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Evaluating and improving fleet safety in Australia

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Evaluating and improving fleet safety in Australia

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Abstract

This project has reviewed developments in fleet and work-related road safety in Australia, particularly the following areas.

- The extent of the problem.
- Examples of best practice.
- Mechanisms for evaluation.
- Theoretical paradigms and future directions.

From this, the report achieves the following aims.

1. Identifies a range of societal, business, legal, and cost reasons to focus on fleet safety at the macro and micro levels.
2. Describes a wide range of government, insurer, and occupational health and safety (OHS)-led case studies.
3. Develops an approach to fleet safety evaluation based on a range of proactive and reactive, or lead and lag key performance indicators (KPIs) on crash rates, costs, and qualitative process issues.
4. Identifies an apparent lack of fleet safety theory, and then describes several more general safety theories and frameworks, including the Surveillance Model, the Haddon Matrix and Organisational Culture-based approaches.
5. Synthesises the above to develop a best practice process model for fleet safety and recommend future work.

Keywords

Fleet safety management, work-related road safety, evaluating fleet safety, best practice fleet management

NOTES:
(1) ATSB research reports are disseminated in the interests of information exchange.
(2) The views expressed are those of the authors and do not necessarily represent those of the Commonwealth Government.

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Executive summary

This report reviews the emerging area of fleet and work-related road safety in Australia through a review of the literature, interviews with fleet managers, and discussions with a wide range of fleet safety practitioners and other experts.

A large number of social, business, legal and financial problems have been associated with poor fleet safety, and it is clear that there is a serious need to address this issue in Australia. **In Queensland, crashes involving fleet vehicles account for 25% of road fatalities, 43% of work-related fatalities, and cost businesses more than $1 billion per annum. It is clear that improvements in work-related road safety will have benefits in terms of meeting targets to reduce the road toll, improving occupational health and safety and supporting the competitiveness of Australian industry.** Employers generally have a high level of control over staff that drive for work, which can and should be used to implement safety improvements in a work setting that may be more difficult to implement within the general driving population.

After reviewing the extent of the problem, the report introduces and describes a range of 'fleet safety active' case studies from different sectors including BP, DuPont, Fleet South Australia (SA), Lumley Insurance, National Transport Insurance (NTI), QFleet, Santos, Shell, and the Southern Sydney Regional Organisation of Councils (SSROC). The fleet safety programs that several government agencies have undertaken or have the potential to undertake are set out. These include the state, territory and federal level transport, compulsory third party insurance (CTP), and Occupational Health and Safety (OHS) agencies. To date several agency-led projects have been developed, however few have been evaluated, there is only fledgling inter-agency cooperation and in many cases very limited and rarely integrated data.

This analysis identified a range of best practice approaches and processes and suggested that to date very little theory has been applied to the area of fleet safety. For this reason, a range of safety promotion theories were reviewed, and in conjunction with the case study material, used to develop a fleet safety improvement framework that focuses on four key areas.

1. Identifying the societal, business, legal and cost **reasons for a fleet safety program**.
2. Undertaking an **initial and on-going safety status review** based on surveillance theory.
3. **Implementing countermeasures** using the Haddon Matrix as an organising framework.
4. Utilising a range of both proactive and reactive crash, cost, and qualitative **key performance indicators (KPIs) to evaluate** and develop the program.

As well as this organisational or micro-level process, several recommendations are made at the macro level. These relate to the **need for better data, acknowledging the importance of fleet safety, inter-agency cooperation, greater OHS involvement and for government agencies to lead by managing their own fleets** as effectively and safely as possible.

Finally, several limitations in the report, particularly in relation to methodology, are set out and a range of important areas for further study suggested. These include developing a structure for **'purpose of journey' data, influencing several agencies to focus more attention on fleet safety, tailoring and evaluating countermeasures for specific sectors and situations, and reviewing the options for safer journey management** and modal choice decisions for work-related travel.

Acknowledgements

Thanks to the Australian Transport Safety Bureau (ATSB), particularly Brian Versey, for project funding, support and feedback and to the many managers in all the organisations who contributed their time, ideas, feedback and criticisms.

Members of the Fleet Safety Forum, especially Phil Sochon, have been particularly supportive in providing information and reviewing an early draft of the report.

Thanks also to Marja Thompson at the Australasian Fleet Managers Association (AfMA), for supporting the initial funding bid and access to members via AfMA's annual conference.

The research was undertaken at the Centre for Accident Research and Road Safety – Queensland (CARRS-Q) between September 2000 and May 2002. A quality review was undertaken during June-August 2002 and the final edits undertaken in October and November 2002. Developments since May 2002 are only included where peer and quality reviewers have provided more recent information.

Any errors or omissions in the report are the fault of the authors and should be referred to us.

We welcome all positive and negative feedback on our work. If you wish to comment or contact us for any reason, please use the evaluation form and contact details provided in Appendix 5b.

As well as feedback and criticism, we also welcome the use of our work, but please acknowledge the authors in all cases and let us know what went well and what did not.

The report should be cited as:

Murray W, Newnam S, Watson B, Davey J and Schonfeld C Evaluating and improving fleet safety in Australia, ATSB report, November 2002.

Dr Will Murray, CARRS-Q, January 2003

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List of abbreviations

4WD	Four wheel drive vehicle
ABS	Anti-lock braking systems
ACRS	Australian College of Road Safety
ACT	Australian Capital Territory
AfMA	Australasian Fleet Managers Association
ANCAP	Australian New Car Assessment Program
ARRB	Australian Road Research Board
AS/NZ ISO	Australian/New Zealand International Standard Organisation
ASA	Advanced Safety Auditing
ATA	Australian Trucking Association
ATN	Australasian Transport News
ATSB	Australian Transport Safety Bureau
BCC	Brisbane City Council
BCT	Behaviour Change Taxonomy
BTE	Bureau of Transport Economics
CARRS-Q	Centre for Accident Research and Road Safety – Queensland
CAS	Client access system
CCSM	Costs, causes, systems and solutions and monitoring
CD	Compact disk
CEO	Chief Executive Officer
COR	Chain of Responsibility
COSBOA	The Council of Small Business Organisations of Australia
CoVIR	Company vehicle incident reporting and recording
CPP	Customer performance pricing
CTP	Compulsory third party insurance
DIER	Department of Infrastructure, Energy and Resources
DRL	Daytime running lights
FMCSA	Federal Motor Carrier Safety Administration
FNCA	Forum for Nuclear Cooperation in Asia
FORS	Federal Office of Road Safety
GDT	Group decision theory
GPS	Global positioning satellite
GS	General Standard
HAZOP	Hazard and operability analysis – systematic risk study of a proposed design
HM	Hazardous materials
HRM	Human resource management
HSE	UK Health and Safety Executive or health safety and environmental
IDS	Interactive Driving Systems
IMS	Incident management system
IT	Information Technology
ITS	Intelligent transport systems
JSA	Job safety analysis
Kms/h	Kilometres per hour
KPI	Key performance indicator
LTS	Land Transport Safety
MAA	Motor Accidents Authority
MAIC	Motor Accident Insurance Commission
MIL	Multiple Inventory Level
MORR	Managing Occupational Road Risk
MUARC	Monash University Accident Research Centre
NCAP	New car assessment program
NOHSC	National Occupational Health and Safety Commission
NRTC/NTC	National Road Transport Commission (soon to be the National Transport Commission)

NSCA	National Safety Council of Australia
NSW	New South Wales
NZ AA	New Zealand Automobile Association
NTI	National Transport Insurance
NZ LTSA	New Zealand Land Transport Safety Authority
OHS	Occupational health and safety
P	Proactive
PaQs ARM	People and Quality Solutions Pty Ltd Accident Risk Management
PCCSM	Proactive, costs, causes, systems, monitoring
PhD	Doctor of Philosophy
PR	Public relations
QAS	Queensland Ambulance Service
Qld	Queensland
QPS	Queensland Police Service
QRA	Quantitative risk analysis
QUT	Queensland University of Technology
QWC	Queensland Workers Compensation
RACQ/V	Royal Automobile Club of Queensland/Victoria
RCAG	Research Coordination Advisory Group
RHT	Risk homeostasis theory
RoSPA	Royal Society for the Prevention of Accidents
RSL	Road Safety Leadership
RTA	Road traffic accident or Roads and Traffic Authority
RWTS	Retail, Wholesale, Transport & Storage
SA	South Australia
SAFE	Safe and friendly environment
SBI	Safe behaviour involvement
SCOT	Standing Committee on Transport
SEK	Swedish Kroners ($s)
SHEA	Safety Health Environment Area
SME	Small and medium sized enterprise
SOP	Site operating procedures
SSROC	Southern Sydney Regional Organisation of Councils
States	Australian states and territories
SWP	Safe working practices
TAC	Transport Accident Commission
TIN	Traffic incident number
Travelsafe symposium	Travelsafe symposium on work-related road trauma and fleet risk management
TRL	Transport Research Laboratory
TWU	Transport Workers Union
UK	United Kingdom
USA	United States of America
US DOT	United States Department of Transport
VIC	Victoria
VORAM	Vehicle Operator Risk Assessment Model
VTA	Victorian Transport Association
WA	Western Australia
WCTR	World Conference on Transportation Research
WFSS	Workplace Fleet Safety System
WRRSTG	Work-related road safety task group
WST	Workplace Standards Tasmania

1 Introduction

This section describes the background to the project, its aims and the methodology used to meet them.

1.1 Background

Fleet, or work-related road safety and risk management, is an emerging issue which has received increasing attention in recent years in Australia and overseas due to the growing awareness of the extent of the problem and its impact on business effectiveness, workplace health and safety, and the road toll (Dimmer and Parker 1999, Downs et al 1999, Haworth et al 2000, Stradling 2000). The term 'fleet safety' is generally used in relation to light vehicles such as cars and vans less than 4.5 tonnes in Australia. Work-related drivers, however, are defined more widely as those who drive at least once per week for work-related purposes (Downs et al 1999, Haworth et al 2000). Such people range from truck drivers, couriers, police and emergency service drivers, to sales people (Collingwood 1997). Work-related drivers include senior executives provided with salary sacrificed vehicles, those who drive badged work-related vehicles both for work and non-work purposes, and those employed to drive fleet cars, vans, or other specialist vehicles (Dimmer and Parker 1999). Although there appears to be a large distinction made between heavy and light vehicles in Australia, many of the safety issues and countermeasures are similar, so both are covered to some extent in this report.

Research undertaken in the UK (Bibbings 1997, Murray 2000) and in Australia (Haworth et al 2000, Sochon 1999, Anderson and Plowman 1999, Staysafe36) has suggested that fleet and work-related road safety is an area with potential to improve general road safety outcomes. Despite this growing interest in the subject, little published data is currently available on the true extent of the problem, no in-depth evaluations of programs have been published, there are few objective non-PR-based case studies available, and there is no obvious proven model of best practice in Australia. This report will begin to address all of these issues with an overall objective to review fleet and work-related road safety in Australia. To achieve this, the project has five main aims.

1.2 Project aims

1. To identify the full extent and costs of the involvement of fleet vehicles and work-related driving in fatal, injury and damage only [1]crashes in Australia.
2. To develop a robust and practical way for industry to evaluate the effectiveness of fleet safety programs that will also promote their wider application.
3. To identify and evaluate a small number of best practice case studies.
4. To develop a model of fleet safety best practice that includes the integration of fleet management, OHS and road safety.
5. To help 'invigorate' and 'enthuse' the fleet safety issue in Australia and facilitate, implement and change manage its development to a more advanced stage.

To meet these aims, the following methodology was adopted.

[1] In this report a crash is defined as **'any contact or alleged contact resulting in vehicle or property damage, both on- and off-road, whether or not injury is involved'.**

1.3 Project methodology and structure

The approach taken was mainly exploratory, survey, and case study-based. A literature, internet [2] and company document review focused on reasons to concentrate on fleet safety, reviewing previous work and potential fleet safety and risk management countermeasures. Telephone, email, face-to-face interviews, questionnaires, informal discussions and more formal group discussion-based workshops were undertaken with a range of government and business-based participants to extend and update the literature-based information.

- Telephone interviews were undertaken with QFleet, FleetSafe, Lumley General Insurance, DuPont, Santos, National Transport Insurance, Fleet South Australia and Shell. Questions were asked about the reasons for their programs, what steps they had taken, any barriers they had encountered and how they had evaluated their success.

- Management discussion workshops were undertaken with SSROC, Santos, Shell (in Australia and New Zealand), Queensland Transport, Tasmanian Chamber of Commerce, Tasmanian Department of Infrastructure, Energy and Resources (DIER) and Esanda FleetPartners.

- Meetings and informal discussions were held with the Fleet Safety Forum, the Australasian Fleet Managers Association (AfMA), the Australian College of Road Safety (ACRS), the Staysafe and Travelsafe committees, the Safety Institute of Australia (SIA), Queensland Taxi Council, Motor Accident Insurance Commission (MAIC), Santos, Shell, Queensland Transport, Queensland University of Technology (QUT), the New South Wales Road Traffic Authority (RTA), QFleet, WorkCover Victoria, Tasmanian Department of Infrastructure, Energy and Resources (DIER), South Australian Road Safety Group, National Occupational Health and Safety Commission (NOHSC), Australian Trucking Association (ATA), New Zealand Land Transport Safety Authority (LTSA), Lumley Insurance, SurePlan, WorkCover New South Wales and the Australian Transport Safety Bureau (ATSB).

- Questionnaires were circulated to members of the Fleet Safety Forum and to OHS agencies around the states. The content of the questionnaires, are shown in Appendices 3.2 and 3.7.

- The report was circulated to a wide range of stakeholders for comments.

This material was then used to identify the reasons why fleet safety is an important issue in Section 2. Section 3 summarises a wide range of Australian industry and government-led fleet safety initiatives. Several overseas initiatives are also described. This leads into the development of a process-based fleet safety model in Section 4 and guidance on evaluating fleet safety in Section 5. Both macro and micro level recommendations and areas for future study are addressed in Section 6.

[2] All the relevant internet sites identified in this report are listed in Appendix 1.

2 Why fleet safety[3] is important for Australia

Work-related crashes are a significant element of the Australian road toll and a high proportion of all work-related deaths and injuries. This means that there are strong grounds to believe that fleet safety programs will have a positive impact on the road toll and bring significant road safety gains (Wheatley 1997, Collingwood 1997). Wheatley (1997) quoted US cases where implementing a safety program gave substantial benefits. Similarly, Henderson (1997) felt that the work driving issue is a relatively new one, and as such is under-researched. Like McCorry and Murray (1993), he argued that employers have a degree of control over their vehicles, drivers and sites, which means that actions can be taken and monitored. Thus, a range of academics (Haworth et al 2000), local governments (Gibbs 2000), and commercial managers (Clarence 2000, Gialantzis 2001) are beginning to understand the extent of the problem and recognise a range of reasons to focus on fleet safety.

Murray (2001) summarised the work of several other writers (for example, many of the Staysafe36 papers, Stewart-Bogle 1999, Gibbs 2000, Anderson and Plowman 1999, Haworth et al 2000) into 13 reasons why fleet safety is an important issue in Australia. Murray (2000) provides a similar list for the UK. In this report, such 'why' information is reviewed and structured into a framework of societal, business, legal, and financial factors at both the national (macro) and organisational (micro) level in Australia. A similar structure was originally proposed by Whiting (1997).

2.1 Societal reasons to focus on work-related road safety

As noted by Tyler Miller (1996), road fatalities are a major global issue. He estimated that over 18 million people have been killed on roads worldwide since the internal combustion engine emerged in the 1880s. He estimated that there are 750,000+ world road deaths, as well as 23 million injuries and disablements per year, and that in the US, road death is 12 times more likely than murder. In the UK, road deaths are the most likely way for people between 4-44 years old to die. ATSB data for 1998 indicated that the total number of road deaths in 1998 was 1,839, while there were 42 rail deaths, 64 air deaths and 52 deaths at sea in Australia. Although this raw data does not allow for exposure, it suggests that modal choice and journey planning could be an important road safety issue. Interestingly, it is not known what proportion of these fatalities involved, let alone were caused by, someone driving for, to, or from work.

What is known is that a large proportion of the Australian workforce commutes to work by road, which is classed as driving for work by workers' compensation regulations in most states. In addition, many are required to hold a driver's licence for their jobs, including those shown in Appendix 2 who recently made driving related workers compensation claims in Queensland. Vincent (1997) suggested that people who drive in the course of their employment form the majority of drivers on the road on any given work day, but have been overlooked by road safety and OHS specialists. Interestingly, NOHSC data also shows that more of Australia's police and fire fighters die on the roads than while solving crimes or fighting fires.

[3] Fleet safety and work-related road safety are used interchangeably throughout this report. Both phrases relate to all work vehicles, irrespective of size or shape. Anyone driving a work vehicle, or their own vehicle for work purposes, more than once per week is classed as a fleet driver.

2.1.1 The 'work driver effect'

Haworth et al (2000) described how work vehicles are typically larger, newer, faster, and travel further than the average vehicle. Few of these drivers actually own the vehicle (Skewes 1997), which can lead to less care or more risks being taken and a higher chance of driver fatigue (Collingwood 1997), particularly among shift workers (Vincent 1997). This is supported by WA (2001), which found that company car drivers travel further, drive under time pressure due to tight schedules, and do not own the car they drive so are less concerned about it. Easton (1997) suggested that work-related drivers are exposed to a wide range of hazards including poor driving, fatigue, noise, vibration, poor air quality, chemical hazards, and the risks of injury associated with seating posture and manual handling during loading and unloading. Down's et al (1999) agreed that time pressures, the nature of the drivers themselves, the nature of the vehicles, and responsibility for costs lead to a 'work driver effect', but suggested that the reasons underlying it are still poorly understood.

Murray and Dubens (2001) synthesised several reports on fleet drivers to suggest that there is a common perception that company car drivers are the most likely to speed, tailgate (drive too close to other vehicles), consume alcohol before driving, show aggression, take risks, lose concentration, use their mobile phone while driving, and park in illegal places. They are seen to have worse lane discipline (excessive use of the outside lane on motorways) and commit more traffic offences than the general driving population (speeding and illegal parking). Ironically, company car drivers consider themselves more skilful than other drivers! Adams-Guppy and Guppy (1999) focused particularly on speed among UK company car drivers.

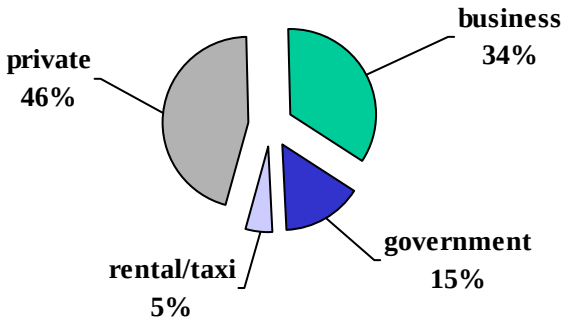
Accordingly there may be some type of 'work driver effect' that is worthy of further investigation. If this could be used to positive effect, and work drivers could 'take safety home' fleet safety may be able to offer a much wider societal benefit through their private driving and influence on family members. This issue has been cited by DuPont (see Appendix 3.8.1) as one of the motivators for its extensive fleet safety program. At present the work-related driver effect may be difficult to prove, as Williamson (1997) suggested that, unfortunately, Australian statistics on work-related fatalities and injuries are poor, often out of date, and very difficult to extract from a range of currently fragmented databases. Purpose of journey data is a key element that is missing in many states (Faulks 2001), which makes it impossible to know the full extent of the work-related road safety problem. Stewart-Bogle (1999) went further, suggesting that there is no statistical evidence as to the actual number of work-related traffic crashes in Australia. In reality, some data is available, but is typically fragmented between the states, compulsory third party insurance, workers compensation and OHS, hospitals, and damage-only insurance.

2.1.2 Fleet proportion of vehicles and distance travelled

Wheatley (1997), cited in Haworth et al (2000), suggested that work-related vehicles constitute about 30% of registered vehicles in Australia (including 15% of cars). This represents over three million vehicles. Collingwood (1997) and Griffiths (1997) suggested that fleet vehicles travel about three times the distance of the average private motorist in Australia (about 30,000 compared to 10,000 kilometres per annum). In total, business travel accounts for about a third of all travel, and over half if commuting to and from work is included (Collingwood 1997, Haworth et al 2000). WA (2001) suggested that 37% of Australian travel is for business, 20% commuting, and 43% personal (for Western Australia the figures are 31%, 23% and 46% respectively). This varies by vehicle type. Trucks and buses are 100% work-related, light commercial vehicles about 65% and passenger cars about 40%.

Figure 1 shows that over 50% of new vehicles in Australia are initially purchased for commercial purposes. This data is higher still (about 70%) for Australian-made vehicles such as Ford and Holden (Griffiths 1997). Several writers (including Stone 1994, Collingwood 1997, Griffiths 1997, Gibbs 2000, Haworth et al 2000) described how most of these vehicles will be integrated into the wider Australian vehicle pool within two to three years. For example, the Queensland Government vehicle-leasing agency QFleet replaces its vehicles every two years or 40,000 kilometres. The same writers argued that the more safety features fleet buyers specify, the safer the general vehicle pool in Australia will become. As a second benefit, they suggested that if fleet buyers demand safety features, manufacturers will eventually find it cost effective to fit them as standard to all new vehicles. Griffiths (1997) and Haworth et al (2000) believe that such safer vehicles are a key element in injury prevention strategies.

Figure 1 - New vehicle buyers in Australia (*Financial Review* 14/2/01)



2.1.3 Work-related deaths and injuries

In Australia, road crashes are the most common cause of work-related death, injury and absence from work (Haworth et al 2000). This information comes from the second of two studies of work-related fatalities that have been conducted by NOHSC. The first of these studies covered 1982-1984. During this period 39% of work-related fatalities involved driving or commuting for work. Wheatley (1997) felt this might have been an under-estimate. Henderson (1997) and Williamson (1997) both suggested that these drivers tended to be older (30-50) than the average crash victim, typically male and most frequently in urban areas, often between 2am and 4am. Excluding commuting, heavy trucks accounted for about 60% of these work-related driving fatalities.

By the time of the second and most recent study which covered the period 1989-1992, the 39% figure had increased to 49%. According to Haworth et al (2000), this was 13% of the 9,219 road fatalities during the same period. The data is quite old because detailed information has to be extracted from coronial files.

Table 1 shows that NOHSC's second investigation into work-related fatalities during 1989 to 1992 found that 541 people were killed in on-road work-related incidents. Another 628 were fatally injured travelling to or from work. Further correspondence with NOHSC (Driscoll 2001) found that 225 of the total on-site workplace fatalities involved vehicles, including tractors, heavy and light vehicles.

Table 1 - 'At work' fatalities in Australia 1989-1992

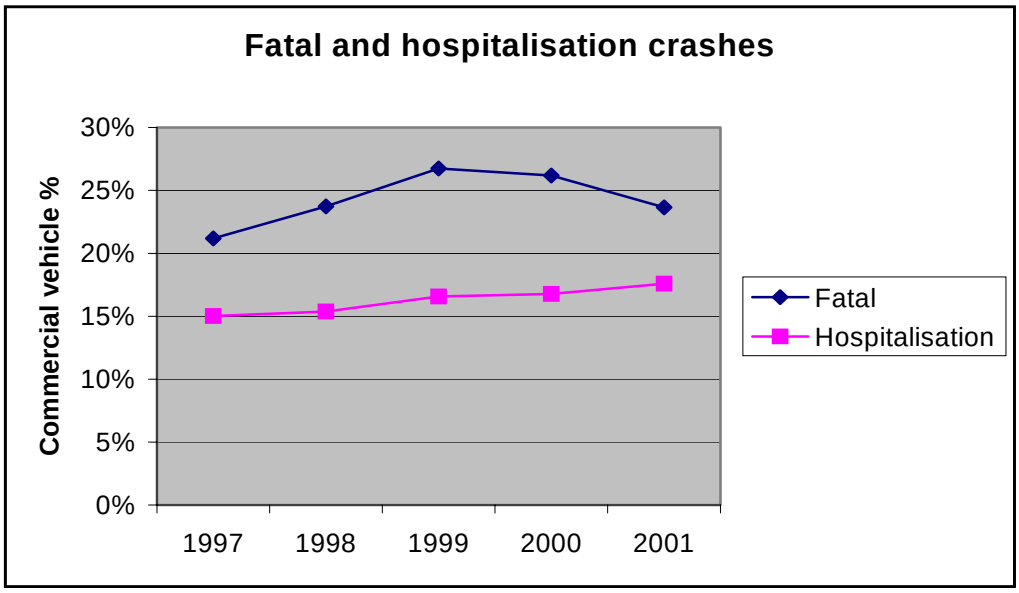
	Total deaths	% of total deaths 1989-1992	% of total deaths 1982-84
At workplace-non-vehicle	995	42%	?
At workplace – vehicle	225	9%	?
Work-related on-road	541	23%	24%
Commuting on-road	628	26%	14%
Total	2,389		

(Source: NOHSC 1999)

2.1.4 Fleet vehicles in road transport statistics

Recently, a detailed analysis of serious casualty crashes involving one or more commercial vehicles of all types (as determined by the attending police officer) was undertaken in Queensland for the five years from 1997 to 2001 (Meers 2002). This data was updated and analysed further by the current authors. It is summarised in Figure 2. Approximately a quarter of Queensland's fatal crashes and a sixth of hospitalisation crashes involve at least one commercial vehicle. The higher involvement of commercial vehicles in fatalities than hospitalisations is probably due to the size of heavy vehicles, the distances travelled and the high speeds associated with highway driving.

Figure 2 - Fatal and hospitalisation crashes in Queensland involving commercial vehicles



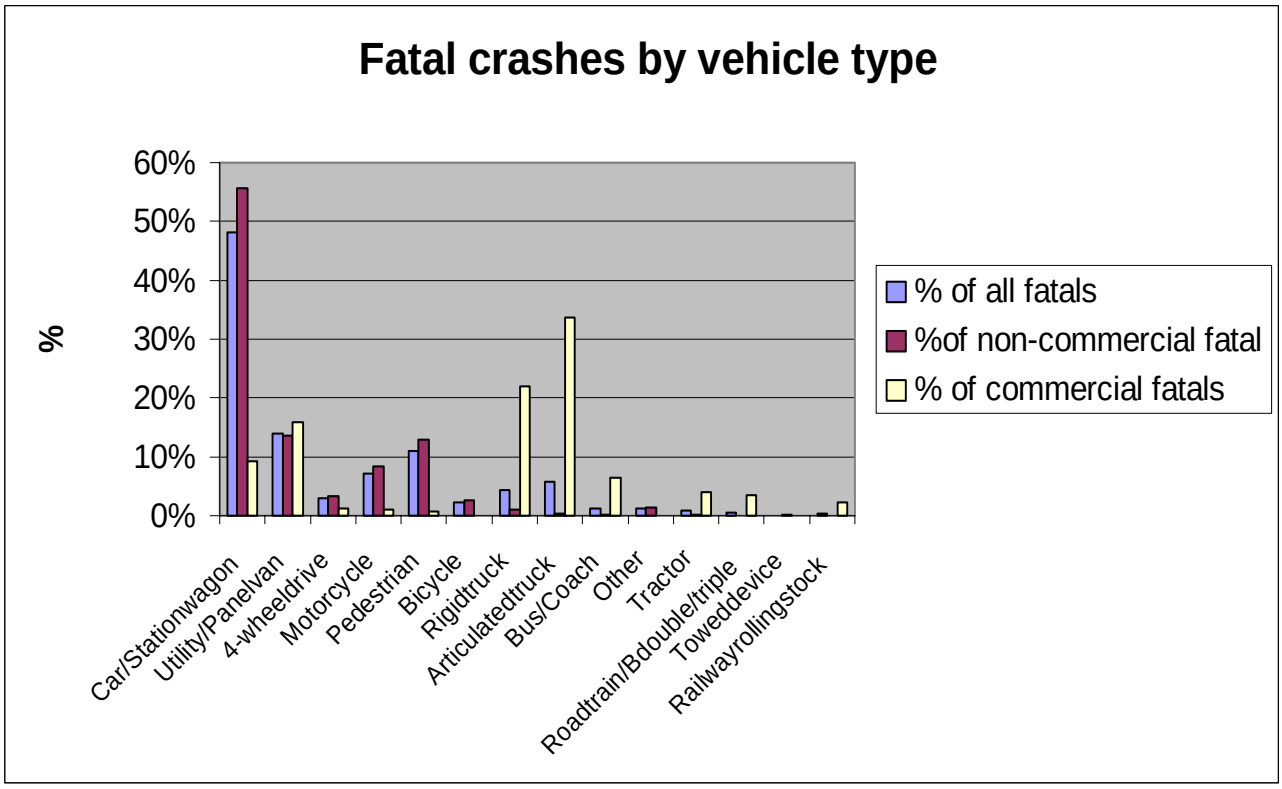
(Source: Queensland Transport crash database)

This data represents a major concern because most Australians are road dependent for work (Murray 2001). It may underestimate the problem of work-related driving, however, as there are limited resources to identify those crashes in which one or more of the vehicles was driven for work-related purposes.

Figure 3 compares commercial and non-commercial vehicles based on all the fatal crashes over the 5-year period from 1997 to 2001. Clearly, trucks are a high-risk group, being involved in over 50% of fatal work-related crashes. Interestingly, there is growing evidence from around the world (including the ATSB in Australia and the Automobile Association in the United States) that trucks are at fault less than other road users, who would benefit from more advice on sharing the road effectively with heavy vehicles. The truck data in Figure 3 is likely to be more accurate than that for cars, where it is more difficult to identify whether it is a commercial vehicle or not. Further limitations are that there is no exposure information to relate the data to time on the road, road type

or kilometres travelled and the crash database in Queensland has not been linked with the vehicle registration (ownership) database.

Figure 3 – Fatal crashes involving commercial and non-commercial vehicles 1997-2001



(Source: Queensland Transport crash database)

2.1.5 Fleet vehicles and drivers in Australian insurance data

Workers compensation, compulsory third party (CTP) and damage-only insurance data, all illustrate the extent of the problem. Queensland Workers Compensation figures provided by Robinson (2001) for 1997-2000, show that vehicle accident payments from 10,195 claims (5% of total claims) cost over $52.5 million (10% of total costs) and resulted in 233,013 workdays absent (9% of total days). Vehicles were involved in 99 (43%) of the fatal claims. Further discussion with Robinson (2002) revealed that in Queensland data is not collected by vehicle type operated. Appendix 2 shows that in 2000/2001 heavy truck drivers made up 33% of total payments, 26% of lost-time and 11% of vehicle claims. For commuting claims, Robinson (2002) estimated that 95% involved a car, the remainder involved pedestrians, motorbikes, bicycles and skateboards. This data is explored further in Travelsafe34 (2002).

WorkCover Western Australia data for 1996 to 2001 indicates an annual average of 12 fatalities and 650 lost-time claims from work-related crashes (WA 2001). This is an under-estimate because fatal crashes are included only where there is a clear relationship between the crash and the work performed by the worker. In addition, some employees (eg Commonwealth) are not included in WorkCover WA data. Car crashes represented about 40% of total claims (WA 2001). Larsson and Field (2000) focused on the distribution of occupational injury risks in Victoria. They classified car, delivery and van drivers, couriers, taxi drivers, hire car drivers, and road passenger carrying drivers as one of the top priority occupational groups for safety prevention countermeasures, along with miners, drillers, roof layers and forestry workers. This group's risk of sustaining a severe work-

related injury was found to be four times the average for the Victorian workforce, with 3% of workers injured every year. The average severity was 40% higher than across the whole study.

Anderson (2002) showed that work vehicles including taxis, buses, trucks and hire vehicles, have the highest CTP claims frequencies and insurance premiums of all vehicle types (see Appendix 3.6). Similar CTP data for truck claims in New South Wales led to the *'Quinlan Report'* on heavy vehicle safety (see Appendix 3.4). Damage only insurance data provided by Stone (1994), Lumley Insurance (Appendix 3.5.2) and QFleet (Appendix 3.3.2) suggests that one in four to one in five light work vehicles will be involved in an insurance claim each year.

Anderson and Plowman (1999) referred to Lynn and Lockwood's (1998) UK-based study of whether drivers of company-owned vehicles had higher crash liabilities than drivers of private cars. In Lynn and Lockwood's survey, company car drivers reported an average of 0.19 crashes per year. After allowing for demographic and exposure variables, they average about 50% more crashes than private drivers and drive much longer distances. Anderson and Plowman (1999) suggested that the study highlights two salient points for Australian organisations: (1) company drivers are likely to have more crashes than the general population; and (2) organisations with any type of vehicle (from car to heavy truck) need to address fleet safety, as employees required to drive while at work are at risk.

Wheatley (1997) claimed that in New South Wales, 22% of work-related traffic injuries led to death or permanent disability. A key element of the Swedish developed Vision Zero safety concept described by Haworth (1999) is that leaders, governments and agencies should 'have their own houses in order' and set an example for other organisations to follow. Fleet safety is clearly an area where this can occur and there appear to be several opportunities in Australia. Recent poor examples include the recent Crossin case in the Northern Territory (Toohey 2000) and a hit and run crash in Canberra allegedly involving a government car (Dickins 2001). In New Zealand, Government Minister's cars were involved in 12 crashes during the first three months of 2001 (Milne 2001).

Gibbs (2000) provided New South Wales data showing that approximately 800,000 vehicles were registered for fleet or organisational purposes. About 8% of these were in government use. New South Wales Roads and Traffic Authority (RTA) had 10,500 employees in 1997, of which approximately 8,000 were occupational drivers of about 6,000 vehicles and plant (Vincent 1997). According to Collingwood (1997), the RTA had around 7,800 vehicles, making it the fourth largest fleet in New South Wales. He felt the RTA was committed to the OHS of its own workers and wanted to provide a best practice model for other fleets. He saw this as practical community involvement at an organisational level. Similarly, Gibbs (2000) suggested that Staysafe36 made the NSW Road Safety Group recognise the lack of a coordinated safety focus on work-related driving. She felt that if government driver and vehicle safety can be improved, a major contribution could be made to improving safety on local roads.

Overall, from a societal point of view, and despite the limitations in available data, there is growing evidence that work-related road safety is an important issue which to date has suffered from a 'scandal of tolerance'. This is true at the level of individual organisations for a range of legal, business and financial reasons.

2.2 Legal reasons to focus on work-related road safety

In recent years the importance of OHS regulations, duty of care, Chain of Responsibility (COR), and corporate manslaughter requirements have increased in the transport and road safety sectors. In the heavy truck sector in particular, organisations are increasingly being forced to change their practices under the requirements of COR regulations (ATN 2002). COR is progressively being included in road transport law to make third parties, such as consignors, packers, loaders and customers, in addition to drivers and transport suppliers, legally accountable for offences to which they have contributed or encouraged. Although COR does not currently apply to light vehicle fleets, it sends a clear message to organisations requiring their staff, or those of their contractors and sub-contractors, to drive for work purposes.

Organisations operating light vehicles have legal obligations and a duty of care under the OHS regulations to provide a safe and healthy workplace that includes the operation of trucks, buses, utes or cars (Easton 1997). Legally, vehicles are considered as part of the workplace in all jurisdictions around Australia. This means that there is a requirement to ensure ways in which they are used provide a working environment that is safe and has minimal risk to health (Haworth et al 2000). To date, however, this has not been strongly enforced.

Vincent (1997) described how work drivers and their employers are controlled by road traffic legislation and the NSW OHS Act (1983). The latter means that employers are obliged to provide safe vehicles, information, work-instructions and training[4]. The employee must co-operate with the employer to meet health, safety and welfare requirements. Unfortunately, the OHS field does not appear to treat occupational driving as a priority. The relationship between OHS, road safety, public health, fleet management and occupational driving safety is unclear, meaning that none of these groups focus enough attention on it until a fatality or major incident occurs. Vincent (1997) felt that the OHS field does not take occupational driving seriously enough. This was backed up by Haworth et al (2000), who suggested that the courts rarely apply OHS regulations to fleet safety. Anderson and Plowman (1999) suggested that there have been relatively few developments in workplace safety management to address vehicle and driver safety obligations in organisations where driving or transportation is not the core business.

This may be about to change, however, as OHS appears to be moving in the direction of transport and there are increasing calls for fleet safety to be managed under an OHS framework (Haworth et al 2000). Several writers in Staysafe36 argued that fleets should focus on safety to comply with OHS requirements to provide a safe workplace. Collingwood (1997) felt that focusing on fleet safety would provide a practical impetus for integration of road safety into OHS programs, as well as encouraging improved monitoring of fleet performance. Gibbs (2000) focused on the OHS Act (1983) in New South Wales, which places legal and duty of care responsibilities on employers for the safety of staff while driving work vehicles or their own car for work purposes. She suggested that road safety needs to be integrated into OHS programs, and felt that her organisation, SSROC, had legal and duty of care obligations for the safety of staff while driving work vehicles. This was a major driver for the FleetSafe program described in Appendix 3.3.3. A more recent Act in 2000 places even more onus on employers in New South Wales.

Stewart-Bogle (1999) described potential savings if employers acknowledged their legal responsibility and undertook more extensive road safety training for employees, based on research by Worksafe WA. He suggested that the courts should find employers have a duty of care to implement a holistic approach to employee driver training and fatigue, although Yates (1997) went

[4] In this report the terms education and training are used interchangeably, depending on where the information was sourced from. Although its an important issue, the wider debate about the importance of education and training and the differences between them is beyond the scope of the report.

further by suggesting that companies have responsibilities to customers, employees, the community and shareholders. All of these groups are affected by road safety, which should be seen as a quality mechanism, rather than a minimal legal standard. WA (2001) focused on the importance of OHS as a driver for fleet safety in Western Australia, where the OHS Act (1984) applies to all non-Commonwealth workplaces and employees, including in a vehicle and on a public road. This means that employers and employees have a duty of care to ensure that employees and others are not exposed to hazards. The employer must provide a safe workplace and systems of work, and safety information, instruction, training and supervision. In the context of work-related driving this includes both driving on duty and commuting.

Seljak (2002) believes that integrating fleet safety management into the workplace's health and safety management system can reduce the risk of injury and illness, increase productivity and reduce costs. He described how OHS in Australia is becoming more punitive and how OHS agencies are starting to work more closely with the police and other agencies. Through integration of work vehicles into OHS programs, factors contributing to road trauma such as stress, hours of work, workload, noise, vibration, and ergonomics related to driving, can be systematically identified, evaluated and controlled. This type of approach would assist employers to meet their obligations under both OHS law and road transport law. **At the very least, organisations should be developing fleet safety programs as a way of being seen to be doing the right things to protect themselves in relation to the regulations.** This is likely to become increasingly important as new corporate manslaughter laws being developed in Victoria as part of the Crimes (Workplace Deaths and Serious Injuries) Bill, are likely to have major cost and legal implications for negligent organisations (Notebook 2002). OHS is considered further in Section 3.7.

2.3 Business reasons to focus on work-related road safety

As well as the legal reasons discussed above, there are many business reasons to focus on fleet safety (Baran and Jones 1997). Typically, senior managers only tend to focus on fleet safety as a reactive response to a range of negative events such as being involved in a fatality or very expensive crash, increasing insurance premiums and excesses, insurers refusing cover, crash and maintenance costs increasing, and a rising number and cost of third party claims.

Anderson and Plowman (1999) suggested that there have been relatively few developments in workplace safety management to address vehicle and driver safety obligations in organisations where driving or transportation is not core business. This is a problem because in any organisation where employees may be required to drive vehicles, workplace factors that contribute to safe driving are subject to the requirements of OHS legislation.

A more proactive approach may bring benefits because safety is closely linked to quality, customer service, efficiency, environmental programs, getting things right first time as well as removing waste and errors from the system. Recent research in the UK (Coyle 2002) and Australia (Haworth and Symmons 2001) suggests that fuel-efficient driving styles are usually better for the environment too. According to Ranck (2000), DuPont (see Appendix 3.8.1) sees both humanitarian and business reasons to focus on fleet safety. In the current consultant jargon this is known as the triple bottom line, focusing on people and the planet as well as profits. The business benefits from fleet safety can include the following.

- Improved productivity.
- Enhanced quality.
- Improved employee relations.
- Reduced costs.

- Better public image.
- Regulatory compliance.
- Off-the-job awareness.

DuPont believes that crashes occurring during a driver's private time will inevitably affect their working life. Thus, there is an integration of the work and personal driving context, which ensures that the safety culture remains with drivers after leaving the work environment. In some cases an organisation can gain political or public support through a well managed safety program or recruit and keep more safety conscious staff. From an image, perspective a fleet safety program can have very high 'face validity'.

Griffiths (1997) argued that fleet operators can gain cost and safety benefits from purchasing vehicles that have a demonstrably improved safety performance, as there are significant differences between the best and worst vehicles in the same vehicle category. **Focusing on safety can keep organisations ahead of, and protected from, regulations, and can offer a range of PR, business development and diversification opportunities.** From a PR point of view it is much better for an organisation to get good publicity for its safety programs, rather than trying to suppress bad news after a major incident. According to Collingwood (1997) major Australian fleets are becoming more interested in the issue. A range of Australian organisations including QFleet (Section 3.3.2), SSROC (Section 3.3.3), and Lumley Insurance (Section 3.5.2) have all gained excellent publicity through their safety programs. Wheatley (1997) suggested that crash costs are part of the cost of doing business and reducing them can lead to a competitive advantage.

2.4 Financial reasons to focus on work-related road safety

In addition to the high crash rates described above, commercial vehicle crashes place a heavy financial burden on business and the community. Bureau of Transport Economics (BTE 2000) estimated the average cost of road crash types in Australia. In 1996, a fatal crash cost $1.7m, serious injury $408,000, minor injury $14,000, and damage only $6,000. Safety costs can be broken down into injury costs, damage-only costs and the iceberg effect, all of which are described.

2.4.1 Work-related road safety injury costs

Stewart-Bogle (1999) estimated that work-related on-road crashes cost Australia $425 million each year, the average cost of a work-related traffic crash is about $18,500 and the average time lost from traffic crashes is greater than for any other work place claim. Industry Commission statistics (quoted by Wheatley 1997 and Henderson 1997) show that the costs of workplace injuries are shared, 40% by the employee, 30% by the employer and 30% by the community.

Since that time, insurance ambulance chasing by 'no win-no fee solicitors' and personal injury costs have all increased. 'September 11' and a range of lesser insurance disasters in 2001 (including the Petrobras oil rig, Air Lanka aeroplane attack, tropical cyclone Alison and the Toulouse factory explosion) mean that all Government agencies and business fleets will need to manage their insurance more effectively. This is especially true in Australia, with its increasingly litigious population, an ongoing crisis of confidence in the insurance and legal sectors, and substantial premium increases.

In the 1999/2000 financial year in Queensland, almost $17 million was paid in workers' compensation claims for injuries and illnesses sustained from work-related vehicle crashes, including commuting to and from work (Seljak 2002). A further $4.4 million was paid in workers' compensation for injuries and illnesses sustained as a result of incidents related to occupational

driving (such as hearing loss and back strain), but not directly from vehicle crashes. Travelsafe34 (2002) examines this data in more depth. According to WA (2001), WorkCover Western Australia data shows that each vehicle related claim has about 80 lost days. Compensation costs average $20,000, including medical, rehabilitation, staff replacement and property damage.

2.4.2 Work-related road safety damage-only costs

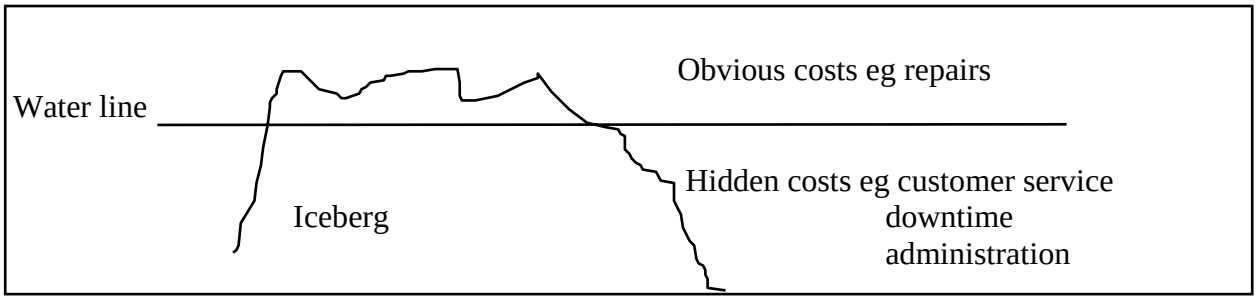
As well as fatal and injury crashes, damage-only crashes are a major problem in Australia. Anderson and Plowman (1999) discussed Stone's (1994) report. It suggested that about 25% of passenger and light commercial fleet vehicles are involved in crashes each year. Each crash averages between $4,000 and $18,000 in repair costs, excluding other costs such as loss of productivity. They concluded that work-related crashes cause unnecessary expense to organisations in terms of repair costs, reduced productivity, and death or injury of workers. These include costs associated with injured employees, repairs to damaged vehicles, insurance premiums and excesses, and staff down-time. As an example, Gibbs (2000) described the Southern Sydney Regional Organisation of Councils (SSROC) case where potential insurance, lost time and maintenance cost savings were identified through the FleetSafe project (Section 3.3.3). Together the councils spend over $1.2 million in annual repair costs and nearly $1 million in vehicle damage insurance premiums.

Based on Lumley Insurance benchmarking data, 27% of fleet vehicles are involved in a crash each year with a range from less than 10% to more than 50%, with the fleet driver being at-fault in about 60% of crashes (Collingwood 1997). Wheatley (1997) used Stone's 25% figure and assumed an average cost of about $2,000 each. He estimated that there were two million light vehicles used for business in Australia, giving about 500,000 damage only crashes at a cost of $1 billion per annum. Applying the profits to sales ratio of 10%, Australian industry has to generate $10 billion dollars to pay for all these crashes. For this reason, Baran and Jones (1997) believe that insurers (and brokers) are in a good position to assist fleets improve their safety record so that both can benefit.

2.4.3 The work-related road safety cost iceberg effect

Crash costs show an 'iceberg or ripple in the pool effect' (Figure 4). Baran and Jones (1997) suggested that many areas of a business are affected by a vehicle crash. Fleet crash costs are much higher than just vehicle repairs and include both insured and uninsured costs such as down time and legal fees. Business Motoring (2000) quoted the Federal Office of Road Safety (FORS) data suggesting that the indirect costs of fleet crashes, including personal injury, medical/hospital, rehabilitation, absence from work, workers compensation, downtime/lost productivity, and potential loss of custom are about ten times the average repair bill. Easton (1997) argued that every injured worker in an organisation involves financial (between four and ten times the obvious) and productivity costs that could have been prevented.

Figure 4 - The 'iceberg' effect



(Source: UK Health and Safety Executive, HSE 1993)

Collingwood (1997) structured the costs of crashes using a direct (repairs) and indirect (customer service, lost productivity, replacement vehicles, administration, insurance hikes, medical and compensation) framework. Insurance data for 1996 showed that the average direct repair cost of a claim was about $2,000, with the total cost about 4-5 times higher. Vincent (1997) structured them into insured and uninsured costs. The uninsured costs, including legal costs, can be up to 20 times higher than the insured ones. Murray and Dubens (2000) used a similar framework to identify and structure the costs in the UK (see Section 5.2). Anderson and Plowman (1999) focused on these costs, as did WA (2001), which included repairs, productivity loss, injury and death. Other costs include insurance premiums, maintenance costs and reduced resale values.

UK research (HSE 1993) suggests the hidden costs are 8-36 times higher, although these are likely to involve more of the injury costs than Australian figures. In reality, individual fleets should calculate actual costs based on their own data. Collingwood (1997) used these hidden costs to suggest large potential cost reductions could be achieved through improved risk management and OHS. He suggested that **crash costs are part of the cost of doing business and reducing them (through lower crash rates and higher staff productivity and welfare) can lead to a competitive advantage and good PR**, showing that major fleets are becoming more interested in the issue. Finally, Collingwood (1997) quoted 1993/4 figures from 3M Australia whose Safe Driving Policy gave them a 6% reduction in crashes and a 36% saving in costs.

2.5 Summary

This section has described a range of societal, business, legal and financial reasons why work-related road safety is an important issue. **These are important at both policy and organisational levels, for making a case to decision makers and budget holders about the need to invest in programs and countermeasures.**

Several previous researchers and practitioners have already used such arguments to justify a range of programs being developed and implemented in Australia, several of which are reviewed in Section 3.

3 Fleet safety initiatives in Australia

Staysafe36 (1997), Haworth et al (2000), Murray (2001) and Murray and Hansen (2002) have documented a number of Australian work-related road safety initiatives. These and a range of international initiatives are summarised in this section, structured under the following headings.

- Parliamentary road safety committees.
- Fleet Safety Forum members.
- Government fleets.
- Lessons from the heavy truck sector.
- Comprehensive vehicle insurance.
- Compulsory Third Party insurance.
- Occupational Health and Safety.
- OHS-led fleet safety programs.
- Australasian Fleet Managers Association (AfMA) initiatives.
- Small fleets and work-related driving.
- Lessons from overseas.

Each of these initiatives is summarised below, based on more detailed descriptions in Appendix 3.

3.1 Parliamentary road safety committees

Of the Six parliaments in Australia and New Zealand that have transport and road safety committees, Staysafe in New South Wales and Travelsafe in Queensland appear to have been the most active in the area of fleet safety.

- The Staysafe committee produced the highly influential Staysafe36 report, and several other relevant publications and related events. Staysafe36 covered a range of road safety and OHS issues, and can be seen as a very important starting point for many of the current fleet safety initiatives in Australia, including the Federal Office of Road Safety (FORS) *'Fleet safety manual'*, the FleetSafe program (Appendix 3.3.3), Queensland Transport's Workplace Fleet Safety System, the Monash University Accident Research Centre (MUARC) fleet safety report, the eventual formation of the Fleet Safety Forum and a range of other programs.

- The Travelsafe Committee co-organised and hosted a symposium on work-related road trauma and fleet risk management and released Travelsafe Report No. 34. This has led to a range of recommendations for different government agencies in Queensland, including the collection of purpose of journey data, more fleet safety in the road safety action plan and closer collaboration between key Government agencies, including Police, Transport and OHS. Several participant organisations have also implemented fleet safety reviews, programs and specific countermeasures as a direct result of the symposium.

Together, these two examples suggest that the parliamentary road safety committees around Australia can play an important role in facilitating fleet safety improvements.

3.2 The Fleet Safety Forum

The Fleet Safety Forum is an informal group of road safety practitioners from across all the state and territory governments together with others from national bodies and university research centres. The members meet six monthly to discuss matters of mutual interest and share ideas. The forum first met in 1999 and recently reconfirmed the following objectives.

- Share information on developments and recent actions in fleet safety.
- Communicate ideas and data to avoid duplication and wasted effort.
- Identify common issues at state and federal levels and examine improvement opportunities.
- Evaluate fleet safety issues around Australia.
- Evaluate the impact of changes to OHS and other workplace issues.

A range of outcomes have emerged from the Forum, which are described in detail in Appendix 3.2. Many of the state governments around Australia have developed some form of fleet safety program. Queensland, New South Wales, Victoria and Western Australia have been the most proactive to date. Both MUARC and the Centre for Accident Research and Road Safety – Queensland (CARRS-Q) have produced research outputs on work-related road safety. At Forum meetings, several recurring issues emerged and were used as the content for a survey of members as part of the current project. Responses to the ten questions are summarised below and shown in full in Appendix 3.2.13.

- Members defined fleet safety in a range of different ways. Some focused on just light vehicles while others included heavy vehicles. The overall consensus led to the definition being used in the current document, which describes the safety of **anyone driving a work vehicle or their own vehicle, for work purposes, at least once per week.**
- Components of an effective fleet safety management system are as follows.

    1. Safety audits.
    2. Taking an OHS approach.
    3. Setting, implementing and managing a policy.
    4. Vehicle selection.
    5. Driver programs (recruitment, assessment, monitoring, training, fatigue and health).
    6. Vehicle, driver and crash data monitoring.
    7. Evaluation against standards.

- Fleet safety initiatives are mentioned in varying degrees of detail in road safety action plans in all of the participant states.
- Most participant states appear to be in the early stages of moving towards having fleet safety programs in place for some or all of their own vehicles.
- As yet, no state specifically records ‘purpose of journey’ information on crash report forms, although in Queensland information is collected based on whether or not the crash involves a ‘commercial vehicle’. This means that of all the states and territories only Queensland, where approximately a quarter of fatalities involve a commercial vehicle, has any data on the full extent of crashes involving work-related driving. Based on the outcomes of the Travelsafe symposium described in Appendix 3.1, ‘purpose of journey’ data is likely to be collected in Queensland in the very near future.

- Fleet vehicles are classed as workplaces under OHS regulations in all participant states, although there is limited enforcement for all but very major incidents. Cross agency collaboration and data integration appear to be growing.
- Fleet safety is starting to be seen as an OHS issue in most of the participant organisations, although practical management of the process is limited.
- Process and outcome benchmarking were generally believed to be a good idea for the Forum, although comparisons need to be valid to be useful.
- The main barriers to fleet safety were identified as: not having the data to identify work-related fatalities and injuries; securing management focus and energy; lack of OHS impetus; and limited resources to promote it and other safety priorities.

Overall, the Fleet Safety Forum is an informal, but important, mechanism for facilitating fleet safety improvements, at both a macro policy level and in Australia's various Government operated vehicle fleets.

3.3 Government fleets

From these findings and the discussion in Section 2 government fleets and their leadership role is an important area for work-related road safety. In Appendix 3.3 three government fleets are considered in detail, two state level government leasing organisations and a group of local authorities. Fleet South Australia, QFleet and the Southern Sydney Regional Organisation of Councils (SSROC) were chosen because they have won various safety awards and because key individuals in the organisations are regular speakers on the fleet and safety conference circuits. Furthermore, CARRS-Q has worked closely with QFleet and SSROC on several projects.

- Fleet South Australia has implemented a range of countermeasures including driver training programs, a vehicle wear and tear policy, KPI monitoring and management education. It appears to have been at least partly led by the need to protect itself from OHS obligations. Fleet South Australia has very detailed claim cost and rate data to evaluate its performance.

- QFleet has implemented four main countermeasures (driver training, newsletters, a group-based incentive and internet-based KPIs) aimed at both drivers and managers. It evaluates its performance in comparison to the Lumley Insurance benchmarking program based on its claim rate.

- SSROC members operate both light and heavy vehicles and have implemented FleetSafe, which involved the development of a policy and a range of programs to support it. They use and benchmark claim and cost-based KPIs to evaluate their success.

These cases suggest that Government can lead by example in fleet safety, and provide a range of strategies for improving fleet safety.

3.4 The heavy truck sector

A great deal of time and energy in Australia has been focused on heavy truck safety in recent years. For this reason members of the Fleet Safety Forum suggested that an important question is: what lessons can be learnt from the heavy truck sector? The Quinlan Report, Chain of Responsibility (COR), OHS, fatigue management and accreditation schemes such as TruckSafe have all received a

great deal of media attention and are discussed in more detail in Appendix 3.4. **Quinlan made six main recommendations relating to the following area.**

- **Occupational health and safety (OHS) regulations.**
- **Interagency co-operation.**
- **COR.**
- **Educational programs for the public on sharing the road with heavy vehicles.**

All of these recommendations appear highly relevant for light vehicles. As the Quinlan report was an insurance-led initiative and focused on OHS, these areas are described next.

3.5 Comprehensive and compulsory vehicle insurance

There appears to be three main types of insurance relevant to work-related road safety: comprehensive asset damage insurance, compulsory third party (CTP) insurance and OHS workers compensation insurance.

In the heavy truck sector, NTI is the main comprehensive insurer, with 40% of the Australian market for hire and reward vehicles. It has been active in supporting the TruckSafe accreditation scheme, promoting COR and supporting the fleets it insures, particularly those with the highest claim rates, to develop risk management programs. These programs include a safety audit, fatigue management tools and more systematic processes for driver recruitment, assessment and management.

Lumley insurance appears to be the best known comprehensive insurer for light vehicle fleets in Australia, particularly because of its benchmarking program. It also helps its clients to develop a loss control measures based on the application of risk management principles.

Despite their important role, asset damage insurers such as NTI and Lumley can only go so far in influencing their clients to operate more safely. The CTP and workers compensation agencies that control injury insurance also have an important role in improving fleet safety.

Each state and territory in Australia has compulsory third party insurance and workers compensation schemes. In Queensland, for example, the Motor Accident Insurance Commission (MAIC) manages CTP insurance. It has 24 vehicle classes, of which the four with the highest claims frequencies are all work-related vehicles, taxis, buses, heavy truck and hire cars. MAIC has been proactive in focusing attention on the taxi and bus industries. Several other initiatives including the Quinlan Report (Appendix 3.4.1) have also been implemented by CTP agencies in other states and territories, however there appear to be further opportunities to use CTP data and influence to leverage work-related road safety actions. This is described further in Appendix 3.6.

The above cases suggest that insurers can play an important role in facilitating fleet safety improvements, which is also true for the OHS agencies and workers compensation insurers.

3.6 Occupational Health and Safety (OHS)

A recurring theme during the research for this report was a feeling by many participants that fleet safety needs to be managed within an OHS framework. The following information relating to OHS was summarised from the NOHSC internet site (www.nohsc.gov.au) standards and legal obligations

section. The site also provides more detail about the various OHS agencies around Australia and a great deal of OHS guidance information.

Each state and territory in Australia has a principal OHS Act, which sets out requirements for ensuring that workplaces are safe and healthy. These requirements are known as the 'duty of care'. Employers, employees and contractors have a duty to do everything 'reasonably practicable' to protect the health and safety of others at the workplace.

OHS encourages a risk-dependent 'hierarchy of control' approach to allow those responsible to meet their duty of care at the lowest cost. The duty holder must show that it was not reasonably practicable to do more, or that they have taken 'reasonable precautions and exercised due diligence'.

Applying 'hierarchy of control' normally includes the following.

- Elimination of the hazard.
- Substitution with a less harmful version.
- Redesign.
- Engineering controls.
- Isolation of the hazard from people at the workplace.
- Safe work practices.
- Redesigning work systems.
- Use of personal protective equipment by people at the workplace.

The vehicle is classed as part of the workplace in Australia, and figures quoted in Section 2 of this report suggest that a disproportionate number of vehicle-related workers compensation claims are made, but vehicle safety appears to only rarely be managed as an OHS issue. Somerville (2002) takes this further by describing fleet safety as 'Australia's most serious OHS issue'. For this reason, the *'National OHS Strategy 2002-2012'* was reviewed, but says nothing specific about work-related road safety or vehicle use (www.nohsc.gov.au/nationalstrategy/Strategy.pdf). Due to this lack of information, OHS was investigated via direct correspondence with individual state government agencies.

Discussion with Thomas (2001) from WorkCover New South Wales, highlighted a link between fleet safety and OHS, particularly in terms of the necessity to use a risk management approach for managing hazards encountered in at-work driving and properly assigning accountability to those in control of the work system. She suggested that OHS legislation has been in place for 17 years in New South Wales, but many employers and those in fleet management do not understand that OHS legislation applies in all workplaces even in non-traditional and mobile ones such as motor vehicles. Utilising an OHS risk management approach (where all risks are identified, assessed and controlled) in fleet management would assist in increasing awareness of OHS obligations and in promoting the required changes. She felt that the emphasis would move from focusing on drivers to the implementation of COR. A similar principle exists in OHS legislation, so the implementation of OHS requirements for those driving in the course of their work has a significant role to play in achieving road safety outcomes. As such, driving in the course of work should be viewed and treated in the same way as other workplace hazards, such as manual handling.

Thomas felt that OHS jurisdictions have been measured in taking action on work-related road safety because of the crossover of road safety and OHS legislation and resource issues. OHS legislation is general and refers to work-related road use while road safety legislation is specific to the road and covers all road users. Generally, the courts prefer specific legislation when it comes to enforcement. It is now accepted that OHS agencies have a complementary role in the achievement of road safety

outcomes especially in relation to the effective management of issues such as fatigue. Overall, Thomas concluded that the solution is a properly coordinated approach between the relevant government departments, which is already beginning to occur in some states including Western Australia, Tasmania, Queensland, and New South Wales. In late 2001, the New South Wales Government established a Government Agency Task Force on Long Haul Trucking, in response to the Quinlan Report (Appendix 3.4.1), which is likely to form the basis for a more coordinated approach to the light vehicle area of work-related road safety.

As part of the research for this study, the OHS agencies in each state were sent a short survey questionnaire on work-related road safety. The full responses received from Queensland, Tasmania and New South Wales are shown in Appendix 3.7 and summarised below.

- The vehicle is classed as part of the workplace in each state that responded.
- Investigation processes vary for on-road crashes. In Queensland, the police have a Memorandum of Understanding to notify the OHS agency of any work-related incident they are investigating. In Tasmania, the police and Department of Infrastructure, Energy and Resources (which includes the OHS agency) investigate road trauma. In New South Wales, major heavy truck crashes are investigated by the OHS agency in collaboration with the police.
- The main challenges facing OHS in road transport were identified as the need for transport, police and OHS agencies to work together and how to convince employers (and their drivers) to identify, assess, and control their road transport risks.
- Strategies to manage fleet safety in an OHS framework included encouraging a risk management approach, integrating vehicles into OHS systems and better education, laws and enforcement.
- Barriers included fleet safety not being perceived as an OHS issue by organisations, the lack of a risk management approach, limited employee consultation and training, a poor understanding of OHS issues by general managers, contracting out of operations, and lack of resources.

Based on this information, it would appear that there are some gaps and quite large differences between the states. OHS agencies investigate some, particularly those that are major, but not all incidents. This suggests that further national standards may be required, particularly for investigation. It also suggests the need for further research on the following questions.

- What happens in the other states and territories and the Commonwealth?
- What is the extent and cost of transport-related incidents in workers compensation claims data in each state/territory (proportion of claims transport related, proportion of fatalities transport related, proportion of costs work-related, proportion of days lost time)?
- What is the breakdown of these claims by journey type (commuting or at work) and by vehicle (truck or car) type?
- If the figures in the other states/territories are similar to Queensland (over 40% of workers compensation fatalities are vehicle related), should the OHS agencies be encouraged to focus more attention on the issue?
- What proactive fleet safety initiatives have the OHS agencies in each state/territory undertaken?

Finally, there may be some scope for **fleet safety specialists to target the OHS agencies and their conference 'circuit', media and professional bodies (such as the Safety Institute of Australia and the Industrial Foundation for Accident Prevention) to encourage them to support fleet safety improvements. There is also a strong argument that at the very least the OHS agencies around Australia should investigate all work-related road fatalities.** The following cases show four organisations that have been proactive in fleet safety as part of their wider OHS processes.

3.7 OHS-led fleet safety programs

The importance of OHS for work-related road safety was a recurring theme at Fleet Safety Forum meetings and in discussion with many organisations. Only a few of the organisations spoken to, however, actually managed fleet safety as part of their OHS activities. These included DuPont, Santos, Shell and BP, all of whom are discussed in more detail in Appendix 3.8.

- DuPont is active in the Lumley benchmarking program described in Appendix 3.5 and its fleet safety program is driven by its reputation and a desire to protect its employees. It includes a policy and manual; assessment, induction and training using the 'Smith System'; crash reporting and a driver safety committee.

- Santos uses its business standards and a range of OHS derived tools, including a very comprehensive near-hit reporting system to manage the safety of its operations – including its vehicles and drivers. The safety of its vehicles and drivers is under constant review as part of its wider OHS processes.

- Shell's focus is on management accountability for the welfare of its employees, its contractor's employees and the public. In a similar way to Santos, it is highly conscious of the implications of safety failures and has a range of OHS-led initiatives, including drug and alcohol policies, documented processes, employee health and well being, employee involvement through safety meetings and detailed monitoring of performance.

- BP has similar OHS-led processes in place, and has also introduced a road safety leadership program for its managers, supervisors, drivers and transport contractors focusing on behaviour change. This is based on a similar approach to that adopted in the Swedish Televerket study described in Appendix 3.10.

All of these OHS-led cases are large manufacturing and supply companies and dangerous or high value products are a key feature of their operations. This makes safety a very important issue, because the consequences of safety failures are potentially very high. Much fleet safety best practice originates from such organisations before filtering down to other parts of industry.

3.8 Australasian Fleet Managers Association (AfMA) initiatives

Another source of best practice is the industry associations. The MUARC report described in Appendix 3.2.2 included interviews with a range of AfMA fleet safety award winners, who appear to be some of the most proactive and PR conscious fleet managers in Australia. For this reason, the role of AfMA in fleet safety was considered further. The association has nearly 600 members throughout Australia and New Zealand representing the three levels of government, banks, insurance companies, car rental organisations and a variety of commercial organisations and service providers who are responsible for approximately 800,000 fleet vehicles (www.afma.net.au).

As well as the awards program, AfMA provides a range of other services to members including professional qualifications in the form of a Graduate Certificate of Corporate Management for Fleet Managers, benchmarking and publications. It also organises an annual conference held in Melbourne and Sydney and a range of other regional and national seminars. The 2001 and 2002 conferences included several papers on fleet safety covering the evaluation of risk management programs, fleet safety liability, cases studies, new car assessment program (NCAP) testing, workplace safety and benchmarking.

3.9 Small fleets

There is a perception among Fleet Safety Forum members that most small fleets do not have the resources to be OHS-led or be active in organisations like AfMA. In particular, the many single vehicle fleets of heavy and light vehicles in Australia fall outside many existing frameworks such as OHS and workers' compensation. For this reason smaller fleets were considered in more detail (see Appendix 3.9). **The findings from analysis of insurance and government data were inconclusive, suggesting the need to investigate the safety of small fleets further.**

3.10 Lessons from overseas

Research from Sweden, the USA, and the UK was reviewed in Appendix 3.10 to look for lessons to guide work-related road safety in Australia.

- The Swedish Televerket study (Gregersen et al 1996) is probably the most quoted (and mis-quoted) fleet safety study undertaken anywhere to date. Four countermeasures (driver training, Group Decision Theory (GDT)-based driver discussions, campaigns and incentives) were compared against a control group over a two-year during the mid-1980s. Based on crash numbers and costs the driver group discussions were concluded to be the most effective countermeasure. A more detailed review of the case is shown in Appendix 3.10.1.

- Similar conclusions were drawn from work involving UK pizza delivery drivers. From this research, undertaken over a 10 year period, Ludvig and Geller (2000) developed their multiple intervention level hierarchy model (MIL) of countermeasure effectiveness, intensity and cost, and a behaviour change taxonomy model (BCT). Their analysis of countermeasures and application of both models suggests the need for a combination of lower cost group-based countermeasures and more individual targeted countermeasures.

- Other, more general, US-based studies have focused on safety auditing, comparisons between dangerous and non-dangerous industries and the need for better data.

- In the UK work-related road safety has become an increasingly important issue in recent years as the full extent and costs of the problem have been highlighted and addressed by organisations such as Brake, Royal Society for the Prevention of Accidents (RoSPA), the Transport Research Laboratory (TRL) and the University of Huddersfield. This has led to the wide range of initiatives with individual fleets and at Government level through the Work-related Road Safety Task Group, more detail about which is available in Appendix 3.10.3. Along with many countermeasures aimed at vehicles, drivers and the work environment; better management of the problem; the need for better data; and the

importance of minimising the risk through better journey planning are some of the key issues to emerge from the UK.

Many of these overseas initiatives appear to have the potential to be developed further in the Australian setting.

3.11 Summary

This section and the more detailed findings in Appendix 3 have reviewed a range of government and industry-led fleet safety programs in Australia and overseas. From this analysis it is clear that several very well planned initiatives have already been implemented by a range of government and industry organisations. Typically they focus on some or all of the following eight areas.

1. **Fleet safety policy, program and guidelines** that include fleet safety policy in organisational and OHS policy and objectives focused on securing management commitment and the resources necessary for implementation.
2. **Driver recruitment, selection and management programs** that hire and manage drivers based on safe driving records and safety awareness.
3. **Induction programs that** induct all new recruits and supervisors in fleet safety.
4. **Fleet vehicle selection and maintenance** that adheres to best practice.
5. **Vehicle crash monitoring** by maintaining an efficient system of recording, monitoring, investigating and setting targets for overall fleet, individual driver and individual vehicle crash involvement.
6. **Communication and awareness** through regular information to keep drivers alert to objectives and reinforce company safety requirements.
7. **Training and education** to support continuous improvements.
8. **On-going evaluation** to recognise and learn from good and bad performance.

Table 2 shows a summary of all the countermeasures identified across all the Australian and international case studies reviewed using the Haddon Matrix (Haddon 1980) as a framework. Table 2 provides a very useful tool for generating ideas for work-related road safety countermeasures. It can also be used by organisations to audit their existing fleet safety programs and systems by asking a simple question *'do we have the following in place?'* for each item.

Based on the cases in this section and Appendix 3 it is clear that there are some **gaps and areas of opportunity for work-related road safety in Australia. One example is the need for theories and frameworks to better structure, implement, change manage and evaluate fleet safety programs.** This is described further in Section 4.

Table 2 - Review of countermeasures using the Haddon Matrix

	Vehicle	**People**	**Environment**	**Management culture**
Pre-crash	Specification, selection and purchasing Vehicle crashworthiness (NCAP) Vehicle inspection and maintenance Weekly vehicle inspections Nightly vehicle checks Pre-drive vehicle checks Vehicle servicing Less powerful vehicles for high risk drivers Ensure quality of outsourced as well as own vehicles Proactive safety features Intelligent transport technology Very detailed vehicle wear and tare policy	Include driving in position descriptions Assess driver history records Driver recruitment, selection, induction Pre-employment driver assessments eg People and Quality Solutions Pty Ltd (PaQs) or interactive driving systems (IDS) driver assessment Fatigue, eyesight and health assessments Reassess drivers two yearly Drug/alcohol testing and training Assess/train high risk drivers Competency-based training program Incident and job specific training IT-based assessment and training Group discussion-based training Defensive driver training Hazardous substance training Physical handling workshops Stress workshops Group or individual incentives and disincentives Speeding Driver information – newsletter, internet and handbook Education program for all road users to deal with trucks 1800 number for public feedback Employee safety surveys Instil a sense of vehicle ownership Driver pledges	Observe behaviour at regular sites and locations New, more visible signage and warning lights Make hazards more visible Improve site lighting Improve private roads/sites Handbook and tools for hazard identification Evaluate schedules to minimise 12-6am driving Work permit system Lobby for dangerous road improvements Make drivers aware of blackspots Weather – 3/4 second rule in wet Road rules Improve vehicle routes Managers and schedulers go on trips with drivers to highlight operational hazards Risk assess existing plant/sites Emergency exercises at all sites Black spot mapping programs to identify poor road conditions Involve drivers in designing frequently visited sites	Review/reduce journeys, modal choice, work instructions Document journey management and compliance Write a fleet safety policy, systems, manual and program Management champions and accountability Form a vehicle fleet transport strategy group or driver safety committee to gather data, identify issues and review options to improve performance Quality management approach/safety emphasis Employee involvement, surveys, newsletters and PR Acknowledge legal responsibility and need for fleet safety as part of a general safety or OHS framework Appoint an OHS or risk management coordinator Set achievable safety targets eg zero injuries Recognise and value safety contributions Foster an environment where employees care Zero alcohol and drug policies, programs and testing Fatigue, speed, distance, hours and night driving policies Government fleets should lead by example Focus on the full costs and risks of crashes Supervisor sign-off on vehicle use Document and apply COR and duty of care Work closely with insurers and brokers Evaluate claims, maintenance, resale values and violations Develop driver and contractor monitoring, standards and training Recognise safe driving Encourage near-hit and honest crash reporting Daily driver/manager toolbox meetings
At scene	Reactive safety features and equipment Heavier cars safer for occupants Good crashworthiness	Crash packs to manage scene	Site risk assessment Crash site investigation	Support the driver at the scene Manage PR process for serious crashes
Post-crash	Strong openable doors Vehicle inspection Outsourcing of maintenance to improve reporting levels Review vehicle selection Review vehicle elements of crash data	More driver friendly crash reporting Post-Crash investigation process Driver, scheduler, supervisor and manager review, disciplinary and re-training process Review people elements of crash data	Re-design car parks and sites Paint lines on road and dangerous objects Review site elements of crash data	Blame free or ‘midway culture’ investigation of causes Incident reporting system for reporting, recording, analysis of crash data and dissemination of results Crash costs charged to user Incident follow-up procedures Document and cost injuries and unsafe practices Evaluation and monitoring of KPIs Internet based claims data for risk management Strong wear & tear policy

4 Using theory to develop a best practice fleet safety framework

Based on the above discussion and Appendix 3, very little theory appears to have been applied to the development of fleet safety initiatives in Australia. At the micro level, the organisations that volunteered to participate in the report can be seen to have quite extensive fleet safety policies and procedures in place, and have implemented a range of countermeasures. Despite this, however, over 40 interviews with organisations conducted by Mooren and Sochon (2001) suggested that there have been limited publicly available empirical evaluations of the effectiveness of any of these programs and safety measures. This can partly be explained by the fact that organisations gaining a competitive advantage through a successful program may not wish to publicise it or release highly sensitive company data. It is also the case that evaluation is often an afterthought and can be very difficult, costly and time consuming to undertake effectively.

There appear to have been several influences on each participant's program, ranging from claims management at the least proactive extreme, to fleet safety being part of OHS strategy at the other extreme. In between, there are programs instigated by insurers or brokers or as part of the vehicle asset management process. There does not appear to be one single intervention strategy applied to the fleet safety problem, although driver training is probably the most common and talked about countermeasure.

Some form of driver training was implemented in all of the case studies described in Appendix 3. It is a topic that arouses a polarity of strong and extreme views in Australia and internationally. Driver trainers and their advocates believe in its value wholeheartedly, and stress the need for in-vehicle programs (Nielson 2002). At the other end of the spectrum many researchers and experts are questioning its proven usefulness as a road safety countermeasure. (For examples see Skewes 2002, Christie 2002, Haworth et al 2000 and Jerrim 1997.)

This topic on its own is worthy of further debate and research, which is felt to be beyond the scope of this report. In principle, the ideas put forward by Watson et al (1996) appear to offer a common sense 'middle way' approach. They discussed fleets in their review of post-licence driver training, suggesting that although there is a lack of hard evidence (in the form of case controlled studies) for the success of fleet driver training, there is anecdotal evidence that it can be effective as part of a wider fleet safety program. Fleet driver training helps to show drivers that the company is concerned with safety and that their performance is under observation. In addition, the training may be more specifically tailored to the demands of work-related driving and be reinforced by other countermeasures implemented by employers. Watson et al (1996) also identified the high face validity or face value of driver training, which may contribute to employee acceptance and approval of a fleet safety program. Over and above these considerations, they emphasised the need for further research and evaluations in this area.

Given this discussion, a great deal of interest has emerged in the idea of the workshop or Group Decision Theory-based training that appears to have had some success in the Swedish Televerket, US pizza, BP and other cases described in Appendix 3. To date, this does not appear to have been researched and replicated in an Australian context, which clearly suggests the need for further studies in this area.

For these reasons, Laflamme et al's (1999) summary of the development of several safety promotion models was reviewed in an attempt to develop a model or theoretical framework to guide fleet safety. These approaches are loosely described in the historical order that they emerged.

4.1 Safety promotion models

4.1.1 Heinrich's Domino theory

Heinrich's Domino theory suggested there are five 'dominos': ancestry and the social environment; human factors; hazards and unsafe acts; the accident; and injury (Laflamme et al 1999). These show causation as a linear flow of time ordered stages and options for prevention. Heinrich argued that if this series is interrupted by the elimination of one or more of these factors, the accident sequence is interrupted and the injury cannot occur. In a fleet safety context, developing a safety culture affects the social environment, improving the depot layout improves the environment, training affects human factors, speed reduces hazards and crashes, and seatbelts reduce injury. This is good approach because it **focuses on underlying causes and the importance of investigation**. Bird (1997) and Cooper (1998) also described Heinrich's work.

4.1.2 Haddon Matrix

The Haddon Matrix is a conceptual model that is applied to injury control, particularly motor vehicle crashes (Haddon 1980, Williams 1999). The matrix involves three phases: prevention of injury (pre-event phase); minimising the potential for injury to occur (the event phase); and reducing the unnecessary consequences associated with injury (post-event stage). In accordance with the model, countermeasures for preventing or ameliorating injuries may involve changes in human behaviour, vehicles/equipment, or the physical or socio-economic environment. Table 2 summarises the fleet safety countermeasures identified throughout this report in the structure of the Haddon Matrix. The focus is mainly preventative, based on vehicle selection, driver management, and the organisational framework in which they sit. **The Haddon Matrix provides a good overall framework and adapts well to the fleet safety context of focusing on asset protection and loss control, as well as injury prevention and rehabilitation.** Bird (1997) is particularly complimentary of Haddon's work.

Faulks (2001) suggested that a major problem with Haddon's formulation is that it takes little account of motivational issues, particularly purpose of journey, of which driving for work is a key element. It is possible, and important at the macro level, to extend the Haddon Matrix into a 'cube' to include a third dimension, purpose of journey, to allow a better understanding of the extent of the fleet safety problem, and to target countermeasures more accurately. This extension of the model can provide opportunities for combining concepts in road safety and workplace safety.

Faulks (2001) identified three broad aspects of purpose of journey: road use for business; road use for holiday and recreation; and road use for lifestyle maintenance. An alternative purpose of journey framework has recently been developed in the UK, based on survey research undertaken by Stradling (2000) at Napier University. He identified seven types of trip for which people use their car.

1. Driving as part of work (64% of respondents).
2. Driving to and from work (90% of respondents).
3. Ferrying kids.
4. Life and network maintenance (eg shopping, visiting, evenings out).
5. Car as load carrier.
6. Holidays and weekends away.
7. Life enhancement activities (eg hobbies, driving for pleasure).

Adopting such a purpose of journey framework would allow the state and territory transport departments and police to improve their crash reporting and recording, and thus provide a better understanding of motivational issues and the extent of the work-related road safety problem. This will allow better targeting of countermeasures. Frameworks for this process are currently being reviewed for inclusion in the data collection process in the UK and in Queensland.

4.1.3 Surveillance model

The Surveillance model focuses on vehicle crash reporting, recording, and coding to allow an understanding of causation and preventative actions (Laflamme et al 1999). Ideally, data is recorded on the linear crash sequence of precipitating factors, contributory factors, event, intermediate event and contact event. The main problem is the imbalance between post (injury, insurance and costs) and pre-event (who, what, where, when and why) data. There appear to be several levels of data in Australia, some of which are more work-related than others (Table 3).

Table 3 - Level and source of crash data in Australia

Level of crash	Source of data in Australia	Collection method	Reliability
Fatal	State level transport OHS workers compensation NOHSC and ATSB fatal files	Police Employee claims Coroner reports	Reliable Reliable Reliable, slow
Hospitalisation and injury	State level transport OHS workers compensation CTP insurance Health statistics	Police Employee claims Police and public Queensland Ambulance Service (QAS) and hospitals	Under reporting Reliable, misses self employed False claims Availability
Asset damage only	State level transport Tow truck data Comprehensive insurance	Police Royal Automobile Club of Victoria (RACV) Claim reports	Under reporting Under reporting False claims/liability/excess level/ un-reported damage
Wear and tear	Maintenance data	Workshop, lease or maintenance invoices	Available where vehicles leased or on contract maintenance Often hidden in general maintenance data for owned vehicles
Near hits	Organisational reporting systems	Incident management system	Few organisations have Reporting level

Road safety researchers and practitioners in Australia have tended to focus on injury and fatality prevention based on national and state-level data. One problem identified in this report is that there is limited purpose of journey data available, making it difficult to understand the true extent of the work-related road safety problem or to target countermeasures. Work-related data is typically available for heavy vehicles and buses, but not other types of vehicle. Another problem with this data is that it only provides part of the picture, typically, fatalities, injuries and hospitalisations. An area that has not been greatly researched to date is the use of insurance data for road safety improvements. Fleet safety offers an opportunity in this area, as all fleets have insurance claims data in one form or another, and because organisations have some degree of employee control.

For these reasons, the use of insurance data as a tool to understand the extent of the problem and begin to develop countermeasures has been reviewed. Table 3 suggests that work-related insurance in Australia appears to operate at three levels.

1. State or territory level government-administered compulsory third party (CTP) insurance schemes covering injury claims for third parties involved in a crash with a commercial vehicle. (See Appendix 3.6)
2. Commonwealth, state or territory level government-administered OHS workers compensation schemes covering injury claims when the driver is at work or commuting. (See Section 3.6). Passengers in the vehicle would either claim through workers compensation or CTP. In some cases, CTP would reimburse the workers compensation agency for the costs.
3. Damage only, or comprehensive insurance, which covers vehicle and asset damage only and is operated by private insurance companies such as NTI and Lumley described in Appendix 3.5.

All have some potential, as well as limitations, in terms of understanding and improving work-related road safety. Comprehensive insurance data is very cost-based and is mainly focused on the vehicle asset. Workers compensation data is injury focused, but on the individual rather than the vehicle, and so does not always allow an analysis by vehicle type. In Queensland, for example, truck drivers can be identified by their job title, but not by the type of vehicle or work they are doing (Appendix 2). CTP data is cost and rehabilitation oriented, rather than risk management-based, and purpose of journey data is not one of the fields requested by CTP agencies from their insurers.

There appear to be mixed views on the use of non-injury data. Discussion and debate with traditional Australian road safety researchers, who tend to focus on injury and fatality data, suggests that there may only be a limited link between human harm and vehicle or property damage in many instances. Other researchers (for example Bateman et al 1996, Bird 1997, and Boyle 1999, who specialise in occupational safety) and practitioners such as Adamson (1997) suggest that there is a link between asset and human damage reduction. It is suggested that the only difference between a dint, scrape or lost wing mirror and injury, is timing or a few centimetres. Tay (2002) also argued that the total costs of non-fatal crashes are much higher than for fatalities and should be focused on more by Australian policy makers.

Several authors have tried to quantify the relationship between these differing levels of incident (Table 4). RoSPA (1998) and Cooper (1998) both point to a direct relationship between small and large accidents. Cooper suggested that, for every 30 unsafe acts at work, there would be one lost time accident. RoSPA (1998) quoted national statistics, which suggest that for every 1,800 damage only crashes in the UK there is a driver fatality. Whatever the exact relationship, the most common fleet vehicle crash involves slow speed manoeuvring, minimal vehicle or property damage and relatively low repair costs. As often as not, it goes unreported and is financed by general maintenance costs or the wear and tear budget. A good example involves the safety of reversing vehicles, which are typically low cost crashes, but with the potential to be fatal. Sometimes this type of fatality does not show up in road safety data because it happens on a work site and not the road (Murray 2001a). Whiting (1997) and Bird (1997) also discussed the use of such safety ‘triangles’.

Table 4 - The relationship between different levels of safety incident, from near hits to fatalities

Source	Cooper	Geller	Murray and Rand	RoSPA	Boyle	Boyle	Boyle	BTE
Industry	General	General	Trucks	All vehicles	Construction	Factory	Oil rig	All vehicle
Driver fatality	-	-	-	1	-	-	-	-
Driver/passenger fatality	-	-	1	1.6	-	-	-	1,970
Serious driver or passenger injury	-	-	-	20	-	-	-	21,989
All other vehicle related injury	-	-	29	81	-	-	-	-
Major or lost time incident	1	1	-	-	1	1	1	-
Minor injury	29	30		156	56+	5	4	213,322
Vehicle or property damage	-	90	221	1,800	3,570+	148	126	1,533,279
Wear and tear	-	-	-	-	-	-	-	-
Unsafe behaviours	300	-	-	-	-	-	-	-
Near hits	-	1,800	-	364,000	-	-	-	-

In particular, Bird (1997) and Geller (1999) agree that identifying root causes of damage-only insurance claims and near hits will lead to lower injury rates. They suggest that linking property damage to workplace injuries has the potential to encourage more reporting, investigation, damage repair and corrective action. Behaviour that contributes to property damage is much less thoughtless and careless than failing to report and facilitate the repair of such damage. This sets the stage for more proactive reporting, investigating and preventative countermeasures. In the Australian fleet safety setting more work is required to understand the extent to which minor crashes are predictive of injury outcomes, and how high the relative risks are in a range of crash scenarios.

In the UK, Murray and Rand (2000) investigated best practice in vehicle crash reporting and recording. They showed how **insurance claims data on the vehicle, driver and crash can be coded and used to guide fleet safety improvements.** Murray and Dubens (2000) also provide more discussion and examples of the use of insurance data to guide fleet safety improvements.

4.1.4 Risk homeostasis theory

According to Wilde's Risk Homeostasis theory (RHT) people have a desired or target level of risk with which they are comfortable. When external factors, such as adding more safety features to a vehicle, impact on their perceived level of risk, they will adjust their behaviour to maintain their target level of risk. Another term for this is behavioural adaptation. It means that managers should not assume that a direct safety benefit will result from safety initiatives. Wilde (1994) suggested that to create change, people's perceptions and attitudes to accepting risks should be influenced. RHT has since been questioned by Ludvig and Geller (2000) who suggested that spread of effect and counter control may be a better explanation, as some countermeasures can have positive impacts on other areas than those targeted, as well as negative impacts. Job (2002) described this as category shift. Whether Wilde's theory is valid or not, it **highlights the importance of change management when implementing fleet safety programs.** Ludvig and Geller (2000), Gregersen et al (1996), Huetson (1999), Murray and Rand (2000), and Skewes (2002) also focus on **change and the importance of involving workers at all levels in the decision making and implementation processes**.

4.1.5 Multiple intervention level hierarchy model and behaviour change taxonomy model

Ludvig and Geller (2000) developed a multiple intervention level hierarchy model (MIL) of countermeasure effectiveness, intensity and cost, and a behaviour change taxonomy model (BCT).

Using their MIL hierarchy model, they argued that managers wishing to improve safety related behaviours should begin with a large-scale group-based program targeting all employees through group meetings, sign based prompts, and other media. Subsequently, they should enrol those employees who were influenced by the group countermeasure to become agents of change (and apply peer pressure) for the more intrusive and targeted countermeasures required for employees not influenced by the group-based program. This will allow managers to target more difficult employees and at the same time continue to influence the behaviour of the agents themselves.

Their BCT model covered countermeasure effectiveness (both concurrent and maintained) on both targeted and non-targeted countermeasures. Using this model they scored their seven countermeasures (mentioned in Appendix 3.10.2) on concurrent impact, maintained impact and spread of effect (response generalisation or counter control). They scored each countermeasure on involvement, peer support, response information and external control. This is a very good process model for managing change.

Ludvig and Geller (2000) also focused on several key issues to consider when measuring fleet safety improvements. These include **positive and negative 'spread of effects'** called generalisation and counter control. **Generalisation effects** occur when the countermeasure positively affects more than what was targeted, for example, seatbelt countermeasures also positively affect turn signal use. This was most common where the participants were heavily involved in the design of the countermeasure. **Counter control** is an undesired change in target behaviour, where the countermeasure creates adverse situations for participants, who decrease their incidence of the targeted behaviour, for example by using their seatbelt less. Counter control also affects non-targeted behaviours, and in the pizza studies, typically resulted from strong external controls, such as management policies imposed without consulting staff.

Social validity relates to whether the targeted countermeasure has an affect on the wider community. **History effects** are major events related to road safety. Typically, this could include the company being involved in a fatality or very heavy legal costs that focus management and employee attention on the issue. Externally, this could be a national road safety campaign. **Stimulus events** include factors such as weather and traffic conditions.

Overall, Ludvig and Geller concluded that their MIL and BCT models could help managers to choose more effective behaviour change techniques when planning their safety programs.

Applying this summarising model allowed them to conclude that involvement and peer support are important and most likely to be sustained by the culture after the countermeasure is discontinued. Countermeasures high on external contingencies (imposed by management) are most likely not to be sustained. Involvement is also important in creating a positive spread of effect (response generalisation) rather than a negative one (counter control).

Finally they concluded that the most beneficial behaviour change countermeasures should:

- offer opportunities for involvement
- foster peer support
- provide on-going feedback to participants.

Countermeasures using external contingencies (eg policies, sanctions and mandates) need to be developed with substantial employee involvement to avoid undesirable influences on non-targeted behaviours.

4.1.6 Risk analysis and systems approaches

Risk analysis focuses on the technical, organisational, environmental and people-based circumstances leading to hazards. It emphasises system design, rather than looking at a single individual's safety performance under given conditions, in an attempt to build safety into the design and implementation stages of projects. It is consistent with adopting an OHS-led approach to fleet safety, focussing on identifying, assessing and controlling risks. Similarly, **Surrey's Systems approach** aimed to better understand the pre-crash, at-scene and post-crash process (Laflamme 1999). He argued that too much emphasis is put on human error and showed the importance of 'change/deviation' for causation, and of organisational and societal factors as an extension to the dimensions of the Haddon Matrix. **This shows the importance of change management and of wider KPIs such as employee morale and staff turnover, and leads very clearly into applying an organisational culture-based approach.**

4.1.7 Organisational culture-based model

Organisational culture-based models focus on the individual's role and skills within the organisational and working climate in which they operate (Laflamme 1999). The approach argues that latent organisational and management failures in work systems must be considered in crash investigations. Such an approach had its foundations in dangerous industries. In the nuclear industry for example, safety culture is defined as

> 'the assembly of characteristics and attitudes in organisations and individuals which establishes that, as an overriding priority, nuclear plant safety issues receive the attention warranted by their significance'.

(Source: Forum for Nuclear Cooperation in Asia (FNCA), www.ansto.gov.au/fnca/whatis.html)

It goes on to say that safety culture is about good safety attitudes in people and good safety management established by organisations, giving the highest priority to safety and making a constant assessment of the safety significance of events, and issues, in order that the appropriate level of attention can be given. In this way, safety is linked to quality and standards and the focus is on influencing group norms. It also lists a set of KPIs for evaluating safety culture. These include:

- discussion between management and employees to enhance safety;
- a system for analysis of incidents to determine causal factors and lessons;
- relevant training activities;
- meetings or activities with regulators, contractors and users to discuss safety culture;
- employee attitude surveys and behavioural studies carried out; and
- adequacy of resources allocated to promote safety culture activities.

(Source FNCA internet site: www.ansto.gov.au/fnca/indicators.html)

In the fleet context, establishing a strong safety culture conveys the message that the organisation is genuinely committed to maintaining and improving working standards. Grayson (1999), Haworth et al (2000), and Murray and Dubens (2000) all concluded that the culture of an organisation can have a significant impact on safe driving behaviour. Organisations with a strong focus on safety-related policies and practices would normally encourage safer driving among their employees. Adopting a combination of policies and practices, rather than a single initiative is believed to be the best

method of creating a clear message that an organisation is serious about driver safety (Downs et al 1999). In support of this, Grayson (1999) concluded that an integrated set of safety policies based on a strong safety culture within the organisation would be more effective in decreasing the crash rate than any single measure. Similarly, Whiting (1997) argued that organisations must recognise the need to establish the right management systems before focusing on behaviour modification programs. Further, it has been suggested that **incorporating safety into the entire working environment is the most effective strategy to ensure that all staff become involved in fleet safety** (Elliott and Shanahan Research 1995). Cooper (1998) provides a practical and comprehensive guide to improving both safety culture and climate in organisations.

4.1.8 Prevention model

The Prevention model of safety applies on several levels and dimensions (Laflamme 1999). **Primary** actions are taken in advance, **secondary** actions spot problems early and manage them, and **tertiary** actions manage consequences and rehabilitation. **Proactive** actions deter or limit exposure and **reactive** actions adapt to exposure. The **macro** level is policy-related and the *micro* level relates to specific countermeasures. Prevention also operates on a continuum from *active* (involves people) to **passive** (involves environment). Passive measures are those that protect individuals automatically without any action on their part, including vehicle design changes. Active measures require individuals to actively participate in their own protection. It is advocated by the domain of public health that providing passive protection through product or environmental design is the preferred strategy (Williams 1999). Griffiths (1997) also contends that employers should anticipate human failure and specify passive safety features on vehicles, as this does not require any difficult behavioural changes. A counter argument is that it lowers people's concentration and skill levels. In reality, a combination of both is generally implemented in organisations. Table 5 shows some vehicle-based examples. Where different countermeasures sit in the framework is open to some discussion. There is a view that by choosing to specify safety features, fleet managers are being proactive and active. Despite this, it remains a useful structure for focusing on safety programs, particularly vehicle safety features. The proactive and reactive structure is similar to the 'pre-crash' and 'at-scene' elements of the Haddon Matrix shown in Tables 2 and 6.

Table 5 - Vehicle related countermeasures

	Passive	**Active**
Proactive to avoid crashes	Speed limiter Wired in daytime running lights Alcohol ignition interlock Visible colour Handling/stability Tyres Windows Steering Traction control Stronger/safer seats Mobile phones confiscated Intelligent speed limiters GPS based vehicle tracking Black-box vehicle monitoring	ABS and brakes Daytime running lights High mounted rear centre brake lights Mirrors Remote control mirrors Cruise control Air conditioning Ventilation control Warning devices Reversing cameras Mobile phone use banned
Reactive at-scene	Airbag Seatbelt interlock NCAP crashworthy vehicle Heavier vehicle Anti whiplash protection Cargo barrier/load restraint Crush zones and safety cages Frontal impact protection Side impact protection Safe vehicle interiors Black box crash recorders	Quality front and rear seatbelts Seatbelt wearing Head restraints Strong easy to open doors Seats Fire safety Child restraints

4.1.9 Other approaches

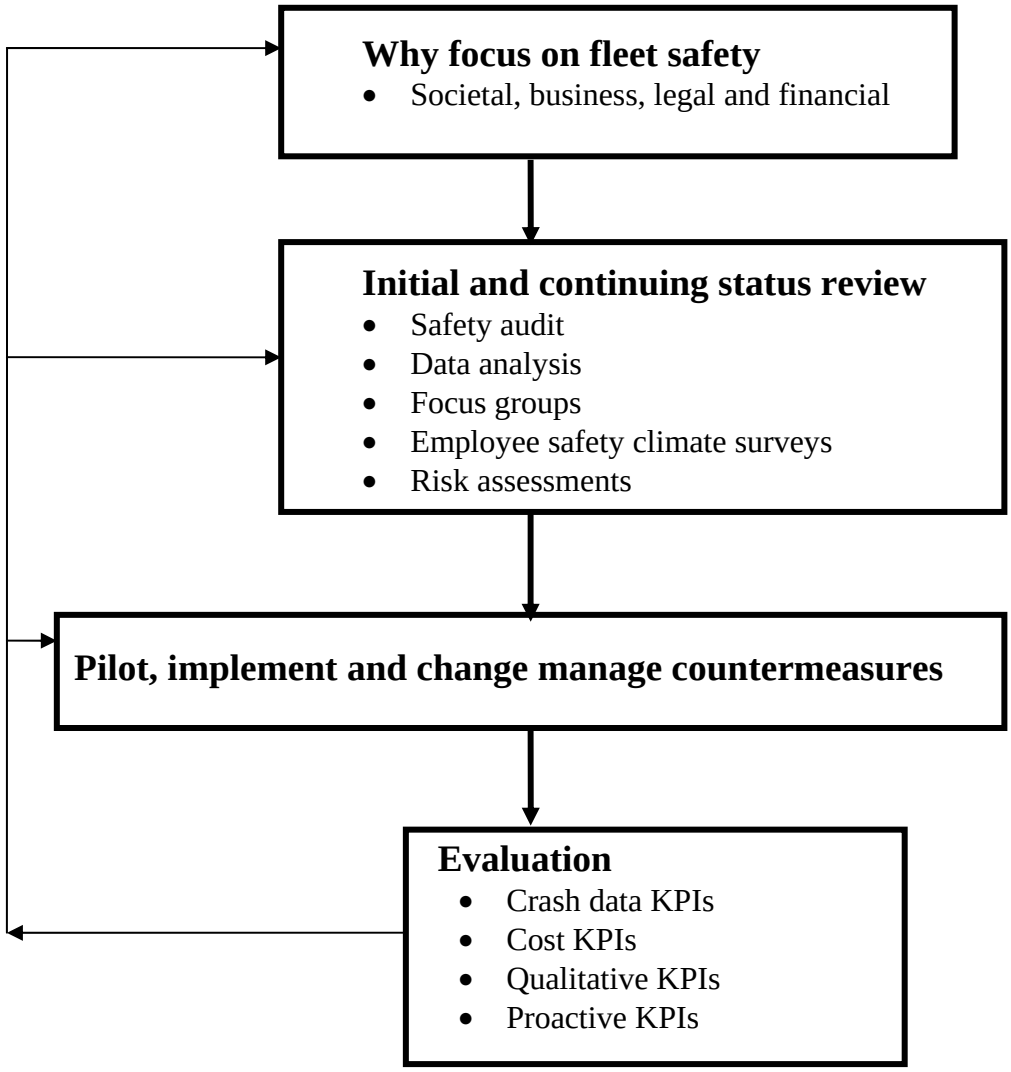
Other approaches identified in a range of organisations in the UK and Australia include a marketing tool called Gap Analysis, which is used to identify countermeasures to close the planning gap between the current and desired future trends. Some organisations have used and extended the road safety 'E's in the fleet setting. These include education (training), enforcement (disciplinary policy), engineering (vehicle selection and maintenance), enthusiasm (management champion), encouragement (implementation and change management), and evaluation (crash rates and $s).

In Australia, www.ambulancedriving.com/manage/manmodel.html has developed a model to help ambulance services improve their safety performance. It focuses on the organisation's mission, integrating different areas of the organisation such as personnel, finance, quality management and operations, and developing and working towards standards and targets.

4.2 A best practice process model for fleet safety

All of the above theories and ideas were synthesised and integrated into the four-stage organisational level fleet safety process framework shown in Figure 5.

Figure 5 – The WIPE fleet safety process model that emerged from this research



Identifying the reasons to focus on fleet safety is an important starting point. The societal, business, legal and cost reasons to focus on fleet safety described in Section 2 above are an important starting point. They provide a range of motivations for government, organisations or individuals to focus attention in this area.

Whatever the motivation for focusing on improving fleet safety, the next step is to gain a detailed **understanding of the current situation or 'where are we now?'** A safety audit, such as the Queensland Transport (Appendix 3.2.4) and Western Australian (Appendix 3.2.3) examples, is a very useful tool. Analysis of the available data (including CTP, workers compensation and damage only claims, maintenance records, violations, fuel records, customer service failures and complaints as well as the results of health, alcohol, drug and eyesight tests) allows the extent and full costs of the problem to be understood. This should include the hidden costs described in Sections 2.4 and 5.2 so that the required cost trade-offs can be made between resources allocated to safety and operations. Employee surveys and focus groups allow a consultation, involvement and pledging process to be developed, as well as gaining an understanding of people's perception of the safety culture and practices within the organisation.

Risk assessments of journeys, vehicles, people, the environment and organisational culture allow a detailed needs analysis to be undertaken. Journey risk assessments allow questions such as 'do we really need to travel', 'what is the safest practical mode', and 'should we break the journey'? Risk

assessments of vehicles include pre-purchase vehicle selection, pre- and post-use checks, and high quality maintenance. People can be assessed at all levels in relation to safety. For example, driver assessment can focus on in-vehicle skills and behaviour, attitude, hazard perception, health, eyesight, alcohol and drug use and a range of other issues. Site risk assessments and black spot analysis are particularly useful for organisations with regular trips on the same routes or to the same specific locations. Start and end-points (delivery and collection points and organisation's own sites) are particularly important locations to risk assess. The status review allows a series of targets, standards or KPIs to be developed, which helps to turn the status review into an on-going process.

The Haddon Matrix, described in Section 4.1.2 above, is a very useful framework of classifying fleet safety improvement countermeasures to be piloted, implemented and change-managed. Undertaking pilot studies at one site, or with one team of drivers, is a very useful exercise because it helps to evaluate the effectiveness of a program, make appropriate cost trade-offs and develop the process for implementation of any wider program. Implementation and change management were identified as key barriers to fleet safety in Appendix 3.2.5. The MIL and BCT approaches suggested by Ludvig and Geller (2000) are useful frameworks for managing this process. They (and Job 2002) stress the importance of understanding the impact of countermeasures on both the direct area targeted and any counter control in other areas. Both can be positive or negative. For this reason, **it is important to acknowledge that countermeasures should be well researched, pilot tested and developed in consultation with the target population.**

In Table 6 some typical broad countermeasures are shown. Having a proactive safety management culture has been a recurring theme throughout the report, summarised in Section 4.1.7. 'Journey' has been separated out from the larger matrix shown in Table 2, to stress its importance. Journey planning can have a major impact on safety. Probably the decision not to travel or to change mode would be the safest option. Where this is not practical, good journey planning can be used to manage fatigue and to specify and monitor (through global positioning satellite (GPS)-based vehicle tracking) the safest routes. Selection, recruitment, induction, assessment and relevant training are all important. For vehicles selection, maintenance and checking are important. Risk assessing the road environment is particularly important for developing driver guidelines, improving site layouts, and road design.

Table 6 - Summary of countermeasures in a Haddon Matrix framework

	Management culture	**Journey**	**People**	**Vehicle**	**Environment**
Pre-crash	Policy and procedures Organisational climate Management structure Board level champion OHS or quality-led Safety committee	Purpose Need to travel Modal choice Journey planning and route selection Take stopovers	Select Recruit Induct Handbook Assess Train	Selection Maintenance Checking ITS to monitor	Risk assessments Guidelines Site layouts Road improvement
At scene	Emergency response Support to driver	-	Known process to manage the scene using the crash pack	Crashworthy ITS to capture data	Manage scene
Post-crash	Report, record, investigate and evaluate Change management	Debrief and review	Driver debrief Counselling & support Reassess/train	Investigate ITS data Vehicle inspection & repair	Investigate and improve

Managing the scene is a very important part of the fleet safety process in terms of providing organisational support to the driver, making sure that drivers know the correct processes, and drivers having and correctly using their crash pack (including a camera, first aid kit, bumpcard and crash report form). Crashworthy vehicles help to reduce employee injury and using intelligent transport systems (ITS) to capture data can support a more objective investigation process. Managing the road environment at the scene minimises the risk of further incidents and ensures that all the available evidence is recorded.

Post-crash reporting, recording and investigation are all important elements of fleet safety applying the Surveillance Model described in Section 4.1.3 to identify areas for improvement. Where possible, OHS specialists should be involved in crash investigations. Journeys must be reviewed and a process should exist for driver debrief, counselling, support and retraining. Vehicles should be inspected in detail before repair and ITS data should be used as part of the investigation process. The road or site environment should be reviewed and risk-assessed to identify improvements. Implementation and change management have been identified as key elements in this process in many of the case studies described in Appendix 3. There are many barriers to change. Consultation with, and the involvement of, staff at all levels (including the unions) is a key issue.

Typically, operational managers have to make a trade-off between focussing time and resources on investigation or day to day operations. In many cases, maintaining the operation is seen as more important, so only minimal, or no, investigation actually takes place. Therefore, it is **very important to understand all the relevant cost trade-offs.**

UK-based research by Murray and Rand (2000) suggests that effective evaluation, through the monitoring of KPIs, is a key component of a fleet safety program. In Australia, Haworth et al (2000) and Mooren and Sochon (2001) have highlighted its importance. For this reason, evaluation is described in detail in the next section.

4.3 Summary

This section has reviewed and used a range of safety promotion theories to aid the development of a fleet safety improvement framework. This focuses on understanding ‘why’ fleet safety is an important issue and undertaking a status review to lead the piloting, implementation and on-going evaluation of relevant and targeted countermeasures on the basis of need.

5 Evaluation methodologies

Evaluation was referred to in several cases throughout the report. A wide range of proactive pre-crash, and more reactive post-crash, KPIs were in place for evaluation. These were merged with the KPIs suggested by Murray and Rand (2000) and are shown in full in Appendix 4.

The most common KPI used appears to be claims per vehicle. Figure 6 below compares all the examples identified in the discussion shown in Appendix 3, particularly based around the Lumley Benchmarking process. Such a comparison is fraught with difficulties because of the differences in vehicle types involved, different journeys and vehicle uses, different definitions of a claim, and different insurance excess levels. It is meant to be indicative only, to show the wide variations in claim rates and to give a starting point for fleets to begin to evaluate their own performance.

In Figure 6 *'Gialantzis 1'* and *'2'* both show the crash rates before and after a safety program was implemented by two different organisations. Although there may be some regression to the mean in the data, and it is unknown exactly how the savings were achieved, they do show the potential of using the crash rate by vehicle as a KPI.

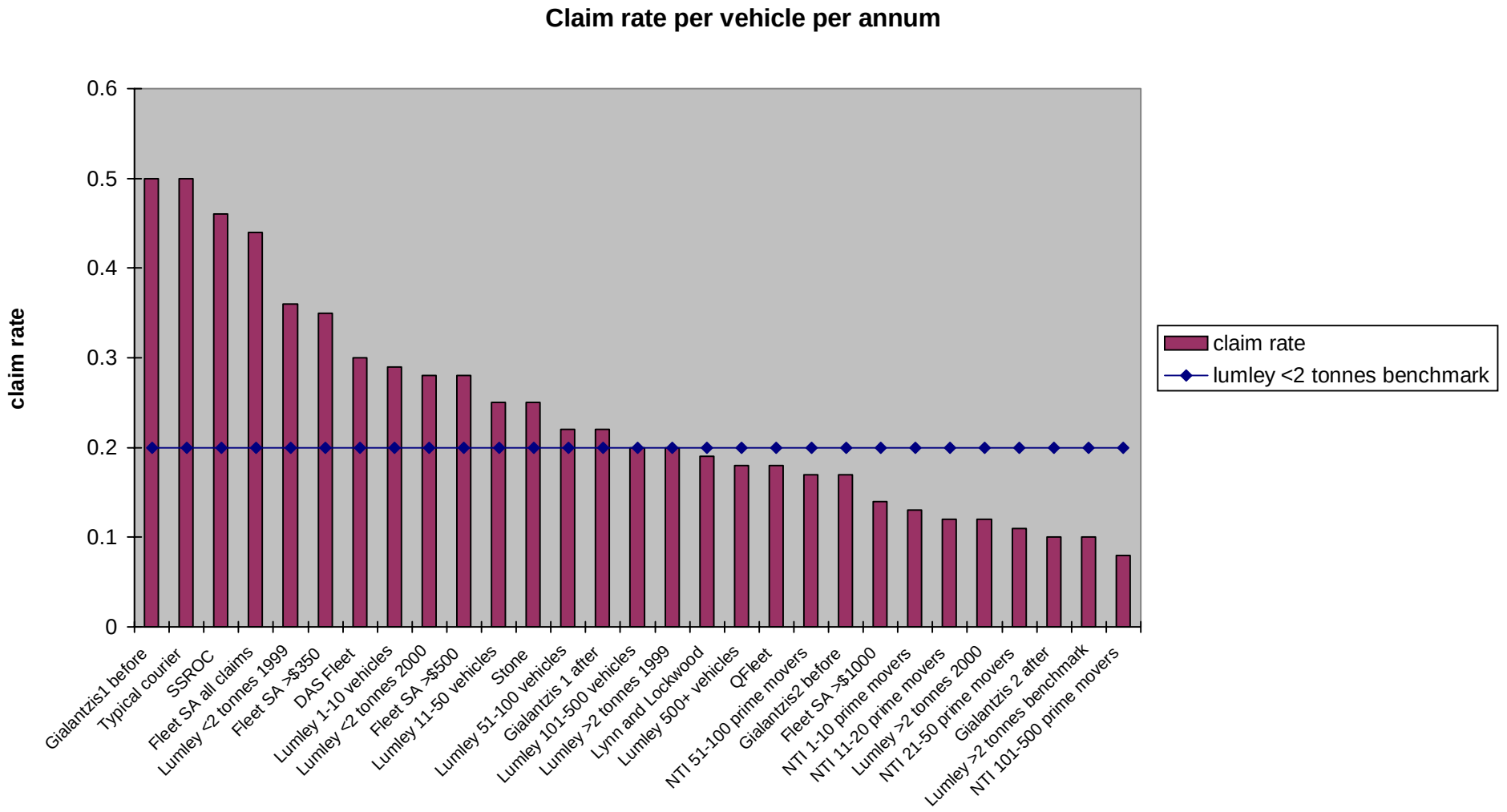
As with the lack of theory or frameworks for fleet safety, there appear to have been few published evaluations, and limited guidance is available to managers on how to undertake it (Haworth et al 2000, Christie 2002). A key question that emerges from this is 'what is a practical, cost effective mechanism to evaluate programs which satisfies the needs of industry and academic rigour?' In an ideal academic or scientific world, statistical predictions of what would happen if no changes were made would be a part of an evaluation including controlled trials of different countermeasures over a long time period to show what the KPIs would have shown if the program had not been implemented. The program may have stopped a long upward trend or prevented a major increase. In many cases, a fleet safety program may actually show an initial increase in crashes, because the first stage is often to begin to count crashes that previously went unnoticed! This requires research and methodological skills, time and money.

In reality, controlled evaluations that separate out each individual countermeasure are not easy, cheap, nor in many cases, practical. Industry rarely has the money or time to invest and settles for process and short-term outcome evaluations at best. These rarely consider 'regression to the mean', 'order effect', 'category shift' or 'counter control'.

Undertaking a pilot study to test the countermeasure before implementation is a compromise. Although not as rigorous as a detailed experiment using a control group, it is more practical and easier to 'cost justify'. Proactive and reactive KPIs including costs, complaints, fuel utilisation, crashes, and qualitative issues such as attitude, safety awareness and teamwork can be monitored, as can the process.

Even where safety gains in a pure academic or statistical sense cannot be proved, a safety program has very high face validity, helps provide protection from OHS regulations and duty of care or COR requirements, encourages more systematic processes, and offers a range of PR and business development opportunities. In many ways, the change management and implementation processes may be as important as the actual safety countermeasure.

Figure 6 - Some of the claim rates per vehicle per annum identified in this research



In the UK, Murray and Dubens (2000) suggested that evaluation must cater for the views, objectives, and needs of a range of groups. These include: external organisations such as the press; the government and a range of pressure groups; shareholders and the 'city'; senior managers; accountants; line managers and supervisors; drivers and vehicle schedulers; personnel managers; the unions; insurers; health and safety managers; and the public relations (PR) department. They structured the range of options available for evaluating risk management programs into crash-based, financial and qualitative KPIs, to assess the effectiveness of the countermeasures in terms of both the overall process and the success of the outcomes.

5.1 Crash rates

Murray and Dubens (2000) felt that as well as assessing the situation to date, evaluation must lead into the next stage of the program and be part of the feedback/selling process of 'keeping the safety message high'. Too much attention is often paid to 'who is at fault'? **Effective evaluation of a safety program must look for corrective actions, should aim to improve as much as prove, and be an integral and regular part of the management process.** It should take place at a range of different levels including: the individual driver; depot; division/region; company; and industry. To work effectively, crash rates should be presented as simply and briefly as possible. They should also include clear trend graphs and a minimal amount of data. Table 7 shows several ways of measuring crash rates.

Table 7 - Crash-based KPIs

Simple ways to count vehicle crashes
Number of crashes per week/month/quarter/year
Number of claims
Number of airbag 'go-offs'
Numbers of injuries
Number of vehicle write-offs
Crashes per vehicle or percentage of vehicles in a crash (Figures 6 and 7)
Crashes per million kilometres driven
Hours, days or months driving per crash
Time to report crash
Level of unreported damage or 'unknowns'
Specific areas (eg crash types, reversing and crash locations)

The more simple measures, such as counting the number of crashes, can indicate useful trend information. 'Crashes per vehicle' allows easy benchmarking between depots or organisations. Many companies use these ratios. They are limited, however, in that they cannot monitor individual drivers, nor do they deal well with seasonality and the use of extra vehicles and drivers at peak times. Fleet injury data in Australia is not as easy to obtain as in the UK, because insurance is split between workers compensation, CTP and comprehensive. **Exposure and external factors such as the economy, weather, road safety initiatives and organisational change such as contracting out or growth can all affect these indicators.**

Hours, days or months driving per crash are probably the most useful of the measures shown. They are easy to understand, can cater for seasonality, and can be used at all levels from the individual driver

upwards. Shaw and Sichel (1961) were early pioneers of this approach. These ratios can also easily monitor different groups of drivers.

Other measures can relate to the efficiency of the crash reporting process, or to specific issues. Crash location, for example, is an important KPI as many fleet crashes happen at particular location types. If these can be identified in a systematic way, relatively low cost actions such as risk assessments and driver guidelines can be implemented.

Standards and objectives can be set against all the measures shown in Table 7, to be monitored on a weekly, monthly, quarterly or annual basis to evaluate and benchmark the success of countermeasures.

5.2 Costs

However strong the societal issues are for reducing crashes, a reaction to high costs or a major crash has been the driving force in most fleet crash reduction programs (eg Murray and Dubens 2000, Fidderman 1993, Shaw and Sichel 1961). As discussed in Section 2.4 above, cost savings made through safety countermeasures go straight to the 'bottom-line' profit margin and can also benefit society in general. This cost relationship is a powerful argument for investing in fleet safety, and a useful mechanism for focusing the minds of accountants, senior management and local operational managers on the need for proactive crash reduction. The relevant cost trade-offs need to be evaluated on a case-by-case basis. Typically, the extra costs are the program itself, and management and staff time. Potential cost savings include insurance, crashes, vehicles, drivers, quality and PR.

Normally, vehicle operators focus on vehicle repairs and insurance costs. There are, however, many other costs that are more difficult to quantify, but the quantification of these can make the arguments in favour of investing in fleet safety even greater. As a starting point, it is vital to get an understanding of the full costs involved (Fidderman 1993). The costs described in Section 2.4 above can be split into recoverable and irrecoverable through insurance. Table 8 shows examples of these costs split down by vehicles, drivers, third parties and others. Whether costs are recoverable or not depends very much upon individual cases, so vehicle operators should use the second column in Table 8 to assess the extent of their own hidden costs.

Even those costs in Table 8 that are recoverable can be a problem. The continued submission of claims will increase annual premium costs and the size of the 'excess' paid on each crash. Both of these trends have been occurring in the UK and Australia.

Once these costs are fully understood and as far as possible quantified, they can then be used to set standards and targets as part of the evaluation process of fleet safety programs. Cost measures by themselves are not enough, however, because a highly successful program can be made to look a failure by one high cost crash. Costs must therefore be used in conjunction with the crash rates shown in Table 7 above. For completeness, it is also useful for the evaluation to focus on qualitative and process issues as well as the outcomes in terms of crash rates and costs.

Table 8 - Cost-based KPIs

Vehicle costs	**Recoverable/insured**
Recovery and storage	Yes/no
Repair of vehicle	Yes/no
Vehicle downtime and replacement vehicle	Yes/no
New vehicle if written off	Yes/no
Reduced resale value	Yes/no
Leased vehicle life costs if written off	Yes/no
Increased insurance excess and premiums	Yes/no
Driver costs	**Recoverable/insured**
Loss of expertise	Yes/no
Personal injury compensation	Yes/no
Lost productivity due to injury absence	Yes/no
Replacement driver - overtime, temporary driver	Yes/no
Medical and welfare	Yes/no
Counselling	Yes/no
Reassessment and training	Yes/no
Third party costs	**Recoverable/insured**
Vehicle damage	Yes/no
Vehicle downtime and loss of earnings	Yes/no
Property damage	Yes/no
Personal injury compensation and rehabilitation	Yes/no
Hospital fees	Yes/no
Inconvenience	Yes/no
Disbursements including expert witnesses, police reports, post-mortem if fatality and GP notes or reports	Yes/no
Legal, court issue setting down and specialist report fees	Yes/no
Fines	Yes/no
Other costs	**Recoverable/insured**
Redelivery	Yes/no
Missed/late delivery penalties	Yes/no
Customer service/good will/missed sales	Yes/no
Damaged/lost stock	Yes/no
Own property damage	Yes/no
Investigation time	Yes/no
Management and administration time	Yes/no
Image/reputation/PR	Yes/no
Increased congestion	Yes/no
Extra tax to cover road safety improvements	Yes/no

5.3 Qualitative process issues

Fleet safety is a quality issue, and cannot be separated from 'good' planning, management and supervision. Qualitative issues focus particularly on the process as well as the outcomes of a program. Involving and observing participants are important features. Those involved in the program must be included in the evaluation of it, and the results must be fed back to them in a meaningful way as part of an on-going process of 'selling' and 'keeping the safety message alive'.

Most companies say 'we have a safety policy already'. Having a safety policy is, however, no more than a starting point, and is of very little use if planners, managers and supervisors do not believe in it

or implement it. You have to ‘do’ the policy, as well as just ‘have’ it. The way in which the policy is implemented is a qualitative process issue.

The effectiveness of training is a qualitative issue. Training must be needs based! The type and level of training is a qualitative issue. Often fleet safety training is focused on drivers, when in reality the knowledge, attitude and skills of managers, supervisors and schedulers are at least of equal importance.

A range of qualitative issues should be included when implementing and evaluating a fleet safety program. Typical examples are shown in Table 9.

Table 9 - Qualitative KPIs

Qualitative measures
Company systems and policies
Management attitude, processes and norms
Extent to which the organisation appears covered for OHS, COR and duty of care requirements
Employee opinion surveys about the general safety climate or specific programs
Employee turnover and difficulty in recruiting staff if you have a poor safety record
Employee involvement, morale and job satisfaction
Employee relations, absenteeism, time off work and stress/sickness levels
Anecdote, gut feel, experience, stories and ‘what the guys talk about in the locker room’
Vehicle fuel usage, care, sympathy, general wear and tear and quality of the fleet
Awards and industry recognition
Public relations (PR) business development and diversification issues
Reputation and social responsibility

Involvement of staff at all levels is a key issue in the success of any program. This involvement must take place when the program is being developed and is an important part of the evaluation process. Genuine involvement can help to improve employee relations, morale and job satisfaction, as well as improve crash reporting and reduce the amount of unreported damage. Other benefits can include increased vehicle sympathy, better fuel utilisation and some very positive PR and business development opportunities. As an extreme case, one transport company in the UK, which has approximately 2,000 vehicles, started to assess drivers after senior managers identified certain crash patterns in the fleet. This was so successful in saving fuel costs and reducing crashes that it built the program into its business development presentations and started doing external assessment programs for other organisations. Within two years this became one of the most profitable and high profile elements of its business.

Implementing a proactive and successful fleet safety program can often gain much more media coverage than any amount of planned business development activity. This helps in terms of developing new business, attracting and keeping more safety conscious employees and OHS protection. Internal publicity, inside the company through in-house publications such as newsletters, video, compact disc (CD), audio cassette, intranet, email and payslips is useful in focusing attention to the safety issue. At the opposite extreme, reacting to events such as a major crash will often mean trying to reduce the negative impact of a great deal of bad publicity. Table 21 shows how Shell attempt to structure and quantify this.

When added to the crash rates and costs discussed above, these more qualitative measures and issues help to make a very comprehensive and ongoing evaluation process. Further work on KPIs has been undertaken in the UK by Murray and Rand (2000) who identified the importance of both proactive and reactive indicators across 80+ UK fleets (Appendix 4). The more proactive KPIs listed should also be considered when evaluating the success of a program.

5.4 Summary

Overall, effective evaluation is a key element in the process of improving fleet safety. The crash rates, costs, and qualitative and proactive indicators discussed provide a range of options for evaluating risk management programs. These should be used and benchmarked regularly (weekly, monthly, quarterly and yearly), be easy to understand and as minimal as possible. Ideally, they should be visual, and wherever possible, positive. The results of the evaluation should be preventive rather than blame-based, be part of the ongoing risk management process, highlight further issues to be addressed and help to develop standards and targets for future actions.

6 Conclusions

6.1 Findings and summary of how the project aims were met

Aim 1, *'to identify the full extent and costs of fleet safety',* was to some extent achieved in Section 2. Four key reasons: societal; business; legal; and costs, were identified. These are important as they provide a great deal of justification to managers, organisations, public servants and government agencies wishing to allocate scarce resources to fleet safety. It is currently very difficult to reliably estimate the full extent and costs of work-related driving due to data limitations. At the macro level, data has to be drawn from several sources that are rarely linked nor have standard coding. **Data is fragmented between the transport agencies, compulsory third party (CTP) providers, workers compensation, OHS, hospitals and damage only comprehensive insurance.** Another problem is that the relevant government agencies are only now beginning to communicate and collaborate effectively enough for the collective benefit of the whole. Further, limited purpose of journey information is available to allow the full extent of the work-related road safety problem to be identified. As well as crash data, there is also only a limited amount of exposure data.

Aim 2, *'to develop an evaluation tool for fleet safety'* was achieved in Section 5. It suggests **focusing more widely than just crash outcomes, to include costs and more qualitative business (and societal)** gains. A range of indicators, including proactive pre-crash and more traditional reactive post-crash and cost/based KPIs have been identified.

Aim 3, *'to identify and evaluate a small number of best practice case studies'* was partially achieved. Many government and industry-led initiatives have been reviewed suggesting that initiatives at both the macro (government) and micro (organisational) level are important. It appears that some government agencies are doing more than others to provide guidance and to lead by example by managing their own fleets effectively. The evaluation framework described in Section 5 has only partially been applied to the cases. Research is ongoing in several of the organisations to develop this process further.

Aim 4 *'to develop a model of fleet safety'* was achieved in Section 4.2, which summarises the best practice ideas identified throughout the project. This advocates **understanding the extent of the problem, undertaking a detailed needs analysis using a range of techniques, applying the Haddon Matrix to develop and structure countermeasures for implementation and using KPIs for evaluation**.

Aim 5, *'to help invigorate and enthuse fleet safety in Australia'* is discussed in Section 6.4 below.

Based on these findings the following recommendations can be made at the macro and micro levels.

6.2 Recommendations

Several recommendations for action to be taken can be made at the macro and micro levels.

6.2.1 Macro level recommendations for policy makers

- The discussion in Sections 2.1.4 and Appendix 3.2.12 suggests that state level **purpose of journey data** should be recorded and coded on police crash report forms to allow a full understanding of the

extent of the problem. To date, only Queensland, where at least a quarter of road fatalities involve a commercial vehicle, appears to have any data in this area. Queensland Police and transport agencies in the UK are currently developing detailed structures for purpose of journey data based on the type of codes shown in Section 4.1.2. These could be used to guide the other Australian states. **Better exposure data** (such as vehicle types, distances and time of day) is also required. A partial starting point for this process would be to analyse the registration databases in each state to assess the extent of fleet ownership, although this only hints at vehicle use.

- If, as expected, the issue is as large in other states as in Queensland, fleet and work-related road safety should be **built much more extensively into long, medium and short-term road safety plans around Australia**, as well as the National Road Safety Strategy. Other agencies, particularly OHS/workers compensation (Section 3.6) and CTP insurance (Section 3.5), should be encouraged and supported to focus more attention on fleet safety in their strategies and programs. As a minimum standard the OHS agencies should investigate every work-related road fatality.
- Closer **links and collaboration between agencies** (and professional groups) is required, through inter-agency task groups, particularly between police, transport, insurance and OHS/workers compensation bodies. This should acknowledge that many on-road outcomes are the result of off-road decisions by a range of people in the transport chain. It will allow more integrated data recording and use (currently fragmented between OHS/workers compensation, CTP and comprehensive insurance), more thorough investigation, and better-coordinated and targeted improvement programs. These should cover areas such as developing safety cultures, applying OHS principles and laws, and employee well being (for example fatigue management, speed management and the use of drugs). The main barriers to this are the differences in approach of transport and OHS practitioners and the laws that govern them. Cooperation is required on both policy development and enforcement.
- One mechanism to achieve this that is worthy of more consideration is to extend the scope of COR (see Sections 2.2 and Appendix 3.4). Many of the recommendations put forward for heavy vehicles in the '*Quinlan Report*' (Appendix 3.4.1) and reforms being coordinated by the National Road Transport Commission (Appendix 3.4) also appear to be relevant to lighter vehicles. Another potential lesson from the heavy truck sector for light vehicles may be the role of accreditation schemes such as TruckSafe (Appendix 3.4.4), as an alternative mechanism for introducing cultural change in organisations.
- Given the substantial size of their fleets, more **government agencies should take a leadership role in the safe management of their own vehicles and drivers**. At present there appear to be several such initiatives in place, examples of which are described in Appendices 3.2 and 3.3. There is, however, no apparent mechanism to collect and share fleet safety data, to understand the extent of the Australian government vehicle safety problem, and implement best practice countermeasures. More work is required to understand the exact make up and management structures of the Government fleets in each state, and the extent to which they have fleet safety programs in place. This could include wider Government fleets such as the military and prison services.

6.2.2 Micro level recommendations for organisations and their management

The need for fleet safety improvement depends on a range of factors, including detailed cost trade-offs, which need to be considered on a case-by-case basis. Some organisations already appear to have a comprehensive range of OHS or insurance-led programs in place, while others do not. Typically, the

more dangerous areas of industry, such as petrochemicals, tend to be the most proactive, due to the serious consequences of safety failures involving those products (See Appendices 3.8 and 3.10.2). Other sectors can learn a great deal from them. Some government agencies have also recognised the leadership role that they should take in this area (Appendix 3.3). In Section 4.2 of the report, a process has been recommended based on understanding the need for a fleet safety program, and reviewing the current situation to develop appropriate countermeasures that should then be evaluated against an appropriate range of KPIs.

The managers or team that implement the process described in Section 4.2 will vary by organisation, but should include OHS workers. Senior management support is vital if operational managers, supervisors and work-schedulers are to make the necessary trade-offs between the needs of operations and safety. For fleet safety programs to be successful, a range of potential barriers (see Table 10) need to be identified and overcome.

6.3 Limitations of the report

No research is without limitations. In this case there are several.

- **Fleet safety data in Australia is fragmented** between the state transport authorities, the OHS/workers compensation agencies, CTP insurers, the comprehensive insurers and the fleets themselves. This means that it is a very difficult process to obtain and integrate the data and understand the full extent and costs of the problem. Even for individual fleets it can be difficult to integrate all these sources of data to gain a true picture.
- The research was only exploratory, and **relies heavily on 'what people have told us'** about what is often sensitive information. Only limited crash data has been published from the participating organisations. This means that the material is based on what people say, which may not always be exactly what they do. Most of the organisations reported on are very active in the fleet safety world, and very aware of the good PR and opportunities that being proactive in safety can bring. Focusing on prize winners for case studies leads to mainly working with good and PR orientated organisations. It is much more difficult to obtain information about poorer performing organisations or to provide a true 'warts and all' picture about the industry as a whole. Sometimes what is not said in interviews, or only after the tape recorder has been turned off is very important, but can rarely be fully captured and described in this type of report.
- None of the case studies undertaken utilised any detailed claims, maintenance or insurance industry data to identify appropriate countermeasures, for example, in relation to the types or locations of fleet crashes.
- The breadth of the subject areas covered means that some parts of the report lack depth, with several areas clearly requiring more analysis, validation or updating. Some of this work is already in process as part of more recent projects. Other elements would require substantial further funding and industry collaboration.

Overall this report can be seen to have further developed the level of knowledge and understanding about fleet safety in Australia, but it is clear that a great deal of work is still required.

6.4 Areas for further work

The following areas for further research have been identified. They are not presented in any specific structure or priority order, but as a list of ideas for further consideration.

- Continue undertaking initiatives to **enthuse fleet safety in Australia**. These should include promoting this report and publishing it in collaboration with other interested parties to ensure a wide circulation, integrating the material into refereed and industry journal papers, a book, conference papers, management courses, teaching programs, newsletters, internet-based resources and a media campaign.
- Work closely with the police and state transport agencies to develop a process and codes for collecting **purpose of journey data** to allow the full extent of the problem to be quantified. This is already at an advanced stage in Queensland. More exposure data on fleet tasks would also be useful.
- Work closely with the road safety, **CTP, OHS/workers compensation agencies and insurers** on fleet safety, including how they can improve and integrate data collection, coding and analysis, as well as the development of countermeasures. This should also focus on understanding the differences in legislation, systems, processes and procedures around Australia.
- Classify the fleet industry into sectors, including large and small fleets, so that countermeasures can be targeted and best practice shared. This will give a better idea about the times and distances driven and work undertaken by different types of workers. It will also help to understand how heavy vehicle safety initiatives, such as 'COR', stricter licensing, targeted driver assessment, recruitment and training, fatigue management and accreditation schemes may be applicable to light vehicle fleets. Reviewing the most recent progress of programs such as TruckSafe, Beyond the Midnight Oil, and COR, would support this process.
- Work closely with individual sectors, agencies, organisations and individuals to allow **targeted and needs-based approaches** to be developed based on the process described in Section 4.2. It is important to develop well evaluated best practice fleet safety case studies based on a detailed integration and analysis of all the available data sources. This could include organisations and fleets of all types, including the newly emerging accident management service providers, and should aim to evaluate the importance of the individual elements of fleet safety, as well as the overall process. This should focus on a wide range of key performance indicators, including the cost trade-offs between safety and operations.
- The **full costs and benefits of safety need to be quantified** and understood. What are the 'real' costs of crashes? What is the actual impact of safety features on vehicle resale values? How does investment in safety affect other areas of an operation? Does work safety really affect home safety and what are the real benefits of fleet safety for road safety in the wider community? What is the relationship between near hits, asset damage and human harm?
- Explore the **role and potential of agencies and industry lead bodies** such as the trucking associations, the unions, ATSB, NOHSC, National Safety Council of Australia (NSCA), NRTC, Insurance Council of Australia (ICA) and AfMA in developing more centralised Australia-wide approaches.
- Assess the potential for fleet safety issues to be put to the National Road Safety Strategy Panel. The Research Coordination Advisory Group (RCAG), which advises Austroads on road safety research projects, could be targeted.

- Review the growth in freight and passenger vehicles and the over-dependence on roads for transporting people and goods. Explore how such movements can be reduced and the likely impact on the road toll.
- Review the role of **driver training and education** in reducing work-related road trauma. This should aim to bring the training and research communities closer together and develop research programs that allow training and education to be effectively evaluated and where necessary improved. A detailed driver needs assessment, including physical, psychological, health and safety performance can help in this process. This could also include evaluating the differences between long and short distance driver fatigue and the impact of shift work, lifestyle and health issues on driver fatigue and crash involvement.
- Evaluate the role and successful implementation of ITS in fleet safety. More research is required to understand the safety benefits of ITS. If such benefits can be proved, how it can be effectively promoted to fleet buyers and the barriers to implementation and change will then need to be considered.

Several of these processes are already started or planned, but all require further research funding and support from Government and industry. The extent of the fleet safety problem identified in this report would suggest that it would be a very good use of some of Australia's road safety, OHS and business improvement research dollars.

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Appendices

Appendix 1 – Internet sites relevant to fleet safety

Site description	Site address
ACT Department of Urban Services	http://www.act.gov.au/urbanservices
Ambulance service fleet safety	http://www.ambulancedriving.com/
Australasian Fleet Managers Association	http://www.afma.net.au
ARRB Transport Research Ltd (formerly the Australian Road Research Board)	http://www.arrb.org.au
ATSB fleet safety issues	http://www.atsb.gov.au/road/indxf
ATSB fleet safety issues	http://www.atsb.gov.au/road/research/reshome.cfm
Brake – Pledge to drive safely	http://www.brake.org.uk
CARRS-Q fleet safety resources	http://www.carrsq.qut.edu.au/staff/murray.jsp
Dasfleet – Commonwealth fleet leasing company	http://www.dasfleet.com.au
Queensland Department of Employment and Training and Queensland Department of Industrial Relations	http://www.detir.qld.gov.au
Site on Drivers and Driver Behaviour	http://www.drivers.com
Easifleet – Western Australian fleet leasing company	http://www.easifleet.com.au/intro.htm
Fleet South Australia	http://www.fleetsa.sa.gov.au
FleetSafe report	http://www.fleetsafetysolutions.com/files/fleetsafe.pdf
Accident Research Centre, Monash University (MUARC)	http://www.general.monash.edu.au/muarc
MUARC vehicle use and purchasing policy	http://www.general.monash.edu.au/MUARC/carpolcy.htm
Full MUARC fleet safety report	http://www.general.monash.edu.au/MUARC/pub2000.htm
Summary of MUARC fleet safety report	http://www.general.monash.edu.au/MUARC/rptsum/es166.htm
TAC how safe is your car project	http://www.howsafeisyourcar.com.au
Work-related road safety task group in UK	http://www.hse.gov.uk/road/index.htm
University of Huddersfield fleet safety resources	http://www.hud.ac.uk/sas/transold/newsold.htm
Insurance council of Australia	http://www.ica.com.au
International Motor Carrier Audit Commission	http://www.imcac.com
Land Transport Safety Authority of New Zealand	http://www.ltsa.govt.nz/
Safe driving is good business - Forming a Safe Driving Policy	http://www.ltsa.govt.nz/commercial/safe-d-policy.html
NZ Land Transport Authority - A guide to new car safety	http://www.ltsa.govt.nz/vehicle-safety/safer-car/index.html
NSW Motor Accidents Authority	http://www.maa.nsw.gov.au

Report of inquiry into safety in the long haul trucking industry (Quinlan)	http://www.maa.nsw.gov.au/pdfs/quinlan_execsum.pdf
Motor Accident Insurance Commission	http://www.maic.qld.gov.au/
Road Safety Research, Policing and Education Conference November 2001, Melbourne	http://www.monash.edu.au/oce/roadsafety
National Occupational Health and Safety Commission	http://www.nohsc.gov.au/
National OHS Strategy 2002-2012	http://www.nohsc.gov.au/nationalstrategy/default.asp
National Road Transport Commission	http://www.nrtc.gov.au
NRTC Road Transport Reforms	http://www.nrtc.gov.au/progress/reforms1.asp
Northern Territory Department of Infrastructure, Planning and Environment	http://www.nt.gov.au/dtw/aboutus/branches/transport/roadsafety
Northern Territory Road Safety Council	http://www.nt.gov.au/ipe/dtw/aboutus/branches/transport/roadsafety/council/index.shtml
National Transport Insurance	http://www.nti.com.au/
New Zealand Automobile Association (NZ AA) Driver Education Foundation	http://www.nzaa.co.nz/
Occupational Road Safety Alliance in UK	http://www.orsa.org.uk/
Occupational Safety and Health Act	http://www.oshabulletin.com/index.html
Safety Attitude Scales - People and Quality Solutions Pty Ltd, organizational and industrial psychologists	http://www.paqs.com/armq_sas.html
NSW parliament	http://www.parliament.nsw.gov.au/
Queensland parliament	http://www.parliament.qld.gov.au
Travelsafe Committee	http://www.parliament.qld.gov.au/Committees/travel.htm
Travelsafe Committee – Symposium: Work-related road trauma and fleet risk management in Australia	http://www.parliament.qld.gov.au/Committees/TSAFE/TSAFEWorksymposium.htm
Road Accident Research Unit – Adelaide University	Http://www.raru.adelaide.edu.au/library/index.html
Queensland Transport Workplace Fleet Safety System	http://www.roadsafety.net/WORKPLACEFLEET/workplace.html
UK Royal Society for the Prevention of Accidents – Practical Aspects of Managing Occupational Road Risk seminar	http://www.rospa.com/morr/
UK Royal Society for the Prevention of Accidents	http://www.rospa.org.uk/CMS
New South Wales RTA - leading to the Road Safety Branch	http://www.rta.nsw.gov.au
NSW Heavy Vehicle Handbook	http://www.rta.nsw.gov.au/licensing/heavyvehiclehandbook2001.pdf
NSW Fleetsafe	http://www.ipwea.org.au/papers/download/Phil%20Sochon.doc
WorkSafe WA, Safe movement of vehicles at workplaces	http://www.safetyline.wa.gov.au/PageBin/guidswwa0065.htm

Queensland Road Safety Action Plan 2000-2001, Queensland Government/Transport	http://www.transport.qld.gov.au/home.nsf/driving/strategy
National Safety Council of Australia	http://www.safetynews.com
Safety Institute of Australia	http://www.sia.org.au
Safety Transportation Services, Inc. is a Fleet Safety Management company	http://www.stsny.com
Queensland Transport heavy vehicle projects	http://www.transport.qld.gov.au/home.nsf/driving/heavyvehicles
Review of taxi driver remuneration and conditions of work	http://www.transport.qld.gov.au/home.nsf/images/public/$file/Reportfinal.pdf
Road Safety Research, Policing and Education Conference November 2000, Brisbane – fleet papers	http://www.transport.qld.gov.au/qt/driver.nsf/index/conference_fleet
Queensland Transport	http://www.transport.qld.gov.au/safety
Transport SA	http://www.transport.sa.gov.au
Tasmanian Department of Infrastructure, Energy and Resources, Transport	http://www.transport.tas.gov.au/services/road_safety
Western Australia's Office of Road Safety	http://www.officeofroadsafety.wa.gov.au/
Western Australia's Office of Road Safety fleet safety policy guidelines	http://www.officeofroadsafety.wa.gov.au/facts/fleet_policy/
Insurance Commission of Western Australia - Conference on road safety 1999	http://www.transport.wa.gov.au/roadsafety/Facts/papers/contents.html
Road Safety directions for government agencies and the Private Sector	http://www.transport.wa.gov.au/roadsafety/Facts/way_ahead/index.hml
WA road safety manual for employers	http://www.transport.wa.gov.au/roadsafety/Facts/workplace/workbook/index.html
Western Australia Road Safety Council	http://www.transport.wa.gov.au/roadsafety/index2.htm
Truck and bus news	http://www.trucknbus.com.au
Australian Trucking Association and TruckSafe	http://www.trucknbus.com.au/ata/
VicRoads Road Safety	http://www.vicroads.vic.gov.au
US SafeStat Safety Rating Methodology	http://www.fmcsa.dot.gov/rulesregs/fmcsr/regs/385appb.htm
American Trucking Association	http://www.truckline.com/safetynet/
Labour Ministers' Council's - Comparison of OHS arrangements in Australian jurisdictions	http://www.workplace.gov.au/DEWRSB/WP/Content/Files/WP/WR/Publications/CPMReport0802OHSComparison.pdf

Appendix 2 – 'Fleet' workers compensation claims 2000-2001

Queensland employee injury and disease data 2000-01 for vehicle accidents on duty, sorted on occupation by total payments, work days absent and number of claims.

Occupation	Payments	% of payments	Work days absent	% of days absent	No of claims	% of claims
Heavy truck driver	3,328,339	33%	10,588	26%	184	11%
General farm hand	869,617	9%	4,516	11%	85	5%
Police officer	429,297	4%	831	2%	86	5%
Unknown/not stated	373,519	4%	1,533	4%	99	6%
Intensive care ambulance paramedic	344,822	3%	4	0%	4	0%
Commercial cleaner	339,517	3%	312	1%	17	1%
Bulldozer operator	272,025	3%	256	1%	6	0%
Labourers and related workers	250,777	2%	1,341	3%	57	3%
Miner	243,060	2%	585	1%	48	3%
General manager	168,696	2%	520	1%	18	1%
Bus driver	164,525	2%	917	2%	29	2%
Construction assistant	140,381	1%	514	1%	9	1%
Forklift driver	137,195	1%	865	2%	23	1%
Delivery driver	136,304	1%	951	2%	56	3%
Aircraft pilot	117,178	1%	158	0%	3	0%
Motor mechanic	104,990	1%	811	2%	26	2%
Fitter	96,550	1%	279	1%	16	1%
Mobile plant operators	84,093	1%	367	1%	14	1%
General clerk	77,638	1%	355	1%	44	3%
Garden labourer	72,512	1%	586	1%	10	1%
Storeperson	65,642	1%	456	1%	43	3%
Primary school teacher	62,966	1%	297	1%	20	1%
Loader operator	61,801	1%	309	1%	11	1%
Registered nurse	61,730	1%	327	1%	19	1%
Personal care assistant	59,513	1%	454	1%	12	1%
Paper products machine operator	59,091	1%	238	1%	1	0%
Sales representatives	57,143	1%	309	1%	18	1%
Furniture removalist	55,372	1%	384	1%	5	0%
Motor vehicle licence examiner	53,054	1%	245	1%	8	0%
Medical laboratory technical officer	52,940	1%	284	1%	5	0%
Tour guide	51,306	1%	238	1%	4	0%
Nursing assistant	49,892	0%	355	1%	5	0%
Shop manager	49,331	0%	438	1%	5	0%
Secretary	46,308	0%	374	1%	5	0%
General plumber	45,565	0%	183	0%	7	0%
Construction rigger	43,199	0%	64	0%	1	0%
Other hospitality and accommodation managers	42,772	0%	0	0%	2	0%
Data entry operator	41,638	0%	392	1%	3	0%
Excavator operator	40,838	0%	32	0%	1	0%
Carpenter	39,612	0%	187	0%	2	0%
Road roller operator	39,252	0%	412	1%	4	0%
Apprentice carpenter	39,195	0%	382	1%	4	0%
Receptionist	37,215	0%	232	1%	8	0%
Other	1,265,832	12%	7081	18%	655	39%
Total	10,172,242	100%	39,962	100%	1,682	100%

Appendix 3 – Work-related road safety review

3.1 Parliamentary road safety committees

Six parliaments in Australia and New Zealand have committees whose work focuses on transport and road safety.

- House of Representatives Standing Committee on Transport and Regional Services.
- Joint Committee on Transport Safety, Parliament of South Australia.
- Road Safety Committee of the Parliament of Victoria.
- Transport and Industrial Relations Committee of the Parliament of New Zealand.
- Joint Standing Committee on Road Safety (Staysafe) of the Parliament of New South Wales.
- The Select Committee on Travelsafe of the Parliament of Queensland.

Of these, the last two, Staysafe and Travelsafe, appear to have been the most active in the area of fleet safety.

'Staysafe Report 36: drivers as workers, vehicle as workplaces – issues in fleet management' was based on a seminar held at Parliament House in Sydney during April 1996. It included 24 papers under the sub-headings of 'issues in work-related driving', 'policies and systems', 'issues in driver training', 'insuring the occupational driver', and 'specific examples'. It was commissioned because of an 'information gap' in this area and because of uncertainty about the efficacy of post-licence acquisition countermeasures to improve driving. Each of the papers was reviewed in detail and many are referred to below. Overall Staysafe36 covered a range of road safety and OHS issues, and can be seen as a very important starting point for many of the current fleet safety initiatives in Australia, including the FORS *'Fleet safety manual'*, the FleetSafe program (Appendix 3.3.3), Queensland Transport's Workplace Fleet Safety System (Appendix 3.2.4), the MUARC report (Appendix 3.2.1), the impetus for the Fleet Safety Forum and a range of other programs.

One of the Staysafe36 papers (Wheatley 1997) described the development of the *'Fleet safety manual'*, which aimed to improve corporate road safety by putting it on the management agenda. Another Staysafe36 paper (Elliot 1997) described the consultation survey that identified strategies currently in use. The main countermeasures identified were reporting, recording and analysis of crash data, driver orientated strategies, fleet safety policies, and vehicle orientated strategies.

The *'Fleet safety manual'*, developed in 1996, covered the following areas.

The manual has nine sections, and clearly influenced the structure and content of more recent programs such as FleetSafe (see Appendix 3.3.3) and Queensland Transports Workplace Fleet Safety System (WFSS) (see Appendix 3.2.4).

1. Introducing a fleet safety program, securing management commitment and obtaining the resources necessary for implementation.
2. Driver selection.
3. Driver induction.
4. Vehicle selection.

5. Driver education and training.
6. Incentive/disincentive schemes.
7. Crash reporting.
8. Crash investigation.
9. Crash databases.

Wheatley (1997) also covered ways to evaluate the success of a fleet safety program, particularly comparing scientific methods with more typical corporate bottom-line approaches. He suggested fleets should focus on vehicle selection, seatbelt use, alcohol and speed for the following reasons.

1. Specifying as many safety features as possible, particularly airbags and anti-lock braking systems (ABS), improves safety and increases vehicle resale values. (No data was provided to verify this). High-risk drivers, particularly young males, should have the lowest risk, least powerful vehicles.
2. Even though 95% of Australians wore seatbelts in 1994, a quarter of car occupant fatalities were not wearing a seatbelt. Employers should ensure that employees always wear their seatbelts to reduce their exposure to harm and the business to increased costs.
3. Employers should focus on the effects of alcohol and the importance of a company policy to discourage drink driving, and the morning after effect.
4. Business travellers are suspected of driving too fast, suggesting that employers should try to get messages about the dangers of speed across to their drivers.

Wheatley (1997) concluded that all employers should focus on these four areas in their driver training to help improve employee safety. This can have a major impact on a company's profitability and can be used as a business development tool. He advocated discussion groups, based on the Swedish Televerket approach, as an implementation tool to address culture and awareness, and to get drivers focused. He felt that discussion groups should then be encouraged to evolve into action groups.

Further research was undertaken on the '*Fleet safety manual'* to evaluate how well it has been taken up and used. The Federal Office of Road Safety (FORS) in the former Department of Transport released the *'Fleet safety manual'* in May 1996 under the banner 'Fleet safety - cutting the cost of doing business'. The media release for its launch described it as 'Australia's first fleet safety manual, which aims to improve safety in company fleets, cut business crash costs, save lives and livelihoods, and contribute to reductions in Australia's road toll'.

FORS is now part of the Australian Transport Safety Bureau (ATSB), a division of the Department of Transport and Regional Services, and the manual is sold through NSCA and AfMA. The ATSB Annual Review 2000 (ATSB 2000) suggests that there is a growing interest in the potential road safety benefits of workplace-based fleet safety programs, but no mention is made of the role or success of the *'Fleet safety manual'*. According to Hemsworth (2000) no evaluation has been undertaken, other than that approximately 1,500 copies have been sold.

Several attempts were made to evaluate the success of the FORS manual as part of this project. The original authors are no longer involved with it and no database of purchasers has been maintained. AfMA agreed to circulate a survey to its members who had purchased it, however no responses were received. Although these evaluation attempts failed, it appears that the manual has been used as a template to guide several of the more recent initiatives described in this report, particularly FleetSafe,

the Queensland Transport Workplace Fleet Safety System, and an internet-based fleet safety policy in Western Australia (www.transport.wa.gov.au/roadsafety/Facts/fleet_policy/index.html). Two of its nine elements, driver training and driver incentives, have both received some criticism in more recent years.

As a follow up to Staysafe36, and to coincide with a meeting of the Fleet Safety Forum described below, the Staysafe Committee and Australian College of Road Safety organised a fleet safety seminar in February 2001. Speakers described the FleetSafe program (Holgate and Sochon 2001), Lumley Insurance programs (Gialantzis 2001), the Swedish Televerket study (Gregersen 2001) and the potential to extend the Haddon Matrix to include purpose of journey information (Faulks 2001). A Staysafe report about this event is due for publication during 2002.

In Queensland, the Travelsafe Committee, Queensland Transport, the Department of Industrial Relations and CARRS-Q hosted a symposium on work-related road trauma and fleet risk management during August 2001, again to coincide with a meeting of the Fleet Safety Forum. A wide range of issues were covered and after the symposium the Travelsafe Committee made the following three recommendations in its report to the Queensland Parliament (Travelsafe34 2002).

1. The Queensland Police Service examines the feasibility of police officers collecting purpose of journey data for people involved in crashes.
2. Queensland Transport includes initiatives in the Queensland Road Safety Strategy and Action Plan that are specifically designed to address work-related road trauma.
3. The Division of Workplace Health and Safety, Department of Industrial Relations, in collaboration with Queensland Transport, implement measures to address and reduce work-related road trauma. These measures may include targeted safety campaigns, promoting the development of risk management strategies and the development of codes of practice where relevant.

To date, some progress has been made on the first two of these. Recommendation three is currently ‘under consideration’ by the relevant agencies. Several of the symposium participants have also made progress in developing fleet safety policies and programs in their own organisations.

The full proceedings from the symposium, Travelsafe34 and ministerial responses are linked on the internet at www.carrsq.qut.edu.au/staff/murray.jsp

3.2 Fleet Safety Forum members

Several of the state governments around Australia have been active in developing fleet safety programs. The ATSB Annual Review (2000) described the recently formed Fleet Safety Forum, which aims to facilitate the cooperation and coordination of effort in fleet safety. Its members include Queensland Transport, NSW Roads and Traffic Authority, Australian Capital Territory (ACT) Department of Urban Services, VicRoads, Transport Accident Commission (TAC), Tasmanian DIER, Transport South Australia, Western Australian Department of Transport, Northern Territory Land Transport Safety Authority, ATSB, the New Zealand Land Transport Safety Authority (LTSA), MUARC and CARRS-Q. Fleet safety initiatives by each member are discussed below based on the literature, an internet search, communication with members of the Fleet Safety Forum involvement in three of its five meetings to date.

Coxon (2001) summarised the first meeting of the Fleet Safety Forum as being focused on the MUARC Report described in Appendix 3.2.2 and the selection of safer vehicles. The second meeting focused on vehicle crashworthiness, policies that could be instigated across government, council and private fleets, a code of practice on fleet safety issues, and the need for good fleet operator case studies. Initiatives from more recent meetings are described on a participant by participant basis below.

Discussion with Versey (2000) and Sochon (2001) suggests that the Fleet Safety Forum was originally established as an informal group of road safety individuals from across all the state and territory governments together with others from national bodies, university research bodies and major companies. The members meet six monthly to discuss matters of mutual interest and share ideas. The Forum first met in 1999 and has the following objectives.

- Share information on developments in fleet safety and recent actions.
- Communicate ideas and data to avoid duplication of effort.
- Identify common issues at state and federal levels and examine improvement opportunities.
- Evaluate fleet safety issues around Australia.
- Evaluate the impact of changes to OHS and other workplace issues.

Initiatives in each state are discussed below. They are not shown in any specific order.

3.2.1 Victoria

Four main Victorian initiatives were discussed.

First, Royal Automobile Club of Victoria (RACV), TAC, VicRoads and MUARC are working together on fleet safety. VicRoads has analysed the crash data from its own fleet and has developed a safe driving policy, implemented by all the key agencies and seen as a model for other organisations. Victorian studies suggested that the OHS worker is a key champion in making driver education work in business. A pilot study involving a spread of organisations fed into the following safer driving resource kit.

- The *'Safer driving manual'*.
- Videos on workplace road safety, vehicle selection and fatigue.
- Fact sheets on drink driving, fatigue, speed, mobile phones, vehicle purchasing, road rules, restraints, partying, fuel efficiency and pedestrian safety.
- Simple crash data software and an interactive CD.

The manual has the following sections.

1. Financial, injury, insurance, legal, PR and community reasons to have a safe driving policy.
2. Three steps (identify key people, target key organisational issues and gather support) to develop a safer driving policy.
3. Four steps (launch, educate, maintain awareness and monitor) to implementing a safer driving policy.
4. Evaluation (collate vehicle and driver data, analyse claim data, impact of policy, change, targeting and impact of wider road safety trends).

Train-the-trainer work is progressing aimed at OHS staff with VicRoads internet-based support and a SafeCar internet site has been developed by TAC.

Second, from a Victorian OHS perspective, Batchelor et al (1999) presented work-related fatality data and countermeasures based on research undertaken in collaboration between the Victorian WorkCover Authority and the Victorian State Coroners Office. Their paper described the data collected and collated from these different sources.

Initially they used 1993/4 as a pilot study before extracting data from each source and merging it into one database for the period 1993/4 to 1996/7. This database included 332 relevant work-related fatalities, of which 58 (17.5%) were heavy truck drivers, over half of which were in single vehicle incidents. When analysed against deaths per 100,000 workers the results were: truck drivers (33.3), behind farm workers (104.9), air transport professionals (101.4) and labourers (36.1).

Third, WorkCover Victoria is involved with TruckSafe and the Transport Industry Safety Group along with the Victorian Transport Workers' Union, the Victorian Transport Association (VTA), the Bus Association of Victoria, VicRoads and the Police. The group was established to develop and facilitate an industry approach to OHS following coronial inquests in relation to fatalities in the transport industry. One output was its 1997 *'Transport industry guide to meeting the OHS duty of care'*. This is an advisory document providing information and guidance on OHS matters for employers and employees involved in the transport industry to encourage their ongoing commitment towards health and safety and allow them to meet their duties under Section 21 and Section 25 of the OHS Act. It includes sections on management, policy, auditing, reporting and investigation, health and safety committees, training, occupational health, managing contractors, and compliance. VTA has since developed this further through an OHS program, TransCare, which focuses on prevention, safety auditing and benchmarking.

Fourth, Batchelor et al (1999) mentioned that fleet vehicles, such as taxis, showed up in their data with similar problems to heavy vehicles, but that WorkCover had not targeted these drivers due to their diverse nature. They discussed 'struck by moving object' accidents, most of which involved vehicles, and suggested this is an important area, where there are few existing standards. WorkCover is currently developing a range of countermeasures.

From a process perspective, their paper showed the importance of combining data on work-related fatalities from several sources and the need for improved liaison between different agencies. Further discussion with Batchelor (2001) identified reversing truck accidents, falls from high trucks and fatigue related safety among 'professional' (truck, taxi and courier) drivers as key issues.

3.2.2 MUARC report/policy on fleet safety and vehicle selection

Haworth et al (2000) investigated the potential to introduce road safety based initiatives into the corporate environment. The Victorian Fleet and Corporate Road Safety Working Party commissioned the MUARC report in response to an increasing awareness of work-related crashes and the need to implement casualty reduction programs likely to be well accepted in the business environment. Its scope was limited to light commercial vehicles and cars over which a business has some degree of influence.

A literature review identified a large number of references to fleet safety in industry magazines but relatively few references in the scientific literature. Crash reduction countermeasures were structured under the following headings.

1. Fleet safety guidelines developed by road safety organisations.
2. Driver selection and induction procedures.
3. Vehicle selection.
4. Driver training and education.
5. Driver management.
6. Incentives and disincentives.
7. Company safety programs.

From the literature Haworth et al concluded that four fleet safety countermeasures had potential, based on available examples that had been successfully evaluated.

1. Selecting safer vehicles including crash tests, ABS, airbags, alcohol ignition interlocks, intelligent speed limiters, anti-whiplash, daytime running lights (DRL).
2. Some particular driver development programs (including the Swedish Televerket case).
3. Incentives.
4. Safety programs in companies with a safety emphasis as part of their quality systems.

The report cited the following evaluation data.

- Seatbelt interlocks could reduce occupant fatalities by 20%.
- The most crashworthy cars are 60% safer than the average car.
- Heavier cars are safer for occupants (if not other road users).
- Safer vehicles have higher resale values (although no data was provided in evidence) and improve the overall Australian vehicle fleet.
- Side airbags and anti-whiplash protection might add benefits of 5-25%.
- Daytime running lights have a benefit to cost ratio of 3.3-5.7 to 1.

Griffiths (1997) also focused on vehicle selection, particularly the safety and cost benefits of purchasing safer vehicles, which he saw as an integral part of a model safe driving policy. He argued that employers should foresee human failure. Safer vehicles do not require any behavioural change, which is much easier than trying to change people. He suggested that fitting airbags can give a 10-25% reduction in injuries and concluded that the RTA model package for the selection of safe vehicles and equipment could benefit both fleet operators and individual buyers. Overall, Griffiths recommended the following countermeasures for fleet managers.

- Setting a target of zero disabling injury crashes, based on Vision Zero.
- Using NCAP and driver protection rating figures to specify vehicles.
- Assessing vehicles from a pre-crash, at-scene and post-crash perspective. Pre-crash countermeasures include high mounted rear centre brake lights, daytime running lights,

remote control mirrors and cruise control. At-scene factors include good crashworthiness, airbags and head restraints. Post-crash factors include easy opening doors.

- Daytime running lights are a low cost countermeasure predicted to reduce crashes by 6%.

Griffiths focused mainly on injury rather than crash prevention. There is, however, some evidence that the safety benefits of vehicle features may not be fully realised due to changes in driver behaviour that may inadvertently increase crash involvement (Wilde 1995). This suggests the need for more evaluation of existing vehicle selection programs and for fleet safety to focus on wider issues than vehicles and injuries alone.

The second part of the MUARC report reviewed fleet safety research in Europe, and identified the following possible countermeasures.

1. Fleet safety as part of quality management or an integrated set of measures based on organisational safety culture and OHS.
2. Vehicle specification.
3. Linking road safety and environmental initiatives.
4. Ensuring the quality of outsourced transport as well as the use of owned vehicles.
5. The rated crashworthiness of vehicles, rather than a specific list of safety features.
6. Government fleets should be addressed to show leadership as part of vision zero.
7. Collaboration between government, insurance companies, OHS agencies and companies.
8. Raising industry awareness of crash costs and insurance premiums.
9. Concentrating on key issues such as drink driving, speeding, fatigue and seatbelts.
10. Voluntary safety circles in which employees discuss critical points and devise solutions.
11. Driver training programs.
12. Incentive schemes and penalties.
13. Accident reviews.
14. Driver monitoring systems and driver feedback.

It was concluded, however, that evaluation of the effectiveness of these fleet safety initiatives is rarely published so it is difficult to measure their effect.

The third part of the MUARC report involved telephone interviews with nine corporate organisations, mainly identified as winners of AfMA safety awards.

The main countermeasures described in the case studies were driver induction, training and assessment, handbooks, stickers, safety committee, crash and violation data analysis, work instructions, vehicle safety features, driver discussion groups, newsletters, random safety and car condition checks, competitions, incentives, safety articles circulated, post-incident investigation, link to OHS, licence checks and supervisor sign-off for use of vehicles.

The main evaluation measures described were training outcomes, top management support, insurance claims, ‘dints and scratches’, costs, insurance premiums, vehicle resale values, numbers of speeding and other violations, at-fault crashes and comparison to Lumley benchmarks.

Overall, several conclusions were based on the interviews.

- Fleet driver management varies. Some companies are changing the content of driver training programs from attempting to improve skills to focusing on improving attitudes and reducing risks.
- The move to maximise resale values has led to vehicle care programs and consideration of the resale implications of safety features, although this was not quantified.
- There is a general emphasis on counting crashes and repair costs rather than injuries. Many organisations do not appear to count the hidden costs of crashes such as lost time and productivity.
- Fleet safety programs are often undertaken in response to a period of poor performance or the interest of someone in management. There are very few evaluations published, even by best practice companies. Benchmarking is one of the few examples of evaluation, but only hints at why some organisations may have lower crash rates.

Lack of evaluation was a recurring theme throughout the report. Some of the cases did contain good process, cost and quantitative evaluation data, but there do not appear to be any standard ways to record/compare it. This suggests the need for more work to be undertaken to develop a realistic framework and KPIs for fleets to evaluate the long term effectiveness of their safety initiatives (see Section 5).

Finally, Haworth et al (2000) reviewed OHS in Victoria. Vehicles are workplaces, and as such their use must be safe and without risks to health. There is often a 'gap', however, between those responsible for fleet management and OHS within organisations, which can manifest itself in the lack of attempts to integrate them. Fleet and OHS managers must work more closely together to ensure that fleet safety is not neglected. Current OHS legislation in Victoria allows considerable opportunity for promotion of best practice injury prevention measures, but enforcement is limited.

More recently MUARC has focused on quantifying the additional benefits that derive from fleet safety. For example, there are potential fuel savings and environmental benefits. This includes an ATSB study linking driving style and fuel economy (Haworth and Symmons 2001). In preliminary case study findings fuel efficiency is about 10% less for more crash involved drivers, meaning that crash involved drivers are also inefficient drivers fuel-wise. Poor data quality and limited availability, however, were issues in this study.

Another Monash University research project, being undertaken in the Department of Epidemiology and Preventative Medicine, aims to evaluate model systems for corporate fleet vehicle management in light vehicle fleets. The focus is on occupational driving being a work-related issue rather than simply a road safety one. It will cover policy related to occupational fleet safety; what legislative objectives support the policy; how these are met; how trauma is identified in fleet safety, and what data collection systems underpin injury prevention and management in this field. The focus is on developing a better understanding of the realities of making fleet safety an OHS issue in Victoria.

MUARC has also been highly proactive in implementing its own vehicle use and purchasing policy (www.general.monash.edu.au/MUARC/carpolcy.htm). The policy is based on a wide review of vehicle safety issues and aims to maximise safety and minimise environmental impact at lowest possible cost, without causing a negative impact on operations. It lists a range of mandatory, highly desired, environmental and economic requirements. Active safety features to help reduce the chances of a crash

and passive safety features designed to prevent or minimise injury to the vehicle's occupants in the event of a crash are both included. It also covers speeding, non-aggressive driving, alcohol, driving when fatigued, mobile phones, daytime running lights, employees own vehicles, and use of rental cars and taxi companies. It does not cover crash or near hit reporting and recording nor how they will measure and evaluate the effectiveness of the policy.

3.2.3 Western Australia

Western Australia appears to have been one of the more proactive states in developing fleet safety, with several internet-based resources available at www.transport.wa.gov.au/roadsafety, by clicking on 'road safety topics' and scrolling down to 'road safety in the workplace'.

In 1997, Main Roads WA used external consultants to develop a driver safety system. It covered the introduction of a fleet safety program, driver selection and hiring, driver induction, vehicle selection, driver training and education, incentives and disincentives, crash reporting, crash investigation, system design, and implementation. No information is available about how it went, the extent to which it was implemented, whether it has been evaluated, or its current status.

The 1999 Insurance Commission of Western Australia conference on road safety included three papers on corporate road safety by Ahem who focused on safety culture and change, Anderson and Plowman who described the WFSS and Stewart-Bogle who focused on the extent and costs of the problem (www.transport.wa.gov.au/roadsafety/Facts/papers/contents.html).

Western Australia's inter-agency Road Safety Council has set up a Workplace Road Safety Task Force chaired by WorkSafe WA. Its policy document for a whole of government response to fleet safety is currently being developed. Transport Western Australia's internet site provides advice to fleets on setting up a safe driving policy (www.transport.wa.gov.au/roadsafety/Facts/fleet_policy/index.html). It covers reasons for developing a policy, policy focus, policy components, target areas and some other considerations.

The taskforce meets quarterly and members include representatives from Worksafe, the Insurance Commission of Western Australia, the Office of Road Safety, and various businesses. Its first output was a manual aimed at fleet OHS managers and a Chief Executive Officer (CEO) booklet released at a series of business breakfasts. The full manual is accompanied by a brief guide and summary document, called '*Road Safety in the Workplace for company cars and light vehicles'* (WA 2001), and is aimed at fleets of 5-50 vehicles. It covers the extent of the problem, legal issues, elements of fleet safety and a range of case studies. It fits the vehicle very much into an OHS framework. Seven generic elements of workplace road safety were 'borrowed' from the Queensland Transport and FleetSafe systems described below (www.transport.wa.gov.au/roadsafety/Facts/workplace/brochure/index.html).

WA (2001) described the cases of award winners Woodside, Alinta Gas, BHP, Hamersley Iron and Telstra. The first four involved dangerous products or locations. It is common for these types of organisations to have strict OHS driven polices due to the nature of the product or environment. Countermeasures described focused on policies, data analysis, driver training and assessment, 1800 phone number stickers, drug and alcohol programs, fatigue management, vehicle inspection and maintenance, purchasing, safety equipment, incident follow up, journey and route management, the involvement of staff in safety committees and management accountability. Some, but not all of the cases provided evaluation data.

Other initiatives in WA are described on its excellent road safety internet site, including '*The way ahead'* (www.transport.wa.gov.au/roadsafety/Facts/way_ahead/index.html) and WA Worksafe's promotion of safe vehicle use at workplaces (www.safetyline.wa.gov.au/pagebin/guidwswa0065.htm).

3.2.4 Queensland

Queensland Transport has been proactive in trying to help fleets to improve their safety performance and has collected crash and injury data to identify the extent of work-related crashes. Its Workplace Fleet Safety System (WFSS) was developed to assist organisations that employ people who drive vehicles as part of their jobs. The system and the reasons for its implementation have been described in their publications (Queensland Transport), at recent conferences (eg Anderson and Plowman 1999) and on the internet (www.roadsafety.net/WORKPLACEFLEET/workplace.html).

The WFSS adopts a 'quality management' approach and was implemented to contribute to an overall road safety benefit for the community, as well as save participants money. Queensland Transport describes it as a hands-on system for increasing safety levels for employees and reducing injury. It provides a practical guide to best practice fleet safety in Queensland. The WFSS is based on the Australian Standard Australian/New Zealand International Standard Organisation (AS/NZ ISO) 9001:1994 Quality Systems Model. It incorporates three main resource booklets.

1. How to Conduct a Self-Audit: a guide to the seven elements of best practice fleet safety.
2. Self-Audit Workbook: a checklist for conducting a fleet safety audit in an organisation.
3. Achievement Application books to allow participants to apply for Bronze, Silver or Gold recognition from Queensland Transport after completion of the WFSS.

Anderson and Plowman (1999) described the development of the system and its seven elements based on a literature review, discussion with fleet operators and a questionnaire to 300+ organisations. Over 150 organisations responded to the survey, the results of which showed that most organisations had an ad hoc approach to fleet safety. Many participants wanted assistance from Queensland Transport, with 80% responding that they would welcome and use information that could improve their fleet safety. The culmination of this process provided the framework for the WFSS which drew heavily on the SafetyMap self-audit approach developed by the Victorian WorkCover Authority. The plan is for organisations to use the workbook to record their performance standards and outline strategies for improvement.

The workbook contains seven elements for best practice fleet safety, all of which are discussed further in the workbook and audit guide (Queensland Transport) and by Anderson and Plowman (1999).

1. **Fleet safety policy**: includes fleet safety policy in organisational policy and objectives.
2. **Recruitment and selection**: hire drivers based on safe driving records and safety awareness.
3. **Induction programs**: induct all new recruits and supervisors using a fleet safety program.
4. **Fleet selection and maintenance**: adhere to best practice in fleet selection and maintenance.
5. **Vehicle crash involvement**: Maintain an efficient system of recording and monitoring overall fleet, individual driver and individual vehicle crash involvement.
6. **Incentives and disincentives**: recognise good/bad performance through a commensurate scheme.

7. **Training and education**: Support safe driving training, education and development programs.

Overall, the program has gained a great deal of kudos for Queensland Transport, who has presented the results widely at a range of transport, fleet and safety conferences around Australia. According to Anderson (2000), the take-up rate for the self-audit books has been reasonable with over 350 organisations - many from outside Queensland - requesting the system. So far, however, no fleet has been completely through Queensland Transport's accreditation process. Feedback received from organisations has been that they were not implementing the system as a whole but were using various sections important to their organisation.

Main Roads has recently been supported through the process. Several meetings have been held to audit Main Roads against the bronze level of WFSS, discus some of the issues it has with fleet safety and what it sees as the priorities to improve. Elements that participating managers have direct control over or previous knowledge of are relatively quick and easy, those that cross into other areas or departments are more complex. Queensland Transport is currently considering Main Roads application for Bronze level accreditation, which has been discussed further by Smith (2002).

Murray, Anderson and Clements (2001) reported on a Queensland Transport and CARRS-Q hosted fleet safety workshop for those organisations that had requested copies of the Fleet Safety Workbooks. It was attended by over 40 managers from a range of government, industrial and other organisations and was intended to evaluate the WFSS to date and help to develop it further. This established that while the Workbooks were useful documents, they were difficult to implement by just one person and required a multi-functional team approach.

Most seminar participants admitted some scope for improvement of their own policies and performance. Management time and resources were highlighted as the main barriers to action, although the participants committed themselves to a range of activities, such as building fleet safety into their general OHS policies, meetings and minutes. A full report on the seminar is available on the internet at www.carrsq.qut.edu.au/staff/murray.jsp.

In the heavy truck sector, Queensland Transport has been proactive and has worked closely with the National Road Transport Commission (NRTC) in developing a fatigue management program and applying Chain of Responsibility regulations, particularly on vehicle overloading (see Appendix 3.4). It is also working closely with the Queensland OHS agencies on heavy truck initiatives.

3.2.5 CARRS-Q

CARRS-Q has undertaken several fleet safety projects, particularly focusing on the extent of the problem of work-related road safety and how to make improvements. Some specific projects are listed below.

- Using insurance claims data for risk management purposes (Murray 2000), including a collaborative project on heavy truck insurance.
- A review of Queensland University of Technology's vehicle fleet, to ensure that CARRS-Q was in a position to 'practice what it preached'.
- Working with Queensland Transport to promote and evaluate the WFSS (Murray, Anderson and Clements 2001).

- Helping organise the Travelsafe symposium on work-related road trauma and fleet risk management (Murray and Hansen 2002).
- Working closely with several organisations to review their insurance claims data and the barriers to improved safety within their organisations.
- Undertaking drug and alcohol workplace audits, education and change programs (Davey et al 2000).

Four particular current projects cover the barriers to fleet safety, driver attitudes to their work and home vehicles, evaluation of countermeasures in a large Australian fleet, and drug use by heavy truck drivers.

1. Murray et al (2001) described a range of barriers to improved fleet safety in organisations, based on several UK and Australian projects. Table 10 summarises and expands on these barriers.

2. The work versus home vehicle study (Newnam et al 2002) was designed to investigate whether people who drive for work-related purposes drive in a less safe manner than drivers in the general population. It examined whether work-related drivers appeared to drive less safely in a work vehicle compared with their personal vehicle, in terms of both previous crash and traffic offence involvement and current driving practices. Additionally, safety policies and practices within their organisation were investigated to determine any potential influence they have on driving behaviour.

3. 'Fleet Safety Countermeasures in a large Australian Fleet' is a Doctor of Philosophy (PhD) project funded by the Australian Research Council Linkage program and QFleet. Its initial aim was to 'replicate' the Swedish Televerket study in an Australian context, involving three studies to: evaluate existing countermeasures; design, implement and evaluate new countermeasures; and develop a model or framework for fleet safety improvements and evaluation. The first study of this project is currently being undertaken.

4. The culture of illicit drug use by long haul truck drivers is being investigated through focused interviews and a written survey questionnaire with drivers. The aim of the study is to develop research methodologies to aid further investigations into the harm associated with personal use and health, public safety on the roads, and the transport and shipment of illicit drugs by truck drivers.

Table 10 - Summary of barriers to fleet safety

Current barriers	Ways to overcome them
Limited data to identify the true extent and costs of the problem, which means limited senior management commitment, funding, priority and time to implement countermeasures.	More should be done to identify the full costs and consequences, by focusing on the relevant trade-offs between operational versus safety needs and the costs of countermeasures against benefits. Identifying 'board level' and senior management advocates and helping them understand the full costs, impact across the whole organisation, and external consequences of fleet safety can lead to the allocation of funding, time and more committed staff.
Complacency and a poor perception of the level of the problem, leading to low commitment, lack of ownership by managers, supervisors, planners, drivers, suppliers and customers, and a lack of desire/flexibility to change.	Changing the 'culture of complacency' by raising the awareness of managers and staff and increasing their knowledge and perception of the extent and cost of the problem. Develop change and union management programs, involving people in the process early, utilising key advocates, change agents and champions.
Lack of management, supervisory and driver skills. Limitations in current training programs, which are rarely tailored enough to high-risk areas and specific needs.	Tailored development programs based on KPIs, assessments, needs analysis and Group Decision Theory. Realigning safety training more toward managers, supervisors and work schedulers as well as drivers and focusing training more on the actual risks and issues - slow speed manoeuvring, inattention and specific recurring situations. Proactive supervisors and managers with a hybrid mix of skills research, analysis, management of change, and program implementation skills are required.
Current operational procedures and management structures. Examples include job and finish payment schemes, crash related bonus schemes and traditional hierarchical structures.	Work-related road safety should be built into OHS strategy, focusing on its impact on all areas of an organisation. Where possible, fleet safety should be linked to other programs such as quality, efficiency, customer service or environmental projects.
Limited integration between fleet safety and OHS, and limited or no mention of fleet safety in overall health and safety policy at both a macro and micro level.	Integrate fleet safety into OHS policy and encourage more co-operation between fleet and OHS teams within organisations. For example include OHS specialist in crash investigations and fleet safety in OHS committee meetings and minutes.
Limited 'claims-led' procedures and instructions for drivers, supervisors and managers.	Develop procedures manual, driver handbooks and in-vehicle crash packs to show how to manage the scene, and report and record the crash effectively for risk management.

Limited fleet crash investigation procedures and recording, particularly for damage only crashes.	Develop a procedure to investigate and learn from all incidents, identify remedial action and allocate tasks.
No standard definitions, codes, conventions or methodology for reporting and recording fleet crashes.	Develop a standard set of agreed KPIs and codes to allow current claims data to be used for risk management, based on a review of existing cases and t he needs of the organisation.
Reactive focus on injury prevention by fleets.	Proactive focus on damage only, vehicle wear and tear, near hits and their costs to work towards injury prevention.
Attitudes – people are not employed to drive, driving is just one part of the job.	'Non- professional drivers' who drive for work should be targeted by educating managers on the importance of driving for the job. Driving safety should be included in position descriptions and selection criteria where staff have to drive for work at least once per week. Licence checks should be undertaken at the start of employment and on an annual basis.
Poor communication.	Improving the manager/employee and employee/manager communication channels.
Poor layout of delivery, collection, work and parking sites.	Undertaking site-based risk assessments.

(Source: expanded from Murray et al 2001)

3.2.6 Tasmania

According to Brown (2001), Tasmania has a number of road safety officers and consultants who work with industry on request. The programs have included a pilot scheme with a number of enterprises to undertake the following.

1. Survey employees to obtain a snapshot of driving age, experience and understanding of employees.
2. Operate a 6-7 week program covering the following.

    - Road crashes.
    - Alcohol, drugs and driving.
    - Fatigue and planning.
    - Seatbelts.
    - Defensive driving principles.
    - Weather/road conditions.
    - And safe driver attitudes.

No comprehensive research into outcomes has been undertaken. The 'French Pine' project is promoted as a success. The company, with about 100 staff, had been involved in two serious injuries and one fatality involving staff travelling to and from work. The project involved five one-hour discussion sessions for all staff focusing on fatigue and inattention. It was felt that in small rural communities work like this in companies can have a significant impact on the wider community and positive results were seen in this case.

More recently, workplace road safety has become more of a major focus in Tasmania with fleet safety seminars being undertaken by CARRS-Q for government and other organisations, the development of an award for organisational road safety, and a DIER employee being made responsible for the area. Currently DIER is developing a whole-of-government fleet safety policy. A research project has been established with Hydro Tasmania to evaluate its fleet safety program in order to develop a best practice Tasmanian case study.

3.2.7 New South Wales

In New South Wales the RTA and other government agencies have been very proactive in developing work-related road safety programs and in the on-going development of the Fleet Safety Forum, motivated by the belief that fleet safety initiatives have wider societal benefits for general road safety.

Collingwood (1997) described the RTA's '*Model Safe Driving Policy'*. He suggested that organisational safe driving policies should focus on three essential elements: safe vehicles, driving behaviours and management practices. He described how the RTA was targeting public and private sector fleets through conference papers, newsletters, the trade press, visits and direct mail. Over 2,500 fleets had 20+ vehicles, with the ten largest fleets having a combined total of over 65,000. He also discussed the range of managers who had been targeted including fleet, general, HR and finance/administration managers.

The policy covered the following.

1. Selection, operation and maintenance of vehicles for maximum safety including crash test results, specifying safety features to avoid crashes (visible colour, daytime running lights and ABS) and reduce injury (airbags, quality front and rear seatbelts and cargo barriers).
2. Driver group discussions and training on risk factors such as speed, fatigue, alcohol/drugs and seatbelt use.
3. Management setting objectives, monitoring and reviewing progress. A key manager should be responsible for implementation in each organisation. Crash rates and costs should be reported at management meetings. Crash costs should be charged to the user. Crashes should be investigated and safe driving should become part of workplace meetings, conferences and newsletters. Senior managers must show commitment to driving safety for it to become embedded in the workplace culture.

Finally, Collingwood described the strategy to promote the scheme to fleet operators. This is very important, as change management and implementation are key issues in fleet safety. The RTA planned to adopt a three-stage diffusion of innovation strategy including awareness, intention to implement, and implementation, with 25% of fleet operators implementing the policy within 12 months. Discussion with Sochon (2000) revealed that the model policy was never widely implemented due to staff and

priority changes. The FleetSafe program (see Appendix 3.3.3) which was funded by the RTA did, however, eventually develop from it. This initiative gave effect to the RTA's support for fleet safety. Since completion of the report, the RTA has provided continuing support to assist with implementation to ensure optimisation of the potential benefits. This recognises that behavioural change takes time and resources for any organisation.

Sochon (2002) described a range of other initiatives currently taking place in New South Wales. The RTA now provides general advice to enquiring organisations, promotes fleet safety among rural communities, including attitude surveys, and has undertaken presentations to Statefleet customers (the provider of vehicles to state government agencies). A safe driving program is underway in the RTA, including a pilot in the Western Region with policies and data as first priorities. Focus groups provided some very useful feedback on actual driving needs. The program is developing resources (including crash data, costs, OHS requirements, self-audits, a management system, model policy guidelines and information sheets), and demonstration projects.

As part of its safe driving program focussing on its own staff, the RTA is re-vamping its safe driving policy under the auspices of OHS. In addition, separate light and heavy fleet policies are being updated to reflect good practice.

Other schemes in New South Wales include the following.

- Organisation-registered vehicles are being identified and compared to other vehicles in terms of crash rates and causes.
- The RTA and other Government Agencies in Southern New South Wales are working on the development of a fatigue workbook and policy resource.
- RTA has supported a wide range of other government agencies, including local councils, parks and health agencies, to enhance fleet safety and implement policies and other initiatives in local areas.

3.2.8 Australian Capital Territory (ACT)

Paule (2001) was unaware of any fleet safety programs in the Australian Capital Territory. He suggested that it is not a high priority issue in road use management and cited the implementation of a new legislation package introduced in 2000, the registration and licensing computer system being upgraded, 50km/h trials in residential streets, and expansion of the integrated speed and red light camera program as all being more important issues. No Australian Capital Territory delegates have attended any of the last three Fleet Safety Forum meetings, even though it is likely that a large proportion of Australian Capital Territory vehicles are likely to be government fleet cars.

3.2.9 Northern Territory

Lau (2001) said that a 'work-related' road safety program is being developed. She provided a copy of the six-page *Fleet Drivers Handbook* that gives guidelines on the use and care of Northern Territory Government vehicles. It covers driving standards and responsibilities, fuel supplies, care and security of vehicles, daily and weekly checks, service and maintenance of vehicles, travel out of town, procedures for crashes and breakdowns, service level agreements, and penalties for poor behaviour.

Lau described how the Northern Territory Government launched a *'Taking Care of Business Kit'* in November 2000 aimed at equipping employers with the skills to deal with alcohol and drug issues in the workplace. The initiative was part of the Government's Living with Alcohol program. The Kit is a step-by-step guide to combating the negative effects of drugs and alcohol at work. It features guidelines to assist workplaces with policy development and implementation, managing people with alcohol and drug problems and customising education for different types of working environments.

No Northern Territory representatives have attended the last three Forum meetings.

3.2.10 South Australia

Coxon (2001) outlined the position in South Australia. He said that government vehicle purchasers receive regular updates of NCAP results for cars to assist them with purchasing decisions, but they are under pressure to minimise costs and at present do not look too much at the occupant injury figures. Government customer requests for safety features are infrequent, even from those with a road safety role. One success was achieved, however, when a fleet car provider was forced to add extra safety features after that vehicle was taken off the purchasing list. Another success was the development of an information technology (IT)-based safety program for road workers exposed to traffic.

Coxon described South Australia Transport's daytime running lights (DRL) proposal, awaiting approval to proceed, based on US research that identified the positive impact of fitting DRLs to all General Motors models since the mid 1990s and a fleet safety proposal called '*Improving fleet vehicle safety'*, which was based heavily on FleetSafe. It covers the following.

1. Implementation issues should include data collection, management champions, safety working groups, incorporation of the plan into wider business plans and standard driver education kits.
2. Accountability for safety should include managers and drivers.
3. All OHS requirements must be met, particularly the procurement of safe vehicles, maintenance and user training.
4. Driver competency, training, attitude, use of safety features such as seatbelts, ABS, traction control, cruise control, load security, child restraints and mobile phones.
5. Purchasing safer vehicles based on NCAP results, including safety features such as airbags and ABS.
6. Evaluation to include crash investigation, data collection, development, comparison and publication of KPIs, and internal and external benchmarking.

This paper is in its infancy and has not been implemented by Government fleets in South Australia. No staff are working full time on fleet safety and no South Australia representatives have attended the last two Forum meetings.

3.2.11 New Zealand

The New Zealand Land Transport Safety Authority (NZ LTSA) recently released a new guide that shows fleet operators how to develop and implement a safe driving policy (www.ltsa.govt.nz/news/news/983011.html). It covers the following areas.

- How a safe driving policy can save money.
- Seven steps towards a safe driving policy.
- The responsibilities of management and staff.
- The key issues every policy should address.
- Descriptions of driver training courses.
- Information on vehicle safety features.
- A workbook and floppy disc to help implement a policy.

According to Hebden (2001), more than 2,000 copies have been distributed to hospitals, Area Health Boards, small businesses, regional councils and government departments. He suggested that most of these organisations have developed a safe driving policy or updated their existing one. He could not say how effective it has been in reducing fleet crashes because the LTSA has not done any formal evaluation to date, mainly due to lack of staff resources.

The LTSA has published a guide to safe vehicle selection focusing on active and passive safety (www.ltsa.govt.nz/vehicle_safety/safer_car/intro.html). Active safety crash prevention features include tyres, brakes, lights/windows/mirrors, steering/traction, handling/stability, seats, air-conditioning, and warning devices. More passive safety features include occupant protection such as crush zones and safety cages, frontal impact protection, side impact protection, size of vehicle, safety belts, air bags, seats, head restraints, safe vehicle interiors, load restraint and fire safety.

3.2.13 Fleet Safety Forum member survey

At the meetings of the Forum several recurring issues emerged and were used as the content for a member questionnaire administered at a Forum meeting in May 2002, the full results of which are shown below.

Member	Question 1 - Define fleet safety
ATSB	**The National Road Safety Action Plan 2001 and 2002 Strategic Objective 1.8 on work-related road use refers to both heavy and light vehicles.**
Tasmania	Fleet safety refers to light vehicles and some fatigue management issues from heavy vehicles
NSW	Fleet safety is the promotion of improved safety of work-related driving including commuting, heavy and light vehicles. The truck industry can inform us about fatigue management and competency based training.
Victoria - TAC	Vehicles less than 4.5 tonnes, 12 maximum passengers, light vehicles over which the employer has some control, all vehicles used for work driving.
Queensland	Fleet safety - a program for organisations to implement that raises employee knowledge that a vehicle is a workplace and of the need to consider safety like any other area of the organisation. The Workplace Fleet Safety System is aimed at light vehicles. This was done because it was felt that it would be necessary to include additional specific information aimed at heavy vehicles.
Western Australia	One of the guides for our work on fleet safety in WA is the Monash review of best practice. On a working basis we would use the definition that 'vehicles over which a business has some degree of influence in their selection and operation'. In WA programs are in place for both heavy and light vehicles.
Vic Roads	Fleet safety means light vehicles. Transport safety means heavy vehicles. From the heavy truck industry we can learn about fatigue management practices, duty of care and Chain of Responsibility.
MUARC	Covers both heavy and light vehicles. At present heavy vehicle safety receives much more emphasis than light vehicles. The lessons to be learnt from the heavy truck industry is about managing the fleet – rather than having a laissez faire approach.
CARRS-Q	The safety of anyone driving for or commuting to and from work at least once per week.

Member	Question 2 - Components of a good fleet safety management system
ATSB	Use OHS approach from NOHSC and State Worksafe Offices. The National Road Safety Action Plan 2001 and 2002 Strategic Objective 1.8 on work-related road use covers resource material, vehicle safety features, safe driving policy, heavy vehicle compliance, fatigue and driver health and national data and strategies.
Tasmania	Policy, safer vehicles and safer drivers. Driver skills training can give people a false sense of security and complacency. SSROC, Telstra, WA and MUARC are examples of best practice.
NSW	Fleet Safe and Queensland WFSS. We are evaluating FleetSafe in several councils over two years, but are not really able to attribute change to fleet safety.
Victoria – TAC	Needs to be driven through OHS legislation and frameworks – must be proactive rather than reactive.
Queensland	Components of a good fleet safety system should include several elements including the policies on how they recruit drivers, what programs are offered to staff to ensure they are safe drivers, how to select appropriate vehicles for the organisation and maintaining data in relation to drivers and monitoring fleet crash involvement. The Workplace Fleet Safety System nominates seven elements of best practice.
Western Australia	The seven step program developed by in the WFSS and FleetSafe, described above and at www.transport.wa.gov.au/roadsafety/Facts/fleet_policy/index.html WA documentation describes case studies of Woodside, Alinta Gas, BHP, Hamersley Iron and Telstra.
Vic Roads	Crash data collection, WorkCover data collection, TINs collection and monitoring, manager interviews. Swedish Televerket group discussions worked. Some cases are documented in VicRoads safer driving manual.
MUARC	Ongoing monitoring, management and data collection. Better vehicles have been a successful countermeasure.
CARRS-Q	Safety audit, needs analysis and risk assessments including claims data; safety policy; management structure and accountability; recruitment and induction; vehicle selection and maintenance; monthly crash data review, investigation and action; change management, assessment and training program; evaluation. Senior management commitment and action has been a successful countermeasure.

Member	Question 3 - Fleet safety initiatives in state road safety action plans
ATSB	The National Road Safety Action Plan 2001 and 2002 Strategic Objective 1.8 covers work-related road use by heavy and light vehicles.
Tasmania	Fleet Safety is highlighted as a significant issue in the Tasmanian Road Safety Strategy, 2002-2006.
NSW	Fleet safety is in Road Safety 2010 – safer vehicles in fleets and safe driving policies in organisations.
Victoria - TAC	Highlighted in 'arrive alive' Victoria's five year orad safety strategy and in TAC/Vic Roads business plans for 2002/3.
Queensland	Fleet safety initiatives are included in the Queensland Road Safety Strategy 1993 – 2003. Objective 2.1.3 encourages fleets to 'introduce best practice workplace fleet safety systems'. Fleet Safety is also in the draft road safety action plan for 2002.
Western Australia	WA Road Safety Strategy 2000-2005 highlights the importance of improved fleet safety. This has provided the Workplace Road Safety Taskforce with clear priority objectives particularly on vehicle selection and safety features.
Vic Roads	Fleet safety is included in safety and action plans.
MUARC	Yes – part of community involvement.
CARRS-Q	CARRS-Q has worked closely with Queensland Transport to promote Fleet Safety.

Member	Question 4 - Fleet safety programs government agencies have in place
ATSB	Comcare, DASFLEET, National Safety Council of Australia. Nobody appears to be monitoring the content and effectiveness of these programs.
Tasmania	DIER is presently finalising its own fleet safety policy with the intention that it will become a model for all government agencies.
NSW	As well as FleetSafe, the RTA DriveSafe project is currently underway. Sydney Central Area Health service has a driver safety awareness program. The State Transit Authority is implementing BUSSAFE, based on the FleetSafe model.
Victoria - TAC	TAC and VicRoads both have a fleet purchase and safe driving policy, and the Government is currently reviewing its policies.
Queensland	The Queensland Transport Workplace Fleet Safety System. Queensland Transport monitors and reviews the content of the system. As yet no fleet (government or otherwise) has gone through the accreditation process, although Main Roads have submitted an application for the Bronze standard.
Western Australia	In February 2002 the WA government endorsed the concept of Government leading the way. Cabinet agreed to the development and implementation of a fleet safety program for the purchase and use of the government's fleet cars – which can have a wider flow on benefit to the general community. A small number of Government agencies are in the early stages of developing fleet safety programs.
Vic Roads	Pilot program is currently being undertaken with 10 organisations including local governments. A safer driving kit is available on the internet and for purchase. A training program is being developed.
MUARC	MUARC's vehicle selection policy has greatly influenced many of the vehicle selection policies developed by government agencies around Australia.
CARRS-Q	CARRS-Q has worked closely with Queensland Transport and has also reviewed the University's own fleet safety performance.

Member	Question 5 – Is purpose of journey monitored in you state's crash databases?
ATSB	Federal records do not identify purpose of journey from the data supplied.
Tasmania	No
NSW	No
Victoria - TAC	No
Queensland	Queensland Police Service (QPS) collect crash data on the type of vehicle involved in reportable crashes (commercial vehicle or not). The Travelsafe Committee has recommended that QPS collect purpose of journey data.
Western Australia	Occasionally shows up in police crash descriptions, but not a standard check box on police crash reports.
Vic Roads	No
MUARC	No. Not in general crash data.
CARRS-Q	As Queensland Transport. CARRS-Q has been looking at 'purpose of journey structures'.

Member	Question 6 - % of fatal and hospitalisation crashes involving work-related driving
ATSB	Not known
Tasmania	Not known
NSW	Not known
Victoria - TAC	Not known
Queensland	24% and 16%
Western Australia	Not known
Vic Roads	Not known
MUARC	Not known
CARRS-Q	24% and 16%

Member	Question 7 - Are fleet vehicles as workplaces under OHS regulations?
ATSB	Yes: the work vehicle is part of the workplace.
Tasmania	Yes. Work-related crash data is kept by workplace standards, it is currently being accessed.
NSW	Yes. It is enforced by the police.
Victoria - TAC	Yes, but only enforced sporadically by individual organisations. If an injury crash happens while a driver is working it is dealt with by workers compensation. If the driver is not working TAC, VicRoads and the police record it using consistent codes which allows exchange of information and data cleaning.
Queensland	Speak with Department of Industrial Relations regarding OHS legislation.
Western Australia	Yes under the Occupational Safety and Health Act 1984. Unlike other states commuting is excluded. It is enforced by Worksafe, who must b informed of all work-related crashes that result in >10 work days lost. Worksafe estimates that only 20-25% if work-related crashes are reported to them. They and the Injury Research Centre in WA are currently conducting research on how workplace road crash data can be better collected.
Vic Roads	Yes, but even though organisations have duty of care there is little regulation and limited linkage between agencies.
MUARC	Yes and no. Road crashes are only well investigated if there is a multiple fatality or major truck incident.
CARRS-Q	Yes, but there is no clear evidence of how it is enforced or managed.

Member	Question 8 - Fleet safety in the respondent's organisational OHS framework.
ATSB	Yes: Regulations are enforced through the reporting requirements of Comcare.
Tasmania	We are about to make the change and promote links with our work safety agency.
NSW	Yes. Policy and driver safety program currently underway. Lack of injuries is an issue.
Victoria - TAC	Yes. It is part of the general OHS program including vehicle purchase policy, driving policy, systems management and incident/injury reporting.
Queensland	Fleet safety is not treated as an OHS issue within the organisation, but it could be managed more effectively with an OHS framework.
Western Australia	Road safety is included in the Department of Planning of Infrastructure, OHS. The policy covers all departmental staff, all vehicles (including bikes) owned by the department and all driving by staff at work and when commuting.
Vic Roads	Yes and no! It is starting to be seen as an OHS issue, and should be firmly managed and enforced as an OHS issue.
MUARC	No, not at Monash University.
CARRS-Q	Both fleet management and OHS staff were involved in the recent QUT fleet review, although communication between them is not always good. The outcomes of the review have so far not been evaluated.

Member	Question 9 - Should Forum members benchmark against each other?
ATSB	Yes: initially so as to find out what benchmarking is effective and how (other) benchmarking can be made effective.
Tasmania	We should benchmark between our Tasmanian agencies as a starting point.
NSW	Important to learn about the issues first hand.
Victoria - TAC	
Queensland	I think benchmarking is very important. Forum members would need to agree whether to set down benchmarks. It is important for the Forum to continue so that states have the opportunity to share experiences and information.
Western Australia	We would be keen to discuss the issue of data (availability, management and analysis) and the development of appropriate benchmarks and indicators to monitor progress. This will help at the local organisational level and at the state level to monitor progress.
Vic Roads	This seems like a good starting point, we need to standardize what to benchmark and we can supply information on VicRoads as long as it is kept confidential.
MUARC	Useful if we can compare apples with apples. For example benchmarking costs varies depending on whether or not the
CARRS-Q	This is already a good Forum for process benchmarking. Comparing crash rates depends on accurate data and an understanding of other issues such as level of insurance excess as well as wear and tear/unreported damage. The only highly accurate data that can be benchmarked easily is fatalities and perhaps hospitalizations.

Member	Question 10 - What are the barriers to fleet safety?
ATSB	We are primarily involved in research issues, which restricts action that can be funded and/or otherwise taken on progressing fleet safety matters. Although, the organisation does have a strategy development role also. Fleet safety is primarily seen as a state/territory matter.
Tasmania	Because they do not show up obviously in the data as major injuries many do not believe it is that serious an issue – most fleet crashes are parking and reversing.
NSW	Management focus and energy. Requires project management resources to establish and manage initiatives.
Victoria - TAC	Lack of support through government OHS drivers, due to the perception that it's a road safety only problem.
Queensland	Some of the barriers we face in promoting fleet safety are ensuring our organisation is committed to best practice fleet safety (ie allocating resources for it).
Western Australia	Both resources and other road safety priorities are considerations for promoting fleet safety in WA.
Vic Roads	OHS people not too proactive, privacy acts and the Road Safety Act.
MUARC	Cost being viewed as more important than injury.
CARRS-Q	We have identified a whole range of barriers particularly related to data, organisational, ownership and management change issues.

3.3 Government fleets

The discussion in Section 2 above mentioned the importance of government fleets and leadership. In this section, three government fleets are considered in more detail, two state level government leasing organisations and a group of local authorities. All three cases were chosen because they have won various awards, because key individuals in the organisations are regular 'names' on the fleet conference circuit and because CARRS-Q has worked closely with them on various projects.

3.3.1 Fleet South Australia (government vehicle leasing agency)

This case study is based on the literature (Haworth et al 2000), presentations at AfMA conferences, and an interview and informal discussion with its manager of contract and project services, Andrew Norton, undertaken as part of this project.

Fleet SA provides a public sector fleet management service for passenger and light commercial motor vehicles. The service includes vehicle leasing, car-pooling, accident management and transport services for ministers and visiting dignitaries.

Fleet SA's fleet safety program was initiated in 1997 with the assistance of a special projects officer from the RTA. The Program has not specifically been based on a recommended best practice model, however, the RTA, Road Transport SA, journals and publications, government bodies and QFleet influenced its design. Countermeasures implemented include driver training and education, vehicle wear and tear policy, load restraints in vehicles, vehicle specification, and publicity campaigns.

According to Haworth et al (2000), Fleet SA provided a detailed process evaluation of the training, suggesting that it was much more difficult to implement than originally thought. Other benefits were better vehicle fault identification, a closer link between driving and OHS, and 'protection' from OHS legal obligations. The wear and tear policy aimed to improve the roadworthiness of vehicles by making users more accountable for the condition of the vehicle and to maintain a good resale value at the end of the vehicle's life. Its success was not evaluated. Load barriers were fitted to help protect vehicle passengers. The road safety benefits have not been evaluated, but the OHS legal obligations have been covered. On vehicle specification, users were given the option to specify extra safety features.

Fleet SA uses crashes and costs related to the vehicle as key performance indicators (KPIs) to evaluate its client's progress. Crash costs decreased while the number of reported crashes increased. Costs per reported crash decreased over a three-year period from $1,153 in 1995/6 to $894 in 1998/9 and the number of reported crashes increased from 2,236 to 2,771 over the same period. The cost reductions were attributed to the training program, lower driving speeds, better control of crash repairs, better/newer vehicles in the fleet and police speed/drink campaigns. The rising number of crashes was attributed to better reporting of minor damage and a tightening up of the vehicle wear and tear policy. These figures are very consistent with similar UK-based studies, where fleet safety programs which focus on collecting good crash data often identify a large number of crashes that have previously gone unreported (Murray and Dubens 2000). The evaluation was used to identify a range of areas for further action including: implementing a performance-based premium, which has since been implemented to offer financial incentives to clients; developing a safe driving policy; and trying to establish a new innovative approach to driver training.

More recently, Fleet SA provided the claims statistics in Table 11. This is useful as it allows 'apples to be compared with apples' when benchmarking data internally or against external organisations.

Table 11 - Fleet SA claims data for 2000/2001

Level of claim	Claim rate per vehicle per annum
All claims	0.44
> $350 (Fleet SA excess level is $350)	0.35
> $500	0.28
> $1000	0.14

(Source: Fleet SA)

Driver training and education providers have tailored their programs to suit the needs of those employees working in rural remote regions of South Australia. Additionally, a safe driving policy document is to be released that can be modified to suit the needs of individual client organisations.

Fleet SA disseminates the fleet safety message to clients through its driver training providers and seminars to fleet managers. It frequently educates and encourages clients to be responsible for fleet safety through a greater focus on OHS, flyers and brochures, performance-based premiums, the safe driving policy document, an internet site which covers safe driving issues and driver training sources, and a newsletter which includes fleet safety issues.

Barriers that Fleet SA have encountered include clients not recognising their OHS obligations, difficulties in disseminating the fleet safety message to particular individuals, and convincing senior management that fleet safety is an important issue.

Factors that have assisted the adoption of its fleet safety programs include better vehicle specification, the formation of a vehicle fleet transport strategy group with representatives from all different agencies, and the education providers that deliver the training programs.

In the future Fleet SA aim to address the following issues.

1. Fatigue awareness, which will be covered in the safe driving policy.
2. A training package consisting of safety information.
3. Increasing public awareness of fleet safety.
4. Quantify the results and the indirect costs.
5. Investigate specific problems identified with 4WDs (four wheel drive vehicles).
6. Launch a whole of government safe driving policy for South Australia.

3.3.2 QFleet (government vehicle leasing agency)

This case study is based on CARRS-Q's close working relationship with QFleet.

QFleet is similar to Fleet SA. It was formed in 1991 to coordinate government vehicles in Queensland. It has a client base of more than 1,200 government and government-funded organisations and almost 13,000 vehicles under management, which can be driven by up to 40,000 employees. Services include vehicle leasing, fleet management, vehicle servicing, maintenance and repairs, short-term hire, asset leasing and management, strategic advisory services and accident management. Between 1994 and

2000 almost 13,000 insurance claims were made on these vehicles, at a conservative maintenance cost of $21 million (Business Motoring 2000). QFleet appeared to be 'at fault' in 61% of cases (Bakker and Parsonson 2000), which is similar to comparative fleet figures from the UK (Murray and Dubens 2000). Like FleetSafe, QFleet has been discussed widely in the literature (Haworth et al 2000), at conferences (Clarence 2000), in the trade press (eg Business Motoring 2000, McDonald 2000) and at presentations to road safety students (Bakker and Parsonson 2000). QFleet's fleet safety program has won several awards, has been a role model for others and has gained support in the political domain.

To reduce crash risks and costs, QFleet has implemented four countermeasures.

1. An internet-based Client Access System (CAS) for data management.
2. A group-based financial incentive scheme called Customer Performance Pricing (CPP).
3. Several driver training programs.
4. Regular information in its *'Journey'* newsletter, which provides a number of safety hints, along with messages to reinforce fleet safety. Recent editions covered its road safety review, its safety awards, crash reporting, driver training and four-wheel drive safety. QFleet distributes ten editions per year to approximately 4,000 clients.

CAS is an internet-based fleet management system. For claims management purposes, it links QFleet, its clients, insurer and broker. Clients can use CAS to review and assist in updating information relating to where, when and how crashes have occurred in their fleet. Clients can benchmark their performance against other QFleet clients and lodge their own insurance claims directly into the system while risk analysis information and financial details are added by QFleet, its broker and its insurer. Being online with real-time access is particularly useful for rural and remote clients, who can obtain fleet reports and management information on vehicle use, servicing, costs, violations and insurance claims.

Based on the information available in CAS, clients can make informed decisions about the management of risk for their drivers. Bakker and Parsonson (2000) showed that for each claim, the CAS system contains data on the vehicle (type, make, rego), the driver (name, licence details, age), the crash (what happened, where, when) and repair costs. From this, a range of KPIs and benchmarks are automatically calculated to allow an ongoing performance review. In comparison to a range of UK-based systems (Murray and Rand 2000), CAS is an excellent and unique system based around internet technology, being matched only by some of the better accident management companies (for example Stone 2002).

The information from CAS is then used to **'incentivise'** the insurance premiums for QFleet's 1,200+ clients (McDonald 2000), based on their performance (CPP). This is calculated on at-fault crashes, costs, single vehicle crashes, an improvement factor and the frequency of total crashes. Premium adjustments can be +/- $180 per vehicle per annum based on performance. McDonald (2000) reported that between 1998 and 2000 the number of clients having a premium reduction went from 47% to 60%. Although these incentives have proved to be promising, UK research by Murray and Rand (2000) identified incentive schemes as a major factor in the under and dishonest reporting of crashes by drivers.

Other fleet safety initiatives adopted by QFleet include the following.

- A new combined CD and in-vehicle based driver training program.

- Production of Fleet Performance Score Cards.
- A Technical User Group, which advises clients on vehicle suitability.
- Weekend driver training program for clients unable to attend sessions throughout the week.
- On-site lecturers to explain the CAS system.

QFleet's safety program was developed from external sources such as the FORS fleet safety manual, AfMA membership, motor shows and networking. Crash rates, claims and costs are the KPIs to evaluate progress. Clarence (2000) states that QFleet benchmarks its performance in terms of crash damage against other organisations in the Lumley benchmarking program and is consistently better in key areas than most other large commercial fleets. Its claim rate is approximately 0.2. In other words, one in five QFleet vehicles will be involved in an insurance claim each year. Bakker and Parsonson (2000) compared this ratio with several others, as shown below (Table 12). This comparison should be treated with some caution, however, as crashes are defined in different ways and varying excess levels apply on insurance policies.

Table 12 - Percentage of vehicles in a crash each year

Fleet	**Annual crash rate**
QFleet	0.20
Lumley Insurance benchmark	0.20
Lumley Insurance actual	0.28
DAS Fleet	0.30
Typical courier	0.50

(Source: Parsonson and Bakker)

Further discussions with Parsonson (2001) identified that some attempt has been made to use the information to evaluate the success of individual programs, such as skills-based, defensive and competency-based driver training. Although changes in the pattern of data have been shown to correspond with specific programs, Parsonson believes that it has been impossible to verify because control groups have not been used to isolate the various countermeasures from general trends taking place at any one time. This means that the extent to which changes were due to increased police activity related to the changing use of alcohol and speed by Australian drivers in general is not known.

As an asset-leasing organisation, QFleet has only limited day to day control over client use or management of vehicles. Some clients lack commitment to fleet safety because it is not their core business and in some cases there is a low sense of ownership of the vehicles. QFleet aims to overcome these limitations by developing specific programs based on client needs and a whole of government fleet safety policy.

Overall, the QFleet system is well regarded as a leader in the industry, particularly from an asset management perspective. QFleet has, however, acknowledged that there are some areas of opportunity available and with CARRS-Q, has successfully bid for Australian Research Council funding to undertake a PhD-based project (Appendix 3.2.5).

Fleet SA and QFleet both acknowledge that their main role is to manage vehicle assets. This means that they have a relatively limited sphere of influence in developing fleet safety countermeasures. For this reason, the SSROC case is considered in more detail.

3.3.3 Southern Sydney Regional Organisation of Councils FleetSafe program

This case study is based on an interview with Melissa Gibbs, the Executive Director of SSROC, conversations with the FleetSafe Project Manager Phil Sochon, an evaluation workshop undertaken with FleetSafe managers in April 2001, and analysis of the FleetSafe data.

SSROC comprises the 12 (now 11) municipal councils in the south-eastern part of the Sydney metropolitan area (Gibbs 2000). In 1996, the area's Road Safety Group recognised the lack of a coordinated safety focus being given to the management and use of council vehicles. The member authorities operate 2,700 vehicles and employ about 5,900 people, most of whom regularly or occasionally drive council vehicles. SSROC identified potential insurance, lost time and maintenance cost savings. Together, the councils expend over $1.2 million in annual vehicle repair costs and nearly $1 million in vehicle insurance premiums.

The SSROC Road Safety Group developed a proposal for a Safe Driving Best Practice Project in 1997 (Gibbs 2000). The result was the FleetSafe program, which has been discussed widely in the literature (Haworth 2000), at numerous conferences and events (eg Gibbs 2000, Sochon 2001), and through a comprehensive policy and guidelines document (Sochon 1999). FleetSafe was grounded in risk management compliance, OHS and road safety. Its policies and procedures were developed and implemented by SSROC-wide working and steering groups covering a range of disciplines relating to council fleet management.

In phase one, the current status of fleet safety was established and recommendations made for improvements. Phase two involved working with the councils to develop best practices to improve driver and vehicle safety. This phase of the program provided SSROC councils with a model policy, recommended operating guidelines to establish best practice driver and heavy/light vehicle safety policies and procedures to tailor to their unique requirements, as well as sample forms for performance monitoring. In addition, Gibbs (2000) described how the model policy provides the basis for other councils, and possibly, other government and industry organisations to adopt a similar course of action. According to Sochon (2002) this has since started to occur throughout the other Sydney Councils, the RTA and the State Transit Authority bus fleet.

Despite the lack of any critical evaluation, the FleetSafe program appears to have many of the vital ingredients for success. It is research-based, focuses on implementation, involvement and change management (through its various committees of council personnel and elected officials), has a project champion in Phil Sochon and a senior management champion in Melissa Gibbs. Further discussion with Sochon (2001) revealed the following ongoing issues 18 months after it was launched.

- Very little insurance or maintenance data was initially available, so FleetSafe focused on crash numbers and costs, without looking at more detail such as types, causes and locations.
- Setting standard definitions for everyone to work to. Agreeing how to define costs and the cut-off point between wear and tear and crashes, remain key issues in comparing council data.
- A great deal of unreported damage has been identified in the maintenance records of some of the councils. For example through FleetSafe the largest council discovered it spent about $100,000 per annum on in-house repairs to vehicles through their own smash repair shop.

- The continued change management issues of getting local managers to implement the system. The management aspect of implementation of best practice measures needs careful consideration, requiring a significant shift in culture, which is a challenge. This is seen as a key issue in promoting fleet safety.

A workshop (Murray, Sochon and Gibbs 2001) was undertaken in April 2001 to evaluate and explore the way ahead for FleetSafe. A range of managers from seven councils participated. The seminar identified the following issues.

- Obtaining good crash data is a key element of successful fleet safety and councils need to work towards comparable standards.
- The FleetSafe implementation has been a success to date but further actions including data collection and analysis, encouraging union support, and ensuring senior management support remain key issues.
- The barriers to the FleetSafe implementation are the lack of senior management support, lack of time and resources, the culture and internal structure of council operations, working cooperatively with the unions, and identifying training needs and resources.
- The way forward for FleetSafe includes obtaining more senior management support in some councils and continuing to hold two-monthly meetings. In the short-term, the meetings should focus on involving non-participants, analysing the crash data and costs, involving the unions and other council staff, and developing a Group Decision Theory-based cross council assessment and training program.

See www.ipwea.org.au/papers/download/Phil%20Sochon.doc for more details about the workshop.
The initial FleetSafe report and policy is also available on the internet (www.fleetsafetysolutions.com).

Overall, the FleetSafe implementation can be seen as success from both safety and PR perspectives. Most of the member councils have made progress on implementing the policy and guidelines. The project has received several awards. FleetSafe is a regular topic on the fleet and safety conference circuits. Further actions, including data collection and analysis, working cooperatively with the unions, and ensuring senior management support in the individual councils, are key issues in its continued success.

Analysis of the SSROC FleetSafe crash data has been summarised for the periods 1999/2000 and 2000/2001. For the financial year July 1999 to June 2000, the 2,900 SSROC vehicles were involved in 1,341 reported crashes at a total cost of $2,024,750. The crash rate was 46%, the average cost per crash $1,474 and average cost per vehicle $675, although these varied greatly by council and by vehicle type. The cost figures exclude any hidden costs. The four largest councils accounted for 65% of the fleet, 67% of the reported crashes and 77% of total costs. This suggests that focusing on these four councils could be the initial basis for investigation.

Analysis by vehicle type found that sedans and utes made up 48% of the total vehicle fleet, 68% of all the crashes and 64% of total costs. This suggests that a targeted risk management program should be tailored specifically for these two similar types of vehicle. A comparison of the data for 1999/2000 and 2000/2001 identified that four councils saw a reduction in their crash rate, and four an increase. Three councils saw a reduction in their total crash costs and crash costs per vehicle, and five an increase. To date, however, it is impossible to evaluate whether these changes were due to FleetSafe, or whether other factors were involved. In light of these findings, several recommendations were made about how

to improve the validity and useability of the data. The program is currently being evaluated by external consultants who are reviewing both process and data issues.

3.4 Lessons from the heavy truck sector

It has been suggested by Forum members that there may be lessons for the safety of lighter fleets from the heavy vehicle industry. For this reason, the Australian Trucking Association (ATA) (www.trucknbus.com.au/ata/) was contacted and the publication *'Australasian Transport News'* (ATN), which regularly features safety issues, was reviewed. Several recurring themes emerged, including the TruckSafe scheme, self regulation, accreditation (rather than licensing) and compliance, Chain of Responsibility, duty of care, the '*Quinlan Report'*, fatigue management and the '*Beyond the Midnight Oil'* report, drug driving, standards and enforcement, and legal/OHS issues. The March 2002 issue (ATN 2002), for example, had more than ten articles and features on safety. The August 2001 issue also had ten features on safety. This suggests that safety is a key issue in the heavy transport sector. As many of the issues appear similar, there is a strong argument for aligning the safety management of light vehicles more closely to that of heavy vehicles. The NRTC internet site (www.nrtc.gov.au) is also an excellent source of information about heavy vehicle safety, including its recent benchmarking study and joint ATSB conference.

3.4.1 Quinlan Report

ATN 2002 was reviewed in detail to provide more information on some of the issues listed above. It described a taskforce set up to respond to the '*Quinlan Report''* on safety in long haul trucking (www.maa.nsw.gov.au/quinlan_execsum.pdf), which made a range of recommendations to improve safety in the heavy trucking industry in New South Wales (ATN 2002). The Taskforce comprises the Police, RTA, WorkCover, Industrial Relations, Motor Accidents Authority (MAA), Cabinet Office and representative bodies.

The Quinlan Enquiry was initially prompted by the poor CTP claims performance of heavy trucks in New South Wales. Table 13 shows that they are more than three times more likely to be involved in a claim than a sedan car. More discussion on CTP is provided in Appendix 3.6.

Table 13 - CTP claims data for NSW

Vehicle	Claim frequency/1000	Claim costs ($)	Relativity
Small truck	5.3	44,000	130
Heavy truck	10.9	54,000	325
Sedan car	4.7	41,000	100

(Source: ATN)

The taskforce's proposed action plan is likely to contain six main elements. It was due to report to the New South Wales Government by 30 June 2002.

1. OHS law must apply to on-road activity.
2. Inter-agency (Police, WorkCover and RTA) protocols are required for crash investigations. This inter-agency cooperation is a key issue, being developed in several states.

3. Chain of Responsibility (including all those with an economic stake such as shippers and customers) must be properly documented.
4. Road traffic injuries and unsafe practices need to be documented and costed.
5. Larger role for risk-based management programs through incentives.
6. Educational program for other road users about the dangers of sharing the road with heavy vehicles.

3.4.2 Chain of Responsibility and OHS

Through its fatigue management and COR reforms, the NRTC[5] is working to ensure that changes in these areas are implemented (www.nrtc.gov.au/progress/reforms1.asp). One example will allow the NSW RTA to demand that rogue operators fit GPS systems to their trucks through the courts (ATN 2002). The implementation of such vehicle tracking systems has to date been undertaken by more proactive fleets wishing to manage their assets better, or by insurers such as NTI encouraging clients to better manage their risks.

Vehicle operators who do comply with regulations suggest they are penalised because enforcement is not strong enough to deter illegal or non-complying competitors and is fragmented between different states and initiatives. They call for better cross-agency and jurisdictional frameworks, a coordinated national direction and national (rather than state level) offender databases, better audited accreditation, a coordinated, cohesive and consistent better targeted enforcement regime aimed at operators outside of recognised accreditation schemes, and for less 'nit-picking' by the police (ATN 2002). Other articles (ATN 2002) show how Queensland Transport is the first state to use COR in collaboration with Main Roads, the Police and the OHS agencies, both to prosecute rogue organisations and to help them improve. At present, Queensland appears to have been one of the most proactive states in applying COR, particularly on vehicle overloading. COR also appears to have a great deal of potential to address other issues including fatigue, speed and payment systems.

The NSW RTA is implementing vehicle operator risk assessment model (VORAM), a computerised risk profiling system targeting high-risk vehicle operators, to bring together infringement data from a range of sources including vehicle inspections, the police and speed cameras. Initial trials suggest that 5% of vehicles, mainly from small and medium sized operators, are involved in nearly 50% of incidents (ATN 2002). According to McCartney (2002) this will help to ensure that the New South Wales fleet is inspected in a targeted way, by focusing on those operators that are not performing as well as they should.

Industry experts discussed the need to align and integrate the current narrow prescriptive on-road transport safety regulations and COR with OHS law (ATN 2002), to ‘bear down’ on the recidivists. The boundary between them is currently blurred on issues such as driving hours, speeding, and fitness for work. For example, do drivers comply with OHS laws if they drive for 14 out of 24 hours? It is hoped that the NRTC’s fatigue management code of practice will help to align the two regulatory regimes. This, however, requires inter-agency coordination and possibly a rethink of the skills and competency of the people who regulate and enforce the industry as their role widens.

[5] The National Road Transport Commission is to change its name to the National Transport Commission (NTC).

WorkCover New South Wales is turning its attention to road transport. It considers the vehicle to be part of the workplace, has shifted its policy decision not to investigate heavy truck collisions and is currently investigating two fatal truck crashes. They normally wait to be invited to investigate by the Police and RTA. As in the UK, there is a resource issue, for example in Queensland there are 150 inspectors to cover 100,000 employers. More discussion on OHS is provided in Section 3.6.

3.4.3 Fatigue

From the research perspective most transport and safety conferences in Australia appear to feature work on fatigue, particularly in the heavy trucking industry. The Road Safety Research, Policing and Education Conference in Brisbane during November 2000 was no exception, featuring ten papers on the issue by authors from a wide range of academic and government organisations.

At the federal level *'Beyond the Midnight Oil'* (www.aph.gov.au/house/committee/cta/mfindex.htm) was produced in October 2000. It was the culmination of 12 months of work including 15 public hearings and over 115 submissions. The process found that many transport workers go way beyond what are reasonable and safe hours of work. The report focused on fatigue management. Its 40 recommendations on the way ahead for drivers, managers, freight forwarders, and the customers of the transport industry included the following.

- An operator accreditation scheme for the road transport industry.
- Make driving or operating a vehicle while fatigued an offence, similar to alcohol and driving.
- Introduce a drug free policy into the transport industry and require all road transport companies to institute and administer random drug testing.
- Amend the Road Transport Reform (Driving Hours) Regulations to incorporate time of day considerations and increase the minimum allowable rest periods.
- Declare a national OHS standard on fatigue and develop effective codes of practice on how best to manage fatigue for all sectors of the transport industry.
- Improved fatigue management requires better training and support; better work practices and job scheduling; more effective regulation and better awareness of optimal work and rest patterns.
- Transport company managers and customers have a major impact on the level of fatigue in the industry and an important role in helping to alleviate the problem.
- Governments and all players in the industry must recognise the scale of the problem and accept responsibility for improved management.

Some discussion was provided about how all this will be funded, implemented, change managed, policed, and evaluated; but probably not enough and it will not be an easy, cheap or short-term process. To date it remains unclear how much of it has actually been, or will ever be, implemented and in some ways it appears to have been overtaken by other initiatives such as Chain of Responsibility (COR).

At the state level, the National Safety Council of Australia's internet site (www.safetynews.com) referred to a new health and safety guide for the road freight transport industry that is available from the Queensland Division of Workplace Health and Safety. *The Road Freight Transport Health and Safety Guid*e suggests that Queensland's annual workers compensation payments for carriers exceeds

$15 million. Drivers and employers have a joint responsibility to ensure that the driver is in a fit state to drive the heavy vehicle properly. The guide (www.detir.qld.gov.au) contains practical advice on how to deal with a range of issues for managers and drivers and is designed for easy photocopying and circulation. It covers driver fatigue, stress and training; vehicle ergonomics, noise and maintenance; and loading and unloading. The appendices provide a range of tips for managers and drivers and a self-audit checklist of best practice.

In Western Australia fatigue is a major issue due to the 'isolated' nature of the state and long distances. A heavy truck maintenance, fatigue, training and management systems accreditation process is being implemented. Currently, however, it is limited to vehicles over 42.5 tonnes in weight and 19 metres in length and excludes a large proportion of the heavy vehicles in the state.

3.4.4 The Australian Trucking Association (ATA) and TruckSafe

At the industry level, the ATA was set up as a national organisation based in Canberra after several multiple fatalities involving heavy trucks in 1989. Its members include operators of heavy vehicles (over 4.5 tonnes) and the unions. Discussion with Edmonds (2000) suggested that the ATA has several functions, including lobbying and helping its members to improve the quality and efficiency of their performance.

Information about the ATA and TruckSafe was initially obtained from the ATA's internet site (www.trucknbus.com.au/ata), documents (ATA 2000) and a meeting with Mike Edmonds, the ATA's former National TruckSafe and Communications Manager. More recent information was provided by Mike McCartney, the ATA's current National Safety Manager. Dare (2002) and Sullivan (2002) also referred to TruckSafe, the latter providing a quite detailed critique.

According to McCartney (2002) the ATA established a Safety Council in 2000/2001 made up from a cross section of state member organisations, large fleet operators and owner driver representatives. Chaired by John Allan, the Federal Secretary of the TWU, the council is involved in regulatory interaction, identifying and developing policy drawing on operators and councillors experiences to improve road safety in the trucking industry. The most recent safety Council meeting held in co-operation with the NRTC focused on driving hours and fatigue management, the Compliance and Enforcement Bill, rest areas and medical certificate standards. The Safety Council is involved in over 20 national and state steering and other committees in co-operation with commonwealth and state jurisdictions.

TruckSafe is a self-regulation accreditation tool and is a not for profit subsidiary of the ATA. It was developed because industry and government agencies have begun to move heavy vehicle compliance strategies away from direct enforcement mechanisms to an alternative compliance management system. Demonstration of compliance is achieved through an audit of performance records by regulatory or enforcement agencies or approved auditors (ATA 2000).

TruckSafe is based around a 'kit' that includes a video, books, CD and internet site. It covers four modules at present, with three new ones planned (Table 14). Participants undertake annual performance audits.

Table 14 - The TruckSafe components

Existing	New	Missing
Vehicle maintenance standards	Environmental management	Fatigue management
Management standards	Mass management	OHS
Workplace and driver health standards	Workshop management	Crash data analysis
Training standards		Driver's hours and logbook

(Source: ATA 2000, Edmonds 2000)

The Maintenance Management Standards of TruckSafe require accreditation of participants' vehicle maintenance systems to a prescribed set of standards based on the requirements of the National Road Transport Reform Regulations for vehicle standards, and the Australian Design Rules. TruckSafe provides standards and criteria for daily vehicle checks, fault recording, reporting and repair, scheduled maintenance, maintenance records, documentation and management, internal review, and maintenance training and education. The management standards of TruckSafe require documented policies and procedures for operational and management functions and responsibilities. These form the basis for being able to demonstrate due diligence and indicate whether problem areas are being addressed. TruckSafe provides standards and criteria for management policies and procedures, responsibilities, internal reviews and record keeping.

The workplace and driver health standards of TruckSafe are not meant to be legal standards. They do not replace or even cover all the legal requirements for health and safety, driving hours or rehabilitation. Instead TruckSafe focuses on implementing and documenting key issues such as preventative health checks, fatigue, stress, lifestyle, risk assessments and risk reduction. TruckSafe provides standards and criteria for workplace health and safety, appointment of a company doctor, driver health screening, rehabilitation and driving hours.

The training standards component of TruckSafe aim to ensure drivers are correctly licensed, qualified and trained to meet due diligence and OHS requirements. TruckSafe provides standards and criteria for the company training and education policy and driver road use requirements.

According to McCartney (2002) the 'missing' items in Table 14, particularly fatigue management and OHS, can already be found to varying degrees within the Workplace and Driver Health module. TruckSafe is working through the national reform process with the NRTC and Queensland Transport as lead agency to develop a comprehensive Fatigue Management Program. The Mass Management module is awaiting regulatory approval, and a Workshop Accreditation Module is nearing finalisation.

What are the reported outcomes of TruckSafe?

- In December 2000, over 720 companies were participating in the program of which 344 are accredited and listed on the internet site (www.trucknbus.com.au/ata/national.cfm). According to Edmonds (2000), approximately 7,000 of the 60,000 registered articulated heavy trucks in Australia are currently in the scheme and the aim is for one in six by 2003.
- More recently McCartney (2002) provided the following data from NTI. Operators involved in TruckSafe enjoy an average of 32% lower premiums than the general fleet (based on 12 months of insurance data up to July 2002). Of the 16,000 vehicles (owned by 400 operators) now in the TruckSafe fleet, some 55% are insured with NTI who report that these operators have 56% less accidents than the general fleet, at an average of 26% lower cost of losses. As

such, TruckSafe operators enjoy a financial benefit through lower average premiums. Another 209 operators are working up to accreditation. TruckSafe covers 9.3% of all articulated vehicles in Australia.

- TruckSafe helps operators of all sizes formalise their procedures, be more professional and generate documentary evidence to protect them against legal requirements of duty of care and due diligence.
- Financial benefits resulting from better maintenance procedures, lower insurance costs and tighter employment procedures.
- It's the biggest men's health program of any kind in Australia.
- It provides a potential network of other similar operators who can all learn from each other.
- Members obtain a quality badge. Customers, freight forwarders and prime contractors are likely to give TruckSafe operators preference in loading and rates because they provide better quality and safer transport. Insurers, banks and other suppliers are likely to favour quality orientated operators, especially where they were lowering their risk profile through TruckSafe.

TruckSafe has not been without criticism and problems, some of which were documented by Sullivan (2002). It appears to have evolved over time, however, and its advocates and sponsors, such as NTI believe in its value as an accreditation, self-regulation and safety tool. Overall accreditation and enforcement via COR and OHS regulations appears to be the preferred approach to regulating the Australian trucking industry. NTI appears to be a proactive heavy vehicle insurer and is regularly featured in '*Australasian Transport News*'.

3.5 Comprehensive vehicle insurance

3.5.1 National Transport Insurance (NTI)

NTI's fleet safety program was initiated in 1994 to lower the huge costs associated with heavy vehicle claims. It was based on lessons learned from the aviation industry and engineering. The following case study is based on an interview with NTI's now-retired Risk Manager, Peter Dare, and his presentation at the recent Travelsafe symposium (Dare 2002).

NTI is Australia's largest heavy vehicle insurer with 40% of the market, covering approximately 35,000 vehicles and 50,000 drivers (Dare 2002). Its fleets range from owner-drivers to 200+ units (vehicles and other items). This puts NTI in a very strong position to influence fleet safety by making risk management a pre-requisite for obtaining insurance and by targeting high risk fleets. NTI's risk management programs apply a human resource management (HRM) approach to assist policyholders. It is a strong advocate for TruckSafe (which it sponsors) and COR. NTI has recently produced a booklet *'Wake up call to users of the trucking industry: the Chain of Responsibility'* to help shippers be more aware of their responsibilities.

Dare (2002) described how during September 2000, NTI was asked to insure and provide risk management for a large interstate carrier that had incurred more than $1.2m in claims during the previous 12 months. Claims had been steadily growing over the previous four years, as had the size of the fleet, which consisted of 85 prime movers and 150 trailers. There had been 27 claims of which 14 were major. Thirteen claims were rollovers and six were fatigue-related (based on the time of day). One

accident was fatal. The drivers involved in the other claims sustained minor injuries. Sub-contractors supplying prime movers to tow company-owned trailers were responsible for four major claims and a number of smaller claims. These were subjected to the same risk management as the client company.

Safety audits were undertaken at its six depots. Depot two was over-represented in claims considering the small number of trucks based there, probably due it its unique freight task that required comparatively young drivers. Approximately 43% of all claims and 50% of fatigue-related claims involved trips from depot three, where there appeared to be little control of drivers due to management workload. The other fatigue-related claims involved trips originating from depots one and four.

All drivers were hired from depot one (main depot) and very little autonomy was given to other depots. Human resource management practices were poor. Many of the tools were in place but were not being correctly utilised. Driver standards were poor. No single person had been given responsibility for driver management and there was little monitoring of driver behaviour.

A report including 20 risk management recommendations was tabled at a meeting of the managers, subcontractors and NTI. The managing owner explained that the business would be closed down at the end of 12 months if claims were not substantially reduced.

The 20 recommendations were as follows.

1. Appoint a risk management project coordinator.
2. Appoint a human resource management (HRM) supervisor.
3. Develop written driver standards.
4. Begin a driver recruitment program.
5. Use People and Quality Solutions Pty Ltd (PaQs) profiling for all existing and new drivers based at depots two and three.
6. Provide immediate in-cabin training for all drivers at depot two specifically targeting rollovers.
7. Interview drivers to determine their training needs.
8. Develop an induction training process.
9. Draw up a training schedule for all drivers, targeting rollovers.
10. Provide fatigue-management training for all long-distance drivers using NTI fatigue CDs.
11. Evaluate all schedules to minimise midnight to 6am driving.
12. Explore the feasibility of changeovers and staging drivers on some runs.
13. Convene monthly management meetings to discuss progress.
14. Ascertain why drivers leave the company and report this to the monthly management meeting.
15. Develop driver monitoring standards and methodology.
16. Develop tow operator recruitment standards and training.
17. Develop a system to check drivers' fitness for duty.
18. Train night supervisors to recognise fatigue and other fitness-for-duty criteria.
19. Develop a strategy to advise customers of their obligations under COR.
20. NTI Resources to write safety hints for the company newsletter.

All recommendations were adopted. Satellite tracking has been evaluated as a monitoring device with better than expected results. It will not be installed in the short-term due to cost. Plans have, however, been devised for gradual implementation at a later date. Management workloads have been reviewed and, in many instances, extra staff employed and training implemented. During the period of risk management, the company lost a contract and this eased a driver shortage problem. It has since won new contracts and the recruitment program is working full-time to meet demand. It was hard to evaluate driver turnover, as many of the drivers who left were made redundant due to the loss of the contract.

From a research perspective, however, it is impossible to evaluate which elements of the program were most effective. Dare (2002) believes that the most important step was the appointment of a HRM supervisor. By August 2001, the company had recorded three claims since the program began: one a minor collision with a car, a rollover and an engine failure that caused a fire. The cost of claims had reduced to $240,000 of which $93,000 was subject to a recovery action. Although such results could be attributed to some type of regression to the mean or a very poor starting point, this does appear to be a very comprehensive program.

The People and Quality Solutions Pty Ltd Accident Risk Management (PaQs ARM) profile was explored further. Its internet site (www.PaQs.com/armq_sas.html) provides a great deal of mainly sales-based information, including some results and case studies from a range of industries. It is based on seven scales: safety control; risk avoidance; stress tolerance; driver attitude; quality orientation; accuracy; and distortion.

NTI's multimedia fatigue management training consists of three CD's.

1. **Personal Fatigue Management Training**: a 45-minute session discussing the physiology of fatigue, sleep debt, circadian cycles and recognising the onset of fatigue.
2. **On Road Fatigue Management Training**: discusses methods of combating fatigue while on the road (including good diet) and how the family can help drivers ready themselves for a trip.
3. **Operational Fatigue Management Training**: aimed at management - covering duty of care, COR, rostering, scheduling, and fatigue management.

This fatigue management program is currently being reviewed and updated by NTI.

NTI accredited trainers apply a very specific program that includes safe emptying of articulated trailers and procedures to negotiate corners with high centre of gravity vehicles. Rollovers are a major cause of cost and injury in the heavy vehicle industry and NTI aims to implement driver-training programs on vehicle stability. To date, however, there has been limited time and money available for implementation.

NTI has been testing the use of ITS to determine if the trailer is level before the driver attempts to unload, and satellite tracking to monitor behaviours such as deviating from set routes, disobeying driving hour rules and speeding.

The fleet safety message is frequently disseminated to NTI clients through personal visits, and articles through the press, the trucking associations and conferences. NTI's clients recognise the value of good

driving performance through reduced claims and lower premiums. There is a strong focus on making the material educational and easy to understand.

Claims costs are the core KPI adopted to evaluate client progress. These figures are based on severity and frequency rates. The types of claims that are reported to NTI consist of anything with a dollar value. The current average annual claims frequency per 100 vehicles insured is 6.3%.

NTI has encountered the following barriers when implementing fleet safety programs.

- Lack of client commitment and awareness of the need to be proactive about safety.
- Transport operators that tend to be very anti-paper work.
- Limited client resources and funding to implement safety programs.
- Limited and inefficient policing and enforcement of the industry by the regulatory agencies.

Interestingly, just as NTI has been proactive in the heavy truck sector, another insurer, Lumley, has been very proactive as the largest insurer of light vehicle fleets in Australia.

3.5.2 Lumley Insurance

Lumley Insurance is best known for its fleet safety benchmarking (Haworth et al 2000), which aims to assist clients to reduce costs and meet their legal obligations. The following case study is based on presentations undertaken by Lumley staff (Steel 1997, Gialantzis 2001), discussions with Hetherington (2001), and an interview with its National Motor Risk Manager, Robert O'Shea.

Steel (1997) described how Lumley insures approximately 180,000 vehicles. Of these, fleets comprising a total of 58,000 vehicles participate in the 'Benchmarking Program'. He suggested that insurers should partner their clients for effective risk management. He described accountability, loss control and benchmarking as three of the most effective programs for reducing crash costs and frequency.

1. **Accountability** means users (department or division that incurs the losses) pay. This focuses management attention.
2. **Loss control** typically starts with a review, a loss control manual and gaining management commitment. Lumley gives quarterly reports to its clients on KPIs such as driver at fault, costs and claim types and conducts driver awareness workshops and seminars on specific issues.
3. Lumley analyses its best performing clients and sets **benchmarks** on KPIs such as claim rate, driver at fault, single vehicle, damage while parked (to assess quality of reporting), claims per million kilometres, average claim cost, and average cost per vehicle for fleets to identify areas of strength and weakness.

In 1997 and 1999 Lumley's benchmarking club won the AfMA Fleet Safety Award. Steel (1997) described in more detail how it operates. Lumley produces individual reports and risk management programs for clients and encourages them to attend benchmarking meetings, which it holds in Sydney and Melbourne each year. Data is confidential but individual participants know which is their own data and can compare with similar sectors. Discussions with Hetherington (2001) provided more up to date

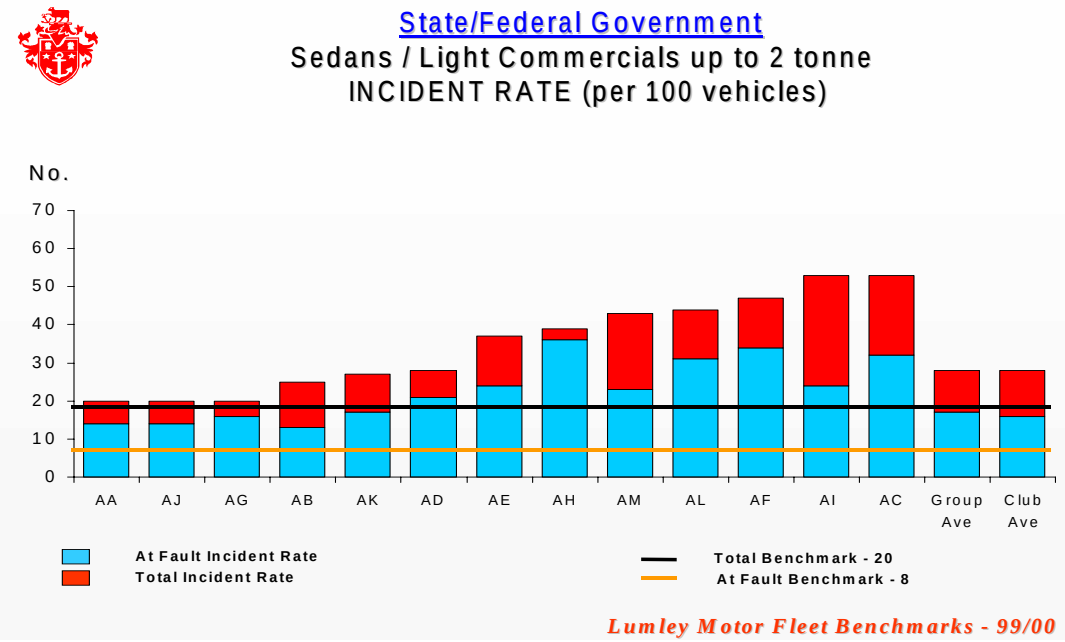
information about the continuing benchmarking programs and other fleet risk management initiatives. He suggested that Lumley is now the biggest fleet insurer in Australia insuring over 250,000 vehicles. The benchmark data is extrapolated from 60 participating fleets operating 110,000 vehicles ranging from 100 up to 18,000. The make up of vehicle types insured is shown in Table 15. Lumley reviews its clients' results, and constantly investigates new techniques and ideas. In October 2000, 150 people attended the Sydney meeting from which Hetherington (2001) and later Gialantzis (2001) both provided the overall benchmarking results and a case study of DuPont (see Appendix 3.8.1).

Table 15 - Vehicle types insured by Lumley

Vehicle type	% of vehicles insured
Cars	45%
Utes	20%
Light trucks	18%
Buses	1%
Heavy trucks	15%
Plant	1%

The benchmarking graphs used at the meetings are broken down by vehicle type for each of the following sectors: government; religious/charity; media; manufacturers; transport; finance; emergency services; construction; bus and coach; technology; and agriculture (Gialantzis 2001). Figure 7 shows the crash performance and rates for government sedan/light commercial vehicles for the period July 1999 to June 2000. Each bar (eg AA) is an individual fleet. The light and dark lines (Lumley Benchmarks) are seen as 'best practice' rates for 'at fault' and all crashes. The Group Average indicates the average result for that particular group. The Club Average indicates the average result of all Benchmark club members.

Figure 7 - Lumley claim rates for government sedan/light commercial vehicles



(Source: Lumley 2000)

The current claim rate per 100,000 kilometres is 1.14 based on an average of 25,000 kilometres per vehicle. All types of damage and theft, from the 'ground-up' regardless of excess, are reported to and recorded by Lumley.

Summary data for all the benchmarking participants is shown in Table 16. This suggests that from July 1999 to June 2000 just less than a third of sedans and light commercial vehicles were involved in a crash, at an average cost of $1,670 per crash. Additionally, the data for all commercial vehicles >2 tonnes (Table 17) showed an incident rate of 12 crashes per 100 vehicles, at an average cost of $3,276 per crash. The tables show a reduction in crash rates and costs from the period 1998/1999 for both vehicle types. Lumley believes the reductions were due to less client activity, better weather, improved risk management, fewer high cost claims, and repair cost control. It is not known, however, if this improvement occurred across the insurance industry as a whole.

Table 16 - Lumley averages for all sedans and light commercials up to two tonnes

Benchmark criteria	**98/99 actual**	**99/00 actual**	**Lumley standard**
Incident Rate per 100 vehicles	36	28	20
At Fault Incident Rate per 100 vehicles	21	16	8
Average Incident Cost	1,947	1,670	-
Incident Cost per Vehicle	629	467	-
Driver at fault % of claims	30	25	25
Client vehicle only % of claims	25	32	15
Unknown third party at fault % of claims	15	15	10

(Source: Lumley 2000)

Table 17 - Lumley averages for all commercial vehicles >2 tonnes

Benchmark criteria	**98/99 actual**	**99/00 actual**	**Lumley standard**
Incident Rate per 100 vehicles	20	12	10
At Fault Incident Rate per 100 vehicles	15	5	4
Average Incident Cost	3,461	3,276	-
Incident Cost per Vehicle	558	378	-
Driver at fault % of claims	59	28	25
Client vehicle only % of claims	13	11	10
Unknown third party at fault % of claims	3	2	5

(Source: Lumley 2000)

According to Hetherington (2001), the average cost shown in the benchmarks covers all costs associated with the management of the claim, other than Lumley's own cost of administration. For example, it includes own damage repair costs, payments to third parties, recoveries from third parties, assessing fees, towing costs, and police reports. It is difficult for Lumley to quantify the additional costs associated with crashes described in Sections 2.4, as it requires a considerable amount of information from their client and this is often not readily available. An analysis of the claim rates in terms of different vehicle types revealed the following best and worst.

- For light vehicles the best crash rate was 0.04 crashes per vehicle, the worst was 0.9 crashes per vehicle per annum.

- For heavy vehicles the best crash rate was 0.03 crashes per vehicle, the worst was 0.52 crashes per vehicle per annum.

Although Hetherington is aware of the pitfalls of benchmarking crash data, such as comparing 'like with like', defining crashes and identifying what is wear and tear and what is a crash (Murray and Rand 2000), he suggests that the figures provide a good start for fleet operators to begin to evaluate their performances. The key for operators is to get behind the figures and be able to understand and explain why the benchmarks are as they are and what the numbers mean. As an example, Gialantzis (2001) quoted data from two of its successful clients. One OHS-led program involving a fleet of 199 vehicles reduced the 35 incidents (costing $72,706) in 1999 to 19 incidents (costing $53,530) in 2000. No data was available to evaluate the costs of the program or the possibility of any regression to the mean.

Hetherington (2001) was not supportive of the idea of providing insurance discounts based on membership of safety programs such as the Queensland Transport WFSS or TruckSafe. He has seen cases where some organisations have 'got the badge' then done nothing and Lumley have been left to 'clear up the mess'. He feels the best way to reduce premiums is to maximise safety performance. To achieve this, Lumley applies principles from risk management programs in other disciplines. The following list combines Lumley's risk management plan for smaller fleets with the strategies it considers vital in the reduction of incident costs.

1. **Sample fleet safety policy**.
2. **Driver training and education.** Driver training combined with management and driver accountability and responsibility will get results.
3. **Claims form and data capture.** Reinforces accountability and provides an accurate history of incident causes and costs.
4. **Incident review.** Management review of incidents reinforces accountability and responsibility.
5. **Management and driver guidelines**. Written guidelines leave no doubt as to what is required and the expected outcomes.
6. **Performance standards.** An agreed level of performance should be set, so as to achieve continual improvement.
7. **Communication and awareness.** Regular information to drivers will keep them alert to objectives and reinforce company safety requirements.

Lumley supports clients through claims reporting, client visits, educational materials, seminars, audits, presentations, news briefs, and developing strategies. The fleet safety message is disseminated to its clients through all forms of the media. Additionally, Lumley recognises safe driving performance through reduced premiums and excesses, providing awards at the Benchmark Club meetings and helping clients generate good publicity in the media.

Hetherington provided a range of other Lumley material including its glove box kit (crash pack), motor risk management program, claims management, driver development, loss control and a risk management plan for smaller fleets. The loss control program includes fleet safety reviews, a range of videos, a risk control manual and brochures on topics such as driver selection, sharing the road with heavy vehicles, dangerous road conditions, using roundabouts, driving on country roads, adverse weather, safe reversing, four wheel driving, right of way, mobile phones, using ABS brakes, avoiding rear end collisions and how to manage the scene of a crash.

The main barrier that Lumley encounters in implementing fleet safety programs is their clients' low commitment to safety. In the past, it was not common to try and manage fleet crash costs, as there was not much information available. No one wanted to own the problem. Most client resources would be directed towards the more high profile risks such as liability, property and workers' compensation. Clients did not have internal structures to properly manage the problem. More recently, rising insurance premiums, greater OHS exposure for clients and an increased focus on risk management for legal and cost reasons have all facilitated the adoption of Lumley's fleet safety programs.

Despite their important role, asset damage insurers such as NTI and Lumley can only go so far in influencing their clients to operate more safely. The agencies that control injury insurance and OHS also have an important role in improving fleet safety. The following sections review the CTP and OHS agencies.

3.6 CTP insurance

Each state and territory in Australia has a statutory body that is responsible for managing compulsory vehicle related personal injury compensation claims. For some vehicle types, including taxis (Staysafe36), buses and trucks (ATN 2002), the crashes obviously involve work vehicles. For others, including utes and cars, the crashes may or may not involve work. CTP data is important because it allows a comparison/cross-over with the state level transport data (eg Meers 2002) and with workers compensation claims data. CARRS-Q's close collaboration with the Queensland Motor Accident Insurance Commission (MAIC) also suggests that CTP providers can be proactive in leveraging fleet safety improvements.

Anderson (2002) suggested that the high crash experience of commercial vehicles presents a particular set of problems for the compulsory third-party insurers. This was supported by Deans (1997), who focused on the relevance of the NSW MAA's CTP scheme to work-related driver safety. She felt that although people whose work involves driving may claim workers' compensation, there are a proportion of work drivers who will also seek compensation under the CTP scheme. She argued that compulsory third party insurance is important for work-related road safety, but that not all work-related incidents could be easily identified. More recently the MAA sponsored the '*Quinlan Report'* described in Appendix 3.4.

In Queensland, MAIC manages the compulsory third party motor vehicle insurance scheme, through a small number of licensed insurers. Established under the *Motor Accident Insurance Act 1994*, MAIC is funded by a statutory levy within the compulsory third party premium that is included as part of the annual car registration fee. When a personal injury crash occurs a claim is made with the relevant insurer. Injury crashes should also be recorded in police Traffic Incident Reports. Insurers verify these reports. Eventually the insurers provide data about claims to MAIC.

MAIC monitors activities through the examination of the claims data (MAIC 2000). It monitors developments in claims reporting and settlements, and inputs the information into the premium setting process and legislative framework. The MAIC claims register and statistical database provides information that is useful to safety management. It promotes measures to eliminate or reduce the causes of motor vehicle crashes, and mitigate their results by funding rehabilitation and crash prevention research.

In Table 18, CTP premiums and claims frequencies (shown in relation to Class 1 vehicles) for work vehicles such as taxis, trucks and buses are the highest. These figures have since changed slightly as individual MAIC insurers can now set their own premiums within a range provided by MAIC on a quarterly basis.

Typical costs covered by MAIC include aids and appliances, long-term care/homecare, past and future economic loss, general damages, home and vehicle modifications, investigation costs, legal costs, hospital/medical/drugs and rehabilitation.

MAIC has used the data in Table 18 to be highly proactive in fleet safety by targeting, encouraging and supporting the bus and the taxi industries to improve their performance. For example, Brisbane City Council (BCC) has been supported to improve the CTP claims experience of its bus fleet. In October 2000, it formed a safety group to gather data, identify issues and review options to improve performance. The group meets every few weeks and reports back to management once a month on the program, which includes the following.

- Consolidated recording of all crashes and traffic infringement notices by the Risk Manager.
- Crash report form made more relevant and user-friendly for drivers.
- Bus tours by managers to highlight operational hazards.
- Links with Urban Management - to be pro-active and avoid creation of physical hazards.
- Driver recruitment, assessment, training and disciplinary processes reviewed and further developed.
- Improved communication, including a handbook for bus drivers.
- Closer relationship with CTP insurer and Police.
- Improvements to 'on bus' passenger information and cameras on board buses.
- Nightly checks on buses to identify drivers who have not reported crashes.

BCC has since used MAIC data on claim type and comparative information against other bus fleets. BCC's statistics show that since October 2000, the crash rate has been falling. Driver reporting of crashes has increased, while non-reporting has decreased. This is an example of how CTP agencies can support fleet safety initiatives in Australia.

A similar process has been supported with the Queensland taxi industry, which has also been identified as a high risk group of drivers in other jurisdictions and by other agencies in Queensland. For example, Staysafe36 (1997) analysed New South Wales CTP data to make recommendations on taxi safety. Dalziel and Job (1997) evaluated safety issues with New South Wales taxis. A report on the taxi industry was recently published by Queensland Transport and the Department of Industrial Relations (www.transport.qld.gov.au/home.nsf/images/public/$file/Reportfinal.pdf).

Table 18 - Number of vehicles and CTP premiums in Queensland

Class	Type	Vehicles June 2000	Claims 1998/99	Premium cost June 2000	Work vehicles	% work-related	Claims frequency	Fleet safety initiatives
1	Cars and station wagons	1,727,208	6,655	286	Y	Not known	1	
2	Motor homes	5,072	7	286	N	Not known		
3	Taxis	2,512	174	1,859	Y	100	16	Yes
4	Hire vehicles	15,390	150	972	Y	Not known	3	
5	Vintage, veteran and street rod vehicles	5,472	8	25	N			
6	Trucks, utes and vans <4.5 tonne	405,788	1,349	286	Y	Not known	1	
7	Trucks, utes and vans >4.5 tonne	48,393	517	858	Y	100	3	
8	Non business buses	5,619	25	286	N			
9	School/similar buses	2,742	17	286	Y	100		
10	Local buses	3,544	159	308+30 per passenger	Y	100	12	Yes
11	Other buses	3,792	51	308+53 per passenger	Y	100	5	
12	Driver only motorcycles	30,273	12	80	Y	Not known		
13	Passenger carrying motorcycles	42,812	65	286	N			
14	Tractors	28,445	9	80	Y	100		
15	Self propelled machinery/Fire trucks	10,038	29	80	Y	100		
16	Ambulances	732	6	286	Y	100		
17	Primary production (farm) vehicles	48,385	54	129	Y	100		
19	Limited use plates <1 tonne	548	Na	25	N			
20	Limited use plates >1 tonne	107	Na	25	N			
21	Recreation vehicles	6	Na		N			
22	Permits for unregistered use		1					
23	Dealer plates	3,838	3	286	Y	100		
24	Trailers	28	0	286	Y			
	Total	2,390,744	9,291					

(Source: MAIC 2000, MAIC 2000a, Anderson 2002)

After several meetings with the Queensland Taxi Council, MAIC provided the industry with its claims data and supported the implementation of the action plan summarised in Table 19. A senior level project officer has been funded and recruited by a 'safety levy' on taxi licence holders, and an Action Watch Task Force of key stakeholders establised. To date the taskforce has focused on crash statistics, better reporting, understanding the CTP premium process, driver assessment, the use of ITS and managing drivers. The Queensland Transport WFSS is being adapted to meet the needs of the taxi industry.

Table 19 - Elements of the Queensland Taxi Council Safety Action Plan

Set up Accident Watch Task Force
Adopt intelligent transport technology
Develop industry wide road safety policy and procedures
Data management (crash/driver behaviour)
Taxi industry discussion group
Improve recruitment and selection
Post-affiliation strategies induction, monitoring and countermeasure
Vehicle selection and maintenance
Driver training and education strategies

These bus and taxi examples suggest that CTP insurance can be used to leverage fleet safety programs. This can achieved be through premium levels based on performance and encouraging, developing and supporting risk management programs for high-risk groups such as taxis, buses, hire cars and heavy trucks. Collecting and monitoring 'purpose of journey' data would allow for a fuller understanding of the extent, costs and details of work-related claims in the other vehicle classes.

This experience in Queensland, where MAIC has been proactive on taxi and bus fleet safety, and has supported CARRS-Q's fleet safety program, shows the full fleet safety potential across all CTP agencies around Australia. A first step could be a CTP benchmark survey on the following types of questions.

- To what extent does each vehicle class involve work-related claims?
- Is 'purpose of journey' monitored?
- Does the CTP agency work closely with specific fleets, or have a risk manager?
- What fleet safety initiatives have been undertaken?
- Has the CTP agency recognised its own potential for 'leveraging' fleet safety improvements?
- What is the relationship between CTP and workers compensation insurance?

Finally, there may be some scope for fleet safety specialists to target CTP agency leaders, conference 'circuit', media and professional bodies to encourage them to support fleet safety improvements.

3.7 OHS survey responses

The importance of occupational health and safety (OHS) is a recurring theme in fleet safety. For this reason the state level OHS agencies were questioned about their fleet safety programmes. Three states replied, and their full responses are shown below.

State	Respondent
Queensland	Rob Seljack General Manager, Qld Division of Workplace Health and Safety, Dept of Industrial Relations
Tasmania	Steve Hyam General Manager, Workplace Standards Tasmania
NSW	Jenny Thomas Team Manager - Retail, Wholesale, Transport & Storage Team OHS Division, WorkCover NSW

State	Question 1 - Does the OHS legislation recognize the motor vehicle that is used for work purposes as part of the workplace?
Queensland	**Yes: The definition of the workplace is broad enough to include motor vehicles. There are no regulations specific to motor vehicles under the Workplace Health and Safety Act, 1995. The manner in which vehicles are used (eg fatigue management, scheduling, loading and other issues related to operator and vehicle safety) are covered by the general legal obligations of employers under the Act.**
Tasmania	Yes: A vehicle is a workplace under the Tasmanian Workplace Health and Safety Act 1995. Enforcement is no different from the enforcement associated with the other aspects of the act.
NSW	Yes: Vehicles are defined as workplaces under the definition of 'premises' in both OHS Act 1983 and 2000

State	Question 2 - Are both on and off road work-related road crashes generally investigated by your agency? What is the process of investigation?
Queensland	On-road crashes are investigated by the Queensland Police Service (QPS). The Division of Workplace Health and Safety has a Memorandum of Understanding with the QPS to be notified of any work-related accidents that are being investigated by the QPS. Off-road crashes are investigated by Workplace Health and Safety inspectors if it is ascertained that the vehicle was a 'workplace' and a fatality or serious bodily injury occurred in line with the Division's enforcement framework. The process of investigation is governed by internal investigation procedures that are applied to all workplace incidents.
Tasmania	The Police and the Department of Infrastructure Energy and Resources (DIER) investigate road trauma. WST (Workplace Standards Tasmania) and LTS (Land Transport Safety) are divisions of DIER.
NSW	Currently, crashes involving Heavy Vehicles (of which retail, wholesale, transport and storage (RWTS) Team is informed) are investigated by the RWTS Team in the Metropolitan area and by Country Teams outside the Metro area, but in consultation with the RWTS Team. Investigation involves the securing of the Police investigation report for examination of whether any workplace factors may have contributed to the collision.

State	Quesstion 3 - What do you see as the main challenges for Workplace Health and Safety in relation to the road transport industry?
Queensland	The main challenge is to work co-operatively with the road transport authority (Queensland Transport) and the Police to avoid duplication and increase effectiveness. To this end, Queensland Transport has established a Chain of Responsibility Overview Committee to review investigation and enforcement of road crashes. The Division of Workplace Health and Safety is represented on this Committee.
Tasmania	Acceptance of individual accountability by the drivers. Drivers are working in 'remote' locations and are not under the direct supervision or control of the employer. Employers (and contract principals) being held accountable for motivating anti-social behaviour by drivers, generally due to the imbalance of power between the employer (or contract principal) and the driver.
NSW	Convincing the Transport industry that OHS risks (including risks arising from driving in the course of work) should be managed as any other business risk is managed i.e. as part of their usual business risk management system. In simple terms, workplace driving is a hazard that should be identified, assessed and controlled in the same way that any other workplace hazard is risk managed.

State	Question 4 - What strategies do you believe could be adopted to manage fleet safety more effectively within an OHS framework?
Queensland	More use could be made of the risk management approach in OHS legislation, rather than the prescriptive approach traditionally applied in road safety enforcement. The integration of fleet safety management into broader workplace health and safety management systems would assist in this regard.
Tasmania	The framework is irrelevant. The analysis needs to be conducted at a behavioural level, informed by behavioural psychologists. The outcome from the study then needs to be given the force of law and be supported with sufficient resources to enable effective implementation.
NSW	Recognising that road safety exists as a safety imperative entirely separately from workplace safety i.e. all drivers have to comply with road safety legislative requirements whether or not they are driving in the course of their work. In translating this to OHS, this means that there is a stronger reliance on the employee/worker responsibilities than may apply in a non-mobile workplace.

State	Question 5 - What barriers do you believe tend to be encountered by organisations when implementing fleet safety programs?
Queensland	Fleet safety is often treated as an isolated issue. The control measures to ensure fleet safety should be integrated with the safety management systems for the entire workplace (eg integrated with general induction, training, working hours, etc.)
Tasmania	At present the policy setting is biased towards financial motivators and it is necessary to provide equal power to the social side of the motivational equation.
NSW	As with many other organisations/industry sectors: • Too heavy reliance on individuals to 'be safe' without the proper workplace risk management process (identification, assessment, control, review) occurring – including the provision of information, training and supervision to employees/workers. • Lack of consultation with employees/workers about the risk management process and the resultant programs which may be implemented. • Limited understanding of obligations of line managers under the OHS legislation. • Belief that 'contracting out' fleet safety arrangements means that the company's obligations under OHS legislation are also contracted out

State	Question 6 - General Comments
Queensland	Queensland Transport is regarded as the leading agency for on-road safety issues, especially in regard to commercial vehicles (eg heavy vehicles and taxi industry). The Division of Workplace Health and Safety offers support and assistance as required, joint inspection activities and policy advice. A Memorandum of Understanding is being prepared (similar to the one with QPS) that clearly sets out the role of the regulatory agencies and identifies areas for information sharing and cooperation.
Tasmania	There are two problems that need to be resolved: power imbalance and motivational effects.
NSW	Recommend the accessing of the HSE (UK) internet site to peruse and consider the Report on 'at work' road incidents. The recommended approach aligns with that proposed by WorkCover NSW to strategically address these matters

3.8 OHS-led fleet safety programs

The petrochemical industry is a leader in the safety field due to the dangerous nature of the product and the high risks and costs involved. This type of organisation tends to have OHS-led programs in place which may offer potential lessons for other fleets. For this reason DuPont, Santos, Shell and BP case studies were reviewed.

3.8.1 DuPont (global manufacturer)

As part of Lumley's benchmarking meeting outputs, Hetherington provided a case study paper from DuPont (Ranck 2000). It focused on DuPont's safety culture, the business benefits of fleet safety and the eight elements of its safe driving program. A follow-up interview was undertaken with DuPont Project Manager Dean White.

DuPont delivers science-based solutions in industries such as food and nutrition, health care, apparel, home and construction, electronics, and transportation, and is seen by Lumley Insurance as a leader in fleet safety. DuPont has identified training, standards, inspections, audits and documentation as keys to the safe operation of its business units, including fleet safety. It puts a strong emphasis on organisational safety culture, based on the belief that it is the responsibility of the entire organisation to meet the requirements of the established safety policies. Its safety culture is based on the following principles.

- All incidents are preventable.
- Management is responsible and accountable for safety.
- All operating exposures can be controlled.
- Working safely is a condition of employment.
- Employees must receive safety training.
- Management audits are a 'must'.
- Deficiencies must be corrected promptly.
- Off-the-job safety is important.
- Good safety is good business.
- Employees are the key.

The eight elements of the DuPont Australia Driver Safety Program include the following.

1. **Company policy and manual.** Each employee who drives a company vehicle receives a copy of a driving safety booklet.
2. **Responsibilities**. Managers should take responsibility for the safety of their people.
3. **Driver induction and training programs**. Driving is a key element of staff inductions.
4. **Observation check drives**. Drivers should have an annual assessment.
5. **Basic defensive driving techniques and the Smith System of safe driving.** The Smith System is based on 'Five Keys to Space Cushion Driving': 'aiming high in steering', 'leaving yourself an out', 'keeping your eyes moving', 'making sure they see you' and getting the big picture'.
6. **Motor vehicle crash/damage reporting.** All drivers are familiarised with the reporting of traffic incidents. All collisions are investigated and documented within 24 hours and a determination is made as to what appropriate follow-up action may be required.
7. **Safe driving recognition.**
8. **Driving safety committees.** Such committees consist of ten members, mainly drivers and the general manager and meet every two months. Committees provide drivers with the opportunity to present their ideas on ways to improve the safety culture within DuPont and suggest new initiatives to undertake. Additionally, its computer-based training program involves both theoretical and practical components and is based on an interactive easy to use system.

Within the DuPont culture, the work vehicle is treated as an OHS issue, and employees are educated and encouraged to be responsible for fleet safety. The program developed out of the safety culture that originated in the United States. The Safety Health Environment Area (SHEA), along with the driving safety committee, makes recommendations for the fleet safety program. It is, however, the responsibility of line managers to implement the programs.

The fleet safety message is disseminated to employees and all levels of management through promotions, competitions involving family members and children, brochures, posters, and presentations.

The main fleet safety barriers that DuPont have encountered include time pressures and developing fresh and innovative ideas to keep the safety message active. The factors that have assisted the adoption of their fleet safety program include employee commitment to the strong safety culture and the involvement of the drivers in fleet safety decisions. Dupont believes that drivers make a significant contribution in striving to maintain a strong safety culture because they can see the results of their input.

DuPont evaluates its fleet safety program through KPIs such as crash rates (preventable crashes based on fleet size), days that are accident-free, costs, injuries, claims reported and compliance rates. It is regularly cited as a best practice case study, based on the following results.

- Over recent years DuPont has shown overall safety improvements based on an incident rate of injuries per 200,000 exposed hours and its worldwide insurance claims rate (Ranck 2000).
- Its standard in the 1980's was 3.97 crashes per million miles, or about one crash for every 250,000 miles travelled (Elliott and Shanahan Research 1995). More recent Lumley benchmark data suggests that DuPont maintains one of the safest vehicle fleets in Australia.
- Excellent performance in the Lumley Benchmarking program.

3.8.2 Santos (Australian oil and gas company)

This case is based on a visit by CARRS-Q staff to the Santos field operations at Coopers Basin in South West Queensland, attending its Transport Contractor Management Sub-Committee meeting, an interview with Santos's Chief Health and Safety advisor, Tony Jones, and on his presentation at the Travelsafe symposium (Jones 2002). It describes a range of lessons that can be learnt from Santos, including the importance of a no-blame culture, putting safety at the centre of operations and the use of a thorough incident management system for reporting, recording and learning from incidents.

Santos is Australia's largest natural gas producer, supplying all mainland states and territories. Santos Road Transport Safety operates in highly hazardous work environments in remote parts of Australia. Managing land transportation risks are a priority for the organisation as safety is placed at the core of its business mission (Jones 2002). It works on the belief that all injuries are preventable.

According to Jones (2002) Santos has a range of General Standards (GS) that provide the base guidance across 16 areas of risk exposure including Health and Safety Commitment, Risk Assessment and Management, Communication and Consultation, Transportation and Auditing.

Jones (2002) stated that the Santos risk management tools are fairly traditional and include formal safety assessments, a computerised incident management system, Safety Case quantitative risk analysis (QRA), hazard and operability analysis (HAZOP), Global Procedures, site operating procedures (SOP), safe working practices (SWP), Job Safety Analysis (JSA), most importantly 'Stepback' and safe behaviour involvement (SBI). The system is focused on identifying and controlling hazards by having a work permit system, incident reporting system, safety plans and risk assessments well embedded in its culture.

A range of initiatives were progressed during 2001 including fitness for work, focus on root causes, development of catastrophic risk indicators, improved induction, frontline safety leadership and transport safety.

Other Santos initiatives include the following.

- **Computerised Incident Management System (IMS),** which consists of hazard and incidents data and promotes sharing of information within the organisation. The IMS has increased crash reporting, thus, has assisted in identifying a number of key issues that required attention, including, driving in dust, fatigue, failure to drive to road conditions, poor driver risk management and hazard perception, lack of communication (particularly with sub-contractors), and back problems caused by driving on dirt roads.
- **New common Land Transportation Procedure**. The contents of this procedure apply to all road vehicles driven by Santos employees, contractors and visitors, and include driving competency standards, seatbelts for every passenger in a vehicle, record keeping, 80 kph limit on unsealed roads, lights-on policy, installation of roll bars on all Santos utilities and tray tops, minimisation of night and off-road driving, and journey management. It also includes detailed audits and work instructions.
- **Field driver-training component in the workplace safety policy.** The program is based on nationally recognised competencies and is assessed by registered training organisations. It must be completed before driving a Santos vehicle and is re-assessed every five years.
- **Daily toolbox meetings between operators and supervisors.** These meetings are held to discuss important issues relating to safety.
- **Vehicle circle checks** are conducted by drivers on a daily basis and supervisor checks are performed every fortnight. The vehicles are maintained according to manufacturers' specifications.
- **Dissemination of the fleet safety message to employees** through bulletins, awareness campaigns, induction processes, and slide show presentations that are presented at toolbox meetings. These issues are often based on issues and near-hits identified in the incident management system. Each driver at Santos is familiarised with the crash report/investigation forms. These forms involve limited paper work and through the IMS, the crash is comprehensively investigated. Santos recognises safety performance by offering incentives.
- **Development of a new program for driver assessment** and profiling, for pre-employment use, to evaluate training needs for existing staff, to identify high risk groups and to evaluate training programs.

Jones (2002) describes the IMS and Land Transportation Procedure in more detail.

The Queensland Transport WFSS, historical inputs, industry best practice, and benchmarking, influenced Santos's fleet safety program. Fleet safety programs have been actively operating since 1999 and every level of management is responsible for the implementation. The programs were initiated due to concerns about risk levels and crash rates.

Santos's Hilux 4WD fleet is the worst performing fleet in the organisation. This would be expected considering the road conditions encountered by the drivers in rural and remote parts of Australia, on often unsealed, very dusty private roads. Thus, Santos considers driver training competency programs to be particularly beneficial.

Santos has undertaken some evaluation and recognises that continuous safety improvement is a long-term program. KPIs used to evaluate the fleet safety program include the traditional reactive indicators such as crashes and injuries. Through the implementation of their IMS, proactive indicators, such as hazards and near hits, are also monitored. Santos believes that to remain proactive in the field of fleet safety, it is important to address the factors that could potentially contribute to the cause of a crash, before it occurs. Furthermore, Santos attempts to quantify the additional costs associated with crashes though lost time and injuries.

Based on visits to both their field and city sites, Santos was identified as having very thorough OHS-led safety procedures. Despite this, the following appear to be some key issues and barriers, mostly related to management policy, analysis and change.

- Despite the safety culture in the organisation, some individual managers and drivers do not acknowledge the risks, making culture change difficult.
- Lack of resources to make safety a priority.
- Lack of company direction for sub-contractors.
- Some disagreement between the city and remote sites over issues such as quality and contracting out services.
- Vehicle maintenance issues related to the shift system, the vehicle management/spares inventory system not allocating costs to individual vehicles, and some lack of control of its contract maintenance system.
- Attitude to, and use of, alcohol testing equipment.
- Drug and alcohol policy is heavily geared towards alcohol.
- City-based 4WD driver training was criticised as inadequate for the 'field' conditions.

Jones (2002) suggests that although things are by no means perfect, Santos has been successful. It has developed a safety culture (measured by survey), improved its incident reporting and investigation (measured through the IMS), identified areas requiring further attention (measured through the IMS and annual Safety Management Plan implementation), and reduced its crash involvement, heat related injuries, and total recordable incident case frequencies (Lost Time and Medical Treatment Injuries combined). This is shown in the Cooper Basin region data in Table 20 below. There are approximately 40 utes and other light vehicles based in the region.

Table 20 - Santos motor vehicle crashes, heat related incidents and incident case frequencies

Year	Crashes	Heat related	All incident case frequency
1988	30	No data	No data
1989	23	No data	No data
1990	23	No data	No data
1991	9	No data	No data
1992	4	No data	No data
1993	7	No data	No data
1994	9	No data	No data
1995	5	6 (1994/5)	No data
1996	15	11 (1995/6)	No data
1997	13	19(1996/6)	21
1998	15	34(1997/8)	15
1999	7	21(1998/9)	10
2000	3	12(1999/2000)	9

(Source: Jones 2002)

Overall, Santos plans to improve its current programs, rather than implement new initiatives. Improving the monitoring of fatigue through logbooks, driver competency, monitoring vehicle use through automated reporting systems, and the implementation of its alcohol and drug policy are key future aims.

3.8.3 Shell (multinational oil company)

This case study is based on several visits to Shell, participation in two of its monthly transport health safety and environment focus group meetings, its participation in a CARRS-Q research project and an interview with operations manager, Cliff Bell.

Shell is an energy company operating throughout the world. Its fleet safety initiatives were introduced after recognising the fatality risk (including a multiple fatality in Victoria during 2001 involving one of Shell's transport contractors) and the role of management accountability, including the management of its transport contractors.

Shell has introduced a number of fleet safety initiatives.

- Medical screening for all employees.
- Defensive driving courses.
- Adherence to driver working hours (fatigue management).
- Documented journey management for all long haul trips and compliance against those procedures.
- Black spot mapping programs to identify poor road conditions.

Additional initiatives undertaken at Shell include alcohol and drug training, hazardous substance training, physical handling workshops, diet management, stress workshops and driver assessment and training programs (eg vehicle roll-overs).

These fleet safety programs were developed through group experiences, and, in particular, learning from incidents. It is the practice within Shell to record and disseminate information relating to incidents that did, or potentially could result in death or injury. It is through these processes that both management and drivers can learn from and develop fleet safety initiatives based on their own experiences. Additionally, management is frequently engaging in new information from external sources such as fleet magazines and university research.

Operational managers are responsible for the implementation of the fleet safety programs, however, taking responsibility for safe working practices is regarded as a priority for all employees. Fleet safety is treated as an OHS issue and each employee actively contributes to safety improvement programs.

Prior to an employee commencing work at Shell, there are a variety of pre-employment checks. There are comprehensive documentation and induction programs to ensure that the most appropriate applicant is employed. For example, all potential employees at Shell are given a skills and competency profile, which assesses areas such as literacy, and numerical and mechanical skills. Driving experience and mechanical knowledge is also considered as part of the recruitment process.

Shell uses the following broad-based KPIs to evaluate its fleet safety program.

- Near hits and non-conformers (including losses of containers, mixes and motor vehicle crashes), which will lead to a reduction in the other five categories.
- Risks identified.
- First aid.
- Medical treatment cases per 1,000 hours.
- Lost time and injuries per 1,000 hours.
- Fatalities.

All drivers at Shell are familiarised with the procedures involved in reporting and investigating incidents. The drivers are involved in the incident investigation process, and 'learning points' are acknowledged. Each incident at Shell is rated on a severity scale within four categories: (1) harm to people; (2) asset damage and other consequential business losses; (3) environmental effect; and (4) impact on company reputation, as shown in Table 21. These guidelines for incident reporting ensure a comprehensive approach to fleet safety within Shell, and are driven by OHS and the need for loss control.

Table 21 - Shell's safety severity scale

Rating	People	Business (US$)	Environment	Reputation
0	No injury/health effect	No damage	No environmental damage	No public awareness
1	Slight injury	Slight (<$10,000)	Slight – within fence	No public concern
2	Minor injury	Minor (>$100,000)	Minor – no lasting effect	Some local concern
3	Major injury	Local (up to $1m)	Local – many incidents	Regional concern
4	Permanent disability/death	Major (up to $10m)	Major – severe damage	National concern
5	Multiple fatalities	Extensive (>$10m)	Massive – persistent severe	International public attention

(Source: Shell incident reporting and review guide 2002)

Shell employees are continuously encouraged to be responsible for fleet safety. There are focus group meetings, involving management and drivers every six weeks to discuss important fleet safety issues within the organisation. Regular on-site toolbox meetings between shift supervisors and drivers discuss 'lesson points' and other issues. Through these processes, the fleet safety message is constantly reinforced. Rather than offering drivers incentives for good driving performance, Shell frequently celebrates any achievements that have been made in fleet safety.

Shell has encountered two main barriers to the implementation of its fleet safety programs.

1. Introducing random drug and alcohol testing, which is felt to be intrusive towards recreational drug users.
2. Capturing the hearts and minds of all employees in the acceptance of its health, safety and environmental (HSE) culture.

Increasing driver awareness of safety issues, for example through focus group meetings that consist of management and drivers, has facilitated the adoption of the fleet safety program.

An outstanding issue Shell aim to address is the notion of engaging all drivers in safe driving practices. Shell strongly believes that if the drivers can understand and appreciate the impact of unsafe driving behaviour, they will try to engage in safe driving practices. Through this belief, Shell aims to promote fleet safety by targeting the 'hearts and minds' of drivers and management.

3.8.4 BP (multinational oil company)

This case study is based on a conference paper presented by Huetson (1999) and the company's recent expression of interest document for its road safety leadership program.

BP is a global company engaged in the exploration, production, refining and marketing of petroleum products. BP also has a chemicals manufacturing and marketing business, and has a developing solar business. BP is one of the largest listed companies on the British Stock Exchange, operates in over 100 countries, and employs more than 100,000 people.

In Australia and New Zealand, BP operates refineries in Western Australia and Queensland, and has an extensive retail network in Australia, New Zealand and the South Pacific. It also has lubricants, aviation and bitumen businesses in the region. Delivery is conducted using third party carriers and distributor networks, working to approved BP standards.

Employees at BP and their contract carriers are frequently exposed to a huge range of diverse activities involving environments that can be hazardous. BP first focused on fleet safety after realizing that it could reduce its crash rate by introducing new equipment and improving procedures. More recently the focus has been on people and change management and Hueston (1999) described its Road Safety Leadership (RSL) approach to 'capturing hearts and minds for better safety performance'.

The advanced safety auditing (ASA) technique has been implemented to provide managers and supervisors with a systematic approach to improving safety related behaviour in the workplace. It is very similar to the Group Decision Theory approach described by Gregersen et al (1996). The primary focus of the ASA is on people in the workplace. The key skills used when applying the techniques of ASA are observing people at work, questioning employees about safety, listening to what the employees have to say relating to safety, and promoting conversations about safety.

Huetson (1999) described a series of 300+ forums held at 70+ locations in nine countries, which were held approximately every six weeks. They consisted of people at all levels, from regional and terminal managers to mechanics and drivers. The forums were informal sessions in which workgroups came together to discuss the following types of issue and then set goals to take action.

- How to improve their safety performance.
- Barriers to improving performance and how to overcome these barriers.
- Generating a list of actions that would be reviewed at regular intervals.

BP has also introduced a system for investigating safety incidents called 'root cause investigations', to investigate work-related fatal accidents and assist in preventing future accidents.

Huetson (1999) described the important elements of the group discussion process as: management support; excellent communication before and after the forum; employee involvement and ownership; focusing on local issues; and, having skilled regional facilitators/champions to keep the message high. Many issues for change emerged, including four key recurring themes: the need for improved near hit reporting; improved job training; improved fatigue management; and involving staff in change management decisions.

Hueston (1999) addressed some examples of the positive change that the forums bought about.

- Global campaigns encouraging the wearing of seatbelts and safe use of mobile phones.
- In BP Amoco South East Asia, road-related fatalities have halved.

- Driver shift schedules were changed to avoid fatigue, and lifestyle/well-being issues were focused on in more depth.
- Drivers were included on safety and operating committees.
- Logistics teams were involved in designing service stations.
- Near hit reporting improved substantially.
- Program planned to be rolled out to light, as well as heavy, vehicle drivers.

During the 18 months in 1998-1999, BP reduced its crash rate to just a third of what it was in 1997, before the RSL program was introduced. Although the outcomes of the program were not measured against any control groups and the pre-existing trend is unknown, BP clearly feels that the program was a success. During mid-2002 it has re-tendered its RSL program, with the following objectives.

1. Determine if the policies, practices and procedures followed by carrier organisations are preventing or inhibiting required behavioural changes.
2. Conduct forums with carrier management teams to provide feedback on driver forums.
3. Conduct and facilitate forums with carrier drivers, providing a process where individuals can examine and discuss their own behaviours and attitudes, and the resulting effects on road safety.
4. Ensure that the outcome of such forums is to encourage each driver to take responsibility for his/her own actions and manage the risks associated with their role, driving a change in behaviour as required.
5. Equip carrier drivers and management with knowledge of legislative requirements regarding duty of care, due diligence, COR, fatigue, and HSE and OHS knowledge in line with BP's RSL objectives.
6. Provide assurance to BP that it is meeting its duty of care obligations with respect to the way in which the company does business with its carriers.

It appears that BP's approach is heavily led by OHS and compliance issues and is focused particularly on people and change management processes.

Overall, such OHS-led cases show a great deal of good practice, based on OHS principles. One problem is that evaluation of the individual countermeasures described is difficult.

3.9 Small fleets and work-related driving

During the project, ATSB requested a review of the safety performance of small fleets. No definition of 'small' was provided so the Council of Small Business Organisations of Australia (COSBOA) was contacted. It provided the definitions of 'small' businesses shown in Table 22, based on Australian Bureau of Statistics data from June 2001.

Table 22 - Small business definitions

Type of business	Definition by number of employees	Number of Australians employed in sector
Sole operators	0	637,300
Micro business	1-4	397,700
Small businesses	5-19	126,900
Total		1,161,900

COSBOA had no specific figures in relation to small business fleets. At the Travelsafe symposium, however, a representative from the Queensland Trucking Group suggested that 72% of heavy truck fleets in Australia are single-vehicle operators. This was confirmed by the 1998 data shown in Table 23, which shows that for heavy vehicles at least, the majority of the industry is made up of small fleets.

Table 23 - Structure of the heavy truck hire and reward sector by fleet size and type of operation

Number of trucks in fleet	Long distance interstate	Long distance intrastate	Short distance	Road freight forwarding	Total	% of trucks
1	3087	3824	27640	367	34918	79%
2	465	1177	2932	87	4661	11%
3	191	564	925	62	1742	4%
4	132	172	473	51	828	2%
5-9	96	153	223	58	530	1%
10-19	159	255	372	96	882	2%
20-49	87	158	187	34	466	1%
50-99	12	16	26	11	65	0%
100 or more	4	2	10	3	19	0%
Total	4233	6321	32788	769	44111	100%

(Source: ATN Facts on Freight, April 2002, p7)

Given this information, the main insurers for light and heavy fleet vehicles in Australia, Lumley and NTI, were contacted to obtain claims data by size of fleet, as was the main supplier of Government vehicles in Queensland (QFleet).

Lumley (mainly light vehicles) and NTI (mainly heavy vehicles) provided the data shown in Table 24. Both sets of data suggest that smaller fleets have a higher claim rate than larger fleets. NTI warned, however, that variation by fleet is substantial, based on vehicle type, operation type, differing policy deductibles (excesses) and levels and self-insurance.

Table 24 - Lumley and NTI data on claim rate per vehicle per annum by fleet size

Fleet size	Lumley (mainly light vehicles)	NTI (based on heavy vehicle prime Movers
1-10 vehicles	0.29	0.13
11-20	-	0.12
21-50	-	0.11
11-50	0.25	-
51-100	0.22	0.17
101-500	0.2	0.08
500+	0.18	-

(Source: Lumley data provided for this report)

QFleet provided claim rates by the size of the government fleets it supplies. A summary of this data is shown in Table 25. At first glance, based on the average claims per vehicle, it would appear that its smaller fleets have the highest rate. More detailed analysis of the data suggests that this figure is highly skewed by a few high values.

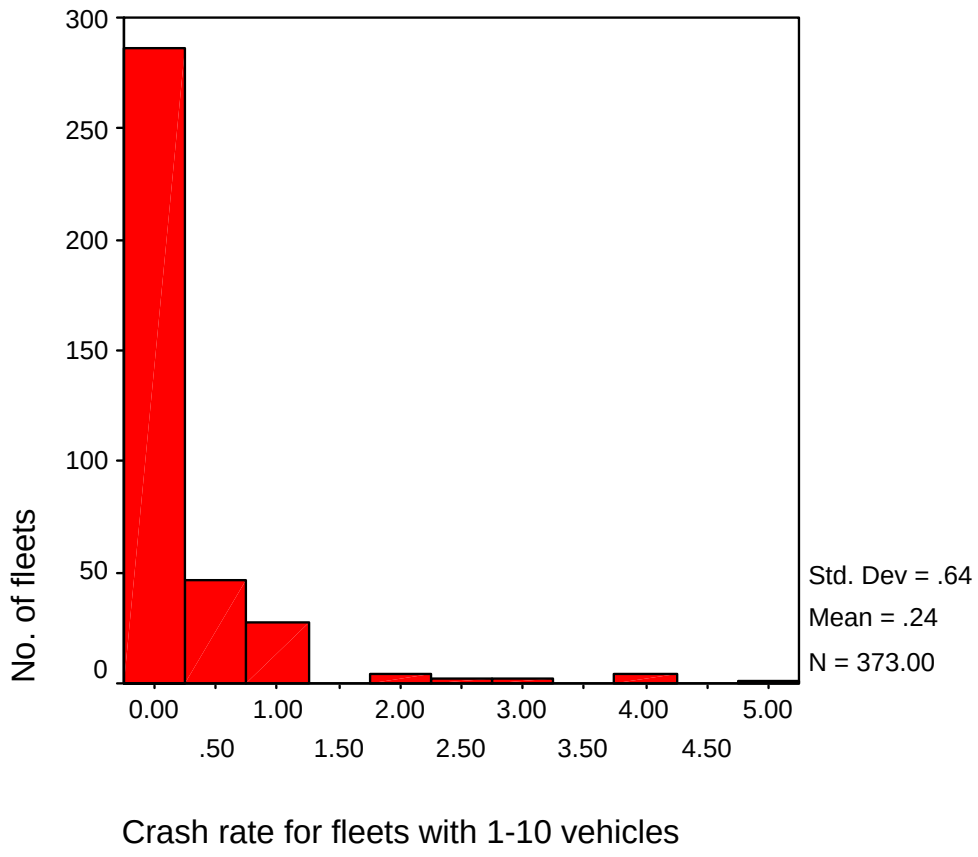
Table 25 - Summary of QFleet claims data by fleet size

Fleet size ->	1-10	11-50	51-100	101-500	500+
No. of fleets	373	27	4	11	9
% of fleets	88%	6%	1%	3%	2%
Average claims per vehicle per anum	0.24	0.19	0.15	0.16	0.18
Standard deviation	0.64	0.16	0.12	0.09	0.04
Max claim rate	5	0.46	0.26	0.31	0.24
Min claim rate	0	0	0	0	0.11
Median	0.00	0.15	0.17	0.18	0.19
Mode	0.00	0.00			
3rd quartile	0.14	0.31	0.23	0.21	0.21
Skew	4.33	0.24	-0.80	-0.58	-0.19

(Source: QFleet data provided for this report)

Figure 8 confirms that the one to ten vehicle data is heavily influenced by the 279 fleets that had no claims and the 13 fleets with a crash rate of two or above. For this reason it should be treated with caution. If the 13 fleets with a crash rate greater than two are removed the crash rate declines to 0.14, however the standard deviation remains high. This means that from the QFleet data it is difficult to reliably conclude whether smaller fleets have a different claim rate to larger fleets.

Figure 8 - Histogram of the crash rates for fleets with 1-10 vehicles



(Source: QFleet data provided for this report)

Based on the Lumley, NTI and QFleet data there is some tentative evidence that smaller fleets have a higher claim rate than larger fleets. The findings are inconclusive, however, due to the variance in the data. This suggests the need to investigate organisations that have small fleets further. More

research is required to understand the size and make up of both light and heavy vehicle fleets by analysing vehicle registration data and possibly talking to managers from a number of small organisations. The type of work being undertaken, and the exact mechanisms of the data used also need to be considered. Experience in the UK suggests that 'getting into' such organisations is difficult as they are often highly secretive and suspicious of outsiders, spend most of their time on survival and do not have the human resources to commit to safety issues until it becomes a major problem (Murray, Whiteing and Bamford 2002).

3.10 Work-related road safety overseas

Haworth et al (2000) reviewed several international case studies. They concluded that internationally, there appears to have been little rigorous research into strategies for decreasing the crash rate within organisations. Exceptions are two studies conducted in Sweden and the US. Gregersen et al (1996) researched the effect of different safety countermeasures implemented by the Swedish Televerket (Telstra) company. Ludvig and Geller (2000) implemented and evaluated a range of safety behaviour change countermeasures among US-based pizza delivery drivers over a 10-year period. In North America, there has also been work undertaken on heavy vehicle fleets, for example by Savage and Moses (1994), Saccomanno and Shortreed (1996) and Abkowitz et al (2001). All of these are reviewed below, as is applied research undertaken in the UK by the University of Huddersfield, and the road safety charitable organisations Brake and the Royal Society for the Prevention of Accidents.

3.10.1 Swedish Televerket study

To date, only one experimental study including a control to test countermeasures on crash rates appears to have been published in a refereed journal. This was based on work undertaken during the mid-1980s by the Swedish Televerket company (Gregersen et al 1996). It is referred to regularly by Australian writers (for example Watson et al 1996, several in Staysafe36, Christie 2002, Haworth et al 2000, WA 2001). The study is summarised in some detail below.

Gregersen et al (1996) were a multi-disciplinary team from the Swedish Road and Transport Research Institute, and university psychology and community medicine departments. Five groups of 900 Televerket drivers were used in the experiment to compare the effectiveness of (1) driver training, (2) group discussions, (3) campaigns and (4) bonuses for crash-free driving against a 'no action' control group. Where their research was unique, and still the best study available on fleet safety, was in the use of the control group to allow for changes and other influences taking place outside of the study.

Due to the growing criticism of driver training (including Gregersen's own research), the Televerket training program focused on making drivers aware of their own limitations and on other issues as well as safety, including the environment and fuel saving. It focused on three main elements: slow speed manoeuvring in confined spaces; skid training; and a commentary drive. Each one lasted about 2.5 hours and was undertaken by a mix of external and internal trainers.

Five campaigns were highly targeted, focusing on specific company problems in relation to seasonal driving. The first introduced the project and motivated the drivers to take part. The second focused on autumn driving issues: darkness; stopping distances; and ice warnings. The third focused on winter driving, and the fourth on spring driving, vulnerable road users and vehicle loading. The final campaign meeting summarised and discussed the other meetings. The campaigns included use of video, pamphlets and meetings led by internally trained staff.

The bonus scheme was based on a group reward where the drivers earned (or lost) the bonus together to gain the effect of social norms. Each group started with a money level based on the average size of the fleet, for each crash caused by a driver in the group the money was reduced by a certain amount depending on the seriousness of the crash. Bonus schemes are discussed in more detail by Wilde (1994, 1995). Murray and Rand (2000) also identified several problems with bonus schemes, particularly those aimed at individual employees, they advise extreme caution in their use.

The group discussions were based on 'Group Decision Theory', a six-stage process that had previously been used successfully in changing people's eating habits in the US and with Japanese workers. Each Televerket driver participated in three one-hour meetings in small groups of 8-15 drivers, discussing road safety and how to improve it. The discussions were led by drivers from their own work group who had been trained in what was required.

The six-stage process from the Televerket study is described below.

1. A 60-minute warm up, designed to ease tension among participants.
2. Split into small groups to undertake a 40-minute discussion of the problems.
3. A 20-minute report back meeting in the large group. From this a 'top ten problems' is established.
4. Each small group discusses which problems they can solve themselves and which ones the company should try to solve.
5. Report back to large group.
6. Small group discussions about measures and changes in behaviour. Participants were asked to record on a piece of paper what driving behaviour they proposed to change from the following day.

Gregersen et al (1996) then evaluated the effect of each of the four measures on crash risk (crashes caused by each Televerket group of drivers per 10,000 kilometres) and crash costs over two-year periods before and after the measures were applied using internal company data and insurance records. Costs were used as an indication of the seriousness of the crash.

Two types of comparison were made, before and after for each group and between groups after the countermeasures had been implemented. The results showed statistically significant reductions of crash risks in three of the groups: driver training; group discussions; and bonuses. Table 26 shows that group discussions and driver training were the most successful countermeasures in reducing the crash risk in comparison to the control group. Crash costs were reduced in all four groups, but not in the control group.

Table 26 – Results from the Swedish Televerket study

	Crashes per 10000 km before	Crashes per 10000 km after	Cost per 10000 km before Swedish Kroners(SEK)	Cost per 10000 km after (SEK)
Group discussions	0.17	0.08	800	250
Campaigns	0.14	0.18	1000	700
Bonus	0.12	0.1	800	450
Driver training	0.14	0.08	1150	800
Control	0.14	0.13	900	800

(Source: Gregersen et al 1996, approximate figures based on graphs)

Based on discussions with Gregersen (2001), the main limitations of the Televerket study are that it made no attempt to quantify and trade-off the costs of the countermeasures implemented against the

savings made. No discussion or analysis was made about softer or more qualitative outcomes, nor other predicted benefits such as fuel savings and environmental benefits. Televerket has since been privatised and gone through massive changes, making it impossible to undertake any long-term evaluation.

Variations on the group discussion method have since been used by several organisations in Australia including the BP case described in 3.8.4 and some New South Wales government agencies (Haydon 2001). Neither was measured against any kind of control group to allow an effective evaluation of their success, suggesting that a clear area for further study in Australia would be an academically rigorous evaluation of the impact of countermeasures on crash rates and costs in a fleet setting.

3.10.2 North America

In the US, Ludvig and Geller (2000) implemented and evaluated a range of driving safety behaviour change countermeasure studies among pizza delivery drivers over a 10-year period. This process was initially started due to the high crash rates, including fatalities, identified among this group of typically young and casually employed type of workers.

Ludvig and Geller did not focus directly on crash rates, rather, risky manoeuvres including seatbelt wearing, signalling, and stopping at intersections. The studies involved control groups, but no statistical hypothesis testing. As a result of the programs Ludvig and Geller proposed the **multiple intervention level hierarchy model (MIL)** of countermeasure effectiveness, intensity and cost, and the **behaviour change taxonomy model (BCT)**. Their analysis of countermeasures among pizza delivery drivers using these two models suggests the need for a combination of lower cost group-based countermeasures and more individual targeted countermeasures.

Ludvig and Geller focused on seven countermeasures.

1. Group awareness sessions and a promise card.
2. A mandated 'turn-signal' use policy.
3. Assigned versus participatory goal setting and feedback.
4. Group goal setting with public individualised feedback.
5. Public individualised feedback with competition.
6. Static versus dynamic goal setting.
7. Community change agents.

There were several limitations in Ludvig and Geller’s research, which can provide useful lessons for future fleet safety projects.

- The focus on observed driving actions such as manoeuvring and seatbelt wearing rather than actual crash rates and costs.
- They did not test the significance of any of their results.
- Limited detail on wider industry issues, such as employing younger vulnerable age-range staff on productivity-based payment schemes that may have encouraged unsafe driving behaviours.

Also in the USA, Savage and Moses (1994) explored the relationship between truck firm characteristics and accident rates using the Federal Highway Agency's national auditing database on heavy vehicles. This showed that firms with the best safety performance recorded and investigated accidents to determine if disciplinary or educational action is necessary for the drivers involved.

They concluded that American motor carriers could improve their accident rates by an average of 43%. It should be noted, however, that the data was based on firms targeted for their previous poor accident record, for 'enforcement and education action', that had made these improvements.

Savage and Moses (1995) evaluated the effectiveness of two government programs to collect data to identify unsafe motor carriers. The first audited safety management practices within firms, and the second undertook a series of driver and vehicle roadside inspections. Audits provided a benefit ratio of 4-1, against a ratio of 1.5-1 for the inspections. They recommended the government to use indicators such as the audit and inspection results to identify firms with deficient safety practices.

In the audits, inspectors undertake a two- to three-hour visit to companies and interview managers with a list of 75 'yes or no' questions and add notes where necessary. The questions are grouped into nine categories. The companies are rated as 'satisfactory', 'conditional', or 'unsatisfactory' in each of the nine areas, and a final rating score provided. If a firm is unsatisfactory, a return visit 'Compliance Review' occurs. These are much more detailed than the original visit, taking 28 staff hours. The inspectors re-evaluate the company to determine if any legal enforcement is necessary and collect evidence to support any recommended action. Failing firms can be fined and in the worst cases banned from operating.

More recently, the United States Department of Transport (US DOT) has used a 'SafeStat' measure that combines together audit questions, roadside inspections, tickets given to drivers, and crashes. Delorenzo (2001) described how the Federal Motor Carrier Safety Administration (FMCSA) undertakes reviews of the companies based on the results of SafeStat to determine their safety fitness rating and initiate enforcement when necessary. An explanation of the Safety Rating Methodology is found at the FMCSA internet site (www.fmcsa.dot.gov/rulesregs/fmcsr/regs/385appb.htm). Truck driver drug and alcohol tests are also common in the USA at crash scenes and on random basis. As a result of this process the American Trucking Association (www.truckline.com/safetynet/) reports that truck fatalities are at an all time low rate in the US.

Abkowitz et al (2001) described how motor carrier safety continues to be an important national issue due to the scale of industry activity, and its impact on human health and the environment. They focused on fatalities, injuries, evacuations, property damage, environmental degradation, and traffic disruption incidents involving loading/unloading and transport. They described the results of a comparative risk assessment of hazardous materials (HM) and non-hazardous materials (non-HM) truck shipments, including their risk assessment-based methodology, data, and key results. They concluded that HM truck incidents cost US society over $1.1 billion on an annual basis, with injuries and fatalities the largest cost. The annual economic impact of non-HM truck crashes in the US is over $43 billion, considerably higher than for HM truck incidents. This is due to a much larger scale of non-HM truck transport activity.

They also estimated the non-HM truck crash rate as more than twice the HM truck crash rate, a relationship also reflected in the impact cost per truck-mile. They suggested that the HM truck crash rate is lower due to better training, equipment and driver selection, as well as greater care due to regulations and the inherent risk associated with the material being transported. This matches similar findings in Australia and the UK, where there are many potential lessons that non-HM fleets can learn from HM practices.

Saccomanno and Shortreed (1996) identified five issues of national importance for heavy truck safety in Canada as driver training and empowerment, driver fatigue, data needs, vehicle standards (especially brakes), and harmonisation of regulations between areas. They suggested that police crash reports fail to accurately pinpoint the causes of the problem. There is a need to identify the

long term data required to understand crash causation, determine who should collect this data and ensure that the collecting agency is adequately trained to do so. They made several recommendations that are also relevant in an Australian context.

- Identify and share existing truck crash exposure data.
- Improve the reliability of police crash reports through better training in the collection and reporting of data on the causes and consequences of truck crashes.
- Standardise police crash reporting forms across all areas.
- Establish a North American Truck Safety data centre.

3.10.3 UK

The University of Huddersfield, Brake, the Transport Research Laboratory (TRL) and the Royal Society for the Prevention of Accidents (RoSPA) have all been active in the area of fleet and work-related road safety.

Working closely with hundreds of managers, graduates and undergraduates from transport and other industries since 1991, the **University of Huddersfield** has developed several approaches and frameworks for improving work-related driver safety, many of which developed out of case studies involving the use of insurance claims data (for example McCorry and Murray 1993). Huddersfield projects have focused on claims data analysis, driver assessment and training, safe vehicle reversing and manoeuvring, safe management of temporary labour in transport, management development, and fleet fuel efficiency (www.hud.ac.uk/sas/trans/transnews.htm).

Most organisations striving to improve the performance of their fleets tend to follow a similar pattern based around the identification of high crash costs. This has led them to look at causes and different systems to implement. Monitoring and evaluation is often an afterthought, introduced as a mechanism to justify expensive driver training that is not working as well as promised, or the effect of which has faded after a few months. Seeing this same pattern on a regular basis led Murray and Whiteing (1995) to develop the costs, causes, systems and solutions and monitoring (CCSM) approach shown in Figure 9.

Over the past five years, 450+ managers and supervisors have been trained in applying this approach. This experience, and observations of many organisations, identified the importance of being **proactive** and implementing safer systems of work before the identification of high costs forces them to do so (the PCCSM approach). Like trying to sell someone insurance when they do not feel they need it, this is not an easy process.

Figure 9 - The PCCSM approach

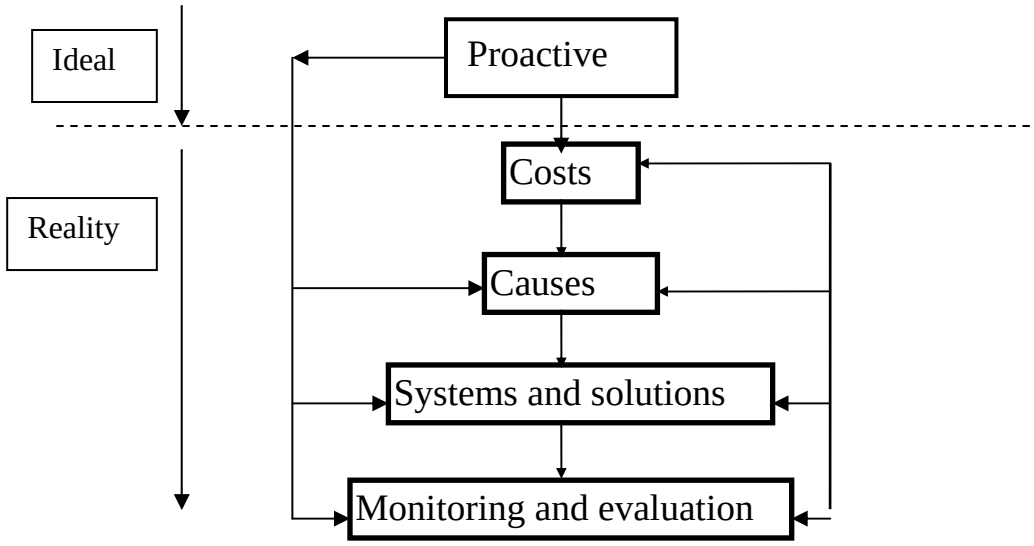


Figure 10 summarises the typical elements of such a proactive approach.

Figure 10 - The proactive approach

THE PROACTIVE APPROACH
Policy - do it rather than *just* have it
Risk assessments
Occupational health and safety (OHS) integration
Assess managers, supervisors and drivers
Crash investigation and data analysis
Train managers, supervisors and drivers
Implementation and change management
Very enthusiastic management champion
Evaluate – proactive, quantitative, costs and qualitative KPIs

Many organisations that have a fleet safety policy rarely do more than 'just have it'. Only the best organisations ‘live it, breath it, make it happen’, and understand the wider trade-offs and relationships with quality, business effectiveness, customer service, environmental sustainability, company image, and PR. Risk assessments are the starting point in understanding the extent of the problem and how to address it. OHS structures and approaches provide an excellent framework for improving fleet safety. Assessment and auditing should come before any training, to identify needs. Managers, supervisors and work schedulers should be included, as well as drivers.

Detailed claims analysis and investigation allows a much better understanding of the extent and costs of the problems, as well as how to treat them. Implementation and change management skills are a key requirement in improving fleet safety, and often the passion and enthusiasm of one senior person or work team can make a big difference. Finally, evaluation is a vital element in fleet safety because it helps to justify the cost of change, identifies any problems caused by countermeasures, and shows areas for future action. It is described in more detail in Section 5.

The main limitation of the Huddersfield research is that it has tended to focus on identifying and disseminating best practice and processes, rather than any scientific evaluation of statistics against control groups.

TRL in the UK has also undertaken work on fleet safety. For example, Lynn and Lockwood (1998) used survey data from 1990 to compare the crash rates of company car drivers against the general driving population. They used regression analysis to conclude that company car drivers have about 50% more crashes than ordinary drivers, even after allowing for their higher mileages. Following on from this research, Downs et al (1999) undertook a review of factors influencing the safety of fleet drivers. They took the Lynn and Lockwood data further suggesting that the fleet driver effect varies from 29-50% depending on the operation and individual driver.

Downs et al (1999) undertook focus groups with fleet managers, trainers, drivers and insurers. They identified training, incentives, penalties, crash reviews, driver monitoring systems, and driver feedback as the main types of fleet safety countermeasure. Although they found little evidence in the literature that any of these measures are effective, they concluded that 'fleet safety is most likely to be improved by the introduction of an integrated set of measures based on a strong safety culture within the organisation'. They suggested that organisations with a strong safety culture tended to follow OHS procedures rigorously and were involved directly in transport, or with expensive or dangerous products. They also saw positive environmental, cost, and employee well-being benefits from fleet safety and considered the cost trade-off between the importance of safety and operational need.

Based on their focus groups, Downs et al (1999) provided Tables 27 and 28, which are useful, if subjective, to classify organisations and different countermeasures.

Table 27 - Classification of organisational approaches to fleet safety

Element of safety strategy	**Active approach**	**Limited approach**	**Weak approach**
Training	All or remedial	Not liked	None
Incentives	Used	-	-
Penalties	Considered	Probably	Perhaps
Investigation	Yes	If several	Weak or punitive
Work pressure strategy	Encouraged	Allowed	Part of job
Communication and feedback	Strong	Post-crash	Poor/None

Table 28 - Perceived advantages and disadvantages of different fleet safety countermeasures

Element of safety strategy	**Advantages**	**Disadvantages**
Training	Easy to target Popular Cost effective Good PR	Costly Ineffective Need to repeat it
Incentives	Popular More effective with certain drivers	Costly Ineffective Withdrawal penalty Under-reporting
Penalties	Insurers like Natural justice Cost claw back	Can lead to deceit Drivers dislike Punitive
Investigation	Cheap Targeted Effective	Take time Reactive
Work pressure strategy	Less stress	Operational costs
Communication and feedback	Cheap Reminder to drivers	Hard to do it well Must be sincere

Downs et al (1999) concluded that better exposure data is required, in the form of a breakdown of driving patterns and vehicle use by job functions.

Brake (www.brake.org.uk) is a charitable campaigning, lobbying and research organisation that promotes safe use of roads by addressing the skills and attitudes of road users, enforcement of traffic rules, and appropriate punishment and education of road users who break the law. It has done a great deal to raise the profile of fleet safety in the UK and produces guidance and advice to policy makers, the media, professional transport companies and all road users about the importance of prioritising safety on the road. It runs Road Safety Week in the UK and a network of road safety professionals, called the Fleet Safety Forum, to encourage discussion and development of road safety solutions. Members include road safety officers, vehicle fleet managers, enforcement officers, insurers and organisations with a concern for road safety. Another output is its ***'Pledge to drive safely',* which asks fleet drivers to belt up, move up, slow up, back up, buck up, sober up, wake up, shut up, look up, wise up, and check up.** It also organises fleet safety awards and has recently launched a guide to managing road risk.

The **Royal Society for the Prevention of Accidents (RoSPA)** began focusing on managing occupational road risk (MORR) in 1996. Like Brake, it produces a range of resources and has lobbied hard for fleet managers and the agencies that regulate them to take action. Bibbings (1997) described the RoSPA approach. More up to date details and resources are available on the internet (www.rospa.com) in a document called '*Managing Occupational Road Risk: The Next Steps'*, which shows how RoSPA focuses at both the macro and micro level. At the micro level its MORR approach covers the vehicle, driver, journey and management systems. Its focus on the journey is particularly useful when asking questions such as 'do we need the journey', 'what mode of transport should we use', and 'what is the safest route'? Its guidance recommends the following.

- Ensuring that organisations have a systematic risk management capability, adapting the 'systems approach' to health and safety management.
- Getting risks down 'at source' by exploring safer alternatives to travel by road.
- Specification of safest routes.
- Setting standards for safe schedules, journey times and distance limits.
- Specification of vehicles with additional safety features.
- Ensuring safe maintenance.
- Ensuring drivers are fit, and having suitable selection, assessment and development arrangements in place to help them to cope with the risks on the road.

To some extent, RoSPA has been successful at the macro level in that the UK government set up the cross-agency **Work-related Road Safety Task Group** (WRRSTG) during 2000.

After a yearlong consultation process, the WRRSTG made the following primary recommendations in November 2001. Many of the issues appear very similar and relevant to those in Australia.

- Health and Safety law should apply to on road crashes.
- Work-related road safety should be managed as part of OHS.
- Employers must ensure drivers are competent.
- An OHS information campaign and guidance document should be produced.
- The Police Stats19 recording system should be adapted to collect purpose of journey data.
- On-road crashes should be included in OHS data from its next review.

- There should be a coordinated cross agency approach to investigation and prevention.
- A new program of joint Transport and OHS research should be established.
- A standing body should be set up to take the recommendations forward for review in 2004.
- The resource requirements for implementation need to be evaluated.

The full process and recommendations are on the internet (www.hse.gov.uk/road/index.htm). Changes in government and resource allocation issues have made the outcomes of the recommendations uncertain. For this reason, RoSPA has set up the Occupational Road Safety Alliance to ensure that the momentum generated to date in the UK is not lost (www.orsa.org.uk).

Having reviewed these case studies and initiatives, a great deal of good practice appears to exist, but it is quite fragmented and there is no obvious theoretical basis for many of the programs. Therefore, safety promotion theory is explored in Section 4 of the report to develop a framework for fleet safety.

Appendix 4 – KPIs identified for fleet safety evaluation

Do you monitor them weekly, monthly, quarterly, 6-monthly yearly or not at all?

Proactive pre-crash KPIs	Monitoring	Reactive post-crash KPIs	Monitoring
Barriers to change identified		Blackspots and crash location types	
Budget available for safety		Crash numbers	
Complaints and customer service failures		Blameworthy/non-blameworthy (unavoidable/avoidable or fault/no fault)	
Contractor safety meetings held		Costs - % of total fleet or maintenance costs	
Crash-free days		Crashes per million kilometres	
Fuel economy		Crashes per vehicle	
Hazards identified, risk assessed and controlled		Costs – driver, vehicle, third party, wear and tear, hidden and resale	
Health, eyesight and well-being checks undertaken		Crash type eg property damage, rollovers	
Job safety analysis scores		Crash type by cost	
Journeys evaluated and documented		Crashes per $100,000 turnover	
Legal and OHS requirements met		Crashes per 1,000 employees	
Level of employees observed safety behaviour		Crashes per driver	
Near hits and non-conformers		Crashes per 1,000,000 miles/kilometres	
Observations undertaken		Crashes per 100,000 hours worked	
Positive PR, awards and industry recognition		Crashes per 100,000 miles/kilometres	
Processes monitored		Date/day/time	
Regulator safety meetings held		Damage while parked	
Relevant training activities undertaken		Driver age/experience	
Safety ‘comfort’ surveys undertaken		Driver agency performance	
Safety attitude surveys undertaken		Drivers’ shift and sleep pattern	
Safety audits undertaken		Environmental degradation	
Safety discussions between managers and workers		Evacuations	
Safety toolbox meetings undertaken		First aid cases, medical treatments, lost time, injuries or fatalities	
Safety training sessions undertaken		Incident rate per 200,000 hours exposed	
Senior management safety tours		Investigations undertaken and actioned	
Site audit and risk assessment scores		Manoeuvre	
Staff assessed		Miles/kilometres per crash	
Vehicle circle checks undertaken and damage reports actioned		Negative PR outcomes	
Vehicle faults identified		Product (eg hazardous v non-hazardous)	
Violations		Non-claim/minor/under excess crashes	
Wear and tear		Repeat offenders	
		Shifts/months per crash	
		Single vehicle crashes	
		Third party type	
		Time to report	
		Underlying causes	
		Uninsured losses/recoveries	
		Unreported damage	
		Vehicle downtime	
		Vehicle manufacturer	
		Vehicle type	
		Vehicle use	

(Source: research for this project, Murray and Rand 2000)

Appendix 5a – Fleet safety report quality reviewers

The following people were circulated a draft copy of this report to make comments and suggestions.

Quality reviewer	Organisation	Feedback provided
Marja Thompson	AfMA	Y
Brian Versey	ATSB	Y
Chris Brooks	ATSB	Y
John Collis	ATSB	Y
Mike McCartney	Australian Trucking Association	Y
Celine Amoyal	BP	
Mary Sheehan	CARRS-Q	Y
Barry Watson	CARRS-Q	Y
Jeremy Davey	CARRS-Q	Y
Cynthia Schonfeld	CARRS-Q	Y
Cathryne Lang	CARRS-Q	Y
Anu Datta	CARRS-Q	Y
Andrew Wills	CARRS-Q	Y
Dean White	DuPont	
Andrew Norton	Fleet SA	Y
Phil Heatherington	Lumely Insurance	Y
Lesley Anderson	MAIC	Y
Narelle Haworth	MUARC	
Phil Sochon	NSW RTA/SSROC	Y
Bob Dudley	NTI	Y
Les Clarence	QFleet	Y
Rob Seljack	Queensland Department of Industrial Relations	
Warren Anderson	Queensland Transport	Y
Graham Fraine	Queensland Transport	
Tony Jones	Santos	Y
Cliff Bell	Shell	Y
Ian Faulks	Staysafe Committee	Y
Susanne Haydon	Synthesys Strategic Thinking	Y
Rosina Beaumont	Tasmanian DIER	Y
Samantha Cockfield	Traffic Accident Commission	
Rob Hansen	Travelsafe Committee	Y
Greg Rowe	VicRoads	Y
Iain Cameron	Western Australia Office of Road Safety	Y
Jenny Thomas	WorkCover NSW	Y
Steve Hyam	Workplace Standards Tasmania	Y

Appendix 5b – Fleet safety report quality review form

We'd like to know how useful you found this report and solicit your input for future reports.

First name _____ Family name_____

Job title _____ Organisation _____

Telephone _____ Email _____ Date _____

	Very good	Good	Adequate	Poor
How readable was the report?				
How informative was the report?				
How usefulness was the report?				
How would you rate the overall quality of the report?				

Are you happy for us to say what we have about you/your organisation?

What did you find most useful about the report?

How would you suggest that we should improve the report?

What is the main thing that you will change at work as a result of the report?

What is the main thing that your manager/supervisor should change at work as a result of the report?

What do you think is the main barrier to improving fleet safety in your organisation?

To help us improve future reports, do you have any additional comments?

What sound byte summary would you use to promote the report?

Thanks for taking part in our quality evaluation process. Post, fax or email this form back to: Dr Will Murray, CARRS-Q, Queensland University of Technology, Queensland 4034, **w.murray@qut.edu.au**, fax: (07) 3864 4688.