

**REFORM EVALUATION SURVEY
ON DRIVER FATIGUE**

**A NATIONAL STUDY OF HEAVY
VEHICLE DRIVERS**

MAY 2007



**Prepared by
AMR Interactive**



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Department of Employment and
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National Transport Commission

Reform Evaluation Survey on Driver Fatigue: A National Study of Heavy Vehicle Drivers

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REPORT OUTLINE

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Address:	National Transport Commission Level 15/628 Bourke Street MELBOURNE VIC 3000 E-mail: ntc@ntc.gov.au Website: www.ntc.gov.au
Objectives:	To provide a baseline for future measurement of the impact of the 2006 Heavy Vehicle Driver Fatigue reform on road transport industry awareness, attitudes and behaviour relating to driver fatigue.
NTC Programs:	NTC Strategic Program, Road Safety.
Key Milestones:	Delivery of final report in May 2007.
Abstract:	<p>The NTC is assessing the effectiveness and the impact of its major national reforms.</p> <p>The 2006 Heavy Vehicle Driver Fatigue reform shifts the focus from the driver to other roles within companies with the power to exercise management over driver fatigue. The reform also targets external third parties in the road transport chain who can also exert influence and affect compliance with road safety regulations.</p> <p>The survey assesses the awareness and attitudes of fatigue among short and long haul heavy vehicle drivers, including employee drivers, subcontractors and owner/operators.</p> <p>A complementary survey has been conducted of road transport operators, freight forwarders, logistics companies and third party consignors.</p>
Purpose:	For information.
Key words:	Road safety, reform evaluation, heavy vehicle, driver fatigue.
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FOREWORD

The National Transport Commission (NTC) is a body established under an inter-governmental agreement with a charter to develop, monitor, and maintain uniform or nationally consistent regulatory and operational reforms relating to road transport, rail transport, and inter-modal transport. The NTC is funded jointly by the Australian Government, States and Territories.

Under this agreement, the NTC has a statutory obligation to review the success of, and maintain, the agreed reforms it has developed. However, in order to assess the effectiveness of its reforms, the NTC must first establish a set of base level compliance data for reform evaluation.

In 2004, the NTC contracted ARRB Transport Research to conduct an initial survey of existing data collections within Australia relevant to the effective implementation of NTC road transport reforms. ARRB also advised the NTC on a strategy to develop a usable set of base level compliance data for road transport reform evaluation. The ARRB report concluded that collection of data on key issues from multiple sources would be necessary, before and throughout the lifespan of reforms and beyond. The aim of these surveys is to address gaps in the identified data by obtaining a set of base level compliance data in order to build a more complete picture of the impact of these national reforms over time.

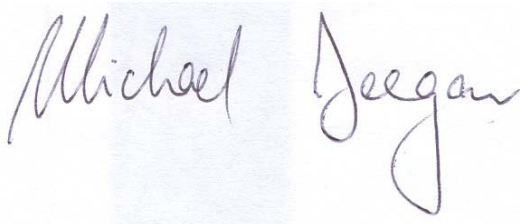
In the context of the 2006 Heavy Vehicle Driver Fatigue reform, this survey assesses the awareness and attitudes of fatigue among heavy vehicle drivers including employees, subcontractors and owner/operators. The new reform approved by the Australian Transport Council in February 2007 is due for implementation by February 2008.

A complementary survey has also been conducted over the same period of road transport operators, freight forwarders, logistics companies and third party consignors who exert influence and can affect compliance with road safety regulations.

The results from these surveys will serve as a baseline for comparison with past and future evaluations of reforms on driver fatigue.

A similar exercise is anticipated two to three years following implementation of this reform.

On behalf of Commissioners I would like to thank all those who took the time and effort to take part in the survey for providing valuable insights into this important issue.

A handwritten signature in blue ink that reads "Michael Deegan". The signature is written in a cursive style and is positioned over a light blue rectangular background.

Michael Deegan

Chairman

ACKNOWLEDGEMENTS

This survey would not have been possible without the support of the participating companies, the individual drivers who kindly took part, and the assistance of BP Australia, and managers of truck stops for giving permission to conduct the survey research.

The NTC acknowledges the funding provided by the Australian Transport Safety Bureau (ATSB) and by the Office of the Australian Safety and Compensation Council (ASCC), a branch of the Department of Employment and Workplace Relations.

The NTC would also like to thank Chris Brooks from the ATSB, representatives from the Office of the ASCC and Jeff Potter and Christine Roche of the NTC who all provided valuable assistance with the formulation of the surveys and with the drafting of the final reports.

GLOSSARY

Ancillary operator:	A firm that carries freight in its own vehicles but whose main business is normally non-transport related.
Articulated vehicle:	A combination consisting of a prime mover towing a semi-trailer.
B-double:	A combination consisting of a prime mover towing two semi-trailers where the first semi-trailer is connected to the prime mover by a fifth wheel coupling and the second semi-trailer is connected to the first semi-trailer by a fifth wheel coupling.
Consignee:	A consignee of goods is a person who actually receives the goods after completion of their transport by road but does not include a person who merely unloads the goods.
Consignor:	A <i>consignor</i> of goods is a person who engages an operator of a vehicle, either directly or indirectly or through an agent or other intermediary, to transport the goods by road; who has possession of, or control over, the goods immediately before the goods are transported by road; or who loads a vehicle with the goods, for transport by road, at a place where goods in bulk are stored or temporarily held and that is unattended (except by a driver of the vehicle or any person necessary for the normal operation of the vehicle) during loading. If none of these apply, and the goods are imported into Australia — a person who imports the goods is a consignor.
Employee driver:	A driver employed directly by a company, not under contract.
Freight forwarder:	A sub-category of hire and reward operators that act as intermediaries between clients (consignors) and those that carry out the transport task (sub-contractors). A freight forwarder can also be a prime contractor under the new reform.
Freight operator:	A sub-category of hire and reward operators that secure consignments on a contractual basis, either directly from consignors or from freight forwarders.
Heavy vehicle:	Drivers in the survey were required to drive a heavy vehicle of at least 12 tonnes gross vehicle mass.
Hire and reward operator	A firm that is involved in carrying freight for another firm on a contractual basis.
Gross vehicle mass (GVM):	The maximum loaded mass of a vehicle.
Independent driver:	An owner driver/operator not working as a subcontractor.
Long haul trip:	A trip taking the driver more than 100 km from the driver's base.

Mainly-long haul:	A term used in the report to define heavy vehicle drivers in the survey sample for whom at least 90% of their trips take them more than 100 km from their base.
Mainly-short haul:	A term used in the report to define heavy vehicle drivers in the survey sample for whom less than 30% of their trips take them more than 100 km from their base.
Owner driver/operator:	Self-employed carriers operating their own business.
Prime contractor:	A prime contractor is a person who engages someone else to drive a regulated heavy vehicle under a contract for services. (<i>Example of a prime contractor: A logistics business that engages a subcontractor to transport goods.</i>)
Rigid truck:	A heavy vehicle that is not articulated.
Road train:	A combination, other than a B-double, consisting of a motor vehicle towing at least two trailers (counting as a single trailer a converter dolly supporting a semi-trailer).
Scheduler:	A person who schedules a driver's work or rest time; or who schedules the transport of passengers or goods by road; or who makes a demand that affects a time in a schedule, such as the distribution manager for a retail chain or a loading agent or freight forwarder who sets a deadline for a delivery.
Short haul trip:	A trip taking the driver up to 100 km from the driver's base.
Stay awake drug:	One of a number of stimulant drugs other than caffeine, often illegal, used to increase alertness.
Subcontractor:	A driver engaged for a specific task or period of time, working who would usually operate for a range of clients, and under a business or company name.
Transitional Fatigue Management Scheme:	A voluntary alternative to the standard regulated driving hours. It provides drivers with a set of interim arrangements designed to assist industry by enabling more flexible rostering hours of drivers.

SUMMARY

Background and Objectives

The NTC is keen to assess the impacts of its national reforms over time and to develop a long term strategy to evaluate the effectiveness of the reforms it has developed. Currently two major reforms are being implemented in 2006-07 and 2007-08. Both the Compliance and Enforcement reform (2003) (National Transport Commission, 2002, 2003) and the new Heavy Vehicle Driver Fatigue reform (2006) (National Transport Commission, 2004a, 2004b) target heavy vehicle road transport operations (long distance and urban).

Fatigue is one of the main causes of crashes involving heavy vehicle drivers. Current prescriptive approaches are inflexible, not fully effective and are inconsistent with requirements under occupational health and safety laws.¹

The Heavy Vehicle Driver Fatigue reform shifts the focus from the driver to a range of other roles within a company. These roles are responsible for management and safety practices, e.g. scheduling, with the ability to manage driver fatigue precursors, such as opportunity for sleep, time of day influences, and the cumulative nature of fatigue and sleep loss. The aim of this reform is to improve road safety through the implementation of company policies and practices to address the management of driver fatigue in the road transport supply chain.

This reform will affect all parties in the road transport supply chain, including freight forwarders, shippers, stevedores, loaders, schedulers, distribution centres, unloaders and prime contractors, and third parties such as consignees and major consignors of goods including manufacturers, farmers and retailers, among others who exert influence and can affect compliance with road safety regulations.

In order to gauge the impacts of the Heavy Vehicle Driver Fatigue reform on road transport industry management and safety practices, the NTC needs to gather data both prior to and post-implementation of this reform. Two studies were conducted relating to driver fatigue, one with heavy vehicle operators and consignors, and one with heavy vehicle drivers. This report covers transport operators, freight forwarders and third party consignors.

The purpose of this survey is to assess, prior to implementation of the new reform, the current attitudes, awareness and understanding among long and short haul heavy vehicle drivers of fatigue management issues, and their day to day experience of fatigue-related issues.

Results from this survey have also been compared with those from the company survey, from two earlier surveys on driver fatigue conducted with drivers in 1998 (Williamson, Sadural, Feyer, and Friswell, 2001) and in 1991 (Williamson, Feyer, Coumarelos, and Jenkins, 1992); and with a later study conducted in 2004-05 comparing fatigue experiences

¹ See background information to the fatigue reform in House of Representatives, Standing Committee on Communication, Transport and the Arts (2000), Motor Accidents Authority, NSW (2001), National Transport Commission (2001), National Transport Commission (2002), and National Road Transport Commission and Ken Smith – Smithworks Consulting (2001).

of local area drivers of light trucks with those of long haul drivers (Friswell, Williamson and Dunn, 2006b).

The Study

Method

A preliminary, qualitative study was conducted to explore issues with both drivers and operators involved in road freight transport. Companies included freight operators, hire and reward operators, and ancillary operators. Preliminary focus groups with drivers and in-depth interviews with companies were conducted during April/May 2006.

The main quantitative survey was conducted in August/September 2006, involving a final sample of 613 heavy vehicle drivers across Australia. Drivers were recruited who operated vehicles of at least 12 tonnes gross vehicle mass. Bus drivers were not included in the survey. Drivers were recruited in two ways:

- **TRUCK STOPS:** Face to face interviews with 553 drivers at truck stops in New South Wales, Victoria, Queensland, South Australia and Western Australia.
- **SPECIAL RECRUIT:** To supplement the number of short haul and regional drivers, an additional 60 drivers were accessed through a specialist market research recruitment agency, and interviewed by telephone.

A parallel study was conducted with heavy vehicle transport operators and third party consignors, and is covered in a separate report.

Results in the study were assessed on a number of different driver group variables. One such variable was the incidence of long haul trips, defined as a trip taking the driver more than 100 km away from the driver's base. Drivers were divided into three groups:

- 'mainly-short haul' drivers, with under 30% of their trips being long haul (21% of the sample, n=130);
- 'mixed', with 30-89% of their trips being long haul (17% of the sample, n=103); and
- 'mainly-long haul' drivers, with 90-100% of their trips being long haul (62% of the sample, n=379).

The Survey as a Baseline

The survey serves as a baseline prior to fuller implementation in 2008 of the Heavy Vehicle Driver Fatigue Reform. An important role of the study is as a baseline for measures of awareness, attitudes and behaviour of drivers in the context of driver fatigue. Changes in these measures at some later stage can be used to assess the effectiveness of the Reform in meeting its objectives. It should be noted, however, that the survey was conducted during the Heavy Vehicle Driver Fatigue reform public consultation period, which may have influenced awareness and perceptions.

Comparison with the 1991 and 1998 Surveys

The current survey also provided an opportunity to assess changes that have occurred over time since the two previous surveys with long distance transport drivers conducted for the NTC in 1991 and 1998. The earlier surveys focused on long haul drivers doing trips of at least 300 km, recruited at truck stops and yards, although it was not specified whether all their trips were this length, or just some of their trips (including their previous trip). While

the current survey included a more general sample of drivers, it was possible to define a broadly comparable group of drivers, also recruited at truck stops, for whom the large majority of their trips were 'long haul' (taking them more than 100 km from their driver base).

Summary of Results

Attitudes and Perceptions about Driver Fatigue

Driver fatigue continues to be seen as a substantial problem in the road freight transport industry by three quarters of heavy vehicle drivers. Furthermore, many drivers considered that driver fatigue is not well managed in the industry, including a quarter saying that it was 'extremely badly' managed. Few drivers, however, considered that it was a substantial problem for them personally, and almost all drivers considered that they managed their fatigue well.

The contrast between perception of the problem in the industry and seeing the problem as a personal one was very strong, and may present an obstacle for motivating drivers to accept further change to their working environment on the grounds of improving driver fatigue. It is possible, however, that drivers were unwilling to admit that fatigue was an issue for them, and that even rating fatigue as a 'minor' problem implies acknowledging it as a problem.

In contrast to the low admission of fatigue as a problem, a quarter of drivers reported becoming fatigued on at least half of their trips, increasing to 60% of drivers who experienced fatigue at least occasionally. As a further measure, about a fifth of drivers reported often feeling exhausted at the end of their working day/shift. So while the large majority of drivers do not see fatigue as a problem personally, many admit being fatigued at least occasionally. Furthermore, fatigue appears to be an issue for short haul drivers as well as long haul drivers. While the frequency of experience of fatigue increased with the amount of long haul driving, the difference between the mainly-short haul and long haul groups was not very large; and both groups of drivers reported a similar incidence of feeling exhausted at the end of their working day/shift.

Drivers nominated a number of factors as contributors to their fatigue while driving. The most commonly nominated covered not only 'long driving hours' and 'irregular/inadequate sleep', but also other aspects of the work such as 'having to stick to regulations' and 'heavy traffic'. The mainly-short haul drivers were more likely to nominate several factors as contributing to their fatigue, 'long working hours', 'not enough night time sleep' and 'insufficient rest break'.

Driver fatigue has not received much attention as a possible issue for short haul drivers. The main focus has been on long haul trips, with the traditional working environment of long hours, driving at night, and inconsistent sleep patterns. So it is interesting to see short haul drivers also raising these types of issues as contributors to their fatigue.

Further analysis revealed that drivers' reported frequency of being fatigued was strongly associated with experiencing symptoms of fatigue such as 'heavy or tired eyes' and 'loss of concentration or attention', as well as 'feeling exhausted at the end of the working day or shift'. This set of relationships shows that many drivers do correctly identify being fatigued, even if they do not accept it as an actual problem for them.

Managing Fatigue

Almost every driver nominated strategies around stopping or resting as helpful in managing fatigue, but the majority also continue to see temporary strategies such as 'adjusting ventilation', 'listening to the radio or music' and 'having a drink containing caffeine' as at least helpful. It is of concern if drivers were content to manage their fatigue through these means. A further concern was that about one in six drivers also considered that 'stay awake drugs' were helpful in managing fatigue. Many drivers also raised issues about the value of the driving hours regulations, with two fifths of drivers considering that it was helpful that they be 'ignored to finish a trip close to home'.

As the large majority of drivers are employed by companies, the approach taken by companies to fatigue management is clearly of importance in helping deal with the problem. Larger companies (especially those operating more than 10 trucks) were much more likely than smaller companies to provide a range of policies and schemes to their drivers. Half of drivers working for companies reported that the company implemented a Fatigue Management Scheme, and over two fifths or more were covered by a medical policy or a fatigue management policy.

The large majority of companies were also reported to implement practices to allow for adequate breaks and rest; but while three quarters of the company drivers said that the company monitored their working hours, only about half reported that they specifically monitored levels of driver fatigue.

Trip Profiles

Drivers reported a number of features of trips that are cause for concern in the prevention or management of fatigue. While half of the drivers considered that they could plan every day to have adequate breaks/rest, a quarter considered that they could only do this on, at best, some days. A further issue around planning of trips was that a quarter of drivers reported at least sometimes not being able to take a break when feeling tired/drowsy. The incidence of not taking breaks when tired/drowsy was found to be related to drivers' perceived ability to plan their day.

The ability of drivers to manage their time was limited by the varying level of input they had into planning their trips. Two fifths had input into all their trips, but a quarter had no input into any trips, and two fifths of drivers also considered that they had unrealistic schedules on at least some of their trips.

Problems with schedules were also implicated in the incidence of drivers reporting driving contrary to driving/work hour regulations. Two fifths of drivers reported driving contrary to regulations at least occasionally, including a fifth on most of their trips. Motivations to break the rules included issues not only around schedules but also more personal motivation, such as to make more money. The regulations can therefore be seen both as inflexible, such as where drivers consider that sticking to the regulations contributes to fatigue; as well as restrictive on the amount of work drivers can do.

The solution to the problem of not taking breaks, however, would not simply be from better planning of the trip schedule. Common reasons for not being able to stop for a break included both aspects of planning (e.g. having a tight schedule) as well as practical limitations (e.g. nowhere to stop the truck). Some drivers were also motivated by more personal reasons, such as not being delayed getting home or to start the next trip early.

Relationships with Risk

A number of questions were included in the survey to assess risk measures around driver fatigue. These included specific measures of dangerous events while driving, as well as hours of work/rest over the last week.

Analysis of the work/rest profile highlighted continuing problems in the amount of work that drivers are undertaking. Key baseline measures included the following:

- one in six had worked more than 72 hours in the last week, and about one in eight had not had a full 24 hour period without work over that week;
- more than two fifths of drivers had worked for greater than 14 hours in a 24 hour period over the week, including a quarter having worked for more than 16 hours;
- over half had not had a break of 6 hours (or 8 hours in two parts) in at least one 24 hour period during the week; and
- about a third of drivers overall had slept for 7 hours during 10 pm to 8 am on no more than three nights.

All of these measures were more prevalent among the mainly-long haul group of drivers.

Drivers were asked how frequently they had experienced a number of dangerous events over the last 12 months. Given the sensitive nature of the questioning, requiring the drivers to acknowledge mistakes and unsafe behaviour, it is likely that even a response of 'rarely' experiencing an incident is an important disclosure. A third (36%) of drivers reported experiencing 'nodding off for a moment' on at least some occasion in the last 12 months, including one in eight (12%) at least sometimes. One in twenty (5%) drivers reported 'falling asleep at the wheel'. Other more commonly reported events were 'having a near miss' (33%), 'late braking' (33%), 'crossing over lane lines' (30%) and 'over or under steering' (24%).

Focusing on the incidence of at least sometimes experiencing each event, there were no clear differences between the driver groups on the specific fatigue-related events of 'nodding off' or 'falling asleep at the wheel'. The main difference was for 'having a near miss' and 'late braking' to increase as the amount of long haul driving decreased. There was no measure of the severity of situations in which these events occurred, so it is not possible to assess whether the more frequent incidents reported by short haul drivers involved potentially less serious, lower speed situations associated with city driving.

Two thirds of drivers reported having worked for five or more days in the last week, including a third who had worked on six or seven days. The mainly-long haul group of drivers was the most likely to have driven six or seven days.

Specific work and sleep patterns over the week were assessed on several measures, some in the context of specific requirements in the new working hour regulations to be implemented in 2008.

Among drivers giving relevant information about their work and rest periods, it was found that one in six had worked more than 72 hours in the last week, and about one in eight had not had a full 24 period without work over that week. More than two fifths of drivers had worked for greater than 14 hours in a 24 hour period over the week, including a quarter having worked for more than 16 hours. Over half had not had a break of the required 6 or

8 hours in at least one 24 hour period during the week. All of these measures were greatest among the mainly-long haul group.

Among drivers giving complete sleep information, it was found that a fifth had slept for 7 hours during the period 10 pm to 8 am on each night over the past week. Very few (4%) had not slept in this way on any night, and about a third overall had slept in this way on no more than three nights.

While the mainly-long haul group worked for marginally longer hours on average each week, and slept for marginally fewer hours on average, there were no clear differences in the number of night sleep periods and amount of long haul driving, driver employment or size of company. So night sleep patterns did not appear to be related to the proportion of long haul trips.

In order to look in more detail at factors associated with risk taking, relationships were assessed between a range of questions in the survey and three key outcome measures associated with risk. The outcome measures were:

- frequency of being fatigued;
- frequency of dangerous events; and
- frequency of the specific dangerous events directly associated with fatigue.

The internal consistency of relationships between reported experience of fatigue and particular attitudes is useful for identifying triggers that lead drivers to interpret the experience of fatigue. Additional relationships with risk taking and other detrimental behaviours associated with risk, however, can help validate this profile as well as identifying potential key causal factors leading to fatigue.

The frequency of feeling fatigued was also strongly correlated with the frequency of ‘not taking breaks when feeling tired/drowsy’ and ‘driving contrary to driving/work hours regulations’; and was related to the experience of several of the dangerous events measured in the survey, most strongly with the fatigue-related ‘nodding off for a moment’.

Relationships with the key risk measures highlight issues and behaviours that help define problems associated with fatigue, and hence point to where change is needed to promote issues to drivers to improve their awareness and identification of the problem; and to deal with precursors in the workplace and trip characteristics that lead to fatigue.

These key issues fell into three broad areas:

Work profile

- Longer hours worked
 - Hours spent driving a heavy vehicle
 - Hours spent loading or unloading
 - Unrealistic schedules
 - Ability to plan trips to take breaks
-

Experience

- Feeling fatigued on trips
- Feeling exhausted at end of working day/shift
- Personally manage fatigue badly
- Heavy or tired eyes
- Loss of concentration or attention

Behaviour on trips

- Not taking breaks when tired/drowsy
 - Working contrary to work/driving hours regulations
 - Dangerous events, especially ‘nodding off’
-

Changes from 1991 and 1998

The survey results already show some important improvements in attitudes and behaviour compared with the surveys conducted in 1991 and 1998. These changes include the following:

- The perception of the problem in the industry showed no change since 1991, and the perception of how well fatigue is managed showed no change from 1998. The perception of fatigue as a problem personally for the driver had reduced progressively since 1991.
- Nomination of ‘minimising night driving’ as a company practice to manage fatigue increased from 10% to 30% in the current survey.
- The reported frequency of becoming fatigued had reduced progressively since 1991. Experiencing fatigue ‘very rarely/never’ increased from 15% in 1991 to 25% in 1998 and to 36% in the current survey.
- About half of drivers reported working contrary to working/driving hour regulations on half or more of their trips in both the 1991 and 1998 surveys, reducing to about a quarter in the current survey. Half of drivers reported never or very rarely driving contrary to the regulations in the current survey compared with a quarter in the earlier surveys.
- The incidence of dangerous events reported in the 1998 survey was higher than in the current survey across each of four specific events reported. There was a reduction in the key fatigue-related event of ‘nodding off’, from 48% of drivers in 1998 reporting it occurring at least rarely down to 38% in the current survey.

Conclusion

The results of the study provide a baseline for measures of awareness, attitudes and behaviour of companies in the context of driver fatigue. Changes in these measures at some later stage can be used to assess the effectiveness of the Reform in meeting its objectives. While the use of truck stops to recruit the large majority of drivers in the survey biased the sample towards long haul drivers, comparisons were still possible based on incidence of short/long haul trips. Furthermore, the survey was conducted during the

Heavy Vehicle Driver Fatigue reform public consultation period, which may have influenced awareness and perceptions.

Results from the current survey already show some important improvements in attitudes and behaviour compared with the survey conducted in 1998.

There are a number of opportunities to promote awareness and benefits of the reform, and to influence attitudes towards driver fatigue and acceptance of the reform.

Awareness of fatigue

- Risk of fatigue was evident among both short and long haul drivers in the survey. There was also a strong perception that fatigue was a substantial problem in the heavy vehicle industry. Very few drivers, however, considered fatigue to be more than a minor problem for them. These trends suggest that many drivers are unwilling to admit that fatigue is a problem for them.
- A requirement for progressing improvements in driver fatigue for heavy vehicle drivers appears to be building more acceptance of the potential extent and severity of fatigue as a problem, both for long haul and short haul drivers.
- Given the differences between long and short haul driving, it would be important to tailor a communication strategy to the different groups.
- If short haul fatigue were to be addressed, there would be value in promoting the concept more broadly in the community. This would help raise the profile and community norms around the issue more effectively to enhance strategies that are implemented to combat fatigue.
- A further issue is the way in which drivers interpret/recognise symptoms of fatigue, and attribute behavioural outcomes to fatigue; and the effectiveness or ineffectiveness of strategies to prevent or limit fatigue.

Driving hours and breaks

- Drivers themselves see long working hours as one of the more important contributors to fatigue. This is more of an issue for long haul drivers, who report longer hours and are potentially more likely to be driving through the night.
- Pressure to drive without taking breaks is influenced not only by schedules and driving conditions, but also by the drivers' motivation to make money. Drivers are motivated to take work that would otherwise go to another driver.
- Policies/restrictions implemented and promoted by companies are of relevance to limiting unsafe practices of drivers who simply want to make more money (e.g. number of hours, taking breaks). Education of drivers about healthy lifestyle and work practices is also appropriate, taking into account that truck drivers may not be so receptive to this type of promotion.
- In other situations, changing the way that schedules are set which pressure drivers to work long hours and drive without taking breaks would be relevant.

Companies/Workplace

- Influencing the attitudes and actions of transport companies and freight clients is likely to be difficult, but these groups have an important role to play in bringing about improvements in the driver fatigue area.
- Companies have an important role in monitoring driver behaviour and promoting safe work practices. It is possible, however, that a particular restriction can have negative consequences if it puts more pressure on completing work: for example, enforcing breaks may reduce the risk of driver fatigue, but if there is not adequate time available for the trip, the risk of speeding or other violations may be increased.
- Companies should be encouraged to promote taking breaks and educating drivers about the symptoms of fatigue and how to manage fatigue.
- Companies (and clients) should be encouraged to adopt practices which ensure that rest breaks are incorporated into a driver's schedules and trip times, and which manage typical foreseen delays; and to have in place strategies to manage unforeseen delays outside of a driver's control.
- Authorities in NSW and Victoria have widely publicised fatigue issues to drivers over the last four years.

Regulations

- It is important to promote the credibility of the new regulations as a way of increasing acceptance of the regulations and understanding of the benefits.

AT A GLANCE

Measure	Results for Drivers
Payment Method	<ul style="list-style-type: none"> • 76% were paid per trip/load. • 42% were paid more than award rate. • Improvement in payment at/above the award since 1998.
Fatigue as a Problem	<ul style="list-style-type: none"> • 74% considered fatigue at least a substantial problem in the industry, similar to the result in 1998 (76%). • Only 15% considered fatigue a problem for them personally, with a progressive improvement from 1991 to 1998 and to 2006.
Contributors to Fatigue	<ul style="list-style-type: none"> • The most nominated contributors to fatigue were: <ul style="list-style-type: none"> – aspects of hours of work/sleep ('long driving hours' by 69%, and 'irregular/inadequate sleep' by 61%); as well as – aspects of the work structure ('having to stick to regulations' by 69%, and 'heavy traffic' by 67%). • Several factors associated with work/sleep were more highly nominated by mainly-short haul drivers.
Helpfulness of Strategies to Manage Fatigue	<ul style="list-style-type: none"> • Of concern were the high overall ratings of helpfulness (>75%) of 'adjusting ventilation', 'listening to the radio or music'. • 18% also considered that 'stay awake drugs' were helpful. • 43% considered it helpful that driving hours regulations be 'ignored to finish a trip when close to home'.
Fatigue Management	<ul style="list-style-type: none"> • Only 41% considered driver fatigue 'well managed' in the industry. • 96% considered that they personally managed their fatigue 'well'.
Company Policies and Schemes	<ul style="list-style-type: none"> • 66% of drivers working for a company reported being covered by 'standard working hours'. • 55% reported the company having a Fatigue Management Scheme, while 47% had a medical policy and 41% had a fatigue management policy. • Medium and large sized companies (operating 11+ trucks) were more likely to implement fatigue management practices. • 85% said the company 'allows flexible schedules to rest when needed'; and 82% 'allow enough time between trips for sleep'. • 73% reported that companies 'monitor working hours', but only 54% reported they 'monitor levels of fatigue'. • 66% reported that the company split off 'loading/unloading work' from the drivers. • Provision of education 'about fatigue' (54%) and 'about health' (40%) was less well implemented.

Experience of Fatigue	<ul style="list-style-type: none"> • 24% reported becoming fatigued on ‘about half or more’ of their trips. The reported incidence of becoming fatigued increased with the amount of long haul driving. • The reported experience had decreased from incidences measured in the 1991 and 1998 surveys.
Symptoms	<ul style="list-style-type: none"> • Half reported at least sometimes feeling ‘exhausted at the end of the working day/shift’. • Experience of symptoms formed two separate factors: <ul style="list-style-type: none"> – symptoms of fatigue: ‘heavy or tired eyes’, ‘loss of concentration or attention’ and ‘headaches’, and ‘feeling exhausted at end of day/shift’; and – symptoms of stress: ‘frustration’ and ‘aggression’.
Planning Breaks	<ul style="list-style-type: none"> • 41% had input into planning all of their trips, increasing to 66% on at least half of their trips. • 49% considered that they could plan every day to have adequate breaks/rest. • 23% reported not being able to take a break when feeling tired/drowsy on at least ‘some days’. • There was a clear relationship between the ability to plan and the incidence of being unable to take a break when tired. • The most common reasons for not being able to take a break were ‘nowhere to stop the truck’ and ‘having a tight schedule’.
Schedules and Delays	<ul style="list-style-type: none"> • 12% considered that they had unrealistic schedules on ‘most or all’ of their trips. • 47% reported being delayed for more than 15 minutes waiting in queues to load or unload on at least ‘most’ of their trips. • 48% reported that time for queuing was adequately built into their schedule on at most ‘some trips’. • There was a strong relationship between the incidence of being delayed queuing and the incidence of taking the delay into account in scheduling.
Driving Contrary to Working Hour Regulations	<ul style="list-style-type: none"> • 28% reported that they drove contrary to regulations on at least ‘a quarter’ of trips, including a fifth on at least ‘most’ trips. • Reasons for driving contrary included: <ul style="list-style-type: none"> – demands on drivers – ‘because of tight schedules’ (21% of drivers overall); ‘in order to return home’ (27%); and ‘in order to reach adequate rest facilities’ (25%); and – self-motivated reasons – ‘in order to do enough trips to earn a living’ (23%); and ‘to get in early to get the next load’ (19%). • Substantial reductions from previous surveys in reasons such as ‘to return home’ and ‘to keep your job’ suggest substantial changes to the working environment for long distance driving since the 1990s.

<p>Dangerous Events</p>	<ul style="list-style-type: none"> • 36% reported experiencing ‘nodding off for a moment’ on at least some occasion in the last 12 months. • 5% reported ‘falling asleep at the wheel’. • Incidence of dangerous events had decreased since the 1998 survey. 						
<p>Work Profile</p>	<ul style="list-style-type: none"> • 67% reported having worked for five or more days in the last week, including a third (36%) who had worked on six or seven days. • 16% had worked more than 72 hours in the last week, and 12% had not had a full 24 hour period without work over that week. • 45% of drivers had worked for more than 14 hours in a 24 period over the week, including 25% for more than 16 hours. • 57% had not had a break of at least 6 hours (or 8 hours in two parts) in at least one 24 hour period during the week. • 49% had slept for 7 hours during the period 10 pm to 8 am on no more than four nights in the last seven days. 						
<p>Relationship Between Risk Taking, Attitudes and Behaviour</p>	<ul style="list-style-type: none"> • The relationship between ‘risk’ measures and other attitudes and behaviours in the survey was assessed. The key risk measures were: <ul style="list-style-type: none"> – experience of fatigue; and – dangerous events. • Issues and behaviours associated with both types of measures included: <table border="1" data-bbox="475 1098 1279 1690"> <tr> <td data-bbox="475 1098 678 1308"> <p>Work profile</p> </td> <td data-bbox="678 1098 1279 1308"> <ul style="list-style-type: none"> • Hours spent driving a heavy vehicle • Hours spent loading or unloading • Unrealistic schedules • Ability to plan trips to take breaks </td> </tr> <tr> <td data-bbox="475 1308 678 1518"> <p>Experience</p> </td> <td data-bbox="678 1308 1279 1518"> <ul style="list-style-type: none"> • Personally manage fatigue badly • Heavy or tired eyes • Loss of concentration or attention • Feeling exhausted at end of working day/shift </td> </tr> <tr> <td data-bbox="475 1518 678 1690"> <p>Behaviour on trips</p> </td> <td data-bbox="678 1518 1279 1690"> <ul style="list-style-type: none"> • Not taking breaks when tired/drowsy • Working contrary to work/driving hours regulations • Dangerous events, especially ‘nodding off’ </td> </tr> </table> 	<p>Work profile</p>	<ul style="list-style-type: none"> • Hours spent driving a heavy vehicle • Hours spent loading or unloading • Unrealistic schedules • Ability to plan trips to take breaks 	<p>Experience</p>	<ul style="list-style-type: none"> • Personally manage fatigue badly • Heavy or tired eyes • Loss of concentration or attention • Feeling exhausted at end of working day/shift 	<p>Behaviour on trips</p>	<ul style="list-style-type: none"> • Not taking breaks when tired/drowsy • Working contrary to work/driving hours regulations • Dangerous events, especially ‘nodding off’
<p>Work profile</p>	<ul style="list-style-type: none"> • Hours spent driving a heavy vehicle • Hours spent loading or unloading • Unrealistic schedules • Ability to plan trips to take breaks 						
<p>Experience</p>	<ul style="list-style-type: none"> • Personally manage fatigue badly • Heavy or tired eyes • Loss of concentration or attention • Feeling exhausted at end of working day/shift 						
<p>Behaviour on trips</p>	<ul style="list-style-type: none"> • Not taking breaks when tired/drowsy • Working contrary to work/driving hours regulations • Dangerous events, especially ‘nodding off’ 						

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1. INTRODUCTION

The National Transport Commission (NTC) is keen to assess the impacts of its national reforms over time and to develop a long term strategy to evaluate the effectiveness of the reforms it has developed. Currently two major reforms are being implemented in 2006-07 and 2007-08. Both the Compliance and Enforcement reform (2003) (National Transport Commission, 2002, 2003) and the new Heavy Vehicle Driver Fatigue reform (2006) (National Transport Commission, (2004a, 2004b) target heavy vehicle road transport operations (both long distance and urban).

Fatigue is one of the main causes of crashes involving heavy vehicle drivers. Current prescriptive approaches are inflexible, not fully effective and are inconsistent with requirements under occupational health and safety laws.²

The Heavy Vehicle Driver Fatigue reform shifts the focus from the driver to a range of other roles within a company. These roles are responsible for management and safety practices, e.g. scheduling, with the ability to manage driver fatigue precursors, such as opportunity for sleep, time of day influences, and the cumulative nature of fatigue and sleep loss. The aim of this reform is to improve road safety through the implementation of company policies and practices to address the management of driver fatigue in the road transport supply chain.

This reform will affect all parties in the road transport supply chain, including freight forwarders, shippers, stevedores, loaders, schedulers, distribution centres, unloaders and prime contractors, and third parties such as consignees and major consignors of goods including manufacturers, farmers and retailers, among others who exert influence and can affect compliance with road safety regulations.

In order to gauge the impacts of the Heavy Vehicle Driver Fatigue reform on road transport industry management and safety practices, the NTC needs to gather data both prior to and post-implementation of this reform. Two studies were conducted relating to driver fatigue, one with heavy vehicle operators and consignors, and one with heavy vehicle drivers. This report covers transport operators, freight forwarders and third party consignors.

The purpose of this survey is to assess, prior to implementation of the new reform, the current attitudes, awareness and understanding among long and short haul heavy vehicle drivers of fatigue management issues, and their day to day experience of fatigue-related issues. It should also be noted, however, that the survey was conducted during the Heavy Vehicle Driver Fatigue reform public consultation period, which may have influenced awareness and perceptions.

Results from this survey have also been compared with those from the company survey, from two earlier surveys on driver fatigue conducted with drivers in 1998 (Williamson, Sadural, Feyer, and Friswell, 2001) and in 1991 (Williamson, Feyer, Coumarelos, and

² See background information to the fatigue reform in House of Representatives, Standing Committee on Communication, Transport and the Arts (2000), Motor Accidents Authority, NSW (2001), National Transport Commission (2001), National Transport Commission (2002), and National Road Transport Commission and Ken Smith – Smithworks Consulting (2001).

Jenkins, 1992); and with a later study conducted in 2004/5 comparing fatigue experiences of local area drivers of light trucks with those of long haul drivers (Friswell, Williamson and Dunn, 2006b).

2. METHOD

2.1 Qualitative Research

A preliminary, qualitative study was conducted to explore issues with both drivers and companies involved in road freight transport, operating vehicles of at least 12 tonnes gross vehicle mass. The companies survey included freight operators, hire and reward operators, ancillary operators and consignors.

Exploratory focus groups with drivers and in-depth interviews with companies were conducted during April/May 2006. The results of this stage of the research were used to develop questions for the main survey.

2.2 Survey Research

2.2.1 The Sample

The main quantitative survey was conducted in August/September 2006, involving a final sample of 613 heavy vehicle drivers across Australia. Drivers were recruited to be involved in road freight transport operating vehicles of at least 12 tonnes gross vehicle mass. Bus drivers were not included in the survey.

Drivers were recruited in one of two ways:

- **TRUCK STOPS:** Face to face interviews with 553 drivers at truck stops in NSW, Victoria, Queensland, South Australia and Western Australia.
- **RECRUIT:** To supplement the number of short haul and regional drivers, an additional 60 drivers were accessed through a specialist market research recruitment agency, and interviewed by telephone.

A cross section of long haul and short haul drivers, owner/operators, subcontractors and employee drivers were surveyed. The final sample is described in Table 1, including main category of drivers, location, and types of trips.

More detail on the method is provided in Appendix A.

Table 1. Summary of Locations and Sample Sizes

Measure	No.	%
Interview location		
NSW	188	31%
Vic	186	30%
Qld	133	22%
SA/NT	56	9%
WA	50	8%
Driver Base		
NSW	165	27%
Vic	191	31%
Qld	155	25%
Other	102	17%
Type of Driver		
Employee	432	70%
Owner - Subcontractor	55	9%
Owner - Independent	108	19%
Insufficient detail	18	2%
% Long haul trips (>100 km from base)		
0%	83	14%
1-29%	47	8%
30-89%	96	16%
90-99%	38	6%
100%	341	56%

2.2.2 Questionnaire

The questionnaire was developed around the objectives for the research, with input from the qualitative research, and is provided in Appendix B. The questions covered:

- driver profile, including location, driver employment, and size of company operation;
- freight transport profile including main types of freight and short/long haul distribution;
- pay rates and payment for non-driving work;
- practices and strategies in place to manage fatigue;
- attitudes and perceptions about driver fatigue in the industry and personally;
- perceptions of contributors to fatigue and helpfulness of strategies to manage fatigue;
- experience of fatigue and experience of driving incidents; and
- a diary of hourly work/rest patterns over the last seven days.

2.3 Analysis

2.3.1 General Results and Group Comparisons

The main body of the Results Section (section 3) summarises the findings for each question. Comparisons have been made between different categories of drivers, based on a number of groupings. These are summarised in Table 2, along with the sample sizes in the survey.

For the variable *Long haul trips*, those drivers reporting 0-29% of their trips as long haul have been described as the ‘mainly-short haul group’, while those drivers reporting 90-100% of their trips as long haul have been described as the ‘mainly-long haul group’.

Table 2. Main Categories of Drivers Used for Comparisons in the Analysis, Including Sample Size and Maximum 95% Confidence Interval

Grouping	Categories	Sample size	% of sample	Maximum 95% confidence interval on the results
Total		613	100%	±4%
Employment	Employee driver	432	70%	±5%
	Owner driver/operator	181	30%	±7%
Long haul trips (>100 km from driver base)	0-29% [mainly-short haul]	130	21%	±9%
	30-89%	103	17%	±10%
	90-100% [mainly-long haul]	379	62%	±5%
FOR EMPLOYEE DRIVERS: Number of vehicles operated by company	1-4	113	26%	±9%
	5-10	97	23%	±10%
	10-50	136	32%	±8%
	>50	83	19%	±11%
Main vehicle driven	Rigid truck	70	11%	±12%
	Articulated	320	52%	±5%
	B-double	177	29%	±7%
	Road Train	46	8%	±15%

2.3.2 Statistical Tests

In reading the results of the survey, it is important to note that each result is not a precise figure but an estimate based on a sample of drivers.

As a guide to the level of precision of the results, Table 2 shows the ‘maximum 95% confidence interval’. This interval is the range around a percentage result from a random sample of a given size in which we have 95% confidence that the true population result lies. This range in the estimation is greatest for a survey result of 50%.

Chi-square tests have been used to compare differences among the groups of drivers. Statistically significant differences between groups within each grouping variable (reported at a statistical significance level of .05) have been highlighted by:

- a symbol above the grouping measure (*) in charts; or

- by bolding higher results in tables (24).

Correlational analysis and ANOVA statistical techniques were also used to assess specific relationships. More detail on the analysis is provided in Appendix A.

2.3.3 Comparisons with the 1991 and 1998 Surveys

Comparisons have also been made with results on relevant questions from the surveys conducted of long distance drivers in 1991 and 1998, to provide some measure of changes in the industry. Not all results were included in the published reports on the 1991 and 1998 surveys. As the current survey includes a broader range of drivers operating heavy vehicles, especially short haul drivers, comparisons have been based only on drivers in the current survey who were primarily long haul: 90-100% of their trips, representing 62% of the sample (n=379). With the larger sample sizes involved, statistically significant differences between the surveys have been reported at a statistical significance level of .01.

3. RESULTS

3.1 Profile of Drivers

Table 3 summarises the profile of drivers in the survey on a set of driver groupings.

Table 3. Profile of the Survey Sample, by Driver Groupings

Grouping	Total (n=613)	DRIVER TYPE		LONG HAUL TRIPS			COMPANY TRUCKS (EMPLOYEES)				USUAL VEHICLE			
	%	Employee (n=432) %	Owner driver (n=171) %	0-29% (n=130) %	30-89% (n=103) %	90-100% (n=379) %	1-4 (n=113) %	5-10 (n=97) %	11-50 (n=136) %	>50 (n=83) %	Rigid (n=70) %	Articulated (n=320) %	B-double (n=177) %	Road Train (n=46) %
Employment														
Employee driver	70	100	–	62	68	74	–	–	–	–	69	66	80	70
Subcontractor	23	–	77	26	23	21	–	–	–	–	20	28	15	24
Independent	4	–	13	5	7	3	–	–	–	–	4	4	3	7
Other	3	–	10	6	2	2					7	3	2	0
% Long haul trips (>100 km away from base)														
0-29% [mainly short haul]	21	19	26	–	–	–	23	18	14	19	50	23	10	9
30-89% [‘middle’ group]	17	16	19	–	–	–	16	22	12	18	27	16	10	33
90-100% [mainly long haul]	62	65	55	–	–	–	61	60	74	63	23	61	80	59
Main vehicle driven														
Rigid truck	11	11	11	27	18	4	16	18	4	7	–	–	–	–
Articulated	52	49	62	57	50	51	48	46	57	40	–	–	–	–
B-double	29	33	19	13	17	37	31	32	29	41	–	–	–	–
Road Train	8	7	8	3	15	7	5	4	9	12	–	–	–	–

Bolded: Higher result, with a statistically significant difference between groups ($p < .05$).

Over two thirds (70%) of drivers were employee drivers of a company, which was similar to the figure reported in the 1998 survey (69%), but marginally lower than in the 1991 survey (77%). The remaining drivers were mainly subcontractors.

A fifth of drivers were classified as ‘mainly-short haul’, with fewer than 30% of their trips taking them more than 100 km from their base. Close to two thirds (62%) of the drivers in the survey were primarily ‘long haul’, with at least 90% of their trips taking them more than 100 km from their base.

The drivers in the survey carried a variety of types of freight (Table 4). The main group of long haul drivers was most likely to report carrying ‘refrigerated/temperature controlled’ and ‘general/mixed freight’. Among employed drivers, those working in larger companies reported a larger number of types of freight, particularly ‘dangerous goods’ and ‘building materials’.

Table 4. Main Types of Freight Carried, by Driver Groupings

Main types of freight	Total (n=613) %	DRIVER TYPE		LONG HAUL TRIPS			COMPANY TRUCKS (EMPLOYEES)				USUAL VEHICLE			
		Employee (n=432) %	Owner driver (n=171) %	0-29% (n=130) %	30-89% (n=103) %	90-100% (n=379) %	1-4 (n=113) %	5-10 (n=97) %	11-50 (n=136) %	>50 (n=83) %	Rigid (n=70) %	Articulated (n=320) %	B-double (n=177) %	Road Train (n=46) %
Livestock	3	2	4	5	3	2	4	1	1	5	3	1	5	9
Refrigerated or temp. controlled	19	22	12	15	11	23	15	21	26	28	10	24	16	9
Dangerous goods	10	11	8	13	15	8	8	6	10	24	9	7	16	17
Farm produce	18	17	21	12	22	20	16	12	23	17	3	20	20	28
Building materials	14	13	17	17	17	12	12	14	14	11	17	15	11	13
Groceries	12	14	8	13	12	12	9	8	18	22	10	12	15	11
Other bulk	16	16	17	32	26	9	13	18	14	24	17	16	15	26
Machinery	13	11	17	15	16	11	12	14	10	7	13	12	11	22
Car carrying	3	2	5	2	3	3	2	4	1	1	3	3	2	4
Manufactured goods	9	10	8	13	10	8	7	10	11	11	9	8	11	15
General or mixed freight	38	38	40	24	32	45	40	33	44	30	19	37	49	37
Express freight	8	10	2	3	6	10	5	8	14	12	1	5	16	2
Any other	9	8	12	12	9	8	10	7	9	7	23	9	6	4

Bolded: Higher result, with a statistically significant difference between groups ($p < .05$).

Comparison with the 1991 and 1998 surveys

The change in the mix of drivers in the current survey compared with the 1991 and 1998 surveys led to some overall differences in the incidence of freight transported. The main difference was for a reduction in the incidence of ‘general or mixed freight’ in the current survey (from 49% in 1991 and 50% in 1998 down to 38%). Interestingly, this difference was also evident among the mainly-long haul group of drivers.

3.2 Payment Methods

About two thirds of drivers (64%) were paid a ‘per trip’ rate, with a third (34%) being paid on an ‘hourly’ rate or a ‘salary’ rate, including those calculated daily or weekly (Table 5).

Table 5. Payment Profiles, by Driver Groupings

Payment	Total (n=613) %	DRIVER TYPE			LONG HAUL TRIPS			COMPANY TRUCKS (EMPLOYEES)				USUAL VEHICLE			
		Employee (n=432) %	Owner driver (n=171) %		0-29% (n=130) %	30-89% (n=103) %	90-100% (n=379) %	1-4 (n=113) %	5-10 (n=97) %	11-50 (n=136) %	>50 (n=83) %	Rigid (n=70) %	Articulated (n=320) %	B-double (n=177) %	Road Train (n=46) %
Payment method															
Hourly	17	21	7	46	22	5	19	25	14	28	40	15	7	29	
Daily/Weekly/Salary	17	20	8	16	21	16	23	22	17	20	20	14	18	22	
Per trip/load/km	64	56	85	37	50	77	55	49	67	47	40	69	70	44	
Mixed	3	3	1	2	6	2	4	4	2	5	0	2	5	4	
Award rate															
At the award rate	35	37	29	28	28	39	38	32	39	36	31	33	40	28	
Less than the award rate	9	5	19	15	7	8	3	7	6	5	9	10	8	9	
More than the award rate	42	49	26	42	50	40	50	55	45	51	50	41	38	52	
Don't know	14	9	26	15	16	13	10	6	10	8	10	15	14	11	
Contract															
Negotiate	14	6	34	11	19	14	8	4	7	5	16	15	9	22	
Contract - <u>all</u> loads	24	25	24	23	24	25	31	19	26	19	19	24	29	11	
Contract - <u>some</u> loads	8	9	6	3	9	10	10	7	13	6	3	8	11	11	
Contract - <u>no</u> loads	53	59	35	63	47	51	50	69	54	69	61	52	50	57	
Payment for non-driving work															
Yes - at same rate	40	44	28	55	50	32	48	48	37	46	67	34	32	63	
Yes - not same rate	10	12	5	5	8	12	6	11	14	16	3	8	15	9	
Yes - don't know if at same rate	1	1	1	1	2	1	2	2	1	0	0	2	1	0	
No	45	38	62	37	37	50	39	35	43	34	27	50	47	28	
Don't know	5	5	4	3	3	6	5	3	5	5	3	5	5	0	

Bolded: Higher result, with a statistically significant difference between groups ($p < .05$).

The incidence of ‘per trip’ rates increased with the amount of long haul driving. A third of the mainly-short haul group was paid by the trip compared with three quarters of the mainly-long haul group. Owner drivers were also more likely than employee drivers to be paid on a ‘per trip’ rate (85% vs 56%).

A third (35%) of drivers were paid at the award rate, while two in five (42%) were paid above the award rate. A quarter of owner drivers did not know whether or not they were paid at the award, but the overall trend among aware drivers was that they were paid less than the award rate. In contrast, owner drivers were more likely to negotiate each load (34% vs 6% of employee drivers), although the majority (59%) of employee drivers were not under a specific contract for loads. The mainly-short haul group was the most likely to say that they were not under a contract (63%).

Half (50%) of the drivers in the study were paid for non-driving work, with the large majority being paid ‘at the same rate’ as driving work (Table 5). Groups less likely to get paid for non-driving work included:

- owner drivers (28% vs 44% of employee drivers); and
- the mainly-long haul group (44% vs 70% for other drivers).

Comparisons with the 1991 and 1998 surveys

Comparing results for the mainly-long haul group in the current survey with the 1991 and 1998 surveys showed broad similarities in the payment method but differences in the award rate (Table 6). The majority of drivers in all three surveys were paid per trip/load, with the incidence being higher in 1998 (82%) and the current survey (76%) compared with the 1991 survey (60%), suggesting a shift during the 1990s away from hourly or salary rates.

There also appeared to have been a shift since 1991 in payment relative to the award rate. Payment at less than the award rate decreased from 16% in 1991 and 1998 down to 8% in 2006. Payment at more than the award rate increased from 15% in 1991 to 26% in 1998, and up to 40% in 2006.

Table 6. Payment Profiles – Comparing 1991, 1998 and 2006 Surveys

MEASURE	1991	1998	2006 (Mainly- Long Haul Group)
	%	%	%
Payment method			
Hourly	12	7	5
Daily/Weekly/ Salary	13	9	16
Per trip/load/km	60	82	77
Mixed / Other	12	5	2
Award rate			
At the award rate	59	38	39
Less than the award rate	16	16	8
More than the award rate	15	26	40
Don't know	10	20	13

Bolded: Higher result, with a statistically significant difference between surveys ($p < .05$).

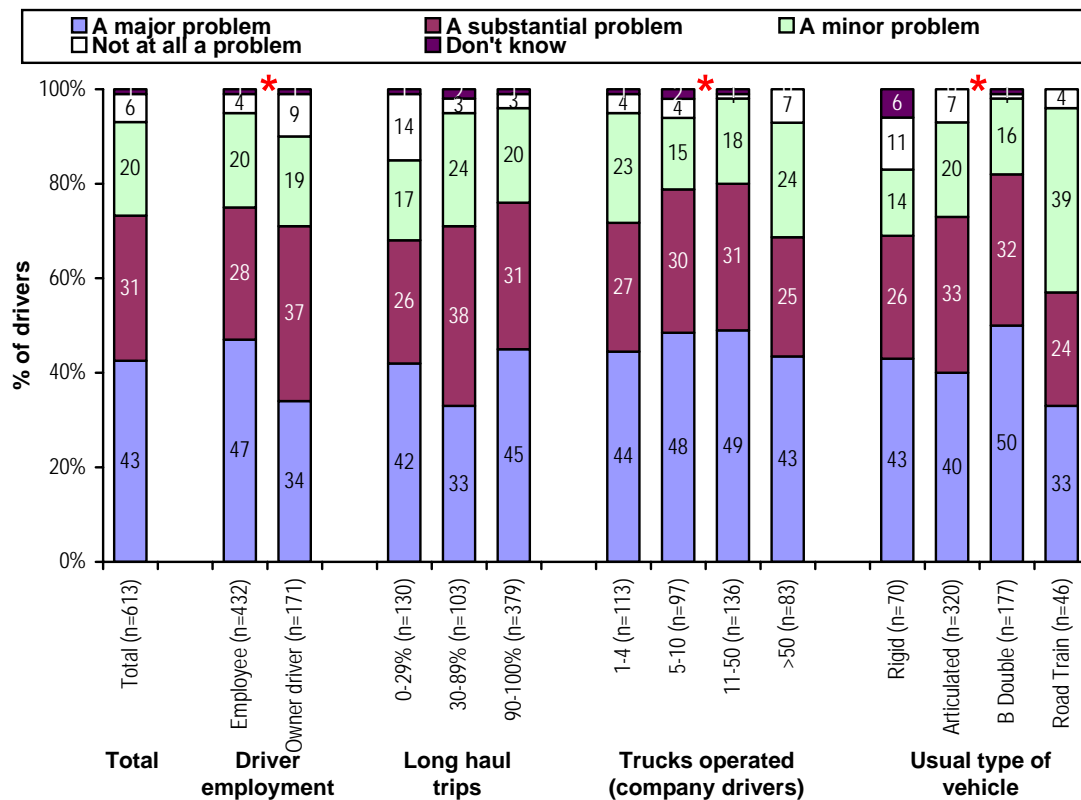
3.3 Attitudes and Perceptions about Driver Fatigue

3.3.1 General Perceptions

Three quarters of drivers considered that driver fatigue was at least a ‘substantial’ problem in the industry (Figure 1). This view was stronger among employee drivers (85%) compared with owner drivers (71%); and was also more likely to be seen as a problem by drivers in medium sized companies (operating 5-50 trucks). Drivers of road trains (59%) were the least likely to consider fatigue to be such a problem.

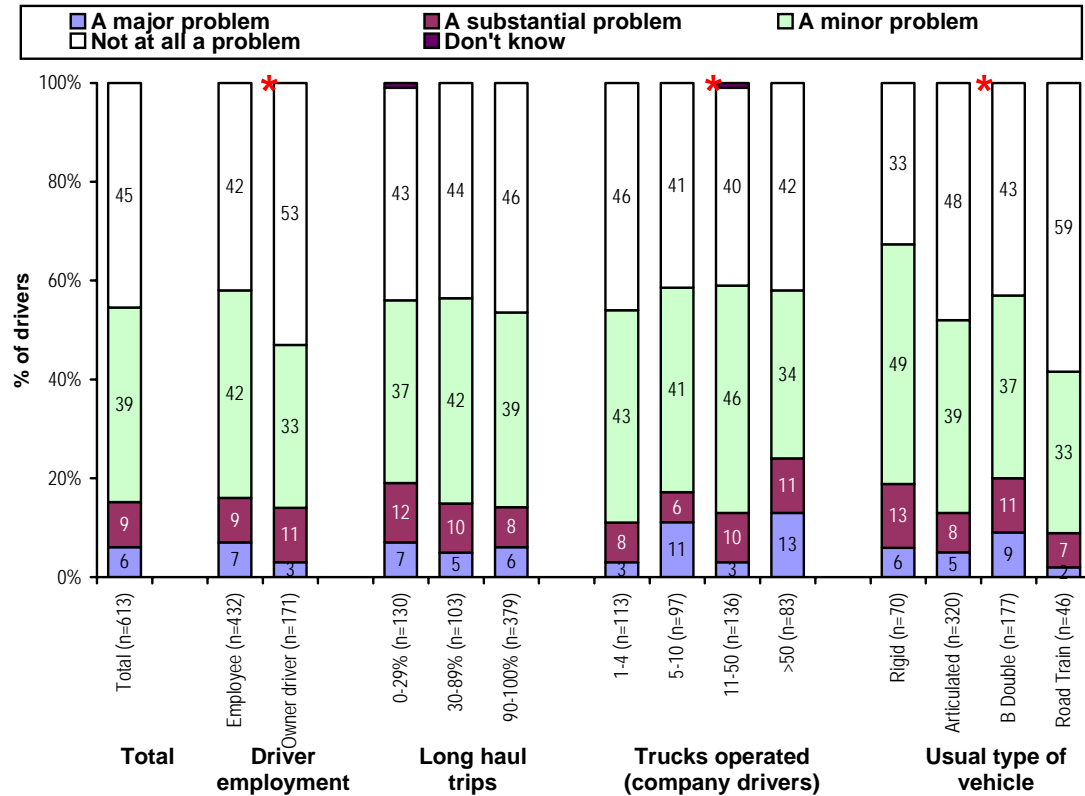
When fatigue was considered as a personal problem, however, only 15% of drivers rated it as at least a ‘substantial’ problem. In this case, employee drivers were still more likely than owner drivers to consider fatigue to be at least a ‘minor’ problem (58% vs 47%), but drivers in large companies (operating 50+ trucks) now tended to be the most likely to rate the problem more seriously. Interestingly, there was no difference in the rating between short haul and long haul drivers.

Figure 1. Driver Fatigue as a Problem in the Industry, by Driver Groupings



* Statistically significant difference between groups ($p < .05$).

Figure 2. Driver Fatigue as a Personal Problem, by Driver Groupings



* Statistically significant difference between groups ($p < .05$).

Comparisons with the 1991 and 1998 surveys

The perception of the problem in the industry was very similar to the results in the 1991 and 1998 surveys, with three quarters of drivers rating it as a ‘substantial/major problem’ (Table 7). In contrast, rating of fatigue as a problem personally decreased progressively through 1991, 1998 and the current survey. Overall, only 15% of drivers in the 1991 survey considered that fatigue was not at all a problem for them personally, increasing to 30% in 1998 and to 49% in the current survey.

Table 7. Perceptions of Driver Fatigue as a Problem – Comparing the 1991, 1998 and 2006 Surveys

Fatigue as a problem in industry	1991	1998	2006 (Mainly-long haul group)	Fatigue as a problem personally	1991	1998	2006 (Mainly-long haul group)
	%	%	%		%	%	%
Problem in industry				Problem personally			
A major problem	38	40	45	Major problem	9	6	6
Substantial problem	40	36	31	Substantial problem	26	15	8
A minor problem	20	21	20	A minor problem	50	49	29
Not at all a problem	2	3	3	Not at all a problem	15	30	49
Don't know	0	0	1	Don't know	0	0	0

Bolded: Higher result, with a statistically significant difference between surveys ($p < .05$).

3.3.2 Contributors to Driver Fatigue

Drivers nominated a number of factors as contributors to their fatigue while driving (Figure 3). The most nominated, by two thirds of drivers, covered aspects of both hours of work/sleep ('long driving hours' by 69%, and 'irregular/inadequate sleep' by 61%) as well as aspects of the work structure ('having to stick to regulations' by 69%, and 'heavy traffic' by 67%). Fewer than half of drivers nominated factors around time of day, specifically driving at night (39%) and 'driving in early afternoon' (44%), as contributing to their fatigue.

Interestingly, nomination of several factors as 'major' contributors decreased with the amount of long haul driving (Table 8). The mainly-short haul group was the most likely to nominate 'long working hours' (52%), 'not enough night time sleep' (44%) and 'insufficient rest break' (42%). This was reflected in a higher overall average number of contributors being nominated as 'major' by this short haul group (3.3 compared with an overall average of 2.7); and in the higher average among drivers of rigid trucks (3.4) who were more likely to be short haul.

Figure 3. Factors that are Contributors to the Driver's Fatigue while Driving

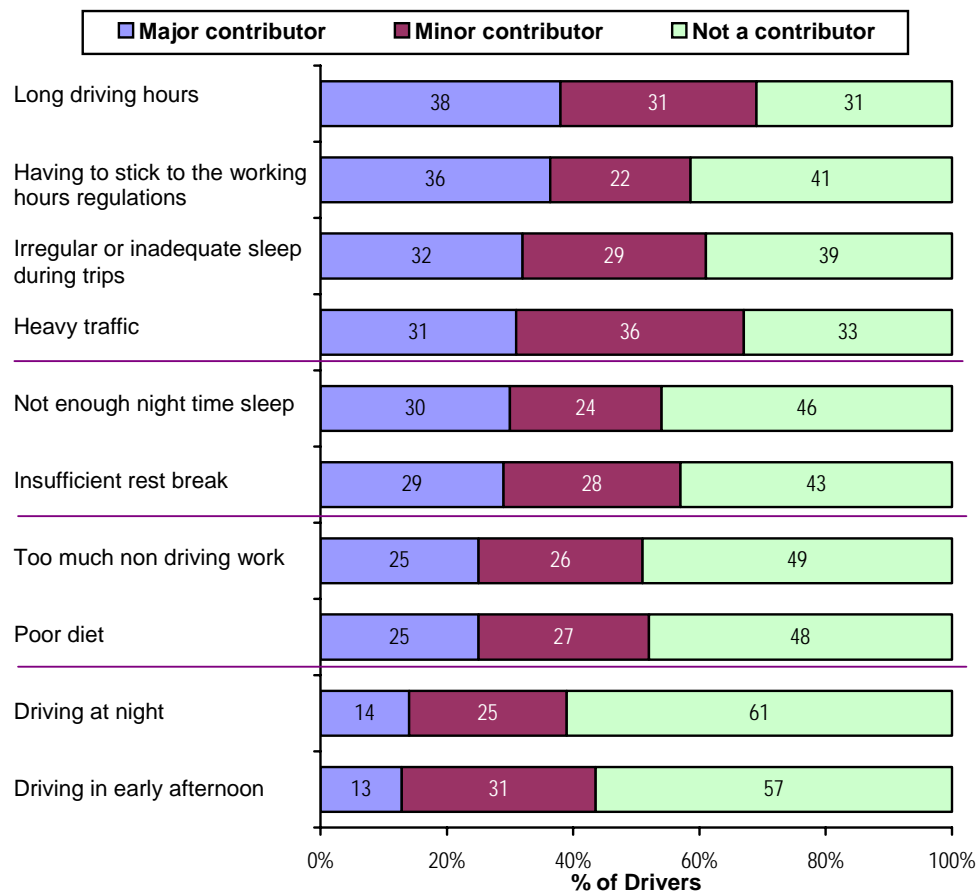


Table 8. Factors that are 'Major Contributors' to the Driver's Fatigue while Driving, by Driver Groupings

Major contributors	Total (n=613) %	DRIVER TYPE		LONG HAUL TRIPS			COMPANY TRUCKS (EMPLOYEES)				USUAL VEHICLE			
		Employee (n=432) %	Owner driver (n=171) %	0-29% (n=130) %	30-89% (n=103) %	90-100% (n=379) %	1-4 (n=113) %	5-10 (n=97) %	11-50 (n=136) %	>50 (n=83) %	Rigid (n=70) %	Articulated (n=320) %	B-double (n=177) %	Road Train (n=46) %
Long driving hours	38	37	38	52	40	32	31	44	36	40	54	36	33	39
Having to stick to the working hours regulations	36	34	40	31	30	40	30	31	39	37	22	39	41	22
Irregular or inadequate sleep during trips	32	34	30	39	37	29	30	42	32	31	42	29	36	33
Heavy traffic	31	32	28	33	31	30	35	35	24	40	33	31	33	17
Not enough night time sleep	30	31	28	44	34	25	23	34	29	43	49	29	26	30
Insufficient rest break	29	29	29	42	27	25	23	40	26	29	46	28	25	29
Poor diet	25	26	22	27	27	24	23	30	27	26	30	25	22	33
Too much non driving work	25	26	20	27	15	26	28	30	27	18	28	25	26	11
Driving at night	14	15	12	19	17	12	12	14	15	21	26	14	10	15
Driving in early afternoon	13	12	13	12	11	14	13	19	11	6	10	13	12	15
AVERAGE NOMINATED	2.7	2.8	2.6	3.3	2.7	2.6	2.5	3.2	2.7	2.9	3.4	2.7	2.6	2.4

Bolded: Higher result, with a statistically significant difference between groups ($p < .05$).

Comparisons with the 1991 and 1998 surveys

Direct comparisons with the 1991 and 1998 surveys cannot be made as a result of changes to the question structure. A major/minor scale was introduced in the current survey, and the list of strategies for drivers to nominate was reduced.

Comparing nominations in 1991 and 1998 with nomination as either a 'major' or 'minor' contributor in the current survey results in large increases in all factors (Table 9). Comparison only with nomination as a 'major' factor in the current survey would suggest a reduction in the contribution of 'long driving hours' (48%/49% down to 32%) and 'irregular/inadequate sleep' (40%/38% down to 29%). There was, however, a trend for nomination of 'heavy traffic' to increase as a contributor.

Table 9. Contributors to the Driver's Fatigue while Driving – Comparing the 1991, 1998 and 2006 Surveys

Factor	1991	1998	2006 (Mainly-long haul group)	
	Contributor %	Contributor %	Major Contributor %	Minor/Major Contributor %
Long driving hours	49	48	32	67
Heavy city traffic	25	23	30	66
Heavy highway traffic	14	14		
Irregular or inadequate sleep during trips	40	38	29	64
Not enough night time sleep	NA	23	25	51
Insufficient rest break	25	23	25	50
Poor diet	30	27	24	49
Too much non driving work	NA	30	26	48
Driving at night	17	11	12	36
Driving in early afternoon	NA	18	14	31

Bolded: Higher result, with a statistically significant difference between surveys ($p < .05$).

3.3.3 Helpfulness of Strategies to Manage Driver Fatigue

Drivers were also asked to rate how helpful each of a number of strategies was in managing driving fatigue (Figure 4). These strategies were divided into three broad areas: stopping, eating/ingesting (including a caffeine drink and ‘stay awake’ drugs), and other ‘in trip’ strategies. Almost every driver nominated as helpful ‘stopping to sleep’ (including 78% as ‘very helpful’) and ‘stopping to rest’ (67% as ‘very helpful’). The mainly-long haul group was the most positive about ‘stopping to sleep’ (Table 10).

The second tier of strategies, judged as helpful by over half of drivers, included actions within the vehicle of ‘adjusting ventilation’ (27% as ‘very helpful’) and ‘listening to the radio or music’ (27%); and ‘having a drink containing caffeine’ (17%). The high overall rating of helpfulness (>75%) of these strategies is of some concern as they are more temporary solutions than strategies involving rest.

About one in six (18%) drivers also considered that ‘stay awake drugs’ were helpful. The value of the driving hours regulations was questioned by two fifths (43%) of drivers who considered that it was helpful that they be ‘ignored to finish a trip when close to home’. The mainly-long haul group was the most positive about this strategy (Table 10).

Figure 4. Rating of Helpfulness of Driver Strategies to Manage Fatigue

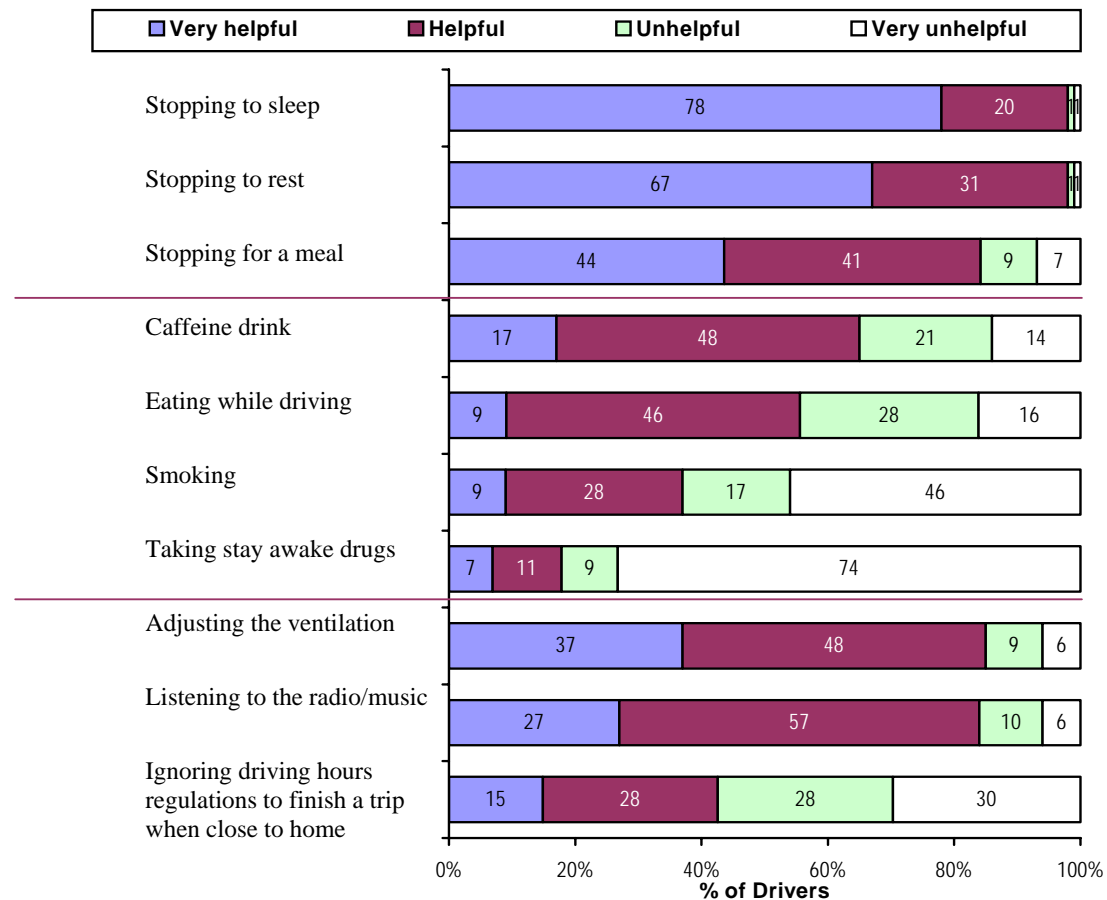


Table 10. Driver Strategies Rated as ‘Very Helpful’ to Manage Fatigue, by Driver Groupings

Strategies	Total (n=613) %	DRIVER TYPE		LONG HAUL TRIPS			COMPANY TRUCKS (EMPLOYEES)				USUAL VEHICLE			
		Employee (n=432) %	Owner driver (n=171) %	0-29% (n=130) %	30-89% (n=103) %	90-100% (n=379) %	1-4 (n=113) %	5-10 (n=97) %	11-50 (n=136) %	>50 (n=83) %	Rigid (n=70) %	Articulated (n=320) %	B-double (n=177) %	Road Train (n=46) %
Stopping to sleep	78	77	82	66	74	84	72	79	80	75	64	82	83	60
Stopping to rest	67	68	65	63	63	70	68	66	71	66	73	67	70	54
Stopping for a meal	44	45	40	42	45	44	46	52	43	41	46	44	43	43
Adjusting the ventilation	37	37	37	38	34	38	38	41	33	40	34	34	43	42
Listening to the radio or music	27	28	26	20	25	30	29	23	27	33	20	28	28	28
Ignoring driving hours regulations to finish a trip close to home	15	14	15	6	11	19	15	13	19	9	7	16	18	7
Having a drink containing caffeine	17	17	17	18	12	18	18	16	15	21	13	19	17	7
Eating while driving	9	8	13	10	5	11	8	7	7	10	13	8	12	4
Smoking	9	11	5	7	5	11	12	12	7	16	7	7	14	8
Taking stay awake drugs	7	7	6	3	7	8	7	14	4	5	4	7	8	5

Bolded: Higher result, with a statistically significant difference between groups ($p < .05$).

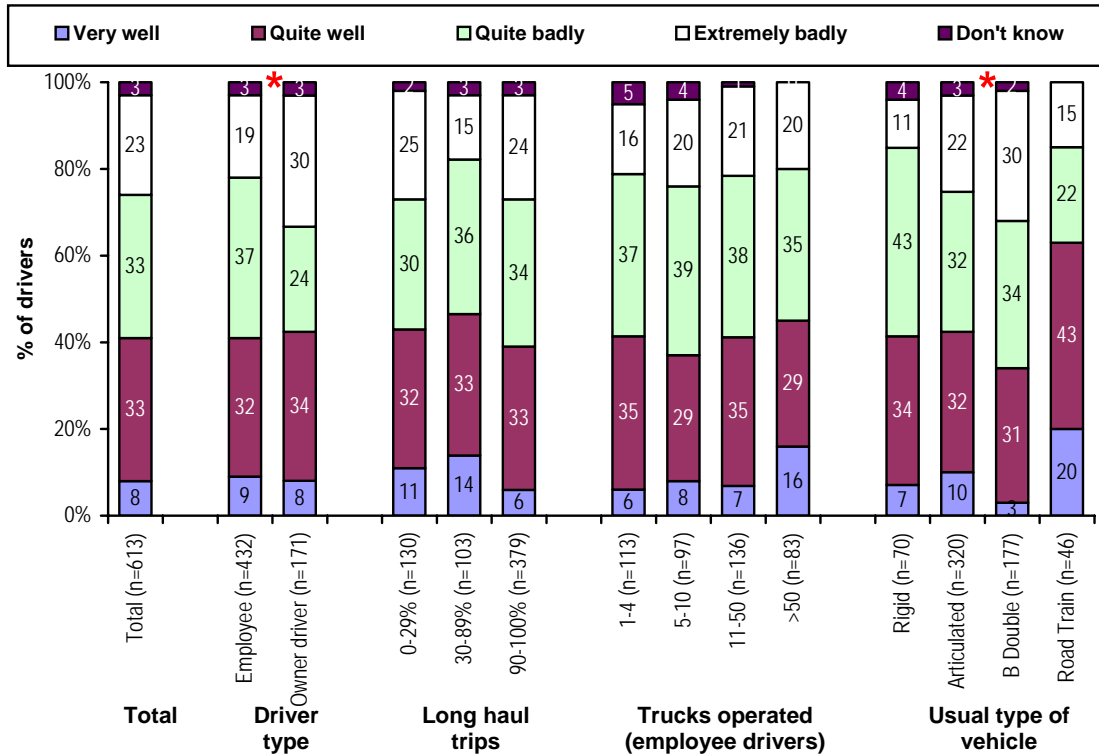
3.4 Fatigue Management

3.4.1 General Perceptions

Fewer than half (41%) of drivers considered that driver fatigue was ‘well managed’ in the industry, with a quarter (23%) considering that it was ‘extremely badly’ managed (Figure 5). Owner drivers were more likely than employee drivers to consider it was ‘extremely badly’ managed (30% vs 19%); drivers of B-doubles were also more likely to rate this way (30%).

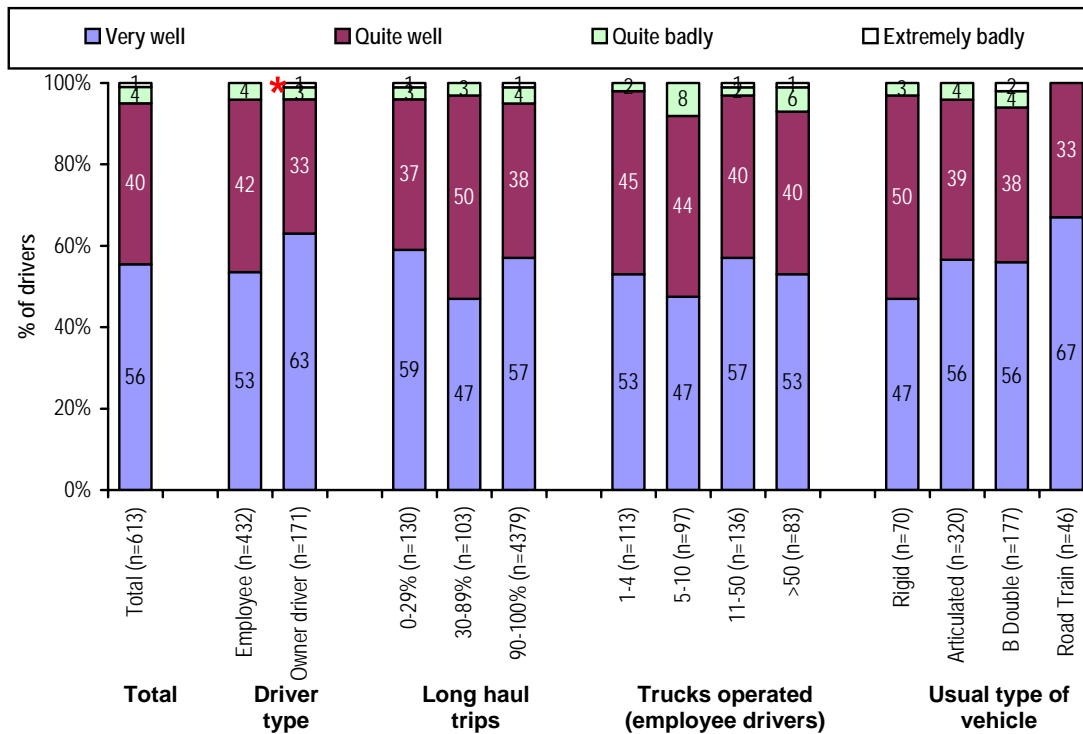
In contrast, almost all drivers (96%) considered that they personally managed their fatigue ‘well’ (Figure 6). Owner drivers were more likely than employee drivers to consider they managed their own fatigue ‘very well’ (63% vs 53%).

Figure 5. How Fatigue is Managed in the Industry, by Driver Groupings



* Statistically significant difference between groups ($p < .05$).

Figure 6. How Well is Fatigue Managed Personally, by Driver Groupings



* Statistically significant difference between groups ($p < .05$).

Comparison with the 1998 survey

The proportion of drivers who considered that fatigue was badly managed in the industry was at a similar level in the current survey (58% of mainly-long haul drivers) compared with the 1998 survey (53%). The large majority of drivers continued to consider that they personally managed their fatigue well (96% compared with 92% in 1998).

3.4.2 Company Policies and Schemes

Drivers working for a company, either as employee drivers or owner drivers (as subcontractors/independent drivers) were asked about a number of practices that the company had in place. Two thirds (66%) of drivers reported being covered by ‘standard working hours’ (Table 11). The incidence increased with the amount of long haul driving, to be greatest among the mainly-long haul group (77%). Employee drivers were more likely than owner drivers to report being covered (73% vs 53%).

Table 11. Company Schemes and Policies, by Driver Groupings

BASE: Employee and owner drivers working for a company.

Practice	Total (n=487) %	DRIVER TYPE		LONG HAUL TRIPS			COMPANY TRUCKS (EMPLOYEES)				USUAL VEHICLE			
		Employee (n=432) %	Owner driver (n=55) %	0-29% (n=102) %	30-89% (n=81) %	90-100% (n=303) %	1-4 (n=113) %	5-10 (n=97) %	11-50 (n=136) %	>50 (n=83) %	Rigid (n=55) %	Articulated (n=241) %	B-double (n=153) %	Road Train (n=38) %
Standard working hours for drivers	70	73	53	55	68	77	67	66	81	76	65	68	71	87
Fatigue Management Scheme	49	50	40	37	48	53	31	45	62	65	29	48	52	74
Transitional Fatigue Management Scheme	37	38	33	28	36	41	19	34	49	49	24	34	42	58
<i>Net Scheme</i>	<i>55</i>	<i>57</i>	<i>40</i>	<i>40</i>	<i>51</i>	<i>61</i>	<i>33</i>	<i>54</i>	<i>70</i>	<i>72</i>	<i>31</i>	<i>55</i>	<i>59</i>	<i>76</i>
A formal medical policy for drivers	47	47	40	42	44	49	27	36	62	65	33	42	50	82
A formal driver fatigue management policy for drivers	41	41	42	37	41	42	28	33	50	52	31	40	40	66
Don't know	2	1	9	3	2	1	1	1	0	1	2	2	1	0
None of these	15	14	29	30	20	9	20	18	11	4	22	17	13	8

Bolded: Higher result, with a statistically significant difference between groups (p<.05).

Half of drivers (55%) working for companies reported that the company implemented a fatigue management scheme, while about two fifths or more were covered by a medical policy (47%) or a fatigue management policy (41%). The incidence increased, again with the amount of long haul driving, to be greatest among the mainly-long haul group (61%). Employee drivers were more likely than owner drivers to report being covered (57% vs 40%).

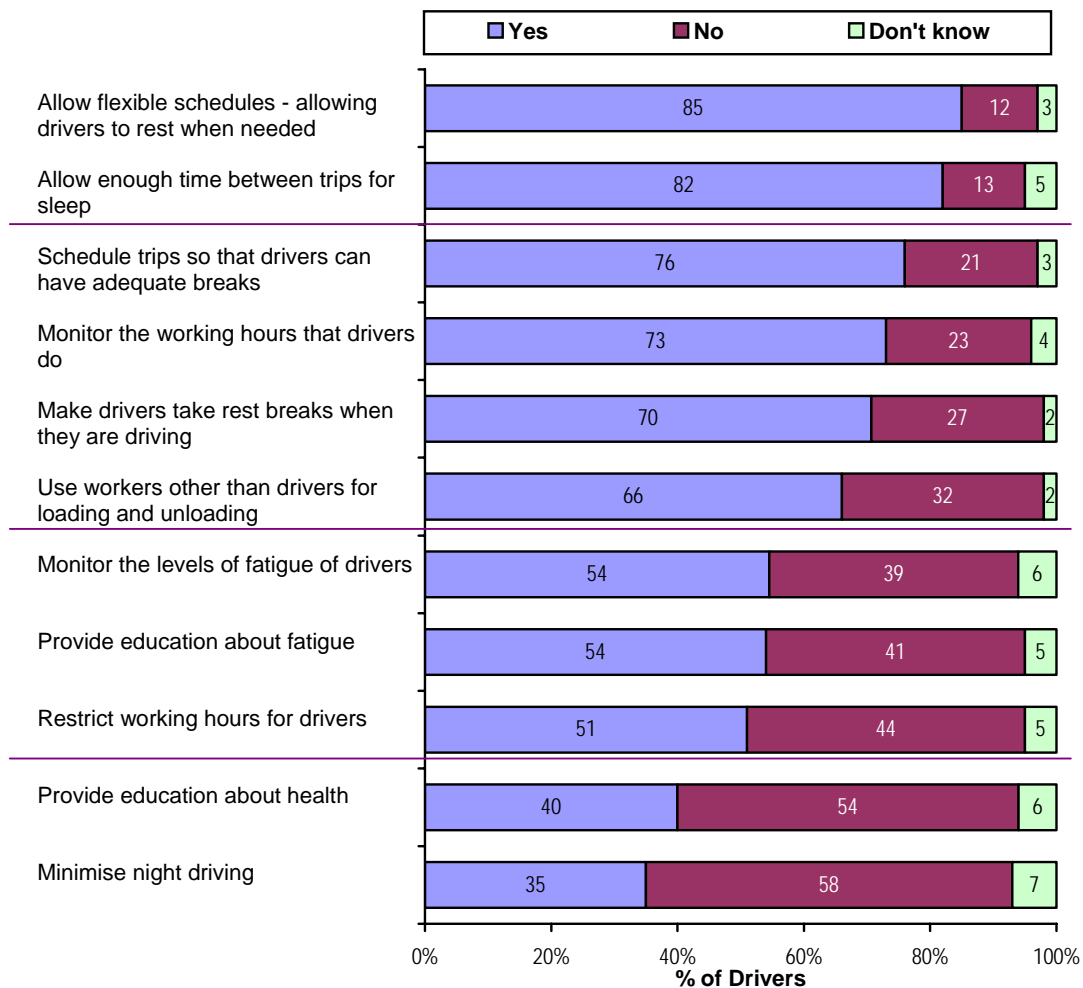
Medium and large sized companies (operating 11+ trucks) were more likely to implement all of the practices. Overall, one sixth of drivers reported that the company did not implement any of these practices. The incidence of non-implementation was greatest for owner drivers (29%), the mainly-short haul group (30%), and in companies with fewer than 10 trucks (19%).

3.4.3 Company Practices to Manage Fatigue

Drivers were presented with a series of 11 activities that they might undertake to manage driver fatigue. Each of these was nominated by at least one third of drivers (Figure 7).

Figure 7. What Your Company Does to Manage Driver Fatigue

BASE: Employee and owner drivers working for a company.



Practices about adequate breaks and rest were the most commonly nominated, in particular:

- ‘allow flexible schedules – to rest when needed’ by 85%; and
- ‘allow enough time between trips for sleep’ by 82%.

While about three quarters (73%) reported that companies ‘monitor working hours’, only about half (54%) reported that companies specifically ‘monitor levels of driver fatigue’. Two thirds (66%) of drivers reported that the company split off ‘loading/unloading work’ from the drivers, although implementing other specific restrictions on work such as ‘restrict working hours’ (51%) or ‘minimise night driving’ (35%) were not as well nominated. Provision of education ‘about fatigue’ (54%) and ‘about health’ (40%) was also less well implemented.

It is possible that for many drivers ‘night driving’ was not part of the normal work practice, and so a strategy of minimising night driving would not be applicable. Night driving, however, would be expected to be a greater part of work by long haul drivers; consequently there was a trend for the mainly-long haul group to be the least likely to say that the company minimised night driving (35%) (Table 12).

Fatigue management practices were most likely to be mentioned specifically by drivers of road trains. Employee drivers were more likely than owner drivers to nominate practices around monitoring, breaks and schedules, while owner drivers were more likely to nominate ‘restricting working hours’ and ‘minimising night driving’ (Table 12). The main difference between the driver groupings, however, was for larger companies (11+ trucks) to implement more practices.

Comparison with the 1998 survey

The questions on company practices in the current survey were different from those in the 1998 survey. One specific issue for comparison was the nomination of ‘minimising night driving’ as a strategy to manage fatigue. In 1998, 10% of the long distance drivers working for a company reported that their company minimised night driving. The incidence of this strategy had increased to 30% in the current survey.

Table 12. What Your Company Does To Manage Driver Fatigue, by Driver Groupings

BASE: Employee drivers and owner drivers working for a company

How company manages fatigue	Total (n=487) %	DRIVER TYPE		LONG HAUL TRIPS			COMPANY TRUCKS (EMPLOYEES)				USUAL VEHICLE			
		Employee (n=432) %	Owner driver (n=55) %	0-29% (n=102) %	30-89% (n=81) %	90-100% (n=303) %	1-4 (n=113) %	5-10 (n=97) %	11-50 (n=136) %	>50 (n=83) %	Rigid (n=55) %	Articulated (n=241) %	B-double (n=153) %	Road Train (n=38) %
Allow flexible schedules - to rest when needed	85	87	76	76	84	89	87	79	90	90	80	85	85	97
Allow enough time between trips for sleep	82	83	71	70	84	85	85	77	89	80	80	83	80	89
Schedule trips so that drivers can have adequate breaks	76	79	56	69	77	79	81	72	84	75	78	76	74	84
Monitor the working hours that drivers do	73	75	55	68	73	75	68	71	82	78	67	74	67	95
Make drivers take rest breaks when they are driving	70	70	69	64	69	73	69	59	79	71	64	71	67	84
Use workers other than drivers for loading and unloading	66	67	55	64	56	69	64	65	73	64	62	67	67	55
Monitor the levels of fatigue of drivers	54	56	42	44	54	58	48	51	63	63	45	51	57	82
Provide education about fatigue	54	55	45	46	58	56	45	43	65	69	44	54	53	74
Restrict working hours for drivers	51	49	65	53	49	50	48	45	51	51	45	51	48	66
Provide education about health	40	41	36	40	48	38	38	32	46	46	42	39	37	61
Minimise night driving	35	34	49	47	41	30	38	35	32	29	49	35	29	45
<i>Average nominations</i>	<i>6.9</i>	<i>7.0</i>	<i>6.2</i>	<i>6.4</i>	<i>6.9</i>	<i>7.0</i>	<i>6.7</i>	<i>6.3</i>	<i>7.5</i>	<i>7.2</i>	<i>6.6</i>	<i>6.9</i>	<i>6.6</i>	<i>8.3</i>

Bolded: Higher result, with a statistically significant difference between groups ($p < .05$).

3.4.4 Company Monitoring of Fatigue

Drivers in companies that ‘monitored the fatigue of drivers’ were asked which of a series of activities the company engaged in (Table 13). The most common ways in which companies monitored fatigue, nominated by about two fifths of drivers, were:

- ‘review drivers log books’;
- ‘review any incidents or accident’; and
- ‘ask drivers how they felt’.

About a third (31%) of drivers reported that the company ‘reviewed truck computer records’, and a fifth (20%) used ‘monitoring devices’.

Table 13. How Companies Monitor Fatigue, by Driver Groupings

NOTE: Asked if company monitors fatigue.

BASE: Reported on the total number of employee and owner drivers working for a company.

Methods of monitoring fatigue	Total (n=487) %	DRIVER TYPE		LONG HAUL TRIPS			COMPANY TRUCKS (EMPLOYEES)				USUAL VEHICLE			
		Employee (n=432) %	Owner driver (n=55) %	0-29% (n=102) %	30-89% (n=81) %	90-100% (n=303) %	1-4 (n=113) %	5-10 (n=97) %	11-50 (n=136) %	>50 (n=83) %	Rigid (n=55) %	Articulated (n=241) %	B-double (n=153) %	Road Train (n=38) %
Review drivers log books	44	45	30	33	42	48	30	39	56	58	35	40	46	69
Review any incidents or accident	43	45	34	34	47	46	30	39	54	57	37	39	45	75
Ask drivers how they felt	41	44	21	27	44	46	40	38	52	43	31	38	45	61
Review truck computer records	31	33	17	24	34	33	20	22	44	47	24	25	37	58
Use monitoring devices	20	21	13	16	17	22	7	10	30	36	14	17	22	36

Bolded: Higher result, with a statistically significant difference between groups ($p < .05$).

All of the more formal review/monitoring methods were more likely to be implemented in larger companies operating 11+ trucks, influenced in part by the higher incidence of monitoring fatigue overall.

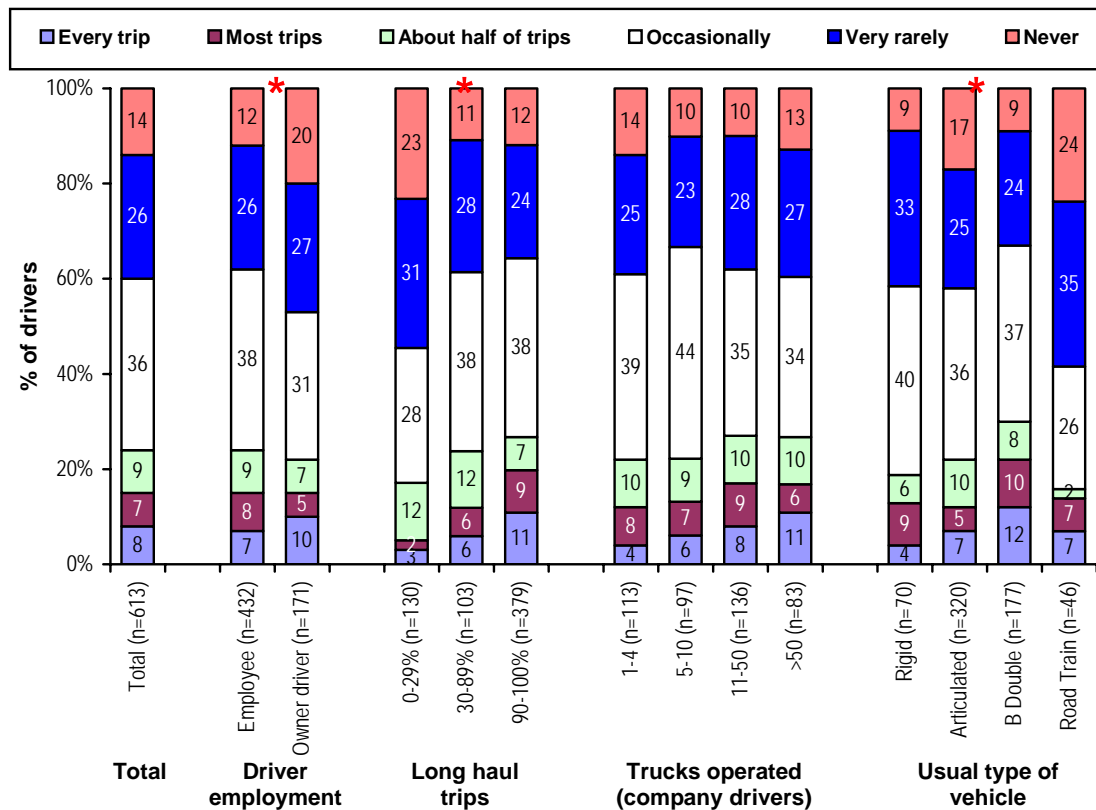
The mainly-short haul group, as well as the small group of owner drivers working for companies, was less likely to report multiple practices. Drivers of road trains were much more likely than drivers of other vehicle types to nominate practices, again influenced by the higher incidence of their company monitoring fatigue.

3.5 Experience of Fatigue

3.5.1 Fatigue as a Problem

A quarter (24%) of drivers reported becoming fatigued on ‘about half or more’ of their trips (Figure 8). This incidence increased to 60% for at least ‘occasionally’ experiencing fatigue. The reported incidence of becoming fatigued increased with the amount of long haul driving, increasing from 15% of the mainly-short haul group reporting becoming fatigued on ‘about half or more’ of trips up to 27% of the mainly-long haul group. Fatigue was also most likely to be associated with drivers of B-doubles.

Figure 8. Frequency of Becoming Fatigued, by Driver Groupings



* Statistically significant difference between groups (p<.05).

Comparisons with the 1991 and 1998 survey

The overall experience of fatigue by the mainly-long haul group in the current survey was highest in 1991, when close to half (46%) of drivers reported being fatigue on half or more of their trips (Table 14). This level of experience was reported by a third (31%) of drivers in the 1998 survey, and reduced further to a quarter (26%) of drivers in the current survey.

Table 14. Frequency of Becoming Fatigued – Comparing the 1991, 1998 and 2006 Surveys

Factor	1991	1998	2006 (Mainly- Long Haul Group)
	%	%	%
On every trip	11	8	11
On half/most trips	35	23	15
<i>Half or more trips</i>	46	31	26
Occasionally	39	44	38
Very rarely	15	25	24
Never	–	–	12
<i>Never/Rarely</i>	15	25	36

Bolded: Higher result, with a statistically significant difference between surveys ($p < .01$).

3.5.2 Symptoms of Fatigue and Stress

Drivers were asked about their experience of a number of symptoms of fatigue or stress when driving. Feelings of stress were the most frequently reported, with about a quarter of drivers reporting often feeling ‘frustration towards other road users’ (29%) and ‘aggressive towards other road users’ (22%) (Figure 9). Among the symptoms of fatigue, half of drivers reported at least sometimes feeling ‘exhausted at the end of the working day/shift’, and over a third (39%) ‘heavy or tired eyes’.

There was little overall difference between the driver groupings—the symptoms of fatigue and stress were experienced similarly (Table 15). The main difference was around experiencing ‘heavy or tired eyes’, which was higher among longer haul drivers, and more specifically associated with drivers of articulated trucks and B-doubles.

Further analysis of the pattern of responding found that the experience of these symptoms formed two separate factors, or dimensions.

- symptoms of fatigue—‘heavy or tired eyes’, ‘loss of concentration or attention’ and ‘headaches’, and ‘feeling exhausted at end of day/shift’; and
- symptoms of stress—‘frustration’ and ‘aggression’.

Figure 9. Frequency of Experiencing Symptoms of Fatigue and Stress

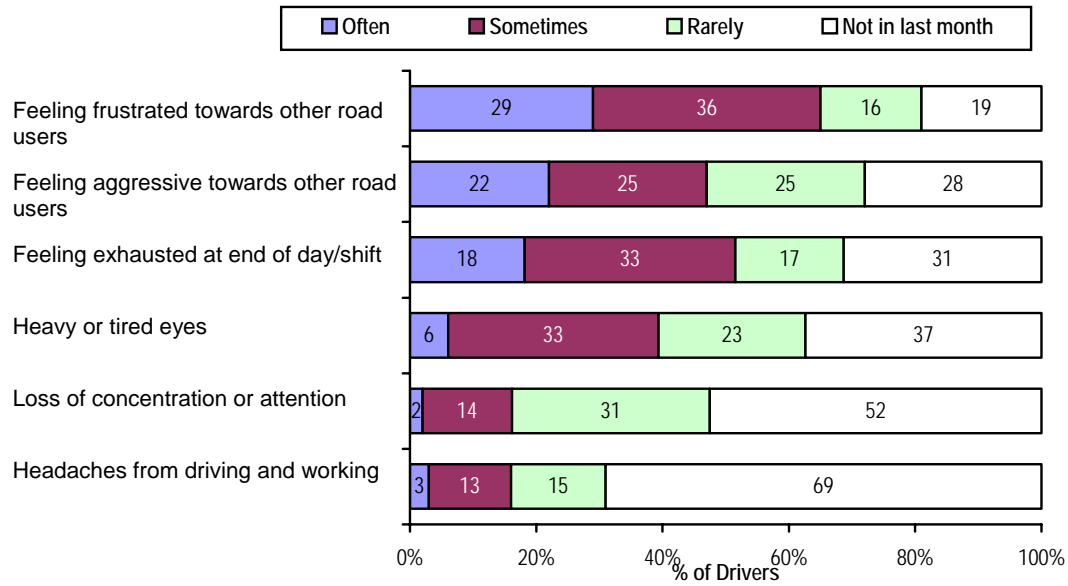


Table 15. Frequency of Experiencing Symptoms of Fatigue and Stress ‘Often or Sometimes, by Driver Groupings

Symptoms	Total (n=613) %	DRIVER TYPE		LONG HAUL TRIPS			COMPANY TRUCKS (EMPLOYEES)				USUAL VEHICLE			
		Employee (n=432) %	Owner driver (n=171) %	0-29% (n=130) %	30-89% (n=103) %	90-100% (n=379) %	1-4 (n=113) %	5-10 (n=97) %	11-50 (n=136) %	>50 (n=83) %	Rigid (n=70) %	Articulated (n=320) %	B-double (n=177) %	Road Train (n=46) %
Feeling frustrated towards other road users	65	66	62	65	64	65	69	66	64	67	63	68	62	61
Feeling exhausted at end of day/shift	51	51	51	49	57	50	51	55	50	51	59	52	52	35
Feeling aggressive towards other road users	47	49	45	49	53	45	50	51	44	53	42	51	45	41
Heavy or tired eyes	39	41	35	28	46	41	39	45	40	39	26	42	44	24
Headaches from driving and working	17	17	16	14	17	18	14	15	19	21	21	16	18	11
Loss of concentration or attention	16	16	17	14	24	15	17	20	15	12	21	17	16	7

Bolded: Higher result, with a statistically significant difference between groups ($p < .05$).

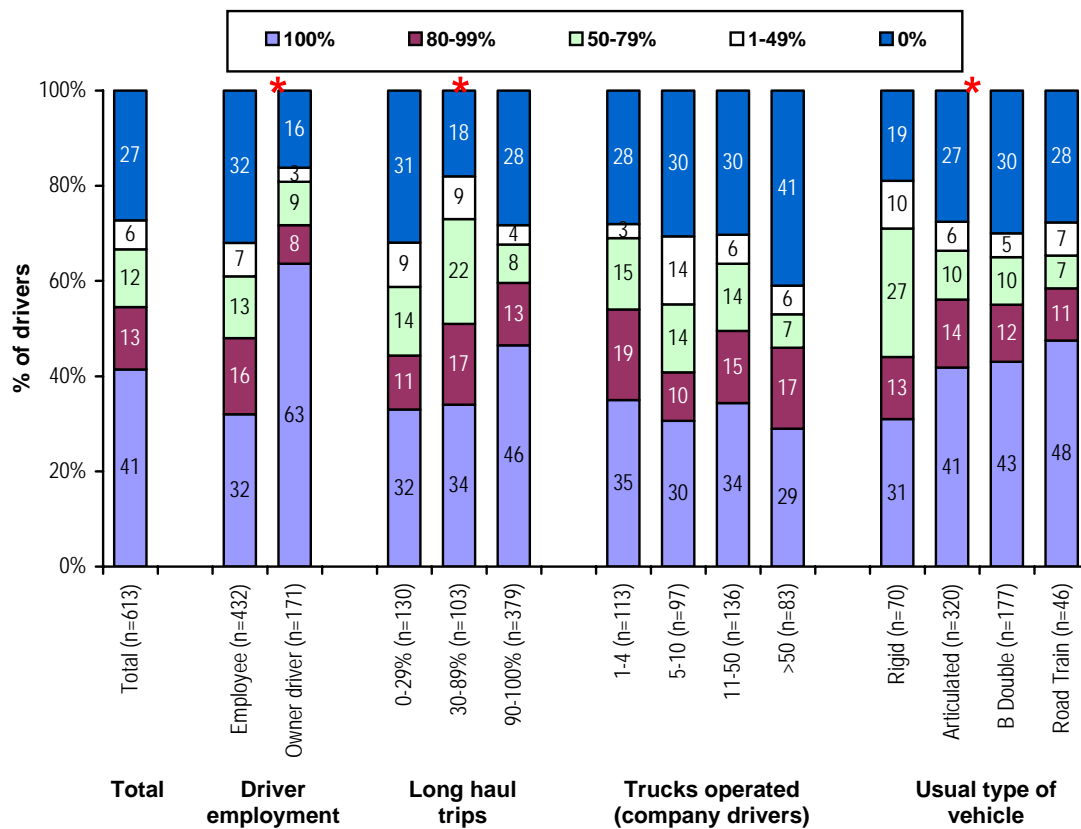
An interesting relationship was found between experience of the symptoms of stress and rating of usefulness of ‘stay awake drugs’ as a way to manage fatigue. The small group of drivers (7%) who nominated ‘stay awake drugs’ as very helpful were more likely to report often feeling:

- aggressive towards other road users;
- frustrated towards other road users; and
- exhausted at the end of the working day or shift.

3.5.3 Planning Breaks

Two fifths (41%) of drivers had input into planning all of their trips (Figure 10). This incidence increased to two thirds (66%) of drivers having input into planning at least half of their trips. A quarter (27%) of drivers, however, had input into none of their trips. Owner drivers were more likely than employee drivers to have input into their trips (80% for at least half of their trips compared with 61% of employee drivers). There was a more complex relationship with the amount of long haul driving. Input on half or more trips increased with the overall amount of long haul driving. The group of drivers reporting 30-89% of their trips of long haul were most likely to have input into planning on at least some trips. These patterns resulted in the average input into planning being lowest for the mainly-short haul group.

Figure 10. Input into Planning Trips, by Driver Groupings



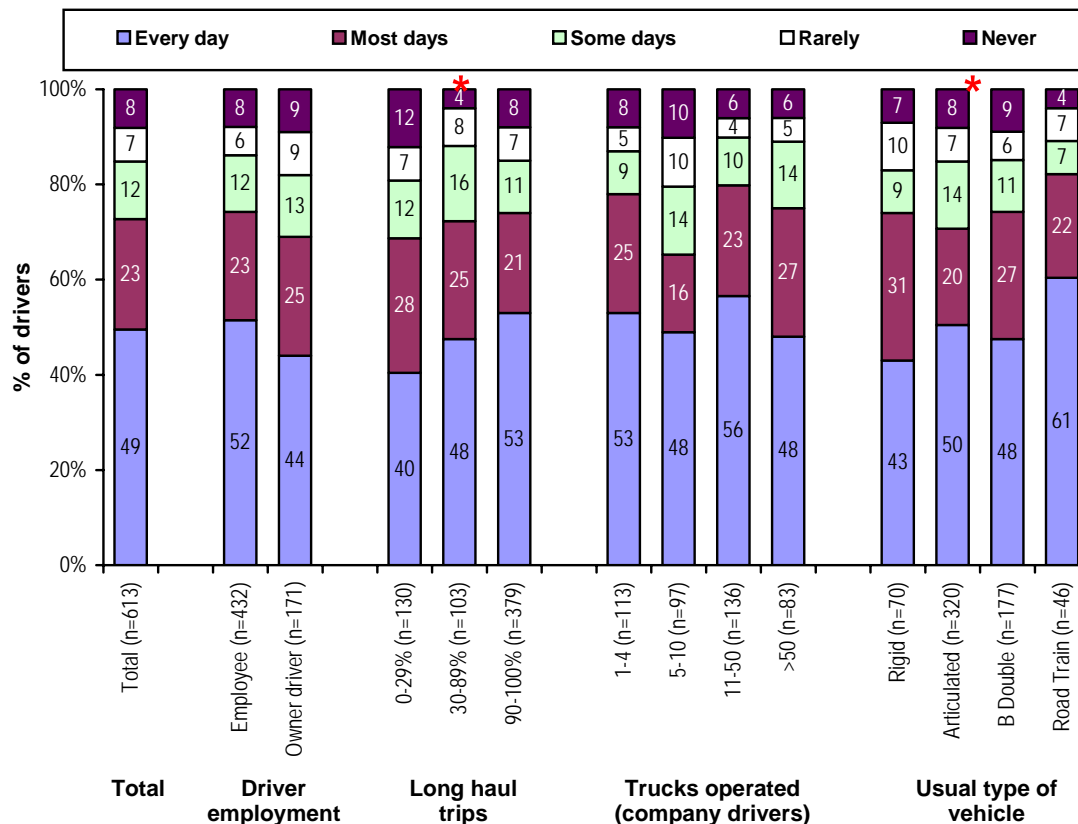
* Statistically significant difference between groups ($p < .05$).

Half (49%) the drivers considered that they could plan every day to have adequate breaks/rest (Figure 11). A quarter of drivers (27%), however, considered that they could only do this on ‘some days’ at best, including 15% ‘rarely or never’. The ability to plan every day increased with the amount of long haul driving, from 40% of the mainly-short haul group to 53% of the mainly-long haul group.

A possible consequence of inability to plan is that drivers may not be able to take a break when needed. About a quarter (23%) of drivers reported not being able to take a break when feeling tired/drowsy on at least ‘some days’ (Figure 12). Although employee drivers reported being less able than owner drivers to plan their day, they were actually more likely to report that, at least ‘occasionally’, they were unable to take breaks when tired (57% vs 44%).

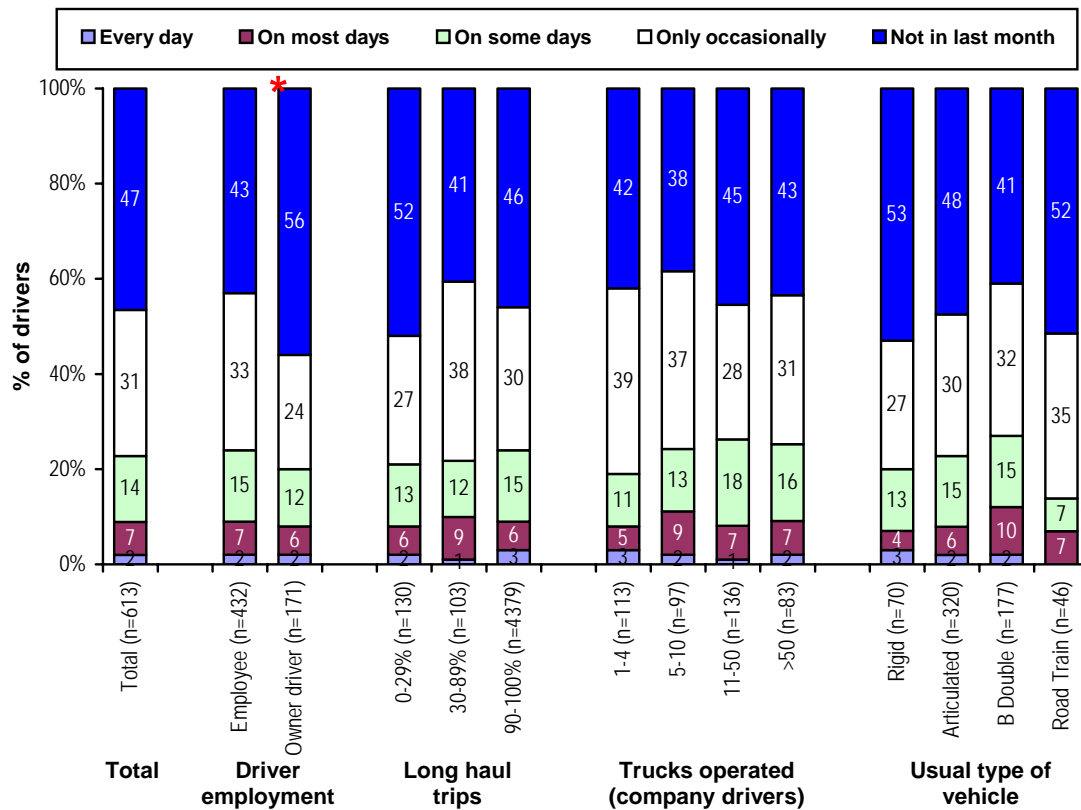
While the overall incidence of not being able to take breaks when needed was not very high, there was clearly a relationship between the ability to plan and the incidence of being unable to take a break when tired. Only 10% of drivers who planned ‘every day’ reported being unable to take a break on at least ‘some days’, compared with 44% of drivers who were able to plan at most ‘on some days’ (Table 16).

Figure 11. Frequency of Ability to Plan Breaks and Rest, by Driver Groupings



* Statistically significant difference between groups (p<.05).

Figure 12. Incidence of Drivers not Taking a Break When Feeling Tired or Drowsy, by Driver Groupings



* Statistically significant difference between groups (p<.05).

Table 16. Relationship Between Ability to Plan and Inability to Take Breaks When Tired

Incidence of not taking a break when tired	Ability to Plan Breaks and Rest		
	Every day (n=302) %	Most days (n=143) %	Less often (n=166) %
On at least some days	10	25	44
Only occasionally	28	40	28
Not in last month	62	35	28
Total	100	100	100

Bolded: Higher result, with a statistically significant difference between groups (p<.05).

Drivers who reported at least occasionally being unable to take a break when tired were asked the reasons for this happening. The most common responses were (Table 17):

- ‘nowhere to stop the truck’, nominated by 28% of drivers overall; and
- ‘having a tight schedule’, nominated by 21% of drivers overall.

The problem with ‘stopping the truck to take a break’ was greater among employee drivers (31%), increased with the amount of long haul driving (33% for the mainly-long haul group), and was also more associated with B-doubles (35%) and articulated trucks (27%). In contrast, ‘having a tight schedule’ was more likely to be associated with short haul drivers.

While the above reasons were associated with causes outside of the driver’s control, some responses may also be associated more with a decision by the driver not to stop. A fifth (19%) of drivers nominated each of the reasons ‘so as not to delay getting home’ or ‘to finish a trip early so you can start your next trip’.

Few drivers reported that they did not stop because they may be penalised in some way (<10%).

Table 17. Reasons for Not Being Able to Take a Break When Tired/Drowsy, by Driver Groupings

NOTE: Asked if driver is at least occasionally unable to take breaks.

BASE: Reported on the total number of drivers.

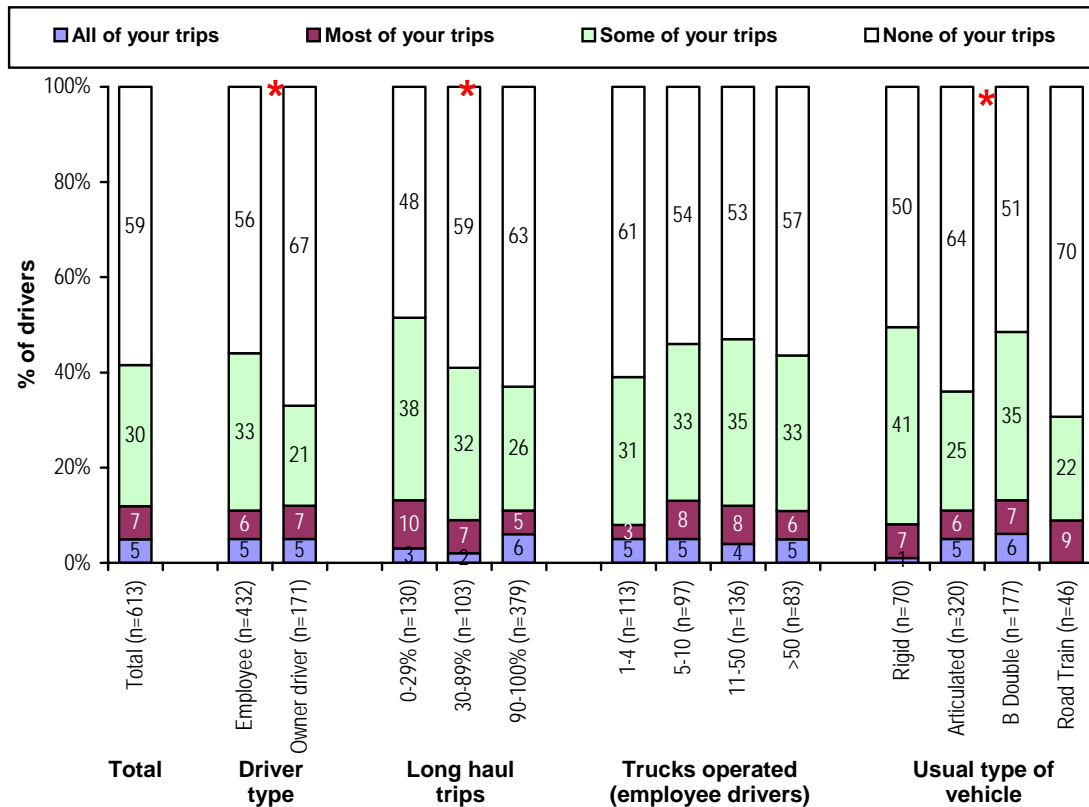
Reasons	Total (n=613) %	DRIVER TYPE		LONG HAUL TRIPS			COMPANY TRUCKS (EMPLOYEES)				USUAL VEHICLE			
		Employee (n=432) %	Owner driver (n=171) %	0-29% (n=130) %	30-89% (n=103) %	90-100% (n=379) %	1-4 (n=113) %	5-10 (n=97) %	11-50 (n=136) %	>50 (n=83) %	Rigid (n=70) %	Articulated (n=320) %	B-double (n=177) %	Road Train (n=46) %
Because there was nowhere to stop your truck to take a break	28	31	21	16	25	33	25	34	30	37	20	27	35	20
Because you had a tight schedule	21	24	14	30	24	17	25	32	19	23	30	19	23	17
So as not to delay getting home	12	13	10	12	9	13	12	14	13	14	17	11	12	11
To finish a trip early so you can start your next trip	11	12	9	15	12	9	10	12	14	11	11	12	12	2
Because you would be penalised if you were late	5	5	4	4	7	4	3	6	6	4	4	3	9	2
In order to keep your job	4	4	3	8	3	3	3	7	4	4	6	3	6	0
None of these	6	5	8	4	8	6	7	2	4	5	1	5	7	9

Bolded: Higher result, with a statistically significant difference between groups ($p < .05$).

3.5.4 Schedules and Delays

Only about one in eight (12%) drivers considered that they had unrealistic schedules on ‘most or all’ of their trips (Figure 13). This incidence increased to two fifths (41%) of drivers on at least ‘some’ of their trips. This incidence was higher among employee drivers (44%), and the mainly-short haul group (52%).

Figure 13. Incidence of Unrealistic Schedules, by Driver Groupings



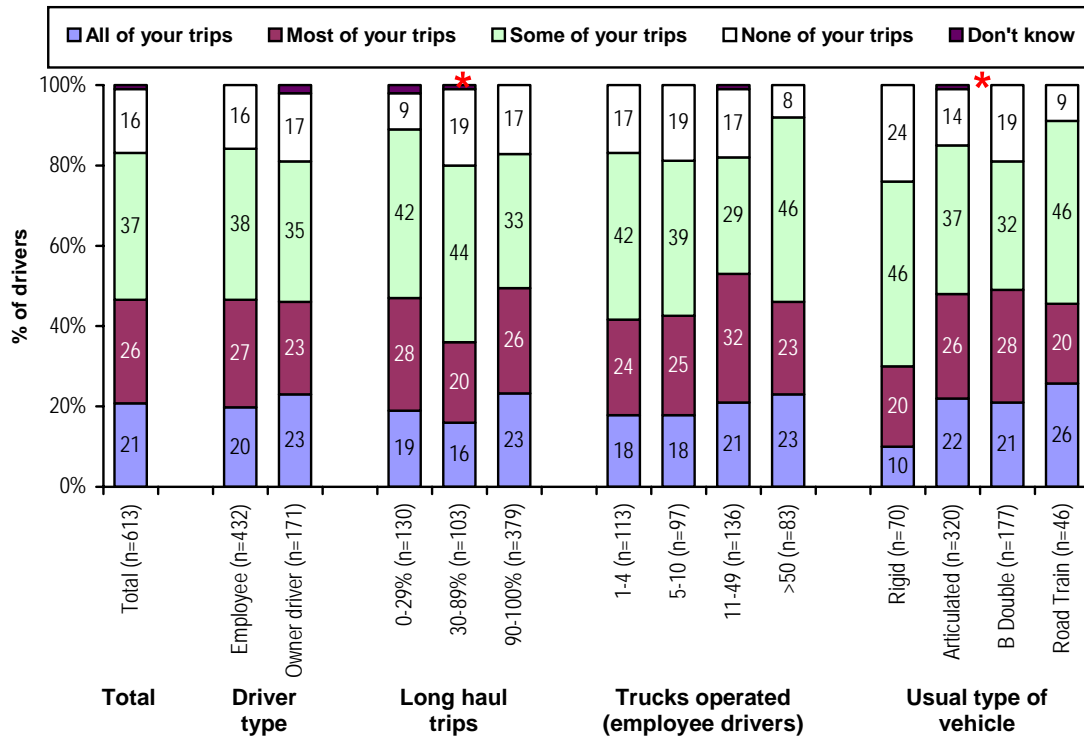
* Statistically significant difference between groups ($p < .05$).

About half (47%) of drivers reported being delayed for more than 15 minutes waiting in queues to load or unload on at least ‘most’ of their trips. This incidence increased to 83% on at least ‘some’ of their trips (Figure 14). This incidence did not differ substantially between driver groups. The main differences were for a higher incidence among the middle group of long haul drivers, and among drivers of rigid trucks.

Drivers were also asked about how frequently time for queuing was adequately built into their schedule. About half (48%) of drivers reported that it was taken into account on at most ‘some trips’, including a quarter (25%) on no trips. There was a trend for drivers in large companies (operating more than 50 trucks) to have the most problem with getting adequate time built in; while drivers of road trains had the fewest problems with the scheduling.

There was a strong relationship between the incidence of being delayed queuing and the incidence of taking the delay into account in scheduling. Those drivers who reported a greater incidence of delays were the least likely to be able to take this into account in scheduling (Table 18). Half (48%) of drivers who were delayed on all of their trips were unable to schedule for delays on any of their trips.

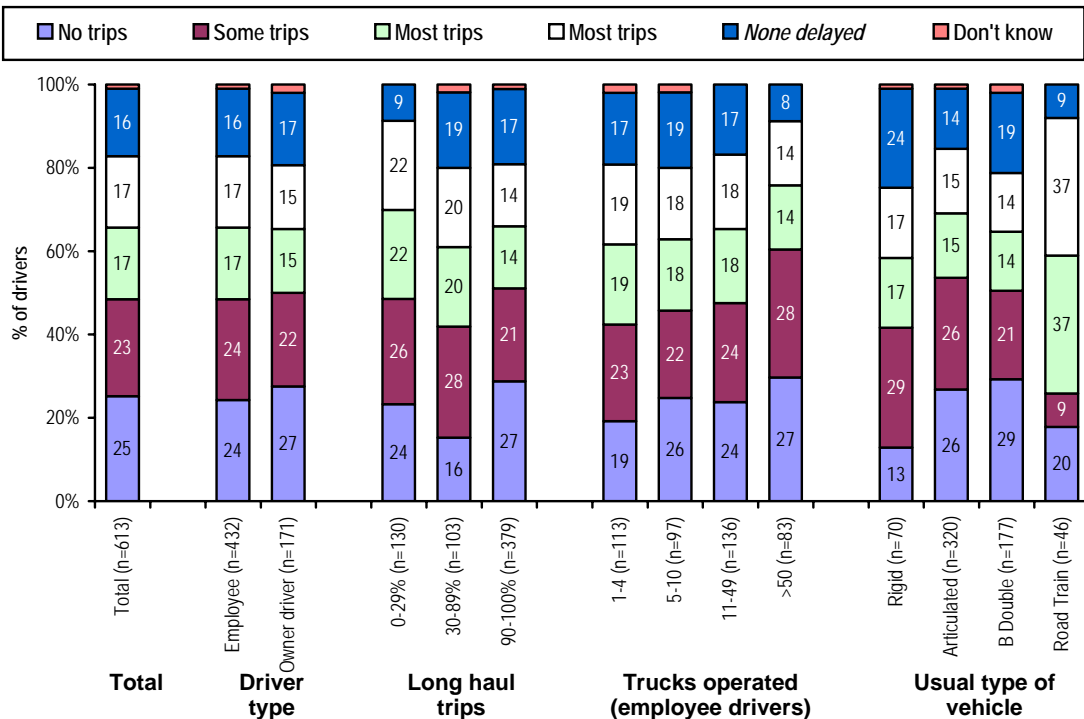
Figure 14. Incidence of being Delayed More than 15 Minutes Waiting in Queues to Load/Unload, by Driver Groupings



* Statistically significant difference between groups (p<.05).

Figure 15. Incidence of Adequate Time for Queuing Taken into Account When Scheduling, by Driver Groupings

NOTE: Asked of drivers who reported delays when queuing. BASE: All drivers.



* Statistically significant difference between groups (p<.05).

Table 18. Relationship Between Incidence of Queuing Delays and Being Taken into Account in Scheduling

Taken into Account in Scheduling	Incidence of Delays Queuing		
	All trips (n=128)	Most trips (n=154)	Some trips (n=223)
	%	%	%
All trips	23	17	24
Most trips	11	25	22
Some trips	18	29	34
No trips	48	29	20
Total	100	100	100

Bolded: Higher result, with a statistically significant difference between groups (p<.05).

3.6 Risk Behaviour

3.6.1 Driving Contrary to Driving/Work Hour Regulations

Drivers were asked how often they drove contrary to driving/work hour regulations, described to drivers as including working more hours than permitted or taking fewer rest breaks than required. A quarter (28%) of drivers reported that they drove contrary to regulations on at least ‘a quarter’ of trips, including a fifth on at least ‘most’ trips (Table 19). The mainly-long haul group was the most likely to report driving contrary to regulations (31% on at least ‘a quarter’ of trips). Drivers of B-doubles were the most likely to report this incidence of violation (36%) and drivers of road trains the least likely (15%).

Table 19. Frequency of Working Contrary to Driving/Work Hour Regulations, by Driver Groupings

Incidence	Total (n=613) %	DRIVER TYPE		LONG HAUL TRIPS			COMPANY TRUCKS				USUAL VEHICLE			
		Employee (n=432) %	Owner driver (n=171) %	0-29% (n=130) %	30-89% (n=103) %	90-100% (n=379) %	1-4 (n=113) %	5-10 (n=97) %	11-50 (n=136) %	>50 (n=83) %	Rigid (n=70) %	Articulated (n=320) %	B-double (n=177) %	Road Train (n=46) %
Most/every trip	19	20	16	12	13	23	15	23	22	20	11	18	24	13
Quarter/half of trips	9	8	10	12	7	8	10	14	5	5	16	7	11	2
Quarter or more	28	28	26	23	19	31	25	37	27	25	27	25	36	15
Occasionally	16	16	15	15	20	15	13	11	21	13	16	16	15	15
Very rarely	19	18	21	16	25	18	16	20	18	19	16	20	18	22
Never	38	38	38	46	35	35	45	32	34	41	41	39	30	48
Refused	0	0	0	0	0	1	1	0	0	1	0	0	1	0

Bolded: Higher result, with a statistically significant difference between groups (p<.05).

Drivers nominated a number of different reasons for driving contrary to working hour regulations (Table 20).

The most common responses reflected both demands on drivers as well as more clearly self-motivated reasons. More specific work demands included: ‘because of tight schedules’ (21% of drivers overall); ‘in order to return home’ (27%); and ‘in order to reach adequate rest facilities’ (25%). Financial motivations included: ‘in order to do enough trips to earn a living’ (23%); and ‘to get in early to get the next load’ (19%).

A small minority of drivers were motivated by penalties, such as ‘in order to keep your job’ (7%), or generally ‘penalties associated with arriving late’ (5%).

Table 20. Reasons for Working Contrary to Driving/Work Hours Legislation, by Driver Groupings

NOTE: Asked of drivers who report having sometimes driven contrary.

BASE: All drivers.

Reason	Total (n=613) %	DRIVER TYPE		LONG HAUL TRIPS			COMPANY TRUCKS (EMPLOYEES)				USUAL VEHICLE			
		Employee (n=432) %	Owner driver (n=171) %	0-29% (n=130) %	30-89% (n=103) %	90-100% (n=379) %	1-4 (n=113) %	5-10 (n=97) %	11-50 (n=136) %	>50 (n=83) %	Rigid (n=70) %	Articulated (n=320) %	B-double (n=177) %	Road Train (n=46) %
In order to return home	27	27	27	28	26	27	24	26	32	22	33	26	30	15
In order to reach adequate rest facilities	25	25	26	15	34	27	19	31	27	24	17	24	33	20
Because of tight schedules	21	24	15	28	19	20	21	32	23	19	27	18	25	20
In order to keep your job	7	8	3	8	6	6	6	10	10	6	7	6	9	4
Because of penalties associated with arriving late	5	6	3	5	3	6	5	6	7	4	1	5	8	0
In order to do enough trips to earn a living	23	21	27	20	20	24	17	23	23	18	13	23	27	15
To get in early to get the next load	19	19	18	22	20	17	14	22	20	20	21	19	20	9
Because of rewards associated with arriving early	5	5	5	8	4	4	3	6	5	4	7	3	7	2
None of these	6	6	7	5	12	5	8	9	3	5	9	6	6	4

Bolded: Higher result, with a statistically significant difference between groups ($p < .05$).

Comparisons with the 1991 and 1998 survey

Over half of drivers in the 1991 (56%) and 1998 (57%) surveys reported working contrary to regulations on half or more of their trips, including over a quarter on every trip (Table 21). In the current survey, a third (31%) of the mainly-long haul group reported driving contrary to regulations on ‘a quarter or more’ trips. Furthermore, a third (35%) of drivers in the current survey reported never driving contrary to regulations. It is interesting to note that ‘never’ was not included as an option in the 1991 and 1998 surveys.

With the higher incidence in the 1991 and 1998 surveys, most of the reasons for driving contrary to regulations that were common to the current survey were also reported at a higher level than in the current survey. Two reasons, however, were equally nominated in both the 1998 survey and the current survey: ‘to reach adequate rest facilities’ (27% in 2006), and ‘because of penalties for arriving late’ (6% in 2006).

The substantial reductions in reasons such as ‘to return home’ and ‘to keep your job’ do suggest that there have been substantial changes to the working environment for long distance driving since the 1990s.

Table 21. Incidence and Reasons for Working Contrary to Driving/Working Hour Regulations – Comparing the 1991, 1998 and 2006 Surveys

Measure	1991	1998	2006
	%	%	(Main Long Haul Group) %
Frequency			
Every trip	30	26	13
Most trips	18	21	9
Half of trips	8	10	5
Quarter of trips			3
<i>Quarter or more of trips</i>	56	57	31
Occasionally	17	21	15
Very rarely	24	23	18
Never	3	–	35
Reasons			
To return home	55	47	27
To reach adequate rest facilities	–	26	27
To do enough trips to earn a living	49	36	24
Because of tight schedules	–	31	20
To get in early to get the next load	–	26	17
To keep your job	–	24	6
Because of penalties for arriving late	–	8	6

Bolded: Higher result, with a statistically significant difference between surveys ($p < .01$).

3.6.2 Dangerous Events

Drivers were asked how frequently they had experienced a number of dangerous events over the last 12 months. Given the sensitive nature of the questioning, requiring the drivers to acknowledge mistakes and unsafe behaviour, it is likely that even a response of ‘rarely’ experiencing an incident is an important disclosure.

A third (36%) of drivers reported experiencing ‘nodding off for a moment’ on at least some occasion in the last 12 months, including one in eight (12%) at least ‘sometimes’ (Figure 15). One in twenty (5%) drivers reported ‘falling asleep at the wheel’.

Other more commonly reported events were ‘having a near miss’ (33%), late braking’ (33%), ‘crossing over lane lines’ (30%) and ‘over or under steering’ (24%).

Focusing on the incidence of ‘often/sometimes’ experiencing each event, there were no clear differences between the driver groups on the specific fatigue-related events of ‘nodding off’ or ‘falling asleep at the wheel’ (Table 23). The main difference was for ‘having a near miss’ and ‘late braking’ to increase as the amount of long haul driving decreased. There was no measure of the severity of situations in which these events occurred, so it is not possible to assess whether the more frequent incidents reported by short haul drivers involved potentially less serious, lower speed situations associated with city driving.

Figure 16. Frequency of Dangerous Events Experienced in the Last 12 Months

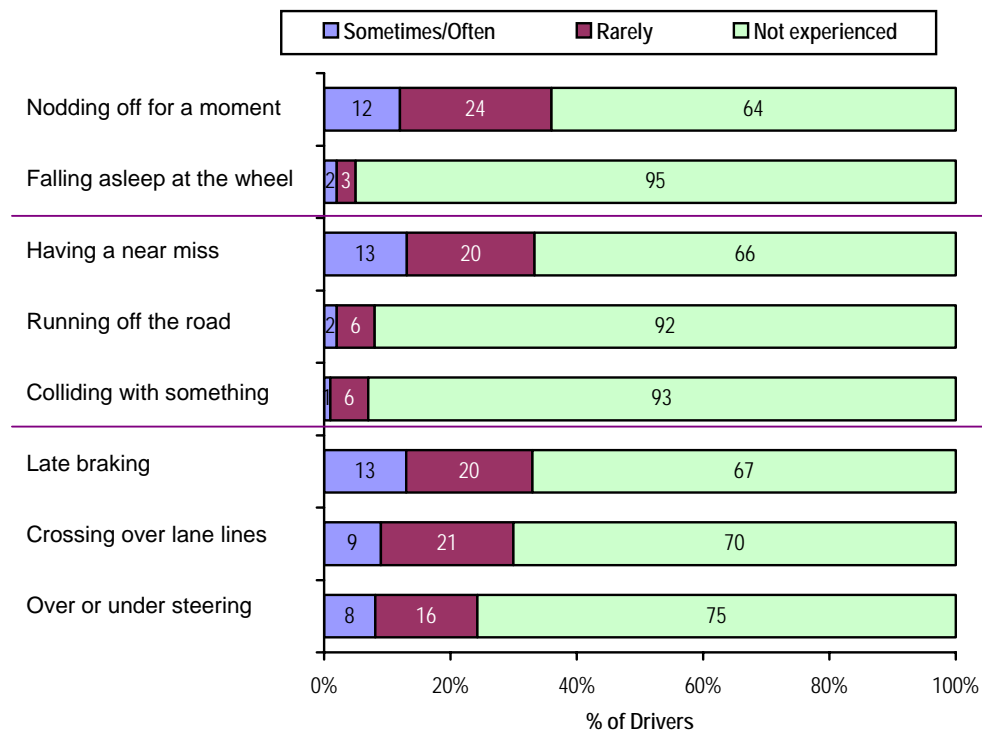


Table 22. Dangerous Events Experienced Often/Sometimes in Last 12 Months, by Driver Groupings

Incident	Total (n=613) %	DRIVER TYPE		LONG HAUL TRIPS			COMPANY TRUCKS (EMPLOYEES)				USUAL VEHICLE			
		Employee (n=432) %	Owner driver (n=171) %	0-29% (n=130) %	30-89% (n=103) %	90-100% (n=379) %	1-4 (n=113) %	5-10 (n=97) %	11-50 (n=136) %	>50 (n=83) %	Rigid (n=70) %	Articulated (n=320) %	B-double (n=177) %	Road Train (n=46) %
Nodding off for a moment – called a microsleeep	12	13	10	10	15	12	10	14	11	17	11	10	15	13
Falling asleep at the wheel	2	2	2	3	4	1	2	6	1	0	4	1	3	2
Having a near miss	14	13	16	25	17	9	19	10	10	11	16	13	13	13
Late braking	13	14	12	25	17	8	17	13	14	10	23	14	10	7
Colliding with something	1	1	2	2	2	1	1	0	1	1	1	1	1	0
Crossing over lane lines	9	10	8	8	13	9	14	10	7	6	13	8	10	9
Over or under steering	8	9	7	9	10	8	10	8	8	11	10	10	6	4
Running off the road	4	5	3	5	2	3	4	9	3	2	6	2	6	2
ANY	33	34	30	41	41	29	36	32	35	34	39	33	32	30

Bolded: Higher result, with a statistically significant difference between groups ($p < .05$).

Comparison with the 1998 survey

Drivers were asked to report the incidence of each of a series of dangerous events experienced in the last 12 months. In the 1998 survey, the introduction to the question referred to encountering ‘potentially dangerous events due to fatigue’; although the wording of the actual question did not explicitly require that the events were a result of fatigue³. The context of the question in the current survey was left more general, without mentioning the role of fatigue.

³ While the results in the 1998 survey is reported as ‘events due to fatigue’, the actual wording of the question was ‘How often have these things happened to you this year?’ It is possible, therefore, that respondents were not thinking specifically of the events as being ‘due to fatigue’. This would be a more conservative interpretation but, given the relatively high incidences of events in the 1998 survey, a more likely interpretation.

Drivers in the 1998 survey were more likely than the mainly-long haul group in the current survey to nominate each of the four events measured in both surveys (Table 23):

- ‘Nodding off’ (48% at least rarely in 1998 vs 38% in 2006);
- ‘A near miss’ (43% vs 27% in 2006);
- ‘Running off the road’ (31% vs 7% in 2006); and
- ‘Colliding with something’ (12% vs 5% in 2006).

Table 23. Dangerous Events Experienced in the Last 12 months – Comparing 1998 and 2006 Surveys

Event	1998	2006 (Mainly- Long Haul Group)
	%	%
Nodding off		
Often/sometimes	18.1	11.9
Rarely	30.3	25.7
Never	51.6	62.4
Having a near miss		
Often/sometimes	13.1	9.0
Rarely	30.3	17.8
Never	56.6	73.2
Running off the road		
Often/sometimes	9.0	2.1
Rarely	22.0	5.0
Never	69.0	93.0
Colliding with something		
Often/sometimes	4.0	0.8
Rarely	8.0	4.2
Never	88.0	95.0

Bolded: Higher result, with a statistically significant difference between surveys ($p < .01$).

3.6.3 Accidents in the Last 12 Months

Fewer than one in ten (8.2%) of drivers reported having had an accident in the last 12 months (Table 24). This incidence reduced to less than 1% for accidents judged by the driver to involve fatigue (representing 7% of the drivers reporting any accident). The large majority (85%) of accidents involved property damage. The mainly-long haul group was less likely than other drivers to report an accident (6.3% vs 10.8% and 11.7% for the other two groups). Only 2.2% of drivers of road trains reported an accident.

Table 24. Accidents in Last 12 Months, by Driver Groupings

Accident in last 12 months	Total (n=613) %	DRIVER TYPE		LONG HAUL TRIPS			COMPANY TRUCKS (EMPLOYEES)				USUAL VEHICLE			
		Employee (n=432) %	Owner driver (n=171) %	0-29% (n=130) %	30-89% (n=103) %	90-100% (n=379) %	1-4 (n=113) %	5-10 (n=97) %	11-50 (n=136) %	>50 (n=83) %	Rigid (n=70) %	Articulated (n=320) %	B-double (n=177) %	Road Train (n=46) %
Yes	8.2	9.3	5.5	10.8	11.7	6.3	8.8	11.3	8.8	8.4	7.1	9.1	8.5	2.2
Fatigue a factor	0.7	0.9	0.0	0.0	1.0	0.8	2.7	1.0	0.0	0.0	0.0	0.9	0.6	0.0
Fatigue as (% of accidents)	7.0	7.9	5.0	7.7	10.7	5.8	8.8	9.3	6.6	7.2	5.7	7.8	7.3	2.2
Property damage	1.0	0.9	1.1	0.8	2.9	0.5	0.0	2.1	0.7	1.2	2.9	0.6	1.1	0.0
No property damage	7.0	7.9	5.0	7.7	10.7	5.8	8.8	9.3	6.6	7.2	5.7	7.8	7.3	2.2

Bolded: Higher result, with a statistically significant difference between groups ($p < .05$).

3.7 Work Profile

3.7.1 Recording of Data

Information about the amount of work done by drivers was asked in two ways:

Firstly, drivers were asked about the number of hours they would work in a typical week on a range of tasks (the total amount of work in a week was capped at 120 hours, to take into account over-estimations made by drivers across each category).

Secondly, drivers were asked to record their work, rest and sleep patterns for the last seven days, in hourly intervals. Drivers were also asked to record whether they took short breaks (up to 10 minutes, and more than 10 minutes) during the morning, afternoon and evening/night on days that they worked (giving six break periods per day). Of the 613 drivers in the study, a few had not worked in the past seven days. Work and rest data were available for the full week for 545 drivers; and full work, rest and sleep data were available for 461 drivers.

3.7.2 The Typical Working Week

Drivers reported, on average, working 67.3 hours in a typical working week (Table 25). The number of hours increased with the amount of long haul driving, from a low of 57.0 hours for the mainly-short haul group up to 70.8 hours for the mainly-long haul group. The mainly-short haul group reported a greater number of hours on non-driving work, but this was more than made up by the number of hours that the mainly-long haul group spent driving a heavy vehicle.

The total average time reported for a typical week, over the different tasks, is greater than the average calculated from the 'last seven days', reported in the next section. It is possible that drivers were over-reporting the typical work week, given that some nominations were relatively high, leading to relatively long working weeks. Some drivers may have been over-stating tasks, or possibly referencing each task separately, which would have led to 'double counting' hours (i.e. because the typical amounts for each may not occur all together in the same week). Drivers were not given a 'running total' of the hours they had provided, as a check of the final accuracy.

Table 25. Hours Worked on Different Tasks in a Typical Week, by Driver Groupings

Type of work	Total (n=613)	DRIVER TYPE		LONG HAUL TRIPS			COMPANY TRUCKS (EMPLOYEES)			
	mean	Employee (n=432) mean	Owner driver (n=171) mean	0-29% (n=130) mean	30-89% (n=103) mean	90-100% (n=379) mean	1-4 (n=113) mean	5-10 (n=97) mean	11-50 (n=136) mean	>50 (n=83) mean
Driving a heavy vehicle	52.7	54.3	48.9	40.0	50.1	57.8	51.2	56.7	55.7	53.6
Driving a light vehicle	0.6	0.6	0.5	1.3	0.7	0.3	1.2	1.1	0.1	0.2
<i>Sub total - Driving work</i>	<i>53.3</i>	<i>54.7</i>	<i>49.5</i>	<i>41.3</i>	<i>50.8</i>	<i>58.1</i>	<i>52.4</i>	<i>57.8</i>	<i>55.8</i>	<i>53.8</i>
Loading or unloading your heavy vehicle	9.8	9.3	10.9	10.2	11.2	9.3	8.9	9.3	9.6	9.5
Checking or repairing your heavy vehicle	3.2	2.8	4.2	3.1	3.8	3.1	3.0	3.7	2.2	2.4
Other yard work	1.3	1.0	1.9	2.4	2.1	0.7	1.5	1.7	0.5	0.6
<i>Sub total - Non driving work</i>	<i>14.3</i>	<i>13.2</i>	<i>17.0</i>	<i>15.6</i>	<i>17.1</i>	<i>13.1</i>	<i>13.4</i>	<i>14.7</i>	<i>12.4</i>	<i>12.4</i>
<i>Total work#</i>	<i>67.3</i>	<i>67.7</i>	<i>66.2</i>	<i>57.0</i>	<i>67.5</i>	<i>70.8</i>	<i>64.9</i>	<i>72.3</i>	<i>67.8</i>	<i>66.2</i>

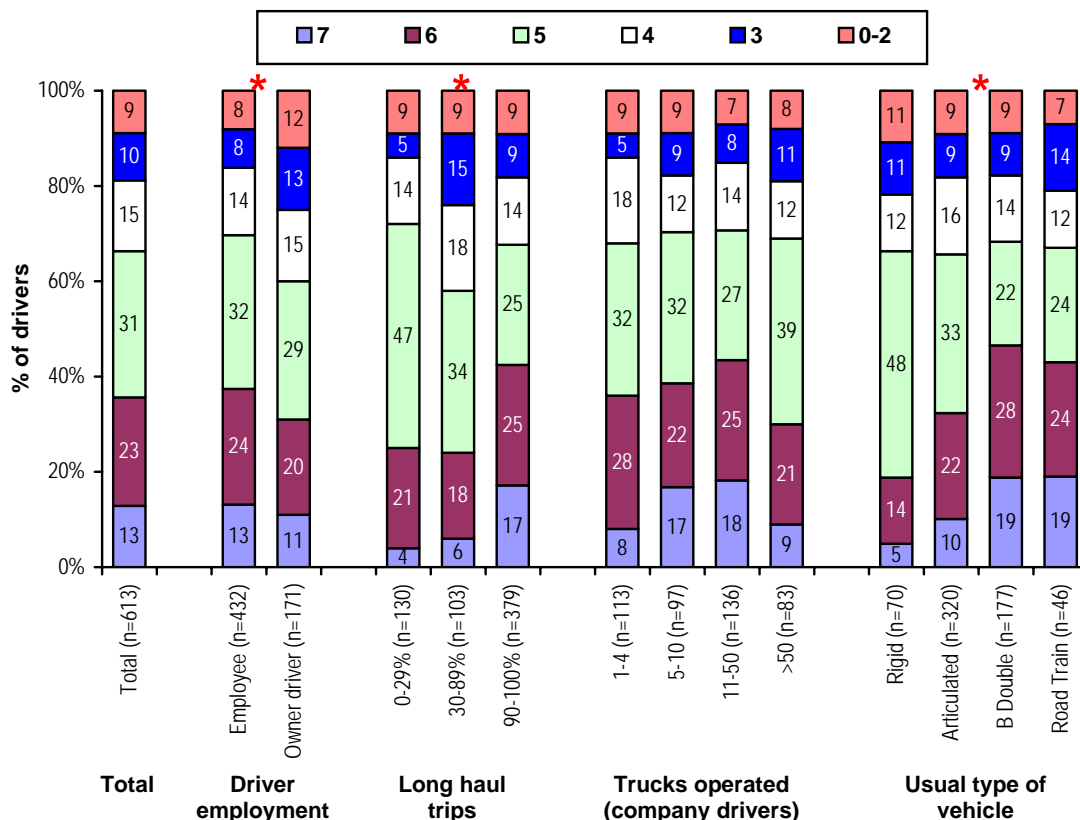
Bolded: Higher result, with a statistically significant difference between groups ($p < .05$).

Means for individual types of work do not add up to the Total Work mean due to a small number of drivers giving 'don't know' responses to each type of work.

3.7.3 The Last Week

Two thirds (67%) of drivers reported having worked for five or more days in the last week, including a third (36%) who had worked on six or seven days (Figure 17). Employee drivers were marginally more likely than owner drivers to have worked 5 or more days (69% vs 60%), while the mainly-long haul group was the most likely to have driven six or seven days (42% vs 25%). Drivers of articulated trucks were the least likely to have driven on six or seven days (19%), while drivers of B-doubles (47%) and road trains (43%) were the most likely.

Figure 17. Days Worked in the Last Week, by Driver Groupings



* Statistically significant difference between groups (p < .05).

Specific work and sleep patterns over the week were assessed on several measures, some in the context of specific requirements in the new working hour regulations to be implemented in 2007. The patterns assessed were:

- working more than 72 hours in the week;
- not having a 24 hour period without work;
- working more than 14 hours or 16 hours in a 24 hour period;
- no break in a 24 hour period of at least 6 hours or 8 hours in two parts; and
- nights without 7 hours of sleep between 10 pm and 8 am.

Among drivers giving full, relevant information, it was found that one in six (16%) had worked more than 72 hours in the last week, and about one in eight (12%) had not had a full 24 hour period without work over that week (Table 26). More than two fifths (45%) of drivers had worked for more than 14 hours in a 24 period over the week, including a quarter (25%) having worked for more than 16 hours. Over half (57%) had not had a break of at least 6 hours (or 8 hours in two parts) in at least one 24 hour period during the week. All of these measures were greatest among the mainly-long haul group.

Among drivers giving complete sleep information, it was found that a fifth (20%) had slept for 7 hours during the period 10 pm to 8 am on each night over the past week (Table 27). Very few (4%) had not slept in this way on any night, and about half (49%) overall had slept in this way on no more than four nights.

While the mainly-long haul group worked for marginally longer hours on average each week, and slept for marginally fewer hours on average, there were no clear differences between the driver groups in the number of night sleep periods. So night sleep patterns did not appear to be related to the proportion of long haul trips.

Table 26. Hours Worked and Break Patterns in the Last Week, by Driver Groupings

BASE: Details available to calculate work/rest pattern.

Measure	Total (n=545)	DRIVER TYPE		LONG HAUL TRIPS			COMPANY TRUCKS (EMPLOYEES)			
		Employee (n=391)	Owner driver (n=154)	0-29% (n=110)	30-89% (n=95)	90-100% (n=339)	1-4 (n=104)	5-10 (n=90)	11-50 (n=119)	>50 (n=75)
Mean hours worked	51.8	52.4	50.4	51.8	47.7	53.1	50.6	54.5	53.4	51.3
Assessment against requirements	%	%	%	%	%	%	%	%	%	%
Worked more than 72 hours in the week	16	15	18	11	8	19	13	22	15	8
No 24 hours without work	13	14	12	5	6	18	9	18	18	9
Worked more than 16 hours in a 24 hour period	25	26	23	12	16	32	29	31	28	15
Worked more than 14 hours in a 24 hour period	45	46	43	22	37	55	47	49	51	32
No Break in a 24 hour period of (1) at least 6 hours, or (2) 8 hours in two parts	57	57	57	34	54	66	55	54	65	53

Bolded: Higher result, with a statistically significant difference between groups ($p < .05$).

Table 27. Hours of Work, Rest and Sleep and Nights Worked in the Last Week, by Driver Groupings

BASE: Full details available to calculate work/rest/sleep patterns

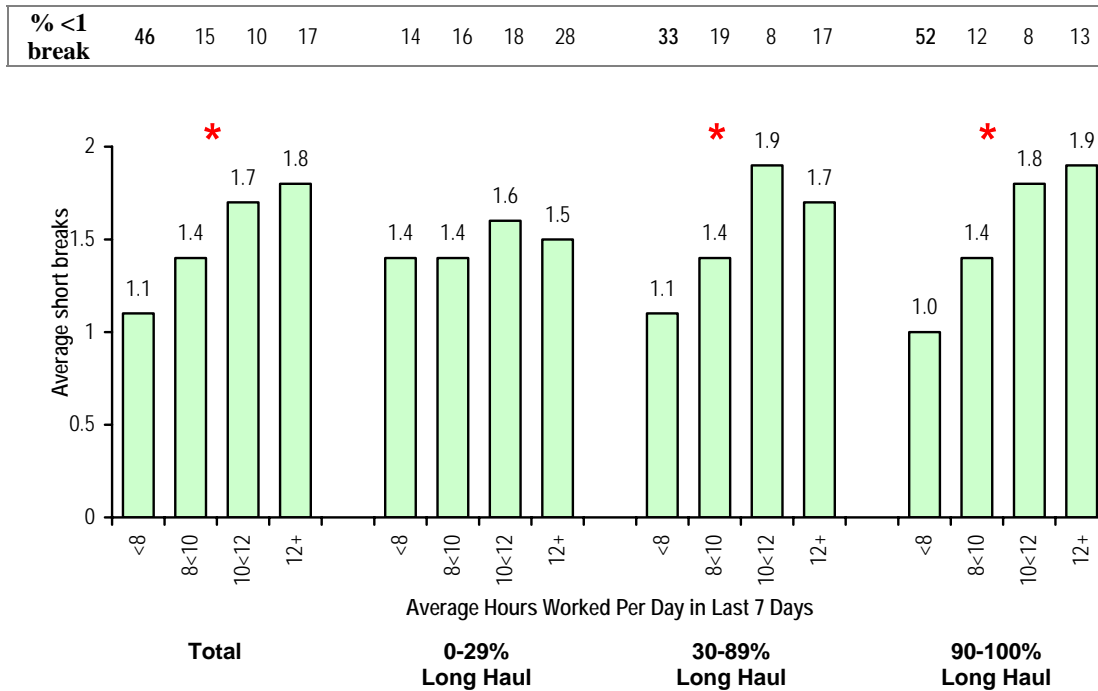
Measure	Total (n=461)	DRIVER TYPE		LONG HAUL TRIPS			COMPANY TRUCKS (EMPLOYEES)			
		Employee (n=333)	Owner driver (n=128)	0-29% (n=98)	30-89% (n=69)	90-100% (n=293)	1-4 (n=87)	5-10 (n=74)	11-50 (n=108)	>50 (n=61)
Distribution of 168 hours over the week										
Mean hours worked	54.8	55.3	53.4	53.1	52.4	55.9	52.7	57.9	55.1	57.0
Mean hours slept	57.7	57.8	57.5	56.9	58.0	58.0	58.5	56.5	57.2	59.5
Mean hours other	55.5	55.0	57.0	57.9	57.6	54.1	56.8	53.6	55.8	51.5
Sleeping 7 hours between 10 pm and 8 am#										
	%	%	%	%	%	%	%	%	%	%
0 nights	4	4	2	3	3	4	2	5	5	3
1-2 nights	21	23	18	20	20	22	21	22	23	28
3-4 nights	24	24	23	24	17	25	17	22	28	30
5-6 nights	31	31	33	28	36	32	39	30	31	21
7 nights	20	18	23	24	23	17	21	22	14	18

The 12am to 8 am period of the 1st day of the 7 day period was combined with the 10 pm to 12 am period of the 7th day in order to give a complete 7 nights for this calculation.

A final analysis of the work patterns over the last week was on the short breaks that drivers took. Drivers nominated taking a break of less than 10 minutes or greater than 10 minutes during the morning, afternoon, and evening/night. This gave up to six break periods on each day of work. Almost all of the break periods reported were of greater than 10 minutes. The patterns of breaks have been reported as the average number of breaks taken each work day based on the average number of hours worked on each of these days. An additional measure was the percentage of drivers taking an average of less than one break on each work day.

The pattern of taking breaks was assessed for the three long haul trip groupings (Figure 18). There was a clear increase in the average number of breaks taken with an increase in the average number of hours worked each day over the week. Drivers working an average of fewer than 8 hours per working day took an average of 1.1 break periods, compared with an average of 1.8 among those drivers working an average of 12 or more hours per working day. This relationship was strongest for the mainly-long haul group broadly similar for the middle group, and weakest among the mainly-short haul group. Overall, about half of those drivers working an average of fewer than 8 hours on their working days over the last week took less than one break period per day on average.

Figure 18. Average Number of ‘Short Breaks’ Taken by Average Daily Hours Worked, by Long Haul Trip Grouping



* Statistically significant difference between groups ($p < .05$).

Comparison with the 1998 survey

In the 1998 survey, 149 drivers provided full work, rest and sleep data. These drivers had an average of 57.8 hours of work and 54.3 hours of sleep in the last 7 days (Table 28). These figures compare with 54.8 hours and 57.7 hours respectively for the mainly-long haul group in the current survey. On the basis of this comparison, the amount of sleep in the last week had increased significantly in the current survey.

About a quarter (23%) of drivers were reported to have worked more than 72 hours in the last week in the 1998 survey, compared with 16% in the current survey.

Table 28. Hours of Work, Rest and Sleep in the Last Week – Comparing 1998 and 2006 Surveys

Measures Factor	1998	2006 (Mainly-Long Haul Group)
	%	%
Mean hours worked	57.8	55.9
Mean hours slept	54.3	58.0
Mean hours other	55.9	54.1

Bolded: Higher result, with a statistically significant difference between surveys ($p < .01$).

3.8 Relationships between Risk Taking, Attitudes and Behaviour

3.8.1 Assessment

In order to look in more detail at factors associated with risk, relationships were assessed between a range of questions in the survey and three key outcome measures associated with risk. The outcome measures were:

- frequency of being fatigued (from Q23, see questionnaire in Appendix B);
- frequency of dangerous events (calculated as a sum of the eight events using a score of ‘often/sometimes’=2 and ‘rarely’=1), referred to as the Dangerous Events Index (see item list in Table 30); and
- frequency of the specific dangerous events directly associated with fatigue—‘nodding off’ and ‘falling asleep’—(calculated as a sum using a score of ‘often/sometimes’=2 and ‘rarely’=1), referred to as the Fatigue Events Index.

A simple correlational analysis was conducted, reporting strong relationships (identified with a level of statistical significance of $p<.001$ and $p<.0001$). The absolute size of each correlation has also been shown⁴.

3.8.2 Relationships

The reported frequency of being fatigued was strongly associated with the frequency of experiencing symptoms of fatigue such as ‘heavy or tired eyes’ and ‘loss of concentration or attention’ (Table 29). There was also a consistent relationship with experience of ‘feeling exhausted at the end of the working day or shift’. There was further overall consistency with greater reporting by drivers of various contributors to personal fatigue, including ‘long driving hours’, and being more likely to report that they managed their fatigue badly. This profile provides some evidence that, at least for those drivers admitting that fatigue is a problem for them, there was awareness of a range of symptoms and contributors to the problem, even though there was an unwillingness to accept that the experience of fatigue equates to a problem. As noted earlier in the report, experience of fatigue was not restricted to the mainly-long haul group, although there was an increase in reporting of the problem by this group.

The internal consistency of relationships between reported experience of fatigue and particular attitudes is useful for identifying triggers that lead drivers to interpret the experience of fatigue. Additional relationships with risk taking and other detrimental behaviours associated with risk, however, can help validate this profile as well as identifying potential key causal factors leading to fatigue.

The frequency of becoming fatigued was also strongly correlated with the frequency of ‘not taking breaks when feeling tired/drowsy’ and ‘driving contrary to driving/work hours regulations’ (Table 29); and was related to the experience of several of the dangerous events measured in the survey, most strongly with the fatigue-related ‘nodding off for a moment’ (Table 30).

⁴ It should be noted that for questions involving binary responses (e.g. yes/no options) the size of the correlation will undervalue the true strength of the relationship. A more stringent test of statistical significance was used, $p<.001$ in order to focus on the stronger relationships.

Table 29. Relationships Between Risk Measures and Profile, Attitudinal and Behavioural Questions

QUESTION <i>[direction of relationship with fatigue]</i>	Frequency of becoming fatigued		Dangerous Events index		Fatigue Events index	
	Correl.	<i>p</i>	Correl.	<i>p</i>	Correl.	<i>p</i>
Profile						
Type of truck <i>[greatest for B-doubles]</i>	0.14	*				
Long haul trips <i>[+more trips] [#fewer trips]</i>	0.17+	**	0.17#	**		
Payment method <i>[greatest for load/km rate]</i>	0.17	**				
Contributors to Own Fatigue While Driving <i>[a contributor]</i>						
Long driving hours	0.26	**	0.23	**	0.21	**
Having to stick to working hours regulations	0.26	**				
Heavy traffic	0.23	**	0.21	**		
Irregular or inadequate sleep during trips	0.22	**	0.21	**	0.20	**
Driving at night	0.22	**	0.23	**	0.21	**
Poor diet	0.21	**			0.15	*
Too much non driving work	0.20	**				
Insufficient rest break	0.18	**	0.19	**	0.18	**
Driving in early afternoon	0.17	**			0.14	*
Not enough night time sleep	0.14	*	0.22	**	0.19	**
Helpfulness of strategies to manage fatigue <i>[helpful]</i>						
Ignoring regulations to finish a trip	0.16	**				
Smoking	0.16	*				
Taking stay awake drugs	0.15	*				
Fatigue management						
Company policies, schemes (company drivers)	<i>No relationship</i>					
How fatigue managed personally <i>[badly]</i>	0.35	**	0.34	**	0.30	**
How fatigue is managed in industry <i>[badly]</i>	0.23	**				
Planning and breaks						
Unrealistic schedules <i>[more trips]</i>	0.27	**	0.20	**	0.17	**
Input into planning trips <i>[fewer trips]</i>			0.15	*		
Ability to plan day to take breaks <i>[fewer days]</i>	0.21	**	0.20	**	0.20	**
Delayed more than 15 minutes <i>[fewer trips]</i>	0.18	**				
Allow time for queuing <i>[fewer trips]</i>	0.15	*				
Not taking breaks when tired/drowsy						
How often not taken breaks <i>[more trips]</i>	0.52	**	0.32	**	0.32	**
Because you had a tight schedule <i>[yes]</i>			0.21	*		
Because you would be penalised if late <i>[yes]</i>	0.19	*				
Work Contrary to Driving/Work Hours Regulations						
How often work contrary to laws <i>[more days]</i>	0.43	**	0.28	**	0.27	**
Because of tight schedules <i>[yes]</i>			0.24	**		
Because of rewards for arriving early <i>[yes]</i>			0.19	*		

Correl: Correlation

* $p < .001$, ** $p < .0001$ **Bolded:** Strongest relationships

Table 30. Relationships Between Risk Measures and Fatigue Symptoms, Dangerous Events and Working Hours

QUESTION <i>[direction of relationship with fatigue]</i>	Frequency of becoming fatigued		Dangerous Events Index		Fatigue Events Index	
	Correl.	p	Correl.	p	Correl.	p
Frequency of becoming fatigued <i>[more trips]</i>	—	—	0.33	**	0.35	**
Symptoms <i>[experience]</i>						
Heavy or tired eyes	0.54	**	0.35	**	0.31	**
Feeling exhausted at end of working day/shift	0.43	**	0.34	**	0.25	**
Loss of concentration or attention	0.38	**	0.39	**	0.29	**
Headaches from driving and working	0.27	**	0.18	**	0.15	*
Aggressive towards other road users			0.20	**		
Frustrated towards other road users	0.17	**	0.21	**	0.15	*
Dangerous Events <i>[experienced]</i>						
Dangerous Events Index	0.35	**	—		—	
Fatigue Events Index	0.35	**	—		—	
Nodding off for a moment	0.37	**	—		—	
Over or under steering	0.28	**	—		—	
Crossing over lane lines	0.23	**	—		—	
Falling asleep at the wheel	0.19	**	—		—	
Running off the road	0.14	*	—		—	
Late braking	0.14	*	—		—	
Hours in a typical week <i>[more hours]</i>						
Total hours worked	0.33	**	0.14	*	0.21	**
Loading or unloading your heavy vehicle	0.21	**	0.19	**	0.14	*
Hours driving a heavy vehicle for work	0.27	**				
Patterns over last week						
Work >16 hours in one day	0.27	**			0.17	**
Not taking break of 6 hours / 8 hours in two parts	0.29	**				
Nights without 7 hours sleep between 10 pm and 8 am	0.18	**			0.16	*

* $p < .001$, ** $p < .0001$ **Bolded:** Strongest relationships

Table 31 highlights the profile of issues and behaviours correlated most strongly with both the frequency of experiencing fatigue and the indices of dangerous events (particularly the fatigue events). These items help define the context of problems associated with fatigue, and hence point to where change is needed to:

- promote issues to drivers to improve their awareness and identification of the problem; and
- deal with precursors in the workplace and trip characteristics leading to fatigue.

Table 31. Key Issues and Behaviours Associated with Fatigue

Category	Issue/Behaviour	Context of problem
Work profile	• Longer hours worked	• Average of 67.3 hours in a typical week (29% drove >60 hours in the last week)
	• Hours spent driving a heavy vehicle	• Average of 52.7 hours per week (27% spent more than 60 hours per week)
	• Hours spent loading or unloading	• Average of 9.8 hours per week (21% spent more than 15 hours per week)
	• Unrealistic schedules	• 41% on at least 'some trips' (12% on at least 'most trips')
	• Ability to plan trips to take breaks	• 27% at most on 'some trips' (15% 'rarely/never')
Experience	• Personally manage fatigue badly	• 5% badly (56% 'very well')
	• Heavy or tired eyes	• 39% at least 'sometimes'
	• Loss of concentration or attention	• 16% at least 'sometimes'
	• Feeling exhausted at end of working day/shift	• 51% at least 'sometimes'
Behaviour on trips	• Not taking breaks when tired/drowsy	• 23% on at least 'some days'
	• Working contrary to work/driving hours regulations	• 28% on at least 'a quarter of trips'
	• Dangerous events, especially 'nodding off'	• 12% at least 'sometimes', 36% on some occasion in last 12 months

Interestingly, as detailed earlier in the report, the relationship with the short haul/long haul grouping differed for the measure of becoming fatigued and the dangerous events index. The mainly-long haul group reported a higher incidence of becoming fatigued, but scored lower on experiencing dangerous events.

Two relationships were examined in more detail:

- the relationship between payment method and reported frequency of being fatigued; and
- the relationship between hours spent loading/unloading and reported frequency of being fatigued.

Payment by the load/trip/km was associated with a greater frequency of becoming fatigued (28% reporting half or more trips), and payment at an hourly rate was associated with a lower frequency (15% reporting half or more trips). This relationship was assessed in the context of incidence of long haul trips, which was also related to frequency of feeling fatigued, being greatest among the mainly-long haul group. It was found that the relationships remained when each variable was accounted for. That is, both payment method and incidence of long haul trips were associated with frequency of becoming fatigued.

Similarly, it was found that hours spent loading/unloading and incidence of long haul trips, both independently contributed to the frequency of becoming fatigued. Both measures also contributed to the incidence of dangerous events, but in this case a greater incidence of long haul trips was associated with a lower incidence of events. That is, short haul drivers were more likely to report such events.

4. DISCUSSION

4.1 Trends in responding

As the survey required drivers to answer questions about sensitive issues, such as the incidence of breaking laws and admitting to experiencing problems, some tendency to minimise such reporting, at least among some respondents would be expected.

In this context, the level of reported behaviour/experience may under-represent the true situation. While this is an issue in terms of assessing the *absolute* level of the results, it is still possible to look at *relative* trends in responding and assess relationships associated with these trends: for example, assessing the profile of those drivers reporting issues.

Relationships measured in the survey showed a number of consistencies, such as the correlations between reported experience of fatigue and reported dangerous events (Table 29 and Table 30). Such relationships can reflect a type of 'consistency bias' where a respondent's answer to a particular question biases the way the respondent answers later questions. The implication is that the response to a question will differ based on the position in the survey in which it is asked, and impacts on the validity of concluding casual relationships (e.g. concluding that experience of fatigue may lead to the occurrence of dangerous events).

One way of examining the extent to which such consistency might be occurring would be to assess questions which are of a more objective or factual nature, or that are asked in a way which would be less likely to be influenced by such a bias. One section of the questionnaire meeting these requirements is the recording of work/sleep/rest patterns over the previous week. It is less likely that a 'consistency bias' would have affected the way that drivers completed the record. The relationships found between work/sleep/rest patterns and measures of fatigue provide a reasonable validation of the relationships found elsewhere.

4.2 The Survey as a Baseline

The survey serves as a baseline prior to implementation in 2008 of the Heavy Vehicle Driver Fatigue reform. An important role of the study is as a baseline for measures of awareness, attitudes and behaviour of drivers in the context of driver fatigue. Changes in these measures at some later stage can be used to assess the effectiveness of the reform in meeting its objectives. It should also be noted, however, that the survey was conducted during the Heavy Vehicle Driver Fatigue reform public consultation period, which may have influenced awareness and perceptions.

The survey method included some compromises in the sampling of drivers in order to achieve a cost-effective, efficient study. Using truck stops to access heavy vehicle drivers is an efficient way of obtaining a large sample, but is limited in how representative the sample will be of all heavy vehicle drivers. Sampling was spread between metropolitan and regional locations to improve capture of a range of drivers, including local drivers. The

issue of representativeness was foreseen in the design of the study, and an additional sample of mainly-short haul drivers was recruited in order to better represent this group.

Comparisons between the survey of drivers and the parallel survey of companies indicated that the incidence of long haul drivers was greater in the survey of drivers (see Appendix C). Despite issues about the overall representativeness of heavy vehicle drivers, the survey sample allowed comparisons between drivers based on their incidence of short/long haul trips.

4.3 Comparisons with the 1991 and 1998 Surveys

The survey also provided an opportunity to assess changes that have occurred since 1991, using results from surveys of long distance transport drivers conducted in 1991 and 1998. The earlier surveys focused on long haul drivers doing trips of at least 300 km recruited at truck stops and yards, although it was not specified whether all their trips were this length, or just some of their trips (including their previous trip). While the current survey included a more general sample of drivers, it was possible to define a broadly comparable group of drivers, also recruited at truck stops, for whom the large majority of their trips were 'long haul' (taking them more than 100 km from their driver base).

4.4 Attitudes and Perceptions About Driver Fatigue

Driver fatigue continues to be seen as a substantial problem in the road freight transport industry by three quarters of heavy vehicle drivers. Furthermore, many drivers considered that driver fatigue is not well managed in the industry, including a quarter saying that it was 'extremely badly' managed. Few drivers, however, considered that it was a substantial problem for them personally, and almost all drivers considered that they managed their fatigue well.

The contrast between perception of the problem in the industry and seeing the problem as a personal one was very strong, and may present an obstacle for motivating drivers to accept further change to their working environment on the grounds of improving driver fatigue. It is possible, however, that drivers were unwilling to admit that fatigue was an issue for them, and that even rating fatigue as a 'minor' problem implies acknowledging it as a problem.

In contrast to the low admittance of fatigue as a problem, a quarter of drivers reported becoming fatigued on at least half of their trips, increasing to 60% of drivers who experienced fatigue at least occasionally. As a further measure, about a fifth of drivers reported often feeling exhausted at the end of their working day/shift. So while the large majority of drivers do not see fatigue as a problem personally, many admit being fatigued at least occasionally. Furthermore, fatigue appears to be an issue for short haul drivers as well as long haul drivers. While the frequency of experience of fatigue increased with the amount of long haul driving, the difference between the mainly-short haul and long haul groups was not very large; and both groups of drivers reported a similar incidence of feeling exhausted at the end of their working day/shift.

Drivers nominated a number of factors as contributors to their fatigue while driving. The most commonly nominated covered not only 'long driving hours' and 'irregular/inadequate sleep', but also other aspects of the work such as 'having to stick to regulations' and 'heavy traffic'. Short haul drivers were more likely to nominate several factors as contributing to their fatigue, 'long working hours', 'not enough night time sleep' and 'insufficient rest break'.

Driver fatigue has not received much attention as a possible issue for short haul drivers. The main focus has been on long haul trips, with the traditional working environment of long hours, driving at night, and inconsistent sleep patterns. So it is interesting to see short haul drivers raising these types of issues as contributors to their fatigue.

Further analysis revealed that drivers' reported frequency of being fatigued was strongly associated with experiencing symptoms of fatigue such as 'heavy or tired eyes' and 'loss of concentration or attention', as well as 'feeling exhausted at the end of the working day or shift'. This set of relationships shows that many drivers do correctly identify being fatigued, even if they do not accept it as an actual problem for them.

4.5 Managing Fatigue

Almost every driver nominated strategies around stopping or resting as helpful in managing fatigue, but the majority also continue to see temporary strategies such as 'adjusting ventilation', 'listening to the radio or music' and 'having a drink containing caffeine' as at least helpful. It is of concern if drivers were content to manage their fatigue through these means. A further concern was that about one in six drivers also considered that 'stay awake drugs' were helpful in managing fatigue. Many drivers also raised issues about the value of the driving hours regulations, with two fifths of drivers considering that it was helpful that they be 'ignored to finish a trip close to home'.

As the large majority of drivers are employed by companies, the approach taken by companies to fatigue management is of importance in helping deal with the problem. Larger companies (especially those operating more than 10 trucks) were much more likely than smaller companies to provide a range of policies and schemes to their drivers. Half of drivers working for companies reported that the company implemented a fatigue management scheme, and over two fifths or more were covered by a medical policy or a fatigue management policy.

It should be noted, however, that size of company was not related to either the experience of fatigue reported by drivers nor other risk measures that were assessed.

The large majority of companies were also reported to implement practices to allow for adequate breaks and rest; but while three quarters of the company drivers said that the company monitored their working hours, only about half reported that they specifically monitored levels of driver fatigue.

4.6 Trip Profiles

Drivers reported a number of features of trips that are cause for concern in the prevention or management of fatigue. While half of drivers considered that they could plan every day to have adequate breaks/rest, a quarter considered that they could only do this on, at best, some days. A further issue around planning of trips was that a quarter of drivers reported at least sometimes not being able to take a break when feeling tired/drowsy. The incidence of not taking breaks when tired/drowsy was found to be related to drivers' perceived ability to plan their day.

The ability of drivers to manage their time was limited by the varying level of input they had into planning their trips. Two fifths had input into all their trips, but a quarter had no input into any trips, and two fifths of drivers also considered that they had unrealistic schedules on at least some of their trips.

Problems with schedules were also implicated in the incidence of drivers reporting driving contrary to driving/work hour regulations. Two fifths of drivers reported driving contrary to regulations at least occasionally, including a fifth on most of their trips. Motivations to break the rules included issues not only around schedules but also more personal motivation, such as to make more money. The regulations can therefore be seen both as inflexible, such as where drivers consider that sticking to the regulations contributes to fatigue; as well as restrictive on the amount of work drivers can do.

The solution to the problem of not taking breaks, however, would not simply be from better planning of the trip schedule. Common reasons for not being able to stop for a break included both aspects of planning (e.g. having a tight schedule) as well as practical limitations (e.g. nowhere to stop the truck). Some drivers were also motivated by more personal reasons, such as not being delayed getting home or to start the next trip early.

4.7 Relationships with Risk

A number of questions were included in the survey to assess risk measures around driver fatigue. These included specific measures of dangerous events while driving, as well as hours of work/rest over the last week.

Analysis of the work/rest profile highlighted continuing problems in the amount of work that drivers are undertaking. Key baseline measures, which were all more prevalent among the mainly-long haul group, included:

- one in six had worked more than 72 hours in the last week, and about one in eight had not had a full 24 hour period without work over that week;
- more than two fifths of drivers had worked for greater than 14 hours in a 24 hour period over the week, including a quarter having worked for more than 16 hours;
- over half had not had a break of 6 hours (or 8 hours in two parts) in at least one 24 hour period during the week; and
- about a third of drivers overall had slept for 7 hours during 10 pm to 8 am on no more than three nights.

Relationships with the key risk measures highlight issues and behaviours that help define problems associated with fatigue, and hence point to where change is needed to:

- promote issues to drivers to improve their awareness and identification of the problem; and
- deal with precursors in the workplace and trip characteristics that lead to fatigue.

These key issues fell into three broad areas:

Work profile

- Longer hours worked
- Hours spent driving a heavy vehicle
- Hours spent loading or unloading
- Unrealistic schedules
- Ability to plan trips to take breaks

Experience

- Feeling fatigue on trips
- Feeling exhausted at end of working day/shift
- Personally manage fatigue badly
- Heavy or tired eyes
- Loss of concentration or attention

Behaviour on trips

- Not taking breaks when tired/drowsy
 - Working contrary to work/driving hours regulations
 - Dangerous events, especially ‘nodding off’
-

The relationship between incidence of short/long haul driving and risk differed for measures of experience of being fatigued and experience of dangerous incidents. A higher incidence of long haul driving was associated with greater experience of fatigue but fewer dangerous events. It is possible that the different driving environment for short haul drivers contributes to a greater incidence of dangerous events, either independently of fatigue, or by increasing the likelihood that fatigue will cause such events.

The relationship between payment method and incidence of being fatigued showed a greater association with being paid on a ‘per trip’ rate. This relationship was independent of the amount of short/long haul driving. While the difference was not large, it does raise concern over practices that might pressure drivers to complete a greater number of trips in order to make money.

4.8 Changes since 1991

The survey results already show some important improvements in attitudes and behaviour compared with the surveys conducted in 1991 and 1998. These changes include the following:

- The perception of the problem in the industry showed no change since 1991, and the perception of how well fatigue is managed showed no change from 1998. Perceptions of fatigue as a problem personally for the driver, however, had reduced progressively since 1991.
- Nomination of ‘minimising night driving’ as a company practice to manage fatigue increased from 10% to 30% in the current survey.

- The reported frequency of becoming fatigued had reduced progressively since 1991. Experiencing fatigue ‘very rarely/never’ increased from 15% in 1991 to 25% in 1998 and to 36% in the current survey.
- About half of drivers reported working contrary to working/driving hour regulations on half or more of their trips in both the 1991 and 1998 surveys, reducing to about a quarter in the current survey. Half of drivers reported never or very rarely driving contrary to the regulations in the current survey compared with a quarter in the earlier surveys.
- The incidence of dangerous events reported in the 1998 survey was higher than in the current survey across each of four specific events reported. There was a reduction in the key fatigue-related event of ‘nodding off’, from 48% of drivers in 1998 reporting it occurring at least rarely down to 38% in the current survey.

5. CONCLUSION

The results of the study provide a baseline for measures of awareness, attitudes and behaviour of companies in the context of driver fatigue. Changes in these measures at some later stage can be used to assess the effectiveness of the reform in meeting its objectives. While the use of truck stops to recruit the large majority of drivers in the survey biased the sample towards long haul drivers, comparisons were still possible based on incidence of short/long haul trips. Furthermore, the survey was conducted during the Heavy Vehicle Driver Fatigue reform public consultation period, which may have influenced awareness and perceptions.

Results from the current survey already show some important improvements in attitudes and behaviour compared with the surveys conducted in 1991 and 1998.

There are a number of opportunities to promote awareness and benefits of the reform, and to influence attitudes towards driver fatigue and acceptance of the reform.

Awareness of fatigue

- Risk of fatigue was evident among both short and long haul drivers in the survey. There was also a strong perception that fatigue was a substantial problem in the heavy vehicle industry. Very few drivers, however, considered fatigue to be more than a minor problem for them. These trends suggest that many drivers are unwilling to admit that fatigue is a problem for them.
- A requirement for progressing improvements in driver fatigue for heavy vehicle drivers appears to be building more acceptance of the potential extent and severity of fatigue as a problem, both for long haul and short haul drivers.
- Given the differences between long and short haul driving, it would be important to tailor a communication strategy to the different groups.
- If short haul fatigue were to be addressed, there would be value in promoting the concept more broadly in the community. This would help raise the profile and community norms around the issue more effectively to enhance strategies that are implemented to combat fatigue.

- A further issue is the way in which drivers interpret/recognise symptoms of fatigue, and attribute behavioural outcomes to fatigue; and the effectiveness or ineffectiveness of strategies to prevent or limit fatigue.

Driving hours and breaks

- Drivers themselves see long working hours as one of the more important contributors to fatigue. This is more of an issue for long haul drivers, who report longer hours and are potentially more likely to be driving though the night.
- Pressure to drive without taking breaks is influenced by tight schedules and driving conditions. In some cases, however, there is also an element of personal decision not to stop, such as not delaying getting home or to start the next trip early.
- In other situations, changing the way that schedules are set which pressure drivers to work long hours and drive without taking breaks would be relevant.

Companies/Workplace

- Influencing the attitudes and actions of transport companies and freight clients is likely to be difficult, but these groups have an important role to play in bringing about improvements in the driver fatigue area.
- Companies have an important role in monitoring behaviour and promoting safe work practices. It is possible, however, that a particular restriction can have negative consequences if it puts more pressure on completing work: for example, enforcing breaks may reduce the risk of driver fatigue, but if there is not adequate time available for the trip, the risk of speeding or other violations may be increased.
- Companies should be encouraged to promote taking breaks and educating drivers about the symptoms of fatigue and how to manage fatigue.
- Companies (and clients) should be encouraged to adopt practices which ensure that rest breaks are incorporated into a driver's schedules and trip times, and which manage typical foreseen delays; and to have in place strategies to manage unforeseen delays outside of a driver's control.

Regulations

- It is important to promote the credibility of the new regulations as a way of increasing acceptance of the regulations and understanding of the benefits.

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7. APPENDICES

7.1 Appendix A – Additional Detail on the Method

7.1.1 Recruitment of Drivers

The large majority (n=553) of the survey was conducted with truck drivers at truck stops around major routes in NSW, Victoria, Queensland, South Australia, and Western Australia, and are summarised in Table 32. Selection of truck stops was influenced by willingness of proprietors to allow the survey research to be conducted on the premises.

Table 32. Locations of Truck Stops for the Face to Face Interviews with Truck Drivers

State	Location
NSW	BP Truck Stop, Beresfield
	BP Truck Stop, Marulan
	Caltex Truck Stop, Dubbo
Victoria	BP Truck Stop, Footscray
	BP Truck Stop, Somerton
Queensland	BP Truck Stop, Archerfield
South Australia	BP Truck Stop, Wingfield
Western Australia	Ginger's Gull Roadhouse, Upper Swan

It was anticipated that recruitment at truck stops would bias the sample towards long haul drivers. For this reason, an additional sample (n=60) of drivers was specially recruited as mainly-short haul drivers (i.e. no more than 30% of their trips were long haul trips). A specialist recruitment company was used for this purpose. Drivers were identified through recruitment networks and screened to qualify for the survey.

7.1.2 Interview Procedure

Fieldwork at truck stops was conducted primarily during daylight hours from morning to evening. Interviewers worked in the restaurant areas of the truck stops approaching drivers to obtain interviews. Drivers were offered a \$20 incentive to take part in the survey.

Interviews were conducted face-to-face, with interviewers reading out all questions and responses. Drivers were shown the hourly grid for Q50 (for recording work/sleep and rest times – see Questionnaire in Appendix B) while the interviewer progressively completed the grid.

Interviews with the specially recruited drivers were all completed by telephone. These drivers were also given an incentive to take part in the research.

7.1.3 Interview Outcomes

A total of 553 surveys were conducted at the truck stops. An additional 440 drivers were recorded as refusing to take part in the research, while some other drivers did not qualify as driving a vehicle of at least 12 tonnes gross vehicle mass. The response rate, based on completed interviews and refusals was therefore 55.7% (553 out of 993).

It is possible that some of the refusals were by drivers who would not have qualified as driving a heavy vehicle, which would increase the response rate.

7.1.4 Statistical Analysis

The main statistical analysis was conducted using chi-square tests in a spreadsheet set up in Microsoft Excel⁵. This test is suitable for looking at differences between groups measured on categorical variables or scales with few points.

Differences were assessed separately for each grouping variable (e.g. differences between the two categories of 'driver employment', and differences between the three categories of 'long haul trips'). Differences have been reported at a statistical significance level of $p < .05$.

In general, the chi-square tests were conducted separately on each response, to give more information about where differences occurred. The test was not applied on response categories where expected cell sizes were less than 5. In such cases, percentage results for all groups were typically very low or very high.

Additional tests were conducted using the statistical software package SPSS. These included correlations and regression analysis to assess relationships with risk measures (Table 29 and Table 30) and the ANOVA statistical technique to assess specific relationships in more detail. Correlation coefficients have been reported for consistency, although for questions involving binary responses (e.g. yes/no options) the size of the correlation will undervalue the true strength of the relationship. A more stringent test of statistical significance was used, $p < .001$ in order to focus on the stronger relationships.

For regression analysis combining both continuous and nominal/driver group variables as predictors (e.g. incidence of long haul trips and rate of pay), categorical regression was conducted using SPSS's Optimal Scaling module. ANOVA was used when assessing differences involving more than one nominal/driver group variables.

⁵ The output from the formulas set up in Excel was checked against the output from SPSS to ensure that the calculations were accurate.

7.2 Appendix B – Questionnaire

SAMPLE

Location

- 1 NSW
- 2 Victoria
- 3 Queensland
- 4 South Australia
- 5 Western Australia

PREAMBLE

Good morning/afternoon/evening. My name is ... from ... the survey research company.

We are conducting a survey with truck drivers on behalf of the National Transport Commission. The NTC is keen to find out the opinions of truck drivers about road safety and about what the NTC can do to improve safety for truck drivers.

NOTE: NEED TO CONFIRM THAT THEY DRIVE A TRUCK OF AT LEAST 12 TONNES GROSS VEHICLE MASS (GVM).

Please be assured that your responses will be kept confidential. This information will not be used for any other purpose and will be destroyed once the survey is completed. Only combined results from the survey will be reported back to the NTC.

DRIVER PROFILE

Q1. RECORD GENDER

- 1 Male
- 2 Female

Q2. What is your age?

RECORD AGE _____ (99=REFUSED)

Q3. Are you a company driver?

1	Yes	ASK Q4
2	No	GO TO Q5

Q4. How many trucks does your company operate? Would it be... READ OUT

- 1 Fewer than 5
- 2 Between 5 and 10
- 3 Between 11 and 50
- 4 More than 50
- 9 DO NOT READ OUT: Don't know

GO TO Q8

Q5. Are you... an owner-driver?

- 1 An owner-driver
- 2 An owner-operator
- 3 Neither of these **GO TO Q8**

Q6. How many trucks do you own?

RECORD NUMBER _____

Q7. Are you a... READ OUT

- 1 Prime contractor
- 2 Subcontractor in company colours
- 3 Freelance subcontractor
- 4 Or some other type of operator _____

Q8. Is your business... READ OUT (could be both responses)

- 1 Carrying goods for other people
- 2 Transporting its own products

Q9. How many years have you been driving heavy vehicles for a living?

RECORD WHOLE YEARS – ROUNDED DOWN (less than 1 = 0) _____

Q10. In which state is your home base?

- 1 NSW
- 2 Victoria
- 3 Queensland
- 4 South Australia
- 5 Western Australia
- 6 Tasmania
- 7 ACT
- 8 NT
- 9 Refused

Q11. What are the main types of freight you usually transport?

READ OUT – MULTIPLE RESPONSE

- 1 Livestock
- 2 Refrigerated or temperature controlled
- 3 Dangerous goods
- 4 Farm produce
- 5 Other bulk (specify)
- 6 Machinery
- 7 Building materials
- 8 Groceries
- 9 Manufactured goods (specify)
- 10 General or mixed freight
- 11 Car carrying
- 12 Express freight
- 13 Any other freight (specify)

Q12 - REMOVED

Q13. What percentage of your transport trips are... READ OUT

GET % IN EACH CATEGORY TO ADD UP TO 100%
 IF UNSURE, GET APPROXIMATE DISTRIBUTION, OR THINK ABOUT IN THE LAST WEEK,
 999=DON'T KNOW

- 1 Within a capital city metropolitan area _____
- 2 Interstate trips between metropolitan centres _____
- 3 Within a regional centre _____
- 4 Between regional centres, less than 100 km apart _____
- 5 Between regional centres, more than 100 km apart _____
- 6 Between metropolitan and regional areas _____

100%

Q14. The next couple of questions are about how you get paid.

Do you negotiate your rate of pay for each load?

- 1 Yes GO TO Q16
- 2 No

Q15. Do you have an ongoing contract for... READ OUT

- 1 All your loads
- 2 Some of your loads
- 3 None of your loads

Q16. In which of the following ways are you usually paid?

READ OUT AND RECORD MOST USUAL – TRY TO GET AS ONE TYPE

- 1 By hourly rate
- 2 Flat day rate
- 3 Day rate with overtime
- 4 Weekly rate
- 5 Weekly rate with overtime
- 6 Flat rate for every truck load carried
- 7 Rate for each trip based on kilometres travelled or tonnage carried
- 8 Or would it be some other way?

9 DO NOT READ OUT: No response

Q17. Would you usually be paid... READ OUT

- 1 At the award rate
- 2 Less than the award rate
- 3 More than the award rate
- 9 DO NOT READ OUT: Don't know

Q18. What sort of vehicle do you usually drive?

READ OUT AND RECORD MOST USUAL

- 1 Rigid truck
- 2 Articulated truck
- 3 B-double
- 4 Road train
- 9 Other (specify) _____

Q19 - REMOVED

**Q20. Do you get paid for non-driving work? By this we mean work such loading and unloading?
IF YES, PROBE FURTHER: Is it as the same rate as driving work?**

- 1 Yes – at same rate
- 2 Yes – not at same rate
- 3 Yes – don't know if at same rate
- 4 No
- 9 Don't know

FATIGUE MANAGEMENT

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 or bored, unable to concentrate, unable to sustain attention, and being mentally slowed.

PERCEPTIONS

**Q21. In your opinion, how much of a problem is driver fatigue in your industry? Do you think it is...
READ OUT**

- 1 A major problem
- 2 A substantial problem
- 3 A minor problem
- 4 Not at all a problem
- 9 DO NOT READ OUT: Don't know

**Q22. And how much of a problem is driver fatigue to you personally in your job? Do you think it is...
READ OUT**

- 1 A major problem
- 2 A substantial problem
- 3 A minor problem
- 4 Not at all a problem
- 9 DO NOT READ OUT: Don't know

Q23. How often do you become fatigued while driving? Is it... READ OUT

- 1 On every trip
- 2 On most trips
- 3 On about half of your trips
- 4 Occasionally
- 5 Very rarely
- 6 Never
- 9 DO NOT READ OUT: Don't know

Q24, Q25, Q26, Q27 REMOVED

Q28. Thinking about your truck driving in the last month, how often would you have experienced each of the following?

Firstly... READ OUT EXPERIENCE

Would you have experience it ... READ OUT SCALE

EXPERIENCE – ROTATE	Often	Some-times	Rarely	Not in last month	DNRO: Don't know
1 Feeling aggressive towards other road users	1	2	3	4	9
2 Headaches from driving and working	1	2	3	4	9
3 Loss of concentration or attention	1	2	3	4	9
4 Feeling frustrated towards other road users	1	2	3	4	9
5 Heavy or tired eyes	1	2	3	4	9
6 Feeling exhausted at the end of your working day or shift	1	2	3	4	9

Q29a. How often do you find that you are able to plan your working day in order to take breaks and rest when you need to? Would it be... READ OUT

- 1 Every day
- 2 Most days
- 3 Some days
- 4 Rarely
- 5 Never
- 9 DO NOT READ OUT: Don't know/can't say

Q29b. Thinking about the times you have been driving a truck in the last month. How often would you say that you felt tired or drowsy, but did not take a break? Would it have been... READ OUT

- 1 Every day
 - 2 On most days
 - 3 On some days
 - 4 Only occasionally
 - 5 Not in last month
 - 9 DO NOT READ OUT Don't know
- GO TO Q31
GO TO Q31

Q30. Which of the following would be reasons that you had not taken breaks when you felt tired or drowsy? READ OUT – ALLOW MULTIPLES

SITUATIONS - ROTATE

- 1 Because you had a tight schedule
- 2 To finish a trip early so you can start your next trip
- 3 In order to keep your job
- 4 Because you would be penalised if you were late
- 5 So as not to delay getting home
- 6 Because there was nowhere to stop your truck to take a break
- 9 DO NOT READ OUT: None of these

Q31. I am going to read out a list of things that might contribute to driver fatigue. Please tell me which you think contribute to your fatigue while driving. Please use a scale of... READ OUT SCALE

CONTRIBUTORS – ROTATE		Major contributor	Minor contributor	Not a contributor	DNRO: Don't know
1	Long driving hours	1	2	3	4
2	Insufficient rest break	1	2	3	4
3	Irregular or inadequate sleep during trips	1	2	3	4
4	Not enough night time sleep	1	2	3	4
5	Driving at night	1	2	3	4
6	Having to stick to the working hours regulations	1	2	3	4
7	Too much non driving work	1	2	3	4
8	Heavy traffic	1	2	3	4
9	Poor diet	1	2	3	4
10	Driving in early afternoon	1	2	3	4

Q32. I am now going to read out a list of strategies that drivers might use to manage fatigue. Please rate how helpful you think each of them is for managing fatigue. Please use a scale of... READ OUT SCALE

CONTRIBUTORS - ROTATE		Very Helpful	Helpful	Un-helpful	Very Unhelpful	DNRO: Don't know
1	Eating while driving	1	2	3	4	9
2	Stopping to rest	1	2	3	4	9
3	Adjusting the ventilation, such as windows, heater, air conditioning	1	2	3	4	9
4	Taking stay awake drugs	1	2	3	4	9
5	Smoking	1	2	3	4	9
6	Stopping to sleep	1	2	3	4	9
7	Having a drink containing caffeine	1	2	3	4	9
8	Ignoring driving hours regulations to finish a trip when close to home	1	2	3	4	9
9	Listening to the radio or music	1	2	3	4	9
10	Stopping for a meal	1	2	3	4	9

Q33. How well do you feel that driver fatigue is managed in your industry now? Do you think it is managed... READ OUT

- 1 Extremely badly
- 2 Quite badly
- 3 Quite well
- 4 Very well
- 9 DO NOT READ OUT: Don't know/Don't have an opinion

Q34. And how well do you consider that you manage your fatigue? Would you say you manage it... READ OUT

- 1 Extremely badly
- 2 Quite badly
- 3 Quite well
- 4 Very well
- 9 DO NOT READ OUT: Don't know/Don't have an opinion

PLANNING

Q35. Thinking about your trips and schedules. On what percentage of trips would you personally have input to determining your schedules and delivery times?

% ____

RECORD AS %. IF UNSURE GET AN APPROXIMATE FIGURE. 999=DON'T KNOW

Q36. On how many of your trips do you consider that you have unrealistic schedules set? Would it be on... READ OUT

- 1 All of your trips
- 2 Most of your trips
- 3 Some of your trips
- 4 None of your trips
- 9 DO NOT READ OUT: Don't know

Q37. On how many trips would you be delayed for more than 15 minutes waiting in queues to load or unload? Would it be on... READ OUT

- 1 All of your trips
- 2 Most of your trips
- 3 Some of your trips
- 4 None of your trips
- 9 DO NOT READ OUT: Don't know

IF Q37=4 GO TO Q39

Q38. On trips that do involve queuing, is adequate time for queuing taken into account when your work schedule is put together? Would it be... READ OUT

- 1 All of your trips
- 2 Most of your trips
- 3 Some of your trips
- 4 None of your trips
- 9 DO NOT READ OUT: Don't know

WORK PRACTICES

IF WORK FOR A COMPANY IN Q3 OR Q7, ASK Q39-41

Q39. The next couple of questions are about things that the company you work for might do to help manage fatigue. Firstly, does the company you work for have any of the following? (READ OUT, RECORD ALL THAT APPLY)

- 1 Standard working hours for drivers (where the driver fills out a log book)
- 2 Transitional Fatigue management Scheme
- 3 Fatigue Management Scheme
- 4 A formal driver fatigue management policy for drivers
- 5 A formal medical policy for drivers
- 8 DO NOT READ Out: Don't know
- 9 DO NOT READ OUT: None of these

Q40. Next, does your company do any of the following to manage driver fatigue?

ACTIONS – ROTATE		Yes	No	Don't know
1	Make drivers take rest breaks when they are driving	1	2	9
2	Provide education about health	1	2	9
3	Allow flexible schedules – allowing drivers to rest when needed	1	2	9
4	Allow enough time between trips for sleep	1	2	9
5	Minimise night driving	1	2	9
6	Restrict working hours for drivers	1	2	9
7	Use workers other than drivers for loading and unloading	1	2	9
8	Monitor the working hours that drivers do	1	2	9
9	Schedule trips so that drivers can have adequate breaks	1	2	9
10	Monitor the levels of fatigue of drivers	1	2	9
11	Provide education about fatigue	1	2	9

IF Q40 STATEMENT 10 = YES ASK Q41

Q41. In which of the following ways does your company monitor driver fatigue

ACTIONS – ROTATE 1/5, THEN 6		Yes	No	Don't know
1	Ask drivers how they felt/	1	2	9
2	Use monitoring devices	1	2	9
3	Review drivers' log books	1	2	9
4	Review truck computer records	1	2	9
5	Review any incidents or accident	1	2	9
6	Is there any other way your company monitors levels of fatigue (specify)	1	2	9

FATIGUE-RELATED INCIDENTS

Q42. The next few questions are about potentially dangerous incidents that may happen to you when you are driving a heavy vehicle.

**Firstly, has [incident] happened to you in the last 12 months?
IF YES: has it happened often, sometimes, or rarely?**

EXPERIENCES - ROTATE		Often	Sometimes	Rarely	No	DNRO: Don't know
1	Nodding off for a moment – called a microsleep	1	2	3	4	9
2	Falling asleep at the wheel	1	2	3	4	9
3	Running off the road	1	2	3	4	9
4	Crossing over lane lines	1	2	3	4	9
5	Over or under steering	1	2	3	4	9
6	Having a near miss	1	2	3	4	9
7	Late braking	1	2	3	4	9
8	Colliding with something	1	2	3	4	9

Q43. Have you had an accident in the last 12 months while driving a heavy vehicle?

- 1 Yes
- 2 No GO TO Q46

Q44. How many accidents did you have in the last 12 months ...
READ OUT EACH ONE AND RECORD NUMBER – GET APPROXIMATE NUMBER IF NECESSARY,
99=DON'T KNOW

- 1 With property damage or injury _____
- 2 Without property damage or injury _____

Q45. Do you think that fatigue was a factor in any of these accidents?

- 1 Yes
- 2 No
- 9 Don't know

BREAKING THE RULES

Q46. How often do you work contrary to the driving/work hour regulations?
This would include working more hours than permitted, or taking fewer rest breaks than required. Would it be... READ OUT

- 1 On every trip
- 2 On most trips
- 3 On about half your trips
- 4 On about a quarter of trips
- 5 Occasionally
- 6 Very rarely
- 7 Never GO TO Q48
- 9 DO NOT READ OUT: No response GO TO Q48

**Q47. Which of the following would be reasons that you work contrary to the driving/work hours regulations? You can nominate as few or as many as you like.
Would it be... READ OUT**

REASONS - ROTATE

- 1 Because of tight schedules
- 2 Because of penalties associated with arriving late
- 2 Because of rewards associated with arriving early
- 3 To get in early to get the next load
- 4 In order to return home
- 5 In order to do enough trips to earn a living
- 6 In order to reach adequate rest facilities
- 7 In order to keep your job
- 9 DO NOT READ OUT: None of these

WEEKLY WORK/REST SCHEDULE

Q48. Did you work at any time in the last 7 days?

- 1 Yes
- 2 No GO TO Q52

Q49. We are interested in your work and rest periods over the last 7 days.

Firstly, thinking about [yesterday]. I want to tell me when you were working and when you were sleeping. I want you to cover the 24 hour period from midnight to midnight

RECORD YESTERDAY

- 1 Monday
- 2 Tuesday
- 3 Wednesday
- 4 Thursday
- 5 Friday
- 6 Saturday
- 7 Sunday

GET RESPONDENT TO REFER TO START AND FINISH TIME FOR EACH
IF CAN'T REMEMBER PRECISE, GET APPROXIMATE DURATIONS,
BUT IF CAN'T REMEMBER AT ALL (JUST GUESSING) — CODE FULL DAY AS 'U'

DAY 1 – YESTERDAY

Q50, Q51 for YESTERDAY THEN ADDITIONAL 6 TIMES

Q50.

W=Working, S=Sleeping, X=Neither working nor sleeping,

	AM												PM											
Code	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Period	12-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12	12-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12
Activity																								

IF ANY WORK ON THAT DAY, ASK ABOUT BREAKS

Q51. And also please tell me whether you took any breaks during the morning, afternoon, or night?

- 1 No breaks taken GO TO NEXT DAY
- 2 Breaks taken RECORD BELOW
- 3 Don't know/No response GO TO NEXT DAY
- 3 NOT WORKED GO TO NEXT DAY

IF ANY BREAKS TAKEN

— GET NUMBER UP TO 10 MINUTES, MORE THAN 10 MINUTES — IN EACH PERIOD

TIME	Short breaks (up to 10 min)	Longer breaks (more than 10 min)	Can't remember length
1 Morning			
2 Afternoon			
3 Evening/Night			

Q50, Q51 REPEATED FOR ADDITIONAL SIX DAYS

Q52. In a typical working week, how much time in hours would you spend on each of the following?

**READ OUT EACH ONE AND RECORD HOURS TO ONE DECIMAL POINT
0=NONE, 99=DON'T KNOW**

- 1 Checking or repairing your heavy vehicle _____
- 2 Loading or unloading your heavy vehicle _____
- 3 Other yard work _____
- 4 Driving a heavy vehicle for work _____
- 5 Driving a light vehicle for work _____

That's the end of the interview. Thank you for your time.

The information you gave us will be used only for research purposes, and no-one outside the research team will be given information that identifies individual drivers. There are laws to protect the privacy of people who answer this type of survey, and our company is careful to obey them.

As part of quality control system, someone from our project team might contact you to ask a couple of questions: just to check that I did interview you, and that I recorded your answers accurately.

Can I please get your name and contact number?

NAME _____

NUMBER _____

Once our validation period has finished, please be assured that your name and contact details will be removed from your responses to this survey. After that time we will no longer be able to identify the responses provided by you.

7.3 Appendix C – Comparing the Parallel Surveys of Drivers and Companies

7.3.1 The Surveys

Surveys with a number of common questions were conducted of a sample of companies and a sample of drivers. The following discussion compares results between the two surveys on key attitudinal questions.

Profiling of the companies/drivers in the surveys does reveal differences between the samples, reflecting the sampling methods for the two surveys (Table 33). The Driver survey, with respondents recruited primarily from truck stops, included a large proportion of long haul drivers (62% with 90+% of their trips as long haul). The company survey, with random sampling of transport companies supplemented by a sample of consignors, included about half (47%) as exclusively short haul, or mainly short haul, companies.

About half of drivers covered in the Company Survey (i.e. weighted by drivers) were paid 'hourly', which appeared consistent regardless of long haul trip profile. In contrast, the incidence of an hourly rate in the Driver Survey decreased substantially with the amount of long haul trips, and the overall distribution included over half paid a rate based on the trip.

The distribution by company size also differed between the surveys, with those in the Driver Survey more likely to come from smaller companies, compared with the drivers covered in the Company Survey.

Interviewing at truck stops clearly had an impact on the overall profile of the Driver Survey, both in terms of the incidence of long haul drivers, but also possibly on the type of long haul driver (e.g. those specifically using truck stops).

Table 33. Profile of the Companies and Drivers in the Two Surveys

MEASURE	COMPANY SURVEY		DRIVER SURVEY
	Companies %	Drivers [weighted] %	Drivers [working for a company] %
% Long haul trips (>100 km away from base)			
0-29% [mainly-short haul]	47	51	21
30-89%	27	33	17
90-100% [mainly-long haul]	26	16	62
Size of company			
1-4	39	4	26
5-10	26	10	23
11-50	27	41	32
>50	11	45	19
Payment rate (drivers working for a company)			
Hourly		47	20
Weekly/salary		4	19
Flat km/load		36	58
Mixed/other		13	3

Bolded: Main differences between the surveys have been indicated by bolding the higher results.

While it was still possible to make comparisons between the different short/long haul groups of drivers in the Driver Survey, to look at the impact of trip type, direct comparison between the Driver Survey and Company Survey needs to be qualified.

7.3.2 Perception of How Well Fatigue is Managed in the Industry

Drivers were much less likely than companies to consider that driver fatigue is ‘well managed’ in the industry (Table 34).

Table 34. Perception of How Well Fatigue is Managed in the Industry

How well is fatigue managed	COMPANY SURVEY		DRIVER SURVEY
	Companies	Drivers [weighted]	Drivers
	%	%	%
Very well	18	20	8
Quite well	50	54	33
Quite badly	15	10	33
Extremely badly	6	4	23
Don't know	11	12	3

Bolded: Main differences between the surveys have been indicated by bolding the higher results.

7.3.3 Contributors to Fatigue

Companies were asked about how each of a set of factors might contribute to fatigue, while drivers were asked whether each factor directly contributed to their fatigue. In this context, companies were more likely than drivers to nominate all but one factor as a major contributor (Table 35).

Table 35. Rating of Contributors to Fatigue

NOTE: Companies asked in the context of potential contributors to fatigue
Drivers asked in the context of actual contributors to their fatigue

Contributors	COMPANY SURVEY		DRIVER SURVEY	
	Major Contributors		Minor Contributor	Minor/Major Contributor
	Companies	Drivers [weighted]	%	%
Long driving hours	76	70	38	69
Insufficient rest break	77	68	29	57
Irregular/inadequate sleep during trips	79	73	32	61
Not enough night time sleep	68	54	30	54
Driving at night	41	35	14	39
Too much non driving work	37	39	25	51
Having to stick to the working hours regulations	29	19	36	58
Poor diet	55	60	25	52
Heavy traffic	43	38	31	67
Driving in early afternoon	11	9	13	44

Bolded: Main differences between the surveys have been indicated by bolding the higher results.

Using the drivers’ total major/minor rating of contributors as an index highlights issues with four of the contributors, where companies appear to underestimate the importance:

- Heavy traffic
- Having to stick to the working hours regulations
- Too much non driving work
- Driving in early afternoon.

7.3.4 Helpfulness of Strategies

Drivers were more likely than companies to nominate all strategies as ‘very helpful’. Considering all nominations of ‘helpful’ highlights several of the ‘non stopping’ strategies that were rated higher by driver (Table 36):

- Ignoring driving hours regulations to finish a trip when close to home
- Smoking
- Eating while driving
- Having a drink containing caffeine.

Table 36. Driver Strategies Rated as ‘Helpful’ to Manage Fatigue

Strategies	COMPANY SURVEY		DRIVER SURVEY
	Companies	Drivers [weighted]	Drivers
	%	%	%
Sleep/Rest			
Stopping to sleep	98	94	98
Stopping to rest	98	100	98
Stopping for a meal	95	97	85
Eating/Ingesting (not stopping)			
Having a drink containing caffeine	55	49	65
Eating while driving	30	29	55
Smoking	16	15	37
Taking stay awake drugs	12	9	18
Other Activities			
Listening to the radio or music	75	78	85
Adjusting the ventilation	75	71	84
Ignoring driving hours regulations to finish a trip when close to home	17	15	43

Bolded: Main differences between the surveys indicated by bolding the higher results.

The overall conclusion is that drivers were more optimistic than companies about managing their own fatigue. A more conservative attitude by companies is encouraging in

this regard. There is concern, however, about the high nomination of helpfulness of temporary strategies such as ‘listening to the radio or music’ and ‘adjusting ventilation’, and the small percentage of both companies and drivers nominating ‘taking stay awake drugs’.

Furthermore, while drivers might be more optimistic about managing their own fatigue, they are clearly more negative about the way that fatigue is managed in the industry. These perceptions—a stronger internalised sense of control and a poorer perception of external support—are likely to be related. The direction of the relationship, however, is unclear: does a perception of poor management in the industry lead to drivers relying on their own strategies; or do at least some drivers want to control their own work situation, including ‘bending the rules’, so disregard the controls in the industry as being ineffective or even inappropriate (e.g. the value of the driving/working hour regulations).

7.4 Appendix D – Comparison with the 2004/2005 Survey of Short Haul, Light Truck Drivers

7.4.1 The Study

A study was conducted in 2004/2005 by the NSW Injury Risk Management Research Centre (IRMRC) (Friswell, Williamson and Dunn, 2006b) of a sample of 321 drivers with the following characteristics:

- drove a truck of up to 12 tonnes gross vehicle mass (GVM)⁶; and
- drove on trips within a 100 km radius of their home base (short haul).

Drivers were recruited for the survey at truck stops or through companies. The survey was conducted in both urban and regional areas of NSW.

7.4.2 Comparisons

Overview

The study included a number of questions that were the same or similar to those used in the national survey described in the main report. Chi-square tests have been used to assess differences between the two surveys, with statistical significance assessed at $p < .05$.

For ease of comparison, drivers in the current survey have been referred to as 'Heavy Vehicle drivers', and drivers in the IRMRC's survey have been referred to as 'Light Vehicle/Short Haul drivers'.

Profile of Drivers

The main profile of drivers in the two surveys is described in Table 37.

Light Vehicle/Short Haul drivers were less likely than Heavy Vehicle drivers to say that they were an 'employee driver'. Among the owner drivers/operators, Light Vehicle/Short Haul drivers were more likely than Heavy Vehicle drivers to operate under 'company colours', and less likely to be independent subcontractors.

Light Vehicle/Short Haul drivers who were employee drivers were also much more likely than the corresponding Heavy Vehicle drivers to work in large companies, operating more than 50 vehicles.

Light Vehicle/Short Haul drivers were much more likely than Heavy Vehicle drivers to report being paid a flat hourly rate. In contrast, Heavy Vehicle drivers were much more likely to report being paid a 'per trip/load' or flat rate. While it might be expected that the higher incidence of employee drivers among Heavy Vehicle drivers would lead to a higher incidence of a flat rate payment, this was clearly not the case. Furthermore, the trend for the Heavy Vehicle drivers to be more likely to be paid at a flat rate is consistent with the IRMRC's previous surveys of long haul heavy vehicle drivers, reported in Section 3.2 of this report.

⁶ The authors acknowledged that this was not a usual definition of a 'heavy vehicle' but a logical point of division in the context of driver fatigue, as the National Driving Hours Regulations applied to drivers of trucks over 12 tonnes GVM.

Table 37. Profile of Drivers in the Two Surveys

Measure	Category	2004/2005 Light Vehicle/ Short Haul drivers	2006 Heavy Vehicle drivers
<i>Employment type</i>		(n=270) %	(n=613) %
	Employee driver	55.2	70.5
	Owner driver or operator	44.8	29.5
<i>Type of owner</i>		(n=121) %	(n=172) %
	Prime contractor	18.5	14.0
	Painted subcontractor	58.8	18.0
	Independent subcontractor	15.1	62.8
	Other	7.6	5.2
<i>Fleet size of employer (if employee)</i>		(n=149) %	(n=432) %
	1-4 vehicles	24.2	26.2
	5-10 vehicles	21.5	22.5
	11-50 vehicles	18.1	31.5
	>50 vehicles	34.9	19.2
	Unknown	1.3	0.7
<i>Payment type</i>		(n=267) %	(n=613) %
	Flat hourly rate	58.1	16.6
	Flat day/weekly rate	17.2	16.6
	Flat item/delivery/load rate	6.4	64.1
	Kilometre or tonnage rate	7.1	
	Other (incl. multiple types)	11.2	2.6
<i>Freight tasks</i>		(n=270) %	(n=613) %
	Express	32.2	7.7
	General/mixed	24.1	38.5
	Building materials	20.7	13.9
	Dangerous goods	13.3	10.3
	Manufactured goods	11.5	9.5
	Refrigerated transport	9.6	19.2
	Removals	9.3	–
	Machinery	7.0	12.7
	Bulk	3.3	16.5
	Groceries	3.0	12.4

Bolded: Higher result, with a statistically significant difference between groups ($p < .05$).

The more detailed analysis of payment methods in Section 3.2 of the main report shows that mainly-short haul drivers in the current survey were more likely than mainly-long haul drivers to be paid a flat rate. The results therefore suggest that payment method is influenced by both the profile of short/long haul driving as well as the size of vehicle.

Further differences occurred between the two surveys on the types of freight carried (Table 37). Different freight categories were presented in the two surveys, reflecting broad differences in the type of work. Non-common categories are not included in Table 37, but are commented on below.

Light Vehicle/Short Haul drivers were more likely than Heavy Vehicle drivers to be involved in express freight and carrying building materials; and in addition, over a third reported being involved in courier or taxi truck work. Heavy Vehicle drivers were more likely to report carrying a number of different categories of freight, including general or mixed freight, refrigerated transport, bulk and groceries; and in addition a fifth reported carrying livestock or farm produce.

7.4.3 Work Profile

Drivers in the two surveys were asked about their time spent working. The questions in the two surveys were asked in different ways. As described in Section 3.7 of the main report, Heavy Vehicle drivers were asked to complete a detailed hourly record of their activity over the previous seven days. The Light Vehicle/Short Haul drivers were asked to report their ‘usual weekly working hours’, reflecting the more discrete daily or weekly work patterns in this industry.

Three quarters (74%) of Light Vehicle/Short Haul drivers reported working five days in a normal week (Table 38). In contrast, Heavy Vehicle drivers who had worked in the last week were more likely to report working both fewer and greater number of days in the last week. A third (31%) of Heavy Vehicle drivers reported working one to four days and over a third (39%) reported working six to seven days.

Table 38. Number of Days Worked in a Week in the Two Surveys

Number of days	2004/2005	2006
	Light Vehicle/Short Haul drivers	Heavy Vehicle drivers
	<i>Asked as ‘Normal week’</i>	<i>Asked as ‘Last week’ (if worked)</i>
	<i>(n=270)</i>	<i>(n=613)</i>
	%	%
1	0.0	1.7
2	0.8	4.2
3	1.5	9.9
4	3.0	15.2
5	74.4	32.1
6	18.8	23.7
7	1.5	13.2

Bolded: Higher result, with a statistically significant difference between groups ($p < .05$).

It is likely, however, that the differences between the two driver groups have been influenced by a ‘regression to the mean’ effect for Light Vehicle/Short Haul drivers, where

a 'normal' working week will include fewer extreme values that might occur in a specific week.

A similar pattern occurred in measuring the number of hours worked. Two thirds (69%) of Light Vehicle/Short Haul drivers reported normally working 41-60 hours, compared with two fifths (41%) of Heavy Vehicle drivers (Table 39). Heavy Vehicle drivers were again more likely to report working both shorter hours and longer hours.

Table 39. Number of Hours Worked in a Week in the Two Surveys

Number of hours	2004/2005	2006
	Light Vehicle/Short Haul drivers <i>Asked as 'Normal week'</i> (n=270) %	Heavy Vehicle drivers <i>Asked as 'Last week' (if worked)</i> (n=545) %
Up to 20	2.3	5.1
21-40	19.6	23.5
41-60	69.4	41.1
61-80	8.7	22.4
81+	0.0	7.9

Bolded: Higher result, with a statistically significant difference between groups ($p < .05$).

7.4.4 Fatigue Attitude and Experience

Fatigue as a Problem

Perceptions of fatigue as a problem revealed a complex relationship between the context of the problem and the two groups of drivers. Light Vehicle/Short Haul drivers were less likely than Heavy Vehicle drivers to consider that fatigue was a problem in their industry, but more likely to consider that it was a problem for them personally (Table 40).

Three quarters (74%) of Heavy Vehicle drivers considered fatigue at least a substantial problem in their industry, compared with two fifths (39%) of Light Vehicle/Short Haul drivers. In contrast, about half (54%) of Heavy Vehicle drivers considered that fatigue was at least a minor problem for them personally (mainly rating as minor), compared with three quarters (78%) of Light Vehicle/Short Haul drivers, including a quarter (28%) considering it at least a substantial problem.

Table 40. Perception of Fatigue as a Problem in the Industry and Personally, in the Two Surveys

Fatigue a problem	2004/2005	2006
	Light Vehicle/Short Haul drivers	Heavy Vehicle drivers
<i>In industry sector</i>		
No	13.8	5.5
Minor	47.4	19.7
Substantial	26.1	31.0
Major	12.7	42.7
Don't know	–	1.0
<i>For driver personally</i>		
No	22.0	45.4
Minor	50.0	39.2
Substantial	20.9	9.5
Major	7.1	5.9
Don't know	–	0.2

Bolded: Higher result, with a statistically significant difference between groups ($p < .05$).

Experience of Dangerous Incidents

Drivers were asked to report the incidence of each of a series of dangerous events experienced in the last 12 months. In the survey of Light Vehicle/Short Haul drivers, the question was reported in the context of 'events due to fatigue'. The actual question was not included in the survey report (or in the later more detailed report Friswell, Williamson and Dunn, 2006a), but appears to be based on the question used in the IRMRC's 1998 survey (Williamson, Sadural, Feyer, Friswell, 2001). In contrast, the context of the question in the current survey was left more general and fatigue was not specifically mentioned as a cause.

Light Vehicle/Short Haul drivers were at least as likely as Heavy Vehicle drivers to report experiencing each of the four events measured in both surveys (Table 41).

Table 41. Experience of Dangerous Incidents in the last 12 Months in the Two Surveys

Dangerous Events	2004/2005	2006
	Light Vehicle/Short Haul drivers <i>Asked as 'due to fatigue'</i> %	Heavy vehicle drivers <i>Experienced 'rarely or greater'</i> %
Had near miss	(<i>n</i> =209)	(<i>n</i> =613)
	65.1	34.0
Collided with something	(<i>n</i> =204)	(<i>n</i> =613)
	22.1	7.4
Ran off road	(<i>n</i> =201)	(<i>n</i> =613)
	19.4	7.7
Nodded off/Fell asleep	(<i>n</i> =209)	(<i>n</i> =613)
	45.0	35.8

Bolded: Higher result, with a statistically significant difference between groups ($p < .05$).

7.4.5 Discussion

The comparison of the two surveys highlights a number of issues for Light Vehicle/Short Haul Drivers. Some of the overall differences from Heavy Vehicle drivers are in the same direction as differences between the mainly-short haul and mainly-long haul drivers among the Heavy Vehicle drivers. These include employment type (employee vs owner), payment method, and experience of dangerous incidents. Differences in types of freight carried (e.g. express freight, courier/taxi truck) appear to be related more to an overall difference between the light vehicle and heavy vehicle transport industries.

An interesting finding was that Light Vehicle/Short Haul Drivers were much less likely than Heavy Vehicle drivers to consider that fatigue was a problem in their industry, yet they were more likely to consider fatigue was a problem for them personally. This trend raises issues around both the true extent of fatigue as a problem for Light Vehicle/Short Haul drivers as well as factors influencing how these drivers judge, or are willing to admit, that fatigue is a personal problem.

Fatigue has been well established in the community as a problem for long distance driving in general, and heavy vehicle drivers in particular. This broad perception is also held strongly by heavy vehicle drivers, as measured in the current survey, and it might be expected that this context would support them 'admitting' that fatigue affects them. Very few, however, considered fatigue more than a minor problem suggesting strong resistance to acceptance, despite the fatigue-related experiences they reported.

Fatigue as an issue for short haul driving has not been established on the public agenda, and this was reflected in the lower perception of a problem in the survey of Light Vehicle/Short Haul drivers compared with Heavy Vehicle drivers. Over a third of Light Vehicle/Short Haul drivers, nevertheless, considered that fatigue was at least a substantial problem in their industry, and these drivers were more likely than Heavy Vehicle drivers to admit fatigue as a personal problem. These trends suggest that short haul fatigue should be taken seriously as an issue, and the true extent of the problem established.

Light Vehicle/Short Haul drivers reported a greater incidence of dangerous events than Heavy Vehicle drivers. This difference was similar to that measured in the Heavy Vehicle survey between mainly-short haul and mainly-long haul drivers. It is possible that the different driving environment for short haul drivers contributes to a greater incidence of dangerous events, either independently of fatigue, or by increasing the likelihood that fatigue will cause a dangerous event.