DRIVERS WHO DON'T COMPLY WITH A MINIMUM PASSING DISTANCE RULE WHEN PASSING BICYCLE RIDERS

Narelle Haworth[ac], Kristiann C Heesch[bc], Amy Schramm[ac]

[a]Queensland University of Technology (QUT), Centre for Accident Research and Road Safety - Queensland

[b]Queensland University of Technology (QUT), School of Public Health and Social Work

[c]Queensland University of Technology (QUT), Institute of Health and Biomedical Innovation

Corresponding author:

Professor Narelle Haworth

Centre for Accident Research and Road Safety - Queensland and Institute of Health and Biomedical Innovation

Highlights

- Passing cyclists too closely can lead to crashes, falls, and fear of cycling
- Almost half of the drivers reported not complying with MPD rule
- Non-compliance is related more to attitudinal than demographic factors
- No influence of driver sex, amount of driving or perceived level of enforcement
- Strategies are needed to help drivers judge and understand passing distance

ABSTRACT

Introduction Drivers' passing cyclists closely can contribute to crashes falls, and intimidation, which may discourage cycling. In response, minimum passing distance (MPD) rules have been introduced in many jurisdictions. This study examined the factors associated with non-compliance with a MPD rule.

Method An online survey of 3207 drivers in Queensland, Australia was administered 1 year after a MPD rule began. It assessed compliance with and attitudes towards the rule. Linear regression modeling was used to examine which attitudinal and demographic factors were associated with non-compliance.

Results The percentage of drivers who reported that they did not comply with the road rule "most of the time" or "almost always" was 35.5% in speed zones of ≤60 km/h and 31.8% in speed zones of > 60 km/h. Associated with a greater likelihood of being non-compliant were: only infrequently observing motorists giving bicycle riders more distance when overtaking, greater awareness of bicycle riders when driving on the road, disagreeing that the rule had changed the person's driving, agreeing that the rule was making overtaking bicycle riders difficult, disagreeing that the rule had made it safer for bicycle riders, agreeing that it was difficult to judge 1 or 1.5 m when overtaking a bicycle rider, and agreeing that giving 1.5 m clearance in > 60 km/h zones to bicycle riders was annoying ($p<0.05$). In high speed zones, drivers aged 18-39 years were more likely than those aged 50+ years to be non-compliant ($p<0.05$). Compliance was not associated with driver sex, amount of driving or perceived level of enforcement.

Conclusions Reported non-compliance with the MPD rule is widespread and is related more to attitudinal than demographic factors.

Practical Applications Strategies for helping drivers to judge passing distance and improve their understanding of the importance for cyclist safety of leaving an adequate distance are needed.

Keywords: Cyclist safety, Lateral clearance, One metre rule, Three-foot law, Overtaking.

1. Introduction

Drivers' passing cyclists closely can contribute to rear-end and sideswipe crashes and near misses (Aldred & Crosweller, 2015; Poulos et al., 2017; Sanders, 2015), which may discourage cycling. Close passes can also destabilize cyclists because of the turbulence created by the passing vehicle (Chuang, Hsu, Lai, Doong & Jeng, 2013; Llorca, Angel-Domenech, Agustin-Gomez & Garcia, 2017) or the cyclist's attempts to avoid a collision (Eilert-Petersson & Schelp, 1997). In response, minimum passing distance (MPD) laws have been introduced on a permanent or trial basis in many Australian jurisdictions, in 26 US states (National Conference of State Legislators, 2016) and in some European countries. Generally, these laws require that drivers leave at least one metre (or three-feet) when passing in lower speed zones and 1.5 m in higher speed zones. Queensland observations show that 88% of drivers comply with the requirement to give at least one metre distance in 60 km/h or lower speed zones, and 79% comply with the 1.5 m requirement in higher speed zones (Schramm, Haworth, Heesch, Watson, & Debnath, 2016). These results are similar to the 84% compliance rate with the "three-foot" (90 cm) passing distance law observed in the City of Baltimore, Maryland by Love et al. (2012). However, Llorca et al. (2017) reported only a 64% compliance with the Spanish 1.5 m rule on rural roads.

As summarised below, there is extensive research on how roadway and traffic factors influence passing distances, limited research on the influence of cyclist characteristics on passing distances and considerable research on driver attitudes to cyclists (e.g., Fruhen & Flin, 2015; Johnson, Oxley, Newstead, & Charlton, 2014; Rissel, Campbell, Ashley, & Jackson, 2002), but little is known about the

influence of driver characteristics on their behavior when passing cyclists. This paper compares the characteristics of drivers who self-reported complying or not complying with the Queensland MPD rule to inform future educational and other approaches to improving compliance.

1.1 Roadway and traffic factors that influence passing distances

Roadway and traffic factors appear to exert a strong influence on passing distance. There is reasonable agreement that drivers leave greater passing distances when there are more lanes (Apasnore, Ismail, & Kassim, 2017; Mehta et al., 2015; Shackel & Parkin, 2014) and when lanes are wider (Apasnore et al., 2017; Debnath, Haworth, Schramm, Heesch & Somoray, 2018; Love et al., 2012; Mehta, Mehran, & Hellinga, 2015; Shackel & Parkin, 2014). Higher vehicle speeds are associated with greater passing distances (Chapman & Noyce, 2012; Shackel & Parkin, 2014) but adjacent or oncoming vehicles result in closer passing (Dozza, Schindler, Bianchi-Piccinini & Karlsson, 2016; Mehta et al., 2015; Stewart & McHale, 2014). The evidence is more mixed in regard to the effect of the size of the passing vehicle. Several studies found that trucks and busses leave less room than cars when passing bicycles (Parkin & Meyers, 2010; Stewart & McHale, 2014; Walker, 2007) but Shackel and Parkin (2014) failed to confirm this effect. Sando, Chimba, Kwigizile and Moses (2011) reported that sports utility vehicles (SUVs) and pick-up trucks left greater distances than cars. Research in Taiwan (Chuang et al., 2013) showed that the smallest passing distances were left by motorcycles but Australian research found the opposite (Haworth, Heesch, Schramm & Debnath, 2018), with less non-compliance by motorcycles (Debnath et al., 2018).

1.2 Cyclist characteristics that influence passing distances

The findings regarding the influence of cyclist characteristics on passing distances adopted by drivers are mixed (Debnath et al., Florida DOT, 2011; Haworth et al., 2018; Olivier & Walter, 2013; Sando et al., 2011; Walker, 2007; Walker, Garrard, & Jowitt, 2014). Three studies have reported greater passing distances when the cyclist appeared to be female (Chuang et al., 2013; Florida DOT, 2011;

Sando et al., 2011; Walker, 2007) but recent analyses of Australian data have failed to confirm these results (Debnath et al., 2018; Haworth et al., 2018). The influence of clothing worn by cyclists (street clothes compared to lycra or spandex) on passing distance is also unclear. Walker et al. (2014), whose single participant was male, and US studies that examined both clothing and gender (Florida DOT, 2011; Sando et al., 2011) did not find significant effects of cyclist attire on passing distance. Haworth et al. (2018) found that passing distances were greater for cyclists wearing street clothing than those wearing lycra at four Queensland sites when group riders were excluded, but this was not significant for individual and group riders across a larger number of sites (Debnath et al., 2018). The report of closer passing for riders who wore helmets (Walker, 2007) was disputed in a re-analysis by Olivier and Walter (2013) and was not supported by later research (Walker et al., 2014).

1.3 Driver attitudes toward cyclists

Numerous studies have demonstrated that many drivers have negative attitudes towards cyclists (e.g., Basford, Reid, Lester, Thomson, & Tolmie, 2002; Fruhen & Flin, 2015; Rissel et al., 2002). In an early British survey, drivers indicated that they were annoyed by the presence of cyclists on the road due to their slowing traffic, lane filtering and not using hand signals (Basford et al., 2002). In research conducted by Rissel and colleagues (2002) in New South Wales, Australia negative attitudes towards cyclists were associated with a lack of road rule knowledge and lower tolerance of cyclists on the road. The researchers concluded that the attitudes of New South Wales drivers to cyclists had not improved since the same questions were previously asked of drivers in 1994 (Bell Dignam, 1995). Fruhen and Flin (2015), using Rissel et al.'s Attitudes to Cyclists Scale in Western Australia, found that poorer attitudes towards cyclists were associated with higher levels of aggressive driving behavior that included swearing, horn sounding, verbal threats, ramming and physical attacks.

Other researchers have examined whether attitudes to cyclists differ between drivers who ride a bicycle (driver-cyclists) and those who do not. Studies in the Australian states of Victoria (Johnson et al., 2014) and Western Australia (Fruhen & Flin, 2015) have reported driver-cyclists were more likely to report positive attitudes towards cyclists and non-cyclist drivers were more likely to express negative attitudes. US research has shown that drivers who primarily commute by car have more negative attitudes towards cyclists than other drivers and this difference is even greater for drivers who make most of their non-commute trips by car (Goddard, Dill & Monsere, 2016).

It is clear that poor driver attitudes towards cyclists are associated with poor driving behaviors around cyclists (Basford, Reid, Thomson, & Tolmie, 2002; Fruhen & Flin, 2015; Heesch, Sahlqvist, & Garrard, 2011; Johnson, Oxley, Newstead, & Charlton, 2014; Rissel, Campbell, Ashley, & Jackson, 2002). However, the evidence also suggests that the more positive attitudes towards cyclists displayed by drivers who ride themselves do not translate to better behavior towards cyclists (Fruhen & Flin, 2015; Johnson et al., 2014).

Aggressive behavior and harassment from drivers have been reported by cyclists in the US (Sanders, 2015), the UK (Aldred & Crosweller, 2015) and Australia (Heesch et al., 2011; Heesch et al., 2017), with driving too close being the most common form of harassment reported. In an examination of harassment both pre- and post-introduction of the Queensland MPD road rule (Heesch et al., 2017), most Queensland cyclists reported that drivers were deliberately driving too close to cyclists, causing fear and anxiety: 68% before the road rule introduction and 66% 1 year after the introduction of the road rule.

Overall, the findings from previous research suggest that many drivers have negative attitudes to cyclists and that many cyclists report that drivers pass too close. It is not clear how much drivers' failure to comply with MPD laws stems from difficulty in judging the distance or roadway limitations, and how much results from their negative attitudes to cyclists. The aim of this study was to determine the awareness, attitudinal and demographic factors that influence non-compliance with a MPD rule, to inform future educational and other approaches to improving compliance.

2. Materials and methods

2.1 Data collection

The survey was a component of the evaluation of the Queensland MPD trial which began on 7 April, 2014. The aim of the survey was to assess cyclists' and motorists' awareness of, knowledge and perceptions about, and self-reported compliance with the MPD road rule. An overview of the evaluation is presented in Schramm et al. (2016) and the analyses of the observational data are presented elsewhere (Debnath et al., 2018; Haworth et al., 2018). Members of the Royal Automobile Club of Queensland (RACQ) were recruited to complete an online survey. RACQ is the largest club in Queensland, with more than one-third of the state's population being members. Members were initially recruited through an article in the February/March issue of the RACQ's print magazine "The Road Ahead", with a circulation of approximately 900,000. To increase the response rate, the study was then advertised in the RACQ's online "Club News" newsletter on 8-9 July, 2015. As an incentive to participate, members were offered the opportunity to enter a prize draw for one of five $200 gift cards to local retailers. Ethical approval was received from the university's ethics committee (approval number 1500000146).

In total 3,769 adult members (aged 18+ years) of RACQ completed the online survey between April and July 2015. They were asked about their compliance with, awareness of, and attitudes towards the rule. Members were excluded from analysis if they were members of a local bicycle sporting or

advocacy group (n=262) or reported that they were not aware of the road rule (n=171). After these exclusions, 3,336 drivers were eligible for analysis.

2.2 Variables in analysis

The outcome variables were (1) compliance with the road rule first in speed zones of ≤60 km/h and (2) compliance in speed zones of > 60 km/h. For the first outcome variable, the item was, "When you are driving on roads with a speed limit of 60 km/h or less, how often do you leave less than 1 m?' For the second variable, the item was, "When you are driving on roads with a speed limit over 60 km/h, how often do you leave less than 1.5 m?'. Response options were on a 5-point Likert scale (1="almost never"; 2="Rarely; 3=Sometimes; 4="Most of the time"; 5= "almost always").

The independent variables included demographic characteristics (sex, age, highest education level attained), driving–related characteristics (years since received a driver's licence, average km driven weekly over the previous year, average days per week driven, type of vehicle driven most frequently on roads), awareness of bicycle riders on the road, awareness of police enforcement, and attitudes towards the road rule. New items to assess perceptions about the MPD road rule and road-user behavior were developed for this study. Other items were adapted from previous studies (Crosby Textor, 2014: Heesch, Garrard & Sahlqvist, 2011) to allow comparisons to be made. Awareness of bicycle riders on the road was measured with three items that assessed changes in awareness from before the road rule was implemented until 1 year later. The items had the stem 'Compared to 12 months ago', and response options for these items were on a 5-point Likert scale ranging from "strongly agree" to "strongly disagree". For the item that measured awareness of police enforcement ('Do you think the police are enforcing the MPD road rule?'), response options were "yes", "no" and "don't know". Attitudes were measured with six items. For each item, drivers were to place a check mark next to any item (see Table 2) for which they were in agreement. The terms

198 "bicycle rider" was used in the survey because it was felt that "cyclist" has developed a connotation
199 of a lycra-clad enthusiast, which not all bicycle riders would identify with, and to which some drivers
200 might respond more negatively than the less charged term of "bicycle rider".

201 ***2.3 Data analysis***

202 Descriptive statistics were computed for all variables. To address the study aims, linear regression
203 modeling was used to examine the association between each independent variable and each
204 outcome variable. Categorical independent variables were treated as a series of dummy variables,
205 and continuous independent variables were retained in their continuous form. Associations were
206 first examined in bivariate models. An independent variable found to be statistically significant in the
207 model of non-compliance in speed zones of ≤60 km/h or in the model of speed zones > 60 km/h was
208 included in final multivariable linear regression models, one for each non-compliance outcome. The
209 analysis sample excluded data from drivers who had missing outcome data (n=54) or missing data
210 for an independent variable that was included in the final modeling (for age or sex: n=75), leaving
211 data from 3207 drivers (96.1% of eligible drivers) included in the analysis (see Table 1). All analyses
212 were conducted in SPSS v23 (IBM, New York City, NY) and significance was set at $p<.05$.
213

Drivers who don't comply

3. Results

The mean scores on the non-compliant outcome were 2.68 (SD=1.59) in speed zones of ≤60 km/h and 2.59 (SD=1.52) in speed zones of >60 km/h. Thus on average, drivers reported that they "rarely" to "sometimes" left less than 1 m when overtaking bicycle riders in speed zones of ≤60 km/h and less than 1.5 m when overtaking in speed zones of >60 km/h. The percentage of drivers who reported that they were not compliant with the road rule "most of the time" or "almost always" was 35.5% in speed zones of ≤60 km/h and 31.8% in speed zones of > 60 km/h. As shown in Table 1, the majority of respondents (63%) were men, aged 40 years or older (86%), and with an education above a high school diploma (79%). Over half lived in urban areas (58%), and almost half (47%) drove less than 250 km per week. The majority (78%) drove 5-7 days/week. Almost all (94%) most frequently drove a car.

Table 1

Characteristics of the driver sample drawn from the membership of RACQ (n=3207)

Characteristics	**n**	**%**
Sex		
Male	2021	63.0
Female	1186	37.0
Age (years)		
<25	81	2.5
25-39	377	11.8
40-59	1463	45.6
50+	1286	40.1
Educational attainment [1]		
No high school certificate	288	9.0

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High school or senior certificate	399	12.4
Trade/apprenticeship or certificate/diploma	1141	35.6
Undergraduate university degree	1379	43.0
Residential location [1]		
Urban	1856	57.9
Regional/remote	1342	41.8
Driving distance in average week (km) [1]		
1 to < 250	1518	47.3
250 to < 500	956	29.8
500+	642	20.0
Driving frequency in average week, in previous year [1]		
5-7 days/week	2512	78.3
3-4 days/week	520	16.2
1-2 days/week	146	4.6
Less than weekly	20	0.6
Vehicle driven on the road more frequently [1]		
Car [2]	3002	93.6
Motorcycle, motor scooter or moped	49	1.5
Van/light commercial vehicle	61	1.9
Truck	44	1.4
Bus	34	1.1

[1]Frequencies do not sum to the total analysis sample due to missing data: 91 were missing driving distance in an average week (km); 9 were missing residential location; and 17 were missing type of vehicle driven most frequently. These variables were not included in the multivariable regression modeling. No variable had more than 3.0% missing values.

Drivers who don't comply

[2]Respondents were told this category included sedan, hatchback, wagon, people mover, utility and 4WD.

As shown in Table 2, most drivers indicated that pre- to post-implementation of the MPD road rule, they had observed other motorists' giving bicycle riders a greater distance when overtaking. Less than half had observed more bicycle riders on the road or were aware of more riders when driving. Few drivers believed that the police were enforcing the rule. The majority of drivers (72%) reported they that did not know if the police were enforcing the rule. Less than half of drivers agreed with each attitude item.

Table 2

Perceptions of drivers toward Queensland's Minimum Passing Distance road rule (n=3207)

	Drivers in agreement with each statement	
Awareness and attitude items	**n**	**%**
AWARENESS		
I have observed motorists giving bicycle riders more room when overtaking[1]	1961	61.1
I have observed more bicycle riders on the road[1]	1387	43.2
I am more aware of bicycle riders when driving on the road[1]	1351	42.1
Police are enforcing the road rule[2]	305	9.5
ATTITUDES		
It hasn't changed my driving	1066	33.2
It only makes it more difficult to pass a cyclist	1548	48.3

Drivers who don't comply		
Cyclists use it to block the lane	1223	38.1
It has made it safer for cyclists	1036	32.3
I find it difficult to judge this distance	614	19.1
It annoys me that cyclists must be given this much clearance	681	21.2

[1]Responses options were on a 5-point Likert scale. For comparison with other items in this table, the percentage of drivers who reported that they 'strongly agree' or 'agree' with the statement are reported here. [2] The percentage of drivers who reported that police are enforcing the road rule is reported here. Most respondents reported "I don't know" (n=2303, 71.8%).

In univariate modeling (data not shown) sex was a significant correlate of non-compliance with the road rule only in >60 km/h zones. Significant correlates of non-compliance in both speed zones were age, three of the four awareness variables (all but awareness of police enforcement), and all attitude variables. Therefore, age, sex, three awareness variables and six attitude variables were included in the multivariable models but not included in that modeling were other demographic characteristics, the driving-related characteristics, and awareness of police enforcement.

The results of the multivariable regression modeling are shown in Table 3. In modelling the correlates of non-compliance in ≤ 60 km/h zones, age and sex were not significant correlates. However, in modeling the correlates of non-compliance in > 60 km/h zones, being younger than 40 years was associated with a greater likelihood of being non-compliant. In both models most awareness variables and attitudinal variables were significant. Specifically, associated with a greater likelihood of being non-compliant were: only infrequent observations of motorists giving bicycle riders more distance when overtaking, greater awareness of bicycle riders when driving on the road, disagreeing that the rule had changed the person's driving, agreeing that the rule was making overtaking bicycle riders difficult, disagreeing that the rule had made it safer for bicycle riders,

agreeing that it was difficult to judge 1 or 1.5 m when overtaking a bicycle rider, and agreeing that giving 1.5 m clearance in > 60 km/h zones to bicycle riders annoyed the person.

Table 3

Correlates of non-compliance with the Queensland road rule in multivariable linear regression modelling (n=3207).

	Non-compliance with 1-m rule		Non-compliance with 1.5-m rule	
Independent variables	**B**	**95%CI**	**B**	**95%CI**
Sex				
Male (referent)	0.00		0.00	
Female	0.08	-0.04, 0.19	-0.04	-0.15, 0.08
Age (years)				
<25	0.31	-0.05, 0.67	*0.38	0.04, 0.72
25-39	0.18	-0.01, 0.36	**0.24	0.06, 0.41
40-59	0.08	-0.04, 0.20	0.08	-0.04, 0.20
50+ (referent)	0.00		0.00	
AWARENESS ITEMS[1]				
I have observed motorists giving bicycle riders more room when overtaking	***-0.11	-0.17, -0.04	**-0.09	-0.16, -0.03
I have observed more bicycle riders on the road	0.04	-0.02, 0.10	0.05	-0.01, 0.11
I am more aware of bicycle riders when driving on the road	***0.12	0.06, 0.18	***0.09	0.04, 0.15
ATTITUDE ITEMS[2]				

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The minimum overtaking distance rule has changed my driving	***-0.21	-0.33, -0.09	***-0.26	-0.37, -0.14
The minimum overtaking distance rule only makes it more difficult to pass a cyclist	**0.18	0.05, 0.31	**0.16	0.04, 0.29
Cyclists use the minimum overtaking distance rule to block the lane	-0.01	-0.14, 0.12	0.03	-0.09, 0.16
The minimum overtaking distance rule has made it safer for cyclists	**-0.19	-0.32, -0.07	***-0.22	-0.34, -0.10
I find it difficult to judge this distance	*0.17	0.03, 0.31	**0.20	0.06, 0.33
It annoys me that cyclists must be given this much clearance	0.11	-0.04, 0.25	**0.19	0.04, 0.33

271 CI = confidence interval

272 Separate models were created for the two outcomes (non-compliance in ≤ 60 km/h zones and > 60

273 km/h zones). All independent variables were included in each of the two models.

274 [1]Response options: 1 (strongly disagree) to 5 (strongly agree).

275 [2]Response options: 0 (disagree) and 1 (agree).

276 *p<0.05. **p≤0.01; ***p≤0.001

277

278 **4. Discussion**

Drivers who don't comply

This study is the first to examine the relationship between drivers' awareness and attitudes, as well as other characteristics of drivers, and their self-reported compliance with a MPD rule. About one-third of drivers surveyed reported that they did not comply with the MPD rule "most of the time" or "always". Their responses were similar when asked about compliance with the 1 m minimum in speed zones of 60 km/h and lower, and compliance with the 1.5 m minimum in higher speed zones. Likewise, about 40% of drivers reported that they had not observed other drivers' giving bicycle riders more space than they did before the rule was introduced. These findings are consistent with the widespread level of cyclist concern about close passing (Aldred & Crosweller, 2015; Heesch et al., 2017; Sanders, 2015). Almost three-quarters of the drivers "did not know" whether the police were enforcing the rule, and the level of drivers' awareness of police enforcement did not significantly influence their reported level of non-compliance (not statistically significant in bivariate modeling so not included in the final modeling reported in Table 3). This suggests that lack of concern about enforcement may be contributing to the high level of reported non-compliance.

Drivers who reported more frequent non-compliance with the rule were less likely to agree that they had observed other motorists giving riders more space when overtaking or that the rule had made it safer for cyclists. Non-compliance was also associated with agreeing that the law only made it more difficult to pass cyclists. These results are consistent with Rissel et al.'s (2002) finding that 57% of drivers reported that 'it is very frustrating sharing the road with cyclists' and Johnson et al.'s (2014) finding that drivers who did not cycle were more likely to agree that 'I feel frustrated when I have to keep passing the same cyclist'. Certainly, the general response to the survey items suggested that non-compliance was related to doubting that the rule was beneficial for cyclist safety and promotion of cycling, and being annoyed by the 1.5 m requirement in higher speed zones.

A surprising finding was that non-compliance was associated with now being more aware of cyclists. Finding it more difficult to overtake cyclists was also correlated with noncompliance. It may be that experiencing the feeling that it is more difficult to overtake is making these non-compliant drivers more aware of cyclists. The awareness may be provoked by irritation, rather than empathy.

Non-compliance was associated with a range of attitudinal factors, including the belief that it is difficult to judge the required distance in overtaking bicycle riders. In a previous report of the same study, we reported that only 60% of drivers surveyed were 'certain' or 'very certain' that *they* could accurately judge 1 m or 1.5 m when passing a cyclist, and only 19% thought that *other drivers* could do this when passing (Schramm et al., 2016). The police officers interviewed for the same study commented that some drivers were leaving 'excessive' distances when passing (Schramm et al., 2016). These findings are consistent with the poor ability to judge lateral distances that have been reported in psychophysical experiments (Levin & Haber, 1993) and in a driving simulator (Baumberger, Flückiger, Paquette, Bergeron & Delorme, 2005).

A major strength of the study is that data were collected from a large and diverse sample of drivers. However, the study also has some limitations. The survey was administered at one time point 1 year after the commencement of the MPD rule, so it was not possible to assess whether passing distances were affected by the introduction of the rule. Drivers who stated that they were unaware of the rule were excluded from the analyses. They comprised only 5% of the original sample, suggesting that public education regarding the introduction of the rule was effective. While their exclusion means that their degree of compliance is unknown, their small representation in the original sample suggests that their exclusion was unlikely to have markedly affected the results. In addition, the survey measured self-reported non-compliance and the relationship with actual non-compliance is not clear. While self-reported levels of non-compliance were similar across the speed

zones, observational data collected as part of the larger Queensland MPD evaluation (Schramm et al., 2016) suggested that 88% of drivers complied with the 1 m rule in speed zones of ≤60 km/h and 79% complied in higher speed zones. There is no direct comparison between the rating scale of frequency of non-compliance used in the survey and the frequency of compliance in the observed data, but the reported level of non-compliance does seem lower than in the observational data. This may reflect drivers' underestimation of their passing distance, as suggested by police observations of drivers' giving too much space. Further research where both self-reported and observational data are collected for the same passing events could help to understand this discrepancy.

5. Conclusions

About one-third of Queensland drivers reported that they were not consistently complying with the MPD rule. Reported non-compliance with the MPD road rule was widespread and was related more to attitudinal than demographic factors. Among those who reported frequent non-compliance, the rule appeared to influence their attitudes towards bicycle riders negatively. These findings suggest that strategies are needed to help drivers judge passing distances and improve their understanding of the importance for cyclist safety of leaving an adequate distance.

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