

CONTRACT REPORT

Feasibility of Developing a Crash Prediction Model for Cyclists in Queensland

Project No: 006575

by Hanford Cheung

for Department of Transport and Main Roads,
Queensland



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FEASIBILITY OF DEVELOPING A CRASH PREDICTION MODEL FOR CYCLISTS IN QUEENSLAND

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SUMMARY

The development of crash prediction model for cycle related crashes is one of the ways that the Department of Transport and Main Roads (TMR) can contribute positively to the building of safe, direct and connected cycle networks, which is one of the priority areas identified in Queensland Cycle Strategy 2011 – 2021.

A crash prediction model is a mathematical formula describing the relationship between the safety performance of existing facilities and variables that contribute to the varying safety performance of those existing facilities. Safety performance can be measured in number of crashes or crash rates, such as generalised crash rate, crash rates for specific types of road user.

The general process of developing a crash prediction model involves:

- the analysis of crash history for a sample of sites, generally a minimum of 50 sites are included, in most of the studies
- the evaluation of factors and design elements that could be contributing to the observed safety performance, i.e. number of crashes.

It is concluded from a review of data requirements that not all data are available for the development of a crash prediction model for cyclists in Brisbane or other locations in Queensland and the data gaps appear to be significant. Furthermore, supplementary data from a range of potential data sources are required to determine whether a crash prediction model for cyclists can be developed and more work is required to obtain and utilise information and data from other sources.

A number of recommendations are included in this report for TMR's consideration.



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CONTENTS

1	INTRODUCTION	1
2	STATE OF THE ART	2
2.1	Crash prediction models in general	2
2.2	Crash prediction models for cyclists	3
2.3	Data requirements	3
3	DATA HELD BY TMR	5
3.1	Cyclist volume data.....	5
3.2	Cyclist Crash Data	9
3.3	Road Infrastructure Data	9
3.4	STREAMS Intersection Operational Data.....	9
3.5	Data Gaps.....	9
4	POTENTIAL DATA SOURCES.....	11
4.1	RiderLog	11
4.2	SCATS Data from Brisbane City Council.....	12
4.3	Central Business District (CBD) Cordon Count	12
4.4	Brisbane City Council (BCC) Cycle Count.....	12
5	CONCLUSIONS	13
6	RECOMMENDATIONS	14
	REFERENCES	15
APPENDIX A	LIST OF LITERATURE REVIEWED	16

TABLES

Table 4.1:	Available RiderLog data in various local government areas (LGA)	11
Table 4.2:	Cycle trip length compositions on various road types in Queensland	12

FIGURES

Figure 3.1:	Bicycle counting sites in Brisbane, most of them are off-road counting stations (green cyclist symbols)	8
Figure 3.2:	Bicycle counting sites in Gold Coast, on-road counting stations appears to be more prevalent (green cyclist symbols)	8
Figure 3.3:	Cyclist crashes in Brisbane plotted as red triangles, with counting station information shown as green cyclist symbol	9

1 INTRODUCTION

The development of crash prediction model for cycle related crashes is one of the ways that the Department of Transport and Main Roads (TMR) can contribute positively to the building of safe, direct and connected cycle networks, which is one of priority areas identified in Queensland Cycle Strategy 2011 – 2021.

A crash prediction model is a mathematical formula describing the relationship between the safety performance of existing facilities and variables that contribute to the varying safety performance of those existing facilities. Safety performance can be measured in number of crashes or crash rates, such as generalised crash rate, crash rates for specific types of road user.

Variables that contribute to the varying safety performance may include but are not limited to the following:

- road length
- width
- traffic volume
- visibility
- land use
- surface type
- intersection control.

The development of a crash prediction model may simplify the comparison of safety performance resulting from different design elements or solutions for future projects in Queensland.

This report investigates whether it is possible for TMR to develop a crash prediction model specifically for cyclists using data currently held by TMR.

2 STATE OF THE ART

2.1 Generalised Crash Prediction Models

Crash prediction models or accident prediction models have been developed by practitioners in Australia and New Zealand since the late 1990's and early 2000's. The general process of developing a crash prediction model involves:

- the analysis of crash history for a sample of sites, generally a minimum of 50 sites are included for each model, in most of the studies
- the evaluation of factors and design elements that could be contributing to the observed safety performance, i.e. number of crashes.

The basic form of most crash prediction models is:

$$E(\lambda) = \alpha Q_{MA}^{\beta} Q_{MI}^{\beta} e^{\sum \gamma_i x_i}$$

1

where:

- $E(\lambda)$ = Expected number of accidents
- Q = Traffic volume
- α = Constant for a particular location, e.g. city, where the model is applicable
- β = Elasticity factor to raise the effects of traffic volume
- x_i = Variable component of risk factors
- γ_i = Co-efficient component of risk factors

Explanatory variables for a crash prediction model generally include traffic volume and risk factors. In theory, the selection of explanatory variables should be based on traffic engineering principles. However, data availability may be a restricting factor for such selection to occur. Generally, the following are used as explanatory variables for crash prediction models:

- annual average daily traffic (AADT)
- section length
- access (and driveway) density
- carriageway, shoulder widths
- intersection control type
- intersection type.

Although there are other factors, e.g. land use, that would affect safety performance of a road section or a road network, the data or information to accurately define these factors are not readily available in most situations. Therefore, the development of a crash prediction model would require the use of other available explanatory variables with good correlation.

2.2 Crash Prediction Models for Cyclists

Considerable research has been done in the past to explore the relationship between number and types of crashes involving vehicles and geometric design and operation of road sections and intersections. However, there have been limited studies that focus on cyclists.

A recent Austroads study developed a number of crash prediction models for the major crash types that affects cyclists at signalised intersections, i.e. right turn against (right turning vehicle hitting opposing through cycle), right angle (both travelling straight through), same direction (on the approach), left turn side-swipe (left turn vehicle hitting straight through cyclists) and 'other' (most of the remaining crash types (Austroads, 2011)).

The study utilised sites in Christchurch (New Zealand) and Adelaide (South Australia), where cycle count at intersections take place regularly. Six years of crash data (2003 – 2008), which included 147 injury crashes, were used to develop their crash prediction model. The following data were also assessed for correlation:

- motor vehicle volume at each intersection approach
- cycle volume at each intersection approach
- number of lanes for through traffic
- total width of approaching lanes
- lane layout arrangements
- cycle lane and kerbside lane widths
- presence of cycle treatment facilities, e.g. transition, departure, storage, approach, painted treatments
- depth of cyclist storage boxes
- intersection depth
- right turn signal phasing
- signal inter-green times
- cycle facility implementation years
- CBD cordon cyclist count.

The Austroads project also included a "before and after" evaluation for treatments deployed and a cross-sectional analysis.

It is considered that a similar exercise to analyse the relationships between the potential explanatory variables with the actual number of cyclist related crashes at a number of selected locations would be beneficial. The outcomes of such analysis would lead to a better understanding of cycle related crashes in Brisbane or other locations in Queensland.

2.3 Data Requirements

To develop a cyclist crash prediction model for Brisbane or other locations in Queensland, the following data will be necessary:

- crash history
- traffic and cycle volume

- geometric information for on-road cycle facilities
- traffic signal operation data (from SCATS or STREAMS).

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3 DATA HELD BY TMR

3.1 Cyclist Volume Data

Cyclist count data on the following state-controlled roads in Brisbane are published on TMR 131940 website (2001 – 2010):

1. U99 – Deagon Deviation at Houghton Highway
2. U99 – Deagon Deviation at Pomona Street
3. U12A – North of Vulture Street
4. U12A – North of Park Road
5. U12A – Pemberton Street
6. U12A – South of Passchendale Street
7. U12A – North of University Road
8. U18B – West of Dean Street
9. U18B – North of Russell Terrace
10. U18A – North of Koorungal Drive
11. U18A – South of Endeavour Road
12. 900 – North of Chinook Street
13. 900 – South of The Boulevard
14. 900 – South of Albany Forest Drive
15. U88 – North of Rode Road
16. U88 – South of Zillmere Road
17. U88 – South of Roghan Road

A quick review of data availability found that some of the count data at the above locations were incomplete.

In addition to the above locations, the TMR cycle count database also contains count information for the following locations; including Gold Coast and Toowoomba (most of the locations are off-road cycle paths):

- Mowbray Park
- Auchenflower
- Downey Street Footbridge (North)
- Downey Street Footbridge (East)
- Downey Street Footbridge (South)
- Downey Street Footbridge (West)
- River Walk (West of Herschel Street ramp)
- Story Bridge
- Victoria Bridge

- Kedron Brook at Gateway
- ICB Land Bridge (North)
- ICB Land Bridge (South)
- ICB Land Bridge (West)
- The Cliffs Boardwalk
- Riverwalk at New Farm
- Sandgate Foreshore
- Wynnum Foreshore
- Jack Pesch Bridge
- Bedivere Street (North)
- Bedivere Street (South)
- Bedivere Street (West)
- Riverwalk (Herschel St ramp)
- Riverwalk (E of Herschel St ramp)
- St Johns Wood (north)
- St Johns Wood (west)
- St Johns Wood (south)
- Eleanor Schonell Bridge (Bike)
- Eleanor Schonell Bridge (Pedestrian)
- Ekibin Park
- Riverwalk
- Kedron Brook at Mitchelton Pony Club
- Stanley Street under Freeway
- Hooker Boulevard / Bermuda St
- Reedy Creek Rd & Bermuda St
- Nerang Broadbeach Rd / Boulton Rd (cemetery)
- Corner of Oxley Dr and Brisbane St Labrador
- Marine Parade and Central St Labrador
- Marine Parade Surfers Paradise
- Burleigh Heads foreshore adjacent 1st Ave
- Broadbeach Foreshore
- Len Fox Park
- Broadbeach Boulevard at Australia Avenue
- Esplanade at Second Avenue
- Gateway North
- Gateway South

- Normanby East
- Normanby West
- Toowong Footbridge
- Boggo Road
- Kurilpa Bridge
- Goodwill Bridge
- Macdonald Street
- Rickertts Road
- North Bank at Margaret Street
- North Bank at QUT
- Claymore Rd Interchange
- McKenzie Bridge
- Alexandra Parade at Okinja
- Eenie Creek Rd, Noosaville
- Eenie Creek Rd, Noosa Aquatic Centre
- Lake Street, Tewantin
- Weyba Street
- West Creek
- East Creek
- Eleanor Schonell Bridge
- Macquarie Street

The data for the sites listed above are not currently up to date in TMR cycle database. Some of the data required to update the database have been downloaded and reported as part of a separate project 'Cycle and pedestrian data base review and data analysis project'. Further details associated with the data quality, reliability and availability for use in developing crash prediction models are documented separately in this report.

The locations of most of the cycle counting sites in Brisbane appear to be off-road (Figure 3.1), whereas proportionately there are more on-road cycle count locations in Gold Coast (Figure 3.2). The difference could be the result of different design philosophy for cyclist facilities in these two cities.

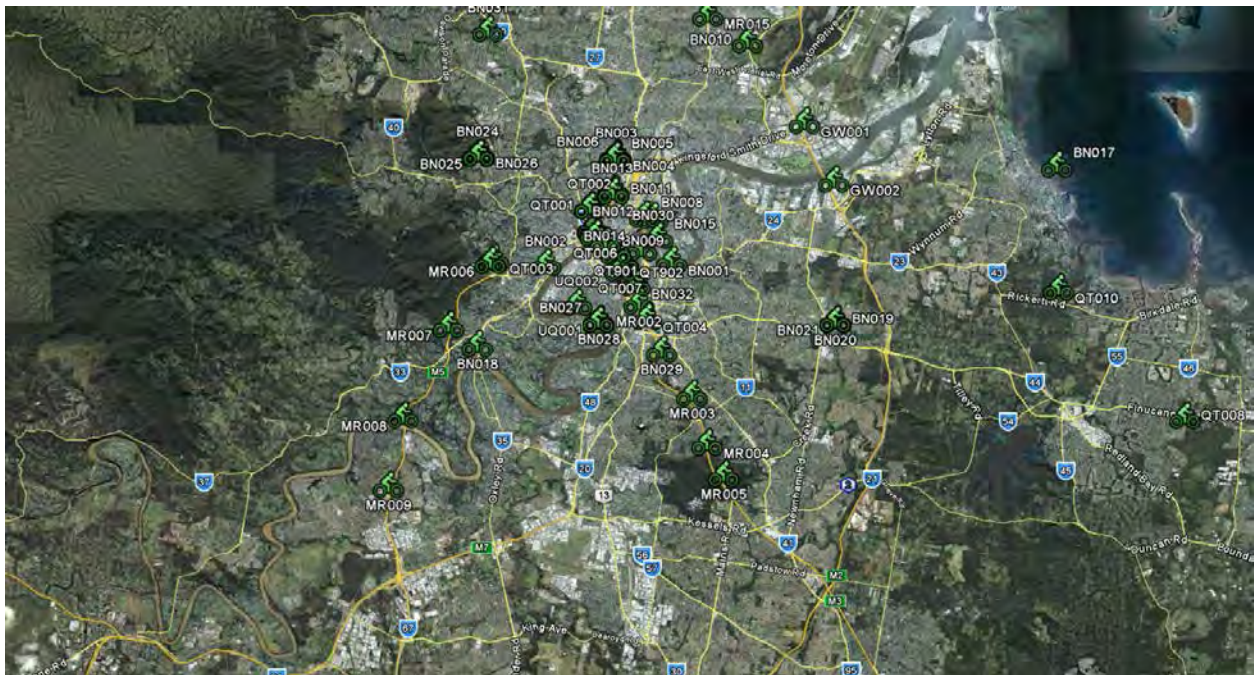


Figure 3.1: Bicycle counting sites in Brisbane, most of them are off-road counting stations (green cyclist symbols).

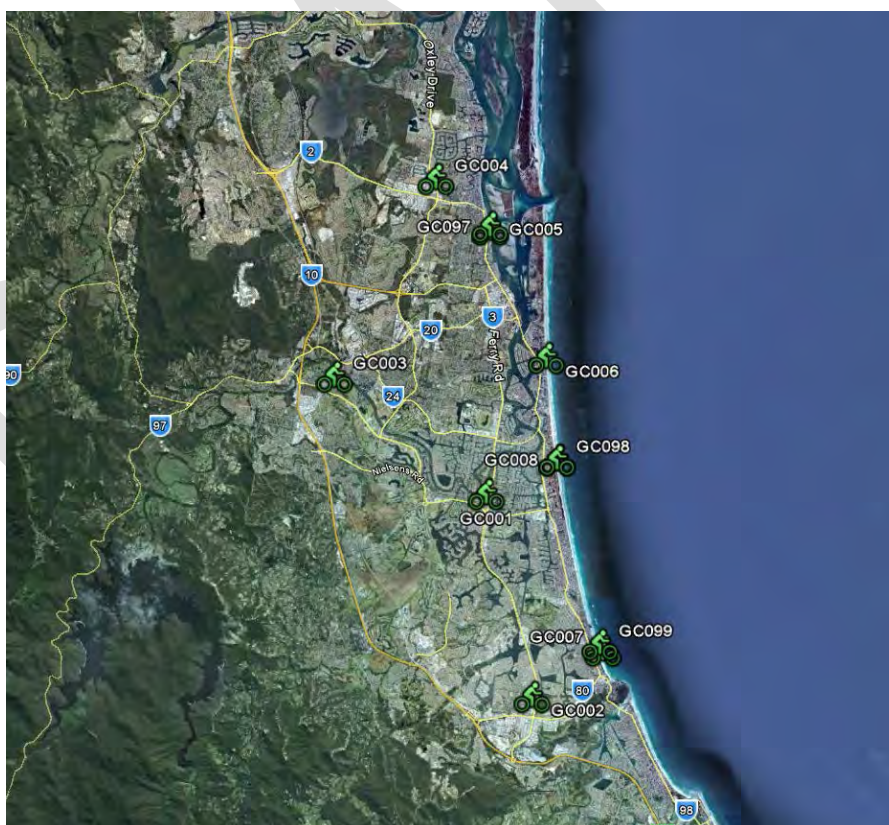


Figure 3.2: Bicycle counting sites in Gold Coast, on-road counting stations appears to be more prevalent (green cyclist symbols).

3.2 Cyclist Crash Data

Cyclist crash data from 1992 to June-2010 have been supplied by TMR. The crash data was geocoded and mapped to show the spatial distribution of cycle crashes. Figure 3.3 shows the location of cycle crashes (red triangles) overlaid with cycle counting stations (green cyclist symbol). Most of the crashes involving cyclists have occurred at locations where there are no count information.

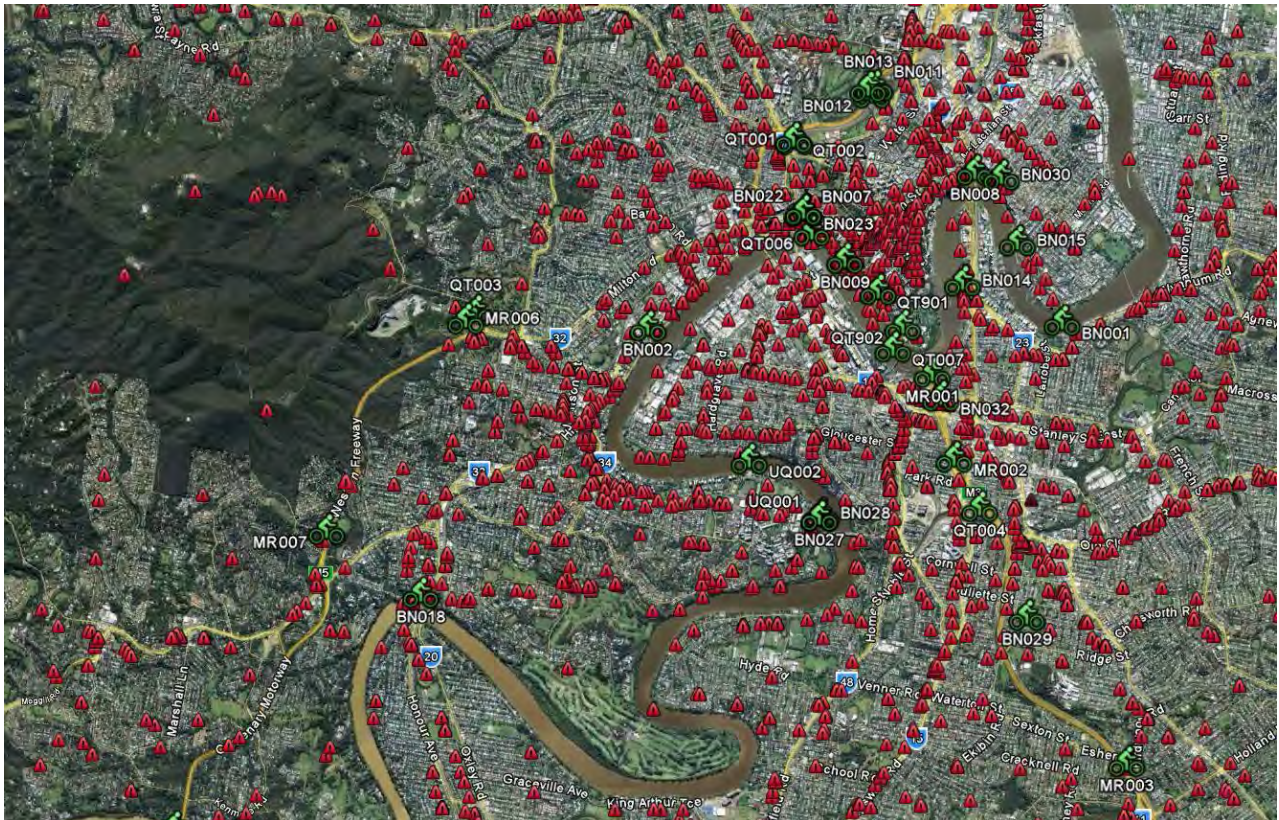


Figure 3.3: Cyclist crashes in Brisbane plotted as red triangles, with counting station information shown as green cyclist symbol

3.3 Road Infrastructure Data

Road infrastructure data was supplied by TMR. A review of the data shows that information on on-road bicycle lanes are recorded in TMR database, but relevant intersections treatments are not. Additional data collection and/or coding exercise for a number of sites are considered necessary to obtain road geometric information for development of a crash prediction model for cyclists.

3.4 STREAMS Intersection Operational Data

It is understood that intersection operational data from TMR STREAMS system has limited coverage and unsuitable for widespread analysis. Therefore, an alternative source of data, such as SCATS data from Brisbane City Council, will be required for the development crash prediction models for cyclists.

3.5 Data Gaps

The review identified significant gaps in available data sets, due to:

- the lack of count data where cycle crashes have occurred
- the lack of required road infrastructure data, e.g. intersection depths, treatment, information for local roads
- the lack of intersection operational data.

It is considered that alternative data sources have to be explored to supplement the data currently held by TMR.

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4 POTENTIAL DATA SOURCES

4.1 RiderLog

RiderLog is a self-reporting system where cyclists report their trips using GPS-enabled smartphone. Table 4.1 summarises the number of trips and unique trips recorded in the RiderLog database since 2010. It is considered that the available sample size may be suitable for supplementing count information or for extrapolation of cycle demands at uncounted locations. However, some further work into the available data would be necessary.

Table 4.1: Available RiderLog data in various local government areas (LGA)

LGA	Trips			Unique trips		
	Weekend	Weekday	Total	Weekend	Weekday	Total
Brisbane	512	2685	3197	177	508	685
Ipswich	5	9	14	5	7	12
Redland	17	13	30	9	7	16
Moreton Bay	34	68	102	7	16	23
Sunshine Coast	42	24	66	17	16	33
Gold Coast	165	574	739	45	81	126
Toowoomba	11	87	98	7	11	18
Townsville	30	100	130	10	26	36
Mackay	0	0	0	0	0	0
Whitsunday	0	0	0	0	0	0
Cassowary	0	0	0	0	0	0
Cairns	5	20	25	3	14	17
Tablelands	0	0	0	0	0	0
Mt Isa	0	0	0	0	0	0
Central Highlands	0	0	0	0	0	0
Gladstone	0	0	0	0	0	0
Bundaberg	0	0	0	0	0	0
Rockhampton	0	0	0	0	0	0
Fraser Coast	0	0	0	0	0	0
South Burnett	0	0	0	0	0	0
Gympie	0	0	0	0	0	0
Maranoa	0	0	0	0	0	0
Southern Downs	0	0	0	0	0	0

Using Open Street Map (OSM) layer for Queensland, it was found that most of the bicycle trip lengths recorded in RiderLog in Queensland occur on-road (Table 4.2). Therefore the purchase of RiderLog data may contribute to better understanding of on-road cyclists characteristics.

Table 4.2: Cycle trip length compositions on various road types in Queensland

Road type	Composition of cycle trip length (%)
Cycleway (could be on or off road)	22.2%
Secondary	17.3%
Primary	16.0%
Residential	15.9%
Tertiary	15.7%
Unclassified	3.3%
Trunk	2.5%
Service	2.0%
Motorway	1.8%
Pedestrian	1.1%
Primary Link	1.0%
Motorway Link	0.6%
Bridleway	0.2%
Trunk Link	0.1%
Secondary Link	0.1%
Living Street	0.0%
Steps	0.0%
Road	0.0%
Tertiary Link	0.0%
Construction	0.0%

4.2 SCATS Data from Brisbane City Council

SCATS intersection configuration and operational data can provide a wide range of useful information, including but not limited to, phasing, count, green times, which would enable the testing of various potential explanatory variables for the construction of a crash prediction model for cyclists.

4.3 Central Business District (CBD) Cordon Count

The CBD cordon count would enable us to have a better understanding of overall commuting cycle demands, which would potentially allow ARRB to develop ways to extrapolate RiderLog or other self-reported trip information service, e.g. Strava.

4.4 Brisbane City Council (BCC) Cycle Count

It is understood that BCC undertake cycle count regularly, but sharing of information with others appears to occur only sporadically. A higher level involvement from management of TMR may be necessary to encourage collaboration among organisations.

5 CONCLUSIONS AND RECOMMENDATIONS

It is concluded that:

- not all the data required for the development of a crash prediction model for cyclists in Brisbane or other locations in Queensland is available and the data gaps appear to be significant
- supplementary data from a range of potential data sources will be required to determine whether a crash prediction model for cyclists can be developed
- more work is required to obtain and utilise information and data from other sources.

It is recommended that:

- attempts are made to address the data gaps
- selection of a number of sites, at least some with known cycle demands and/or safety concerns to focus efforts on development of a better understanding of the explanatory variables in Brisbane or wider Queensland
- additional data collection activities are undertaken to enable the project to progress further, including but not limited to, collection of geometric and count information.

REFERENCES

Austrroads 2011, *Effectiveness and selection of treatments for cyclists at signalised intersections*, AP-R380/11, Austrroads, Sydney, NSW.

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APPENDIX A LIST OF LITERATURE REVIEWED

Record Number: 1302AR204E
Year Published: 2013
Publication Title: Injured cyclist profile: an in-depth study of a sample of cyclists injured in road shes in South Australia
Personal Author: Lindsay=VL (University of Adelaide. Centre for Automotive Safety Research (CASR))
Publication Details: PN: CASR Report, NO: CASR112, DATE: 2013-01, PAGES: 43p, PUBLISHER: University of Adelaide. Centre for Automotive Safety Research (CASR), T: Adelaide, S: South Australia, C: Australia, ISSN: 1449-2237, ISBN: 9781921645501
Abstract: Crashes involving pedal cyclists in South Australia have steadily increased over the past ten years. In 2001 pedal cycle crashes constituted around 12 per cent of all traffic crashes resulting in hospital admission, increasing to 17.4 per cent in 2010 (SA Heath and SA Police unpublished data sources). There have been several suggestions why the increase has occurred including a renewed interest in cycling and an increased awareness of the health and environmental benefits. In response to the demonstrated increase in crashes there is a need to identify those contributing factors that may place this vulnerable road user group at increased risk. This project explores the circumstances surrounding crash involvement for a group of 61 bicycle riders involved in a collision with a motorised vehicle who were admitted to the Royal Adelaide Hospital over the period between January 1 2008 and December 31 2010. Data collected and matched during the study included medical records data generated during hospitalisation, police data related to the crash and forensic science data related to mandatory testing for alcohol and drugs. This data was combined with information gathered during voluntary participation in interviews with the cyclists involved following informed consent.
Descriptors: Cyclist; Injury rate; Accident analysis; Vehicle; Interview
Identifiers: South Australia
Shelf Location: ARRB (Electronic copy (Not for external loan))
Electronic Version: <http://library.arrb.com.au/e-pubs/CASR/CASR112.pdf>
URL: <http://casr.adelaide.edu.au/publications/list/?id=1346>
Date Created Wednesday, 13 February 2013

Record Number: 1003AR109E
Year Published: 2012
Publication Title: Vulnerable road users
Corporate Author: SWOV Institute for Road Safety Research
Publication Details: PN: Fact Sheet, DATE: 2012-07, PAGES: 5p, PUBLISHER: SWOV Institute for Road Safety Research, T: Leidschendam, C: Netherlands
Notes: Updated version of 2009 publication
Abstract: The group of vulnerable road users can be defined in a number of ways, such as by the amount of protection in traffic (e.g. pedestrians and cyclists) or by

the amount of task capability (e.g. the young and the elderly). Vulnerable road users do not usually have a protective 'shell', and also the difference in mass between the colliding opponents is often very important. Vulnerable road users can be spared by limiting the driving speed of motorized vehicles and separating unequal road user types as much as possible. Adapting motor vehicles (e.g. by side-underrun-protection for lorries and collision-friendly car fronts) can lessen the injury severity of vulnerable road users.

Descriptors: Road safety; Vulnerable road user; Injury prevention; Speed control; Vehicle type
Identifiers: Netherlands
Shelf Location: ARRB (Electronic copy (Not for external loan))
Electronic Version: http://library.arrb.com.au/e-pubs/SWOV/FS_Vulnerable_road_users.pdf
URL: http://www.swov.nl/rapport/Factsheets/UK/FS_Vulnerable_road_users.pdf
Date Created Friday, 12 March 2010

Record Number: 1005AR872E
Year Published: 2012
Publication Title: Risk in traffic
Corporate Author: SWOV Institute for Road Safety Research
Publication Details: PN: Fact Sheet, DATE: 2012-07, PAGES: 7p, PUBLISHER: SWOV Institute for Road Safety Research, T: Leidschendam, C: Netherlands

Notes: Originally published in 2009.

Abstract: The most common way of measuring road safety is the number of road crashes and/or the number of casualties in such crashes. This is not, however, the measure that most accurately reflects the road safety level. The casualty rate is more accurate: it not only looks at the number of casualties in a specific group of road users, it also takes the exposure into account. The exposure is often expressed in terms of distance travelled. The fatality rate of car occupants has been decreasing in the Netherlands since the 1970s. Moped and light moped riders and motorcyclists have relatively high fatality and injury rates. In addition, young people and especially the elderly are at above-average risk.

Descriptors: Road safety; Risk; Fatality rate; Exposure; Vehicle kilometre; Vulnerable road user

Identifiers: Netherlands
Shelf Location: ARRB (Electronic copy (Not for external loan))
Electronic Version: http://library.arrb.com.au/e-pubs/SWOV/FS_Risk.pdf
URL: http://www.swov.nl/rapport/Factsheets/UK/FS_Risk.pdf
Date Created Wednesday, 12 May 2010

Record Number: 1202AR073E
Year Published: 2012
Publication Title: Pedestrian crash trends and potential countermeasures from around the world
Personal Author: Zegeer=CV; Bushell=M
Publication Details: PN: Accident Analysis and Prevention, VOL: 44, NO: 1, DATE: 2012-01, PAGES: 3-11

- Descriptors:** Pedestrian; Accident countermeasure; Vulnerable road user; International comparison
- Identifiers:** USA
- Shelf Location:** ARRB (Journals Compactus)
- Other Libraries:** SRAR
- URL:** <http://dx.doi.org/10.1016/j.aap.2010.12.007>
- Date Created** Tuesday, 14 February 2012
-
- Record Number:** 1202AR090E
- Year Published:** 2012
- Publication Title:** Injury protection and accident causation parameters for vulnerable road users based on German in-depth accident study GIDAS
- Personal Author:** Otte=D; Jaensch=M; Haasper=C
- Publication Details:** PN: Accident Analysis and Prevention, VOL: 44, NO: 1, DATE: 2012-01, PAGES: 149-53
- Descriptors:** Accident analysis; Accident cause; Injury cause; Injury severity; Pedestrian; Motorcyclist; Cyclist; Vulnerable road user
- Identifiers:** Germany
- Shelf Location:** ARRB (Journals Compactus)
- Other Libraries:** SRAR
- URL:** <http://dx.doi.org/10.1016/j.aap.2010.12.006>
- Date Created** Tuesday, 14 February 2012
-
- Record Number:** 1205AR145E
- Year Published:** 2012
- Publication Title:** Vulnerable road users: characteristics of pedestrians
- Personal Author:** Bakovic=Z (Parsons Brinckerhoff)
- Publication Details:** PN: Journal of the Australasian College of Road Safety, VOL: 23, NO: 1, DATE: 2012, PAGES: 45-8
- Descriptors:** Pedestrian; Road user behaviour; Road user characteristics; Pedestrian crossing; Crossing the road
- Identifiers:** Australia
- Shelf Location:** ARRB (Journals Compactus)
- URL:** <http://acrs.org.au/journals/february-2012-vol-23-no-1/>
- Date Created** Tuesday, 15 May 2012
-
- Record Number:** 1207AR299E
- Year Published:** 2012
- Publication Title:** Potential application of shared space principles in urban road design: effects on safety and amenity
- Personal Author:** Edquist=J (Monash University. Accident Research Centre (MUARC)); Corben=B (Monash University. Accident Research Centre (MUARC))
- Publication Details:** DATE: 2012-03, PAGES: 31p, PUBLISHER: NRMA-ACT Road Safety Trust, T: Canberra, S: ACT, C: Australia
- Abstract:** 'Shared space' is an approach to road design that is growing in popularity

around the world. The idea is that instead of being segregated into their own sections of pavement, vehicles, pedestrians and cyclists are free to move through the space more or less at will, negotiating right of way with other road users via eye contact and social norms. In theory, the increased perceived risk of such a situation causes road users to slow down and be more aware and considerate of other road users. However, concerns have been raised that vulnerable pedestrians (particularly those with visual impairments) are not able to negotiate such spaces safely, and may be forced to avoid them, thus reducing their mobility. The limited data available so far on shared spaces that have been constructed in the Netherlands and UK suggest that crash rates are no higher than comparable traditional environments, and in some cases may be lower. However many crash evaluations suffer from problems such as limited data collection times and the lack of a comparison site, thus running the risk of biased data. There is also limited information on whether vulnerable pedestrians are able to use these areas safely. It is important to understand the usage of such shared spaces and the behaviour of road users in more detail before large amounts of public space are converted to this style of design.

- Descriptors:** Road design; Pedestrian facilities; Disabled person; Vision impairment; Accident rate; Vulnerable road user; Road safety
- Identifiers:** Netherlands; United Kingdom
- Shelf Location:** ARRB (Electronic copy (Not for external loan))
- Electronic Version:** http://library.arrb.com.au/e-pubs/NRMA_ACTRoadSafetyTrust/shared_space.pdf
- URL:** <http://www.roadsafetytrust.org.au/c/rtt?a=sendfile&ft=p&fid=1339632202&sid>
- Date Created** Friday, 13 July 2012
- Record Number:** 1208AR238E
- Year Published:** 2012
- Publication Title:** Analysis of child pedestrian deaths and serious injuries in Malaysia
- Personal Author:** Oxley=J (Monash University. Accident Research Centre (MUARC)); Jamaludin=A (Monash University. Accident Research Centre (MUARC Malaysia)); Johnson=M (Monash University. Accident Research Centre (MUARC))
- Publication Details:** PN: Journal of the Australasian College of Road Safety, VOL: 23, NO: 2, DATE: 2012, PAGES: 30-7
- Abstract:** Vulnerable road users are at increased risk in many middle-income countries, largely due to rapid motorisation without associated road safety infrastructure initiatives and programs. Pedestrians are one of the most vulnerable road user groups, particularly young children. While crash patterns and causes of collisions amongst pedestrian are established in developing countries, less is known about crash patterns, types and contributing factors to pedestrian trauma in Malaysia. Analyses of fatal and serious injury child pedestrian crashes were undertaken by examining the police-reported crash database. The results identified high rates of pedestrian deaths overall, and high rates of serious injury amongst young children. Young children were at highest risk in rural areas, on major roads with relatively high speed limits and while they

were playing on or attempting to cross the road without the aid of crossing facilities. Passenger vehicles and motorcycles were the most frequent striking vehicle. These findings have significant implications for countermeasures to address priority child pedestrian trauma issues in Malaysia including improved road design and reduced speeds on rural roads, as well as supporting education and enforcement initiatives.

Descriptors: Road safety; Child; Pedestrian; Fatality rate; Accident analysis
Identifiers: Malaysia
Shelf Location: ARRB (Journals Compactus)
URL: <http://acrs.org.au/journals/2012-vol-23-no-2/>
Date Created: Wednesday, 8 August 2012

Record Number: 1211AR067E
Year Published: 2012
Publication Title: Aspects of engineering approaches to reduce speeds and speed related crashes on rural highways in Bangladesh
Personal Author: Hoque=M (Bangladesh University of Engineering and Technology (BUET)); Salehin=MF (Bangladesh University of Engineering and Technology (BUET)); Smith=G (iRAP Australia)
Conference: ARRB Conference, 25th, 2012, Perth, Western Australia, Australia
Publication Details: DATE: 2012-09, PAGES: 15p, PUBLISHER: ARRB Group Ltd, T: Vermont South, S: Victoria, C: Australia, ISSN: 0572-1431

Abstract: Excessive and inappropriate speeding of motor vehicles and risk taking behaviour of road users have been shown to contribute substantial portion of accidents in Bangladesh. Adverse roadway environmental factors are also very much prevalent which are aggravating the situation. Nearly two-thirds of casualty-accidents were on rural roads and highways which are mostly undivided with significant roadside developments. Pedestrians are the most vulnerable road user group and 'hit-pedestrian' crashes accounted for more than 50 per cent of fatal crashes, followed by 'head-on', 'rear-end', 'run-off-road' and 'side-swipe' crashes. Buses and trucks account for over 70 per cent of the single vehicle accidents and their share in multi-vehicle accident is around 50 per cent whereas they constitute only 9 per cent of the total registered vehicles. Operating speeds of buses and trucks appeared to excel the posted speed limits in most instances while overspeeding has been reported as the most frequent cause of accidents. iRAP infrastructure risk assessment program revealed that highways are mostly rated 2-stars or less (out of possible 5-stars) for all road users which is indicative of serious road infrastructure deficiencies and uncontrolled linear developments fronting the highways. This paper discusses the aspect of speeding and speed related crashes in Bangladesh by presenting a brief overview of road crash characteristics. The paper in particular illustrates adverse road environmental factors contributing to accidents and discusses promising road infrastructural measures that demand priority consideration in improving road safety through mitigating the problem of speeding and accident.

Descriptors: Accident analysis; Accident rate; Accident cause; Speed control; Developing countries; Rural road
Identifiers: Bangladesh

- Shelf Location:** ARRB (CD 768 (Not for external loan))
URL: <http://www.arrb.com.au/ARRB-Conferences/Conference.aspx?id=3>
Date Created: Tuesday, 20 November 2012
- Record Number:** 1301AR039E
Year Published: 2012
Publication Title: A parametric study of collision avoidance between heavy goods vehicles and cyclists
 A study of collision avoidance between heavy goods vehicles and cyclists
- Personal Author:** Jia=Y; Cebon=D
Conference: HVTT12: International Symposium on Heavy Vehicle Transport Technology, 12th, 2012, Sweden International Symposium on Heavy Vehicle Transportation Technology, 12th, 2012, Sweden
- Publication Details:** DATE: 2012-09, PAGES: 14p, PUBLISHER: Conference Committee, T: Stockholm, C: Sweden
- Abstract:** Bringing more, possibly longer, articulated vehicles to urban areas for goods delivery provides significant benefits, in terms of lower fuel consumption and more efficient operation. However it may also increase the risk of accidents with vulnerable road users (VRUs) such as pedestrians and cyclists. Simulations of HGV cornering manoeuvres were carried out to examine the vehicle's cut-in and closing speed to the curb. A collision avoidance strategy was proposed and simulated, based on an assumption of constant acceleration for both the HGV and the cyclist. A left-turning manoeuvre was adopted to verify the effectiveness of the proposed collision avoidance strategy. Varying cyclist's speed and its initial distance relative to the HGV, the simulation results were mapped to estimate the proportion of accidents that could be avoided by such a system.
- Descriptors:** Heavy vehicle; Cyclist; Accident countermeasure; Vehicle handling; Turning traffic; Collision avoidance system
- Shelf Location:** ARRB (CD 779)
URL: <http://road-transport-technology.org/conferenceproceedings/hvtt-12/>
Date Created: Tuesday, 15 January 2013
- Record Number:** 1302AR045E
Year Published: 2012
Publication Title: Exploring an application of the safe system approach to a set of self-reported cycling crashes
- Personal Author:** Shaw=L (University of New South Wales. School of Public Health and Community Medicine); Poulos=R (University of New South Wales. School of Public Health and Community Medicine); Hatfield=J (University of New South Wales. Transport and Road Safety Research Centre); Rissel=C (University of Sydney. Sydney School of Public Health)
- Conference:** Australasian College of Road Safety Conference 2012, Sydney, New South Wales, Australia
- Publication Details:** DATE: 2012-08, PAGES: 14p, PUBLISHER: Australasian College of Road Safety, T: Canberra, S: ACT, C: Australia

Abstract: Vulnerable road users are over-represented in traffic injuries and fatalities. Police reports and hospitalisation data grossly underestimate bicycle crashes, and data on causation are limited. In Australia, the safe system approach (SSA) has been adopted for motor vehicles and is an important paradigm for road safety. However, the SSA does not appear to have been explicitly applied in policy documents that address cycling safety. We undertook a thematic analysis of cyclists' perceived causes of sustained collisions or falls as reported in 145 interviews with participants of the Safer Cycling Study. The interview was structured around the four key areas of the SSA. Qualitative data analysis indicates that cyclists perceived behaviour (road use factors) as being the greatest contributor to crashes, followed by infrastructure (road and roadside factors). Cyclists rarely reported vehicle factors or speed as contributory factors. Consideration of the four key areas of the SSA provides a useful framework for analysing cyclists' self-reported crash causation and may assist in the identification of crash countermeasures.

Descriptors: Cyclist; Accident cause; Interview; Road user behaviour; Accident countermeasure

Identifiers: Australia

Shelf Location: ARRB (CD 782)

URL: <http://acrs.org.au/events/acrs-past-conferences/2012-acrs-conference/program/papers/>

Date Created Wednesday, 13 February 2013

Record Number: 1104AR025E

Year Published: 2011

Publication Title: Safety at traffic signals for cyclists and pedestrians

Personal Author: Singh=R (Beca Infrastructure); Turner=S (Beca Infrastructure); Hughes=T (New Zealand Transport Agency); Nates=G (Beca Infrastructure)

Conference: Institution of Professional Engineers New Zealand (IPENZ) Transportation Conference, 2011, Auckland, New Zealand

Publication Details: DATE: 2011-03, PAGES: 14p, PUBLISHER: Harding Consultants, T: Christchurch, C: New Zealand

Abstract: This paper presents the findings of two key studies that have been undertaken on the safety impacts of cycle facilities and other intersection features on the crash risk faced by cyclists and pedestrians at traffic signals. The first study (Austroads Effectiveness and Selection of Intersection Treatments for Cyclists), referred to as Study 1 in this paper, has focused on cycle safety at traffic signals, with a specific focus on the safety benefits that might be achieved from installing approach and storage cycle facilities. The most recent study (NZTA Crash Prediction Models for Signalised Intersections – Draft Report), referred to as Study 2 in this paper, looks at the effects of signal phasing and geometry on the crash risk faced by various user classes at traffic signals. The paper provides details on cycle and pedestrian crash relationships that were developed as part of Study 1 and 2 respectively.

Descriptors: Road safety; Cyclist; Pedestrian; Signalized intersection; Bicycle facilities; Traffic signal

Identifiers: New Zealand

Shelf Location: ARRB (Electronic copy (Not for external loan))

- URL:** <http://www.hardingconsultants.co.nz/ipenz2011/index.html>
Date Created Wednesday, 13 April 2011
- Record Number:** 1106AR220E
Year Published: 2011
Publication Title: Unprotected road users: a key concern of road safety
Corporate Author: European Transport Safety Council (ETSC)
Publication Details: PN: Road Safety Performance Index (PIN) Flash, NO: 19, DATE: 2011-05, PAGES: 22p, PUBLISHER: European Transport Safety Council (ETSC), T: Brussels, C: Belgium
- Abstract:** At least 15,300 pedestrians, cyclists and motorcycle riders were killed in the EU in 2009, and 169,000 since 2001. Deaths among this category of unprotected road users have been decreasing at a lower rate than for vehicle occupants. Deaths among pedestrians and cyclists decreased by 34 per cent between 2001 and 2009 and those among powered two-wheelers (PTW) riders by only 18 per cent, compared with 39 per cent for car drivers. While the number of road deaths has declined considerably in the past decade in Europe, the number of PTW riders killed rose in 13 out of 26 countries. This rise can be attributed only partly to the increase in use of PTWs and should urgently receive special attention from policy makers at the national and European levels. The safety of walking and cycling also needs special attention if public health is to be improved by encouraging these forms of active travel. Experiences from fast progressing and well performing countries show that affordable measures are known that can save the lives of many unprotected road users. The fastest reductions in pedestrian deaths have been recorded in Portugal, Sweden, Norway and Belgium and in cyclist deaths in Finland, Israel, Slovakia and Latvia. Best progress in reducing deaths among motorcyclists and moped riders has been achieved by Portugal, Latvia, and to a lesser extent by Ireland and France.
- Descriptors:** Vulnerable road user; Motorcyclist; Cyclist; Pedestrian; Fatality rate; Accident countermeasure; Injury prevention
- Identifiers:** Europe
Shelf Location: ARRB (Electronic copy (Not for external loan))
Electronic Version: http://library.arrb.com.au/e-pubs/EU&EC/ETSC_PINFlash19_unprotected_road_users.pdf
- URL:** http://www.etsc.eu/documents/ETSC_PINFlash19_unprotected_road_users.pdf
- Date Created** Tuesday, 7 June 2011
- Record Number:** 1107AR107E
Year Published: 2011
Publication Title: Vulnerable road user safety: a comparison between a middle-income and a high-income country
Personal Author: Oxley=J (Monash University. Accident Research Centre (MUARC)); Fildes=B (Monash University. Accident Research Centre (MUARC)); Sadullah=F (Malaysian Institute of Road safety); Lahausse=J (Monash University. Accident

- Research Centre (MUARC)); Newstead=S (Monash University. Accident Research Centre (MUARC))
- Publication Details:** PN: Journal of the Australasian College of Road Safety, VOL: 22, NO: 2, DATE: 2011, PAGES: 63-70
- Abstract:** The study set out to compare crash and injury patterns of vulnerable road users (VRU) between a high- and a middle-income country to illustrate relative outcomes between such countries. Several analyses of crash and casualty crash patterns were undertaken using real-world crash databases from Australia and Malaysia. The factors examined included the type of vulnerable road user, the vehicle involved, the primary crash cause, age of the road user, injury outcome (fatal or casualty), crash location and single/multi-vehicle collisions. The findings from this study highlighted emerging and severe road crash problems currently not being addressed in existing safety initiatives within these countries by governments or vehicle manufacturers. A number of potential solutions to these problems were identified including engineering countermeasures for vehicles and road infrastructure, greater use of protective equipment for riders, enhanced police enforcement efforts and technologies, and improved training and licensing practices. Public policy response to this growing epidemic in low and middle-income countries has been muted at national and international levels and policy makers need to recognise this growing problem as a public health crisis and design appropriate policy responses. With growing usage of VRU transport in developing countries, this burden is expected to become even larger in the years ahead unless action is taken.
- Descriptors:** Road safety; Accident analysis; Income; Accident record
- Identifiers:** Australia; Malaysia
- Shelf Location:** ARRB (Journals Compactus)
- URL:** <http://www.acrs.org.au/publications/journalscurrentandbackissues.html>
- Date Created:** Friday, 8 July 2011
- Record Number:** 1107AR109E
- Year Published:** 2011
- Publication Title:** iRAP assessment of risk on national highways in Bangladesh
- Personal Author:** Smith=GS (iRAP)
- Publication Details:** PN: Journal of the Australasian College of Road Safety, VOL: 22, NO: 2, DATE: 2011, PAGES: 76-85
- Abstract:** Bangladesh faces significant road safety challenges. As many as 55 people are reportedly killed in traffic crashes each day. Like many low-income countries, vulnerable road users (including pedestrians, motorcyclists and bicyclists) account for a large proportion of road deaths. In 2010, with the support of the FIA Foundation and local road safety organisations, iRAP undertook a risk assessment of two of Bangladesh's main highways, the N2 and N3. These roads experience death rates in the order of 10 times higher than equivalent highways in Australia. In the case of the N2, this is despite the fact that major upgrades were undertaken as recently as 2005. This paper provides an overview of the iRAP project; it includes an explanation of the iRAP approach to assessing risk and proposing countermeasures, and provides a summary of key results. The assessments showed that the majority of the N2 and N3 are

rated 2 stars or less (out of a possible 5 stars) for car occupants, pedestrians, motorcyclists and pedestrians, indicating a relatively high level of risk of death or serious injury. To mitigate this risk, a series of investment plan options were developed for each road. These generally focused on the provision of wider shoulders, safety barriers, pedestrian footpaths and crossings and safer intersections. The most comprehensive of the plans identified the potential to reduce deaths and serious injuries by 36 per cent on the N2 and by 44 per cent on the N3.

Descriptors: Road safety; Risk assessment; Accident countermeasure
Identifiers: iRAP Bangladesh
Shelf Location: ARRB (Journals Compactus)
URL: <http://www.acrs.org.au/publications/journalscurrentandbackissues.html>
Date Created: Friday, 8 July 2011

Record Number: 1107AR143E
Year Published: 2011
Publication Title: Requirements of a system to reduce car-to-vulnerable road user crashes in urban intersections
Personal Author: Habibovic=A; Davidsson=J
Publication Details: PN: Accident Analysis and Prevention, VOL: 43, NO: 4, DATE: 2011-07, PAGES: 1570-80

Descriptors: Road safety; Advanced driver information systems (ADIS); Accident analysis; Accident countermeasure; Accident cause; Intersection; Vulnerable road user
Identifiers: Sweden
Shelf Location: ARRB (Journals Compactus)
Other Libraries: SRAR
URL: <http://dx.doi.org/10.1016/j.aap.2011.03.019>
Date Created: Friday, 8 July 2011

Record Number: 1111AR146E
Year Published: 2011
Publication Title: Development of crash prediction models with individual vehicular data
Personal Author: Son=H; Kweon=Y-J; Park=B
Publication Details: PN: Transportation Research, Part C-Emerging Technologies, VOL: 19C, NO: 6, DATE: 2011-12, PAGES: 1353-63
Descriptors: Accident analysis; Forecast; Data analysis; Traffic flow
Identifiers: USA
Shelf Location: ARRB (Journals Compactus)
URL: <http://dx.doi.org/10.1016/j.trc.2011.03.002>
Date Created: Monday, 14 November 2011

Record Number: 1205AR268E
Year Published: 2011
Publication Title: Estimating potential effect of speed limits, built environment, and other

- factors on severity of pedestrian and cyclist injuries in crashes
- Personal Author:** Zahabi=SAH; Strauss=J; Manaugh=K; Miranda-Moreno=LF
- Publication Details:** PN: Transportation Research Record, NO: 2247, DATE: 2011, PAGES: 81-90, PUBLISHER: Transportation Research Board (TRB), T: Washington, S: DC, C: USA, ISSN: 0361-1981, ISBN: 9780309167673
- Abstract:** Road facilities in urban areas are a major source of injury for non-motorized road users despite the benefits of non-motorized transportation. In particular, large Canadian cities such as Montreal face serious problems with pedestrian and cyclist safety. To address these problems, funds are continually allocated through different safety improvement programs such as reduction of speed limits, improvement of intersections, and increased traffic enforcement. However, few analytical tools help to identify and quantify the benefits of countermeasures (e.g., roadway design, speed management strategies, or land use policies) in reducing accident frequency and severity. Injury severity models were developed to determine the effects of road design, built environment, speed limits, and other factors (e.g., vehicle characteristics and movement type) on injury severity levels of pedestrians and cyclists involved in collisions with motor vehicles. Sources of data included police reports describing vehicle-pedestrian and vehicle-cyclist collisions, as well as information on land use, transit network, and road design attributes from the city of Montreal. The impacts of road design, land use, built environment, and other strategies on the injury severity levels of vulnerable road users were investigated. Factors such as darkness, vehicle movement, whether an accident occurred at an intersection, vehicle type, and land use mix affected the severity of pedestrian injuries from collisions. For cyclists, however, only vehicle movement and whether the accident occurred at a signalized intersection had significant effects on the severity of the injury.
- Descriptors:** Road safety; Accident severity; Cyclist; Pedestrian; Accident countermeasure; Accident cause
- Identifiers:** Montreal, Canada
- Shelf Location:** ARRB (S 625.7(73) TRA (TRR 2247))
- Other Libraries:** NRTA
WMR (HO)
- URL:** <http://dx.doi.org/10.3141/2247-10>
- Date Created** Tuesday, 15 May 2012
- Record Number:** 1005AR146E
- Year Published:** 2010
- Publication Title:** Vulnerable road user safety across several international regions
- Personal Author:** Fildes=B (Monash University. Accident Research Centre (MUARC)); Oxley=J (Monash University. Accident Research Centre (MUARC)); Pennisi=L; Lahousse=J (Monash University. Accident Research Centre (MUARC)); Newstead=S (Monash University. Accident Research Centre (MUARC)); Sadullah=AF (Malaysian Institute of Road Safety Research (MIROS))
- Conference:** Road Safety on Four Continents, 15th, 2010, Abu Dhabi, United Arab Emirates
- Publication Details:** DATE: 2010-03, PAGES: 828-40, PUBLISHER: Swedish National Road and Transport Research Institute, T: Linköping, C: Sweden, ISBN: 9789163363597
- Abstract:** The study set out to compare crash and injury patterns of vulnerable road

users (VRU) across a number of different countries and databases to illustrate relative outcomes in different regions. Several analyses of crash and casualty crash patterns were undertaken using real-world crash databases from a number of different countries. The factors examined included the type of vulnerable road user, the vehicle involved, the primary crash cause, age of the road user, injury outcome (fatal or casualty), crash location and single or multi-vehicle collision. The findings from this study highlighted emerging and severe road crash problems for society currently not being addressed in existing safety initiatives by governments or vehicle manufacturers in these regions. A number of potential solutions to these problems including engineering countermeasures for vehicles and road infrastructure, greater use of protective equipment for riders, enhanced police enforcement efforts and technologies, and improved training and licensing practices. Public policy response to this growing epidemic in developing countries has been muted at national and international levels and policy makers need to recognise this growing problem as a public health crisis and design appropriate policy responses. With growing usage of VRU transport in developing countries, this burden is expected to become even larger in the years ahead in these regions without urgent attention.

Descriptors: Road safety; Vulnerable road user; International comparison; Developing countries; Accident analysis; Accident countermeasure; Policy
Shelf Location: ARRB (CD 688)
Date Created Wednesday, 12 May 2010

Record Number: 1007AR188E
Year Published: 2010
Publication Title: The effect of traffic lane widths on the safety of cyclists in urban areas
Personal Author: Schramm=A (Queensland University of Technology. Centre for Accident Research and Road Safety (CARRS-Q)); Rakotonirainy=A (Queensland University of Technology. Centre for Accident Research and Road Safety (CARRS-Q))

Publication Details: PN: Journal of the Australasian College of Road Safety, VOL: 21, NO: 2, DATE: 2010-05, PAGES: 43-50

Abstract: This literature review examines the relationship between traffic lane widths on the safety of road users. It focuses on the impacts of lane widths on motor vehicle behaviour and cyclists' safety. The review commenced with a search of available databases. Peer reviewed articles and road authority reports were reviewed, as well as current engineering guidelines. Research shows that traffic lane width influences drivers' perceived difficulty of the task, risk perception and possibly speed choices. Total roadway width, and the presence of on-road cycling facilities, influence cyclists' positioning on the road. Lateral displacement between bicycles and vehicles is smallest when a marked bicycle facility is present. Reduced motor vehicle speeds can significantly improve the safety of vulnerable road users, particularly pedestrians and cyclists. It has been shown that if road lane widths on urban roads were reduced, through various mechanisms, it could result in a safer environment for all road users.

Descriptors: Road safety; Traffic lane; Width; Cyclist; Driver behaviour; Lateral position;

- Literature review**
- Shelf Location:** ARRB (Journals Compactus)
URL: <http://www.acrs.org.au/publications/journalscurrentandbackissues.html>
Date Created Tuesday, 13 July 2010
- Record Number:** 1008AR053E
Year Published: 2010
Publication Title: Addressing the needs of vulnerable road users: application of road safety auditing in New South Wales (Australia)
Personal Author: Winning=TG (Winning Traffic Solutions); Park=SR (Winning Traffic Solutions)
Conference: Local Road Safety and Traffic Engineering Conference, 3rd, 2010, Sydney, New South Wales, Australia
Publication Details: DATE: 2010-06, PAGES: 6p (Thurs am), PUBLISHER: Hallmark Editions, T: Brighton, S: Victoria, C: Australia
Abstract: The practice of road safety auditing has become an important tool in the prevention of road accidents in New South Wales since its formalisation in the early 1990's. While there is considerable emphasis placed on the role of road safety audits at the concept and design stages (thus facilitating the identification of potential safety hazards long before the road or traffic facility has been built), there has been growing recognition of the role of thematic road safety audits in assessing risks to specific road users. Audits of "School Zones" (designated low speed education precincts) focus on the movement needs of children, parents and teachers, assess integration of public transport and identify conflicts with vehicular through traffic. Work zone audits assess the dangers to the occupational health and safety of road workers, the hazards of temporary travel paths and the effectiveness of temporary traffic control in reducing accident risk. Principles of safe traffic integration for vulnerable road users are identified from audit experience and the benefit of thematic road safety audit programs concluded.
- Descriptors:** Road safety; Safety audit; Vulnerable road user; Pedestrian; Child; Construction site
Identifiers: New South Wales
Shelf Location: ARRB (CD 697)
Date Created Wednesday, 11 August 2010
- Record Number:** 1008AR980E
Year Published: 2010
Publication Title: Recent progress in implementing the safe system approach
Personal Author: Turner=B (ARRB Group Ltd); Cairney=P (ARRB Group Ltd); Jurewicz=C (ARRB Group Ltd); McTiernan=D (ARRB Group Ltd)
Publication Details: PN: Journal of the Australasian College of Road Safety, VOL: 21, NO: 1, DATE: 2010-02, PAGES: 17-9
Abstract: The Safe System approach has now been adopted by each jurisdiction within Australia, and is likely to be at the core of the new national road safety strategy. Based primarily on the Swedish 'Vision Zero', and the Dutch 'Sustainable Safety' approaches, the Safe System approach recognises that

humans as road users are fallible and will make mistakes. There are also limits to the kinetic energy exchange which humans can tolerate (e.g. during the rapid deceleration associated with a crash) before serious injury or death occurs. A key part of the Safe System approach requires that infrastructure be designed and managed to take account of these errors and vulnerabilities so that road users are able to avoid serious injury or death on the road. Although the Safe System vision is clear within Australia, and there is general agreement about this, the approaches that might be taken to achieve this vision are less obvious. Advice is required regarding infrastructure options for achieving Safe System outcomes; on appropriate speed management strategies; and on ways to maximise the alertness and compliance of road users. In order to help understand how jurisdictions can meet these objectives, ARRB has facilitated a series of national workshops to discuss these issues.

Descriptors: Road safety; Accident countermeasure; Injury prevention; Infrastructure; Vulnerable road user; Speed control; Driver performance

Shelf Location: ARRB (Journals Compactus)

URL: <http://www.acrs.org.au/publications/journalscurrentandbackissues.html>

Date Created Wednesday, 11 August 2010

Record Number: 1008AR986E

Year Published: 2010

Publication Title: Do light truck vehicles (LTV) impose greater risk of pedestrian injury than passenger cars? A meta-analysis and systematic review

Personal Author: Desapriya=E; Subzwari=S; Sasges=D; Basic=A; Alidina=A; Turcotte=K; Pike=I

Publication Details: PN: Traffic Injury Prevention, VOL: 11, NO: 1, DATE: 2010-02, PAGES: 48-56

Descriptors: Vehicle safety; Vehicle aggressivity; Light commercial vehicle; Vulnerable road user; Vehicle design; Accident proneness; Injury rate; Meta analysis; Systematic review

Identifiers: Canada

Shelf Location: ARRB (Journals Compactus)

URL: <http://dx.doi.org/10.1080/15389580903390623>

Date Created Wednesday, 11 August 2010

Record Number: 1101AR198E

Year Published: 2010

Publication Title: Determination of the car-pedestrian collision avoidance probability

Personal Author: Chaim=MB; Yanetz=S; Brand=M

Conference: International Conference on Safety and Mobility of Vulnerable Road Users, 2010, Jerusalem, Israel

Publication Details: DATE: 2010-06, PAGES: 15-31, PUBLISHER: Israel National Road Safety Authority, T: Jerusalem, C: Israel

Abstract: In this paper, an attempt has been made to define probabilistic characterizations of the car-pedestrian collision. To this end previous incident parameters were also taken into account (parameters associated to the vehicle, the pedestrian, the road and the dynamic characteristics of the vehicle etc.). The main result is a Monte-Carlo based calculation of a car-pedestrian

collision probability. Furthermore, some analytical dependencies were extracted, relating the incident avoidance probability with several influence arguments. Finally, these provided a platform for solving some practical problems in the field of pedestrian safety. When studying certain practical tasks such as preliminary consideration and investigation of road accidents, when instructing new drivers in practical skills of driving as well as estimating the efficiency of various systems of increasing traffic safety, etc., it is important to have a clear notion of scenarios of various road situations. Using numerical characteristics of road accident prevention probability in such cases may be of great help. This paper considers the questions of analytical dependence of the probability of prevention of road accidents using the example of the passenger car-pedestrian collision.

Descriptors: Vulnerable road user; Pedestrian; Traffic accident; Probability; Car; Road safety
Shelf Location: ARRB (CD 717)
Date Created Monday, 17 January 2011

Record Number: 1101AR201E
Year Published: 2010
Publication Title: Vulnerable road user safety at roundabouts: empirical results
Personal Author: Daniels=S; Brijs=T; Nuyts=E; Wets=G
Conference: International Conference on Safety and Mobility of Vulnerable Road Users, 2010, Jerusalem, Israel
Publication Details: DATE: 2010-06, PAGES: 86-99, PUBLISHER: Israel National Road Safety Authority, T: Jerusalem, C: Israel

Abstract: This paper presents the results of recent research on safety for different types of road users at roundabouts. Regression models were developed in order to explain variations in crash counts among roundabouts. Data on injuries, traffic volumes and roundabout geometry were collected. The results show that the variation in accident counts is relatively small and mainly driven by the traffic exposure. Confirmation was found for the existence of a "safety in numbers" effect for bicyclists, moped riders and – more uncertain – for pedestrians at roundabouts. Vulnerable road users (moped riders, motorcyclists, bicyclists and pedestrians) are more often involved in injury crashes at roundabouts than could be expected based on their presence in traffic. Moped riders and motorcyclists are overrepresented in single-vehicle crashes whereas moped riders and bicyclists are overrepresented in multiple-vehicle crashes. A before-and-after study of injury accidents with bicyclists on 90 roundabouts in Flanders-Belgium was carried out. The study design accounted for effects of general safety trends and regression-to-the-mean. Conversions of intersections into roundabouts turned out to have caused a significant increase of 27 per cent in the number of injury accidents with bicyclists on or nearby the roundabouts. The increase was even higher for accidents involving fatal or serious injuries. Roundabouts with cycle lanes close to the roadway appeared to perform significantly worse compared to other design types. Also roundabouts that were replacing signal-controlled intersections had a worse evolution compared to roundabouts on other types of intersections.

Descriptors: Vulnerable road user; Roundabout; Cyclist; Motorcyclist; Pedestrian;

- Identifiers:** Accident rate; Before and after study
Shelf Location: Belgium
Date Created: ARRB (CD 717)
Monday, 17 January 2011
- Record Number:** 1101AR920E
Year Published: 2010
Publication Title: International Conference on Safety and Mobility of Vulnerable Road Users: pedestrians, motorcyclists and bicyclists, May 30-June 2, Jerusalem, Israel
Conference: International Conference on Safety and Mobility of Vulnerable Road Users, 2010, Jerusalem, Israel
Publication Details: DATE: 2010-06, PAGES: 1 CD-ROM, PUBLISHER: Israel National Road Safety Authority, T: Jerusalem, C: Israel
Notes: Most papers are abstracts only (6 full text papers)
Descriptors: Road safety; Mobility; Vulnerable road user; Pedestrian; Motorcyclist; Cyclist; Injury prevention
Shelf Location: ARRB (CD 717 (Not for external loan))
Other Information: 1. Conference covering entry
Date Created: Monday, 17 January 2011
- Record Number:** 1106AR056E
Year Published: 2010
Publication Title: Effects of horizontal curvature on single-vehicle motorcycle crashes along rural two-lane highways
Personal Author: Schneider=WH; Savolainen=PT; Moore=DN
Publication Details: PN: Transportation Research Record, NO: 2194, DATE: 2010, PAGES: 91-8, PUBLISHER: Transportation Research Board (TRB), T: Washington, S: DC, C: USA, ISSN: 0361-1981, ISBN: 9780309160704
Abstract: Motorcycle crashes and fatalities have been increasing rapidly during the past 12 years both in Ohio and across the rest of the United States. In response to these issues, various studies have examined aspects of motorcycle safety in recent years. However, there has been limited research on the effects of site-specific roadway geometry on the frequency of motorcycle crashes, particularly at nonintersection locations. Typically, researchers employ Poisson and negative binomial crash prediction modeling techniques in these types of studies. The research presented in this paper uses a negative binomial model, applying full Bayes methods to improve model performance and to assess the impacts of horizontal curvature and other geometric features on the frequency of single-vehicle motorcycle crashes along segments of rural two-lane highways. The data used in this study include crash records for the years 2002 through the spring of 2008, in combination with available geometric design information, for those curves maintained by the State of Ohio. The analysis data set includes 30,379 horizontal curves that experienced a total of 225 motorcycle crashes during the study period. The findings show that the radius and length of each horizontal curve significantly influence the frequency of motorcycle crashes, as do shoulder width, annual average daily traffic, and the

- Descriptors:** location of the road segment in relation to the curve.
Road safety; Motorcycle; Accident cause; Curve; Modelling; Single vehicle accident
- Identifiers:** Ohio, USA
- Shelf Location:** ARRB (S 625.7(73) TRA (TRR 2194))
- Other Libraries:** NRTA
WMR (HO)
- URL:** <http://dx.doi.org/10.3141/2194-11>
- Date Created** Tuesday, 7 June 2011
- Record Number:** 1106AR222E
- Year Published:** 2010
- Publication Title:** Bicycle facilities on distributor roads
- Corporate Author:** SWOV Institute for Road Safety Research
- Publication Details:** PN: Fact Sheet, DATE: 2010-12, PAGES: 6p, PUBLISHER: SWOV Institute for Road Safety Research, T: Leidschendam, C: Netherlands
- Abstract:** A sustainably safe road environment requires bicycle facilities that separate motorized traffic from relatively vulnerable road users like cyclists. Research indicates that on distributor roads the road sections with adjoining or separate bicycle tracks are safer than the road sections without any bicycle facilities. Furthermore, roundabouts with separate bicycle facilities are safer than roundabouts without such facilities. Other intersection types require speed reduction measures to reduce the number of crashes.
- Descriptors:** Bicycle facilities; Bicycle lane; Intersection; Roundabout; Distributor road
- Identifiers:** Netherlands
- Shelf Location:** ARRB (Electronic copy (Not for external loan))
- Electronic Version:** http://library.arrb.com.au/e-pubs/SWOV/FS_Bicycle_facilities.pdf
- URL:** http://www.swov.nl/rapport/Factsheets/UK/FS_Bicycle_facilities.pdf
- Date Created** Tuesday, 7 June 2011
- Record Number:** 1109AR208E
- Year Published:** 2010
- Publication Title:** Public lighting
- Corporate Author:** SWOV Institute for Road Safety Research
- Publication Details:** PN: Fact Sheet, DATE: 2010-12, PAGES: 6p, PUBLISHER: SWOV Institute for Road Safety Research, T: Leidschendam, C: Netherlands
- Abstract:** Visual perception is very important for road users and in the dark it can be facilitated by public lighting. Public lighting has a mostly positive road safety effect. Installing public lighting on roads that were previously unlit generally results in fewer and less serious crashes. This effect seems to be stronger for roads in rural than in urban areas. Furthermore, the effect seems to be greater on the risk of vulnerable road users (pedestrians, cyclists, (light) moped riders) than on that of drivers of motor vehicles. Increasing the luminance on roads that are already lit, has a considerably smaller effect. Decreasing the existing luminance, however, appears to lead to an increase in the number of crashes. It seems to be possible to apply public lighting cost-

- Descriptors:** effectively on the majority of roads in the Netherlands. However, increasing luminance on already lit rural roads is not cost-effective. Street lighting; Road safety; Accident countermeasure; Luminance; Cost effectiveness
- Identifiers:** Netherlands
- Shelf Location:** ARRB (Electronic copy (Not for external loan))
- Electronic Version:** http://library.arrb.com.au/e-pubs/SWOV/FS_Public_lighting.pdf
- URL:** http://www.swov.nl/rapport/Factsheets/UK/FS_Public_lighting.pdf
- Date Created** Tuesday, 13 September 2011
- Record Number:** 0906AR006E
- Year Published:** 2009
- Publication Title:** Intelligent transport systems and variable message signs for road safety applications: current status and future prospects
- Personal Author:** Cairney=P (ARRB Group Ltd); Roberts=P (ARRB Group Ltd)
- Publication Details:** NO: AP-T133/09, DATE: 2009-05, PAGES: 81p, PUBLISHER: Austroads, T: Sydney, S: New South Wales, C: Australia, ISBN: 9781921551307
- Notes:** Austroads Project ST1346
- Abstract:** This report reviews current developments in infrastructure-based safety-related ITS, documents their status in Australia and New Zealand, and makes recommendations for future developments in this area. A literature review is presented in which intersection warning systems, collision detection systems, lane departure warning, vehicle-activated speed warning, point-to-point speed enforcement, fixed speed cameras, intelligent speed adaptation (ISA), weather and flooding alerts, and automatic crash notification are examined, along with systems to protect vulnerable road users and developments in variable message signs. Workshop discussions were held across Australia and New Zealand. Discussion points are summarised in a table, with full summaries reported in an appendix. It was evident that there was relatively little contact between groups in the different authorities. There was also concern that up to the present, systems had developed in isolation with little reference to emerging standards in ITS, and an urgent need to get ready for the widespread availability of ITS in new vehicles was evident. Current developments impacting on the future of infrastructure based safety related ITS are discussed, including the allocation of dedicated radio spectrum in the 5.9 GHz range, developments in the intelligent speed assist area, and the launch of the dedicated short range communication cluster, established with the goal of facilitating the next wave of ITS developments. Recommendations for the organisation of future work in this area are made, including a research and development strategy.
- Descriptors:** Intelligent transport systems (ITS); Variable message sign; Literature review; Road authority; Standardization; Interview; Infrastructure; Innovation
- Identifiers:** Australia; New Zealand
- Shelf Location:** ARRB (S 625.7(94) AUS.1 (T13309)) + Deposit copy
- Electronic Version:** <http://library.arrb.com.au/e-pubs/Austroads/AP-T133-09.pdf>
- Other Libraries:** TGO
- URL:** <https://www.onlinepublications.austroads.com.au/items/AP-T133-09>
- Date Created** Thursday, 4 June 2009

- Record Number:** 0907AR229E
Year Published: 2009
Publication Title: Moped and light-moped riders
Corporate Author: SWOV Institute for Road Safety Research
Publication Details: PN: Fact Sheet, DATE: 2009-03, PAGES: 7p, PUBLISHER: SWOV Institute for Road Safety Research, T: Leidschendam, C: Netherlands
- Abstract:** Moped and light-moped riders run a relatively high risk of becoming crash casualties. This is mainly due to the high riding speed in relation to the riders' vulnerability. Moped riders are obliged to wear a helmet but light-moped riders are not. In addition, a high proportion of the kilometres ridden on mopeds and light mopeds is ridden by groups that are at higher risk. Specifically, these are young people (15-17 years, mainly moped riders) and older people (60 and older, mainly light-moped riders). In the (recent) past, the Netherlands have taken various measures to increase the safety of moped and light-moped riders (moped from the bicycle path to the carriageway, measures to prevent tuning up of mopeds and light mopeds, mandatory vehicle registration and moped driving licence). As yet, these have not been shown to have an effect on moped and light-moped casualties. The number of tuned-up mopeds and light mopeds has declined in recent years and is now about 20 per cent. SWOV calls for an effort to achieve 100 per cent use of helmets when riding mopeds. In addition, SWOV is in favour of for mopeds and light mopeds being made two clearly recognisable vehicle categories again: the current moped and the (original) 'bicycle with auxiliary engine'.
- Descriptors:** Road safety; Moped; Motorcyclist; Vulnerable road user; Risk; Injury prevention
- Identifiers:** Netherlands
- Shelf Location:** ARRB (Electronic copy (Not for external loan))
- Electronic Version:** http://library.arrb.com.au/e-pubs/SWOV/FS_Moped_riders.pdf
- URL:** http://www.swov.nl/rapport/Factsheets/UK/FS_Moped_riders.pdf
- Date Created** Monday, 13 July 2009
- Record Number:** 0907AR234E
Year Published: 2009
Publication Title: Subjective and objective safety: the effect of road safety measures on subjective safety among vulnerable road users
Personal Author: Soerensen=M; Mosslemi=M
Publication Details: PN: TOI Report, NO: 1009/2009, DATE: 2009-04, PAGES: 140p, PUBLISHER: Institute of Transport Economics, T: Oslo, C: Norway, ISSN: 0808-1190, ISBN: 9788248009597
- Abstract:** The objective of the project has been to summarize the effect of 54 road safety measures on subjective safety among vulnerable road users. The assessment is based on literature and theoretical considerations. The effect has only been directly studied for 14 measures and indirectly studied for another 14 measures. 39 measures are assessed to have a positive effect of subjective safety. Among 125 submeasures it is assessed that 78 have a

positive effect on both objective and subjective safety and 25 have an opposite effect on objective and subjective safety, i.e. having positive effect on one parameter and negative effect on the other. 20 measures have an unknown or unclear effect on objective or subjective safety. Further investigation is relevant for at least 50 of the submeasures. 13 measures most relevant for further studies are selected.

Descriptors: Road safety; Accident countermeasure; Evaluation; Risk; Vulnerable road user; Human factors
Shelf Location: ARRB (Electronic copy (Not for external loan))
Electronic Version: <http://library.arrb.com.au/e-pubs/InstituteofTransportEconomicsNorway/1009-2009-nett.pdf>
URL: <http://www.toi.no/article27666-29.html>
Date Created Monday, 13 July 2009

Record Number: 0908AR832E
Year Published: 2009
Publication Title: 3rd International Symposium on ESAR "Expert Symposium on Accident Research": reports on the ESAR-Conference on 5th/6th September 2008 at Hannover Medical School

Conference: International Symposium on ESAR "Expert Symposium on Accident Research", 3rd, 2008, Hannover, Germany

Publication Details: PN: Berichte der Bundesanstalt fuer Strassenwesen, Fahrzeugtechnik, NO: F 72, DATE: 2009-01, PAGES: 1 CD ROM, PUBLISHER: Bundesanstalt fuer Strassenwesen (BAST), T: Bergisch Gladbach, C: Germany, ISSN: 0943-9307, ISBN: 9783865098931

Descriptors: Road safety; Motorcycle; Motorcyclist; Accident investigation; Accident analysis; Accident countermeasure; Vulnerable road user; Injury prevention
Shelf Location: ARRB (CD 653 (Not for external loan))
Other Information: 1. Conference covering entry
Date Created Monday, 17 August 2009

Record Number: 0911AR121E
Year Published: 2009
Publication Title: Roundabout crash prediction models
Personal Author: Turner=SA (Beca Infrastructure); Roozenburg=AP (Beca Infrastructure); Smith=AW (Beca Infrastructure)
Publication Details: PN: New Zealand Transport Agency Research Report, NO: 386, DATE: 2009-06, PAGES: 103p, PUBLISHER: New Zealand Transport Agency, T: Wellington, C: New Zealand, ISSN: 1173-3764, ISBN: 9780478352207

Abstract: The management of speed is considered an important safety issue at roundabouts. The approach speed and negotiating speed through roundabouts depends on the geometric design of the roundabout and sight distance. In New Zealand and in Australia, the design standards recommend long approach sight distances and provision of relatively high design speeds. This is in contrast to European roundabouts, where visibility is normally restricted and the geometric design encourages slow approach and

negotiation speeds. This work, undertaken in 2006, extends previous research by the authors developing crash prediction models at roundabouts to include sight distance, intersection layout and observed speed variables. Models have been produced for the major motor vehicles only, pedestrians versus motor vehicles and cyclists versus motor vehicle crash types. Flow-only models have also been produced for roundabouts on roads with high speed limits. The models produced indicate that roundabouts with lower speeds (observed and speed limit), fewer approach lanes and reduced visibilities have lower crash rates.

Descriptors: Road safety; Roundabout; Speed control; Visibility distance; Traffic accident; Modelling; Forecast

Shelf Location: ARRB (Electronic copy (Not for external loan))

Electronic Version: <http://library.arrb.com.au/e-pubs/NZTA/386.pdf>

URL: <http://www.landtransport.govt.nz/research/reports/>

Date Created Wednesday, 18 November 2009

Record Number: 1001AR142E

Year Published: 2009

Publication Title: Road safety engineering challenges in Bangladesh

Personal Author: Hoque=M; Sohel Mahmud=SM

Conference: Road Engineering Association of Asia and Australasia (REAAA) Conference, 13th, 2009, Incheon, Korea

Publication Details: DATE: 2009-09, PAGES: 10p, PUBLISHER: Road Engineering Association of Asia and Australasia (REAAA), T: Seoul, C: Korea

Abstract: More than half of the world's traffic fatalities occur in the Asian-Pacific region although only one in five motorized vehicles are registered here. It is estimated that by 2020 about two-thirds of the world's traffic fatalities might be in the Asian-Pacific region. The road accidents statistics and characteristics revealed that Bangladesh has one of the highest fatality rates. About 70 percent of road accident fatalities occurred in rural areas including rural sections of national highways. Almost 80 percent of fatalities are vulnerable road users viz. pedestrians, bicyclists and motorcyclists. Pedestrian-vehicle conflicts are clearly the greatest problem with significant involvement of trucks and buses. The road factors are particularly prevalent in accidents and it is well known that the systematic road design and engineering improvements can prevent many such accidents and save lives quickly and affordably. Indeed, road safety issue in Bangladesh thus posits a considerable challenge to the road engineering professionals. In this paper an attempt has been made to highlight the road safety issues and priorities in Bangladesh with particular emphasis on the road safety engineering challenges and opportunities.

Descriptors: Road safety; Road engineering; Road design; Accident countermeasure; Accident rate

Identifiers: Bangladesh

Shelf Location: ARRB (CD 672)

Date Created Tuesday, 19 January 2010

- Record Number:** 1001AR173E
Year Published: 2009
Publication Title: Crash prediction modelling at intersections in New Zealand 1990 to 2009
Personal Author: Turner=S (Beca Infrastructure); Wood=G (Macquarie University. Department of Statistics)
Conference: Australasian Transport Research Forum (ATRF), 32nd, 2009, Auckland, New Zealand
Publication Details: VOL: 32, DATE: 2009-09, PAGES: 19p (session Wed 2C), PUBLISHER: Convention Management, T: Auckland, C: New Zealand
Abstract: A large number of crash prediction models have been developed in New Zealand, for different road elements and for different speed limits. The crash modeling methods used in New Zealand are based on best practice overseas, from the UK, Canada and the USA, with some local enhancements. The research to date has produced a number of interesting and thought-provoking outcomes including the "safety-in-numbers" effect for cyclists and pedestrians and that reducing visibility can lead to safety gains at roundabouts. This paper profiles the models that have been developed for low and high speed traffic signals, roundabouts and priority intersections in New Zealand. In addition to presenting the crash models and the modeling methods, the paper will show how the models are used to compare various forms of control at an intersection. It will highlight the importance of using the models within the prescribed flow ranges. The models are less accurate when used to extrapolate to traffic volumes that are not typical for the intersection type, for example, for low volume traffic signals and high volume priority intersections.
Descriptors: Road safety; Traffic accident; Forecast; Modelling; Intersection; Traffic control; Traffic flow
Identifiers: New Zealand
Shelf Location: ARRB (CD 668)
URL: <http://www.atrf.info/papers/index.aspx>
Date Created: Tuesday, 19 January 2010
- Record Number:** 1001AR196E
Year Published: 2009
Publication Title: Design, feasibility and application of an instrumented vehicle
Personal Author: Imberger=K (ARRB Group Ltd)
Corporate Author: Austroads
Publication Details: NO: AP-145/09, DATE: 2009-12, PAGES: 35p, PUBLISHER: Austroads, T: Sydney, S: New South Wales, C: Australia, ISBN: 9781921709036
Notes: Austroads Project ST1431
Abstract: This project has built upon the findings from two previous Austroads projects, a 2008 project Future strategic road safety engineering research and a 2006 project Scoping of future strategic road safety research: improving road safety engineering practice with the use of an instrumented vehicle. Consultation with organisations that use or supply instrumented vehicles revealed that costs for an instrumented vehicle begin at as little as \$3,410. However, based on the use of a greater number of instrumented devices, which would achieve improved research outcomes, a minimum expenditure of \$5,000 to \$15,000 per vehicle may be required, depending upon the research to be undertaken.

Consultation with the Austroads Road Design and Traffic Management Review Panels revealed roadsides, followed by intersections, are the most important areas for research. More specific topics for important investigation include, heavy vehicle interaction with other road users and the road environment, roadside hazards, treatments designed to minimise conflicts with vulnerable road users, and effectiveness of delineation treatments during wet and/or night conditions. Thus it is recommended that these areas be scoped for research projects, with the application of an instrumented vehicle (or more than one) if determined viable.

Descriptors: Road safety; Instrumented vehicle; Design; Research needs; Roadside hazard; Intersection; Heavy vehicle; Vulnerable road user; Pavement marking

Shelf Location: ARRB (Electronic copy (Not for external loan))

Electronic Version: <http://library.arrb.com.au/e-pubs/Austroads/AP-T145-09.pdf>

URL: <http://www.onlinepublications.austroads.com.au/items/AP-145-09>

Date Created Tuesday, 19 January 2010

Record Number: 50584

Year Published: 2009

Publication Title: MADYMO reconstruction of a real-world collision between a vehicle and cyclist

Personal Author: Carter= EL; Neal-Sturgess= CE

Publication Details: International journal of Crashworthiness 2009; 14(4): 379-390

Abstract: Numerical simulations of vulnerable road user impacts are becoming increasingly popular in the field of vehicle design for pedestrian and cyclist safety, as representations of humans are becoming more sophisticated using both the multi-body and finite-element (FE) approaches. Several previous studies have involved the reconstruction of pedestrian real-world accidents using multi-body models, but cyclists have been the subject of less research attention. In order to study the kinematics involved in cyclist accidents as well as the specific injuries and the points of contact on the vehicles, a real accident for which sufficient data was available was reconstructed using mathematical dynamic model (MADYMO) crash simulation software. Initial conditions were found that matched the relevant accident details from the police and post-mortem reports with regard to contact between the cyclist and vehicle, bicycle and street furniture and resulting injuries.

Descriptors: Cyclist; Injury; Vulnerable road user

Shelf Location: Not held at ARRB, see library for interlibrary loan

Other Libraries: CASR (Periodical)

Date Created Monday, 8 February 2010

Record Number: 1002AR013E

Year Published: 2009

Publication Title: Area-wide traffic calming for preventing traffic related injuries (review)

Personal Author: Bunn=F; Collier=T; Frost=C; Ker=K; Steinbach=R; Roberts=I; Wentz=R

Corporate Author: Cochrane Collaboration

Publication Details: PN: Cochrane Library, NO: CD003110, DATE: 2009, PAGES: 36p, PUBLISHER:

Wiley, T: Hoboken, S: New Jersey, C: USA

Abstract: Area-wide traffic calming (such as introducing road/speed humps) may reduce death and injury from road traffic crashes but more research is needed. Road traffic crashes are a major problem worldwide. In high-income countries, traffic calming schemes aim to make the roads safer (particularly for vulnerable road users such as pedestrians and cyclists) in areas that are particular 'hot spots'. Strategies include slowing down traffic (eg road/speed humps, mini-roundabouts, reduced speed limit zones), visual changes (road surface treatment, changes to road lighting), redistributing traffic (blocking roads, creating one-way streets), and/or changes to road environments (such as trees). This review found that area-wide traffic calming may have the potential to reduce death and injuries, but more research is needed particularly in low and middle income countries.

Descriptors: Road safety; Injury prevention; Local area traffic management; Before and after study; Research needs; Developing countries; Systematic review

Shelf Location: ARRB (Electronic copy (Not for external loan))

Electronic Version: <http://library.arrb.com.au/e-pubs/CochraneReviews/CD003110.pdf>

URL: <http://www.mrw.interscience.wiley.com/cochrane/clsysrev/articles/CD003110/frame.html>

Date Created Friday, 12 February 2010

Record Number: 1003AR155E

Year Published: 2009

Publication Title: Low range speeding and the potential benefits of intelligent speed assistance

Personal Author: Paine=M (Vehicle Design and Research)

Conference: Australasian Road Safety Research Policing Education Conference, 2009, Sydney, New South Wales, Australia

Publication Details: DATE: 2009-11, PAGES: 9p, PUBLISHER: Roads and Traffic Authority (RTA), T: Sydney, S: New South Wales, C: Australia, ISBN: 9781921692260

Abstract: More than half of fatalities to seat-belt-wearing drivers in frontal crashes occur at impact speeds below 55km/h. Pedestrians and other vulnerable road users are at risk at much lower speeds. The impact speed depends on the timing and degree of braking, if any, that occurs before the crash. The resulting impact speed is highly dependent on the initial travel speed. Small increases in travel speed can disproportionately increase impact speeds and small increases in impact speed can greatly increase the risk of serious injury or fatality. This double whammy effect is not appreciated by many motorists, who routinely travel several km/h over the speed limit. It is shown that low-range speeding, up to 10km/h over the speed limit, makes up a large proportion of preventable road trauma. It is difficult for enforcement methods alone to have an effect on this minor speeding. An added problem is that even motorists who want to obey the speed limits (to keep their life, licence or livelihood) have difficulty doing so in modern cars on modern roads. This is where Intelligent Speed Assistance (ISA) can help. The system has a simple function, backed up by clever technology. It knows the location and speed of the vehicle and, from an on-board database of speed limits, it can alert the driver to speeding.

Descriptors: Road safety; Speeding; Intelligent speed adaptation (ISA); Accident

- countermeasure
Shelf Location: ARRB (CD 679)
Date Created Friday, 12 March 2010
- Record Number:** 1003AR882E
Year Published: 2009
Publication Title: 2009 Australian Road Safety Research, Policing and Education Conference, Wednesday 11 to Friday 13 November 2009, Sydney Convention and Exhibition Centre, Darling Harbour, New South Wales, Australia
 2009 Intelligent Speed Adaptation Conference, Tuesday November 10 2009
- Personal Author:** Grzebieta=R(ed) (University of New South Wales. Injury Risk Management Research Centre); McTiernan=D(ed) (ARRB Group Ltd)
- Conference:** Australasian Road Safety Research Policing Education Conference, 2009, Sydney, New South Wales, Australia Intelligent Speed Adaptation Conference, 2009, Sydney, New South Wales, Australia
- Publication Details:** DATE: 2009-11, PAGES: 1 CD-ROM, PUBLISHER: Roads and Traffic Authority (RTA), T: Sydney, S: New South Wales, C: Australia, ISBN: 9781921692260
- Descriptors:** Road safety; Intelligent speed adaptation (ISA); Accident countermeasure; Road user education; Law enforcement; Vehicle safety; Human factors; Vulnerable road user
- Shelf Location:** ARRB (CD 679 (Not for external loan))
Other Information: 1. Conference covering entry
Date Created Friday, 12 March 2010
- Record Number:** 51090
Year Published: 2009
Publication Title: A comparison study on head injury risk in pedestrian and cyclist accidents
Personal Author: Chen=Y; Yang=J; Otte=D
Conference: INFATS - the 7th international forum of automotive traffic safety, Changsha, China, 4 - 6 December 2009
- Abstract:** Pedestrian and cyclist are the most vulnerable road users in traffic crash. This paper aims to make a comparison study on head injury risk and kinematics of adult pedestrian and cyclist accidents and to correlate of calculated injury related physical parameters with injuries observed in real-world accidents. A total of 20 passenger-cars to adult pedestrian and cyclist accidents were sampled from GIDAS database, Germany, of which 10 cases were pedestrian accidents and another 10 cases were cyclist accidents. Accidents were reconstructed by using PC-Crash and MADYMO program. The pedestrian and cyclist kinematics and physical injury parameters such as throw out distance, head impact velocity, head contact time, HIC value, 3ms linear head acceleration, maximum angular acceleration and head impact angular were calculated. Relationship curves were obtained based on the calculated parameters and logistic regression model was employed to study brain injury risk in terms of the calculated physical parameters. It is observed that different head injury risks and kinematics are existed between pedestrian and cyclist.
- Descriptors:** Road safety; Pedestrian; Cyclist; Accident reconstruction; Head; Injury

Identifiers: kinematics Changsha, P.R. China
Shelf Location: Not held at ARRB; see library for interlibrary loan
Other Libraries: CASR
Date Created: Tuesday, 16 March 2010

Record Number: 1009AR793E
Year Published: 2009
Publication Title: Automated analysis of pedestrian-vehicle conflicts using video data
Personal Author: Ismail=K; Sayed=T; Saunier=N; Lim=C
Publication Details: PN: Transportation Research Record, NO: 2140, DATE: 2009, PAGES: 44-54, PUBLISHER: Transportation Research Board (TRB), T: Washington, S: DC, C: USA, ISSN: 0361-1981, ISBN: 9780309142731

Abstract: Pedestrians are vulnerable road users, and despite their limited representation in traffic events, pedestrian-involved injuries and fatalities are overrepresented in traffic collisions. However, little is known about pedestrian exposure to the risk of collision, especially when compared with the amount of knowledge available for motorized traffic. More data and analysis are therefore required to understand the processes that involve pedestrians in collisions. Collision statistics alone are inadequate for the study of pedestrian-vehicle collisions because of data quantity and quality issues. Surrogate safety measures, as provided by the collection and study of traffic conflicts, were developed as a proactive complementary approach to offer more in-depth safety analysis. However, high costs and reliability issues have inhibited the extensive application of traffic conflict analysis. An automated video analysis system is presented that can (a) detect and track road users in a traffic scene and classify them as pedestrians or motorized road users, (b) identify important events that may lead to collisions, and (c) calculate several severity conflict indicators. The system seeks to classify important events and conflicts automatically but can also be used to summarize large amounts of data that can be further reviewed by safety experts. The functionality of the system is demonstrated on a video data set collected over 2 days at an intersection in downtown Vancouver, British Columbia, Canada. Four conflict indicators are automatically computed for all pedestrian-vehicle events and provide detailed insight into the conflict process. Simple detection rules on the indicators are tested to classify traffic events. This study is unique in its attempt to extract conflict indicators from video sequences in a fully automated way.

Descriptors: Road safety; Pedestrian; Vehicle; Accident; Accident analysis; Data collection; Data analysis; Video

Identifiers: Vancouver, Canada
Shelf Location: ARRB (S 625.7(73) TRA (TRR 2140))
Electronic Version: <http://dx.doi.org/10.3141/2140-05>
Date Created: Thursday, 9 September 2010

Record Number: 0807AR126E
Year Published: 2008
Publication Title: Guidance for implementation of the AASHTO Strategic Highway Safety Plan:

- volume 18: a guide for reducing collisions involving bicycles
- Personal Author:** Raborn=C; Torbic=DJ; Gilmore=DK; Thomas=LJ; Hutton=JM; Pfefer=R; Neuman=TR; Slack=KL; Bond=V; Hardy=KK
- Publication Details:** PN: National Cooperative Highway Research Program (NCHRP) Report, NO: 500, DATE: 2008, PAGES: 1 vol (various pagings), PUBLISHER: Transportation Research Board (TRB), T: Washington, S: DC, C: USA, ISSN: 0077-5614, ISBN: 9780309099226
- Descriptors:** Road safety; Accident countermeasure; Cyclist; Bicycle; Vulnerable road user; Traffic control; Bicycle facilities
- Shelf Location:** ARRB (S 625.7(73) TRA (NCHRP R 500 Vol 18))
- Other Libraries:** NRTA
WMR (HO)
- URL:** http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_500v18.pdf
- Date Created** Wednesday, 9 July 2008
- Record Number:** 0809AR038E
- Year Published:** 2008
- Publication Title:** Accident prediction models for traffic signals
- Personal Author:** Turner=S (Beca Infrastructure); Turner=B (ARRB Group Ltd); Wood=G (Macquarie University)
- Conference:** ARRB Conference, 23rd, 2008, Adelaide, South Australia, Australia
- Publication Details:** DATE: 2008-07, PAGES: 20p, PUBLISHER: ARRB Group Ltd, T: Vermont South, S: Victoria, C: Australia, ISSN: 0572-1431, ISBN: 1876592540
- Abstract:** A significant proportion of urban crashes occur at traffic signals. Many of the black-spots in both Australia and New Zealand cities occur at high volume and/or high speed traffic signals. Major intersections often have long cycle times and complex phasing arrangements, which can confuse and frustrate drivers and pedestrians. Right turning phases are often introduced at traffic signals to reduce right-turn-against crashes, but this in turn increases cycle lengths and overall delays. Some traffic signals have unusual layouts, such as highly staggered right turn bays, which may cause safety problems. Crash prediction models have been produced, in several separate research projects for traffic signals, examining the impact of traffic volumes, speed limit, signal phasing, number of pedestrians and cyclists and intersection layout on various crash types. These crash prediction models have enabled a better understanding of the impact of these factors on safety and also allow the safety impact to be quantified. This paper summarises the outcomes of each of the separate studies and key findings of the research.
- Descriptors:** Road safety; Signalized intersection; Modelling; Traffic accident; Forecast; Turning traffic
- Shelf Location:** ARRB (CD 582)
- Date Created** Thursday, 28 August 2008
- Record Number:** 0904AR168E
- Year Published:** 2008
- Publication Title:** Effectiveness of the dwell-on-red signal treatment to improve pedestrian

- safety during high-alcohol hours
- Personal Author:** Archer=J (Monash University. Accident Research Centre (MUARC)); Candappa=N (Monash University. Accident Research Centre (MUARC)); Corben=B (Monash University. Accident Research Centre (MUARC))
- Conference:** Australasian Road Safety Research Policing Education Conference, 2008, Adelaide, South Australia, Australia
- Publication Details:** DATE: 2008-11, PAGES: 14p, PUBLISHER: South Australia. Department for Transport, Energy and Infrastructure, T: Walkerville, S: South Australia, C: Australia, ISBN: 1876346566
- Abstract:** The Dwell-on-Red (DoR) signal treatment aims to reduce the number and severity of pedestrian-vehicle crashes that occur during high-alcohol hours (HAH) at signalised intersections. The treatment involves reverting to an all-red phase when there is no traffic demand during late evening and early morning. This causes vehicles to slow down or stop thereby reducing average speeds on intersection approaches. Lower speed is known to be beneficial to traffic safety particularly for vulnerable road-users. DoR was trialled at a metropolitan intersection in Melbourne. An observational study was carried out at this intersection and revealed a number of serious safety problems during late evening hours. As part of the evaluation of effectiveness speed and flow data were collected using detectors placed 10 and 50 metres upstream of the stop-line. The treatment was found to bring about a significant reduction in average speed at both detector positions. Significant changes were also found in the proportions of vehicles travelling at less than or equal to 30 km/h and greater than 50 km/h at the 10 metre detector position, and for speeds greater than 50 km/h at the 50 metre detector position. These findings indicate a potential reduction in fatal and serious injury risk. While DoR has a minimal impact on traffic performance, its effectiveness was found to be heavily dependent on traffic-flow. This aspect has an important bearing on future applications.
- Descriptors:** Road safety; Signalized intersection; Signal timing; Red light; Pedestrian; Speed control; Accident countermeasure
- Identifiers:** Melbourne, Victoria
- Shelf Location:** ARRB (CD 623)
- URL:** <http://acrs.org.au/publications/conference-papers/database/>
- Date Created** Wednesday, 15 April 2009
- Record Number:** 0704AR080E
- Year Published:** 2007
- Publication Title:** Tomorrow's roads: safer for everyone: the second three-year review: the Government's road safety strategy and casualty reduction targets for 2010
- Corporate Author:** Great Britain. Department for Transport
- Publication Details:** DATE: 2007-02, PAGES: 27p, PUBLISHER: Great Britain. Department for Transport, T: London, C: United Kingdom, ISBN: 9781904763789
- Descriptors:** Road safety; Traffic accident; Strategic planning; Policy; Accident countermeasure; Drink driving; Drug driving; Speed control; Vulnerable road user; Law enforcement; Driver education
- Identifiers:** United Kingdom
- Shelf Location:** ARRB (Electronic copy (Not for external loan))

Electronic Version: <http://library.arrb.com.au/e-pubs/DfTUK/TomorrowsRoads.pdf>
Date Created Monday, 16 April 2007

Record Number: 0705AR009E
Year Published: 2007
Publication Title: Second review of the Government's road safety strategy
Corporate Author: Great Britain. Department for Transport
Publication Details: DATE: 2007-02, PAGES: 74p, PUBLISHER: Great Britain. Department for Transport, T: London, C: United Kingdom

Abstract: It is now seven years into Great Britain's road safety strategy 'Tomorrow's roads - safer for everyone', and overall there has been good progress against the targets. However, there are still some groups that remain more at risk, especially young drivers, motorcyclists and those who drive for work. Most worrying is the slow progress that is being made to reduce the number of deaths caused by road traffic collisions. Drink driving, speeding and seatbelt wearing also remain key issues on which more needs to be done. This review document therefore sets out what steps should be taken to help these groups and address these issues, but also to make Britain's roads safer for all road users.

Descriptors: Road safety; National government; Policy; Vulnerable road user; Fatality rate; Accident countermeasure; Strategic planning

Identifiers: United Kingdom
Shelf Location: ARRB (Electronic copy (Not for external loan))
Electronic Version: http://library.arrb.com.au/e-pubs/DfTUK/review_rss.pdf
Date Created Tuesday, 15 May 2007

Record Number: 0705AR016E
Year Published: 2007
Publication Title: Pedestrian and bicycle safety
Personal Author: Teigen=A
Publication Details: PN: Transportation Review, DATE: 2007-04, PAGES: 8p, PUBLISHER: National Conference of State Legislatures, T: Washington, S: DC, C: USA

Abstract: In 2005, 4,881 pedestrians were killed in traffic crashes in the United States, and 64,000 pedestrians were injured, according to The National Highway Traffic Safety Administration (NHTSA). These numbers mean that, on average, one pedestrian is killed every 108 minutes and one is injured every 8 minutes. The good news is that the number of pedestrians killed has decreased by 13 percent from the 5,584 pedestrians killed in 1995. In 2005, 782 bicyclists were killed in the United States; 673 of those were not wearing a helmet. State legislatures play a key role in ensuring bicycle and pedestrian safety. Actions by state, local and federal governments have made streets safer for people to bike and walk.

Descriptors: Road safety; Vulnerable road user; Pedestrian; Cyclist; Fatality; Accident countermeasure

Identifiers: USA
Shelf Location: ARRB (Electronic copy (Not for external loan))

Electronic Version: <http://library.arrb.com.au/e-pubs/MiscReports/ped-bikesafety07.pdf>
URL: <http://www.ncsl.org/IssuesResearch/Transportation/PedestrianSafety/tabid/13605/Default.aspx>
Date Created Tuesday, 15 May 2007

Record Number: 0708AR115E
Year Published: 2007
Publication Title: The current injury situation of bicyclists: a medical and technical accident analysis
Personal Author: Richter=M; Otte=D; Haasper=C; Sommer=K; Knobloch=K; Probst=C; Westhoff=J; Krettek=C
Conference: International Conference on ESAR "Expert Symposium on Accident Research", 2nd, 2006, Hannover, Germany
Publication Details: PN: Berichte der Bundesanstalt fuer Strassenwesen, Fahrzeugtechnik, NO: F 61, DATE: 2007-03, PAGES: 256-62, PUBLISHER: Bundesanstalt fuer Strassenwesen (BAST), T: Bergisch Gladbach, C: Germany, ISSN: 0943-9307, ISBN: 9783865096449
Descriptors: Cyclist; Vulnerable road user; Injury severity; Accident analysis; Accident investigation; Road type; Bicycle lane; Helmet usage; Speed
Identifiers: Germany
Shelf Location: ARRB (S 656.08 BUN.2 (F61))
Date Created Monday, 13 August 2007

Record Number: 0807AR154E
Year Published: 2007
Publication Title: Addressing the needs of vulnerable road users: application of road safety auditing in New South Wales (Australia)
Personal Author: Winning=TG (Winning Traffic Solutions); Park=SR (Winning Traffic Solution)
Conference: International Conference on Urban Transport and the Environment in the 21st Century, 13th, 2007, Coimbra, Portugal
Publication Details: PN: WIT Transactions on the Built Environment, DATE: 2007, PAGES: 283-8, PUBLISHER: WIT Press, T: Southampton, C: United Kingdom, ISSN: 1746-4498, ISBN: 9781845640873
Descriptors: Road safety; Safety audit; School; Construction site; Traffic control; Vulnerable road user
Identifiers: New South Wales
Shelf Location: ARRB (S 656.026 URB (2007) (Not for external loan))
Date Created Wednesday, 9 July 2008

Record Number: 52975
Year Published: 2007
Publication Title: Safety level of vulnerable road users on European roads. A statement of in-depth-investigation GIDAS
Personal Author: Otte=D
Conference: International Forum of Automotive Traffic Safety (INFATS), 2007, Changsha,

- Abstract:** China
Road accidents are a worldwide situation while taken part in traffic behaviors. Today this results in over 1.18 million deaths (1999 World Health Report) and over 20 million persons being injured or dying every year worldwide. Due to the different population structures and the traffic behaviors in the different countries and continents the risks for the groups of participants differ. The main victims of road accidents especially in developing countries are the vulnerable road users (pedestrians, cyclists, motorized two-wheeler riders). For this common group many results and experiences are exists in Europe about driver behaviors, risks, injury situations and accident and injury mechanisms. The possibilities and the effectiveness of many countermeasures can be shown and discussed how they are implemented on the roads in different countries, where the vast majority of injuries still exist. Vulnerable road users are less safe in their protective equipments and passenger cars tend to be better equipped with safety tools. Accident documentation from GIDAS (German In-Depth-Accident Study) is used for this presentation, differentiated as pedestrians, motorcyclists and bicyclists, focused on car accidents. The injuries are described in detail with location on the body and injury severity AIS. The injury related speed distributions and the parts of cars to which the injuries can be attributed are shown and discussed in the paper. Proposals for countermeasures are discussed in the conclusions. Recommendations for future countermeasures are given on the basis on In-Depth-Investigation.
- Descriptors:** Accident analysis; Vulnerable road user; Pedestrian; Bicycle; Motorcycle
Shelf Location: Not held at ARRB; see library for interlibrary loan
Other Libraries: CASR
Date Created Thursday, 18 August 2011
- Record Number:** SRAR-19816
Year Published: 2006
Publication Title: Sensor system requirements for detection of vulnerable road users during the pre-crash phase - an analysis of real world accident data
Personal Author: Nentwich=M
Publication Details: DATE: 2006, PAGES: 124p, PUBLISHER: Autoliv, T: Vargarda, C: Sweden
Descriptors: Pedestrian; Vehicle safety; Accident countermeasure; Vulnerable road user
Shelf Location: Not held at ARRB; see library for interlibrary loan
Other Libraries: SRAR (GN 110/43)
Date Created Friday, 1 September 2006
- Record Number:** 0612AR107E
Year Published: 2006
Publication Title: Getting in the way of (each other's) progress: managing pedestrian-cyclist conflict on paths
Personal Author: Ker=I (ARRB Group Ltd); Huband=A (ARRB Group Ltd)
Conference: ARRB Conference, 22nd, 2006, Canberra, ACT, Australia
Publication Details: DATE: 2006-11, PAGES: 16p, PUBLISHER: ARRB Group Ltd, T: Vermont South, S:

- Victoria, C: Australia, ISSN: 0572-1431, ISBN: 1876592494
- Abstract:** The interaction between pedestrians and cyclists is increasingly causing safety concerns, exacerbated by the use of wheeled recreational devices and mobility aids. Some of these concerns are real; others are perceived, but nevertheless important in terms of people's willingness to walk. The issue of conflict on paths may be becoming more serious as the number of people walking or cycling increases after a prolonged period of decline in many places, combined with a high level of reliance on shared facilities. This paper outlines the findings of a project funded by Austroads and managed by the Australian Bicycle Council and provides a guide to appropriate initiatives to recognise and minimise conflict. Some of the approaches developed directly relate to design or engineering approaches to minimising conflict; some relate to behavioural approaches, including regulation and enforcement; and others are based on the desirability of avoiding uncertainty for users. Individual approaches are based on current good practice and recent research, but this project brings them together in one place to facilitate their application by practitioners.
- Descriptors:** Vulnerable road user; Pedestrian; Cyclist; Road user behaviour; Footpath; Bicycle path; Road safety; Traffic engineering
- Shelf Location:** ARRB (CD 452 (Not for external loan))
- Date Created:** Friday, 8 December 2006
- Record Number:** 0612AR109E
- Year Published:** 2006
- Publication Title:** Effect of shifting edge lines on an urban collector street
- Personal Author:** Oka=K (Japan. National Institute for Land and Infrastructure Management); Takamiya=S (Japan. National Institute for Land and Infrastructure Management); Nakano=K (Sekisui Jushi Corporation)
- Conference:** ARRB Conference, 22nd, 2006, Canberra, ACT, Australia
- Publication Details:** DATE: 2006-11, PAGES: 10p, PUBLISHER: ARRB Group Ltd, T: Vermont South, S: Victoria, C: Australia, ISSN: 0572-1431, ISBN: 1876592494
- Abstract:** In Japan, even urban collector streets include streets with two traffic lanes, no sidewalks and narrow hardstrips on both sides. On such streets, because pedestrians and cyclists travel on the hardstrips, the space for them is narrow, and depending on conditions, they must travel in the traffic lanes. And because automobiles travel at somewhat high speed on the traffic lanes, pedestrians and cyclists are in great danger of being involved in accidents. Therefore, the centerline stripes are eliminated and the edge lines are shifted towards the center of the streets to reduce automobile speed and to ensure traveling space for pedestrians and cyclists. In this research, the effect of such measure is considered by analyzing the traveling positions of pedestrians and automobiles on a street. As a result, pedestrians traveled mainly on the hardstrips while the traveling position of automobiles shifted towards the center of the street. It is, therefore, concluded that this measure increases the width of the space for pedestrians. But on the other hand, when automobiles meet and pass each other, an automobile may be forced outside the edge line, so it was concluded that a measure must be taken to maintain safety in such cases.
- Descriptors:** Pedestrian; Vulnerable road user; Pavement marking; Edge marking; Urban

- road; Pedestrian facilities; Traffic management
- Identifiers:** Japan
Shelf Location: ARRB (CD 452 (Not for external loan))
Date Created: Friday, 8 December 2006
- Record Number:** 0612AR110E
Year Published: 2006
Publication Title: Road accident models and safety measures for vulnerable road users
Personal Author: Valli=PP (Central Road Research Institute (CRRI))
Conference: ARRB Conference, 22nd, 2006, Canberra, ACT, Australia
Publication Details: DATE: 2006-11, PAGES: 13p, PUBLISHER: ARRB Group Ltd, T: Vermont South, S: Victoria, C: Australia, ISSN: 0572-1431, ISBN: 1876592494
- Abstract:** Rapid growth of population coupled with increasing economic activities particularly in developing countries is responsible for the continuing increase in motor vehicles, thereby causing road accidents. The increase in road accidents has created social problems due to loss of life and human suffering. The causation of accidents can be understood with the help of in-depth analysis of accident statistics, which provides clues to the many factors involved. An attempt has been made to analyse the road accident data pertaining to Delhi, the capital city of India, by developing suitable models. Corrective safety measures as suggested in this paper aim to prevent safety problems and encourage smooth mobility for people in the future. Safety measures for vulnerable road users such as policy decisions, law and enforcement, environment change, traffic education and traffic safety research, which need to be adopted to enhance road safety, are included in this paper. Some of the preventive measures to reduce road accidents are also listed. However, it is important to list and discuss all possibilities as this encourages future developments for the prevention of road accidents.
- Descriptors:** Vulnerable road user; Accident analysis; Data analysis; Developing countries; Road safety; Accident countermeasure
- Identifiers:** India
Shelf Location: ARRB (CD 452 (Not for external loan))
Date Created: Friday, 8 December 2006
- Record Number:** 0701AR090E
Year Published: 2006
Publication Title: Integrating policy approaches for vulnerable road users
Personal Author: Haworth=N (Queensland University of Technology. Centre for Accident Research and Road Safety (CARRS-Q))
Conference: Australasian Transport Research Forum (ATRF), 29th, 2006, Gold Coast, Queensland, Australia
Publication Details: VOL: 29, DATE: 2006-09, PAGES: 10p, PUBLISHER: Queensland Transport, T: Brisbane, S: Queensland, C: Australia, ISBN: 1877040568
- Abstract:** Vulnerable road users comprise a significant proportion of road fatalities, traffic- and non-traffic- related transportation injuries and falls. Yet policy approaches are fragmented and can have conflicting goals. This is despite

many similarities between the three groups (pedestrians, cyclists and motorcyclists). The opportunity exists for much more coordinated effort among the three groups and working together on common issues such as conspicuity and road surface treatments. There is certainly a need to improve data sources to identify current and emerging issues and to monitor the effects of new programs.

Descriptors: Road safety; Vulnerable road user; Policy; Pedestrian; Cyclist; Motorcyclist
Shelf Location: ARRB (CD 455)
URL: <http://www.atrf.info/papers/index.aspx>
Date Created: Friday, 12 January 2007

Record Number: 0702AR156E
Year Published: 2006
Publication Title: National Conference on Pedestrian and Cyclist Safety, held on 9 June 2006 at Parliament House, Melbourne: transcript of proceedings
Conference: National Conference on Pedestrian and Cyclist Safety, 2006, Melbourne
Publication Details: DATE: 2006-06-09, PAGES: 104p, PUBLISHER: Australian College of Road Safety (ACRS), T: Pearce, S: ACT, C: Australia
Notes: Proceedings contain transcript only
Descriptors: Road safety; Pedestrian; Cyclist; Policy; Vulnerable road user; Injury prevention; Accident countermeasure
Shelf Location: ARRB (Electronic copy (Not for external loan))
URL: <http://www.acrs.org.au/publications/>
Other Information: 1. Conference covering entry
Date Created: Tuesday, 13 February 2007

Record Number: 0704AR176E
Year Published: 2006
Publication Title: Estimating pedestrian fatal crash risk
Personal Author: Corben=B (Monash University. Accident Research Centre (MUARC)); D'Elia=A (Monash University. Accident Research Centre (MUARC)); Healy=D (Transport Accident Commission)
Conference: Australasian Road Safety Research Policing Education Conference, 2006, Surfers Paradise, Queensland, Australia
Publication Details: DATE: 2006-10, PAGES: 9p, PUBLISHER: Able Video and Multimedia, T: Gold Coast, S: Queensland, C: Australia, ISBN: 0734525516
Abstract: Pedestrians are highly vulnerable in traffic with the young, aged and alcohol-affected being at even greater risk. Vehicle speeds are the primary determinant of pedestrian crash risk and, more importantly, injury severity in the event of a crash. The main purpose of the research was to build on current research evidence concerning the risk of death to a pedestrian, as a function of impact speed, in order to develop a reliable method for estimating the relative risk of a fatal crash involving a pedestrian, as a function of alternative travel speed choices. These estimates apply to a pedestrian in the path of two vehicles travelling at different initial speeds and, within meaningful limits, enable pair-wise comparison of risk for selected initial travel

speeds. The model outputs offer objective new information on pedestrian fatal crash risk, based on the laws of kinematics and the biomechanical limits of humans exposed to kinetic energy. By allowing differences in travel speed choices to be translated to changes in pedestrian fatal crash risk, key groups, such as drivers and riders, pedestrians, stakeholders, policy makers, and traffic and road engineers, can be provided with scientifically-derived information on the role of speed. Proposed future developments of the model are also discussed.

Descriptors: Road safety; Pedestrian; Vulnerable road user; Speed; Traffic accident; Risk analysis; Modelling; Injury severity; Fatality
Shelf Location: ARRB (CD 485)
Other Libraries: QDOT (CD 1059)
URL: <http://acrs.org.au/publications/conference-papers/database/>
Date Created Monday, 16 April 2007

Record Number: 0704AR213E
Year Published: 2006
Publication Title: Cyclist safety: reducing the crash risk
Personal Author: Turner=S (Beca Infrastructure); Durdin=P (Beca Infrastructure); Roozenburg=A
Conference: Institution of Professional Engineers New Zealand (IPENZ) Transportation Conference, 2006, Queenstown, New Zealand
Publication Details: DATE: 2006-10, PAGES: 4p, PUBLISHER: Harding Consultants, T: Christchurch, C: New Zealand

Abstract: Cycling is a sustainable mode of travel and is supported by a number of government strategies. While there are benefits in promoting more cycling, the risk of having a crash while cycling is typically higher than while travelling as a driver or passenger in a motor vehicle. Recent research has demonstrated a 'safety in numbers' effect for cyclists. While this is reassuring, the challenge is to create an environment for cyclists that is as safe as possible. This can be achieved through a series of measures, including, reducing traffic volumes and speeds on high volume cycle routes, building on-road cycle lanes and intersection facilities and construction of off-road cycle paths. This technical note reports on a study that has used the empirical Bayes method ('before and after' studies) and crash prediction models to determine safety benefits of these measures/treatments.

Descriptors: Road safety; Cyclist; Risk management; Accident rate; Bicycle facilities; Statistical analysis; Before and after study; Modelling
Identifiers: New Zealand
Shelf Location: ARRB (656 INS)
URL: <http://www.hardingconsultants.co.nz/transportationconference2006/index.html>
Date Created Monday, 16 April 2007

Record Number: 0704AR221E
Year Published: 2006
Publication Title: Roundabout safety: influence of speed, visibility and design

- Personal Author:** Turner=S (Beca Infrastructure); Roozenburg=A (Beca Infrastructure)
- Conference:** Institution of Professional Engineers New Zealand (IPENZ) Transportation Conference, 2006, Queenstown, New Zealand
- Publication Details:** DATE: 2006-10, PAGES: 10p, PUBLISHER: Harding Consultants, T: Christchurch, C: New Zealand
- Abstract:** Roundabout design in New Zealand generally follows the Austroads guideline for intersection design (Austroads, 2005), which recommends long approach sight distances and provision of relatively high design speeds. This is in contrast to European-based design philosophy where visibility is normally restricted and the geometric design encourages slow approach and negotiation speeds. This paper reports on the results of a study that used crash prediction models to investigate how the characteristics of roundabouts influences safety at 104 roundabouts in three centres. Using a dataset that contains pedestrian, cyclist and motor vehicle flows, approach and circulating speeds and sight distances an analysis was carried out for a number of crash types and new crash relationships established. It will be shown that safety benefits can be achieved by a more European-based design philosophy.
- Descriptors:** Road design; Roundabout; Geometric design; Accident analysis; Forecast; Design speed; Visibility distance
- Identifiers:** New Zealand
- Shelf Location:** ARRB (656 INS)
- URL:** <http://www.hardingconsultants.co.nz/transportationconference2006/index.html>
- Date Created** Monday, 16 April 2007
- Record Number:** 0704AR891E
- Year Published:** 2006
- Publication Title:** Australasian Road Safety Research, Policing and Education Conference 2006, Holiday Inn, Surfers Paradise, Gold Coast, Wednesday 25th October - Friday 27 October 2006
- Conference:** Australasian Road Safety Research Policing Education Conference, 2006, Surfers Paradise, Queensland, Australia
- Publication Details:** DATE: 2006-10, PAGES: 1 CD ROM, PUBLISHER: Able Video and Multimedia, T: Gold Coast, S: Queensland, C: Australia, ISBN: 0734525516
- Descriptors:** Road safety; Motorcyclist; Psychology; Fleet management; Intelligent transport systems (ITS); Accident analysis; Graduated licence; Aged driver; Heavy vehicle; Young driver; Vision; Human fatigue; Crash test; Law enforcement; Rural area; Perception; Road engineering; Child restraint; Offender; Road user education; Attention; Vulnerable road user
- Shelf Location:** ARRB (CD 485 (Not for external loan))
- Other Libraries:** QDOT (CD 1059)
- URL:** <http://acrs.org.au/publications/conference-papers/database/>
- Other Information:** 1. Conference covering entry
- Date Created** Monday, 16 April 2007
- Record Number:** 0508AR119E

- Year Published:** 2005
Publication Title: Road users' perceptions of other road users: do different transport modes invoke qualitatively different concepts in observers?
Personal Author: Walker=I
Publication Details: PN: Advances in Transportation Studies, VOL: 6, DATE: 2005-07, PAGES: 25-33
Descriptors: Road safety; Driver behaviour; Vulnerable road user; Pedestrian; Cyclist; Motorcyclist; Eye movement; Perception; Road user; Psychology
Shelf Location: ARRB (Journals Compactus)
Electronic Version: http://host.uniroma3.it/riviste/ats/journal_page_6th%20issue.htm
Other Information: 1. For electronic version, click above link - then click on particular paper's link "Full paper (subscribers)" - password is herein6
 2. For assistance in downloading, please contact the library x1600.
Date Created 2005
- Record Number:** 0509AR268E
Year Published: 2005
Publication Title: Traffic and transport psychology: theory and application: Proceedings of the ICTTP 2004
Personal Author: Underwood=G(ed)
Conference: International Conference on Traffic and Transport Psychology, 3rd, 2004, Nottingham, United Kingdom
Publication Details: DATE: 2005, PAGES: 621p, PUBLISHER: Elsevier, T: Oxford, C: United Kingdom, ISBN: 0080443796
Notes: This volume contains a selection of papers that originally formed part of the programme of the International Conference on Traffic and Transport Psychology, Nottingham, England in September 2004.
Descriptors: Road user behaviour; Psychology; Vulnerable road user; Pedestrian; Cyclist; Aged driver; Aged person; Novice driver; Personality; Automation; Advanced driver information systems (ADIS); Driver performance; Perception; Offence; Travel demand; Modal choice; Road safety
Shelf Location: ARRB (656.09 TRA)
Date Created 2005
- Record Number:** 0512AR314E
Year Published: 2005
Publication Title: The effect of cognitive impairment on older pedestrian behaviour and crash risk
Personal Author: Oxley=J (Monash University. Accident Research Centre (MUARC)); Charlton=J (Monash University. Accident Research Centre (MUARC)); Fildes=B (Monash University. Accident Research Centre (MUARC))
Publication Details: PN: Report, NO: 244, DATE: 2005-12, PAGES: 53p, PUBLISHER: Monash University. Accident Research Centre (MUARC), T: Clayton, S: Victoria, C: Australia, ISBN: 0732623146
Abstract: This report assesses the current state of knowledge in regard to the key issues affecting older pedestrian safety , particularly the effect of cognitive impairment on behaviour and crash risk. The association between normal age-

related cognitive decline and pedestrian performance and crash risk seems to be fairly moderate. In contrast, more substantial evidence was found of an effect of medical conditions that result in cognitive impairment on pedestrian performance and crash risk. This was particularly so for impairments associated with moderate to severe dementia, moderate to severe Parkinson's Disease, cerebrovascular disease (particularly stroke), and multiple sclerosis. The review highlighted the need for better knowledge with regard to the effect and extent of cognitive decline and impairment on pedestrian safety and provides a number of recommendations for research priorities. While there are obvious benefits of walking for health and well-being of individuals and the environment, and pedestrian travel is a major mode of transport, older adults are at increased risk of death and serious injury as pedestrians. Unless there is a good understanding of how cognitive decline and impairment contributes to crash risk of older pedestrians and development of appropriate countermeasures, the problems and risks associated with pedestrian travel will worsen in the coming decades.

Descriptors: Road safety; Pedestrian; Aged person; Ageing; Perception; Health; Road user behaviour; Risk analysis; Traffic accident; Vulnerable road user; Research needs

Shelf Location: ARRB (Electronic copy (Not for external loan))

Electronic Version: <http://library.arrb.com.au/e-pubs/MUARC/ReportNo244.pdf>

Other Libraries: VMOU

URL: <http://www.monash.edu.au/muarc/reports/muarc244.html>

Date Created 2005

Record Number: 0603AR300E

Year Published: 2005

Publication Title: Road Safety on Four Continents, Warsaw, Poland 5-7 October 2005: conference proceedings

Conference: Road Safety on Four Continents, 2005, Warsaw, Poland

Publication Details: DATE: 2005, PAGES: 1 CD ROM, PUBLISHER: Swedish National Road and Transport Research Institute, T: Linköping, C: Sweden

Descriptors: Road safety; Road design; Driver training; Driver education; Heavy vehicle; Accident; Risk assessment; Developing countries; Road user education; Accident countermeasure; Reaction time; Traffic engineering; Variable message sign; Driver education; Road user education; Driver training; Accident black spot; Vulnerable road user; Modelling

Shelf Location: ARRB (CD 393 (Not for external loan))

Other Information: 1. Conference covering entry

Date Created 2006

Record Number: 0603AR302E

Year Published: 2005

Publication Title: Creating a safe environment for older cyclists: lessons learnt from a review of world's best practice measures

Personal Author: Oxley=JA (Monash University. Accident Research Centre (MUARC)); Corben=BF

- (Monash University. Accident Research Centre (MUARC); Charlton=JL (Monash University. Accident Research Centre (MUARC); Fildes=BN (Monash University. Accident Research Centre (MUARC)
- Conference:** Road Safety on Four Continents, 2005, Warsaw, Poland proceedings
- Publication Details:** DATE: 2005, PAGES: 832-43, PUBLISHER: Swedish National Road and Transport Research Institute, T: Linkoeeping, C: Sweden
- Abstract:** Cycling is a major mode of transport in many European and developing countries, however, cyclist crashes are severe in nature and represent a major road safety problem. Furthermore, older cyclists are especially vulnerable to injuries. This paper discusses the contributing factors to increased crash and injury risk for older cyclists including behavioural, vehicle and environmental factors. The growing complexity of the road environment, particularly the dominance of vehicles, high speed and traffic volumes on many roads used by cyclists, place high demands on an older person's adaptability, whilst ageing can diminish the capacity to cope with many traffic situations. Older adults, therefore, experience many problems using the transport system, largely because it does not adequately accommodate their special needs and capabilities. Further, the design features of frontal structures of vehicles can greatly affect cyclist injury outcome. World best-practice strategies and initiatives for managing the safe mobility of older cyclists are identified and described. These include programs that promote safe cycling practices, improvements to vehicle frontal design to optimise the protective capabilities of vehicles, and innovative treatments that aim to improve the crashworthiness of the road transport system and be more forgiving of vulnerable road users. Several examples are described including measures to moderate vehicle speeds in high cyclist activity areas, measures to separate or restrict vehicular and non-vehicular traffic, and measures to reduce the complexity of the road environment. Recommendations for a system-wide approach for the management of older cyclist safe mobility are provided.
- Descriptors:** Cyclist; Road safety; Cycling; Vulnerable road user; Accident; Aged person; Vehicle design; Geometric design; Road engineering; Developing countries; Injury prevention; High speed
- Shelf Location:** ARRB (CD 393)
- Date Created** 2006
- Record Number:** 0703AR814E
- Year Published:** 2005
- Publication Title:** The effect of cognitive impairment on pedestrian behaviour
- Personal Author:** Oxley=J (Monash University. Accident Research Centre (MUARC)); Charlton=J (Monash University. Accident Research Centre (MUARC)); Fildes=B (Monash University. Accident Research Centre (MUARC))
- Publication Details:** PN: Report, DATE: 2005-07, PAGES: 71p, PUBLISHER: Monash University. Accident Research Centre (MUARC), T: Clayton, S: Victoria, C: Australia
- Notes:** Report prepared for VicRoads R&D project no. 917, part 1
- Abstract:** While much research on older road users has focussed on identifying those who may be at increased risk, there is a lack of knowledge with regard to the effect of functional impairment, particularly the types and levels of cognitive impairment, on pedestrian performance and crash risk of older adults. This

review assessed the current state of knowledge in regard to the key issues affecting older pedestrian safety, particularly the effect of cognitive impairment on behaviour and crash risk, and provides some recommendations for further work to understand this relationship better. During the course of the literature search, the distinction between normal age-related cognitive decline and cognitive impairment associated with medical conditions emerged as a key issue and these are discussed separately in the review. It is noted throughout this review that very few studies are directly related to pedestrian performance or crash risk. The conclusions drawn from this review are from a combination of evidence of an effect of cognitive impairment on driving ability, ability to perform activities of daily living, particularly walking (these are intuitively related to crossing roads in a safe manner) and the few studies directly related to pedestrian behaviour.

Descriptors:

Road safety; Pedestrian; Aged person; Ageing; Perception; Health; Road user behaviour; Risk analysis; Traffic accident; Vulnerable road user; Research needs

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<http://www.monash.edu.au/muarc/reports/rpts05.html>

Date Created

Wednesday, 21 March 2007

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