

MONASH University

---

**Aboriginal Road Safety: A review of issues, initiatives and needs  
in Western Australia: Phase 1**

---

**C-MARC**

**CURTIN-MONASH  
ACCIDENT RESEARCH CENTRE  
Faculty of Health Sciences  
Curtin University  
Hayman Road  
Bentley WA 6102**

Dr Kate Brameld, Professor Lynn Meuleners  
February 2018

**CURTIN-MONASH ACCIDENT RESEARCH CENTRE  
DOCUMENT RETRIEVAL INFORMATION**

---

<b>Report No.</b>	<b>Project No.</b>	<b>Date</b>	<b>Pages</b>	<b>ISBN</b>
RR 18-00	RSC	April 2018	100+	N/A

---

**Title: Aboriginal Road Safety: A review of issues, initiatives and needs in Western  
Australia**

---

**Author(s):** Dr Kate Brameld, Professor Lynn Meuleners

---

**Performing Organisation**

Curtin-Monash Accident Research Centre (C-MARC)  
Faculty of Health Sciences  
Curtin University  
Hayman Road  
BENTLEY WA 6102  
Tel: (08) 9266-2304  
[www.c-marc.curtin.edu.au](http://www.c-marc.curtin.edu.au)

---

**Sponsor**

Road Safety Commission  
Level 1, 151 Royal Street  
East Perth WA 6004

---

**Abstract**

This report reviews the most recent data in Western Australia and Australia on road trauma in the Aboriginal population and attempts to identify relevant risk factors for road injury among WA's Aboriginal population and elsewhere. It includes a review of literature regarding road safety interventions in Australia and interviews with a number of stakeholders from around the country regarding Aboriginal road safety initiatives and some initial work collecting the views of Aboriginal people regarding road safety issues. While there is a lack of published data for Western Australia, it is clear that road injury rates are higher in Aboriginal males, in those aged 10-49 years, in rural and remote areas and in car occupants and pedestrians. Risk factors for crashes included lack of access to safe and well maintained vehicles, fatigue, alcohol, rural and remote roads and lack of driver training. Of the interventions identified, those that appear most effective are those that are run in consultation with communities. A list of recommendations has been developed to address lack of WA data on incidence and risk factors, to allow targeting and monitoring of interventions, to ensure that we are using evidence-based interventions and to begin to address the concerns of the Aboriginal community. Road trauma in the Aboriginal population cannot be addressed in isolation from the socio-cultural issues which impact so greatly on their lifestyle. Progress in "Closing the Gap" is vital to the success of this program.

**Keywords**

Aboriginal road safety, data, risk factors, road safety interventions

---

## TABLE OF CONTENTS

LIST OF TABLES .....	v
LIST OF FIGURES .....	vi
EXECUTIVE SUMMARY .....	vii
ACKNOWLEDGEMENTS .....	xiv
1. INTRODUCTION .....	1
1.1 Aims and objectives .....	1
1.2 Significance .....	2
2. The epidemiology of road injuries among the WA Aboriginal population .....	3
2.1 Introduction.....	3
2.2 Fatal and serious injuries in Western Australia and Australia .....	3
2.3 Injuries by age group.....	9
2.4 Mode of transport .....	10
2.5 Effect of Remoteness .....	15
2.6 Mechanism of injury .....	19
2.7 Summary and Discussion.....	20
2.8 Conclusion .....	21
3. Risk factors for road injury among the WA Aboriginal population and across Australia ...	22
3.1 Introduction.....	22
3.2 Methods.....	22
3.3 Results .....	22
3.3.1 Risk factors .....	23
3.4 Conclusion .....	28
4. Aboriginal-specific road safety interventions: A Literature Review.....	31
4.1 Introduction.....	31
4.2 Methods.....	31
4.3 Results .....	31
4.4 Conclusion .....	43

5. Aboriginal-specific road safety initiatives: Interviews with key road safety agencies and other relevant organisations.....	44
5.1 Introduction.....	44
5.2 Method .....	44
5.3 Results .....	44
5.4 Details of Current road safety initiatives of relevance to the Aboriginal population in Australia.....	48
5.4.1 Education .....	48
5.4.2 Media and advertising campaigns .....	51
5.4.3 Community and stakeholder engagement.....	52
5.4.4 Driver education and Licensing programs.....	53
5.4.5 Alcohol interlock schemes.....	60
5.4.6 Public transport.....	61
5.4.7 Collection and analysis of Aboriginal crash data .....	61
5.5 Conclusion .....	62
6. Interviews with Aboriginal people to identify road safety issues.....	64
6.1 Introduction.....	64
6.2 Method .....	64
6.3 Results .....	69
6.3.1 Issues .....	69
6.4 Conclusion .....	69
7. Summary and recommendations regarding the road safety needs of WA’s Aboriginal population.....	70
7.1 The incidence, trend and risk factors for Aboriginal road crashes and injury.....	70
7.2 Literature review and Stakeholder interviews regarding interventions .....	72
7.3 Community interviews in the Fitzroy Valley .....	74
8. REFERENCES.....	76
9. Appendices .....	81

## LIST OF TABLES

Table 2-1 Fatality rates from land transport accidents (V01-V89) 2016.....	7
Table 2-2 Serious traffic injury rates , 2011-2013(Australian Institute of Health and Welfare, 2015a).....	7
Table 2-5 Rate per 100,000 population of transport-related fatal injuries by model of transport and Aboriginal status, NSW, Vic, Qld, WA, SA & NT, 2005–06 to 2009–10	13
Table 2-6 Rate per 100,000 population of transport-related serious injuries by model of transport and Aboriginal status, NSW, Vic, Qld, WA, SA & NT, 2005–06 to 2009–10.....	14
Table 2-9 Mechanism of fatal and serious injury*, by Aboriginal status, NSW, Vic, Qld, WA, SA & NT, 2005–06 to 2009–10.....	19
Table 3-1 Risk factors for road crashes in the Aboriginal population by safe system categories .....	30
Table 4-1 At-A-Glance Summary for What Works to Prevent MVC Injury/Death (Letourneau & Crump, 2016) .....	39
Table 5-1 Current Aboriginal Road Safety Initiatives in Australia .....	45
Table 6-2 Most Common Road Safety Issues identified by Aboriginal people in the Fitzroy Valley .....	66

## LIST OF FIGURES

Figure 2-1 Fatal and Serious traffic injuries in Aboriginal Australians .....	5
Figure 2-2 Fatal and Serious injury trends in Aboriginal Australians .....	6
Figure 2-3 Injury rates by age group.....	11
Figure 2-4 Serious injury rates for males by mode of transport and age group.....	12
Figure 2-5 Injury rates by remoteness category .....	17
Figure 2-6 Injury rates by remoteness category and for traffic and non traffic crashes .....	18
Figure 6-1 Map of the Fitzroy Valley communities, highlighting the communities represented in the survey .....	65

## **EXECUTIVE SUMMARY**

### **Introduction**

Aboriginal people living in Western Australian, particularly those living in regional and remote communities, experience high rates of road related serious and fatal injuries. Both fatal and serious road injury rates in the Western Australian Aboriginal population are higher than in Australia as a whole by factors of 2.1 and 1.4 respectively. In 2016, the rate of fatal road injuries in WA was 4.1 times higher for the Aboriginal population compared to the non-Aboriginal population. The serious injury rate was 1.6 times higher in the Aboriginal population during 2011-2013. Trend data suggests that the fatality rate is decreasing, but there has been little change in the serious injury rate in both populations. A continuing focus on road injury in the Aboriginal population in Western Australia is required to address these unacceptably high rates of death and serious injury.

### **Method**

This is the first phase of a project exploring Aboriginal road safety issues in Western Australia. The report reviews the most recent data in Western Australia and Australia on road trauma in the Aboriginal population and attempts to identify relevant risk factors for road injury among WA's Aboriginal population and elsewhere. It includes a review of the literature regarding road safety interventions in Australia and internationally and interviews with a number of stakeholders regarding Aboriginal road safety initiatives from around Australia. It also includes preliminary work collecting the views of local WA Aboriginal people (from the Fitzroy Crossing, Kimberley) regarding road safety issues. Further phases of the study will include more extensive consultation with Aboriginal people from various regions across the State. The report includes recommendations regarding the road safety needs of WA's Aboriginal population, particularly those residing in rural and remote WA, and the implementation of appropriate interventions to reduce road injury across the state for Aboriginal people.

### **Results**

Available data suggest that rate of fatal road injury in the Aboriginal population is 2.1 times as high in Western Australia compared to Australia as a whole and that the rate of

serious injuries is 1.4 times higher in WA. Road injury rates are consistently shown to be higher in the Aboriginal population than the non-Aboriginal population and remain so by a factor of 4.1 for fatal injuries in WA in 2016 and 1.6 for serious injuries in WA during 2011-2013. Male Aboriginals have a higher road injury rate than female Aboriginals. The Aboriginal population have higher road injury rates across a broader range of ages (10-49 years) than the non-Aboriginal population.

The rate of fatal and serious injuries in the Aboriginal population is highest in the remote and very remote areas compared to the metropolitan area. (The fatal injury rate was 50 per 100,000 in remote areas, 48 per 100,000 in very remote areas and 10 per 100,000 in the major cities. The serious injury rate was 453 per 100,000 in remote areas, 432 per 100,000 in very remote areas and 216 per 100,000 in the major cities.) For the non-Aboriginal population, fatal injuries are also highest in remote and very remote areas (22 and 25 per 100,000 respectively compared to 6 per 100,000 in the major cities). Serious injuries are also highest in very remote areas (667 per 100,000 compared to 196 per 100,000 in the major cities).

Aboriginal males and females have a higher risk of fatal and serious injury as a car occupant or pedestrian, the highest increased risk of fatal injury being as a car passenger where it is 5.8 times higher than in the non-Aboriginal population. Aboriginal pedestrians are 2.8 times more likely than non-Aboriginal pedestrians to be seriously injured and there is a similar increased risk for those injured while boarding or alighting from a vehicle or on the outside of the vehicle. Fatal injuries to car occupants in the Aboriginal population are most likely to result from collisions with fixed or stationary objects (45% of injuries) and non-collision crashes (34% of injuries) whereas the non-Aboriginal population are most likely to have a non-collision crash (44%) or collision with another motor vehicle (41%).

The report identified the following risk factors for the increased rate of road injury in the Aboriginal population:

- Safe Vehicles – lack of access to safe vehicles, car maintenance, overcrowded, defective and old vehicles.
- Safe Roads and Roadsides – unsealed roads and increased use of rural and remote roads which are associated with higher crash rates.



- Safe road use – people in the following categories had higher crash rates: males, age groups covering the age range 10-49 years, car occupants and pedestrians, no driving license, no seatbelt or helmet, low socioeconomic status, fatigue, alcohol, distraction, males in remote areas and kinship obligations.
- Safe speeds – unsuitable speeds for road conditions.

It also notes the effect of socioeconomic status and cultural issues on the rate of road crashes in the Aboriginal population and the relevance of the “Closing the Gap” initiative to addressing these issues.

The literature review highlighted a number of successful interventions in the areas of driver licensing, child restraints and seat belts and some promising work in the area of drink driving. Further to this, the Stakeholder review identified current Aboriginal road safety initiatives being undertaken around Australia. Extensive road safety education programs were described together with programs to address Aboriginal driver licensing. Programs to fit child restraints were mentioned by a number of jurisdictions, but Aboriginal specific advertising campaigns, programs to address public transport issues and programs to support the use of alcohol interlocks were less common. Information on road conditions, vehicle safety, drink driving programs, and on monitoring and enforcing the use of protective equipment such as seat belts, bike and motorbike helmets and child restraints were not mentioned by Stakeholders. This is likely to be because the initiatives would not be directed specifically to the Aboriginal population, eg roads, and some are not within the jurisdiction of road safety agencies but rather agencies such as Police and Mental Health which covers alcohol and drug treatment programs.

Our initial study into the road safety concerns of Aboriginal people from the town of Fitzroy Crossing and surrounding communities has identified the issues of alcohol and drugs, road maintenance, driver licensing and training, lighting and cattle on the roads, as being their major concerns. The solutions recommended by community members to address their concerns included improved maintenance of roads by the Shire, more education about road safety issues, greater levels of police enforcement regarding speeding and drink driving, driver training schools and various measures to keep cattle off the highway including fencing and methods of alerting the public to the risk of cattle on the road. The literature review and Stakeholder consultation addressed the issues of

road safety education, driver training and police enforcement in the areas of speeding and drink driving, but not the issues of road maintenance and cattle on the road.

## **Discussion and Recommendations**

The report has highlighted the lack of detailed published epidemiological data on Aboriginal road crashes in Western Australia to reliably estimate the incidence and trend of crashes and injuries. While we were able to present ‘national’ data for land transport injuries among Aboriginal and non-Aboriginal populations, this data cannot be used to reliably estimate and describe the problem in Western Australia due to the differing geography and population distribution of Western Australia’s Aboriginal population. Another consequence is that we have not been able to empirically identify and quantify relevant risk factors for a crash and injury among the local Aboriginal population. Recommendations are provided to improve the interim and longer term recording of the Aboriginal status of crash and non-crash involved road users. Improved recording of Aboriginal status will also provide for a more timely surveillance of the incidence of crashes and injuries in this group and provide important empirical information on relevant crash and injury risk factors to identify critical areas for intervention.

Given the size of the Aboriginal road safety issue, there is relatively little published literature addressing it. There was evidence of success of interventions that are run in consultation with communities in improving licensing rates and getting people to engage with drink driving programs. There is evidence from the United States and Canada of the success of programs addressing use of child restraints and seat belts and to a lesser extent drink driving. A number of programs have been implemented to reduce alcohol related harm with varying levels of success and new programs continue to be developed.

As part of this project, some initial work has been done to consult with the Aboriginal community regarding road safety. Further work is planned to build up a greater evidence base from across the State. It is important that we address the issues that have been raised if we are to build credibility with the Aboriginal community.

## **Recommendations**

The results of the study indicate that Western Australia should look at developing an Aboriginal Road Safety Action Plan to address the issues highlighted in this report. As many of the issues affecting road safety result from the specific socioeconomic and cultural issues relevant to the Aboriginal population, the action plan will require collaboration with a range of stakeholders who are working towards improving their health and wellbeing.

### **The incidence, trend and risk factors for Aboriginal road crashes and injury**

#### *Recommendation 1*

That a detailed analysis of WA linked crash, emergency, hospital and death data to identify the incidence and trends in road injuries among the WA Aboriginal population in metropolitan, regional and remote areas and to identify specific risk factors for road crashes and injuries is undertaken as soon as possible.

#### *Recommendation 2*

Implement a system which will allow Aboriginal status to be identified for all road crashes in the IRIS database. This could come through driver licensing applications and renewals, police crash reports or online crash reports.

#### *Recommendation 3*

An analysis of driver licensing data by Aboriginal status, age group, gender and geographic area be undertaken to help to pinpoint the areas of greatest need and to measure the success of current programs.

### **Literature review and Stakeholder interviews regarding interventions**

#### *Recommendation 4*

Current WA initiatives to increase use of seat belts and child restraints, and prevent drink driving should be reviewed to ensure they include all the necessary components, eg. education, mass media, enhanced enforcement. If not, further work should consider how these can be implemented.

#### *Recommendation 5*

Further work should be undertaken to identify the incidence of drink-driving offences, the extent to which treatment programs are available and what the uptake and completion

rates are. Evaluation of these programs should be reviewed and if necessary the potential for the “Hero to Healing” drink driving program should be considered.

*Recommendation 6*

Consideration be given to how public transport/safer vehicles could be made more available to rural and remote communities.

*Recommendation 7*

That the practicalities of the use of alcohol interlocks in remote communities be considered (for example, servicing requirements and cost) and a similar scheme be adopted to that used in Queensland/South Australia (see chapter 5, pages 92-93).

*Recommendation 8*

That further interviews be conducted with relevant agencies to identify road improvement initiatives, safe vehicle initiatives and enforcement programs encompassing issues such as speed, seat belts, child restraints, alcohol and drugs which are of relevance to the Aboriginal population.

*Recommendation 9*

That research be conducted into the post-crash response to identify if there are particular issues with regards crash notification and time to receipt of appropriate care for the Aboriginal population.

**Community interviews in the Fitzroy Valley**

*Recommendation 10*

That a program of work be undertaken to address the road safety issues of the Fitzroy Valley population.

*Recommendation 11*

Review of current education and mass media campaigns to see if they can be better targeted to reach rural and remote communities.

*Recommendation 12*

Review of police traffic enforcement in rural and remote communities to see how it could be improved.

*Recommendation 13*

Ensure that the crash data which is being collected allows identification of injuries sustained as a result of cattle on the road.

*Recommendation 14*

That the program of research to identify the views of Aboriginal people in Western Australia about road safety continue.

## **ACKNOWLEDGEMENTS**

This study was funded by the Road Trauma Trust Account and overseen by the Road Safety Commission, WA. The authors acknowledge the contribution of the Stakeholders involved in the interviews for section 5, Fitzroy Valley Futures, specifically Vaughan Duncan and Erica Sykes for facilitating the Fitzroy Valley community interviews and the people of the Fitzroy Valley whom we interviewed for their time and expertise. We thank Peter Palamara for his help in writing this report.

## 1. INTRODUCTION

Western Australian Aboriginals, particularly those living in regional and remote communities, experience high rates of road related serious and fatal injuries. In 2016, the rate of fatal road injuries in WA was 4.1 times higher for the Aboriginal population compared to the non-Aboriginal population (ABS, 2017). The serious injury rate was 1.6 times higher in the Aboriginal population during 2011-2013 (Australian Institute of Health and Welfare, 2015a). Trend data suggests that the fatality rate is decreasing, but there has been little change in the serious injury rate in both populations.

Both fatal and serious road injury rates in the Western Australian Aboriginal population are higher than in Australia as a whole by factors of 2.1 and 1.4 respectively. This is likely a reflection of the State's geography, with over 60% of the State's Aboriginal population living in regional and remote areas (Australian Institute of Health and Welfare, 2015b) and the majority of the State's land mass and roads being in regional and remote areas (Bureau of Infrastructure, 2013; Geoscience Australia) where their fatal road injury rates are up to five times higher than for major cities and serious injury rates are up two times higher (Henley & Harrison, 2013).

A continuing focus on road injury in the Aboriginal population in Western Australia is required to address these unacceptably high rates of death and serious injury. The key issues need to be identified by good quality data addressing the needs of Western Australia and addressed using evidence based interventions that have been shown to work in the Aboriginal population. The strategy must be set within the wider context of addressing the socioeconomic and cultural issues relevant to the Aboriginal population. This is the remit of the Commonwealth Government's "Closing the Gap" initiative.

### 1.1 Aims and objectives

The aim of this project is to provide an understanding of current Western Australian Aboriginal road safety issues and relevant countermeasures for injury reduction. The project will address the key cornerstones of the safe systems framework of *Toward Zero*. These include issues such as safe road use by Aboriginal road users; the quality and safety of roads used by Aboriginal people in rural and remote Western Australia; the travel speeds on these roads, and the types and safety of vehicles used by Aboriginal people who reside in rural and remote Western Australia.

This research will involve a review of the available data and literature and interviews with community members and Stakeholders.

The specific objectives are to:

- Provide a best estimate of the incidence and trend of road injuries among the WA Aboriginal population from 2005 - 2016.
- Identify relevant risk factors for road injury among the WA's Aboriginal population and elsewhere.
- Review the road safety literature on interventions and their effectiveness which are targeted to WA's Aboriginal population at the local level and globally.
- Interview Stakeholders in road safety from across Australia to identify current interventions and evidence of their effectiveness.
- Interview and identify current road safety issues for Aboriginal persons living in the Kimberley.

Based on the objectives, develop recommendations regarding:

- a) the road safety needs of WA's Aboriginal population, particularly those residing in rural and remote WA, and
- b) the implementation of appropriate interventions to reduce road injury across the state for Aboriginal people.

## **1.2 Significance**

This report will assist with the development of the State's planned Regional and Remote Road Safety Action Plan 2018-2020. It will provide current information on Western Australian Aboriginal road safety issues such as the incidence of and risk factors for road injury; the road safety needs of Aboriginal Western Australians - particularly those in regional and remote WA. It will describe the types of road safety interventions that will assist in the reduction of road injuries. It will also identify where there are gaps in this information and research that needs to be addressed.



## **2. The epidemiology of road injuries among the WA Aboriginal population**

### **2.1 Introduction**

The aim of this section is to describe the incidence and characteristics of road injuries among the WA Aboriginal population using data which is currently available. However, there is minimal information that has been published. Data on fatal road injuries is produced by the Australian Bureau of Statistics and the most recent data is for 2016. Data on serious (hospitalised) road injuries is produced by the Australian Institute of Health and Welfare (AIHW), and the most recent data are available for 2011-2013.

The Integrated Road Information System (IRIS) which is maintained by Main Roads WA contains detailed information on all motor vehicle crashes in WA which are reported to the Police as well as property damage only crashes. This database does not record Aboriginal status as it would rely on police ascertaining this information when attending a crash. However, the crash data can be linked with other data sources such as the Hospital Morbidity Data System and the Register of Deaths, both of which include Aboriginal status and thus allow reporting of serious and fatal crashes according to Aboriginal status. Options for identifying Aboriginal status for non-hospitalised and non-fatal crashes need to be investigated. This could come through driver licensing applications and renewals, police crash reports or online crash reports. Aboriginal status is now being collected on the WA Driver Licence application form.

Communication from the Road Safety Commission suggests that summary information based on the linked crash data is available from them on request.

### **2.2 Fatal and serious injuries in Western Australia and Australia**

Land transport injuries (all transport injuries other than water, air and space and other and unspecified transport injuries) (V01-V89) were the sixth leading cause of death in the Aboriginal population in Western Australia in 2016 but ranked 21st in the non-Aboriginal population (ABS, 2017). Fatal traffic injury data from the ABS shows that:

- a) the rate of fatal injuries in the WA Aboriginal population at 28.3 per 100,000 population was 4.1 times higher than for the non-Aboriginal population where the rate was 6.9 per 100,000 (Figure 2-1)(ABS, 2017).

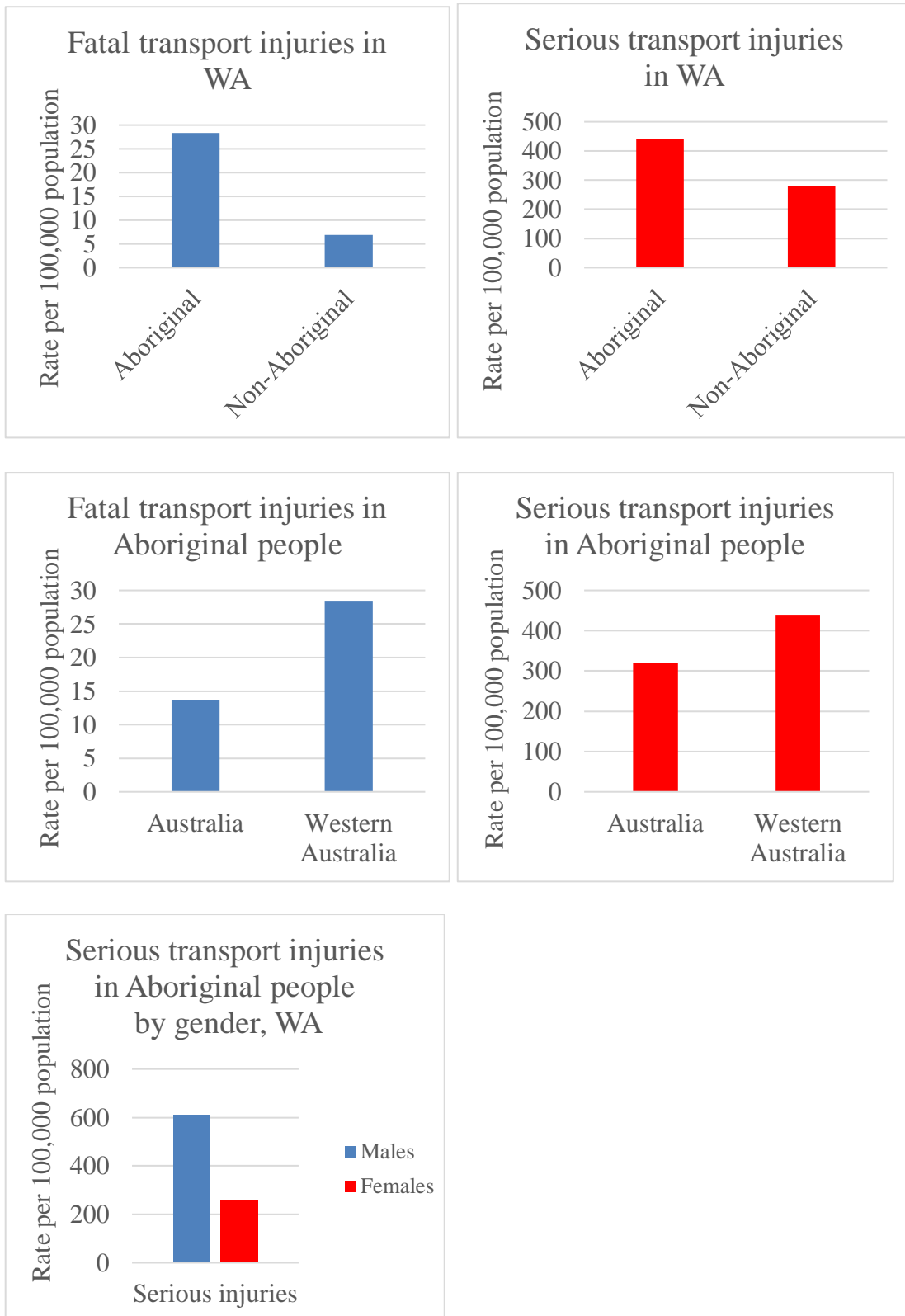
- b) the rate of fatal transport injuries in the Aboriginal population was 2.1 times higher in Western Australia than in Australia at 28.3 per 100,000 compared to 13.7 per 100,000 population (Figure 2-1) (ABS, 2017).
- c) Data from the AIHW for the period covering 2005-2010 and 2011-2013 shows that the fatal injury rate in Australia has fallen from 19.7 to 13.7 per 100,000 in the Aboriginal population and from 7.0 to 5.4 per 100,000 in the non-Aboriginal population over this period (Figure 2-1) (Australian Institute of Health and Welfare, 2015a). The rate ratio for the Aboriginal to non-Aboriginal fatal injury rate reduced from 2.8 to 2.5.

The hospitalisation rate for transport injuries is quoted as the serious injury rate (Australian Institute of Health and Welfare, 2015a; Henley & Harrison, 2013). These data indicate that:

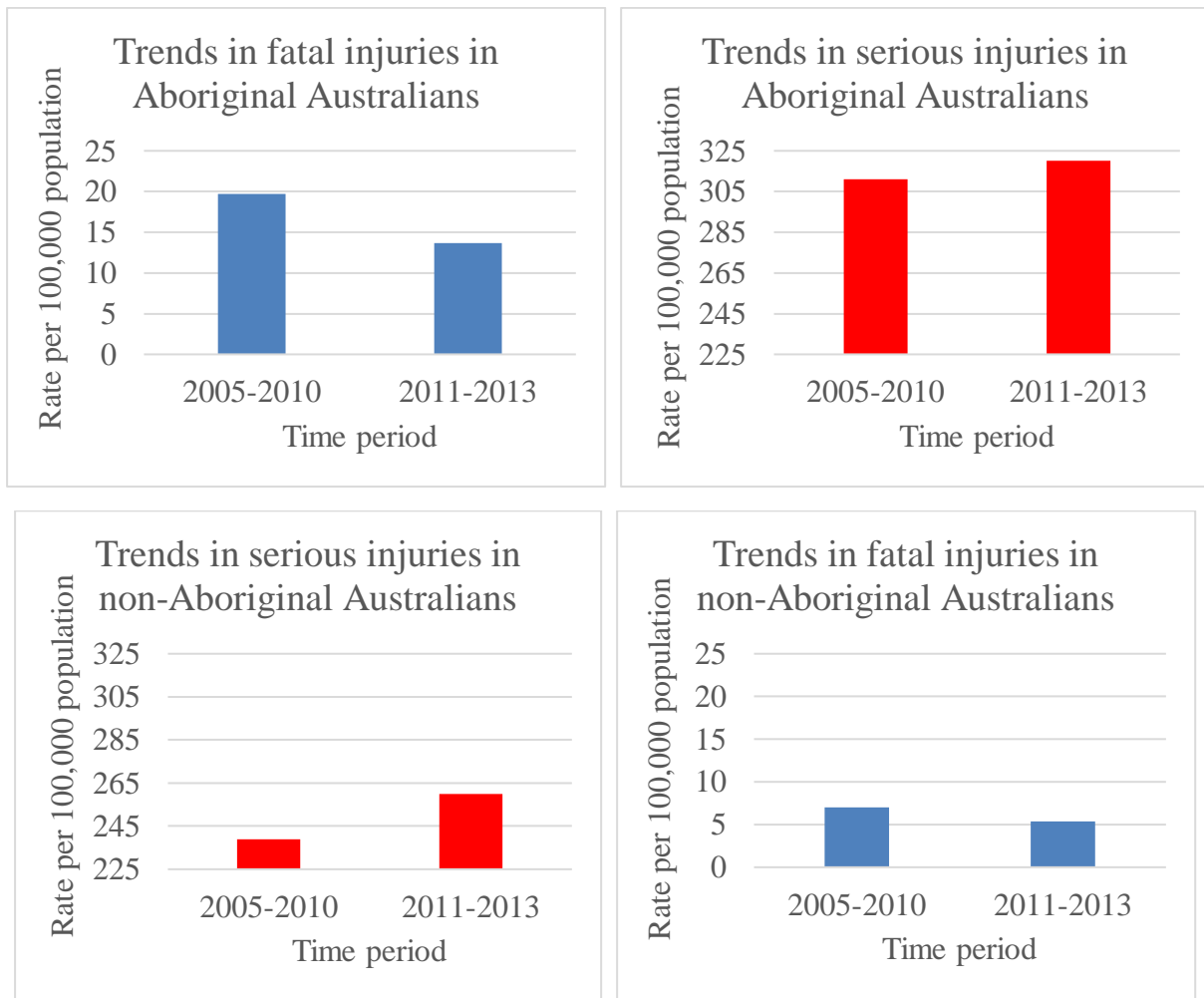
- d) The serious injury rate in the Western Australian Aboriginal population at 440 per 100,000 population was 1.6 times higher than in the non-Aboriginal population where the rate was 280 per 100,000 during 2011-2013 (Figure 2-1) (Australian Institute of Health and Welfare, 2015a). This is a smaller difference than that seen for fatal traffic injuries.
- e) There is a higher serious injury rate in Western Australia than in Australia at 440 per 100,000 population compared to 320 per 100,000 population during 2011-2013, giving a rate ratio of 1.4 (Figure 2-2)(Australian Institute of Health and Welfare, 2015a).
- f) Serious injury rates among the Aboriginal population are 2.3 times higher in males in Western Australia at 610 per 100,000 population than females at 260 per 100,000 population during 2011-2013 (Figure 2-2) (Australian Institute of Health and Welfare, 2015a).

Comparison of the Australian serious injury rates among the Aboriginal population for 2005-2010 against 2011-2013 show a negligible increase from 311 per 100,000 to 320 per 100,000 (Australian Institute of Health and Welfare, 2015a; Henley & Harrison, 2013). Serious injury rates in the non-Aboriginal population have also increased over this period from 239 per 100,000 to 260 per 100,000 population.

Figure 2-1 Fatal and Serious traffic injuries in Aboriginal Australians



**Figure 2-2 Fatal and Serious injury trends in Aboriginal Australians**



**Table 2-1 Fatality rates from land transport accidents (V01-V89) 2016**

	Fatalities per 100,000 population (BITRE, 2017)	ABS Deaths of Aboriginal and Torres Strait Islander Australians 2016(ABS, 2017)			
		Aboriginal		Non-Aboriginal	
		Number	Rate per 100,000	Number	Rate per 100,000
NSW	5.0	20	9.1	373	4.8
Vic	4.8	-		-	
Qld	5.2	-		-	
SA	5.0	-		-	
WA	7.4	23	28.3	168	6.9
Tas	7.1	-		-	
NT	18.4	23	32.8	18	-
ACT	2.3	-		-	
Australia*	5.4	80	13.7	910	5.4

\* ABS figures for NSW, Qld, SA, WA & NT only

**Table 2-2 Serious traffic injury rates , 2011-2013(Australian Institute of Health and Welfare, 2015a)**

	Aboriginal Rate per 100,000	Non-Aboriginal Rate per 100,000
NSW	330	250
Vic	230	240
Qld	290	280
SA	330	210
WA	440	280
Tas	-	-
NT	330	380
ACT	-	-
Australia	320	260

In the next section we present published data that is available for Australia as a whole and have relied heavily on the work of Henley and Harrison (2013) who have conducted further analysis of the ABS and AIHW fatal and serious injury data in the Aboriginal population. However, differing traffic injury rates between jurisdictions suggest a lack of comparability with WA. This is illustrated in Tables 2-1 and 2-2. Table 2-1 shows fatal traffic injury rates and Table 2-2 serious traffic injury rates. The highest fatal injury rate is seen in the Northern Territory (NT) and WA and Tasmania are shown to be above the national average. Fatality data by Aboriginality is only available for three States, New South Wales, WA and the NT. These also indicate above average fatality rates in WA and the NT. In terms of serious traffic injury for the non-Aboriginal population, the highest rate is again seen in the NT, followed by WA and Queensland. However, when looking at the Aboriginal population alone, the WA serious injury rate is the highest, and the NT, South Australia and New South Wales rates are just above the national average. This appears inconsistent with the rest of the data. However, closer inspection shows that the national average is being partially determined by a particularly low serious injury rate in Victoria. Victoria is quite different to most other jurisdictions in that it has no Aboriginal population in remote areas.

In interpreting Tables 2-1 and 2-2, the accuracy of the data depends on the accuracy of reporting and recording. In terms of crashes, accurate data requires that all crashes are reported and that the data are accurately recorded. Evidence suggests that Aboriginal people have a reluctance to have contact with the police and also to go to hospital (Australian Institute of Health and Welfare, 2007; Helps & Moller, 2007). This, in addition to the issue of identifying whether or not somebody is of Aboriginal descent, reduces the possibility that crashes involving Aboriginal people will be accurately reported. This may result in underreporting of Aboriginal crashes in general and in comparison to non-Aboriginal crashes.

The lack of comparability between jurisdictions is likely to be a result of differing road user behaviour, road conditions and transport infrastructure, distances between localities, population distribution, extreme weather conditions that can cause dangerous road conditions and may result in geographic isolation and policies related to road safety. As the largest State in terms of land area with the third largest road network (Bureau of Infrastructure, 2013), Western Australia is characterised by long travel distances in

remote areas where road infrastructure is generally of lower quality than in metropolitan areas. In terms of population distribution, 6% of the WA population live in remote areas compared to the Australian average of 2% and 40% of the Aboriginal population compared to the Australian average of 20% (Australian Institute of Health and Welfare, 2015b).

### **2.3 Injuries by age group**

The following sections (2.3 – 2.6) are taken exclusively from Henley & Harrison 2013 (Henley & Harrison, 2013) who provide an overview of fatal and serious traffic injury in Aboriginal people in Australia. Figures included in this section are copyright to the AIHW.

Figure 2.1 shows the fatal and serious injury rate by age-group. The highest fatality rate is seen in Aboriginal male's aged 30-34 years but rates are elevated from the 15-19 year age group up until the 45-49 year age group. This compares to non-Aboriginal males where the highest fatality rate was in the 20-24 years age group. For Aboriginal females the fatal injury rate increased in the 15-29 year age groups and was highest for age groups from 30-49 years.

For serious injuries, the highest rates in the Aboriginal population are in a much younger age group, 15-19 years for both males and females, and this is the same for the non-Aboriginal population. The serious injury rate decreases more slowly with increasing age in the Aboriginal population compared to the non-Aboriginal population.

An increased risk of fatal injury in males compared to females is evident across all age groups but is less marked in those aged 5-9 and 10-14 years of age where the rates are lowest. The greatest difference between Aboriginal males and females is between ages 15-19 and 20-24 years where the fatality rate is 3.2 to 3.5 times higher. For serious injury the difference between males and females is clearly visible across all age groups and the greatest difference is seen for those aged 30-34 years, 45-49 years and 15-19 years where the differences are 2.6, 2.3 and 2.3 times higher respectively. This represents peaks of differing road user activity for males: 30-34 year olds are most commonly car drivers, 45-

49 years olds passengers and then drivers and 15-19 year olds motorcyclists and then car drivers (Figure 2.2). In contrast, females are most likely to be seriously injured as car passengers in each of these age groups.

#### **2.4 Mode of transport**

The most commonly occurring fatal injuries were to car occupants and pedestrians in both the Aboriginal and non-Aboriginal population (Table 2-3). However, drivers, passengers and pedestrians had an increased risk of a fatal injury in the Aboriginal population. This was by a factor of 2.3 for drivers, 5.8 for passengers and 5.2 for pedestrians.

The most common mode of transport resulting in serious injury for the Aboriginal population was as a motorcyclist or pedal cyclist for males, and as a driver, passenger or pedestrian for both males and females (Table 2-4). The increased risk for serious injury in comparison to the non-Aboriginal population was lower than for fatal injuries at 1.2 for drivers, 2.6 for passengers and 2.8 for pedestrians. For male motorcyclists and pedal cyclists, the risk of serious injury was lower than for the non-Aboriginal population.

The rates of non-traffic injury are highest on pedal cycles and motorcycles in both Aboriginal and non-Aboriginal males. (Non-traffic cases occur entirely off-road. Traffic cases involve at least one vehicle and must occur at least partly on a road accessible to the public.)



Figure 2-3 Injury rates by age group

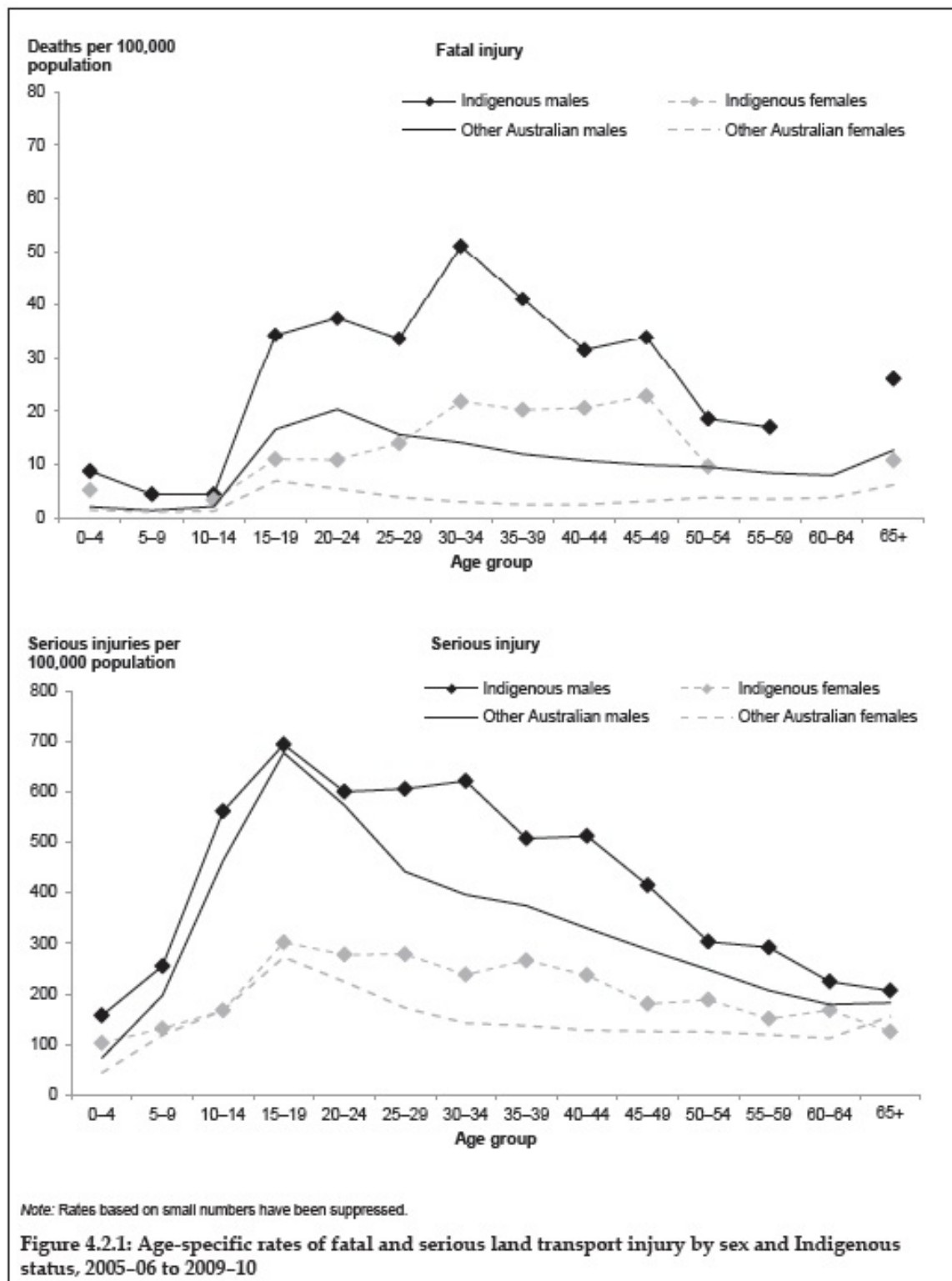
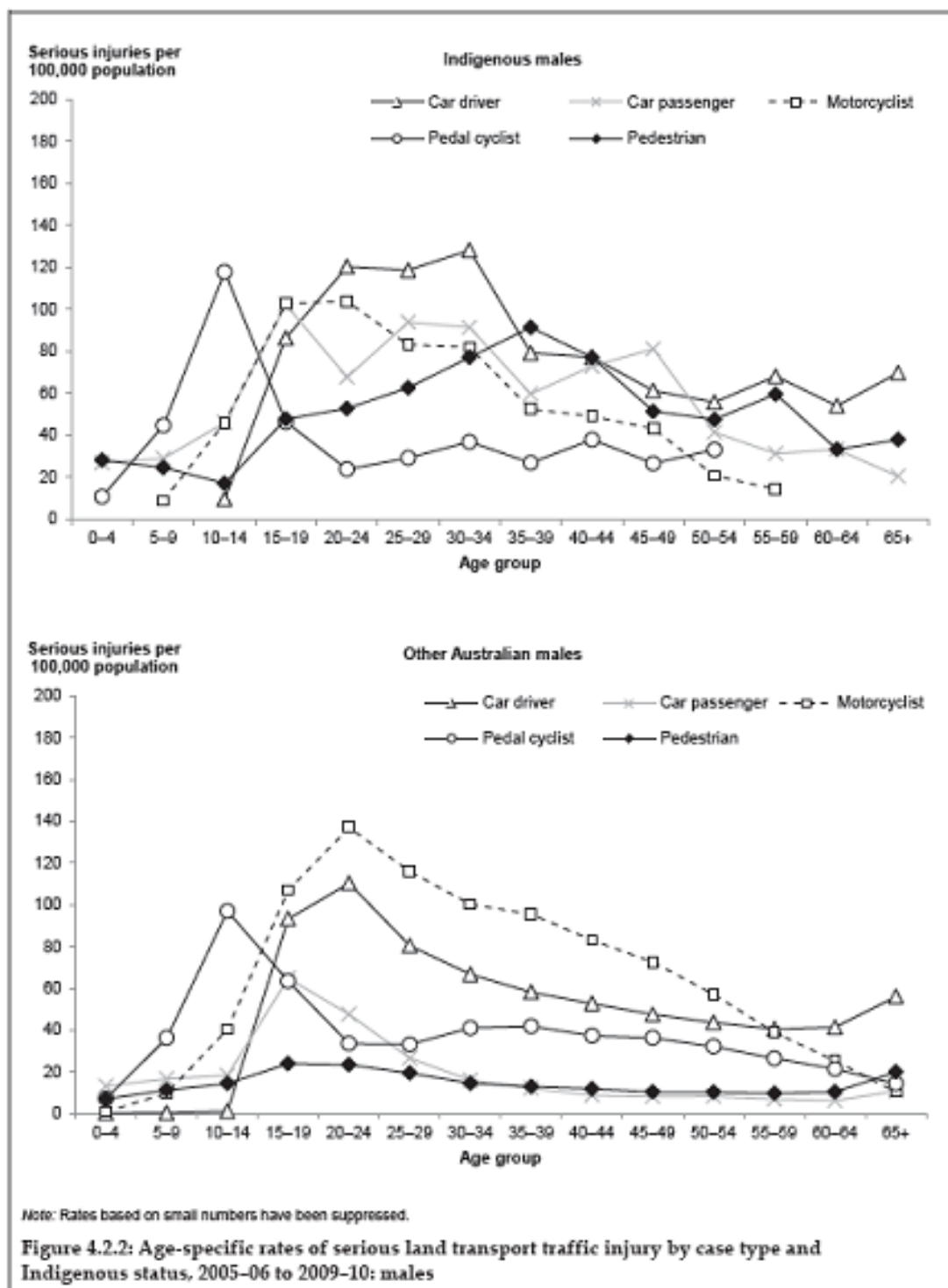


Figure 2-4 Serious injury rates for males by mode of transport and age group



**Table 2-3 Rate per 100,000 population of transport-related fatal injuries by model of transport and Aboriginal status, NSW, Vic, Qld, WA, SA & NT, 2005–06 to 2009–10**

	Fatal Injuries								
Mode of transport	Males			Females			Persons		
	Aboriginal	Non-Aboriginal	Rate ratio	Aboriginal	Non-Aboriginal	Rate ratio	Aboriginal	Non-Aboriginal	Rate ratio
Car occupant	16.5	4.9	3.4	7.7	2.4	3.2	11.9	3.6	3.3
Driver	9.3	3.7	2.5	2.6	1.4	1.9	5.8	2.5	2.3
Passenger	7.3	1.1	6.5	4.9	0.9	5.4	6.0	1.0	5.8
Other and unspecified*	0.1	0.1	1	0.1	0.0	-	Np	0.1	Np
Motorcyclist	1.3	2.2	0.6	0.0	0.1	-	0.7	1.2	0.6
Pedal cyclist	0.1	0.3	0.3	0.0	0.0	-	Np	0.2	Np
Pedestrian	7.0	1.4	5	3.9	0.6	6.5	5.4	1.0	5.2

**Table 2-4 Rate per 100,000 population of transport-related serious injuries by model of transport and Aboriginal status, NSW, Vic, Qld, WA, SA & NT, 2005–06 to 2009–10**

Mode of transport	Serious Injuries						Persons		
	Males			Females					
	Aboriginal	Non-Aboriginal	Rate ratio	Aboriginal	Non-Aboriginal	Rate ratio	Aboriginal	Non-Aboriginal	Rate ratio
Car occupant	164.5	83.8	2.0	116.5	76.7	1.5	140.0	80.4	1.7
Driver	77.7	54.8	1.4	38.4	43.4	0.9	57.3	49.0	1.2
Passenger	63.7	21.1	3.0	58.2	26.1	2.2	61.0	23.8	2.6
Other and unspecified*	23.1	7.9	2.9	19.8	7.3	2.7	21.6	7.6	2.8
Motorcyclist	84.4	118.1	0.7	11.3	12.0	0.9	47.7	65.5	0.7
Pedal cyclist	60.1	70.2	0.9	14.7	16.6	0.9	37.4	43.7	0.9
Pedestrian	63.7	20.5	3.1	31.3	12.9	2.4	46.9	16.8	2.8

\*Persons injured while on the outside of a vehicle and persons injured while boarding or alighting from a vehicle.

## 2.5 Effect of Remoteness

The highest proportion of road related fatal injuries in the Aboriginal population occurred in very remote areas (34%). This is approximately double the proportion occurring in major cities (15%) and inner regional (14%), outer regional (18%) and remote areas (18%). Serious injuries were more evenly dispersed between remoteness categories (major cities 23%, inner regional 19%, outer regional 23%, remote 14% and very remote 21%). In the non-Aboriginal population over 50% of fatal and serious injuries occur in major cities and become less common with increasing remoteness. However, when population distribution is taken into account, the rate of fatal and serious injuries in the Aboriginal population is highest in the remote and very remote areas compared to the metropolitan area as shown in Figure 2.3. (The fatal injury rate was 50 per 100,000 in remote areas, 48 per 100,000 in very remote areas and 10 per 100,000 in the major cities. The serious injury rate was 453 per 100,000 in remote areas, 432 per 100,000 in very remote areas and 216 per 100,000 in the major cities.) For the non-Aboriginal population, fatal injuries are also highest in remote and very remote areas (22 and 25 per 100,000 respectively compared to 6 per 100,000 in the major cities). Serious injuries are also highest in very remote areas (667 per 100,000 compared to 196 per 100,000 in the major cities).

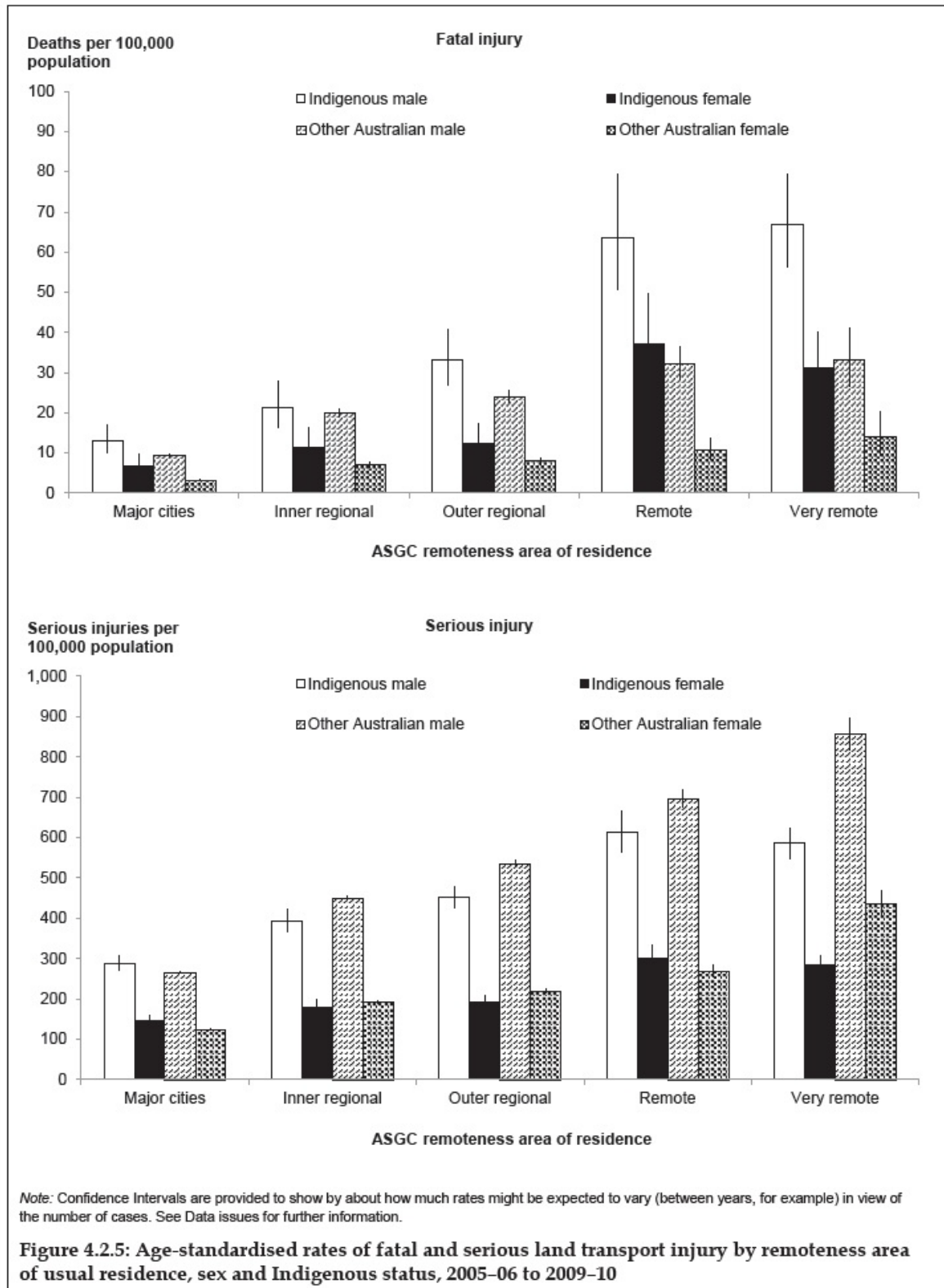
Rates of fatal injury are higher in Aboriginal males than females in outer regional and remote areas and there were no significant differences in cities and inner regional areas. Aboriginal males have similar rates of fatal injury to non-Aboriginal males in major cities and inner regional areas but their rates in other areas are higher. Rates for Aboriginal females are higher than for non-Aboriginal females in major cities and remote areas but not significantly so in regional areas.

Rates of serious injuries divided into traffic and non-traffic injuries are presented in Figure 2.4. Both traffic and non-traffic injuries were significantly higher in Aboriginal males than females in all areas (major cities, regional and remote). The ratio of injuries in males compared to females was higher for non-traffic injuries at 3.4 compared to 1.9 for traffic injuries.

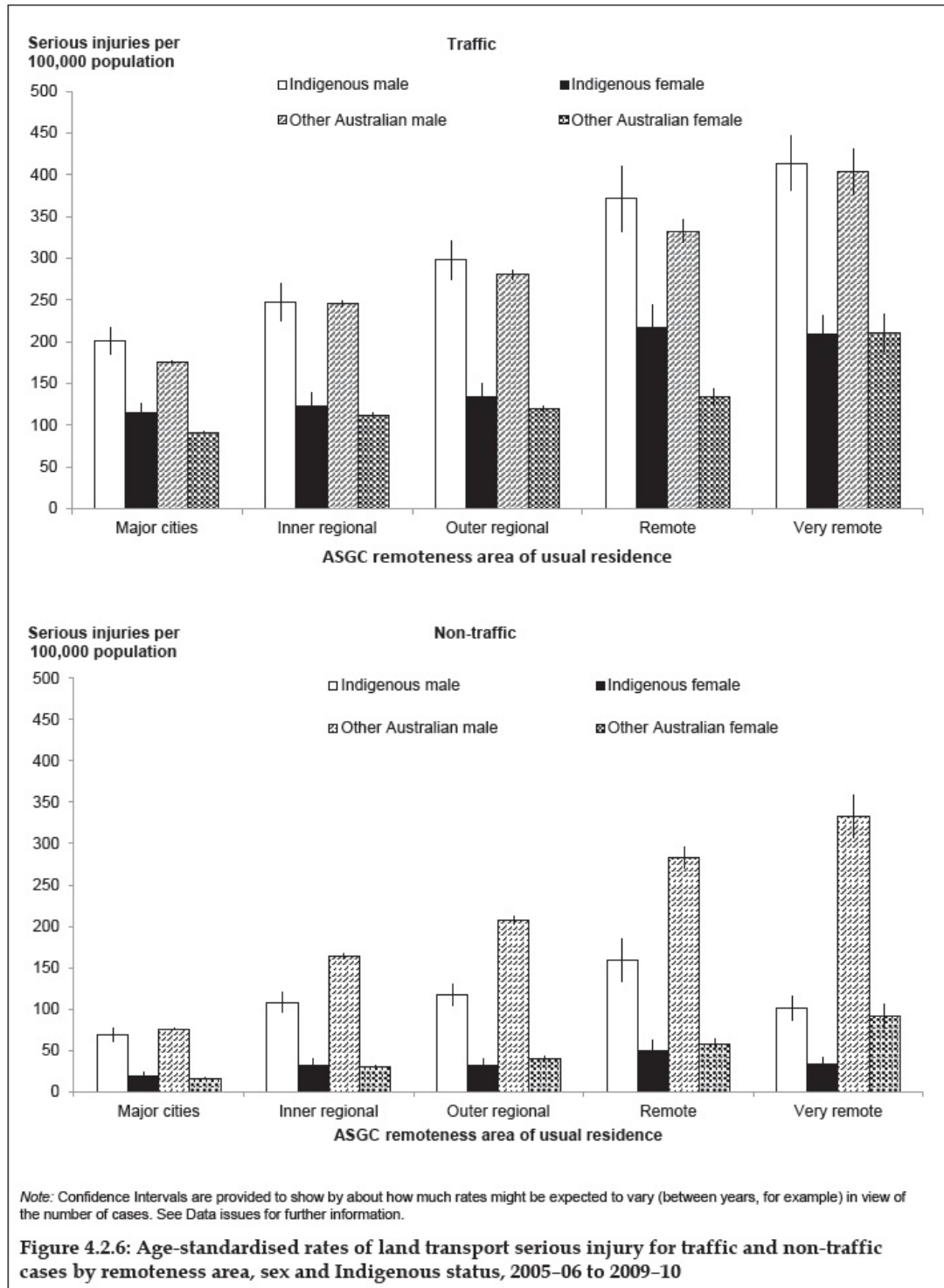
Aboriginal and non-Aboriginal males have similar rates of serious traffic injury in regional and remote areas, but Aboriginal males have a higher rate of serious injury in major cities. Aboriginal females have higher rates of traffic injuries in major cities and remote areas (excluding very remote) than non-Aboriginal females.

There are lower rates of non-traffic injuries in Aboriginal males compared to non-Aboriginal males outside of major cities where the rates are similar. Aboriginal and non-Aboriginal females have similar rates of non-traffic injuries by remoteness category, other than in “very remote” areas where they are higher in the non-Aboriginal population.

**Figure 2-5 Injury rates by remoteness category**



**Figure 2-6 Injury rates by remoteness category and for traffic and non traffic crashes**





## 2.6 Mechanism of injury

Fatal injuries to car occupants in the Aboriginal population are most likely to result from collisions with fixed or stationary objects (45%) and non-collision accidents (34%) whereas the non-Aboriginal population are most likely to have a non-collision accident (44%) or collision with another motor vehicle (41%) (Table 2.5).

In both the Aboriginal and non-Aboriginal populations, non-collision accidents form a smaller proportion of serious injuries (23% and 25% respectively). The greatest proportion of injuries is caused by collision with another motor vehicle in the non-Aboriginal population (47%) or collision with a fixed or stationary object in the Aboriginal population (44%).

Mechanism of injury is likely to be related to location of crash in terms of remoteness. Injuries involving collision with another vehicle become less likely with increasing remoteness.

**Table 2-5 Mechanism of fatal and serious injury\*, by Aboriginal status, NSW, Vic, Qld, WA, SA & NT, 2005–06 to 2009–10**

	Fatal Injury				Serious Injury			
	Aboriginal		Non-Aboriginal		Aboriginal		Non-Aboriginal	
	No.	%	No.	%	No.	%	No.	%
Collision with another motor vehicle	47	17	1504	41	715	21	38131	47
Non-collision accidents	94	34	1623	44	791	23	20141	25
Collisions with fixed or stationary object	123	45	474	13	1476	44	16325	20
Total	274		3682		3392		81102	

\*Table only includes major accident mechanism categories and so percentages do not add up to 100 (Complete table, Henley & Harrison 4.2.11)

## 2.7 Summary and Discussion

The current evidence suggests that the rate of traffic injury in the Aboriginal population is higher in Western Australia than in Australia by a factor of 2 for fatal injuries and 1.4 for serious injuries. Injury rates were higher in the Aboriginal population compared to the non-Aboriginal population of WA by a factor of 4.1 for fatal injuries and 1.6 for serious injuries.

The data consistently show higher rates of fatal and serious injuries in the male Aboriginal population compared to the female Aboriginal population. In 2016, fatal injuries were 1.6 times higher in males and serious injuries were 2.3 times higher in males.

The highest fatality rate is seen in Aboriginal male's aged 30-34 years but rates are elevated from the 15-19 year age group up until the 45-49 year age group. This compares to non-Aboriginal males where the highest fatality rate was in the 20-24 years age group. For Aboriginal females the fatal injury rate increased in the 15-29 year age groups and was highest for age groups from 30-49 years.

For serious injuries, the highest rates in the Aboriginal population are in a much younger age group, 15-19 years for both males and females, and this is the same for the non-Aboriginal population. The serious injury rate decreases more slowly with increasing age in the Aboriginal population compared to the non-Aboriginal population.

The rate of fatal and serious injuries in the Aboriginal population is highest in the remote and very remote areas. A similar pattern is also seen in the non-Aboriginal population. For both groups this is most likely due to a number of safe systems related issues such as travel at higher, unsafe speeds on less safe roads and potentially less safe road use behaviours (e.g., speeding, drink driving) that cannot be easily enforced in less trafficked areas. Both Aboriginal males and females have higher rates of serious traffic injuries in major cities than their non-Aboriginal counterparts. Aboriginal females have a higher rate of fatal crashes in major cities than non-Aboriginal females.

There are lower rates of non-traffic injuries in Aboriginal males compared to non-Aboriginal males outside of major cities where the rates are similar. Aboriginal and non-Aboriginal females have similar rates of non-traffic accidents by remoteness category, other than in "very remote" areas where they are higher in the non-Aboriginal population.

Aboriginal males and females have a higher risk of fatal and serious injury as a car occupant or pedestrian, the highest increased risk being as a car passenger. Fatal injuries to car occupants in the Aboriginal population are most likely to result from collisions with fixed or stationary objects and non-collision accidents whereas the non-Aboriginal population are most likely to have a non-collision accident or collision with another motor vehicle. This is likely to be related to location of injury in terms of remoteness. Injuries involving collision with another vehicle become less likely with increasing remoteness.

## **2.8 Conclusion**

The data in this chapter highlights the disparity between Aboriginal and non-Aboriginal Australians for transport injuries and which groups of Aboriginal people are at greatest risk of injuries. Unfortunately, most of these data are for Australia as a whole as opposed to Western Australia, for which there is little published data available. In terms of the safe system approach, the high rates of crashes in rural and remote areas suggest that roads in these areas are less safe than metropolitan roads and this is likely to be a result of road conditions (safe roads) with higher posted speed limits (safe speeds) and potentially less safe road use (e.g., speeding, drink driving, vulnerable road users).

### **3. Risk factors for road injury among the WA Aboriginal population and across Australia**

#### **3.1 Introduction**

This section involves a review of the Australian literature from 2000-2017 to identify risk factors for road injury among the WA Aboriginal population and elsewhere.

#### **3.2 Methods**

The peer-reviewed and ‘grey’ literature was searched to identify studies of risk factors for traffic crashes in the Aboriginal population from 2000 -2017. The following search terms were used to search the Medline database: (Aboriginal.mp or Aboriginal.mp or Torres Strait.mp) and (Traffic accident.mp or Accidents, Traffic/).

These terms were adapted as appropriate to search the following on-line databases: Cinahl plus, Informit, Medline, Psychinfo, Pubmed, Scifinder and Scopus. Further references were identified from the reference lists of the identified documents, through government road safety websites and from the Aboriginal infonet weekly bulletin.

#### **3.3 Results**

Disparities in road injury rates between Aboriginal and non-Aboriginal populations have been documented in many countries, including Australia (Clapham, Senserrick, Ivers, Lyford, & Stevenson, 2008), Canada (Short, Mushquash, & Bedard, 2013) and the United States (Amiotte, Balanay, & Humphrey, 2016). The disparity in Australia can be traced back to European colonisation which began in January 1788 with the arrival of Captain Arthur Phillip and the First Fleet at Botany Bay. Relations between the Europeans and the Aboriginals were originally hospitable until the Aboriginals realised their land and resources were being seriously compromised by the continued presence of the colonisers (Aboriginal Heritage Office, 2018). With colonisation came epidemic disease and restriction of Aboriginal people to reserves such that they were less able to support themselves from the land. The subjugation of Aboriginal people continued into the twentieth century: they were not given the right to vote until 1962 and not included in the census until 1967 (Australian Institute of Health and Welfare, 2015b). Their land ownership was not recognised by the High Court until 1992, previously having been described as “belonging to no one”(Australian Institute of Health and Welfare, 2015b).

As a result, many Aboriginal people still suffer from economic disadvantage in terms of lower education and employment levels and poorer health (Australian Institute of Health and Welfare, 2015b).

### **3.3.1 Risk factors**

The following section describes various risk factors for Aboriginal road injuries. Demographic risk factors and risk factors related to the mode and mechanism of Aboriginal road injuries were described in the previous chapter.

#### ***3.3.1.1 Socioeconomic status***

Low socioeconomic status (SES) has itself been identified as a risk factor for injury and it is widely established that Aboriginal people have an increased risk of injury (Ivers, Clapham, Senserrick, Lyford, & Stevenson, 2008). Potential mechanisms for this relationship may be that low SES areas present more hazards (Evans & Kantrowitz, 2002) such as busier roads with less access to public transport and recreational areas and greater exposure to crime (Evans & Kantrowitz, 2002). People of low SES may have poorer access to information and less knowledge about injury prevention and thus be less likely to take action to prevent injury and more likely to engage in riskier behaviour (Girasek, 2001).

Low socioeconomic status impacts upon a person's ability to gain a driving licence due to the cost of lessons and cost of the licence. Access to safer vehicles is low with many vehicles poorly maintained (Helps & Moller, 2007) and thus it may be difficult to find a supervising driver with a suitable car. Language, reading and writing issues together with distrust of police and authorities also serves as a barrier to driver licensing (Helps & Moller, 2007). Difficulty in obtaining a driver's license may lead to unlicensed driving, under-age driving and increased risk of traffic crashes due to lack of safe driving education and experience (Helps & Moller, 2007; Watson, Elliott, Kinsella, & Wilson, 1997).

#### ***3.3.1.2 Rural and remote residence***

Data from section 2.5 demonstrated that fatal crash rates in the Aboriginal population were up to five times higher in remote areas compared to the metropolitan area, and that for serious injuries, crash rates were approximately twice as high in remote areas (Henley & Harrison, 2013). Edmonston (Edmonston, 2016) conducted a study of rural and remote

road trauma in North Queensland. This involved interviews with 229 Aboriginal and non-Aboriginal crash victims from rural and remote areas admitted to larger health facilities for a length of stay of over 24 hours and any road crash victims admitted to smaller health facilities. He identified the key contributing factors to rural and remote road crashes to be alcohol, inappropriate speed, failure to use seat belts or helmets, unlicensed driving, distraction and fatigue. Risky road safety behaviour was identified as a part of rural life which is characterised by limited public transport, inappropriately high speeds and decreased seatbelt compliance as the chance of being caught is low (Sticher, 2009). Aboriginal crash victims also described “feelings of hopelessness due to poor life circumstances (poor, bored, not having a job) which manifest in excessive alcohol and risky behaviour, thus elevating crash risk.”(Edmonston, 2016)

Aboriginal people often travel large distances to attend cultural events with family members. (Helps & Moller, 2007; Watson et al., 1997). Travel commitments combined with the rural and remote residence of a large proportion of Aboriginal people result in them travelling greater distances on roads with higher speed limits that are not as well maintained in cars that may be overcrowded, lacking modern safety features and also poorly maintained (Thomson, Krom, & Ride, 2009).

To the issues of greater road safety risk in rural and remote areas, we can add delays in retrieving people post-crash as a result of poorer telecommunications resulting in delays in alerting emergency services and also greater travel distances for emergency services and reduced access to medical treatment and rehabilitation (Thomson et al., 2009). Fatovich et al showed that in a cohort of Western Australian trauma patients from metropolitan and rural WA, mean time to definitive care was 59 minutes for metropolitan patients and 11.6 hours for rural patients who were transferred by the Royal Flying Doctor Service (Fatovich, Phillips, Jacobs, & Langford, 2011). The rural group had a significantly increased risk of death (OR 2.60, 95% CI 1.05-6.53) after adjustment for age, injury severity and the interaction between severity and time to ambulance arrival and time from ambulance arrival to arrival at a tertiary hospital. This study is based on data from 1997-2006.

### **3.3.1.3 Seat belts**

Evidence from a number of studies shows that a large proportion of Aboriginal people involved in fatal and serious injuries were not wearing seat belts. In a study based on

West Australian data for the period 2001-2006, Oxley et al(Oxley et al., 2009) found that 19.4% of Aboriginal people involved in a fatal traffic crash and 35.3% of those admitted to hospital as a result of a traffic crash were wearing a seat belt. Of those crashes resulting in a serious injury, similar proportions of males (32.6%) and females (33.8%) were wearing seat belts, but only 26.6% of those aged 26-40 years wore seat belts compared to 35.7% of those aged 16-25 years and 39.5% of those aged 41+ years. Nearly half (46.5%) of drivers were wearing a seat belt compared to 20.8% of passengers. Those from rural areas also appeared less likely to be wearing a seat belt (35% rural vs 44% metro).

A Northern Territory study based on linked data for the period 2001-2007 showed a relative fatal crash risk of 2.2 (95% CI 1.3-3.7) for Aboriginal drivers not wearing a safety device (seat belt or helmet) (Dempsey, 2016).

A record linkage study has also been conducted in New South Wales covering the period 2005-2015 (Centre for Road Safety, 2017). New South Wales has the largest Aboriginal population in Australia but in comparison to Western Australia where 50% of the Aboriginal population lives in regional and remote areas, 20% of the NSW Aboriginal population (Figure 2.3) resides in regional and remote areas, and these are relatively small in terms of area in comparison to WA. This found that 71.4% of Aboriginal people fatally injured in a car crash and 91.7% seriously injured were wearing seat belts. The study also showed that 75% of motorcyclists fatally injured and 78.4% of those seriously injured were wearing helmets, but only 48.6% of pedal cyclists seriously injured were wearing helmets.

A CARRSQ (Centre for Accident Research and Road Safety – Queensland) factsheet on Aboriginal road safety (Centre for Accident Research & Road Safety - Queensland (CARRS-Q), 2016) reports that almost 70% of Aboriginal car occupants or motorcycle riders involved in fatal injuries were not wearing a seatbelt or helmet (Australian Transport Safety Bureau, 2004);

#### **3.3.1.4 Child restraints**

Similarly to the use of seat belts, use of child restraints by Aboriginal people is also substandard. Data from the Northern Territory show that of the 50 Aboriginal children killed or seriously injured in car accidents from 2005-2015, 92% were not properly restrained in a baby capsule or child seat (Thiel, 2017). The report also states that children often travel in other people's cars and that child restraints are often removed to make way

for more people. In addition, the cost of child restraints in remote communities is up to three times higher than that found in Darwin.

### **3.3.1.5 Driver licensing**

As mentioned in section 3.3.1.1, Aboriginal people often have difficulties with gaining a driving license, leading to an increased risk of traffic crashes due to lack of safe driving education and experience (Watson et al., 1997). The NSW study identified around 20% of Aboriginal people involved in fatal and serious accidents as being unlicensed, compared to around 9% of non-Aboriginal people involved in fatal crashes and 5% of those with serious injuries (Centre for Road Safety, 2017).

The CARRSQ factsheet states that:

- A high proportion of Aboriginal drivers are unlicensed compared to non-Aboriginal drivers both in major cities and regional areas (23.6% vs 3.2%) and remote areas (38.5% vs 4.6%) (Edmonston, 2016);
- Low rates of driving licenses in predominantly Aboriginal local government areas (40%) compared to non-Aboriginal local government areas (90%) (Edmonston, 2016).

### **3.3.1.6 Fatigue**

Fatigue has also been shown to contribute to the risk of fatal and serious crashes. The NSW study identified fatigue as a risk factor for 17% of serious crashes and 30% of fatal crashes in the Aboriginal population (Centre for Road Safety, 2017).

### **3.3.1.7 Alcohol**

Low levels of alcohol just above 0g/dl BAC can impair driving skills and once levels reach 0.05 g/dl most studies report significant impairment (Moskowitz & Fiorentino, 2000). The relative risk of an “alcohol-related” crash in the Northern Territory study was shown to be 2.8 (95% CI 1.6-4.7). Thirty percent of crashes involving pedestrians were thought to be alcohol related. In addition, 78% of Aboriginal pedestrians were found to be at fault of causing the injury (Dempsey, 2016).

The NSW study also identified “illegal blood alcohol concentration” as contributing to 20% of serious crashes and 33% of fatal crashes (Centre for Road Safety, 2017).

The CARRS-Q factsheet (Centre for Accident Research & Road Safety - Queensland (CARRS-Q), 2016) reports:



- That 17.5% of Aboriginal drivers involved in injury crashes in cities and regional areas were over the legal BAC limit and 31.5% of those in remote areas (Edmonston, 2016);
- That young people may engage in drink driving as they have been requested to do so by a senior family member and they feel obliged as a result of kinship (Fitts, Palk, Lennon, & Clough, 2013b);
- That Aboriginal Australians have high rates of pedestrian injuries, and a high proportion of those hospitalised or killed are under the influence of alcohol (53.7% in the study sample) (Edmonston, 2016);

A further issue specific to Aboriginal people is the presence of alcohol bans in some communities (Fitts, Palk, & Jacups, 2013). This has led to some people driving long distances to obtain alcohol and then driving long distances in an impaired state (Fitts, Palk, & Jacups, 2013; Government of Western Australia, 2018).

### ***3.3.1.8 Drink driving convictions***

Further data on levels of alcohol impaired driving which may not have resulted in a crash can be obtained by analysis of drink driving convictions data. Fitts et al (Fitts, Palk, Lennon, & Clough, 2013a) have studied the characteristics of Aboriginal people convicted of drink-driving offences in Queensland over the period 2006-2010. They have shown that of the 9323 convictions, 77.5% were for males and just over half (52.6%) were for people aged under 25 years with the median age of offence being 28 years for males (range 11-81 years) and 29 years for females (range 12-65 years). The rate of drink driving convictions increased by remoteness category from 4873 per 100,000 in the metropolitan area to 10,587 per 100,000 in the remote regions, declining slightly to 7406 per 100,000 in very remote regions. In very remote areas, a greater proportion of convictions were for males aged 40 years and over whereas in the metropolitan and inner regional areas, a larger proportion of convictions were for people aged under 25 years. Increased remoteness was also associated with higher blood alcohol content ( $\geq 0.15\text{g}/100\text{mL}$ ) convictions for males and females.

A further study of young Aboriginal drink drivers aged 12-24 years during the period 2006-2013 also found that males were responsible for the majority of offences (78.5%) and half of the males were aged 18 years or younger compared to one third of females

(Fitts, Palk, Lennon, & Clough, 2017). Just over 30% of individuals were convicted more than once (recidivists) and 10% of people had four convictions. Logistic regression analysis showed that male offenders were more likely than females to be convicted of more than one offense (OR 2.35 95% CI 1.77-3.1) and that those convicted at an earlier age were more likely to reoffend. Offenders living in inner regional areas were more likely to reoffend than those in major cities. With regards to remoteness, first-time drink drivers from remote areas were more often convicted of high range BAC offenses as were remote recidivists.

### **3.3.1.9 Road conditions**

Crash rates also vary according to road conditions. A study involving interviews with Chairpersons of communities in the Fitzroy Valley about road safety problems found that road conditions were the most commonly reported issue followed by flooding and dust (Cercarelli, Ryan, Knuiman, & Donovan, 2000).

The NT study found a relative crash risk of 6.4 (95% CI 2.5-16.5) for travelling on an unsealed road (Dempsey, 2016).

### **3.3.1.10 Vehicle condition**

A number of factors relating to the safety of vehicles also affect crash rates. The NT study (Dempsey, 2016) found that Aboriginal passenger casualties were nine times more likely to be travelling in an overcrowded vehicle than non-Aboriginal passengers. An increased crash risk was also seen for those travelling in defective vehicles (Relative risk 6.4, 95% CI 2.5-16.5), in vehicles older than 10 years (RR 1.8, 95% CI 1.1-3.0) and in unregistered vehicles (RR 3.5, 95% 1.1-13.0). The NSW study also found that 11.7% of fatal and 10.4% of serious injuries occurred in unregistered vehicles compared to 5.1% and 2.4% respectively in the non-Aboriginal population (Centre for Road Safety, 2017).

The CARRSQ factsheet (Centre for Accident Research & Road Safety - Queensland (CARRS-Q), 2016) suggests that the high proportion of fatal and serious injuries resulting from single vehicle rollover crashes (Henley & Harrison, 2013) may be due to overcrowding of the vehicle which could occur as a result of low car ownership rates.

## **3.4 Conclusion**

Table 3.8 summarises the risk factors for road traffic injuries among the Aboriginal population that have been identified in this review of the Australian literature. They are

identified in terms of the Safe System approach which looks at safe roads, safe speeds, safe vehicles and safe people.

This chapter highlights the Aboriginal population groups that are most at risk of road crashes. It identifies the issues that need to be addressed, such as licensing, use of seat belts and child restraints, alcohol, fatigue and distraction and shows that many of these issues are compounded by remoteness. However, it also demonstrates the importance of “closing the gap” in terms of addressing issues related to socioeconomic status. The safety of vehicles and of roads, particularly in rural and remote areas, remain an important issue.

The chapter also highlights the need for the collection of detailed data on road crashes so that specific risk factors can be identified and addressed. In particular it highlights that West Australian data is required to identify risk factors relevant to the unique West Australian situation.

**Table 3-1 Risk factors for road crashes in the Aboriginal population by safe system categories**

<b>Safe Vehicle</b>	<b>Safe Roads and Roadsides</b>	<b>Safe Road Use</b>	<b>Safe speeds</b>
Lack of access to safe vehicles	Rural and remote roads	Males	Speed not appropriate for road type
Lack of car maintenance	Unsealed roads	Age groups 10-49 years	
Overcrowding in vehicles		Car occupants and pedestrians	
Defective vehicles		No driving license	
Vehicle is older than 10 years		Seat belt/child restraint/helmet non-compliance	
Vehicle is unregistered		Helmet non-compliance for cyclists and motorcyclists	
		Low socioeconomic status	
		Alcohol	
		Fatigue	
		Distraction	
		Males in remote areas	
		Kinship obligations	

## 4. **Aboriginal-specific road safety interventions: A Literature Review**

### 4.1 **Introduction**

This section presents the findings of a review of the Australian and international literature from 1995-2017 to identify and describe Aboriginal-specific road safety interventions and their outcomes.

### 4.2 **Methods**

The following search terms were used to search the Medline database and were adapted as appropriate for other databases: Aboriginal.mp or Indigenous.mp or Torres Strait.mp and Traffic accident.mp or Accidents, Traffic/. These terms were also adapted as necessary to search the following on-line databases: Cinahl Plus, Informit, Medline, Psychinfo, Pubmed, Scifinder and Scopus. In addition, searches were conducted using the Australian Indigenous HealthInfoNet maintained by Edith Cowan University, Google, Google Scholar and relevant Australian road safety and government webpages to identify 'grey', non-peer review literature. In general, we have only included studies where a complete project report is available, describing the methods, results and outcome of the project.

The literature search covered the period 1995 onwards and incorporates a review of Australian Aboriginal road safety programs by Senserrick et al for the period 1995-2010 (T. Senserrick et al., 2010) and of international Aboriginal road safety programs by Short et al for the period 1980-2010 (Short, Mushquash, & Bedard, 2014).

### 4.3 **Results**

#### 4.3.1.1 ***Alcohol restrictions/Alcohol management programs***

The first intervention identified in the late 1990s was the Northern Territory "*Living with Alcohol*" program (Chikritzhs, Stockwell, & Pascal, 2005; T. Stockwell et al., 2001). This was a comprehensive public health strategy to address alcohol-related harm in the Northern Territory (NT). The program was funded by a tax on drinks with greater than 3% alcohol content by volume. It included price increases on alcoholic drinks, an increase in treatment programs and more high profile prevention programs. During the same period, the legal blood alcohol content for drivers was lowered to 0.05 BAC and restrictions on hours of trading for licensed premises were introduced.

The tax was removed in 1997 but the program continued until 2002. An evaluation of the first four years of the program (1992-96) found reductions in the estimated number of road deaths related to alcohol by 34.5% and in road crash injuries requiring hospital treatment by 28.3% (T. Stockwell et al., 2001). A further evaluation was undertaken after funding for the program ceased in 2002 (Chikritzhs et al., 2005). This report examined the impact of the program on chronic and acute alcohol-attributable deaths, but not specifically on road injury deaths. Acute alcohol-attributable deaths were shown to decline between 1992-97 but not from 1998-2002, following removal of the tax.

Alcohol restrictions were also implemented in Tennant Creek, NT in 1996 and were evaluated by Gray et al (Gray, Siggers, Atkinson, Sputore, & Bourbon, 2000). This evaluation identified a reduction in hospital admissions for acute alcohol-related diagnoses in the three years following the restrictions in comparison to the two years prior to the restrictions. An alcohol management plan was implemented in Alice Springs in 2006. Evaluation by Senior et al showed a decline in alcohol-related hospital separations in the 24 months following implementation compared to the 12 months beforehand, but again these data were not specific to road trauma (Senior, Chenhall, Ivy, & Stevenson, 2009). Alcohol restrictions were also implemented in the Fitzroy Valley, WA in 2007. An evaluation 12 months later found a decrease in emergency presentations and hospital admissions for injury, but did not evaluate data specific to road trauma (Kinnane, Farrington, Henderson-Yates, & Parker, 2009).

Alcohol management plans were introduced by the Queensland Government to remote communities in Cape York during 2002-2003 (Fitts, Palk, & Jacups, 2013). Restrictions were tightened in 2008 and in some cases total prohibition was introduced. Fitts et al conducted a study to look at the impact of the restrictions on drink driving in four of the communities, with populations ranging from 432-1195 people (Fitts, Palk, & Jacups, 2013). They analysed drink driving convictions during 2006-2008 and 2009-2011, pre and post implementation of restrictions in 2008. A statistically significant decline was seen in the number of drink driving offences in 3 of 4 communities but persistent high range BAC readings remained. The study concluded that alcohol restrictions are not clearly linked to reductions in drink driving and may lead to a shift in the location where alcohol is purchased and consumed.

#### **4.3.1.2 Media/Education based strategies**

In the early 2000s, there were two programs in the Kimberley area of Western Australia, one in the East Kimberley targeting increased use of motor vehicle safety restraints and a reduction in drink driving (Short et al., 2014) and the other program targeted pedestrian safety in Fitzroy Crossing (Clapham, 2003; Macaulay et al., 2003). The findings of an evaluation for the East Kimberley project were reported though it focussed on self-reported impacts such as the respondents' increased consideration for using a seat-belt and not drink driving. It did not report on the incidence of crashes and injuries.

The Aboriginal Pedestrian Road Safety project in Fitzroy Crossing consisted of a variety of strategies including;

- road awareness talk ins in schools about visibility on roads at night,
- lobbying of the local shire to improve street lighting, road signage, footpaths and road edges,
- radio advertisements using elders speaking about road safety in their own language,
- distribution of reflective wrist bands in places where people walked or bought alcohol.

Spot interviews were undertaken to assess behavioural and attitudinal changes as a result of the program. These suggested a greater awareness of issues by interviewees. An increased number of warning signs and street lights were also added to roads. During the first six months of the project, no road injury occurred. In the previous five years there had been at least one injury every 6 months. No post project evaluation was undertaken (Clapham, 2003; Macaulay et al., 2003).

The Stop Territory Aboriginal Road Sadness “STARS” program was developed by the Indigenous Policing Development Division of the Northern Territory Police in 2008 with the aim of developing an education program targeting drink and drug driving, pedestrian deaths and wearing of seat belts (Fuller, 2011). The program involved a number of components including a road safety song competition, education sessions at schools and public events, road safety merchandise, community road safety days which included presentation of the play “Muttacar Sorry Business” and “talking

posters” which were displayed in Aboriginal communities and used the voices of AFL footballers to give a road safety message. The project received media coverage from Radio Larrakia, the Darwin Indigenous Radio Service, SBS and ABC television and print media including NT News. Unfortunately no reported evaluation could be located for this diverse intervention.

#### **4.3.1.3 *Open load legislation***

A further program, also based in Western Australia, targeted the carriage of passengers in open load spaces (Hawkes, 2005). This was reported to have coincided with reduced Aboriginal road crash fatalities for people travelling in open load spaces but did not report any information regarding hospitalisations.

#### **4.3.1.4 *Drink driving programs***

The development of a drink driving program for regional and remote Aboriginal communities was described by Fitts and Palk in 2014 (Fitts & Palk, 2014). Phase 1 involved an analysis of drink driving conviction data and has been described in section 3.3.1.8. Phase 2 involved consultation with indigenous people (n=73) who had a drink driving conviction to identify their ideas about the type of information to be included in the program and the delivery style they felt most comfortable with. Experienced facilitators were interviewed about their views on the program content and the most feasible and effective process for delivering a culturally sensitive drink driving program. The study identified the importance of community ownership of drink driving programs. Participants needed to be able to identify with the information and stories. The facilitator should preferably be indigenous and connected to the community.

Phase 3 involved delivery of a drink-driving program in collaboration with community Elders and local drug and alcohol workers in two communities (n = 8 and n=9) (Fitts & Palk, 2014, 2016). A focus group following the program prompted discussion on expectations, perceptions, feelings and experiences to determine short term perceptions of the program content and delivery. Participants identified with program content and others’ stories and were able to explore their own risk factors. Participants were supportive of behaviour change strategies and identified a need for new initiatives that promoted understanding of their drink driving behaviour.



Earlier drink-driving programs were described by Wyatt 2007. These included the Queensland “Under the Limit” Program which was an 11 week education-based course. Evaluation reported that 76% of respondents said they were unlikely to reoffend, while 22% thought it likely that they may reoffend.

The Amity Drink Driving Program was introduced in the late 1990’s in the Northern Territory and was an educational course specifically for drink driving offenders. Evaluation indicated some success in reducing recidivism among first-time drink drivers, but not among repeat offenders and those in the higher blood alcohol concentration range.

A recent review highlighted the importance of rehabilitation courses focusing on behavioural change as well as providing information (Slootmans, Martenson, Kluppels, & Meesmann, 2017).

#### ***4.3.1.5 Driver Licensing programs***

The driver licensing programs included the Driving Change program in New South Wales (Cullen, Clapham, et al., 2016) and DriveSafe NT Remote (Cullen, Chevalier, Hunter, Gadsden, & Ivers, 2016). The Driving Change program began in February 2013 and aimed to improve license participation in New South Wales communities where licensing was identified as an issue for Aboriginal people, particularly those aged 16-24 years (Cullen, Clapham, et al., 2016). A pilot program was run in three Aboriginal communities. The program was delivered by an Aboriginal youth worker. It provided practical support for community members to access all aspects of licensing services required to get a driving license. An evaluation of the program implementation at three pilot sites showed that they were delivering all aspects of the services to the target population, albeit at different rates. Across the three sites, 194 individuals participated in the program during April 2013 - October 2014.

DriveSafe NT Remote is a program to address barriers to licensing faced by remote communities (Cullen, Chevalier, et al., 2016). It enabled community members to apply for a learner license, take the learner’s license theory test, receive professional driving lessons and supervised driving practice where available, receive road safety education and take the driver license practical test. The program demonstrated capacity for a flexible approach that is responsive to remote communities. Licensing trends showed that learner and open licenses increased more on average where the program had been

delivered compared to other remote areas. From April 2012 to June 2014 the program was taken to 23 communities and 1953 licences were issued.

A number of Aboriginal Licensing projects in Aboriginal communities in Western Australia were briefly described by Wyatt in 2007 (Committee to Explore the Effect of Motor Driver's Licence and Driving Laws on Remote Communities, 2007). It appears that many of these initiatives may have been successful but were short lived due to funding and/or staffing issues. The same report describes initiatives by the then Department of Corrective Services to assist inmates in gaining or regaining their learner's permits and/or driver's licences. This occurred in 2005 and 2006. Information regarding whether this scheme was ongoing has not been located.

In 2006, an Indigenous Drink Driving and Licensing project (IUDDP) was established by the Office of Road Safety (ORS) with the aim of identifying and progressing initiatives to address drink driving and unlicensed driving in Aboriginal Australians. Reference to a "Final Strategy Report" has been located (Wyatt) but the report has not been located. A project brief:

([https://healthinonet.ecu.edu.au/uploads/programs/263\\_iuddp\\_proj\\_brief.pdf](https://healthinonet.ecu.edu.au/uploads/programs/263_iuddp_proj_brief.pdf))

reports that the IUDDP project was a response to the Repeat Drink Driving Strategy (RDDS) and that an Aboriginal Advisory Group was established to facilitate Aboriginal community participation and ownership of the RDDS. Information from the Hansard

([http://www.parliament.wa.gov.au/Hansard%5Chansard.nsf/0/3a17f3a1ae682d934825793000165f80/\\$FILE/A38%20S1%2020111018%20p8260c-8261a.pdf](http://www.parliament.wa.gov.au/Hansard%5Chansard.nsf/0/3a17f3a1ae682d934825793000165f80/$FILE/A38%20S1%2020111018%20p8260c-8261a.pdf)) states that the following initiatives arose from this process:

**Alcohol Interlock Demonstration Project (AIDP)** This commenced in January 2011. The Repeat Drink Driving Strategy recommended the use of alcohol interlocks in WA to reduce the incidence of repeat drink driving. The ORS conducted a demonstration project on the use of alcohol ignition interlock devices in order to assess the impact they would have on regional and remote communities in the Pilbara. The trial was conducted in Roebourne under the coordination of Ngarliyarndu Bindirri Aboriginal Corporation. An independent evaluation of the trial was reported to have commenced in April 2013, but a report of this has not been located.

## **Austroads National Indigenous Safe System Demonstration Project**

The ORS led the development and implementation of the National Indigenous Safe System Demonstration Project. This encompassed the Safe System Audit at the Bidyadanga Aboriginal community which is described below.

### **Indigenous Road Safety Education Resource**

An Indigenous Drink Driving and Licensing Resource Kit was developed to raise the awareness among Indigenous people about drink driving and licensing. The kit was for use by community organisations and became available in 2011.

<https://www.rsc.wa.gov.au/News/Media-Releases/News-Archive/2011/Indigenous-drink-driving-licensing-kit>

Unfortunately there is a lack of detail available on many of these projects and their outcomes. The information is not readily accessible and its ability to inform future Aboriginal road safety work is thus limited.

### **Safe System Audit**

In 2009, Austroads funded a demonstration project - a Safe System audit of an Aboriginal community (T Senserrick et al., 2011). This was conducted at the Bidyadanga Aboriginal Community in Western Australia. Bidyadanga is 190 km south of Broome and at that time had up to 800 residents. The project involved a physical audit of roads, road infrastructure, speeds and vehicles and also collected information on road safety issues, policy and management from key stakeholders. A variety of issues regarding roads, vehicles, speeds, road users and safe policy and management were identified. An implementation plan was drawn up and various grant and funding opportunities were investigated and an evaluation plan was written. During 2012 plans and funding for a pedestrian crossing were approved and cattle fencing on the highway next to the community was repaired. A RoadWise Community Road Safety Project grant was submitted and a revised submission planned following feedback. Further funding applications were planned to address the many outstanding issues. There is no further information regarding implantation and evaluation of this project in the Austroad reports. Further information from the Road Safety Council Report on Activities 2012-13

([http://www.parliament.wa.gov.au/publications/taledpapers.nsf/displaypaper/3911040c770206d6afc0468a48257c30000b38b3/\\$file/tp-1040.pdf](http://www.parliament.wa.gov.au/publications/taledpapers.nsf/displaypaper/3911040c770206d6afc0468a48257c30000b38b3/$file/tp-1040.pdf))

stated that project outcomes included:

- improving and correcting signage to Main Roads standards in May 2013
- education campaigns on pedestrian safety and safe speed in October 2012 and
- improved pedestrian crossing and lighting in May 2013.

This project also resulted in the development of the document “Keeping your mob safe. A guide to making roads safer in your community” by the Road Safety Commission.

<https://www.rsc.wa.gov.au/RSC/media/Documents/Resources/Publications/safe-mob-guide.pdf>

A formal evaluation of this program was unable to be located.

A summary of the identified Australian Aboriginal road safety programs is available in Appendix 1.

#### ***4.3.1.6 International Studies***

Details of international studies, principally from the United States and Canada from 2010 onwards can be found in Appendix 2. These have been mainly concerned with increasing compliance with seat belt and child restraint usage and reducing drink driving and unlicensed driving. Many of these studies have received funding from the Centers for Disease Control and Prevention in the United States (Billie, Crump, Letourneau, & West, 2016; Piontkowski et al., 2015) and have used the evidence based interventions detailed in the Tribal Motor Vehicle Injury Prevention Best Practices Guide 2016 (Letourneau & Crump, 2016). These are described in Table 4-3. Interventions were evaluated by recording use of child restraints and seat belts and monitoring driving under the influence arrests before and after the campaigns. In many cases driving related injuries and fatalities were also monitored.

**Table 4-1 At-A-Glance Summary for What Works to Prevent MVC Injury/Death**  
(Letourneau & Crump, 2016)

**Recommended strategies to increase child safety seat use**

Strategy	Evidence
<b><u>Laws Mandating Use:</u></b> Child safety seat laws that require children riding in motor vehicles to be restrained in approved child restraints (for example, car seats and booster seats).	Strong
<b><u>Distribution and Education Programs:</u></b> Programs that provide approved child safety seats to parents and caregivers combined with an educational component.	Strong
<b><u>Community-Wide Information and Enhanced Enforcement Campaigns:</u></b> Campaigns that include mass media, information and publicity, public child safety seat displays, and other targeted strategies such as checkpoints, dedicated law enforcement officials, or alternative penalties.	Sufficient
<b><u>Incentive and Education Programs:</u></b> Programs that offer parents, caregivers, and/or children rewards for properly using child safety seats, and education that varies in content, duration, intensity and delivery methods.	Sufficient

**Recommended strategies to increase seat belt use**

Strategy	Evidence
<p><b><u>Laws Mandating Use:</u></b> Seat belt laws that require motor vehicle occupants to wear seat belts.</p>	<p>Strong</p>
<p><b><u>Primary (vs. Secondary) Enforcement Laws:</u></b> ‘Primary’ enforcement laws allow police to stop motorists because someone in the vehicle is unbelted. They are more effective than secondary enforcement laws.</p>	<p>Strong</p>
<p><b><u>Enhanced Enforcement Programs:</u></b> Enhanced enforcement conducted in addition to normal enforcement; includes publicity; and increased citations in combination with increasing the number of officers on patrol or by issuing more citations during an officer’s normal patrol.</p>	<p>Strong</p>

**Recommended strategies to reduce impaired driving (and associated crashes, injuries/deaths)**

Strategy	Evidence
<b><u>0.08% Blood Alcohol Concentration (BAC) Laws:</u></b> Laws that declare it is illegal for a driver’s BAC to reach exceed 0.08% (0.08 g/dL) for drivers aged 21 years and older.	Strong
<b><u>Maintaining Current Minimum Legal Drinking Age (MLDA) Laws:</u></b> Laws that specify an age below which the purchase or public consumption of alcoholic beverages is illegal (21 years of age).	Strong
<b><u>Publicized Sobriety Checkpoint Programs:</u></b> Programs that involve high visibility enforcement conducted by law enforcement stopping drivers systematically to assess alcohol impairment.	Strong
<b><u>Multicomponent Interventions with Community Mobilization:</u></b> Interventions that can include one or more components (for example, sobriety checkpoints, training in responsible beverage service, education and awareness-raising efforts, and limiting access to alcohol).	Strong
<b><u>Ignition Interlocks:</u></b> Devices that are installed in motor vehicles (mandated by a court system or offered as an alternative to a suspended driver’s license) to prevent operation of the vehicle by a driver who has a BAC above a specified level (usually 0.02% to 0.04%).	Strong
<b><u>Mass Media Campaigns:</u></b> Campaigns that are designed to educate individuals to avoid drinking and driving, or to prevent others from drinking and driving.	Strong
<b><u>Lower BAC Laws for Young or Inexperienced Drivers:</u></b> Laws that identify a lower illegal BAC (for example, 0.02% or lower) for young or inexperienced drivers under the age of 21 (the minimum legal drinking age in the U.S.) than for older or more experienced drivers	Sufficient

<p><b><u>School-Based Instructional Programs:</u></b> Programs that address the problem of riding with alcohol impaired drivers. There is insufficient evidence to determine the effectiveness of these programs on reducing alcohol-impaired driving by the drivers themselves.</p>	<p>Sufficient</p>
--	-------------------



## 4.4 Conclusion

The literature review highlighted a number of successful initiatives in the areas of driver licensing, child restraints and seat belts and some promising work in the area of drink driving.

Historical interventions in Western Australia have focussed on safe vehicle use (i.e., the introduction of roll cages), safe road use behaviour (e.g., banning of open load space travel; drink driving; pedestrian safety; seat belt use) and driver licensing with varying information available on scientific evaluation and program effectiveness. However, information on evidence-based strategies in indigenous populations in the United States suggests that programs including mass media campaigns, education and enhanced enforcement programs can be successful.

Western Australia was fortunate to host the Austroads funded Safe System audit of an Aboriginal community. This highlighted some of the issues present in a number of communities and the problems in obtaining funding to address the issues.

The results of alcohol restrictions and alcohol management plans in the Northern Territory and Western Australia in the late 1990's and 2000's were reported to be successful in reducing acute-alcohol related hospital admissions. Evaluation of the alcohol management plans (AMPs) implemented by the Queensland Government during 2002-2011 are less conclusive, showing that while there was a significant decline in drink driving offences, high range BAC readings remained, and there was a suggestion that the AMPs resulted in a shift in the location where alcohol was purchased and consumed.

Additional alcohol harm reduction strategies are currently being considered by Australian jurisdictions. For example the Northern Territory are currently considering a minimum unit price, also known as a "floor price" (Northern Territory Government, 2017). Minimum unit pricing involves setting a price below which it is illegal to sell alcohol. Canadian research has shown that a 10% increase in the minimum price of alcohol was effective in reducing acute alcohol attributable admissions by 8.95% (Tim Stockwell et al., 2013). It is clear that addressing the issue of drink-driving requires a strategy that addresses alcohol abuse in general. Road safety authorities will need to work together with other relevant authorities to achieve this.

## **5. Aboriginal-specific road safety initiatives: Interviews with key road safety agencies and other relevant organisations**

### **5.1 Introduction**

This section presents the findings of interviews with Australian road safety stakeholders to identify contemporary Aboriginal-specific road safety programs. The interviews were intended to supplement the published literature reviewed in Section 4 by providing an overview of current Aboriginal road safety programs and interventions that may not yet have been publicly reported.

### **5.2 Method**

A list of Stakeholders was compiled to cover Western Australia in detail and the main organisations in other Australian jurisdictions (see Appendix 4). Contact people for each organisation were identified based on current staff knowledge, internet searches and identification of Indigenous road safety researchers who attended the Australasian College of Road Safety Conference in Perth in October 2017. Ethics approval to conduct this study was requested and provided by the Curtin University Human Research Ethics Committee (Approval 2017/0611). An introductory letter was emailed to Stakeholders, explaining the study background and protocol. Stakeholders were telephoned one to two weeks following the email requesting their participation in the study. Some were interviewed at that time and in other cases, appointments were made to ring at a prearranged time or for information to be sent by email. The majority of participants were interviewed during November 2017. Participants were asked:

- a) Are you aware of any road safety interventions/initiatives occurring in your jurisdiction aimed at the Aboriginal population? If so, can you please describe the interventions/initiatives?
- b) Are you collecting any information to evaluate the success of this intervention?
- c) Is there a report available?

### **5.3 Results**

Interviews were conducted with Stakeholders in every Australian jurisdiction. Twenty-two stakeholder interviews were conducted, nine in Western Australia and 13 elsewhere. Relevant information was obtained from twenty stakeholders. The information collected

from the interviews is summarised below, brief details are given in Table 5.1 and a more detailed description of some of the initiatives is given in the following text. It should be noted that initiatives may either be specifically be targeted at the Aboriginal population or towards disadvantaged groups of the population in which the Aboriginal population often predominate. In some cases, programs are targeted at the whole population, but may be tailored towards the Aboriginal population if the audience is predominantly Aboriginal, (eg some school programs in remote areas).

The range of initiatives fall into the following categories:

- Education
- Media and advertising campaigns
- Community and Stakeholder engagement to better understand the needs of Aboriginal people
- Driver education and Licensing programs
- Alcohol interlock schemes
- Public transport
- Community Road Safety Grants
- Collection and analysis of Aboriginal crash data
- Review of research literature

Brief information regarding some of the schemes is given below with more detailed information in the following section.

**Table 5-1 Road Safety Initiatives of relevance to the Aboriginal population in Australia**

Education	<ul style="list-style-type: none"> <li>• Road safety education for pre-schoolers, school-age children and young people,</li> <li>• Promotion of road safety at community events</li> <li>• Education regarding the correct fitting of child restraints and in many cases subsidised or reduced price child restraints.</li> <li>• Basic literacy programs to provide people with skills to pass the driving test.</li> </ul>
-----------	--

	<ul style="list-style-type: none"> <li>• Production of plain language documents and appropriate educational materials for the driver licensing test</li> <li>• Modernising the driving test platform and associated materials. Determining the best technology to suit the needs of Aboriginal people.</li> <li>• Residential programs for Aboriginal youth from remote areas with a program that includes road safety.</li> </ul> <p><a href="https://www.afInt.com.au/mllic-remote-projects/afInt-remote-projects">https://www.afInt.com.au/mllic-remote-projects/afInt-remote-projects</a></p>
Media and advertising campaigns	<ul style="list-style-type: none"> <li>• The Northern Territory and Western Australia have developed Aboriginal specific material. WA advertises targeted drink driving and in the NT, drink driving, seat belts and child restraints.</li> <li>• A further example was the Aboriginal written and performed play: Muttacar sorry business – which addressed key road safety issues such as drink driving, speeding and overcrowding.</li> </ul>
Community and Stakeholder engagement	<ul style="list-style-type: none"> <li>• Consultation with Aboriginal people regarding specific road safety related initiatives, eg sealing of the Dampier Peninsula road in Western Australia.</li> <li>▪ Consulting regarding development of the NSW Aboriginal road safety strategy</li> <li>• Road Safety teams having a presence in regions and work closely with communities.</li> <li>• Road safety engagement team includes Aboriginal staff.</li> </ul>

<p>Driver education and Licensing programs</p>	<ul style="list-style-type: none"> <li>• Road safety and driver training programs aimed at helping people get their driving licence. These are provided in schools, to community groups, to young people in State-based care, in Juvenile Justice facilities and in prisons. Eg ‘Keys for Life’ in Western Australia, Road Smart in Victoria and Safer Driver Program in NSW.</li> </ul> <p>Some States also have learner driver mentoring programs, eg VicRoads L2P. These are subsidised programs to provide log book hours for the driving test.</p> <ul style="list-style-type: none"> <li>• Remote area licensing programs which include help with providing the identifying information required for a driving licence, payment of fines, driver education and in some cases practical tuition.</li> <li>• Aboriginal Driver Training and Education Program</li> </ul> <p>The Aboriginal Justice Program was allocated Royalties for Regions funding for the Aboriginal Driver Training and Education (ADTE) program over five years, starting in 2012/13. The funding has been used to establish a targeted scheme aimed at assisting Aboriginal people, particularly young people, in the criminal justice system in regional and remote communities to support the provision of access to driver training and culturally appropriate education services for obtaining, regaining and retaining motor driver’s licenses.</p>
<p>Alcohol interlock schemes</p>	<ul style="list-style-type: none"> <li>• NSW has a scheme to provide alcohol interlocks at a discount or free to disadvantaged people who are not allowed to drive without them. Aboriginal people are frequently included in this disadvantaged group.</li> </ul>

	<ul style="list-style-type: none"> <li>• South Australia is considering a scheme whereby exemptions could be negotiated for remote Aboriginal people due to the high cost of participating in the scheme in terms of equipment and servicing.</li> </ul>
Public transport	<ul style="list-style-type: none"> <li>• Provision of remote area bus services - commercial services with some government funding to support trial routes.</li> <li>• Provision of bus and taxi transportation for communities to attend funerals and other significant social and cultural events.</li> </ul>
Community Road Safety Grants	<ul style="list-style-type: none"> <li>• These can be used to fund a variety of activities. An example is the driver mentor program.</li> </ul>
Collection and analysis of Aboriginal crash data	<ul style="list-style-type: none"> <li>• To better understand the risk profile of Aboriginal people</li> </ul>
Review of research literature	<ul style="list-style-type: none"> <li>• To identify effective road safety programs targeted towards the Aboriginal population.</li> </ul>

**5.4 Details of Current road safety initiatives of relevance to the Aboriginal population in Australia**

**5.4.1 Education**

As part of the RSC’s promotion of Safe Vehicles, it has developed *A Consumer Guide to Safer Vehicles – Suitable for Remote and Regional Western Australia*. The Guide does not specifically address vehicles for use by Aboriginals. See: <https://www.rsc.wa.gov.au/News-Media/News-Archive/2016/A-Consumer-Guide-to-Safer-Vehicles>.

In addition, through Road Trauma Trust Account funding, the RSC continues to support the delivery of the RPH Preventing Alcohol and Risk Related Trauma in Youth (PARTY program) which includes outreach programs to regional communities, Aboriginal Youth and planned health expo

<http://www.rph.wa.gov.au/Our-services/Service-Directory/PARTY-Program>

### **School Drug Education and Road Aware Program (SDERA)**

SDERA run the *Keys for Life* program for those aged 15 years+. This allows young people to sit for their learners permit at school or in other locations such as in workplace training, juvenile justice and re-engagement centres. They also coordinate a road safety program for children aged 4+. SDERA train teachers to present road safety programs and provides resources suitable for children of different age ranges.

SDERA's programs do not specifically focus on Aboriginal people but are available across the whole State and can be tailored to particular populations.

**WALGA Roadwise Kimberley region** – competition for children to design seat belts, though not an Aboriginal specific program it will have some reach to reach this target group. Joint WALGA RoadWise and School Drug Education and Road Aware (SDERA) project which aims to generate awareness of the importance of wearing a seatbelt and raise awareness of the impact not wearing a seatbelt will have on other people (i.e. friends and family) in the event of a crash. More than 250 students from across the Kimberley took part in the 2017.

**New South Wales Programs-** these are run through NSW Roads and Maritime Services (RMS) and the Centre for Road Safety (CRS).

Road Safety Education Consultants - Facilitate activities with teachers in public and independent schools.

Early childhood road safety education -Facilitate road safety activities for pre-schoolers – run from Macquarie University

Literacy for Life program (not for profit) -Run programs in far west NSW in basic literacy that has been sufficient for some people to obtain a license.

Child restraint program - Engaged with Aboriginal community controlled health services to deliver the child restraint program to communities in rural and remote locations. This involved provision of child restraints, proper fitting of restraints and safer driving policies.

Bicycle Safety Programs - Programs to target bike safety and to provide bike helmets and allow exchange of bike helmets. Parents are involved in the program so it is not seen as a baby sitting service. Families may be engaged through community events.

NSW Resource Hub - Trailer that can be taken to community events. This includes a breathalyser, TV screen and ipads – (where young people can practice their driver licensing theory) and allows promotion of road safety at community events.

NSW have a lot of communication and campaign material targeting Aboriginal people. Priorities emerging indicate that community engagement and capacity building are extremely important. Communities need to be engaged and proactive. The NSW RMS team have a presence in every region and work closely with communities.

RMS have also worked with Family and Community Services to improve licensing rates for those who have been in State-based care, a high proportion of whom are Aboriginal. This has included concessions being made available for licenses etc.

Work is also being done on modernising the driver testing platform and associated materials such as hazard perception and driver knowledge.

A plain English version of the road user handbook has been produced : Get legal, get license, get work. All resources are being digitised.

In addition, work is being undertaken to find out which technology Aboriginal people use, what are the barriers in remote areas and what can be done to provide for their needs.

The NSW road safety engagement team includes two Aboriginal positions and the Licensing and Policy Unit includes 1 dedicated Aboriginal position.

### **Child Restraints - Buckle Up Borroloola (Northern Territory)**

Buckle up Borroloola was a pilot program to see if a concerted effort in one largely Aboriginal community could make a difference to people's behaviours when it comes to keeping children safe in cars. The program was a joint initiative of MACC, McArthur River



Mine (MRM) and Mabunji Aboriginal Resource Aboriginal Corporation, with support from Kidsafe NT and Northern Territory Police. <http://www.ntmacc.com.au/buckle-up-borroloola>

The pilot program was funded by MACC. They identified key stakeholders, held a workshop to organise the program and develop a communication strategy. A launch event was held followed by open days to fit the restraints. Nine fitters were originally trained but this didn't work as the people weren't available when required. Therefore, Kidsafe people were flown in for the open days. Considerable transportation logistics were associated with getting the equipment and staff into communities. A key lesson learned was of the importance of working with the right people and keeping stakeholders to a minimum to prevent the organisation becoming too complicated. A further lesson was that it is best to distribute the seats first and then fit them. A new program aims to distribute and fit 1000 seats. This has involved employing a full-time person.

The need for child restraints had been recognised by the Police, Department of Transport and other agencies. Attitudes and behaviours towards road safety indicate that it has a low priority compared to other issues such as literacy, domestic violence and youth suicide.

#### **5.4.2 Media and advertising campaigns**

The Road Safety Commission in WA engages with the Aboriginal community through monthly appearances on Noongar Radio and is seeking to establish a regular timeslot on Goolarri Radio. In addition, as part of the 2017/18 Road Safety campaign, the RSC have recently launched a series of drink driving ads that are currently running on Goolarri TV. These were developed in partnership between the RSC and Goolarri media.

See: <https://youtu.be/NTiLWfiBHRs> and <https://youtu.be/h8Kg5vdszIU>

**Northern Territory Road Safety Campaigns** <http://www.ntmacc.com.au/road-safety>

These include drink driving, seat belt and child restraint campaigns.

The Aboriginal campaign includes 6 X 1 minute stories. Stories are expressed in the artwork and have been broadcast on TV, youtube and social media. Police also use them when meeting with communities. Campaign materials include vinyl banners which can be displayed in communities and tin cups.

The material has been produced in English as well as 6 key languages. The seat belt campaign lasts 30 seconds but there are three different commercials distributed in seven different languages which requires a lot of media spots and thus a large budget.

### **5.4.3 Community and stakeholder engagement**

As part of the RSC's exploration of regional and remote road safety, it continues to engage and consult with key stakeholders and community to better understand the needs of Aboriginal people. For example, recent visits by the RSC to the Dampier Peninsula as part of the Aboriginal Justice Program open days. In addition, the RSC continues to engage with agencies such as the Department of Justice and Department of Transport to explore opportunities to overcome disadvantage in Aboriginal communities in regards to licensing, and also engaging with the Department of Communities in relation to access roads to remote communities.

The RSC is also a member of the Austroads Safety Taskforce who is responsible for leading the *National Road Safety Action Plan 2018-2020*. The action plan includes a specific focus on regional and remote road trauma, calling to action the development of a national regional/remote action plan. WA (the RSC) will be one of the lead jurisdictions in developing this plan along with the Northern Territory and Queensland.

The RSC funds the Road Trauma Support Service through Road Trauma Trust Account funding. This service provides counselling to victims of road trauma and has increased their focus on delivering this program to Aboriginal people. The link to their website is <https://injurymatters.org.au/our-programs/>

**The Centre for Road Safety (CRS) New South Wales** are responsible for developing policy and strategy in support of road safety. A new road safety strategy is currently being developed, including an Aboriginal specific strategy. This involved a workshop with stakeholders and community representatives. The program is implemented by George Shearer's team at NSW Roads and Maritime Services. The CRS has a behavioural program targeting high risk areas such as child restraints, seatbelts and drink driving for Aboriginal people. An action plan was produced three years ago which brought together stakeholders to address the needs of Aboriginal people eg licensing. This plan finished in December 2017 and a new plan has been developed which will continue to address outstanding issues.

#### **5.4.4 Driver education and Licensing programs**

##### **Driver Licensing - NSW Roads & Maritime Services (NSW RMS)**

The NSW RMS team targets driver license access for disadvantaged Aboriginal people and other disadvantaged people. The scheme has been running for three years. They work with 18 different providers to provide programs to help people get a license. This includes the documentation necessary for the license application and dealing with fines that are automatically linked to driver licensing issues.

The team also engage contractors to deliver programs aimed at people getting their learner and provisional licenses. This can include supervisor drivers who may be volunteers or people provided through the contractor. The contractors have targets to achieve in terms of the number of licenses issued.

##### **Safer Driver Program (SDP)**

The Safer Driver Course is for younger drivers aged 17-25 years who are moving from their Ls to Ps. The first 6 months of driving solo represents the highest crash risk for young drivers. The course provides 1000 free places to help those from disadvantaged backgrounds. The course is designed to help people understand more about speed management, gap selection, hazard awareness and safe following distances, which parents, supervising drivers or professional driving lessons may not have covered. The course includes a bonus of 20 hours of log book credit once completed. Participation data indicate that around 30% of learner drivers have done this course and that 20% of those who did the course nominated that they were Aboriginal.

##### **L2P learner driver mentor program**

The VicRoads L2P - Learner Driver Mentor Program assists learners under 21 years of age, who do not have access to a supervising driver or vehicle, to gain the driving experience required to apply for a probationary license.

Young people are matched with fully licensed volunteer mentors and have access to a sponsored vehicle, which they can use to get supervised driving experience. L2P is free for eligible young people and is funded by the Transport Accident Commission.

<https://www.vicroads.vic.gov.au/licenses/your-ps/get-your-ps/preparing-for-your-license-test/l2p-learner-driver-mentor-program>

## **Road Smart program**

Road Smart is a new road safety education and training program for Year 10 students.

The program is part of the Victorian Government's Young Driver Safety Package and aims to build the knowledge, skills and behaviours for safe driving among young people.

Road Smart aims to have 100% coverage.

<https://www.vicroads.vic.gov.au/safety-and-road-rules/road-safety-education/secondary-schools/practical-safe-driving>

## **Tasmania**

Programs are designed to target disadvantage as opposed to Aboriginality. The learner driver mentor program is aimed at people who don't have access to a vehicle to drive or a driver to supervise them and who are defined as disadvantaged, generally based on Centrelink payments. Sixteen programs around the State including two specifically targeting migrants. Program on the NW Coast run by the Circular Head Aboriginal Corporation – still targets Aboriginal and non-Aboriginal people. There is also a Learner License Assist Program which helps people with literacy difficulties to take driving license theory test.

## **Remote Area Licensing programs**

### **Western Australian Department of Transport – Driver & Vehicle Licensing Services**

The Department of transport (DoT) operate a remote area licensing unit which has a primary focus on Aboriginal communities but also on other communities. They also service some town based communities such as Roebourne where there is no driver licensing centre. They operate in the Kimberley, Pilbara, Gascoyne, Mid West, Goldfields and Esperance areas providing a comparable level of service to a regional office. They have 4 teams that reach around 70 locations per year.

They may engage organisations to do theory testing which can be either written or oral. Most of these organisations also provide a driver education program and pre-employment programs which help people to get job ready, which includes getting a driving license.

The remote services team (and in some places the police) operate a "Safe driving course" which is available to those aged 25 and over who are applying for a driving license. This is a theory based course which is used as an alternative to log book hours in remote communities, as most people aged 25 and over will have sufficient driving experience. The course covers topics such

as driving to conditions, seat belts and restraints and effect of alcohol on driving. This takes approximately 2 hours and includes an assessment.

DoT are working on a trial to verify birth details with the Registrar of Births, Deaths & Marriages (RBDM) and work closely with the Fines enforcement registry to look at methods of lifting driving license suspension, for example payment plans. DoT are on a working group with the Department of Justice (DoJ) regarding their Open days and the priority areas for open days. DoT provide tally sheets to DoJ with their statistics from the open days which include trends over time, areas of demand, issues on the date. They find the open days work better when other agencies are present, particularly RBDM and Fines enforcement.

**Excerpt from DoT Annual Report 2016/17 (Page 26)**

<https://www.transport.wa.gov.au/annualreport/annual-report-home.asp>

*Licensing services delivered in remote areas*

DoT recognises the importance of a valid driver's license for people living in remote Western Australia, particularly in Aboriginal communities. Barriers to obtaining and retaining a license have negative impacts on individuals, their communities and the State as a whole. These include the over-representation of Aboriginal people in the justice system and road trauma as well as the inability to access employment and access essential services.

This year, DoT continued to address this issue and make a difference to individuals and communities across the State through its Remote Areas Licensing Program.

DoT teams made approximately 180 visits to more than 65 locations across the Kimberley, Pilbara, MidWest, Goldfields and Gascoyne regions. They delivered mobile licensing services to local residents and provided them with practical solutions to assist them in obtaining and retaining a license.

In 2016-17, the teams:

- issued, re-issued, transferred or renewed a total of 232 driver's licenses;
- delivered 238 theory tests for learner's permits including 37 oral theory tests for customers with different needs;
- issued 356 learner's permits;
- conducted 258 practical driving assessments;

- issued 109 log books; and
- delivered the interactive Safe Driving Course 66 times as an alternative to log book hours.

At 30 June 2017, 66 per cent of customers issued a driver's license through the remote service held an active license, which clearly indicates the success of the program.

The Remote Areas Licensing Program regularly receives positive feedback from customers and is a very tangible way that DoT is helping to close the gap on Aboriginal disadvantage and improve remote service provision.

DoT also continued to strengthen partnerships with Aboriginal corporations, private industry and not for profit organisations that deliver learner's permit theory testing on DoT's behalf. This year marked nine years since DoT signed an agreement with Fortescue Metals Group to provide this service as part of their pre-employment program. Given the success of the long-term partnership, in June 2017 this agreement was extended for three years.

Collaboration with other State Government agencies remained a key success factor of the program and in 2016-17 DoT continued its strong presence at the Community Open Days which are facilitated by the Department of Justice.

## **Department of Justice, Western Australia**

### **Aboriginal Justice Program**

The Aboriginal Justice Program was allocated Royalties for Regions funding for the Aboriginal Driver Training and Education (ADTE) program over five years, starting in 2012/13. The funding has been used to establish a targeted scheme aimed at assisting Aboriginal people, particularly young people, in the criminal justice system in regional and remote communities to support the provision of access to driver training and culturally appropriate education services for obtaining, regaining and retaining motor driver's licenses.

Services provided under the program include driving instruction, driver education and assistance with administrative and testing procedures to obtain, or regain a driver's license. The program also recruits and trains local community members to become qualified driving instructors. The funding provides for clients to be referred to service providers by a range of justice-related agencies including prison/work camps, WA Police, Corrective Services, Adult



The IDLU work in close cooperation with agencies, organisations and private groups in order to achieve positive licensing outcomes for disadvantaged members of the community.

For example:

**Lotus Glen Correction Facility (LGCF) – Licensing Trial.** The services provides inmates with the identification and licensing products that are essential to a successful transition back into the community following their release from custody.

**Job Network Agencies (JNA).** The support of local JNA is fundamental to the success of IDLU activities. Organisations such as My Pathways and Job Futures, not only refer their clients to the IDLU and promote upcoming visits to the broader community, but also assist in ensuring correct paperwork and associated requirements have been completed either prior the IDLU's arrival or during the course of their visit. JNA often provide the location at which the IDLU sets up and JNA staff frequently lend a hand to the IDLU to organise customers during daily business operations.

JNA provide the IDLU with a reliable and influential connection to individual communities. The IDLU is working to improve communication with JNA in order to increase the proactive engagement of local people with the aims of the Indigenous Driver Licensing program.

### **Births, Deaths and Marriages (BDM)**

The IDLU relies heavily on the services of BDM to ensure the products issues in community are compliant with required identification standards. BDM regularly accompany IDLU on remote community visits. The BDM confirm registered birth details and issue birth certificates to community members and provide culturally respectful information regarding the importance of consistent identification.

The coordinated services of BDM and the IDLU have provided the opportunity for increased registration of births and issue of compliant license and identification products in remote Indigenous communities. The potential for other government agencies to engage with coordinated service visits is being explored.

### **Department of Aboriginal and Torres Strait Islander Partnerships (DATSIP)**

DATSIP provides the IDLU with strong support and ongoing assistance in engaging with remote Indigenous communities. IDLU is working to develop a proactive relationship with



DATSIP, further expanding their involvement and influence in licensing and road safety initiatives.

In October 2017, IDLU supported DATSIP to conduct licensing awareness and education activities in Doomadgee. IDLU provided DATSIP with resources aimed at increasing awareness and familiarity with road rules, test scenarios and driver licensing requirements.

Many people living in remote communities are unsure of what a license test involves and what might be required of them. In some instances this causes a level of anxiety and or confusion that causes the person to fail their test, or may even stop them from taking the test. There is then the possibility that the individual will decide to drive unlicensed – leading to further serious social and personal consequences.

DATSIP aimed to increase participation and successful outcomes for community members, by preparing individuals for the requirements of licence testing. Over the weeks leading up to IDLU’s November 2017 servicing visit, DATSIP conducted ‘practice learner licence’ testing sessions and shared information about practical driving test requirements with the community. Individuals were also assisted to collect necessary documentation required for their driver license applications.

IDLU and DATSIP are now working together at a local level to develop a number of education materials that will assist community members prepare for IDLU visits and their driver license tests.

It is hoped that the partnership between IDLU and DATSIP will continue to develop towards supporting the initiation and ongoing operation of sustainable community-led licensing and road safety activity across remote northern Queensland.

### **Northern Territory**

Main focus is the Driver licensing program – DriveSafe NT Remote (Cullen, Chevalier, et al., 2016; The George Institute for Global Health, 2014). This program is an initiative of the Northern Territory Government, funded by the former National Road Safety Council (with funding administered by the Australian Government Department of Infrastructure and Transport), Territory Insurance Office (TIO), the Australian Government Department of

Families, Housing, Community Services and Indigenous Affairs (FAHCSIA) and the NT Government's Department of Transport. The DriveSafe NT Remote Program was initially a two year trial program commissioned by the Northern Territory Government to improve driver knowledge around safe road use and to reduce the rates of unlicensed driving in rural and remote Aboriginal communities in the Northern Territory. The program has been evaluated by the George Institute for Global Health and a comprehensive report is available (The George Institute for Global Health, 2014).

### **South Australia**

**On the right track remote** – Aboriginal driver licensing program.

<http://www.dpti.sa.gov.au/ontherighttrack/remote>

**Teach em right** – program to encourage people with full license to supervise learner drivers.

[http://www.dpti.sa.gov.au/ontherighttrack/resources/teachem\\_right](http://www.dpti.sa.gov.au/ontherighttrack/resources/teachem_right)

Programs are designed to encourage behavioural change on the basis of “care for your community” and “love your family”. Many of the programs are run by non-government partners, eg program to help fund and fit child restraints.

#### **5.4.5 Alcohol interlock schemes**

**The Alcohol Interlock Scheme** in South Australia (**MAIS**) is mandatory for drivers disqualified from driving following a serious drink driving offence. The driver must re-apply for a license and fit an alcohol interlock breath-testing device to their vehicle before they can resume driving. The driver is responsible for all costs associated with the installation, rental, servicing and removal of the alcohol interlock device.

For Aboriginal people subject to a MAIS who live in the APY Lands or MT Lands the closest service centres are Port Augusta and Whyalla, involving a return journey of 24 to 30 hours, depending on which community a person resides in. For a person subject to a MAIS for 12 months the costs are approximately \$2,500. A MAIS may be required to be fitted for up to three years. The device requires regular servicing in addition to installation and removal.

In Queensland exemptions from the MAIS are available to people whose principal place of residence is outside a 150km radius from the nearest interlock installer's place of business.

Exemptions are also available in some circumstances of severe hardship where no other means or mode of transport is reasonably available.

A similar scheme is proposed in South Australia. The exemption scheme will need to manage the risk associated with drink driving, have the endorsement of Aboriginal communities and other relevant service providers, and offer a pragmatic and enforceable solution.

The scheme proposed involves at least two measures to mitigate risk:

A letter provided by a doctor from a local health service stating that the person is not alcohol dependent; and

A pledge to the APY Executive that the person will not drive after consuming alcohol.

**NSW Mandatory alcohol interlock program** - These can be provided at a discount or for free to disadvantaged people who are not allowed to drive without them. Aboriginal people are frequently included in this disadvantaged group.

#### **5.4.6 Public transport**

Northern Territory Remote area bus services. Three trials – Tiwi islands, Central Region and Top End. Run by Bodhibus (Catherine) and Centre Bush Bus (Alice Springs). Services are fully commercial. Government provides approx. \$800,000 per year which supports a couple of trial routes.

<https://www.centrebushbus.com.au/>

<http://www.thebodhibus.com.au/>

#### **5.4.7 Collection and analysis of Aboriginal crash data**

NSW have a comprehensive crash data linkage system and thus have an evidence base from which to identify Aboriginal road trauma (Centre for Road Safety, 2017). Crash reports are linked with four datasets including the Admitted Patient Data Collection (APCD), Emergency Department Data Collection (EDDC), the State Insurance Regulatory Authority (SIRA) Compulsory Third Party (CTP) Insurance and the iCare (Insurance & Care NSW) (Lifetime

Care)(LTC). Aboriginal status is determined from these linked records. NSW are the only State to have published an up-to-date analysis of Aboriginal road trauma based on linked data. A similar analysis is possible in Western Australia.

## **5.5 Conclusion**

Agencies with road safety responsibilities across the jurisdictions are running a variety of programs to address Aboriginal road safety with varying levels of evaluation. In some cases the focus is on those who are disadvantaged or on low income rather than the Aboriginal population per se. Most jurisdictions have programs to address road safety education, particularly for young drivers. There are also fairly extensive programs to address Aboriginal driver licensing but conversely very little data on Aboriginal driver licensing rates. Programs to fit child restraints were mentioned by a number of jurisdictions, but Aboriginal specific advertising campaigns, programs to address public transport issues and programs to support the use of alcohol interlocks were less common. The collection and analysis of Aboriginal crash data was mentioned by NSW and WA, although we are aware of work in the Northern Territory as well. Availability of good quality crash and licensing data would facilitate the evaluation of many of these projects.

Comparison of the table of risk factors identified in Chapter 3 (Table 3.1 Page 30) with programs being run by Stakeholders identified gaps in addressing issues such as road conditions, vehicle safety, alcohol and drug misuse, particularly in people convicted of traffic related alcohol and drug offences and in monitoring and enforcing the use of protective equipment such as seat belts, bike and motorbike helmets and child restraints. This is likely because these programs would not be specific to the Aboriginal population. A further round of interviews with agencies such as the Mental Health Commission (drugs and alcohol), Department of Justice, the Police and Main Roads needs to be conducted to establish what is being done in these areas.

New South Wales, the State with the largest Aboriginal population, demonstrates a comprehensive approach to Aboriginal road safety supported by collaboration between NSW Roads and Maritime Services, the Centre for Road Safety and the George Institute. Their approach is consolidated within a three year action plan. The 2014-2017 action plan was followed by an extensive consultation and review process with relevant Stakeholders to produce the 2018-2020 action plan. This facilitates the process of reviewing progress and accountability

and ensuring that the program is meeting current needs. Some of the more comprehensive evaluation work has been completed on these programs and those in other states by the George Institute, highlighting the benefit of government and academic partnerships.

## **6. Interviews with Aboriginal people to identify road safety issues**

### **6.1 Introduction**

In this section we present some initial work on the views of Aboriginal people regarding road safety issues. Further phases of the study will include more extensive consultation with Aboriginal people from various regions across the State.

### **6.2 Method**

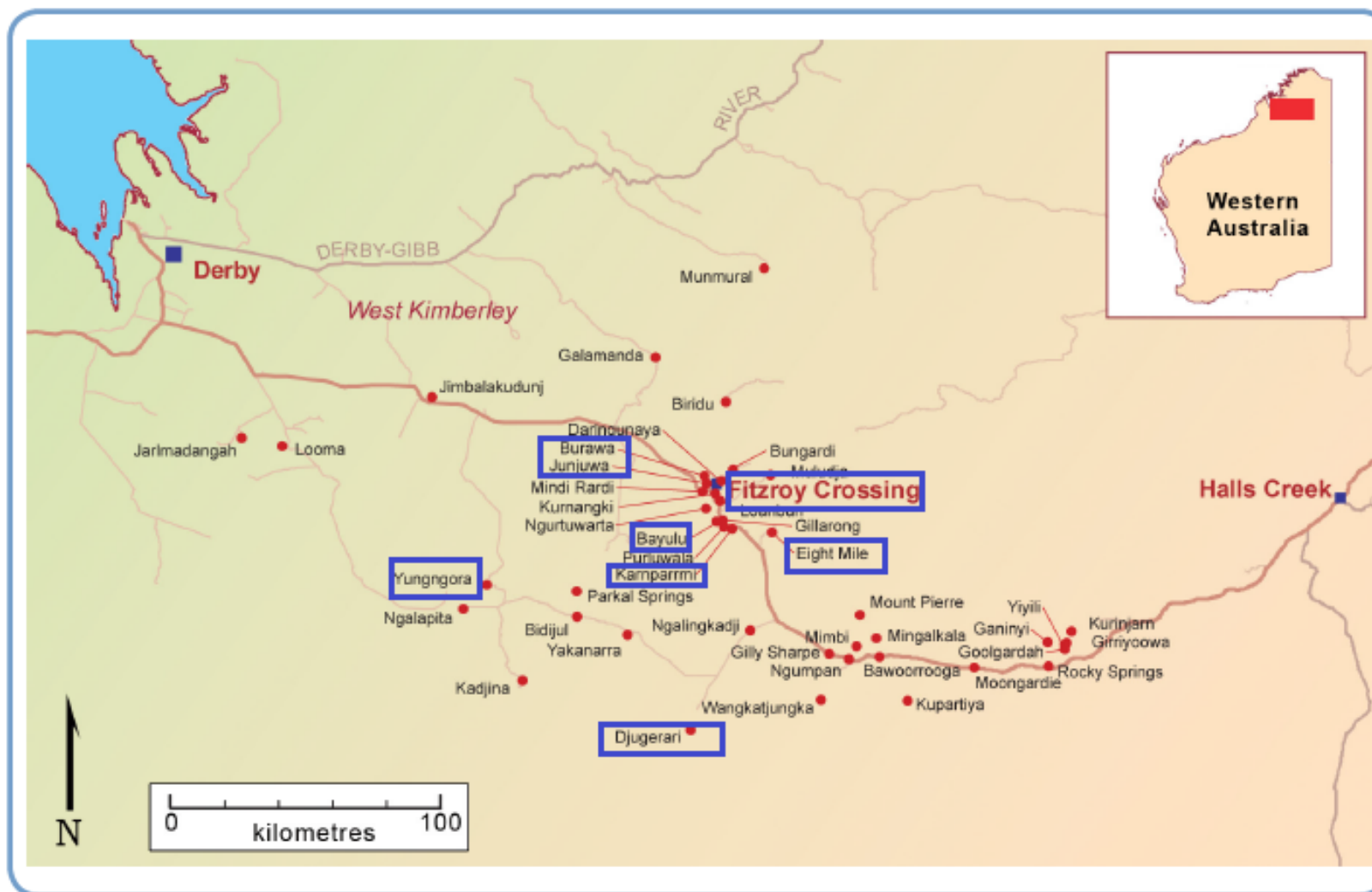
We approached a number of Aboriginal organisations and communities by phone/email inviting them to participate in this study. We were able to connect with Fitzroy Valley Futures (FVF) who have a memorandum of understanding with Curtin University to conduct research. A member of staff from the BankWest Curtin Economics Centre was already conducting research with FVF and was happy to provide an introduction. A research plan was negotiated with FVF and once approved by their governing committee, ethics approval was sought and granted by Curtin University Human Research Ethics Committee (Approval 2017/0736).

The Fitzroy Valley is about 2600 km from Perth, in the Kimberley Region (Figure 6-1). A 2009 population survey found that the Aboriginal population was around 3000 and there are approximately 37 communities, the largest of which have populations of around 300 people whereas the smallest may have 10 people or less who are not permanently there (Morphy, 2010). The non-Aboriginal population for the statistical area of Derby-West Kimberley represents 45% of the total population and thus the non-Aboriginal population of the Fitzroy Valley is likely to be around 2500 people (ABS, 2013).

Interviews with Aboriginal people resident in the Fitzroy Crossing area were conducted by Dr Kate Brameld, together with a community navigator, Ms Erica Sykes, from FVF. The role of the community navigator was to identify interviewees for the study and to ensure that community protocols and traditions were adhered to during the course of the research. The age group, gender and community of residence of each interviewee was recorded and then interviewees were asked the following questions:

1. What do you think the main road safety risk factors are in this area?
2. Has anything been done to address these issues?
3. What do you think should be done to address these issues?

Figure 6-1 Map of the Fitzroy Valley communities, highlighting the communities represented in the survey



**Note:** This map is adapted from an original produced by the Western Australia Department of Indigenous Affairs in 2009. The following surveyed communities have been added: Gogo station, Kurinjarn, Loanbun, Parkal Springs and Purluwala.

**Table 6-1 Most Common Road Safety Issues identified by Aboriginal people in the Fitzroy Valley**

Most commonly reported problems	Current solutions	Potential solutions
Alcohol and drugs (10)	Alcohol restrictions  Random breath testing	Relax alcohol restrictions to combat “sly grogging”  Education regarding drugs and alcohol  Police enforcement  Advertising regarding dangers of drink driving
Condition of roads (9)	Some road maintenance is being undertaken	Shire to maintain all roads  Roads to be sealed  Grading to occur before the wet season
Licensing (7)	Some driver education provided but the instructor left. Currently advertising for a new instructor.	Need more community based driver training and the remote licensing unit to come more often.



	<p>Remote Licensing Unit has improved services.</p> <p>Department of Transport are available once a week for vehicle and license registration.</p>	
Lack of street lighting (6)	<p>Solar lights put on pub road towards Crossing Inn.</p> <p>Orange street lights on the main highway.</p>	More street lighting around town
Stray cattle (6)	-	<p>Improve/repair fencing</p> <p>Accountability by pastoralists</p> <p>Phone number or website to register stray cattle</p> <p>Shoot cattle if not removed within 2 days</p> <p>Removal of dead animals</p>
Speeding (4)	Speed cameras used occasionally, particularly for big events	Greater levels of speed enforcement including impounding cars.

		<p>Use of safe speeding signs – ones that flash when you're doing the right speed.</p> <p>Need speed bumps to get people to slow down</p>
--	--	---

## **6.3 Results**

Interviews were conducted with 14 participants during November 2017. The participants represented eight different communities (including the town site of Fitzroy Crossing) which are marked in Figure 6.1. There were ten males and four females. Nine participants were in the age group 45-70 years and five in the age group 18-44 years.

### **6.3.1 Issues**

A summary of the issues raised in the interviews are detailed Table 6-2, together with then number of times that they were mentioned by different participants, solutions that have already been implemented and suggested solutions for future use. The key issues identified were alcohol and drugs (10 mentions), road maintenance (9 mentions), licensing and driver training (7 mentions), lighting, cattle on the roads (6 mentions each) and speeding. Detailed interview information is given in Appendix 4.

## **6.4 Conclusion**

This initial study into the road safety concerns of Aboriginal people from the Fitzroy Crossing area has identified the issues of drink driving, road maintenance, lighting, licensing and driver training, cattle on the roads and speeding as being their major concerns. Surprisingly few people mentioned the condition of vehicles. A previous study involving interviews with Chairpersons of communities in the Fitzroy Valley about road safety problems also reported the condition of roads followed by flooding and dust to be a major concern (Cercarelli et al., 2000). Young drivers, alcohol and speeding were also mentioned in this study.

The solutions recommended by community members to address the most common community concerns are also shown in Table 6-2. These included improved maintenance of roads by the Shire, improved street lighting, more education about road safety issues, greater levels of police enforcement regarding speeding and drink driving, speed reduction measures such as speed humps and flashing signs and regular maintenance of fencing to keep cattle off the highway. Road safety education, media campaigns and police enforcement are recommended strategies to address drink driving and speeding. A road safety audit, similar to that conducted in Bidyadanga may be appropriate to address issues such as road maintenance, speeding and cattle on the highway.

## **7. Summary and recommendations regarding the road safety needs of WA's Aboriginal population.**

The results of the study indicate that Western Australia should look at developing an Aboriginal Road Safety Action Plan to address the issues highlighted in this report. As many of the issues affecting road safety result from the specific socioeconomic and cultural issues relevant to the Aboriginal population, the action plan will require collaboration with a range of stakeholders who are working towards improving their health and wellbeing.

### **7.1 The incidence, trend and risk factors for Aboriginal road crashes and injury**

The current evidence suggests that the rate of traffic injury in the Aboriginal population is higher in Western Australia than in Australia by a factor of 2.1 for fatal injuries and 1.4 for serious injuries. Injury rates were higher in the Aboriginal population compared to the non-Aboriginal population by a factor of 4.1 for fatal injuries and 1.6 for serious injuries.

The data consistently show higher rates of fatal and serious injuries in the male Aboriginal population compared to the female Aboriginal population. In 2016, national data showed that fatal injuries were 3.4 times higher in males and serious injuries were 2.2 times higher in males.

The highest fatality rate is seen in Aboriginal males aged 30-34 years but rates are elevated from the 15-19 year age group up until the 45-49 year age group. This compares to non-Aboriginal males where the highest fatality rate was in the 20-24 years age group. For Aboriginal females the fatal injury rate increased in the 15-29 year age groups and was highest for age groups from 30-49 years.

The rate of fatal and serious injuries in the Aboriginal population is highest in the remote and very remote areas compared to the metropolitan area. (The fatal injury rate was 50 per 100,000 in remote areas, 48 per 100,000 in very remote areas and 10 per 100,000 in the major cities. The serious injury rate was 453 per 100,000 in remote areas, 432 per 100,000 in very remote areas and 216 per 100,000 in the major cities.) For the non-Aboriginal population, fatal injuries are also highest in remote and very remote areas (22 and 25 per 100,000 respectively compared to 6 per 100,000 in the major cities). Serious

injuries are also highest in very remote areas (667 per 100,000 compared to 196 per 100,000 in the major cities).

Aboriginal males and females have a higher risk of fatal and serious injury as a car occupants or pedestrians, the highest increased risk of fatal injury being as a car passenger where it is 5.8 times higher than in the non-Aboriginal population. Aboriginal pedestrians are 2.8 times more likely than non-Aboriginal pedestrians to be seriously injured and there is a similar increased risk for those injured while boarding or alighting from a vehicle or on the outside of the vehicle. Fatal injuries to car occupants in the Aboriginal population are most likely to result from collisions with fixed or stationary objects (45% of injuries) and non-collision crashes (34% of injuries) whereas the non-Aboriginal population are most likely to have a non-collision crash (44%) or collision with another motor vehicle (41%).

The report identified the following risk factors for the increased rate of road injury in the Aboriginal population:

- Safe Vehicles – lack of access to safe vehicles, car maintenance, overcrowded, defective and old vehicles.
- Safe Roads and Roadsides – unsealed roads and increased use of rural and remote roads which are associated with higher crash rates.
- Safe road use – people in the following categories had higher crash rates: males, age groups 10-49 years, car occupants and pedestrians, no driving license, no seatbelt or helmet, low socioeconomic status, fatigue, alcohol, distraction, males in remote areas and kinship obligations.
- Safe speeds – unsuitable speeds for road conditions.

It is clear from the review of data and risk factors that a detailed analysis of WA specific crash data for the Aboriginal and non-Aboriginal population is required. Analysis of WA linked crash, emergency, hospital and death data will go a long way to addressing this concern. A further requirement is to be able to identify Aboriginal status on crashes not resulting in Emergency department presentations, hospital admissions or death. Aboriginal status could be made available from driver licensing data, as it is now collected on the driving license application form. To achieve maximum population coverage, it

would also be necessary to collect Aboriginal status on driving licence renewals. Other possibilities include that police attending crashes be required to collect the Aboriginal status of those involved or that drivers and riders nominate their Aboriginal status when completing an online crash report.

Detailed analysis of the linked crash data may highlight some issues with regards collection of risk factor data such as whether risk factors are being systematically recorded. Any such issues would need to be addressed in a forum including the relevant data custodians. Specific recommendations from this section are thus:

*Recommendation 1*

Detailed analysis of WA linked crash, emergency, hospital and death data to identify the incidence and trends in road injuries among the WA Aboriginal population in metropolitan, regional and remote areas and to identify specific risk factors for road crashes and injuries.

*Recommendation 2*

Implement a system which will allow Aboriginal status to be identified for all road crashes in the IRIS database. This could come through driver licensing applications and renewals, police crash reports or online crash reports.

*Recommendation 3*

An analysis of driver licensing data by Aboriginal status, age group, gender and geographic area be undertaken to help to pinpoint the areas of greatest need and to measure the success of current programs.

## **7.2 Literature review and Stakeholder interviews regarding interventions**

The literature review highlighted a number of successful interventions in the areas of driver licensing, child restraints and seat belts and some promising work in the area of drink driving. Further to this, the Stakeholder review identified current Aboriginal road safety initiatives being undertaken around Australia. Extensive road safety education programs were described together with programs to address Aboriginal driver licensing. Programs to fit child restraints were mentioned by a number of jurisdictions, but Aboriginal specific advertising campaigns, programs to address public transport issues and programs to support the use of alcohol interlocks were less common. Information on

road conditions, vehicle safety, drink driving programs, and on monitoring and enforcing the use of protective equipment such as seat belts, bike and motorbike helmets and child restraints was generally not made available as part of this study. Some of these initiatives would not be directed specifically to the Aboriginal population, eg roads, and some would require interviews with different agencies, eg police.

*Recommendation 4*

Current WA initiatives to increase use of seat belts and child restraints, and prevent drink driving should be reviewed to ensure they include all the necessary components, eg. education, mass media, enhanced enforcement. If not, further work should consider how these can be implemented.

*Recommendation 5*

Further work should be undertaken to identify the incidence of drink-driving offences, the extent to which treatment programs are available and what the uptake and completion rates are. Evaluation of these programs should be reviewed and if necessary the potential for the “Hero to Healing” drink driving program should be considered.

*Recommendation 6*

Consideration be given to how public transport/safer vehicles could be made more available to rural and remote communities.

*Recommendation 7*

That the practicalities of the use of alcohol interlocks in remote communities be considered (for example, servicing requirements and cost) and a similar scheme be adopted to that used in Queensland/South Australia (see chapter 5, pages 92-93).

*Recommendation 8*

That further interviews be conducted with relevant agencies to identify road improvement initiatives, safe vehicle initiatives and enforcement programs encompassing issues such as speed, seat belts, child restraints, alcohol and drugs which are of relevance to the Aboriginal population.

*Recommendation 9*

That research be conducted into the post-crash response to identify if there are particular issues with regards crash notification and time to receipt of appropriate care for the Aboriginal population.

### **7.3 Community interviews in the Fitzroy Valley**

This initial study into the road safety concerns of Aboriginal people from the Fitzroy Crossing area has identified the issues of alcohol and drugs, road maintenance, driver licensing and training, lighting and cattle on the roads, as being their major concerns. The solutions recommended by community members to address their concerns included improved maintenance of roads by the Shire, more education about road safety issues, greater levels of police enforcement regarding speeding and drink driving, driver training schools and various measures to keep cattle off the highway including fencing and methods of alerting the public to the risk of cattle on the road.

#### *Recommendation 10*

That a program of work be undertaken to address the road safety issues of the Fitzroy Valley population.

#### *Recommendation 11*

Review of current education and mass media campaigns to see if they can be better targeted to reach rural and remote communities.

#### *Recommendation 12*

Review of police traffic enforcement in rural and remote communities to see how it could be improved.

#### *Recommendation 13*

Ensure that the crash data which is being collected allows identification of injuries sustained as a result of cattle on the road.

#### *Recommendation 14*

That the program of research to identify the views of Aboriginal people in Western Australia about road safety continue.





## 8. REFERENCES

- Aboriginal Heritage Office. (2018). A brief Aboriginal history. Retrieved from <http://www.aboriginalheritage.org/history/history/>
- ABS. (2013). *Estimates of Aboriginal and Torres Strait Islander Australians, June 2011*. Retrieved from Canberra: <http://www.abs.gov.au/ausstats/abs@.nsf/latestProducts/3238.0.55.001Media%20Release1June%202011>
- ABS. (2017). *Causes of Death, Australia, 2016. 12. Deaths of Aboriginal and Torres Strait Islander Australians*. Retrieved from Canberra: <http://www.abs.gov.au/ausstats/abs@.nsf/mf/3303.0>
- Amiotte, J., Balanay, J. A., & Humphrey, C. (2016). Seat Belt Usage Interventions for Motor Vehicle Crash Prevention on the Pine Ridge Indian Reservation, South Dakota. *J Environ Health*, 78(6), 46-52.
- Australian Institute of Health and Welfare. (2007). *Rural, regional and remote health: a study on mortality*. Retrieved from Canberra: <https://www.aihw.gov.au/reports/rural-remote-australians/rural-regional-remote-mortality-study-2nd-edition/contents/table-of-contents>
- Australian Institute of Health and Welfare. (2015a). *Aboriginal and Torres Strait Islander Health Performance Framework 2014. Online data tables*. Retrieved from: <https://www.aihw.gov.au/reports/indigenous-health-welfare/health-performance-framework/data>
- Australian Institute of Health and Welfare. (2015b). *The health and welfare of Australia's Aboriginal and Torres Strait Islander peoples 2015*. Retrieved from Canberra: <https://www.aihw.gov.au/getmedia/584073f7-041e-4818-9419-39f5a060b1aa/18175.pdf.aspx?inline=true>
- Australian Transport Safety Bureau. (2004). *Profile of Road Safety among Indigenous Australians*. Retrieved from [https://infrastructure.gov.au/roads/safety/publications/2005/pdf/Road\\_safety\\_indig\\_au.pdf](https://infrastructure.gov.au/roads/safety/publications/2005/pdf/Road_safety_indig_au.pdf)
- Billie, H., Crump, C. E., Letourneau, R. J., & West, B. A. (2016). Child safety and booster seat use in five tribal communities, 2010-2014. *J Safety Res*, 59, 113-117. doi:10.1016/j.jsr.2016.09.002
- BITRE. (2017). *Road trauma Australia 2016 statistical summary*. Retrieved from Canberra: [https://bitre.gov.au/publications/ongoing/files/Road\\_Trauma\\_Australia\\_2016\\_Web.pdf](https://bitre.gov.au/publications/ongoing/files/Road_Trauma_Australia_2016_Web.pdf)
- Bureau of Infrastructure, T. a. R. E. (2013). *Australian infrastructure statistics yearbook 2013*. Retrieved from Canberra: [https://bitre.gov.au/publications/2013/yearbook\\_2013.aspx](https://bitre.gov.au/publications/2013/yearbook_2013.aspx)
- Centre for Accident Research & Road Safety - Queensland (CARRS-Q). (2016). *State of the Road: Indigenous Road Safety*. Retrieved from <https://research.qut.edu.au/carrsq/wp-content/uploads/sites/45/2017/12/Indigenous-Road-Safety-Fact-sheet-screen.pdf>
- Centre for Road Safety. (2017). *Road trauma amongst Aboriginal and Torres Strait Islander people in NSW 2005-2015 Statistical profile*. Retrieved from Sydney: <http://roadsafety.transport.nsw.gov.au/downloads/aboriginal-road-trauma-2005-15.pdf>
- Cercarelli, L., Ryan, G., Knuiman, M., & Donovan, R. (2000). Road safety issues in remote Aboriginal communities in Western Australia. *Accid Anal Prev*, 32, 845-848.

- Chikritzhs, T., Stockwell, T., & Pascal, R. (2005). The impact of the Northern Territory's Living With Alcohol program, 1992-2002: revisiting the evaluation. *Addiction*, *100*(11), 1625-1636. doi:10.1111/j.1360-0443.2005.01234.x
- Clapham, K. (2003). *Injury Prevention Activity among Aboriginal and Torres Strait Islander Peoples. Volume II. Programs, Projects and Actions*. Retrieved from Canberra
- Clapham, K., Senserrick, T., Ivers, R., Lyford, M., & Stevenson, M. (2008). Understanding the extent and impact of Indigenous road trauma. *Injury*, *39 Suppl 5*, S19-23. doi:10.1016/S0020-1383(08)70025-1
- Committee to Explore the Effect of Motor Driver's Licence and Driving Laws on Remote Communities. (2007). *Indigenous Licensing and Fine Default: A Clean Slate. Report presented on behalf of the Minister for Corrective Services, Margaret Quirk MLA*. Retrieved from
- Cullen, P., Chevalier, A., Hunter, K., Gadsden, T., & Ivers, R. (2016). 'The program was the solution to the problem': Process evaluation of a multi-site driver licensing program in remote communities. *Journal of Transport and Health*. doi:<http://dx.doi.org/10.1016/j.jth.2016.07.004>
- Cullen, P., Clapham, K., Byrne, J., Hunter, K., Rogers, K., Senserrick, T., . . . Ivers, R. (2016). Implementation of a driver licensing support program in three Aboriginal communities: a brief report from a pilot program. *Health Promot J Austr*, *27*(2), 167-169. doi:10.1071/HE15089
- Dempsey, K. (2016). *In harm's way: a study of Northern Territory linked crash records*. (Doctor of Public Health), Charles Darwin University, Darwin.
- Edmonston, C. (2016). *Profiling indigenous and non-indigenous road trauma in rural and remote North Queensland: It's not all black and white*. (Doctor of Philosophy), Queensland University of Technology, Brisbane.
- Evans, G. W., & Kantrowitz, E. (2002). Socioeconomic status and health: the potential role of environmental risk exposure. *Annu Rev Public Health*, *23*, 303-331. doi:10.1146/annurev.publhealth.23.112001.112349
- Fatovich, D. M., Phillips, M., Jacobs, I. G., & Langford, S. A. (2011). Major trauma patients transferred from rural and remote Western Australia by the Royal Flying Doctor Service. *J Trauma*, *71*(6), 1816-1820. doi:10.1097/TA.0b013e318238bd4c
- Fitts, M. S., & Palk, G. R. (2014). *Development of a drink driving program for regional and remote Aboriginal and Torres Strait Islander communities. Final Report*. Retrieved from <http://www.ndlrf.gov.au/sites/default/files/publication-documents/monographs/monograph-55.pdf>
- Fitts, M. S., & Palk, G. R. (2016). 'Hero to Healing' drink-driving program for Indigenous communities in Far North Queensland. *Health Promot J Austr*, *27*(1), 74-79. doi:10.1071/HE15069
- Fitts, M. S., Palk, G. R., & Jacups, S. (2013). *Alcohol restrictions and drink driving in remote Indigenous communities in Queensland, Australia*. Paper presented at the 23rd Canadian Multidisciplinary Road Safety Conference, Montreal, Canada.
- Fitts, M. S., Palk, G. R., Lennon, A. J., & Clough, A. R. (2013a). Prevalence and characteristics of Indigenous drink-driving convictions in Queensland, Australia. *Road & Transport Research*, *22*(2), 40-51.
- Fitts, M. S., Palk, G. R., Lennon, A. J., & Clough, A. R. (2013b). *Why do Indigenous Australians drink and drive? A qualitative exploration of self-reported influences on drink driving behaviours of Indigenous Australians from remote communities*. Paper presented at the 23rd Canadian Multidisciplinary Road Safety Conference, Montreal, Canada.

- Fitts, M. S., Palk, G. R., Lennon, A. J., & Clough, A. R. (2017). The characteristics of young Indigenous drink drivers in Queensland, Australia. *Traffic Inj Prev*, 18(3), 237-243. doi:10.1080/15389588.2016.1186273
- Fuller, T. (2011). Stop Territory Aboriginal Road Sadness - NT Police Indigenous Road Safety Project. *Journal of the Australasian College of Road Safety*, 22(1), 33-36.
- Geoscience Australia. Area of Australia - States and Territories. Retrieved from <http://www.ga.gov.au/scientific-topics/national-location-information/dimensions/area-of-australia-states-and-territories>
- Girasek, D. C. (2001). Public beliefs about the preventability of unintentional injury deaths. *Accid Anal Prev*, 33(4), 455-465.
- Government of Western Australia. (2018). Liquor Restrictions. Retrieved from <http://www.rgl.wa.gov.au/liquor/restrictions/liquor-restrictions>
- Gray, D., Siggers, S., Atkinson, D., Sputore, B., & Bourbon, D. (2000). Beating the grog: an evaluation of the Tennant Creek liquor licensing restrictions. *Aust N Z J Public Health*, 24(1), 39-44.
- Hawkes, E. (2005). *Open load space project*. Paper presented at the Australasian Road Safety Research Policing Education Conference, Wellington, New Zealand.
- Helps, Y., & Moller, J. (2007). *Aboriginal people travelling well literature review: driver licensing issues, seat restraint non-compliance, Aboriginal health, Aboriginal disability*. Retrieved from Canberra: <https://www.lowitja.org.au/aboriginal-people-travelling-well-literature-review-driver-licensing-issues-seat-restraint-non>
- Henley, G., & Harrison, J. (2013). *Injury of Aboriginal and Torres Strait Islander people due to transport, 2005-06 to 2009-10*. Retrieved from Canberra: <https://www.aihw.gov.au/getmedia/b2dd484e-48ce-4adf-bcd6-c197f42b38bd/15819.pdf.aspx?inline=true>
- Ishikawa, T., Oudie, E., Desapriya, E., Turcotte, K., & Pike, I. (2014). A systematic review of community interventions to improve Aboriginal child passenger safety. *Am J Public Health*, 104 Suppl 3, e1-8. doi:10.2105/AJPH.2013.301683
- Ivers, R., Clapham, K., Senserrick, T., Lyford, M., & Stevenson, M. (2008). Injury prevention in Australian Indigenous communities. *Injury*, 39 Suppl 5, S61-67. doi:10.1016/S0020-1383(08)70030-5
- John, S., & Berger, I. (2001). Yakama Nation initiatives to promote seat belt use. *IHS Prim Care Provid*, 26, 168-169.
- Kinnane, S., Farrington, F., Henderson-Yates, L., & Parker, H. (2009). *Fitzroy Valley Alcohol Restriction Report: An evaluation of the effects of a restriction on take-away alcohol relating to measurable health and social outcomes, community perceptions and behaviours after a 12 month period*. Retrieved from Mt Lawley, Western Australia:
- Letourneau, R. J., & Crump, C. E. (2016). *Tribal Motor Vehicle Injury Prevention Best Practices Guide 2016*. Retrieved from [https://www.cdc.gov/motorvehiclesafety/pdf/native/tmvip\\_best-practices\\_guide\\_2016-a.pdf](https://www.cdc.gov/motorvehiclesafety/pdf/native/tmvip_best-practices_guide_2016-a.pdf)
- Letourneau, R. J., Crump, C. E., Bowling, J. M., Kuklinski, D. M., & Allen, C. W. (2008). Ride Safe: a child passenger safety program for American Indian/Alaska Native children. *Matern Child Health J*, 12 Suppl 1, 55-63. doi:10.1007/s10995-008-0332-6
- Letourneau, R. J., Crump, C. E., Thunder, N., & Voss, R. (2009). Increasing occupant restraint use among Ho-Chunk Nation members: Tailoring evidence-based strategies to local context. *IHS Prim Care Provid*, 34, 212-218.

- Macaulay, J., Thomas, R., Mabbot, N., Styles, T., Edmonston, C., Sheehan, M., & Schonfeld, C. (2003). *Australian Indigenous Road Safety*. Retrieved from
- Morphy, F. (2010). *Population, people and place: The Fitzroy Valley population project*. Retrieved from Canberra: caepr.cass.anu.edu.au/sites/default/files/docs/CAEPRWP70\_0.pdf
- Moskowitz, H., & Fiorentino, D. (2000). *A Review of the Literature on the Effects of Low Doses of Alcohol on Driving-Related Skills*. Retrieved from Washington DC: <https://rosap.nhtl.bts.gov/view/dot/1677>
- Northern Territory Government. (2017). *Alcohol Policies and Legislation Review. Final Report*. Retrieved from Darwin: <https://alcoholreview.nt.gov.au/governance?a=453497>
- Oxley, J., Langford, J., Palamara, P., Muir, C., Koppel, S., Bohensky, M., & Williamson, A. (2009). *Non-wearing of adult seat belts in Australia: Where to next?* Retrieved from Sydney: <https://www.onlinepublications.austroads.com.au/items/AP-R346-09>
- Phelan, K. J., Khoury, J., Grossman, D. C., Hu, D., Wallace, L. J., Bill, N., & Kalkwarf, H. (2002). Pediatric motor vehicle related injuries in the Navajo Nation: the impact of the 1988 child occupant restraint laws. *Inj Prev*, 8(3), 216-220.
- Piontkowski, S. R., Peabody, J. S., Reede, C., Velascosoltero, J., Tsatoke, G., Jr., Shelhamer, T., & Hicks, K. R. (2015). Reducing Motor Vehicle-Related Injuries at an Arizona Indian Reservation: Ten Years of Application of Evidence-Based Strategies. *Glob Health Sci Pract*, 3(4), 619-629. doi:10.9745/GHSP-D-15-00249
- Reede, C., Piontkowski, S., & Tsatoke, G. (2007). Using evidence-based strategies to reduce motor vehicle injuries on the San Carlos Apache Reservation. *IHS Prim Care Provid*, 32, 209-212.
- Robertson-Begay, M., Bert, B., Deal, P., & Bill, N. (2007). Hardrock Chapter's injury prevention program: Building tribal capacity in a rural Navajo community. *IHS Prim Care Provid*, 32, 266-268.
- Russel-Weisz, L. (2004). *Kimberley Aboriginal restraints & drink driving media campaign*. Retrieved from
- Senior, K., Chenhall, R., Ivy, B., & Stevenson, C. (2009). *Moving Beyond the Restrictions: The Evaluation of the Alice Springs Alcohol Management Plan*. Retrieved from Darwin, NT: [http://www.territorystories.nt.gov.au/bitstream/10070/218442/2/Vatskalis-110609-Alcohol restrictions working in Alice Springs attachment.pdf](http://www.territorystories.nt.gov.au/bitstream/10070/218442/2/Vatskalis-110609-Alcohol%20restrictions%20working%20in%20Alice%20Springs%20attachment.pdf)
- Senserrick, T., Hinchcliff, R., Ivers, R., Martiniuk, A., Boufous, S., & Clapham, K. (2010). *Aboriginal injury prevention projects: a review*. Retrieved from Sydney: [https://www.saxinstitute.org.au/wp-content/uploads/19\\_Senserrick-et-al-Aboriginal-injury-prevention-projects.pdf](https://www.saxinstitute.org.au/wp-content/uploads/19_Senserrick-et-al-Aboriginal-injury-prevention-projects.pdf)
- Senserrick, T., Yip, P., Grzebieta, R., Ivers, R., Clapham, K., & Lyford, M. (2011). *Safe System Demonstration Project Involving an Indigenous Community: Audit and Implementation Plan. AP-R377B/11*. Retrieved from Sydney:
- Short, M. M., Mushquash, C. J., & Bedard, M. (2013). Motor vehicle crashes among Canadian Aboriginal people: a review of the literature. *Can J Rural Med*, 18(3), 86-98.
- Short, M. M., Mushquash, C. J., & Bedard, M. (2014). Interventions for motor vehicle crashes among Indigenous communities: strategies to inform Canadian initiatives. *Can J Public Health*, 105(4), e296-305.
- Slootmans, F., Martenson, H., Kluppels, L., & Meesmann, U. (2017) Rehabilitation courses as alternative measure for drink-driving offenders.: European Road Safety Decision Support System, developed by the H2020 project SafetyCube.

- Sticher, G. (2009). *Barriers to the acceptance of road safety programmes among rural road users: Developing a brief intervention*. (PhD), QUT.
- Stockwell, T., Chikritzhs, T., Hendrie, D., Fordham, R., Ying, F., Phillips, M., . . . O'Reilly, B. (2001). The public health and safety benefits of the Northern Territory's Living with Alcohol programme. *Drug and Alcohol Review*, 20(2), 167-180. doi:Doi 10.1080/09595230124886
- Stockwell, T., Zhao, J., Martin, G., Macdonald, S., Vallance, K., Treno, A., . . . Buxton, J. (2013). Minimum Alcohol Prices and Outlet Densities in British Columbia, Canada: Estimated Impacts on Alcohol-Attributable Hospital Admissions. *American Journal of Public Health*, 103(11), 2014-2020. doi:10.2105/ajph.2013.301289
- The George Institute for Global Health. (2014). *Evaluation of the DriveSafe NT Remote Driver Education and Licensing Program*. Retrieved from
- Thiel, C. (2017). *Buckle up Borroloola - Pilot Indigenous child restraints program*. Retrieved from Darwin:
- Thomson, N., Krom, I., & Ride, K. (2009). *Summary of road safety among Indigenous peoples*. Retrieved from Perth:  
<https://www.healthinonet.ecu.edu.au/uploads/docs/road-review.pdf>
- Watson, M., Elliott, P., Kinsella, C., & Wilson, S. (1997). *Aboriginal road safety issues report*. Retrieved from Adelaide:
- Williams, D. (1998). Buckle up for life: An incentive program. *IHS Prim Care Provid*, 23, 75-77.

9. **Appendices**

**Appendix 1 Australian Aboriginal road safety interventions for the period 1995-2017**

<b>Category</b>	<b>Author</b>	<b>Title &amp; Setting</b>	<b>Outcome</b>
Alcohol restrictions/ Alcohol management program	(T. Stockwell et al., 2001)	Living with alcohol program NT, 1992-1996	Reductions in the estimated number of road deaths related to alcohol by 34.5% and in road crash injuries requiring hospital treatment by 28.3%
	(Chikritzhs et al., 2005)	Living with alcohol program NT, 1992-2002	Reduced acute alcohol-attributable deaths but specific effect on road trauma not measured
	(Gray et al., 2000)	Tennant Creek Liquor Licensing restrictions 1996-98	Reduced acute-alcohol related hospital admissions
	(Senior et al., 2009)	Alice Springs Alcohol Management Plan 2006-2008	Reduced alcohol related hospital admissions
	(Kinnane et al., 2009)	Fitzroy Valley Alcohol restrictions 2007	Reduced hospital admissions for injury

	(Fitts, Palk, & Jacups, 2013)	Alcohol restrictions and drink driving in remote indigenous communities in Queensland, 2002-2011 implemented by the Queensland government	Decline in drink driving offences but high range BAC readings remained
Media campaign and education targeting road safety	Russel-Weisz, L(Short et al., 2014)	East Kimberley Aboriginal restraints and drink driving media campaign, early 2000's.	Increased consideration for using a seat-belt and not drink driving
	Unknown (Clapham, 2003), (Macaulay et al., 2003)	The Crossing Aboriginal Pedestrian Road Safety Project. Fitzroy Crossing, 2002-2003	Spot interviews indicated a greater awareness of issues by interviewees. A comparative reduction of injuries during the first 6 months of the project was reported.
	(Fuller, 2011)	<i>Stop Territory Aboriginal Road Sadness (STARS) – NT Police Indigenous Road Safety Project</i> conducted in the Northern Territory, 2008.	Evaluation report unable to be located



Open Load legislation	(Hawkes, 2005)	Open load space project Western Australia, 2001-2005	Coincided with reduced Aboriginal road crash fatalities for people travelling in open load spaces
Drink-driving programs	(Fitts & Palk, 2014)	Development of a drink driving program for regional and remote Aboriginal and TSI communities.	The study identified the importance of community ownership of drink driving programs.
	(Fitts & Palk, 2016);	'Hero to Healing' drink driving program for Aboriginal communities in Far North Queensland, 2012	Participants supportive of program
Driver Licensing programs	(Cullen, Clapham, et al., 2016)	Driving Change program to improve license participation by Aboriginal people in NSW. Pilot program in three Aboriginal communities	Increased rates of licensing in target group
	(Cullen, Chevalier, et al., 2016)	DriveSafe NT Remote 2012-2014	Increased rates of driver licensing

Safe System Audit:		Safe System Demonstration Project Involving an Indigenous Community (Bidyadanga). 2011	Pedestrian crossing built. Fencing repaired. Improved signage and lighting. Education campaigns.
--------------------	--	--	--

## Appendix 2 International Aboriginal road safety interventions for the period 2010-2017

Author	Title & Setting	Description	Outcome
(Billie et al., 2016)	Child safety and booster seat use in five tribal communities, United States, 2010-2014	Implementation of evidence-based strategies to increase child safety seat (CSS) use. These included enhanced enforcement campaigns and CSS distribution and education programs.	Increases in the use of CSS's ranging from 6-40%.
(Amiotte et al., 2016)	Seat belt usage interventions for motor vehicle crash prevention on the Pine Ridge Indian Reservation, South Dakota. 2007-2012	<p>Distribution program for child safety seats</p> <p>Improved enforcement of seat belt laws</p> <p>Development of traffic court system to enforce seat belt citations</p> <p>Education campaign on importance of seat belt use to prevent severe injuries</p>	Increase in seat belt usage. Decline in crash fatalities.
(Piontkowski et al., 2015)	Motor vehicle injury prevention program operations from 2004-2013 at an Arizona Indian reservation.	<p>Mass media campaigns to enhance awareness and outreach</p> <p>High visibility sobriety checkpoints</p>	<p>Reduction in motor vehicle crashes</p> <p>No change in arrests for driving under the influence</p>

		<p>Passing &amp; enforcing 0.08% blood alcohol concentration limits for drivers and primary occupant restraint laws</p> <p>Child car seat distribution and education</p>	Increase in driver/front passenger seat belt use
(Ishikawa, Oudie, Desapriya, Turcotte, & Pike, 2014)	Systematic review of community interventions to improve aboriginal child passenger safety. (5 studies) Conducted 2011-2012. Not limited to publication year.	<p>Child seat loans or giveaways</p> <p>Child safety seat installation clinics</p> <p>Home visits</p> <p>Community wide education campaigns</p> <p>Child safety seat technician training</p> <p>Law enactment or enforcement</p>	Four of the studies reported increased child safety seat use in their earliest post intervention assessment. Only one study reported on long term follow-up.
(Short et al., 2014) Details available in Appendix 3.	Interventions for motor vehicle crashes among Indigenous communities: Strategies to inform Canadian initiatives.	<p>Targeted Child restraints ,</p> <p>Seat belts, drink driving, unlicensed driving,</p>	Most report increased use of child restraints and seat belts. Some data show decrease in injuries and fatalities following crashes. One study showed increase in DUI arrests.

	Included studies from 1980 onwards. Eleven studies identified. (See table below)		
--	---	--	--

**Table 3.** Intervention studies targeting motor vehicle crashes among Indigenous communities

Study	Population (geographic location and Indigenous community)	Targeted risk factors	Intervention components	Key findings	Reported considerations	Source*	Quality†
<b>Canadian Studies</b>							
Transport Canada <sup>15</sup>	Grand Rapids, Tootinaowaziibeeng, & Sandy Bay, Manitoba  First Nations	<i>Human factors:</i> Correct use of car seats, booster seats, and seat belts by children and parents	Focus groups (e.g., explore local beliefs, practices, barriers and solutions, and tailor the interventions)	Child restraint use increased significantly in the largest community (11.6% to 54.5%), but not in the other intervention community (40% to 45%) or the control community (18.4% to 26.2%)	Limitations related to the timing of the intervention (i.e., middle of winter and 3-month duration)	GL	19
		Children 12 years and younger riding in the rear seat	Select community members completed child restraint technician training	Driver restraint use did not significantly improve in any of the communities (34% to 26% for the full sample)	Barriers for using child restraints included (indicated in focus group): 1) cost 2) lack of awareness 3) availability (car seats not stocked in nearby stores) 4) lack of vehicle (relied on others for rides) 5) perception of low risk 6) over-capacity 7) conformity/peer pressure 8) discomfort (in children and pregnant women) 9) low enforcement 10) older vehicles (do not have anchors)		
		Not riding in the back of pick-up trucks	Brief intervention given to all three communities at baseline (e.g., correction of errors, individual counselling, and replacement of defective seats)	No significant change in seating position or riding in the back of pickup trucks after the intervention (62% to 65% for the full sample)			
	Comprehensive intervention (e.g., education, car seat clinics) completed in two communities, and third community acted as a control group	Predictors of correct use included driver restraint, child age (i.e., younger) and rear seating position for children					
			Evaluation methods included roadside and parking lot checks, and focus groups				
<b>Non-Canadian Studies</b>							
Billie et al. <sup>22</sup>	Uintah and Ouray Reservation, Utah  Ute Indians	<i>Human factors:</i> Correct use of child safety seats	Hired a full-time police officer to implement the program using a collaborative, community-based approach	Adult restraint use increased from 22% to 42%	Turnover in police chief position was a challenge as there was unfamiliarity with the objectives of the intervention	PR	9
		Increase seat belt use	Community education campaign (e.g., newspaper and radio announcements, and posters)	Child restraint use increased from 20% to 42%			
		Reduce alcohol-impaired driving	Enforcement (e.g., DUI checkpoints and saturation patrols)	Total MVCs reduced by 9%			
			Child safety seat clinics	MVCs involving a fatality decreased by 67%			
				MVCs involving injury decreased by 50%			
Brewin & Coggan <sup>24</sup>	Ngati Porou Community, New Zealand  Maori	<i>Human factors:</i> Reduce speeding	Focus groups with community members	Self-reports of never exceeding the speed limit increased from 19% to 26%	Methodological challenges (e.g., geographic distance between the community and evaluation team)	PR	20
		Increase seat belt and child seat use	Road safety media campaign (e.g., radio, newspaper, factsheets, flyers, posters, t-shirts)	Child restraint use increased from 51% to 59%			
		Decrease unlicensed drivers	Driver licensing course				
			Incentive program (i.e., random checkpoints targeting seat belt use and child safety seat use with rewards, such as window stickers, balloons)				

...continues

INTERVENTIONS FOR MOTOR VEHICLE CRASHES

**Table 3.** Intervention studies targeting motor vehicle crashes among Indigenous communities, continued

Study	Population (geographic location and Indigenous community)	Targeted risk factors	Intervention components	Key findings	Reported considerations	Source*	Quality†
John & Berger <sup>16</sup>	Yakama Nation, Oregon American Indians	<i>Human factors:</i> Increase infant and child safety seat use	Education component involved hands-on classroom activities at prenatal clinics  Training for staff members conducting the child safety program  Car seat distribution registry  Evaluation methods consisted of an observational survey	Seat belt use increased from 17% to 41%  Seat belt use decreased to 35% six months after campaign ended	Education efforts alone were of limited effectiveness	PR	7
Letourneau et al. <sup>17</sup>	Tribal Head Start Centers across United States (i.e., Arizona, Michigan, Minnesota, New Mexico, Nevada, Wisconsin)  American Indians/ Alaskan Natives	<i>Human factors:</i> Increase safety seat use in children ages 3-5	Focus groups with community members and Head Start staff (to assess reasons why safety seats not used, determine marketing strategies, discuss program components)  Head Start coordinators implemented program (e.g., completed child passenger safety technician training, requested child safety seats, completed follow-up home visits to review installation information and provide positive feedback)  Educational activities (e.g., parent training sessions)  Evaluation methods conducted by Head Start coordinators (e.g., progress reports to discuss implementation barriers, child safety seat use observational surveys)	Observations of restrained children were 74% higher after one year of implementing the program (odds ratio=1.74)  Increase not sustained in following year, which may have been due to decrease in intensity of the program	Law enforcement limitations  Tribal sovereignty (i.e., Tribal occupant laws differ from state laws)  Difficulties with conducting observational studies	PR	19
Letourneau et al. <sup>18</sup>	Ho-Chunk Nation, Wisconsin  American Indians/ Alaskan Natives	<i>Human factors:</i> Increase seat belt and child safety seat use	Community education events (e.g., safety expositions, crash simulations)  Media awareness (e.g., billboards, radio announcements)  Education and training (e.g., child passenger safety training, provision of child safety seats)  Enforcement (e.g., Law Enforcement Commission participation, enhanced Click-it or ticket campaigns)	Seat belt use increased from 50.5% to 62.7% for drivers and from 32.6% to 56.0% for passengers  Child safety seat use increased from 26.4% to 78.4%	No tribal police department  Located in a state with a secondary enforcement seat belt use law  Membership of tribe spread across 14 counties in central and western Wisconsin	PR	12

...continues

**Table 3.** Intervention studies targeting motor vehicle crashes among Indigenous communities, continued

Study	Population (geographic location and Indigenous community)	Targeted risk factors	Intervention components	Key findings	Reported considerations	Source*	Quality†
Phelan et al. <sup>19</sup>	Navajo Nation, Utah, Arizona, and New Mexico  American Indians/ Alaskan Natives	<i>Human factors:</i> Increase seat belt and child restraint use	Enforcement (i.e., a primary enforcement safety belt use and a child restraint law)	Motor vehicle injury discharge rates (SE) significantly decreased (per 100,000): • 0-4 years: 62 (7) to 28 (4) • 5-11 years: 55.3 (6) to 26 (4) • 15-19 years: 139 (14) to 68 (7)  The proportion of children aged 0-4 with new injury severity scores >4 (i.e., more severe injuries) significantly decreased	Limitations in full enforcement of restraint use laws  Limitations in conducting longitudinal designs (e.g., natural trends)	PR	4
Reede et al. <sup>20</sup>	San Carlos Apache, Arizona  American Indians/ Alaskan Natives	<i>Human factors:</i> Reduce alcohol impaired driving	Enforcement (i.e., lower the legal limit to 0.08% BAC for drivers on the reservation and increase sobriety checkpoints)  Education (e.g., public information media campaign, including posters, radio, newspaper and casino announcements)  Focus groups (e.g., to develop culturally appropriate media messages)	DUI arrests increased by 33.4%  Police-reported MVCs decreased by 26.9%  Nighttime MVCs decreased by 32.9%  Daytime MVCs decreased by 25.7%  MVCs involving injuries and/or fatalities decreased by 20.2%  Fatal MVCs decreased by 16.6%	Shortage of police officers	PR	13
Robertson-Begay et al. <sup>21</sup>	Hardrock Chapter Community (Tse Dildo' ii), Arizona  American Indians/ Alaskan Natives	<i>Human factors:</i> Increase seat belt and child safety seat use	Community needs assessment (e.g., designed community questionnaire and provided training of community members to conduct interviews)  Distribution of car seats  An incentive program (e.g., observations of safety belt use, increased police enforcement and rewards for people wearing safety belts)	Seat belt use increased from 6% to 64%  Child safety seat use increased from 0% to 54%	Integration of local customs and cultural values into program activities facilitated successful implementation (e.g., public health terms needed to be translated into the Navajo language)	PR	16
Russell-Weisz <sup>25</sup>	East Kimberley, Western Australia  Aboriginal	<i>Social environment factors:</i> Attitudes toward seat belt use, child restraint, and drinking and driving	Education (e.g., radio advertisements using local Aboriginal role models)	Self-report surveys indicated the following:  • 90% of respondents could recall what the advertisement was about • 100% indicated that they thought the advertisements were appropriate for Aboriginal people • 80% indicated that they thought more about using a seat belt and not drinking and driving after hearing the advertisements	Scheduling conflicts of community meeting to measure outcomes was a challenge (i.e., low attendance)	GL	12

...continues



**Table 3.** Intervention studies targeting motor vehicle crashes among Indigenous communities, continued

Study	Population (geographic location and Indigenous community)	Targeted risk factors	Intervention components	Key findings	Reported considerations	Source*	Quality†
Williams <sup>23</sup>	Uintah and Ouray reservation, Utah  Ute Indians	<i>Human factors:</i> Increase seat belt and child safety seat use	Incentive program (e.g., seat belt checkpoint rewards for people wearing safety belts)  Education (e.g., posters, radio and newspaper announcements)	Driver seat belt use increased by 111% for sedan or station wagon, 218% for a pickup truck, 17% for 4-wheel drive or van, 159% for government or tribal vehicle  Passenger seat belt use increased 111% for sedan or station wagon and 225% for a pickup truck but decreased 49% for 4-wheel drive or van  Infant car seat use increased by 389% for sedan or station wagon, and by 209% for 4-wheel drive or van  Results maintained at 1-year follow up, with exception of regression for government and tribal vehicles	Positive relationship with the police office was an essential component to successful implementation	PR	10

\* PR=published in a peer-reviewed journal; GL=published as grey literature.

† Quality score is the sum of item scores (Yes = 2; Partially = 1; No or unable to determine = 0) from the quality assessment criteria for each study (criteria listed in Table 2; adapted from Mercer et al.<sup>14</sup>).  
DUI=driving under the influence; BAC=blood alcohol concentration.

(John & Berger, 2001; Letourneau, Crump, Bowling, Kuklinski, & Allen, 2008; Letourneau, Crump, Thunder, & Voss, 2009; Phelan et al., 2002; Reede, Piontkowski, & Tsatoke, 2007; Robertson-Begay, Bert, Deal, & Bill, 2007; Russel-Weisz, 2004; Williams, 1998)

## **Appendix 4. Stakeholder organisations interviewed for Chapter 5**

### **Western Australia**

Road Safety Commission

Department of Transport – Driver and Vehicle Licensing

Department of Health

WA Local Government Association (WALGA)

Goolarri Media

SDERA

Department of the Attorney General

Main Roads

### **Australia**

NSW Roads & Maritime Services

Centre for Road Safety, Transport for New South Wales

Transport for Victoria

Transport and Main Roads Queensland

Road Safety (Northern) (Queensland)

Northern Territory Government

MACC Road Safety Programs (NT Motor Accidents Compensation Commission)

Department of Planning, Transport and Infrastructure, South Australia

Department of State Growth, Tasmania

**Appendix 5 Road Safety Issues identified by Aboriginal people in the Fitzroy Valley**

	<b>Road safety risks &amp; problems</b>	<b>Number of times mentioned</b>	<b>Solutions to date</b>	<b>Future solutions</b>
<b>Vehicle</b>	Tyre condition (bald, not checked enough)	1		
<b>Road</b>	Lack of street lighting on main roads and access roads	6	Solar lights put on pub road towards Crossing Inn.  Kids have made road safety signs.  Orange street lights on the main highway.	More street lighting around town
	Stray cattle	6		Fencing  Pastoralists to be made accountable  Phone number to ring about stray cattle or website to register stray

	<b>Road safety risks &amp; problems</b>	<b>Number of times mentioned</b>	<b>Solutions to date</b>	<b>Future solutions</b>
				<p>cattle sightings. See Facebook site: Kimberley cattle alert.</p> <p>Permission to shoot cattle if not moved within 2 days</p> <p>Remove dead animals</p>
	People on road	1		
	<p>Access roads need regular maintenance/grading – suffer from potholes, no kerbing, blind spots, wash away with rain.</p> <p>“Good maintenance in Derby but not here”</p> <p>“Fitzroy pothole town”</p>	9	<p>Some potholes fixed</p> <p>Some funding provided to help get fuel truck in and out`</p> <p>“Few holes being fixed. More needs to be done”/”Potholes not repaired for ages”/”Little work has been done in Fitzroy”/Looks like it has been bombed”/”Government worried</p>	Community unsealed roads should be graded before the wet season

	<b>Road safety risks &amp; problems</b>	<b>Number of times mentioned</b>	<b>Solutions to date</b>	<b>Future solutions</b>
	<p>“Road not repaired soon enough after flooding.”</p> <p>Use of dirt tracks rather than roads</p> <p>Station access roads – these roads get graded as owners pay rates. Community access roads do not get graded.</p> <p>“Shire get money based on population but then don’t distribute it for access roads”</p>		<p>about black spots. Sort out road surface problem”</p> <p>Town roads slowly getting better in condition.</p>	<p>Make proper tracks to make it safer.</p> <p>Shire to maintain all roads</p>

	<b>Road safety risks &amp; problems</b>	<b>Number of times mentioned</b>	<b>Solutions to date</b>	<b>Future solutions</b>
	<p>“Government is concerned with black spots but people would rather the road surface problem was attended too.”</p> <p>“Shire do nothing about roads. When it is wet can’t get anywhere.” Problems for people accessing community – teachers, rubbish disposal, fuel etc.</p>			
	<p>“Bad road conditions cause excess wear and tear on vehicles”</p>			

	<b>Road safety risks &amp; problems</b>	<b>Number of times mentioned</b>	<b>Solutions to date</b>	<b>Future solutions</b>
	Lack of signage regarding speed and cattle warnings  Lack of stop signs and give way signs	1		More signage around town and communities to prompt road safety
	Footpath too close to the road	1		
	Lack of sealed shoulders	1		
	Roads need to be wider	1		

	<b>Road safety risks &amp; problems</b>	<b>Number of times mentioned</b>	<b>Solutions to date</b>	<b>Future solutions</b>
	Kids play cat and mouse on the highway – need big workshop for all kids.	1		
	Lack of safe crossing places “People need to feel safer when crossing the road”	1		<p>Add pedestrian crossings &amp; warning signs for pedestrians &amp; drivers to look out for each other</p> <p>“Nothing has been done in FX. Kids need to be taught road rules, eg to look left and right. People are not slowing down for school – driving faster than 40 km/h. Some people don’t understand what 40 in circle means.</p>



	<b>Road safety risks &amp; problems</b>	<b>Number of times mentioned</b>	<b>Solutions to date</b>	<b>Future solutions</b>
				<p>Kids need a fenced off play area with shade to stop them playing near the road”</p> <p>Education in schools about road safety.</p> <p>Warning signs both sides of town warning motorists especially trucks that people are frequently crossing main highway.</p>
<b>Speed</b>	“Road trains and trucks drive too close to cars and speed around the corner” in town.	2		“Big trucks should have a bypass road.”

	<b>Road safety risks &amp; problems</b>	<b>Number of times mentioned</b>	<b>Solutions to date</b>	<b>Future solutions</b>
	Some trucks driving too fast through the town.			
	Speeding	4	Speed cameras used occasionally, particularly for big events	<p>“Police need to be more forceful with people who are speeding, eg impound cars right away.”</p> <p>“Could also use safe speeding signs – ones that flash when you’re doing the right speed.”</p>
	Speed needs to be suitable for road			

	<b>Road safety risks &amp; problems</b>	<b>Number of times mentioned</b>	<b>Solutions to date</b>	<b>Future solutions</b>
	Okay with regards seat belts and baby seats, Speeding is a problem.			
	“Winding access road makes it difficult for cars to see kids and kids to see cars. Drive too fast and sometimes drunk. Danger for kids while playing.”			“Need speed bumps to get people to slow down. This is a problem because of kids running around. Already have a speed limit sign.”  Need community meeting to sort problem out.
<b>People</b>	Drink driving	10	Alcohol restrictions – associated with sly grogging, leads to fatigue while driving & drink driving. People may also bring drugs in. Also will sit on road if car breaks down.	More education regarding drugs and alcohol  Relax restrictions - allow people to buy a carton in the pension off-week

	<b>Road safety risks &amp; problems</b>	<b>Number of times mentioned</b>	<b>Solutions to date</b>	<b>Future solutions</b>
			Notice more breath testing by police	<p>ads on TV and radio to warn about drink driving</p> <p>Police enforcement – “could stop everybody going over bridge out of FX”</p> <p>“Could have road blocks on Thursday, Friday and Saturday to test for alcohol. Alcohol restrictions not helping”.</p> <p>More policing to control alcohol and drugs.</p> <p>Need signs on highway and TV adverts about alcohol and driving.</p> <p>Educations programs needed about drink driving. Special counselling that is culturally appropriate.</p>

	<b>Road safety risks &amp; problems</b>	<b>Number of times mentioned</b>	<b>Solutions to date</b>	<b>Future solutions</b>
				“Inform people about the dangers of drink/driving in community settings.”
	Lack of night time driving experience	1		
	“Load everybody in car, not enough safety belts – can’t refuse people”	1	Family getting more switched on to dangers of overloading a car.	Education about overloading cars. Ads/leaflets about what happens with no seatbelts.  “Workshops with younger people about road safety, by the police or could be organised by FVF.”

	<b>Road safety risks &amp; problems</b>	<b>Number of times mentioned</b>	<b>Solutions to date</b>	<b>Future solutions</b>
	Lack of use of seat belts and child restraints	2	Cultural health service have baby seats for hire	<p>“Seatbelts and child restraints – need more education in the community.”</p> <p>No baby seats available for sale in FX. Early childhood centre used to be involved. People need to know where they can buy them.</p> <p>Some kids not in car seats – need information about where seats are available from.</p> <p>“Womens resource centre could run some workshops and show what happens to children who are not in car seats.”</p>

	<b>Road safety risks &amp; problems</b>	<b>Number of times mentioned</b>	<b>Solutions to date</b>	<b>Future solutions</b>
	Problem is people being run over – a result of bad driving and road quality – no bitumen. Bad driving due to alcohol. Also difficult for people to get license. People loose license for a long time due to drink driving.		Has anything been done? Not really. Remote licensing helps. Families getting better driving education – not overloading cars, wearing seatbelts.  Families getting driver’s license helps stop overloading.	
	Problems are alcohol, drugs, tiredness, distractions (kids and phones), speeding, tyre conditions/car condition in general.			
	“Familiarity, complacency about road conditions”	2		

	<b>Road safety risks &amp; problems</b>	<b>Number of times mentioned</b>	<b>Solutions to date</b>	<b>Future solutions</b>
	<p>Licensing</p> <p>Payment of vehicle licenses and fines difficult as DOT only available 1.5 days per week and police won't always accept fines payment. No sheriff or FER (fines enforcement registry) in town. Sheriff in Broome. Also need a debit or credit card.</p>	7	<p>“Some work was being done by the Aboriginal Education Centre, but the man left.”</p> <p>Driver licensing – improving with remote service unit.</p> <p>Dept of Transport available once a week for vehicle and license registration</p> <p>Currently advertising for a driving instructor</p>	<p>“Need a local group to help with driver education and with providing driving practice.”</p> <p>Some people “too shy to go to police station to get license”.</p> <p>Need more education regarding kid safety, licensing, seat belts.</p> <p>Lack of driver training – no service to do driver training. Many people have “lack of understanding about how to get a license”. Need more community based training and the remote license unit to come more often. More education on driving in communities.</p>



	<b>Road safety risks &amp; problems</b>	<b>Number of times mentioned</b>	<b>Solutions to date</b>	<b>Future solutions</b>
				<p>“Build a driving school to teach road rules.”</p> <p>Defining community vs town driving criteria/suitability</p>
<b>Governance</b>	Lack of public transport	1		

