Submission 80



SUBMISSION TO THE QUEENSLAND PARLIAMENTARY INQUIRY INTO CYCLING ISSUES

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Executive Summary

This submission has been prepared in response to the Queensland Parliamentary Transport, Housing and Local Government Committee *Inquiry into Cycling Issues*. The document first outlines CARRS-Q's expertise in cycling safety. Detailed information relevant to the first two issues is then presented. Some brief comments on the final two issues are then provided before other potential issues are mentioned. A summary of the specific information for each of the four issues being examined by the Committee is provided below. Supporting references are provided in the body of the submission.

1. Short and long term trends in bicycle injuries and fatalities involving motor vehicles

Most bicycle crashes do not involve motor vehicles, but those that do are often severe. Less than 10% of cyclist Emergency Department presentations result from collisions with motor vehicles. However, about 40% of cyclist hospital admissions and about 60% of all cyclist fatalities are due to collisions with motor vehicles. Less than half of the bicycle-motor vehicle crashes not resulting in a fatality are reported to police and therefore we have presented health data, rather than police data, wherever possible in our submission.

In Queensland, hospital data show that the number of cyclists admitted following road vehicle traffic crashes rose from 824 in 2005-06 to 1,093 in 2008-09. Across Australia, hospital admissions also increased from 4,370 in 2005-06 to 5,340 in 2009-10. The number of fatalities in Queensland is too small to show any reliable trends, but the Australia-wide data suggest fewer fatalities in the later years than the first two years. However, during recent years the number of people cycling (particularly adults) has grown. The data are inadequate to assess whether cycling is becoming safer, but suggest that injury and fatality rates are not increasing. Nevertheless, cyclist fatality and injury rates per km remain about 10-20 times higher than for car occupants and are about three times higher than in the best-performing countries.

Over the longer term, the annual number of cyclist fatalities roughly halved from 1990-91 (when mandatory helmet legislation was introduced) to 2011-12, both in Queensland and across Australia. The reduction was greater for children than adults. In Australia, children made up half of the cyclists killed in 1989 to 1991, but less than 10% of cyclists killed in recent years (Queensland numbers are too small for trends to be clear). In contrast, hospital data (both on- and off-road, including a motor vehicle or not) suggest that almost as many children as adults continue to be admitted to hospital as a result of bicycle crashes.

The lack of consistent and comprehensive long-term data regarding the amount and patterns of cycling makes it difficult to interpret the long-term changes in bicycle fatalities. The general consensus is that the reduction in fatalities following the

introduction of mandatory helmet legislation partly reflects helmet effectiveness and partly reflects a reduction in riding. Other longer-term societal changes have also contributed to less riding by children (and adults). Nevertheless, the recent growth in riding without a commensurate increase in injuries and fatalities is encouraging.

Heavy vehicles are over-represented among fatal cyclist crashes and drivers of utilities and panel vans are more likely to be at fault (compared to car drivers). Child riders have relatively few crashes with motor vehicles but are more likely to be at fault. It may be more effective to adapt the riding environment to the needs of children, particularly in the low speed areas where children usually access roads from footpaths, rather than attempting to make children behave more like the adults.

2. Evaluation, considering factors such as effectiveness, enforceability and impacts on other road users of existing and any other alternative road rules, such as the 1m rule, which govern interaction between cyclists and other road users

Good rules allow and promote safe behaviour, and prohibit and discourage unsafe behaviour. Rules which prohibit safe behaviours (or behaviours perceived by many to be safe) are likely to result in poor compliance. Rules which allow or encourage unsafe behaviours are likely to lead to harm. This framework provides a useful approach to evaluating existing and alternative road rules.

In 2011, TMR commissioned CARRS-Q to review the Queensland Road Rules to identify legislative impediments to increasing walking and cycling that could be changed without compromising safety. Road users' level of knowledge of the rules and the degree of compliance and enforcement were examined as part of this review. Helmet legislation, passing distance requirements and penalties for violations were outside of the scope of the review. Some rules related to bicycle lanes (Rules 132 and 153) were found to prevent or inflate the cost of installing bicycle facilities which would better separate bicycles and motor vehicles. Other rules related to priority at intersections (Rules 62, 67-69, 72-73) and riding across pedestrian crossings (Rule 248) discourage and fail to protect those new or risk-averse cyclists who are riding on the footpath. The rules related to where bicycles should travel, and their priority, where there are no bicycle facilities (Rules 119 and 150) were also identified as potentially impacting rider safety and participation.

The Queensland Road Rules (unlike those in other States) do not prohibit motor vehicles from parking in bicycle lanes. The obstruction caused by parked vehicles leads cyclists to ride within the "door zone" (the space where an opening car door would strike the cyclist) or in the path of moving motor vehicles. In moving across to avoid parked cars, the cyclist is also required to give way to any and all traffic, potentially causing risk and delay to the cyclist.

Other CARRS-Q research has concluded that Rule 250 allowing adult cyclists in Queensland to ride on the footpath does not pose a major safety danger for cyclists or pedestrians and the opportunity to ride on the footpath may act to encourage cycling (particularly among new cyclists) because it is perceived to be less dangerous than riding on the road.

There is little scientific research specifically addressing the safety effects of a one-metre rule. However, some CARRS-Q research has implications for the likely effectiveness of such a rule. Our analysis found that the types of crashes for which a one-metre rule might be a suitable countermeasure comprised less than 20% of Police-reported injury and fatality crashes in Queensland involving a motor vehicle and a bicycle. In addition, our research supported international findings that the driver of the motor vehicle commonly failed to give way or stop, probably because the driver failed to notice the cyclist. A one-metre rule can only affect the behaviour of drivers who have noticed the cyclist. Therefore such a rule is unlikely to have any benefit in the common crash scenario where the driver states that they did not see the cyclist.

Strict liability laws have also been proposed to improve cyclist safety. Under these laws, motorists are assumed liable for collisions involving vulnerable road users (and cyclists if a rider collides with a pedestrian) until proven otherwise. They have been introduced in many European countries and similar laws are in place in parts of North America, but there are no published evaluations of the effects of these laws on cycling safety.

3. Current penalties and sanctions, including where there are differential fine rates for cyclists compared to other road users

We are not aware of any research that specifically examines the road safety effects of differential fine rates (monetary penalties) for cyclists compared to other road users. Research by CARRS-Q and others has concluded that drivers are more often at fault and more often commit violations than cyclists in motor vehicle-cyclist crashes (except children who are more likely to be at fault). This suggests that the size of penalties for cyclists is less relevant, given they are less often applicable. In other areas of road safety, particularly speeding and drink driving, the certainty of detection and the certainty and swiftness of penalties have been found to be more important contributors to effectiveness than the size of the penalty. It has been argued that penalties and sanctions can only deter deliberate, reasoned actions, and so are not useful for actions which are errors (e.g. failing to notice a cyclist).

4. The potential benefits and impacts of bicycle registration

We are not aware of any research that specifically examines the benefits and impacts of bicycle registration. In our submission, we have summarised the rationale for registration of vehicles and provide some comments about their relevance for bicycles and the potential negative impact on government targets for increasing cycling.

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Other issues

Recent years have seen the development and increased popularity of a wide range of human-powered and motorised two- and three-wheeled vehicles. Many of these new vehicles do not easily fit into current vehicle classifications and legislative requirements and raise questions about who should be allowed to use them, and where, and under what rules. The compatibility of powered two-wheelers (including motorised bicycles or Segway-type devices) with bicycles, pedestrians and motor vehicles requires further examination.

1. INTRODUCTION

On 7 June 2013, the Legislative Assembly agreed to a motion that the Transport, Housing and Local Government Committee inquire into and report on cycling issues. The Committee stated that it will consider the following particular issues to improve the interaction of cyclists with other road users:

- 1. short and long term trends in bicycle injuries and fatalities involving motor vehicles;
- 2. evaluation, considering factors such as effectiveness, enforceability and impacts on other road users of existing and any other alternative road rules, such as the 1m rule, which govern interaction between cyclists and other road users;
- 3. current penalties and sanctions, including where there are differential fine rates for cyclists compared to other road users; and
- 4. the potential benefits and impacts of bicycle registration.

This submission from the Centre for Accident Research and Road Safety-Queensland (CARRS-Q) begins with an outline of its expertise in cycling safety. Then detailed information relevant to the first two issues being considered by the Committee is presented in Sections 2 and 3, respectively. Some brief comments on the final two issues are then provided in Sections 4 and 5. Other relevant issues are mentioned in Section 6.

1.1 CARRS-Q expertise in cycling safety

CARRS-Q is one of the leading centres in Australia dedicated to research, education and outreach activities in road safety. It exemplifies an approach to shaping and informing public debate that works through long-term partnerships with key government and industry bodies. The Centre was founded by Professor Mary Sheehan, and is currently headed by Professor Barry Watson, with a strong support team of leading academics.

CARRS-Q builds new scientific understanding that enables regulatory authorities, policy makers, educators and communities to frame strategic choices about applied future actions. Clear proactive input to relevant national research priorities is a key element of the research strategy, which has been assisted by staff membership of all major road safety policy groups including at the state and federal level.

The impact of the research is recognised in state and national policy development, and CARRS-Q takes a lead role in road safety advocacy. As well as working closely with local

agencies to develop road safety strategy, CARRS-Q has actively contributed to road safety research, policy review and development in Queensland and across Australia.

Vulnerable Road Users is one of the six research themes at CARRS-Q, and this area is headed by Professor Narelle Haworth, with input from researchers across the Centre. In recent years, CARRS-Q cycling research has examined a large range of issues including: the effectiveness of bicycle helmet and other legislation, factors contributing to bicycle crashes, usage of public bicycle schemes, interactions between pedestrians and cyclists, the safety of footpath cycling and how perceived and actual risk are related. CARRS-Q contributes to international research in cycling safety through its involvement in the European Commission project "COST Action TU1101: Towards safer bicycling through optimization of bicycle helmets and usage" and the US Transportation Research Board Committee ANF20 Bicycle Transportation. A list of CARRS-Q publications relating to cyclist safety containing links to electronic copies is presented in Appendix 1.

2. SHORT- AND LONG-TERM TRENDS IN BICYCLE INJURIES AND FATALITIES INVOLVING MOTOR VEHICLES

This section begins with a description of some important issues related to terminology and data sources that are relevant to the interpretation of bicycle injury and fatality data.

2.1 Terminology and data sources

Crashes involving motor vehicles are a major contributor to the most severe outcomes for bicycle riders. They represent 63.3% of cyclist fatalities (Australian Bureau of Statistics, 2013), 39.4% of cyclists admitted to hospital (Henley & Harrison, 2012b), and 6-8% of cyclist Emergency Department presentations (Queensland Injury Surveillance Unit, 2005) on public roads. Of the bicycle crashes that result in injury or fatality, only those that occur on the public road network and involve a motor vehicle are required to be reported to Police and thus become part of the Police-reported crash data.

Unfortunately, many of these crashes which are required to be reported are not actually reported. US and European studies indicate that only 11% (Stutts et al., 1990) to 13% (Veisten et al., 2007) of bicycle crashes are recorded in police statistics and the data are skewed to serious injury crashes and those that involve motor vehicles (Stutts et al., 1990). The extent of under-reporting is greater in less serious bicycle crashes in many countries (see ITF, 2012). In a CARRS-Q survey of Queensland cyclists, only 3.9% of self-reported crashes that met the requirement for reporting to police (occurred on a public road, and resulted in at least one person being injured or killed) were reported to police. While 45.5% of bicycle-motor vehicles were reported, only 4.8% of multiple bicycle crashes, 16.7% of bicycle-pedestrian and 18.8% of bicycle-animal crashes were reported. The survey results indicate that single vehicle, and multiple bicycle crashes are severely under-reported in official police data. Thus the Police-reported crash data is not always accurate.

For the reasons above, the numbers of bicycle riders admitted to hospital following onroad crashes involving motor vehicles will differ depending on whether hospital data from the Australian Institute of Health and Welfare (AIHW) is used or the TMR database of Police-reported crashes is used. Given the greater completeness of the hospital data from AIHW (particularly for comparison with non-motor vehicle bicycle crashes), then that source is used in preference to TMR data where possible in this submission.

2.2 Short-term trends

Short-term trends in bicycle injuries and fatalities have been examined using the last five years of available data as the timeframe for "short-term". Unfortunately, data from different sources are available for differing time periods. Where possible, data have been re-grouped to allow comparison between the Police and road authority data which is commonly represented in calendar years and the hospital data which is represented in financial years. Data are presented for Queensland and compared to the whole of Australia where possible.

Table 2.1 presents data on the number of cyclists hospitalised (from health data) and the number of cyclists killed (from transport data) in road traffic vehicle crashes in recent years. In Queensland, the number of cyclists hospitalised due to road vehicle traffic crashes rose from 824 in 2005-06 to 1,093 in 2008-09. Across Australia, the numbers also increased from 4,370 in 2005-06 to 5,340 in 2009-10. The number of fatalities in Queensland is too small to show any reliable trends, but the Australia-wide data suggests fewer fatalities in the later years than the first two years.

Year	Queen	sland	Australia*		
	Hospitalisations [†]	Fatalities [^]	Hospitalisations [†]	Fatalities [^]	
2005-06	824	7	4,370	42	
2006-07	1,000	11	4,789	44	
2007-08	999	8	4,814	28	
2008-09	1,093	8	5,264	33	
2009-10		7	5,340	38	
2010-11		5		33	
2011-12		9		31	

Table 2.1. Short-term trends in numbers of cyclists admitted to hospital due to road vehicle traffic crashes

*All states and territories

[†] Berry & Harrison, 2008; Henley & Harrison, 2009; Henley & Harrison, 2012a; Henley & Harrison, 2012b

^BITRE Australian Road Deaths Database

2.3 Long-term trends

Data on numbers of cyclists admitted to hospital after road crashes involving motor vehicles is not publicly available from the AIHW before 2003-04. The fatality data in Table 2.2 is taken from the BITRE Australian Road Deaths Database. It shows large reductions in fatalities in both Queensland and Australia as a whole from 1989-90 to 1990-91 (corresponding with the introduction of mandatory helmet legislation). The annual number of cyclist fatalities roughly halved from 1990-91 to 2011-12 in both Queensland and Australia.

Year	Queensland	Australia*	
	Fatalities^	Fatalities [^]	Hospitalisations [†]
1989-90	26	96	
1990-91	14	67	
1991-92	15	49	
1992-93	16	38	
1993-94	12	55	
1994-95	12	54	
1995-96	9	55	
1996-97	10	55	
1997-98	10	42	
1998-99	7	42	
1999-2000	12	41	
2000-01	6	26	
2001-02	12	42	
2002-03	6	36	
2003-04	10	37	3,676
2004-05	6	37	
2005-06	7	42	4,370
2006-07	11	44	4,789
2007-08	8	28	4,814
2008-09	8	33	5,264
2009-10	7	38	5,340
2010-11	5	33	
2011-12	9	31	

Table 2.2 Long-term trends in numbers of cyclist fatalities due to road vehicle traffic crashes

*All states and territories ^BITRE Australian Road Deaths Database

⁺ Berry & Harrison, 2008; Henley & Harrison, 2009; Henley & Harrison, 2012a; Henley & Harrison, 2012b

The long-term trends in bicycle fatalities have differed somewhat for children and adults (see Table 2.3). While the Queensland fatality numbers are too small for trends to be clear, the Australian fatality numbers show that the numbers of children and adults killed in bicycle crashes were similar in 1989 to 1991, very few children were killed in bicycle crashes in recent years. The low proportion of bicyclist fatalities in road crashes that are children was not reflected in serious injuries. While bicyclist hospitalisation data is not easily available by age, the data in Table 2.4 suggests that almost as many children as adults are hospitalised as a result of bicycle crashes (both on- and off-road, including a motor vehicle or not).

	0-4 years		5-17 y	vears	18+ years		
Year	Queensland	Australia*	Queensland	Australia*	Queensland	Australia*	
1989	0	2	10	47	10	54	
1990	0	2	9	34	10	47	
1991	0	2	6	25	11	35	
1992	0	0	9	17	9	24	
1993	0	0	4	16	7	30	
1994	0	0	4	24	10	37	
1995	0	0	3	13	7	36	
1996	0	0	7	21	3	37	
1997	0	0	6	21	8	33	
1998	0	0	5	17	4	27	
1999	0	0	1	10	8	30	
2000	0	1	2	9	4	22	
2001	0	0	6	17	10	34	
2002	0	0	1	8	4	26	
2003	0	0	2	6	5	20	
2004	0	0	3	12	6	31	
2005	0	2	1	6	4	33	
2006	0	2	1	5	8	32	
2007	0	0	2	8	8	33	
2008	0	0	0	4	7	24	
2009	0	0	2	3	7	29	
2010	0	0	0	1	7	37	
2011	0	0	2	2	7	32	
2012	0	0	0	2	10	31	

Table 2.3 Pedal cycle fatalities, by age (BITRE, 2013)

Table 2.4 Serious injury due to land transport accidents (road and non-traffic), by age,	
Australia	

Year	0-4 years		5-17 yea:	rs	18 years and older	
	Hospitalisations	Fatalities	Hospitalisations	Fatalities	Hospitalisations	Fatalities
2005-	-	2	-	9	-	26
06						
2006-	269	1	4,403	5	4,574	36
07						
2007-	290	1	3,980	7	4,832	36
08						
2008-	272	0	3,767	4	5,538	24
09						

2.4 Interpretation of long-term trends in bicycle fatalities and injuries

To understand what the data presented earlier mean about the safety of bicycle riding and how this may have changed, it is necessary to compare them to measures of the amount of riding.

2.4.1 Information on amount of riding

Information on how much bicycle riding occurs and by what groups in Queensland and Australia is sparse. Australia has not conducted national travel surveys since the early 1970s (Garrard, Greaves & Ellison, 2010). The Exercise, Recreation and Sport Survey conducted by the Australian Bureau of Statistics provides some limited long-term data on participation in cycling (Australian Sports Commission, 2011). In this survey, people who said that they had participated in any physical activities for exercise, recreation or sport during the last 12 months, were asked which activity they had participated in (which included cycling). Table 2.5 shows that the rate of participation in cycling has generally been lower for Queensland than for Australia as a whole. However, the percentage of people reporting cycling in Queensland increased by 65% from 2001 to 2010 and by 45% across Australia. Table 2.6 shows that the increase in cycling has been evident mostly in persons aged 35 and older. The participation rate was also roughly double for males, compared to females.

Year		Nat		Queens	and	
	participation	rate	Organised	Non-	participation	rate
	'000	%		organised	'000 '	%
2001	1,438.3	9.5	124.2	1,349.8	235.1	8.4
			(0.8%)	(8.9%)		
2002	1,419.4	9.3	135.1	1,342.3	243.2	8.5
			(0.9%)	(8.8%)		
2003	1,471.8	9.4	124.6	1,402.3	274.6	9.3
			(0.8%)	(9.0%)		
2004	1,658.4	10.5	128.1	1,591.3	291.1	9.6
			(0.8%)	(10.1%)		
2005	1,646.9	10.3	143.3	1576.4	308.6	9.9
			(09%)	(9.9%)		
2006	1,642.8	10.2	139.5	1,571.7	273.2	8.7
			(0.9%)	(9.8%)		
2007	1,591.1	9.7	121.5	1,532.0	326.5	10.2
			(0.7%)	(9.4%)		
2008	1,928.1	11.6	192.5	1,850.5	333.3	10.2
			(1.2%)	(11.1%)		
2009	1,901.3	11.1	224.3	1,809.9	364.4	10.6
			(1.3%)	(10.5%)		
2010	2,081.2	11.9	264.0	1,985.1	389.6	11.1
			(1.5%)	(11.3%)		

Table 2.5 Australian cycling participation rates, National and Queensland, by year (ERASS) (Standing Committee on Recreation and Sport, 2002-2011)

(Standing Committee on Recreation and Spore, 2002 2011)								
Year	National (number '000)							
	15-24	25-34	35-44	45-54	55-64	65+		
2001	255.0	427.1	359.9	250.9	93.8	51.6		
	(9.6%)	(14.8%)	(12.3%)	(9.5%)	(5.3%)	(2.3%)		
2002	226.1	373.1	376.5	285.2	110.8	47.7		
	(8.4%)	(12.8%)	(12.8%)	(10.8%)	(5.9%)	(2.1%)		
2003	218.4	399.3	404.2	266.7	127.0	56.2		
	(8.0%)	(13.5%)	(13.7%)	(9.9%)	(6.4%)	(2.5%)		
2004	276.0	430.3	461.5	287.7	130.5	72.4		
	(9.9%)	(14.4%)	(15.6%)	(10.5%)	(6.4%)	(3.2%)		
2005	238.1	428.4	428.9	303.4	164.2	83.7		
	(8.4%)	(14.4%)	(14.5%)	(11.0%)	(7.7%)	(3.6%)		
2006	224.4	373.8	506.1	271.5	188.3	78.6		
	(8.1%)	(13.3%)	(16.9%)	(9.7%)	(8.5%)	(3.2%)		
2007	1975	258.2	160 5	221.1	160.8	84.0		
2007	107.5	(12.60%)	(15.6%)	(11706)	(7.106)	(2,20%)		
2009	1027	274.9	[13.0%]	(11.770)	2570	126.4		
2008	192.7	374.0 (12.00/)	557.5 (19.404)	410.0 (14 E04)	257.0 (11.00/)	120.4		
2000	(0.7%)	(13.0%)	[10.4%]	(14.5%)	(11.0%)	(4.9%)		
2009	238.5	305.8	502.3	405.8	220.8	108.1		
	(8.1%)	(12.2%)	(18.1%)	[13.6%]	(9.0%)	(4.0%)		
2010	235.5	435.9	582.7	465.3	247.2	114.7		
	(7.9%)	(14.3%)	(18.7%)	(15.4%)	(9.8%)	(11.9%)		

Table 2.6 Australian cycling participation data, by age group, for cycling (ERASS) (Standing Committee on Recreation and Sport, 2002-2011)

The Australian Bureau of Statistics collects information on travel to work as a cyclist as part of the Census held every five years. However, this data is restricted to travel to work (and not other forms of cycling) and the reliability of comparisons is questionable given that it is based on one day only and weather conditions can markedly affect the number of people cycling on that day.

Many general household travel surveys contain very few cyclist trips and so their data is not very reliable for calculation of trends. Garrard, Greaves and Ellison (2010) report that the bicycle kilometres of travel in the Sydney Household Travel Survey increased by 29% from 2002-2005, but this was based on only about 250 bicycle trips per year.

A recent increase in cycling in the Brisbane CBD was evident in an observational study conducted by CARRS-Q in 2010 and repeated in 2012. In October 2010, 1992 bicycles were observed. In October 2012, 2552 bicycles were observed, representing an increase of 28%. The greatest increase in cyclists was observed between 7-9am (43%) and between 4-6pm (26%), suggesting a growth in the use of bicycles for commuting to work in the city.

2.4.2 Estimates of fatality and injury rates

Garrard, Greaves & Ellison (2010) estimated the fatality and serious injury risks for cyclists in Melbourne and Sydney. The Melbourne fatality risk is based on four fatalities from only one year and so is not likely to be a reliable estimate. The Sydney estimates

vary from 3.9 to 6.9 fatalities per 10⁸ kms in 2002 to 2005 (see Table 2.7). This is between 11.1 and 18.6 times greater than for travelling by car. The (police-reported) injury risk for cycling in Sydney was estimated at between 412 and 685 per 10⁸ kms, about 13.2 to 19.1 times the risk of travelling by car. However, there was some evidence that both the fatality rate and the injury rate fell from 2002 to 2005.

(dui ruru,								
Data	Fatality	Injury	Average	Fatality	Injury rate	Relative	Relative	
source	count	count	daily	rate (per	(per	fatality	injury	
			distance	10 ⁸ km)	10 ⁸ km)	risk	risk	
			travelled			(Bicycle:	(Bicycle:	
			(5-7 yr			Car)	Car)	
			pooled)					
2002	10	1,014	487,687	5.62	569.64	13.52	15.35	
2003	9	901	360,147	6.85	685.41	18.60	19.11	
2004	8	928	452,459	4.84	561.92	14.03	17.65	
2005	9	948	630,420	3.91	411.99	11.07	13.18	

Table 2.7 Fatality and serious injury risks for cyclists in the Sydney GMA (2002-2005) (Garrard, Greaves & Ellison, 2010)

In Melbourne, it was possible to compare the numbers of cyclists recorded as admitted to hospital in the Victorian Injury Surveillance Unit data (which included bike paths and cycle ways as well as roads) with those recorded as hospitalised in the police accident data set. There were approximately 2.5 times as many cyclists recorded in the hospital data, and so the fatality and serious injury rates reflected this difference, as shown in Table 2.8. This also suggests that the NSW fatality and injury rates also underestimate the true values.

Table	2.8 Fatality and serious accident risks for cyclists in the Melbourne metropolitan
area (Garrard, Greaves & Ellison, 2010)

Data	Fatality	Serious	Average	Fatality	Serious	Relative	Relative
source	count	injury count	daily distance travelled (2007- 08)	rate (per 10 ⁸ km)	injury rate (per 10 ⁸ km)	fatality risk (Bicycle: Car)	injury risk (Bicycle: Car)
Crash stats	4	440	934,180	1.18	123.5	4.54	12.9
VISU		1075	934,180		315.3		33.5

2.5 Comparisons with other countries

Cyclist fatality rates can be compared across countries to provide an overall measure of the relative safety of cycling in Australia. The European PROMISING project estimated bicyclist fatality rates across Europe as 4.6 per 100 million kilometres ridden

(PROMISING, 2001), compared to the 3.9 to 6.9 range reported for Sydney by Garrard et al (2010). However, other data suggests that the fatality rates are between 1 and 2 in the Netherlands, Denmark and Germany, but roughly double in the United Kingdom (Pucher & Buehler, 2008).

There are many other sources that present bicycle fatality and injury rates as a function of head of population (European Road Safety Observatory, 2010), or number of trips (Beck, Dellinger & O'Neil, 2007; PROMISING, 2001), or number of hours ridden (PROMISING, 2001). Differences in the definitions of injury between countries and studies also make it difficult to compare injury rates in Australia and other countries.

2.6 Types of motor vehicles involved in bicycle crashes

The collision counterpart is not recorded for many bicyclists admitted to hospital (see Table 2.9). However, where it is reported, cars, pick-up trucks and vans are (not surprisingly) the most frequent collision partner. Among police-reported bicycle crashes in Queensland, Victoria and Western Australia, Watson and Cameron (2006) reported that large cars were the most common types of motor vehicles involved (see Table 2.10).

Collision	Injured cyclist, 2007-08		Injured cyclist, 2008-09		
counterpart					
	Traffic	Non-traffic	Traffic	Non-traffic	
Car, pick-up truck or van	1,076	43	1,090	36	
2- or 3- wheeled motor vehicle	11	-	14	6	
Pedal cycle	146	116	198	307	
Pedestrian or animal	24	28	33	32	
Heavy transport vehicle or bus	55	-	71		
Train	-	-		0	
Other non-motor vehicle	-	-			
Fixed or stationary object	217	239	253	284	
Non-collision transport accident	1,595	2,985	2,152	3,126	
Other and unspecified transport accidents	1,682	538	1,445	269	
Total	4,614	3,955	5,264	4,068	

Table 2.9 Traffic and non-traffic serious injury pedal cyclist serious injury in Australia, by collision counterpart (Henley & Harrison, 2009; 2012a)

	State			
Vehicle market	Victoria	Queensland	Western	Total
group			Australia	
Unknown	2,108 (43.6%)	1,438 (38.3%)	1,107 (39.0%)	4,653 (40.7%)
Compact 4WD	73 (1.5%)	42 (1.1%)	42 (1.5%)	157 (1.4%)
Large 4WD	84 (1.7%)	50 (1.3%)	91 (3.2%)	225 (2.0%)
Medium 4WD	70 (1.5%)	18 (0.5%)	39 (1.4%)	127 (1.1%)
Commercial	160 (3.3%)	244 (6.5%)	118 (4.16%)	522 (4.6%)
Ute				
Commercial	65 (1.4%)	60 (1.6)	31 (1.1%)	156 (1.4%)
Van				
Large car	1,056 (21.9%)	878 (23.4%)	551 (19.4%)	2,485 (21.7%)
Luxury car	212 (4.4%)	120 (3.2%)	90 (3.2%)	422 (3.7%)
Medium car	207 (4.3%)	173 (4.6%)	133 (4.7%)	513 (4.5%)
People Mover	47 (1.0%)	48 (1.3%)	28 (1.0%)	123 (1.1%)
Small car	469 (9.7%)	400 (10.6%)	340 (12.0%)	1,209 (10.6%)
Light car	208 (4.3%)	248 (6.6%)	237 (8.4%)	693 (6.1%)
Sport car	73 (1.5%)	40 (1.1%)	30 (1.1%)	143 (1.3%)

Table 2.10 Type of motor vehicles involved in collisions with bicycle, police reported crashes (Watson & Cameron, 2006)

An analysis of fatal cyclist crashes across Australia between 1996 and 2000 (ATSB, 2006) found that 33% of all fatal crashes involving another vehicle involved an articulated or rigid truck. The ABS Survey of Motor Vehicle Usage (ABS, 2013) notes that rigid trucks and articulated trucks together only accounted for approximately 7% of all kilometres travelled on Australian roads between 2005 and 2012. In the United Kingdom, heavy goods vehicles are involved in 4% of cyclist casualty crashes (killed and seriously injured), but 18% of fatality crashes (Knowles et al., 2009). Taken together, these figures indicate a substantial over-representation of heavy vehicles among fatal cyclist crashes. In our analysis of Queensland bicycle-car crashes reported to police, drivers of utilities and panel vans were more likely to be at fault (compared to car drivers) in bicycle crashes with a corresponding increase in odds by 95.4% (Haworth & Debnath, 2013).

2.7 Comparing bicycle crashes of children and adults

Bicycle crashes involving children and adults differ in their characteristics and contributing factors. Table 2.11 below shows that information about place of injury is not specified for many bicyclists admitted to hospital in Australia. However, for those injuries where location is known, the majority of crashes of adults occur on streets and highways while many children's crashes occur in sports and athletics areas or at home. Thus, it is likely that many more of the cyclist crashes of adults involve motor vehicles. A Swedish study of bicycle-related injuries confirmed this finding, with 2.6% of child

cyclist crashes involving a motor vehicle, compared to more than 10% of adult cyclist crashes (Eilert-Petersson & Schelp, 1997).

British data for police-reported crashes shows that the likelihood that a bicycle-car crash results in a fatality is lowest for children and increases systematically with age (Stone & Broughton, 2003). The research does not explain the underlying mechanisms, but it may partly reflect that children are generally riding in locations with lower speed limits and that older adults are more frail (as they are as drivers).

	Age 0-4		Age 5-17		Age	e 18+
Place	2007-8	2008-9	2007-8	2008-9	2007-8	2008-9
Driveway of home	6	8	22	27	15	26
Other and unspecified	70	41	153	59	19	19
place in home						
Street and highway	24	37	1,033	962	2,055	2,945
Roadway	14	24	823	768	2,314	2,446
Footpath next to road	-	6	90	88	117	150
Cycleway			30	19	115	119
Other specified street	6*	7*	20	17	45	62
and roadway						
Unspecified public			70	70	64	166
highway, street or road						
Parking place			5	8	7	9
Farm	-	-	6	9	-	-
School	14	5	27	32	-	-
Sports and athletics area			366	383	189	230
Forest, beach, area of			66	79	144	232
water and other specified						
countryside						
Other specified place of	14	16	175	151	134	195
occurrence						
Unspecified place of	161	165	2.127	2,057	1,666	1,881
occurrence						
Total	290	272	3,980	3,767	4,832	5,538

Table 2.11 Land transport accident pedal cyclist serious injury, by age, and place of injury (AIHW, 2008-09 data)

*both specified and unspecified grouped together

Section 4.1 presents CARRS-Q research that has demonstrated that child riders are more likely than adults to be at fault in bicycle-motor vehicle collisions (Schramm, Rakotonirainy & Haworth, 2010; Haworth & Debnath, 2013). The most commonly coded crash types for children were 'vehicle leaving driveway' and 'intersection from adjacent approaches'. The children were coded as at fault in about 90% of both of these types of crashes, while the at-fault rate was much lower for adult bicyclists.

Since children are mostly at fault in these scenarios and adults are generally not, educational approaches such as improving child riding awareness (e.g., education from

school or parents) are needed for the children. Structured educational programs like the Bikeability scheme (UK) and Cycling certificates and Great Cycling Exam (Belgium) could improve the skills of children as well as older cyclists (Steriu, 2012). Furthermore, since the severity levels of these child bicyclist crashes were high, implementing measures to reduce injury severity (e.g., helmet use, lower speed limits or traffic calming measures to reduce travel speeds) could be beneficial for them (as well as adults). It may be more effective to adapt the riding environment to the needs of children, particularly in the low speed areas where children usually access roads from footpaths, rather than attempting to make children behave more like the adults.

Many of the bicyclist crashes involving children occurred at intersections with no traffic control on roads with speed limits of 60 km/h or less. Arguably, these are areas of low traffic volume (as evidenced by the lack of traffic controls) and therefore the economic value of installing on-road treatments or separated facilities at each of these sites is likely to be low. Therefore, measures that have a more area-wide effect, such as lower speed limits, and potentially rider or driver education, may be more appropriate than intersection improvements. It has been recommended that speed limits on access roads, which are shared by bicycles and motorized traffic, should be set at 30 km/h to minimize the risk of death and serious injury (Steriu, 2012). Enforcement of the speed limits and supplementing the signs by installing low-cost traffic calming measures were recommended to improve driver compliance with speed limits.

3. EVALUATION OF EXISTING, AND ANY OTHER ALTERNATIVE ROAD RULES, WHICH GOVERN INTERACTION BETWEEN CYCLISTS AND OTHER ROAD USERS

The second issue being examined by the Inquiry is

"evaluation, considering factors such as effectiveness, enforceability and impacts on other road users of existing and any other alternative road rules, such as the 1m rule, which govern interaction between cyclists and other road users".

A simple representation of how road rules and other rules should function is presented in the table below. Good rules are those which allow and promote safe behaviour, or those which prohibit and discourage unsafe behaviour. Rules which prohibit safe behaviours (or behaviours perceived by many to be safe) are likely to result in poor compliance. Rules which allow or encourage unsafe behaviours are dangerous and are likely to lead to harm. This framework provides a useful approach to evaluating existing and alternative road rules.

Table 3.1A framework for classifying rules and their relationship to safe and unsafebehaviours.

	SAFE	UNSAFE
LEGAL	\checkmark	Dangerous law
ILLEGAL	Poor compliance	✓

This section of CARRS-Q's submission to the Inquiry into Cycling Issues begins by presenting the results of a review of current Queensland Road Rules which CARRS-Q conducted for TMR. It then summarises CARRS-Q research on footpath cycling and

discusses some of the concepts related to a one-metre rule and other potential road rules.

3.1 CARRS-Q review of legislation

In 2011, CARRS-Q conducted a review of legislation relating to walking and cycling for Transport and Main Roads (Haworth, Schramm, Palk & King, 2011). TMR commissioned CARRS-Q to:

- Identify legislative impediments to walking and cycling that have the scope to be changed without compromising the original safety intent of the legislation;
- Identify the impact of the likely changes of these legislative impediments and prioritise these based on the likely increase to walking/cycling; and
- Develop options and recommendations for legislative amendments or changes.

Legislation can impede increased walking and cycling by making these modes less safe (objectively or in user perceptions), by making them slower or less convenient, or by preventing or increasing the cost of changes to infrastructure designed to promote walking or cycling. Given the focus of the project on impediments to increasing current levels of walking and cycling, attractiveness and perceived safety were assessed in relation to new or less confident users, rather than experienced and highly competent users. The extent to which legislation functions as an impediment is limited by the extent to which it is complied with, which in turn relates to the level of knowledge of the legislation and the degree of enforcement.

Importantly for the current Inquiry, the following items were deemed by TMR to be out of scope:

- Passing distance requirements for vehicles overtaking cyclists;
- Potential change of liability in crashes involving motor vehicles and vulnerable road users; and
- The current level of penalties imposed for violations.
- Compulsory helmet legislation;
- Taxation and other related issues considered by the Australian Bicycle Council review;
- Planning legislation;
- Road design/engineering; and

• Complete analysis of large-scale recent crash dataset.

The review concluded that some rules related to bicycle lanes (Rules 132 and 153) can prevent or inflate the cost of installing specific bicycle infrastructure to allow better separation of bicycles and motor vehicles. Other rules related to priority at intersections (Rules 62, 67-69, 72-73) and riding across pedestrian crossings (Rule 248) discourage and fail to protect those new or risk-averse cyclists who are riding on the footpath. The rules related to where bicycles should travel, and their priority, where there is no bicycle-specific infrastructure (Rules 119 and 150) were also identified as potentially impacting rider safety and participation. The full wording of these road rules is presented in Appendix 2. The effects of these rules, options for change and the impact of changing them is discussed in the sections which follow.

3.1.1 Rule 132: Keeping to the left of the centre of a road or the dividing line

The current legislation impedes the installation of specific bicycle infrastructure, particularly separated kerb-side two-way bicycle lanes (sometimes referred to as Copenhagen lanes) where they cross roads and are no longer able to be completely segregated from traffic.

3.1.1.1 Options for change

Option 1: Define separated kerb-side two-way bicycle lanes on two-way streets, or bicycle lanes installed to provide two-way bicycle access along one-way streets, as bicycle paths – thereby removing the requirement to comply with s132.

Option 2: Add bicycle lane to s132 (5).

3.1.1.2 Impact assessment

Changes to this legislation would impact on cyclists, pedestrians and motorists. Allowing bicycles to travel in a direction opposite to that of motorised vehicles increases the cognitive demand on pedestrians and drivers. Signing segregated bicycle facilities provides a simple solution to s132 and is the approach preferred by TMR. However this would require education to ensure motorists were aware of their obligations at these new facilities.

However, bicycle paths are road-related areas, and therefore crossing bicycle paths involves moving from a road to a road-related area and vice versa. This may affect legal definitions of priority (see s74), while not being apparent to the road users concerned.

The indirect effects of any changes on other rules need careful consideration (eg. s247, if the bicycle lane becomes a path). Considerations should also be given to how this would affect pedestrian mobility.

Changes to the legislation would reduce the cost of installing new infrastructure. It would also improve the attractiveness of cycling (by reducing inherent delays in the trip).

Current Australian Road Rules does not permit jurisdictional variation to this rule. However there are exceptions to the rule – outlined in s133 and s134.

Consideration of the effects on pedestrians at intersections with segregated bicycle paths is required. There is also a need to consider the flow-on effects in regard to several other sections of the legislation (eg. s74).

Extensive education would be required in conjunction with the development of infrastructure.

3.1.2 Rule 153: Bicycle lanes

There are two issues relating to the legislation surrounding bicycle lanes. The first relates to the fact that a bicycle lane sign (and appropriate road markings, a white bicycle symbol at appropriate distances) is required to mark a regulatory special purpose bicycle lane. However, there may be some distance between the side of the road (where the bicycle lane signs are placed), and the bicycle lane (in several locations around Brisbane, this space includes the width of an emergency stopping lane/road shoulder and bicycle lane before the first traffic lane). There is a legislative precedent for removing the need for both signs and road markings; with give way and stop signs not required if the road is marked appropriately. It is also possible to mark a special purpose bus lane with a "BL" symbol on the road. It may be even more appropriate for bicycle lanes, as it is likely that the most salient marking to all road user groups may be the regular bicycle symbols on the road. Secondly, it also seems unusual that a lane dedicated to a particular type of vehicle does not continue through the intersection (unless continued across the intersection by broken line markings, although this is not required for a normal traffic lane), as bicycles must also travel through the intersection one way or another.

3.1.2.1 Options for change

There are two separate issues with respect to Rule 153: (1) Bicycle lanes requiring signs and road marking, and (2) Bicycle lanes not continuing through intersections.

The first option for dealing with issue (1) is to remove the option for signs at the beginning and end of the bicycle lane and allow a 'white bicycle symbol on road' to be used instead. The second option is to allow a 'green surface treatment with white bicycle symbol on road' to be used instead of a sign. However, TMR advised that green surfacing be reserved for high conflict zones.

Issue (2) could be resolved by removing the requirement in 4(b)(ii), for the bicycle lane to end at an intersection.

3.1.2.2 Impact assessment

It is unlikely that changes to the legislation that permit the continuation of bicycle lanes through intersections (without the use of further signs, or marking the lane through the intersection) would affect other road users. Currently drivers turning left at an intersection are required to give way to a bicycle rider proceeding straight ahead, regardless of whether a bicycle lane is present or marked through the intersection. The research team acknowledges the current legislation, but suggest that legislation can be better structured to provide greater support for certain road user groups. In addition, suitably designed infrastructure can support legislation to bring about desired behaviours.

It is anticipated that changes to the requirement for a bicycle sign would have minimal impact on road users (cyclists and drivers). Research on visual clutter in the roadside environment (considering the considerable distance between the roadside where the sign is located and the left traffic lane in some locations) suggests that the most salient indication of the presence of a bicycle lane is the road markings on the road surface. This would also decrease the number of potential objects that drivers may collide with in event of a crash, and decrease the cost of installing and maintaining bicycle infrastructure.

Changes allowing bicycle lanes to be established without signs decrease visual clutter on the roadside, and would decrease the cost of installing and maintaining bicycle lanes.

There would be a small increase in costs, relating to road markings, should bicycle lanes continue through intersections. Neither change to the legislation should reduce safety, or alter the intention of the rule.

Greater enforcement, and if necessary education, to ensure drivers are not driving/travelling in the marked bicycle lane would improve the actual safety of installed bicycle lanes.

3.1.3 Rules 62, 67-69, 72-73: Priority at intersections for footpath cycling

The rules apply to:

- Giving way when turning at intersection with traffic lights (62)
- Stopping and giving way at a stop sign or stop line at an intersection without traffic lights (67)
- Stopping and giving way at a stop sign or stop line at other places (68)
- Giving way at a give way sign or give way line at an intersection, other than a roundabout (69)

- Giving way at an intersection (except a T-intersection or roundabout) (72)
- Giving way at a T-intersection (73)

Cyclists are currently permitted to ride on the footpath in Queensland (see further discussion in Section 3.4), but are not afforded the same level of priority as pedestrians. Requiring cyclists to dismount and act as pedestrians at intersections to receive priority reduces the benefit of travelling by bicycle. Walking in shoes with cleats can be difficult, and cyclists are less likely to dismount. Cyclists who ride on footpaths may be more risk-adverse, and generally more reluctant to ride if the benefits of cycling are removed at intersections and they feel forced to travel on the road with motorised traffic.

The current wording of several sections within the Queensland Road Rules do not adequately provide for cyclists travelling on the footpath. Under the current legislation bicycles are considered vehicles, and the general road rules do not address the fact that cyclists are permitted to ride on the footpath (unlike any other vehicle under the legislation). This directly affects several general traffic rules. Rule 62 currently doesn't provide any priority for bicycles crossing roads at signalised bicycle crossings. Currently drivers are required to give way to pedestrians at uncontrolled intersections, but similar priorities are not ascribed to cyclists, even when they are legitimately cycling across the road (not dismounting and acting as pedestrians, as they would be should they be crossing at a marked foot crossing). Rule 67-69 and 72-23 currently do not ascribe any priority to bicycles travelling by footpath (they are not considered pedestrians under the legislation unless they are walking their bicycle). These rules could impact on the attractiveness of cycling by the implied lack of priority given to cyclists (further marginalising the road user group).

3.1.3.1 Options for change

Option 1: Add after 'pedestrian', ', or bicycle rider travelling on the footpath' in all parts of the rules s73 and s74 where pedestrian priority is outlined.

3.1.3.2 Impact assessment

With respect to Rules 72-73, the majority of these uncontrolled (absence of lights or signs) intersections occur in low-traffic residential areas so the burden on drivers would be minimal, particularly as drivers should be preparing to give way to pedestrians at these locations (and pedestrians can travel as fast as a slow moving cyclist if they are jogging/running). Consideration should be given to ensure that cyclists are required to travel at an appropriate speed when approaching crossings, providing drivers sufficient time to observe cyclist and give way. This may be best achieved through engineering practice, rather than legislation.

Changes to the legislation would validate cyclists' use of bicycle crossings, and nonmarked foot crossings. Changes to the legislation would not result in additional costs. There may be additional costs related to changes in engineering practice.

Education and enforcement of vulnerable road user priority at intersections should be implemented to validate, and increase the attractiveness of use of active travel modes.

3.1.4 Rule 248: Riding across a pedestrian crossing

Cyclists are currently permitted to ride on footpaths, unless otherwise signed. However, whenever they approach a marked crossing (pedestrian crossing or signalised pedestrian crossing) Rule 248 requires them to dismount and walk across. This affects the continuity of travel, and adds delays to the trip which decreases the attractiveness of cycling. The current legislation acts as an impediment to those cyclists who prefer to travel on the footpath, an environment that allows cyclists an alternative travel route largely separated from motor vehicles.

3.1.4.1 Options for change

Option 1. Change the rule, allowing cyclists to ride across crossing under provision that they cyclist travel at an appropriate speed (on approach to, and during crossing).

Option 2. Develop new crossing types that are shared crossings, rather than pedestrian crossings. This would require changes to engineering practice and additional changes to multiple sections in the legislation.

3.1.4.2 Impact assessment

There is limited information on the impact of these options. Riding across a marked pedestrian crossing point (pedestrian crossing, or signalised pedestrian crossing) was not one of the 12 most frequent infringements issued to Queensland bicycle riders between January 2003 and November 2010. Police-reported crash data (Queensland 2001-2005) showed 65 bicycle rider and pillion injuries as a result of crashes with motor vehicles at pedestrian crossings (no fatalities and 18% required hospitalisation), and 13 bicycle rider and pillion injuries as a result of crashes with motor vehicles at pedestrian crossings (no fatalities and 18% required hospitalisation).

The proposed changes will legalise current user behaviour. An accurate picture of rider behaviour in not available, as regular observation and enforcement is not conducted, although it is anticipated that compliance is very low. While compliance levels might not be considered an appropriate reason for changing legislation, the safety implications of high levels of non-compliance should be examined, in addition to the effect changes would have on the attractiveness of cycling.

The proposed changes may decrease cyclist and pedestrian safety. However, it is difficult to calculate the true costs of changes as current behaviour is not understood.

Data suggests there are very few (78 during the period of 2001-2008) casualties resulting from bicycles riding across marked crossings, and if current compliance is less than 10% it could be argued the safety implications of the proposed changes are minimal.

Education and enforcement, regardless of the status of the legislation, should be used to improve the safety of pedestrians at marked crossings. If legislative changes were implemented, engineering practice may have to be modified to promote appropriate behaviours by all road users (e.g. encourage appropriate crossing speeds for cyclists).

3.1.5 Rule 119: Giving way by the rider of a bicycle or animal to a vehicle leaving a roundabout

This section requires the bicycle rider to observe traffic from both directions at once. Mirrors are not standard bicycle fixtures, and it is potentially unsafe to require bicycles to monitor traffic from both directions. Safety may be enhanced by drivers' lack of knowledge about this section of the legislation.

3.1.6 Rule 150: Riding in a shoulder (on or across a continuous white line)

Cyclists are exempted in Rule 150 which governs driving on or across a continuous white edge line. This allows cyclists to travel on road shoulders but creates a conflict with Rule 138 which states that drivers (and cyclists) are prohibited from travelling on painted islands, which can be present at merge and exits on arterial roads and other locations on the road shoulder. As the legislation currently stands, cyclists riding in the shoulder are required to give way to vehicles every time the shoulder ends. There are several instances where the shoulder may end including: the road space is reduces and the shoulder ceases; or the marking indicates the shoulder stops for traffic moving from the road to a road related area. This section does not support current behaviours of cyclists, who regularly seek the safety of riding in the shoulder.

3.1.6.1 Options for change

Option 1: Add an exemption to s138, or s139(4) that permits cyclists to travel on painted islands.

It is unclear how the legislation can be changed to allow cyclists travelling in the shoulder a level of continuity that allows them to travel straight ahead, without giving way to other traffic, when marked shoulders are not continuous.

3.1.6.2 Impact assessment

Option 1 is unlikely to pose any significant effects on any road user group. Any changes may have implications for engineering practice and design requirements.

Changing the legislation would provide a level of protection and priority for cyclists travelling in road shoulders.

It is not envisaged that there will be significant costs associated with changes to the legislation, although changes in engineering practice may result in minor costs (consideration for the position of retro-reflective raised pavement markers).

If changes to the legislation are not made, it may be necessary to educate road users (and potentially increase enforcement) to ensure cyclists are not intimidated and forced to act against the legislation.

3.1.7 Lack of legislation prohibiting parking in bicycle lanes

Unlike other States, there is no provision within the Queensland Road Rules prohibiting motor vehicles from parking in bicycle lanes. The current approach of allowing motor vehicles to park within bicycle lanes, unless prohibited by signs or road markings, makes it difficult and potentially dangerous to comply with Rule 247 "Riding in a bicycle lane on a road unless it is impractical to do so". The current engineering standard of making bicycle lanes 1.5m wide in urban areas with speed limits of 60 km/h means the a parked vehicle mostly or completely obstructs the bicycle lane. In cases where the motor vehicle does not completely obstruct the bicycle lane, if the cyclist was to ride in the bicycle lane they would be within the "door zone" (the space where an opening car door would strike the cyclist). Approximately 3% of all bicycle-motor vehicle crashes involve the traffic violation 'open car door causing danger'. If the motor vehicle completely obstructs the bicycle lane. In moving across, the cyclist is also required to give way to any and all traffic within the traffic stream, potentially causing risk and delay to the cyclist.

3.1.7.1 Options for change

Option 1. Add bicycle lane to the list of special purpose lanes where stopping is prohibited in s187.

Option 2. Add a provision to the legislation that specifies that bicycle lanes are clearways during certain times (e.g. between 6-9am and 4-7pm – those hours currently used for peak-hour-only bus lanes).

3.1.7.2 Impact assessment

Any limitations on on-street parking could have impacts on all road users, as well as other impacts. The proposed changes would improve the safety of cyclists; however Option 2 only provides the benefits to those travelling during usual commuting times. The potential impacts for pedestrians needs to be examined further, however the absence of parked cars would improve sight-lines and reduce the likelihood pedestrians

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could 'appear out of nowhere'. Placing limitations on parking in bicycle lanes would have limited impact on moving traffic, although it may impact on drivers who have reached the end of their journey.

The proposed changes would improve the safety, attractiveness and continuity of bicycle facilities.

These changes may have impacts on businesses. The proposed changes would also reduce the signage and road marking requirements of local governments. It is possible that changes would result in the need for more frequent road sweeping to clean the bicycle lanes, a job that would have previously been done by moving motor vehicles.

Implementation of requirements for developments to provide off-street parking for customers/clients would reduce the demand for on-street parking. If bicycle lanes and on-street parking are both to be provided, considerations should be given to the space required. There should be sufficient space for a parked car, an opening car door and a bicycle to travel. Additional road markings may be required to provide guidance to motor vehicles as to where to park.

3.2 Footpath cycling by adults

Cycling on the footpath is one way of separating cyclists from motor vehicle traffic but it is prohibited in most Australian jurisdictions for adults except when accompanying a child of 12 years of age or younger. In Queensland (under Rule 250), Tasmania and the Australian Capital Territory it is legal for adults to ride a bicycle on the footpath. The legislation requires cyclists to give way to pedestrians on the path, but is vague about "safe passing". The prohibition against cycling on the footpath appears to be based on concerns about dangers to cyclists associated with motor vehicle crashes at driveways and intersections and cyclists posing a threat to pedestrians on footpaths. Research has identified that older pedestrians are particularly intimidated by the presence of cyclists on footpaths (Bernhoft & Carstensen, 2008).

We have reviewed the international evidence related to the safety of footpath cycling (Haworth & Schramm, 2011) and concluded that many of the studies reporting concerns for cyclist safety on footpaths were based on low-severity crashes, while there is little evidence that footpath cycling contributes to serious injuries to pedestrians. Indeed, it may provide cyclists with an option to avoid collisions with motor vehicles. The challenge occurs when cyclists are riding on the footpath in the opposite direction to traffic and not be noticed by drivers when the cyclists leave the footpath to cross intersections.

Australia-wide hospital separations data for land transport accidents (Henley & Harrison, 2009) provides limited but more recent information on injuries associated with footpath cycling. In the financial year 2006-07, 103 (2.3%) hospitalised pedal

cyclists were coded as injured on "footpath next to road", compared with 105 on a cycleway, 2,248 on a roadway, and 1,548 with unspecified place of occurrence. In the same year, 27 pedal cyclists were hospitalised for a total of 59 days as a result of a traffic accident where the counterpart in the collision was a pedestrian or animal (whether on the footpath or on the road). This corresponds to 0.5% of hospitalised cyclists and 0.4% of cyclist bed-days from traffic accidents. There were 42 pedestrians hospitalised for a total of 230 bed-days as a result of a traffic accident where the counterpart was a pedal cyclist (whether on the footpath or on the road). This corresponds to 2.8% of hospitalised pedestrians and 1.0% of pedestrian bed-days from traffic accidents. Data from the Queensland Trauma Registry from 2005 to 2009 (Queensland Trauma Registry, 2010) showed that of the 2,300 cyclists admitted to hospital or died in hospital, only 22 (1.0%) were coded as having collided with a pedestrian or animal.

A CARRS-Q survey of Queensland riders (Haworth & Schramm, 2011) found that a third of the respondents reported riding on the footpath, with about two-thirds of them doing so reluctantly. New riders and utilitarian riders rode more on the footpath. The frequency, and particularly distance ridden, on the footpath was less than for urban roads and bicycle paths, suggesting that the footpath was used in locations where the urban road was considered unsafe or inconvenient (e.g. one-way streets), rather than being used for the entire trip. It was not surprising that new riders spent a larger proportion of their riding on footpaths than more experienced riders, but the interesting finding was that the mean distance ridden on footpaths per week was greater for experienced riders. This shows that, like bicycle paths, footpaths are an important facility for riders of all levels of experience.

The percentage of most serious crashes reported in the survey that occurred on the footpath was similar to the percentage of total distance ridden on the footpath, suggesting that riding on the footpath did not increase crash risk. Footpath crashes were less likely to require medical treatment than crashes on roadways which is consistent with the Safe Systems principles of separating vulnerable road users from motorised vehicle traffic. Almost 10% of footpath crashes did involve pedestrians, however, and the survey did not collect information about their injuries. Surprisingly, the percentage of crashes involving pedestrians on bike paths was double that on footpaths, suggesting that shared paths may be a greater challenge for cyclist-pedestrian interactions than footpaths. The reluctance of cyclists to travel on the footpath may provide a clue here. Perhaps cyclists are more careful of pedestrians and travel more slowly on footpaths than on shared paths (as reported by Kiyota et al. 2000).

CARRS-Q also conducted an observational study of cycling in the Brisbane CBD in 2010, and repeated it in 2012 which examined interactions between cyclists and pedestrians. Of the 2552 cyclists observed in 2012, 98.4% had no conflict with another road user, 1.1% had a conflict with a pedestrian, and 0.6% had a conflict with a motor vehicle. No

collisions between cyclists and pedestrians or cyclists and motor vehicles were observed. When a cyclist was travelling on the footpath, and there was 1 or more pedestrian within 1m of the cyclists (252 observations), only 16 (6.3%) resulted in a conflict. When a cyclist was travelling on the footpath, and there was 1 or more pedestrian 1m-5m from the cyclist (303 observations), only 12 (4%) resulted in a conflict.

From a public health perspective, the opportunity to ride on the footpath may act to encourage cycling (particularly among new cyclists) because it is perceived to be less dangerous than riding on the road.

3.3 One-metre rule

Some organisations are calling for the introduction of a one-metre rule to improve cyclist safety. The underlying concept is that drivers leaving one metre between the left edge of their vehicle and any cyclist would reduce the number of rear-end and sideswipe collisions with cyclists. Similar laws have been introduced in some states of the United States and parts of Europe.

Brown et al (2012) have conducted a review of the 3-Foot Laws introduced in the United States. They found that the 3 Foot Laws were generally introduced in response to a cyclist being killed following the collision with a passing vehicle. They concluded that the laws can be seen to increase the awareness that bicyclists are legitimate road users. Some of the perceived shortcomings of the law that were identified include: difficulty in enforcing the law, lack of education and awareness of the law, and the rigid delineation of road space. Many jurisdictions where the law is in place report little or no enforcement, with citations often only issued following a collision. There is also concern that 3 feet may not be sufficient lateral separation between a motor vehicle and a bicycle. However, enumerating the separation distance may clarify the ambiguity present in traffic legislation where overtaking is specified as at a "safe distance" or the driver is to take "due care". No evaluation has been conducted on the impact of the 3 Foot Law on cycling safety.

3.3.1 Relevant CARRS-Q research

CARRS-Q has not conducted any research specifically addressing the safety effects of a one-metre rule. However, some of our research has implications for the likely effectiveness of such a rule.

Haworth and Debnath (2013) examined Police-reported crashes in Queensland involving one motor vehicle and one bicycle that resulted in fatality, hospitalisation or medical treatment. It found that rear-end crashes comprised 3.9% of crashes, lane changes comprised 6.9% and parallel lanes turning comprised 7.9% of crashes. These are the crash types for which it could be argued that lack of lateral distance could

potentially be a relevant factor and therefore a one-metre rule might be a suitable countermeasure.

However, the driver of the motor vehicle failing to give way or stop was identified in 26% of crashes. The results of this study support earlier research showing that a very large proportion of multi-vehicle bicycle (Räsänen and Summala, 1998) crashes involve right-of-way violations by other vehicles. Many of these crashes fall into the category of 'looked but failed to see' (LBFTS) crashes (Broughton and Walker, 2009; Brown, 2005).

Driver failure to see two-wheelers has been identified as important causes of 'failure to give way' type crashes for bicycles (Pai, 2011b) and motorcycles (e.g., Haque et al., 2012; Horswill et al., 2005; Pai et al., 2009). A one-metre rule can only logically affect the behaviour of drivers who have seen that a cyclist is present. Therefore it is unlikely to have any benefit in the common crash scenario where the driver states that they did not see the cyclist.

3.3.2 Compatibility with road safety approaches

The Safe System approach to road safety endorsed by Australian governments recognises human error is inevitable, and the protection of road users is best provided by a combination of safer roads, safer speeds, safer vehicles and safer road users (Australian College of Road Safety, 2010). One of the underlying principles of the Safe Systems approach to road safety is that of separating road users with vastly different levels of kinetic energy. The Vision Zero philosophy, on which the Safe Systems approach is based, states that vulnerable road users should not be exposed to motorised vehicles at speeds exceeding 30 km/h (Johansson, 2009). . Given the vulnerable nature of cyclists, the Vision Zero road safety philosophy argues that separation needs to be more tangible than that offered by a one-metre rule. It states that pedestrians and bicyclists should not be exposed to motorised vehicles at speeds exceeding 30km/h, and if this cannot be satisfied then separate, or reduce the vehicle speed to 30km/h (Johansson, 2009). Separation is always a physical separation, typically a barrier. "Where driving speeds are 50km/h... pedestrians and bicyclists do not cross between crossings and vehicle speeds are reduced to 30km/h where vulnerable road users cross....In 50+ km/h environment vulnerable road users are never mixed with cars" (Johansson, 2009). While this recommendation is not widely followed by Australian road authorities and is not attractive to those wishing to promote cycling participation, it implies that a one-metre rule is not sufficient separation to provide a safe system.

3.4 Strict liability

Another potential law that has been proposed for introduction to improve cyclist safety is that of strict liability. Strict Liability applies to collisions involving vulnerable road users (pedestrians and cyclists). This approach establishes a hierarchical structure to identify responsibility in the event of a road traffic crash, whereby motorists are assumed liable for collisions involving vulnerable road users (until proven otherwise). Under the hierarchy established, a cyclist would be deemed to be at fault if a rider collided with a pedestrian.

Strict Liability is only concerned with civil law, and only refers to financial responsibility (who will pay for the damage). The extent to which vulnerable road users can be considered to contribute to the crash is dependent on age (age of responsibility varies by jurisdiction). However, if a vulnerable road user is old enough, he/she can be held at least partly responsible for the crash. Strict Liability is currently in place in Denmark, the Netherlands, France, Belgium, Sweden, Norway, Germany, and across the European Union. There are only five EU countries that do not have Strict Liability: Cyprus, Malta, Romania, Ireland and the United Kingdom. Strict Liability (or "reverse onus") also applies in Canada. Many states in the USA have enacted Vulnerable Road User laws which are similar in many respects.

The operation of the Dutch Strict Liability law (Article 185 Wegenverkeerswet (Strict Liability in Dutch Road Law) is summarised in Figure 3.1 below (bicycledutch, 2013). There have been no published evaluations of the effectiveness of Strict Liability laws in reducing cyclist injury risk (Weiss & Ward, 2013).



Article 185 Wegenverkeerswet; (a.k.a. "Strict Liability" in Dutch Road Law)

* People or goods transported in the motorised vehicle, a different motor vehicle or animals.
** The motorised party is always liable for 50% of the damage, the rest must be determined.

4. CURRENT PENALTIES AND SANCTIONS

The third issue being examined by the Inquiry is

"Current penalties and sanctions, including where there are differential fine rates for cyclists compared to other road users"

CARRS-Q has conducted research that examines the role of violations in crashes involving cyclists and drivers (Schramm, Rakotonirainy & Haworth, 2010; Haworth & Debnath, 2013), which is summarised below. It has also reviewed and conducted research that examines the effectiveness of penalties and sanctions in other areas of road safety, particularly speeding and drink driving. We are not aware of any research that specifically examines the road safety effects of differential fine rates (monetary penalties) for cyclists compared to other road users.

4.1 The role of violations in crashes involving cyclists and drivers

Media articles have promoted the view that cyclists are risk takers who disregard traffic rules, but most of the published literature suggests that it is the motorist who is more likely to be at fault in car-bicycle crashes, than the cyclist. The results of two CARRS-Q studies which have examined fault and violations in car-bicycle crashes in Queensland are presented below.

Schramm, Rakotonirainy & Haworth (2010) examined the role of traffic violations in the 6774 police-reported bicycle crashes in Queensland between January 2000 and December 2008. Of the 6328 crashes involving bicycles and motor vehicles, cyclists were deemed to be at fault in 44.4% of the incidents. However, young and elderly cyclists were more likely to be at fault. Cyclists aged under 17 were at fault in more than 70% of the bicycle-car crashes in which they were involved, and the very small number of cyclists aged 80 and over were at fault in more than 60% of their crashes.

When the motorist was at fault, traffic violations were recorded in 85.4% of crashes and driver conditions were recorded for 16.4% of crashes. When the cyclist was at fault, traffic violations were recorded in only 28.1% of bicycle–motor vehicle crashes.

When motorists were determined to be at-fault, 'failure to yield' violations accounted for three of the four most reported contributing factors. In crashes where the cyclist was at fault, attention and inexperience were the most frequent contributing factors. There were 67 collisions between bicycles and pedestrians, with the cyclist at fault in 65.7%. During the data period, 302 single-bicycle crashes were reported. The most

frequent contributing factors were avoidance actions to miss another road user and inattention or negligence.

Haworth and Debnath (2013) examined who was at fault and the violations in two-unit car-bicycle (and car-motorcycle) police-reported crashes from 1 January 2005 to 31 December 2009 in Queensland. Drivers of other vehicles were coded most at fault in the majority of two-unit bicycle (57.0%) crashes. Driver failure to give way or stop (26.2% of crashes) and illegal manoeuvre (10.4% of crashes) were the most commonly recorded violations. These were also the most commonly recorded violations by cyclists, but their prevalence was much lower (failure to give way/stop – 5.8% and illegal manoeuvre – 3.7%). The prevalence of disobeying a traffic sign/light was greater for cyclists than drivers, however (3.9% vs 1.1%).

Riders aged 0–15 years made up 22.6% of the bicycle crashes and their odds of being at fault were eight times higher than for riders aged 25–39 years. The most commonly coded crash types for children were 'vehicle leaving driveway' and 'intersection from adjacent approaches'. The children were coded as at fault in about 90% of both of these types of crashes, while the at-fault rate was much lower for adult bicyclists. Of the 'vehicle leaving driveway' crashes, 214 involved a controller (presumably a cyclist) riding out from the footpath and colliding with a vehicle travelling along the road. Most of the child cyclist crashes occurred during the day on 0–60 km/h speed limit roads where there were no traffic controls.

Similar findings were also found in the Canadian province of Ontario, where 79% of bicycle riders aged under 10 and 55% aged 10–19 years were at-fault (Rowe et al., 1995).

4.2 Factors affecting the effectiveness of penalties and sanctions

Much of the research on the effectiveness of penalties and sanctions in deterring illegal behaviours has shown that it is the likelihood of detection and penalty that is important, more than the magnitude of the penalty (Nichols & Ross, 1990; Legge & Park, 1994). There may be a lower threshold below which a penalty is trivial and has no effect, but there is also evidence that penalties which are higher than enforcement and judicial agencies consider valid may lead to lower rates of detection and/or application of penalties (see Elliot, 2003). Elliot (2003) cites an earlier paper by David South who argues that penalties and sanctions can only deter deliberate, reasoned actions, and so are not useful for actions which are errors (e.g. failing to notice a cyclist).

5. POTENTIAL BENEFITS AND IMPACTS OF BICYCLE REGISTRATION

The fourth issue being examined by the Inquiry is

"The potential benefits and impacts of bicycle registration"

This section commences with an outline of the rationale for registration for motor vehicles and then makes some comparison with bicycles.

Motor vehicle registration meets several objectives. It is an important component of the management of the road transport system in Queensland (Department of Transport and Main Roads, 2010). The primary purpose of vehicle registration, when introduced, was to collect taxes from vehicle owners to fund the state-wide road network (Rigby, 1983). In addition to collecting taxes, the current registration system also: sets the safety standards required of vehicles, with vehicles required to comply with the Australian Design Rules and meet roadworthy certificate criteria, to reduce the likelihood of crashes due to defective vehicles; allows driver behaviour to be managed by identifying vehicles, and the responsible owners of vehicles, for law enforcement purposes; and facilitates the collection of insurance premiums for the Queensland Compulsory Third Party (CTP) insurance scheme (Watson, Armstrong & Wilson, 2011)

CARRS-Q has not conducted any research that examines the safety effects of bicycle registration. Vehicle registration in the absence of the requirement to hold a licence to operate the vehicle would not be unique to bicycles, because this is the case for mopeds (although a car licence is required). Given that there is separate infrastructure provided for bicycle use, then the concept of using registration from bicycle owners to fund development and maintenance would not be inconsistent with the initial, primary purpose of vehicle registration. While bicycles are required to comply with Australian Design Rules (like all other vehicles), the potential costs and benefits of setting up a system to inspect and issue roadworthy certificates for bicycles is unknown. The function of registration in management of driver behaviour by allowing the driver to be identified does not appear to be relevant in the absence of licences for bicycles, although this could potentially be linked to motor vehicle licensing (if only for adults). CTP coverage for bicycles may become an issue in the future if the Queensland scheme moves to a no-fault basis, but there has been little discussion of this matter.

On the other hand, it might be expected that the imposition of registration for bicycles would act as a disincentive to bicycle ownership and thus work against the government strategies to increase cycling participation.

6. OTHER POTENTIAL ISSUES

Recent years have seen the development and increased popularity of a wide range of human-powered and motorised two- and three-wheeled vehicles. Many of these new vehicles do not easily fit into current vehicle classifications and legislative requirements. For example, there are relatively few external or performance differences between some electric (or petrol) bicycles and mopeds, which creates difficulties for regulation and enforcement. Many of these new vehicles raise questions about who should be allowed to use them, and where, and under what rules.

Previously, the Australian Design Rules defined a bicycle as a vehicle which is designed to be propelled by human power using pedals, which may have an electric or petrol powered motor attached provided the motor's maximum power output does not exceed 200 watts. Recent changes to the Australian Design Rules have incorporated Pedelecs (Bourke, 2013). A Pedelec is defined as meeting EU standard EN15194, has a motor of no more than 250w of continuous rated power and which is only to be activated by pedalling, when travelling at speeds of between 6 km/h and 25 km/h.

This change to the ADRs is likely to result in a large increase in sales and use of electric bicycles. Power Assisted Bicycle sales in Europe more than tripled from 2007 to 2010 and now 1 in 5 bicycles sold in Europe are electric (Bourke, 2013). Bourke (2013) reports that the international experience is that the riders of electric bicycles are older, less fit, more likely to have been injured, and more likely to be commuters than the riders of standard bicycles. The safety and health consequences of such a future increase in usage and change in demographics need to be carefully examined.

Recently, the Queensland Government has announced that they will allow the use of Segways (referred to generically as two-wheeled self-balancing personal transporters) on footpaths and bikeways. The popularity of these devices is yet to be determined, but they are wide and heavy and their compatibility with bicycles and pedestrians on footpaths and in relation to motor vehicles when used on roads requires further research.

This "morphing" of vehicle categories is likely to continue into the future and may lead us to abandon our current prescriptive vehicle classifications in favour of a performance-based system with consequences for operator licensing and training, and vehicle registration.

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Appendix 2- Wording of road rules that were identified as impediments to cycling

62 Giving way when turning at intersection with traffic lights

- (1) A driver turning at an intersection with traffic lights must give way to-
 - (a) any pedestrian at or near the intersection who is on the road the driver is entering; and
 - (b) if the driver is turning left at a left turn on red after stopping sign at the intersection—
 (i) any vehicle approaching from the right, turning right at the intersection into the road the driver is entering, or making a U-turn at the intersection; and
 - (ii) any pedestrian at or near the intersection who is on the road the driver is leaving; and
 - (c) if the driver is turning right—any oncoming vehicle that is going straight ahead or turning left at the intersection (except a vehicle turning left using a slip lane).Maximum penalty—20 penalty units.
- (2) However, a driver who is turning at an intersection with traffic arrows showing a green traffic arrow need not give way to an oncoming vehicle if the driver is turning in the direction indicated by the green traffic arrow.

67 Stopping and giving way at a stop sign or stop line at an intersection without traffic lights

- (1) This section applies to a driver at an intersection without traffic lights who is facing a stop sign or stop line.
- (2) The driver must stop as near as practicable to, but before reaching—
 - (a) the stop line; or
 - (b) if there is no stop line—the intersection.
 - Maximum penalty—20 penalty units.
- (3) The driver must give way to a vehicle in, entering or approaching the intersection except—
- (a) an oncoming vehicle turning right at the intersection, if a stop sign, stop line, give way sign or give way line applies to the driver of the oncoming vehicle; or
 - (b) a vehicle turning left at the intersection using a slip lane; or
 - (c) a vehicle making a U-turn.
- Maximum penalty—20 penalty units.
- (4) If the driver is turning left or right or making a U-turn, the driver must also give way to any pedestrian at or near the intersection on the road, or part of the road, the driver is entering. Maximum penalty—20 penalty units.
- (5) For this section, an oncoming vehicle proceeding through a T-intersection on the continuing road is taken not to be turning.

68 Stopping and giving way at a stop sign or stop line at other places

- (1) This section applies to a driver approaching or at a place with a stop sign or stop line, unless the place is—
 (a) an intersection; or
 - (b) a children's crossing; or
 - (c) an area of a road that is not a children's crossing only
 - because it does not have-
 - (i) children crossing flags; or
 - (ii) children's crossing signs and twin yellow lights; or
 - (d) a level crossing; or
 - (e) a place with twin red lights.
- (2) The driver must stop as near as practicable to, but before reaching—
 - (a) the stop line; or
 - (b) if there is no stop line—the stop sign.
 - Maximum penalty—20 penalty units.
- (3) The driver must give way to any vehicle or pedestrian at or near the stop line or stop sign. Maximum penalty—20 penalty units.

69 Giving way at a give way sign or give way line at an intersection, other than a roundabout

- (1) This section applies to a driver at an intersection, other than a roundabout, who is facing a give way sign or give way line.
- (2) Unless the driver is turning left using a slip lane, the driver must give way to a vehicle in, entering or approaching the intersection except—
 - (a) an oncoming vehicle turning right at the intersection, if a stop sign, stop line, give way sign or give way line applies to the driver of the oncoming vehicle; or
 - (b) a vehicle turning left at the intersection using a slip lane; or
 - (c) a vehicle making a U-turn.
 - Maximum penalty—20 penalty units.
- (2A) If the driver is turning left using a slip lane, the driver must give way to—

(a) a vehicle, other than a vehicle making a U-turn at the intersection, that is-

(i) on the road that the driver is entering; or

- (ii) turning right at the intersection into the road that the driver is entering; and
- (b) a vehicle or a pedestrian on the slip lane.
- Maximum penalty—20 penalty units.
- (3) If the driver is turning left or right or making a U-turn, the driver must also give way to any pedestrian at or near the intersection on the road, or part of the road, the driver is entering. Maximum penalty—20 penalty units.
- (5) For this section, an oncoming vehicle proceeding through a T-intersection on the continuing road is taken not to be turning.

72 Giving way at an intersection (except a T-intersection or roundabout)

- (1) A driver at an intersection (except a T-intersection or roundabout) who is not facing traffic lights or a stop sign, stop line, give way sign, or give way line, must give way in accordance with this section. Maximum penalty—20 penalty units.
- (2) If the driver is going straight ahead, the driver must give way to any vehicle approaching from the right (except a vehicle approaching or at a place with a stop sign, stop line, give way sign, or give way line).
- (2) If the driver is going straight ahead, the driver must give way to any vehicle approaching from the right (except a vehicle approaching or at a place with a stop sign, stop line, give way sign, or give way line).
- (3) If the driver is turning left (except if the driver is using a slip lane), the driver must give way to—
 (a) any vehicle approaching from the right (except a vehicle approaching or at a place with a stop sign, stop line, give way sign, or give way line); and
 - (b) any pedestrian at or near the intersection on the road the driver is entering.
- (4) If the driver is turning left using a slip lane, the driver must give way to—
 - (a) any vehicle approaching from the right or turning right at the intersection into the road the driver is entering (except a vehicle making a U-turn at the intersection); and
 - (b) any pedestrian on the slip lane.
- (5) If the driver is turning right, the driver must give way to—
 - (a) any vehicle approaching from the right (except a vehicle approaching or at a place with a stop sign, stop line, give way sign, or give way line); and
 - (b) any oncoming vehicle that is going straight ahead or turning left at the intersection (except a vehicle turning left using a slip lane or a vehicle approaching or at a place with a stop sign, stop line, give way sign, or give way line); and
 - (c) any pedestrian at or near the intersection on the road the driver is entering.

73 Giving way at a T-intersection

- (1) A driver at a T-intersection who is not facing traffic lights or a stop sign, stop line, give way sign, or give way line, must give way in accordance with this section.
 Maximum paralty 20 paralty units
 - Maximum penalty—20 penalty units.
- (2) If the driver is turning left (except if the driver is using a slip lane) or right from the terminating road into the continuing road, the driver must give way to—
 - (a) any vehicle travelling on the continuing road except—
 - (i) a vehicle approaching or at a place with a stop sign, stop line, give way sign, or give way line; or (ii) a vehicle making a U-turn on the continuing road at the T-intersection; and
 - (b) any pedestrian on the continuing road at or near the intersection.
- (3) If the driver is turning left from the terminating road into the continuing road using a slip lane, the driver must give way to—
 - (a) any vehicle travelling on the continuing road (except a vehicle making a U-turn on the continuing road at the T-intersection); and (b) any pedestrian on the slip lane.
- (4) If the driver is turning left (except if the driver is using a slip lane) from the continuing road into the terminating road, the driver must give way to any pedestrian on the terminating road at or near the intersection.
- (5) If the driver is turning from the continuing road into the terminating road using a slip lane, the driver must give way to—
 - (a) any vehicle approaching from the right (except a vehicle making a U-turn from the terminating road at the T-intersection); and
- (b) any pedestrian on the slip lane.
- (6) If the driver is turning right from the continuing road into the terminating road, the driver must give way to—
 - (a) any oncoming vehicle that is travelling through the intersection on the continuing road or turning left at the intersection (except a vehicle approaching or at a place with a stop sign, stop line, give way sign, or give way line); and
 - (b) any pedestrian on the terminating road at or near the intersection.
- (7) In this section—

- (a) *turning left from the continuing road into the terminating road*, for a driver, includes, where the continuing road curves to the right at a T-intersection, leaving the continuing road to proceed straight ahead onto the terminating road; and
- (b) *turning right from the continuing road into the terminating road*, for a driver, includes, where the continuing road curves to the left at a T-intersection, leaving the continuing road to proceed straight ahead onto the terminating road.

119 Giving way by the rider of a bicycle or animal to a vehicle leaving a roundabout

The rider of a bicycle or animal who is riding in the far left marked lane of a roundabout with 2 or more marked lanes, or the far left line of traffic in a roundabout with room for 2 or more lines of traffic, other than animals, bicycles, motorbikes or motorised wheelchairs, must give way to any vehicle leaving the roundabout. Maximum penalty—20 penalty units.

132 Keeping to the left of the centre of a road or the dividing line

- (1) A driver on a two-way road without a dividing line or median strip must drive to the left of the centre of the road, except as permitted under section 133 or 139(1).
- Maximum penalty—20 penalty units.
- (2) A driver on a road with a dividing line (except 2 continuous dividing lines) must drive to the left of the dividing line, except as permitted under section 134 or 139(2). Maximum penalty—20 penalty units.
- (2A) A driver on a road with a single continuous dividing line, a single continuous dividing line to the left of a broken dividing line or 2 parallel continuous dividing lines must not drive across the dividing lines to perform a U-turn.
 - Maximum penalty—20 penalty units.
- (3) A driver on a road with 2 continuous dividing lines must drive to the left of the dividing lines, except as permitted under section 139(2).
 - Maximum penalty—20 penalty units.
- (4) This section, and sections 133, 134 and 139(1) and (2), apply to a service road to which a two-way sign applies as if it were a separate road, but do not apply to any other service road.
- (5) In this section road does not include a footpath, nature strip, bicycle path, separated footpath or shared path.

153 Bicycle lanes

- A driver (except the rider of a bicycle) must not drive in a bicycle lane, unless the driver is permitted to drive in the bicycle lane under this section or section 158. Maximum penalty—20 penalty units.
- (2) If stopping or parking is permitted at a place in a bicycle lane under this regulation, a driver may drive for up to 50m in the bicycle lane to stop or park at that place.
- (3) A driver may drive for up to 50m in a bicycle lane if the driver is—
- (a) driving a bus or taxi; and(b) dropping off, or picking up, passengers.
- (4) A *bicycle lane* is a marked lane, or the part of a marked lane—
 - (a) beginning at a bicycle lane sign applying to the lane; and
 - (b) ending at the nearest of the following—
 - (i) an end bicycle lane sign applying to the lane;
 - (ii) an intersection (unless the lane is at the unbroken side of the continuing road at a T-intersection or continued across the intersection by broken lines);
 - (iii) if the road ends at a dead end—the end of the road.

250 Riding on a footpath or shared path

(1) Subject to subsection (1A), the rider of a bicycle riding on a footpath or shared path must—

- (a) keep to the left of the footpath or shared path unless it is impracticable to do so; and
 - (b) give way to any pedestrian on the footpath or shared path.
- Maximum penalty—20 penalty units.

(1A) Subsection (1) does not apply to a person riding a bicycle on a footpath if a local law otherwise provides.(2) In this section—

footpath does not include a separated footpath.