security. We have had so many bikes stolen, have lobbied MLAs and ACT Police, not interested. It seems there is an organised racket going on, but few measures put in place particularly at tram stop bike lock up.
Some of these make cycling safer, but it makes driving more dangerous.
Drivers do not respect cyclists. I believe this to be a cultural issue. Reforms that do not address this will not change behaviours. As long as drivers feel that cyclists are less entitled to use roads, they will continue to treat cyclists poorly.

Better and more dedicated cycle paths, separate pedestrian and cycle paths in high traffic areas, more education.
Proper maintenance and repair of cycling paths, with minimum standards to be maintained, with those not meeting standard being repaired in a timely manner. On a path I use to ride to work, some tradies used it as a service road for their trucks while building a house. This resulted in severe damage (total breakup) of sections of the path. For over a year all we got was a traffic cone to highlight the danger.
Driver education, getting kids riding to school, (teaches kids and calms parents - it could be their child) getting Police to actually enforce the law and Courts to apply serious penalties, take it seriously.
More separate bike paths in built up areas for cyclists to feel safer and more likely to ride. Community service for drivers who cause bodily harm to cyclists, along with a fine.
Administrative reforms such has increased penalties and minimum distance requirements do not work when they cannot, or are not enforced. The best way to increase cycling safety is to construct separated cycling infrastructure that has a barrier between bikes and cars, to prioritise cycling movements over car movements when they do need to interact, and to build infrastructure to slow cars down in high traffic areas. Drivers do not respond to fines since they are difficult to enforce but will avoid infrastructure that could damage their cars.
Target repeat offenders. Widen paths. Reduce inclines on routes.
More bike paths to all parts of Canberra, not just beside arterial corridors. Public awareness of passing distances, penalties for neg driving and abuse.
I think some of these reforms are good in principle (i.e. minimum distance to pass safely) but no one actually does it and they're not easily enforced, there also hasn't been a lot of ongoing education to help support the behaviour change of drivers. I think more off-road cycle paths will help.
Cyclists on separated bike paths should have right of way when those paths cross roads, driveways, etc. Police should enforce offences against cyclists to the same extent they enforce speeding, drink driving, etc. Lower speed limits. Average weight and size of cars is increasing every year it seems. Restrict the use of SUVs and other excessively large cars in urban areas.
More off-road or separated paths. Slowing infrastructure at intersections (raised, extra lighting, on road signage). Better lighting on off-road paths. More over-passes or under-passes. Ongoing driver education.
Improved infrastructure, continuing emphasis to vehicle operators with regard to safe driving awareness of cyclists.
Having substantial attention to improving cycling infrastructure and breaking the entitlement of drivers to travel in the ACT. If we can find the funds to build quality road infrastructure year after year (despite the impact on our environment) then we can do the same for cycling and pedestrians.
Enhanced Infrastructure/Build dedicated cycling lanes and paths: Constructing separate lanes or paths for cyclists can significantly reduce the risk of accidents with motor vehicles. Improve road signage and markings: Clear and visible signs, road markings, and designated bike lanes can help both motorists and cyclists understand their respective spaces on the road. Education and Awareness: Promote cycling safety campaigns, conduct public awareness campaigns to educate both cyclists and motorists about sharing the road responsibly. Offer cycling safety training programs: Provide training sessions that teach proper cycling techniques, traffic rules, and defensive riding skills to enhance cyclist's safety.

Ensuring bike lanes are constructed on newly built roads, ensuring pedestrian (and bike) crossings are raised - indicating that cars are crossing pedestrian terrain not vice versa, narrowing suburban roads to reduce speed limits (lots of ACT suburban roads are very wide which encourages speeding), increase lighting in unlit areas (e.g., much of the C5 bike path around the western end of lake Burley Griffin is unlit).
More options for cyclist to not ride next to cars. Even if they are more circuitous routes. With the increase of e-bikes, there will be more cyclists able to ride distances, but also okay to go a few extra kms out of the way to avoid stinky, and dangerous, cars.
More separated bike lanes. slower traffic restrictions on cars for the safety of cyclists and pedestrians. Restrictions on the size of vehicles - imported American trucks are way too large to see pedestrians and cyclists from the drivers' seat and have no business on urban streets.
Properly designed and well-connected grade separated cycling infrastructure, separated from both vehicle traffic lanes and pedestrian pavements. See www.copenhagenize.eu for more info. Changing road rules so motorist are required to give way to cyclists travelling straight ahead when motorists are turning left across their path. Strict liability laws, where accidents between motorists and cyclists occur, motorists are automatically deemed at fault.
Better lighting on shared paths so people use them at night rather than the roads. Media campaign that cyclists are people too - with families, jobs, part of the community etc - not just 'cockroaches' or 'road kill'.
Clear diversions for cyclists at roadworks. More separated bike paths. Repairs to bike paths, especially where tree roots have created major humps in path , it is particularly difficult to see these at night.
Separated lanes (including on roads). Also, cyclists need to take personal responsibility themselves by ensuring they ring bells/shout warnings etc. Not competing in the tour de France on a suburban cycle lane!
ACT has a cars first mentality when it comes to cyclists on roads. This needs to change. Driver education to explain how roads are funded (e.g. from all taxes not just car rego fees) would help reduce resentment to cyclists and cyclists right to be on the road would help as virtually nothing seems to be done here. Penalties for hitting cyclists are ridiculously low as some penalties for wiping out a cyclist are no more than a speeding fine (this may have changed).
Driving culture needs to change. Road cyclists need to be more mindful of how they conduct themselves on the road also. We need to have an actual police presence on the roads throughout the city enforcing traffic laws. Can't remember the last time I saw a police car. People drive horribly with almost no consequences. Road rules are never policed, only speed is enforced (weeks later by mail by use of speed cameras which do nothing to improve drivers' behaviour).
While minimum passing requirements and increased penalties are good ideas, they are not enforced and so are basically useless. Enforcement of these rules should be accompanied by education rather than just fines. Sending aggressive drivers on cycling awareness courses could actually make a difference. There needs to be smarter policies towards road safety rather than simply an enforcement first approach.
1.With answers 102-103 - this only works if the driver can be caught, and penalty actually apply. Too many hit and runs or near misses. 2. Question - if a driver hits a cyclist or causes harm, can a cyclist go after the driver's insurance, like you can if you have an incident between cars? 3. I believe cyclists should not be allowed to ride on a road that does not have a shoulder of at least 1 metre. There are too many times that cyclists are riding on roads that are narrow. Example. The section of road between Namatjira drive Weston Creek and the lights near the fire station in Kambah, there is a cycle path next to the road, but cyclists still ride on the road, there is no shoulder, cars are doing 80kms and the path goes along beside the road. There should be a rule that if there is a cycle path that runs parallel with the road, they should not be allow on the road.

4. Lights on bikes, is there a rule that bikes must have lights on during the day? It would be good to know what the actual rules are. 5. Bells. ARH!!! I ride and I always ring my bell to alert people, I also walk/run and walk my dog, the amount of cyclists that don't ring their bells and speed past, is terrible. 6. It is great to have rules, but when there is no one to enforce them, it really makes them mute doesn't. I have never seen a police officer pull over a cyclist and give them a ticket. 7. I have done the Hartley cycle challenge from Canberra to the snowy mountains and the highway riding was one of the scariest moments of my life. We abandoned the return ride to Canberra due to the danger to cyclists. Hartley has since changed the ride to be only in the Snowy's due to the risk from drivers. 8. I wish I had a magic wand, and I could get people to show compassion and empathy towards others. People are either too self-entitled, in a hurry or just plain rude towards one another.
Develop 'Bicycle Streets' as in Belgium. They have 'Fietstraats', painted reddish paths where cyclists have right of way, the speed limit is 30km/hr and cars cannot overtake cyclists.