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DEFINITION

There is no universally accepted definition of what constitutes driver fatigue. However, the National Road Safety Action Plan defines fatigue as a loss of alertness that reduces human performance and may or may not end up in sleep or micro-sleeps (National Road Safety Action Plan 2018–20).

Safework Australia define fatigue as more than feeling tired or drowsy. In a work context, fatigue is mental and/or physical exhaustion that reduces the ability to perform work safely and effectively.

Fatigue can be caused by several factors:

- **Medical causes** – Unrelenting exhaustion may be a sign of an underlying illness.
- **Lifestyle-related causes** – Alcohol or drugs or lack of regular exercise can lead to feelings of fatigue.
- **Workplace-related causes** – Workplace stress can lead to feelings of fatigue.
- **Emotional concerns and stress** – Fatigue is a common symptom of mental health problems.

THE STRATEGY

Fatigue-related crashes remain a major concern for the government and other road safety authorities across Australia.

In 2008, the State Government released its 12-year road safety strategy, Towards Zero, which set out the ambitious target of 11,000 fewer people killed or seriously injured (KSI) by 2020, which is a 40% reduction from the baseline period of 2005-2007.

The baseline figure for fatigue-related KSI was 264. Using a 40% reduction, a figure of 158 is the government's target for 2020.

However, the estimated figure for fatigue-related KSI in Western Australia (WA) for 2016 was 319. This statistic exceeds the 2020 KSI reduction target (n=158) by 161 people on WA roads.

Figures between the years 2010-15 show a steady trend of fatigue-related deaths in WA:

Year	2010	2011	2012	2013	2014	2015
Fatigue related deaths	19	13	17	10	30	17
Total road deaths	192	179	183	161	182	161
Percentage of total	9.9	7.3	9.3	6.2	16.5	10.5

Table 1: Fatigue related deaths between 2010-15 (Road Safety Commission, 2015)

Except for 2014 (16.5%), fatigue-related deaths fluctuated between 6-10.5% over the five year period.

Fatigue is not exclusive to a unique set of people and can affect anyone who uses the road network, either privately, or as professional drivers.

A study in the United States (NHTSA, 1996) identified the high-risk groups of being involved in crashes while driving tired:

- Young people (especially male) 16-29.
- Shift workers (including drivers of heavy vehicles*).
- People with untreated sleep apnoea or narcolepsy.

* Transport Accident Commission

Impacts of fatigue on a driver can vary, but typically can be experienced both physically and mentally. Fatigue affects drivers by:

- Impairing performance.
- Decreasing attention and concentration.
- Slowing down reaction times and decision making.
- Reducing tolerance for other road users.
- Increasing fluctuations in speed.

The National Road Safety Partnership Program provides extensive information on driver fatigue and has produced fact sheets and self-check lists. The website has a fatigue calculator which allows input of sleep over a 24-48 hour period and performs a calculation of fatigue likelihood.

The Road Safety Commission website also has a Frequently Asked Questions fact sheet and a Facts at a Glance poster which can be printed as a quick reference.

Fatigue accounts for more than 20-30% of all fatal crashes and serious injuries on Australian roads . It is thought that this figure underrepresents the actual figure due to the difficulty of accurately measuring fatigue and the potential for fatigue to be masked by other factors, such as drugs and alcohol (Baulk, et al. 2006). Research shows that workers are more at risk of these incidents because of irregular work schedules and longer distances driven, compared to non-commercial drivers. It is estimated that fatigue-related road incidents cost workers, families and the Australian economy \$3 billion each year out of an estimated \$27 billion per year in road incidents (Williamson & Feyer 2000).

SUPPORTING RESEARCH AND EVIDENCE

Effects of fatigue

The effects of fatigue on drivers was poorly understood until studies compared fatigue to alcohol. Research has since determined:

- A driver who has been awake for 17-19 hours had the same driving ability as an individual with a blood-alcohol level of 0.05%. They are therefore twice as likely to be involved in a road incident where someone is seriously injured or killed, compared with a driver who is not tired.
- A driver who has been awake for 24 hours had the same driving ability as an individual with a blood-alcohol level of 0.1%. They are therefore seven times as likely to be involved in a road incident where someone is seriously injured or killed, than a driver who is not tired.

Source: Dawson and Reid 1997

Similarly, drivers who have slept for 4-5 hours in the past 24 hours are 4.5 times more likely to crash than drivers who have slept 7 hours or more. Drivers who have slept 4 hours in the past 24 hours are 11.5 times more likely to crash than drives who have slept 7 hours or more (Tefft 2016). As the number of hours a person is awake increases so does their mean reaction time:

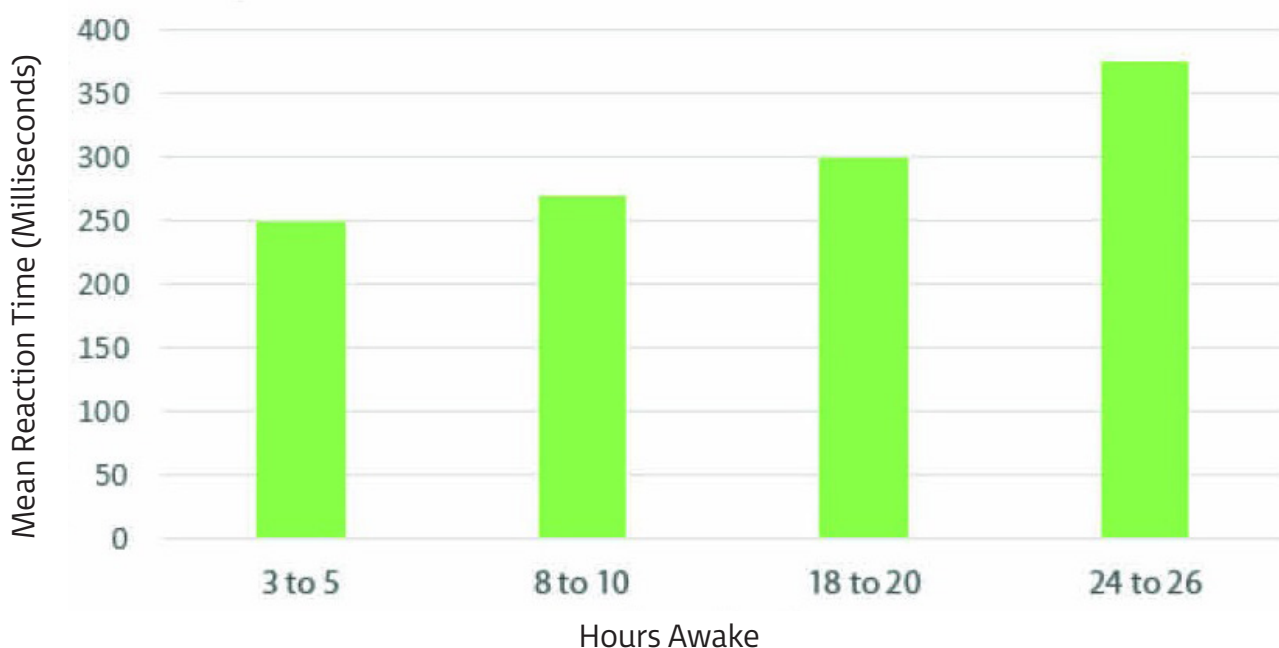


Figure 1: Hours awake v mean reaction time for a driver

Causes of fatigue

The general consensus (Hartley, Penna, Corry and Feyer, 2000; Williamson, Feyer, Friswell and Finlay-Brown, 2000) appears to be that the three main causes of fatigue are:

- Lack of restorative sleep.
- Time of day or circadian factors.
- Time spent performing a task.

Individual factors such as age, physical fitness and medical condition (for example, sleep disorders) also affect the incidence of fatigue (HORSCOCTA, 2000).

Due to the large distances truck drivers are required to drive and the length of time taken to complete these distances, time of day or circadian factors and time spent performing a task will contribute heavily to fatigue and fatigue-related symptoms in truck drivers.

Circadian rhythm (body clock) – Australian Transport Safety Bureau (ATSB)

Humans possess a neurobiological based sleep-wake cycle called a circadian rhythm or body clock (EPDFS, 1997; Folkard, 1997). Research has shown that there are two periods during the 24 hour circadian cycle where the level of sleepiness is high. The first period is during the night and early morning, and the second is in the afternoon (Hartley et al, 2000). During these periods of sleepiness, many functions (e.g., alertness, performance and subjective mood) are degraded (Rosekind, 1999).

The effect of the circadian rhythm in road crashes was demonstrated by Pack et al (1995) who analysed North Carolina road crash data. This study found that fatigue-related crashes corresponded to circadian variation in sleepiness, with a major peak during the night and a secondary peak mid-afternoon.

The optimum time for the body clock to require rest/sleep (circadian lows) is between midnight and 6am as well as (to a lesser extent) between 2pm to 4pm.

Time on task – (ATSB)

Research based on driving tasks has shown that the length of time spent on a task affects performance. As time spent on a task is increased, the level of fatigue is increased, reaction time is slowed, vigilance and judgement is reduced and the probability of falling asleep during the task is increased (EPDFS, 1997; HORSCOCTA, 2000).

The road transport industry is under increasing pressure to deliver goods on time over increasing distances. Drivers are expected to be able to meet and exceed tight deadlines of deliveries to avoid costly penalties and possible lost contracts. To achieve this, drivers are having to work increasingly long hours, with minimal rest time between journeys and during unsociable hours when the body clock is attempting to rest.

Despite relatively low admission of sleepiness as a problem by heavy vehicle drivers (NTC 2007), there is some evidence that a considerable proportion of Australian truck drivers may regularly drive in a sleepy state. In a national study of heavy vehicle drivers (n=613), 36% of drivers reported 'nodding off for a moment' on some occasion in the previous 12 months of work (NTC 2007). In another study of 1,249 truck drivers, approximately 14% admitted to falling asleep at least occasionally whilst driving for work (Arnold, et al. 1997), while another survey of 1,007 truck drivers found that nearly half reported that they had dozed off in the previous year (Williamson, et al. 2001).

While sleepy driving may be related to driver attitudes toward break-taking (Adams-Guppy. J, Guppy A., 2003), pressures from managing organisations and other parties in the supply chain may have substantial influence on a driver's perceived

need to continue driving (McDonald, N. 1981). Many drivers have reported that the schedules imposed by management made it difficult to take breaks when sleepy (Adams-Guppy, J, Guppy A., 2003). Another study found that a considerable proportion (57%) of drivers regularly exceeded regulated maximum hours, with “tight schedules” as the most common reason cited, followed by “in order to return home” and “to do enough trips to earn a living” (Williamson, et al. 2001). Moreover, drivers reported engaging in risky driving behaviours to the point of breaking road rules in order to meet delivery deadlines (Williamson, et al. 2001). Hence, many professional truck drivers may lack sufficient control in determining when they work.

An American study (Beilock, R. 1995) of schedules of 498 long-distance drivers found that, assuming average legal speed limits of 55 mph, 26% of the drivers had schedules that required them to exceed speed limits in order to meet the schedule. Assuming average travelling speeds of 50 mph, the vast majority of long distance drivers would have to work more than 40 hours a week, half would work more than 65 hours and a quarter over 81 hours a week.

An Australian study (Dalziel, et al. 1997/07) examined fatigue-related variables and their relationship with accident involvement in a group of 42 Sydney metropolitan taxi drivers over a two-year period. The authors found that driver time on the road is often considerable: 67% of those surveyed drove at least 50 hours per week, yet time off in long shifts (up to 12 hours) was often short (as low as 3 minutes, with an average of 37 minutes).

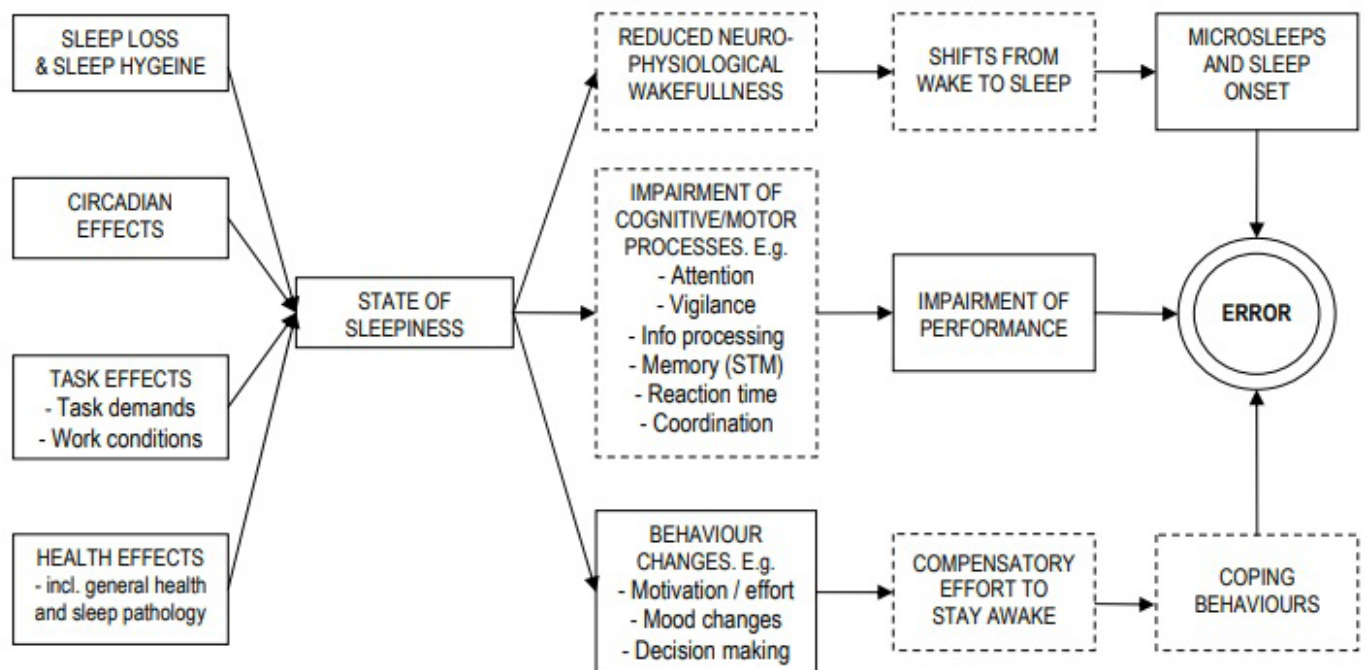


Figure 2: An overview of truck driver sleepiness regarding its potential causes and effects on sleep onset and performance impairment as precursors to error based on previous research

Fatigue risks

The driving public, in recent times, has been saturated with campaigns to address drink driving and speeding. These campaigns have had measurable success, and this has been reflected in the overall drop of KSI through both behaviours. However, convincing the driving public that fatigued-driving is a problem is proving to be a harder case to sell.

Research conducted by Philip et al. found that sleep restriction significantly increased the risk of inappropriate line crossings by 8.1 times in an on-road study conducted on an open French highway (Baulk et al 2006).

The problem of fatigued-driving is not confined to car drivers. A 2017 NSW study stated that in 2015 10 motorcycle riders died in fatigue-related crashes and 86 were seriously injured. These types of crashes are even more dangerous for motorcycle riders as they are virtually unprotected. Generally, fatigue-related crashes involve high speeds, single vehicle, a head on collision or a run-off road incident.

There are many causal factors that contribute to crashes, the table below (National Road Safety Strategy 2011-2020) outlines the most common. Figure 3 highlights the fact that fatigue is a contributing factor in as many cases as drink driving and more than drug driving.

	Proportion of total deaths (%)	Proportion of total serious injuries (%)
Speeding	34	13
Drink driving	30	9
Drug driving	7 ^a	2
Restraint non-use	20	4
Fatigue	20-30 ^b	8

Note: categories are not mutually exclusive.

- Estimate excludes fatalities involving both alcohol and other drugs, which are included in the drink driving estimate.
- Estimates of fatigue involvement in serious casualty crashes vary considerably. However, it is widely recognised as a significant contributing factor.

Figure 3: Deaths and serious injuries by main behaviour factor

The National Road Safety Action Plan concludes that “fatigue is four times more likely to contribute to impairment than drugs or alcohol.”

In recent years, the WA Government have been successful in achieving results to lower the incidents of risk-taking behaviours such as drink or drug related driving and speeding, however, in the same time, there has been a 21% increase fatigue related serious crashes.

It is very difficult to quantify with a reasonable degree of precision the incidents of fatigue in serious road crashes, however, latest statistics indicate that around 70% of all crashes that result in death or serious injury involve poor decision making, distraction or inattention that are all symptoms of fatigue.

COUNTERMEASURES

The four Safe System cornerstones of the government's road safety strategy, Towards Zero, all touch on fatigued-driving initiatives:

Safe Road Use – Integrating behaviour change programs with improved enforcement to make them more powerful and addressing impaired driving (alcohol, drugs, fatigue and distraction), restraint use, graduated licensing and speed choice.

Safe Roads and Roadsides – Investing in Safe System infrastructure improvements (such as the Rural Run-off Road Crash Program).

Safe Speeds – Enhancing speed enforcement and further reflecting on the appropriateness of WA's speed limits.

Safe Vehicles – Promoting the uptake of safer vehicles and key safety features, particularly by government and corporate fleets (such as Lane Departure Warning and Intelligent Speed Assist).

Legislation

General

Road Traffic Act 1974 – Section 61 (Dangerous Driving)

Road Traffic Act 1974 – Section 62 (Careless Driving)

Road Traffic Code 2000 – (Generally e.g.: contravening traffic control signals, failing to give way, etc.)

There is no specific legislation in Western Australia that outlaws driving whilst fatigued, however, general provisions of the Road Traffic Act 1974 and Road Traffic Code 2000 may apply. For example, the offences of 'Careless' or 'Dangerous Driving' (including Dangerous Driving causing Bodily Harm, Grievous Bodily Harm or Death) will apply where, as a consequence of fatigue, a person's manner of driving is such that it meets the threshold of careless or dangerous driving. Additionally, minor indiscretions such as failing to give way or contravening traffic control signals that may occur as a result of fatigue are addressed in the Road Traffic Code 2000.

In New Jersey, USA, a law was enacted in 2003 that specifically criminalised knowingly driving a vehicle while impaired by lack of sleep in cases where a person was killed in a road crash. If a driver kills someone whilst knowingly driving a vehicle while impaired by lack of sleep, there are evidentiary averments that assist in prosecuting a person for vehicular homicide.

Victoria have enacted similar legislation to that of New Jersey; s.318 Crimes Act 1958 (Vic) in relation to culpable driving causing death, and how negligence there may be established if it can be proven that –

- (a) a person drove a motor vehicle when fatigued to such an extent that he or she knew, or ought to have known, that there was an appreciable risk of him or her falling asleep while driving or of losing control of the vehicle; and
- (b) by so driving the motor vehicle the person failed unjustifiably and to a gross degree to observe the standard of care which a reasonable person would have observed in all the circumstances of the case.

Heavy Vehicles

Road Traffic (Vehicles) Regulations 2014 – Part 8, Division 7 (Heavy Vehicle Accreditation)

In 2002, WA implemented the Heavy Vehicle Accreditation Scheme (requiring the introduction of a quality systems approach to the management of heavy vehicle maintenance and driver fatigue).

The State of Queensland has introduced driver work diaries for fatigue regulated heavy vehicles. These must be carried by the driver and must be completed if they are, or have been in the last 28 days:

- Working more than 100km from the base location.
- Working under any fatigue management accreditation (Basic Fatigue Management (BFM)/Advanced Fatigue Management (AFM)).
- Driving under a work and rest hours exemption.

Drivers residing in WA have to complete the diaries; however, only when they travel interstate. The initiative is not in place in WA nor the Northern Territory. It is a penalty offence to fail to complete a driver work diary.

Commercial Drivers

The Commercial Driver Fatigue Management Code of Practice is a set of operating standards in WA, under the Occupational Safety and Health Act, aimed at regulating heavy vehicle companies to limit operating outside of accepted industry practice. Introduced in 2003, the code has recently been updated to place more emphasis on hours of rest as opposed to hours of work.

Enforcement

Owing to the difficulty of accurately measuring fatigue, it is extremely difficult to enforce measures to combat it. Currently, there is no specific offence that can apply universally to provide a measure of compliance for what is an unacceptable driver behaviour. In order to pursue a driver for fatigue-related driving, a police officer must observe acts of driving that could constitute fatigue-related behaviour, such as swerving or drifting across road lanes, etc.

The sparsity of reliable and affordable fatigue warning systems in vehicles means that driver self-regulation is currently the most reliable attempt at addressing the problem.

In-vehicle technology

Vehicle manufacturers recognise that in-vehicle safety features now compete on the same level as in-vehicle sound and connectivity technology. Vehicles are now being fitted, as standard, with features such as:

- Autonomous Emergency Braking (AEB)
 - » Detects the speed and distance of objects in the vehicle's path and automatically brakes if the driver does not respond in order to minimize the severity of the impact.
- Following Distance Warning
 - » Uses radar to determine the distance to the vehicle travelling in front and warns the driver if the distance is too close.
- Lane Support Systems (LSS)/Lane Keep Assist (LKA)
 - » Recognises lane markings and alerts the driver through either audible or visual warnings or vibration of the steering wheel if the vehicle is leaving the lane without indicating. Active systems may automatically steer the vehicle back within the lane if the driver fails to do so.
- Pre-crash Systems
 - » Detects that a collision is imminent and takes action by preparing the vehicle and the occupants for the impact by reducing slack in seat belts, adjusting seating positions and shutting windows.

Australasian New Car Assessment Program (ANCAP) is an independent vehicle safety advocate. The Road Safety Commission is a member of ANCAP and provides research and promotion of ANCAP. ANCAP publishes crash results and awards a safety rating, based on a star system of between 1-5 stars, indicating the level of safety provided by the vehicle.

Vehicle manufacturers now realise the importance of organisations like ANCAP and that the buying public are now doing more research into safety measures prior to buying a car. The safety system is now expanding into the used car market. From 1 January 2018, ANCAP extended the safety rating measures to include: adult occupant protection; child occupant protection; vulnerable road user protection and safety assist technology.

Driver monitoring systems

Driver behaviour accounts for many of the driver errors that lead to crashes. A European consortium of research centres (HARKEN) have been working to develop a seat belt and seat cover system that monitors biometric outputs of a driver's body. By monitoring the physiological and mechanical activity related to respiration and the cardiac cycle, the system is able to detect when a driver presents symptoms associated with fatigue. The system, once having detected fatigue symptoms, vibrates the seat in an attempt to bring the driver back to an alert state. The system is still in a development state and is not yet available to the general market.

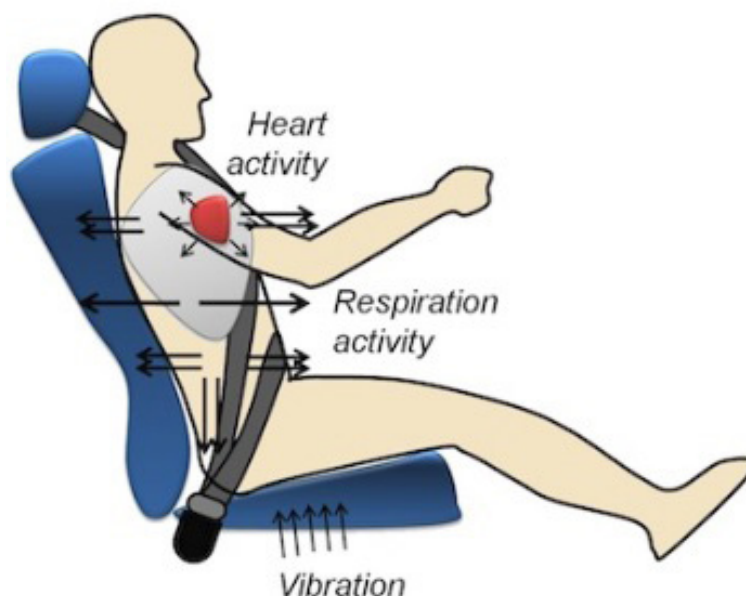


Figure 4: Integrated HARKEN seat system warning drivers of suspected fatigue symptoms

The Seeing Machines FOVIO Driver Monitoring system uses computer vision algorithms to accurately and in real-time, measure a driver's visual attention to their environment, assessing the driver's degree of drowsiness and ultimately detect if the driver has passed a threshold of risk. If the driver fails to pass the threshold, intelligent alerting systems warn the driver, as well as informing a vehicle's wider control systems. The system can detect microsleep events and also, in the event of a medical event, if the driver is unconscious.

Seeing Machines has installed (in some cases, retro-fitted) technology into over 200 fleets worldwide. This type of technology is widely available and is now being trialled in autonomous vehicles, such as the Guardian Backup-driver Monitoring System (BdMS). Seeing Machines driver-assist technology can be sourced within WA.

Infrastructure measures

It is difficult to build roads to recognise fatigued-driving; however, measures can be taken to provide some protection or early warning for drivers. In WA, the Regional Run-off Road Program has attempted to improve roads in order to add a modicum of protection to drivers. Improvements include:

- Installation of audible edge lines (that produce a bumping sensation and noise if the car drifts to the edge of the road).
- Widening of road shoulders on the regional network.
- Flexible wire rope safety barriers.



Figure 5: Infrastructure Fatigue Improvements

Education

Information regarding driving fatigued and the best ways to revive and refresh the driver are provided through the Commission, Main Roads WA, RoadWise, Toll, Worksafe and other like-minded organisations.

The Commission regularly targets road safety issues and recently advertised fatigued-driving through the 'Don't trust your tired self' television campaign.

The Department of Justice (DoJ) administers an Aboriginal Driver Training and Education Project, which aims to deliver a range of services to provide Aboriginal people who are in the criminal justice system with culturally appropriate driver training and education services.

The Keys for Life (School Drug Education and Road Aware (SDERA)) program supports year 10-12 students and provides opportunities for participants to gain pre-driver education prior to gaining a WA driver's licence.

Royal Automobile Club WA (RACWA) runs the On the Roads Program, aimed at year 10-12 students. The program aims to influence risk reduction, increasing resilience and encourages responsible behaviour.

Cranbrook Rest Area Project: This project aimed to reduce heavy vehicles travelling at speed through the Great Southern town of Cranbrook by providing a safe, designated stopping place for all heavy vehicles, as well as other road users.

In 2017/2018, the Commission contributed to 22 of the 77 Road Safety Community Grant Committee supported grants, aimed to tackle the run-off road, distraction and fatigue problems.

Dedicated fatigue campaigns have been instigated across the state. In October 2017, the Fighting Fatigue in Regional WA campaign was launched, and March 2018 saw the Easter Fatigue campaign take place.



Figure 6: Driver Reviver Layby

Queensland Transport and Main Roads (TMR) alerts drivers by a series of road signs that they are in a recognised fatigue zone.



Figure 7: Queensland Fatigue Zone Trivia Sign

The signs aim to keep the driver aware of their surroundings during a monotonous journey.

FUTURE FOCUS

Legislation

Future directions in legislation may involve specific legislative provisions to deal with deliberately driving whilst fatigued. Main Roads WA are currently reviewing the Heavy Vehicle Accreditation Scheme with likely recommendations to amend the Road Traffic (Vehicles) Regulations 2014 with a focus on compliance and audit requirements. Consideration may also be given to increasing the use of telematics systems and fatigue monitoring systems in heavy vehicles.

Community engagement and education

Road safety researchers will continue to strive to better understand the causes of fatigue. The research will be utilised in strategies to help facilitate and better manage fatigue, either through education, technology or changes to legislation.

Infrastructure

The Run-off Roads Project is expected to continue identifying high risk roads and installing road safety road treatments such as audible edge lining, sealing and widening road shoulders.

REFERENCES

Towards Zero Road Safety Strategy 2008 to 2020

National Road Safety Strategy www.roadsafety.gov.au

National Road Safety Action Plan 2018 – 2020

National Road Safety Strategy 2011–2020, Australian Transport Council

Safework Australia: www.safeworkaustralia.gov.au/fatigue

Reported Road Crashes in Western Australia 2015, Road Safety Commission

Williamson, A.M., & Feyer, A.M. (2000). Moderate sleep deprivation produces impairments in cognitive and motor performance equivalent to legally prescribed levels of alcohol intoxication. *Occupational and Environmental Medicine*, 57(10), 649–655

Dr. Baulk, S.D., Biggs, S., Dr. v.d.Heuvel, C., Dr. Reid, K., Prof. Dawson, D., (2006). Managing Driver Fatigue: Quantifying real world performance impairment. Australian Transport Safety Bureau

Dawson, D. & Reid, K. Fatigue, alcohol and performance impairment. *Nature*, 1997; 338(6639): 235

Tefft, B. C. Acute Sleep Deprivation and Risk of Motor Vehicle Crash Involvement 2016. AAA Foundation for Traffic Safety – www.aaafoundation.org

Dobbie, K. Fatigue related crashes: An analysis of fatigue related crashes on Australian roads using an operational definition of fatigue, Australian Transport Safety Bureau; 2002:30

Philip, P., Vervialle, F., Le Breton, P., Taillard, T. & Horne, J. A. Fatigue, alcohol, and serious road crashes in France: factorial study of national data. *British Medical Journal*, 2001; 322: 829–30

Drowsy driving and automobile crashes. Washington, DC, National Center on Sleep Disorders Research/National Highway Traffic Safety Administration Expert Panel on Driver Fatigue and sleepiness. 1996. https://one.nhtsa.gov/people/injury/drowsy_driving1/drowsy.html

Hartley LR, Penna F, Corry A and Feyer AM (2000). Comprehensive Review of Fatigue Research. Report Number 116: Institute for Research in Safety and Transport.

Williamson A, Feyer AM, Friswell R and Finlay-Brown S (2000). Demonstration Project for Fatigue Management Programs in the Road Transport Industry: Summary of findings. CR192, Canberra: Australian Transport Safety Bureau.

House of Representatives Standing Committee on Communications, Transport and the Arts (2000). Beyond the Midnight Oil: an inquiry into managing fatigue in transport. Canberra: The Parliament of the Commonwealth of Australia

Expert panel on driver fatigue and sleepiness (1997). Drowsy Driving and Automobile Crashes. Washington DC: National Centre for Sleep Disorders Research/National Highway Traffic Safety Authority

Folkard S (1997). Black times: Temporal determinants of transport safety. *Accident Analysis and Prevention*, 29(4), 417–430

Hartley LR (2000). Murdoch University submission to the House of Representatives Inquiry into Managing Fatigue in Transport

Rosekind M (1999). Fatigue in transportation: Physiological, performance and safety issues. Evaluation of US Department of Transportation Efforts in the 1990s to Address Operator Fatigue. Safety Report NTSB/SR-99/01, Washington DC

Pack AI, Pack AM, Rodgman E, Cucchiara A, Dinges DF and Schwab CW (1995). Characteristics of crashes attributed to the driver having fallen asleep. *Accident Analysis and Prevention*, 27(6), 769–775

National Transport Commission (Australia). Reform evaluation survey on driver fatigue: A national study of heavy vehicle drivers; 2007 May.

Arnold PK, Hartley LR, Corry A, Hochstadt D, Penna F, Feyer A-M. Hours of work, and perceptions of fatigue among truck drivers. *Accident Analysis and Prevention*. 1997; 29: 471-477.

Williamson A, Sadural S, Feyer A-M, Friswell R. Driver fatigue: A survey of long distance heavy vehicle drivers in Australia. National Road Transport Commission (Australia); 2001 September. Report No. CR 198.

Adams-Guppy J, Guppy A. Truck driver fatigue risk assessment and management: A multinational survey. *Ergonomics*. 2003; 46(8): 763-779.

McDonald N. Safety and regulations restricting the hours of driving of goods vehicle. *Ergonomics*. 1981; 24: 475-485.
R Beilock, Schedule-Induced Hours of Service and Speed Limit Violations Among Tractor-trailer Drivers, *Accident Analysis and Prevention* Vol. 27(1), 1995

J R Dalziel et al, Motor Vehicle Accidents, Fatigue and Optimum Bias In Taxi Drivers. *Accident Analysis and Prevention*. 1997/07. 29(4) Elsevier Science Ltd, Exeter, UK

Misa, R., Conduit, R., Coleman, G. 2011. Sleepy driving in truck drivers: Insights from a self-report survey