

Development of a proactive brief road safety intervention for industry: Identifying issues associated with implementation

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Abstract

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). Furthermore, work-related crashes account for up to 49% of work-related fatalities in Australia (NOHSC, 1998), and 13% of the national road toll (Murray, Newnam, Watson, Davey & Schonfeld, 2003). Consequently, there is a growing necessity to implement proactive interventions aimed at reducing crash occurrence and improving driver behaviour whilst maintaining time, cost and resource effectiveness. Based on previous brief intervention techniques used successfully in the health care field, a driving diary concept was developed with aims to reduce engagement in unsafe driving practices. This paper draws together findings from focus group research of government work-related drivers (n = 217) across Queensland metropolitan and regional areas. Results of the study will outline intervention objectives and conceptual characteristics, as well as, investigate issues and difficulties associated with the driving diary program implementation. This paper will further report on the major advantages and barriers associated with fleet safety interventions and propose recommendations directed at improving the implementation of fleet safety interventions, especially, the driving diary program.

Keywords

Work-related drivers, fleet drivers, driver behaviour, driving diary

Introduction

In Australia, it is estimated that approximately a third of all travel is work-related and if work-related commuting is included in calculations, this estimation increases to over a half (Wheatley, 1997). Not surprisingly, evaluations conducted reveal that vehicle crashes comprise a substantial proportion of all work-related fatality figures. For example, data from the Australian National Occupational Health and Safety Commission (NOHSC) showed that approximately 23% of all work-related fatalities between 1989-1992 were the result of road crashes at work and a further 26% of fatalities were whilst commuting to and from work (NOHSC, 1998). It was, however, suggested that this figure was underestimated because the coronial data that was utilised in the examination was incomplete. In the state of Queensland, recent research has reported that around 37% of all fatal vehicle crashes between the years 1997-2000 involved a commercial vehicle (Meers, 2002). The number of workers compensation claims between the years 1996-2001, also showed that 203 claims were made for fatal work-related crashes which represents 47% of all workplace fatal incidents for that period (Travelsafe, 2002). In addition, research indicates that work-related drivers have an increased road/travel exposure. For example, Lynn and Lockwood (1998) conducted a survey in work-related driving and found that company drivers travelled more than twice the annual distance than private car drivers travelled. Furthermore, from reported incident statistics revealed in the survey, Lynn and Lockwood (1998) suggested that after differences in

demographic and exposure variables had been considered, company car drivers had about 50% more incidents than private drivers.

In regards to the economic cost, previous estimations have indicated that the total cost of work-related road incidents in Australia was in the vicinity of \$1.5 billion (Wheatley, 1997). More recent evidence has suggested that the average total insurance cost of a fleet incident to organisations and society is approximately \$28,000 (Davey & Banks, 2005), while the average cost of a fatal crash in the general Australian motoring community is estimated to be \$2 million (Austroads, 2006). While there are obvious costs related to work crashes such as vehicle and property repairs, there are also many hidden expenses including third party costs, workers compensation, medical costs, rehabilitation, customer related costs, increased insurance premiums, administrative costs, legal fees and loss of productivity (Haworth, Tingvall, & Kowadlo, 2000). Taken together, it is acknowledged the true figures are currently unclear, and available evidence appears to suggest that the direct cost of work-related crashes is only the 'tip of the iceberg' (Murray et al., 2003). As a result of fatality/injury statistics, the cost of work-related crashes, offences and increased road exposure, it could be argued that work-related drivers are a high risk road user. In addition, research highlights work-related road safety as an area that requires further attention with a focus on developing research informed interventions aimed at improving road safety outcomes, and in turn, offering huge financial savings to industry and the community (Haworth et al., 2000; Murray et al., 2003; Staysafe 36, 1997).

Occupational Health and Safety legislation

Arguably the most significant effect upon work-related driving has been the increasing focus on the issue from a legal perspective within Australia. Under all Occupational Health and Safety (OHS) acts, employers have a duty of care to ensure safe and healthy workplaces (which include vehicles) and conditions of work. In addition, it is the responsibility of the employing organisation to ensure their driving activities do not present a hazard to the community. Recent changes to the road transportation industry laws including the introduction of Chain of Responsibility (COR) laws may also have a significant impact upon future work-related driving (Murray et al., 2003). COR laws regard all parties involved in the supply chain equally responsible for the safety of each other and the overall event. In other words, responsibility is shared by all parties including consignors, packers, loaders, receivers and not just drivers and operators of vehicles. While there is a trend toward national standards regarding OHS processes, particularly crash investigation, responsibility for developing and implementing risk management policies and procedures related to work-related road safety currently rests with individual employers. As a result, the quality and extent of policy and procedure and countermeasure implementation related to work-related road safety across organisations is variable.

Need for brief interventions

A variety of work-related road safety initiatives have been implemented in recent years to reduce the highlighted costs of work-related driving incidents. For example, existing initiatives employed by organisations to reduce crashes typically focus on fleet safety policies and procedures, driver training, driver education and incentives (Haworth et al., 2000; Lancaster & Ward, 2000; Murray et al., 2003). However, an overarching influence on any intervention implemented within work-related driving settings is the need for such countermeasures to be brief, as historically, 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. The term, 'brief intervention' is an umbrella term that originated from a family of therapeutic techniques such as Milton Erickson's seminal works on brief therapy. When brief therapy originated, it represented a departure from the traditional worldview of the nature and treatment of psychological problems as it was not aimed at finding a cure for problems but rather trying to identify and mobilise client resources, energy and skills aimed at doing something to change the current status quo (Cade & O'Hanlon, 1993).

Barriers to implementing safety countermeasures

Historically in terms of exploring and implementing fleet safety interventions, industry has often taken a "silver bullet" approach aimed at developing and implementing a single countermeasure or intervention strategy to encompass and address all work-related road safety issues (Wishart & Davey, 2004). This approach is often reactive rather than proactive which aims to only reduce similar incidents but also is aimed at improving behaviour. Davey, Freeman, Wishart and Rowland (2008) state that one shortcoming with a reactive approach is that often times the single implemented countermeasure results in only a short term fix and does not address the underlying contributing behavioural factors relating to the crash. Thus the organisation embarks on a circular process similar to a "dog chasing its tail" and may not demonstrate significant improvement in their work-related road safety records over time. Furthermore, the silver bullet approach is no longer used in other areas of road safety, as research would suggest that intervention approaches need to be proactive and multi-dimensional (Davey et al., 2008). In addition, Davey et al. (2008) suggest that the current state of work-related road safety has many organisations not addressing the work-related road safety issue as comprehensively as other work-related safety risk issues within their workplace. For example, organisations often allocate more safety related resources to lower exposure and lower workplace risk processes in contrast to the high exposure and high risk of work-related driving.

In attempting to satisfy legislated OHS requirements, organisations will plan the development of work-related road safety intervention strategies. However, the reality within the majority of organisations is that they often struggle to implement such interventions. The failure to effectively implement fleet safety interventions often stems from a lack of management commitment and support, and general under-resourcing (Davey et al., 2008; Davey & Wishart, 2004). Thus there is an immense discrepancy between what organisations plan to do and what is actually undertaken in addressing work-related road safety risks and initiatives. Furthermore, Davey et al. (2008) suggest that there are a number of additional organisational difficulties that impact upon the successful implementation of fleet-based interventions. For example, these include:

- A tendency to focus on asset management rather than on employee safety;
- Fleet safety is rarely considered to be a core business issue;
- There is often a lack of resources allocated to work-related road safety;
- OHS and fleet safety are historically viewed as separate and often competing issues;
- Organisations do not always see an instant monetary return;
- Fleet safety is often overlooked until a crash happens; and
- Organisations rely heavily on inconclusive and insufficient crash data.

Research aims

As an initial component of a PhD study, this preliminary research aimed to explore the characteristics behind the development of the driving diary brief intervention and associated difficulties with implementation. More specifically, the study aimed to:

- a) outline the intervention objectives and conceptual characteristics of the driving diary brief intervention program; and
- b) explore qualitative data (i.e., focus groups) to identify barriers to the implementation of the driving diary within industry.

Method

The method utilised within this conceptual paper is divided into two phases. Phase 1 outlines the initial development of the Driving Diary. Due to the originality of the Driving Diary in the road safety arena, the authors believe that a detailed outline of the intervention and its development was warranted. Phase 2 identifies preliminary information on the potential barriers to intervention implementation within an industry organisation. Barriers can hinder or prevent an intervention's successful implementation and completion. Therefore, identification of the major barriers to intervention implementation was conducted to inform potential changes to content of the current version of the Driving Diary and also identification of potential methods for initial intervention implementation and continual facilitation.

Phase 1 – The driving diary concept

Phase 1 of the paper provides an overview of the driving diary concept, theoretical perspectives and the design process. Data collected for this phase of the project was summarised from an extensive literature review of road safety research and relevant research conducted in other areas in relation to intervention design and implementation. Basically, the driving diary is a brief intervention designed primarily to target high risk drivers that have been identified through traffic infringements, especially speeding, and work-related crashes. The intervention aims to reduce the incidence of dangerous driving practices committed by the employee through the use of a diary. The employee records in the diary the type and frequency of traffic violations they commit, and is then required to reflect and comment on their behaviour. Based on the Transtheoretical Model (DiClemente & Prochaska, 1998) of behaviour change, it is through this increased awareness that employees perceive themselves at increased risk, thereby facilitating their progress towards behaviour change.

Phase 2 – Focus group interviews

Focus groups were conducted as a component of a series of workshops undertaken with organisational staff from metropolitan and regional areas across the state of Queensland. A predefined set of semi-structured and open-ended questions aimed to explore participants' perceptions and experiences in relation to work-related road safety and barriers to the completion of the driving diary. The structured open-ended questions were employed as the researcher had a limited period of time with participants. 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 barriers that are associated with work-related driving intervention implementation.

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. 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 a second researcher independently identify themes and then code responses according to themes obtained from participant responses. The researchers collaborated on each of their results and subsequently developed themes from the sample. Reliability of coding between researchers on the sample indicated a 91% level of accuracy between coding responses according to the themes identified. This level of accuracy was achieved by computing the total number of agreements of coded responses between the two researchers divided by the total number of agreements plus disagreements of both researchers. Minor corrections were then made to the coding scheme and/or the coding of participants. The researcher subsequently re-read and re-coded the transcripts in order to make the necessary changes that resulted from the coding exercise with the second researcher.

Focus group participants

In total, 217 work-related drivers provided data through semi-structured, qualitative interviews for this research. Focus group interviews were undertaken with employees, ranging from field staff to management, in both major urban metro areas and provincial and regional centres across Queensland. Participants all volunteered to partake in the focus group sessions and stated that they drive a vehicle as a component of their work. The participants were not specifically targeted as high risk drivers from within their organisation. Rather, a random sample of work-related drivers was engaged representing drivers from across an organisation that drive in city, urban, rural and off road situations. As stated previously, work-related drivers could be considered as high risk road users due to the identified fatality and injury statistics, the costs associated with crashes and offences and increased exposure to the road. Focus group participant’s comments are identified in the text through the use of quotation marks and italics. The names of the focus group participants were not recorded, and the various organisational departments and regions where the interviews took place and the name of the organisation remain confidential.

Results

Phase 1

The driving diary

The driving diary is based upon brief intervention techniques used successfully in the health care arena over the last twenty years, and thus the tool aims to reduce engagement in unsafe driving practices. A common example is a drinking diary which requires respondents to keep a record of how many standard drinks they consume in a week (Ryder et al., 1995). Diaries have been found to assist people tackle a wide range of health problems including reducing harmful levels of drinking (Ryder et al., 1995), smoking cessation (Jasjit et al., 1998) and have also been found to be beneficial in weight loss programs (Schmitz & Wiese, 2006). Generally, the research evidence on the effectiveness of brief interventions that has been systematically reviewed has been favourable (Heather, 2002). While it is acknowledged that the diary concept is not new, the use of a diary as a behaviour change strategy in a work-related road safety setting is novel.

Theoretical perspectives

Recipients of brief interventions are often at various stages of readiness to change. One theoretical approach that details these stages of change is known as the Transtheoretical Model of Behaviour Change (DiClemente & Prochaska, 1998). The model proposes that individuals move through five behavioural change stages before successfully ceasing a problem behaviour. These stages are:

- **Precontemplation** – No acknowledgment that there is a problem
- **Contemplation** - Acknowledgement that there is a problem but not ready to change
- **Preparation** - preparing to change
- **Action** – making changes
- **Maintenance** – maintaining changes

The model underpins a number of prominent public brief intervention health initiatives (diabetes, weight control, cancer prevention) as brief interventions have been demonstrated to instigate a natural change process from pre-contemplation to contemplation to action. Given the utility and predictive efficacy of the Transtheoretical Model, this theoretical underpinning was also utilised in the driving diary.

Another major component of many brief interventions such as drinking diaries, is a self-assessment of the nature and extent of current risky behaviour. The most common assessment tool is the AUDIT (Alcohol Use Disorders Identification Test AUDIT) (Who, 1996). The AUDIT assists in identification of excessive drinking behaviour and consists of ten questions designed to interpret the risk level of alcohol (Babor & Higgins-Biddle, 2001). The score levels are indicative of relative risk levels which have different implications for the type of intervention suggested. For example, no or low risk scoring individuals may only require some form of alcohol education whereas those who scored slightly higher and were of greater risk would require more specific alcohol advice. Those at higher risk levels would require more involved interventions ranging from intense advice to specialist referral (Babor & Higgins-Biddle, 2001). Examination of the AUDIT effectiveness literature reveals that it has been rigorously validated (Maisto et al., 2000). From a practical perspective, it also appeared to be relatively short, easy to understand and administer. Consequently, the research team

decided to incorporate an AUDIT-style approach within the driving diary to assess driving risk.

Consequently, after reviewing the general brief intervention and health promotion literature, the research team decided to develop an intervention tool that incorporates common key aspects from various successful initiatives within the health field such as an assessment of risk procedure (e.g., AUDIT) and use of a diary, with the overall intervention being guided by the Transtheoretical Model.

Diary content and design

The concept of the driving diary evolved from a larger body of research aimed at work-related road safety and the associated issues experienced by work-related drivers. From this research, it became evident that a number of additional more contemporary issues such as work pressures and multi-tasking (e.g., mobile phone use) were directly impacting upon the safety of drivers (Freeman et al., 2007, Rowland et al., 2008). In contrast, the research projects also revealed that traditional factors do not accurately account for a high proportion of the predictability of crashes (Freeman et al., 2007) or offences incurring demerit point loss (Freeman et al., 2007, Rowland et al., 2008) in the Australian fleet setting.

The current version of the driving diary consists of approximately 20 pages of information regarding (a) the importance of improving road safety and (b) material highlighting the procedures for completing the corresponding driving diary. The first section (e.g., 4 pages) outlines the importance of road safety, the responsibility of every road user, and why it should be the concern for employers and employees e.g., obligation and duty of care. The next section in the driving diary (2 pages) focuses on the “Challenge to Change” and provides some reasons for why someone would benefit from taking the time to examine how they perceive their driving behaviour. As highlighted in Table 1, the section also begins incorporating the concept of “risky driving behaviours” by highlighting a range of such behaviours (e.g., speeding, not wearing a seat belt, drink driving, etc) and asks respondents to start thinking about and identifying their own risky behaviours.

Table 1. *The Challenge to Change* (Wishart, Davey, Freeman & Rowland, 2007)

You may believe that due to your training and experience you are a good driver and possess better driving skills than the ‘average’ driver. You may never have been involved in a crash while driving for work. However, there may have been times, where you have found yourself:

- *exceeding the speed limit without realising*
- *driving without wearing your seat belt*
- *driving while under time pressure*
- *driving while using a hand-held mobile phone*

We will refer to these driving behaviours as “risky behaviours”. You may think of others which you can write below in the space provided.

Driver self assessment and motivation to change

Modelled on the AUDIT tool, the third section focuses on “Assessing Your Risky Driving Behaviours” and requires respondents to answer 10 questions that focus on the frequency and severity of the behaviour. Respondents are then required to total their responses to the items which provide an overall score highlighting their category of risk: (a) low-moderate, (b) high and (c) serious. The section also explains the possible risks associated with each category, discusses the benefits of change and requires participants to provide their own perceived possible benefits to commencing the change process e.g., reduce demerit point loss or reduce risk of harm.

This section also includes three questions related to readiness or motivation to change, confidence about making change and level of importance assigned to the behaviour change process. It is expected that the driving diary will assist drivers move through the various stages of change suggested by the stages of change model in relation to changing unsafe driving behaviours. Therefore, for both practical and research purposes, an initial assessment of motivation to change is undertaken.

Introducing the driving diary

The final section introduces the concept of the driving diary, outlines the process and highlights the importance of motivation and confidence both in regards to remaining on task and creating behavioural change. Filling out the diary requires respondents to make notes on how often they carry out unsafe and risky driving behaviours and take note of situations in which they have a tendency to engage in these behaviours more often than others. The section also reinforces that users need to fill in their diary on a daily basis, either during the day while on breaks, just before they are about to get out of the car, or at the end of the day. Taken together, there is no special induction in relation to the implementation of the driving diary program. However, research suggests that it would be beneficial if a brief workshop or induction program (e.g., explanation) is provided to participants at the commencement of the intervention to remind drivers of how the driving diary is congruent with the company’s policies and strategies to encourage safe driving (Davey, Rowland, Wishart, & Freeman 2008a; Wishart et al., 2007).

The instruction material also highlights that respondents will need to review what they have written on a daily basis. It is anticipated that daily completion of the driving diary would take participants approximately 10 minutes each day, usually at the end of the work day. Importantly, one of the primary aims is to identify when and where high risk driving behaviours occur and what feelings and emotions are associated with the event. By engaging in this process it is anticipated that participants will gain a greater level of understanding regarding their driving habits and high risk times, which will ultimately help them improve their own driving behaviour. Table 2 highlights an example of the driving diary and typical responses to the task.

Table 2. *Driving Diary Example* (Wishart et al., 2007)

	Behaviour	Where	When	What happened	How do you feel	What could I have done differently
DAY 1	Speeding	On Highway	6.00pm	I was speeding on the way home	Annoyed, frustrated and tired	Slowed down and thought of arriving safely
DAY 1	Cut drivers off	City	2.00pm	Rushing to next client and was late	Stressed	Phoned ahead and advised of new arrival time/ review schedule

Phase 2 – Focus group responses

Responses to questions relating to the barriers to the driving diary completion were comprehensive, with some common recurring issues emerging. In addition, interviews with participants revealed two primary themes relating to the barriers to the driving diary completion. For example, the two themes represent organisational and individual barriers to the completion of the driving diary.

Organisational theme

The organisational theme represents responses regarding the barriers to intervention implementation in relation to organisational structure and processes, and managerial processes and perceptions. General consensus from operational field type staff was that any countermeasures or interventions (relating to the driving diary) would need to be both time and cost effective or they would not be implemented by management. For example, *“if it takes too long to do or it costs too much, management won’t run with it”* (male driver) and *“the (organisation) put in place things to improve road safety in the past, for example, driver training, but have not followed through with it ...I wasn’t asked to take part”* (female driver). Encouragingly, in relation to intervention implementation, most managerial staff believed some form of countermeasure or intervention was urgently required for work-related driving safety. However, management also had initial concerns regarding the cost and time needed to develop and implement specific road/driver safety interventions within their organisation. For example, a male manager stated that *“we have a specified budget and timeframe for completion of work tasks...we cannot afford staff to be away from the workplace for any period of time or spend excessive time on intervention processes which takes valuable time from their usual work activities”*.

Interestingly, interviews with some management and/or supervisors, particularly executive management, revealed a reluctance to consider work-related driving as an organisational issue (n = 3). For example, one participant stated *“it’s the drivers who are not doing the right thing, it’s not an organisational problem”* (male manager). In addition, managers generally had reservations regarding whether all staff would attempt or subsequently complete the driving diary program. For example, *“I know the staff ... if you don’t make them do it they won’t bother”* (male supervisor). In contrast, some managerial staff (n = 6) believed that they are not required to participate within the driving diary program (or any other intervention) because they believed that they were safe drivers and that the intervention should be directed toward staff. For example, *“I have an impeccable driving history ...I don’t need to undertake the program”* (male manager) and *“I have been known to speed a little but I do it when it is safe to do so... I know when it is risky ...the intervention should be targeted to the field staff”* (male supervisor) and *“I don’t have time each day to partake in the program”* (male manager).

Individual theme

The individual theme identified responses by individual drivers in relation to barriers/issues that hindered the implementation of road safety interventions, particularly the driving diary. Generally, operational drivers viewed work-related driving as a Workplace Health and Safety issue and welcomed any countermeasure to improve safety. However, a number of participants also stated they would attempt any intervention as long as it did not mean extra work for them. For example, one participant’s response suggested *“I am willing to try any safety measure as long as it doesn’t mean more paperwork for me”* (male driver). Likewise,

drivers stated that there was not enough time in the day to complete their work tasks as well as the required daily paperwork. For example, “*we have too much paperwork already ... no time to do work*” (male driver) and “*I’m sick and tired of doing more paperwork ... we never used to have to do as much as we are doing these days*” (male driver). Due to revised systems within the organisation, the amount of paperwork has increased compared to previous years. Additional, paperwork (e.g. job completion worksheet, incident reports, etc) were introduced throughout the organisation as a requirement of Quality Assurance, Workplace Health and Safety legislation and Environmental legislation, etc.

A small number of drivers (n = 11) indicated that they did not believe they are required to complete the driving diary program. This was primarily due to their perception of past safe driving history. However, three drivers suggested that they could not be bothered to attempt the driving diary program because they did not have a problem (in relation to work-related driving). For example, “*couldn’t be bothered ... I don’t have a driving problem, I’ve never had an accident*” (male driver). In addition, a number of drivers stated that they would attempt the driving diary program but may not complete it for the specified ten days. Furthermore, within the organisation there are issues in relation to poor literacy of some drivers, especially from rural and/or remote areas. Most of these drivers, although not admitting their literacy issues, did state that they would complete the program by mentally reviewing their driving day. For example, “*I may not complete the driving diary in written form but will go over my driving performance at the end of the day each day*” (male driver – rural area).

Discussion

A primary aim of brief interventions is to convince recipients of the potential harmful aspects of their behaviour and encourage them to change (Heather, 2002). Furthermore, one of the best arguments for the implementation of brief interventions, especially evident within the health care sector, is that such interventions can be time and cost effective methods for behaviour change. Therefore, the aim of Phase 1 of the current paper was to highlight the initial development and characteristics of a driving diary brief intervention tool designed for work-related road safety settings. It is anticipated that the tool will provide drivers with information about safe driving behaviours and strategies to overcome bad habits, which will ultimately encourage behavioural change. Generally, the driving diary aims to not only improve driver safety but also to empower and motivate drivers to maintain changes so that they are less likely to fall back into inappropriate driving habits and behaviours.

The driving diary is based on the brief intervention concept, and draws on well-validated and effective assessment and intervention concepts such as the AUDIT and Transtheoretical Model of Change. As a result, it is anticipated that creating change within work-related driving environments will not necessarily be a linear process, but may involve relapse and recycling before termination of unwanted behaviours is achieved. Taken together, it is anticipated that the driving diary will provide information that helps individuals think about their driving and give them a rationale for changing unsafe behaviour and implementing safe driving behaviour. The driving diary is not designed to be a “silver bullet” but rather utilised as part of a multi-dimensional and proactive course of interventions/countermeasures designed to specifically target work-related road safety within the organisation. In addition, a benefit of the driving diary is that drivers can complete the intervention autonomously and at their own pace. Therefore, the demographic location of staff (e.g., city, urban or rural) does not pose a barrier to the intervention implementation or completion. Contact details are included within

the driving diary booklet if a driver requires any assistance in regards to the completion of the driving diary.

Phase 2 aimed to explore the barriers to the implementation of the driving diary by work-related drivers. This was undertaken by analysis of qualitative data, specifically focus groups, within an organisation with a large vehicle fleet. The response by focus group participants was generally positive in regards to completion of the driving diary program. However, there were a number of identified barriers to the completion of the driving diary program. For example, a number of participants identified work/time pressures as well as a substantial amount of current work-related paperwork to be completed as the primary barrier for completing the driving diary program. In addition, some drivers stated their good driving history as a reason for potentially not completing the driving diary program. Furthermore, it was also noted that the literacy of some participants would also hinder completion of the driving diary. Consequently, a workshop designed to convey work-related road safety information, the importance of road safety and the benefits of the driving diary is recommended to be facilitated before implementation of the driving diary. Potential strategies can be devised at the workshop to address barriers to the driving diary completion.

Management generally stated that they believed some form of countermeasure or intervention was urgently required for work-related driving safety. However, some management stipulated publicly that they were not going to participant within the driving diary program. Potentially this does not convey a sense of teamwork within the organisation or in the least promote a good impression to staff. Management have previously stated that some form of road safety countermeasure or intervention was urgently required. However, if managers do not provide commitment and support (e.g., “walk the talk”) it demonstrates to staff that perhaps management do not recognise work-related road safety as a high risk. This may hinder completion of the driving diary by the organisation’s drivers. Therefore, ensuring management commitment and support is an integral process in the successful completion of all interventions (Davey & Wishart, 2004), including the driving diary.

The anticipated limitations of the tool are that individuals may not devote the necessary time to sufficiently complete the allocated tasks and that an adequate workshop or brief induction program will not be permitted to be implemented. Nevertheless, this work-related road safety countermeasure may prove to make a practical contribution to road safety in the work-related arena and thus assist in reducing the tremendous burden of road crashes on the Australian community.

Conclusion

In summary, this paper has highlighted some of the major design concepts and characteristics of the driving diary. The driving diary is a cost, time and resource effective intervention designed to assist behaviour change in work-related drivers. Additionally, the paper has identified some of the major barriers to the effective implementation of the driving diary initiative (as well as other interventions) and discussed the value of a proactive multi-modal approach to improving safety within organisations. Furthermore, the effectiveness of work-related road safety programs are likely to improve through organisations and researchers working collaboratively to encourage both management and staff commitment and ensure work-related road safety intervention strategies are specifically targeted to meet the needs of organisations. The paper suggests that the driving diary intervention’s successful implementation can only be achieved with management commitment and support. Many of

the barriers to implementation, such as, time, support for drivers to complete the daily task, and realisation that work-related road safety is an important issue could be alleviated with full management commitment and support. Observations and research conducted with organisations that have successful safety programs also have full management commitment. In addition, to overcome additional barriers due to driver inadequacies or attitudes towards their own driving safety and organisational issues could be alleviated with the introduction of a short workshop. The workshop could be utilised as an additional intervention informing drivers and management of the importance of road safety, the risks, the reasoning behind the intervention, details regarding implementation and further discuss strategies to alleviate the effect of barriers to intervention implementation.

However, it remains of concern that organisations are reluctant to adequately resource and implement work-related road safety interventions that have been tailored to reduce their specific work-related road safety risks. Despite such difficulties, continued efforts to develop, implement and evaluate effective work-related road safety interventions and consequently communicate and consult with all staff during the implementation process can ultimately contribute to the reduction in the burden of work-related road trauma.

References

- Austrroads (2006). *Guide to Road Safety, Part 1: Road Safety Overview*. Sydney, Australia.
- Babor, T.F. & Higgins-Biddle, J.C. (2001). *Brief intervention: For hazardous and harmful drinking. A manual for use in primary care*. World Health Organisation.
- Cade, B. & O'Hanlon, W. (1993). *A brief guide to brief therapy*. New York: WW Norton Co.
- 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 Policing and Education Conference New Zealand. [CD-ROM].
- Davey, J., Freeman, J., Wishart, D. & Rowland, B. (2008). Developing and implementing fleet safety interventions to reduce harm: where to from here? Paper to be presented at *International Symposium on Safety Science and Technology, Beijing*.
- Davey, J., Rowland, B., Wishart, D. & Freeman, J. (2008a). *Townsville Taxis Post Intervention Survey Final Report*. CARRS-Q, Unpublished Manuscript.
- DiClemente, C.C. & Prochaska, J.O. (1998). Toward a comprehensive, transtheoretical model of change: Stages of change and addictive behaviors. In: Miller, W. R. and Heather, N., (Eds). *Treating addictive behaviors*. 2nd edition. New York: Plenum.
- Freeman, J., Davey, J., & Wishart, D. (2007). A study of contemporary modifications to the Manchester Drivers Behaviour Questionnaire for organizational fleet settings. *Paper to be presented at the Third International Driver Behaviour and Training Conference, Dublin*.

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

Heather, N. (2002). Effectiveness of brief interventions proved beyond reasonable doubt. *Addiction*, 97(3): 293-294.

Jasjit, A.S., McNagny, S.E., & Clark, S.W. (1998). Smoking cessation among inner-city African Americans using the nicotine transdermal patch. *Journal of General Internal Medicine*. 13(1): 1-8.

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

Lancaster, R. & Ward, R. (2000). *Management of work-related road safety*. HSE Publication. London:HMSO.

Lynn, P. and Lockwood, C. (1998). The accident liability of company car drivers (TRL Report 317). Crowthorne, Berkshire: Transport Research Laboratory.

Maisto, S.A., Conigliaro, J., McNeil, M., Kraemer, K., & Kelley, M.E. (2000). An empirical investigation of the factor structure of the AUDIT. *Psychological Assessment*, 12 (3): 346-353.

Meers, G. (2001). Queensland crash data on work-related crashes and injuries. Symposium conducted at the *Work-related Road Trauma and Fleet Risk Management in Australia*, Brisbane, Australia.

Murray, W., Newnam, S., Watson, B., Davey, J. & Schonfeld, C. (2003). *Evaluating and improving fleet safety in Australia*. Australian Transport Safety Bureau.

NOHSC. (1998). *Work-related fatalities of road-workers, involved in road construction or road maintenance in Australia, 1989 to 1992*. Sydney: National Occupational Health and Safety Commission.

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

Rowland, B., Davey, J., Freeman, J. & Wishart, D. (2008). *The Influence of Driver Pressure on Road Safety Attitudes and Behaviours: A Profile of Taxi Drivers*. Paper presented at 18th Canadian Multidisciplinary Road Safety Conference, Whistler, Canada.

Ryder, D., Lenton, S., Blignault, I., Hopkins, C., & Cooke, A. (1995). *Drinkers Guide to Cutting Down and Cutting Out*, Drug and Alcohol Services Council, Adelaide.

Schmitz, B., & Wiese, B. (2006). New perspectives for the evaluation of training sessions in self-regulated learning: Time-series analyses of diary data. *Contemporary Educational Psychology*, 31(1): 64-96.

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

Staysafe36. (1997). *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.

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.

Travelsafe. (2002). *Report on the Symposium on Work-Related Road Trauma and Fleet Risk Management in Australia*. (Report No. 34). Travelsafe Committee of the 50th Parliament, Brisbane.

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. and 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.

Wishart, D., Davey, J., Freeman, J., & Rowland, B. (2007). *Creating Behavioural Change Through a Driving Diary: Designing and Implementing a Theory Based Brief Intervention to Improve Fleet Safety*. Paper presented at 3rd International Road Safety Conference, Perth, WA.

World Health Organization (1996). Brief intervention study group. A cross-national trial of brief interventions with heavy drinkers. *American Journal of Public Health*, 86,948–955.

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