

Report No. 43, October 2005

*Driving on empty: Fatigue driving in Queensland*





**LEGISLATIVE ASSEMBLY OF QUEENSLAND**

**PARLIAMENTARY TRAVELSAFE COMMITTEE**

**Driving on Empty: Fatigue driving in  
Queensland**



# **PARLIAMENTARY TRAVELSAFE COMMITTEE**

## **51<sup>ST</sup> PARLIAMENT**

### **1<sup>ST</sup> SESSION**

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<b>EXECUTIVE ASSISTANTS</b>	Ms Tamara Vitale Ms Maureen Coorey (7 March 2005 to 12 September 2005)

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<sup>1</sup> On secondment from 14 March 2005 to 14 June 2005

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## **FOREWORD**

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This report focuses on the issue of driving while tired and the seriousness of crashes involving drivers affected by fatigue.

Since the invention of the electric light bulb by Thomas Edison in 1879 there has been a significant reduction in the average hours of sleep obtained each night. This, combined with longer working hours and more recent technologies such as the internet, has led to a society that operates 24 hours a day, 7 days a week where daily fatigue is an issue.

The primary purpose of this report is to examine the involvement of driver and rider fatigue in road crashes in Queensland. Our recommendations to Parliament aim to reduce the incidence of fatigue-related crashes.

Fatigue was a contributing factor in five per cent of the total reported crashes and in 13 per cent of fatal crashes in Queensland for 2003. Thus, fatigue is greatly over-represented in fatal crashes. These statistics, however, are likely to underestimate the actual number of fatigue-related crashes due to the difficulty in defining fatigue and accurately identifying drivers affected by fatigue.

Although fatigue has a dramatic impact on road safety, its causes and effects are not limited to the road. The recommendations from this report are designed to work jointly to produce an overall reduction in fatigue and, particularly, fatigue-related crashes. The committee made recommendations regarding fatigue driving policies and legislation, raising awareness of the problem and countermeasures.

On behalf of the committee, I would like to thank the people who contributed to this inquiry by making submissions, participating in the symposium and public hearing, providing us with information at private meetings or supplying documents and advice.

I also acknowledge and sincerely appreciate the dedication of committee members and research staff in bringing this report to the Parliament.

I commend the report to the House.

A handwritten signature in black ink that reads "Jim Pearce". The signature is written in a cursive style with a large, stylized initial "J".

Jim Pearce MP

Chairman

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# ABBREVIATIONS

Abbreviation	Definition
AAMI	Australian Associated Motor Insurers Ltd
ABS	Australian Bureau of Statistics
ACRS	Australasian College of Road Safety
AIS	Accident Investigation Squad
ASA	Australasian Sleep Association
ATC	Australian Transport Council
ATSB	Australian Transport Safety Bureau
BAC	Blood Alcohol Content
CARRS-Q	Centre for Accident Research and Road Safety – Queensland
COR	Chain of Responsibility
DIR	Department of Industrial Relations, Queensland
DMR	Department of Main Roads, Queensland
EDS	Excessive daytime sleepiness
FMP	Fatigue Management Program
IAP	Intelligent Access Project
ITS	Intelligent Transport Systems
NTC	National Transport Commission
OSA	Obstructive sleep apnoea
QPS	Queensland Police Service
QT	Queensland Transport
RAAG	Road Accident Action Group, Mackay
RACQ	Royal Automobile Club of Queensland
RTA	Roads and Traffic Authority, Sydney
TFMS	Transitional Fatigue Management Scheme
VMS	Variable Message Sign
WHSQ	Workplace Health and Safety Queensland

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# SUMMARY OF RECOMMENDATIONS

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<b>RECOMMENDATION 1:</b> .....	<b>15</b>
<p>That Queensland Health should actively promote the importance of sleep to health and the adverse health consequences of insufficient or poor quality sleep.            Ministerial Responsibility: Minister for Health</p>	
<b>RECOMMENDATION 2:</b> .....	<b>20</b>
<p>That the Minister for Transport and Main Roads should seek the support of all Australian Transport Council members for the development of standardised fatigue crash definitions and reporting for road safety purposes.            Ministerial Responsibility: Minister for Transport and Main Roads</p>	
<b>RECOMMENDATION 3:</b> .....	<b>21</b>
<p>That Queensland Transport should <u>not</u> adopt the ATSB fatigue crash definition in its present form.            Ministerial Responsibility: Minister for Transport and Main Roads</p>	
<b>RECOMMENDATION 4:</b> .....	<b>22</b>
<p>That Queensland Transport should, in consultation with the Department of Main Roads, the Queensland Police Service and other stakeholders, consider amending its fatigue crash definition to exclude 0.05 BAC and higher drink driving crashes and to remove the speed limit criteria. Crashes identified by police as being caused by fatigue and drink driving would continue to be included.            Ministerial Responsibility: Minister for Transport and Main Roads</p>	
<b>RECOMMENDATION 5:</b> .....	<b>24</b>
<p>That the Queensland Police Service should trial the collection of 'time on task' and 'amount of sleep' information by police who attend crashes. The trial should consider the benefits and costs of collecting the extra data as well as the feasibility of collecting the data for all crashes attended by police in Queensland.            Ministerial Responsibility: Minister for Police and Corrective Services</p>	
<b>RECOMMENDATION 6:</b> .....	<b>24</b>
<p>That the Queensland Police Service should, with assistance from Queensland Transport, provide comprehensive training for traffic and general duties officers who attend road crashes to assist in their identification of fatigue-related crashes and the detection of drivers who are impaired by fatigue.            Ministerial Responsibility: Minister for Police and Corrective Services and Minister for Transport and Main Roads</p>	
<b>RECOMMENDATION 7:</b> .....	<b>33</b>
<p>That Queensland Transport and Queensland Health should consult with the Australian Medical Association regarding the best way to inform general practitioners about the need to:</p> <ul style="list-style-type: none"> <li>• Better inform their patients about the dangers of driving and riding while fatigued;</li> <li>• Identify patients with sleep disorders; and</li> <li>• Help them seek treatment.</li> </ul> <p>Ministerial Responsibility: Minister for Transport and Main Roads and Minister for Health</p>	

**RECOMMENDATION 8: ..... 33**

Following the consultation in recommendation 7, Queensland Transport and Queensland Health should contact general practitioners and advise them about their obligation to better inform their patients about the dangers of driving and riding while fatigued, identify patients with sleep disorders and help them seek treatment.  
Ministerial Responsibility: Minister for Transport and Main Roads and Minister for Health

**RECOMMENDATION 9: ..... 34**

Queensland Transport should advise general practitioners that, if a patient continues to drive against their advice, it is their ethical and legal responsibility, to advise the patient that in the interest of public safety, they must inform Queensland Transport. Queensland Transport should provide information to general practitioners regarding their legal rights and protections when informing Queensland Transport about a patient's inability to drive safely.  
Ministerial Responsibility: Minister for Transport and Main Roads

**RECOMMENDATION 10: ..... 41**

That the Queensland Police Service should, in conjunction with Queensland Transport, increase the level of on-road enforcement of driving hours for heavy vehicle drivers.  
Ministerial Responsibility: Minister for Police and Corrective Services and Minister for Transport and Main Roads

**RECOMMENDATION 11: ..... 45**

That Queensland Transport should review the New South Wales and Victorian legislation that directly addresses fatigue driving to identify if it reduces the incidence of fatigue-related crashes; the success rate of prosecutions; the ease of enforcement; and the likely benefits of introducing similar legislation in Queensland.  
Ministerial Responsibility: Minister for Transport and Main Roads

**RECOMMENDATION 12: ..... 46**

That the Department of Industrial Relations should provide guidelines for employers and workers on the extent of eligibility for compensation for injuries sustained in crashes by workers who have a short sleep before driving home after shifts or break their journey to use another fatigue management countermeasure.  
Ministerial Responsibility: Minister for Employment, Training and Industrial Relations

**RECOMMENDATION 13: ..... 46**

That the Department of Industrial Relations should work with organisations to provide opportunities for employees to have a short sleep before travelling home after work, particularly in industries where employees have a higher risk of a fatigue-related crash.  
Ministerial Responsibility: Minister for Employment, Training and Industrial Relations

**RECOMMENDATION 14: ..... 47**

That the Department of Industrial Relations should develop a directive similar to those used by Department of Main Roads, Department of Industrial Relations and other Queensland Government agencies for all state government departments and agencies that will reduce the risk of public servants experiencing a fatigue-related crash while driving for work.  
Ministerial Responsibility: Minister for Employment, Training and Industrial Relations

**RECOMMENDATION 15: ..... 48**

That the Department of Natural Resources and Mines should work with employers, employees and other stakeholders within the mining industry to support and encourage the development of countermeasures such as more effective rostering systems, public education, health programs and alternative transport arrangements to reduce the incidence of fatigue-related crashes on the way to and from work.

Ministerial Responsibility: Minister for Natural Resources and Mines

**RECOMMENDATION 16: ..... 48**

That the Department of Industrial Relations should identify particular industries where employees have a high-risk of experiencing a fatigue-related crash either at work or while travelling to or from work and then, using information gathered from the implementation of recommendation 15, support and encourage the development of countermeasures to reduce fatigue-related crashes within these high-risk industries.

Ministerial Responsibility: Minister for Employment, Training and Industrial Relations

**RECOMMENDATION 17: ..... 52**

That Queensland Transport should introduce public education campaigns targeted at all high-risk groups outlined in Part 5 of this report. These campaigns should incorporate information on a range of symptoms and effects of driving fatigued and countermeasures that can be used to prevent fatigue-related crashes.

Ministerial Responsibility: Minister for Transport and Main Roads

**RECOMMENDATION 18: ..... 52**

That Queensland Transport should complement existing mass media fatigue-related campaigns by using alternative, more targeted, communication methods which target key groups such as passengers and children to influence drivers.

Ministerial Responsibility: Minister for Transport and Main Roads

**RECOMMENDATION 19: ..... 52**

That Queensland Transport should liaise with non-government organisations such as the RACQ and insurance companies in order to enhance the effectiveness of alternative, more targeted education campaigns.

Ministerial Responsibility: Minister for Transport and Main Roads

**RECOMMENDATION 20: ..... 53**

That Queensland Transport should include questions on driver fatigue in some versions of the novice driver and rider licence theory tests.

Ministerial Responsibility: Minister for Transport and Main Roads

**RECOMMENDATION 21: ..... 55**

That Queensland Transport should liaise with the community sector and the Department of Transport and Regional Services to provide a stable and recurrent source of funding for Driver Reviver programs on national highways and roads of national importance.

Ministerial Responsibility: Minister for Transport and Main Roads

**RECOMMENDATION 22: ..... 55**

That Queensland Transport, the Department of Main Roads and the Queensland Police Service should review the location and messages provided by signage for Driver Reviver sites.

Ministerial Responsibility: Minister for Transport and Main Roads and Minister for Police and Corrective Services

**RECOMMENDATION 23: ..... 56**

That Queensland Transport should explore alternative models to Driver Reviver for the provision of rest facilities for drivers. This should include partnership with fuel and food outlets, along with other businesses with a presence across Queensland's road network.

Ministerial Responsibility: Minister for Transport and Main Roads

**RECOMMENDATION 24: ..... 57**

That Queensland Transport should, in conjunction with Queensland Health and the Victorian authorities, evaluate the HealthBreak program to determine whether it should be adopted in Queensland. When making a decision about the adoption of the program, Queensland Transport and Queensland Health should consider the existing resources allocated to treat sleep disorders, the resources required to effectively treat the individuals diagnosed with a sleep disorder and, if necessary, allocate more resources.

Ministerial Responsibility: Minister for Transport and Main Roads and Minister for Health

**RECOMMENDATION 25: ..... 62**

That Queensland Transport and the Department of Main Roads should construct more quality rest areas based on the Department of Main Roads rest area policy outlined in Chapter 20 of their *Road Planning and Design Manual*. The location of future rest areas should be decided through consultation with heavy vehicle drivers and other key stakeholder groups.

Ministerial Responsibility: Minister for Transport and Main Roads

**RECOMMENDATION 26: ..... 64**

That, following an independent evaluation of the current audio-tactile devices, the Department of Main Roads should continue to deploy audio-tactile devices throughout Queensland.

Ministerial Responsibility: Minister for Transport and Main Roads

**RECOMMENDATION 27: ..... 67**

That Queensland Transport should, in conjunction with other transport agencies and universities, support research into different types of fatigue including hypo vigilance.

Ministerial Responsibility: Minister for Transport and Main Roads

**RECOMMENDATION 28: ..... 68**

That Queensland Transport should liaise with other transport agencies and universities to continue research into fatigue detection technologies. This research should have a particular focus on:

- Developing valid and reliable methods to measure fatigue or types of fatigue such as monotony;
- Linking the fatigue detection technology to, and accurately measuring, crash risk; and
- Providing research evidence to satisfy prerequisites for test results to be admissible in a court of law.

Ministerial Responsibility: Minister for Transport and Main Road

**RECOMMENDATION 29: ..... 69**

That Queensland Transport should, in conjunction with Queensland Health, monitor the development and usage of drugs, such as Modafinil, which are used to address fatigue.

Ministerial Responsibility: Minister for Transport and Main Roads and Minister for Health<sup>69</sup>

**RECOMMENDATION 30: ..... 69**

That Queensland Transport should, in conjunction with Queensland Health, liaise with research institutions to investigate and gain an understanding of:

- The effect of Modafinil and other similar drugs on the central nervous system;
- The effect of Modafinil and other similar drugs on healthy adults;
- The effect of Modafinil and other similar drugs on driving; and
- The development of additional, safer and more effective drugs to reduce fatigue.

Ministerial Responsibility: Minister for Transport and Main Roads and Minister for Health

**RECOMMENDATION 31: ..... 70**

That Ministers should report annually to Parliament on the implementation by their departments of supported or partially supported recommendations in this report.

Ministerial Responsibility: Minister for Transport and Main Roads, Minister for Police and Corrective Services, Minister for Health, Minister for Employment, Training and Industrial Relations and Minister for Natural Resources and Mines





# PART 1 ~ INTRODUCTION

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## THE TRAVELSAFE COMMITTEE

1. The 51<sup>st</sup> Legislative Assembly appointed the Travelsafe Committee on 18 March 2004 to monitor, investigate and report on all aspects of road safety and public transport in Queensland, in particular:
  - Issues affecting road safety including the causes of road crashes and measures aimed at reducing deaths, injuries and economic costs to the community;
  - The safety of passenger transport services, and measures aimed at reducing the incidence of related deaths and injuries; and
  - Measures for the enhancement of public transport in Queensland and reducing dependence on private motor vehicles as the predominant mode of transport.

## TERMS OF REFERENCE FOR THE INQUIRY

2. In the inquiry, the committee examined:
  - The involvement of driver and rider fatigue as a factor in road crashes in Queensland;<sup>2</sup>
  - The causes and symptoms of this fatigue; and
  - Legislative, enforcement, educational and other measures to reduce the incidence of fatigue-related crashes.

## INQUIRY PROCESS

3. The committee's consultation process provided a range of opportunities for the public to participate. When the committee announced the inquiry in June 2004, they released an issues paper, *Issues Paper No. 8: Inquiry into crashes involving driver and rider fatigue in Queensland*, to promote informed discussion and encourage submissions. The committee published the issues paper on its website at [www.parliament.qld.gov.au/tsafe](http://www.parliament.qld.gov.au/tsafe) and distributed 600 hard copies to interested groups and individuals. They also placed advertisements inviting submissions in newspapers. A copy of this advertisement is at Appendix A.
4. The committee released a second issues paper, *Issues Paper No. 9: Educating drivers to stop driving tired*, in December 2004. This second issues paper invited further submissions that focused on the role of public education initiatives targeted at fatigue driving. This issues paper is also available on the committee website. Over 300 hardcopies as well as electronic versions of this issues paper were distributed.
5. The committee received 38 submissions in response to the first issues paper, tabled 18 June 2004, and 14 submissions in response to the second issues paper, tabled 21 December 2004. Appendix B lists the organisations and individuals who made submissions.
6. The committee held a public hearing in Brisbane on 25 February 2005 to hear evidence from representatives of Queensland Transport (QT), Department of

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<sup>2</sup> In this report the term 'driver' refers to drivers and riders.

Main Roads (DMR), Department of Industrial Relations (DIR), the Centre for Accident Research and Road Safety – Queensland (CARRS-Q), the Queensland Police Service (QPS), Prince Charles Hospital Sleep Disorders Centre, the Australasian Sleep Association (ASA) and the Royal Automobile Club of Queensland Limited (RACQ). A list of witnesses is included in Appendix C.

7. The committee gathered further information on fatigue driving research and countermeasures during a visit to Perth in November 2004. The committee met with representatives from the Injury Research Centre, the Department of Planning and Infrastructure, the Department of Consumer and Employment Protection, Murdoch University, the Western Australia Police Service, the Office of Road Safety and Alertness Solutions. Appendix D lists the groups and individuals the committee met in Perth.

## **RESPONSIBILITY OF MINISTERS**

8. This report makes recommendations for the government to implement. The *Parliament of Queensland Act 2001* (the Act) requires Ministers to provide written responses to these recommendations to Parliament within three months of the report being tabled.
9. ‘Section 107 – Ministerial response to committee report’ of the Act requires the responsible Minister or Ministers to respond to recommendations contained in the committee’s reports.

### **107. Ministerial response to committee report**

- 1) This section applies if -
  - (a) a report of a committee, other than the Scrutiny of Legislation Committee, recommends the government or a Minister should take particular action, or not take particular action, about an issue; or
  - (b) a report of the Members’ Ethics and Parliamentary Privileges Committee recommends a motion be moved in the Assembly to implement a recommendation of the committee.
- 2) The following Minister must provide the Assembly with a response -
  - (a) for a report mentioned in subsection (1)(a) - the Minister who is responsible for the issue the subject of the report;
  - (b) for a report mentioned in subsection (1)(b) - the Premier or a Minister nominated by the Premier.
- 3) The response must set out -
  - (a) any recommendations to be adopted, and the way and time within which they will be carried out; and
  - (b) any recommendations not to be adopted and the reasons for not adopting them.
- 4) The Minister must table the response within 3 months after the report is tabled.
- 5) If a Minister cannot comply with subsection (4), the Minister must—
  - (a) within 3 months after the report is tabled, table an interim response and the Minister’s reasons for not complying within 3 months; and
  - (b) within 6 months after the report is tabled, table the response.
- 6) If the Assembly is not sitting, the Minister must give the response, or interim response and reasons, to the Clerk.

- 7) The response, or interim response and reasons, is taken to have been tabled on the day they are received by the Clerk.
- 8) The receipt of the response, or interim response and reasons, by the Clerk, and the day of the receipt, must be recorded in the Assembly's Votes and Proceedings for the next sitting day after the day of receipt.
- 9) The response, or interim response and reasons, is a response, or interim response and reasons, tabled in the Assembly.
- 10) Subsection (1) does not prevent a Minister providing a response to a recommendation in a report of the Scrutiny of Legislation Committee if it is practicable for the Minister to provide the response having regard to the nature of the recommendation and the time when the report is made.

*Example -*

If the committee recommends that a Bill be amended because, in the committee's opinion, it does not have sufficient regard to fundamental legislative principles and the Bill has not been passed by the Assembly, it may be practicable for the Minister to provide a response.

- 11) Subsection (6) does not limit the Assembly's power by resolution or order to provide for the tabling of a response, or interim response and reasons, when the Assembly is not sitting.
- 12) This section does not apply to an annual report of a committee.



## PART 2 ~ WHAT IS FATIGUE?

### DEFINING FATIGUE FOR ROAD SAFETY

10. Fatigue is an intangible state. It cannot be readily measured or detected.<sup>3</sup> This has led to a variety of approaches to defining and quantifying fatigue's effects and competing views on the benefits or otherwise of these approaches. Due to a lack of agreement, there is no universal definition of fatigue.<sup>4</sup> Part 3 of this report discusses the similar lack of agreement on defining fatigue-related crashes.
11. The term 'fatigue' is used to describe a range of concepts such as sleepiness, tiredness, exhaustion or even inattention.<sup>5</sup> Fatigue is feeling sleepy rather than actually falling asleep. Definitions of fatigue in relation to driving may include both contributory factors such as prolonged activity and inadequate sleep as well as symptoms such as impaired driving performance and feeling drowsy.<sup>6</sup> For most people, fatigue affects performance depending on hours of wakefulness. That is, the longer they stay awake, the more their performance will be impaired.
12. Submissions to the inquiry suggest a range of definitions. QT cite a definition of fatigue in their submission proposed by Dalziel and Job (2000):

*Fatigue refers to the state of an organism's muscles, viscera or central nervous system, in which prior physical activity and/or mental processing, in the absence of sufficient rest, results in insufficient cellular capacity or systemwide energy to maintain the original level of activity and/or processing using normal resources.*<sup>7</sup>

13. QT discuss the advantages of this definition including its precise nature compared to definitions used by other authors. This definition enables distinction between impairment caused by drugs and alcohol with fatigue and the concept that fatigue may cause a subjective feeling of tiredness.<sup>8</sup>
14. The Australasian College of Road Safety (ACRS) cite numerous definitions of fatigue used in research literature in their submission. These include:

*Fatigue is the result of inadequate rest over a period of time and ... leads to physical and mental impairment.*<sup>9</sup>

and

*The symptoms or effects associated with fatigue include impaired performance (loss of attentiveness, slower reaction times, impaired judgement, poorer performance on skilled control tasks and increasing*

<sup>3</sup> Roads and Traffic Authority, *Driver Fatigue: Problem Definition and Countermeasure Summary*, Roads and Traffic Authority, Sydney, 2001, p. 18

<sup>4</sup> LR Hartley, F Penna, A Corry & A Feyer, *Comprehensive Review of Fatigue Research*, report no. 117, Institute for Research in Safety and Transport, Perth, 1996, p. iv; LR Hartley & NA Mabbot, *Fatigue-related Crashes: A Summary of Characteristics and Prevalence*, report no. 130, Institute for Research in Safety and Transport, Murdoch University, Murdoch, Western Australia, 1998, p. 1.

<sup>5</sup> Roads and Traffic Authority, p. 2; Australian Transport Safety Bureau, *Road Safety in Australia: A Publication Commemorating World Health Day 2004*, Australian Transport Safety Bureau, Canberra, 2004, p. 133.

<sup>6</sup> Australian Transport Safety Bureau, p. 133.

<sup>7</sup> Dalziel and Job in Queensland Transport, *Submission No. 33*, p. 3.

<sup>8</sup> Queensland Transport, *33*, p. 3.

<sup>9</sup> Neville Inquiry in Australasian College of Road Safety, *Submission No. 30*, p. 3.

*probability of falling asleep) and subjective feelings of drowsiness or tiredness. Contributory factors include long periods awake, inadequate amount or quality of sleep over an extended period, sustained mental or physical effort, disruption of circadian rhythms, inadequate rest breaks and environmental stresses (heat, noise and vibration).*<sup>10</sup>

15. The ACRS also noted the Job and Dalziel definition cited by QT and discussed above.<sup>11</sup> The ACRS believe that any of these definitions are suitable and apply in every respect to all drivers and riders.<sup>12</sup>

16. The Holden Performance Driving Centre suggest a definition by Deborah Freund of the US Federal Highway Administration. This definition for fatigue is based on outcomes such as:

*Decreased alertness, decreased vigilance/watchfulness, increased information-processing and decision-making time, increased reaction time, more variable and less effective control responses, decreased motivation and decreased psychophysiological arousal (measured by changes in body temperature, brain waves, heart action and nervous system activity).*<sup>13</sup>

17. Dr Ki Douglas from the DIR provided a definition of fatigue in her presentation to the committee's fatigue symposium. She suggested that fatigue is a:

*Subjective experience that includes performance decrements and psychological impairments such as decreased reaction times, poor communication, poor judgment and mood fluctuations.*<sup>14</sup>

18. At the committee's public hearing, Dr Hukins, Clinical Director of the Sleep Disorders Centre and an executive member of the Australasian Sleep Association, stated that fatigue is defined medically as a lack of energy as opposed to sleepiness. Sleepiness is an increased propensity to sleep and is probably more of an issue when driving.<sup>15</sup>

19. CARRS-Q suggest that a single definition is unlikely in the near future due to the current diversity of definitions.<sup>16</sup> Rather than offer their definition of choice, CARRS-Q note that there are ten categories of fatigue definitions and agreement on one single definition is unlikely in the near future. The ten categories are:

- A subjective state – simply feeling fatigued;
- A crash cause;
- Observable behaviour;
- Physiological changes;
- Sleepiness;
- Likelihood to fall asleep based on sleep history;
- Hours of wakefulness compared with blood alcohol concentration (BAC);
- Likelihood of fatigue defined by patterns of sleep and work;
- An outcome of the task being performed; and
- Involvement in crashes when using substitute measures<sup>17</sup>

<sup>10</sup> Fatigue Expert Group in Australasian College of Road Safety, 30, p. 3.

<sup>11</sup> Job and Dalziel in Australasian College of Road Safety, 30, p. 3.

<sup>12</sup> Australasian College of Road Safety, 30, pp. 3-4.

<sup>13</sup> Freund in Holden Performance Driving Centre, *Submission No. 31*, p. 1.

<sup>14</sup> Swaen in K Douglas, *Presentation to the Fatigue Symposium*, 22 October 2004.

<sup>15</sup> C Hukins, *Hearing Transcript – Crashes Involving Driver and Rider Fatigue in Queensland*, 25 February 2005, p. 28.

<sup>16</sup> Centre for Accident Research and Road Safety – Queensland, *Submission No. 37*, 2004, p. 4.

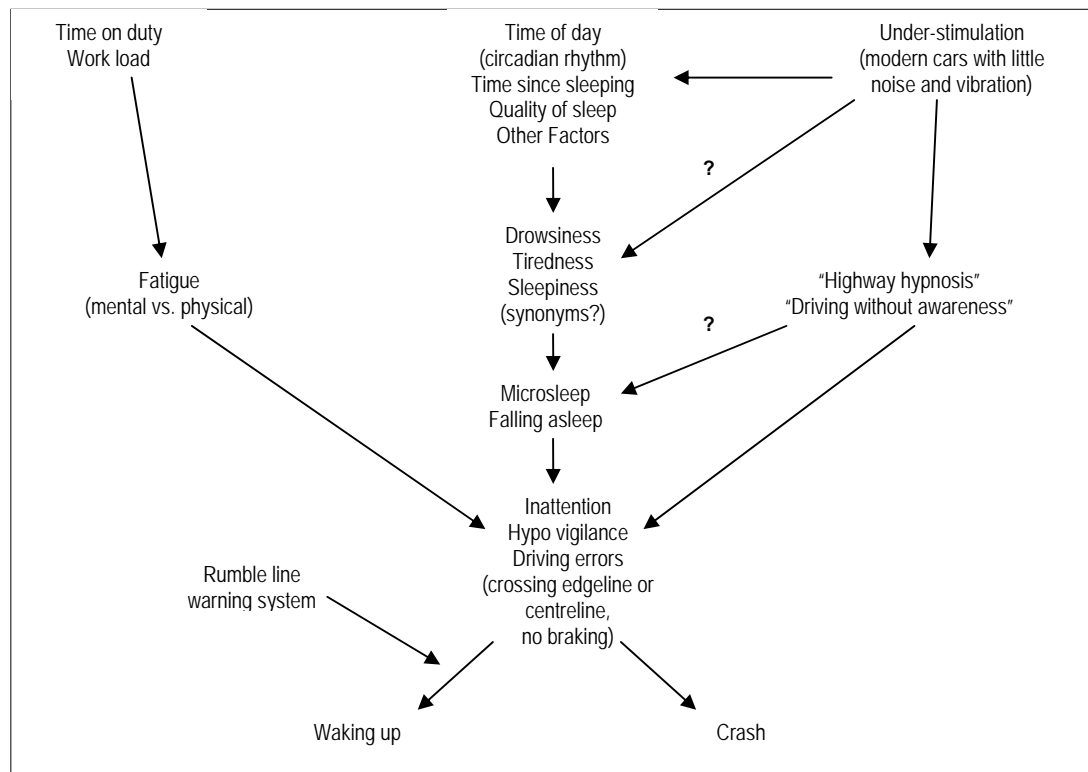
<sup>17</sup> Centre for Accident Research and Road Safety – Queensland, 37, pp. 3-4.

20. Further submissions to the inquiry suggest identifying fatigue by a range of causes including, the number of continuous hours worked, level of stress experienced, sickness and injuries<sup>18</sup> and using the psychological and physiological signs that occur as a person falls asleep.<sup>19</sup>
21. The committee notes the difficulty in providing a single, clear, measurable definition of fatigue. The committee agrees with CARRS-Q that consensus on a single definition is unlikely in the near future. We also agree with ACRS that there is a need for consensus. A standardised definition of fatigue would be useful in ensuring that the 'problem' of fatigue in road safety is clearly outlined and to help target countermeasures. A standard definition should enable quick, easy, reliable and cost-effective measurement of fatigue. For this to occur there is a need to continue and expand existing fatigue-related research within Queensland. The need for further research is discussed in Part 9 of this report.

### PRECURSORS TO FATIGUE

22. Figure 1 below outlines the factors or precursors that lead to fatigue. Each of these, 'time since sleeping', 'quality of sleep', 'time of day', 'time on duty', 'workload', 'under-stimulation' and 'other factors' are discussed separately.

**Figure 1: A conceptual map of fatigue, sleepiness and related phenomena, and their possible precursors and consequences**



Source: Adapted from F Sagberg, P Jackson, H-P Kruger, A Muzet & A Williams, *Fatigue, Sleepiness and Reduced Alertness as Risk Factors in Driving*, Report No. 739/2004, Institute of Transport Economics, Oslo, 2004.

<sup>18</sup> Thuringowa City Council, *Submission No. 7*, 2004, p. 1.

<sup>19</sup> B Puller, *Submission No. 35*, 2004, p. 1.

## Time since sleeping

23. Lack of sleep has impairing effects similar to the excessive consumption of alcohol or the use of mind-altering drugs. The longer a person is awake since they last slept, the greater their likelihood of being involved in a crash. The loss of one night's sleep results in extreme sleepiness.<sup>20</sup>
24. Expressing fatigue-related impairment in relation to a BAC provides an index of the relative impairment associated with fatigue.<sup>21</sup> A study in 2000 commissioned by the Federal Government concluded that a person driving after being awake for 17 to 19 hours has a risk of crashing equivalent to the 0.05 blood alcohol content BAC level.<sup>22</sup> After 20 hours, this crash risk increases to the equivalent of a BAC of 0.10.<sup>23</sup> The level of impairment due to fatigue at this point is twice the legal blood alcohol limit for open licence holders in Australia.

## Quality of sleep

25. Good quality sleep is needed to reduce a person's fatigue. Sleep disruption and fragmentation can cause inadequate sleep and, as a result, affect the person's ability to perform tasks while they are awake.<sup>24</sup> The quality of sleep can be affected by many factors including noise, children, lights, a restless spouse or being on call.<sup>25</sup>
26. Sleep disorders also affect sleep quality. The ASA estimates that almost 90 per cent of Australians suffer from a sleep disorder at some point in their lives and 30 per cent suffer a severe sleep disorder.<sup>26</sup> There is currently limited data on the number of people in Australia with sleep disorders who are diagnosed and treated.<sup>27</sup>

## Time of day

27. People have a natural sleep-wake cycle known as a circadian rhythm or body clock. This cycle lasts 24 hours. During this time there are two periods when sleepiness increases: night time to early morning and the afternoon.<sup>28</sup>
28. Research has shown that fatigue-related crash risks correspond to the effects of circadian rhythms.<sup>29</sup> There is a peak in crash risk at 3am and a secondary peak during the early afternoon at 3pm.<sup>30</sup> Drivers are also more likely to experience a microsleep during these times.<sup>31</sup> Microsleeps are brief,

<sup>20</sup> Carskadon in NCSDR/NHTSA Expert Panel on Driver Fatigue and Sleepiness, *Drowsy Driving and Automobile Crashes*, <[http://www.nhtsa.dot.gov/people/injury/drowsy\\_driving1/Drowsy.html](http://www.nhtsa.dot.gov/people/injury/drowsy_driving1/Drowsy.html)>, p. 5.

<sup>21</sup> D Dawson & K Reid, 'Fatigue, alcohol & performance impairment', *Nature*, 388, 1997, p. 235.

<sup>22</sup> A Williamson, A M Feyer, R Friswell & S Finlay-Brown, *Development of Measures of Fatigue: Using an Alcohol Comparison to Validate the Effects of Fatigue on Performance*, CR189, Australian Transport Safety Bureau, Canberra, <[www.atsb.gov.au](http://www.atsb.gov.au)> 2000, downloaded 4 May 2004.

<sup>23</sup> Australian Transport Safety Bureau, p. 134.

<sup>24</sup> Dinges in NCSDR/NHTSA, p. 6.

<sup>25</sup> NCSDR/NHTSA, p. 6.

<sup>26</sup> Boston Consulting Group, *Proposal for a National Sleep Health Agenda*, Australasian Sleep Association, <[www.sleepaus.on.net/nationalsleephealthagenda.pdf](http://www.sleepaus.on.net/nationalsleephealthagenda.pdf)>, 2003, pp. 2-5.

<sup>27</sup> J Douglas, *Hearing Transcript – Crashes Involving Driver and Rider Fatigue in Queensland*, 25 February 2005, p. 27.

<sup>28</sup> Australian Transport Safety Bureau, p. 134.

<sup>29</sup> Australian Transport Safety Bureau, p. 134.

<sup>30</sup> S Folkard, 'Black times: Temporal determinants of transport safety', *Accident Analysis and Prevention*, vol. 29, no. 4, 1997, p. 417.

<sup>31</sup> Roads and Traffic Authority, p. 7.



unintentional episodes of loss of attention associated with events such as a blank stare, head snapping and prolonged eye closure.<sup>32</sup>

29. The sleep and wake pattern is also influenced by the day and night cycle. As a general rule, people sleep at night and are awake during the day. People who operate outside of this cycle such as night workers tend to experience sleep loss and sleep disruption.<sup>33</sup>

### **Time on duty (time at the wheel)**

30. The longer people perform a task such as driving, the more fatigued they become. This is true for both muscular and mental fatigue.<sup>34</sup> People who are fatigued take longer to react to events, they perform tasks at a lower standard and crash risk increases. The time on duty effect will often combine with the time of day effect.<sup>35</sup>
31. For truck drivers, time on duty includes time spent driving and time spent on other jobs such as loading and unloading trucks.<sup>36</sup> These other activities also contribute to their fatigue.

### **Workload (amount and stressful nature of work)**

32. Longer working hours affect a growing number of Australians.<sup>37</sup> The proportion of full-time workers working a standard 40 hour working week has decreased significantly since the late 1970s, whereas the proportion working long hours has increased. Two thirds of full-time workers were working 35-40 hours per week in the late 1970s. Today employees working standard hours make up less than half of the full-time labour force. The proportion of full-time workers working very long hours (more than 48 hours a week) jumped from 19 per cent to 32 per cent in the late 1990s.<sup>38</sup>
33. Australian workers are increasingly working long hours in comparison with employees in other nations.<sup>39</sup> Australia parallels the United States among the OECD nations in the proportion of men working more than 50 hours per week.<sup>40</sup> More than 20 per cent of men in both countries work more than 50 hours a week compared to less than 10 per cent in Sweden, the Netherlands and Luxemburg.<sup>41</sup>
34. The type of work or the tasks people perform will affect the amount of fatigue that they feel and not varying the tasks that are performed will induce more fatigue.<sup>42</sup>

<sup>32</sup> Roads and Traffic Authority, p. 3.

<sup>33</sup> Akerstedt in NCSDR/NHTSA, pp. 3-4.

<sup>34</sup> Australian Transport Safety Bureau, p. 134.

<sup>35</sup> Hartley, Penna, Corry, & Feyer, p. 23.

<sup>36</sup> Queensland Transport, 33, p. 19.

<sup>37</sup> Australian Centre for Industrial Relations Research and Training, *Australia at Work*, Prentice Hall, Sydney, 1999.

<sup>38</sup> B Pocock, *The Effect of Long Hours on Family and Community Life: A Survey of Existing Literature*, Department of Industrial relations, Brisbane, 2001, p.4.

<sup>39</sup> Pocock, p.3.

<sup>40</sup> J A Jacobs, K Andgerson, 'Overworked individuals or overworked families? Explaining trends in work, leisure and family time', *Work and Occupations*, 28, 2001 pp.40-63.

<sup>41</sup> Pocock, p.4.

<sup>42</sup> Fatigue Expert Group, *Fatigue Expert Group: Options for Regulatory Approach to Fatigue in Drivers of Heavy Vehicles in Australia and New Zealand*, Australian Transport Safety Bureau, Canberra, 2001, <<http://www.atsb.gov.au/road/pdf/cr202.pdf>>, p. 24.

## Under-stimulation

35. A lack of stimulation and a monotonous driving environment often induces fatigue. The high interior comfort level of modern cars that have cruise control and other new technologies and good road engineering can lead to reduced vigilance. Dull scenery and repetitive patterns such as headlights, trees, utility poles and highway markings can also contribute to 'highway hypnosis'. Highway hypnosis is a trance like condition that dulls the senses, affects judgement and reduces reaction time.<sup>43</sup> Other consequences of monotony when driving are less attention to the driving task, drowsiness and failure to react adequately to changes in the road situation.<sup>44</sup>
36. In some cases, monotony-related fatigue can appear in as little as 20 minutes when the driver receives little sensory stimulation.<sup>45</sup> This fatigue is not reduced by adding visual elements such as a sign.<sup>46</sup> Vehicle comfort, ease of control using new technologies such as cruise control as well as the droning of tyres and engines may also contribute to the under-stimulation of the driver.<sup>47</sup>

## Other factors

37. Day-to-day activities such as work, social events and parenting responsibilities also contribute to fatigue.<sup>48</sup> Parents and other people caring for family members often have increased levels of fatigue. In the first year of a child's life, a parent is likely to lose between 400 and 600 hours of sleep.<sup>49</sup>
38. Many people suffer from long or short term mental health problems that often limit or disrupt sleep and therefore cause fatigue. For example, people with depressive illness often report altered sleep patterns.<sup>50</sup> Approximately 17 per cent of Australians are affected by a mental disorder.<sup>51</sup>

## THE IMPORTANCE OF SLEEP

39. Although society often views sleep as a luxury that ambitious or active people cannot afford, research shows that getting enough sleep is a biological necessity, as important to good health as eating well or exercising.<sup>52</sup>
40. The importance of sleep can not be underestimated. Only sleep prevents or cures fatigue. Sleep restores mental functions that resting while awake does not. A short sleep of 10 to 20 minutes is enough to prevent some fatigue.<sup>53</sup>
41. Most people need between seven and nine hours sleep per day. Young people need more sleep. Children and adolescents need even more sleep than adults.

<sup>43</sup> Australian Transport Safety Bureau, p. 135.

<sup>44</sup> Centre for Accident Research and Road Safety – Queensland, 37, pp. 10-11.

<sup>45</sup> Centre for Accident Research and Road Safety - Queensland, *Hearing Transcript – Crashes Involving Driver and Rider Fatigue in Queensland*, 25 February 2005, p. 17.

<sup>46</sup> P Thiffault & J Bergeron, 'Monotony of road environment and driver fatigue: A simulator study', *Accident Analysis and Prevention*, vol. 35, no. 3, 2003, p. 381.

<sup>47</sup> Australian Transport Safety Bureau, p. 135.

<sup>48</sup> W Harrison, 'Fatigued driving in urban areas: The role of daily activities', *Road Safety Research, Policing and Education Conference Proceedings*, 2002, <[www.rsconference.com](http://www.rsconference.com)>, downloaded 29 April 2004, p. 6.

<sup>49</sup> Hukins, p. 32.

<sup>50</sup> Australian Institute of Health and Welfare, *NHPA Report on Mental Health 1998: A Report Focusing on Depression*, Australian Institute of Health and Welfare, Canberra, 1999, p. 44.

<sup>51</sup> Australian Institute of Health and Welfare, p. 10.

<sup>52</sup> National Sleep Foundation, *Teens and Sleep*, <[www.sleepfoundation.org](http://www.sleepfoundation.org)>.

<sup>53</sup> Hukins, p. 30.

The following table is a breakdown of the recommended number of hours of sleep people need by age.

**Table 1: Required sleep by age (\*including naps)**

<b>Infants</b>	(0 to 2 months):	10-1/2 to 18 hours*
	(2-12 months):	14 to 15 hours*
<b>Toddlers/Children</b>	(12-18 months):	13 to 15 hours*
	(18 months-3 years):	12 to 14 hours*
	(3-5 years):	11 to 13 hours*
	(5-12 years):	9 to 11 hours
<b>Adolescents</b>		8-1/2 to 9-1/2 hours
<b>Adults</b>		7 to 9 hours

Source: National Sleep Foundation, *Teens and Sleep*, <www.sleepfoundation.org>

42. ASA suggests that the vast majority of the population – up to 90 per cent – does not get enough quality sleep at some time(s) in their lives. The association also notes anecdotal evidence from sleep specialists that Australians sleep an average of seven hours a night, about one hour less than 100 years ago.<sup>54</sup>
43. ASA estimates that almost 90 per cent of people suffer from a sleep disorder at some time or times in their lives, with 30 per cent suffering a severe or serious disorder. Throughout the community, very few people regularly enjoy the amount of quality sleep they need.<sup>55</sup>
44. ASA defines ‘sleep disorder’ as a medical illness or poor sleep behaviour that leads to inadequate amounts of sleep or poor quality sleep.<sup>56</sup> Table 2 discusses sleep disorders and their prevalence in Australia.

**Table 2: Classification of Sleep Disorders**

	<b>Poor Sleep Behaviours</b>	<b>Other Medical Sleep Disturbances</b>	<b>Obstructive Sleep Apnoea (OSA)</b>
<b>Description</b>	<ul style="list-style-type: none"> <li>• Insufficient amounts of sleep or poor quality sleep in the absence of a medical cause</li> <li>• Increasing sleep deprivation caused by shift work, longer hours of work and modern lifestyles</li> <li>• Insomnia caused by acute stressors or poor sleep hygiene</li> </ul>	<ul style="list-style-type: none"> <li>• Range of medical disorders including:                             <ul style="list-style-type: none"> <li>- dyssomnias eg narcolepsy, drug and alcohol use disorders</li> <li>- parasomnias eg sleep walking, nocturnal leg cramps</li> </ul> </li> <li>• Psychiatric disorders eg mood disorders, anxiety disorders</li> </ul>	<ul style="list-style-type: none"> <li>• Clearly defined syndrome characterised by at least five obstructed breathing events per hour of sleep with major symptoms eg: sleepiness, difficulty concentrating</li> <li>• Associated with significant comorbidities including hypertension, ischaemic heart disease, stroke, cardiac failure, respiratory failure</li> </ul>
<b>Relative Prevalence</b>	<ul style="list-style-type: none"> <li>• Affects up to 90 per cent of population</li> </ul>	<ul style="list-style-type: none"> <li>• Affects approximately 5-7 per cent of population</li> <li>- only 10-20 per cent of affected population are recognised</li> </ul>	<ul style="list-style-type: none"> <li>• Affects approximately 3-5 per cent of population</li> <li>- only 10-20 per cent of affected population are diagnosed and treated</li> </ul>

Source: BCG interviews, N Douglas, *Clinician’s Guide to Sleep Medicine in Australasian Sleep Association*, 2003.

<sup>54</sup> Boston Consulting Group, p.5.  
<sup>55</sup> Boston Consulting Group, p.2.  
<sup>56</sup> Boston Consulting Group, p.2.

45. Without adequate sleep, the body builds up a 'sleep debt' which is the difference between the minimum amount of sleep required and the actual sleep obtained.<sup>57</sup> A loss of a small amount of sleep, such as two hours, can severely affect the alertness and reaction times of drivers.<sup>58</sup>
46. Not all sleep prevents or cures fatigue with the same effect. Restless or broken sleep leaves a person tired and at a higher risk of making errors.<sup>59</sup> Regularly having inadequate sleep leads to severe sleepiness and impaired performance.<sup>60</sup> Significant numbers of people experience chronic sleep loss. According to the ASA, 11 per cent of people in the general community and 24 per cent of Australian transport drivers have chronic excessive sleepiness. This increases their crash risk by two to three times.<sup>61</sup>
47. ASA conclude that the nature and magnitude of sleep disorders in the community, and the economic and other costs of those disorders, warrant the establishment of a national sleep health agenda. The association notes:

*Clear gaps in current sleep service offering, as well as fragmentation and under-resourcing in the sleep service landscape, make it imperative that Australia adopt a coordinated national approach. Such an approach will make it possible to provide education, services and funding, and to establish a national champion/change agent to lead the sleep agenda into the future.<sup>62</sup>*

## **PUBLIC HEALTH IMPACTS OF FATIGUE**

48. Sleep problems are a major public health problem in Australia with substantial consequences and costs to the wider community. The consequences of sleep disorders include:
  - Health costs from co-morbidities, the inappropriate use of sleep medications, and higher than average consumption of medical resources;
  - Lost productivity;
  - Transport accidents;
  - Workplace accidents; and
  - Social outcomes.
49. ASA estimated the cost to the Australian community from sleep problems to be in the range of \$3-7 billion per year. Figure 2 below provides breakdowns for these costs estimates calculated by the Boston Consulting Group.

<sup>57</sup> Australian Transport Safety Bureau, p. 133.

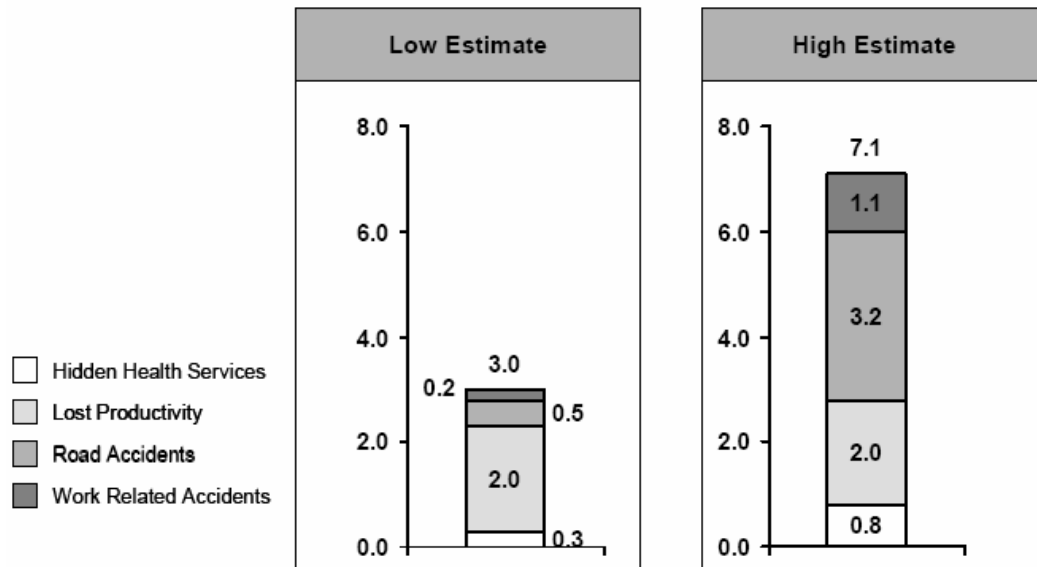
<sup>58</sup> Australian Transport Safety Bureau, p. 133.

<sup>59</sup> P Gander, L Le Quesne & N Marshall, *How Important is Driver Fatigue in Truck Crashes?*, Sleep/Wake Research Centre, Massey University, Wellington, p. 16.

<sup>60</sup> Boston Consulting Group, p. 5.

<sup>61</sup> Boston Consulting Group, p. 3.

<sup>62</sup> Boston Consulting Group, p. i.

**Figure 2: Estimated costs of sleep related problems in Australia per annum**

Source: Boston Consulting Group, *Proposal for a National Sleep Health Agenda*, Australasian Sleep Association, <[www.sleepaus.on.net/nationalsleephealthagenda.pdf](http://www.sleepaus.on.net/nationalsleephealthagenda.pdf)>, 2003.

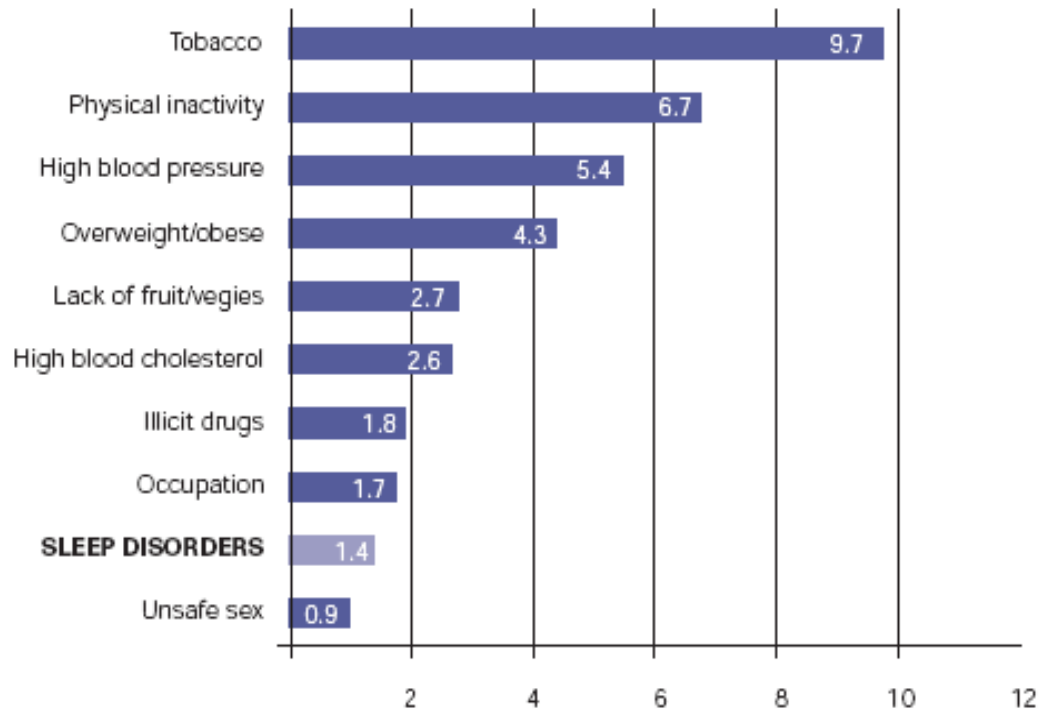
50. A subsequent report commissioned by Sleep Health Australia, Access Economics and funded by the Resmed Research Foundation estimates that over six per cent of the Australian population experienced a sleep disorder, costing \$10.3 billion in 2004.
51. All up, health costs of sleep disorders were estimated at \$628 million in 2004 (nearly 1 per cent of total Australian health costs). This is of a similar order of magnitude to asthma, which is a national health priority. Other indirect financial impacts outweigh the health costs nearly 9 to 1, adding \$5.6 billion to the annual bill for sleep disorders. Access Economics also estimate that sleep disorders are a contributing factor in 7.6 per cent of non work-related motor vehicle crashes.<sup>63</sup>
52. The same report concludes that motor vehicle crashes in Australia involving drivers affected by sleep disorders cost approximately \$1.1 billion in 2004. This figure includes the costs of medical care, vehicle repairs, long term care, loss of productivity in the workplace and home, lost leisure and quality of life, travel delays and insurance administration.<sup>64</sup> This was the second largest indirect financial cost of sleep disorders after work-related injuries.<sup>65</sup>
53. If sleep disorders are treated as a risk factor for other disease, they rank in the top ten risk factors in Australia. Figure 3 below provides a comparison of risks to health from sleep disorders and other risks in Australia. The figure suggests that sleep disorders cause more ill-health than well known risks to health such as unsafe sex or alcohol abuse.

<sup>63</sup> Access Economics, *Wake Up Australia: The Value of Healthy Sleep*, Sleep Health Australia, June 2005, <[www.accesseconomics.com.au](http://www.accesseconomics.com.au)>, p. i.

<sup>64</sup> Access Economics, pp. 41-42.

<sup>65</sup> Access Economics, p. 58.

**Figure 3: Sleep disorders relative to other risks to health (per cent of Disability Adjusted Life Years)**



Source: C Mathers, T Vos, & C Stevenson, *The burden of disease and injury in Australia AIHW Cat. No. PHE17, AIHW Canberra, 1999.*

54. Access Economics also note that the importance of sleep health is beginning to gain recognition overseas. In the United States, the National Commission on Sleep Disorders Research in 1993 identified priorities for a national sleep health agenda and called for action from Congress to recognise sleep-related problems as an important public health issue by:
- Establishing a National Centre for Research and Education on Sleep;
  - Expanding basic, clinical, epidemiological, health services and prevention research;
  - Providing cross-departmental links within all affected Federal departments/agencies;
  - Increasing Federal support for research into workforce training and career development;
  - Broadening awareness of, and training in, sleep and sleep disorders across all health professions, particularly at the primary care level; and
  - A major public awareness and education campaign about sleep and sleep disorders.<sup>66</sup>
55. The committee notes the importance of sleep and the prevalence of sleep problems and estimates of their economic and other costs in Australia. The committee could not identify an effort in Australia comparable to those in other countries to raise public awareness of sleep problems, to further research, or to coordinate initiatives across government.

<sup>66</sup> Access Economics, p. iii.

56. The committee suggests that sleep health should be considered by governments as with any other comparable significant public health issue. In Queensland, this is a matter for Queensland Health.

**RECOMMENDATION 1:**

That Queensland Health should actively promote the importance of sleep to health and the adverse health consequences of insufficient or poor quality sleep.

**Ministerial Responsibility:**

**Minister for Health**





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## PART 3 ~ FATIGUE CRASH DEFINITIONS

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57. Fatigue crashes are very difficult to research and manage. This is because of the intangible nature of fatigue, as discussed in Part 2, and the failure of road safety agencies to adopt a standard crash definition. As a result, crashes identified as being fatigue-related in one jurisdiction may, in another jurisdiction, be attributed to quite different causes. This impedes efforts to compare crash trends and the effectiveness of countermeasures from one state to another.
58. Fixing the definition problem is crucial to gaining a better understanding of, and addressing, fatigue crash risks.

### DETECTING FATIGUE CRASHES

59. Fatigue is difficult to identify as a crash factor due to its subjective nature and difficulty in establishing it as a cause.<sup>67</sup> Unlike the presence of other impairing agents like drugs or alcohol, post-mortems cannot identify the impairing effects of fatigue.<sup>68</sup> There is, as yet, no simple scientific test to show fatigue impairment or tiredness. It leaves no detectable chemical or physical traces. There is also no universal definition for what constitutes a fatigue crash in Australia or any other country.
60. To gauge the prevalence of fatigue crashes, road safety agencies in Australia rely on the assessments by police who attend crashes. QT, the Australian Transport Safety Bureau (ATSB), the New South Wales Roads and Traffic Authority (RTA) and the Office of Road Safety in Western Australia also use statistical surrogates to supplement the police-reported fatigue crashes. QT's rationale for using both police reports and a statistical surrogate is well explained in their annual crash report series – *Road Traffic Crashes in Queensland 2003*:

*Because fatigue is difficult to determine, particularly in more severe crashes, for the purpose of this report, the numbers based on police assessment have been augmented to include single vehicle-type crashes (such as roll-overs or hit objects) on open roads, during high risk times for fatigue (that is 2pm to 4pm and 10pm to 6 am). While this approach may still understate the contribution of fatigue (it ignores crashes at other times of day, crashes in urban areas and multi-vehicle crashes such as head-on crashes unless positively identified as fatigue-related by police), it does isolate the common factors of fatigue-related crashes and will allow for consistent analysis over time.<sup>69</sup>*

### Police crash reports

61. The crash reports filed by police are the primary source of information about the causes and characteristics of crashes. Police who attend crashes are well placed to record the facts, interview the people involved, including witnesses and other motorists and investigate the background of drivers they suspect to be impaired by fatigue.

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<sup>67</sup> K Diamantopoulou, E Hoareau, P Oxley & M Cameron, *The Feasibility of Identifying Speeding-Related and Fatigue-Related Crashes in Police-Reported Mass Crash Data*, Monash University Accident Research Centre, Melbourne, 2003, p. 8.

<sup>68</sup> Australian Transport Safety Bureau, p. 132.

<sup>69</sup> Queensland Transport, *Road Traffic Crashes in Queensland 2003, 2004*, p.43

62. QPS incident reports have a section where fatigue can be specified as a contributing factor to a crash, however, such assessments are highly subjective.<sup>70</sup> Depending on the depth of the investigating officer's inquiries, the role played by fatigue in crashes is likely to be underestimated.<sup>71</sup> Estimates from self-report data tend to be higher than those from police data.<sup>72</sup> Many crashes where the cause is described as 'unknown' may also be fatigue-related.<sup>73</sup>
63. Fatigue is unlikely to be the sole cause of a crash. Drivers who drive fatigued may also have an illegal BAC, be speeding or not be wearing a seatbelt or motorcycle helmet.<sup>74</sup> These other factors can mask the contribution of fatigue to crash risk.
64. In Queensland, if a crash is serious or involves a fatality, the QPS Accident Investigation Squad (AIS) will be called to examine the crash in greater detail to identify the cause(s).<sup>75</sup> For crashes outside metropolitan areas, an AIS-trained officer may be called to attend. To determine the role of fatigue, the AIS specifically look for symptoms such as:
- Lack of braking or evasive tactics prior to the crash;
  - A vehicle travelling straight ahead prior to the crash;
  - A vehicle travelling off the road at a very shallow angle (usually indicated by the path of the vehicle across a gravel verge or grassed area);
  - The movements of the driver in the 36 hours leading up to the crash (including his/her work hours, workload, recreational activities and hours of sleep);
  - The time of day, weather conditions, heater settings and where the journey began and ended;
  - Witness descriptions of the movements of the vehicle leading up to the crash; and
  - The medical history of the driver, for instance the presence of obstructive sleep apnoea (OSA).<sup>76</sup>
65. QPS officers receive training as part of their recruit training to assist them to recognise the markers of a fatigue crashes. This training also covers the signs of driver impairment, including fatigue. The committee is not aware of the effectiveness of this training.

### **Statistical surrogates**

66. The ATSB, QT, RTA and Office of Road Safety in Western Australia use statistical surrogates to identify crashes that have characteristics strongly associated with fatigue crashes. These surrogates are sets of operational definitions as listed in Table 3. Crashes that fit all the definitions are counted as fatigue crashes, irrespective of any findings by police who attend the crashes.
67. Operational definitions have the advantage of being repeatable in other studies and provide practical and useful guides of the relative occurrence of fatigue-related crashes. However, they also have the disadvantage of missing some

<sup>70</sup> Centre for Accident Research and Road Safety - Queensland, 37, p. 6.

<sup>71</sup> Queensland Police Service, *Submission No. 16*, p. 6.

<sup>72</sup> Diamantopoulou et al., p. 7.

<sup>73</sup> Australian Transport Safety Bureau, p. 132.

<sup>74</sup> Roads and Traffic Authority, p. 6.

<sup>75</sup> Queensland Police Service, *Hearing Transcript – Crashes Involving Driver and Rider Fatigue in Queensland*, 25 February 2005, p. 22.

<sup>76</sup> Queensland Police Service, *Personal Correspondence*, Accident Investigation Squad, 2005.

fatigue crashes while counting others where fatigue was not a contributing factor.<sup>77</sup> They remain a useful guide to the incidence of fatigue crashes.

68. The most notable exclusions to the Queensland and ATSB surrogates are fatigue crashes on urban roads. The surrogates only count crashes on high-speed roads - roads with posted speed limits of 80 km/hr and faster for the ATSB surrogate and 100 km/hr and faster for the QT surrogate.

**Table 3: Fatigue crash surrogates**

<b>Queensland Transport</b>	<ul style="list-style-type: none"> <li>• a single vehicle crash</li> <li>• occurs 10pm - 6.00am or 2pm - 4pm</li> <li>• occur on roads with speed limits of 100 kilometres per hour or higher</li> </ul>
<b>Australian Transport Safety Bureau</b>	<ul style="list-style-type: none"> <li>• a single vehicle crash occurring between midnight - 6 am or 2 pm - 4 pm or</li> <li>• a head-on collision where neither vehicle was overtaking at the time of the crash</li> <li>• occur on roads with speed limits 80 kilometres per hour or higher</li> <li>• excludes crashes involving pedestrians</li> <li>• excludes crashes involving unlicensed drivers</li> <li>• excludes crashes involving drivers with high blood alcohol levels (BAC over 0.05g/100ml)</li> </ul>
<b>New South Wales Roads and Traffic Authority</b>	<ul style="list-style-type: none"> <li>• The vehicle performed a manoeuvre that suggested loss of concentration of the controller due to fatigue, that is:               <ul style="list-style-type: none"> <li>- The vehicle travelled onto the incorrect side of a straight road and was involved in a head-on collision (and was not overtaking another vehicle and no other relevant factor was identified); or</li> <li>- The vehicle ran off a straight road or off the road to the outside of a curve and the vehicle was not directly identified as travelling at excessive speed and there was no other relevant factor identified for the manoeuvre.</li> </ul> </li> </ul>
<b>Office of Road Safety, Western Australia</b>	<ul style="list-style-type: none"> <li>• A vehicle travelled to the incorrect side of the road and was involved in a head-on collision while not overtaking another vehicle; or</li> <li>• The vehicle ran off the carriageway and the vehicle was not directly identified as travelling at excessive speed and there were no other factors identified as causing loss of control (e.g. alcohol, road condition, tyre blow-out, sun glare, side wind, headlights, driver condition or broken screen).</li> </ul>

Source: Based on K Dobbie, *Fatigue-related Crashes: An Analysis of Fatigue-related Crashes on Australian Roads Using an Operational Definition of Fatigue*, Road Safety Research Report OR 23, 2002.

69. Other differences between the ATSB and QT surrogates include variations in the time bands (ATSB midnight - 6.00am; QT 10pm - 6.00am) and the treatment of head-on crashes, pedestrian crashes, and crashes involving unlicensed drivers and drink drivers. These crashes are included as fatigue crashes by the QT surrogate but excluded by the ATSB surrogate.

## IMPROVING FATIGUE CRASH REPORTING

70. The first step in managing the risks posed by driver fatigue is to quantify the problem. This requires crash statistics that are reliable, accurate and standardised. Presently, fatigue crash statistics are lacking in all three areas. The committee considered three options to help achieve this: standardising the definitions of fatigue crashes in Australia, enhancing the QT fatigue crash definition and better training and guidance for police to recognise crashes contributed to by fatigue.

<sup>77</sup> Nova: Science in the News, *Driver Fatigue*, Australian Academy of Science, Canberra, 2002, <[www.science.org.au](http://www.science.org.au)> p. 1.

### **Standardising the definitions for fatigue crashes in Australia**

71. The absence of a universally recognised definition for fatigue crashes has resulted in crash data that has limited usefulness. Most significantly, it makes it difficult to draw conclusions about the effectiveness of fatigue-related countermeasures across jurisdictions and to benchmark road safety management performance.<sup>78</sup> The incomplete crash data that is available does not describe the full extent of the fatigue driving problem.
72. The ACRS told the committee that it is imperative to use a common definition for the involvement of fatigue in Australian crash data. According to the college, there is more to be gained by having a consistent definition of a fatigue-related crash across all jurisdictions than by debating which definition gives a closer approximation to an unknown value. They believe that the parameters embodied in such a definition are less important than actually achieving a common definition.<sup>79</sup> The committee strongly agrees.
73. The committee concludes that the Australian Transport Council (ATC) is the best forum to resolve the inter-jurisdictional definitional problems involving driver fatigue. The committee urges the Minister for Transport to place this matter on the council's agenda.

#### **RECOMMENDATION 2:**

That the Minister for Transport and Main Roads should seek the support of all Australian Transport Council members for the development of standardised fatigue crash definitions and reporting for road safety purposes.

**Ministerial Responsibility:**

**Minister for Transport and Main Roads**

### **Enhancing the Queensland Transport fatigue crash definition**

74. The committee considered a number of options for enhancing QT's fatigue crash definition, particularly for detecting urban fatigue crashes, and bringing the surrogate closer to the ATSB and fatigue definitions used in New South Wales and Western Australia. Like Queensland, the road safety agencies in these two states use the combination of a surrogate crash measure (the characteristics of the crash) and an assessed crash measure (police assessment). Aligning with these two states would involve deletion of the speed limit and time period criteria for single-vehicle crashes, exclusion of single vehicle crashes involving a BAC of more than 0.05 and inclusion of all head-on crashes where the vehicle was not overtaking another vehicle at the time of the crash.<sup>80</sup>
75. The committee also considered whether QT should adopt the ATSB fatigue crash surrogate. As noted above, all Australian jurisdictions use slightly different definitions of fatigue-related crashes. Because of this, there would be limited benefit for QT to adopt the ATSB definition as it currently stands.<sup>81</sup> QPS noted some of the limitations of the ATSB definition: does not exclude drug or speed related crashes; excludes a number of fatal crashes identified as

<sup>78</sup> K Dobbie, *Fatigue-related Crashes: An Analysis of Fatigue-related Crashes on Australian Roads Using an Operational Definition of Fatigue*, Australian Transport Safety Bureau, Canberra, 2002, p. 1.

<sup>79</sup> Australasian College of Road Safety, 30, p. 6.

<sup>80</sup> Queensland Transport, 33, pp. 13-14.

<sup>81</sup> Queensland Transport, 33, p. 9.

fatigue-related through QPS data due to use of critical time periods; and overestimates the incidence of fatigue by attributing fatigue as a cause of a crash when the cause is unknown.<sup>82</sup>

76. On the other hand, the Queensland definition also has weaknesses. According to the RACQ, the definition may understate the actual contribution of fatigue to crashes. The RACQ notes, however, that there is no assurance that any of the approaches used by the ATSB or other Australian jurisdictions do not possess similar limitations.<sup>83</sup> The RACQ recommends investigation into other Australian states' measures used to define fatigue-related crashes to assess whether other states believe they are accurate in gauging the number of fatigue crashes and why they have not adopted surrogate measures such as QT's.<sup>84</sup>
77. The committee was not persuaded that the ATSB surrogate is better than the QT surrogate, despite the weaknesses of the QT measures. We looked, instead for ways to make it better.

### **RECOMMENDATION 3:**

That Queensland Transport should not adopt the ATSB fatigue crash definition in its present form.

**Ministerial Responsibility:**

**Minister for Transport and Main Roads**

78. Mindful of the need to better identify fatigue crashes on urban roads, the committee considered the benefits of dropping the speed limit and time of day criteria from the QT definition. QT proposed in their submission that these changes be examined. The amended definition would then capture all single vehicle crashes and head-on crashes where the vehicle was not overtaking another vehicle at the time of the crash, excluding crashes involving drivers with a BAC of more than 0.05.
79. The speed limit and time criteria were included in the ATSB definition to automatically capture crashes in rural areas at high risk times, particularly as research has indicated that the incidence of fatigue-related crashes is higher on rural highways than on other rural and urban roads. This provides a bias in the data towards fatigue crashes on high risk roads, especially in rural areas, and against fatigue crashes in urban areas where only police-reported fatigue crashes are recorded.
80. The effect of circadian rhythms on driver fatigue is well documented in the literature. The inclusion of circadian time bands gives the fatigue crash definition its distinctive effect. The committee suggests that its removal could diminish the usefulness of the fatigue crash definition.
81. The committee also considered the present exclusion by the QT surrogate of crashes on roads with posted speed limits below 100 km/hr. The committee notes that the circadian rhythm effect that makes drivers prone to tiredness at certain times of the day and night is not connected to the travelling speed of the vehicle. Drivers can suffer fatigue in a vehicle at any travelling speed. This should be reflected in the definition. The removal of the speed criteria would appear to have merit.

<sup>82</sup> Queensland Police Service, 16, p. 4.

<sup>83</sup> Royal Automobile Club of Queensland, *Submission No. 34*, p. 7.

<sup>84</sup> Royal Automobile Club of Queensland, *Submission No. 43*, p. 7.

82. The committee considered the effects of excluding crashes involving drivers with a BAC of more than 0.05. These crashes are presently included in QT fatigue crash statistics based on the QT surrogate. The links between fatigue driving and other high risk driving behaviours such as drink driving are well established in the literature. Whilst the evidence of alcohol should not rule out fatigue as a contributing factor, excluding crashes involving a BAC reading of more than 0.05 in the QT operational fatigue crash definition has merit. Separating the two factors in statistical collection will omit cases which are purely BAC related. Crashes identified by police as being caused by fatigue and drink driving combined would continue to be included.
83. The committee concludes that removing the speed limit criteria and excluding 0.05 BAC crashes from its fatigue crash definition has merit and should be considered by QT. This requires a level of prior consultation with transport agencies and other stakeholders that is outside the scope of the committee work.
84. The committee also considered a proposal by QPS that QT use their operational definition of fatigue as merely an index of fatigue rather than attempting to measure the actual number of fatigue-related crashes. They recommend that the two current methods of defining fatigue-related crashes in Queensland, by QT and QPS, should remain as two separate data entities. The committee notes that QT's Webcrash2 statistical database offers this functionality. Users can extract statistics for either 'fatigue related' crashes (compiled using the QT definition) or 'fatigue as a contributing circumstance' crashes (based purely on police crash reports).<sup>85</sup>

#### **RECOMMENDATION 4:**

That Queensland Transport should, in consultation with the Department of Main Roads, the Queensland Police Service and other stakeholders, consider amending its fatigue crash definition to exclude 0.05 BAC and higher drink driving crashes and to remove the speed limit criteria. Crashes identified by police as being caused by fatigue and drink driving would continue to be included.

**Ministerial Responsibility:**

**Minister for Transport and Main Roads**

#### ***Training and guidance for police***

85. The committee considered ways to improve the police reporting of fatigue crashes by getting police to collect more information and providing officers with training to equip them to make better judgements.
86. As indicated in Part 2, there are several causes of fatigue. The QT and ATSB statistical indices identify fatigue-related crashes using only one of these main causes - 'time of day' which is linked to drivers' circadian rhythms. The time of day in this context is the time the crash occurred as taken from police crash reports.
87. Dr Lee Di Milia, a researcher from Central Queensland University, believes that fatigue is more than a biological process as proposed by fatigue crash

<sup>85</sup> Queensland Transport, *Questions Taken on Notice and Additional Documentation – Queensland Transport and Main Roads*, 8 March 2005, p.16.

definitions based on circadian rhythms and that recent work history needs to be considered.<sup>86</sup>

88. The committee considered whether police might get a better picture of the role of fatigue in crashes if they routinely included information in crash reports about other important precursors to fatigue such as 'time on task' and 'amount of sleep' for drivers involved in crashes. To do this, police would need to be able to obtain information at the time of a crash, or shortly thereafter, about drivers' prior sleep and other activities. This could be problematic. In the absence of a definition that establishes a point at which driver fatigue becomes unreasonably dangerous, the committee suggests that drivers may be reluctant to assist police. Some drivers may be reluctant to produce self-incriminating evidence.<sup>87</sup>
89. While we agree with Dr Di Milia, the practical implications of routinely collecting background information for all crash drivers may be prohibitive. As noted above, AIS already attend serious injury and fatal crashes and gather detailed information about the movements of involved drivers in the 36 hours leading up to the crash. This includes their work hours, workload, recreational activities and hours of sleep. The committee concludes that this should continue. The committee would also like QPS to trial the collection of 'time on task' and 'amount of sleep' information for all crashes to gauge the costs and benefits and determine whether the collection of this additional data is useful and feasible for all crashes.
90. As noted above, police receive training in the detection of fatigued drivers and fatigue crashes. While similar to alcohol and drugs in its impairing effects, fatigue has distinctively different characteristics. The committee is not aware of the effectiveness of this training.
91. When police make judgements about the role of fatigue in crashes, they are required to evaluate the weight of the evidence. Police must make their judgements based on limited information and under difficult time and environmental constraints. It is incumbent on the QPS to provide officers in these circumstances with the best technical information available or reasonably attainable, including evaluations of the weight of the evidence that supports different assumptions and conclusions. CARRS-Q suggested that police officers could be specifically trained "in the analysis of crash scenes for evidence of fatigue involvement".<sup>88</sup> The RACQ submission also called for improved training.<sup>89</sup> CARRS-Q suggested that training could address the problems associated with definitions of fatigue-related crashes in Queensland.<sup>90</sup> The committee agrees.
92. Comprehensive training in the identification of fatigue as a crash factor should be provided to traffic and general duties officers. This training could teach officers to look for, amongst other things, lack of braking or evasive tactics prior to the crash or a vehicle travelling off the road at a very shallow angle. These crash symptoms, used by the AIS, can be checked comparatively quickly by traffic and general duties officers at the crash scene. Given their expertise, QT should be involved in the delivery of this training.

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<sup>86</sup> L Di Milia, *Submission No. 38*, p. 1.

<sup>87</sup> Dobbie, p. 24.

<sup>88</sup> Centre for Accident Research and Road Safety – Queensland, 37, p.25.

<sup>89</sup> Royal Automobile Club of Queensland, 43, p. 10.

<sup>90</sup> Centre for Accident Research and Road Safety – Queensland, 37, pp. 5-6.

**RECOMMENDATION 5:**

That the Queensland Police Service should trial the collection of 'time on task' and 'amount of sleep' information by police who attend crashes. The trial should consider the benefits and costs of collecting the extra data as well as the feasibility of collecting the data for all crashes attended by police in Queensland.

**Ministerial Responsibility:**

**Minister for Police and Corrective Services**

**RECOMMENDATION 6:**

That the Queensland Police Service should, with assistance from Queensland Transport, provide comprehensive training for traffic and general duties officers who attend road crashes to assist in their identification of fatigue-related crashes and the detection of drivers who are impaired by fatigue.

**Ministerial Responsibility:**

**Minister for Police and Corrective Services**

**Minister for Transport and Main Roads**



## PART 4 ~ FATIGUE CRASH RISKS

93. This part discusses the contribution of driver fatigue to road crash risks. Because of the difficulties in defining and identifying fatigue crashes, fatigue crash statistics have a lot of variability. The statistics need to be treated with considerable caution. They are arguably the weakest in terms of accuracy and reliability of all the crash statistics used in road safety. The terminology also varies for different parts of the world. What Australians describe as fatigue driving is described as 'drowsy driving' in the United States and 'sleepy driving' in Europe.

### FATIGUE CRASHES IN OTHER COUNTRIES

94. The prevalence of sleep-related crashes varies from country to country. Driver sleepiness has been found to be the cause of between 1.5 per cent to as much as 40 per cent of fatal crashes on the New York State highway.<sup>91</sup> The following is a snapshot of findings from studies in the United Kingdom, the United States of America, Germany and Norway:
- Driver fatigue causes up to 20 per cent of crashes on monotonous roads in the United Kingdom.<sup>92</sup>
  - Sleep related crashes comprised 16 per cent of all road crashes and 23 per cent of crashes on United Kingdom motorways.<sup>93</sup>
  - 17 per cent (about 1 million) of United States road crashes are sleep related.<sup>94</sup>
  - Driver sleepiness causes 30 – 40 per cent of crashes involving heavy trucks in the United States.<sup>95</sup>
  - 35 per cent of fatal motorway crashes in Bavaria, Germany were due to reduced vigilance (driver inattention and fatigue).<sup>96</sup>
  - 3.9 per cent of crashes in a Norwegian study were sleep related but almost 20 per cent of night-time crashes involved driver drowsiness.<sup>97</sup>
95. The studies provide some indication of the problems posed by fatigue driving in countries around the world and indicate that fatigue is a significant cause of traffic crashes.

### FATIGUE CRASHES IN AUSTRALIA

96. CARRS-Q estimates that fatigue is the primary contributing factor in six per cent of all road crashes, 15 per cent of all fatal crashes and 30 per cent of fatal crashes on rural roads nationally.<sup>98</sup>

<sup>91</sup> Rayner, Flatley and Horne in A Davis, A Quimby, W Otero, G Gururai & M Hijar, *Improving Road Safety by Reducing Impaired Driving in Developing Countries: A Scoping Study*, TRL Limited, Berkshire, p. 100; Flatley and Rayner in Davis et al., p. 100..

<sup>92</sup> Horne & Reyner, 2000 in Royal Society for the Prevention of Accidents, *Driver Fatigue and Road Accidents: A Literature Review and Position Paper*, Royal Society for the Prevention of Accidents, 2001, p. 3.

<sup>93</sup> J Horne & L Reyner, 'Sleep Related Vehicle Accidents', *British Medical Journal*, Vol 310, Sleep Research Laboratory, Loughborough University, 1995, p. 1.

<sup>94</sup> Johnson in Royal Society for the Prevention of Accidents, p. 3.

<sup>95</sup> National Transportation Safety Board in Royal Society for the Prevention of Accidents, p. 3.

<sup>96</sup> W Hell et al in Royal Society for the Prevention of Accidents, p. 4.

<sup>97</sup> Sagberg in Royal Society for the Prevention of Accidents, p. 4.

<sup>98</sup> Centre for Accident Research and Road Safety – Queensland, 37, p. 10.

97. Dobbie reports on fatigue crash statistics using the ATSB fatigue crash index of fatal fatigue crashes by state and territories that occurred in 1998. Table 4 below presents a breakdown of fatigue and non-fatigue crashes by state/territory. From the study, 16.6 per cent of fatal crashes and 19.6 per cent of fatalities in Australia were identified as fatigue-related by the operational definition. Of these, 16.7 per cent occurred in Queensland, equivalent to the national average.<sup>99</sup>

**Table 4: Fatal crashes by State/Territory and fatigue involvement, Australia, 1998**

State / Territory	Fatigue		Non-fatigue		Total
	Number	Per cent	Number	Per cent	
New South Wales	97	22.0	343	78.0	440
Victoria	55	15.6	297	84.4	352
Queensland	42	16.7	210	83.3	252
South Australia	19	13.1	126	86.9	145
Western Australia	18	9.2	178	90.8	196
Northern Territory	10	16.9	49	83.1	59
Tasmania	7	14.9	40	85.1	47
Australian Capital Territory	3	15.0	17	85.0	20
Australia	251	16.6	1260	83.4	1511

Source: K Dobbie, *Fatigue-related Crashes: An Analysis of Fatigue-related Crashes on Australian Roads Using an Operational Definition of Fatigue*, Australian Transport Safety Bureau, Canberra, 2002.

## QUEENSLAND

98. From 1998 to 2003, there were 2,124 serious injury (fatal and hospitalised) fatigue-related crashes resulting in 2,819 serious injury casualties. The majority of casualties were male (68 per cent). Both males and females had the highest proportion of casualties (19 per cent) in the 17 - 20 year age group followed by the 30 - 39 year age group (18.5 per cent and 13.7 per cent respectively for females and 19.4 per cent and 18.6 per cent respectively for males).<sup>100</sup>
99. Table 5 provides a breakdown of serious injury fatigue-related crashes in Queensland over the six years 1998 to 2003 by geographic location. The majority of serious injury fatigue-related crashes occurred in rural areas followed by provincial cities, such as Townsville and Rockhampton.<sup>101</sup> The bias towards rural fatigue crashes reflects QT's operational definition. The table shows that fatigue was a factor in 16.9 per cent of serious injury crashes in the Brisbane Statistical Division, 15.4 per cent in provincial cities and 67.7 per cent of serious injury crashes throughout the rest of Queensland.<sup>102</sup>

**Table 5: Geographic location of fatigue-related crashes in Queensland, 1998 to 2003**

Crash location	1998	1999	2000	2001	2002	2003	Total	Per cent
Brisbane City	29	20	23	35	29	31	167	7.9
Rest of BSD*	37	20	35	34	24	42	192	9.0
Provincial cities	54	52	36	66	61	58	327	15.4
Rest of state	226	223	229	254	263	242	1437	67.7
<b>Total</b>	<b>346</b>	<b>315</b>	<b>323</b>	<b>389</b>	<b>377</b>	<b>374</b>	<b>2124</b>	<b>100</b>

\* Brisbane Statistical Division

Source: Queensland Transport, Submission No. 33, 2004.

<sup>99</sup> Dobbie, p.11.

<sup>100</sup> Queensland Transport, 33, p. 5.

<sup>101</sup> Queensland Transport, 33, p. 6.

<sup>102</sup> Queensland Transport, 33, p. 6.

100. Table 6 shows a breakdown of key crash factors for fatal crashes and all crashes in 2003. While fatigue is not very often reported as a contributing factor to a crash in relation to all crashes, it does account for a greater proportion of fatal crashes. For example, in 2003, fatigue as a contributing factor was identified in five per cent of the total number of reported crashes. However, of the proportion of fatal crashes, fatigue was identified as a contributing factor in 13 per cent of crashes.<sup>103</sup>
101. This indicates that although fatigue is less frequently identified as a contributing factor to a crash, the severity of fatigue-related crashes is relatively high.

**Table 6: Assessed contributing factors to road crashes\* in Queensland, 2003**

Contributing factor	Fatal crashes			All reported crashes		
	Number	Proportion of fatal crashes (per cent)	Rank	Number	Proportion of all reported crashes (per cent)	Rank
Alcohol/drugs	107	37.7	1	2503	11.3	5
Disobeyed traffic rules**	83	29.2	2	8945	40.5	1
Inattention	74	26.1	3	6397	29.0	2
Inexperience	48	16.9	4	4452	20.2	3
Speed	45	15.8	5	1108	5.0	7
Fatigue	37	13.0	6	1148	5.2	8
Age	31	10.9	7	1163	5.3	9
Other	31	10.9	7	2996	13.6	4
Rain/wet road	16	5.6	9	1916	8.7	6
Road conditions	12	4.2	10	1077	4.9	10
Negligence	12	4.2	10	444	2.0	12
Other driver conditions***	10	3.5	12	1426	6.5	7
Vehicle defects	4	1.4	13	632	2.9	11
No street lighting	4	1.4	13	77	0.3	13

\* More than one contributing factor could be attributed to a crash and therefore this table may not reflect crash totals  
 \*\* Disobeyed traffic rules does not include Alcohol/Drugs, Inexperience, Speed, and Inattention  
 \*\*\* Driver conditions do not include Inattention, Negligence, Inexperience, Fatigue, or Age

Source: Queensland Transport, Submission No. 33, 2004.

102. Table 7 shows the driver and rider most at fault in serious injury fatigue-related crashes in Queensland from 1998 to 2003. Light vehicle drivers were deemed to be most at fault in 86 per cent of serious injury fatigue-related crashes over the period. In comparison, truck drivers and motorcycle riders were found to be most at fault in approximately nine per cent and four per cent of these crashes respectively. Bus drivers, cyclists, and pedestrians were each deemed to be most at fault in less than one per cent of serious injury fatigue-related crashes.<sup>104</sup>
103. According to QT methodology, between 1998 and 2003 there were 1828 serious injury fatigue-related light vehicle crashes where the driver was considered to be most at fault. Heavy vehicle drivers were considered to be most at fault in 183 serious injury fatigue-related crashes. The next highest group were motorcycle riders who were most at fault in 93 crashes of this type. Bus drivers (6), bicycle riders (4) and others (6) were most at fault in relatively few serious injury fatigue-related crashes.

<sup>103</sup> Queensland Transport, 33, p. 4.

<sup>104</sup> Queensland Transport, 33, p. 5.

**Table 7: Driver and rider most at fault in serious injury fatigue-related crashes in Queensland, 1998 to 2003**

Type	1998	1999	2000	2001	2002	2003	Total	%
Driver	306	270	280	326	326	320	1828	86.1
Truck Driver	26	25	27	36	34	35	183	8.6
Bus Driver	0	1	2	1	1	1	6	0.3
Motorcycle Rider	13	17	12	22	13	16	93	4.4
Bicycle Rider	1	0	0	1	1	1	4	0.2
Pedestrian	0	0	2	1	1	0	4	0.2
Other	0	2	0	2	1	1	6	0.3
<b>Total</b>	346	315	323	389	377	374	2124	100

Source: Queensland Transport, Submission No. 33, 2004.

104. The majority of casualties were drivers or passengers (61 per cent and 35 per cent respectively), with motorcyclists accounting for only four per cent of the proportion of casualties. Cyclists and pedestrians each accounted for less than one per cent of the proportion of casualties.<sup>105</sup>

<sup>105</sup> Queensland Transport, 33, p. 5.

## PART 5 ~ HIGH RISK GROUPS

105. While every driver is at risk of driving fatigued, this part of the report discusses a range of high-risk groups. These groups include young drivers and riders, shift workers, people with medical conditions, commercial and heavy vehicle drivers, rural drivers and riders as well as light vehicle drivers and riders. Of course a driver or rider may be classified under more than one category. For instance, a young driver may also work shift work.

### RURAL DRIVERS AND RIDERS

106. Rural drivers and riders are a high-risk group for fatigue-related crashes. CARRS-Q state in their submission that the relative risk of dying as a result of a fatigue-related crash in rural areas of Queensland is 13.5 times higher than the risk in urban areas.<sup>106</sup> One possible reason why the risk of a fatigue-related crash is higher in rural areas is because of the operational definition used by QT. This definition includes a speed component. Any crashes below 100 kilometres per hour are automatically excluded. There are more high-speed roads in rural areas.
107. Nearly half of all fatal crashes in Australia occur on rural roads and another 14 per cent in towns with less than 50,000 people. While the urban fatality rate has declined since 1995, the fatality rate in rural areas has increased markedly. The prevalence of higher travel exposure rates (in deaths per 100 million vehicle kilometres travelled) and the problem of fewer alternative modes of transport in rural areas lead to greater driver boredom and fatigue.<sup>107</sup>
108. As shown in Table 4, for the six year period between 1998 and 2003, two thirds (67.7 per cent) of serious injury fatigue-related crashes in Queensland occurred in rural areas followed by provincial cities such as Rockhampton and Townsville (15.4 per cent). The regional areas where the highest number of serious injury fatigue-related crashes occur, involve the main transport corridors heading north along the coastline and heading west through the Darling Downs.<sup>108</sup>
109. The Queensland Government has commissioned CARRS-Q to examine options to reduce crash risks in rural and remote areas of Queensland as part of a substantial longitudinal study.

### YOUNG DRIVERS AND RIDERS

110. Young people are more likely to be involved in a crash than any other age group.<sup>109</sup> They are also more likely to be the driver most at fault in serious fatigue-related crashes than other age groups. Table 8 provides a breakdown of drivers and riders most at fault by age groups. Drivers and riders aged 17 to 24 years were involved in almost 35 per cent of all serious fatigue-related crashes in Queensland from 1998 to 2003. This table does not give an indication of how many drivers of different age groups there are in Queensland and hence, these figures should be interpreted with caution.

<sup>106</sup> Centre for Accident Research and Road Safety – Queensland, 37, p. 10.

<sup>107</sup> Australasian College of Road Safety, *Rural Roads*, Australasian College of Road Safety, Canberra, March, 2004, <<http://www.acrs.org.au/collegepolicies/otherissues/ruralroads.html>>.

<sup>108</sup> Queensland Transport, 33, p. 6.

<sup>109</sup> Queensland Transport, *Never the Same Again: L & P Licences*, Queensland Government, 2004, <<http://www.neverthesameagain.com.au/html/gettingLicence.cfm>>.

**Table 8: Drivers and riders most at fault in serious fatigue-related crashes, by age, Queensland, 1998 to 2003**

Age group	Total	Per cent
0 – 16	36	1.7
17 – 24	743	35.0
25 – 29	274	12.9
30 – 39	411	19.3
40 – 49	289	13.6
50 – 59	182	8.6
60 – 69	102	4.8
70 – 79	60	2.8
80 and over	22	1.0
Unknown	7	0.3
Total	2126	100

Source: Queensland Transport, Personal Correspondence, June 2005.

111. Young drivers and riders are at risk of driving tired for a number of reasons, including lack of sleep, the times of day they travel, part-time work commitments and lack of knowledge of the risks of driving fatigued.<sup>110</sup>
112. Most adolescents do not get as much sleep as they need. Adolescents require at least as much sleep as they did as pre-adolescents. Generally this is between 8.5 and 9.25 hours each night. Many factors contribute to problem sleepiness in teenagers and young adults. The main causes are not getting enough sleep and irregular sleep schedules.<sup>111</sup> Young people are also sleepier during the day than other age groups.<sup>112</sup>
113. Studies in the United States show that only 15 per cent of adolescents reported sleeping 8.5 or more hours each night, and 26 per cent of students reported sleeping 6.5 hours or less each school night. This lack of sleep can have severe consequences, including an increased risk of drowsy driving.<sup>113</sup> Although this research is American and generally there is a lower licensing age in the United States, a significant number of Queensland senior students are licensed.
114. Young drivers often travel at high fatigue-risk times of the day. This group often drives around the hours of 2 or 3am, a low point in the circadian rhythm. This increases their crash risk.<sup>114</sup> This risk for young drivers is worse when combined with the effects of alcohol, excessive speed and relative inexperience with driving.<sup>115</sup>
115. Young people seem unaware of their risk of driving fatigued. New South Wales research suggests that adolescents, particularly males, have poor knowledge of the risk of fatigue-related crashes.<sup>116</sup> Over 65 per cent of adolescents in the study did not know that younger drivers were more likely to fall asleep at the

<sup>110</sup> National Heart, Lung and Blood Institute, *Facts About: Problem Sleepiness*, National Institutes of Health, Maryland, US, 1997, <[http://www.nhlbi.nih.gov/health/public/sleep/pslp\\_fs.pdf](http://www.nhlbi.nih.gov/health/public/sleep/pslp_fs.pdf)>, p. 2.

<sup>111</sup> National Heart, Lung and Blood Institute, p. 2.

<sup>112</sup> Building Bridges Newsletter, *Drowsy Driving and Traffic Safety: An Interview with Dr Allan Pack*, vol. III, no. 3, Education Development Center, Inc., US, 1997, <<http://www2.edc.org/buildingsafecommunities/buildbridges/bb3.3/packint.html>>, p. 3.

<sup>113</sup> National Sleep Foundation, *The Year in Sleep: 2000 Annual Report*, National Sleep Foundation, Washington, DC, 2000, p. 5.

<sup>114</sup> Building Bridges Newsletter, p. 3.

<sup>115</sup> Fatigue and Transport Working Party, *Australasian Sleep Association Submission: Neville Committee, Fatigue and Transportation*, Australasian Sleep Association, 1999, pp. 3-4.

<sup>116</sup> R Grunstein & R Grunstein, *Sleep Driving Knowledge in NSW Adolescents*, Proceedings of the Road Safety Research, Policing and Education Conference, Brisbane, 2000, p. 335.

wheel than older drivers. More than 40 per cent were unaware that younger people need the same or more sleep than their elders.<sup>117</sup>

116. Research conducted by the Royal Automobile Club of Victoria suggests that young people are less likely to take rest breaks when driving, are less aware of the onset of fatigue and effective countermeasures than their older counterparts.<sup>118</sup> Even though young people are less aware of the onset of fatigue, another study concluded that a young person monitoring their own sleepiness is likely to be the most effective method of reducing driving while sleepy. The study recommended that the most successful strategy is educating young people about the dangers of driving while sleepy to improve their understanding of the consequences.<sup>119</sup>
117. The ASA suggest that young adults should be considered for targeted interventions. According to the ASA, education for these drivers should explain the causes of sleepiness, promote awareness of fatigue and effective countermeasures, promote attaining adequate sleep and avoidance of night time driving as well as advise drivers with chronic sleepiness to seek medical help.<sup>120</sup>

## SHIFT WORKERS AND PEOPLE WITH LONG WORK HOURS

118. A number of factors in the workplace can cause sleep loss, including: shift work; extended working hours; irregular and unpredictable working hours; time of day when work is performed and sleep is obtained; and having more than one job.<sup>121</sup>
119. Shift work is defined as any work that is conducted outside of the standard work cycle: 8am to 6pm. Shift work includes permanent night shifts or other permanent shifts that extend into hours that would normally be spent asleep, compressed work weeks with extra long work days and rotating work shifts.<sup>122</sup>
120. Approximately 209,000 people are currently engaged in shift work in Queensland, compared to 196,000 people in 1997, a 6.6 per cent increase. However, shift workers as a proportion of the total Queensland work force, have decreased. This information needs to be treated with caution, however, as DIR rely on Australian Bureau of Statistics (ABS) data that only captures full-time equivalents of shift workers rather than actual numbers including casual workers.<sup>123</sup> As a result, the committee was unable to ascertain the actual number of casual workers working shift work in Queensland.
121. Shift workers, particularly those who work at night or commence work early, are likely to experience reduced amounts of sleep.<sup>124</sup> Most shift workers get less sleep over 24 hours than day workers and between 60 and 70 per cent of shift workers have difficulty sleeping or problem sleepiness that may result in

<sup>117</sup> Grunstein & Grunstein, p. 338.

<sup>118</sup> T Gunatillake, *Public Perceptions of Rest Areas in Victoria*, Report No. 03/02, Royal Automobile Club of Victoria, June 2003, pp. 26-27.

<sup>119</sup> S S Smith & J A Trinder, *Sleep and Driving in Young Adults*, University of Melbourne, Parkville, Victoria, 2001, <[http://www.atsb.gov.au/road/pdf/UniMelb\\_Smith-Trinder\\_121001.pdf](http://www.atsb.gov.au/road/pdf/UniMelb_Smith-Trinder_121001.pdf)>, p. 28.

<sup>120</sup> Australasian Sleep Association, *Submission No. 44*, p. 9.

<sup>121</sup> Department of Industrial Relations, *Fatigue Management Guide*, Department of Industrial Relations, Brisbane, February 2005, p. 6.

<sup>122</sup> Department of Industrial Relations, *Fatigue Management Guide*, p. 9.

<sup>123</sup> Department of Industrial Relations, *Hearing Transcript – Crashes Involving Driver and Rider Fatigue in Queensland*, 25 February, 2005, p. 13.

<sup>124</sup> Gander, Le Quesne & Marshall, p. 15.

an increased risk for motor crashes, especially on the commute home after a night shift.<sup>125</sup> This was confirmed by a 2005 driving study of shift workers.<sup>126</sup> The study demonstrated that commuting home after night shift work clearly caused incidents (e.g. two wheels outside lane markings), decreased time to crashes, increased variability in lane positioning, increased eye closure durations and increased subjective sleepiness. These results indicate severe post-night shift effects on sleepiness and driving performance.

122. A quarter of all shift workers probably have what is called shift work maladaptation syndrome.<sup>127</sup> This syndrome is characterised by sleep disturbances, chronic fatigue, gastrointestinal problems (heartburn, constipation or diarrhoea), alcohol or drug abuse (usually related to self-treatment of insomnia), higher rates of accidents, mood disturbances and depression and interpersonal relationship difficulties.<sup>128</sup>
123. Working long work hours at any time of day can also cause fatigue. Recently released ABS survey results show that of the 9.6 million employed Australians aged 15 years and over in November 2004, one in four (24 per cent) worked for 45 hours or more per week in their main job.<sup>129</sup> Along with this, out of all Australian employees aged 15 years and over in November 2000, 33 per cent worked overtime on a regular basis.<sup>130</sup> The average hours worked by people in Queensland over the last 19 years between 1985 and 2004 has increased by an approximate average of 1.3 hours per week. The number of people who are working excessively long hours (more than 50 hours per week) in Queensland has increased from around 74,000 in 1985 to a current figure of approximately 185,000.<sup>131</sup>

## PEOPLE WITH MEDICAL CONDITIONS

124. Sleep disorders and some medical conditions influence an individual's level of fatigue and increase their risk of experiencing a fatigue-related crash. Examples of these disorders include OSA, narcolepsy, insomnia and Excessive Daytime Sleepiness (EDS).
125. QT has recognised the increased crash risk of this group. Section 32 of the *Transport Operations (Road Use Management – Driver Licensing) Regulation (Qld) 1999* states that Queensland Transport may amend, suspend or cancel a Queensland drivers licence if the licence holder has a mental or physical incapacity that is likely to adversely affect the licence holder's ability to drive safely.<sup>132</sup> However, this provision does not make specific mention of sleep disorders.
126. The New South Wales RTA, have more stringent requirements. Drivers are required to notify the RTA if they have any condition, such as a sleep disorder, that may impair their ability to drive. The RTA also encourages medical

<sup>125</sup> National Heart, Lung and Blood Institute, p. 3.

<sup>126</sup> T Åkerstedt, B Peters, A Anund & G Kecklund, 'Impaired alertness and performance driving home from the night shift: A driving simulator study', *Journal of Sleep Research*, Vol. 14, No. 1, 2005, p. 19.

<sup>127</sup> J Douglas, p. 27.

<sup>128</sup> VGA Grossman, 'Defying circadian rhythm: The emergency nurse and the night shift', *Journal of Emergency Nursing*, Vol. 23, No. 6, 1997, p. 604.

<sup>129</sup> Australian Bureau of Statistics, *One in Four Working 45 Hours or More a Week: ABS*, Media Release, Australian Government, Canberra, 2005, <<http://www.abs.gov.au/ausstats/abs@.nsf/w1.2.2?OpenView>>.

<sup>130</sup> Australian Bureau of Statistics, *Year Book Australia 2003: Labour – Characteristics of Employment*, Australia Now, Australian Government, Canberra, 2003, <<http://www.abs.gov.au/ausstats/abs@.nsf/w1.2.2?OpenView>>.

<sup>131</sup> Department of Industrial Relations, *Hearing Transcript*, p. 13.

<sup>132</sup> s32 Transport Operations (Road Use Management – Driver Licensing) Regulation (Qld) 1999.



practitioners to inform them of individuals who may be either temporarily or permanently unable to drive. In these cases, the RTA suspends or cancels the licence until it is safe for the driver to drive again.<sup>133</sup>

127. Associate Professor Douglas McEvoy from the Adelaide Institute for Sleep Health suggests doctors have a crucial role in identifying and advising patients in an attempt to prevent fatigue-related crashes. Dr McEvoy explains that doctors should build rapport with their patients, make an assessment about their sleepiness and risk to driving safely and inform the patient of this risk. In the instance that a patient continues to drive against advice, Dr McEvoy suggests doctors should consider their ethical and legal responsibility and advise the patient that in the interest of public safety they must inform the licensing authority. Legislation in all Australian States and Territories provides medical practitioners with legal indemnity under these circumstances.<sup>134</sup> The committee agrees with Associate Professor McEvoy's comments.

### **RECOMMENDATION 7:**

That Queensland Transport and Queensland Health should consult with the Australian Medical Association regarding the best way to inform general practitioners about the need to:

- Better inform their patients about the dangers of driving and riding while fatigued;
- Identify patients with sleep disorders; and
- Help them seek treatment.

**Ministerial Responsibility:**

**Minister for Transport and Main Roads**

**Minister for Health**

### **RECOMMENDATION 8:**

Following the consultation in recommendation 7, Queensland Transport and Queensland Health should contact general practitioners and advise them about their obligation to better inform their patients about the dangers of driving and riding while fatigued, identify patients with sleep disorders and help them seek treatment.

**Ministerial Responsibility:**

**Minister for Transport and Main Roads**

**Minister for Health**

<sup>133</sup> Roads and Traffic Authority, p. 25.

<sup>134</sup> D McEvoy, 'Asleep at the Wheel: Who's at Risk?', *Medical Journal of Australia*, Vol. 178, No. 8, 2003, pp. 365-366.

**RECOMMENDATION 9:**

Queensland Transport should advise general practitioners that, if a patient continues to drive against their advice, it is their ethical and legal responsibility, to advise the patient that in the interest of public safety, they must inform Queensland Transport. Queensland Transport should provide information to general practitioners regarding their legal rights and protections when informing Queensland Transport about a patient's inability to drive safely.

**Ministerial Responsibility:**

**Minister for Transport and Main Roads**

**COMMERCIAL DRIVERS**

128. Fatigue is a workplace health and safety issue as commercial drivers spend a considerable amount of time on the road as part of their job.<sup>135</sup> For the purpose of this report, commercial drivers include drivers in the transport industry as well as taxi, limousine, bus drivers and other individuals who drive regularly for work.
129. There are numerous reasons why commercial drivers are at a higher risk of being involved in fatigue-related crashes. Apart from their greater exposure due to their long hours on the road as well as the inadequate number of rest areas and truck stops, they frequently drive at night, many keep highly irregular schedules, they are sleep deprived and many are obese hence, they have an increased risk of the sleep disorder OSA.<sup>136</sup> Additionally, a lack of workplace safety practices including establishing a strong safety culture, dispatcher scheduling practices and company assistance with fatiguing work behaviours also affects their risk of a fatigue-related crash.<sup>137</sup>
130. A recent Australian study found that OSA is four times more prevalent in transport drivers than other working males. Many of the transport drivers surveyed were obese which partially explains the high prevalence of OSA. Twenty-four per cent of drivers in this study had chronic excessive sleepiness. There was an increased crash risk in those with excessive sleepiness and in those who used pain killers or antihistamines. The degree of crash risk for these drivers is similar to that of driving with a BAC just over the legal limit of 0.05 in Australia.<sup>138</sup> Around 35 per cent of the drivers in this study were involved in a crash, with almost half of these drivers having multiple crashes over the preceding three year period.<sup>139</sup>
131. The ACRS notes that there is substantial freight movement within urban areas, including shuttle operations and delivery runs. People whose work involves a substantial amount of local driving, such as removalists, service and repair people, are at risk of fatigue. Much of their work involves time pressures, frequent movement in and out of vehicles, freight handling and little or no rest

<sup>135</sup> Dobbie, p. 8.

<sup>136</sup> Pack, *Building Bridges*, p. 4.

<sup>137</sup> PC Morrow & MR Crum, 'Antecedents of fatigue, close calls, and crashes among commercial motor-vehicle drivers', *Journal of Safety Research*, Vol. 35, No. 1, 2004, p. 59.

<sup>138</sup> ME Howard, AV Desai, RR Grunstein, C Hukins, JG Armstrong, D Joffe, P Swann, DA Campbell & RJ Pierce, 'Sleepiness, sleep-disordered breathing, and accident risk factors in commercial vehicle drivers', *American Journal of Respiratory and Critical Care Medicine*, Vol. 170, 2004, pp. 1014-1021.

<sup>139</sup> Hukins, p. 29.

breaks. Due to such physically tiring and stressful conditions, fatigue is a risk factor for these commercial drivers.<sup>140</sup>

### Heavy vehicle drivers

132. Heavy vehicle drivers are a subgroup of commercial drivers. Like other high-risk groups, a number of factors affect their level of fatigue. The number of hours a heavy vehicle driver has driven is more important than the number of hours they have been awake. However, these factors combined increase crash risk.<sup>141</sup>
133. Differing patterns of breaks across a lengthy drive do not appear to noticeably reduce fatigue. As a result, the ongoing work schedules of heavy vehicle drivers need consideration to ensure that drivers have adequate rest and recuperation between trips and between blocks of trips to prevent chronic sleep loss and to reduce fatigue.<sup>142</sup>
134. In 2001, a follow-up survey of long distance heavy vehicle drivers in Australia focused on fatigue and its effects on driving. Drivers cited early morning and early afternoon driving, along with problems of loading and unloading, as factors that increase fatigue. They stated that these factors lead to slowed reaction times and impaired gear changes and steering. Around 20 per cent reported a dangerous fatigue-related event of falling asleep, crossing lanes or a near miss, on their last trip. Breaking of working hours regulations was reported by approximately 25 per cent of drivers, mostly due to work, organisational and reward factors such as earning enough money. Drivers who were paid an hourly rate reported problems of fatigue less often than drivers who were paid by the amount of work completed.<sup>143</sup>
135. The ACRS also believe that the long distances travelled by transport drivers leads to excessive periods of sustained work that in turn cause fatigue. This is caused by costs, failure by other people in the supply chain to accept responsibility, the requirements of the freight being carried (livestock or fresh fruit and vegetables) and retailer desire to provide a high level of customer service.<sup>144</sup>
136. Ms Cindee Richardson has conducted driver fatigue management courses in the transport industry for the past six years. Ms Richardson asserts that unfair competition and pressure from customers has encouraged drivers and contractors to exceed legislated driving hours in order to survive in the industry.<sup>145</sup>
137. Along with other high-risk groups, the ASA believes that transport workers should be targeted for education interventions for driving fatigued as they are over-represented in fatigue-related crashes.<sup>146</sup>
138. The committee, while including heavy vehicle drivers as a high-risk group, has not made recommendations targeted specifically at this group. This is because extensive research and policy work has occurred, and is continuing to occur, in

<sup>140</sup> Australasian College of Road Safety, 30, p. 10.

<sup>141</sup> Gander, Le Quesne & Marshall, p. 15.

<sup>142</sup> A Williamson, AM Feyer & R Friswell, 'The impact of work practices on fatigue in long distance truck drivers', *Accident Analysis and Prevention*, Vol. 28, No. 6, 1996, p. 718.

<sup>143</sup> A Williamson, S Sadural, AM Feyer & R Friswell, *Driver Fatigue: A Survey of Long Distance Heavy Vehicle Drivers in Australia*, Australian Transport Safety Bureau, Canberra, 2001, pp. 7-9.

<sup>144</sup> Australasian College of Road Safety, 30, p. 9.

<sup>145</sup> C Richardson, *Submission No. 50*, p. 1.

<sup>146</sup> Australasian Sleep Association, 44, p. 9.

this area. This includes a report by the House of Representatives Standing Committee on Communication, Transport and the Arts, *Beyond the Midnight Oil*, examining fatigue in the heavy vehicle industry.<sup>147</sup> The National Transport Commission (NTC) has published an extensive range of reports into fatigue and the heavy vehicle industry including papers that focus on the bus sector, various shift options and regulation.<sup>148</sup> QT is continuing to work in this area.<sup>149</sup> The committee supports on-going investigation into fatigue-related issues affecting the heavy-vehicle industry by QT.

139. However, in this report, the committee is focussing on fatigue issues and countermeasures that apply to all drivers and riders rather than targeting one high-risk group. The next chapter discusses fatigue driving policies and legislation relating to all types of vehicles, including those regulating the heavy vehicle industry.

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<sup>147</sup> House of Representatives Standing Committee on Communication, Transport and the Arts, *Behind the Midnight Oil*, House of Representatives Standing Committee on Communication, Transport and the Arts, Canberra, 2000, <[www.aph.gov.au](http://www.aph.gov.au)>.

<sup>148</sup> D McLennan, *Heavy Vehicle Driver Fatigue: Bus Sector Options Paper*, National Transport Commission, Melbourne, 2005, <[www.ntc.gov.au](http://www.ntc.gov.au)>; A Williamson, R Friswell, and A-M Feyer, *Fatigue and Performance in Heavy Truck Drivers Working Day Shift, Night Shift or Rotating Shifts*, National Transport Commission, Melbourne, 2004, <[www.ntc.gov.au](http://www.ntc.gov.au)>; Economic Associates, *Heavy Vehicle Driver Fatigue – Review of Regulatory Approach*, National Transport Commission, Melbourne, 2003, <[www.ntc.gov.au](http://www.ntc.gov.au)>.

<sup>149</sup> QT, 33, p. 32.

## PART 6 ~ FATIGUE DRIVING POLICIES AND LEGISLATION

140. This part discusses the current policy frameworks used nationally and within Queensland and legislation used in Queensland to manage driver fatigue and crash risks.

### POLICY FRAMEWORKS

#### National Road Safety Strategy 2001-2010

141. The ATC's *National Road Safety Strategy 2001-2010* provides an overarching framework for the existing road safety plans of federal, state, territory and local governments as well as other road safety organisations. Individual governments continue to develop their own road safety programs, consistent with the strategy, but reflecting the needs of their local communities.<sup>150</sup>
142. The ATC has also released a series of two-year action plans that outline specific measures to achieve the goals in the *National Road Safety Strategy 2001-2010*.<sup>151</sup> The *National Road Safety Action Plan 2005 and 2006* aims to address fatigue through further public education for all drivers on risks, warning signs and preventive strategies.<sup>152</sup>

#### Queensland Road Safety Strategy 2004-2011

143. In December 2003, QT, DMR and the Department of Emergency Services released *safe4life: Queensland Road Safety Strategy 2004-2011*. The strategy is aimed at encouraging community participation in achieving a safer road environment and delivering ongoing reductions in the level of road trauma. The nature of road transport and technologies available in vehicles and on roads will be examined, along with their effect on inattention, speed, drink driving as well as rural and remote road safety.<sup>153</sup>
144. Whilst the Queensland Strategy does not explicitly focus on fatigue driving countermeasures, the key outcomes aimed at achieving the reduced road toll target include:
- Safe attitudes and behaviours, and optimal health outcomes in the event of a crash;
  - Safe roads, safe road environments and safe management of traffic;
  - Safe vehicles that reduce injury severity and maximise the chance of avoiding a crash; and
  - A community that values road safety as a priority.<sup>154</sup>
145. The *Queensland Road Safety Action Plan 2004-2005* that accompanies the Road Safety Strategy, identifies a number of public education related initiatives concerning fatigue including:

<sup>150</sup> Australian Transport Council, *The National Road Safety Strategy 2001-2010*, Australian Transport Council, Canberra, 2000, <[www.atcouncil.gov.au/strategy.pdf](http://www.atcouncil.gov.au/strategy.pdf)>, p. 1.

<sup>151</sup> Australian Transport Council, p. 3.

<sup>152</sup> Australian Transport Council, p. 37.

<sup>153</sup> Queensland Transport, *safe4life: Queensland Road Safety Strategy 2004-2011*, Queensland Transport, Brisbane, 2003, foreword.

<sup>154</sup> Queensland Transport, *safe4life*, p. 8.

- Improving community awareness of fatigue as a road safety problem; and
- Launching a new public education campaign to promote the dangers of driving tired or without due care and attention.<sup>155</sup>

146. The RACQ believes that the *Queensland Road Safety Strategy 2004-2011* and accompanying action plans are the most appropriate approaches for coordinating, planning and implementing countermeasures to address fatigue-related crashes in Queensland.<sup>156</sup>

### Heavy Vehicle Driver Fatigue: Policy Proposal

147. The NTC created the *Heavy Vehicle Driver Fatigue: Policy Proposal* in 2004.<sup>157</sup> The proposal is an integrated package of initiatives designed to improve road safety by addressing all aspects of the fatigue problem rather than focusing on hours of work. The package includes:

- A general duty to manage fatigue to minimise road safety risk;
- A fatigue code of practice;
- Strengthened chain of responsibility provisions;
- Replacement of logbooks with a work diary;
- Strengthened record keeping provisions;
- Risk based categorisation of offences;
- A revised range of sanctions;
- Enhanced enforcement powers; and
- A multi-option approach that links increased flexibility with increased responsibility by operators to manage fatigue.<sup>158</sup>

## LEGISLATION

148. Legislating to prevent fatigue driving is more difficult than legislating to prevent speeding or drink driving. This is because it is not possible to measure fatigue reliably.<sup>159</sup>

149. Fatigue driving in Queensland is regulated by four means:

- *Transport Operations (Road Use Management – Fatigue Management) Regulation (Qld) 1998*;
- *Transport Operations (Passenger Transport) Standard (Qld) 2000*;
- *Transport Operations (Road Use Management) Act (Qld) 1995*; and
- *Criminal Code Act (Qld) 1899*.

150. The first two pieces of legislation cover drivers of heavy and commercial vehicles while light vehicle drivers and riders are covered by the final two pieces of legislation.

### Legislation for heavy and commercial vehicles

#### ***Transport Operations (Road Use Management – Fatigue Management) Regulation (Qld) 1998***

151. The *Transport Operations (Road Use Management – Fatigue Management) Regulation (Qld) 1998* commenced on 30 October 1998. This regulation is

<sup>155</sup> Queensland Transport, *Submission No. 46*, p.6.

<sup>156</sup> Royal Automobile Club of Queensland, 34, p. 32.

<sup>157</sup> Queensland Transport, 33, p. 27.

<sup>158</sup> National Transport Commission, *Heavy Vehicle Driver Fatigue: Policy Proposal – January 2004*, National Transport Commission, Melbourne, 2004 p. ii.

<sup>159</sup> Roads and Traffic Authority, p. 18.

designed to help drivers manage their fatigue and ensure they are able to drive a heavy vehicle safely.<sup>160</sup>

152. The Regulation applies to drivers of heavy vehicles on roads and road-related areas. It also applies to employers of drivers of heavy vehicles. However, it excludes members of the Australian Defence Forces while on official duties. Small parts of the regulation may also apply to other people.<sup>161</sup>
153. The Regulation prevents fatigue driving by providing maximum driving and work times as well as minimum rest times.<sup>162</sup> Appendix E provides an overview of these regulations for Queensland and other selected Australian jurisdictions. Queensland's working, driving and rest period requirements appear similar to those in other states.
154. The Regulation also provides for the National Log Book, the Transitional Fatigue Management Scheme, enforcement and review.<sup>163</sup>

### **National Log Book**

155. The National Log Book was introduced in Queensland on 3 August 1998 as part of Queensland's implementation of the National Driving Hours Policy. A driver who is driving a commercial bus or heavy vehicle outside of their 'local area' is required to record driving, working and rest times in the National Log Book. In Queensland, a driver's local area is the area surrounding the driver's base with a 200 kilometre radius.<sup>164</sup> Appendix F compares the log book requirements in Queensland with other selected Australian jurisdictions.

### **Transitional Fatigue Management Scheme**

156. The Transitional Fatigue Management Scheme (TFMS) is an optional scheme available to employers and heavy truck drivers in Queensland, New South Wales, Victoria and South Australia. The TFMS allows for an increase in flexibility of trip scheduling and driver rostering in return for implementing some extra fatigue management measures. Requirements of the scheme include:
  - Drivers must pass the appropriate medical examination;
  - Drivers and operational staff are required to undertake a training course in fatigue management;
  - Employers must implement auditable processes relating to driver fatigue management, training, health and rostering; and
  - Drivers must carry a Driver Certification Manual while driving, which is their passport to the scheme.<sup>165</sup>

### **Enforcement**

157. QT believes that the current level of enforcement of driving hours regulations is appropriate given the broad spectrum of legislation the inspectorate and police are required to enforce. QT is currently investing more strategic enforcement to curb dangerous behaviour and identify recidivist drivers and employers and is

<sup>160</sup> s3 *Transport Operations (Road Use Management – Fatigue Management) Regulation (Qld) 1998*.

<sup>161</sup> s4 *Transport Operations (Road Use Management – Fatigue Management) Regulation (Qld) 1998*.

<sup>162</sup> s15-s17 *Transport Operations (Road Use Management – Fatigue Management) Regulation (Qld) 1998*.

<sup>163</sup> Queensland Transport, 33, p. 40.

<sup>164</sup> Queensland Transport, *National Fatigue Management Regulation*, Queensland Transport, Brisbane, 2000, pp. 2-3.

<sup>165</sup> Queensland Transport, *National Fatigue Management Regulation*, p. 6.

utilising technology to better track and monitor heavy vehicles. This will continue to improve compliance with the legislation.<sup>166</sup>

158. Table 9 below provides offence statistics for the top twenty offences under the fatigue management regulation between August 2000 and February 2004. Over this time, 13,312 tickets were issued.<sup>167</sup> This is an average of 310 tickets per month over this time period.

**Table 9: Top 20 offences under the [Transport Operations (Road Use Management – Fatigue Management) Regulation (Qld) 1998], August 2000 to February 2004**

Offence Description	Number of Tickets
Fail to record change of activity in logbook	3686
Fail to record required information in logbook before commencing driving or working	2798
Fail to record information in logbook in the required manner	1548
Driving time exceeds maximum for 24 or 168 hour period by 1 hour or more	1086
Fail to carry logbook	1062
Fail to record required information before engaging in non-local area work	350
Driver's rest time is < the minimum for 24, 168 or 672 hour period (shortfall 1 hour>)	323
Make false/misleading entry in driving record or deface/change correct entry	318
Driving time exceeds maximum for 24 or 168 hour period by less than 1 hour	181
Fail to produce driver's licence	144
Driving time exceeds maximum for 5.5 hour period	130
Fail to record registration number of vehicle in logbook	93
Transitional Fatigue Management Scheme (TFMS) driver's time exceeds maximum for 24 or 168 hour period by 1 hour or more	62
Fail to carry driving records for last 28 days (non-local area work)	61
Driver's work time exceeds maximum for 24 or 168 hour period by 1 hour or more	51
Driver's rest time is < minimum for 24, 168 or 672 hour period (shortfall < 1 hour)	46
Fail to carry logbook (where driver's base is not garage address)	42
Engage in non-local area work without a logbook	41
Fail to record required information after ceasing to engage in non-local area work	35
Fail to give copy of daily driving record to employer	31

Source: Queensland Transport, Submission No. 33, 2004.

159. The QPS highlight some of the difficulties related to the enforcement of heavy vehicle legislation in their submission. The QPS require its officers to have in-depth knowledge of the enforcement of heavy vehicle driver fatigue. QT conducts the training of police officers in this area. However, this training is severely limited due to availability and resource constraints.<sup>168</sup>

160. The committee notes that prescribed driving, working and rest period regulations have not resulted in significant reductions in heavy vehicle road crashes.<sup>169</sup> They also note four problems with these type of regulation:

- The regulations do not consider the effect of circadian rhythms (the primary determinant of alertness levels);<sup>170</sup>
- The regulations overemphasise the importance of time spent driving and do not consider the driver's activities during rest periods;<sup>171</sup>
- The regulations do not consider differences in individual capabilities;<sup>172</sup> and

<sup>166</sup> Queensland Transport, *Questions Taken on Notice*, p. 8.

<sup>167</sup> Queensland Transport, 33, p. 41.

<sup>168</sup> Queensland Police Service, 16, p. 12.

<sup>169</sup> Centre for Accident Research and Road Safety – Queensland, 37, p. 16.

<sup>170</sup> A-M Feyer & AM Williamson cited in N Haworth, *Fatigue and Fatigue Research: The Australian Experience*, 7<sup>th</sup> Biennial Australasian Traffic Education Conference, Brisbane, 1998, p. 33.

<sup>171</sup> CD Wylie, T Schultz, JC Miller, MM Mitler & RR Mackie, *Commercial Motor Vehicle Driver Fatigue and Alertness Study: Project Report*, Federal Highway Administration, US Department of Transport, November 1996, pp. 2-64 & 5-14.



- Drivers and companies do not adhere to the regulations.<sup>173</sup>
161. The committee recognises that QT and the QPS have strategies to overcome these last two shortcomings. The TFMS provides companies with the opportunity to take into account the differences in individual capabilities to drive safely. QT and the QPS have also undertaken an enforcement program to apprehend drivers and companies that do not adhere to fatigue regulations.
162. CARRS-Q suggests that a weighting system based on circadian rhythms, where the hours of driving during the night get weighted more heavily than the hours during the day, is one way of improving the system. CARRS-Q comments that this is a promising option from a research point of view but in reality may not be practical for a transport company because it is more costly to transport goods at night than during the day, as well as the implications for traffic and overall profitability.<sup>174</sup>
163. The committee notes that while the implementation of legislation to control the heavy vehicle industry is more advanced than for light vehicle drivers, there are still problems with its effectiveness in reducing crashes. Legislation pertaining to hours of driving and logbooks for drivers of heavy vehicle drivers are ineffective. The committee supports QT developing legislative proposals, consistent with national policies, that the Minister for Transport can take to Cabinet to remedy this problem.
164. The committee also recommends increasing the level of on-road enforcement of heavy vehicle fatigue management legislation.

### **RECOMMENDATION 10:**

That the Queensland Police Service should, in conjunction with Queensland Transport, increase the level of on-road enforcement of driving hours for heavy vehicle drivers.

**Ministerial Responsibility:**

**Minister for Police and Corrective Services**

**Minister for Transport and Main Roads**

### ***Chain of Responsibility prosecutions***

165. QT has had some success in prosecuting transport companies for driving hours offences using Chain of Responsibility (COR) legislation under the *Transport Operations (Road Use Management – Fatigue Management) Regulation (Qld) 1998*. This legislation targets companies that allow or encourage breaches of legislation.<sup>175</sup>
166. The Harker case is a national benchmark for heavy vehicle regulation as it was the first prosecution under the COR regulations where both drivers and the employer were charged.<sup>176</sup> On 16 and 17 March 2004, Harker Transport Services Pty Ltd pleaded guilty to 46 charges. The charges related to allowing drivers to exceed driving hour's regulations and failure to have minimum rest breaks. The company was fined \$40,000.<sup>177</sup>

<sup>172</sup> A-M Feyer & AM Williamson, cited in Haworth, p. 33.

<sup>173</sup> Mabbott & Pinder 2000, cited in Centre for Accident Research and Road Safety – Queensland, 37, p. 17.

<sup>174</sup> Centre for Accident Research and Road Safety – Queensland, *Hearing Transcript*, p. 19.

<sup>175</sup> Queensland Transport, 33, pp. 40-41.

<sup>176</sup> Queensland Transport, 33, pp. 40-41.

<sup>177</sup> Queensland Transport, 33, p. 41.

167. These prosecutions are particularly resource intensive and time consuming. In the prosecution against Harker Transport Services Pty Ltd, QT prosecutions staff were involved in approximately eight weeks of effort, including adjudication of the investigation, briefing of a Queen's Council and court time. Other staff, such as transport inspectors, also invested significant amounts of time in these operations.<sup>178</sup>
168. QT deems the impact of the COR prosecutions on transport companies and drivers has been significant. There is a growing awareness in the transport industry that QT is at the forefront in the introduction of COR legislation and is actively prosecuting offenders. Therefore, rogue operators, drivers, companies and forwarding agents/consigners are now increasingly conscious of their obligations.<sup>179</sup>
169. The committee acknowledges that the existing COR legislation has resulted in several successful prosecutions. They encourage QT to continue to prosecute breaches of this legislation.

### ***Fatigue Management Program pilot for Heavy Vehicles***

170. QT, in conjunction with industry and other Australian transport regulators, has been involved in developing and managing the Fatigue Management Program (FMP) pilot since 1994.<sup>180</sup>
171. Under the FMP, road transport operators are accredited for their work practices. After this accreditation, they are able to operate under an alternate system to the current prescriptive driver hours/log books regulatory system. This system requires transport companies to have documented assurance systems, policies, procedures and records that demonstrate audited management and evaluation systems. These systems are designed to ensure compliance with agreed fatigue management standards.<sup>181</sup>
172. An evaluation of the program supports that drivers working under FMP conditions are exposed to significantly less fatigue-related risk. However, the TFMS was introduced during the FMP pilot. An evaluation found the TFMS to be similar to the FMP pilot. This removed the incentive to participate in the pilot because the TFMS is easier for both companies and drivers to comply with.<sup>182</sup>

### ***Transport Operations (Passenger Transport) Standard (Qld) 2000***

173. Fatigue management of taxi, limousine and bus drivers in Queensland is regulated under the *Transport Operations (Passenger Transport) Standard 2000* that states that drivers of a passenger vehicle must not drive with a level of fatigue that may endanger their passengers.<sup>183</sup> Section 20 of the standard requires owners of companies that offer passenger transport services to ensure their drivers do not operate vehicles when tired.<sup>184</sup>
174. The *Transport Operations (Road Use Management – Fatigue Management) Regulation (Qld) 1998* also regulates the hours for driving, working and resting

<sup>178</sup> QT, *Questions Taken on Notice*, p. 4.

<sup>179</sup> QT, *Questions Taken on Notice*, p. 4.

<sup>180</sup> Queensland Transport, 33, pp. 27-28.

<sup>181</sup> R Burgess-Limerick & D Bowen-Rotsaert, *Fatigue Management Program Pilot Evaluation: Phase 2 Wave 3 Report*, Global Institute of Learning and Development Consortium, for Queensland Transport, 2002, <[http://www.transport.qld.gov.au/qt/LTASinfo.nsf/index/heavy\\_fatigue](http://www.transport.qld.gov.au/qt/LTASinfo.nsf/index/heavy_fatigue)>, p. 5.

<sup>182</sup> Burgess-Limerick & Bowen-Rotsaert, p. 24.

<sup>183</sup> s11 *Transport Operations (Road Use Management – Fatigue Management) Regulation (Qld) 1998*.

<sup>184</sup> s20 *Transport Operations (Passenger Transport) Standard (Qld) 2000*.

of bus drivers. Bus drivers are unable to participate in the TFMS.<sup>185</sup> However, taxi and limousine drivers are not covered by this regulation and therefore, do not have regulated driving, working or resting hours.

## Legislation for light vehicles

### ***Transport Operations (Road Use Management) Act (Qld) 1995***

175. The general driving population is not covered by legislation that explicitly states that driving fatigued is an offence. However, other pieces of legislation cover the offence of driving fatigued in a more general manner. Section 83 of the *Transport Operation (Road Use Management) Act (Qld) 1995* relates to careless driving of motor vehicles and states:

*Any person who drives a motor vehicle on a road or elsewhere without due care and attention or without reasonable consideration for other persons using the road or place shall be guilty of an offence.*<sup>186</sup>

176. Under this section a person driving a vehicle while fatigued is actually driving without due care and attention.

177. The ACRS believe that there is no need for new legislative measures or changes to existing legislation dealing with fatigue driving. They suggest broadening definitions of existing traffic offences to include a presumption of careless driving if the driver is sleep deprived.<sup>187</sup>

### ***Criminal Code Act (Qld) 1899***

178. As in most countries, Queensland has no specific prohibition against fatigue driving.<sup>188</sup> However, a driver involved in a fatigue-related crash can be prosecuted under a general law of dangerous driving of a motor vehicle.

179. Section 328A of the *Criminal Code Act (Qld) 1899* states:

*A person who operates, or in any way interferes with the operation of, a vehicle dangerously in any place commits a misdemeanor.*<sup>189</sup>

### ***Legislation for light vehicle drivers in other jurisdictions***

180. While fatigue-related crashes in Queensland are prosecuted under general laws of driving a motor vehicle dangerously or without due care and attention, New South Wales and Victoria have legislation directly addressing driving fatigued. New Jersey, in the United States of America, also has similar legislation.

181. Section 38(1A) of the *Road Transport (Driver Licensing) Regulation (NSW) 1999* of the New South Wales legislation directly addresses the problem of light vehicle driver fatigue by providing sleep as a specific example of being incapable of controlling a motor vehicle.<sup>190</sup> This section provides the driver licensing authority in New South Wales, the RTA, with the power to suspend a person's licence if they fall asleep at the wheel and cause death or grievous bodily harm.

<sup>185</sup> s11 *Transport Operations (Road Use Management – Fatigue Management) Regulation (Qld) 1998*.

<sup>186</sup> s83 *Transport Operations (Road Use Management) Act (Qld) 1995*.

<sup>187</sup> Australasian College of Road Safety, 30, p. 16.

<sup>188</sup> CB Jones, J Dorrian & SMW Rajaratnam, 'Fatigue and the Criminal Law', *Industrial Health*, Vol. 43, p. 63.

<sup>189</sup> s328A *Criminal Code Act (Qld) 1899*.

<sup>190</sup> Queensland Transport, 33, p. 44.

182. The Victorian Parliament introduced the *Crimes (Dangerous Driving) (Vic) Act* on 1 June 2004. This Act amended, amongst others Acts, the *Crimes Act (Vic) 1958* and provides that driving while fatigued may constitute culpable driving causing death.<sup>191</sup> The Act also provides that a fatigued driver is acting negligently and is guilty of an offence if they cause the death of another person.<sup>192</sup>
183. The New Jersey State Senate passed the Bill, known as '*Maggie's Law*', on 23 June 2003, in response to the death of 20 year old student Maggie McDonnell who was killed in 1997 when a driver crossed three lanes of highway traffic and hit her car head on. The driver admitted he had been awake for 30 hours before the crash and had also been using drugs.<sup>193</sup> *Maggie's Law* states that a person driving while fatigued is a reckless driver and can, therefore, be convicted of vehicular homicide.<sup>194</sup>
184. *Maggie's Law* makes the act of driving fatigued an explicit offence, rather than an implicit offence, as it is in Queensland. However, this approach has severe limitations.
185. Firstly, *Maggie's Law* defines fatigue in terms of hours without sleep and hence, may fail to include in its scope individuals that it was intended to cover. For example, a person who has only had two hours of sleep in the prior 24 hours before a crash would not be covered by the law. Secondly, this law also fails to cover tired individuals causing serious injury but not death. Adopting this approach would do little more than clarify the current situation and can be viewed as a minimalist solution that may only remove some of the difficulties associated with the current laws.<sup>195</sup>
186. The committee believes that legislation relating to driving without due care and attention and dangerous operation of a vehicle is ineffective for regulating fatigue in drivers and riders of light vehicles. The committee believes this is because the current Queensland legislation does not include fatigue as an explicit offence and does not outline what is and is not an acceptable level of fatigue.
187. However, the committee also notes the difficulties in adequately identifying and enforcing fatigue driving legislation. For this reason the committee suggests that QT monitors the legislation that explicitly refers to fatigue driving in New South Wales and Victoria to identify its effectiveness in reducing fatigue driving in those states before considering any legislative change in Queensland.

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<sup>191</sup> Scrutiny of Acts and Regulations Committee, *Alert Digest No. 6 of 2004*, Parliament of Victoria, Victoria, 2004, <<http://www.parliament.vic.gov.au>>.

<sup>192</sup> s318(1-2A) *Crimes Act (Vic) 1958*.

<sup>193</sup> National Sleep Foundation, *NSF Statement Regarding Maggie's Law – Nation's First Law Aimed at Drowsy Driving*, Press Room, National Sleep Foundation, US, <[www.sleepfoundation.org](http://www.sleepfoundation.org)>.

<sup>194</sup> Amendment N.J.S.2C:11-5, enacted by the Senate and General Assembly of the State of New Jersey, 210<sup>th</sup> Legislature.

<sup>195</sup> Jones, Dorrian & Rajaratnam, pp. 67-68.

**RECOMMENDATION 11:**

That Queensland Transport should review the New South Wales and Victorian legislation that directly addresses fatigue driving to identify if it reduces the incidence of fatigue-related crashes; the success rate of prosecutions; the ease of enforcement; and the likely benefits of introducing similar legislation in Queensland.

**Ministerial Responsibility:**

**Minister for Transport and Main Roads**

**FATIGUE REGULATION IN THE WORKPLACE**

188. In Queensland, the DIR helps to manage fatigue in the workplace through Workplace Health and Safety Queensland (WHSQ). The DIR has developed a Fatigue Management Guide for workers across all industries. The intent of this guide is twofold: to educate organisations and workers about the causes and effects of fatigue and to provide practical advice on managing fatigue. The guide provides some best practice strategies for organisations and individuals to manage fatigue and contains some practical tips for shift workers on how to address fatigue in their daily lives. It provides advice that is generally applicable to all workplaces within Queensland where fatigue is a health and safety issue.<sup>196</sup>
189. While DIR provide guidelines to help organisations and individuals manage fatigue, DIR is not covered by any legislation that regulates the maximum number of hours to be worked per week. Hours of work tend to be regulated through industrial agreements, which are usually agreements between relevant unions and workplaces and endorsed through the Queensland Industrial Relations Commission. However, DIR monitor trends relating to hours of work within Queensland.<sup>197</sup>
190. There is also no prescriptive legislation stating that an employer has an obligation to reduce the risk of employees having a fatigue-related crash between their home and place of work. However, there is an implied obligation under section 28 of the *Workplace Health and Safety (Qld) Act 1995*, that requires employers to ensure that persons are free from death, injury or illness caused by the workplace, work activities or specified high-risk plant (trucks, cranes and other similar vehicles). This general obligation extends to the employer identifying any factors in the workplace or the nature of the work that could contribute to the employee being too fatigued to drive home safely.<sup>198</sup>
191. The Road Accident Action Group (RAAG) Mackay is a road safety working group focused primarily on fatigue and speed related issues on the Bruce Highway, the Peak Downs Highway and other major corridors. This group is concerned that the existing legislation in Queensland that offers compensation to workers who suffer an injury between work and home is not up-to-date as a result of changes in the structure of the workforce.<sup>199</sup> The group believes that this legislation is difficult to apply and, therefore, makes it difficult for

<sup>196</sup> Department of Industrial Relations, *Hearing Transcript*, p. 11.

<sup>197</sup> Department of Industrial Relations, *Hearing Transcript*, p. 13.

<sup>198</sup> Department of Industrial Relations, *Hearing Transcript*, p. 14.

<sup>199</sup> Road Accident Action Group, *Submission No. 45*, p. 9.

employees to make an informed decision about whether or not they are covered if they break their journey to reduce fatigue.<sup>200</sup>

192. The committee congratulates DIR and WHSQ on the work undertaken to date for managing fatigue in the workplace. This includes the development of their Fatigue Management Guide. However, the committee suggests that clarification is needed on the eligibility for WorkCover compensation for crash injuries sustained by workers who have a short sleep before driving home or break their journey to use another fatigue management countermeasure. Additionally, DIR should work with organisations in industries where employees have a higher risk of fatigue-related crashes when travelling home from work such as mining. DIR can encourage organisations to provide opportunities for employees to have a short sleep before driving or riding home.

### **RECOMMENDATION 12:**

That the Department of Industrial Relations should provide guidelines for employers and workers on the extent of eligibility for compensation for injuries sustained in crashes by workers who have a short sleep before driving home after shifts or break their journey to use another fatigue management countermeasure.

**Ministerial Responsibility:**

**Minister for Employment, Training and Industrial Relations**

### **RECOMMENDATION 13:**

That the Department of Industrial Relations should work with organisations to provide opportunities for employees to have a short sleep before travelling home after work, particularly in industries where employees have a higher risk of a fatigue-related crash.

**Ministerial Responsibility:**

**Minister for Employment, Training and Industrial Relations**

### **Particular industries**

193. Individual Queensland Government departments produce policies to reduce the risk that their employees will experience a fatigue-related crash while driving for work. For instance, DMR has produced a *Road Travel Safety Policy* that addresses driver fatigue as well as other factors that have an influence on driver safety.<sup>201</sup> DIR also provides guidelines to their employees. The guidelines include instructions on amount of driving time per day and, in more remote areas, the requirement for two drivers in the one vehicle. The DIR policy is available to other government departments.<sup>202</sup>
194. It was not clear to the committee whether the DIR guidelines apply across the government or whether all departments and agencies have individual guidelines in place. The committee believes that the Queensland Government should develop a directive similar to those used by DMR, DIR and other Queensland Government agencies for all departments and agencies that will reduce the risk of public servants experiencing a fatigue-related crash while driving for work.

<sup>200</sup> Road Accident Action Group, pp. 15 & 17.

<sup>201</sup> Queensland Transport, *Questions Taken on Notice*, p. 14.

<sup>202</sup> Department of Industrial Relations, *Hearing Transcript*, pp. 15-16.

**RECOMMENDATION 14:**

That the Department of Industrial Relations should develop a directive similar to those used by Department of Main Roads, Department of Industrial Relations and other Queensland Government agencies for all state government departments and agencies that will reduce the risk of public servants experiencing a fatigue-related crash while driving for work.

**Ministerial Responsibility:**

**Minister for Employment, Training and Industrial Relations**

195. Submissions to the committee and the committee's research identified that workers in particular industries may be at higher risk of a fatigue crash. One example is aircraft cabin crew. There are a number of factors unique to cabin crew working on domestic commercial aircraft in Australia, predominantly: long hours without a rest pause, minimum rest that is further reduced by transportation to and from rest facilities and inappropriate rest facilities resulting in poor quality sleep. The wider ranging impact on the community of airline crew operating in a fatigued state is not only limited to their in-flight role where safety is paramount but also on the roads while driving between airports and home following arduous trips.<sup>203</sup>
196. The Queensland Ambulance Service is moving towards its paramedics operating under a 10 hour shift pattern. However, there is the potential for this time to be extended with overtime. During work shifts, rest and meal breaks are often delayed or not attained due to busy work circumstances. It is common for busy shifts to be extended into longer work periods. Furthermore, 'on call' provisions tend to require employees to be available for up to 16 hours after their shift. Their time away from work is supposed to be uninterrupted but it is not uncommon for this rest time to be broken in excess of two and three times, creating tremendous strain on already fatigued employees.<sup>204</sup>
197. Long work hours and work shifts are part of the medical profession. Research found that the odds of medical interns having a crash on the drive home after an extended work shift were more than double the odds after a non-extended shift. Furthermore, near-miss incidents were more than five times as likely to occur after an extended work shift as they were after a non-extended shift.<sup>205</sup>
198. The RAAG Mackay focuses on fatigue issues in the Bowen Coal Basin and surrounding regional cities. RAAG state that working conditions that contribute to fatigue play a significant role in road crashes in these areas. Workers with long shifts and accrued sleep debt often drive for up to three hours to get home after a 12 hour shift working on plant and machinery. Many workers also need to drive between 2 am and 5 am to get to work and often have rotating rosters that can involve working four to seven 12 hour day or night shifts.<sup>206</sup>
199. New South Wales research helps quantify the effect of fatigue on crashes for coal miners. The research identified that driving home from work was more dangerous for coal miners than driving to work. The researchers concluded that drivers fell asleep and crashed four times more frequently on the way home from work than they did on the way to work. Drivers fell asleep without crashing almost twice as often on the way home as on the way to work. Drivers

<sup>203</sup> Flight Attendants' Association of Australia, *Submission No. 36*, p. 5.

<sup>204</sup> Ambulance Employees Australia – Queensland Branch, *Submission No. 22*, pp. 1 - 2

<sup>205</sup> LK Barger, BE Cade, NT Ayas, JW Cronin, B Rosner, FE Speizer & CA Czeisler, 'Extended work shifts and the risk of motor vehicle crashes among interns', *The New England Journal of Medicine*, Vol. 352, No. 2, 2005, p. 30.

<sup>206</sup> Road Accident Action Group, p. 3.

were also one and half times more likely to crash due to their own inattention on the way home from work.<sup>207</sup>

200. The committee notes that workers in particular industries such as miners and aircraft cabin crew are more likely to experience a fatigue-related crash while travelling between work and home. The committee believes that interventions targeted at these industries will help reduce the incidence and severity of crashes.
201. These interventions could include amendments to the current work rostering systems, public education targeted at both employers and employees, health programs to reduce the likelihood that individuals will develop sleep disorders and providing alternative transport arrangements such as car pooling schemes or bus services. The committee also discusses more general countermeasures in Parts 7 and 8.
202. The committee believes that the mining industry is an appropriate industry to trial these measures. The approach adopted for use within the mining industry could then be used as a model for other, high-risk, industries.

### **RECOMMENDATION 15:**

That the Department of Natural Resources and Mines should work with employers, employees and other stakeholders within the mining industry to support and encourage the development of countermeasures such as more effective rostering systems, public education, health programs and alternative transport arrangements to reduce the incidence of fatigue-related crashes on the way to and from work.

**Ministerial Responsibility:**

**Minister for Natural Resources and Mines**

### **RECOMMENDATION 16:**

That the Department of Industrial Relations should identify particular industries where employees have a high-risk of experiencing a fatigue-related crash either at work or while travelling to or from work and then, using information gathered from the implementation of recommendation 15, support and encourage the development of countermeasures to reduce fatigue-related crashes within these high-risk industries.

**Ministerial Responsibility:**

**Minister for Employment, Training and Industrial Relations**

<sup>207</sup> N Mabbott, D Cornwell, B Lloyd & A Koszelak, *Crashes on the way to and from coal mines in NSW*, Coal Services Health and Safety Trust, 2005, p. 10.



## PART 7 ~ RAISING AWARENESS OF THE PROBLEM

203. This part discusses a range of countermeasures used to raise awareness of fatigue as a road safety problem. It considers public education, licensing, Driver Reviver and the HealthBreak program.

### PUBLIC EDUCATION

#### National public education campaigns

204. National initiatives designed to reduce fatigued driving focus on tourists and other visitors, include *Driving in Australia* and *Safety Tips for Visitors to Australia*.
205. With the aim of providing tourists, and especially international visitors with a better understanding of road safety issues in Australia, a *Driving in Australia* video and brochure were distributed to various car hire companies, bus companies and tourist organisations in 1999. This video featured driver fatigue information relevant to Australia.<sup>208</sup>
206. The *Safety Tips for Visitors to Australia* brochure includes safety tips for visitors on the road, at the beach, in the bush and in the outback. The *Driving in Australia* brochure is currently being reviewed by a working group to be used as a companion to this safety tips brochure.<sup>209</sup>

#### Queensland public education campaigns

207. The majority of Queensland's public education campaigns on road safety issues are conducted by QT. The first of QT's major driver fatigue education campaigns began in 1997. QT's expenditure on light vehicle fatigue public education programs is approximately \$957,000 annually.<sup>210</sup>
208. QT has conducted a number of campaigns including *Do not roll over in your sleep*, *Fatal 4*, *Olympic road safety*, *Rest or R.I.P* and *Microsleeps*. These campaigns included television, radio, outdoor advertising, publicity and promotional activities. Each of these campaigns raised the awareness of fatigue as a road safety issue.<sup>211</sup>

#### Alternative education methods

209. Mass media public education campaigns are not the only method of raising awareness about this issue. The RACQ and the QPS undertook a trial of a *Fatigue Sucks* campaign in Mackay over the 2002-2003 summer holiday period. The major component of this campaign involved police officers speaking to drivers on the Bruce Highway and Peak Downs Highway about fatigue-related issues and offering them a map, fatigue brochures and a lollipop attached to an information card displaying the *Fatigue Sucks* slogan.

<sup>208</sup> Queensland Police Service, 16, p. 10.

<sup>209</sup> Department of Tourism, Fair Trading and Wine Industry Development, *Submission No. 20*, pp. 1-2.

<sup>210</sup> Queensland Transport, *Questions Taken on Notice*, p. 15 (Additional Documentation).

<sup>211</sup> Queensland Transport, 46, pp. 33 – 24.

This campaign was introduced as a state-wide initiative for the 2003 Easter holiday period.<sup>212</sup>

210. Young, newly licensed drivers are provided information regarding fatigue and other road safety risk factors, such as speeding and drink driving through QT's *Never the same again* initiative that was launched in November 2004. A package is mailed to every 17 and 18 year old driver two weeks after they gain their provisional driver's or rider's licence. The main feature of the package is a confronting documentary on CD that shows how three Queensland families' lives have been changed by road crashes involving young people. The documentary is supported by a website ([www.neverthesameagain.com.au](http://www.neverthesameagain.com.au)), a letter to parents from the mother of one of the crash victims and a booklet for parents.<sup>213</sup> The committee notes that QT has also raised awareness of fatigue driving by distributing postcards and advertising on trucks.<sup>214</sup>
211. Previous anti-speeding campaigns have specifically targeted children to encourage their parents to drive safely. The RACQ believe that this is one avenue that should be used to promote messages about driving tired. The RACQ believes that targeting children may also help them to remember these messages when they are driving as adults.<sup>215</sup>
212. Other passengers, apart from children, can talk with the driver about fatigue issues. In 2001, the RTA launched a radio campaign in New South Wales with the purpose of encouraging passengers to speak about fatigue to help influence driver behaviour. The results of this campaign suggest that it was effective in communicating fatigue messages. The RTA used this method as they were unable to use enforcement to deter drivers from driving fatigued.<sup>216</sup>

### Future directions

213. Public education has been used in Queensland to raise awareness of driver fatigue and it is still needed to change driver attitudes and behaviour. Large numbers of drivers are not choosing to reduce their risks of a fatigue-related crash. Research conducted by AAMI in 2004 revealed that almost one third (32 per cent) of drivers would not stop to take a short sleep if they were tired whilst driving. Almost half of the drivers interviewed said that sometimes they drive tired and in the past 12 months, five per cent of drivers said they had momentarily fallen asleep at the wheel.<sup>217</sup> The committee notes that the current *Road Safety Action Plan* calls for the launch of a new public education campaign about the dangers of driving tired or without due care and attention.<sup>218</sup>
214. The effectiveness of public education campaigns is improved by providing audiences with information about how to prevent and combat fatigue.<sup>219</sup> Combining a public education program with either police enforcement or public

<sup>212</sup> Queensland Police Service, *Submission No. 52*, p. 9.

<sup>213</sup> Queensland Transport, *Questions Taken on Notice*, p. 21 (Additional Documentation).

<sup>214</sup> Queensland Transport, 46, p. 16 & p. 19.

<sup>215</sup> Royal Automobile Club of Queensland, *Hearing Transcript*, p. 34.

<sup>216</sup> Roads and Traffic Authority, p. 24.

<sup>217</sup> AAMI, *AAMI Crash Index: Tenth Annual Road Safety Report – October 2004*, AAMI, 2004, <[http://www.aami.com.au/about\\_aami\\_insurance/aami\\_news\\_centre/news\\_special\\_reports.asp](http://www.aami.com.au/about_aami_insurance/aami_news_centre/news_special_reports.asp)>, pp. 2-3.

<sup>218</sup> Queensland Transport, 46, p. 25.

<sup>219</sup> R Tay, B Watson, O Radbourne & B De Young, *The Influence of Fear Arousal and Perceived Efficacy on the Acceptance and Rejection of Road Safety Advertising Messages*, Road Safety Research, Policing and Education Conference, 2001, p. 4.

relations activities increases the effectiveness of public education.<sup>220</sup> Anecdotal evidence from Queensland supports this. The QPS state that police officers generally notice a decrease in certain dangerous driving behaviours following an education campaign, when it has been combined with an active enforcement program.<sup>221</sup>

215. As it is difficult to measure impairment caused by fatigue, it is not possible to support public education with enforcement activities. However, public relations activities could still support the public education program.
216. At the Travelsafe Committee Fatigue Public Hearing, Chief Superintendent Dunn, Officer in Charge of the State Traffic Support Branch, stated that the QPS would be prepared to assist in educating about driver fatigue in any way, including distributing information on the causes, symptoms and countermeasures of fatigue and sleep disorders, whether at random breath-testing sites or when pulling over a motorist for other reasons.<sup>222</sup> The committee notes that QT asks QPS Officers to distribute information brochures to reiterate public education messages.<sup>223</sup>
217. Many submissions including those from the RACQ, the ASA, the QPS and AAMI suggest that public education campaigns in Queensland should specifically target identified high-risk groups.<sup>224</sup> The QPS points out that while QT's most recent *Microsleeps* campaign is specifically directed at some high-risk groups, it does not target other important high-risk groups including shift workers, people with sleep disorders and heavy vehicle drivers. In contrast, Professor Sheehan from CARRS-Q feels that there is still a need to educate all drivers to increase general community acceptance of driver fatigue as an important issue. According to Professor Sheehan, it is too early in the community's acceptance of the driver fatigue issue to shift education resources toward specific groups.<sup>225</sup>
218. QT states that previous fatigue campaigns developed by the department have specifically targeted young drivers, rural drivers, long distance and holiday drivers, as well as shift workers. People with sleep disorders have only been targeted through general mass media as they are difficult to identify.<sup>226</sup>
219. The committee believes that Queensland's general mass media campaigns have been valuable in raising awareness of driver fatigue as a significant road safety issue. However, there is a role for campaigns using alternative, more targeted methods aimed at specific high-risk groups to encourage these groups to change their behaviour. The committee notes that one example of this is the *Never the same again* package provided by QT to novice drivers. The committee believes there is potential benefit in introducing further programs of this type. The committee also believes that encouraging groups such as passengers and children to influence the driver to avoid driving fatigued has potential in reducing fatigue-related crashes. QT could work with non-government organisations like the RACQ and insurance companies, to develop innovative campaigns, such as the *Fatigue Sucks* initiative.

<sup>220</sup> A Delaney, B Lough, M Whelan & M Cameron, *A Review of Mass Media Campaigns in Road Safety*, Monash University Accident Research Centre, Victoria, 2004, pp. 60-61.

<sup>221</sup> Queensland Police Service, *Hearing Transcript*, p. 24.

<sup>222</sup> Queensland Police Service, *Hearing Transcript*, p. 24.

<sup>223</sup> Queensland Transport, 46, p.9.

<sup>224</sup> Royal Automobile Club of Queensland, 43, p. 14; Australasian Sleep Association, 44, p. 9; Queensland Police Service, 52, p. 10; AAMI, *Submission No. 11*, p. 7.

<sup>225</sup> Centre for Accident Research and Road Safety – Queensland, *Hearing Transcript*, p. 21.

<sup>226</sup> QT, 46, pp. 25-26.

**RECOMMENDATION 17:**

That Queensland Transport should introduce public education campaigns targeted at all high-risk groups outlined in Part 5 of this report. These campaigns should incorporate information on a range of symptoms and effects of driving fatigued and countermeasures that can be used to prevent fatigue-related crashes.

**Ministerial Responsibility:**

**Minister for Transport and Main Roads**

**RECOMMENDATION 18:**

That Queensland Transport should complement existing mass media fatigue-related campaigns by using alternative, more targeted, communication methods which target key groups such as passengers and children to influence drivers.

**Ministerial Responsibility:**

**Minister for Transport and Main Roads**

**RECOMMENDATION 19:**

That Queensland Transport should liaise with non-government organisations such as the RACQ and insurance companies in order to enhance the effectiveness of alternative, more targeted education campaigns.

**Ministerial Responsibility:**

**Minister for Transport and Main Roads**

**LICENSING**

220. The QT driver manual for learners, *Your Keys to Driving in Queensland*, contains a two page summary of fatigue-related issues. However, the current written exams do not include any questions about the problems associated with driver fatigue.<sup>227</sup>
221. The QPS recommends that ‘...questions on driver fatigue be included in the oral examination for new drivers as well as the written learner driver examination in order to encourage safe driving attitudes and behaviour in the first instance.’<sup>228</sup> AAMI also support the inclusion of material relating to fatigue and fatigue driving into the driver licensing system.<sup>229</sup> The committee agrees.
222. Including questions on driver fatigue in some versions of the novice driver and rider licence theory tests will provide an incentive for new drivers to develop a greater understanding of fatigue and its impact on driving. The committee believes that this would be a relatively easy road safety measure to implement.

<sup>227</sup> Queensland Police Service, 52, p. 10.

<sup>228</sup> Queensland Police Service, 52, p. 11.

<sup>229</sup> AAMI, 11, p. 7.

**RECOMMENDATION 20:**

That Queensland Transport should include questions on driver fatigue in some versions of the novice driver and rider licence theory tests.

**Ministerial Responsibility:**

**Minister for Transport and Main Roads**

**DRIVER REVIVER**

223. The Driver Reviver program is a community based road safety initiative of QT and the QPS. Driver Reviver is run in conjunction with local communities and sponsors. It aims to reduce the number of fatal crashes caused by fatigue driving.<sup>230</sup>
224. To achieve this, drivers are encouraged to 'STOP REVIVE SURVIVE' at rest stops throughout Queensland and enjoy complimentary tea or coffee.<sup>231</sup> Driver Reviver sites generally operate during these busy holiday periods: Australia Day/back to school, Easter, Anzac Day, Labour Day, Queen's Birthday/June school holidays, September school holidays and Christmas/New Year.<sup>232</sup>
225. Driver Reviver is operated by approximately 3,000 volunteers annually and an estimated 300,000 people visit one of the 37 Queensland sites during peak holiday periods.<sup>233</sup> Driver Revivers are only open at limited times because their operation depends on volunteers being available to staff the sites. The majority of Driver Revivers have demountable buildings in established sites. Many other sites are located in rest areas or service stations.<sup>234</sup>
226. QT's approximate annual expenditure on the Driver Reviver program is \$80,000.<sup>235</sup> QT provides some funding for specific initiatives at the sites including vehicle-mounted warning signs, reflective vests, first aid kits, fire extinguishers and no-smoking signs. QT also provides guidelines to volunteer operators of Driver Reviver sites about how they might best run the sites. DMR also make a contribution towards maintenance of a number of Queensland sites.<sup>236</sup>
227. This year *The Sunday Mail* investigated and identified a number of shortcomings of the Driver Reviver program:
- Poor signage causing reduced use by drivers;
  - Sites being poorly equipped, not open on a regular basis and located too far from highways;
  - People were more readily choosing to stop at service stations where they refuelled but did not rest; and
  - The refusal of the state government to fund the upgrade of sites and passing responsibility back to community organisations.<sup>237</sup>

<sup>230</sup> Queensland Transport, *What is Driver Reviver*, Queensland Transport, Brisbane, 2005, <[http://www.transport.qld.gov.au/qt/LTASinfo.nsf/index/rs\\_driverreviver\\_what](http://www.transport.qld.gov.au/qt/LTASinfo.nsf/index/rs_driverreviver_what)>.

<sup>231</sup> Queensland Transport, *What is Driver Reviver*.

<sup>232</sup> D Brownlow, *Utilising Volunteers to Reduce Fatigue Related Crashes in Queensland*, The Proceedings of the Seventh Biennial Australasian Traffic Education Conference, Australia, 1998, p. 89.

<sup>233</sup> Queensland Transport, 33, p. 34.

<sup>234</sup> Queensland Transport, *Hearing Transcript*, p. 2-3.

<sup>235</sup> Queensland Transport, *Questions Taken on Notice*, p. 15 (Additional Documentation).

<sup>236</sup> Queensland Transport, *Hearing Transcript*, p. 2-3.

<sup>237</sup> P Weston, *Wake-up Call*, *The Sunday Mail*, 9 January, 2005, p. 14.

228. Dr Malcolm Vick from James Cook University, Townsville, told the committee that Driver Reviver sites might be seen by those who are over-represented in fatigue crash statistics as 'not for them'. Comparison of time of day and day of week data for fatigue-related crashes with operating hours of these sites suggests that hours of operation are likely to have only an incidental impact on fatigue-related crashes.<sup>238</sup>
229. Conversely, it has been acknowledged that Driver Reviver has been successful due to the very strong sense of ownership and commitment to the program by the volunteers involved throughout the state. Involvement by volunteers provides numerous advantages to the provision of the program. Volunteers offer local focus, local knowledge, local expertise, commitment, responsiveness and established networks. Volunteers also provide the opportunity to utilise local knowledge in broader education at Driver Reviver sites and within the local community.<sup>239</sup>
230. QT is currently undertaking an analysis of the impact of Driver Reviver on fatigue-related crashes in Queensland.<sup>240</sup> The RACQ and CARRS-Q submissions support the Driver Reviver concept, particularly the involvement of local communities in delivering fatigue awareness messages.<sup>241</sup> However, the RACQ suggests increasing the operating hours to cover high-risk fatigue times<sup>242</sup> and CARRS-Q believes research is needed to demonstrate the benefits of the program in reducing crashes.<sup>243</sup>
231. The QPS believes the program has aged and is at risk of losing relevance. Therefore, it recommends that the Driver Reviver program needs immediate intervention to revitalise and enhance its profile.<sup>244</sup> The QPS suggests that government funding be used to:
- Provide better signage, including increased use of Variable Message Signs (VMS) to signal upcoming rest areas;
  - Operate more frequently and not be restricted to holiday periods only;
  - Increase the number of sites to at least one in every 50 kilometres;
  - Consider the incorporation of Driver Reviver sites with police interception sites;
  - Consider having sites staffed by paid employees; and
  - Increase participation by QT.<sup>245</sup>
232. The committee believes that the Driver Reviver program needs enhancement. A key factor in ensuring the program's continued development is the provision of a stable and recurrent source of funding. The committee believes that the most appropriate method of enhancing Driver Reviver and ensuring continuity of funding is through a partnership between the state government, the federal government and the community sector.

<sup>238</sup> M Vick, *Submission No. 29*, p. 6.

<sup>239</sup> Brownlow, pp. 87-88.

<sup>240</sup> Queensland Transport, 33, p. 46.

<sup>241</sup> Royal Automobile Club of Queensland, 34, p. 24; Centre for Accident Research and Road Safety – Queensland, 37, p. 19.

<sup>242</sup> Royal Automobile Club of Queensland, 34, p. 24.

<sup>243</sup> Centre for Accident Research and Road Safety – Queensland, 37, p. 27.

<sup>244</sup> Queensland Police Service, 16, p. 14.

<sup>245</sup> Queensland Police Service, 46, p. 12.

233. Two of the major problems associated with this program are the location of sites and the lack of appropriate signage approaching the sites. The committee believes that reviewing the location and messages of the signs will help increase patronage at Driver Reviver sites.

### **RECOMMENDATION 21:**

That Queensland Transport should liaise with the community sector and the Department of Transport and Regional Services to provide a stable and recurrent source of funding for Driver Reviver programs on national highways and roads of national importance.

**Ministerial Responsibility:**

**Minister for Transport and Main Roads**

### **RECOMMENDATION 22:**

That Queensland Transport, the Department of Main Roads and the Queensland Police Service should review the location and messages provided by signage for Driver Reviver sites.

**Ministerial Responsibility:**

**Minister for Transport and Main Roads**

**Minister for Police and Corrective Services**

### **Possible alternatives to Driver Reviver**

234. There are alternatives to the Driver Reviver program. Western Australia has a Coffee Stop program that has been operating for almost ten years in addition to Driver Reviver.
235. Coffee Stop is a free service provided to the community provided by participating roadhouses aimed at reducing driver fatigue and the incidence of fatigue-related crashes in regional Western Australia. This program involves participating roadhouses offering a free cup of coffee to the driver (one cup per vehicle) on long journeys. There are 52 Coffee Stop operators in WA operating all year round. These businesses are actively and financially contributing to road safety as there is currently no reimbursement to the roadhouses for the costs of providing coffee. The program is promoted as a sit down only service to ensure that people do actually take a break from driving. The Coffee Stop and Driver Reviver programs are coordinated by the Western Australian Local Government Association's RoadWise program.<sup>246</sup>
236. Based on the number of free coffees provided to drivers by Coffee Stop roadhouses, it is estimated that 538,800 drivers stopped at Coffee Stop roadhouses in the two year period from 1998 to 1999.<sup>247</sup>
237. The use of alternative models to Driver Reviver may encourage those drivers who do not stop at Driver Revivers to take a break from driving. Alternative models may also allow greater provision of services across the road network as well as throughout the year and time of day. The committee suggests that QT explore these alternative models.

<sup>246</sup> Western Australian Local Government Association, information provided, May 2005.

<sup>247</sup> RoadWise, *Coffee Stop*, Western Australian Local Government Association, 2005, pp. 6-9.

**RECOMMENDATION 23:**

That Queensland Transport should explore alternative models to Driver Reviver for the provision of rest facilities for drivers. This should include partnership with fuel and food outlets, along with other businesses with a presence across Queensland's road network.

**Ministerial Responsibility:**

**Minister for Transport and Main Roads**

**HEALTHBREAK PROGRAM**

238. The HealthBreak Program is a joint initiative of the Transport Accident Commission and Workplace Victoria. Funding is also provided by the Transport Workers' Union (Victorian/Tasmanian Branch) and the Institute for Breathing and Sleep. The goal of the HealthBreak program is to prevent workplace injury, accidents and illness among transport workers. It aims to improve awareness among all transport industry workers and employers about:
- Causes of fatigue and sleep disorders;
  - Risk factors and prevention of heart and vascular disease and Type 2 diabetes; and
  - Detection and referral for treatment of employees with sleep disorders, fatigue, diabetes, high cholesterol, high blood pressure and those at high risk of heart and vascular disease.<sup>248</sup>
239. By increasing awareness and providing support, health advice and referral, those employees with an increased risk of a health disorder can be diagnosed and treated.<sup>249</sup>
240. To achieve this, 15,000 workers in the transport industry will be offered a free workplace health check focusing on the detection and prevention of diabetes as well as sleeping, breathing and heart disorders. The program is running over a three year period, from 2002 to 2005. The total cost of the program over the three years is \$750,000. The program costs equate to \$50 per participating transport worker. The effectiveness of the program is being evaluated in terms of the proportion of workers identified with a health problem and the proportion who visit their general practitioners for assistance.<sup>250</sup>
241. In Queensland, drivers who participate in the TFMS and FMP pilot are required to undergo medical certification and training. These checks include consideration of sleep disorders such as apnoea and narcolepsy.<sup>251</sup> However, not all Queensland heavy vehicle drivers participate in these programs. These programs are discussed in Part 6.
242. Dr James Douglas, Director of the Sleep Unit at Prince Charles Hospital, commented on the Victorian HealthBreak Program at the Travelsafe Committee Fatigue Hearing held Friday 25 February 2005. Dr Douglas highlighted that the program is a proactive approach to fatigue issues concerning transport workers, involving collaboration by all the key

<sup>248</sup> Institute for Breathing and Sleep, *Welcome to the HealthBreak Sleep Safe-Work Smart Program*, Institute for Breathing and Sleep, Melbourne, 2005, <<http://healthbreak.ibas.org.au/>>.

<sup>249</sup> Institute for Breathing and Sleep.

<sup>250</sup> Institute for Breathing and Sleep.

<sup>251</sup> Queensland Transport, *Questions Taken on Notice*, p. 2.



stakeholders in the state. He feels that such a program is worthy of monitoring and consideration as to its effectiveness.<sup>252</sup>

243. With regard to treating sleep disorders in the general community, Dr Craig Hukins, Clinical Director of the Sleep Disorders Centre at the Princess Alexandra Hospital and executive member of the ASA, emphasises the importance of resource allocation in public health facilities throughout Queensland. Dr Hukins explains that Queensland's facilities are dealing with less than two per cent of the total population with obstructive sleep apnoea yet there are extremely long waiting times for consultation and treatment. It can take up to 12 months between initial referral and consultation, and sometimes even longer periods between consultation and treatment at the Princess Alexandra Hospital. Dr Hukins states that, as a result, any activity that focuses on raising awareness of sleep disorders should occur with recognition that the current health system is inadequate to cope with the treatment of sleep disorders.<sup>253</sup>

#### **RECOMMENDATION 24:**

That Queensland Transport should, in conjunction with Queensland Health and the Victorian authorities, evaluate the HealthBreak program to determine whether it should be adopted in Queensland. When making a decision about the adoption of the program, Queensland Transport and Queensland Health should consider the existing resources allocated to treat sleep disorders, the resources required to effectively treat the individuals diagnosed with a sleep disorder and, if necessary, allocate more resources.

**Ministerial Responsibility:**

**Minister for Transport and Main Roads**

**Minister for Health**

<sup>252</sup> J Douglas, p. 32.

<sup>253</sup> Hukins, p. 32.



## PART 8 ~ COUNTERMEASURES

244. This part discusses countermeasures that can be used to address fatigue driving. They include sleep, drugs, road design, rest areas, audio-tactile devices, in-vehicle driver monitoring systems and the Intelligent Access Project.

### SLEEP

245. As discussed in Part 2, sleep is the only cure for fatigue as it restores brain functions that merely resting while awake does not. A short sleep of about 15 minutes reduces drowsiness while driving. However, a short sleep does not replace the requirement for adequate sleep at night.<sup>254</sup>
246. Due to the effect of circadian rhythms, the benefits of a short sleep depend on the time of day when it is taken. A short sleep should be taken during the dips in alertness caused by the circadian rhythms. As most people will normally sleep between midnight and 6am, short sleeps should be taken during the early afternoon circadian dip between 2 - 4pm.<sup>255</sup>
247. The length of the sleep affects its usefulness as a fatigue reducing countermeasure. Shorter sleeps of 10 minutes are more beneficial than longer sleeps of 20 to 30 minutes. After a 10 minute sleep there is an immediate increase in alertness and performance. However, sleeps of 20 to 30 minutes require a further 30 minutes to wake fully.<sup>256</sup>

### DRUGS

248. Both legal and illegal drugs affect a person's ability to drive, particularly when fatigued. Some over-the-counter and prescription medication may cause fatigue.<sup>257</sup> In contrast, some drivers use stimulants (for example speed) that allow them to continue to drive even though they are too tired to drive safely.<sup>258</sup> Australian surveys have found between 25 per cent and 50 per cent of truck drivers used drugs to stay awake.<sup>259</sup>
249. Modafinil, marketed under names such as Provigil, Alertec and Modavigil is a drug that enhances wakefulness and vigilance but is less likely to cause jitteriness and anxiety than traditional stimulants. It is currently used in the treatment of narcolepsy, shiftwork sleep disorder and obstructive sleep apnoea.<sup>260</sup>
250. Modafinil was approved for use in Australia in 2002 and is marketed under the trade name Modavigil. The official, prescribed use of this drug within Australia is limited. However, the committee was unable to ascertain the extent of off-

<sup>254</sup> Australian Transport Safety Bureau, p. 138.

<sup>255</sup> S Buxton, L Hartley, M Sully & G Krueger, *A Napping Policy to Prevent Commercial Truck Driver Fatigue*, Murdoch University Institute for Research into Safety and Transport, Perth, p. 8.

<sup>256</sup> A Brooks & L Lack, *A Brief Afternoon Nap Following Acute Nocturnal Sleep Reduction: Which Nap Duration is Most Recuperative?*, School of Psychology, Flinders University, Adelaide, submitted, p. 15.

<sup>257</sup> Queensland Transport, *Fact Sheet: Drug Driving*, Queensland Transport, Brisbane, <[www.roadsafety.qld.gov.au](http://www.roadsafety.qld.gov.au)>.

<sup>258</sup> VicRoads Road Safety Department, *Arrive Alive! – Drugs and Driving*, VicRoads, Melbourne, <[http://www.arrivealive.vic.gov.au/c\\_drugsAD.html](http://www.arrivealive.vic.gov.au/c_drugsAD.html)>.

<sup>259</sup> Travelsafe Committee, *Drug Driving in Queensland*, Travelsafe Committee, Brisbane, 1999, p.13.

<sup>260</sup> Anonymous, *Modafinil*, <[www.modafinil.com](http://www.modafinil.com)>.

label use within Australia.<sup>261</sup> The use of drugs to mask the effects of fatigue is not fully understood. The committee discusses the need for further research into drugs in Part 9.

251. Caffeine is a potentially effective short-term countermeasure, particularly when combined with a short sleep. Two to three cups of coffee, containing 200 mg of caffeine, reduces driver sleepiness. This effect lasts for about 30 minutes if the person had no overnight sleep and for around two hours if they slept for about five hours.<sup>262</sup>
252. However, there may be longer-term effects that need consideration before promoting the use of caffeine. The risk of strokes and heart attacks is directly related to blood pressure and even very small rises, such as those that can be caused by caffeine, can contribute to the likelihood of their occurrence.<sup>263</sup>
253. Caffeine in other drinks, apart from coffee, may also reduce the chances of a fatigue-related crash. For instance, British research identified that a can of Red Bull reduced fatigue-related driving incidents and subjective sleepiness during the afternoon in young adults, particularly for the first 90 minutes. A can of Red Bull contains less than the 200 mg of caffeine found in two to three cups of coffee. However, other ingredients contained in Red Bull drinks such as taurine may combine with caffeine to help to reduce the effects of fatigue.<sup>264</sup>

## ROAD DESIGN

254. The design of roads can reduce the chances of a fatigue-related crash or its severity if a crash does occur. A more forgiving road environment and divided roads are examples of using road design to reduce crashes.
255. A road environment with fewer hazards such as trees, poles, culverts and steep embankments allows drivers space to recover from errors. If a crash does occur, a forgiving road environment will reduce the crash severity by removing or protecting hard, unyielding objects. Road environment safety programs identify roadside hazards and treat the locations of greatest risk. However, it is not possible to address many hazards because of topography or environmental concerns.<sup>265</sup>
256. DMR's current efforts in road safety and fatigue reflect their philosophy about creating a 'more forgiving' roadside environment. The department directs its efforts toward funding engineering countermeasures in locations where the majority of crashes are occurring.<sup>266</sup>
257. DMR has identified that 80 per cent of road crashes in Queensland are actually occurring on only 16 per cent of the road system. The Safer Roads Sooner program includes a Targeted Road Safety Initiative that aims to identify areas

<sup>261</sup> This data was produced by the DUSC, Pharmaceutical Benefits Branch, Medical and Pharmaceutical Services Division, Commonwealth Department of Health.

<sup>262</sup> LA Reynier & JA Horne, 'Early morning driver sleepiness: Effectiveness of 200 mg caffeine', *Psychophysiology*, No. 37, 2000, p. 251.

<sup>263</sup> J Douglas, p. 30.

<sup>264</sup> LA Reynier & JA Horne, 'Efficacy of a 'Functional Energy Drink' in counteracting driver sleepiness', *Physiology & Behaviour*, Vol. 75, No. 3, 2002, p. 334.

<sup>265</sup> Roads and Traffic Authority, p. 28.

<sup>266</sup> Department of Main Roads, *Hearing Transcript – Crashes Involving Driver and Rider Fatigue in Queensland*, 25 February 2005, p. 6.

for targeted road safety efforts and significantly takes account of fatigue-related issues.<sup>267</sup>

258. Separating a road so that traffic travelling in either direction is split can reduce the risk of fatigue-related head-on crashes. A median of adequate width or providing a central safety barrier can be used to separate the road.<sup>268</sup>
259. Fatigue-related crashes may also be decreased by reducing driving monotony by creating a more interesting driving experience through road design. The DMR suggests that road authorities should endeavour to design and construct roads that are interesting for drivers and therefore, less conducive to fatigue.<sup>269</sup> For example, curved roads are preferable to straight roads. Where possible, scenic views such as lakes should be visible from the road.<sup>270</sup>

## REST AREAS

260. Rest areas offer drivers the opportunity to safely pull over and have a break from driving. They aim to reduce the risk of road crashes related to fatigue as well as the number of fatigued drivers on the road.<sup>271</sup>
261. Roadside rest areas for drivers in Queensland are part of a range of roadside amenities established primarily to meet the needs of long distance travellers. They are aimed at reducing fatigue-related crashes by enabling drivers to rest and recuperate. There are approximately 530 rest areas, heavy vehicle stopping areas and points of interest such as scenic lookouts in Queensland. DMR controls 27 per cent and maintains 15 per cent of these. The remainder of the stopping areas in Queensland are controlled by local governments, service clubs and other government authorities such as the Queensland National Parks and Wildlife Service.<sup>272</sup>
262. DMR states that drivers should be provided with advance signing of rest areas to allow adequate time for them to decide to use a particular amenity, with regard to its location and types of facilities provided. Advance warning signs are required at 10 kilometres to indicate the type of rest area and facilities provided and at two kilometres in order to specify the type of rest area and the distance to the next rest area.<sup>273</sup>
263. The DMR *Road Planning and Design Manual* outlines that rest areas for drivers should incorporate, as a minimum, rubbish bins, toilets, sheltered tables, seats and water.<sup>274</sup> Truck rest areas provide places for heavy vehicle drivers to stop so they can meet the statutory requirements for driving hours and rest breaks.<sup>275</sup> The DMR manual states that the minimum facilities required in a heavy vehicle rest area are shade, a table, benches, and rubbish bins.<sup>276</sup>

<sup>267</sup> Department of Main Roads, *Hearing Transcript*, p. 6.

<sup>268</sup> Roads and Traffic Authority, p. 28.

<sup>269</sup> Department of Main Roads, *Traffic and Road Use Management Manual - Volume 3: Driver Fatigue – Guidelines for Road-based Drive Fatigue Management in Rural Areas*, Department of Main Roads, Brisbane, 2004, p. 11.

<sup>270</sup> Department of Main Roads, *Traffic and Road Use Management Manual*, pp. 12-13.

<sup>271</sup> Roads and Traffic Authority, p. 27.

<sup>272</sup> Royal Automobile Club of Queensland, *Economic and Public Policy: Roadside Rest Areas*, Royal Automobile Club of Queensland, Queensland, 2003, pp. 1-2.

<sup>273</sup> Department of Main Roads, *Road Planning and Design Manual – Chapter 20: Roadside Amenities*, Department of Main Roads, Brisbane, 2002, p. 20-28.

<sup>274</sup> Department of Main Roads, *Road Planning and Design Manual*, p. 20-5.

<sup>275</sup> Roads and Traffic Authority, p. 27.

<sup>276</sup> Department of Main Roads, *Road Planning and Design Manual*, p. 20-6.

264. Lengthy stays in rest areas controlled by Main Roads are not encouraged – camping is either prohibited (where nearby camping grounds exist within 25 kilometres of a rest area) or limited to short stays to help manage fatigue (for example, a maximum period of 20 hours or 48 hours during a continuous four week period).<sup>277</sup> The DMR policy on signage of rest areas requires that conspicuous signage should be erected outlining the length of stay permitted and the penalty for non-compliance, allowing for enforcement of the duration of camping to minimise misuse of facilities.<sup>278</sup> Rules on the length of stay at other rest areas, not controlled by DMR, vary depending upon the controlling authorities.<sup>279</sup>
265. The DMR *Road Planning and Design Manual* outlines the benchmark for distances between rest areas. These are:
- 110 kilometres for motorist rest areas;
  - 100 kilometres for heavy vehicle rest areas;
  - 15 kilometres for motorist stopping places
  - 45 kilometres for heavy vehicle stopping places; and
  - Less than 400 kilometres for commercial service centres (subject to commercially viable traffic volumes).<sup>280</sup>
266. DMR has a rest area policy to guide the development, upgrading and expansion of Queensland's rest area network for both drivers and heavy vehicle operators. However, while there are new rest areas currently being constructed, for example, at Waverley Creek near Sarina, limited funding hinders the development of new and upgraded rest areas.<sup>281</sup>
267. The committee believes that the current number of rest areas, heavy vehicle stopping areas and points of interest are insufficient for the vast and dispersed Queensland road network. The committee is also concerned that points of interest and stopping areas do not require the minimum facilities as outlined in the DMR *Road Planning and Design Manual*. There is a lack of consistency in the location and quality of rest areas partly due to varying controlling authorities. The committee believes that the construction of more quality rest areas based on the DMR Rest Area Policy outlined in Chapter 20 of the Manual will encourage drivers to stop and rest and as a result reduce fatigue-related crashes. The committee suggests that new rest area sites are chosen with input from key stakeholders.

### **RECOMMENDATION 25:**

That Queensland Transport and the Department of Main Roads should construct more quality rest areas based on the Department of Main Roads rest area policy outlined in Chapter 20 of their *Road Planning and Design Manual*. The location of future rest areas should be decided through consultation with heavy vehicle drivers and other key stakeholder groups.

**Ministerial Responsibility:**

**Minister for Transport and Main Roads**

<sup>277</sup> Department of Main Roads, *Road Planning and Design Manual*, p. 20-6.

<sup>278</sup> Department of Main Roads, *Road Planning and Design Manual*, p. 20-6.

<sup>279</sup> Department of Main Roads, *Guide to Queensland Roads: Rest Areas*, Department of Main Roads, Brisbane, 2004.

<sup>280</sup> Department of Main Roads, *Road Planning and Design Manual*, p. 20-7.

<sup>281</sup> Department of Main Roads, *Hearing Transcript*, p. 1.

## AUDIO-TACTILE DEVICES

268. The original purpose of profile line marking was to provide a clear delineation in wet conditions by providing a reflective face protruding above water on the road. An additional benefit is the audible and tactile response drivers hear and feel when crossing audio-tactile line marking. This acts as a warning to drivers and can reduce fatigue-related crashes.<sup>282</sup>
269. Audio-tactile devices are used in a variety of ways to provide an audible and tactile warning to drivers. These devices include:
- Edge lines;
  - Rumble shoulders;
  - Rumble strips; and
  - Rumble sections.<sup>283</sup>
270. Audio-tactile edge lines are constructed by a continuous extrusion of thermoplastic material with raised transverse bars or by a discontinuous extrusion of transverse bars.<sup>284</sup> They are placed on the road surface to indicate to drivers that they are traversing over an edge line.<sup>285</sup> However, use of this engineering countermeasure should be considered carefully as audio-tactile edge lines can make the road less safe for certain road users, especially cyclists, and cause noise problems in certain domestic areas.<sup>286</sup>
271. Rumble shoulders are road shoulders with a very rough surface achieved by: cutting grooves into the road shoulder; forming grooves in the shoulder while the asphalt is hot; or laying large stones into the shoulder. In order for a rumble shoulder to be effective it needs to be reasonably wide, for example 400 mm or greater, and therefore provides a greater auditory and tactile effect than edge lines due to the increased rumble area.<sup>287</sup>
272. Rumble strips are transverse strips of rough textured pavement placed across the road, that are achieved by: forming grooves in hot asphalt; grinding grooves in the existing pavement; or constructing a raised tacked-on strip of rough pavement material using a spray seal. Transverse rumble strips can be used in identified fatigue-risk areas, especially for attracting drivers' attention to fatigue signage, high-speed approaches to intersections and narrow structures.<sup>288</sup>
273. Rumble sections involve the use of large/long sections of alternating surface texture on roads to break the monotony of the road noise generated by the same type of pavement surface on long stretches. Unlike edge lines and rumble shoulders, this approach has the advantage of drivers not having to leave their travel lane to experience its effect. However, rumble sections should only be used on rural roads.<sup>289</sup>
274. DMR supports more extensive use of audible edge lines and rumble strips throughout Queensland and is endeavoring to install them where funding

<sup>282</sup> Roads and Traffic Authority, p. 27.

<sup>283</sup> Department of Main Roads, *Traffic and Road Use Management Manual*, p. 5.

<sup>284</sup> Department of Main Roads, *Traffic and Road Use Management Manual*, p. 5.

<sup>285</sup> Queensland Police Service, 16, p. 15.

<sup>286</sup> Department of Main Roads, *Traffic and Road Use Management Manual*, p. 6; F Smith, *Submission No. 14*, p. 1.

<sup>287</sup> Department of Main Roads, *Traffic and Road Use Management Manual*, p. 6.

<sup>288</sup> Department of Main Roads, *Traffic and Road Use Management Manual*, p. 7.

<sup>289</sup> Department of Main Roads, *Traffic and Road Use Management Manual*, p. 7.

permits.<sup>290</sup> Other organisations such as the QPS, ACRS and RACQ recommend the expansion of this program.<sup>291</sup> The RACQ also believes that consideration needs to be given to a cost-effective process of re-installing audible edge lines when they wear away.<sup>292</sup>

275. The committee notes that the DMR Border District is currently undertaking a trial of a suite of new road-based treatments including proactive and reactive measures to both prevent crashes occurring and reduce the severity of crashes should they occur.<sup>293</sup>
276. In their submission, QT states that there has been no recent evaluation of the impact of audible edge lines on fatigue-related crashes in Queensland. Research in other jurisdictions indicates that audible edge lines reduce fatigue-related crashes.<sup>294</sup> QT refers specifically to an evaluation by VicRoads, the Victorian Government department that looks after road safety. This evaluation identified that audible edge lines were 15 per cent more effective in reducing fatigue-related crashes than painted lines.<sup>295</sup>
277. The committee believes that audio-tactile devices should be used more extensively throughout Queensland. However, the committee believes that an independent evaluation of the effectiveness of these devices in Queensland is needed. This evaluation should include a cost benefit analysis.

### **RECOMMENDATION 26:**

That, following an independent evaluation of the current audio-tactile devices, the Department of Main Roads should continue to deploy audio-tactile devices throughout Queensland.

**Ministerial Responsibility:**

**Minister for Transport and Main Roads**

### **IN-VEHICLE DRIVER MONITORING SYSTEMS**

278. The majority of research on emerging technology in road safety is aimed at developing on-board driver monitoring systems or crash prevention systems to reduce fatigue-related crashes.<sup>296</sup> As fatigue is a dimension ranging from declining performance on vigilance tasks through to outright falling asleep, on-board technology needs to deal with all these states to be effective.<sup>297</sup>
279. Many in-vehicle technological aids claim to help reduce the risk of a fatigue-related crash; however, there are concerns about the reliability of these devices. Relying excessively on these devices may be dangerous as they may not work as intended. They may also encourage drivers to rely on them to provide warnings when situations become dangerous rather than drivers having adequate sleep and rest breaks while driving.<sup>298</sup> CARRS-Q also

<sup>290</sup> Queensland Transport, *Questions Taken on Notice*, p. 22 (Additional Documentation).

<sup>291</sup> Queensland Police Service, 16, p. 15; Australasian College of Road Safety, 30, p. 17; Royal Automobile Club of Queensland, 34, p. 5.

<sup>292</sup> Royal Automobile Club of Queensland, 34, p. 27.

<sup>293</sup> Queensland Transport, 33, p. 2.

<sup>294</sup> Queensland Transport, 33, p. 48.

<sup>295</sup> Lee in Queensland Transport, 33, p. 40.

<sup>296</sup> Hartley, Penna, Corry & Feyer, p. 39.

<sup>297</sup> Hartley, Penna, Corry & Feyer, p. 46.

<sup>298</sup> Australian Transport Safety Bureau, p. 138.



suggests that there may be liability issues and legal concerns if a system distracts the driver or fails to operate as advertised.<sup>299</sup>

280. An Australian review of fatigue detection and prediction technologies concluded that while some of the technologies are promising, more work is required to make them valid road safety tools for use in Australia.<sup>300</sup>
281. QT is currently monitoring a range of Intelligent Transport Systems (ITS). Such systems range from looking at eye movement, steering wheel movement, brainwave activity and even levels of energy and concentration in drivers. One specific example of ITS, is the Intelligent Access Project (IAP) that will be able to track heavy vehicles on the network and advise when drivers are driving beyond normal hours and in locations that they should not be driving. QT is also monitoring the development of automatic number plate recognition that will be able to provide information on the exact journeys of heavy vehicles.<sup>301</sup>
282. Some car companies are including alarms in their cars. In his submission to the inquiry, Mr Bryne Smith describes the in-built rest alarm system featured in a new Magna ES Model car that he purchased. This alarm has a two hour default setting at which time the alarm sounds and a coffee cup icon remains illuminated until a rest is taken.<sup>302</sup>
283. The committee notes that at present, there is no existing valid or reliable technology to detect or measure fatigue. QT is currently monitoring the IAP and automatic number plate recognition for tracking the hours of driving and location of heavy vehicles. In-vehicle rest reminders currently appear to be the most viable option for fatigue technology in light vehicles.

### Intelligent Access Project

284. The IAP provides an innovative mechanism for the Government to better manage the road network and its use. The project aims to implement a system that will monitor heavy vehicles remotely to ensure they are complying with their agreed operating conditions using telematics (telecommunications and computing). The IAP will report on the speed, location and mass of heavy vehicles. There is currently a trial of the IAP in Brisbane that has operated successfully for over 18 months.<sup>303</sup>
285. Under the IAP, heavy vehicles are monitored by a certified third-party service provider. The government receives a non-compliance report when a vehicle breaks its conditions. The incident is then investigated to confirm its validity and determine if further action is required. Based on the severity of the breach, the government will then either issue a Penalty Infringement Notice or initiate a judicial briefing.<sup>304</sup>

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<sup>299</sup> Centre for Accident Research and Road Safety – Queensland, 37, p. 15.

<sup>300</sup> LR Hartley, T Horberry, NA Mabbott & GP Krueger, *Review of Fatigue Detection and Prediction Technologies*, National Road Transport Commission, Victoria, 2000, summary.

<sup>301</sup> Queensland Transport, *Hearing Transcript*, p. 5.

<sup>302</sup> B Smith, *Submission No. 41*, p. 2.

<sup>303</sup> Queensland Transport, *Personal Correspondence*, Queensland Transport, June 2005.

<sup>304</sup> Queensland Transport, *Personal Correspondence*.

286. As the IAP monitors heavy vehicles remotely, the system is not reliant on a vehicle passing through fixed points. The IAP is able to monitor vehicles 24 hours per day, seven days a week via GPS technology. This eliminates the need for expensive roadside structures. Apart from a few technical problems, QT report that the technology used in the Brisbane trial has appeared reliable and accurate.<sup>305</sup>

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<sup>305</sup> Queensland Transport, *Personal Correspondence*.

## PART 9 ~ FURTHER RESEARCH AND IMPLEMENTATION OF RECOMMENDATIONS

287. The committee has identified a number of areas that require further research. These topics were identified throughout the inquiry and include hypo vigilance, fatigue detection technologies and the effect of drugs on fatigue.

### HYPO VIGILANCE (UNDER-AWAKENESS)

288. As noted in Part 2, the committee was unable to identify an existing clear definition of fatigue that is universally accepted. One reason for ongoing disagreement to a common definition is the failure by some definitions to deal with different types of fatigue. For instance, monotony-based fatigue is a discrete phenomenon compared with sleep deprivation fatigue.<sup>306</sup> Addressing the different types of fatigue will require greater knowledge than is currently available.
289. CARRS-Q proposes that fatigue research should be broadened from sleep deprivation to include task monotony and resulting hypo vigilance.<sup>307</sup> CARRS-Q is currently submitting an application for a research grant that will enable them to examine this issue. There is limited research on hypo vigilance. Research was conducted in the 1970s that examined monotonous conditions and accidents within factories. Little research has occurred since then. However, advances in information technology may enable the development of countermeasures to reduce crashes that occur as a result of this type of fatigue.<sup>308</sup>
290. The committee believes that research into different types of fatigue such as hypo vigilance should be supported.

### **RECOMMENDATION 27:**

That Queensland Transport should, in conjunction with other transport agencies and universities, support research into different types of fatigue including hypo vigilance.

**Ministerial Responsibility:**

**Minister for Transport and Main Roads**

### FATIGUE DETECTION TECHNOLOGIES

291. Technology is used in other areas of road safety such as drink driving to identify if a driver is safe to continue driving. While fatigue detection technologies exist, most are still in the development and testing stages.<sup>309</sup> Each can be classified into one of four groups:
- Measuring whether the person is capable of driving (this is similar to the approach used to assess if a person is drink driving);
  - Using wrist activity monitors to mathematically calculate alertness based on amount of rest versus activity;

<sup>306</sup> Centre for Accident Research and Road Safety – Queensland, *Hearing Transcript*, p. 16.

<sup>307</sup> Centre for Accident Research and Road Safety – Queensland, 37, pp. 3-4.

<sup>308</sup> Centre for Accident Research and Road Safety – Queensland, *Hearing Transcript*, p. 17.

<sup>309</sup> Hartley, et al. p. 2.

- Measuring vehicle control such as steering wheel movements or braking to assess driver fatigue; and
  - Measuring the performance of the driver in the vehicle by using technology to assess attributes such as eye movement.<sup>310</sup>
292. It is difficult to identify the usefulness of many of these devices without knowing how they relate to, and if they accurately measure, crash risk.<sup>311</sup> The current measures of fatigue may not be reliable enough to be used when prosecuting people in a court of law.<sup>312</sup>
293. The committee believes that a valid and reliable fatigue detection technology, that is suitable for use in on-road enforcement and is recognised by the Courts would be useful in reducing the amount of fatigue driving and, as a consequence, the amount of fatigue-related crashes. However, it believes that further research and development of existing technologies is required to achieve this end.

### **RECOMMENDATION 28:**

That Queensland Transport should liaise with other transport agencies and universities to continue research into fatigue detection technologies. This research should have a particular focus on:

- Developing valid and reliable methods to measure fatigue or types of fatigue such as monotony;
- Linking the fatigue detection technology to, and accurately measuring, crash risk; and
- Providing research evidence to satisfy prerequisites for test results to be admissible in a court of law.

**Ministerial Responsibility:**

**Minister for Transport and Main Roads**

## **THE EFFECTS OF DRUGS ON FATIGUE**

294. As outlined in Part 8, both legal and illegal drugs affect a person's capacity to drive. One recent drug released in Australia, Modavigil, enhances a person's wakefulness.
295. Current research suggests that the drug Modavigil is a safe and effective drug. However, its impact on the Central Nervous System is not yet fully understood.<sup>313</sup> The effects of its off-label use to reduce the effects of fatigue while avoiding sleep are also not known. The committee suggests that further research on the effects of Modafinil on the Central Nervous System and on healthy adults who use it to reduce their need for sleep is needed. The committee does not believe that the focus on Modafinil should stop researchers from trying to develop additional, safer, more effective drugs that help reduce fatigue.
296. While noting that the regulation of this drug is the responsibility of the Federal Department of Health and Ageing Therapeutic Goods Administration, the committee believes that fatigue-reducing drugs such as Modafinil or similar

<sup>310</sup> Dinges & Mallis in Hartley et al, pp. 5-18.

<sup>311</sup> Hartley et al, p. 2.

<sup>312</sup> Centre for Accident Research and Road Safety – Queensland, *Hearing Transcript*, pp. 18-19.

<sup>313</sup> Anonymous, *Modafinil*, <www.modafinil.com>

drugs developed in the future should only be available by prescription. This should reduce the likelihood that these drugs will be abused by individuals who wish to sustain overly fatiguing lifestyles.

**RECOMMENDATION 29:**

That Queensland Transport should, in conjunction with Queensland Health, monitor the development and usage of drugs, such as Modafinil, which are used to address fatigue.

**Ministerial Responsibility:**

**Minister for Transport and Main Roads**

**Minister for Health**

**RECOMMENDATION 30:**

That Queensland Transport should, in conjunction with Queensland Health, liaise with research institutions to investigate and gain an understanding of:

- The effect of Modafinil and other similar drugs on the central nervous system;
- The effect of Modafinil and other similar drugs on healthy adults;
- The effect of Modafinil and other similar drugs on driving; and
- The development of additional, safer and more effective drugs to reduce fatigue.

**Ministerial Responsibility:**

**Minister for Transport and Main Roads**

**Minister for Health**

**IMPLEMENTATION OF RECOMMENDATIONS**

297. The committee acknowledges community concern regarding the implementation of recommendations. To support the implementation process, the committee recommends that QT and QPS report to Parliament on an annual basis on the implementation of supported and partially supported recommendations from this report. Reporting to Parliament annually will ensure Parliament and the public are aware of the progress made towards implementing recommendations.

**RECOMMENDATION 31:**

That Ministers should report annually to Parliament on the implementation by their departments of supported or partially supported recommendations in this report.

**Ministerial Responsibility:**

**Minister for Transport and Main Roads**

**Minister for Police and Corrective Services**

**Minister for Health**

**Minister for Employment, Training and Industrial Relations**

**Minister for Natural Resources and Mines**

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## SUMMARY OF CONCLUSIONS

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298. Fatigue is a difficult concept to define. It is used to describe a range of concepts including sleepiness, tiredness, exhaustion or even inattention.
299. Fatigue has several precursors including time since sleeping, quality of sleep, time of day, time on duty, workload, under-stimulation and other factors. However, the importance of sleep cannot be underestimated as it is the only countermeasure that prevents or cures fatigue. A loss of a small amount of sleep can severely affect the alertness and reaction times of drivers.
300. The estimated financial costs of sleep disorder related crashes was \$1.1 billion in 2004. This was the second largest indirect financial cost of sleep disorders after work-related injuries.

### FATIGUE CRASH DEFINITIONS

301. Fatigue crashes in Queensland are measured in two ways. The primary source of information about the causes and characteristics of crashes are the crash reports filed by police. Part of the training that QPS officers receive when first recruited assists them in identifying the signs of fatigue.
302. QT also use a statistical surrogate to identify crashes that have characteristics strongly associated with fatigue. The ATSB, New South Wales RTA and Office of Road Safety in Western Australia also use statistical surrogates to augment the data collected by police.
303. The committee considered three options to improve fatigue crash reporting: standardising the definitions of fatigue crashes in Australia, enhancing the QT definition and better training and guidance for police officers to recognise crashes contributed to by fatigue.

### HIGH RISK GROUPS

304. The committee identified several groups with a higher risk of experiencing a fatigue-related crash. These included rural drivers and riders, young drivers and riders, shift workers and people with long work hours, people with medical conditions and commercial drivers including heavy vehicle drivers.

### FATIGUE DRIVING POLICIES AND LEGISLATION

305. There are two road safety strategies that provide a framework for road safety initiatives in Queensland: the *National Road Safety Strategy 2001-2010* and the *Queensland Road Safety Strategy 2004-2011*. Each of these strategies is supported by a number of action plans.
306. Fatigue driving in Queensland is regulated by four means:
  - *Transport Operations (Road Use Management – Fatigue Management) Regulation (Qld) 1998*;
  - *Transport Operations (Passenger Transport) Standard (Qld) 2000*;
  - *Transport Operations (Road Use Management) Act (Qld) 1995*; and
  - *Criminal Code Act (Qld) 1899*.
307. The first two pieces of legislation are specifically targeted at heavy vehicle drivers. The committee notes that while the implementation of legislation to

control the heavy vehicle industry is more advanced than for light vehicle drivers, there are still problems with its effectiveness in reducing crashes.

308. The committee believes that legislation relating to fatigue driving by light vehicle drivers is ineffective. However, the committee also notes the difficulties in adequately identifying and enforcing fatigue driving legislation for light vehicle drivers.
309. In Queensland, DIR manage fatigue in the workplace through WHSQ. Individual Queensland Government departments produce policies to reduce the risk that their employees will experience a fatigue-related crash while driving for work. The committee believes that the Queensland Government should develop a directive similar to those used by DMR, DIR and other Queensland Government agencies for all departments and agencies that will reduce the risk of public servants experiencing a fatigue-related crash while driving for work.
310. The committee notes that workers in particular industries are more likely to experience a fatigue-related crash. Interventions targeted at these industries will help reduce the incidence and severity of crashes. The committee believes that the mining industry is an appropriate industry to trial these measures. The approach adopted for use within the mining industry could then be used as a model for other, high-risk, industries.

## **RAISING AWARENESS OF THE PROBLEM**

311. The majority of Queensland's public education campaigns on road safety issues are conducted by QT. The first of QT's major driver fatigue education campaigns began in 1997. QT's expenditure on light vehicle fatigue public education programs is approximately \$957,000 annually.
312. Mass media public education campaigns are not the only method of raising awareness about this issue. As an example, the RACQ and the QPS trialled a *Fatigue Sucks* campaign in Mackay over the 2002-2003 summer holiday period.
313. Although public education has been used in Queensland to raise awareness of driver fatigue, ongoing education is required to change driver attitudes and behaviour. The committee believes there is a role for campaigns using alternative, more targeted methods aimed at specific high-risk groups to encourage these groups to change their behaviour.
314. The QT driver manual for learners, *Your Keys to Driving in Queensland*, contains a two page summary of fatigue-related issues. However, the current written exams do not include any questions about the problems associated with driver fatigue. The committee believes that including questions on driver fatigue in some versions of the novice driver and rider licence theory tests will provide an incentive for new drivers to develop a greater understanding of fatigue and its impact on driving.
315. The Driver Reviver program is a community-based road safety initiative of QT and the QPS. It aims to reduce the number of fatal crashes caused by fatigue driving.
316. The committee believes that the most appropriate method of enhancing Driver Reviver and ensuring continuity of funding is through a partnership between the Queensland Government, the federal government and the community sector.



317. There are alternatives to the Driver Reviver program. The use of alternative models to Driver Reviver may encourage those drivers who do not stop at Driver Revivers to take a break from driving. The committee suggests that QT explore these alternative models.
318. The goal of the HealthBreak program in Victoria is to prevent workplace injury, accidents and illness among transport workers. To achieve this, 15,000 workers in the transport industry will be offered a free workplace health check focusing on the detection and prevention of diabetes as well as sleeping, breathing and heart disorders.
319. The committee suggests that QT, in conjunction with Queensland Health and the Victorian authorities evaluate the HealthBreak program to determine whether it should be adopted in Queensland.

## **COUNTERMEASURES**

320. Sleep is the only cure for fatigue. A short sleep of about 15 minutes reduces drowsiness while driving. However, a short sleep does not replace adequate sleep at night.
321. Both legal and illegal drugs affect a person's ability to drive, particularly when fatigued. Modafinil, marketed under names such as Provigil, Alertec and Modavigil is a drug that enhances wakefulness and vigilance but is less likely to cause jitteriness and anxiety than traditional stimulants. It is currently used in the treatment of some sleep disorders. The effects of drugs used to mask the effects of fatigue are not fully understood. The committee believes further research is required.
322. Caffeine is a potentially effective short-term countermeasure, particularly when combined with a short sleep. Two to three cups of coffee, containing 200 mg of caffeine, reduces driver sleepiness. Caffeine in other energy drinks may also reduce the chances of a fatigue-related crash. However, there may be longer-term effects that need consideration before promoting the use of caffeine.
323. The design of roads can reduce the chances of a fatigue-related crash or its severity if a crash does occur. A more forgiving road environment and divided roads are examples of using road design to reduce crashes. Fatigue-related crashes may also be decreased by reducing driving monotony by making roads more interesting.
324. Rest areas aim to reduce the risk of road crashes related to fatigue as well as the number of fatigued drivers on the road. There are approximately 530 rest areas, heavy vehicle stopping areas and points of interest such as scenic lookouts in Queensland.
325. The committee believes that the current number of rest areas, heavy vehicle stopping areas and points of interest are insufficient for the vast and dispersed Queensland road network. The committee is also concerned that points of interest and stopping areas do not contain the required facilities. The committee believes that the construction of more quality rest areas will encourage drivers to stop and rest and as a result reduce fatigue-related crashes. The committee suggests that new rest area sites are chosen with input from key stakeholders.
326. Audio-tactile devices are used in a variety of ways to provide an audible and tactile warning to drivers. These devices include edge lines, rumble shoulders, rumble strips and rumble sections.

327. The committee believes that audio-tactile devices should be used more extensively throughout Queensland. However, the committee believes that an independent evaluation of the effectiveness of these devices in Queensland is needed. This evaluation should include a cost benefit analysis.
328. The majority of research on emerging technology in road safety is aimed at developing on-board driver monitoring systems or crash prevention systems to reduce fatigue-related crashes. Many in-vehicle technological aids claim to help reduce the risk of a fatigue-related crash, however, there are concerns about the reliability of these devices.
329. The IAP provides an innovative mechanism for the Queensland Government to better manage the road network and its use. The program aims to implement a system that will monitor heavy vehicles remotely to ensure they are complying with their agreed operating conditions using telematics (telecommunications and computing). The IAP reports on the speed, location and mass of heavy vehicles.

### **FURTHER RESEARCH AND IMPLEMENTATION OF RECOMMENDATIONS**

330. The committee was unable to identify an existing clear definition of fatigue that is universally accepted. The committee believes that research into different types of fatigue such as hypovigilance should be supported in order to move towards a common definition.
331. The committee believes that a valid and reliable fatigue detection technology, that is suitable for use in on-road enforcement and is recognised by the Courts would be useful in reducing the amount of fatigue driving and, as a consequence, the amount of fatigue-related crashes. However, they believe that further research and development of existing technologies is required to achieve this end.
332. The committee suggests that further research on the effects of drugs such as Modafinil on the Central Nervous System and on healthy adults who use it to reduce their need for sleep is needed. The committee does not believe that the focus on Modafinil should stop researchers from trying to develop additional, safer, more effective drugs that help reduce fatigue.
333. The committee acknowledges community concern regarding the implementation of recommendations. To support the implementation process, the committee recommends that Ministers report annually to Parliament on the implementation of supported and partially supported recommendations.

## APPENDIX A ~ ADVERTISEMENT CALLING FOR SUBMISSIONS



### Inquiry into Crashes Involving Driver and Rider Fatigue in Queensland

#### Call for submissions

The Travelsafe Committee of the 51st Parliament is inquiring into driver and rider fatigue in Queensland. In this inquiry, the committee will examine and report on:

- The involvement of driver and rider fatigue as a factor in road crashes in Queensland;
- The causes and symptoms of this fatigue; and
- Legislative, enforcement, educational and other measures to reduce the incidence of fatigue-related crashes.

The committee will accept written submissions and electronic submissions lodged via the committee's website at [www.parliament.qld.gov.au/committees/travel.htm](http://www.parliament.qld.gov.au/committees/travel.htm) Written submissions should be sent to:

The Research Director  
Travelsafe Committee  
Parliament House  
BRISBANE QLD 4000

Submissions close on 30 July 2004.

Guidelines on making submissions and copies of the committee's issues paper are available from the committee's secretariat in Brisbane (ph 3406 7908) and from the committee's website at [www.parliament.qld.gov.au/committees/travel.htm](http://www.parliament.qld.gov.au/committees/travel.htm)

Jim Pearce MP  
Chairman



## APPENDIX B ~ LIST OF SUBMISSIONS

Sub No:	Submission from:
1	Mr C Maltman
2	Mr C Davis
3	Mr F B Marold
4	Mr W Bolton
5	Dr T Machin, Senior Lecturer, University of Southern Queensland
6	Mr B Smith
7	Mr B Bailey, Director, Infrastructure Services, Thuringowa City Council
8	Ms P den Ronden, Citizens Against Road Slaughter Ltd
9	Mr B Tait
10	Ms K Laurie
11	Mr M Sopinski, Corporate Affairs Manager, AAMI
12	Mr P Henneken, Director General, Department of Industrial Relations
13	Mr P Johansson, Zurich Financial Services Australia Ltd
14	Mr F Smith, Sunshine Coast Bicycle User Group
15	Mr E J C Schunemann
16	Hon J Spence MP, Minister for Police and Corrective Services
17	Dr S Lal, University of Technology, Sydney
18	Mr I Cameron, Office of Road Safety, Department of the Premier and Cabinet, Government of Western Australia
19	Ms R Stone, Sleep Therapy Australia
20	Hon M Keech MP, Minister for Tourism, Fair Trading and Wine Industry Development
21	Dr G Fitzgerald, Chief Health Officer, Queensland Health
22	Mr S A Crow, Ambulance Section Secretary, Ambulance Employees Australia – Queensland Branch
23	Mr N Ross
24	Ms J Munro, Chief Executive Officer, Brisbane City Council
25	Mr G Webley, Chief Executive Officer, Broadsound Shire Council
26	Mr N and Mrs L Ryan
27	Mr J Varghese, Director-General, Department of Primary Industries and Fisheries
28a	Mr S Mason, Road-skills Advocate
28b	Mr S Mason, Road-skills Advocate (addition to No. 28)
29	Mr M Vick, Senior Lecturer, School of Education, James Cook University
30	Mr K Smith, Australasian College of Road Safety Inc.
31	Mr R White, General Manager, Holden Performance Driving Centre
32	Mr C Dale, President, Law Institute of Victoria
33	Hon P Lucas MP, Minister for Transport and Main Roads
34	Mr Gary Fites, General Manager External Relations, RACQ
35	Ms B Pullar, Registered Psychologist and Author
36	Ms C Tutty, Industrial Organiser, Flight Attendants' Association of Australia
37	Mr M King, Lecturer, Centre for Accident Research and Road Safety – Queensland
38	Dr L Di Milia, Senior Lecturer, Central Queensland University
39	Name withheld
40	Hon M Keech MP, Minister for Tourism, Fair Trading and Wine Industry Development
41	Mr B R Smith
42	Mr B D McIver
43	Mr G Fites, General Manager External Relations, RACQ
44	Mr M Howard, Australasian Sleep Association
45	Ms D Deakin, Road Accident Action Group Mackay
46	Hon P Lucas MP, Minister for Transport and Main Roads
47	Mr N and Mrs L Ryan
48	Mr N and Mrs N McCartney
49	Associate Professor Jeremy Davey, Centre for Accident Research and Road Safety – Queensland
50	Ms C Richardson
51	Ms P McLeod, Road Safety Consultant, Ballyhoo Ideas Factory Ltd
52	Hon J Spence MP, Minister for Police and Corrective Services



## APPENDIX C ~ FATIGUE PUBLIC HEARING WITNESSES

Organisation:	Witness:
Queensland Transport	<b>Mr Tony Kursius</b> , Executive Director, Land Transport and Safety Division <b>Mr Gary Mahon</b> , Director, Strategic Policy Team, Land Transport and Safety Division
Department of Main Roads	<b>Mr Allan Krosch</b> , Executive Director, Traffic and Road Use Management Division <b>Mr Gordon Lee</b> , Principal Engineer (Road Safety), Traffic and Road Use Management Division <b>Mr Mark Mitchell</b> , Manager (Heavy Vehicle Access), Traffic and Road Use Management Division
Department of Industrial Relations	<b>Ms Denise Adams</b> , Director, Legislation Development and Review, Workplace Health and Safety Queensland <b>Dr Ki Douglas</b> , Principal Medical Officer and Manager, Statewide Services, Workplace Health and Safety Queensland <b>Mr Peter Lamont</b> , Assistant General Manager, Workplace Health and Safety Queensland <b>Mr Jordan Watts</b> , Policy Officer, Legislation Development and Review, Workplace Health and Safety Queensland
Centre for Accident Research and Road Safety – Queensland (CARRS-Q)	<b>Mr Mark King</b> , Lecturer <b>Professor Mary Sheehan</b> , Director <b>Dr Andry Rakotonirainy</b> , Senior Research Fellow
Queensland Police Service	<b>Chief Superintendent Kerry Dunn</b> , State Traffic Support Branch <b>Mr Peter Kolesnik</b> , Research Analyst, State Traffic Support Branch
Prince Charles Hospital	<b>Dr James Douglas</b> , Director of the Sleep Disorders Centre
Australasian Sleep Association	<b>Dr Craig Hukins</b> , Respiratory and Sleep Physician, Princess Alexandra Hospital and Clinical Director, Sleep Disorders Centre
Royal Automobile Club of Queensland (RACQ)	<b>Mr John Wikman</b> , Executive Manager, Traffic and Safety Department <b>Mr Joel Tucker</b> , Research Advisor - Transport and Road Safety





## APPENDIX D ~ GROUPS AND INDIVIDUALS THE COMMITTEE MET IN PERTH

Organisation:	Witness:
Injury Research Centre	<b>Dr Rina Cercarelli</b> , Director
Department of Planning and Infrastructure	<b>Mr Trevor Maughan</b> , Manager, Policy and Standards, Licensing and Regional Services
Department of Consumer, and Employment Protection	<b>Ms Nina Lyhne</b> , WorkSafe Western Australia Commissioner, Executive Director WorkSafe <b>Mr Steve Rhodes</b> , Inspector, Road Transport
Murdoch University	<b>Associate Professor Laurence Hartley</b> , School of Psychology
Western Australia Police Service	<b>Senior Sergeant Kevin Groves</b> , State Traffic Coordination, Western Australia Police Service
Office of Road Safety	<b>Mr Iain Cameron</b> , Executive Director
Alertness Solutions	<b>Dr Mark Rosekind</b> , President and Chief Scientist



# APPENDIX E ~ HEAVY VEHICLE LEGISLATION (REST AND WORKTIMES) IN SELECTED AUSTRALIAN STATES

State	Legislative requirements
Queensland	<p><i>Transport Operations (Road Use Management – Fatigue Management) Regulation 1998</i></p> <p>Section 15: The maximum <i>driving</i> times for a heavy vehicle driver are –</p> <ul style="list-style-type: none"> <li>(a) for any 5.5 hour period—5 hours;</li> <li>(b) for any 24 hour period—12 hours; and</li> <li>(c) for any 168 hour period—72 hours.</li> </ul> <p>A driver commits an offence if, for any period mentioned, the driver's total driving time exceeds the driver's maximum driving time.</p> <p>Section 16: The maximum <i>work</i> times for a heavy vehicle driver are –</p> <ul style="list-style-type: none"> <li>(a) for any 5.5 hour period—5 hours;</li> <li>(b) for any 24 hour period—14 hours; and</li> <li>(c) for any 168 hour period—72 hours.</li> </ul> <p>A driver commits an offence if, for any period mentioned, the driver's total work time exceeds the driver's maximum work time.</p> <p>Section 17: The minimum rest times for a driver are –</p> <ul style="list-style-type: none"> <li>(a) for any 5.5 hour period—30 minutes, whether in a single period or 2 periods of 15 consecutive minutes;</li> <li>(b) for any 24 hour period—10 hours, including 1 period of 6 consecutive hours that is not spent by the driver in or on the vehicle, other than a vehicle with a sleeper berth complying with ADR 42; and</li> <li>(c) for any 168 hour period—96 hours, including at least 1 period of 24 consecutive hours that is not spent by the driver in or on the vehicle.</li> </ul>
New South Wales	<p><i>Road Transport (Safety and Traffic Management) (Driver Fatigue) Regulation 1999</i></p> <p>Section 19: The maximum <i>driving</i> times of a heavy vehicle driver are –</p> <ul style="list-style-type: none"> <li>(a) for any relevant period 1—5 hours,</li> <li>(b) for any relevant period 2—12 hours, and</li> <li>(c) for any relevant period 3—72 hours.</li> </ul> <p>Section 20: The maximum <i>work</i> times of a heavy vehicle driver are -</p> <ul style="list-style-type: none"> <li>(a) for any relevant period 1—5 hours,</li> <li>(b) for any relevant period 2—14 hours, and</li> <li>(c) for any relevant period 3—72 hours.</li> </ul> <p>Section 21: The <i>required minimum rest times</i> of a heavy vehicle driver are –</p> <ul style="list-style-type: none"> <li>(a) for any relevant period 1—30 minutes, which must be in a single period or 2 separate periods of 15 minutes,</li> <li>(b) for any relevant period 2—10 hours, which must include a single period of at least 6 hours not spent by the driver in or on: <ul style="list-style-type: none"> <li>(i) a heavy truck, except a heavy truck with a sleeper berth complying with ADR 42, or</li> <li>(ii) a commercial bus, except a commercial bus with an approved sleeper berth; and</li> </ul> </li> <li>(c) for any relevant period 3—96 hours, which must include a single period of at least 24 hours not spent by the driver in or on a heavy truck or commercial bus.</li> </ul>
Victoria	<p><i>Road Safety (Drivers) Regulations 1999</i></p> <p>Section 508: Heavy truck drivers</p> <p>(1) In this Regulation "maximum working time", in relation to a driver (whether a solo driver or a two-up driver) of a heavy truck, is—</p> <ul style="list-style-type: none"> <li>(a) for any 5.5 hour period—5 hours;</li> <li>(b) for any 24 hour period—14 hours, including not more than 12 hours driving; and</li> <li>(c) for any 168 hour period—72 hours.</li> </ul> <p>(2) A driver (whether a solo driver or a two-up driver) of a heavy truck commits an offence if, for any period mentioned in sub-regulation (1) (the "relevant period"), the driver's total working time exceeds the driver's maximum working time for that period.</p>

	<p>Section 508A: Heavy truck drivers</p> <p>(1) In this Regulation "minimum rest time", in relation to a driver (whether a solo driver or a two-up driver) of a heavy truck, is—</p> <p>(a) for any 5.5 hour period—30 minutes, either as one continuous period or as two continuous periods of 15 minutes each;</p> <p>(b) for any 24 hour period—10 hours, including one continuous period of 6 hours; and</p> <p>(c) for any 168 hour period—96 hours, including one continuous period of 24 hours.</p> <p>(2) A driver (whether a solo driver or a two-up driver) of a heavy truck commits an offence if, for any period mentioned in sub-regulation (1) (the "relevant period"), the driver's total rest time is less than the driver's minimum rest time for that period.</p>
Tasmania	<p><i>Vehicle and Traffic (Vehicle Operations) Regulations 2001</i></p> <p>Section 36: A person must not drive a controlled vehicle (commercial bus or heavy truck) if the person's total <i>driving</i> time, in the aggregate, exceeds –</p> <p>(a) 5 hours in the immediately preceding 5 hours and 30 minutes;</p> <p>(b) 12 hours in the immediately preceding 24 hours; or</p> <p>(c) 72 hours in the immediately preceding 168 hours.</p> <p>Section 37: A person must not drive a controlled vehicle (commercial bus or heavy truck) if the person's total <i>work</i> time, in the aggregate, exceeds –</p> <p>(a) 5 hours in the immediately preceding 5 hours and 30 minutes;</p> <p>(b) 14 hours in the immediately preceding 24 hours; or</p> <p>(c) 72 hours in the immediately preceding 168 hours.</p> <p>Section 38: A person must not drive a heavy truck if he or she has not had rest time of at least –</p> <p>(a) 30 minutes in the immediately preceding 5 hours and 30 minutes, either in one continuous period or in 2 separate periods of at least 15 minutes each;</p> <p>(b) 10 hours in the immediately preceding 24 hours, including one continuous period of 6 hours not in or on the truck; and</p> <p>(c) 96 hours in the immediately preceding 168 hours, including one continuous period of 24 hours not in or on the truck.</p>
South Australia	<p><i>Road Traffic (Driving Hours) Regulations 1999</i></p> <p>Section 19: the <i>maximum driving times</i> of a driver are –</p> <p>(a) for any relevant period 15 hours;</p> <p>(b) for any relevant period 212 hours; and</p> <p>(c) for any relevant period 372 hours.</p> <p>Section 20: the <i>maximum work times</i> of a driver are –</p> <p>(a) for any relevant period 15 hours;</p> <p>(b) for any relevant period 214 hours; and</p> <p>(c) for any relevant period 372 hours.</p> <p>Section 21: The <i>required minimum rest times</i> of a (commercial bus) driver are rest times of –</p> <p>(a) for any relevant period 130 minutes, which must be in a single period or 2 separate periods of 15 minutes; and</p> <p>(b) for any relevant period 210 hours, which must include a single period of at least 6 hours not spent by the driver in or on –</p> <p>(i) a heavy truck, except a heavy truck with a sleeper berth complying with ADR 42; or</p> <p>(ii) a commercial bus, except a commercial bus with an approved sleeper berth; and</p> <p>(c) for any relevant period 396 hours, which must include a single period of at least 24 hours not spent by the driver in or on a heavy truck or commercial bus; and</p> <p>(d) for any relevant period 4384 hours, which must include –</p> <p>(i) 4 separate periods of at least 24 hours each; or</p> <p>(ii) a single period of at least 72 hours and a separate period of at least 24 hours; or</p> <p>(iii) 2 separate periods of at least 48 hours each; or</p> <p>(iv) a single period of at least 96 hours, not spent by the driver in or on a heavy truck or commercial bus.</p>

## APPENDIX F ~ LOG BOOK REQUIREMENTS IN SELECTED AUSTRALIAN STATES

State	Legislative requirements
Queensland	<p><i>Transport Operations (Road Use Management – Fatigue Management) Regulation 1998</i></p> <p>Section 44: The driver of a heavy vehicle must not engage in non-local area work unless the driver has a logbook in which the driver can record information under this division. The driver of a heavy vehicle who is engaged in non-local area work must carry his or her logbook.</p> <p>Before the driver's first period of driving or work time on the day, the driver must record the following information in the driver's logbook –</p> <ul style="list-style-type: none"> <li>(a) the day of the week and date;</li> <li>(b) the driver's name and current driver licence number;</li> <li>(c) the State where the licence was issued.</li> </ul> <p>Immediately before or after each change of activity on the day, the driver must record the following information in the driver's logbook –</p> <ul style="list-style-type: none"> <li>(a) the change of activity;</li> <li>(b) the driving time, other work time or rest time spent by the driver since the last change of activity;</li> <li>(c) the time and place of the change of activity;</li> <li>(d) if the driver is or becomes a two-up driver—the name and current driver licence number of the other driver in the two-up driving arrangement.</li> </ul>
New South Wales	<p><i>Road Transport (Safety and Traffic Management) (Driver Fatigue) Regulation 1999</i></p> <p>Section 48: A driver must not engage in non-local area work unless the driver has a logbook in which the driver can record information under this Division in accordance with clause 52 (How information is to be recorded in logbooks).</p> <p>Section 49: Before the driver's first period of driving or work time anywhere on the day, the driver licence must record the following information in the driver's logbook:</p> <ul style="list-style-type: none"> <li>(a) the day of the week and date,</li> <li>(b) the driver's name and current driver licence number,</li> <li>(c) the State or Territory where the licence was issued.</li> </ul> <p>Immediately before or after each change of activity on the day, the driver must record the following information in the driver's logbook:</p> <ul style="list-style-type: none"> <li>(a) the change of activity,</li> <li>(b) the driving time, other work time or rest time spent anywhere by the driver since the last change of activity,</li> <li>(c) the time and place of the change of activity,</li> <li>(d) if the driver is or becomes a two-up driver—the name and current driver licence number of the other driver in the two-up driving arrangement.</li> </ul>
Victoria	<p><i>Road Safety (Drivers) Regulations 1999</i></p> <p>Section 510: A driver of a heavy truck must make, or cause to be made a record of the following information, in the form of a logbook, and carry it in the vehicle during the period of the record:</p> <ul style="list-style-type: none"> <li>(a) the starting and finishing times and places for all periods of solo driving;</li> <li>(b) two-up driving (including periods as a passenger);</li> <li>(c) working time other than driving time;</li> <li>(d) rest time;</li> <li>(e) the date or dates of travel;</li> <li>(f) the driver's name and driver licence number; and</li> <li>(g) the registration number of each commercial bus or heavy truck that the driver has driven during the period of the record.</li> </ul>

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Tasmania	<i>Vehicle and Traffic (Vehicle Operations) Regulations 2001</i>
	<p>Section 40: The Commission, in writing, may direct the driver of a controlled vehicle to obtain a national driver logbook, carry the national driver logbook in the controlled vehicle when driving that vehicle and record his or her daily driving time and non-driving time in respect of the vehicle in the national driver logbook. A person must comply with a direction given under this Regulation. An interstate driver must continue to carry and maintain his or her national driver logbook while in this State.</p>
South Australia	<i>Road Traffic (Driving Hours) Regulations 1999</i>
	<p>Section 48: A driver must not engage in non-local area work unless the driver has a logbook in which the driver can record information under this Division in accordance with Regulation 52 (How information is to be recorded in logbooks).</p> <p>Section 49: This Regulation applies to a driver for a day on which the driver engages in non-local area work.  Before the driver's first period of driving or work time anywhere on the day, the driver must record the following information in the driver's logbook –</p> <ul style="list-style-type: none"> <li>(a) the day of the week and date;</li> <li>(b) the driver's name and current driver licence number; and</li> <li>(c) the State or Territory where the licence was issued.</li> </ul> <p>The driver must record the registration number of each heavy truck or commercial bus to be driven anywhere by the driver on the day in his or her logbook before the driver begins to drive the vehicle for the first time on the day.</p> <p>Immediately before or after each change of activity on the day, the driver must record the following information in the driver's logbook –</p> <ul style="list-style-type: none"> <li>(a) the change of activity;</li> <li>(b) the driving time, other work time or rest time spent anywhere by the driver since the last change of activity;</li> <li>(c) the time and place of the change of activity; and</li> <li>(d) if the driver is or becomes a two-up driver, the name and current driver licence number of the other driver in the two-up driving arrangement.</li> </ul>

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## APPENDIX G ~ FATIGUE RESOURCE LIST

Resource name:	Nature of resource:	Contact details:
Australasian College of Road Safety (ACRS)	The College was established in 1988 as an association for individuals and organisations working in or interested in supporting road safety. The ACRS mission is to link through one association all individuals and organisations in Australia who work in or are interested in road safety, in order to facilitate the efficient interchange of ideas and a united approach in promoting and implementing improved road safety practices.	Website: <a href="http://www.acrs.org.au">www.acrs.org.au</a> Email: <a href="mailto:eo@acrs.org.au">eo@acrs.org.au</a> Phone: (02) 6290 2509 Fax: (02) 6290 0914
Australasian Sleep Association (ASA)	The ASA is the peak scientific body in Australia and New Zealand representing clinicians, scientists and researchers in the broad area of sleep. Its many functions include the organisation of domestic and international scientific meetings, as well as acting in an advisory capacity to government and industry. The ASA is affiliated with the World Federation of Sleep Research Societies.	Website: <a href="http://www.sleepaus.on.net">www.sleepaus.on.net</a> Email: <a href="mailto:sleepaus@ozemail.com.au">sleepaus@ozemail.com.au</a> Phone: (05) 0050 0701 Fax: (05) 0050 0702
Australian Transport Council (ATC)	The ATC is a Ministerial forum for Commonwealth, State and Territory consultations and provides advice to governments on the coordination and integration of all transport and road policy issues at a national level.	Website: <a href="http://www.atcouncil.gov.au">www.atcouncil.gov.au</a> Email: <a href="mailto:atc@DOTARS.gov.au">atc@DOTARS.gov.au</a> Phone: (02) 6274 7851 Fax: (02) 6274 7703
Australian Transport Safety Bureau (ATSB)	The ATSB is an operationally independent body within the Federal Department of Transport and Regional Services and is Australia's prime agency for transport safety investigations. The bureau is entirely separate from transport regulators and service providers. The ATSB's objective is safe transport. The Bureau's mission is to maintain and improve transport safety and public confidence through excellence in: independent transport accident and incident investigation; safety data analysis and research; and safety communication and education.	Website: <a href="http://www.atsb.gov.au">www.atsb.gov.au</a> Email: <a href="mailto:atsbinfo@atsb.gov.au">atsbinfo@atsb.gov.au</a> Phone: (02) 6274 6590 Fax: (02) 6247 3117
BMJ (British Medical Journal) online	This site was launched in May 1995 and contains the full text of all articles published in the weekly <i>BMJ</i> since January 1994. In addition, it contains material that is unique to the website. Currently access to most of the site is free. However, there is a charge for some content for some users on bmj.com.	Website: <a href="http://bmj.bmjournals.com/">http://bmj.bmjournals.com/</a> Phone: +44 20 7387 4499
Centre for Accident Research and Road Safety – Queensland (CARRS-Q)	CARRS-Q was established in 1996 as a joint venture initiative of the Motor Accident Insurance Commission (MAIC) and Queensland University of Technology (QUT). The Centre was created to address the enormous human, economic and social costs resulting from road crashes. It has expanded its research scope to include the broader area of injury prevention with a particular interest in youth and risk-taking behaviours.	Website: <a href="http://www.carrsq.qut.edu.au">www.carrsq.qut.edu.au</a> Email: <a href="mailto:carrsq@qut.edu.au">carrsq@qut.edu.au</a> Phone: (07) 3864 4589 Fax: (07) 3864 4640
Department for Transport, UK	The Department for Transport was set up to provide a stronger focus on delivering the UK Government's transport strategy. The department's role is to set strategy and policy context, and to manage relationships with the delivery agencies. The department's objective is to oversee the delivery of a reliable, safe and secure transport system that responds efficiently to the needs of individuals and businesses whilst safeguarding the environment.	Website: <a href="http://www.dft.gov.uk">www.dft.gov.uk</a> Phone: +44 20 7944 8300 Fax: +44 20 7944 9622
Department of Main Roads (DMR) Queensland	The Department of Main Roads is the steward of 34,000 km of Queensland's state controlled road network (highways and other main connecting roads in Queensland). This 20 per cent of the state's total road network carries 80 per cent of traffic	Website: <a href="http://www.mainroads.qld.gov.au">www.mainroads.qld.gov.au</a> Email: <a href="mailto:www.feedback@mainroads.qld">www.feedback@mainroads.qld</a>

	and represents the state's largest single physical asset with a replacement value of A\$26.6 billion. Main Roads' tasks involve planning, designing, building and maintaining the roads and associated infrastructure (such as bridges).	<a href="http://www.mainroads.wa.gov.au">.gov.au</a> Phone: (07) 3834 2011
Main Roads, Western Australia	Main Roads is Western Australia's State road authority, managing a network of some 17,800 kilometres of National Highways and State Roads with a value of more than \$16.4 billion. Main Roads works in conjunction with local government and its local road network in order to create an integrated and efficient transport network that supports the needs of all road users.	Website: <a href="http://www.mainroads.wa.gov.au">www.mainroads.wa.gov.au</a> Phone: (08) 9323 4111 Fax: (08) 9323 4430
Monash University Accident Research Centre (MUARC), Victoria	The MUARC is a leading Australian injury prevention and control research institute. Its charter includes safety in all modes of transport, in the workplace, in the community and in the home. Established in 1987, MUARC specialises in the study of injury and injury prevention and is the largest multidisciplinary research centre in Australia.	Website: <a href="http://www.monash.edu.au/muarc">www.monash.edu.au/muarc</a> Email: <a href="mailto:muarc.enquire@general.monash.edu.au">muarc.enquire@general.monash.edu.au</a> Phone: (03) 9905 4371 Fax: (03) 9905 4363
Motor Accidents Authority (MAA), New South Wales	The Motor Accidents Authority is a statutory corporation that regulates the NSW Motor Accidents Scheme, which was established on 10 March 1989. The MAA has a road safety strategy to give direction and priority to MAA road safety activities. They are currently involved in the Newell Highway Driver Fatigue Program in conjunction with local government, Institute of Public Works Engineering Australia, RTA and the community.	Website: <a href="http://www.maa.nsw.gov.au">www.maa.nsw.gov.au</a> Email: <a href="mailto:maa@maa.nsw.gov.au">maa@maa.nsw.gov.au</a> Phone: 1300 137 131 Fax: 1300 137 707
National Highway Traffic Safety Administration (NHTSA), US	The National Highway Traffic Safety Administration (NHTSA), under the US Department of Transportation, was established as the successor to the National Highway Safety Bureau, to carry out national safety programs. NHTSA is responsible for reducing deaths, injuries and economic losses resulting from motor vehicle crashes. This is accomplished by setting and enforcing safety performance standards for motor vehicles and motor vehicle equipment, and through grants to state and local governments to enable them to conduct effective local highway safety programs.	Website: <a href="http://www.nhtsa.dot.gov">www.nhtsa.dot.gov</a> (Hint: Search the website using keywords such as "drowsy driving")
National Institutes of Health (NIH), US	The National Institutes of Health is the steward of medical and behavioural research for the US. An agency of the Department of Health and Human Services, the NIH is the Federal focal point for health research.	Website: <a href="http://www.nih.gov">www.nih.gov</a> (N.B. This website is best used for information on sleep and sleep disorders) Email: <a href="mailto:nihinfo@od.nih.gov">nihinfo@od.nih.gov</a>
National Roads and Drivers Association (NRMA)	The NSW branch of the National Roads Association (NRA) was formed in 1920 and in 1923 became the National Roads and Drivers' Association. The NRMA is an organisation aimed at protecting drivers' requirements and offering roadside assistance and guidance.	Website: <a href="http://www.mynrma.com.au">www.mynrma.com.au</a> (The NRMA website has maps and guides to help plan your trip anywhere in Australia) Phone: 131 122
National Sleep Foundation, US	The National Sleep Foundation is a nonprofit organisation dedicated to improving public health and safety by achieving understanding of sleep and sleep disorders, and by supporting education, sleep-related research and advocacy.	Website: <a href="http://www.sleepfoundation.org">www.sleepfoundation.org</a> (N.B. This website has information on sleep, sleep disorders, and drowsy driving)
National Transport Commission (NTC)	The National Transport Commission (NTC) commenced operations in January 2004 after all governments - Commonwealth, States and Territories - agreed to build on significant road reforms achieved in recent years and to extend the approach to include rail and intermodal transport. The NTC are an independent statutory body working in close partnership with the road and rail transport industries and government agencies to develop practical land transport reform.	Website: <a href="http://www.ntc.gov.au">www.ntc.gov.au</a> Email: <a href="mailto:ntc@ntc.gov.au">ntc@ntc.gov.au</a> Phone: (03) 9236 5000 Fax: (03) 9642 8922



Northern Territory Department of Infrastructure, Planning and Environment (IPE)	Infrastructure, Planning and Environment (IPE) provides motor vehicle inspection and registration and driving licensing services throughout the Northern Territory. IPE protects the safety of road users through the development, review and administration of road transport policy and legislation.	Website: <a href="http://www.ipe.nt.gov.au">www.ipe.nt.gov.au</a> (Hint: Click on the Motor Vehicle Registry link under Transport and Roads, then click on the Fatigue Management link on the right of the page under Related Websites) Phone: (08) 8999 5511
Nova: Science in the News	Nova looks at the science behind the headlines. Their goal is to provide reliable and up-to-date information for senior secondary school teachers to use in class or anyone with an interest in topical issues. The information on Nova has been checked for accuracy by experts in the field and is updated regularly. The website is published by the Australian Academy of Science.	Website: <a href="http://www.science.org.au/nova">www.science.org.au/nova</a> Email: <a href="mailto:aas@science.org.au">aas@science.org.au</a>
Office of Road Safety, Western Australia	The Office of Road Safety manages and coordinates the activities of the Road Safety Council of Western Australia. The Council is supported by a comprehensive road safety network. The Office of Road Safety produces a variety of fact sheets and publications on key road safety topics, including fatigue.	Website: <a href="http://www.officeofroadsafety.wa.gov.au">www.officeofroadsafety.wa.gov.au</a> Phone: (08) 9216 8508
Queensland Health (QH)	Queensland Health is a dynamic organisation committed to providing a range of services aimed at achieving good health and well-being for all Queenslanders. Through a network of 38 Health Service Districts and the Mater Hospitals, Queensland Health delivers a range of integrated services including hospital inpatient, outpatient and emergency services, community and mental health services, aged care services and public health and health promotion programs.	Website: <a href="http://www.health.qld.gov.au">www.health.qld.gov.au</a> Phone: (07) 3234 0111
Queensland Police Service (QPS)	The QPS mission is to serve the people of Queensland by protecting life and property, preserving peace and safety, preventing crime and upholding the law in a manner which has regard for the public good and the rights of the individual. Their vision is that of a professional police service, dedicated to excellence and committed to working in partnership with the people of Queensland to enhance the safety and security of our community.	Website: <a href="http://www.police.qld.gov.au">www.police.qld.gov.au</a>  Police Headquarters Brisbane Phone: (07) 3364 6464 Fax: (07) 3236 2359
Queensland Transport	Queensland Transport is the government department responsible for developing and managing the land, air and sea transport environment in Queensland. QT provides transport leadership through developing and ensuring implementation of a strategic transport policy agenda, transport planning and stewardship of Queensland's transport system.	Website: <a href="http://www.transport.qld.gov.au">www.transport.qld.gov.au</a> Phone: 13 23 80
Royal Melbourne Institute of Technology (RMIT), Victoria	Formed in 1887, RMIT has grown to become one of the largest in the country and has built a worldwide reputation for excellence in vocational and technical education and research.	Website: <a href="http://www.rmit.edu.au">www.rmit.edu.au</a> (This website has a range of articles on driver fatigue) Phone: (03) 9925 2000 Fax: (03) 9663 2764
Road Accident Action Group (RAAG) Mackay	The RAAG Mackay is a road safety working group focussed primarily on fatigue and speed related issues on the Bruce Highway. The group was established in 2002 and consists of representatives from Police, Ambulance, Fire, QT, DMR, local governments, RACQ, local businesses, various industries, youth groups, community members and more.	Phone: (07) 4942 5060 Fax: (07) 4942 5060  Post: PO Box 261 Mackay Qld 4740

Roads and Traffic Authority (RTA), New South Wales	The RTA is the NSW State Government agency responsible for: improving road safety; testing and licensing drivers; registering and inspecting vehicles; and managing the road network to achieve consistent travel times. The RTA manages 17,623 km of State Roads including 3105 km of National Highways. This includes facilities such as traffic lights, roundabouts, signs and linemarking. It also manages nearly 3000 km of regional roads and local roads in the unincorporated area of NSW where there are no local councils. It provides financial assistance to local councils to manage 18,497 km of regional roads and, to a limited extent, local roads, through funding and other support.	Website: <a href="http://www.rta.nsw.gov.au">www.rta.nsw.gov.au</a> Email: <a href="mailto:rta@rta.nsw.gov.au">rta@rta.nsw.gov.au</a> Phone: 131 782
Royal Automobile Club of Queensland (RACQ)	As Queensland's peak motoring body, RACQ provides expert advice, information and assistance relating to a wide range of motoring matters. RACQ is committed to improving road safety for all road users. RACQ facilitates safer driving practices through driver assessment, education, training and rehabilitation programs. This organisation encourages road users to be more aware of road conditions through their road condition reports and road hazard reporting facilities. RACQ continually works toward improving the safety and usability of the road network through advocacy activities, including submissions and reports to government.	Website: <a href="http://www.racq.com.au">www.racq.com.au</a> Phone: 131 905 Fax: (07) 3361 2140
Sleep Disorders Australia, Queensland Branch	SDA Queensland has support groups spread from Mareeba/Cairns in the North through to Brisbane/Gold Coast/Tweed in the south and Toowoomba in the West. SDA are a volunteer support group for sufferers of sleep related disorders. SDA aims to: provide support for sleep disorder sufferers and their families; provide up-to-date information to both the medical profession and the general public; raise funds for research into the causes, effects and treatment of sleep apnoea and other sleep disorders; and lobby the government for a fair share of the funds provided for medical care and research.	Website: <a href="http://cwpp.slq.qld.gov.au/sleepqld">//cwpp.slq.qld.gov.au/sleepqld</a> Email: <a href="mailto:sleepdisorders@yahoo.com.au">sleepdisorders@yahoo.com.au</a> Phone: (07) 3255 9026 Fax: (07) 3378 1610
Sleep Research Centre, Loughborough, U.K.	A leading Sleep Research Centre in the UK with a world-wide reputation, the Centre's interests include applied, basic and clinical research into sleepiness and daytime wellbeing. The Centre has modern facilities for sleep research, including equipment for the home-recording of sleep electroencephalograms (EEGs), actimetry (body movement-monitoring during sleep), state of the art computer-based systems, and a driving simulator. One of the two international journals devoted to sleep research, the 'Journal of Sleep Research,' is edited by Professor Jim Horne (Director) and run from the centre.	Website: <a href="http://www.lboro.ac.uk/departments/hu/groups/sleep/">www.lboro.ac.uk/departments/hu/groups/sleep/</a> Email: <a href="mailto:Sleep.Research@lboro.ac.uk">Sleep.Research@lboro.ac.uk</a> Phone: +44 1509 223091
Sleep Therapy Australia	Sleep Therapy Australia is a private psychological practice specialising in the treatment of sleep disorders, primarily insomnia. They are currently based in Queensland, Australia, with clinics in Brisbane and on the Gold and Sunshine Coasts.	Website: <a href="http://www.sleeptherapy.com.au">www.sleeptherapy.com.au</a> Email: <a href="mailto:info@sleeptherapy.com.au">info@sleeptherapy.com.au</a> Phone: 1800 650 150 (toll free)
Sleep/Wake Research Centre, Massey University, New Zealand	The Sleep/Wake Research Centre is a multi-disciplinary research team that was founded in 1998. Their Mission Statement commits the centre to improving the health, performance, safety, and well being of New Zealanders through a programme of basic and applied research with an integrated approach to sleep and waking function. The centre's interests span traditional boundaries, as they work towards: the advancement of scientific knowledge; the improvement of industry practice; and the development of the evidence base for policy making.	Website: <a href="http://sleepwake.massey.ac.nz">//sleepwake.massey.ac.nz</a> (This website is still under construction) Email: <a href="mailto:p.h.gander@massey.ac.nz">p.h.gander@massey.ac.nz</a> (Director: Professor Philippa Gander) Phone: +64 4 380 0602 or +64 4 380 0601

Transport Canada	Transport Canada's mission is to develop and administer policies, Regulations and services for the best transportation system for Canada and Canadians — one that is safe and secure, efficient, affordable, integrated and environmentally friendly.	Website: <a href="http://www.tc.gc.ca/en/menu.htm">www.tc.gc.ca/en/menu.htm</a> Email: <a href="mailto:webfeedback@tc.gc.ca">webfeedback@tc.gc.ca</a> Phone: +1 613 990 2309 Fax: +1 613 954 4731
Transport SA	Transport SA has an important role in the management of the state's transport system. As an agency of the Government of South Australia, they are committed to providing a transport network that is safe, meets community expectations, makes a positive contribution to the economy and has minimal impact on the environment.	Website: <a href="http://www.transport.sa.gov.au">www.transport.sa.gov.au</a> Email: <a href="mailto:enquiries@transport.sa.gov.au">enquiries@transport.sa.gov.au</a> Phone: 1300 360 067
VicRoads	VicRoads is the registered business name of the Roads Corporation, a Victorian statutory authority. VicRoads is responsible for maintaining and improving the condition and performance of Victoria's 22,240 km of arterial roads and 4924 bridges and major culverts. VicRoads also develops road safety programs, registers vehicles and licences drivers. VicRoads has 2245 staff who work with other government agencies, local government and the private sector to provide cost-effective products and services to the community.	Website: <a href="http://www.vicroads.vic.gov.au">www.vicroads.vic.gov.au</a> Phone: 13 11 74



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