

QUT Digital Repository:
<http://eprints.qut.edu.au/>



Rowland, Bevan D. and Davey, Jeremy D. and Freeman, James E. and Wishart, Darren E. (2008) Perceptions of work-related road safety: Safety versus savings. In *Proceedings Australasian Transport Research Forum 2008*, Gold Coast.

© Copyright 2008 (please consult author)

Perceptions of Work-Related Road Safety: Safety versus Savings

Bevan. Rowland¹, Jeremy. Davey¹, James. Freeman¹, Darren. Wishart¹

¹ Centre for Accident Research and Road Safety – Queensland, Queensland University of Technology, Brisbane, Qld, Australia

1 Introduction

In Douglas Adam's "The Hitchhiker's Guide to the Galaxy", published in the 1970s, a computer is confronted with the intriguing question: "What is the meaning of life?" After elaborate and tedious number crunching, the computer returns: "The answer to your question is 42". It is obvious, that the monetary valuation of road safety is not an easy task either. In fact, it implies answering an equally difficult and intriguing question – What is the statistical value of a human life? Although various methods and approaches have been put forward to estimate the statistical cost of a road fatality, some scholars argue that valuing fatal injuries and hence human life is virtually impossible. They maintain that people do not nearly have sufficiently accurate preferences to make a sensible trade-off between road safety and money. The (perceptions of) changes in risk levels are so small that making the trade-off is very difficult, if not impossible (Hauer, 1994). However, other road safety costs can be statistically determined and initiatives developed to reduce the burden to both organisations and individuals. Therefore, the topic of this paper is to determine what factors contribute to work-related road incidents and how economic costs to industry organisations could be reduced.

1.1 The work-related driving safety context

There is a growing awareness in Australia and many other countries of the need to devote more attention to the issue of fleet and work related road safety. This is in part due to the growing body of evidence confirming the overall impact that fleet related safety issues have on business effectiveness and road safety (Downs et al, 1999; Haworth et al, 2000). In addition, over recent years, many jurisdictions have moved to clarify a vehicle used for the purpose of work as a "workplace" under WHS legislation (Hoskins, 2003). Therefore, organisations are required to include work-related driving within their organisational WHS regulation compliance.

A high proportion of work-related deaths and injuries as well as road trauma arise from work-related crashes. Work-related traffic injuries are about twice as likely to result in death or

permanent disability than other workplace accidents (Wheatley, 1997) and account for up to 23% of work related fatalities in Australia and 13% of the national road toll (Murray et al, 2002). A further 26% of fatalities result from crashes which occur while commuting to and from work. This means that 49% of all work-related fatalities occur as a result of on-road crashes when commuting is taken into account (National Occupational Health and Safety Commission, 1998). Therefore, there is an obvious and growing need for industry, government and the community to allocate resources to address the problem of work-related road crashes.

How an organisation performs, or is required to perform, its operations may influence work-related driver safety. Previous research has confirmed the influence of a number of organisational factors on employee safety, including high mileage travel (Collingwood, 1997), time pressures (Downs et al., 1999) and in particular organisational culture (Haworth et al., 2000). Other influences may include poor maintenance procedures, poor selection of vehicles for the job, selection and recruitment of drivers and lack of road safety policies and procedures, etc. These factors may have a direct influence on the incidence of work-related road incident. For example, worn tyres that are overlooked due to a poor maintenance program may cause a crash. In addition, organisational factors may influence driver behaviour, for instance, time pressure to complete jobs may influence the driver to speed which in turn may contribute to the incident. Furthermore, research conducted by Murray et al. (2002) suggests that a number of organisations believe that safety, including work-related driver safety, is not considered an operational priority and that senior managers are often unaware of the problem and make safety a low priority behind 'getting the job done'.

1.2 Costs to organisations

Fleet and work related motor vehicle incidents represent a substantial emotional and financial cost to the community. In Australia, road crashes are the most common cause of work-related fatalities, injuries and absence from work (Haworth et al., 2000), with the average time lost being greater than any other workplace claim (Stewart-Bogle, 1999; WA, 2003). It has been estimated that the total cost of work related road incidents in Australia is in the vicinity of \$1.5 billion (Wheatley, 1997) and the average total insurance cost of a fleet incident to organisations and society is approximately \$28 000 (Davey & Banks, 2005). Estimates of the true cost for work related crashes suggest that hidden costs may be somewhere between 8-36 times vehicle repair/replacement costs (Murray et al, 2002). These hidden costs include items such as, workers compensation, medical costs associated with injury to staff, injury rehabilitation, injury to third party, third party property loss, loss of

productivity due to days off work, loss of position and staff backfill costs as a result of absence from work, legal costs associated with workers compensation and third party claims, increased risk, insurance premiums and potential loss of customers.

As a result, the present research aimed to examine qualitative data obtained from two organisations that contain large fleet components. More specifically, the study aimed to:

- a) review current organisational work-related road safety systems and documentation;
- b) explore qualitative data (i.e., employee interviews) to determine factors that impact on work-related drivers' ability to drive safely; and
- c) identify areas for countermeasure development to improve work-related road safety and reduce the economic burden for organisations.

2 Method

This study involved an examination of the work-related driving safety of two industry organisations. Organisation 1 is a Queensland Government owned corporation overseen by the Department of Natural Resources and Mines. Organisation 2 is a private nationwide organisation with a large vehicle fleet.

2.1 Phase 1: Review of Current Systems

A comprehensive search of current and historical Workplace Health and Safety (WHS) and Human Resources (HR) documents and data files was undertaken with both organisations. This information included current WHS and HR Policy and Procedures, training and induction database, crash/incident database and relevant reports and documents pertaining to WHS. In addition, all WHS and HR databases and intranet sites were searched to ascertain what type of countermeasures or interventions had previously been implemented within each organisation in relation to work-related driving safety.

2.2 Phase 2: Qualitative Approach - Employee Interviews

A predefined set of open-ended questions aimed to explore participants' perceptions and experiences in relation to work-related road safety. The structured open-ended questions were employed as the researcher had a limited period of time with each participant. An informal conversational approach was utilised with additional probing questions employed to clarify and/or expand on important experiences highlighted by participants during the

interviews. A review of the open-ended questions was undertaken after each data collection phase, although ongoing data analysis revealed no necessary amendments.

A constraint of the data collection approach was that time restrictions with participants and the amount and quality of responses would limit the facilitation of conversational or content analysis, which rely on frequency counts (Patton, 1987). Instead, an inductive “open” coding technique developed by Strauss (1987) was implemented that entails re-reading transcripts, focusing on and coding the “conditions” and “consequences” that emerge from the text (e.g., themes), and developing and revising such codes. The technique is drawn from grounded theory which does not rely on frequency counts of specific words or pre-defined words, but rather facilitates the examination of major themes arising from the experiential data such as participants’ responses (Corbin & Strauss, 1990; Yin, 1993). In essence, the study incorporates an open-ended inquiry method to generate linkages and identify patterns among key variables and outcomes such as the identification of behaviours that are associated with work-related driving.

Given the inductive nature of the research, coding focused on the spoken word of participants (Jorgensen, 1989; Smith, 2003), as the data and corresponding themes were provided and described by the work-related drivers. Notes were taken on verbatim statements, as participants’ responses to open-ended questions were jotted down by the researcher during the interview, read back to participants, and then re-written with participants’ necessary amendments included after the completion of the interview. Participants’ relatively brief responses to questions complemented this approach, and making verbal recording of responses (e.g., taping) was not permitted by participants due to the sensitive nature of the data (e.g., reporting on possible offending behaviours), which arguably may have increased the possibility of self-reported biases. The “open” coding technique (Strauss, 1987) entailed repeatedly reading and categorising participants’ responses, focusing on similar experiences and events, which facilitated the development of themes and a coding manual that was employed to analyse the text.

The reliability of the coded schemes was addressed by having the transcripts independently coded by a second researcher. After development of the coding manual and analysis of the transcript by the researcher, a second coder independently coded the transcripts using the same coding scheme. Minor corrections were then made to the coding scheme and/or the coding of participants. The researcher subsequently reread and recoded the transcripts in order to make the necessary changes that resulted from the coding exercise.

2.2.1 Interview Participants

Organisation 1 interviews were conducted with employees who drove work vehicles throughout the organisation's regions within the state of Queensland. In total, 146 drivers ranging from field staff to management participated in the interviews. The study sample was taken from a total organisational population of 532 staff (representing a participation rate of 27%). However, the study sample represented 64% of all operational field type staff ($n = 227$) where driving was a significant part of their work-related duties. Employees not considered for this study consisted primarily of administrative and engineering/design staff who performed little or no work-related driving. Participants included 82% randomly selected from operational field staff and the remaining 18% included operational managers and supervisors.

Organisation 2 interviews were conducted with samples of employees from the eastern states of Australia ($N = 80$) who all drive for work in both metropolitan and regional areas. For example, the sample size from each state includes Queensland ($n = 24$), New South Wales ($n = 18$), Victoria ($n = 23$) and South Australia ($n = 15$). In addition, the study sample represented 90% of field type staff and the remaining 10% included operational field managers and supervisors. It is noteworthy, that the sample size is small when considering the overall operational staff population of the organisation ($n = 2264$). However, the data does provide a representation of the work-related road safety issues evident within the organisation nationally. Administration and other non-operational field staff were not considered for this study as driving for work was not a primary component of their daily work tasks.

The names of the two organisation interviewees were not recorded, and the various organisational departments and regions where the interviews took place and the name of the organisation remain confidential.

3 Results

3.1 Phase 1: Review of Current Systems

The review indicated that both organisations work-related driving safety policy and procedures were inadequate. The documents highlighted an asset management approach to road safety and lacked specific information regarding work-related driving safety and issues of accountability and responsibility. Rather, information within these documents only covered

the steps to be completed in case of an incident/crash, operational use of vehicles and general items of road safety. In addition, both organisations' general induction programs contained insufficient information regarding work-related driving/road safety issues. Both organisations' general employee inductions, located on organisational intranet sites, only referenced the procedure for incident reporting, driving "code of conduct" and for Organisation 1, how to book a pool vehicle.

Both organisations' existing policies indicated that fitted and optional safety features on vehicles, including 4WD's were not considered prior to purchase. Rather, it appeared that vehicle purchasing was generally based on the lowest cost. Furthermore, there appeared to be no consultation with operational staff regarding the suitability of vehicle types and/or safety features. Both organisations' did not obtain advice regarding the purchase of vehicles from safety professionals nor operational staff regarding type of vehicle required for a particular task/job or available or optional safety features, etc.

Both organisations' did have procedures in place to deal with crash/incident reporting and these were documented in in-vehicle kits. Organisation 1 did not have a dedicated incident/crash database and limited vehicle incident/crash information could be analysed by accessing specific vehicle incident/crash report forms. However, Organisation 2 did have a detailed database but did not contain information pertinent to the identification of crash contributory factors. Rather, information was based on insurance company requirements such as type and make of vehicle, incident type and repair costs, etc.

The largest difference between the organisations was in regards to intervention or countermeasure implementation. Organisation 1 had initiated few road safety countermeasures. The only initiatives included four wheeled drive training, facilitated on an adhoc basis, and defensive driving training for employees who may have incurred multiple incidents. Organisation 2 initiated considerable driver training for employees and implemented a whole of business road safety information campaign. However, there is some evidence that the driver training and information campaign did not encompass all work-related drivers across the organisation.

3.2 Phase 2: Employee Interviews

Responses to questions relating factors that impact on driver ability to drive safely for work were comprehensive, with many common recurring issues emerging. Examples of results are presented in Table 1 according to four specific themes that emerged with both organisations'.

Within the “Organisational” theme interview participants from both organisations’ perceived fatigue and work pressures as the two primary factors that impact on their ability to drive safely for work. Importantly, fatigue was a common issue raised by participants as an important factor in incidents and near misses. Interview participants reported that the considerable kilometres/time required for travel to job locations, combined with the effects of working all day and then needing to return to the depot that same day resulted in fatigue. For example, *“we are regularly expected to drive to a job, could be anywhere, work all day then drive home....could mean a twelve hour day....we get paid overtime but after a while you’re stuffed”* (reference to fatigue) (Organisation 1 - male driver). Likewise, participants from both organisations stated that work/time pressures placed upon them by management impacted on the way they drive for work. For example, they perceived they needed to make up time by speeding, performing work tasks (e.g., paperwork) and eating meals while driving: *“was rushing to get to a call out, I didn’t have lunch...just stopped to get a pie from the bakery... driving along some pie dripped on my leg, while trying to wipe it off I ran into the back of the vehicle in front who had slowed down to turn the corner...I only took my eyes off the road for a second”* (Organisation 2 - male driver).

The “Individual” theme indicated a diverse range of issues specifically relating to individual behaviour. In Organisation 1, younger drivers particularly apprentices, reported inexperience in relation to the use of 4WD’s and larger vehicles and also pressures placed upon them by older drivers/tradesman to take risks while driving (see example in Table 1). The younger drivers believed they had to comply with this pressure otherwise they would be victimised. Some drivers (n=6) reported personal problems, for example, relationships and marriage separation as factors impacting on their ability to drive safely. For example, *“I’ve been going through a divorce...have not slept much...I just can’t seem to concentrate at times”* (Organisation 1 - male driver). Interviews also revealed issues of sensation seeking among drivers, for example, as one driver stated *“I love to drive fast, I know it is illegal but I find myself falling asleep if I drive slow...I don’t think it’s a problem I haven’t had an accident in 15 years of driving”* (Organisation 2 - male driver).

Within the “Road and Environmental Conditions” theme, employees from both organisations’ identified animals (see examples in Table 1), road surface and weather conditions as primary factors that impacted on their safe driving. However, it was noted that driving behaviours, for example, driving at incorrect speeds to suit road conditions were also prominent in the examples: *“I know sometimes I drive too fast on dirt roads but I need to get to the job ... like yesterday”* (Organisation 2 - male driver). Road familiarity was one factor that was raised by

a number of participants in Organisation 1. For example, some drivers reported being required to travel outside their own usual work areas due to workload and absenteeism issues. With reference to an incident where a driver was working outside his own familiar work area, he stated that *"it wasn't my patch (reference to individual work area), wasn't used to the road, went around the turn too fast and hit soft gravel... the ute spun out"* (driving on unsealed rural road) (Organisation 1 - male driver).

For both organisations' the "Vehicle" theme highlighted factors of poor rear visibility and suitability of some vehicles, for example, *"guys stack equipment in the centre of the tray between the storage cupboards which reduces rear visibility"* (Organisation 1, male driver). Furthermore, a number of drivers from both organisations were dissatisfied with the vehicle they drove for work (see examples in Table 1).

General consensus of staff from both organisations was that any road safety countermeasures or interventions would need to be cost-effective or they would not be implemented by management. For example, *"unless it doesn't cost much they (management) won't do it"* (Organisational 1 - male driver). Other participants took a more hostile stance in regards to management-driven countermeasures. One typical participant response was: *"get management to drive two to three hours to a job...do a full days manual labour, then drive home again...see if they can do it day in day out over time"* (Organisation 2 - male driver). Generally, operational drivers viewed work-related driving as a workplace health and safety issue and welcomed any countermeasure to improve safety, as long as it did not mean extra work for them. For example, one participant's response suggested *"anything as long as it doesn't mean more paperwork"* (Organisation 2 - male supervisor). In contrast, interviews with management from both organisations, particularly executive management, revealed a reluctance to consider work-related driving as a serious organisational workplace health and safety issue. For example, one participant stated *"it's a driver issue, not an organisational issue"* (Organisation 1 - female manager). In addition, further discussion with a senior operational manager whose performance bonus was dependent partly on the numbers of workplace health and safety incidents stated: *"do vehicle incidents have to be recorded as workplace incidents...after all they are only road accidents...what can we do"* (Organisation 2 - male manager).

Themes	Organisation 1		Organisation 2	
	Content	Examples of Participant Response	Content	Examples of Participant Response
Organisational	Work pressure; time of day travel; length of work day (fatigue); management; distractions	<i>I feel pressured to get to call outs...like I should be there yesterday (male driver)</i>	Fatigue; time pressure; management; remote area travel	<i>Working all day and was tired driving back. I wasn't concentrating and didn't see the tyre on the road (tyre blow out left on road) swerved to miss it, lost control and rear of the wagon side-swiped a tree (male driver)</i>
Individual	Inexperience; personal problems; peer pressure; sensation seeking; fatigue	<i>All the time I'm told to run yellow lights or go quicker by tradies...but they won't drive and take the risks (young male apprentice)</i>	Fatigue; sensation seeking; driving skill; distraction; driver behaviour	<i>I love to drive fast... I get bored driving slow... I am a good driver and have never had an accident (male driver)</i>
Road and Environmental Conditions	Adverse weather; unsealed roads; animals; familiarity	<i>I didn't see the roo, the sun was in my eyes (male driver)</i>	Animals; wet weather; uneven road surfaces; unsealed roads	<i>Wasn't thinking of driving and didn't see the roo till too late" (male driver)</i>
Vehicle	Visibility; suitability	<i>I drive a sedan on mainly dirt roads....some roads are shocking.... I need a 4WD but they won't give me one (male driver)</i>	Visibility; suitability	<i>The vans we drive have lousy all round visibility ... last week I reversed into a tree stump (male driver)</i>

Table 1: Themes associated with factors impacting on ability to drive safely for work

4 Discussion

This paper aimed to report on a study that examined the fleet procedures and outcomes of two large organisations that contain a considerable fleet-element. More specifically, the study reviewed the organisations' work-related road safety systems and documentation and additionally, explored qualitative data (i.e., employee interviews) to determine factors that impact on work-related drivers' ability to drive safely.

Firstly, the review indicated that both organisations' work-related driving safety policy and procedures were generally inadequate in regards to best-practice standards. Briefly, the documents highlighted an asset management approach to road safety and lacked specific information regarding work-related driving safety and issues of accountability and responsibility. Consistent with many fleet-based approaches, information within these documents only covered the steps to be completed in case of an incident/crash, operational use of vehicles and general items of road safety. Similarly, both organisations' induction programs were limited and contained insufficient information regarding work-related driving/road safety issues. Additionally, the organisations' existing fitting and optional safety features were not considered a priority, nor did they obtain advice regarding the purchase of vehicles from safety professionals nor operational staff regarding type of vehicle required for a particular task/job or available or optional safety features, etc. Occupational health and safety injury and fatality statistics indicate that work-related driving is a significant risk. Therefore, organisational practices such as work-related road safety policy and procedure development and vehicle purchasing should be given equal consideration in relation to the organisation's core daily work tasks. Organisations' should strive to develop comprehensive work-related driving organisational policy and procedures, addressing all aspects of work-related road safety. This provides employees with information on "what is expected" by them and management in relation to work-related driving safety. In turn, this may reduce the effects of the contributory factors of crashes (e.g. speed, fatigue, etc) by providing the relevant information and responsibilities necessary to enable drivers' to drive safely for work. A reduction in crashes may result in a reduction in financial costs relating to vehicle crashes and associated hidden costs.

Secondly, without the commitment and support from both management and employees a safe system relating to work-related road safety is unlikely to be effective. To establish a positive safety culture requires senior management commitment and involvement of employees, at all levels, in decision-making (Gallagher, 1997). The study suggested that management did not consider fleet safety a workplace health and safety issue or an

organisational issue. Rather, some management suggested that vehicle incidents were an individual driver issue. Wishart and Davey (2004) suggested that organisations commonly adopt a “blaming” approach when reporting, investigating and implementing interventions within the work environment. The study revealed that this approach, generally directed toward the driver of an incident, promoted a ‘do not admit liability’ culture within the organisation and appeared to contribute to failure by some employees to report incidents. Furthermore, employees cannot operate under the organisation’s policy and procedures if there are none. To encourage employee commitment organisational fleet safety policies and procedures are required to be developed, specifying accountability and responsibility, to ensure all staff are aware of what is required. In addition, without commitment the status quo remains unchanged. Therefore, management commitment (and not blaming employees) may provide direct and indirect benefits for organisations. For example, addressing the road safety problem; by committing resources targeting specific high risk areas, groups or individuals; provide direct financial and safety benefits including reduced costs (direct and hidden) due to vehicle crashes. Also, by displaying their commitment and providing resources to work-related road safety, management can have an indirect effect on the safety culture of the organisations’ by displaying to employees that they “care”.

Seljak (2002) suggested that organisations should take a risk management approach to fleet safety. This approach assists employers to meet their obligations under both occupational health and safety and road transport legislation. When developing risk assessments for the organisation, a range of hazards should be considered in relation to the driver, the vehicle and the journey, specifically including travel time in work orders (Seljak, 2002). Drivers who participated in the study perceived that work pressures and fatigue were primary factors that impacted on their ability to drive safely and contributed also to some incidents/crashes. In relation to work pressures, drivers felt that they had to utilise travel time to ‘make up time’ to meet organisational and customer demands. Examples included speeding and eating or doing paperwork while driving. Interview participants also stated that fatigue was a significant fleet safety factor. Long work hours and daily travel to and from job sites increased the risk of fatigue. In addition, drivers stated that inattention-related incidents/near misses were directly related to fatigue. For example, drivers often felt tired and as a result suffered difficulties concentrating on the driving task and road environment. Fatigue research conducted by Hartley et al. (2000) confirms the risks in this area, finding that inattention can exacerbate the incidence of fatigue-related crashes. Assessment of the risk focuses on classifying the various driving tasks within the organisation, looking at risk factors associated with journeys, vehicles and drivers to ascertain whether existing safety measures are adequate or whether more needs to be done, enabling problems to be prioritised for attention. Having identified

and prioritised the risk factors, a list of objective action plans can be developed to reduce risk at its source, addressing factors such as: vehicle selection and maintenance issues, work travel procedures, and driver selection and competence, etc. Developing work-related driving risk management practices and interventions targeting identified high risk areas not only addresses the specific safety problem but also provides financial benefits. For example, as well as reducing the hidden costs associated with vehicles crashes, the costs associated with resourcing intervention or countermeasure development and implementation are reduced by addressing the specific problem and not wasting financial support targeting low risk areas.

A further examination of the main themes to emerge from the qualitative interviews revealed that a range of individual driver characteristics were perceived to impact upon participants' ability to drive safely for work. These included inexperience, personal problems, peer pressure, sensation seeking, fatigue, distraction and driving skill. Similar to previous research (Lonerio & Clinton, 1998), the results indicate that a variety of factors impact upon the driving task as well as associated outcomes. As a result, fleet interventions designed to improve driving safety may benefit from incorporating a multi-modal approach that considers a range of factors that may impact upon the driving task. While it is recognised that the formulation of interventions that incorporate a range of fleet-safety risk factors are difficult to both develop and implement, the advantages in regards to reducing the personal and financial costs are clear. Alternatively, the results indicate that tailoring interventions to meet the specific needs of organisations has comparative advantages, although such initiatives need to be matched with effective baseline measuring that accurately capture drivers' behaviours and attitudes.

Interestingly, the final two themes incorporate a mixture of environmental elements, focusing on either the driving environment and/or the vehicle. Firstly, interview participants reported a lack of familiarity with road condition as a factor contributing to vehicle incidents. Drivers are frequently required to perform work outside their usual designated work areas because of increased work demands or illness of other staff, etc. Crashes have occurred, primarily on rural gravel roads, due to sudden changes in road condition. This may be a case of not driving to suit the road conditions, for example, speeding and aggressive driving on gravel roads. Subsequently, fleet-safety measures should be considered regarding induction and familiarisation of drivers with other work areas, outside peak work periods. Secondly, participants identified poor visibility from vehicles (due to vehicle load and equipment) and suitability of vehicles as significant influences on fleet safety. As a result, inspection into the design of vehicle rear storage space could be undertaken to ascertain if rear vision can be improved, which can be an organisational workplace health and safety initiative.

Furthermore, from the current systems analysis it was revealed that the organisation purchased most vehicles based on the cheapest quote. It was noted also by interview participants that some vehicles purchased were not suitable for the work to be performed or road terrain travelled. Research conducted by Anderson & Plowman (1999) suggested that a best practice organisation selects vehicles not on cost alone, rather takes into account potential beneficial safety features. Therefore, the organisation could consider additional safety features and vehicle suitability when selecting/purchasing new vehicles, especially where off road travel is undertaken. This may have a further “flow on effect” in relation to safety and economical issues by reducing the seriousness of injuries in the event of a crash. For example, reduced personal and financial costs associated with injury, rehabilitation, and less absenteeism (etc).

The study indicates that a single countermeasure, such as, driver training used by both organisations may not be the most effective method to reduce work-related driving incidents. Rather, the organisation may benefit from the introduction of targeted proactive driver behaviour-based interventions. An overarching influence on any intervention implemented within fleet settings is the need for such countermeasures to be brief, as historically, fleet managers as well as company drivers have little time to devote to safety initiatives. Given the importance of time management within fleet environments, the current research team recognise there is a clear need for brief interventions that demand little resources and can be completed without intense management supervision. Taken together, there are clear alternatives to intensive “larger-scale” interventions that are both costly in regards to time and money. Rather, brief interventions that focus specifically on “at risk” behaviours or people have the potential to create the same level of change in a less costly manner.

5 Conclusion

This study identified a number of opportunities to improve work-related driving within an organisational setting. The existing research and evidence identified within this study suggests that a multi-modal approach should be adopted and encouraged across organisations. Historically, organisations have adopted a reactive approach to work-related road safety and usually focus on a single countermeasure, for example, skills based driver training, in an attempt to improve the organisation’s fleet safety (Wishart & Davey, 2004). This may not only be financially expensive, but also may not address the specific safety problem. This study concerns work-related road safety and as such a single countermeasure is likely to have limited impact and therefore valuable resources and finance is wasted.

Rather, organisations need to adopt a proactive multiple strategy approach and target organisational systems and cost and resource effective intervention strategies, aimed at not only a work-related road safety system but also behavioural and cultural aspects of the organisation. Therefore, the organisations' can incorporate both safety and savings within their work-related road safety regime. In contrast to the quote made by Hauer (1994) within the Introduction, this research implies that the road safety risks are not small and with a small increase in financial support, in relation to road safety practices and targeted interventions, organisations' may in fact provide greater financial benefits. This would be due to a reduction in work-related road crashes, reduced injuries/fatalities and substantial reduction in hidden financial costs.

6 References

Anderson, W. & Plowman, B. (1999). An integrated approach to fleet safety in the workplace. Paper presented at the *1999 Insurance Commission of Western Australia Conference on Road Safety 'Green Light for the Future'*,
www.transport.wa.gov.au/roadsafety/Facts/papers/contents.html

Collingwood, V. (1997). Promoting the safe driving policy in New South Wales fleets of 20 or more vehicles. In STAYSAFE 36: Drivers as workers, vehicles as workplaces: Issues in fleet management. (Report No. 9/51). Ninth report of the Joint Standing Committee on Road Safety of the 51st Parliament. Sydney: Parliament of New South Wales.

Corbin, J., & Straus, A. (1990). Grounded theory method: procedures, canons and evaluative criteria. *Qualitative Sociology*, 13, 3-21.

Davey, J. & Banks, T. (2005). Estimating the cost of work motor vehicle incidents in Australia. Paper presented at the *2005 Research, Policing and Education Conference*, New Zealand.

Downs, C., Keigan, M., Maycock, G. & Grayson, G. (1999). The safety of fleet car drivers: A review (TRL Report 390) Crowthorne, Berkshire: Transport Research Laboratory.

Gallagher, C. (1997). *Health and Safety Management Systems: An Analysis of System Types and Effectiveness*. National Key Centre in Industrial Relations, Monash University, Melbourne.

Hartley, L.R., Penna, F., Corry, A. & Feyer, A.M. (2000). *Comprehensive Review of Fatigue Research*. Report Number 116: Institute for Research in Safety and Transport.

Haworth, N., Tingvall, C. & Kowadlo, N. (2000). Review of best practice fleet safety initiatives in the corporate and/or business environment (Report No. 166). Melbourne: Monash University Accident Research Centre, www.general.monash.edu.au/MUARC/rptsum/es166.htm

Hauer, E. (1994). Can one estimate the value of life or is it better dead than stuck in traffic? *Transportation Research*, 28(2), 109-118.

Hoskins, K. (2003). Fleet vehicle safety management case study. *Safety In Australia*, 25(1), pp. 25-29.

Jorgensen, D.L. (1989). *Participant observation a methodology for human studies*. Newbury Park: Sage Publications Inc.

Lonero L.P. and Clinton K.M. (1998). *Changing road user behaviour: What works, what doesn't*. Toronto: PDE Publications.

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

National Occupational Health and Safety Commission. (1998). Work-related traumatic fatalities in Australia, 1989 to 1992. Summary Report. Sydney: National Occupational Health and Safety System.

Patton, M.Q. (1987). *How to use qualitative methods in evaluation*. New Park: Sage Publications.

Seljak, R. (2002). Workplace health and safety in the road transport industry: a sleeping giant. Paper published in the proceedings of the *Symposium on Work-related road trauma and fleet risk management in Australia*, published in April 2002.

Smith, K. (2003). *A Qualitative Study of Deterrence and Deviance in a Group of Recidivist Drink Drivers*. Unpublished Masters Manuscript. University of Canberra, Australia.

Stewart-Bogle, J.C. (1999). Road Safety in the Workplace. The likely savings of a more extensive road safety training campaign for employees. Paper presented at the *Insurance Commission of Western Australia Conference on Road Safety 'Green Light for the Future'*, www.transport.wa.gov.au/roadsafety/Facts/papers/contents.html

Strauss, A.L. (1987). *Qualitative analysis for social scientists*. Cambridge, UK: Cambridge University Press.

WA. (2003). Road Safety in the Workplace. Seven steps to safer use of company cars and light vehicles, www.transport.wa.gov.au/roadsafety/Facts/workplace/workbook/index.html

Wheatley, K. (1997). An overview of issues in work-related driving. In *Staysafe 36: Drivers as workers, vehicles as workplaces: Issues in fleet management*. (Report No. 9/51). Ninth report of the Joint Standing Committee on Road Safety of the 51st Parliament. Sydney: Parliament of New South Wales.

Wishart, D. & Davey, J. (2004). A research based case study approach to the development of fleet safety interventions in large vehicle fleets. Paper presented at the *Safety in Action Conference*, 30 March-1 April 2004, Melbourne.

Yin, R.K. (1993). *Applications of case study research*. Newbury Park: Sage Publications.