

DISCUSSION

The present results revealed that, for the majority of drivers, fatigue is part of the long distance driver's job. Most drivers reported feeling fatigued at least occasionally, with more than half reporting that they experienced fatigue on the last trip. This is not surprising because, essentially, the human organism is not well designed for vigilance tasks like the job of long distance driving. As discussed in the introduction, we know that there are limits to the ability to sustain alertness in situations where there are long periods of low level stimulation (Krueger, 1989; Moore-Ede et al, 1988; Warm, 1984). Over periods of time under such conditions, human operators experience lapses in alertness which are not under voluntary or conscious control.

Drivers in this study also reported that much of their driving occurred at night, with many drivers starting trips in the night. Many studies have demonstrated that human physiological and psychological functions follow a 24-hour cycle related to diurnal activity (Rosa et al, 1990; US Congress, Office of Technology Assessment, 1991). These circadian rhythms have been shown to affect performance such that when there is a mismatch between the nature of the task required, and the time of day at which it must be performed, then performance deteriorates (Folkard and Monk, 1985). Because performance of vigilance tasks like long distance driving are so demanding of effort and alertness, they deteriorate substantially during the midnight to dawn hours, when physiological arousal is at a low point. Thus, the difficulties that human operators have with performing low level stimulation jobs such as driving, in general, are at their worst during those hours (Folkard and Monk, 1985; Rosa et al, 1990). The most likely time for drivers in this study to report experiencing fatigue was between midnight and 0600 hours.

Thus, it is inevitable that there will be periods during which drivers will find their alertness waning. To maintain the level of attention required to perform the job of

driving at such times, drivers must exert additional effort. Simply having to cover the distances, therefore, is one of the major ways in which fatigue affects driving performance. More effort still is required to maintain performance of any type of work during the early hours of the morning, when the human organism is at its most vulnerable for this type of job. The additional effort required to do the job at such times can make the driver more tired, no matter how far he has driven.

Drivers reported not only starting trips at night, but also working through an average of about 3 nights per week. This means that, for at least a substantial part of the week, drivers are awake and working when they should normally be asleep, and vice versa. Such disruption of normal physiological function on a regular basis is in itself fatiguing (Akerstedt, 1990; Knauth and Rutenfranz, 1987; Rosa et al, 1991) and only serves to further compromise the already considerably flawed match between human operator and the driving task.

Therefore, based on existing knowledge about the impact of shiftwork and night work on performance (Folkard and Monk, 1985) and about long and unstimulating jobs on performance (Warm, 1984), the finding in this study that fatigue is part of the long distance driver's job is hardly surprising. The question is what can be done about it.

The present study provides a unique opportunity to gain some answers. By examining what drivers are actually doing in the job and how they deal with the problem of fatigue, we obtain vital baseline information about what solutions to fatigue already exist and how well they work. By canvassing drivers' views about what they think could be done to better deal with the problem, we obtain equally vital information about both the acceptability of various new strategies as well as their perceived effectiveness. While drivers were not specifically asked about acceptability and effectiveness of the various strategies, we know from the pilot work for this study that the two factors were intertwined in drivers' judgements about the helpfulness of the strategies. Knowing about the acceptability of possible solutions provides a much more informed basis for decision-making about which

strategies are most likely to be successful at reducing fatigue.

It is clear from these results, that drivers' current work practices will on most trips cause them to experience fatigue and, for a reasonable proportion of drivers, cause them to break the driving hours regulations. However, the results also suggest that the reason for the way drivers do their job is not lack of responsibility or lack of awareness of the impact of fatigue on driving performance. Indeed, the majority of drivers are aware that they need adequate rest preparatory to a trip. This can be seen in the result that more than three quarters of drivers rested or slept for at least 5 of the 10 hours immediately preceding the last trip. Rather, it appears that drivers are unable to satisfy the demands of the job within the current driving hours regulations.

Drivers were also clearly aware that there were signs in their driving performance associated with being fatigued. Most reported being aware that their driving deteriorated when they were fatigued. Most commonly, they recognised that they became slower to react, they drove too slowly and that their steering and gear changing deteriorated. That driving is adversely affected in such ways as slower reactions means that driver fatigue is not only a problem for the health and safety of the driver but also for the community at large. There was considerable consistency in the drivers' reports of factors which, in general, contribute to driver fatigue for them. The condition of roads, adverse weather conditions, driving at dawn, long driving hours, and loading/unloading were all factors identified by drivers as aggravating their level of fatigue and, thus, most likely requiring more effort of the driver. This consistency is not remarkable, because, as already discussed, human beings are limited in their capacity to perform the driving task even under ideal conditions. When the less-than-ideal conditions highlighted by drivers as contributors to fatigue are added to the driving task, these limitations are further stretched because even more effort is required.

Knowing that there are universal contributors to fatigue gives us general targets for attention in the arena of preventive efforts. For example, while poor roads are a

difficult proposition to improve, attention to scheduling and efficiency in loading procedures could certainly make an impact on several of the other contributors.

Another useful approach to the development of better fatigue management strategies is to look at what drivers do to help themselves in managing fatigue. While a particular driver's methods for dealing with his fatigue may be constrained by the pressures and demands under which he operates, they will certainly provide some ideas about what drivers find is successful. In this study the most popular ways in which drivers overall currently deal with fatigue fell into two broad categories. First, there are those practices which are essentially temporary superficial ones which merely briefly alleviate the symptoms, for example listening to the radio or to music, improving ventilation in the truck, having a drink containing caffeine and walking around the truck and kicking the tyres. The second type of strategy acts more substantially to promote recovery from fatigue or prevent loss of alertness. The two most prominent examples of this second type of strategy were stopping to have a sleep and the use of stay-awake drugs.

Reporting the use of stay-awake drugs was not uncommon, with almost one third of drivers using them at least some of the time. Among the drivers who used them, a significant proportion considered them to be one of the most effective ways of maintaining alertness beyond its normal limits. In addition, just over 40% of drivers indicated that allowing the use of stay-awake drugs under prescription would be a very helpful solution to the problem of fatigue. It seems that a small group of drivers across all sectors of the industry feel that they need stay-awake drugs in order to do their trips as scheduled.

The most revealing aspect of this study came from examining the influences of sectorial differences within the overall sample. The nature of a driver's employment status and type of driving operation are likely to influence the way the work is done, and, consequently, could be expected to influence the experience and view of fatigue.

There were no major sectorial differences in the factors which most commonly contributed to fatigue. To some extent,

this is perhaps not surprising, since, as discussed earlier, these aspects may be fundamental contributors to fatigue. It seems that none of the different ways of doing the job described in this study, either in terms of type of operation or employment status, buffer drivers from these fundamental contributors to fatigue.

Nor were there any sectorial differences in the ways in which fatigue affected driving. It is conceivable that a given work practice might have built-in ways of allowing early alleviation of fatigue such that fatigue did not persist to the extent that driving skill deteriorates. Clearly, none of the ways of doing the job that were examined in this study did very much to change significantly the effect of fatigue on driving. Indeed, it may be that, by definition, the effects of fatigue on driving will always involve quantitative rather than qualitative improvements in response to various strategies, and, therefore, that the success of any strategy must be evaluated in terms of frequency of fatigue-related decrements in performance.

Nevertheless, there were some differences between the subgroups which may modify their experience of fatigue. The groups who appeared to fare the best were staged drivers, most of whom worked for large companies, and independent owner-drivers. This is a most interesting finding since these groups do very different types of driving.

The reasons for the advantage enjoyed by staged driving are fairly obvious. In the staged operation, drivers were less involved in loading, did shorter trips and had shorter weekly working hours, thereby removing some of the components which increased the effort required for drivers from other sectors.

The more surprising element in these data is the relatively low level of fatigue reported by owner-drivers. The popular view of the owner-driver sector suggests that these drivers are subject to inordinate pressures in order to keep regular work, and that these pressures, especially in depressed economic times, may be overwhelming enough to force the drivers into a range of unsafe practices such as discount rates overloading, tighter schedules and the like. The data in this study paint a rather different picture of this

group. It appears that, while the pressures certainly exist and the operating conditions may be far from ideal, there are some relative benefits in being an owner-driver.

Owner-operators were more commonly involved in loading activities, consistently did longer trips and had longer weekly working hours. They should, therefore, have been among the most heavily burdened groups. It is unlikely that they are less prone or less subject to experiencing fatigue than other drivers. Yet, they appear able to offset the toll of these factors by having the flexibility to arrange the structure of their trips. As trips increased in length all drivers were more likely to take longer breaks and be more likely to take breaks for non-work reasons but nowhere was this effect as apparent as for independent owner-drivers. Independent owner-drivers were also more likely to nominate sleep as their current strategy of choice to deal with the problem of fatigue. They were better able to prepare for a trip by spending more of the time immediately before a trip sleeping or resting, and because they were more likely to be able to schedule their starting times, independent owner-drivers had fewer starting times in the midnight to dawn hours. Thus, the pattern of work reported by independent owner-drivers seems to be better planned according to their own needs and physiological rhythms.

Apart from the relatively lower level of fatigue reported by staged drivers, company employees as a group were not necessarily protected from experiencing fatigue as a problem. Only employees of large companies tended to be low reporters of fatigue. This probably reflects that, to a large extent, many employees of small and medium companies appear to be subject to many of the same pressures that influence owner-drivers: they are involved in loading activities, they get paid trip money rather than a weekly wage, and, overall, the distances covered by these groups were not vastly different to those covered by owner-drivers. Yet, employee drivers from small and medium companies are less likely to have the flexibility of independent owner-drivers to arrange the schedule of their trips to suit themselves. This was seen in the finding that, although employee drivers were similarly likely to need to break the driving hours regulations, they were more likely to include tight schedules as a reason for this, when compared with

other groups. This lack of flexibility may account for these drivers faring worse than might be expected, and worse than owner-drivers, given that they enjoy certain securities as employees.

Two-up drivers, the majority of whom were working for small and medium companies as either employees or owner-drivers, were among the worst off in terms of experiencing fatigue. One of the supposed main benefits of two-up is to provide a mechanism to manage fatigue across long distances, namely, taking rest whenever it is needed. The results of this study suggest, however, that the operation does not appear to achieve this outcome. On the one hand, two-up drivers were doing the longest trips and working longer weekly hours. On the other hand, the availability of the relief driver would be expected to allow two-up drivers to better manage fatigue by giving them considerable flexibility in arranging their trip schedules including the timing and length of breaks.

As expected, two-up drivers were spending proportionally more of their trip time in breaks. Yet these drivers were among the highest reporters of fatigue. Unfortunately, it seems that the restorative power of the breaks taken in two-up operations is limited. One problem may be that the rest in a two-up operation is more broken than in other operations. Recent findings have certainly highlighted the effects of disrupted rest for two-up drivers in crashes. In a US study, Hertz (1988) found that accumulating the required eight hours of rest in two sleeper-berth shifts, rather than in one shift, significantly increased the risk of drivers being involved in a crash. However, importantly, the risk remained the same regardless of whether this non-consecutive rest in the sleeper berth was taken as part of a two-up operation or a single operation. These results indicate that it is not the two-up operation per se which causes the problem, or even taking the rest in the truck, be it moving or not. Rather, it is the timing and broken nature of the rest.

The relatively high level of fatigue reporting among two-up drivers may also be related to the ways in which they currently attempt to deal with the problem. Two-up drivers were at least as likely to use superficial fatigue management techniques such as having a drink containing

caffeine or listening to the radio, as they were to have a sleep. The fact that they use less effective fatigue management strategies may be because their schedules do not permit other solutions. Alternatively, the use of these strategies may reflect that these drivers do not find the rest available to them to be particularly effective.

Perhaps the most obvious explanation for the cost to the driver of the two-up operation is that this group did the longest trips. The sheer distances covered, and therefore the amount of reasonably continuous time on the road involved, might well outweigh the benefits of having access to a relief driver. It may be that the job, as it is presently practiced by two-up drivers, is beyond even the capacities of two drivers working a team.

The fact that two-up does not provide the relief to driver fatigue one might expect, is also reflected in the strong finding that drivers overall prefer single operations to two-up. Very few drivers other than those currently operating two-up, actually expressed a preference for this type of operation. This finding has also been reported at a more anecdotal level by Henderson (1990). In fact, in the present study, those drivers with past experience of two-up driving were very unlikely to prefer it.

In his recent review of safety issues associated with two-up driving, Henderson (1990) points out that since there are very few studies which allow direct assessment of the costs and benefits of the two-up operation relative to single driving, there is little scientific evidence upon which to base a verdict regarding two-up driving. Overall, however, he concludes that when the same conditions of driving are directly compared, taking account of such factors as broken rest and irregularity of hours, two-up does not appear to be more unsafe than single operations. In contrast, the present results suggest that these drivers do fare worse than single drivers, at least in terms of experienced fatigue, and that the conditions under which two-up is driven currently may not be beneficial. Equally importantly, two-up was not generally popular among drivers.

It is possible that the benefits of the two-up system of driving have been over-weighed by the fact that the current

work practices in the industry are to cover extremely long distances using this type of operation. If the distances covered were reduced, it may be that the benefits of two-up would emerge.

With few exceptions, drivers were consistent in nominating a small number of strategies which they thought would improve driver fatigue in the long distance road transport industry. These were improvements to roads, the introduction of more flexible hours, the easing of tight schedules and improvements to loading and unloading. Improvements to infrastructure like roads are clearly important. Not only did most drivers report improvements to poor roads as the most helpful strategy, this strategy was also nominated most frequently as a contributor to fatigue. Unfortunately, this strategy would be difficult to achieve in the short-term, however, its overwhelming prominence must be noted.

The other strategies judged to be very helpful reflect drivers' recognition of the need for a better arrangement of the structure of trips and reducing the amount of additional effort imposed on the driving task by non-driving factors. These strategies, requiring as they do consideration of the problems of scheduling and improving the efficiency of loading operations, are more promising targets on which to focus. To a considerable degree, these preferred strategies reflect the factors nominated by drivers as being the main contributors to fatigue. For example, the judgement that easing tight schedules and the introduction of more flexible hours would be very helpful strategies reflects to a large extent that practices such as driving at dawn and long driving hours were commonly reported as contributors to fatigue. A more specific example was seen in the case of single two-way drivers. This group was the only one to nominate the banning of driving in the early hours of the morning as being among the most helpful strategies. Clearly this choice reflects the fact that single two-way drivers, more often than any other group, started their trips in the early hours of the morning and that these early starts were seen as contributing to fatigue.

Overall, the focus of the perceived causes of fatigue and the most preferred possible solutions highlighted by drivers was consistent. Both suggest the need for evaluation of the

organisational aspects associated with long distance driving in looking for ways to better manage driver fatigue.

The strategies which were least preferred were also informative. Two-up driving was among the most unpopular, and probably reflects that any relief it provides from fatigue is outweighed by other factors such as very long distances. Reducing driving hours and banning driving during the early hours of the morning were also among the most unpopular options for most groups. Their unpopularity is probably due to the pressures that drivers experience. The job of long distance driving necessarily involves long hours, including night hours. The data revealed that for many drivers the demands of the job already require them to exceed the working hours regulations available to them. Simply reducing or restricting the driving hours is unlikely to be a successful approach unless other aspects of the job can be changed to achieve this end.

Finally, strategies of providing information about fatigue and the use of fatigue monitors were also unpopular. Their unpopularity reflects that drivers already have considerable awareness of the presence, causes and consequences of fatigue but feel constrained to continue driving despite it.

One of the most promising findings in this study is that there appears to be considerable agreement between drivers and industry and across industry groups in their views of how to manage the problem of driver fatigue. There was consensus in nominating road improvement, greater flexibility of hours and more efficient loading and unloading as very helpful possible strategies. This agreement within the industry only further underscores the promise of examining work practices in general, and the pattern of work and rest in particular, as an important starting point for better management of driver fatigue.

The main strategy on which there was disagreement was information and training. Industry universally highlighted this strategy as most helpful but drivers hardly ever considered it even helpful. As discussed earlier, drivers in this study indicated very clearly their knowledge of the problem, its causes, consequences and solutions. The finding that drivers are in fact informed about fatigue but feel

pressure to continue driving despite it, is important for industry to know when identifying targets for their preventive efforts. It would appear that improving knowledge and training about fatigue will do little to help drivers on the road under current circumstances.

The other area where some discrepancy was evident was in attitudes to drug use. Clearly, most industry groups were not in favour of permitting drugs as a legitimate way of dealing with driver fatigue. However, for a not insubstantial group of drivers across the industry, drugs were perceived as one of the most effective ways of enabling them to meet the demands of their job. For drivers, the perceived need and usefulness of drugs to do their job is a consequence of the significant pressures on them. These pressures can also be seen in the factors drivers report as causes of fatigue and the strategies they believe will help to reduce it. The fact that some drivers feel that they need stay-awake drugs to do their job does not necessarily indicate that this strategy should be legitimised. Rather, this finding should be viewed as an indicator that the way the job is currently done needs to be changed.

Awareness that drivers and industry agree on the nature of many of these pressures gives industry very strong indications of more acceptable ways of managing fatigue. There was agreement across the industry that difficulties in meeting the scheduled demands of the job are a substantial cause of driver fatigue. This points to better management of schedules and allowing more flexible hours as one way that fatigue might be better managed from the industry's point of view.

Clearly, there are a number of possible limitations to this study. One shortcoming is that, due to the absence of any current information on the structure of the industry, sampling appropriately was virtually impossible. To strengthen this type of study, there is a need for more and better information on the structure of the industry, so that an appropriately stratified sample of drivers could be derived. To try to overcome this problem, the approach taken in this study was to maximise the likelihood that views of all types of drivers would be canvassed. This was achieved to a large extent. While some of the sectors were

represented in smaller numbers than others (for example, livestock carriers), this may reflect their true distribution in the industry. Without access to an accurate description of the various strata in the industry, the relationship of the distribution in the sample to the distribution in the industry is not known. This important information should be less difficult to obtain once the uniform national licensing scheme is in place.

Apart from the representativeness of the sample, sampling bias also needs to be considered because participation in the study was on a volunteer basis. It is possible, with voluntary participation, that a biased sample is obtained, with only the views of some sections of the total population being represented. For example, it could be argued that only the views of those employee drivers who had nothing to fear were obtained in the groups where distribution occurred through the company. If this was so, the results might have been biased. This is unlikely however, because the pattern of results remained the same for drivers whose views were collected by interview and those who completed the questionnaire by self-report. As described earlier, there were only a handful of refusals at interview sites around the country. This meant that the major source of selection bias in the interview data was due to differences between the types of drivers that use truck stops and those that do not. Using two methods of data collection provided a check on the types of biases that occurred in the self-administered data. The pattern of findings between the two methods could be related to the known composition of drivers surveyed by each method.

Another possible source of bias in the study relates to the response rate obtained. The response rate in this study was low, raising the possibility that sections of the industry were undersampled. Again, the similarity of the pattern of responses obtained by the two collection methods, interview and self-administered, allays concerns regarding this source of bias. Indeed, many of the characteristics of the sample obtained in this study corroborate the sample obtained by Hensher et al (1991), who obtained their sample entirely by interview at truck stops or company depots in 5 metropolitan centres, mainly on the eastern seaboard.

Finally, the nature of the data collected in the study leaves some avenues unexplored. The views of drivers were obtained about the nature and management of fatigue in the industry. Such subjective data are often seen as being vague, not able to be verified and possibly an artefact of simply being asked a question. However, subjective data are the only way to obtain information about the driver's experience of fatigue, and, in a diverse work setting like road transport the main way to find out about individual practices. Certainly, subjective data do not yield information about measurable changes in performance. However, the subjective nature of the data must be seen in its proper perspective, namely as the starting point for the examination of the experience of fatigue and for identifying practices and influences relating to the problem in the industry as it actually operates. In trying to gain a thorough understanding of fatigue as it relates to long distance drivers, this would seem an obvious first step. The next step must be to objectively evaluate factors associated with fatigue and improvement in its management. Indeed, this is planned for the second stage of the project.

This study has revealed that while driver fatigue is unlikely to be eliminated from long distance driving, there are a number of different ways in which better management might be approached. Two overall factors emerged which seemed to reduce the amount of fatigue reported by drivers. Shorter trips and greater flexibility in arranging the timing and scheduling of the trip, including loading and unloading, were factors associated with less fatigue. These, coupled with the views of drivers and industry for the most helpful strategies for managing driver fatigue, provide directions for further research.

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APPENDICES

APPENDIX A

LIST OF ADVISORY COMMITTEE MEMBERS

Dr Peter Raggatt
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Mr Ken McGrath
Federal Assistant Secretary
Transport Workers Union
CARLTON SOUTH VIC

Mr Ron Finemore
Finemore Holdings Ltd
WAGGA WAGGA NSW

Mr Robert Hertogs
Toronto Bus Lines
TORONTO NSW

Mr Ian Cootes
Managing Director
I R Cootes Pty Ltd
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Mr Keith Wheatley
Assistant Secretary
Road User Branch
Federal Office of Road Safety
CANBERRA ACT

Ms Wendi Key*
A/G Director
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Mr Chris Brooks*
Director
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- * Ms Wendi Key was replaced by Mr Chris Brooks after the meeting with the Advisory Committee took place on 7 March 1991.

APPENDIX B

**DETAILS OF WORLDWIDE CORRESPONDENCE
AND CONSULTATION**

**ORGANIZATIONS WORLDWIDE THAT WERE SENT
CORRESPONDENCE AND NUMBER OF RESPONSES RECEIVED**

An • denotes that a response was received.

The number next to each country denotes the number of responses over the number of letters sent to that country.

AUSTRALIA (20/47)

New South Wales

- | | |
|--|---|
| <p>* Mrs T McCarthy
(Chairperson)
NSW Traffic
Education Centre
PO Box 999
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| <p>• European Community
Information Office
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MANUKA ACT 2603</p> | <p>* Peter Ferris
National Research
Office
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| <p>• Long Distance Road
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PARRAMATTA NSW 2150</p> | <p>Australian Livestock
Transporters Association
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| <p>NSW Road Transport
Association
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SYDNEY NSW 2000</p> | <p>Transport Workers'
Union of Australia
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SYDNEY NSW 2000</p> |
| <p>* NSW Road Transport
Training Council
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Transport and Storage
Training Board
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Transport Workers Union
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APPENDIX C

QUESTIONS FOR DISCUSSIONS WITH

AUSTRALIAN INDUSTRY GROUPS

HOW MUCH OF A PROBLEM IS DRIVER FATIGUE TO THE LONG DISTANCE ROAD TRANSPORT INDUSTRY?

Is it a problem?

(If yes) How big a problem is it?

Are there bigger or more pressing problems than driver fatigue in the industry?

(If yes) What are they?

WHAT ARE THE EFFECTS OF FATIGUE ON DRIVING?

To what extent does fatigue play a role in heavy vehicle accidents?

In what ways does fatigue play a role in accidents?

Does fatigue play a role in causing drivers to break the rules (ie, are drivers more likely to drive contrary to the rules when they are fatigued?)

(If yes) To what extent?

(If yes) In what ways?

WHAT FACTORS CONTRIBUTE TO DRIVER FATIGUE?

Does each of the following factors contribute to driver fatigue?

Work/rest schedule:

Long driving hours

Too few rest breaks

Too short rest breaks

Working during rest breaks (eg, ticketings)

Irregular or inadequate sleep due to work/rest schedule

External driving conditions:

Poor weather conditions

Poor road conditions

Uninteresting/monotonous driving route

Heavy traffic

Driving at night

Internal to the truck conditions:

Heat/poor ventilation

Vibration

Poor vehicle condition

Personal factors:

Family problems/stress

Inadequate rest/sleep prior to trips

Poor diet/irregular eating

Use of stay-awake drugs

Use of alcohol

Organizational features of the job:

Having to load/unload

Incentive/penalty systems

Overtime pay

Two-up

POSSIBLE STRATEGIES THAT COULD BE INTRODUCED TO REDUCE FATIGUE

As you know, the purpose of our study is to recommend strategies that could be introduced to reduce driver fatigue. We would like to give your group the opportunity to say what you think about the strategies that could be introduced. We've come up with a list of possible strategies.

How EFFECTIVE would each of the following strategies be (ie, would it work)?

How ACCEPTABLE would each of the following strategies be (ie, would it be used)?

Information/training on what causes and what reduces driver fatigue

Strict policing to prevent the use of stay-awake drugs

Regulating the use of stay-awake drugs

Introduction of stricter driving hour regulations (eg, shorter driving periods, more rest breaks, longer rest breaks)

Proper enforcement of current driving hour regulations

Greater flexibility in current driving hour regulations (eg, driving a few hours beyond the usual maximum to enable returning to home base; taking the specified breaks when needed, not according to some schedule)

Banning driving during the "danger hours" (eg, between 2am and 6am)

Self-regulation of driving hours and accreditation of drivers

Driving two-up

Staged driving

Reduction of economic pressures on drivers (eg, easing unreasonably tight schedules imposed by employers and/or freight forwarders)

Better vehicle design (eg, lighter steering and braking, better ventilation, less vibration)

Use of fatigue monitors by drivers (eg, wearing infra-red glasses that can detect eye closure and alert the driver before he falls asleep)

More efficient loading/unloading (eg, less waiting time)

Better off-road rest facilities

Improvements to the roads (eg, surfacing, rumble strips, chatter bars)

Are there any strategies that we haven't discussed that you think could be usefully introduced to reduce driver fatigue?

APPENDIX D

TRUCK DRIVER SURVEY



WORKSAFE AUSTRALIA
NATIONAL OCCUPATIONAL
HEALTH & SAFETY
COMMISSION

*Driver Fatigue In
Long-Distance Road
Transport*

SURVEY

PROJECT TEAM
Dr Ann Williamson
Dr Anne-Marie Feyer
Dr Christine Coumarelos
Mr Tony Jenkins

ABOUT THE QUESTIONNAIRE

A lot has been said about fatigue among long-distance drivers. We at Worksafe Australia are interested in getting the FACTS from DRIVERS about fatigue.

We want to know whether you think fatigue is a problem, how you experience fatigue on the job and what you think can be done to help.

At the end of this study we will be making recommendations about how driver fatigue can be managed in your industry. THIS IS YOUR CHANCE TO HAVE YOUR SAY AND TO INFLUENCE YOUR FUTURE WORKING CONDITIONS.

Everything you tell us will be kept **CONFIDENTIAL**.

We are NOT even asking for your name.

The questionnaire will take about 30 minutes to complete. Please answer all questions.

If you have any queries about the questionnaire or the study, please feel free to call Worksafe Australia on:

008 25 2226 (toll free)

and ask for either **Christine Coumarelos** or **Tony Jenkins**

SECTION 1: DRIVER AND VEHICLE INFORMATION

In this section we ask some questions about yourself and your truck. Please remember that all information you supply is confidential.

Please fill in today's date _____

1. What sex are you?

Male ()

Female ()

2. How old are you? _____ years

3. Which best describes you?

Single ()

In a defacto
relationship ()

Married ()

Separated ()

Divorced ()

Widowed ()

4. Do you have any children?

Yes ()

No ()

If you do have children:

How many? _____

Please list their ages: _____

5. Are you an employee driver?

Yes ()

No ()

If yes, how many trucks does the company you drive for operate?

Fewer than 5 trucks ()

Between 5 and 10 trucks ()

Between 11 and 50 trucks ()

More than 50 trucks ()

6. Are you an owner-driver?

Yes ()

No ()

If yes, how many trucks do you own? _____ trucks**If you are an owner-driver, are you a:**

Prime contractor ()

Painted subcontractor ()

Freelance subcontractor ()

Freelance owner-driver ()

Other (please describe) _____

If you are an owner-driver, do you drive mainly for one company?

Yes ()

No ()

If you are an owner-driver and drive mainly for one company, how many trucks does the company operate?

Fewer than 5 trucks ()

Between 5 and 10 trucks ()

Between 11 and 50 trucks ()

More than 50 trucks ()

7. How long have you been driving heavy vehicles for a living? _____ years

8. Where is your home base? _____ (suburb/town/state)

9. What are the MAIN types of freight you usually transport?

You may tick more
than one option

Livestock	()	
Refrigerated or temperature controlled	()	
Dangerous materials	()	
Bulk	()	What type of bulk? _____
Machinery	()	
Building materials	()	
Farm produce	()	
Groceries	()	
Manufactured goods (eg, clothing)	()	What type of goods? _____
General	()	
Other (please describe)		_____ _____

10. Do you negotiate your rate of pay for each load?

Yes ()

No ()

If no, do you have an ongoing contract for any of your loads?

Yes, for all my loads ()

Yes, for some of my loads ()

No ()

11. How are you usually paid?

Hourly rate	()
Flat day rate	()
Day rate with overtime	()
Flat weekly rate	()
Weekly rate with overtime	()
Flat rate for every truck load carried	()
Rate for each trip based on kms travelled and/or tonnage carried	()
Other (please describe)	_____

12. At what rate are you usually paid?

Award rate	()
Less than the award rate	()
More than the award rate	()
Don't know	()

13. What sort of vehicle do you USUALLY drive?

Rigid truck having a gross combined mass less than 13.9 tonnes	()
Rigid truck having a gross combined mass greater than 13.9 tonnes	()
Articulated truck having a gross combined mass less than 22.4 tonnes	()
Articulated truck having a gross combined mass greater than 22.4 tonnes	()
B-Double or road train	()
Other (please describe)	_____

SECTION 2: FATIGUE

The following questions are about fatigue you may experience when driving.

* By **FATIGUE** we don't **ONLY** mean feeling **DROWSY OR SLEEPY**.
We **ALSO** mean being **TIRED, LETHARGIC, BORED, UNABLE TO CONCENTRATE,**
UNABLE TO SUSTAIN ATTENTION and being **MENTALLY SLOWED**.

14. In your opinion how much of a problem is fatigue in the long-distance road transport *INDUSTRY*?

- A major problem ()
- A substantial problem ()
- A minor problem ()
- Not a problem at all ()

15. How much of a problem is fatigue to *YOU PERSONALLY* in your job?

- A major problem ()
- A substantial problem ()
- A minor problem ()
- Not a problem at all ()

16. How often do you become fatigued while driving?

- On every trip ()
- On most trips ()
- On about half your trips ()
- Occasionally ()
- Very rarely ()

17. How many hours after **STARTING WORK do you usually **BEGIN** to feel fatigued? (Include loading and waiting to load as work.)**

_____ hours

18. At what times of the day or night are you most likely to feel fatigued WHILE WORKING?

LOOK AT THIS EXAMPLE. Let's say that, while working, a driver is most likely to be fatigued from 2am to 4am and from 9pm to 11pm. This driver would shade like this:

mid night	2am	4am	6am	8am	10am	12	2pm	4pm	6pm	8pm	10pm	mid night

NOW YOU GO AHEAD and shade in those times when YOU are most fatigued WHILE WORKING.

mid night	2am	4am	6am	8am	10am	12	2pm	4pm	6pm	8pm	10pm	mid night

19. In general is your driving WORSE when you are fatigued?

Yes ()

No ()

If yes, HOW is it worse?

You may tick more
than one option

Slower to react ()

Poorer steering (eg, crossing
lane lines, over/under steering) ()

Poorer braking ()

Poorer gear changing ()

Poorer overtaking ()

Speeding ()

Driving too slowly ()

Poorer signalling ()

Poorer attention to traffic signs ()

Poorer awareness of other traffic ()

Other (please describe) _____

20. Which of the following can contribute to YOUR fatigue while driving?

Firstly, TICK your selections.

Then CIRCLE the ones which are most important in contributing to YOUR driver fatigue.

You may tick more
than one option

- | | |
|--|-----|
| Long driving hours | () |
| Insufficient rest breaks | () |
| Having to load/unload | () |
| Checking the load | () |
| Driving two-up | () |
| Irregular or inadequate sleep during trips | () |
| Inadequate sleep before trips | () |
| Driving at night | () |
| Driving at dawn | () |
| Driving at dusk | () |
| Poor road conditions | () |
| Uninteresting/monotonous driving route | () |
| Heavy highway traffic | () |
| Heavy city traffic | () |
| Poor weather conditions (eg, fog) | () |
| Poor truck ventilation | () |
| Truck vibration | () |
| Family problems | () |
| Poor diet/irregular eating | () |
| After-effects of using stay-awake drugs | () |
| Use of alcohol | () |
| Other (please describe) _____ | |

21. Please indicate how often you use the strategies listed below in an attempt to deal with YOUR driver fatigue during trips.

Do this by TICKING one of the options next to each strategy.

Then CIRCLE those strategies you find MOST helpful.

	<u>Often</u>	<u>Sometimes</u>	<u>Rarely</u>	<u>Never</u>
Stopping to sleep	()	()	()	()
Stopping to rest	()	()	()	()
Stopping for a meal	()	()	()	()
Eating while driving	()	()	()	()
Having a drink containing caffeine (eg, coffee, tea, Coca-cola)	()	()	()	()
Having a non-caffeine drink	()	()	()	()
Smoking	()	()	()	()
Taking stay-awake drugs	()	()	()	()
Kicking the tyres or walking around	()	()	()	()
Taking a shower	()	()	()	()
Listening to music/radio	()	()	()	()
Using the CB radio	()	()	()	()
Singing	()	()	()	()
Adjusting the ventilation (eg, windows, air conditioning, heater)	()	()	()	()
Other (please describe)				

22. In this question we are interested in your opinions about strategies that **COULD BE USED** to deal with driver fatigue in the long-distance road transport industry.

Please rate how **HELPFUL** you would find each strategy in dealing with **YOUR** driver fatigue by **TICKING one** of the options next to **each** strategy.

Space is also provided for comments on each strategy IF you have any.

Make more information/training available on what causes and reduces driver fatigue

Not helpful () Somewhat helpful () Very helpful ()

Comments: _____

Strict policing to prevent the use of stay-awake drugs

Not helpful () Somewhat helpful () Very helpful ()

Comments: _____

Permitting the use of stay-awake drugs by prescription only

Not helpful () Somewhat helpful () Very helpful ()

Comments: _____

Introduction of stricter driving hour regulations (eg, shorter driving periods, longer rest breaks)

Not helpful () Somewhat helpful () Very helpful ()

Comments: _____

Stricter enforcement of current driving hours regulations	Not helpful ()	Somewhat helpful ()	Very helpful ()	Comments: _____ _____ _____
---	--------------------	-------------------------	---------------------	-----------------------------------

Regulation of work time not just driving hours (eg, including loading time)	Not helpful ()	Somewhat helpful ()	Very helpful ()	Comments: _____ _____ _____
---	--------------------	-------------------------	---------------------	-----------------------------------

Having driving and/or work regulations set by industry people not by government people	Not helpful ()	Somewhat helpful ()	Very helpful ()	Comments: _____ _____ _____
--	--------------------	-------------------------	---------------------	-----------------------------------

Banning driving during the "danger hours" (eg, between 2am and 6am)	Not helpful ()	Somewhat helpful ()	Very helpful ()	Comments: _____ _____ _____
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More efficient loading/unloading (eg, less waiting time, someone loading/unloading for you)	Not helpful ()	Somewhat helpful ()	Very helpful ()	Comments: _____ _____ _____
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Two-up driving	Not helpful ()	Somewhat helpful ()	Very helpful ()	Comments: _____ _____ _____
----------------	--------------------	-------------------------	---------------------	-----------------------------------

Staged driving (ie, driving part of the trip then handing the truck over to a fresh driver who has been waiting at some meeting point)	Not helpful	Somewhat helpful	Very helpful	Comments: _____ _____ _____ _____
	()	()	()	

Increasing rates of pay for drivers	Not helpful	Somewhat helpful	Very helpful	Comments: _____ _____ _____ _____
	()	()	()	

Easing unreasonably tight schedules imposed by employers and freight forwarders	Not helpful	Somewhat helpful	Very helpful	Comments: _____ _____ _____ _____
	()	()	()	

Better truck design (eg, lighter steering and braking, better ventilation, less vibration)	Not helpful	Somewhat helpful	Very helpful	Comments: _____ _____ _____ _____
	()	()	()	

Use of fatigue monitors by drivers (eg, using devices that alert the driver before he falls asleep)	Not helpful	Somewhat helpful	Very helpful	Comments: _____ _____ _____ _____
	()	()	()	

Better off-road rest facilities

Not helpful () Somewhat helpful () Very helpful ()

Comments: _____

Greater flexibility in driving hours regulations (eg, driving beyond the usual maximum to allow return home, taking breaks when needed rather than to regulation)

Not helpful () Somewhat helpful () Very helpful ()

Comments: _____

Improvements to the roads (eg, better surfaces, rumble strips, chatter bars)

Not helpful () Somewhat helpful () Very helpful ()

Comments: _____

23. Of the strategies listed above that you thought would be helpful in dealing with YOUR driver fatigue, which do you think would be MOST helpful?

24. If you have any other ideas about strategies that may be useful in dealing with driver fatigue in the long-distance road transport industry, please describe them below.

SECTION 3: DETAILS OF LAST TRIP

These questions are about your **LAST ONE-WAY LONG DISTANCE TRIP**.

* **ONE-WAY** means, for example, Sydney to Melbourne OR Melbourne to Sydney, NOT both.

* **LONG DISTANCE** means at least 300kms.

25. Where did the trip start? (ie, Where did you start driving the heavy vehicle?)

_____ (suburb/town/state)

26. What date did your last long-distance trip start?

If you can't remember the starting date, was it:

Within the last 24 hours ()

About a few days ago ()

About a week ago ()

About a few weeks ago ()

About a month ago ()

About a few months ago ()

27. What time did you start work for the trip? (Please include driving, loading and waiting to load as work time.)

_____ am/pm

28. Where did the trip finish? (ie, Where did you finish driving the heavy vehicle?)

_____ (suburb/town/state)

29. What day and time did work for the trip finish? (Please include unloading and waiting to unload as work time.)

_____ (day) _____ am/pm

30. Approximately how many kilometres did you travel? _____ kms

31. Did YOU arrange the load for this trip yourself?

Yes ()

No ()

If yes, how long did it take you to arrange your load?

_____ mins OR _____ hrs OR _____ days

32. Was the trip paid at a forward load rate or a backload rate?

Forward ()

Back ()

Neither ()

Don't know ()

33. What type of freight did you carry on this trip?

Livestock ()

Refrigerated or
temperature controlled ()

Dangerous materials ()

Bulk () What type
of bulk? _____

Machinery ()

Building materials ()

Farm produce ()

Groceries ()

Manufactured goods
(eg, clothing) () What type
of goods? _____

General ()

Other (please describe) _____

34. What sort of driving operation was it?

Single ()
Two-up ()
Staged ()

35. Who scheduled the start time?

You ()
Your employer ()
The freight forwarder ()
The loading agent ()
The customer ()
Other (please describe) _____

36. Did you make the scheduled start time?

Yes ()
No ()

37. Did you have an estimated time of arrival (ETA) at your finishing point?

Yes, within a specified hour ()
Yes, within a specified
part of the day ()
Yes, within a specified day ()
No ()

If you had an estimated time of arrival (ETA) at your finishing point, who scheduled it?

You ()
 Your employer ()
 The freight forwarder ()
 The loading agent ()
 The customer ()
 Other (please describe) _____

If you had an ETA, did you keep to it?

Yes ()
 No ()

If you had an ETA, was there a reward (eg, bonus pay, extra time off) for keeping to it?

Yes ()
 No ()

If you had an ETA, was there a penalty (eg, fine) for not keeping to it?

Yes ()
 No ()

38. Regardless of whether you had an ETA, did you have any other reasons for wanting to arrive by a particular time (eg, avoiding peak-hour traffic, getting in early for another load)?

Yes ()
 No ()

If yes, why? _____

39. **ON YOUR LAST TRIP, did you take any breaks from driving that were longer than 15 minutes? (Include loading/unloading stops after you set off.)**

Yes ()
No ()

If yes, please complete the table below for EACH BREAK THAT WAS 15 MINUTES OR LONGER ON YOUR LAST TRIP.

	WHERE DID YOU STOP?	WHAT TIME DID YOU STOP? (Include am or pm)	HOW LONG WAS THE BREAK? (In mins or hrs)	WHAT WAS THE REASON FOR THE BREAK? Eg - To eat/drink - To use the toilet - To load/unload - To check load - For a truck inspection - To change driver - To refuel truck - To sleep - To rest (You may list more than one option)
1ST BREAK				
2ND BREAK				
3RD BREAK				
4TH BREAK				
BREAK				

If you took more than 7 breaks, please use the back of the questionnaire to tell us about your other breaks.

40. We would now like to find out more about the **LOADING AND UNLOADING** on your **LAST** trip. Please tell us about **LOADING** at your **STARTING POINT** and about **UNLOADING** at your **FINISHING POINT**.

	DID YOU DO ANY OF THE LOADING/ UNLOADING OR TARPING? (Please tick "yes" or "no")	HOW LONG WERE YOU WAITING BEFORE YOUR TRUCK COULD BE LOADED/ UNLOADED? (In mins or hrs)	HOW LONG DID IT TAKE TO LOAD/ UNLOAD? (In mins or hrs)
LOADING AT STARTING POINT	Yes () No ()		
UNLOADING AT FINISHING POINT	Yes () No ()		

41. Did you stop to load/unload anywhere else on your trip other than at the starting and finishing points?

Yes ()

No ()

If yes, how many other times did you load? _____

If yes, how many other times did you unload? _____

42. If you had to wait before your truck could be loaded/unloaded at any point on your **LAST** trip, what were the **MAIN** delays?

You may tick more than one option

The depot was not open ()

Waiting for other trucks to be loaded/unloaded ()

Machinery was not available for loading/unloading ()

Other (please describe) _____

**SECTION 4: COMPARISON OF LAST TRIP
WITH OTHER TRIPS**

46. Was your LAST TRIP similar to the trip you do most often?

Yes ()

No ()

If no, HOW was your last trip different? (Eg, On your last trip you took a different route, travelled a different distance, made a different number of stops and/or took longer/shorter stops.)

SECTION 5: WEEKLY WORK/REST SCHEDULE

In this section we want to find out about your work in the SEVEN DAYS IMMEDIATELY BEFORE THE LAST TRIP you just described.

47. Was your working WEEK before your last trip similar to your usual working week?

Yes ()

No ()

If no, HOW was your last working week different? (Eg, Your last working week involved longer/shorter driving hours, more/fewer trips, more/less time away from home.)

48. Did you make any long-distance trips in the WEEK before your last trip?

Yes ()

No ()

If yes, GO TO THE NEXT PAGE.

If no, GO TO PAGE 23.

We are interested in ALL the long-distance ONE-WAY trips you made in the SEVEN days prior to your last trip.

Start with the first trip you made in this period. (Include any time you spent loading/unloading and waiting to load/unload as work time.)

	FROM	DAY AND TIME TRIP STARTED (Include am/pm)	TO	DAY AND TIME TRIP FINISHED (Include am/pm)
1ST TRIP IN 7 DAYS BEFORE LAST TRIP	_____	_____	_____	_____
2ND TRIP IN 7 DAYS BEFORE LAST TRIP	_____	_____	_____	_____
3RD TRIP IN 7 DAYS BEFORE LAST TRIP	_____	_____	_____	_____
4TH TRIP IN 7 DAYS BEFORE LAST TRIP	_____	_____	_____	_____
5TH TRIP IN 7 DAYS BEFORE LAST TRIP	_____	_____	_____	_____
6TH TRIP IN 7 DAYS BEFORE LAST TRIP	_____	_____	_____	_____
7TH TRIP IN 7 DAYS BEFORE LAST TRIP	_____	_____	_____	_____

SECTION 6: COMPARISON OF TRIP RATES

49. For trips of the same distance (eg, Sydney to Brisbane versus Brisbane to Sydney), do you usually get paid at the same rate?

Yes ()

No ()

If no, why do you get different rates of pay?

If you get different rates of pay, is your driving any different when carrying a lower paid load in terms of:

Tick one option

No ()

Speed? Yes, I drive slower ()

Yes, I drive faster ()

Tick one option

No ()

Number of rest breaks? Yes, I take more ()

Yes, I take fewer ()

Tick one option

No ()

Length of rest breaks? Yes, they are longer ()

Yes, they are shorter ()

SECTION 7. BREAKING THE RULES

50. How often do you work contrary to the work hour regulations? (Eg, Working more hours than permitted, taking fewer rest breaks than permitted.)

On every trip ()

On most trips ()

On about half your trips ()

Occasionally ()

Very rarely ()

If you do work contrary to the hours regulations, why do you?

You may tick more
than one option

Because of your tight schedule ()

Because of rewards or penalties associated with arriving early or late ()

To get in early to get the next load ()

In order to do enough trips to earn a living ()

In order to return home ()

In order to reach adequate rest facilities ()

Other (please describe) _____

51. How often do you drive contrary to the road rules? (Eg, Speeding, illegal overtaking, crossing unbroken lines, disobeying traffic signs.)

- | | |
|--------------------------|-----|
| On every trip | () |
| On most trips | () |
| On about half your trips | () |
| Occasionally | () |
| Very rarely | () |

If you drive contrary to the road rules, why do you?

You may tick more
than one option

- | | |
|--|-------|
| Because of your tight schedule | () |
| Because of rewards or penalties associated with arriving early or late | () |
| To get in early to get the next load | () |
| In order to do enough trips to earn a living | () |
| Because you are fatigued | () |
| Because of the effects of alcohol | () |
| Because of the after effects of using stay-awake drugs | () |
| Other (please describe) | _____ |
| | _____ |

SECTION 8: TWO-UP DRIVING

**PLEASE ANSWER THIS SECTION ONLY IF YOU HAVE DRIVEN TWO-UP.
IF YOU HAVE NOT DRIVEN TWO-UP, GO TO PAGE 28.**

52. Which do you prefer?

Working two-up ()

Working as a single driver ()

Do not prefer one over
the other ()

Why?

53. Which do you usually find is MORE fatiguing?

Working two-up ()

Working as a single driver ()

They are about the same ()

Why?

54. How often have you driven two-up?

Fewer than 5 times ()

Between 5 and 20 times ()

Between 21 and 50 times ()

More than 50 times ()

55. When did you last drive two-up?

Within the last week	()
Within the last month	()
Within the last year	()
Within the last 5 years	()
More than 5 years ago	()

56. When you have driven two-up:

How many hours OR days did a typical trip last? _____

How many hours did you USUALLY work in any one week? (Include time spent loading/unloading and waiting to load/unload as work time.) _____ hours

How many hours out of 24 was the truck USUALLY operating? _____ hours

How many hours did you USUALLY drive before changing drivers? _____ hours

How long was your USUAL break from driving while the other driver was at the wheel? _____ hours

How many hours did you USUALLY sleep in each break from driving? (DO NOT include time spent TRYING to fall asleep.) _____ hours

SECTION 9: STAGED DRIVING

PLEASE ANSWER THIS SECTION ONLY IF YOU HAVE DRIVEN IN A STAGED DRIVING OPERATION.

NOTE: Staged driving is where you drive for only part of the trip before getting out of the truck and handing over to a fresh driver who has been waiting at some meeting point.

IF YOU HAVE NOT DRIVEN IN A STAGED DRIVING OPERATION, GO TO PAGE 30.

57. Which do you prefer?

Working as a staged driver ()

Working as a single driver ()

Do not prefer one over
the other ()

Why? _____

58. Which do you usually find is more fatiguing?

Working as a staged driver ()

Working as a single driver ()

They are about the same ()

Why? _____

59. How often have you driven in a staged operation?

Fewer than 5 times ()

Between 5 and 20 times ()

Between 21 and 50 times ()

More than 50 times ()

60. When did you last drive in a staged operation?

- Within the last week ()
- Within the last month ()
- Within the last year ()
- Within the last 5 years ()
- More than 5 years ago ()

61. When you have driven in a staged operation:

How many hours OR days did a typical trip last?

How many hours did you USUALLY work in any one week? (Include time spent loading/unloading and waiting to load/unload as work time.)

_____ hours

How many hours did you USUALLY work in any 24 hour period? (Include time spent loading/unloading and waiting to load/unload as work time.)

_____ hours

How many hours did you USUALLY drive before changing drivers?

_____ hours

After finishing one stage, how long was it USUALLY before you started driving the next stage?

_____ hours

COMMENTS

We're interested in any other comments or suggestions you may have about truck driver fatigue that haven't been covered by the questionnaire.

Please write any comments or suggestions below.

**THANK YOU VERY MUCH FOR YOUR
CO-OPERATION**

APPENDIX E

ADMINISTRATION OF TRUCK DRIVER SURVEY

Table 44: Number of interviews and number of returned self-administered surveys for truckstops/truck terminals in each state

State	Truckstop/Terminal	City/ Town	No. of i/views conducted	No. of self- administered surveys returned
NSW	BP Truckstop Yagoona	Sydney	156	50
	BP Truckstop Marulan	Marulan		
	Caltex Truckstop Dubbo	Dubbo		
	Dubbo Livestock Saleyards	Dubbo		
Vic	BP Truckstop Somerton	Melbourne	36	7
	Ampol Service Station Shepparton	Shepparton		
	Bendigo Livestock Saleyards	Bendigo		
	Ballarat Livestock Saleyards	Ballarat		
Qld	BP Truckstop Rocklea	Brisbane	36	12
	Shell Rocklea Transport Terminal	Brisbane		
	Esso Brisbane Transport Terminal	Brisbane		
	Toowoomba Livestock Saleyards	Toowoomba		
SA	BP Truckstop Wingfield	Adelaide	37	9
WA	BP Truckstop Kewdale	Perth	21	15
	Shell Kewdale	Perth		
	Transport Terminal			
NT	Shell Truck City	Darwin	16	17
Total			302	122

Table 45: List of companies to which self-administered forms were distributed

State	Size of company	Company name	City/town		
NSW	<=10 trucks	WD & FE Rae	Sydney		
		Tim Barret	Dubbo		
		Precision Express	Sydney		
		Unique	Sydney		
		Thompson Brothers	Dubbo		
		Rod Pilon	Dubbo		
		Dickinson	Dubbo		
		Robert Holmes	Dubbo		
		Herbig	Dubbo		
		Walkers	Dubbo		
		Joe Langbein	Dubbo		
	11-50 trucks	Ansett Freight Express	Sydney		
		Jetsroad	Sydney		
		McPhee	Sydney		
		TNT Express	Sydney		
		County Express/Interstate	Sydney		
		Freight	Sydney		
		Chemtrans	Sydney		
		TTS/Darwin Freight Lines	Sydney		
			>50 trucks	Simons	Sydney
				IPEC	Sydney
North Queensland Express	Sydney				
Kwikasair	Sydney				
Comet Express	Sydney				
Lindsay Brothers	Sydney				
K & S Freighters	Sydney				
Finemores	Wagga				
	<=10 trucks	Penny & Lang	Ballarat		
VIC	11-50 trucks	McPhee	Melbourne		
		Toll Transport Express	Melbourne		
		Pearsons Livestock	Ballarat		
		O'Sullivan's Livestock	Elmore		
	>50 trucks	SPD	Melbourne		
		Brambles Tankers	Melbourne		
		Linfox	Melbourne		
		Cootes	Melbourne		
		Roccassanos	Shepparton		
		Phillips	Shepparton		

Table 45: List of companies to which self-administered forms were distributed (cont.)

State	Size of company	Company name	City/town
QLD	<=10 trucks	Troys	Brisbane
		Robertsons	Brisbane
		John Bain	Brisbane
	11-50 trucks	Mansells	Toowoomba
		Johnson	Toowoomba
		Eyers Brothers	Toowoomba
		Fraser Brothers	Warwick
		Allstates Freighters	Brisbane
		Combined Freight Services	Brisbane
		Lill and Alexander	Brisbane
>50 trucks	Simons	Toowoomba	
SA	<=10 trucks	Morris Glen	Adelaide
		McCormack Freighters	Adelaide
		Miners	Adelaide
		Kenco	Adelaide
		Mustard Brothers	Adelaide
	11-50 trucks	Brengary	Adelaide
		Singleton	Adelaide
		J. Collins	Adelaide
		Bunker	Adelaide
		K & S Freighters	Adelaide
		Bulls	Adelaide
	>50 trucks	Booth Wine	Adelaide

Table 45: List of companies to which self-administered forms were distributed (cont.)

State	Size of company	Company name	City/town
WA	<=10 trucks	Gibson Interstate	Perth
		West Brothers	Perth
		Hardys	Perth
		Ezi-Ride	Perth
		Time Road Express	Perth
		Coastal Midwest	Perth
		Ansett Freight Express	Perth
	11-50 trucks	Sadliers	Perth
		Total Western	Perth
		Carnarvon	Perth
		Key	Perth
		Gascoyne	Perth
		Gardiners	Perth
		BP Oil	Perth
		Jayde	Perth
		Brambles Manford	Perth
		Overnighters	Perth
		Darwin Freight Lines	Perth
		Perth Freight Lines	Perth
		Railor	Perth
NT	<=10 trucks	Australian Fuel Distributors	Darwin
		TTS/Darwin Freight Lines	Darwin
		Flynns	Darwin
		Ascot Haulage	Darwin
		McPhee/Northline	Darwin
		K & T	Darwin
	11-50 trucks	Halls	Darwin
		NTFS	Darwin
		Coord	Darwin

Table 46: Number of self-administered surveys distributed via companies broken down by state and company size

State	Key	<= 10 trucks	11-50 trucks	> 50 trucks	Distribution for each State
NSW	No. distributed	67	190	1078	1335
	% of NSW distribution	5.0	14.2	80.7	
	% of column distribution	34.9	20.2	46.9	
	% of total distribution	2.0	5.5	31.4	38.9
VIC	No. distributed	3	98	1062	1163
	% of Vic distribution	0.3	8.4	91.3	
	% of column distribution	1.6	10.4	46.2	
	% of total distribution	0.1	2.9	30.9	33.9
QLD	No. distributed	23	155	60	238
	% of Qld distribution	9.7	65.1	25.2	
	% of column distribution	12.0	16.5	2.6	
	% of total distribution	0.7	4.5	1.7	6.9
SA	No. distributed	22	175	100	297
	% of SA distribution	7.4	58.9	33.7	
	% of column distribution	11.5	18.6	4.3	
	% of total distribution	0.6	5.1	2.9	8.7

continued overleaf.

Table 46 (cont.): Number of self-administered surveys distributed via companies broken down by state and company size

State	Key	<= 10 trucks	11-50 trucks	> 50 trucks	Distribution for each State
WA	No. distributed	40	281		321
	% of WA distribution	12.5	87.5		
	% of column distribution	20.8	29.9		
	% of total distribution	1.2	8.2		9.4
NT	No. distributed	37	41		78
	% of NT distribution	47.4	55.6		
	% of column distribution	19.3	4.4		
	% of total distribution	1.1	1.2		2.3
TOTAL	No. distributed	192	940	2300	3432
	% of total distribution	5.6	27.4	67.0	100.0

Table 47: Response rate for self-administered surveys distributed via companies, broken down by state and company size

State	Size of Company			Row Total
	Small (≤ 10 trucks)	Medium (11-50 trucks)	Large (> 50 trucks)	
NSW	3 / 67 (4.5%)	24 / 190 (12.6%)	210 / 1078 (19.5%)	237 / 1335 (17.8%)
Vic	2 / 3 (66.7%)	9 / 98 (9.2%)	201 / 1062 (18.9%)	212 / 1163 (18.2%)
Qld	0 / 23 (0%)	10 / 155 (6.5%)	7 / 60 (11.7%)	17 / 238 (7.1%)
SA	4 / 22 (18.2%)	17 / 175 (9.7%)	10 / 100 (10.0%)	31 / 297 (10.4%)
WA	1 / 40 (2.5%)	26 / 281 (9.2%)		27 / 321 (8.4%)
NT	9 / 37 (2.4%)	3 / 41 (7.3%)		12 / 78 (15.4%)
Column Total	19 / 192 (9.9%)	89 / 940 (9.5%)	428 / 2300 (18.6%)	536 / 3432 (15.6%)