

Worldwide Occupational Road Safety (WORS) Review Project



Prepared For:

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April 2007

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ACKNOWLEDGMENTS

Many people and organisations have supported this research project. Any errors or omissions in the final report are the fault of the author alone.

Thanks particularly to:

- The National Institute for Occupational Safety and Health (NIOSH) for project funding, and to Stephanie Pratt at NIOSH for feedback and encouragement. The NIOSH website (www.cdc.gov/niosh/injury/traumamv.html) is an excellent source of information on occupational road safety in the USA.
- Gordon S. Smith, Liberty Mutual Research Institute for Safety, for commenting on and supplementing official information about the USA; and for taking the time to provide a very thorough and critical peer review of the final report.
- Professor Colin Bamford at the University of Huddersfield and Paul Grimley at Loughborough University for excellent feedback on the initial project survey.
- Adrian Walsh at Roadsafte in the UK for disseminating the survey and continued championing of occupational road safety issues.
- Andrew Downing, International Federation of Red Cross and Red Crescent Societies, for engaging several of his contacts in the project.
- Ed Dubens and Andy Cuerden at Interactive Driving Systems for on-going support, criticism and personal development. Their success in turning theory into successful practice has made a very positive contribution to improving occupational road safety around the world.
- Peter Sheppard from the AA Driver Education Foundation for his support for the research and his infectious enthusiasm for road safety initiatives in New Zealand.
- Simo Salminen from the Department of Occupational Safety at the Finnish Institute of Occupational Health for contributing several excellent research papers and feedback.
- Dr Barry Watson at CARRS-Q in Australia for updated 'purpose of journey' data for Queensland, and for his extremely thorough and technically honest approach to researching and improving road safety.
- Lori Mooren at ARRB in Australia for comments on the first draft of the report.
- The respondents from 15 different countries, each of whom completed the survey and provided a great deal of extra information. Particularly, Peter Johansen at Zurich in Australia gave very good feedback on the final report.
- Jools Townsend at Brake, the UK road safety charity, for proofreading and peer review of the final document, and for her earnest project management skills.

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Summary of Key Findings

Occupational road safety has grown in importance in recent years as the extent of the problem has emerged, and increasing numbers of researchers, practitioners and government agencies have become interested in it. One example is the National Institute for Occupational Safety and Health (NIOSH) in the USA, which has undertaken a great deal of work to understand and improve the safety of workers. NIOSH has identified that one of the biggest risks that workers face is using the road, and as a result has focused a great deal of attention on occupational road safety.

The aims of NIOSH in sponsoring this particular project were two-fold:

1. Contribute to its research program on occupational road safety.
2. Facilitate the enhancement of global workplace safety and health.

In meeting these aims a literature review (Chapter 2) was undertaken. Contact was then made with a range of participants from 15 countries around the world, all of whom completed a questionnaire and provided a range of other information (Chapter 3). Two main gaps emerged in the participants group: mainland European and less developed countries. Both should be encouraged to take part in any future follow-on projects.

A large number of findings emerged from the project, which are summarised below.

- Where data on the extent of the occupational road crashes is available, it accounts for a significant proportion of both road and workplace fatalities and injuries. This suggests that more attention should be given to the issue by both transport and occupational safety and health-based agencies.
- Good quality ‘purpose of journey’ information should urgently be included in the road safety data collection processes in many participant countries to allow at-work collisions in smaller vehicles such as cars and vans to be identified, as well as those in larger vehicles. Based on recent experiences in the UK, this requires a detailed briefing and training program for the police officers who collect the data at the front line.
- Occupational safety and health (OSH) data and responsibility encompass on-road driving incidents in some countries, but not in others. There is a strong argument for OSH agencies to undertake more data capture, leadership and enforcement on occupational road safety, which appears to be one of the major at-work risks in many jurisdictions.
- Other data sets, including workers’ compensation, insurance, coronial records and hospital admissions also hint at the scale of the problem, but there was no obvious sharing of data standards between participant countries.
- Currently, only limited data linkages exist, for example, between road safety statistics and hospital admissions, or between health and safety or insurance data. Better linkages via common coding and interagency collaboration would enable a more complete picture to be obtained.

- Governments themselves are one of the largest purchasers of vehicles in many regions around the world, and should be seen to lead by example in the effective and safe management of their own vehicles and drivers. Publishing highly detailed case-study-based program evaluations should be a key element of this process. At present there are many public and private sector programs, but few have been effectively evaluated and documented in detail.
- An important next step should be to organise an international conference on occupational road safety that brings together researchers, policy makers, key government agencies, industry practitioners and other stakeholders to agree on definitions, share best practice and guide future actions including leadership on a larger collaborative project to be led by a well-resourced research group to explore and compare the available data and processes around the world.

Overall, the extent on the occupational road safety problem identified suggests that focusing some time and investment of the recommendations in the report would be a very good use of road safety, OSH and business improvement research and project management resources.

Dr Will Murray, March 2007

Abbreviations and Terms

Abbreviation Explanation

A

AADEF Automobile Association Driver Education Foundation (New Zealand)
ACC Accident Compensation Corporation (New Zealand)
ABS..... Australian Bureau of Statistics
ANSI American National Standards Institute (USA)
ATSB Australian Transport Safety Bureau

B

BLS Bureau of Labor Statistics (USA)
Brake UK road safety charity
Bumpcard..... Form completed at the scene of an accident by drivers (UK)

C

CARRS-Q Centre for Accident Research and Road Safety – Queensland (Australia)
CFOI Census of Fatal Occupational Injuries (USA)
CTP Compulsory third party [insurance]
CSIR..... Council for Scientific and Industrial Research (South Africa)
CSTE..... Council of State and Territorial Epidemiologists (USA)

D

DfT Department for Transport (UK)

F

FARS..... Fatality Analysis Reporting System (USA)

H

HSE Health and Safety Executive (UK)

I

ICD..... International Classification of Diseases
IPRU Injury Prevention Research Unit (New Zealand)
ISA InformationsSystemet om Arbetsskador (Sweden)

L

LARSOA..... Local Authority Road Safety Officers Association (UK)
LTNZ Land Transport New Zealand

M

MAIC Motor Accident Insurance Commission (Australia)
MTO..... Ministry of Transportation, Ontario (Canada)
MUARC..... Monash University Accident Research Centre (Australia)

N

NAICS..... North American Industrial Classification System
NASS National Automotive Sampling System (USA)

NCISNational Coronial Information System (Australia)
 NDS.....National Data Set [for workers' compensation claims] (Australia)
 NETS.....Network of Employers for Traffic Safety (USA)
 NGO.....Non-Governmental organisation
 NHTSANational Highway Traffic Safety Administration (USA)
 NIIP.....National Institute for Injury Prevention (Nepal)
 NIOSHNational Institute for Occupational Safety and Health (USA)
 NOHSC.....National Occupational Health and Safety Commission (Australia)
 NOSINOHSC Online Statistics Interactive National Workers' Compensation
 Statistics Databases (Australia)

O

OLVOccupational light vehicle (Australia)
 ORSA.....Occupational Road Safety Alliance (UK)
 ORSAROntario Road Safety Annual Report (Canada)
 OSH.....Occupational safety and health

P

PACTS Parliamentary Advisory Council for Transport Safety (UK)

R

RIDDOR Reporting of Injuries, Diseases and Dangerous Occurrences Regulations
 (UK)
 Roadsaf..... UK road safety charity
 RoSPA..... Royal Society for the Prevention of Accidents (UK)
 RTA..... Road traffic accident or Roads and Traffic Authority (Australia)

S

SAPS South African Police Service
 SIC Standard Industrial Classification (USA)
 SNR/STRADA... Swedish National Road Administration System
 SOC..... Standard Occupational Classification (USA)
 SOII..... Survey of Occupational Injury and Illness (USA)
 Stats19..... Police report form for recording on-road injury accidents in the UK
 STIPDA..... State and Territorial Injury Prevention Directors Association (USA)

T

TADS Traffic Accident Data Systems (Australia)
 TIRS..... Traffic Incident Reporting System (Australia)
 TOT..... Federation of Accident Insurance Institutions Työtaturmatilasto system
 (Finland)
 TRB..... Transportation Research Board (USA)
 TUC..... Trades Union Congress (UK)

U

UK..... United Kingdom
 USA..... United States of America

W

WORS Worldwide Occupational Road Safety
 WSIB..... Workplace Safety and Insurance Board (Ontario, Canada)

1 Introduction

This introductory chapter focuses on the background to the project, its aims and objectives, methodology and the framework of the report.

1.1 Background

Traditionally road safety practitioners have tended to apply the three ‘E’s of engineering, education and enforcement, and focus on general driver behaviours such as speed, alcohol use, fatigue and occupant protection. In most developed countries around the world, these programs can be considered to have been a success based on significant reductions in both the health and traffic risks shown in [Appendix 1](#). Despite these success stories, however, using the road remains one of the most risky day-to-day activities that people undertake. New ways to ‘cut’ the road safety data and target the risks are always being considered, including increasing adoption of a fourth ‘E’ – evaluation.

While a great deal of government time and investment around the world has been given to road safety in general, until recently little attention was focused on work-related injuries occurring on the road. In the last few years, several studies (see for example NIOSH 2003 and Murray et al 2003) have highlighted the extent of the road safety problem involving people driving as part of their work. This has led to the emergence of occupational road safety as an important issue in the USA, UK, Finland, Australia and New Zealand for a range of societal, business, legal and cost reasons.

Initially much of the attention on occupational road safety tends to focus on heavier and bigger vehicles, particularly trucks and buses, because road safety data is readily available for these vehicle types in most jurisdictions. The large number of smaller vehicles driven for work, such as cars, vans, sports utilities and pick-ups, appear to have been mostly overlooked. At the same time, occupational safety and health (OSH) specialists have traditionally focused on safety in the workplace, or on work sites. This is changing, however, with increasingly strong relationships developing between road safety and OSH. Despite this, in many jurisdictions, there is still only limited and fragmented data available on the true extent of the problem, and on what are the most effective improvement countermeasures.

This situation led the US National Institute for Occupational Safety and Health to commission a small-scale exploratory study to review Worldwide Occupational Road Safety (WORS), the findings from which are discussed throughout this report.

1.2 Project objective, aims, and research questions

The overall objective of the project is to contribute to NIOSH’s coordinated research program on occupational road safety and the enhancement of global workplace safety and health.

To meet this objective the following aims were set in the initial project communication ([Appendix 2](#)).

1. Obtain and summarise information on sources of occupational crash data worldwide.
2. Describe the integration of occupational road safety into occupational safety and

transportation infrastructures in different nations.

3. Make recommendations on key government and organisational initiatives that could be undertaken to promote occupational road safety and identify the most pressing needs for future research.

To achieve these outcomes the following nine research questions about occupational road safety data and infrastructure were developed.

1. Based on available data, what is the contribution of occupational crashes to the overall burden of roadway fatalities in various nations?
2. How does the definition of a work-related crash differ country by country? For example, are commuting crashes included?
3. Are work-related crashes captured through reporting systems for occupational fatalities, through the general crash reporting systems, or both?
4. Do any nations keep data about the number of miles driven for work-related journeys? If so, is the information available for all work-related travel or just certain types of vehicles, such as trucks or buses?
5. What is the status of data on non-fatal crashes? Do any countries have comprehensive reporting systems?
6. Is occupational road safety a government priority, or is it typically left to businesses to manage road safety?
7. Where governments do play a role in occupational road safety, is it typically a part of the occupational safety and health infrastructure, transportation safety infrastructure, or both?
8. To what extent are occupational drivers covered by safety regulations? Are all employee drivers regulated or only truck drivers?
9. Other than safety regulations, what other countermeasures have been adopted/researched by governments, businesses, Universities and non-governmental organisations (NGOs)?

1.3 Methods

These questions were addressed primarily through a review of government legislation, policies, guidance and statistics. This was supported by a literature review and discussion, email contact and more formal structured questionnaires/interviews ([Appendix 3](#)) with relevant government OSH, transport and other agencies, industry leaders and experts around the world.

Initially the research was quite broad-based, providing information on a range of countries. More detailed research/analysis was then undertaken with a smaller number of case study countries/regions.

For the survey element of the project personal contacts were obtained in as many countries as possible. The research was also mentioned in an industry newsletter and several organisations, particularly Roadsafes and the Global Road Safety Partnership, helped to circulate details of the project and the questionnaire. During the period of the research, trips were made to both South Africa and New Zealand by the researchers, which meant that more detailed information could be captured for those countries.

Overall there were 31 questionnaires or other communications returned by the organisations

shown in [Appendix 4](#). They represented the 15 countries listed below.

- Australia
- Canada
- Czech Republic
- Finland
- Vietnam
- India
- Ireland
- Nepal
- New Zealand
- Netherlands
- Norway
- South Africa
- Sweden
- UK
- USA

An obvious and disappointing gap in these responses appears to be from mainland European countries, which could not or were unwilling to take part in the research. Correspondence with the European Transport Safety Council (Achterberg 2005) suggested a lack of any pan-European research or practice on the issue of occupational road safety.

1.4 Report structure

The remainder of this report focuses on the findings from the countries listed above, in the form of literature, correspondence, surveys and interviews. [Chapter 2](#) focuses particularly on the growing body of literature on occupational road safety. In [Chapter 3](#) the responses to the questionnaire survey used for the research are collated and discussed on a question-by-question basis. The final [Chapter 4](#) summarises the most important findings, recommendations and areas for further work.

1.5 Summary

This chapter has set out the background to the project, its aims and objectives, methodology and the framework of the report. The next chapter reviews the previous literature on occupational road safety.

2 Literature review

2.1 Introduction

Several recent reviews have been published on occupational road safety in countries around the world, including Australia (Murray et al 2003), Finland (Salminen 2003), New Zealand (IPRU 2003) the UK (Bomel 2004) and USA (NIOSH 2003). These reports provide a rich source of data and information for the countries concerned. Overall, a great deal of work has been produced on highly regulated large or heavy occupational vehicles such as trucks and buses. Much less has been published on small or light occupational vehicles such as cars and vans. Within the limiting constraints of time, budget and space, the aim here is to provide a brief summary of the research and projects undertaken, and allow readers to explore the detailed sources they are based on in more depth. It is structured by region, focusing on:

Overall, a great deal of work has been produced on highly regulated large or heavy occupational vehicles such as trucks and buses. Much less has been published on small or light occupational vehicles such as cars and vans.

- Australia and New Zealand
- Finland and Sweden
- United Kingdom (UK)
- United States of America (USA)

Despite several attempts to identify research or practice in a wider range of European and other locations around the world, no information was available. If you are aware of relevant research or practice in countries not mentioned, we would be delighted if you would contact the authors via email (willmurray@roadrisk.net).

2.2 Australia and New Zealand

As well as the traditional focus on fatigue, regulation and chain of responsibility in the heavy vehicle sector in Australia, there has been a growing interest in the more general occupational road safety of both heavy and light vehicles over the past 6 years. This work has included major initiatives by government, industry and academics, the latter particularly including Monash University Accident Research Centre (MUARC) and the Centre for Accident Research and Road Safety – Queensland (CARRS-Q).

Two particularly good general research-based summaries of occupational road safety regulations and initiatives in Australia and overseas were provided by MUARC (Haworth et al 2000) and CARRS-Q (Murray et al 2003). Both reports include extensive literature reviews, and highlight the extent and costs of the problem to society and industry. In Queensland, for example, still one of the few jurisdictions in the world where the police record ‘purpose of journey’ data for road crashes, they identified that at least a quarter of road fatalities include someone driving for work. More recent outputs from both these research centres have strengthened the development of occupational road safety programs in Australia, and have been on the cusp of turning academic research into practice.

Examples are listed below:

- At MUARC, Haworth, and Symmons (2005) focused on safety attitudes and behaviours in work-related driving, using state-level government crash data. They established that approximately 25% of the vehicles involved in crashes at each level of severity are fleet vehicles. The main limitation of the research was that the data related to crashes involving fleet-owned vehicles rather than identifying the purpose of the vehicle's journey.
- At CARRS-Q, Newnam, Watson and Murray (2004) focused on 'factors predicting intentions to speed in work and personal vehicles.' They concluded that certain psychological processes appear to influence people in a different way when driving a work vehicle in comparison to driving a personal vehicle. This means that the integration of policies and procedures within an organisation's safety culture can significantly influence road safety. Wishart et al (2003) identified the problems and opportunities of using insurance data to identify truck crashes by industry sector. Newnam, Guthrie et al (2004) showed the importance of safety climate and driver safety at work, by integrating fleet management and OSH. Wishart and Davey (2004) presented a research-based case study approach to the development of fleet safety.

Such research by MUARC and CARRS-Q means that Australia's annual Road Safety Research, Policing and Education Conference has a vibrant occupational road safety theme. At the 2004 conference in Perth, for example, papers were presented on fleet safety climate (Watson et al), driver risk assessment (Rea et al), alcohol and work-related road crashes (Haworth and Symmons), work driver speeding and fatigue, (Haworth and Symmons) and safety policy evaluation (Haworth). A similar broad range of papers was also presented at the 2005 conference held in Wellington, New Zealand (see www.rsconference.com). More recently, Haworth has moved from MUARC to CARRS-Q.

Occupational road safety research has also made its way onto the general safety and health agenda in Australia. Stuckey, for example, presented a particularly relevant paper on occupational light vehicle (OLV) use at the 2005 Safety in Australia conference. She focused particularly on the difficulty, but importance of, quantifying OLV use and risks because their users are not typically employed as drivers, but as engineers or sales people who have to use the vehicle as part of their employment. This is compounded by the fact that they may be driving their own vehicle for work, rather than an employer-registered vehicle. She concluded that quantifying the extent of this group of drivers and their involvement in collisions is important, as is the development of safety models that are holistic enough to effectively risk manage this group of workers.

Government-level research undertaken by Mitchell et al (2004) was based on OSH data, coroners' reports and transport data, to provide a detailed description of all work-related road deaths in Australia. They concluded that there is a need to address road safety in the work-based context, as well as through on-going programs in the general community. A great deal of work has been undertaken on the use of coronial data in Australia (see for example Driscoll et al [2003]).

All these studies in Australia have identified issues of data availability and fragmentation. This has led to a greater focus on inclusion of 'purpose of journey' information in road safety statistics, better coding of OSH data to understand vehicle-related incidents, increased use of insurance data, use of hospital data to verify safety statistics and some early attempts to code and integrate these different data sources (Davey and Banks 2005).

In New Zealand, occupational road safety has become more important due to an amendment to the Health and Safety Act in Employment in 2002 (see www.ltsa.govt.nz/commercial/safe-driving/introduction.html), which clarified that people who are mobile when they work are covered by the act. More recently, the Land Transport Amendment Act (2005) continued the regulation of heavy vehicles through driving hours and log books. This legislation also put in place a Chain of Responsibility framework, to extend liability from the driver to include others in the transport chain who should have acted to prevent an accident or offence but did not.

This legislation also put in place a Chain of Responsibility framework, to extend liability from the driver to include others in the transport chain who should have acted to prevent an accident or offence but did not.

The Act addresses driving hours, log books, speeding by commercial vehicles, weight limits, licences, load security and dangerous goods.

Despite this legislative focus on occupational road safety, there is no ‘purpose of journey’ data in the New Zealand road safety statistics, and health and OSH data is limited - although as many as 20 of the 70 annual work-related fatalities could involve vehicles (Hodder 2005). This lack of data means that research on work-related fatal traffic injuries undertaken by the Environmental and Occupational Health Research Centre is based on coronial files (IPRU 2003, McNoe et al 2005). These studies identified that work-related traffic fatalities contributed to 29% of all fatal injuries in the workplace in New Zealand during the time period studied. The overall rate of working fatalities was 1.1 per 100,000 workers and for commuting fatalities the overall rate was 0.9 per 100,000 workers. Fatalities were predominantly male. Notable contributing factors included exposure, speed, lack of occupant restraints and fatigue. Work-related traffic fatalities comprise the country’s largest single category, and a sizeable proportion, of work-related deaths.

Land Transport New Zealand (LTNZ) and the Accident Compensation Corporation (ACC) have been proactive in promoting occupational road safety and providing comprehensive guidance on the issue in the form of a booklet called ‘Your Safe Driving Policy’ (LTNZ/ACC 2002). The AA Driver Education Foundation (AADEF), particularly through its annual conference and training workshops has also done a great deal to raise awareness of the issue. Most recently, several key agencies in New Zealand, including the AADEF, ACC, New Zealand Police, LTNZ, Department of Labour, New Zealand Road Transport and Logistics Industry Training Organisation and Ministry of Transport undertook a joint discussion workshop to identify collaborative approaches to move the occupational road safety agenda forwards (Murray and Sheppard 2006). The focus of the workshop was on definitions, data collection, research, and best practice.

2.3 Finland

Simo Salminen from the Department of Occupational Safety at the Finnish Institute of Occupational Health has written several research papers on the extent of work-related traffic accidents in Finland and how to prevent them, both at the national/macro and at the organisational/micro level. As well as using softer interview, survey and group discussion methodologies, his work has explored a range of data sets, including data from Finland’s Traffic Insurance Centre, Federation of Accident Insurance Institutions and Central Statistical Office.

Salminen (2000 and 2003) analyzed the circumstances of work and commuting-based road traffic accidents. He identified that in Finland traffic is the most important cause (over 50%) of accidental deaths at work. Typically, these vehicle crashes cost two to six times more than other workplace accidents. Salminen also identified several weaknesses in his research, particularly that it did not answer questions about causation factors, such as 'Was the work driver under increased pressure?' He recommended that organisations should use group discussions and employee travel surveys to improve their performance.

The 'Risk factors in work-related traffic' paper (Salminen 2002) used the results from two surveys to examine the extra motives assumed by the theory of zero risk for occupational drivers. Time pressure, tiredness, thinking about work while driving, and use of mobile telephones were shown to be statistically significant risk factors in driving during working hours - which prompted drivers to increase speed, thereby increasing their risk of accidents. Haste was the most important risk factor with tiredness being ranked second. He concluded that only one in eight Finnish companies had paid attention to the traffic safety of their employees, and that that strategies for improvement should be developed and applied. To move towards achieving this, Salminen (2003a) applied the group decision theory approach advocated by Gregersen et al (1986) in a Finnish electricity company. The outcomes from this project suggested that the group discussion method helped decrease traffic-related occupational accidents by as much as 72%, particularly through the influence of peer pressure in work teams (Salminen 2005).

2.4 Sweden

Swedish research is probably the world's most quoted experimental study that tested the effects of road safety countermeasures on crash rates. Work undertaken during the mid-1980s involving the Swedish Televerket company continues to be cited by other writers including Haworth et al (2000), Murray et al (2003) and Salminen (2003a and 2005).

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 (5) 'no action' control group.

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. The study did not evaluate the extent to which this led to selective honesty or memory loss in the reporting of crashes.

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 pledging to improve it. The discussions were led by drivers from their own work group who had been trained in what was required.

Gregersen et al (1996) then evaluated the effect of each of the four measures (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 comparisons were made, before and after for each group and between groups after the countermeasures had been implemented. The results (Table 1) showed statistically significant reductions of crash risks in three of the groups: driver training; group discussions; and bonuses. Group discussions and driver training were the most successful countermeasures in reducing the risks in comparison to the control group. Crash costs were reduced in all four groups, but not in the control group.

Table 1 - 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 transcribed from 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 was later privatised and went through massive changes, making it impossible to undertake any medium or long-term evaluation.

Other relevant Swedish research has been published by psychologists at the University of Uppsala, which has focused particularly on the behaviour of bus drivers (Wåhlberg 2000 and 2004).

2.5 UK

Occupational road safety is a topical issue for industry, researchers, non-governmental organisations and the government, culminating in the Health and Safety Executive (HSE) and Department for Transport (DfT) issuing a joint guidance on work-related road safety in September 2003 (HSE 2003). For the first time, this document acknowledged that a vehicle being driven on the road for occupational purposes is part of the workplace under health and safety regulations. It followed a detailed review undertaken by the Work-related Road Safety Task Group, set up after years of lobbying activity by the driver training industry, and charitable NGOs such as the Royal Society for the Prevention of Accidents (RoSPA), Roadsafes and Brake. All these organisations have more recently contributed to the work of the Occupational Road Safety Alliance (ORSA) (www.orsa.org.uk), which has helped bring together a range of interest groups.

The HSE's work-related road safety home page (www.hse.gov.uk/roadsafety/index.htm) focuses on the following areas:

- HSE and its stance on occupational road safety
- Employer responsibilities and legal requirements
- The full report of the Work-related Road Safety Task Group
- Case studies of UK companies that have successfully managed their occupational road risk
- Several HSE-funded research reports

At present, and despite intense lobbying from various groups, the HSE's Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR) reporting system does not capture information about occupational crashes, except for those that take place on a work site. Occupational road safety is not seen as a priority work area for the HSE, even though it acknowledges that occupational crashes may account for over 20 fatalities and 250 serious injuries every week in the UK. Instead, HSE is working closely with, and tends to defer responsibility to, the DfT and Police, both for incident data collection (road safety data through the Stats19 system) and enforcement.

The DfT has undertaken several research and policy initiatives on work-related road safety which are summarised on its various websites, including:

- Policy updates (DfT 1 and 2, 2005) covering the implementation of recommendations from the Work-related Road Safety Task Group – including working with industry to develop and promote best practice; raising awareness; intelligence and data collection; clarifying investigation / enforcement arrangements between the Police, HSE and Local Authorities; and research and guidance.
- Research reports covering work-related road traffic accidents (Clarke et al 2005), driving behaviour (Ward and Lancaster 2004), work-related road safety (Baughan et al 2004), safety culture and work-related road accidents (Bomel 2004) and company vehicle incident reporting and recording (Murray 2003).
- Production of a CD-ROM on work-related road safety (DfT CD 2006).

Since January 2005, DfT has begun to improve its data on occupational crashes by including a 'purpose of journey' question in its national level road safety data collection processes – the

Stats19 form completed by the police. Although it is still too early to assess its impact and the quality of the first batch of data produced was poor, it is a step forward in helping to identify the extent of the occupational road safety issue in the UK. Pre-implementation trials showed that as many as 30% of road fatalities involved work-related driving.

DfT has also recently supported a new report (Motorists Forum 2005) on how organisations and government can raise their road safety standards. The report recommended six measures for organisations, which address journey planning, policy, training, monitoring, consultation with employees and program evaluation. The five recommendations made for Government are listed below and summarise the current situation in the UK.

1. Government, in the form of the DfT and HSE, should fund an outreach program for successful case studies to be widely shared. (This is now in the early stages of implementation.)
2. Serious incidents relating to on-the-road work activities should become RIDDOR-reportable by the HSE at the earliest opportunity.
3. DfT, other Government departments and public bodies should take the lead in stressing the benefits of best practice for work-related road safety management.
4. All exemptions from seat belt wearing by professional drivers should be removed.
5. The Driving at Work - Managing work-related road safety guidance document which DfT and the HSE jointly published in 2003 should be evaluated as to its effectiveness in getting to organisations and leading to the necessary changes.

2.6 USA

Recent US data showed that of approximately 5,700 worker fatalities annually reported by the Bureau of Labor Statistics (BLS), over 35% are associated with motor vehicles. Between 2000-2004, on average each year:

- 1,380 workers died each year from crashes on public highways
- 347 workers died each year in crashes that occurred off the highway or on industrial premises
- 365 pedestrian workers died each year as a result of being struck by a motor vehicle.

(Source: U.S. Department of Labor, Bureau of Labor Statistics
<http://stats.bls.gov/news.release/pdf/cfoi.pdf>)

The issue of occupational road safety falls within the missions of three US government agencies:

1. Federal Motor Carrier Safety Administration, which regulates large trucks and buses.
2. Occupational Safety and Health Administration (OSHA), which does not regulate lighter vehicles driven for work but promotes occupational road safety through voluntary initiatives.
3. National Institute for Occupational Safety and Health (NIOSH), which is the US government agency responsible for conducting research and making recommendations for preventing occupational injury and illness.

As with other jurisdictions around the world, in the USA there has been a great deal of enforcement, research and management activity around heavy commercial trucks and buses.

For example, Hours of Service regulations have been the subject of intense debate and litigation over recent years. In terms of research, the Transportation Research Board (TRB) has several committees, conferences and symposiums which cover the heavy vehicle sector in great depth. The 2005 International Truck and Bus Safety and Security Symposium, for example, included over 60 papers and presentations on drivers, fleet management, technology and design, enforcement and compliance, security and crash data (www.nsc.org/truckandbus/safety.htm).

Despite this, and some classic research, such as the 10 year ‘pizza delivery driver studies’ (Ludvig and Geller 2000), there appears to have been less research activity in the USA on lighter vehicle fleets. Traditional traffic safety researchers (such as Evans 2004) hardly mention occupational road safety.

NIOSH has increased its focus on road safety issues in the USA in the past few years. Strotmeyer and Pratt (2000), for example, focused on occupational pedestrian-vehicle collision fatalities. More recently, the NIOSH publication ‘*Work-Related Roadway Crashes - Challenges and Opportunities for Prevention*’ (NIOSH 2003) concluded that roadway crashes are the leading cause of death from unintentional injury in the US workplace, and provided safety recommendations to employers, policy makers, and transportation planners.

During 2004, NIOSH released several articles, fact sheets and publications on road safety including ‘Work-related roadway crashes: prevention strategies for employers’ and ‘Work-related roadway crashes: who’s at risk?’ which are available on the NIOSH motor vehicle website (www.cdc.gov/niosh/injury/traumamv.html). In other projects, Pratt (2004) assessed the relationship between crash risk factors and the type of registration for vehicles occupied by workers who died in occupational roadway crashes for the US. The study was based on data from the Fatality Analysis Reporting System (FARS), maintained by the U.S. National Highway Traffic Safety Administration (NHTSA). She concluded that traffic safety interventions directed at workplace drivers should emphasize hazard recognition and avoidance, alcohol awareness and safety belt use.

NIOSH has also recently initiated several projects addressing worker safety and health in transportation, including roadway crashes among public employees in the US and mortality among independent truck drivers, with the goal of developing a balanced research program that will focus on fleets of lighter vehicles as well as large trucks. NIOSH participated in the development of the American National Standard ANSI/ASSE Z15.1, Safe Practices for Motor Vehicle Operations, which is targeted to organisations whose vehicles are not regulated by the trucking safety rules (www.asse.org).

2.7 Summary of literature review

Overall, the literature review has indicated the emerging status of occupational road safety in several countries. Several key findings came from the literature review:

- Researchers, industry bodies and government agencies are beginning to realise the extent of the problem and some good research and practise has emerged.
- The ‘field’ of occupational road safety, work-related road safety, fleet safety or the management of occupational road risk is becoming more mature in certain countries.
- The extent of the problem shows up in several data sets including transport, OSH and insurance, but there are limitations such as the lack of ‘purpose of journey’

information and limited integration between data sets.

- A number of government initiatives have been implemented, but specific legislation is largely limited to heavy vehicles.

Many of the authors and organisations cited can be seen as ‘pioneers’ in the field of occupational road safety, and were later requested to take part in the primary data collection for the project, which is described next through the results of the survey questionnaire.

3 Survey responses

3.1 Introduction

This Chapter identifies what occupational road safety data is available in a range of participant countries, based on the questionnaire shown in [Appendix 3](#).

Useable responses were received from 15 countries. Table 2 summarises the quality, depth and breadth of the data. It shows that generally the data was adequate, although there are gaps, some of which were filled through further discussions with the participants.

Table 2 - Breadth of data received from participants

Country	Survey fully completed	Quality/depth of data	Extra narrative provided
Australia	Yes	Good	No
Canada	No	Incomplete	Yes
Czech Republic	Yes	Good	Yes
Europe	No	Incomplete	Yes
Finland	Yes	Good	No
India	No	Incomplete	No
Ireland	Yes	Good	No
Nepal	No	Incomplete	Yes
New Zealand	Yes	Good	Yes
Netherlands	Yes	Good	No
Norway	Yes	Good	No
South Africa	No	Incomplete	Yes
Sweden	Yes	Good	Yes
UK	Yes	Good	No
USA	Yes	Good	Yes
Vietnam	No	Incomplete	Yes

The following sections summarise the responses from each country on a question by question basis.

3.2 Definitions of occupational road crashes

Question 1 asked:

- a) How is an 'occupational road crash' defined in your country?*
- b) Are crashes that occur in the course of commuting to and from the normal place of work included in your occupational crash definition?*

The following summary of participant responses country by country indicates that there is currently no standard definition of an occupational road crash.

3.2.1 Australia

As described in [Section 2.2](#) an increasing amount of research on occupational road safety has been undertaken in Australia. Despite this, however, there still appears to be no officially agreed definition of an occupational road crash. Generically, most Australian states categorise an occupational road crash as one that occurs while conducting or driving for work, however, some states do define travelling to and from work as a part of work-related driving whereas other states do not.

The road crash data, usually collected by the police and maintained by road or transport authorities, does not normally record ‘purpose of journey.’ What data is available, for Queensland and summarised by Murray et al (2003), suggests that at least one in four road fatalities is work-related; and on average a quarter of vehicles in fleets are involved in a crash in any year. At the organisational level, companies may not record all minor damage crashes because the repairs are covered by ‘wear and tear’ maintenance programs.

The Australian Transport Safety Bureau (ATSB) suggested that the use of the vehicle at the time of the crash is defined in the Australian Fatal Crash Database. Usually this is derived from Coroner reports and coded accordingly – for example as commercial, business, work, government, emergency vehicles, bus, heavy vehicle or taxi. These codes may not always be fully or consistently reported.

For the insurance industry, an occupational road crash is any road accident that occurs while the driver is conducting activities associated with employment requirements, or driving a work vehicle out of work hours.

For workers’ compensation purposes, ‘occupational road crash’ covers incidents in which the person is travelling by road in the course of work, but it may or may not include commuting deaths (i.e., persons travelling between home and work). Commuting and travel between two places of work for separate jobs (as might be undertaken by a contract cleaner, for example) is treated inconsistently between different states.

Road vehicles were not traditionally included under occupational health legislation in Australia on the basis of their regulation through transport legislation. This means that Australian occupational health authorities have often overlooked deaths and serious injuries on the road, unless they occurred in a more formal workplace (such as a vehicle backing over someone at a work site). This has only recently started to change with respect to truck drivers. Occupational health and safety organisations would usually NOT investigate on-road incidents, nor include them in their statistics. However, the approach to this is inconsistent – high profile incidents are sometimes included, and some states take a close interest, whereas others do not. Ultimately more defined occupational safety and health laws and enforcement for all vehicle types will give this problem higher priority in Australia.

3.2.2 Canada

According to Transport Canada, occupational road safety has long been an issue at the provincial/territorial level, and that it is quite clear that a large-truck crash is work-related. For drivers of passenger vehicles or other smaller vehicles there is no facility to assess the purpose of the trip or the origin/destination on the form or in the data. The Canadian Police indicated that they have no definition for an occupational crash, and suggested that the

workers' compensation boards in each province may have definitions used for their own purposes. For this reason, a provincial workers' compensation agency was contacted to take part in the survey. The Ontario Workplace Safety and Insurance Board (WSIB) did not complete the full questionnaire, but offered the following information:

1. The questionnaire asked if crashes that occur in the course of commuting to and from the normal place of work are included in our crash definition. The WSIB in Ontario compensates work-related injuries and illnesses on a case by case basis, guided by provincial legislation and by the WSIB's own operational policies.

There are WSIB policies to follow in the case of injuries sustained while travelling for work purposes. The key guidance policy on 'Travelling' is available on the internet (www.wsib.on.ca/wsib/wopm.nsf/Public/150305).

2. The statistical data on compensated work-related injury, illness and fatality claims that the WSIB publishes annually in its Statistical Supplement to the Annual Report does not specifically identify the events associated with fatality claims. From our Best Practices Branch research, however, we have found that in recent years a large percentage of our work-related traumatic fatalities are due to motor vehicle collisions.

To locate the Statistical Supplement, go to the WSIB website (www.wsib.on.ca), and scroll down from the 'Reference' heading, click on 'Annual Reports', and when this page opens, go to the 2004 'Statistical Supplement'. Table 10, in the detailed claims section, shows a category called 'transportation accidents', with sub-headings for highway and other accidents. Claims data for a range of years are shown. The word 'accidents' is used because it is a specific category label in the coding standard that the Canadian workers compensation boards apply to their data.

The WSIB has recently initiated a multi-agency Road Safety partnership, and is developing various related information resources.

3. The website address for the Ontario Ministry of Transportation's annual reports on road safety is called 'ORSAR' (www.mto.gov.on.ca/english/safety/orsar/orsar03). The report does not specifically identify occupational or work-related data. It does, however, include a table which identifies types of vehicles involved in collisions. This is not meant to be a proxy for work-relatedness, only an indication of the type of vehicle involved.
4. The questionnaire asked about information from other agencies. A key report from the Chief Medical Officer of Health for Ontario highlights the heavy costs of motor vehicle collision injuries. This was published online (see www.health.gov.on.ca/english/public/pub/ministry_reports/injury_rep02/injury_mn.html).

3.2.3 Czech Republic

The exact definition of occupational road crash is not specified, however, some crashes of this type can be selected from the total accident database through some criteria. Overall, the Czech Transport Research Centre sees the problem as very important, but unfortunately there are other even bigger problems in road safety which need to be focused on. Although work

sites have become safer, the biggest current issues concerning occupational safety are tiredness and vehicle overloading, but not enough data is available to be able to undertake any initiatives.

3.2.4 Finland

An occupational road crash is an accident involving a worker during the hours of work hours on a public road. Most of the work-related driving in Finland is undertaken by commercial drivers, making the management of hours of service, carrier rating systems and work crews working in work zones key issues. As described in [Section 2.3](#) above, Salminen (2005) has done a great deal of research on this issue in Finland.

3.2.5 India

Occupational road safety data is not available for India. Only total road deaths and an under-reported number of injuries are recorded, and there is no 'purpose of journey' data to specify whether a crash was related to occupational exposure.

3.2.6 Ireland, Nepal, Netherlands, New Zealand, Norway

Each of these nations reported that they have no official definition of an occupational road crash, as the statistics are not available. Respondents from Nepal and New Zealand offered additional comments.

According to the National Institute for Injury Prevention (NIIP) in Nepal, road safety is only very slowly receiving attention. Despite the fact that the head of state of Nepal (King) addressed the World Health Day 2004 on Road Safety, not much has progressed so far. The NIIP respondent felt that the health system has to take leadership in providing information, and in guiding others in focusing road safety not on 'vehicle safety' but 'people safety,' with clear targets. The current trend of blaming drivers for all road crashes, the limited integration of data and lack of coordination of road safety responsibilities across various agencies needs urgent review and attention.

The AA Driver Education Foundation in New Zealand indicated that occupational road safety is beginning to be taken seriously, but data remains limited (IPRU 2003, McNoe 2005, Murray and Sheppard 2006). There are also several other issues to be resolved:

- There needs to be greater awareness and coordination of the issues through both Government organisations and private industry.
- More appropriate interventions need to be developed to lower risk, build databases and benchmark outcomes.
- Incident prevention systems need to be developed in a more coordinated and structured manner.
- Training/prevention measures need to be agreed upon collectively and standardized.
- Incident investigation processes need to be developed, with particular emphasis on root cause analysis.

3.2.7 South Africa

The definition from the Compensation for Occupational Injuries and Diseases Act, No. 130 of 1993 defines an occupational fatality as ‘an accident arising out of and in the course of an employee's employment and resulting in a personal injury, illness or the death of the employee.’ There is no separate focus on road crashes, which are part of all other occupational injuries.

The respondent from the Council for Scientific and Industrial Research (CSIR) in South Africa reported that developing the requested responses was quite burdensome. The reason for this is the fragmentation of information: health and safety legislation is controlled by three departments (Minerals and Energy, Health and Labour), while the Department of Transport is responsible for road traffic safety and statistics.

Although these departments do publish statistics, it is not possible to integrate the information. For example, traffic accident data does not contain any information about the journey itself and it is impossible to identify work-related injuries. The Department of Labour publishes information about compensation claims based on different sectors, but does not summarise the road accident problem. From the data fields available it might be possible to extract more detailed information from the raw data, but it may not be a complete picture.

There are various organisations and associations working in related fields. A current project funded by the World Health Organisation is looking at deaths from injury (based on a sample of mortuaries). One of the recommendations is the formation of a National Health and Safety Council. An internet search showed 15 different associations for health and safety, some focusing on specific issues, and some generic. These appear to be affiliated to the Association of Societies for Occupational Safety and Health. In addition, many associations are formed around the prevention of AIDS, at home and in the workplace.

The Health and Safety legislation indicates that all industries should keep information about all incidents, whether this resulted in a compensation claim or not. It was not possible to locate such information in summary format at the national level in South Africa.

The South African Police Service (SAPS) collect traffic accident information in a prescribed format. This format has recently changed (via a long process, involving many different role players). Currently there is no field for collection of information on the purpose of the journey. It would, however, be possible to identify heavy vehicle, bus and taxi accidents, all of which can safely be assumed to be work-related.

Data is captured by the road and traffic authorities (local and/or provincial) and sent to the National Department of Transport. The Department of Transport also has an alternative avenue of information, which involves direct communication between them and the SAPS for fatal accidents. Again, however, this does not include information on journey purpose.

Overall in South Africa, work needs to be done for an initial assessment of the scope of the problem, as follows:

- Identify (and get hold of the raw data if possible) all the sources of national information and assess the formats and definitions of the different fields.
- Analyse the different data bases and compare the different results in order to get an

indication of the size of the problem.

- Involve large industries already concerned with the problem and with some historic data.

3.2.8 UK

Unofficially, according to the DfT, a road crash is deemed to be occupational when one of the road users involved was travelling for work purposes. There is, however, no official definition. In general, road traffic accidents are defined as follows: involving personal injury, occurring on the public highway (including footways) in which at least one road vehicle or a vehicle in collision with a pedestrian is involved and which becomes known to the police within 30 days of its occurrence. The vehicle need not be moving and accidents involving stationary vehicles and pedestrians or users are included. One accident may give rise to several casualties.

3.2.9 USA

The responses from the USA revealed the following.

- NHTSA, which maintains the FARS data, does not specifically define ‘occupational road crashes’ in the USA, but collects and analyzes data relating to all police-reported fatal, injury and property-damage crashes on the public roadways. The FARS data do include an “injury at work” designation based on this information being recorded on the death certificate.
- NIOSH defined an occupational road crash as any incident occurring on a roadway that involves collision between vehicles, a single vehicle, or a pedestrian struck by a vehicle. A worker may be a driver, passenger, or a pedestrian. The data may be separated according to whether an incident occurred on or off a public roadway. As defined by the Census of Fatal Occupational Injuries (CFOI), fatal occupational crashes encompass only those that occur during work hours, not while commuting to or from work. Fatalities of bystanders or vehicle occupants who were not working at the time of the crash are also not included in the US statistics on fatal occupational crashes. Some commentators believe they should be included, based on the premise that addressing safer driving practices for working drivers would also reduce the risks to bystanders in local communities, as well as family members.

3.2.10 Vietnam

The Asia Injury Prevention Foundation suggested that in Vietnam the National Traffic Safety Committee keeps track of crashes and casualties overall, and that the Ministry of Labor has some ‘job related injury’ data. No data was available to answer the questionnaire for Vietnam, however, because the concept of ‘occupational road crashes’ or ‘occupational road safety’ is not recognized.

3.2.11 Occupational road crashes and commuting

Crashes that occur in the course of commuting to and from the normal place of work are not included in the occupational crash definition of most participants (Table 3). In many cases,

crashes while commuting are not an issue because occupational road crashes are not defined, there is no ‘purpose of journey’ data collected in the road safety statistics and commuting is not covered by OSH regulations.

3.2.12 Summary of ‘occupational road crash’ definitions

Overall, several conclusions emerged from the analysis of occupational road crash definitions:

- There is limited OSH or transport data available to quantify the full extent of the problem.
- Occupational road safety is both an OSH and a transport issue that has become more important in several participant countries, but neither OSH nor transport systems provide complete data or program management. To date, attention has mostly focused on heavy vehicles and incidents on work sites.
- More work is required to define the scope of occupational road safety, and to manage it as both a transport and an occupational safety issue.
- A starting point to quantify the extent of the problem would be to ensure that transport safety data is coded to include a ‘purpose of journey’ question and that OSH data includes on-road incidents where the person is driving as part of their work.

Many participant countries do not have an official definition of an occupational road crash, and in those that do there is limited consensus as to whether it’s a transport or health and safety management-led issue.

Table 3 - Is commuting seen as an occupational road safety issue?

Country	Response	Notes
Australia	Yes/no	Not available in the road safety data. It is available in the OSH and workers’ compensation databases for some states, but there appears to be a move away from this in an effort to reduce workers’ compensation payments.
Canada	No	No ‘purpose of journey’ data in transport statistics. Some workers’ compensation data may cover, but only on a case by case basis.
Czech Republic	No	
Finland	Yes	
India	No	Occupational road crashes not distinguished
Ireland	No	
Nepal	Yes	
Netherlands	No	Occupational accidents not distinguished
New Zealand	No	No ‘purpose of journey’ data
Norway	No	Occupational road crashes not distinguished
South Africa	No	No ‘purpose of journey’ data
Sweden	No	Occupational road crashes not distinguished
UK	No	No, unless commuting to a non-normal work location. No ‘purpose of journey’ or on-road OSH data.
USA	No	Unless a worker has left work to drive to an out-of-town meeting, which would be included.

3.3 Occupational Safety and Health (OSH) data

Participants were asked separate questions on OSH injury and fatality data. In most cases, the same agencies were responsible for the data, so the responses are combined below.

Questions 2 (fatality) and 5 (injury) focused on the occupational health and safety data.

- a) Are fatal occupational road crashes included and explicitly identifiable through your country's reporting system for occupational fatalities?*
- b) What is the name of the agency which maintains the OSH fatality statistics?*
- c) What is the name or acronym for the reporting and recording system?*
- d) How is an injury defined in the data (eg 3 days lost work time)?*
- e) Is the data publicly available, for example via the internet or other sources?*
- f) How useful, accurate and complete is the data for identifying risk and causation factors?*

A summary of the responses is shown in Table 4, and more discussion is provided below.

Table 4 - Fatal occupational road crashes identifiable in reporting systems for occupational fatalities

Country	Response	Agency	Website
Australia	Yes	NOHSC	www.nohsc.gov.au/OHSInformation/NOSI
Canada	Yes (by province)	WSIB (Ontario)	www.wsib.on.ca
Czech Republic	Yes	Czech Office of Work Safety Research Institute of Work Safety	www.cubp.cz www.vubp.cz
Finland	Yes	Federation of Accident Insurance Institutions	www.tvl.fi
Ireland	Yes	Health and Safety Authority	www.hsa.ie
Nepal	No		
Netherlands	No		
New Zealand	No		
Norway	Yes	Direktoratet for Arbeidstilsynet	www.arbeidstilsynet.no/info/statistikk
South Africa	No		
Sweden	Yes	Arbetsmiljöverket	www.sos.se/sos/statisti.htm
UK	No	Health & Safety Executive	www.hse.gov.uk
USA	Yes	Bureau of Labor Statistics	http://stats.bls.gov/iif/home.htm

Each country is considered in turn below.

3.3.1 Australia

In Australia, occupational health and safety data is collected at the State level for workers' compensation claims, and nationally by the National Occupational Health & Safety Commission (NOHSC). NOHSC data is based on collating the workers' compensation statistics from each state into a National Data Set (NDS) but it only covers employees, and not for example bystanders. It is freely available via the internet (see Table 4) and is useful for understanding the extent of the problem. As with many data sources, however, it is collected for certain purposes, and therefore may not suit the specific requirements of a project. For example, it does not provide a good idea of what really happened and why. Smith et al (2004) discuss the usefulness of this data for occupational road safety in more detail.

NOHSC also conducted two national studies of work-related fatalities; 1982-1984 and 1989-1992, based on coroners' reports, which have been widely cited by many researchers (e.g., Murray et al 2003) and has more recently been published (Mitchell et al 2004). Such fatality data is now available more widely in the National Coronial Information System (NCIS), which contains data on traumatic injury deaths by state. It is obtainable online (www.vifp.monash.edu.au/ncis/) as text and coded data, but requires specific permission, ethical clearance and time consuming detailed searches on 'work-related fatalities.' It is a rich source of information, but is still in its early stages.

In addition to fatalities, the NDS or NOHSC Online Statistics Interactive National Workers' Compensation Statistics Databases (NOSI) database also records occupational injuries. The data is available online (www.nohsc.gov.au/Statistics/OverviewDataPolicyAnalysis) based on workers' compensation data supplied by agencies in each individual state. Five working days or more absence is the accident definition used. Some states have different periods, such as Victoria which works on 11 days, meaning that the national data is not completely standardised. As with fatalities, the data is useful for risk management, although it does not include self-employed workers and only covers relatively serious injuries.

3.3.2 Canada

OSH data is available at the province level. For example, the process for Ontario is described in [Section 3.2.2](#) above.

3.3.3 Czech Republic

Data on occupational health and safety fatalities and injuries is maintained by the Czech Office of Work Safety (www.cubp.cz). This data is relatively accurate, complete and useful for research, which is undertaken by the Research Institute of Work Safety (www.vubp.cz). All accidents involving a fatality or injury are included.

3.3.4 Finland

The Federation of Accident Insurance Institutions capture the occupational fatality and injury data, via a system called Työtaturmatilasto or TOT (see www.tvl.fi). Injuries involving three or more days of lost time are included, based on compensation claims to insurance companies. The data is of generally good quality for research purposes, and the literature

review in [Section 2.3](#) above refers to several published papers undertaken by Salminen (2003).

3.3.5 Ireland

At present, the focus is on vehicle related incidents in the workplace (not on the road), via a guide called “Safety and Workplace Vehicles” (www.hsa.ie/files/product_20041221120222workplace_vehicles.pdf).

Data is available in the annual report of the Health and Safety Authority (www.hsa.ie). The 2004 report (which is free to download) does not include the injury and fatality statistics, which are available separately for a fee. The 2003 data is free. According to a colleague in Ireland (McGrath 2005), a code exists for reporting on-road vehicle accidents, but there is a great deal of under-reporting, and many incidents are missed. For public service vehicles, including the police, some data exists. Appendix C of the 2003 report includes details of the injuries and fatalities by economic sector and type. Transport (excluding road traffic accidents) is one classification while Road Traffic Accidents (RTA) are another. The RTA fatality figure is low - two for 2003 while Transport (excluding RTA) is 12. Table C17 gives the detail.

3.3.6 New Zealand

OSH data in New Zealand does not cover on-road collisions. The Department of Labour, however, suggests that as many as 20 of the 70 annual work-related fatalities could involve vehicles on work sites (Hodder 2005). Published research (IPRU 2004, McNoe 2005) that was partially based on OSH data from New Zealand is described in the literature review in [Section 2.2](#) above.

3.3.7 Norway

The Direktoratet for Arbeidstilsynet maintains Norway’s statistics on occupational accidents. At present, the data is not seen as very useful for occupational road safety, because it just lists fatality and injury counts by industry/occupation. The data is of quite poor quality and its relationship to road accident statistics is unclear. The respondent did not know the definition or cut off point for an injury accident.

3.3.8 South Africa

See [Section 3.2.7](#) above.

3.3.9 Sweden

The Arbetsmiljöverket manages health and safety data in Sweden via its InformationsSystemet om Arbetsskador (ISA). The data is publicly available, based on all fatal and injury accidents reported by employers. The respondent did not know the definition or cut off point for an injury accident.

3.3.10 UK

HSE RIDDOR data collection does not at present collect data relating to on-road incidents. The system is under review, and the situation could change in the future. Incidents involving vehicles on work sites can be identified, and the data has been useful in developing specific safety interventions such as focusing on the safety of reversing (backing) vehicles, and reducing crashes at collection and delivery points. At the current time, there are practical, legal and political reasons why the HSE does not wish to play a full role in occupational road safety in the UK (PACTS 2006).

HSE RIDDOR data collection does not at present collect data relating to on-road incidents.

3.3.11 USA

The source of data on fatal workplace crashes is CFOI, maintained by BLS in the Department of Labor. Limited data are available via online query as well as standard tables produced by BLS (<http://stats.bls.gov/iif/home.htm>). For data users outside BLS, access to raw data files is limited, with strict requirements for confidentiality and review by BLS before any CFOI data can be released to the public. Researchers can, however, obtain copies of the CFOI files after proper approval.

It is suggested that there that may be problems in the completeness of reporting by CFOI. Although CFOI uses multiple data sources to identify work-related fatalities, identifying work-relatedness of roadway fatalities poses particular challenges. Unless the question is asked specifically of all road fatalities it is often missed.

A further advance would be if the CFOI data also contained the FARS report number so that cases could be linked. At present this would be difficult technically because of the time frames in which each data set is gathered. Linkage by death certificate is a further option that could be explored.

CFOI does not collect information on risk factors for motor vehicle crashes. For example, there is no coded information on seat belt use, driver impairment, mechanical defects, fatigue or use of in-vehicle technologies. Further, information on vehicle type is not as specific as it should be, and does not conform to typologies used by the U.S. Department of Transportation. There is, however, a 4-line case narrative, which occasionally contains useful information on driver behaviour, road conditions or vehicle-related factors.

CFOI identifies the industry and occupation of the worker who was killed, which provides information for targeting prevention activities to particular worker groups. CFOI contains a data record only for the worker who was killed; there is no information on other persons injured or otherwise involved, unless it appears in the case narrative.

At present, there is less continuity in occupation and industry coding of the CFOI data than in earlier years of data collection. For data year 2003, the systems used for coding industry and occupation changed from the Standard Industrial Classification (SIC) to North American Industrial Classification System (NAICS) (for industry), and from Census to Standard Occupational Classification (SOC) (for occupation). BLS has advised that this is a major break in the data series. Although there are 'crosswalks' available, there are multiple instances in which the new and old codes cannot be collapsed into one another. This is also true of the BLS data on nonfatal injuries described below.

The BLS Survey of Occupational Injury and Illness (SOII) records reportable injuries; published data emphasizes injuries involving one or more days away from work. The SOII (see <http://stats.bls.gov/iif/oshcdnew.htm>) covers private industry only. The exclusion of self-employed truck drivers is particularly relevant to road safety. The SOII data contains no information on risk and causation factors. Based on current estimates of about 45,000 lost-work-day cases per year in the U.S., it is the opinion of the NIOSH respondent that the SOII underestimates the number of non-fatal occupational crashes resulting in lost work days. Case counts are available by industry. Limited information is available on worker demographics. BLS provides few cross-tabulations in its printed and Web-based tables, and many published tables provide no detail beyond ‘Transportation Incidents,’ which encompasses all modes of transportation, including water and air.

As described in [Section 2.5](#) above, NIOSH has used this data to publish several comprehensive reports and guidance documents on occupational road safety.

3.3.12 Summary of OSH data

From this analysis several conclusions are drawn.

- OSH fatality and injury data in some jurisdictions can at least partly identify the extent of the occupational road safety problem, but this is by no means complete or comprehensive.
- Given the data that has emerged from Australia, New Zealand and the USA, on-road crashes appear to represent a large proportion of occupational fatalities, which means that there could be some justification for the OSH agencies to focus more legislative, enforcement, research and improvement attention in this area.
- Initiatives in occupational road safety can also have a positive effect on the local community, by reducing the risks for bystanders and family members.

Given the data that has emerged from Australia, New Zealand and the USA, on-road crashes appear to represent a large proportion of occupational fatalities.

3.4 Road transport crash data

Participants were asked separate questions on road transport injury and fatality data. In most cases, the same agencies were responsible for the data, so the responses are combined below.

Questions 3 (fatality) and 6 (injury) focused on the road transport crash data.

- Are fatal occupational road crashes included and explicitly identifiable through your country’s reporting system for road fatalities?*
- What is the name of the agency which maintains the road fatality statistics?*
- What is the name or acronym for the reporting and recording system?*
- How is a reportable road transport injury defined by this system (e.g., police attend scene and complete a form, hospitalisation)?*
- Is the data publicly available, for example via the Internet or other sources?*
- How useful, accurate and complete is the data for identifying risk and causation factors?*

A summary of the responses is shown in Table 5, and more discussion is provided below.

Table 5 - Occupational crashes identifiable in reporting systems for road fatalities

Country	Response	National agency	Acronym/Name	Website
Australia	No	ATSB	Fatal Crash Database	www.atsb.gov.au/road/road_fatality_statistics/index.aspx
Canada	No	Transport Canada		
Czech Republic	Yes	Police Directorate		www.mvcr.cz/2003/statist_info.htm
Finland	Yes	Traffic Insurance Center	Tieliikennekuolemat	www.vakes.fi/tieliikennekuolemat
Ireland	No	Department of Transport		www.transport.ie/upload/general/5905-0.pdf
Nepal	No	Traffic Police		
New Zealand	No	LTNZ		www.landtransport.govt.nz
Netherlands	Yes/No	AVV		www.rws-avv.nl/pls/portal30/docs/12917.pdf
Norway	Yes/No	Statistics Norway (Statistisk Sentralbyrå)	Road Accident Statistics	www.ssb.no/emner/vtu
South Africa	No	National Department of Transport		
Sweden	Yes	Arbetsmijöverket	ISA	www.av.se/statistik/om.asp
UK	Yes	Department for Transport	Stats19	www.dft.gov.uk
USA	Yes	National Highway Traffic Safety Administration	FARS	www.fars.nhtsa.dot.gov

Each country is considered in turn below.

3.4.1 Australia

In Australia, the ATSB's Fatal Crash Database reporting system covers road transport fatalities nationally, and includes a 'use of vehicle at time of crash' field. Basic data elements may be downloaded from the Internet

(www.atsb.gov.au/road/road_fatality_statistics/index.aspx), but information on the use of the vehicle at the time of the crash is not part of this data set, making it difficult to identify whether the incidents involved occupational drivers. This means that the data is only of limited value for detailed identification of risk and causation factors, but what is available is accurate as long as the information from the Coroner's report is coded effectively.

Individual states in Australia also maintain fatality and injury data. In some, for example Queensland, the police reports do try to ascertain and record whether a crash-involved vehicle was being driven for work or not, which is recorded and reported in the 'webcrash' system. The Murray et al (2003) analysis of this data system reported that at least 24% of road fatalities over a 4-year period involving a work vehicle. Since that time, Queensland Transport has worked closely with other agencies to develop the following 'purpose of journey' codes for the Police to use when recording road crashes in the Traffic Incident Reporting System (TIRS):

1. Driving to Work
2. Driving as Part of Work
3. Driving from Work
4. Driving to Educational Facility with child/student/self
5. Driving from Educational Facility with child/student/self
6. Life and Network Necessities and Social Activities (e.g., shopping, visiting, evening out, socialising)
7. Life Enhancement Activities (e.g., sporting activities, hobbies, driving for pleasure)
8. Holidays and Weekend Away
9. Other, specify _____
10. Unknown

The process 'went live' in May 2006. Assuming the Police have been correctly trained to record the data, it should help provide visibility on the extent of the occupational road safety problem in Queensland.

The Traffic Accident Data Systems (TADS) system in New South Wales is similar, but does not contain a 'purpose of journey' field. This state-level data is, however, a very useful source of information including risk and causal data. It can be accessed by special arrangement with the Roads and Traffic Authority (RTA). Murray et al (2003) described the other state-level transport agencies in Australia.

3.4.2 Ireland

The Irish Department of Transport does not capture 'purpose of journey' data, and makes no mention of occupational road safety in its road safety strategy (see www.transport.ie/upload/general/5905-0.pdf) except for heavy trucks and buses, which can be identified in the general fatality and injury data.

3.4.3 Nepal

In Nepal the Traffic Police have a reporting system. There is also a health reporting system that is supposed to capture traffic fatalities, but this has very low levels of recording (e.g., 5 deaths reported in the annual health report in comparison to more than 800 deaths by police and more than 1,000 by national survey). The Police attend the scene and report the incident.

The data is kept with the Police. There are no annual or periodic publications, but data is sometimes provided on ad hoc basis. Risk and causation factors are limited to focusing on the driver actions that caused or contributed to the crash, rather than looking for any underlying causes. Injury data is of poor validity and reliability, as it is completed by constables or lower ranking lay police officials. The current data could be used much more effectively if it was linked with health data and its general quality improved.

3.4.6 New Zealand

LTNZ maintains road traffic accident data, and presents up-to-date statistics on its Web site, particularly covering fatal incidents (www.ltsa.govt.nz/research/toll.html). No information is available on 'purpose of journey,' but incidents involving obvious occupational vehicles such as trucks and buses can be identified. As a result of on-going discussions between government agencies in New Zealand, it is possible that 'purpose of journey' data will be monitored in road crash data in the near future (Murray and Sheppard 2006).

3.4.7 Netherlands

In the Netherlands, the AVV (Transport Research Centre, Ministry of Transport, Public Works and Water Management) publishes '*Road Safety in the Netherlands*' (www.rws-avv.nl/pls/portal30/docs/12917.pdf). It shows the number of traffic fatalities and hospital admissions and breaks the data down by vehicle type, but does not include any 'purpose of journey' data, so only obvious work vehicles such as trucks, vans and buses can be identified in the data. Occupational crashes involving other vehicles, such as cars, cannot be distinguished.

3.4.8 Norway

Occupational road safety fatalities and injuries are included in the road accident data maintained by Statistics Norway (Statistisk Sentralbyrå), which is based on police reports. Overall, the data has limited use because it is simply a count of accidents and excludes any 'purpose of journey' or causation data. Occupational crashes are only identifiable for vehicle types such as trucks.

3.4.9 South Africa

The National Department of Transport works with the South African Police Services for the collection of fatal traffic accident data. It is not possible to extract occupationally related road crash data, because the traffic accident information system does not identify occupational road safety fatalities.

There are also many problems with the accuracy and completeness of the data. The data originates from the South African Police Services, from where the form is sent to either provincial or local agencies for recording. The original forms are usually incomplete, resulting in many 'unknowns.' There is limited quality control on the data capture and management. There is no field on the form whereby occupational accidents could be separated from other accidents, except in the case of a minibus taxi transporting passengers for gain, which implies that the driver was 'on duty' while the accident occurred. Taxis are often owner-operated (or operated as very small fleets), making it difficult to really use the

information. Trucks and buses are indicated separately and it can be assumed that most of these are occupational trips.

3.4.10 Sweden

According to the National Road and Transport Research Institute, Sweden does not record 'purpose of journey' in its database of road traffic accidents. The respondents reported that the questionnaire was difficult to complete; although working in road safety, they did not feel themselves to be experts on occupational road safety.

3.4.11 UK

As of January 2005, information on causation and 'purpose of journey' has been recorded in Stats19, the Police/DfT recording system for serious road traffic collisions in the UK.

The codes are as follows:

1. Journey as part of work.
2. Commuting to/from work.
3. Taking pupil to/from school.
4. Pupil riding to/from school.
5. Other/Not known.

The fatality and injury data is available online and in the annual publication '*Road Casualties Great Britain*.' There is evidence of under-reporting of injuries by as much as 30%, with Police data not always corresponding with hospital admissions (DfT 2006, Gil et al 2006). Despite these limitations, the data provided is very comprehensive.

The outcomes from the causation and 'purpose of journey' data were made available for the first time during the second half of 2006. Initial analysis suggests that much more work is required to educate, train and motivate the Police to complete the relevant question (2.29) on the Stats19 form. In over 75% of cases in the first year, this question was completed as 'Other/Not known.' The main problem appears to relate to the Police combining 'Other' and 'Not known' as one answer on the form. This makes it impossible to tell how many crashes genuinely had 'Other' journey purposes and how many were 'Not known.'

3.4.12 USA

In the USA, the FARS database, maintained by NHTSA in the Department of Transportation (DOT), contains a data element on 'injury at work,' and has been successfully used for research purposes, primarily for analysis of large-truck crashes.

Participants identified four key issues:

1. The reporting of work-relatedness of motor vehicle injuries is excluded from some state crash report forms, which are on the internet (www.nhtsa-tsis.net/crashforms) for each state. An example is the Massachusetts crash report (at www.nhtsa-tsis.net/crashforms/Pages/state/ma/MA.htm) If work-relatedness were on all police reports, this information would be easier to collect and more reliable, as police are at the crash scene and in the best position to determine work-relatedness. Improved

capture of occupational crashes would enhance the quality of the BLS CFOI data used to track occupational fatalities, as well as the FARS data used by NHTSA to track fatal motor vehicle crashes in the general population.

2. The FARS data is published each year in the '*Traffic Safety Facts*' publication. Although numerous tabulations by vehicle type are included, this publication has no tables that display the 'injury at work' item. This means that the usual inferences that crashes of large trucks are occupational in nature can be made, but no information on work relationship for crashes of lighter trucks and passenger vehicles is readily available. Raw data files can be downloaded or queried from www-fars.nhtsa.dot.gov. The data is helpful for identifying risk and causation factors, as FARS collects many of the items related to the driver, the vehicle, and the incident that are not collected by CFOI. However, FARS does not capture as many occupational crashes as CFOI does. The FARS database records the death certificate number and whether the 'injury at work' item on the death certificate was selected. This death certificate yes/no box is the only criterion used by FARS to ascertain a work relationship, and is known to be incomplete.
3. There is a need to use more data linkages to check the quality of different data sources (Smith et al 2005). In the USA, this means linking together health data, CFOI and FARS. Determining work relationship is always difficult. For example, CFOI data technically would include a suicide involving a motor vehicle as a work-related death. Anything that occurs at work gets in the CFOI system. The CFOI system therefore reports many more work-related motor vehicle fatalities than the FARS system. FARS relies largely on the death certificate to get data on work-related motor vehicle fatalities. It is uncertain, however, how complete each state in the US is at locating the death certificate. If work-relatedness were included on all police reports this would be easier to collect and more reliable. Overall, linking data is the key.

There is a need to use more data linkages to check the quality of different data sources.
4. Good data on work-relatedness for non-fatal crashes is unavailable. The National Automotive Sampling System (NASS) for non-fatal crashes in the US does not appear to collect data on work-relatedness. If this item were to be added to the state police report then it would be much easier to capture. Smith et al (2006) advocated better reporting of work-relatedness on all injury data sources, including adding a variable to state hospital and emergency department databases to indicate injury at work yes/no, similar to that on the death certificate. This would make it possible to pick up motor vehicle injuries from the hospital discharge database. Some states are using the expected payer source of workers' compensation as a proxy for work-relatedness, which is known to be under-reported (STIPDA 1999, NIOSH 2001, NIOSH-CSTE 2001, and NIOSH-CSTE 2004). Addition of a compulsory yes/no 'injury at work' component on the hospital discharge data, similar to that already on the death certificate, would overcome one of the limitations of workers' compensation data and would greatly improve the usefulness of hospital data for occupational injury surveillance. Similar work has been undertaken in this area for New South Wales in Australia by Boufous and Williamson (2003).

Good data on work-relatedness for non-fatal crashes is unavailable.

3.4.13 Summary of transport data

From this analysis several conclusions are drawn.

- Occupational road safety is only partially on the ‘road safety radar.’ Crashes involving some vehicle types, such as trucks and buses, can be identified in the transport data in most participant countries. However, very few of the countries collect any ‘purpose of journey’ data – so the full extent of the occupational road safety problem is unknown, particularly where small vehicles such as cars and vans are used on work business.
- The fact that some respondents found it difficult to answer within the framework of the questionnaire helps verify the fact that data and initiatives on occupational road safety cut across several agencies including transportation, health and safety, workers’ compensation and medical. These data sources are rarely integrated in a way that can illuminate the full extent of the occupational road safety problem. Better data linkages, for example between road safety statistics and hospital admissions, or between OSH and insurance data, would provide a more complete picture.
- ‘Purpose of journey’ data in road safety statistics is scarce, and would be a useful first step in moving towards a better understanding of the full extent of the problem. Data coding and experience is already available from the UK and Australia.

...Very few of the countries collect any ‘purpose of journey’ data – so the full extent of the occupational road safety problem is unknown, particularly where small vehicles such as cars and vans are used on work business.

3.5 Data from ‘other’ agencies

Participants were asked separate questions about fatality and injury data from other agencies (e.g., health, compulsory insurance or workers’ compensation). In most cases, the same agencies were responsible for the data, so the responses are combined below.

Questions 3 (fatality) and 6 (injury) focused on the data from other agencies.

- a) Are fatal occupational road crashes included and explicitly identifiable through any other reporting systems, such as compulsory insurance, workers’ compensation, or a health agency?*
- b) Describe the agencies who maintain the data and the extent to which occupational road fatality data is captured and identified.*
- c) What is the name or acronym for the reporting and recording system(s)?*
- d) How is a reportable injury defined by these systems (e.g., claim made, claim settled)?*
- e) Is the data publicly available, for example via the Internet or any other source?*
- f) How useful, accurate and complete is the data for identifying risk and causation factors?*
- g) Any further comments on these other sources of road fatality data?*

Very few of the respondent countries indicated that other data sources were available. Those that did are summarised in Table 6 and described below.

Table 6 - Occupational road fatalities and injuries identifiable in other data

Country	Response	National agency	Acronym/Name	Website
Australia	Yes/no	State compulsory insurance, e.g., MAIC in Queensland		www.maa.nsw.gov.au
New Zealand	No	Accident Compensation Commission		www.acc.co.nz
Norway	Yes	Insurance companies		
South Africa	Yes/no	Department of Labour		www.labour.gov.za
Sweden	Yes	Police and hospital	STRADA	www.vagverket.se
USA	No	Some state-level data		

3.5.1 Australia

Another source of some fleet data for Australia is the state-level compulsory third party insurance (CTP) schemes, for example, the data collected in Queensland by the Motor Accident Insurance Commission (MAIC). The main limitations of the CTP data are:

- State-level only – with no national data and slightly different schemes in each state.
- Data is cost and rehabilitation oriented, rather than risk management-based.
- ‘Purpose of journey’ data is not one of the fields requested by CTP agencies from their insurers, so for the biggest vehicle group, cars, it is not possible to identify if occupational driving was a factor in the crash.

Despite these limitations, CTP files are an important source of data for both research and practice. Analysis by Murray et al (2003) showed that in Queensland, work vehicles including taxis, buses, trucks and hire vehicles have the highest claims frequencies and insurance premiums of all vehicle types. These findings led to safety initiatives within the taxi and bus industries. Similar CTP data for truck claims in New South Wales led to the highly influential ‘*Quinlan Report*’ on heavy vehicle safety (Quinlan 2000).

Overall, CTP insurance is an important source of data in Australia that could be standardised and developed further to improve occupational road safety.

The inpatient statistical collections of hospital separation data is coded using the International Classification of Diseases (ICD), making it possible to locate fatal and non-fatal road injuries (not crashes per se) where there was at least one day in hospital. This means that some road crash injuries are identifiable via hospital data, but only where the ICD code is unequivocally related to work, or where the ‘activity’ code is effectively completed. Nationally the data is held by the Australian Institute for Health and Welfare through the National Injury Surveillance Unit (www.aihw.gov.au/hospitals/datacubes/index.cfm).

3.5.2 New Zealand

In New Zealand, the ACC plays a similar role to the Australian CTP insurance schemes. It does not, however, have any clearly defined data that is specifically related to occupational road crashes, although ACC is increasingly focussing on the issue (Murray and Sheppard 2006).

3.5.3 Norway

The Norwegian insurance companies keep records of crashes, but do not always identify those that are occupational. The Rikstrygdeverket – yrkesskadeforsikring, or Association of Insurers, has a database of claims made to insurance companies (Yrkesskadeforsikringsstatistikk). It is not known whether the data is publicly available, but more information is at Finansnæringens Hovedorganisasjon (www.fnh.no). The data is a count of injury cases only and may not be particularly useful for occupational road safety improvement.

3.5.4 South Africa

In South Africa, the Department of Manpower (formerly Labour) maintains statistics on compensation for injuries while on duty from which it is possible to identify the agent of injury (vehicle), but not always whether the incident was a road crash or some other vehicle related incident. A traffic accident relates to an accident on a public road, whereas some of the claims for compensation originate from mining and construction vehicles on site.

The Compensation for Occupational Injuries and Diseases Act 1993 means that reports on compensation claims are available online (www.labour.gov.za). The report itself is not particularly useful for identifying risk and causation factors, but the raw data may be useful if it were to be made available for manipulation. Compensation amounts and some severity categories are given, which might be helpful. It is likely, however, that not all injuries lead to claims through workers' compensation and would thus not feature in the data.

3.5.5 Sweden

Swedish Police and hospital data is available through the National Road Administration (SNR) system called STRADA (see www.vagverket.se). The police reports do not identify whether the accidents are work-related or not, and Sweden does not record 'purpose of journey' in the database of road traffic accidents. In-depth investigation studies of all fatal accidents are undertaken, but to date the Road Administration has focused mainly on the crash scene. Road safety researchers are advocating and encouraging a wider focus on underlying causes and what happened 'pre-crash.'

3.5.6 UK

In the UK, the Association of British Insurers holds a great deal of insurance-based road safety data, based on claims rates and costs. This is described in more detail by Murray (2007). Hospital admission data may also be available for road collisions, and perhaps occupational road collisions, because for the past few years, organisations have had to pay admission charges after road collisions involving employees. To date, this data does not

appear to have been used for research purposes, but there may be opportunity for future analysis. Claims-based data is typically used by many organisations to manage their own risk. Such data is rarely in the public domain, however, as it is seen as highly sensitive commercially.

3.5.7 USA

In the USA, there is no comprehensive national reporting system for workers' compensation, with file structures varying from state to state. Currently, there is a pilot effort to try to combine workers' compensation data from several states. Some information may also be available from insurance carriers or from individual companies, but it is sometimes difficult for researchers to gain cooperation from these groups. For fatalities in particular, which are rare events, data systems from insurance carriers, individual companies, and individual state workers' compensation programs are not a promising data source. Data systems for private corporations tend to focus on paying medical and insurance claims associated with crashes. There does not seem to be a strong emphasis on collecting information that could be used by safety professionals to develop interventions to prevent future crashes. Some insurance companies, however, such as Zurich and Liberty Mutual, have very active programs to increase traffic safety for workers.

3.5.8 Summary of data from other agencies

From this analysis the following conclusions are drawn.

- Several 'other' potential data sources are available, including insurance, workers' compensation and hospital records.
- This information has some potential, but there are limitations in that the data is collected for insurance or hospital administration purposes rather than safety improvement. Statistics are often held at the local or regional level rather than national level. There is limited causation or 'purpose of journey' data, and few linkages appear to exist between data sets.
- Such data is probably most useful for individual organisations and agencies to manage their own risk.

3.6 Measurement of occupational driving exposure

Question 8 focused on the following three measures of exposure:

- a) Do your country's transport statistics include data about the number of vehicles driven for occupational journeys?*
- b) Do your country's transport statistics include data about the number of occupational journeys?*
- c) Do your country's transport statistics include data about the number of miles/kilometres driven for occupational journeys?*

The responses are summarised in Table 7, which suggests that only limited exposure data is available. Further discussion follows on a country by country basis.

3.6.1 Australia

Summary data on the number of vehicles registered in each state and nationally by vehicle type is freely available from the Australian Bureau of Statistics (ABS) Annual Census/Survey of motor vehicle usage. A specific breakdown of data for the number of occupational journeys is not available. Estimates of number of kilometres travelled by vehicles are available for each state, although data specific to occupational journeys is not captured. The most detailed information is available annually in a published year book. The categories of classification are quite broad and access may involve a fee for service or purchase of reports.

Table 7 - Occupational road safety exposure

Country	Vehicles	Journeys	Distance	Data availability
Australia	Yes	No	No	www.abs.gov.au/Ausstats has summary data. Detail can be purchased from Australian Bureau of Statistics
Canada	?	-	-	Statistics/Transport Canada annual exposure survey
Czech Republic	No	No	No	Occupational vehicles cannot be picked out from total vehicles
Finland	Yes	No	No	?
Ireland	No	No	No	
Nepal	No	No	No	
New Zealand	No	No	No	May be some data collected from Otago University and ACC
Netherlands	No	-	-	www.rws-avv.nl
Norway	Yes	Yes/No	Yes	Estimates by Institute of Transport Economics (www.ssb.no)
South Africa	Yes	No	Yes	Total number of km driven for country and provinces
Sweden	Yes	No	Yes	Some data is publicly available at: www.vagverket.se , distance data requires 'special' permission
UK	Yes/No	Yes/No	Yes/No	Information on vehicle stock, ownership and travel surveys at: www.dft.gov.uk
USA	Yes/No	Yes/No	Yes/No	Trucks: www.census.gov/svsd/www/tiusview.html Travel survey: www.bts.gov/programs/national_household_travel_survey/

3.6.2 Canada

The Ministry of Transportation, Ontario (MTO) used to conduct origin/destination surveys by logging the plate number of vehicles at a specific place and time and sending the owner a survey. There were a number of complaints about privacy, however, so this was stopped. Statistics Canada does an annual exposure survey for Transport Canada, but it is uncertain whether they collect trip purpose data.

3.6.3 UK

In the UK, use of vehicles for work purposes cannot easily be identified, although some data is available from the DfT website.

Vehicle stock figures can identify heavy goods vehicles (trucks) and public transport vehicles (buses). They can also identify light goods vehicles (vans) and within that category can identify those owned by companies rather than individuals (although an individual could be a self-employed person who has not registered the van to a company). 'Black cabs' can be identified by body type.

The number of journeys involving large or heavy goods vehicles can be estimated from the Continuing Survey of Road Goods Vehicles, Freight Surveys and the National Travel Survey. Information on vehicle kilometres travelled by trucks and buses is also available. It should be noted, however, that this covers all traffic and in the case of commercial vehicles it can only be assumed that the journeys were of an occupational nature. The National Travel Survey also provides some information on business travel involving non-commercial vehicles.

3.6.4 USA

In the USA, a national survey conducted by the Bureau of Transportation Statistics collects extensive representative data on transport use by mode (www.bts.gov/programs/national_household_travel_survey/) does provide data on work-related driving, and serves as an inventory of personal travel behaviour. The survey includes purpose of the trip, means of transportation, trip length, day of week and month of the year, number of people on trip, and a host of other trip-making characteristics. The way in which it could be used to determine exposure levels for occupational road safety is, however, unclear without much more detailed analysis.

Based on the Vehicle Inventory and Use Survey, it can be inferred that a large truck (over 10,000 pounds gross vehicle weight), or a heavy truck (over 26,000 pounds), is probably used for business purposes. Making certain assumptions, data on vehicle miles driven by some types of vehicles can be used as a proxy for occupational miles driven. The ability to make these inferences is limited to large trucks and buses, as smaller trucks such as pickups are commonly used as passenger vehicles in the US.

3.6.5 Summary of exposure data

From this analysis the following conclusions are drawn.

- Only limited exposure data appears to be available, which makes it difficult to calculate and compare crash rates between different types of vehicle use within and between participant countries.
- Much more work is required to analyse the exposure data that is available, identify what is missing and determine what assumptions need to be made to clarify occupational vehicles and the extent of occupational driving.

Only limited exposure data appears to be available, which makes it difficult to calculate and compare crash rates between different types of vehicle use within and between participant countries.

3.7 Government priorities and regulations

In Question 9 of the survey, participants were asked to agree or disagree with a series of statements on occupational road safety. Figure 1 shows the percentage of respondents who agreed with the statement. Extra comments provided by respondents form the basis of the discussion below.

3.7.1 OSH priority

For five out of 13 (38%) respondents, occupational road safety was seen as a priority for the national government agency responsible for OSH. Additional comments were as follows.

Many of the OSH agencies are still only in the early stages of recognising the potential of occupational road safety initiatives for fatality and injury reduction.

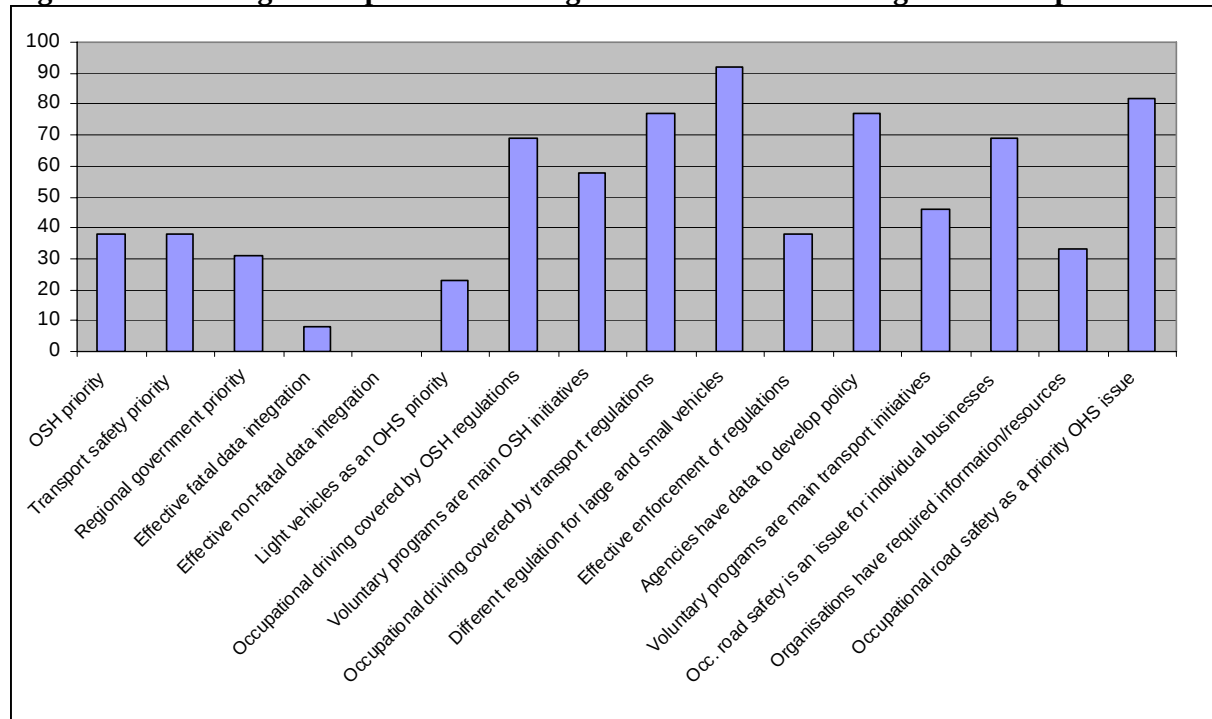
- In many of the respondent countries, transport agencies are typically responsible for road safety in general, but OSH agencies are increasingly showing an interest in occupational road safety as the full extent of the problem emerges.
- Road safety is not seen as an important separate issue from other occupational injuries (for example mine or factory safety). Despite this, occupational road safety priorities have increased substantially in recent years, with a particular focus driven by occupational health and safety legislation that defines the vehicle as part of the workplace.
- Many of the OSH agencies are still only in the early stages of recognising the potential of occupational road safety initiatives for fatality and injury reduction. One respondent summed up a widely held view of the situation in the UK that: ‘the HSE appear to be afraid to enforce this area of their responsibility, due to potential size of workload and lack of resources.’

3.7.2 Transport safety priority

Similarly, 38% of respondents saw occupational road safety as a priority for the national government agency responsible for transport safety. Additional comments were as follows.

- As part of a general focus on reducing the toll of road crashes, occupational road safety is emerging as an area of opportunity.
- It is particularly a government priority with respect to the safety of heavy vehicles operations in many countries. In Australia, for example, new legislative changes to Chain of Responsibility regulations are giving increased priority and responsibility in ensuring the safety of workers and the public.
- In other countries, such as South Africa, the transport agencies have shown little interest in separating occupational road safety from other road safety issues.
- In the USA, the DOT has overall responsibility for highway safety initiatives, but OSH agencies such as NIOSH and OSHA play a role in promoting the importance of occupational road safety.

Figure 1 - Percentage of respondents who agreed with statements on government priorities



3.7.3 Regional government priority

Occupational road safety was seen as a priority for regional, state, and local governments by four out of 13 (31%) of respondents. In several states in Australia and local authorities in the UK, long- term road safety strategies that are being developed and implemented incorporate occupational road safety. Some states and local authorities are trying to lead by example by managing their own fleets effectively – as well as giving guidance to businesses in their local region.

3.7.4 Effective fatal and non-fatal data integration

Only the respondent from Sweden reported that the country had an effective system in place to integrate data from the various reporting systems (e.g. transport, OSH, insurance and hospitals) for fatal occupational road crashes. The usefulness of this process was widely acknowledged, for example by a USA respondent who stated that the matching of CFI and FARS data would be a great step forward. An Australian respondent suggested that the integration of data from various systems can be problematic due to the different reasons for data collection.

Only the respondent from Sweden reported that the country had an effective system in place to integrate data from the various reporting systems (e.g. transport, OSH, insurance and hospitals) for fatal occupational road crashes.

Despite the difficulties, participants believed that moves towards data integration should be encouraged. None of the respondents believed that their country had effectively integrated data for non-fatal occupational road crashes.

3.7.5 Light vehicles as an OSH priority

Only three respondents (23%) felt that the safety of workers who drive passenger vehicles and light trucks is a priority for the national government agency responsible for OSH. An Australian respondent reported that there is no specific focus on passenger vehicles and light trucks, because the governing body for OSH is actively pursuing the safety of all workers regardless of the role or occupation. In the UK, there is an on-going debate about the role of the OSH agency in occupational road safety. In the USA, NIOSH and OSHA have taken steps to raise awareness of the issue. In New Zealand, the OSH agencies have started to focus more attention on the issue, in collaboration with Transport and other agencies.

3.7.6 Occupational driving covered by OSH regulations

Occupational driving was seen to be covered by OSH regulations by 69% (9/13) of respondents. Additional comments were as follows.

- In several countries, including Australia, New Zealand and the UK, occupational vehicles are covered under general duty of care, but it is not well defined, or totally explicit – and rarely enforced on-road. In Australia, there is an increasing focus on driving hours and chain of responsibility for heavy vehicles.
- In most participant countries, the operation of large trucks is governed by a separate set of comprehensive and stringent regulations administered by the transport agencies.

3.7.7 Occupational driving covered by transport regulations

Occupational driving was seen to be covered by generic transportation safety regulations by 77% of respondents. Such drivers must follow the same transport regulations as all road users, with exceptions for specialised, normally large, vehicles. These ‘professional’ drivers of commercial vehicles (for example trucks, buses and in some cases taxis) appear to be covered extensively in relation to the management of driving hours, vehicle weights/mass, driver health and wellbeing, and alcohol use. This is not, however, the case for drivers who may have to use the road to carry out their daily work (e.g., sales representatives in cars and utility workers in vans). In some respondent countries there are national regulations covering these drivers, such as in the UK. In other countries such as the USA and Australia, the regulations vary by State.

3.7.8 Effective enforcement of occupational driving regulations

38% of respondents agreed that in general, government regulations for occupational driving are effectively enforced. Additional comments were as follows.

- Although there are gaps, the adherence to government regulations has become a higher priority in recent times at local and national levels, particularly into heavy vehicle drivers’ hours.
- There is some enforcement, but not enough to deter all violations.

3.7.9 Agencies have data to develop policy

Ten out of 13 (77%) of respondents felt that agencies with responsibility for occupational road safety have the data they need to develop effective policy and regulations. Despite this, the additional comments identified several gaps:

- There are many gaps in coverage. For example, fatigue is a big issue yet very difficult to quantify.
- Inclusion of ‘purpose of journey’ information in the road safety statistics will allow better decision making.
- A great deal of information is currently available, but each agency collects data suitable for its own purpose and policy development. The key is finding the will and the resources to link, analyze, share, and interpret the different data sources so it that becomes more useful.

3.7.10 Voluntary programs are the primary component of transport initiatives

For 46% of respondents, voluntary programs and campaigns were seen as the primary components of the national transportation agency’s efforts to promote occupational road safety, but others felt that enforcement and vehicle safety standards were given greater emphasis. Additional comments are as follows:

There is a move to more industry-oriented development of programs and self regulation within industry sectors, partly driven by increased regulation, intelligence-led enforcement and vehicle safety standards.

- There is a move to more industry-oriented development of programs and self regulation within industry sectors, partly driven by increased regulation, intelligence-led enforcement and vehicle safety standards.
- It depends on whether we are considering drivers of large trucks and buses, where there are lots of government initiatives, or drivers of smaller vehicles – on whom transport agencies have focused relatively little attention.

3.7.11 Occupational road safety is an issue for individual businesses

It was agreed by 69% of respondents that the responsibility for managing occupational road safety falls primarily to individual businesses and organisations, with additional comments as follows:

- This is especially true for organizations with fleets that are not regulated by the Government, particularly passenger vehicles driven for work. In theory, all parties have a responsibility to act, and there are many financial and business benefits for organisations to improve their performance. For example, some large companies keep accident data and base training on risk analysis, often driven by their insurance premium and costs. Typically, however, it is government attention and enforcement that really makes things happen.

- Recent changes to OSH legislation means that increased awareness and responsibility rests with organisations. This has led industry, government and other stakeholders to work collaboratively to improve occupational road safety.

3.7.12 Organisations have the required information and resources

Only four out of 12 respondents agreed that businesses and organisations have the information and resources they need to effectively manage occupational road safety. Many felt that they could and should have access, however, as evidenced by the following summary of participant comments.

- All organisations should have at least some external (e.g., road safety) and internal (e.g., insurance) data available if they wish to look for and use it. Some organisations have used such data effectively, usually for financial, business or legal compliance reasons.
- Many organisations do not appear to use even the information they already have – which helps explain why some businesses have poor safety records. Typically, most organizations do not collect any data on causal factors, and even large organizations may not know accurately how many miles their workers are driving.

3.7.13 Occupational road safety as a priority OSH issue

Compared to other occupational health and safety hazards, occupational driving was felt to be a low priority for most businesses and organizations by nine out of 11 (82%) respondents. This appears to be particularly the case in countries where OSH regulations and initiatives have not traditionally covered occupational road safety. Additional comments were as follows:

- This is somewhat dependent on the organisation and industry in which they operate. For example, if transport is the core business then it is particularly important. If the organisation has only drivers using passenger vehicles in the course of their work, road safety is more likely to be overlooked as a work-related hazard – even though it is often the biggest area of risk and cost. In some cases, once the problem has been identified, organisations do not necessarily know what action to take in response, and typically focus on some form of driver training – even though the risks may be organisational.

3.7.14 Summary of government priorities and regulations

From this analysis the following conclusions are drawn.

- While occupational road safety is not necessarily a priority issue for OSH, transport or regional government agencies, its importance has increased substantially in recent years as the full extent of the potential for fatality and injury reduction becomes better understood.
- Several countries have clarified that the vehicle has been classed as part of the workplace in recent years, although enforcement remains at a relatively low level.
- There is limited evidence of government agencies beginning to lead by example through their own safe travel initiatives.

- Integration of different data sets on occupational road safety is seen as important, but as yet does not seem to be in evidence. There is also limited ‘purpose of journey’ data, which means that government agencies cannot easily generate data-led policies and regulations.
- Most of the focus to date has been on heavy commercial vehicles rather than smaller cars and vans, partly because road safety data (as opposed to OSH data) is available to identify such vehicles.
- Some government agencies have focused on voluntary education-based initiatives (see [Section 3.9](#)), which has engaged some organisations, but several respondents indicated that effective enforcement was required to get the majority of organisations to take action.

3.8 Non-regulatory government initiatives

Question 10 of the survey asked respondents to briefly describe three main types of non-regulatory government initiatives in their country:

- *Non-regulatory road safety initiatives undertaken by OSH agencies.*
- *Non-regulatory occupational road safety initiatives by transport agencies.*
- *Non-regulatory road safety initiatives undertaken by any other government agencies.*

3.8.1 Non-regulatory road safety initiatives undertaken by OSH agencies

In Australia, NOHSC (www.nohsc.gov.au) has published several papers on occupational road safety (see for example Mitchell et al 2004). There have also been some State level initiatives described by Murray et al (2002).

In Ireland the Health and Safety Authority provides information on the Transport of Dangerous Goods (www.hsa.ie).

In New Zealand, several initiatives have been put in place including:

- Research by University of Otago (McNoe et al 2005).
- Driversafe Program (www.roadtrain.org.nz).
- Road Safety Innovation Awards (www.landtransport.govt.nz).
- Interagency management workshop program (Murray and Sheppard 2006).

In the UK, the HSE has undertaken several initiatives:

- Occupational road safety website (www.hse.gov.uk/roadsafety/index.htm) providing a great deal of guidance, research, information, cases and publicity.
- Joint program of work with the DfT, including Guidance on work-related road safety issued in September 2003 (www.hse.gov.uk/pubns/indg382).
- Signing a protocol and undertaking a pilot project with the Police on road collision investigations.
- Considering amending reporting system (RIDDOR) to include on-road collisions.
- Inspectors being made aware of the issues and when to get involved in road traffic crashes.

- Involved in fleet safety guidance tool being launched by the Transport Research Laboratory (DfT 2006).
- Occupational road safety added to agenda of Road Haulage Liaison Group meetings.

Despite this, the majority of the HSE's policy, guidance, regulation, enforcement and support in relation to vehicles only focuses on workplaces – rather than what happens on the public roads.

The following initiatives have been undertaken in the USA.

- Data analysis, media initiatives, information dissemination through annual fact sheets and internet materials from the National Highway Traffic Safety Administration (www.nhtsa.dot.gov). NHTSA reports data on large vehicle crashes separately, but not other occupational crashes. Additional resources specific to large truck and bus safety are available from the Federal Motor Carrier Safety Administration (www.fmcsa.dot.gov), including materials to promote safety belt use among commercial drivers.
- NIOSH conducts research and makes recommendations for prevention of occupational injury and illness (see for example www.cdc.gov/niosh/injury/traumamv.html). It offers a number of road safety publications, and is developing an industry-based program to address occupational road safety and the safety and health of transport workers (see www.cdc.gov/niosh/programs/twu).
- OSHA (see www.osha.gov/SLTC/motorvehiclesafety/index.html) has few regulations that address vehicle safety, but is building 'alliances' with public and private groups to promote occupational road safety and to combat other health and safety problems. One example is the Every Belt – Every Ride initiative to encourage seatbelt use among Federal workers.

3.8.2 Non-regulatory occupational safety initiatives by transport agencies

In Australia, there is a great deal of research and information to manage and improve fleet safety. Most State governments promote fleet safety programs. For example, Queensland Transport's Workplace Fleet Safety System is a useful fleet audit tool used by hundreds of organisations. The Western Australia Government website (www.officeofroadsafety.wa.gov.au/workplace) also shows a useful example. For heavy vehicles, the National Transport Commission (www.ntc.gov.au) provides information on initiatives and enforcement. Due to the size of the country and distances involved, fatigue management, hours of service and use of multi-modal systems to reduce on-road movements have all received attention.

In Australia, there is a great deal of research and information to manage and improve fleet safety. Most State governments promote fleet safety programs.

In Ireland, the National Safety Council in collaboration with the Department of Transport provides information on road safety (see www.nsc.ie/RoadSafety/RoadSafetyIssues).

In New Zealand, the Road Transport and Logistics ITO (www.roadtrain.org.nz) provides support for training in the transport sector. Other initiatives have been described above and by Sheppard and Murray (2006).

In the UK, the DfT (see www.thinkroadsafety.gov.uk/advice/wrrs/index.htm) provides information and publicity on work-related road safety. DfT has also funded several research projects (see for example Murray 2003, Baughan et al 2004, Bomel 2004, Clarke et al 2005) and most recently a CD of resources (DfT CD-ROM 2006). DfT has also supported voluntary sector organisations such as Brake and Roadsafe to develop resources and run initiatives on issues such as benchmarking (www.fleetsafetybenchmarking.net).

In the USA, the Federal Motor Carrier Safety Administration (see www.fmcsa.dot.gov/safety-security/safety-initiatives/safety.htm) promotes safety through efforts to increase compliance with regulations. Other programs, such as the Safety Belt Partnership, more closely resembles a typical public safety campaign. The NHTSA promotes fleet and traffic safety among businesses within communities. Its website (www.nhtsa.dot.gov) describes several programs, including the Buckle up America Campaign which provides guidance to organisations on how to engage employees and the local community in increasing safety-belt use.

3.8.3 Non-regulatory road safety initiatives by other government agencies

The Staysafe Parliamentary Committee of New South Wales in Australia has produced the influential Staysafe36 report and several other publications and events related to occupational road safety. Similarly, in Queensland the Travelsafe Parliamentary Committee organised a symposium to provide a range of recommendations designed to address issues of work-related road safety (Travelsafe34 2001). The Fleet Safety Forum is a group of interested stakeholders from around the country who meet to inform, exchange and develop fleet safety initiatives.

In Ireland there are several important work-related road safety programs which have been implemented by government agencies. These include the following:

- Office of Public Works has begun to lead by example and manage the risks in its own fleet, and recently won a bronze award from RoSPA for its management of occupational road risk.
- The Electricity Supply Board has set up an internal Safe Driving Bureau, which has been involved in benchmarking programs and is embarking on the individual risk assessment of all employees who drive for work (McGrath 2006).
- After several major road fatalities, Bus Eireann has implemented many road safety programs, including detailed post-collision investigations and extensive interactive driver risk assessment and training programs.
- Irish Police (Gardaí) is focusing on more advanced driver training following the recent death of a pensioner who was hit by a patrol car (Ireland Online 2006).

In the USA, NIOSH has been proactive in research and guidance (www.cdc.gov/niosh/injury/traumamv.html). The National Center for Injury Prevention and Control offers road safety resources, some of which are applicable to occupational road safety (www.cdc.gov/ncipc/)

3.8.4 Summary of government led initiatives

There have been a number of government-led initiatives on occupational road safety in countries including Australia, Ireland, the New Zealand, the UK and USA.

Given the importance of government, and the number of government workers who drive, such initiatives are important – particularly where government agencies apply best practice and lead by example themselves to give more credibility to the programs they encourage other organisations to adopt.

3.9 Other initiatives

Question 11 of the survey focused on three other types of initiative.

- *Countermeasures developed by businesses and trade associations.*
- *Countermeasures developed by ‘not for profit’ industry bodies and NGOs*
- *Countermeasures developed by academic researchers*

3.9.1 Countermeasures developed by businesses and trade associations

In Australia there are many fleet safety initiatives at the individual business level based on what is required under a combination of societal, business, legal and financial motivators. Two examples are listed below.

- Trucksafe is an industry and insurer-led heavy vehicle program focusing on issues including driving hours, fatigue management, vehicle maintenance and driver health. It includes the biggest men’s health program ever undertaken in Australia.
- The Australasian Fleet Managers’ Association (www.afma.net.au) conducts annual awards for fleet safety, conferences, management seminars, workshops and overseas visits designed to better inform and educate personnel working within the fleet industry. It also has a variety of web-based resources available to members.

Other Australian initiatives, including some government agencies leading by example and managing the safety of their own fleets, are discussed in some detail by Newnam et al (2004), Murray et al (2003) and Haworth et al (2001). These vary within each organisation and industry, and include driver training, management education and awareness, and compliance initiatives. Programs typically incorporate in-vehicle training, leaflets, posters, workshops and newsletters to create awareness of the issue of work-related road safety. There are also initiatives aimed at post incident investigations, risk assessments, and better crash and offence data reporting and recording mechanisms.

In New Zealand, there is a range of business-led initiatives, particularly focusing on driver training. Some examples are listed below.

- Driver of the Year competitions and Safe Driving Awards.
- Alchemy Driver Program, Practice Driving Program and Defensive Driving Course (all for 15-24 age group drivers).
- Corporate Defensive Driving Course (workplace drivers).

- Competency-based licence test for all heavy vehicle drivers.
- Workplace drivers are able to gain formal driving qualifications.

The ORSA website (www.orsa.org.uk) provides current information for the UK, where there have been many organisational-level programs, often led initially by larger corporate organisations in the high value or dangerous good sectors. Traditionally, such programs have focused on in-vehicle driver training, driven by the promise of maintained or reduced insurance premiums. In recent years, such programs have been increasingly led by health, safety and duty of care worries, and have become more holistic, focusing on the implementation of policies and procedures for the management of the journey, vehicle and driver. Driver risk assessment, monitoring and improvement programs are also being applied more frequently, some with more outcomes-based evaluation data than others.

A small number of innovative local and national government fleets have also begun to focus on the safety of their own vehicles. One local metropolitan council in the North of England which has been particularly proactive on driver training estimated that it was directly involved in between 10-15% of all the journeys in that region – and therefore has a major impact on overall road safety.

In the USA, there are many organisational road safety programs in place, often led by large corporations and their insurers. These programs include procedures for managing the scene and claims process, as well as quite sophisticated fleet safety policies supported by driver risk assessment and monitoring programs.

In the USA, there are many organisational road safety programs in place, often led by large corporations and their insurers.

For example, more and more businesses are implementing policies that prohibit the use of cellular phones by employees while the vehicle is in operation. Courts are increasingly holding employers at least partially liable for cell-phone-related crashes in which an employee is involved. The agency that administers US government fleet vehicles has a policy that discourages use, but does not ban cellular phone use in government vehicles. Many businesses and government agencies have instituted mandatory seatbelt use policies. Such policies are not necessarily a meaningless duplication of traffic laws; a number of US states have laws that allow police to cite a motorist for not wearing a safety belt only if that motorist has been stopped for another traffic violation.

3.9.2 Countermeasures developed by industry bodies and NGOs

In Australia, the Heavy Transport Industry Bodies, such as the Australian Transport Association, run campaigns and programs, typically dealing with issues such as fatigue.

The Australasian College of Road Safety has also focused some attention on occupational road safety, by conducting seminars and workshops, and publishing relevant articles in its Journal.

In Nepal, the National Institute for Injury Prevention provides advice to the government related to road safety.

In New Zealand, the AA Driver Education Foundation is heavily involved in occupational road safety, for example organising conferences and management workshops around the

country which focus on the issue. It has also worked to bring together different government agencies to understand and focus on the extent of the problem.

In the UK, there are several not for profit organisations that have focused on occupational road safety.

- Brake (www.brake.org.uk) is a road safety charity. Its Fleet Safety Forum researches, champions, lobbies for, benchmarks, rewards and disseminates best practice to government and industry.
- Local Authority Road Safety Officers Association (LARSOA) (www.larsoa.org.uk) is a national road safety organisation that represents Road Safety Officers employed in local government across the UK. Occupational road safety is one area of interest, including the publication and wide dissemination of a CD of fleet safety resources.
- ORSA, the Occupational Road Safety Alliance (www.orsa.org.uk), brings together employers, trade unions, local authorities, police forces, safety organisations and professional and trade associations. It aims to raise awareness and encourage businesses to manage at-work road risks more effectively.
- RoSPA has championed the importance of occupational road safety in the UK over the past ten years, focusing at the policy level and also in supporting individual organisations, for example through driver training, award schemes and publication of guidance material (www.rospace.com).
- Roadsafes is a road safety charity which runs a range of initiatives on occupational road safety, including the widely recognised Prince Michael Road Safety Awards.
- Individual unions and the Trade Union Congress (TUC) have also focused on occupational road safety in the UK as a way to help protect the health and wellbeing of their members (see for example www.tuc.org.uk/extras/roadsafety.pdf).

In the UK, there are several not for profit organisations that have focused on occupational road safety.

In the US, not for profit organisations such as the Insurance Institute for Highway Safety (www.iihs.org) and the American Automobile Association (www.aaafoundation.org) have focused some attention on occupational road safety. The American Society of Safety Engineers (ASSE) spearheaded the development of ANSI Z-15, a consensus standard for fleet safety targeted at organizations with motor vehicle operations that are do not fall under the safety regulations applicable to large trucks and buses.

The Network of Employers for Traffic Safety (NETS) promotes road safety on and off the job by delivering safety information through employers (see www.trafficsafety.org). It offers a fleet management program for businesses, campaign materials to educate workers about the dangers of distracted driving, and family-centered programs. By reducing crashes among family members, organisations can reduce lost work time, lowered productivity, and distractions that result when a family member is involved in a crash, and also gain a number of marketing, branding and corporate social responsibility benefits.

3.9.3 Countermeasures developed by academic researchers

Information was only provided for this question from Australia, the UK and USA.

In Australia, research, analysis and information dissemination has been undertaken by some research institutions, most notably MUARC and CARRS-Q. Both are involved in a number

of fleet safety research programs, conference presentations and workshops designed to develop and evaluate intervention strategies along with changing work-related driving behaviour.

Other research centres in Australia have also focused some attention on occupational road safety. For example, the Injury Risk Management Research Centre at the University of New South Wales has done a great deal of research on driver fatigue, and recently focused on the identification of work-related crashes and injuries through linking of road traffic crash databases and workers' compensation database in a report for the New South Wales Road Traffic Authority (RTA). The Australian Road Research Board recently recruited one of Australia's leading fleet safety specialists, in part to concentrate on occupational road safety benchmarking.

In the UK, several universities and research groups have focused at least some attention on occupational road safety:

- Department of Transport and Logistics at the University of Huddersfield, which focused on using crash data analysis, safety audits and risk assessment to identify risks and target interventions.
- Driver Development Unit at Cranfield University, which focuses on driver behaviour.
- Transport Research Institute at Napier University, which focuses on journey choices and speeding.
- Transport Research Laboratory, which runs a wide range of mostly DfT-funded projects, and works with several large fleets.

In the USA, a number of universities have focused on occupational road safety, particularly heavy trucks. Several transportation research centers funded by the U.S. Department of Transportation (<http://utc.dot.gov>) have at least some focus on truck safety, notably the University of Michigan Transportation Research Institute (www.umtri.umich.edu). The conferences, committees, and publications of the TRB provide a forum for wide dissemination of academic research results (www.trb.org).

3.9.4 Summary of other initiatives

From this analysis the following conclusions are drawn.

- Many non-government led programs have been implemented for a range of societal, business, legal and financial reasons.
- To date, many such programs appear to have operated in isolation, often led by dedicated individuals, organisations or groups who identified the extent of the problem and looked for ways to do something about it.
- Occupational road safety research, regulation and practice cuts across many traditional organisational and government level 'boundaries,' such as transport, road safety, health and safety, driver training and insurance risk management.
- Despite the emergence of much best practice, there is still limited information on what are the most effective ways to improve occupational road safety and how it should be funded, implemented, sustained and evaluated.

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4 Conclusions

This concluding chapter sets out the extent to which the project aims were met, a summary of the main findings, limitations and recommended areas for further study.

4.1 Summary of main findings and recommendations

All three of the research aims set out in [Section 1.2](#) above have been met at least to some extent for 15 participant countries. In particular, Chapters 2 and 3 of the report summarise information on sources of occupational crash data worldwide; describe the integration of occupational road safety into occupational safety and transportation infrastructures in different nations; and, provide many recommendations to improve occupational road safety research and practice. These can be summarised as follows.

1. Occupational road safety, work-related road safety, fleet safety or the management of occupational road risk is becoming more ‘mature’ in certain countries, as researchers, industry bodies and government agencies realise the extent of the problem and some good research and practise emerges. The data that has been published already suggests that between a quarter and a third of road fatalities involve someone driving for work; and that at least a similar proportion of at-work injuries and fatalities involve vehicles.
2. Despite the scale of the problem, occupational road safety only appears to be partially on the ‘road safety radar’ in many jurisdictions and the full extent of the problem remains relatively unknown. This is because good quality ‘purpose of journey’ data in road transport safety statistics is scarce. OSH data sometimes, but not always, includes on-road incidents. More widespread collection and availability of these two datasets would be a good first step in moving towards a better understanding of the full extent of the problem. There is also only limited exposure data available, which makes it very difficult to calculate and compare crash rates between different types of vehicle use within and between participant countries.
3. The extent of the problem sometimes shows up at least partly in several different data sets - including transport, OSH, workers’ compensation, health and insurance. All of this information has some potential, but there are limitations:
 - o The data is typically collected for specific purposes rather than safety improvement.
 - o Statistics are often held at the local or regional rather than national level.
 - o There is limited or only poor quality causation or ‘purpose of journey’ data, preventing complete ascertainment of the full extent of the problem.
 - o There appear to be minimal data linkages, for example between road safety statistics and hospital admissions, or with health and safety or insurance data, which would enable a more complete picture to be obtained. This means that in many participant countries, transport data is only available for certain vehicle types that are obviously being used for occupational purposes, such as trucks and buses, but not for other vehicle types, particularly cars. Most government initiatives and legislation, therefore, tends to focus on these larger occupational vehicle types and incidents that occur on work sites.

4. Many respondent countries do not appear to have an official definition of an occupational road crash, and in those that do there is limited consensus as to whether it's a transport or health and safety management-led issue. This means that more work is required to clarify the scope of occupational road safety, and to include it as both a transport and an occupational safety issue. Initial steps are to set appropriate definitions, to ensure that transport safety data is coded to include a 'purpose of journey' question and to ensure that OSH data includes on-road incidents if the person was driving as part of their work. The way in which 'work-relatedness' is measured in the transport or OSH statistics (for example by purpose of journey, work activity, vehicle ownership, vehicle type or job title of employee involved) also needs to be considered and agreed upon. The accessibility, coding and usefulness of Health/hospital and Coronial data should also be explored in more depth to assess the extent to which work-related motor vehicle injuries and fatalities can be identified.
5. Several countries have clarified that the vehicle is classed as part of the workplace in recent years, although enforcement remains at a relatively low level. This is an important step, because even when occupational road safety is not necessarily a priority issue for OSH, transport or regional government agencies, its importance has increased substantially in recent years as the full extent of the potential for fatality and injury reduction becomes better understood. Given the data that has emerged from Australia, New Zealand and the USA for example, on-road crashes appear to represent a large proportion of occupational fatalities. This means that there is scope for the OSH agencies to focus more data collection, research, legislative, enforcement and improvement attention in this area.
6. Some government agencies have focused on voluntary education-based initiatives, which have engaged the more proactive industry organisations, but several participants in this research indicated that effective enforcement is required to get the majority of organisations to take action.

There have been a number of government-led initiatives on occupational road safety in countries including Australia, Ireland, the New Zealand, the UK and USA. Despite this, there is only limited evidence of such

government agencies beginning to lead by example, through their own safe travel initiatives. Given the visibility of government, the large scale of the government fleet identified by Murray et al (2003) and the number of government workers who drive, such initiatives are important. Government agencies should apply best practice and lead by example themselves to give more credibility to the programs they encourage other organisations to adopt. In fact, there is a wide range of societal, business, legal and financial reasons why government agencies should be seen to lead by example in the policies, procedures and processes they adopt to protect the safety of people who are expected to drive as part of their work. Government agencies requiring their own people, contractors and sub-contractors to drive as part of their work should be at the forefront in developing effective occupational road safety programs.

Government agencies should apply best practice and lead by example themselves to give more credibility to the programs they encourage other organisations to adopt.

7. Despite the emergence of much best practice in industry, there is still limited information on what is the most effective way to improve occupational road safety

and how it should be funded, implemented, sustained and evaluated. To date, many such programs appear to have operated in isolation, often led by dedicated individuals, organisations or groups who identified the extent of the problem and looked for ways to do something about it.

Despite these findings and suggestions, the research is not without its limitations – and a great deal of further work is required.

4.2 Limitations of the report and areas for further work

All research has limitations. In this case there are several, the most obvious of which are set out below, along with some suggestions for further work.

- Much of the information used in the report was only exploratory and based on reports from key informants. Only limited crash data has been explored from the participating organisations. This is an obvious next step to help quantify the full extent of the problem.
- The fragmented data, and in many cases an apparent lack of interagency collaboration, was identified as a major stumbling block for the future development of occupational road safety initiatives. Much more work is required to focus on data linkages and common coding between the transport, safety, health, insurance and other agencies so that the full extent of the problem can be identified and any ‘double-counting’ can be identified and avoided.
- The lack of response from many countries, particularly in Europe, was highly disappointing despite several efforts to engage them. This in part stems from a lack of focus on occupational road safety as an issue in those countries, but with the benefit of hindsight perhaps more could have been done to engage participants from those countries. This would be a very useful next step, and could help to motivate researchers, agencies and relevant industry sectors to focus more attention on occupational road safety. Any readers based in countries not included in the report, or who have identified gaps in the discussion, are encouraged to contact the authors via email (willmurray@roadrisk.net).
- The findings in this report are a first step in identifying the extent to which occupational road safety is on the radar in the participant and other countries. There is clearly a need now for a much larger collaborative project to be undertaken, led by a well-resourced research group or consortium to begin to explore and compare the available data and initiatives in each jurisdiction. There is also a strong argument for setting up and hosting an international conference on occupational road safety to bring together researchers, policy makers, key government agencies, industry practitioners and other stakeholders to agree on definitions, share best practice and guide future actions.
- For the UK, it would be useful to understand the extent to which there is some work-related variable in the hospital admissions data and in statistics based on the coroner’s death certificate. This should be explored further, the latter with UK National Statistics (www.statistics.gov.uk).

- This report has focused mainly on the more developed and motorised nations of the world. Future studies and initiatives should focus on the less motorised nations. It is important, therefore, for road safety, OSH and insurance agencies around the world to work closely in the development of occupational road safety research and policy. The results will be more complete data, joined-up thinking, and effective targeting of countermeasures.

Overall, the research on which this report is based can be seen to have further developed the level of knowledge and understanding about occupational road safety around the world, but it is clear that a great deal of work is still needed. This will require further research, funding, policy, enforcement and support from a number of government agencies and industry bodies. The extent of the occupational road safety problem identified by many of the participants in this report would suggest that such initiatives would be an effective use of road safety, OSH and business improvement research and project management resources.

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Appendix 1 – Country by country road safety statistics

HEALTH RISK = Road fatalities per 100,000 inhabitants

TRAFFIC RISK = Road fatalities per 100,000 motor vehicles

SOURCE: International Road Federation, World Road Statistics 2002, quoted in Elvik and Vaa 2004

IRTAD	YEAR	FATALITIES	HEALTH RISK	TRAFFIC RISK
Australia	2000	1818	9.5	15.3
Austria	2000	976	12.0	19.1
Belgium	2000	1470	14.2	25.6
Canada	1999	2972	9.7	16.6
Czech Republic	2000	1486	14.5	31.8
Denmark	2000	498	9.3	20.7
Finland	2000	396	7.7	15.9
France	2000	8079	13.6	23.6
Germany	1999	7503	9.1	14.6
Greece	2000	2116	20.2	41.8
Hungary	2000	1200	11.9	44.3
Iceland	2000	32	11.3	17.6
Ireland	2000	415	11.0	24.6
Italy	2000	6410	11.1	16.9
Japan	2000	10403	8.2	13.2
Luxemburg	2000	76	17.5	23.8
Netherlands	2000	1082	6.8	13.6
New Zealand	2000	462	12.1	17.8
Norway	2000	341	7.7	13.4
Poland	2000	6294	16.3	44.6
Portugal	2000	1860	19.6	23.5
Republic of Korea	2000	10236	21.8	78.4
Spain	2000	5776	14.6	24.8
Sweden	2000	591	6.7	12.5
Switzerland	2000	592	8.3	12.9
Turkey	2000	5123	7.5	53.6
United Kingdom	2000	3580	6.0	12.1
USA	2000	41821	15.2	19.3
IRTAD TOTAL/AVERAGE		123608	12.2	20.6

Appendix 1 – Country by country road safety statistics

FORMER USSR	YEAR	FATALITIES	HEALTH RISK	TRAFFIC RISK
Armenia	2000	214	6.4	891.7
Azerbaijan	2000	596	9.3	133.9
Belarus	2000	1594	16.0	79.7
Estonia	2000	204	14.9	36.4
Georgia	2000	500	11.0	156.7
Kazakhstan	1999	2147	14.5	154.2
Kyrgyzstan	1999	585	12.5	281.3
Latvia	2000	588	24.9	84.5
Lithuania	2000	641	17.4	49.1
Russia	2000	29594	20.4	95.3
Tajikistan	2000	406	6.2	406.0
Ukraine	2000	5185	10.6	51.0
FORMER USSR TOTAL		42254	16.8	87.8

FORMER EASTERN BLOC	YEAR	FATALITIES	HEALTH RISK	TRAFFIC RISK
Bulgaria	2000	1012	12.4	36.7
Croatia	2000	655	14.4	49.7
Moldova	1999	395	10.8	81.4
Romania	2000	2499	11.1	63.4
Slovakia	2000	628	11.6	42.3
Slovenia	2000	313	15.7	33.3
FORMER EASTERN BLOC TOTAL		5502	11.9	50.3

AFRICA	YEAR	FATALITIES	HEALTH RISK	TRAFFIC RISK
Botswana	1999	495	30.7	423.1
Ethiopia	1999	1693	2.6	1553.2
Kenya	2000	2827	9.2	706.8
Lesotho	1999	290	13.5	783.8
Morocco	2000	3627	12.8	229.4
Namibia	1999	292	16.5	194.7
South Africa	1998	9068	20.9	142.3
Tanzania	2000	1737	4.9	1158
Tunisia	1999	1444	14.9	184.7
Uganda	2000	1678	7.2	912
AFRICA TOTAL		23151	9.6	234.3

LATIN AMERICA	YEAR	FATALITIES	HEALTH RISK	TRAFFIC RISK
Brazil	1998	5305	3.2	15.7
Chile	2000	1698	11.2	81.6
Colombia	1999	7006	16.8	268.1
Costa Rica	2000	336	9.1	53.4
Dominican Republic	1998	1683	19.9	336.6
Ecuador	1999	1177	9.5	188.6
Peru	1998	3323	13.2	298.3
LATIN AMERICA TOTAL		20528	7.5	49.7

Appendix 1 – Country by country road safety statistics

ASIA	YEAR	FATALITIES	HEALTH RISK	TRAFFIC RISK
Bangladesh	1999	3598	2.8	1249.3
Cambodia	1999	196	1.6	9.5
China	1999	83529	6.6	146.2
India	1998	62721	6.2	161.8
Malaysia	2000	6029	27.7	56.9
Mongolia	2000	338	14.0	315.9
Philippines	2000	859	1.1	23.2
Taiwan	2000	3303	14.9	19.5
ASIA TOTAL		160573	6.3	123.9

		FATALITIES	HEALTH RISK	TRAFFIC RISK
WORLD TOTAL		375616	8.6	44.8

Appendix 2 – Initial project communication

Worldwide Occupational Road Safety (WORS) Review Project

Introduction

Occupational road safety has been an emerging issue in the USA, UK, Australia and New Zealand in recent years. Despite this, however, there is still only limited and fragmented data available on the true extent of the problem, and on what are the most effective improvement countermeasures. For this reason the US NIOSH has asked us to undertake a small scale exploratory Worldwide Occupational Road Safety (WORS) Review.

Aims and objectives

The overall objective of the proposed project is to contribute to NIOSH's coordinated research program on occupational road safety and the enhancement of global workplace safety and health.

To meet this objective the project has the following aims.

1. Obtain and summarise information on sources of occupational crash data worldwide.
2. Describe the integration of occupational road safety into occupational safety and transportation infrastructures in different nations.
3. Make recommendations on key government and organisational initiatives that could be undertaken to promote occupational road safety and identify the most pressing needs for future research.

Research questions - Data on Work-Related Crashes		Information Sources
1.	Based on available data what is the contribution of occupational crashes to the overall burden of roadway fatalities in various nations?	<i>Published road safety and OSH statistics. Discussion with data agencies.</i>
2.	How does the definition of a work-related crash differ country by country? For example are commuting crashes included?	<i>Discussion with data agencies and industry experts.</i>
3.	Are work-related crashes captured through reporting systems for occupational fatalities (e.g., RIDDOR in UK, CROI in US, Workers Compensation/NOHSC in Australia), through the general crash reporting systems (e.g., Stats19/RCGB in UK, FARS in USA, ATSB in Australia), or both?	<i>Published road safety and OSH statistics. Discussion with data agencies and industry experts.</i>
4.	Do any nations keep data about the number of miles driven for work-related journeys? If so is the information available for all work-related travel or just certain types such as trucks or buses?	<i>Published road transportation statistics. Discussion with data agencies and industry experts.</i>
5.	What is the status of data on non-fatal crashes? Do any countries have comprehensive reporting systems?	<i>Published road safety and OSH statistics. Discussion with data agencies.</i>

Appendix 2 – Initial project communication

	Research questions - Occupational Road Safety Infrastructure	Information Sources
6.	Is occupational road safety a government priority, or is it typically left to businesses to manage road safety?	<i>Review of government policy, legislation and guidance. Discussion with relevant government and industry experts.</i>
7.	Where governments do play a role in occupational road safety, is it typically a part of the occupational safety and health infrastructure, transportation safety infrastructure, or both?	<i>Discussion with relevant government and industry experts.</i>
8.	To what extent are occupational drivers covered by safety regulations? Are all employee drivers regulated or only truck drivers?	<i>Review of government policy, legislation and guidance. Discussion with relevant government and industry experts.</i>
9.	<i>Other than safety regulations what other countermeasures have been adopted by governments, businesses and NGOs?</i>	<i>Discussion with relevant government and industry experts.</i>

Appendix 3 – Project questionnaire

Introduction

Despite an increased interest in occupational or work-related road safety¹ in many countries, including the USA, UK, Australia and New Zealand, there is still only limited and fragmented data available on the true extent of the problem, and the most effective improvement countermeasures.

For this reason the National Institute for Occupational Safety and Health (NIOSH), the US Government agency responsible for conducting OSH research, has set three main objectives for a small scale exploratory review of Worldwide Occupational Road Safety. These objectives are to:

- 1) Summarise sources of occupational road crash data worldwide.
- 2) Describe development of occupational road safety in different nations.
- 3) Make recommendations on government and organisational initiatives.

Please spend 20 minutes or so to support this research project by answering the following questions for your country, and return it to us as soon as possible ideally by the end of February 2005. Type your answers in the spaces provided and return by email to (willmurray@roadrisk.net). If you require any clarification, or wish to discuss the issues raised in more detail, please call us on ++44 1484-400399 or ++44 7713-415454.

Unless you wish to remain anonymous, all respondents will be individually acknowledged in the final project report, which will be freely available to all participants.

The 12 questions that follow are divided into seven sections:

1. Personal details.
2. Definitions.
3. Data on fatal occupational road crashes.
4. Data on non-fatal occupational road crashes.
5. Exposure.
6. Occupational road safety infrastructure.
7. Final comments.

Many thanks for taking part. We look forward to reading your completed information. Your support in this research is greatly appreciated.

¹ Defined as the road safety of people driving as part of their work, sometimes including people working by the side of the road and those commuting to and from their normal place of work.

Section 1: Your personal details

Full name
Title
Organisation
Contact telephone
Contact email
Country

Section 2: Definitions

Question 1: Definitions

- a) How is an 'occupational road crash' defined in your country?
b) Are crashes that occur in the course of commuting to and from the normal place of work included in your occupational crash definition? Yes/No

Section 3: Data on fatal occupational road crashes

Question 2: Occupational Safety and Health (OSH) road fatality data

- a) Are fatal occupational road crashes included and explicitly identifiable through your country's reporting system for occupational fatalities? Yes/No
[If no, please go to Question 3]
b) What is the name of the agency which maintains the OSH fatality statistics?
c) What is the name or acronym for the reporting and recording system?
d) Is the data publicly available, for example via the internet or other sources? Yes/No

Internet address/Title of other source:

- e) How useful, accurate and complete is the data for identifying risk and causation factors?
f) Any further comments on OSH road fatality data?

Question 3: Road transport fatality data

- a) Are fatal occupational road crashes included and explicitly identifiable through your country's reporting system for road transport fatalities? Yes/No
[If no, please go to Question 4]
b) What is the name of the agency which maintains the transport fatality statistics?
c) What is the name or acronym for the reporting and recording system?
d) Is the data publicly available, for example via the internet or other source? Yes/No
Internet address/Title of other source:
e) How useful, accurate and complete is the data for identifying risk and causation factors?
f) Any further comments on road transport fatality data?

Question 4: Road fatality data from other agencies (eg Health, Compulsory insurance or Workers' Compensation)

a) Are fatal occupational road crashes included and explicitly identifiable through any other reporting systems, such as compulsory insurance, workers' compensation, or a health agency? Yes/No
[If no, please go to Question 5]

b) Describe the agencies who maintain the data and the extent to which occupational road fatality data is captured and identified.

c) What is the name or acronym for the reporting and recording system(s)?

d) Is the data publicly available, for example via the internet or any other source?
Yes/No

Internet address/Title of other source:

e) How useful, accurate and complete is the data for identifying risk and causation factors?

f) Any further comments on these other sources of road fatality data?

Section 4: Data on non-fatal occupational road crashes

Question 5: Occupational safety and health (OSH) data for non-fatal occupational road crashes

a) Are non-fatal occupational road crashes included and explicitly identifiable through your country's reporting system for non-fatal occupational injuries? Yes/No
[If no, please go to Question 6]

b) What is the name of the agency which maintains the OSH injury statistics?

c) What is the name or acronym for the reporting and recording system?

d) How is a reportable OSH injury defined by this system (eg 3 days of lost time)?

e) Is the data publicly available, for example via the internet or other sources? Yes/No
Internet address/Title of other source:

f) How useful, accurate and complete is the data for identifying risk and causation factors?

g) Any further comments on OSH injury data?

Question 6: Road transport injury data for non-fatal occupational road crashes

a) Are non-fatal occupational road crashes included and explicitly identifiable through your country's reporting system for non-fatal road transport injuries? Yes/No
[If no, please go to Question 7]

b) What is the name of the agency in your country which maintains the transport injury statistics?

c) What is the name or acronym for the reporting and recording system?

d) How is a reportable road transport injury defined by this system (eg Police attend scene and complete a report form, hospitalisation)?

e) Is the data publicly available, for example via the internet or other source? Yes/No

Internet address/Title of other source:

f) How useful, accurate and complete is the data for identifying risk and causation factors?

g) Any further comments on road transport injury data?

Question 7: Road transport injury data from other agencies (eg Health, Compulsory insurance or Workers' Compensation)

- a) Are non-fatal occupational road crashes included and explicitly identifiable through any other reporting systems, such as compulsory insurance, workers' compensation, or a health agency? Yes/No
[If no, please go to Question 8]
- b) Describe the agencies who maintain the data and the extent to which occupational road injury data is captured and identified.
- c) What is the name or acronym for the reporting and recording system?
- d) How is a reportable injury defined by these systems (eg claim made, claim settled)?
- e) Is the data publicly available, for example via the internet or other sources? Yes/No

Internet address/Title of other source:

- f) How useful, accurate and complete is the data for identifying risk and causation factors?
- g) Any further comments on these other sources of injury data?

Section 5: Exposure

Question 8: Measurement of occupational driving exposure

- a) Do your country's transport statistics include data about the number of vehicles driven for occupational journeys? Yes/No
[If No, please go to Question 8, part b).]
- Is the information limited to certain types of vehicles such as trucks or buses? Yes/No
- Is the data publicly available, for example via the internet or other sources? Yes/No
- Internet address/Title of other source:
- b) Do your country's transport statistics include data about the number of occupational journeys? Yes/No
[If No, please go to Question 8, part c).]
- Is the information limited to certain types of vehicles such as trucks or buses? Yes/No
- Is the data publicly available, for example via the internet or other sources? Yes/No
- Internet address/Title of other source:
- c) Do your country's transport statistics include data about the number of miles/kilometres driven for occupational journeys? Yes/No
[If No, please go to Question 9.]
- Is the information limited to certain types of vehicles such as trucks or buses? Yes/No
- Is the data publicly available, for example via the internet or other sources? Yes/No
- Internet address/Title of other source:

Section 6: Occupational Road Safety Infrastructure

Question 9: Government priorities and regulations

Please circle whether you agree or disagree with the following statements for your country. Provide any further comments in the space provided.

Statement	Comments
a. Occupational road safety is a priority for the national government agency responsible for occupational safety and health (OSH).	Agree/ Disagree
b. Occupational road safety is a priority for the national government agency responsible for transport safety.	Agree/ Disagree
c. Occupational road safety is a priority for regional, state, and local governments.	Agree/ Disagree
d. There is a system in place to effectively integrate data from the various reporting systems for fatal occupational road crashes.	Agree/ Disagree
e. There is a system in place to effectively integrate data from the various reporting systems for non-fatal occupational road crashes.	Agree/ Disagree
f. The safety of workers who drive passenger vehicles and light trucks is a priority for the national government agency responsible for OSH.	Agree/ Disagree
g. Occupational driving is covered by OSH regulations.	Agree/ Disagree
h. Voluntary programs and campaigns are the primary components of the national OSH agency's efforts to promote occupational road safety.	Agree/ Disagree
i. Occupational driving is covered by transportation safety regulations.	Agree/ Disagree
j. There are different sets of regulations for 'professional' (eg large truck and bus) drivers than for other occupational drivers.	True/ Disagree
k. In general, government regulations for occupational driving are effectively enforced.	True/ Disagree
l. Agencies with responsibility for occupational road safety have the data they need to develop effective policy and regulations.	True/ Disagree
m. Voluntary programs and campaigns are the primary components of the national transportation agency's efforts to promote occupational road safety.	True/ Disagree
n. The responsibility for managing occupational road safety falls primarily to individual businesses and organisations.	True/ Disagree
o. Businesses and organisations have the information and resources they need to effectively manage occupational road safety.	True/ Disagree
p. Compared to other occupational health and safety hazards, occupational driving is a low priority for most businesses and organizations.	True/ Disagree

Question 10: Non-regulatory government initiatives

- a) Briefly describe (and provide sources or internet details for) any non-regulatory road safety initiatives undertaken by your OSH agencies.*
- b) Briefly describe (and provide sources or internet details for) any non-regulatory occupational road safety initiatives undertaken by your transport agencies.*
- c) Briefly describe (and provide sources or internet details for) any non-regulatory road safety initiatives undertaken by any other of your government agencies.*

Question 11: Other initiatives

As well as the above government regulations and initiatives, what other countermeasures have been developed by the following groups in your country?

- a) Individual businesses and trade associations*
- b) 'Not for profit' Industry Bodies and Non Governmental Organisations*
- c) Academic researchers*
- d) Other (Please state)*

Section 7: Final comments

Question 12: Further issues or comments

If you have any further comments about the extent of the problem of occupational road safety in your country, or any initiatives to monitor and improve it, please add them below.

Many thanks for your time in taking part in our research. Please email this document to willmurray@roadrisk.net

Appendix 4 – Project Participants

Organisation	Country	Peer Review
Australian Transport Safety Bureau (ATSB)	Australia	No
Centre for Accident Research and Road Safety Queensland (CARRS-Q)	Australia	No
John Lambert & Associates Pty Ltd	Australia	No
Lumley General Insurance	Australia	No
National Occupational Health and safety Commission (NOHSC)	Australia	No
Safety and Communications Pty Ltd	Australia	No
Zurich Financial Services Australia Ltd	Australia	Yes
NSW Injury Risk Management Research Centre, University of New South Wales	Australia	No
Royal Canadian Mounted Police	Canada	No
Workplace Safety and Insurance Board, Ontario	Canada	No
Transport Canada	Canada	No
Transport Research Centre (CDV)	Czech Republic	No
European Transport Safety Council		No
Finnish Institute of Occupational Health	Finland	Yes
Asia Injury Prevention Foundation	Vietnam	No
International Federation of Red Cross and Red Crescent Societies (IFRC)	India	No
National Crime Records Bureau	India	No
Office of Public Works	Ireland	No
National Institute for Injury Prevention	Nepal	No
Transport Research Centre, Ministry of Transport, Public Works and Water Management (AVV)	Netherlands	No
AA Driver Education Foundation	New Zealand	Yes
Institute of Transport Economics	Norway	No
CSIR-Transportek	South Africa	No
Swedish National Road and Transport Research Institute (VTI)	Sweden	No
RoadSafe	UK	No
Road Safety Strategy Division, Department for Transport	UK	No
The Stilwell Partnership LLP	UK	No
Liberty Mutual Research Institute for Safety	USA	Yes
National Highway Traffic Safety Administration (NHTSA)	USA	No
National Institute for Occupational Safety and Health	USA	Yes

Appendix 5 – Occupational road safety report quality review form

We would like to be certain that the report is as accurate as possible, know how useful you found it and solicit your input for future studies.

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/country? Has anything changed since you provided information?

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 and or your manager will change at work as a result of the report?

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

What do you feel would be the best ways for this report to be distributed, and to whom?

Any other comments?

Thanks for taking part in our quality evaluation process. Please email back to willmurray@roadrisk.net



Murray, Will (2007) Worldwide Occupational Road Safety (WORS) Review Project.

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