DRIVER FATIGUE STRATEGY

AN INTER-AGENCY STRATEGY TO COMBAT DRIVER FATIGUE

NATIONAL ROAD SAFETY COMMITTEE

The National Road Safety Committee comprises:

The Chief Executive of the Ministry of Transport
The Commissioner of Police
The Secretary for Education
The Chief Executives of: Land Transport New Zealand, Transit New Zealand,
The Accident Compensation Corporation and Local Government New Zealand

The Secretary of Labour, the Secretary for Justice and the
Director-General of Health are associate members of the Committee.

ISBN: 978-0-478-10020-4

Foreword

As the Convener of the National Road Safety Committee (NRSC), I am pleased to present this Inter-agency Strategy to Combat Driver Fatigue. This publication is designed to guide the ongoing efforts of government agencies in this important area of road safety. It demonstrates the commitment of members of the NRSC and the Driver Fatigue Working Group to develop a collaborative and complementary approach to the issue of driver fatigue.

While we have made substantial improvements in road safety over the past 20 years, the nature and complexity of crashes where driver fatigue is identified presents us with a real and ongoing challenge.

At the end of 2006, the Minister of Transport and the Minister for Transport Safety jointly launched the Road Safety Policy Statement. This statement was designed to guide the future development of road safety, as we work together to complete implementation of the Government's *Road Safety to 2010 Strategy*.

The policy statement highlighted the need to raise awareness about the issue of driver fatigue and for action to be taken by both road users and infrastructure providers to recognise and mitigate the risks.

This Strategy contains an Action Plan that sets out a number of key initiatives. Agencies have been asked to report back to the NRSC on the progress of these. Through the Driver Fatigue Working Group, agencies will also be asked to provide an updated Action Plan for 2009. I am confident, therefore, that this Strategy sets the groundwork for real progress and collaboration across the wider transport sector to address the road safety risks posed by driver fatigue.

Alan Thompson (Chief Executive, Ministry of Transport)
Convener, National Road Safety Committee

Contents

Foreword ..... **iii**

SECTION 1: Executive Summary **1**
- Driver fatigue as a contributor to crashes in New Zealand 1
- Development of the Strategy and Action Plan 1
- Key deliverables 2

SECTION 2: Introduction **3**
- Definition 3
- Driver fatigue in the New Zealand context 3
- Known causes of driver fatigue 3
- Countermeasures 5

SECTION 3: Strategy Development **6**
- Driver Fatigue Working Group 6
- Driver Fatigue Strategy objectives 6
- Primary and secondary goals 7
- Key issues 7
- Links and relationships 8
- Agency action 8

SECTION 4: Acknowledgements **9**

SECTION 5: Action Plan **10**

SECTION 6: Appendices **21**
- Appendix 1: Driver Fatigue – a stocktake of agency activity 21
- Appendix 2: Inter-agency links and relationships 23
- Appendix 3: Driver fatigue and drowsy driving – a driver's checklist 24
- Appendix 4: December 2006 Government Policy Statement 25
- Appendix 5: Fatigue Crash Factsheet 26
- Appendix 6: A short story 33

SECTION 1: Executive Summary

Driver fatigue as a contributor to crashes in New Zealand

Driver fatigue which manifests itself in 'drowsy driving' is an important contributor to fatal and serious injury road crashes in New Zealand. Over the period 2002-2006, driver fatigue was identified as a factor in 12 percent of New Zealand's fatal crashes and eight percent of serious injury crashes.

Driver fatigue has been acknowledged internationally for a number of year. Now the issue is becoming increasingly prominent in New Zealand. It featured strongly in the December 2006 Road Safety Policy Statement[1] where it was identified as a significant road safety issue.

Last year alone, the total social cost of crashes where driver fatigue was recorded as a contributing factor was approximately $293 million. This is around nine percent of the social cost associated with all injury crashes in New Zealand. Over the five year period 2002-2006, the total social cost of crashes where fatigue was recorded as a factor was approximately $1.6 billion.

It is important to recognise that driver fatigue is a complex condition. It can be difficult to identify and recognise its role in crashes. Research suggests that in New Zealand fatigue as a contributing factor may be under-represented in the reported crash system. Without an admission from the driver concerned, or other clear evidence, it is difficult to determine the incidence of driver fatigue during a crash investigation. Recent international research has estimated that the figure for fatal crashes, where driver fatigue has contributed is more likely to be around 20-24 percent.

Development of the Strategy and Action Plan

This Strategy has been developed by the Driver Fatigue Working Group (the Working Group) for consideration and adoption by the National Road Safety Committee (NRSC). The Strategy sets out an agreed course of action, which will guide all future policy development, promotion and delivery of driver fatigue countermeasures within and between agencies in the wider transport sector.

The Action Plan included in this Strategy is intended to be an outline of the key activities and countermeasures that will address driver fatigue in New Zealand. It also sets out, where possible, an indication of costs and timeframes associated with these countermeasures.

[1] To view the Road Safety Policy Statement visit: http://safeas.govt.nz/road-safety-policy-statement-dec-06.pdf

Key Deliverables

- Reviewing the processes and procedures for reporting and analysing driver fatigue as a factor in crashes. Fatigue can then be better identified as a contributing factor at crash sites, and this will be reflected in the Crash Analysis System (CAS).
- Updating our current body of knowledge on driver fatigue, including our knowledge of effective overseas countermeasures, and how these could be applied in New Zealand.
- Ensuring that the effects of work-related fatigue on the incidence of fatigue-related crashes are acknowledged and that workplace training and resources are provided.
- Identifying connections and developing relationships with external partners who are knowledgeable in the area of driver fatigue.
- Monitoring road users' perception of fatigue as a contributor to road crashes in New Zealand. Developing educational resources to assist drivers to recognise the dangers of driving while tired and to modify their behaviour.
- Recognising that the incidence and severity of fatigue-related crashes may be reduced through the implementation and development of engineering improvements to the road network.
- Reviewing countermeasures already in place and assessing their effectiveness in reducing the incidence of fatigue-related crashes.

SECTION 2: Introduction

Definition

‘Fatigue is a physiological condition that can occur long before you fall asleep at the wheel. It has a negative impact on your reaction time, your ability to concentrate and your general understanding of the road and traffic around you.’

(Ministry of Transport Crash Factsheet on Fatigue, July 2007)

Driver fatigue in the New Zealand context

During the period 2002-2006, driver fatigue (which is classified as ‘driver tired or fell asleep’) was identified in New Zealand’s crash database as a factor in 12 percent of fatal crashes, eight percent of serious injury crashes and five percent of minor injury crashes. The social cost of these recorded crashes for each year over this period is shown in Table 1 overleaf.

In 2006 alone, fatigue was identified as a contributing factor in 38 fatal crashes, 157 serious injury crashes and 475 minor injury crashes. These crashes resulted in 41 deaths, 219 serious injuries and 682 minor injuries.

Crashes which result from driver fatigue are amongst the most violent on the road. These types of crashes generally occur when the driver has actually fallen asleep, albeit momentarily, and as a result is unable to brake or avoid the impending crash. As a result, ‘loss of control’ and ‘head on’ crashes are recorded as being the most common types of fatal crashes involving fatigue.

Other factors, such as speed, alcohol and drugs also increase the risk and severity of fatigue-related crashes. Of the 130 fatigue-related fatal crashes for the three year period 2004-2006, approximately 32 percent also had alcohol or drugs as a contributing factor and 10 percent involved excessive speed.

Known causes of driver fatigue

The term ‘driver fatigue’ in the context of this Strategy represents several conditions relating to the driving task.

Doing a task for a long period of time

Research shows that the longer someone spends on a task, for example driving, without a break, the greater their level of fatigue. In addition, the time spent on other activities, such as work or school, before driving can increase fatigue and affect subsequent driving performance.

The time of day and the driver’s bio-rhythm

We all have a built-in body clock in the brain that biologically determines when we feel sleepy. This concept is more commonly referred to as the circadian rhythm and can vary depending on a number of other factors, such as a person’s natural sleep-wake cycle, age, and so forth. These circadian rhythms programme us to feel at our most sleepy between 3am and 5am in the morning and between 3pm and 5pm in the afternoon.

Chronic sleep debt – arising from acute sleep debt or accumulated sleep debt

These are amongst the most commonly known causes of fatigue. It is widely recognised that different individuals require different amounts of sleep. However, seven to eight hours is the average amount of sleep required by most people. Acute sleep debt usually occurs over a short period of time, for example, keeping awake for a long period of time immediately prior to driving.

Table 1: Reported Crashes in New Zealand in which fatigue has been identified as a contributory factor 2002-2006: by year, crash severity and whether alcohol has also been recorded as a contributory factor

	Alcohol involved	Total number of crashes	Casualties			Social cost (NZ $ million)
			Fatalities	Serious injuries	Minor injuries	
2002	No	475	31	160	509	223.2
	Yes	136	11	48	118	69.62
	Total	**611**	**42**	**248**	**627**	**292.82**
2003	No	502	48	152	552	247.35
	Yes	139	17	50	110	84.22
	Total	**641**	**65**	**202**	**662**	**331.57**
2004	No	480	41	154	489	236.98
	Yes	149	19	55	118	100.45
	Total	**629**	**60**	**209**	**607**	**337.43**
2005	No	518	32	172	560	223.02
	Yes	136	18	46	117	82.7
	Total	**654**	**48**	**218**	**677**	**305.72**
2006	No	529	33	180	564	229.8
	Yes	141	8	39	118	63.35
	Total	**670**	**41**	**219**	**682**	**293.15**
	Grand totals	**3205**	**256**	**1096**	**3255**	**1,579.06**

(Source: NZ Ministry of Transport, 2007)

Accumulated sleep debt can build up over a period of time if your sleep is restricted to less than what your body needs, for example many nights of only having six hours sleep, when your body needs eight hours.

Illness or medication

Certain types of illnesses or conditions, including undiagnosed conditions such as sleep apnoea, can cause fatigue. These conditions can contribute to cumulative sleep debt. The use of some medications may also cause or exacerbate fatigue.

The causes of driver fatigue, as listed above, can occur in isolation or in tandem. Research indicates that even low levels of fatigue can be exacerbated by the use of alcohol or drugs, temperature in the vehicle, stress or relaxation after stress, timetable demands, and distraction inside or outside the vehicle (See the short story in Appendix 6 for an example of this inter-relationship).

Countermeasures

International experience has demonstrated that there is a range of responses and countermeasures that can address driver fatigue. However, there is currently no single proven countermeasure that will in itself reduce the incidence of driver fatigue-related crashes. Instead, most overseas jurisdictions have favoured a complementary approach using a combination of interventions.

To successfully intervene it is important for workplaces to help manage fatigue in employees. This can be done through addressing systems that contribute to fatigue and through providing education programmes that raise awareness about the risks of fatigue.

Secondly, it is vital that drivers are encouraged to put in place a travel plan prior to departure to manage sleep debt. If the fatigue is caused by driving for a long time – the equivalent of a repetitive task – then a nap may not be as effective as stopping to take a short walk or a drink of water. When it is caused by chronic sleep debt, often resulting in the driver micro-sleeping at the wheel, then the driver should nap sufficiently to restore full functioning.

The Working Group has chosen to adopt a 'three Es' approach to develop countermeasures or interventions that contribute to reducing the incidence and severity of crashes caused by drowsy driving. Using this model, countermeasures are likely to be organised under the following headings.

Engineering – improving road infrastructure, including rest areas, signage, road design, hazard mitigation, vehicle design and technology. This will help to prevent crashes from occurring in the first instance and to reduce the severity of crashes.

Education – raising road-user awareness about the risks of drowsy driving and countermeasures to it.

Enforcement – ensuring that the New Zealand Police continue to enforce and reinforce the message about the risks of drowsy driving and improve crash investigation processes so that fatigue can be more readily identified as a crash cause.

SECTION 3: Strategy Development

Driver Fatigue Working Group

This Strategy has been developed by the Driver Fatigue Working Group (the Working Group). The Working Group is convened by the Ministry of Transport and comprises representatives from Land Transport New Zealand, Transit New Zealand, the New Zealand Police, the Accident Compensation Corporation and the Department of Labour's Occupational Health and Safety team. The primary and secondary goals in the Strategy are aligned with the government's key priorities as identified in the *New Zealand Transport Strategy (NZTS)*[2], the *Road Safety to 2010 Strategy*[3], and the *New Zealand Injury Prevention Strategy*[4].

More specifically, the intent and direction of the *Strategy* has been guided by the December 2006 Road Safety Policy Statement (see **Appendix 4**) and the associated *Road Safety Education Strategic Framework*[5], endorsed by the Minister of Transport and the Minister for Transport Safety. These two documents form the basis of a commitment by the wider transport sector to develop a culture of safety with a particular emphasis on education.

Driver Fatigue Strategy objectives

The Strategy sets out an agreed course of action, which will guide all future policy development, promotion and delivery of driver fatigue countermeasures within and between agencies in the wider transport sector.

In summary, the collaborative approach will address driver fatigue and therefore drowsy driving by:

- clarifying the causes, effects and countermeasures relating to fatigue and drowsy driving
- monitoring good practice elsewhere and making judgements about using the benefits to fit the New Zealand environment
- improving the quality of data collected at crash sites, so that driver fatigue is better reported
- striving for consistency of treatment in policy development, promotion and delivery through education, engineering and enforcement
- effective system coordination
- active communication, within and between agencies, and with associates, in the wider transport sector.

[2] To read the NZTS, visit: http://www.transport.govt.nz/assets/NewPDFs/nztsv1323nov02.pdf
[3] To read the Road Safety to 2010 Strategy, visit: http://www.transport.govt.nz/road-safety-2010-index/
[4] To read the New Zealand Injury Prevention Strategy, visit: http://www.nzips.govt.nz/
[5] To read the Road Safety Education Strategic Framework. visit: http://www.transport.govt.nz/road-safety-2010-index/

Primary and secondary goals

The **primary goal** is that appropriate measures are taken or implemented which will significantly reduce the incidence and severity of crashes caused by drowsy driving. Secondary to this, road users should exhibit awareness of the risks of driver fatigue, so that they develop attitudes and behaviour that would contribute to the primary goal.

Countermeasures are tested against this primary goal to assess whether they are 'fit for purpose' in combating driver fatigue. At all levels of activity, from strategy to delivery, participants can reflect upon the primary goal to make a judgment about the value of their contribution.

Secondary goals are also important to achieve success. The Working Group intends that each member agency constructs its own secondary goals ensuring that they:

- relate to the Government's broader transport objectives
- reflect how it addresses the issue of driver fatigue
- complement the primary goal of reducing the effects of drowsy driving
- is consistent with the collaborative approach to work with 'best intentions'.

Key issues

The Working Group has identified seven key issues which it believes require attention.

1. Awareness of road users about the risks, causes and countermeasures associated with driver fatigue.
2. Difficulty detecting driver fatigue, especially at crash sites, resulting in under-reporting of fatigue as a contributor. One of the issues identified is the format and use of the Traffic Crash Report (TCR).
3. The recorded crash statistics and other measures may not properly reflect the incidence of driver fatigue, which can result in it receiving insufficient attention or priority from agencies.
4. The physical and mental conditions affecting the driver, such as sleep quality and sleep conditions, each person's natural sleep-wake cycle or circadian rhythm, diet, age and ethnicity, physical effort and workplace stress levels, illness and alcohol or medication use.
5. The driving environment, especially the terrain, traffic, weather, and day or night conditions.
6. Road infrastructure, such as obstructions, rumble strips, rest areas and the accompanying signage.
7. How we can best take advantage of emerging vehicle technology, such as in-vehicle drowsy driving detectors or collision-avoidance systems.

Links and relationships

While this inter-agency Strategy has been developed by the members of the Working Group, it is intended that it will prompt interaction with other agencies, associates and individuals outside of the immediate transport environment.

In particular, the Working Group notes the Department of Labour's intention to work collaboratively to address driver fatigue within the context of its Health and Safety in Employment statutory role. It is intended that this will contribute to a common understanding of compliance initiatives and interventions that manage fatigue in the workplace.

Interest in the driver fatigue issue has been expressed by Ministers, members of the NRSC, and by organisations such as the New Zealand Automobile Association and other road-user groups. Members of professional communities and motivated individuals are also increasingly involved in the current debate.

It therefore makes sense for the Working Group to collaborate to ensure that a complementary approach to this issue is developed. It is important for the group to actively engage with a wide cross-section of organisations and individuals to make the best use of the expertise available.

Agency action

Each agency, with its strategy documents such as the Statement of Intent, states its position on what it intends to do for injury prevention and/or road safety education. These documents also outline how the agency intends to meet the aims of the wider government strategy for the transport sector. The Working Group has agreed that there should be no impediment, as a result of collaborative action, to each agency going about its business as it chooses.

A table has been drafted that acknowledges the authority, expertise and resources of each agency with a significant interest in driver fatigue (this can be found in **Appendix 1**). This chart establishes the leadership role for each organisation and identifies its primary partners, and secondary and tertiary associates. It is envisaged that this hierarchy of relationships will be endorsed by management and included in any subsequent business plans.

> The Working Group members intend that the Action Plan be the main reference for continuing the collaborative approach to dealing with fatigue and drowsy driving, and for assessing progress of the listed activities and countermeasures.

The Action Plan identifies the deliverables that are expected to contribute to the objectives stated on page six. Through the development of this Action Plan the Working Group has been able to identify 'gaps' where there are no planned or current actions under a deliverable. It is envisaged that in time new deliverables will be identified and fed into the Action Plan to address these 'gaps'.

SECTION 4: Acknowledgements

The Driver Fatigue Working Group (DFWG)

Chris Foley – (Convener) Ministry of Transport (MoT)

Carolina Lukkien – Ministry of Transport (MoT)

Miriam Clarke – Ministry of Transport (MoT)

Paul Graham – Land Transport New Zealand (Land Transport NZ)

Simon Gianotti – Accident Compensation Corporation (ACC)

Megan Nagel – Accident Compensation Corporation (ACC)

Judy Buchanan - Accident Compensation Corporation (ACC)

Lynne Heasman – Land Transport New Zealand (Land Transport NZ)

Victoria Slade – Land Transport New Zealand (Land Transport NZ)

Andrew Joel – Land Transport New Zealand (Land Transport NZ)

Dave Parsons – Inspector, New Zealand Police

Stanley Chesterfield – Transit New Zealand (Transit)

Ross Hodder – Department of Labour – Occupational Health and Safety (OSH)

Ted Preston – Strategy Facilitator.

Contributors

Mike Smith – MWH NZ Ltd

Marten Oppenhuis – MWH NZ Ltd

Martin S. Jenkins – AKILLA

Hamish Piercy – Longford Consulting Ltd

Pete Baird – New Zealand Police (Ohakea).

The National Road Safety Committee

The Chief Executive of the Ministry of Transport

The Commissioner of Police

The Secretary for Education

The Chief Executives of: Land Transport New Zealand, Transit New Zealand, the Accident Compensation Corporation and Local Government New Zealand

The Secretary of Labour, the Secretary for Justice and the Director-General of Health are associate members of the Committee.

SECTION 5: Action Plan

The following table presents an Action Plan. This is intended to be an outline of the activities and deliverables that will comprise the first step from management-level strategic and policy decisions, into the operational chain that results in the delivery of action to combat driver fatigue.

In summary, the Action Plan is intended to address the primary goal by:

- continuing with existing countermeasures, where these are considered effective, in contributing to or meeting the primary goal
- implementing and/or advocating for additional fatigue countermeasures that reflect international best-practice
- drawing together what is known (proven or perceived) about the causes of driver fatigue and of the precautions or countermeasures that will reduce the risk and incidence of 'drowsy driving' events
- ensuring that the current body of knowledge on fatigue is used to inform fatigue-related countermeasures
- acknowledging the effect that work-related fatigue has on the incidence of fatigue-related crashes
- identifying connections and promoting relationships with organisations and individuals who are knowledgeable in driver fatigue
- reaching conclusions about road users' perceptions of fatigue as an issue and contributor to road crashes
- designing and promoting agency responses (through the 'three Es' crash analysis and reporting) that are collaborative and complementary
- continuing to review the models and science available on driver fatigue and coordinating research and evaluation.

Note: Gaps in the Action Plan identify areas where deliverables and countermeasures have not yet been developed. The Action Plan will be reviewed six-monthly and the Driver Fatigue Working Group will undertake an assessment of these 'gaps' and feed in new deliverables, as and when appropriate.

Objective	Deliverable	Lead agency	Assessed benefits	Timeframe	Estimated cost	Post-evaluation measures
Continuing with existing countermeasures, where these are considered effective, in contributing to, or meeting the primary goal.	**1. Countermeasures already in place will be maintained and evaluated regularly for effectiveness.**					
	a) Transit will continue with the installation of profiled edge and centrelines to warn drivers they are drifting out of the lane.	Transit	Reduction in likelihood of head-on and off-road crashes where fatigue is implicated. Can only be done where there is negligible risk to cyclists.	Ongoing as sites are justified.	$6.00 - $7.50 per metre including traffic control.	Effectiveness of measures regularly monitored. Programme adjustments made as necessary to achieve desired outcome – reduction in the incidence and severity of fatigue-related crashes in treated areas.
	b) Transit will continue with its Highway Stopping Places(HSPs) initiative[6].	Transit	Availability of safe place to rest approximately every hour along the highway.	Ongoing subject to need and funding priorities.	TBC	As in a).
	c) Transit will continue with the installation of median barriers and safer roadside areas (ie the removal of roadside hazards).	Transit	Reduction of head-on crashes and reduction in severity of off-road crashes.	Subject to demonstrated need and funding priorities.	Wire rope barriers cost from $200 to $3500 per metre, depending on how much highway widening is required and how easy that is.	As in a).
	d) ACC will implement the review of the secondary school resource 'Wake Up'.[7]	ACC	Assessment of an effective programme targeting 15 -19 year olds.	By July 2008.	Within existing staff baselines.	

[6] HSPs, commonly known as 'rest areas', are designated areas on the State Highway network that have been specially developed to serve as safe off-road stopping places.

[7] http://www.acc.co.nz/injury-prevention/road-safety/driver-fatigue/index.htm

Objective	Deliverable	Lead agency	Assessed benefits	Timeframe	Estimated cost	Post-evaluation measures
Implementing and/or advocating for additional fatigue countermeasures that reflect international best practice.	**1. Develop and implement engineering improvements to the roading network. These improvements will include:**					
	a) Signposting indicating Highway Stopping Places (HSPs).	Transit	Improved early warning and reminders of rest areas.	Five years.	$4000 - $5000.	Effectiveness of measures regularly monitored and programme adjustments made as necessary to achieve desired outcome. Reduction in the incidence and severity of fatigue-related crashes in treated areas.
	b) Route delineation, such as specifications for wet night reflective road markings.	Transit	Better route guidance on wet nights.	New specifications (P/30) now available. Installation ongoing where justified.	Approx $5.50 - $7.00 per metre.	As in a).
	c) Transit will participate in the Network Safety Coordination exercise on state highways (where fatigue has been discussed as a factor in crashes).	Transit	Initiatives benefit from multi-party, multi-disciplinary approach.	Ongoing.	Time only.	As in a).
	2. Develop and/or implement educative measures to assist drivers to modify their behaviour to reduce the incidence of driver fatigue.					
	a) Land Transport NZ will continue to expand their advertising campaign to include nationwide TV advertising.	Land Transport NZ	Increased public awareness of the danger of driving while tired/ fatigued.	To air in December 2007.	$900,000 (approx).	Audience recall of key messages from the advertising campaign.

Objective	Deliverable	Lead agency	Assessed benefits	Timeframe	Estimated cost	Post-evaluation measures
	b) ACC will review the scope of its involvement and develop a new strategic direction if necessary.	ACC	ACC is better able to focus its resources on injuries of serious consequence (road).	By March 2008.	Met within existing staff baselines.	
	c) Land Transport NZ will promote the 'plan before driving' concept to drivers over 25 years as a supporting campaign to the nationwide TV advertising and it will utilise existing billboards, print, radio and map resources.	Land Transport NZ	Ensure that the fatigue message is being delivered to all members of the public.	Launch December 2007.	Met within existing baselines.	Audience recall of key messages from the advertising campaign.
	d) Land Transport NZ will carry out online and text message advertising.	Land Transport NZ	Increased awareness of risks of driving tired in specific population groups.	To be completed August 2008.	Met within existing baselines.	As in c).
	e) ACC will continue to deliver Driver Reviver Stops[8] that raise general awareness about the risks of driver fatigue.	ACC	Increased public awareness of the risks of driver fatigue and measures to address these risks.	47 Driver Reviver Stops funded up to June 2008.	$120,000 (approx).	Market research will be undertaken to assess the effectiveness of Driver Reviver Stops.
	f) ACC will continue to support the Driver Reviver Stops with localised radio advertising and billboards, as well as driver fatigue awareness presentations to employers. It will also assist local communities by working with local Transit offices to allow the use of HSPs for Driver Reviver Stops, where appropriate.	ACC		By 30 June 2008.		As in e).
	g) Workplace delivery of the 'Managing Fatigue' training and raising awareness with heavy motor vehicle drivers.					

[8] Driver Reviver Stops – Driver Reviver Stops are locally run initiatives designed to encourage drivers to take regular breaks and to increase their awareness of the issues of driving while tired. For more information on Driver Reviver Stops, go to: http://www.acc.co.nz/injury-prevention/road-safety/driver-fatigue/index.htm#Revive.

Objective	Deliverable	Lead agency	Assessed benefits	Timeframe	Estimated cost	Post-evaluation measures
To draw together what is known (proven or perceived) about the causes of driver fatigue and of the precautions or countermeasures that will reduce the risk and incidence of 'drowsy driving' events.	**1. Research and define the nature, causes and consequences of fatigue.**					
	a) Continue ongoing analysis of crash data to provide annual updates of driver fatigue factsheet[9].	MoT	Improved understanding of the scale of fatigue-related crashes. An assessment of the scale of fatigue-related crashes from year to year.	The factsheet is produced annually. The next factsheet will be produced in July 2008.	No additional cost over staff baselines.	N/A
	b) Provide a summary report on recent international best practice and an assessment of the effectiveness of overseas countermeasures.	Land Transport NZ and ACC	Increased knowledge and understanding of successful and unsuccessful countermeasures.	By December 2007.	$25,000 (approx).	Determine whether planned activities reflect the findings of the summary report by the next review of the Action Plan.
	2. Update research on driver fatigue, in particular measurement evaluation and modelling.					
	a) Undertake some form of gap analysis to identify gaps in fatigue reporting. If gaps are found undertake a review of fatigue reporting within Crash Analysis System (CAS)[10].	MoT	Improved understanding of the gaps that exist in our knowledge of the nature of fatigue-related crashes in New Zealand.	Timeframe to be decided – requires a project to be set up and scope of work to be agreed.	No additional cost over staff baselines.	MoT will organise an independent review of its analysis of CAS to determine whether any gaps have been missed.
	b) Investigate whether any ethnic groups, such as Māori or Pacific peoples, are at increased risk of being involved in fatigue-related crashes.	MoT	Research would improve the current body of knowledge relating to fatigue and would allow awareness campaigns to be targeted appropriately.	By December 2008.	TBC	TBC

[9] http://www.transport.govt.nz/assets/NewPDFs/Fatigue-Crash-Factsheet-July-07-Web.pdf

[10] The Crash Analysis System (CAS) is an integrated computer system that provides tools to collect, map, query and report on road crashes and related data. This link can be used to access more information on CAS. Visit: http://www.landtransport.govt.nz/research/cas/index.html

Objective	Deliverable	Lead agency	Assessed benefits	Timeframe	Estimated cost	Post-evaluation measures
Ensure that the current body of knowledge on fatigue is used to inform fatigue-related countermeasures.	**1. Ensure that medical practitioners are aware of the effects of sleep deprivation and its contribution to driver fatigue.**					
	a) Review the fatigue section of the 'Medical Aspects of Fitness to Drive' resource, including any related forms for medical practitioners, to ensure that they reflect current knowledge of issues associated with sleep deprivation.	Land Transport NZ	Increased credibility and knowledge in the medical field on fatigue and associated sleep disorders.	December 2008.	TBC	Land Transport NZ could undertake a survey of GPs to see if they have used the resource in the last 12 months and whether they found it informative.
To acknowledge the effect that work-related fatigue has on the incidence of fatigue-related crashes.	**1. The DFWG will ensure that workplace fatigue training and resources are appropriately addressed and consider the need for private sector involvement in the development of effective countermeasures.**					
	a) ACC will deliver a 'Managing Fatigue'[11] workshop in at least 50 high-risk workplaces.	ACC	This initiative will target groups that are at high risk of having a fatigue-related crash.	July 2008.	Met within ACC baseline.	A post-evaluation report will be undertaken by ACC.
	b) Land Transport NZ to oversee the rollout of the 'Commercial Drivers Fatigue Management Project', targeted at truck drivers and their employers.	Land Transport NZ	Reduction of fatigue-related crashes among heavy vehicle drivers. Increased knowledge among these drivers about fatigue countermeasures.	Ongoing.	TBC	TBC
	c) Land Transport NZ will ensure that the fatigue section in the 'Your Safe Driving Policy'[12] resource reflects the most up-to-date advice on managing fatigue.	Land Transport NZ	Ensure that the latest information on driver fatigue is provided to employers/individuals and the employer's safe driving policy reflects this.	August 2007.	N/A	A survey will be undertaken to ascertain whether the issue of fatigue has been addressed in employer's safe driving policies.

[11] For more information on fatigue in the workplace and resources available visit: http://www.landtransport.govt.nz/commercial/hours.html

[12] http://www.landtransport.govt.nz/commerical/safe-driving/why-safe-driving-policy.html

Objective	Deliverable	Lead agency	Assessed benefits	Timeframe	Estimated cost	Post-evaluation measures
To identify connections and promote relationships with organisations and individuals who are knowledgeable in driver fatigue.	**1. Each agency will communicate with, and recognise the contribution of, associates outside the DFWG.**					
	a) Agencies will identify organisations and individuals who have an interest and/or have knowledge on driver fatigue issues.	All agencies	Agencies will expand their knowledge of the effects of driver fatigue, regarding the size of the problem, and effective countermeasures.	By March 2008.	N/A	TBC
	b) Agencies will provide the DFWG with a detailed plan of how they intend to engage with organisations/ individuals on driver fatigue, as well as developing a comprehensive and coordinated stakeholder engagement plan.	MoT	As in a).	By June 2008.	N/A	TBC
To arrive at conclusions about road users' perception of fatigue as an issue and contributor to road crashes.	**1. Monitor road users' awareness of fatigue as a contributor to road crashes.**					
	a) MoT will include a question on driving while tired in the latest 'Public Attitudes to Road Safety Survey'[13].	MoT	Both (a) and (b) will contribute to an enhanced understanding of public perceptions of driving while tired, as well as public perceptions being tracked over time.	Completed annually.	No additional cost over staff baselines.	MoT will analyse the initial response to the driving while tired question in the 'Public Attitudes to Road Safety Survey' and report back on its findings within one month of completion of annual survey.

[13] The New Zealand 'Public Attitudes to Road Safety Survey' has been undertaken periodically since 1974, and annually since 1994. It is designed to evaluate attitudes to road safety issues, in particular alcohol-impaired driving and speed. The latest version of the survey is available on the Ministry of Transport's website at: http://www.transport.govt.nz/public-attitudes-index/

Objective	Deliverable	Lead agency	Assessed benefits	Timeframe	Estimated cost	Post-evaluation measures
	b) MoT will include two questions on driver fatigue as part of its ongoing monitoring of advertising performance. MoT regularly asks questions on public attitudes and responses to road safety issues.	MoT	See a).	Carried out on a quarterly basis.		MoT will analyse the initial response to the driver fatigue questions in the 'Advertising Tracking Survey' and report back on its findings.
	c) ACC will commission market research to identify the impact of its fatigue campaign delivered through Driver Reviver Stops.	ACC	This will contribute to an enhanced understanding of public perceptions of the risk of driving while tired and an assessment of the effectiveness of Driver Reviver Stops as a countermeasure. Information will be used to inform future campaigns lead by ACC.	By July 2008.	$30,000 (approx).	Increased recognition of the benefits of Driver Reviver Stops.
	d) ACC will commission market research to identify the impact of its workplace training fatigue campaign delivered through the 'Managing Fatigue' course.	ACC and Land Transport NZ	This will contribute to an assessment of the effectiveness of the 'Managing Fatigue' course and identify behaviour change as a result.	By July 2008.	$30,000 (approx).	Increased recognition of the effectiveness of workplace-based countermeasures.
	2. Address the options for raising road users' awareness about driver fatigue and construct a programme to do that if necessary.					

Objective	Deliverable	Lead agency	Assessed benefits	Timeframe	Estimated cost	Post-evaluation measures
To design and promote agency responses, through the 'three Es', with some emphasis on crash analysis and reporting, that are collaborative and complementary.	**1. Each agency will ensure that driver fatigue is acknowledged in their strategic and policy documents and is then planned and supported by delivery.**					
	a) MoT will ensure driver fatigue is included in the 2006 'Road Safety Policy Statement'.	MoT	Driver fatigue publicly recognised as an important contributor to road crashes. Government expressed support for the development of an overarching public information campaign. A commitment to improve our base information on the nature and extent of driver fatigue.	Completed December 2006.	No additional cost over staff baselines.	N/A
	b) Agencies will acknowledge the issue of driver fatigue in their statement of intent documents and other appropriate business documents.	All agencies	All agencies demonstrate their commitment to addressing driver fatigue.	By July 2008.	N/A	N/A
	2. Promote the driver fatigue issue through communicative and educative processes.					
	a) Agencies will commit to discuss any proposed communicative and educative activities with each other.	All agencies	Ensure common approach and alignment of key messages.	Ongoing.	N/A	N/A
	b) The DFWG will discuss the interaction of agency roles in Education, Engineering and Enforcement, and describe leadership and support roles.					

Objective	Deliverable	Lead agency	Assessed benefits	Timeframe	Estimated cost	Post-evaluation measures
	3. Review the processes and procedures for reporting on and analysing driver fatigue as a factor in crashes.					
	a) Police will undertake further work on reviewing the Traffic Crash Report (TCR)[14] system to be better able to define the presence of driver fatigue in crashes.	NZ Police	Improved reporting of fatigue as a factor in crashes.	The TCR form has now been reprinted to include the reporting of fatigue under the heading 'why crash happened – driver factors'. The new TCR forms came into use as existing stocks were depleted.	Costs absorbed into the ongoing print costs of these forms.	Future reports on '*Motor Vehicle Crashes in New Zealand*' will be reviewed to ascertain the size of the fatigue factor in crashes and to gauge the effect that Police reporting has had. Police will undertake a survey of officers to determine how useful or appropriate they find the 'fatigue' prompt in the TCR.
	b) Police will deliver staff training on developing and piloting the fatigue detection package.	NZ Police	As in a).	The Traffic Reporting Chapter of the *Manual of Best Practice* has been reprinted. The investigation process for identifying fatigue indicators has been included in the training manual and will now form a part of all future crash investigation training courses.	As in a).	As in a).

[14] In New Zealand motor vehicle crashes are attended and investigated by the New Zealand Police. The Police report on these crashes using the standard TCR form. For more information on the TCR and the crash reporting system in general, visit: http://www.transport.govt.nz/assets/NewPDFs/NewFolder/Motor-Vehicle-Crash-Data-2006.pdf

Objective	Deliverable	Lead agency	Assessed benefits	Timeframe	Estimated cost	Post-evaluation measures
	c) MoT in conjunction with Land Transport NZ, will review appropriateness of current instructions for CAS coders, in relation to changes to the TCR.	MoT in partnership with Land Transport NZ and the Police	More robust and consistent recording of driver fatigue as a contributing crash cause.	By June 2008.	No additional cost above existing staff baselines.	TBC
To continue to review the models and science available on driver fatigue, and coordinate research and evaluation.	**1. Continue connections to other/overseas jurisdictions and monitor their activities (including in-vehicle technology) for potential benefits to the NZ road safety effort.**					
	a) MoT will arrange for a presentation to be made to the 'Vehicle Forum' on emerging vehicle technologies and their potential to reduce the incidence of driver fatigue-related crashes.	MoT	Information sharing will lead to enhanced understanding of vehicle technology capable of reducing the incidence of driver fatigue-related crashes.	By June 2008.	No additional cost over staff baselines.	The MoT will undertake a survey of attendees to see if understanding and knowledge has been enhanced.
	2. Construct and use an evaluative tool to monitor and report on the progress of this Action Plan.					
	a) The DFWG will produce a half yearly update to the National Road Safety Committee on progress.	DFWG	Ensure that the group regularly reviews progress, to allow the group to identify new work streams and how they might contribute to the primary goal.	June 2008	No additional cost over staff baselines.	Undertake a survey of working group members to see if they feel that objectives have been met.

SECTION 6: Appendices

APPENDIX 1: Driver fatigue – a stocktake of agency activity (as at September 2007)

Agency	What is being done?	What is planned?
MoT	• Policy advice provided to Ministers. • Convenes the Driver Fatigue Working Group. • Research on fatigue and crashes undertaken, collated and published. • Factsheet available on website. • Established and maintained relationships with overseas jurisdictions.	Continue current activity and: • review CAS fatigue reports. • discuss with Ministry of Health the issue of undiagnosed medical conditions and potential social costs, with a view to re-examining funding for public health initiatives.
ACC	• 'Wake Up' resource in secondary schools. • Driver Reviver Stops (with State Insurance). • Injury Prevention – Sleep stopping places. • 'Managing Fatigue' workplace training courses. • Training the Police on Driver Fatigue (Crash Site) checklist. • Commercial Drivers Project pilot. • Regional and local initiatives: radio advertising, billboards, driver fatigue awareness presentations to employers at forums, and health and safety meetings.	• Review the 'Wake Up' resource. • Ongoing work on Driver Reviver Stops. • Shift Workers 'Managing Fatigue' workshop to be conducted in at least 50 high-risk workplaces. • Police staff training – develop and pilot the fatigue detection package. • Research projects – ie to determine what is required to encourage drivers to stop at rest areas. • Commercial Drivers Project – staged national roll-out. • Building relationships – with the Police, Ministry of Justice, Ministry of Health, Land Transport NZ, Transit and Ministry of Transport to produce an inter-agency strategic approach. • Regional and local – supporting the Driver Reviver Stops with radio advertising and billboards.
NZ Police	• Attend crash scenes and write Traffic Crash Reports (TCR). • Remind drivers (and employers) of 'attentive' driving. • Fatigue Checklist – recently developed with ACC, to assist officers assess driver fatigue causes at crash scene. • Agreed to add a prompt to the TCR form to draw the attention of investigating officers to driver fatigue.	
Land Transport NZ	• Advertising – radio, magazine, billboards. • Community activities nationwide – local advertising – print, billboard, website, event advertising, driver maps showing rest areas, fatigue stops. • 'Managing Fatigue' resource – aimed at shift workers and extended hours workers. Pilot completed and launched in August/September 2007. • Commercial Drivers – staged national roll-out of programme. Targeted at truck drivers and their employers. • 'Your Safe Driving Policy'.	• Online advertising and text message advertising. • Expand advertising campaign to include nationwide TV.

Agency	What is being done?	What is planned?
Transit	• Installation of profiled edge and centerlines to warn drivers they are drifting out of the lane. • Participation in the Network Safety Coordination exercise on State highways (where fatigue has been discussed as a factor in crashes). • Regional multi-agency programmes include billboards about fatigue. • Working with the Police on the RSAP initiative (which identifies fatigue issues). • Transit's Strategic Plan refers to, providing fatigue stops every 1.5 hours of travel time, within five years. • Transit's draft *Highway Stopping Places Strategy* includes driver fatigue. • Installation of median barriers and safer roadside areas.	Continue current activity and: • Improve signposting about HSP. • Improve route delineation – eg specifications for wet night reflective road markings.
Department of Labour	• Review and determine initiatives and interventions relating to the management of driver fatigue. • Plan the position and resources for staff to undertake agreed work programmes in driver fatigue management.	• Operational programming for Department of Labour workplace, road transport and health and safety management, including fatigue management.

APPENDIX 2: Inter-agency links and relationships

Agency	Primary partners	Secondary associates	Tertiary associates
Accident Compensation Corporation	New Zealand Police Land Transport New Zealand	Ministry of Transport Department of Labour (OSH) Automobile Association	Transit New Zealand
Land Transport New Zealand	Accident Compensation Corporation New Zealand Police Transit New Zealand Commercial Industries	Advertising agencies/media Automobile Association Education Advisers Road Safety Coordinators Ministry of Transport Local Councils	
New Zealand Police	Ministry of Transport Land Transport New Zealand Accident Compensation Corporation Transit New Zealand	Local Authorities Automobile Association Road Carriers groups Department of Labour (OSH)	Ministry of Health, Ambulance services New Zealand Fire Service
Ministry of Transport	Land Transport New Zealand New Zealand Police Transit New Zealand Accident Compensation Corporation	Department of Labour (OSH)	Automobile Association Ministry of Health
Transit New Zealand	New Zealand Police Land Transport New Zealand Network Consultants Accident Compensation Corporation	Local Authorities Road Maintenance contractors Automobile Association Road Controlling Authority	Ministry of Health Ministry of Transport New Zealand Fire Service Ambulance services Residents groups Equipment suppliers and installers
Department of Labour	New Zealand Police Accident Compensation Corporation Land Transport New Zealand Ministry of Transport Road Transport Industry affiliations	Road Transport enterprises and stakeholders	Transqual New Zealand Accident Compensation Corporation New Zealand Institute of Driver Education

APPENDIX 3: Driver fatigue and drowsy driving – a driver's checklist

The warning signs	• Frequent yawning. • Drooping head, eyes closing. • Eyes feeling sore or heavy. • Vision blurs or dims. • Daydreaming or inattention. • Unaware of other (especially overtaking) traffic.	• Feelings of hunger or thirst. • Stiffness or cramp. • Driving speed fluctuates. • Crossing the centerline, out of the lane or to the road edge. • No memory of the last few kilometres.
The effects	Early stages: • Driver tends to decrease attention to safety-related tasks and to drive, vacantly gazing, at one point. • Driver delays in changing speed to respond to changes in road gradients. • Drivers may attempt to compensate for slowed reactions by slowing down or being less willing to overtake.	Latter stages: • Little awareness of behaviour. • Steering responses are slower. • Driver tends to zigzag within lane, sometimes crossing centre line or running off road. • Falling asleep (micro-sleeping or 'zoning out') at the wheel may occur.
Ways to avoid fatigue **Once fatigue sets in, there is little you can do about it except stop as soon as you can and take a break. In the end the only cure for fatigue is sleep. If you are in any doubt about your state of fatigue while you are driving, stop in a secure place, get in the passenger seat and sleep (powernap) for 15 – 20 minutes. Before setting off again, get out of the vehicle and walk around for a while – exercise and breathe deeply.**	• Plan your trip and have a good night's sleep beforehand (ie seven or eight hours of uninterrupted sleep). • Do not plan to travel for more than eight to ten hours in any one day. • Plan to take regular breaks (at least every two hours for 15 minutes or more). • Start your trip early in the day, and try to not drive into the night. The chances of crashing are much higher at night. • Plan to stay somewhere overnight so you can arrive alive – even if it is the next day.	• Be aware of the temperature in the vehicle and check the freshness or recirculation of the air. • Eat well-balanced meals at your usual meal times. Avoid fatty foods which can make you feel sluggish. • Don't drink alcohol before driving. • Check what prescription medicines you are taking – some can cause drowsiness. • Share the driving if possible.

APPENDIX 4: December 2006 Government Policy Statement

On 13 December 2006, the Minister of Transport and the Minister for Transport Safety launched the Road Safety Policy Statement, and announced that a focus on driver education is key to reducing the road toll.

The Road Safety Policy Statement notes that:

> *"Driver fatigue, which leads to drowsy driving, is an important contributor to road crashes. In 2005 'driver tired or fell asleep' was recorded as a contributor to 12 percent of fatal crashes. At 12 percent, these factors are widely acknowledged as being under-reported. Recent international research has estimated that the figure for all crashes is around 24 percent.*
>
> *Driver fatigue was widely discussed at stakeholder engagement workshops…Concern has been expressed about the lack of public awareness of the risks posed by driver fatigue and on action that can be taken by road users and infrastructure providers to recognise and mitigate the risks.*
>
> *… Government sees a need for an overarching public information campaign… about how dangerous it is to drive tired. There is also a need to improve our base information on the nature and extent of driver fatigue."*

APPENDIX 5: Fatigue Crash Factsheet

Crash statistics for the year ended 31 December 2006

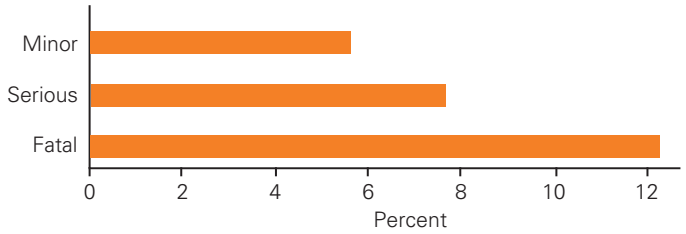
Prepared by Strategy and Sustainability, Ministry of Transport

Fatigue is a physiological condition that can occur long before you fall asleep at the wheel. It has a negative impact on your reaction time, your ability to concentrate and your general understanding of the road and traffic around you. The three main causes of fatigue are[15];

- **Sleep loss** – this is the most commonly known cause of fatigue. Different individuals require different levels of sleep, although the average is seven to eight hours of sleep a day. If you don't get a full night's sleep then it's likely to cause fatigue. It can also build up over time if your sleep continues to be restricted.
- **Circadian rhythms** – everybody has a built-in body clock in the brain that biologically determines when we will feel sleepy. These circadian rhythms program us to feel at our most sleepy between 3am and 5am in the morning, and between 3pm and 5pm in the afternoon.
- **Time spent driving/working etc** – research shows that the longer someone spends driving without a break, the greater their level of fatigue. Also, the time spent in other activities such as work or school before driving can increase fatigue and affect subsequent driving.

In 2006 fatigue was identified as a contributing factor in 38 fatal traffic crashes, 157 serious injury crashes and 475 minor injury crashes. These crashes resulted in 41 deaths, 219 serious injuries and 682 minor injuries. The total social cost of crashes involving driver fatigue was about $290 million that is about nine percent of the social cost associated with all injury crashes. However, fatigue is difficult to identify and recognise as playing a role in an accident. Research suggests that the contribution of fatigue to accidents may be under-represented in the Police reported crash system and therefore may be a factor in more accidents than are reported here.

Percentage of crashes with fatigue as a factor (2004-2006)

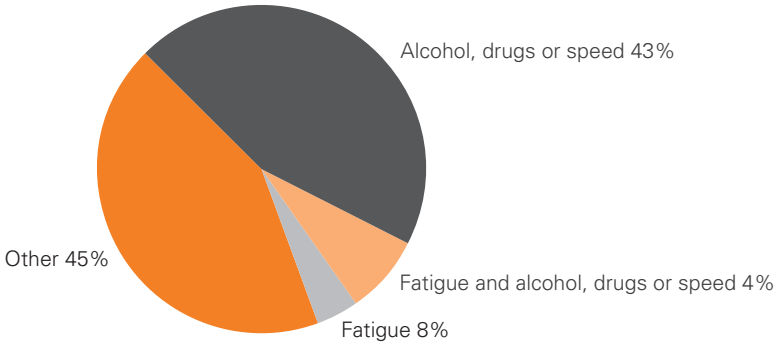


As crash severity increases, so does the involvement of driver fatigue. In New Zealand, over the years 2004 to 2006, driver fatigue was a factor in 12 percent of fatal crashes, 8 percent of serious injury crashes and 5 percent of minor injury crashes.

Fatigue combined with factors like speed and alcohol or drugs increases the risk of an accident. The faster an individual drives the less time they have to react; becoming even more dangerous when combined with the slower reactions already caused by their fatigue. Similarly even small amounts of alcohol or drugs can combine with fatigue to significantly affect driving ability. Therefore, of 130 fatigue-related fatal crashes for the three year period 2004 to 2006, approximately 32 percent also had alcohol or drugs as a contributing factor and approximately 10 percent involved speed.

[15] For additional information on the causes of fatigue and how to prevent them see the Land Transport New Zealand Fatigue Factsheet here at: http://www.landtransport.govt.nz/factsheets/24.html

Fatigue, speed and alcohol/drugs in fatal crashes (2004-2006)



Between 2004 and 2006, 89 percent of the 130 fatal crashes that involved fatigue as a contributing factor occurred on the open road. A further 11 percent occurred in urban areas.

Who dies?

For every 100 drivers or riders killed in road crashes where fatigue is a contributing factor, 38 of their passengers as well as 27 road users die with them.

Deaths in crashes where driver fatigue was a contributing factor (2004-2006)

Age	Fatigue involved drivers	Passengers with fatigue involved drivers	Other road users	Percentage of all deaths
0-14	0	6	1	9%
15-19	7	12	5	11%
20-24	17	3	1	14%
25-29	8	1	0	12%
30-39	15	3	0	12%
40-49	17	1	9	15%
50-59	9	2	4	13%
60+	16	6	4	11%
Unknown	2	1	1	19%
Total	91	35	25	12%

Time Series

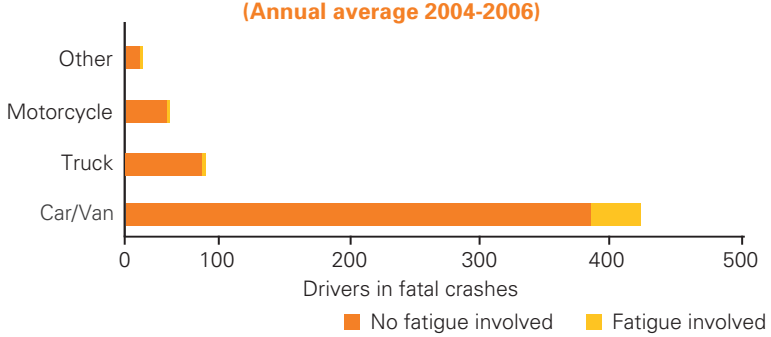
Crashes and casualties with driver fatigue as a contributing factor

Crashes with driver fatigue as a factor					Casualties from crashes with driver fatigue as a factor			
	Fatal		Injury		Deaths		Injuries	
Year	Number	%	Number	%	Number	%	Number	%
1995	40	8%	553	5%	45	8%	810	5%
1996	40	9%	449	4%	41	8%	705	5%
1997	53	11%	425	5%	58	11%	688	5%
1998	22	5%	468	6%	25	5%	722	6%
1999	55	13%	450	6%	76	15%	749	6%
2000	54	14%	439	6%	69	15%	737	7%
2001	48	12%	510	6%	61	13%	835	7%
2002	39	11%	572	6%	42	10%	835	6%
2003	54	13%	587	6%	65	14%	864	6%
2004	52	14%	577	6%	60	14%	816	6%
2005	39	12%	610	6%	47	12%	888	6%
2006	38	11%	632	6%	41	11%	901	6%

Note: The table shows crashes and all casualties from Police reported crashes where at least one driver was affected by fatigue. Not included are the crashes where only the pedestrians, cyclists and passengers were affected by fatigue. As with other subjective measures care must be taken with a time series of fatigue data. It is possible that the subjective assessment of fatigue by reporting officers has changed over the years.

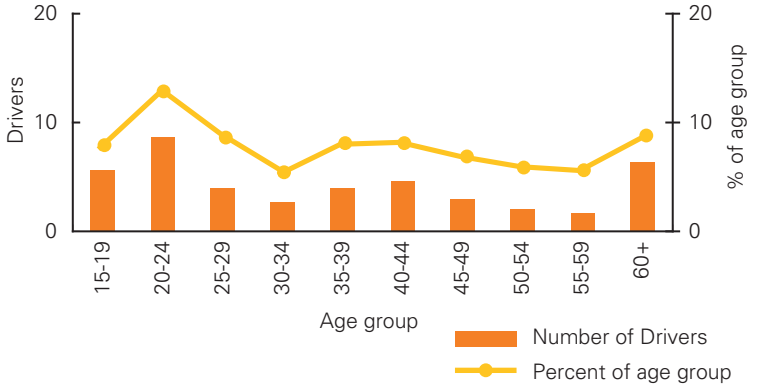
Drivers involved in fatal crashes

Drivers involved in fatal crashes by vehicle type
(Annual average 2004-2006)



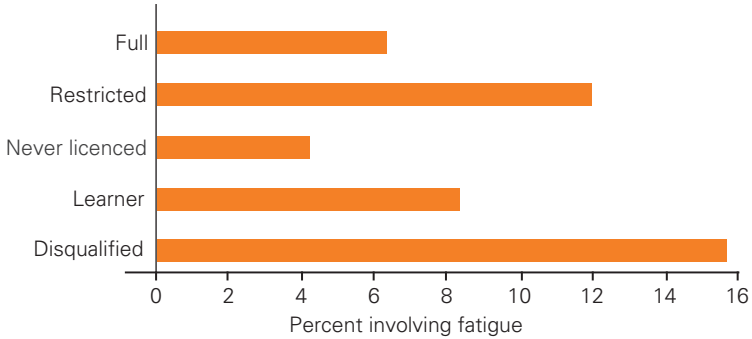
From 2004 to 2006, fatigue was a contributing factor for nine percent of car and van drivers and one percent of motorcyclists in fatal crashes. Approximately five percent of truck drivers involved in fatal crashes were identified as fatigued.

Drivers in fatal crashes involving fatigue by age group
(Annual average 2004-2006)



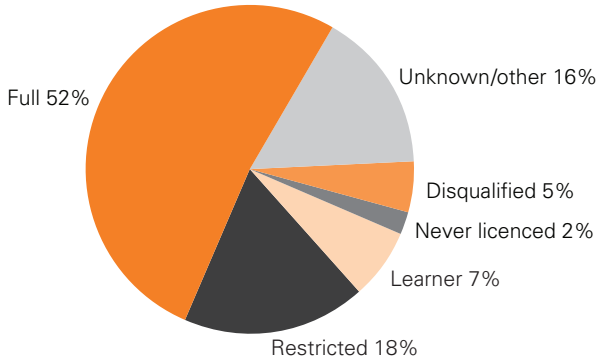
In 2004-2006, fatigue was a factor for eight percent (108) of all male drivers involved in fatal crashes. Fatigue was a factor for six percent (22) of all female drivers involved in fatal crashes. Drivers aged 20-24 appear to have the highest frequency of fatigue related fatal accidents.

Percentage of drivers in fatal crashes involving fatigue by licence status (2004-2006)



Disqualified drivers are much more likely to be in fatal crashes involving fatigue (16%) compared with drivers with a full licence (6%). Drivers with restricted (11%) or learner licences (8%) are also more likely to be in fatigue involved fatal crashes compared with those with full licences.

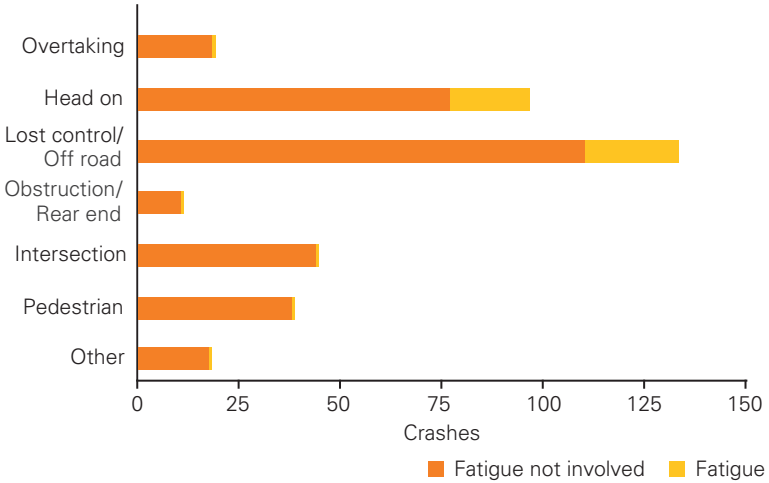
License status of drivers in fatal crashes involving fatigue (2004-2006)



Note: Unknown/other includes drivers with an expired, unknown or wrong licence class.

Types of crashes

Types of fatal crashes where driver fatigue was a factor
(Annual average 2004-2006)

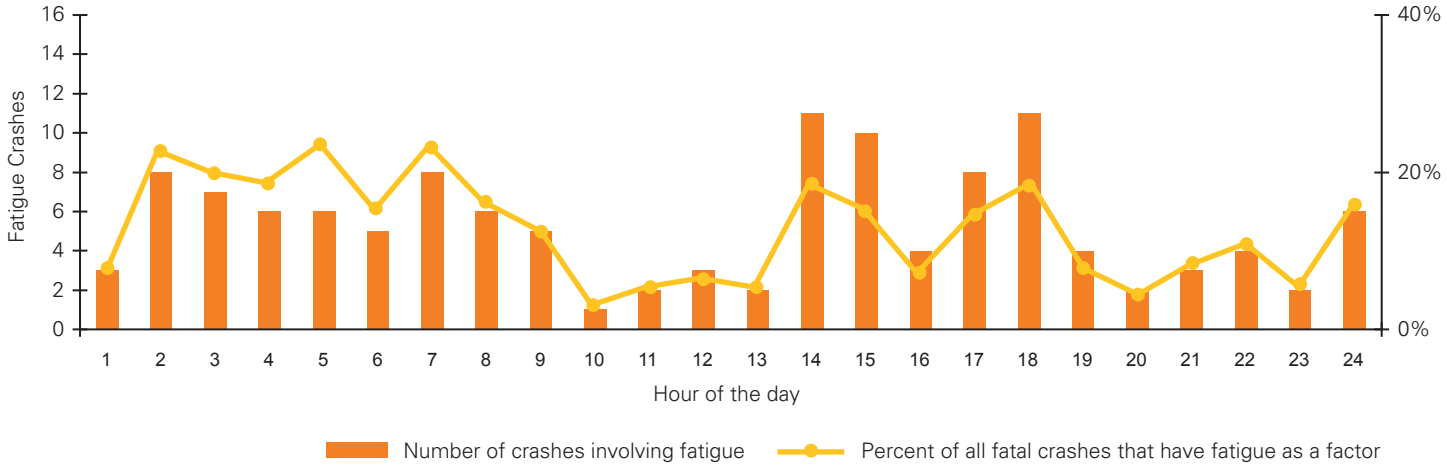


'Loss of control' and 'head-on' crashes are the most common types of fatal crashes involving fatigue. Approximately 99 percent of the fatal crashes where driver fatigue was a contributing factor fall into these categories.

When do crashes involving fatigue occur?

Between 3am and 5am our body clocks (circadian rhythms) programme us to feel very sleepy. There is also a secondary peak in sleepiness between 3pm and 5pm in the afternoon. This is the time of the day when physical and mental performance is at its worst and there is a corresponding increase in fatigue-related crashes at these times. As shown in the graph below there are further peaks when people are typically driving, (ie 7am, 2-3pm and 5-6 pm).

Fatal crashes with drivers fatigue as a factor by time of day
(Annual average 2004-2006)



For further information on crash statistics see *Motor Vehicle Crashes in New Zealand*, the annual statistical statement produced by the Ministry of Transport. This publication is available in secondary school libraries and many public libraries.

Enquires relating to crash statistics can be directed to the Ministry of Transport, PO Box 3175, Wellington, 6140 or email at: info@transport.govt.nz. For more information about road safety, visit the Ministry of Transport website at: www.transport.govt.nz.

The 'Fatigue Crash Factsheet' was prepared by Strategy and Sustainability, Ministry of Transport, July 2007.

For further information see Land Transport New Zealand's – Fatigue Factsheet: www.landtransport.govt.nz/factsheets/24.html

APPENDIX 6: A short story

Follow up on a crash on State Highway 1, north of Pukerua Bay, by Transit New Zealand, led to the discovery of this short story about driver fatigue. The crash occurred shortly after a wire rope median barrier was installed along this section of road. The barrier saved a woman driver from a potential head-on crash. The story illustrates the interdependency between the factors that cause fatigue-related crashes.

"It had been a busy week in our house in Te Horo with several sets of visitors coming and going and other activities going on. On Saturday morning I took the last visitors down to Wellington Airport, waved them goodbye and then started the journey home alone.

As far along as Pukerua Bay, the highway has two lanes northbound and there is a constant need to stay alert and watch for other vehicles overtaking, turning and competing for road space. Beyond Pukerua Bay, the road drops down alongside the coast and the outside temperature typically rises several degrees. (I didn't have the car's air-conditioning on because my husband doesn't like using the extra petrol!) Traffic forms into a single line and takes on a more peaceful style with the water lapping on the rocks alongside.

With the visitors gone and the traffic now easing, I began to relax. A nice cup of tea at home on the couch beckoned me. All of a sudden a loud noise startled me. It was the wire rope barrier grinding along the side of the car. I had nodded off…"

Enquiries:
Land Safety Management Team
Ministry of Transport

Tel: +64 4 439 9000

Novell House, 89 The Terrace, P.O. Box 3175, Wellington 6140

www.transport.govt.nz

THE NATIONAL ROAD SAFETY COMMITTEE

The National Road Safety Committee comprises:

The Chief Executive of the Ministry of Transport
The Commissioner of Police
The Secretary for Education
The Chief Executives of: Land Transport New Zealand,
Transit New Zealand, the Accident Compensation Corporation
and Local Government New Zealand

The Secretary of Labour, the Secretary for Justice and the
Director-General of Health are associate members of the Committee.