SUBMISSION BY SOUTH AUSTRALIA

TO THE

PARLIAMENT OF AUSTRALIA'S

HOUSE OF REPESENTATIVES
STANDING COMMITTEE ON COMMUNICATIONS, TRANSPORT AND THE ARTS

INQUIRY INTO MANAGING FATIGUE IN TRANSPORT

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Abstract

Human error is recognised as a cause of many crashes in transport, and while we know a great deal about the contribution of alcohol and speed to accidents involving human error, the role of fatigue is not fully understood. We are now beginning to understand, however, that the role of fatigue in accidents may be more important than first anticipated.

There are many factors that affect the 'alertness' of a driver and each of these factors has cumulative effects. The causes of fatigue for an individual are therefore difficult to isolate, but to some extent, can be controlled. This submission describes existing fatigue-management strategies and suggests some further possible initiatives.

1. Structure of This Submission

This submission is presented in four sections addressing in turn each of the Inquiry's Terms of Reference.

Compared with rail, sea and road, air transport is relatively highly regulated worldwide and particularly so in Australia by means of the Commonwealth Government Aviation Safety Act. The States do not therefore have the same involvement in managing fatigue in air transport as for other modes.

This submission will therefore focus on road rail and marine transport.

2. Causes of, and Contributing Factors to Fatigue in Transport

The Federal Office of Road Safety/Worksafe Australia Study (cited in National Road Transport Commission, 1992) used 'fatigue' to not only mean feeling drowsy or sleepy, but also the inability to sustain attention and being mentally slowed.

All modes of the transport industry are characterised by long hours, irregular shifts and at times, monotony in the driving tasks. This is compounded by on-going commercial pressures to operate with fewer drivers for a given freight task. In South Australia, much of the line haul freight task is conducted through sparsley populated parts of the State, where the opportunities for driver change over are limited.

Much of the well-documented research has focussed on fatigue in road transport and although this submission draws strongly on examples from road transport, the research findings have application for other transport modes.

For example, the National Road Transport Commission (1992) found that fatigue is a contributing factor in a significant proportion of road crashes around the world. Because of its influence in crashes, considerable research resources have been devoted to the subject of fatigue. However, unambiguous evidence on which to develop research–based regulations is virtually non-existent. Among the many factors which affect the 'alertness' of a driver are:

- Caffeine: An amount of caffeine equivalent to two cups of coffee may counteract fatigue (but only temporarily).

- Alcohol and medication: low amounts of alcohol consumption interact with, and add to drowsiness, as do some medications.

- Health: those who are unfit tend to be more lethargic and some medications can contribute to drowsiness.

- Physical environment: eg; prolonged heat, cold and noise all place stress on the body.

- Road conditions: monotonous, featureless terrain, adequacy of rest facilities.

- Driving patterns and time of day: including driving between midnight and 6am; driving a substantial number of kilometres and/or a substantial number of hours

each day; driving in the midafternoon hours (especially for older persons), and driving for long periods without taking a break.

- Time since last period of rest and/or sleep loss.

Each of these factors have cumulative effects; a combination of them substantially increases crash risk (National Centre on Sleep Disorders Research / National Highway Traffic Safety Administration Expert Panel on Driver Fatigue and Sleepiness, 9/2/98).
In addition, population groups at highest risk are:

- Drivers up to 29 yrs of age (especially young men).
- Drivers over 50 yrs old.
- Shift workers, and
- People with certain medical conditions (Sleep Apnoea, Narcolepsy, Obesity).
- Those for whom driving is part of the job (car, bus and truck drivers).

3. Consequences of Fatigue in Marine, Rail and Road Transport

The consequences of fatigue are likely to be errors committed by those involved in the operation of a transport system. Although many such errors may be inconsequential, others may contribute to catastrophic events.

It is known that moderate levels of fatigue produce high levels of impairment comparable to alcohol intoxication and it has been suggested that 17 hours of sustained wakefulness lead to a decrease in performance equivalent to a blood alcohol concentration of 0.05. Furthermore, sustained wakefulness for 24 hours is equivalent to a blood alcohol concentration of 0.10 (Dawson and Reid, 1997). However, it must also be remembered that the confounding effects of the contributing factors to fatigue are such that excess sustained wakefulness is only one of many performance-impairing factors that needs to be addressed.

Past studies have shown fatigue-related road crashes to have a number of variables in terms of time of day, location, crash pattern and characteristics of the driver involved. On the basis of past research one can expect fatigue-related crashes to:

- Occur more often at night than during the day.
- Occur more in rural areas than in urban areas.
- Often involve single vehicle or involve a vehicle on the wrong side of the road, not overtaking.
- Involve the shoulder of the road.
- Often involve long distance trucks.
- Involve similar numbers of fatigued car drivers and drivers of articulated vehicles
- More often result in death to truck drivers than other non fatigue-related truck crashes.

- Involve longer trip lengths (2-4 hours or more).
- Involve low levels of alcohol.
- Involve intake of sedatives.

(Haworth, N and Rechnitzer, G; 1993)

Driver fatigue in road crashes is notoriously difficult to detect. While it is not always easy to determine the extent fatigue plays a role in individual road crashes, it is estimated that up to 60% of crashes occur at least partly as a result of fatigue (Williamson; et al, 1994).

It has long been recognised that the major offenders in fatigue-related road crashes are long distance professional drivers. This is because one of the major risk factors is driving for extended periods, and unfortunately, in the transport industry, economic pressures, company and driver incentives, as well as loading and unloading delays do not always make regular resting periods an option. Typically, truck drivers report feeling fatigued by the 14th hour of driving, and most particularly in the early hours of the morning (Williamson; et al, 1992).

A survey by Williamson, et al (1994) of 960 truck drivers revealed that almost half of the truck drivers in the survey reported experiencing fatigue while driving on at least half of their trips. Furthermore, around three-quarters of the drivers reported their driving to be worse when they were tired. Tired drivers tended to be slower to react, be poorer in gear changing and pay less attention to road signs and other traffic. An additional problem not covered in this survey, is the occurrence of drivers consuming drugs in an attempt to counteract the effects of fatigue.

By contrast, fatigue may not be as great a problem among long-distance bus and coach drivers. A study by Worksafe Australia of 250 bus and coach drivers (cited in Worksafe Australia, 1993) indicated that 85% of the bus and coach drivers interviewed only occasionally, rarely, or never experienced fatigue, suggesting that they did not suffer fatigue to anywhere near the same degree as truck drivers. In addition, stimulant use among bus drivers was found to be virtually non-existent. The study concluded that the public liability responsibilities of coach drivers and the likelihood of passengers noticing drug usage by a driver could be possible contributing factors. In addition, symptoms of fatigue would most probably be identified by passengers, providing a motivation for drivers to rest before the onset of fatigue.

4. Fatigue Management Initiatives in South Australia.

Transport SA is the South Australian Government Agency most directly involved in the management of the road, rail and marine transport system. The mission of Transport SA is to plan, develop and manage the use of an integrated transport system across the modes of rail road and marine for the movement of people and freight, in partnership with industry, the South Australian Passenger Transport Board and other stakeholders.

Transport SA's goals are to provide a transport system that meets the accessibility needs of the community, is efficient and reliable, safe and in harmony with the environment.

It is in the context of strategic partnership, and transport efficiency and safety, that the following fatigue management initiatives are currently being implemented in SA.

4.1 Rail Initiatives

Currently, rail transport is regulated under the South Australian Rail Safety Act 1996. This legislation imposes requirements on the industry, including the need to conduct audits of the industry at least once yearly to assess the industry's ability to operate within the boundaries of the legislation. Currently the legislation has no fatigue management regulations set in place at either the state or federal level. However, working conditions consisting of an amalgamation of award, union and trade agreements, effectively dictate hours of work.

National Rail and Freightcorp NSW have adopted a fatigue-management approach to setting rosters. However, until other operators adopt the same approach, there will be legitimate criticism that those who use the higher standards are commercially disadvantaged. Some rail operators consider that they are similarly disadvantaged by a low level of enforcement of hours of driving legislation in the road transport industry.

4.2 Marine Initiatives

Marine transport also has no specific fatigue-management regulations on either a state or federal level. The industry tends to be self-regulating, largely due to award conditions and historical reasons of maintaining a desired level of independence from government bodies.

Industry standards are drawn from a national and international collaboration, and due to the recognition of occupational health and safety issues, there is some movement within the industry towards training in fatigue-related matters. A study by Parker; et al, 1999 of 1806 Australian seafarers found that 70% of those surveyed reported their quality of sleep was fair or poor to very poor. In addition, approximately 65% of marine pilots reported between 4-6 hours sleep per night. This could seriously compromise safety when returning to duty, particularly when unexpected or dangerous tasks such as ship handling in heavy traffic or bad weather are performed. It was also suggested that sleep was worsened on many ships by factors such as having sleeping accommodation close to noise sources, as well as poor soundproofing of sleeping accommodation.

Due to the lack of government fatigue management initiatives for Australian seafarers, and because the results by Parker et al. (1999) show that sleep deprivation is common among pilots and engineers, a review of sleep issues in conjunction with wider issues of hours of work and rest between periods of duty could prove valuable.

Given the enormous environmental and economic consequences of shipping accidents, it may be beneficial for a thorough examination of sleep patterns and their effect on work performance to be conducted. It would also be necessary to act upon and rectify the causes for poor sleep (such as better soundproofing, two-up pilots etc).

4.3 Road Transport Initiatives

Broadly speaking, South Australia's road fatigue management initiatives can be described by the type of approach used: legislation, engineering and education. These approaches are implemented in a complementary way and form part of several broad-based management strategies.

4.3.1 Legislation

In response to proposals for further legislative controls, it is the view of the SA Department for Administrative and Information Services that the issue of fatigue management is one that sits best with the existing duty of care provisions under the *Occupational Health Safety and Welfare Act 1986*. The effects of fatigue are an identifiable hazard and, under this legislation, there is a duty of care for the employer, or a self-employed person, to identify, assess and control risks to the health and safety of themselves and other persons. This is a comprehensive duty of care and extends to all aspects of safety management.

The road transport industry and its drivers agree that fatigue is a major problem. However, the South Australian road transport industry currently has legislation in place to aid the management of fatigue in the form of the Commercial Motor Vehicles (Hours of Driving) Act 1973. This Act stipulates the length of time long distance drivers can drive before being legally required to rest or take time off.

Implementation of some new initiatives is underway with hours of driving legislation currently being considered by South Australian Parliament for incorporation into the South Australian Road Traffic Act 1961. The South Australian Parliament is the first to introduce this new legislation which will concentrate on regulating a commercial driver's total *hours of working*, rather than hours of driving, as is currently the case. There will also be opportunities for drivers and employers to become members of a Transitional Fatigue Management Scheme (TFMS) and gain greater flexibility in driving hours. The TFMS is an alternative compliance scheme whereby if driver health checks and fatigue training are undertaken, up to 14 hours of driving per day are possible, and a driver may take two days rest in 14, rather than the prescribed one day rest in seven. However, while the TFMS allows for increased working hours, it also provides for an increase in penalties.

In addition the 'chain of responsibility' will also be tightened. This means that the associated business or company of a driver caught breaking the law can be targeted and penalised at a rate up to five times greater than that of the driver.

The new regulations will also apply to the drivers of heavy trucks over 12 tonnes gross vehicle mass. This is a change from the current South Australian Act which applies to drivers of vehicles with an unladen mass of over 4.5 tonnes. Similarly, the new regulations will also apply to drivers who operate buses that are defined as motor vehicles with a capacity to seat more than 12 persons.

There is no legislative requirement that dictates hours of driving for light vehicles

4.3.2 Engineering Measures

The 1996 *National Road Safety Action Plan* included fatigue management and rural road safety as two of ten priority actions to be addressed by States and Territories. Accordingly, Transport SA is implementing a range of initiatives targeting driver fatigue, including trialing an alternative method of providing audio and tactile pavement warning to drivers who drift towards the edge of the road. The method involves the placement of additional non-reflective pavement markers at close spacings between the reflective markers normally installed on the edge line. A trial of this process is currently underway on a 16 kilometre section of the Dukes Highway near Keith in South Australia.

Transport SA will be monitoring the effectiveness of this measure before any further installations are undertaken elsewhere in the State. If the process is effective, it will enable audio tactile marking to be installed on more roads. For every 100 kilometres using the current, more expensive Audio Tactile Edge Marking system, approximately 500 kilometres can be covered using the alternative process.

In addition, as part of the National Road Safety Strategy, Transport SA has produced new guidelines for rest areas, which will be used to plan for the upgrading of rest areas on National Highways and major rural arterial roads. The guidelines address issues such as the spacing of rest stops and facilities such as lighting. The upgrading of a number of strategic rest stops will begin in the 1999-2000 financial year.

Works are also commencing in the 1998/1999 financial year to upgrade 24 car and truck parking bays between Port Augusta and the Northern Territory border, and a major upgrade of facilities at the border crossing will be completed. This project forms part of the Explorer Highway Tourist Project and is a joint initiative of the South Australian and Northern Territory Government.

During Easter 1999, South Australia Police (SAPOL) worked with Victoria Police, Transport SA, VicRoads and local road safety committees to reduce fatigue-related crashes on the Dukes and Western Highways, the major arterial link between Adelaide and Melbourne. Transport SA, in association with the SAPOL, has also erected (as of the week before Easter 1999) 13 new Reassurance Direction road signs at exits of towns (targeting both in-bound and out-bound traffic) along the Dukes Highway. These signs indicate distances to the next towns as well as the refreshment and rest services they provide. The signs also include fatigue warning advice (eg; 'Drowsy Drivers Die!') which supports a current fatigue management campaign strategy being conducted by the South Australian Government.

4.3.3 Education Campaigns

Drowsy driving in the road transport industry is agreed by both the South Australian industry and drivers to be a major problem, with drivers believing that dawn driving, poor roads, long driving hours, being involved in the loading process and poor weather are the predominant factors contributing to fatigue. However, it is not only long distance transport drivers who are at risk of fatigue, but any driver at any time.

Educating all drivers on fatigue management and helping them to understand the seriously debilitating effects of fatigue is one measure towards creating a more responsible, safer group of road users.

In support of the previously mentioned South Australian legislation and engineering initiatives, a rural public education strategy has been implemented with a further range of initiatives targeting driver fatigue, as well as country driving. The development of public education programs raising community awareness about issues relating to driver fatigue has been identified as a priority action in Australia's *Rural Road Safety Action Plan*, 1996. The initiative has included, within South Australia, the distribution of fatigue 'Smart Cards' and the pamphlet *Country Driving Hints*. These were launched in the lead up to Easter, 1998 and the 1998 Road Safety Week.

The *Country Driving Hints* brochure included sections on fatigue management, and the accompanying 'Smart Card' with the slogan 'Drowsy Drivers Die!' is directed solely at fatigue issues. The distribution of fatigue management print material is a continuing initiative.

A road safety campaign targeting driver fatigue was also implemented during Easter 1999. Throughout the Easter holiday period of 1999, the SAPOL in conjunction with 'Drowsy Drivers Die!' supplied drivers with a voucher for free tea or coffee and discount accommodation along the Dukes Highway to encourage road users to stop for rest and refreshment. The voucher also displays a strip map indicating recommended safe travel times between towns along the Highway, important road safety tips and advice on the location of rest and refreshment facilities.

Unlike the legislative requirements, both the engineering and education measures are directed at all drivers

5. Possible Further Initiatives

In a recent inquiry into a multiple road fatality in South Australia, the Coroner was most critical of the existing logbook system which he described as being "completely ineffective in ensuring that drivers do not become unduly fatigued".

South Australia considers moves beyond log books and regulated hours to be essential for possible further fatigue management tactics. The fundamental aim to have heavy vehicle drivers less fatigued and fit to drive safely on the road should be reflected in the objectives of legislation which should encourage innovation and allow flexibility in achieving compliance with the outcomes sought.

A revised regime should aim to have:

- transport operators recognising that effective fatigue management starts with them;

- acceptance of practical industry-based alternative compliance quality assurance schemes that are subject to audit by third party, independent operators.

- greater responsibility accepted by drivers and owners in meeting due diligence / duty of care obligations;

- enforcement efforts targeted on operators outside of alternative compliance/accreditation schemes to most effectively use resources;

- the possible imposition of hi-technology monitored satellite tracking and driver specific monitoring devices or similar systems included in compliance strategies.

Alternative compliance systems should ideally be developed with regard to:

- recognition of the differences between individuals in their susceptibility to become fatigued and their ability to cope with the effects of fatigue; through some means of objective assessment;

- direct measurement of fatigue through computer observation of physiological indicators or through on-board response testing;

- consideration with, time-of day weighting, of all driving, non-driving, working and non-working activities that either cause or relieve fatigue.

These considerations could possibly be combined in a fatigue assessment computer model using as inputs, individual differences, monitored fatigue levels and comprehensive uninterrupted input of activities both at work and in private, to generate forecasts for driving rostering purposes.

The South Australian Coroner noted that the current system of payment of drivers by the kilometre in the road transport industry represents a strong incentive to drive for long hours and break the law.

Finally the Coroner called for stronger application of the Occupational Health Safety and Welfare Act to the heavy vehicle industry and South Australia has recently set up a process for improved inter-agency monitoring of work practices in the freight industry.

Another possibility which is suggested by the reported differences in attitudes to fatigue in the bus, coach and truck sectors as discussed earlier in this submission, is to focus on the liability associated with errors resulting from fatigue mismanagement.

The Commonwealth Government as regulator of the insurance industry, should consider the notion of appropriate liability. This could be done by providing for insurers such as the Motor Accident Commission in South Australia to recover costs from the transport operator if it can be proved that pressure has been put on the driver by their employer to drive excessive hours.

References

Dawson, D and Reid, K. (1997). *Equating the Performance Impairment associated with Sustained Wakefulness and Alcohol Intoxication*. Pre-press manuscripts. The Centre for Sleep Research. Adelaide, South Australia.

Dawson, D; Roach, G; Reid. K and Barker, A. (1997). *Australian Railways: shiftwork and workload study final draft report.* The Centre for Sleep Research. Adelaide, South Australia.

Haworth, N. and Rechitzner, G. (1993). *Description of Fatal Crashes Involving Various Causal Variables*. Report No CR119, Federal Office of Road Safety, Canberra, ACT.

National Road Transport Commission. (October, 1992). *Driver Working Hours: Technical Working Paper No 5*. Melbourne Victoria.

National Centre on Sleep Disorders Research / National Highway Traffic Safety Administration Expert Panel on Driver Fatigue and Sleepiness. *Drowsy Driving and Automobile Crashes*. (http://www.nhtsa.dot.gov/people/perform/human/drowsy.html; last accessed on 9/2/98).

Williamson, A.M.; Feyer, Anne Marie; Frisnell, Rena.; Leslig, David. (1994). *Strategies to Combat Driver Fatigue in the Long Distance Road Transport Industry Stage 2: Evaluation of Alternative Work Practices.* Federal Office of Road Safety, Canberra.

Worksafe Australia. *Fatigue No Problem For Coach Drivers.* (August 13, 1993). Australasian Bus and Coach. pp29-30.

Parker, A.W; Hubinger, L.M; Green S.; Sargent, L; Boyd, R. *A Survey of the Health, Stress and Fatigue of Australian Seafarers* (FASTOH Report). (http://www.amsa.com.au ; last accessed on 27/5/99).